

1992 Mazda 323 Protegé Workshop Manual

FOREWORD

This workshop manual is intended for use by service technicians of Authorized Mazda Dealers to help them service Mazda vehicles.

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.

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**Mazda Motor Corporation
HIROSHIMA, JAPAN**

APPLICATION:

This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN) shown on the following page.

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VEHICLE IDENTIFICATION NUMBERS (VIN)

PROTEGÉ

JM1 BG223 * NO 400001 ~
JM1 BG224 * NO 400001 ~
JM1 BG225 * NO 400001 ~
JM1 BG226 * NO 400001 ~

3-DOOR HATCHBACK

JM1 BG231 * NO 400001 ~
JM1 BG232 * NO 400001 ~
JM1 BG233 * NO 400001 ~

GENERAL INFORMATION

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IMPORTANT INFORMATION**BASIC ASSUMPTIONS**

This workshop manual assumes that you have certain special tools that are necessary for the safe and efficient performance of service operations on Mazda vehicles and that you know how to use them properly. It also assumes that you are familiar with automobile systems and basic service and repair procedures. You should not attempt to use this manual unless these assumptions are correct and you understand the consequences described below.

SAFETY RISK

This manual contains certain notes, warnings, and other precautionary information that you should carefully read and follow to reduce the risk of personal injury to yourself or others and the risk of improper service that may damage the vehicle or render it unsafe. If there is no such information in regard to any specific service method, this does not mean there is no possibility that personal safety or vehicle safety will be jeopardized by the use of incorrect methods or tools.

POSSIBLE LOSS OF WARRANTY

The manufacturer's warranty on Mazda vehicles and engines can be voided if improper service or repairs are performed by persons other than those at an Authorized Mazda Dealer.

WARNING ON LUBRICANTS AND GREASES

Avoid all prolonged and repeated contact with mineral oils, especially used oils. Used oils contaminated during service (e.g., engine sump oils) are more irritating and more likely to cause serious effects, including skin cancer, in the event of gross and prolonged skin contact.

Wash skin thoroughly after work involving oil.

Protective hand cleaners may be of value provided they can be removed from the skin with water. Do not use gasoline, paraffin, or other solvents to remove oil from the skin.

Lubricants and greases may be slightly irritating to the eyes.

Repeated or prolonged skin contact should be avoided by wearing protective clothing if necessary. Particular care should be taken with used oils and greases containing lead. Do not allow work clothing to be contaminated with oil. Dry clean or launder such clothing at regular intervals.

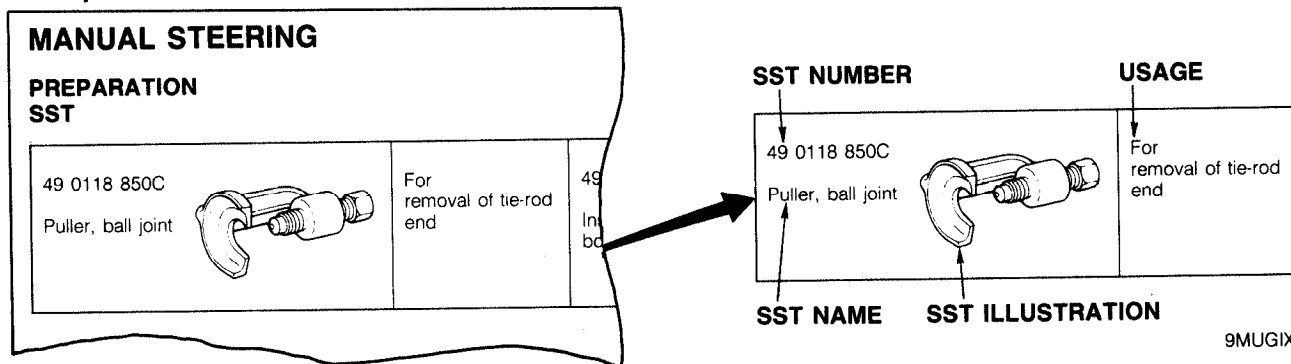
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HOW TO USE THIS MANUAL

PREPARATION

PREPARATION points out the needed **Special Service Tool (SST)** for the service operation that it proceeds. Gather all necessary **SST** before beginning work.

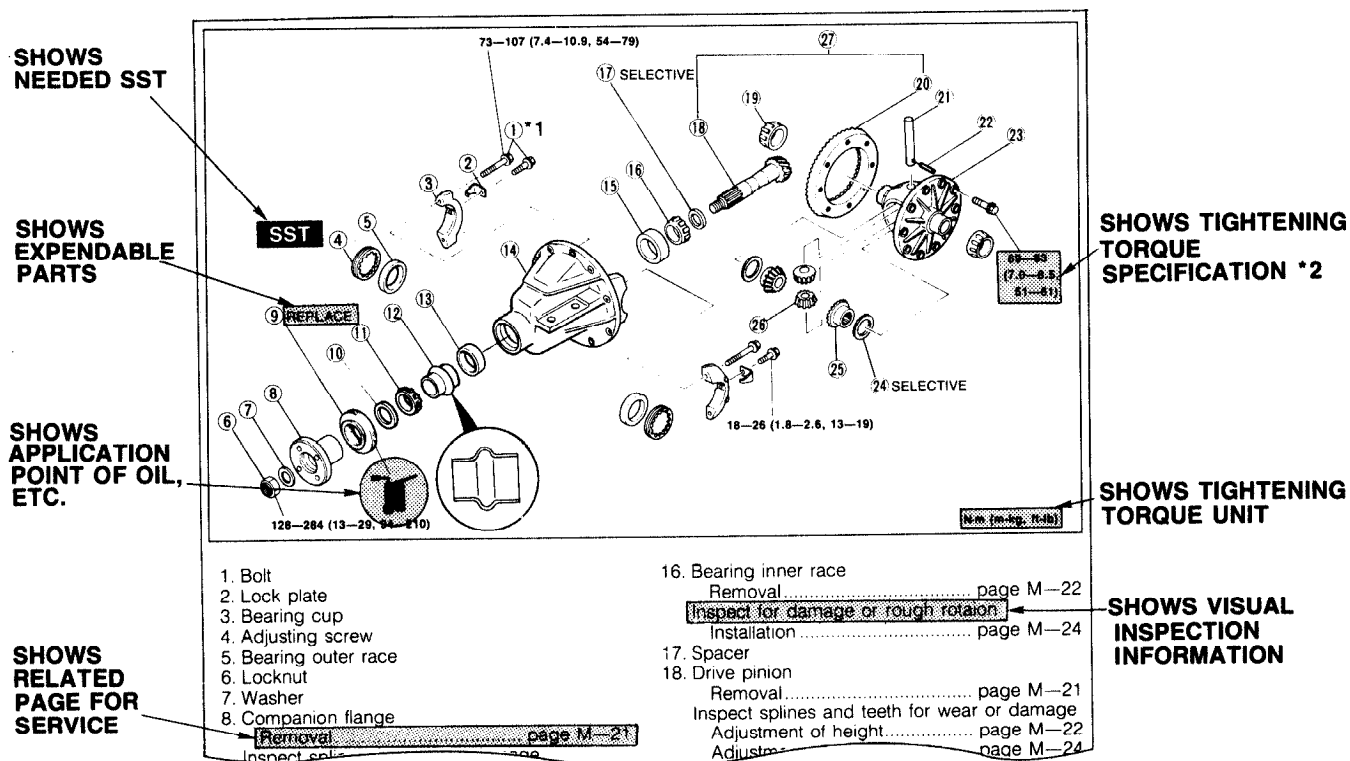
Example:



REPAIR PROCEDURE

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and visual parts inspections. If a damaged or worn part is found, repair or replace it as necessary.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration.
3. Pages related to service procedures are shown under the illustration. Refer to this information when servicing the related part.







Example:



*1: The numbering (ex. ①) shows service procedure.
 *2: Units shown in N-m (m-kg, ft-lb) unless otherwise specified.

SYMBOLS

There are six symbols indicating oil, grease, and sealant. These symbols show the points of applying such materials during service.

Symbol	Meaning	Kind
	Apply oil	New engine oil or gear oil as appropriate
	Apply brake fluid	Only brake fluid
	Apply automatic transaxle fluid	Only ATF
	Apply grease	Appropriate grease
	Apply sealant	Appropriate sealant
	Apply petroleum jelly	Appropriate petroleum jelly

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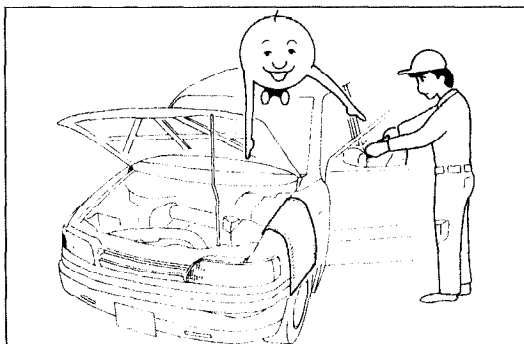
Note

- When special oil or grease is needed, this is shown in the illustration.

NOTES, CAUTIONS, AND WARNINGS

As you read through the procedures, you will come across NOTES, CAUTIONS, and WARNINGS. Each one is there for a specific purpose. **NOTES** give you **added information** that will help you to complete a particular procedure. **CAUTIONS** are given to prevent you from making an error that could **damage the vehicle**. **WARNINGS** remind you to be especially careful in those areas where carelessness can cause **personal injury**. The following list contains some general WARNINGS you should follow when you work on a vehicle.

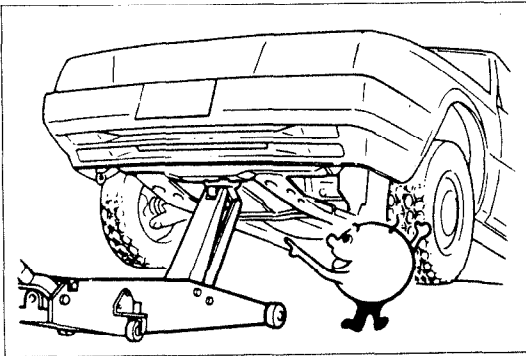
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9MUGIX-037

FUNDAMENTAL PROCEDURES**PROTECTION OF THE VEHICLE**

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



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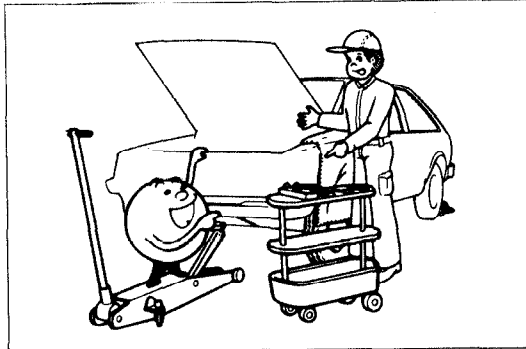
A WORD ABOUT SAFETY

The following precautions must be followed when jacking up the vehicle.

1. Block the wheels.
2. Use only the specified jacking positions.
3. Support the vehicle with safety stands.

Start the engine only after making certain the engine compartment is clear of tools and people.

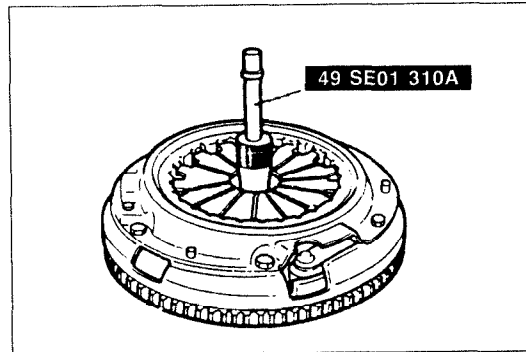
GI



9MUGIX-038

PREPARATION OF TOOLS AND MEASURING EQUIPMENT

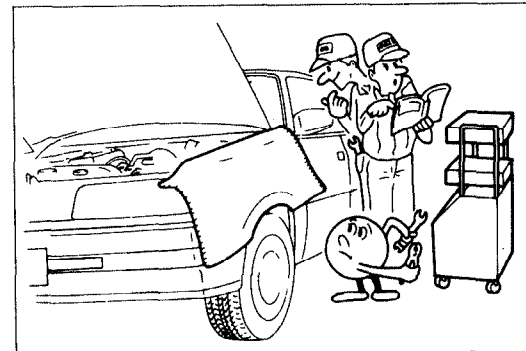
Be sure that all necessary tools and measuring equipment are available before starting any work.



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SPECIAL TOOLS

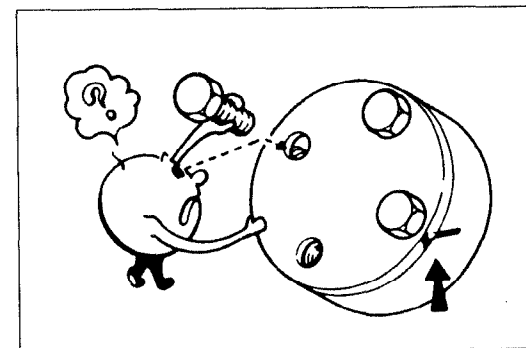
Use special tools when they are required.



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REMOVAL OF PARTS

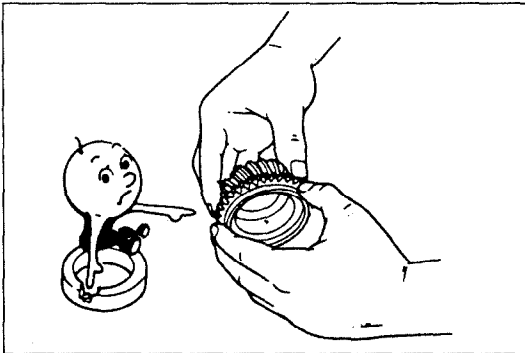
While correcting a problem, try also to determine its cause. Begin work only after first learning which parts and subassemblies must be removed and disassembled for replacement or repair.



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DISASSEMBLY

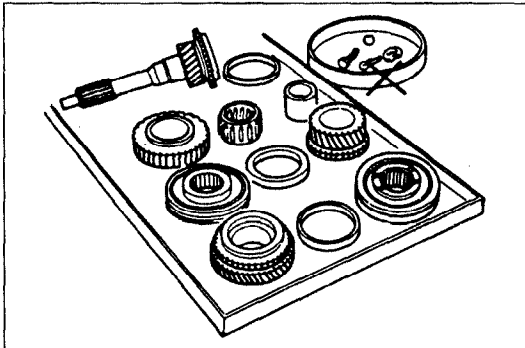
If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be disassembled in a way that will not affect their performance or external appearance and identified so that reassembly can be performed easily and efficiently.



9MUGIX-040

1. Inspection of parts

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

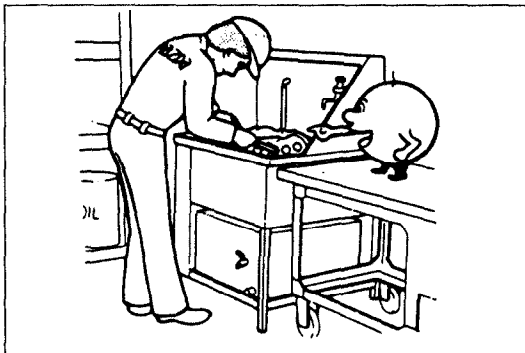


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2. Arrangement of parts

All disassembled parts should be carefully arranged for re-assembly.

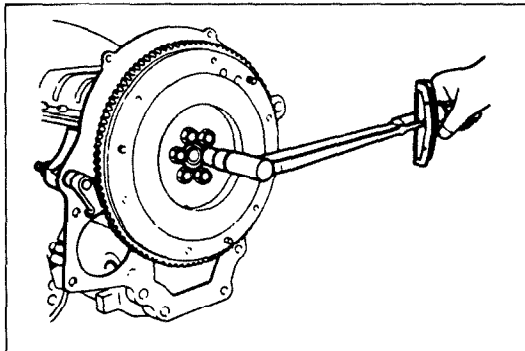
Be sure to separate or otherwise identify the parts to be replaced from those that will be reused.



47U0GX-010

3. Cleaning parts for reuse

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



9MUGIX-004

REASSEMBLY

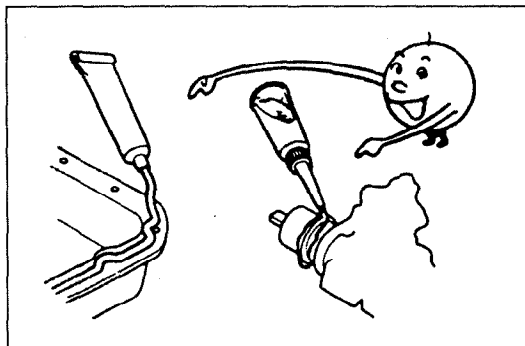
Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts. Refer to STANDARD BOLT AND NUT TIGHTENING TORQUE in Section TD for tightening torques not mentioned in the main text.

If removed, these parts should be replaced with new ones:

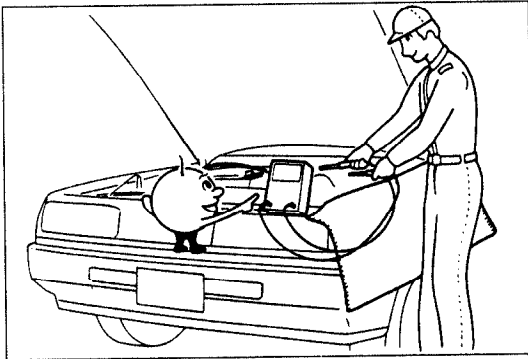
- | | |
|----------------|-----------------|
| 1. Oil seals | 2. Gaskets |
| 3. O-rings | 4. Lock washers |
| 5. Cotter pins | 6. Nylon nuts |

Depending on location:

1. Sealant should be applied or new gaskets used.
2. Oil should be applied to the moving components of parts.
3. Specified oil or grease should be applied at the prescribed locations (such as oil seals) before reassembly.



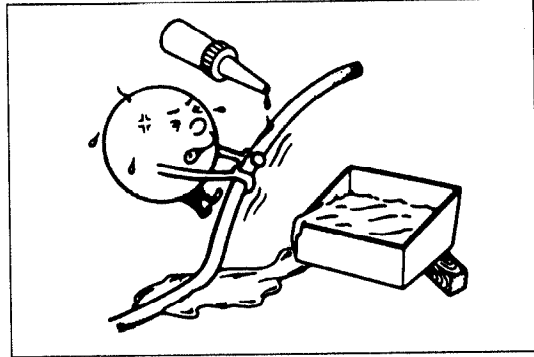
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ADJUSTMENTS

Use suitable gauges and/or testers when making adjustments.



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RUBBER PARTS AND TUBING

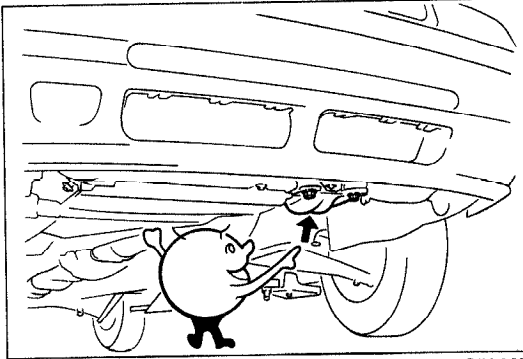
Prevent gasoline or oil from getting on rubber parts or tubing.

JACK AND SAFETY STAND POSITIONS

FRONT END

Jack position:

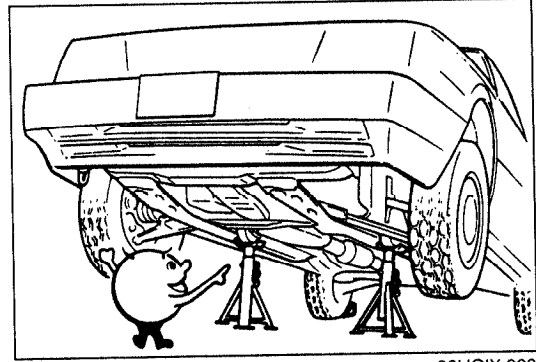
At the front crossmember



03UGIX-007

Safety stand positions:

On both sides of the body frame

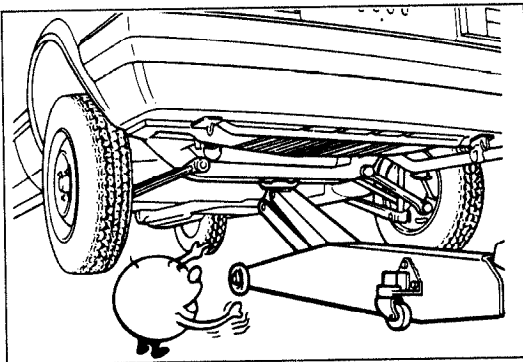


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REAR END

Jack position:

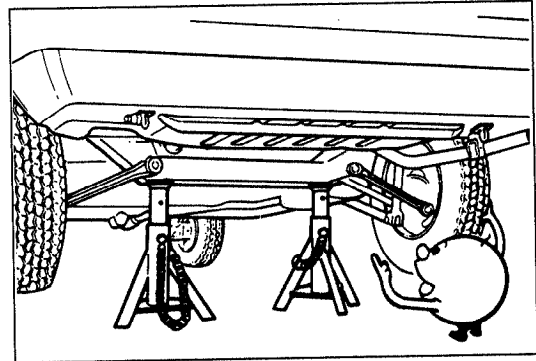
At the center of the rear crossmember



23UGIX-002

Safety stand positions:

On both sides of the body frame



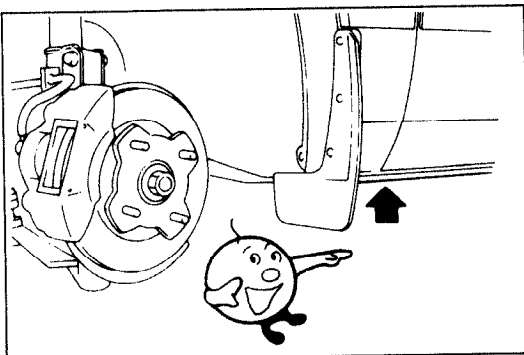
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VEHICLE LIFT (2-SUPPORT TYPE) POSITIONS

FRONT END

Frame

Side sills

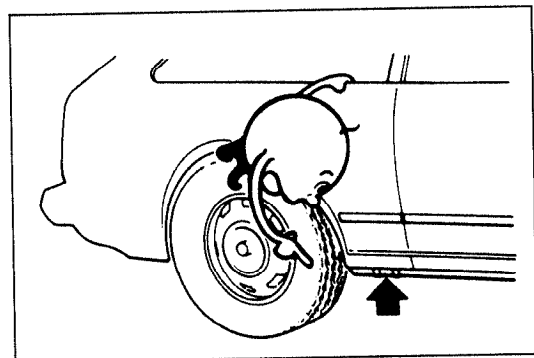


9MUGIX-010

REAR END

Frame

Side sills



9MUGIX-011

TOWING

Proper towing equipment is necessary to prevent damage to the vehicle.

Laws and regulations applicable to vehicles in tow must always be observed.

As a general rule, towed vehicles should be pulled with the driving wheels off the ground. If excessive damage or other conditions prevent towing the vehicle with the driving wheels off the ground, use wheel dollies.

With either automatic or manual transaxle:

1. Set the ignition switch in the ACC position;
2. Place the selector lever or shift lever in N (Neutral);
3. Release the parking brake.

Caution

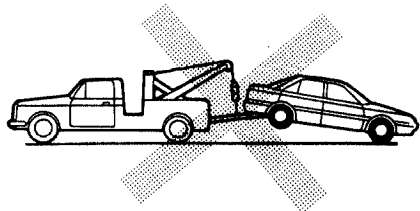
- **Do not tow the vehicle backward with driving wheels on the ground. This may cause internal damage to the transaxles.**
- **Do not use the hook loops under the front and rear of the vehicle for towing purposes. These hook loops are designed ONLY for transport tie-down. If tie-down hook loops are used for towing, the front/rear bumper will be damaged.**



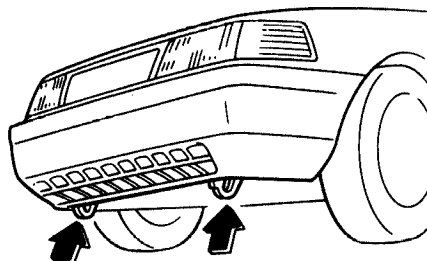
WHEEL DOLLIES



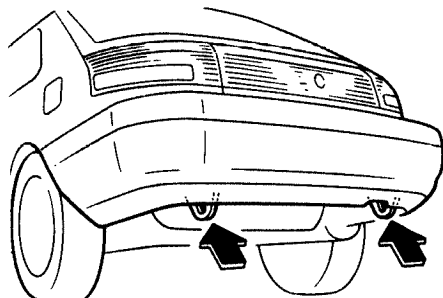
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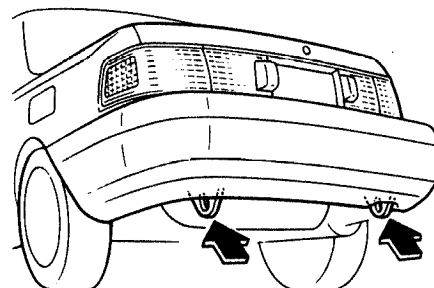
TIE-DOWN HOOKS — FRONT



TIE-DOWN HOOKS — REAR (HATCHBACK)

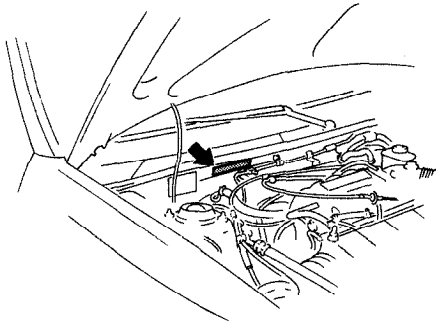


TIE-DOWN HOOKS — REAR (PROTEGÉ)

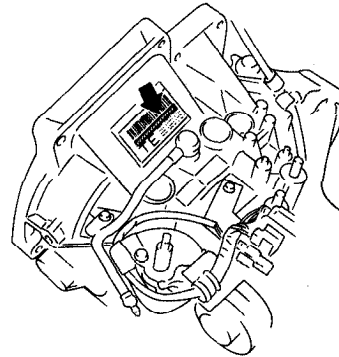


IDENTIFICATION NUMBER LOCATIONS

VEHICLE IDENTIFICATION NUMBER (VIN)

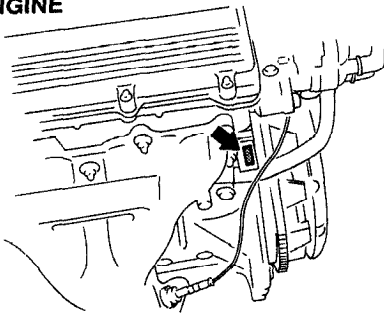


AUTOMATIC TRANSAXLE MODEL AND NUMBER

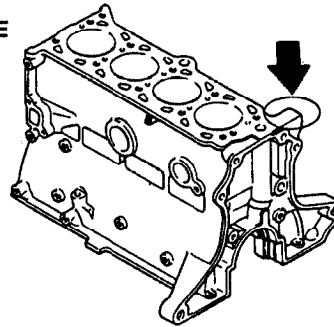


ENGINE MODEL AND NUMBER

BP ENGINE



B6 ENGINE



9MUGIX-015

UNITS

N·m (m·kg or cm·kg, ft·lb or in·lb)	Torque
rpm	Revolutions per minute
A	Ampere(s)
V	Volt(s)
Ω	Ohm(s) (resistance)
kPa (kg/cm ² , psi)	Pressure (usually positive)
mmHg (inHg)	Pressure (usually negative)
W	Watt
liters (US qt, Imp qt)	Volume
mm (in)	Length

89U0GX-006

ABBREVIATIONS

ABDC	After bottom dead center
A/C	Air conditioner
ACC	Accessories
ATX	Automatic transaxle
ATDC	After top dead center
ATF	Automatic transaxle fluid
BBDC	Before bottom dead center
BTDC	Before top dead center
CPU	Central processing unit
DOHC	Double overhead camshaft
DRL	Daytime running lights
EC-AT	Electronically-controlled automatic transaxle

ECU	Engine control unit
EGI	Electronic gasoline injection
E/L	Electrical load
EX	Exhaust
GND	Ground
HLA	Hydraulic lash adjuster
IGN	Ignition
IN	Intake
INT	Intermittent
ISC	Idle speed control
LH	Left hand
M	Motor
MIL	Malfunction indicator lamp
M/S	Manual steering
MTX	Manual transaxle
OD	Overdrive
OFF	Switch off
ON	Switch on
PCV	Positive crankcase ventilation
PRC	Pressure regulator control
P/S	Power steering
RH	Right hand
SOHC	Single overhead camshaft
SST	Special service tool
SW	Switch
TNS	Tail number side
VICS	Variable inertia charging system

23UGIX-003

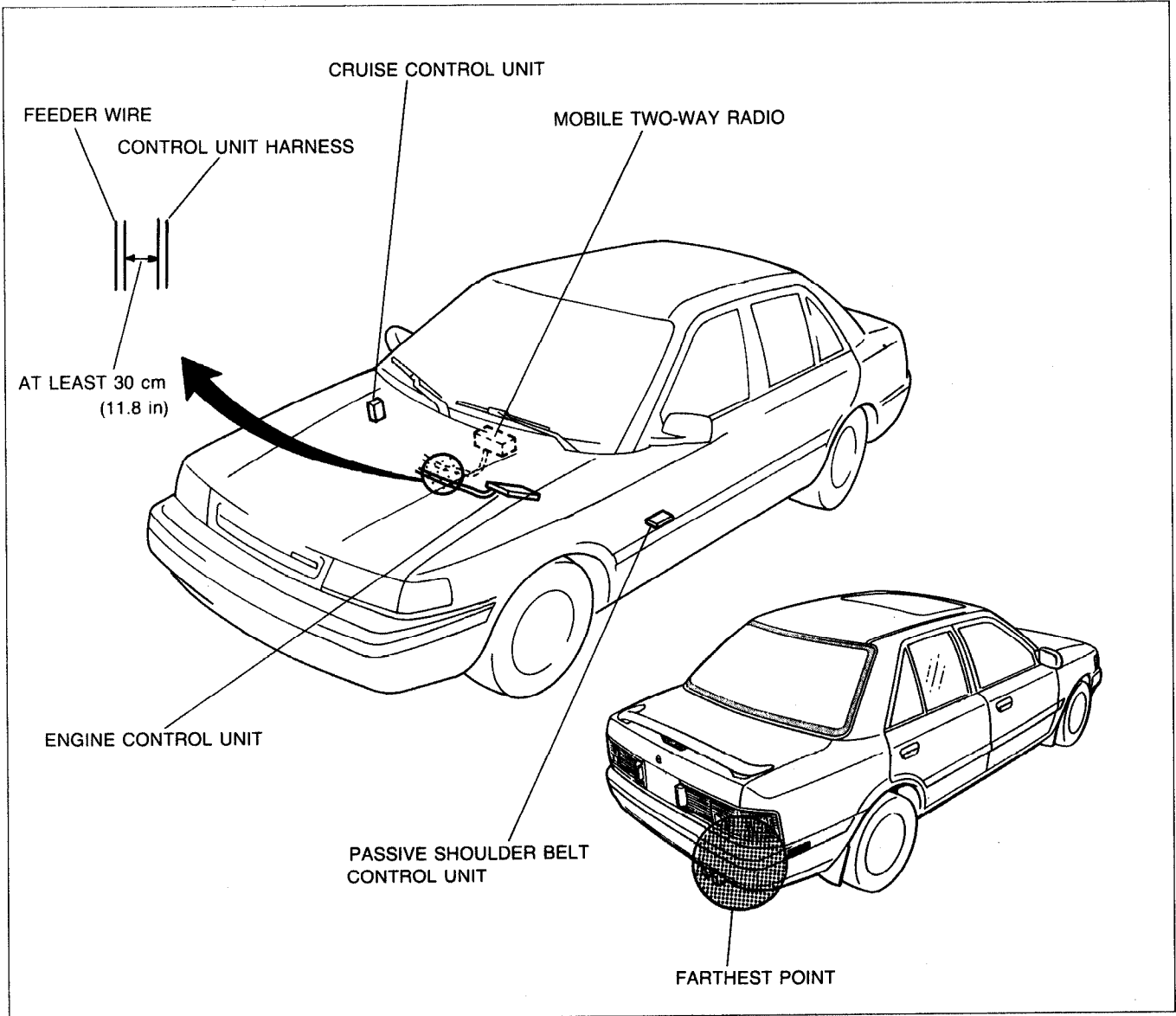
CAUTION

INSTALLATION OF MOBILE TWO-WAY RADIO SYSTEM

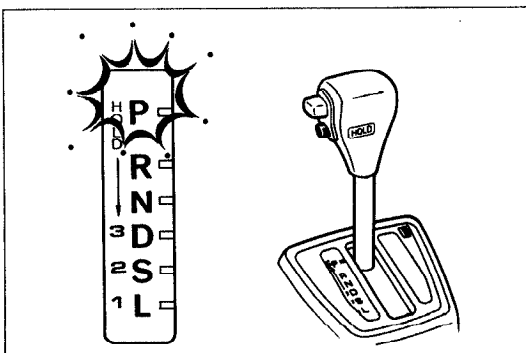
If a mobile two-way radio system is installed improperly or if a high-powered type is used, the EGI system and other systems may be affected.

When the vehicle is to be equipped with a mobile two-way radio, observe the following precautions:

1. Install the antenna at the farthest point from control units.
2. Install the antenna feeder as far as possible from the control unit harnesses (**at least 30 cm [11.8 in]**).
3. Ensure that the antenna and feeder are properly adjusted.
4. Do not install a high-powered mobile two-way radio system.



05UGIX-013



03UGIX-005

REMOVAL OF IGNITION KEY ON AUTOMATIC TRANSAXLE MODEL

The selector lever must be in P (PARK) to turn the ignition key to the OFF position. If the switch seems to be off but the key cannot be removed, the switch may still be in the ACC position, or the selector lever may not be in P (PARK). Shift the selector lever to P (PARK), and turn the ignition key to the LOCK position. The key should now be free for removal.

ELECTRICAL TROUBLESHOOTING TOOLS**Test Light**

The test light, as shown in the figure, uses a 12V bulb. The two lead wires should be connected to probes. The test light is used for simple voltage checks and for checking for short circuits.

Caution

- When checking the control unit, never use a bulb over 3.4W.

Jumper Wire

The jumper wire is used for testing by shorting across switch terminals and ground connections.

Caution

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

Voltmeter

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

Diagnosis Connector

Insert the probe into the service hole when connecting a jumper wire to the diagnosis connector.

Caution

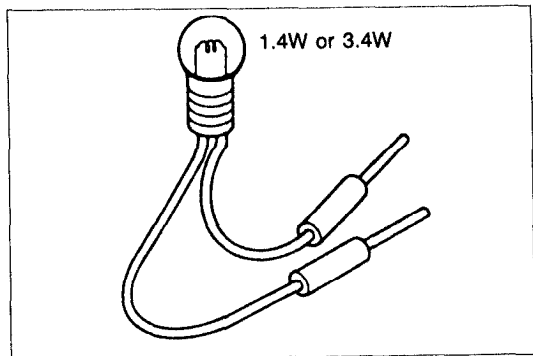
- Do not insert the jumper wire probe into the diagnosis connector terminal, which may damage the terminal.

Ohmmeter

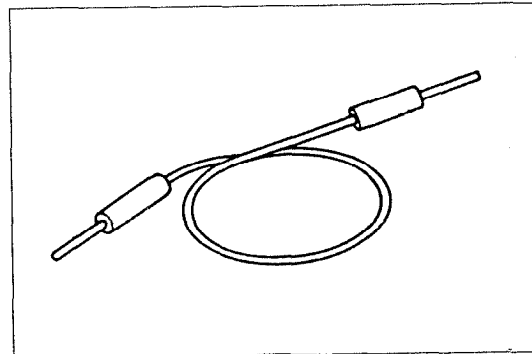
The ohmmeter is used to measure the resistance between two points in a circuit and also to check for continuity and diagnosis of short circuits.

Caution

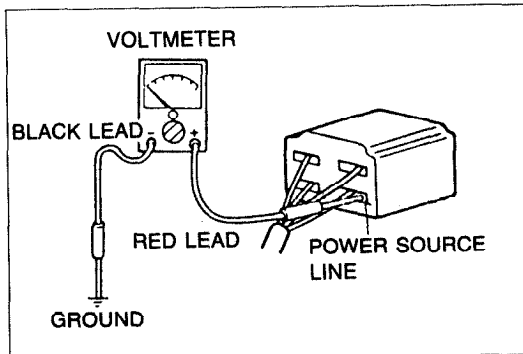
- Do not attempt to connect the ohmmeter to any circuit to which voltage is applied; this may burn or otherwise damage the ohmmeter.



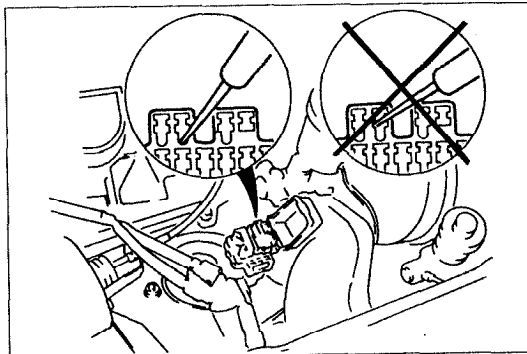
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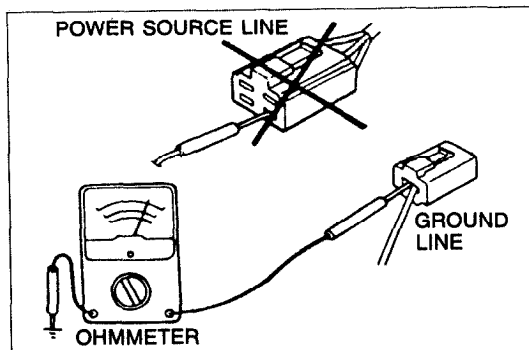
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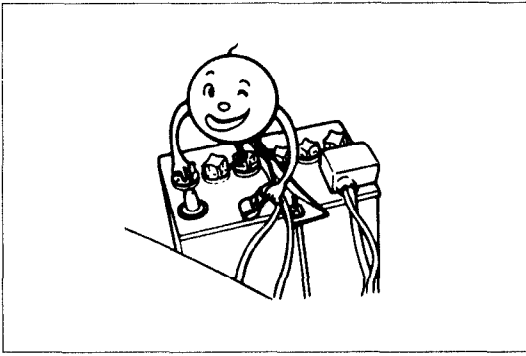
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05UGIX-021



9MUGIX-045

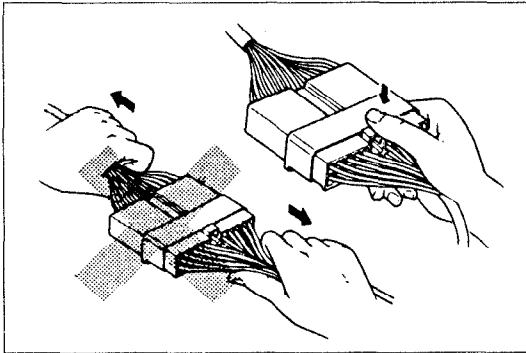


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CAUTION WITH ELECTRICAL PARTS

Battery Cable

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

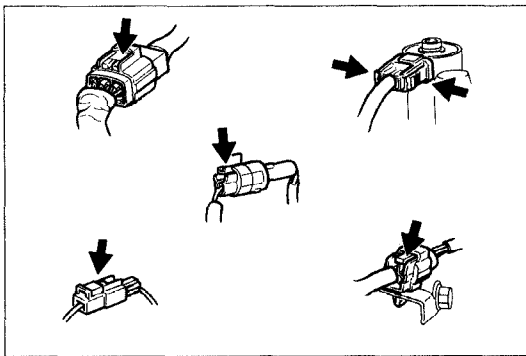


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Connectors

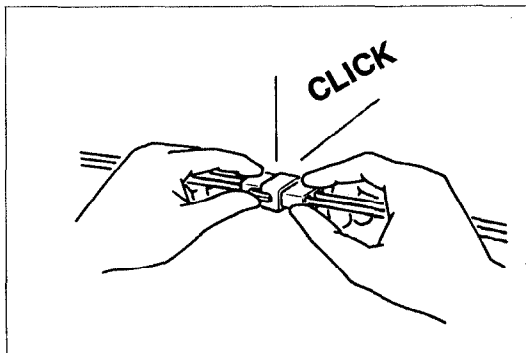
Removal of connector

Never pull on the wiring harness when disconnecting connectors.



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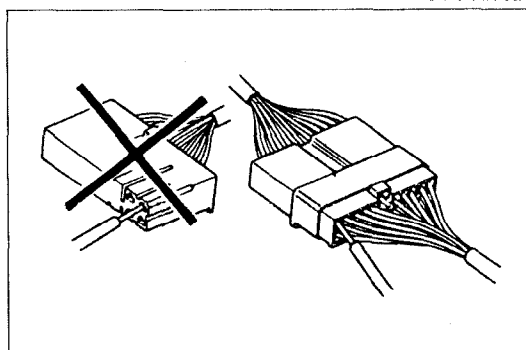
Connectors can be removed by pressing or pulling the lock lever as shown.



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Locking of connector

When locking connectors, make sure to listen for a click that will indicate they are securely locked.



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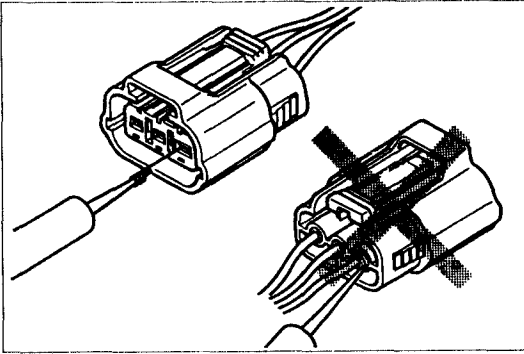
Inspection

1. When a tester is used to check for continuity or to measure voltage, insert the tester probe from the wire harness side.

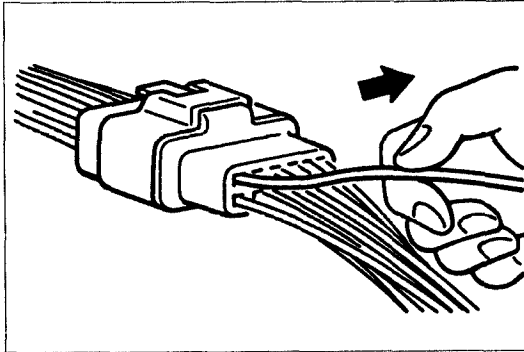
2. Check the terminals of waterproof connectors from the connector side, as they cannot be accessed from the wire harness side.

Caution

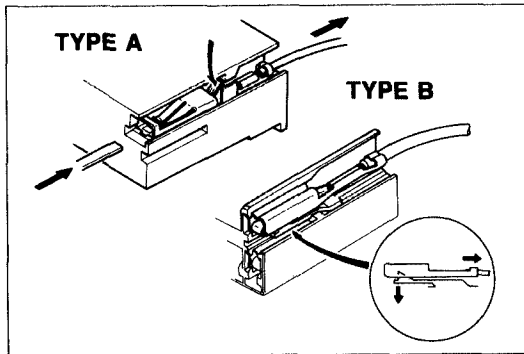
- Use fine wire to prevent damage to the terminal.
- Do not damage the terminal when inserting the tester lead.



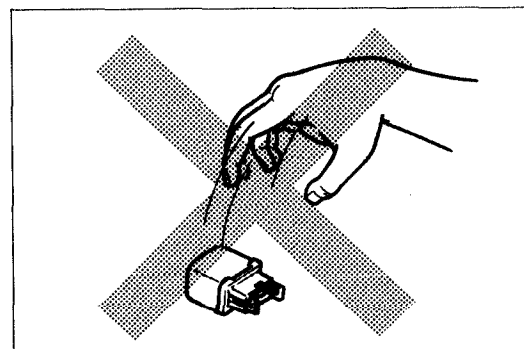
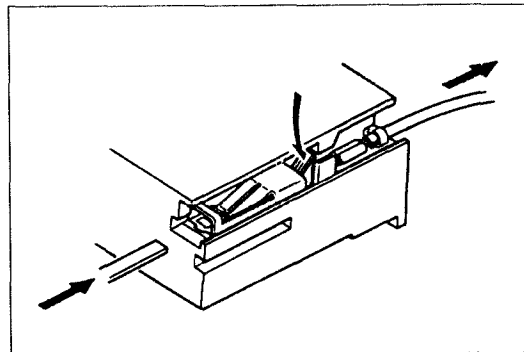
05UGIX-028



9MUGIX-027



9MUGIX-028



9MUGIX-030

Terminals

Inspection

Pull lightly on individual wires to check that they are secured in the terminal.

Replacement of terminals

Use the appropriate tools to remove the terminal as shown. When installing the terminal, be sure to insert it until it locks securely.

< Female >

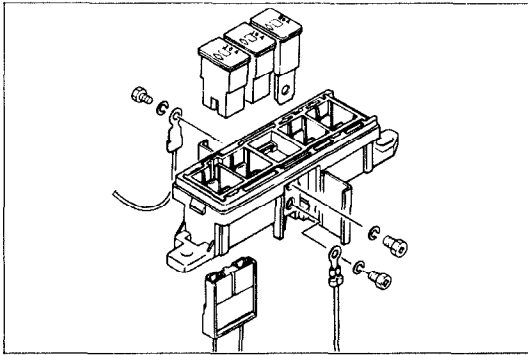
Insert a thin piece of metal from the terminal side of the connector, and then, with the terminal locking tab pressed down, pull the terminal out from the connector.

< Male >

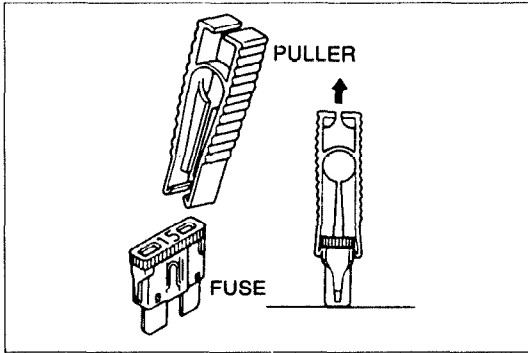
Same as the female type.

Sensors, Switches, and Relays

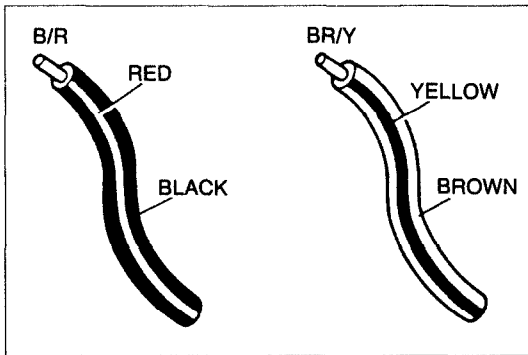
Handle sensors, switches, and relays carefully. Do not drop them or strike them against other parts.



9MUGIX-031



9MUGIX-032



9MUGIX-029

Fuse Replacement

1. When replacing a fuse, be sure to replace it with one of specified capacity.
If a fuse again fails after it has been replaced, the circuit probably has a short circuit and the wiring should be checked.
2. Be sure the negative battery terminal is disconnected before replacing a main fuse (80A).
3. When replacing a pullout fuse, use the fuse puller supplied in the fuse box cover.

**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	—	—

PRE-DELIVERY INSPECTION AND SCHEDULED MAINTENANCE SERVICES

PRE-DELIVERY INSPECTION	A- 2
PRE-DELIVERY INSPECTION TABLE	A- 2
SCHEDULED MAINTENANCE SERVICES (EXCEPT CANADA)	A- 3
SCHEDULE 1 (NORMAL DRIVING CONDITIONS)	A- 3
SCHEDULE 2 (UNIQUE DRIVING CONDITIONS)	A- 6
SCHEDULED MAINTENANCE SERVICES (CANADA)	A- 9
SCHEDULE	A- 9

23U0AX-001

Plugs NGK BKR5E-11 dealer 12/31/94 \$1.98

Air cleaner B6S7-13-240 dealer 12/31/94 \$18.14

Rotor F220-18-V05 dealer 12/31/94 12.84

Cap G609-18-V00 dealer 12/31/94 \$16.32

PRE-DELIVERY INSPECTION

PRE-DELIVERY INSPECTION TABLE

Following items may be done at any time prior to delivery to your customer.

EXTERIOR

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

- Glass, exterior bright metal and paint for damage
- Wheel lug nuts, and locks (if equipped)
88—118 N·m (9—12 m·kg, 65—87 ft·lb)
- All weatherstrips for damage or detachment
- Operation of hood release and lock
- Operation of trunk lid, rear hatch, and fuel lid opener
- With trunk open, check for spare jack, tire, tools, and fasteners securing these items in place.
- Door operation and alignment
- Headlight aim

INSTALL the following parts:

- Wheel caps or rings (if equipped)
- Outside rearview mirror(s)

UNDER HOOD—ENGINE OFF

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

- Fuel, coolant and hydraulic lines, fittings, connections and components for leaks
- Engine oil level
- Power steering fluid level
- Brake and clutch master cylinder fluid level
- Windshield washer reservoir fluid level
- Radiator coolant level
- Tightness of battery terminals
- Manual transaxle oil level

INTERIOR

INSTALL the following parts:

- Rubber stopper for inside rearview mirror

CHECK operation of the following items:

- Seat controls (sliding and reclining) and head restraint
- Folding rear seat
- Door locks, including childproof door locks (if equipped)
- Seat belts and warning system
- Ignition switch and steering lock
- Inhibitor switch (ATX only)
- Starter interlock switch (clutch pedal, MTX only)
- All lights, including warning and indicator lamps
- Sound warning system
- Horn, wipers and washers (front and rear, if equipped)
- Audio system (if equipped)

- Cigarette lighter and clock
- Sunroof (if equipped)
- Remote control outside rearview mirrors (if equipped)
- Power windows (if equipped)
- Heater, defroster and air conditioner at various mode selections (if equipped)

CHECK the following items:

- Presence of spare fuse
- Upholstery and interior finish

CHECK and **ADJUST**, if necessary, the following items:

- Pedal height and free play of brake and clutch pedal

	Pedal height mm (in)	Free play mm (in)
Clutch pedal	196—204 (7.72—8.03) (with carpet)	5—13 (0.197—0.512)
Brake pedal	193—196 (7.60—7.72)	4—7 (0.16—0.28)

- Parking brake
5—7 notches/98 N (10 kg, 22lb)

UNDER HOOD—ENGINE RUNNING AT OPERATING TEMPERATURE

CHECK the following items:

- Automatic transaxle fluid level

ON HOIST

CHECK the following items:

- 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

CHECK the following items:

- Brake operation
- Clutch operation
- Steering control
- Operation of gauges
- Squeaks, rattles or unusual noise
- Emergency locking retractors
- Cruise control system (if equipped)

AFTER ROAD TEST

CHECK for necessary owner information materials.

Following items must be done just before the delivery to your customer.

- Load test battery and charge if necessary
- Adjust tire pressure to the specification
(Refer to door label)
- Clean outside of vehicle

	Volts
Load test result	

- Install fuses for accessories
- Remove seat and floor mat protective covers
- Vacuum and clean interior of vehicle
- Inspect installation of option parts with invoice

SCHEDULED MAINTENANCE SERVICES (EXCEPT CANADA)

Follow Schedule 1 (Normal Driving Conditions) if the vehicle is mainly operated where none of the following conditions apply.
Follow Schedule 2 (Unique Driving Conditions) if any of the conditions below apply:

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

Schedule 1 (Normal Driving Conditions)

MAINTENANCE OPERATION	MAINTENANCE INTERVALS	Number of months or miles (kilometers), whichever comes first								Service data and inspection points	Page																				
		Months	7.5	15	22.5	30	37.5	45	52.5			60																			
		× 1,000 miles	7.5	15	22.5	30	37.5	45	52.5			60																			
	× 1,000 km	12	24	36	48	60	72	84	96																						
Drive belts					I				I	<ul style="list-style-type: none"> • Cracks or damage • Tension 	B1-5 B2-5																				
Engine oil		R	R	R	R	R	R	R	R	<ul style="list-style-type: none"> • Oil pan capacity B6 SOHC: 3.0 liters (3.2 US qt, 2.6 Imp qt) All BP : 3.6 liters (3.8 US qt, 3.2 Imp qt) 	D-5																				
Oil filter		R	R	R	R	R	R	R	R	<ul style="list-style-type: none"> • Oil filter capacity: 0.17 liter (0.18 US qt, 0.15 Imp qt) 	D-5																				
Engine timing belt*1		Replace every 60,000 miles (96,000 km)								—	B1-12 B2-12																				
Air cleaner element					R				R	—	F-79																				
Spark plugs					R				R	<ul style="list-style-type: none"> • Plug gap: 1.0—1.1mm (0.039—0.043 in) • Recommended spark plugs <table border="1"> <thead> <tr> <th>Engine</th> <th>NGK</th> <th>NIPPONDENSO</th> </tr> </thead> <tbody> <tr> <td rowspan="2">B6 SOHC</td> <td>BKR5E-11</td> <td>K16PR-U11</td> </tr> <tr> <td>BKR6E-11</td> <td>K20PR-U11</td> </tr> <tr> <td rowspan="2">BP SOHC</td> <td>BKR5E-11</td> <td>K16PR-U11</td> </tr> <tr> <td>BKR6E-11</td> <td>K20PR-U11</td> </tr> <tr> <td rowspan="3">BP DOHC</td> <td>BKR5E-11</td> <td>K16PR-U11</td> </tr> <tr> <td>BKR6E-11</td> <td>K20PR-U11</td> </tr> <tr> <td>BKR7E-11</td> <td>K22PR-U11</td> </tr> </tbody> </table>	Engine	NGK	NIPPONDENSO	B6 SOHC	BKR5E-11	K16PR-U11	BKR6E-11	K20PR-U11	BP SOHC	BKR5E-11	K16PR-U11	BKR6E-11	K20PR-U11	BP DOHC	BKR5E-11	K16PR-U11	BKR6E-11	K20PR-U11	BKR7E-11	K22PR-U11	G-18
Engine	NGK	NIPPONDENSO																													
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	BKR6E-11	K20PR-U11																													
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BP DOHC	BKR5E-11	K16PR-U11																													
	BKR6E-11	K20PR-U11																													
	BKR7E-11	K22PR-U11																													

Schedule 1 (Normal Driving Conditions) (Cont'd)

MAINTENANCE OPERATION	MAINTENANCE INTERVALS	Number of months or miles (kilometers), whichever comes first									Service data and inspection points	Page
		Months	7.5	15	22.5	30	37.5	45	52.5	60		
		× 1,000 miles	7.5	15	22.5	30	37.5	45	52.5	60		
		× 1,000 km	12	24	36	48	60	72	84	96		
Cooling system					I					I	<ul style="list-style-type: none"> Hoses for cracks or wear Coolant level 	E-5
Engine coolant					R					R	<ul style="list-style-type: none"> Coolant capacity: 5.0 liters (5.3 US qt, 4.4 Imp qt)..... MTX 6.0 liters (6.3 US qt, 5.3 Imp qt) ATX 	E-6
Fuel filter										R	—	F-124
Idle speed					A*2					A	<ul style="list-style-type: none"> ATX: P range, MTX: Neutral 700–800 rpm (with parking brake applied) 	F-80
Fuel lines					I*3					I	<ul style="list-style-type: none"> Fittings, connections, and components for leaks 	F-120
Brake lines, hoses and connections					I					I	<ul style="list-style-type: none"> Proper attachment and connections 	—
Clutch pedal					I					I	<ul style="list-style-type: none"> Operation Pedal height (with carpet): 196–204mm (7.72–8.03 in) Free play: 5–13mm (0.197–0.512 in) 	H-6
Drum brake					I					I	<ul style="list-style-type: none"> Wheel cylinder operation and leakage Lining for wear or damage Lining thickness: Minimum..... 1.0mm (0.04 in) Drum inner diameter Maximum..... 201mm (7.91 in) 	P-28 P-29
Disc brake					I					I	<ul style="list-style-type: none"> Caliper operation Disc plate thickness: Minimum.... Front 20mm (0.79 in) Rear 7.0mm (0.28 in) Pad thickness: Minimum.... Front 2.0mm (0.08 in) Rear 1.0mm (0.04 in) 	P-20 P-25 P-18 P-25
Steering operation and linkage					I					I	<ul style="list-style-type: none"> Operation and looseness Fluid leakage or oozing Free play.... 0–30mm (0–1.18 in) 	N-27 N-8
Front suspension ball joints					I					I	<ul style="list-style-type: none"> Damage, looseness, and grease leakage 	—
Drive shaft dust boots					I					I	<ul style="list-style-type: none"> Cracking and damage 	M-21
Bolts and nuts on chassis and body					T					T	<ul style="list-style-type: none"> Retighten all loose nuts and bolts 	—
Exhaust system heat shield					I					I	<ul style="list-style-type: none"> Insulation clearance 	F-136
Air conditioner system (if equipped)	Refrigerant	Inspect refrigerant amount annually									—	U-35
	Compressor	Inspect operation annually									—	U-39

Note

I Inspect, and if necessary correct, clean, or replace

A.... Adjust

R.... Replace or change

T.... Tighten

After 60 months or 60,000 miles (96,000 km), continue to follow the described maintenance at the recommended intervals.

As for * marked items in this maintenance chart, note the following points:

- *1 Replacement of the timing belt is required every 60,000 miles (96,000 km). Failure to replace the timing belt may result in damage to the engine.
- *2 This maintenance is required for all states except California. However, we recommend that it also be performed on California vehicles.
- *3 This maintenance is recommended by Mazda. However, it is not necessary for emission warranty coverage or manufacturer recall liability.

Schedule 2 (Unique Driving Conditions)

MAINTENANCE OPERATION	MAINTENANCE INTERVALS	Number of months or miles (kilometers), whichever comes first													Service data and inspection points	Page																					
		Months	5	10	15	20	25	30	35	40	45	50	55	60																							
		× 1,000 miles	5	10	15	20	25	30	35	40	45	50	55	60																							
		× 1,000 km	8	16	24	32	40	48	56	64	72	80	88	96																							
Drive belts						I							I	<ul style="list-style-type: none"> Cracks or damage Tension 	B1-5 B2-5																						
Engine oil		R	R	R	R	R	R	R	R	R	R	R	R	<ul style="list-style-type: none"> Oil pan capacity 	D-5																						
Engine oil (For Puer-to-Ri-co)		Replace every 3,000 miles (4,800 km) or every 3 months													<ul style="list-style-type: none"> B6 SOHC: 3.0 liters (3.2 US qt, 2.6 Imp qt) All BP : 3.6 liters (3.8 US qt, 3.2 Imp qt) 																						
Oil filter		R	R	R	R	R	R	R	R	R	R	R	R	<ul style="list-style-type: none"> Oil filter capacity: 	D-5																						
Engine timing belt*1		Replace every 60,000 miles (96,000 km)													—	B1-12 B2-12																					
Air cleaner element				I*2			R			I*2			R	—	F-79																						
Spark plugs							R						R	<ul style="list-style-type: none"> Plug gap: 1.0—1.1mm (0.039—0.043 in) Recommended spark plugs <table border="1"> <thead> <tr> <th>Engine</th> <th>NGK</th> <th>NIPPONDENSO</th> </tr> </thead> <tbody> <tr> <td rowspan="2">B6 SOHC</td> <td>BKR5E-11</td> <td>K16PR-U11</td> </tr> <tr> <td>BKR6E-11</td> <td>K20PR-U11</td> </tr> <tr> <td rowspan="2">BP SOHC</td> <td>BKR5E-11</td> <td>K16PR-U11</td> </tr> <tr> <td>BKR6E-11</td> <td>K20PR-U11</td> </tr> <tr> <td rowspan="2">BP DOHC</td> <td>BKR5E-11</td> <td>K16PR-U11</td> </tr> <tr> <td>BKR6E-11</td> <td>K20PR-U11</td> </tr> <tr> <td></td> <td></td> <td>BKR7E-11</td> <td>K22PR-U11</td> </tr> </tbody> </table>	Engine	NGK	NIPPONDENSO	B6 SOHC	BKR5E-11	K16PR-U11	BKR6E-11	K20PR-U11	BP SOHC	BKR5E-11	K16PR-U11	BKR6E-11	K20PR-U11	BP DOHC	BKR5E-11	K16PR-U11	BKR6E-11	K20PR-U11			BKR7E-11	K22PR-U11	G-18
Engine	NGK	NIPPONDENSO																																			
B6 SOHC	BKR5E-11	K16PR-U11																																			
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Cooling system						I							I	<ul style="list-style-type: none"> Hoses for cracks or wear Coolant level 	E-5																						
Engine coolant							R						R	<ul style="list-style-type: none"> Coolant capacity: 	E-6																						
Idle speed							A*2						A	<ul style="list-style-type: none"> ATX: P range, MTX: Neutral 	F-80																						
Fuel filter													R	—	F-124																						
Fuel lines							I*3						I	<ul style="list-style-type: none"> Fittings, connections, and components for leaks 	F-120																						
Brake lines, hoses and connections							I						I	<ul style="list-style-type: none"> Proper attachment and connections 	—																						

Schedule 2 (Unique Driving Conditions) (Cont'd)

MAINTENANCE OPERATION	MAINTENANCE INTERVALS	Number of months or miles (kilometers), whichever comes first													Service data and inspection points	Page
		Months	5	10	15	20	25	30	35	40	45	50	55	60		
		× 1,000 miles	5	10	15	20	25	30	35	40	45	50	55	60		
		× 1,000 km	8	16	24	32	40	48	56	64	72	80	88	96		
Clutch pedal							I							I	<ul style="list-style-type: none"> • Operation • Pedal height (with carpet): 196–204mm (7.72–8.03 in) • Free play 5–13mm (0.197–0.512 in) 	H-6
Drum brake								I						I	<ul style="list-style-type: none"> • Wheel cylinder operation and leakage • Lining for wear or damage • Lining thickness: Minimum 1.0mm (0.04 in) • Drum inner diameter: Maximum 201mm (7.91 in) 	P-28 P-29
Disc brake				I				I		I				I	<ul style="list-style-type: none"> • Caliper operation • Disc plate thickness: Minimum Front.... 20mm (0.79 in) Rear..... 7.0mm (0.28 in) • Pad thickness: Minimum Front.... 2.0mm (0.08 in) Rear..... 1.0mm (0.04 in) 	P-20 P-25 P-18 P-25
Steering operation and linkage								I						I	<ul style="list-style-type: none"> • Operation and looseness • Fluid leakage or oozing • Free play.... 0–30mm (0–1.18 in) 	N-27 N-8
Front suspension ball joint								I						I	• Damage looseness and grease leakage	—
Drive shaft dust boots								I						I	• Cracking and damage	M-21
Bolts and nuts on chassis and body				T				T			T			T	• Retighten all loose nuts and bolts	—
Exhaust system heat shield								I						I	• Insulator clearance	F-136
Air conditioner system (if equipped)	Refrigerant	Inspect refrigerant amount annually													—	U-35
	Compressor	Inspect operation annually													—	U-39

SCHEDULED MAINTENANCE SERVICES

A

A

Note

I Inspect, and if necessary correct, clean, or replace (Inspect, and if necessary replace..... Air cleaner element only)

A.... Adjust

R.... Replace or change

T.... Tighten

After 60 months or 60,000 miles (96,000 km), continue to follow the described maintenance at the recommended intervals.

As for * marked items in this maintenance chart, note the following points:

- *1 Replacement of the timing belt is required every 60,000 miles (96,000 km). Failure to replace the timing belt may result in damage to the engine.
- *2 This maintenance is required for all states except California. However, we recommend that it also be performed on California vehicles.
- *3 This maintenance is recommended by Mazda. However, it is not necessary for emission warranty coverage or manufacturer recall liability.

SCHEDULED MAINTENANCE SERVICES (CANADA)

Schedule

MAINTENANCE OPERATION	MAINTENANCE INTERVALS	Number of months or kilometers (miles), whichever comes first												Service data and inspection points	Page																				
		Months	5	10	15	20	25	30	35	40	45	50	55			60																			
		× 1,000 km	8	16	24	32	40	48	56	64	72	80	88			96																			
		× 1,000 miles	5	10	15	20	25	30	35	40	45	50	55			60																			
Drive belts		I	I	I	I	I	I	I	I	I	I	I	I	<ul style="list-style-type: none"> Cracks or damage Tension 	B1-5 B2-5																				
Engine oil		R	R	R	R	R	R	R	R	R	R	R	R	<ul style="list-style-type: none"> Oil pan capacity B6 SOHC: 3.0 liters (3.2 US qt, 2.6 Imp qt) All BP : 3.6 liters (3.8 US qt, 3.2 Imp qt) 	D-5																				
Oil filter		R	R	R	R	R	R	R	R	R	R	R	R	<ul style="list-style-type: none"> Oil filter capacity: 0.17 liter (0.18 US qt, 0.15 Imp qt) 	D-5																				
Engine timing belt* ¹		Replace every 96,000 km (60,000 miles)												—	B1-12 B2-12																				
Air cleaner element				I			R			I			R	—	F-79																				
Spark plugs							R						R	<ul style="list-style-type: none"> Plug gap: 1.0—1.1mm (0.039—0.043 in) Recommended spark plugs <table border="1"> <thead> <tr> <th>Engine</th> <th>NGK</th> <th>NIPPONDENSO</th> </tr> </thead> <tbody> <tr> <td rowspan="2">B6 SOHC</td> <td>BKR5E-11</td> <td>K16PR-U11</td> </tr> <tr> <td>BKR6E-11</td> <td>K20PR-U11</td> </tr> <tr> <td rowspan="2">BP SOHC</td> <td>BKR5E-11</td> <td>K16PR-U11</td> </tr> <tr> <td>BKR6E-11</td> <td>K20PR-U11</td> </tr> <tr> <td rowspan="3">BP DOHC</td> <td>BKR5E-11</td> <td>K16PR-U11</td> </tr> <tr> <td>BKR6E-11</td> <td>K20PR-U11</td> </tr> <tr> <td>BKR7E-11</td> <td>K22PR-U11</td> </tr> </tbody> </table>	Engine	NGK	NIPPONDENSO	B6 SOHC	BKR5E-11	K16PR-U11	BKR6E-11	K20PR-U11	BP SOHC	BKR5E-11	K16PR-U11	BKR6E-11	K20PR-U11	BP DOHC	BKR5E-11	K16PR-U11	BKR6E-11	K20PR-U11	BKR7E-11	K22PR-U11	G-18
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	BKR6E-11	K20PR-U11																																	
	BKR7E-11	K22PR-U11																																	
Cooling system			I			I			I				I	<ul style="list-style-type: none"> Hoses for cracks or wear Coolant level 	E-5																				
Engine coolant						R							R	<ul style="list-style-type: none"> Coolant capacity: 5.0 liters (5.3 US qt, 4.4 Imp qt)..... MTX 6.0 liters (6.3 US qt, 5.3 Imp qt) ATX 	E-6																				
		I	I	I	I	I	I	I	I	I	I	I	I	<ul style="list-style-type: none"> Level and condition 	E-5																				
Idle speed			I			I			I				I	<ul style="list-style-type: none"> ATX: P range, MTX: Neutral 700—800 rpm (with parking brake applied) 	F-80																				
Fuel filter													R	—	F-124																				
PCV valve* ²													I	<ul style="list-style-type: none"> Operation 	F-138																				
Emission hoses and tubes													I	<ul style="list-style-type: none"> Fittings and connections 	F-6																				
Fuel lines						I* ²							I	<ul style="list-style-type: none"> Fittings, connections, and components for leaks 	F-120																				
Brake lines, hoses and connections						I							I	<ul style="list-style-type: none"> Proper attachment and connections 	—																				
Automatic transaxle fluid (ATF)		I	I	I	I	I	I	I	I	I	I	I	I	<ul style="list-style-type: none"> Level and condition 	K-135																				

SCHEDULED MAINTENANCE SERVICES

A

Schedule (Cont'd)

MAINTENANCE OPERATION	MAINTENANCE INTERVALS	Number of months or kilometers (miles), whichever comes first													Service data and inspection points	Page
		Months	5	10	15	20	25	30	35	40	45	50	55	60		
		× 1,000 km	8	16	24	32	40	48	56	64	72	80	88	96		
		× 1,000 miles	5	10	15	20	25	30	35	40	45	50	55	60		
Transaxle oil							R							R	<ul style="list-style-type: none"> Capacity MTX B6, BP SOHC: 2.68 liters (2.83 US qt, 2.36 Imp qt) BP DOHC: 3.35 liters (3.55 US qt, 2.96 Imp qt) ATX: 6.3 liters (6.7 US qt, 5.5 Imp qt) 	J1-7 J2-7 —
Brake fluid, clutch fluid		I	I	I	I	I	I	I	I	I	I	I	I	I	<ul style="list-style-type: none"> Level and condition 	—
Brake fluid*3							R							R	—	—
Tire inflation pressure and wear		I	I	I	I	I	I	I	I	I	I	I	I	I	<ul style="list-style-type: none"> Wear and damage Proper pressure 	Q-3, 5
Rotate tires		Rotate every 24,000 km (15,000 miles) or every 15 months													—	Q-6
Power steering fluid		I	I	I	I	I	I	I	I	I	I	I	I	I	<ul style="list-style-type: none"> Level and condition 	N-27
Drum brake							I							I	<ul style="list-style-type: none"> Wheel cylinder operation and leakage Lining for wear or damage Lining thickness: Minimum 1.0mm (0.04 in) Drum inner diameter: Maximum 201mm (7.91 in) 	P-28 P-29
Disc brake				I			I			I				I	<ul style="list-style-type: none"> Caliper operation Disc plate thickness: Minimum Front.... 20mm (0.79 in) Rear..... 7.0mm (0.28 in) Pad thickness: Minimum Front.... 2.0mm (0.08 in) Rear..... 1.0mm (0.04 in) 	P-20 P-25 P-18 P-25
Steering operation and linkage							I							I	<ul style="list-style-type: none"> Operation and looseness Fluid leakage or oozing Free play.... 0-30mm (0-1.18 in) 	N-27 N-8
Front suspension ball joint							I							I	<ul style="list-style-type: none"> Damage looseness and grease leakage 	—
Drive shaft dust boots							I							I	<ul style="list-style-type: none"> Cracking and damage 	M-21
Exhaust system heat shield							I							I	<ul style="list-style-type: none"> Insulator clearance 	F-136
Air conditioner system (if equipped)	Refrigerant	Inspect refrigerant amount annually													—	U-35
	Compressor	Inspect operation annually													—	U-39
Suspension components (front and rear)							I							I	<ul style="list-style-type: none"> Damage 	—
All chassis and body nuts and bolts				T			T			T				T	<ul style="list-style-type: none"> Retighten all loose nuts and bolts 	—
All locks and hinges		L	L	L	L	L	L	L	L	L	L	L	L	L	<ul style="list-style-type: none"> Lubricate all locks and hinges 	—
Washer fluid		I	I	I	I	I	I	I	I	I	I	I	I	I	<ul style="list-style-type: none"> Level 	—
Function of all lights		I	I	I	I	I	I	I	I	I	I	I	I	I	<ul style="list-style-type: none"> Operation Dirt and damage 	—

Note

I Inspect, and if necessary correct, clean, or replace (Inspect, and if necessary replace..... Air cleaner element only)

L Lubricate

R Replace or change

T Tighten

After 60 months or 96,000 km (60,000 miles), continue to follow the described maintenance at the recommended intervals.

As for * marked items in this maintenance chart, note the following points:

*1 Replacement of the timing belt is required every 96,000 km (60,000 miles). Failure to replace the timing belt may result in damage to the engine.

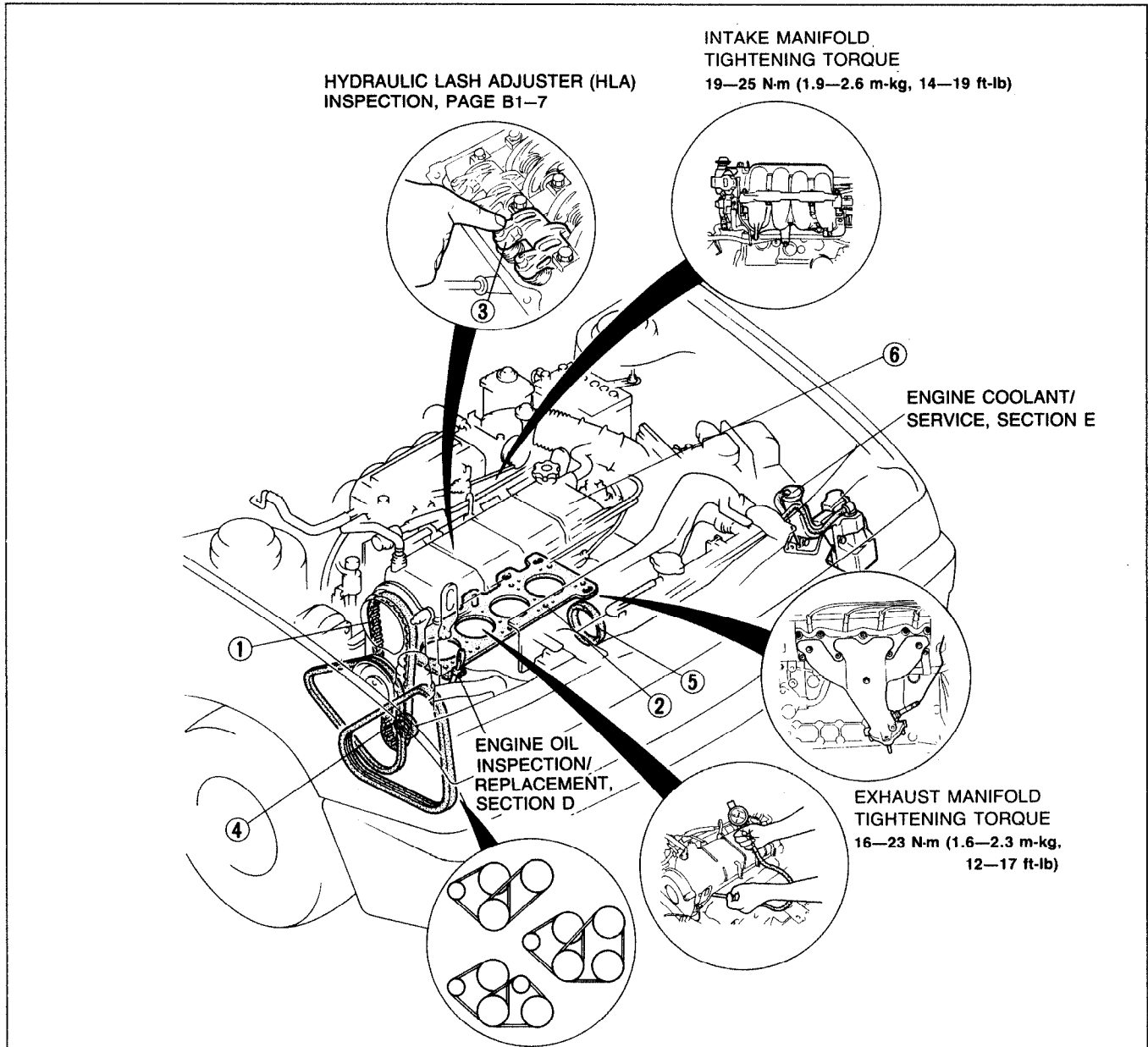
*2 This maintenance is recommended by Mazda. However, it is not necessary for emission warranty coverage or manufacturer recall liability.

*3 This maintenance is recommended by Mazda.

ENGINE (SOHC)

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CYLINDER BLOCK			
(INTERNAL PARTS).....	B1-50		

INDEX



DEFLECTION AT (98 N, 10 kg, 22 lb) mm (in)

DRIVE BELT	NEW	USED	LIMIT
ALTERNATOR	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	12.5 (0.49)
P/S, P/S + A/C	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	11.5 (0.45)
A/C	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	11.5 (0.45)

COMPRESSION INSPECTION PAGE B1-10 kPa (kg/cm², psi)-rpm

	B6 SOHC	BP SOHC
Standard	1,236 (12.6, 179)-300	1,197 (12.2, 173)-300
Minimum	863 (8.8, 125)-300	834 (8.5, 121)-300

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- 1. Timing belt
Removal / Installation page B1-12
- 2. Cylinder head gasket
Replacement page B1-16
- 3. HLA
Removal / Installation page B1-20
- 4. Front oil seal
Replacement page B1-23
- 5. Rear oil seal
Replacement page B1-25

- 6. Engine
Removal page B1-28
- Engine stand mounting page B1-35
- Disassembly page B1-38
- Inspection / Repair page B1-54
- Assembly page B1-66
- Engine stand dismounting page B1-92
- Installation page B1-94

OUTLINE

SPECIFICATIONS



Item		Engine	B6 SOHC	BP SOHC
Type		Gasoline, 4-cycle		
Cylinder arrangement and number		In-line, 4 cylinders		
Combustion chamber		Multispherical		Pentroof
Valve system		OHC, belt-driven		OHC, belt-driven 16 valves
Displacement		cc (cu in)	1,597 (97.4)	1,839 (112.2)
Bore and stroke		mm (in)	78.0 × 83.6 (3.07 × 3.29)	83.0 × 85.0 (3.27 × 3.35)
Compression ratio		9.3		8.9
Compression pressure		kPa (kg/cm ² , psi)-rpm	1,236 (12.6, 179)-300	1,197 (12.2, 173)-300
Valve timing	IN	Open BTDC	14°	2°
		Close ABDC	50°	50°
	EX	Open BBDC	52°	55°
		Close ATDC	12°	8°
Valve clearance	mm (in)	IN	0: Maintenance-free	
		EX	0: Maintenance-free	
Idle speed ^{*1+2}	rpm	MTX	700—800	
		ATX	700—800 (P range)	
Ignition timing ^{*2}		BTDC	6°—8°	4°—6°
Firing order		1—3—4—2		

*1.....With parking brake applied. (Canada)

*2.....TEN terminal of diagnosis connector grounded

23U0B1-003

TRUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
Difficult starting	Malfunction of engine-related components Burned valve Worn piston, piston ring, or cylinder Failed cylinder head gasket	Replace Replace or repair Replace	B1-55 B1-60, 62 B1-16
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Poor idling	Malfunction of engine-related components Malfunction of HLA* Poor valve-to-valve seat contact Failed cylinder head gasket	Replace Replace or repair Replace	B1-20 B1-57 B1-16
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Excessive oil consumption	Oil working up Worn piston ring groove or sticking piston ring Worn piston or cylinder	Replace Replace or repair	B1-62 B1-60, 62
	Oil working down Worn valve seal Worn valve stem or guide	Replace Replace	B1-46, 81 B1-55
	Oil leakage	Refer to Section D	

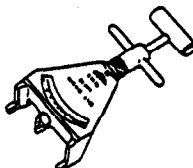
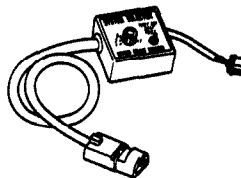
Problem	Possible Cause	Action	Page
Insufficient power	Insufficient compression Malfunction of HLA* Compression leakage from valve seat Seized valve stem Weak or broken valve spring Failed cylinder head gasket Cracked or distorted cylinder head Sticking, damaged, or worn piston ring Cracked or worn piston	Replace Repair Replace Replace Replace Replace Replace Replace	B1-20 B1-57 B1-55 B1-58 B1-16 B1-54 B1-62 B1-62
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
	Others Slipping clutch Dragging brakes Wrong size tires	Refer to Section H Refer to Section P Refer to Section Q	
Abnormal combustion	Malfunction of engine-related components Malfunction of HLA* Sticking or burned valve Weak or broken valve spring Carbon accumulation in combustion chamber	Replace Replace Replace Eliminate carbon	B1-20 B1-55 B1-58 —
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Engine noise	Crankshaft- or bearing-related parts Excessive main bearing oil clearance Main bearing seized or heat-damaged Excessive crankshaft end play Excessive connecting rod bearing oil clearance Connecting rod bearing seized or heat-damaged	Replace or repair Replace Replace or repair Replace or repair Replace	B1-71 B1-64 B1-72 B1-73 B1-64
	Piston-related parts Worn cylinder Worn piston or piston pin Seized piston Damaged piston ring Bent connecting rod	Replace or repair Replace Replace Replace Replace	B1-60 B1-63 B1-62 B1-62 B1-63
	Valves or timing-related parts Malfunction of HLA* Broken valve spring Excessive valve guide clearance	Replace Replace Replace	B1-20 B1-58 B1-55
	Malfunction of cooling system	Refer to Section E	
	Malfunction of fuel system	Refer to Section F	
	Others Malfunction of water pump bearing Improper drive belt tension Malfunction of alternator bearing Exhaust gas leakage Malfunction of timing belt tensioner	Refer to Section E Adjust Refer to Section G Refer to Section F Replace	B1- 5 B1-12

23U0B1-004

* Tappet noise may occur if the engine has set idle for an extended period. The noise should dissipate after the engine has reached normal operating temperature. (HLA troubleshooting: Refer to page B1-7)

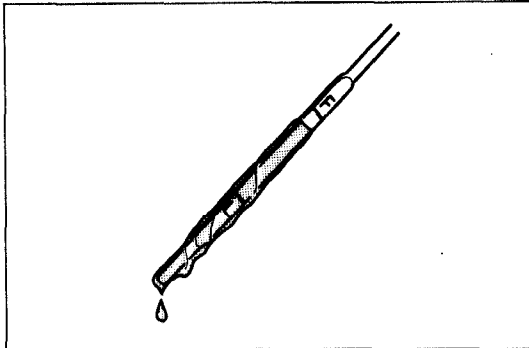
ENGINE TUNE-UP PROCEDURE

PREPARATION
SST

<p>49 9200 020</p> <p>Tension gauge, V-ribbed belt</p> 	<p>For inspection of drive belt tension</p>	<p>49 B019 9A0</p> <p>System selector</p> 	<p>For inspection of ignition timing and idle speed</p>
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B1



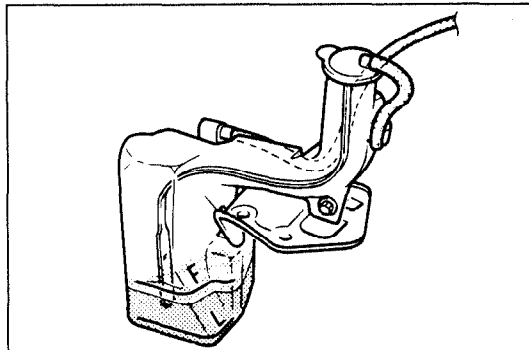
23U0B1-058

ENGINE OIL
Inspection

1. Be sure the vehicle is on level ground.
2. Warm up the engine to normal operating temperature and stop it.
3. Wait for 5 minutes.
4. Remove the oil level gauge and check the oil level and condition.
5. Add or replace oil if necessary.

Note

- The distance between the L and F marks on the level gauge represents 0.8 liter (0.85 US qt, 0.70 Imp qt).



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ENGINE COOLANT

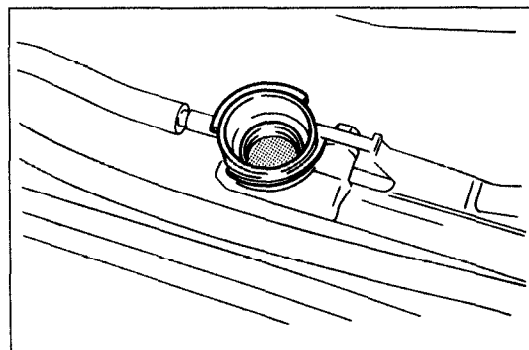
Inspection

Coolant level (engine cold)

Warning

- Never remove the radiator cap while the engine is hot.
- Wrap a thick cloth around the cap when removing it.

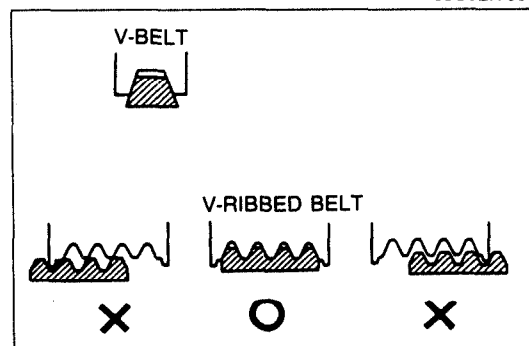
1. Verify that the coolant level is near the radiator filler neck.
2. Remove the coolant level gauge and check the coolant level.
3. Add coolant if necessary.



05U0BX-008

Coolant quality

1. Verify that there is no buildup of rust or scale around the radiator cap or radiator filler neck.
2. Verify that the coolant is free of oil.
3. Replace the coolant if necessary.

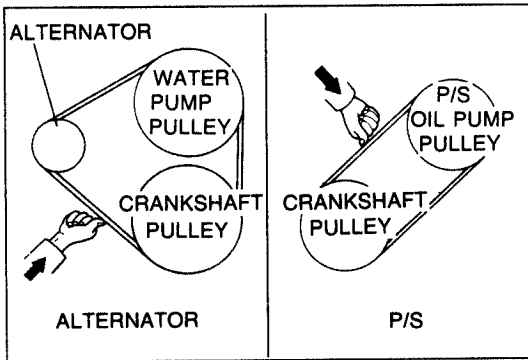


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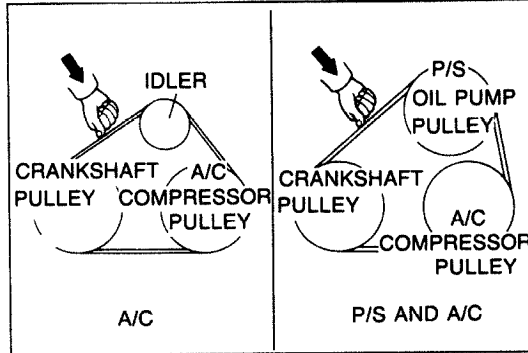
DRIVE BELT

Inspection

1. Remove the air intake pipe.
2. Check the drive belts for wear, cracks, and fraying. Replace if necessary.
3. Verify that the drive belts are correctly mounted on the pulleys.



23U0B1-005



23U0B1-006

4. Check the drive belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the pulleys.

Note

- Measure the belt deflection between the specified pulleys.
- A belt is considered "New" if it has been used on a running engine for less than five minutes. Set the deflection specified below accordingly.
- Check the belt deflection when the engine is cold, or at least 30 minutes after the engine has stopped.

Deflection

mm (in)

Drive belt	New	Used	Limit
Alternator	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	12.5 (0.49)
P/S, P/S + A/C	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	11.5 (0.45)
A/C	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	11.5 (0.45)

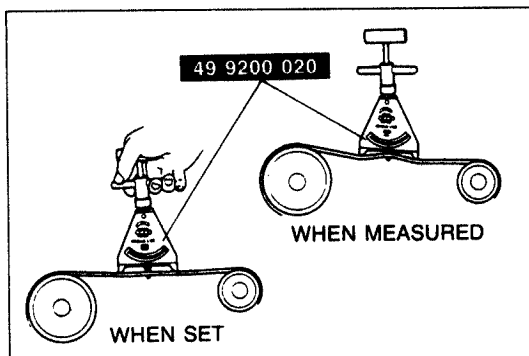
5. If the deflection is not within specification, adjust it.
6. Install the air intake pipe.

Drive belt tension check

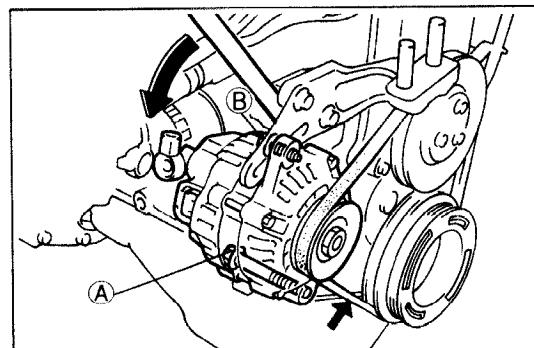
Note

- Belt tension can be checked in place of belt deflection.
- Belt tension can be measured between any two pulleys.

1. Removal the air intake pipe.
2. Using the **SST**, check the belt tension.



23U0B1-007



23U0B1-008

Tension

N (kg, lb)

Drive belt	New	Used	Limit
Alternator	383—461 (39—47, 85.8—103.4)	304—383 (31—39, 68.2—85.8)	167 (17, 37)
P/S, P/S + A/C	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)	245 (25, 55)
A/C	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)	245 (25, 55)

3. If the tension is not within specification, adjust it.
4. Install the air intake pipe.

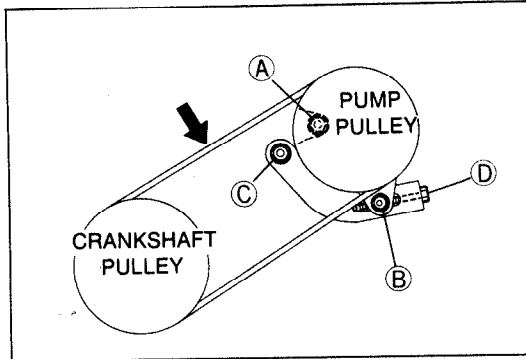
Adjustment

Caution

- If a new belt is used, adjust the belt deflection at the midpoint of new belt specification.
- A belt is considered "New" if it has been used on a running engine for less than five minutes.

Alternator belt

1. If necessary, loosen the alternator mounting bolts (A) and adjusting bolt (B).
2. Lever the alternator outward and apply tension to the belt.



23U0B1-009

Tightening torque

- Ⓐ : 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)
- Ⓑ : 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

P/S belt, P/S + A/C belt

If necessary, loosen the P/S oil pump bolts Ⓐ and nut Ⓑ and Ⓒ and adjust the belt deflection by turning the adjusting bolt Ⓓ.

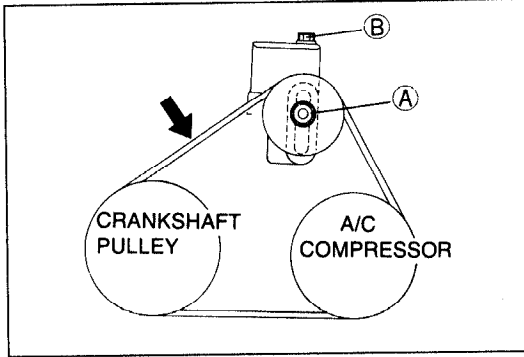
B1

Tightening torque

- Ⓐ : 36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)
- Ⓑ : 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)
- Ⓒ : 31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

A/C belt

If necessary, loosen the locknut Ⓐ and adjust the belt deflection by turning the adjusting bolt Ⓑ.



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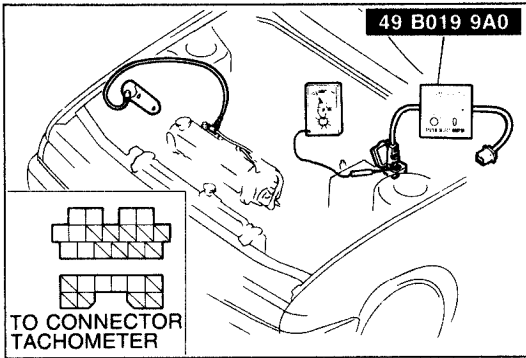
Tightening torque:

- 31—34 N·m (3.2—3.5 m·kg, 23—25 ft·lb)

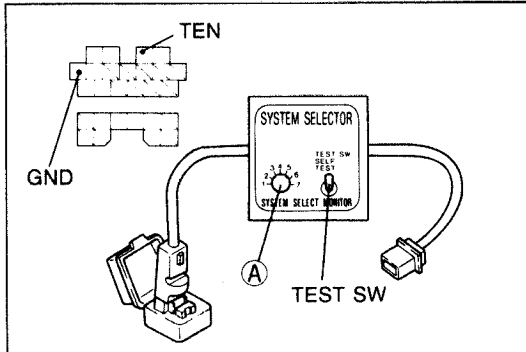
HLA

Problem	Possible Cause	Action
1. Noise when engine is started immediately after oil is changed.	Oil leakage in oil passage	Run engine 2000—3000 rpm. If noise stops after 2 second—10 minutes(*), HLA is normal. If not, replace HLA.
2. Noise when engine is started after setting approx. one day.		
3. Noise when engine is started after cranking for 3 seconds or more.	Oil leakage in HLA	* Time required for engine oil to circulate within engine, includes tolerance for engine oil condition and ambient temperature.
4. Noise when engine is started after new HLA is installed.		
5. Noise continues more than 10 minutes	Insufficient oil pressure	Check oil pressure. If lower than specification, check for cause. Oil pressure; 294—392 kPa (3.0—4.0 kg/cm², 43—57 psi)-3000 rpm
	Faulty HLA	(Refer to page B1-60) Press down HLA by hand. If it does not move, HLA is normal. If it moves, replace HLA. Measure valve clearance. If more than 0mm (0 in), replace HLA.
6. Noise occurs during idle after high-speed running	Incorrect oil amount	Check oil level. Drain or add oil as necessary.
	Deteriorated oil	Check oil quality. If deteriorated, replace with specified type and amount of oil.

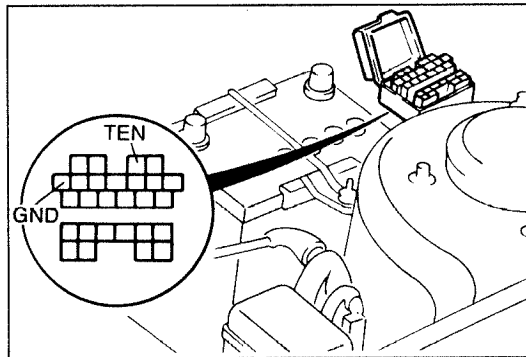
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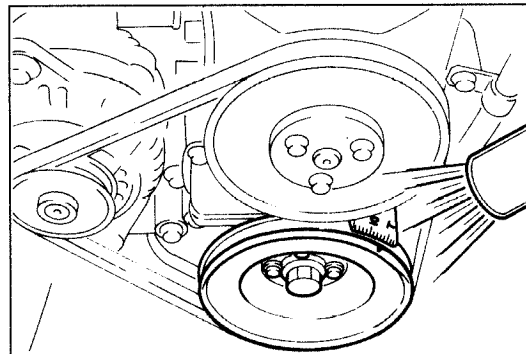
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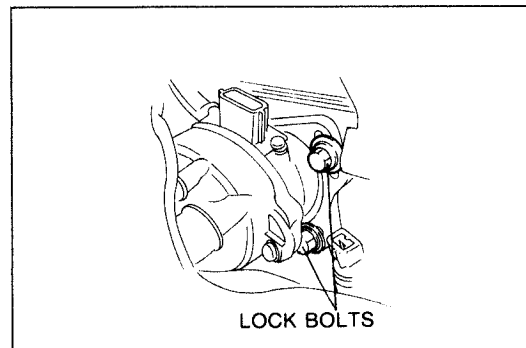
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05U0BX-280



13U0B1-038



13U0B1-039

IGNITION TIMING, IDLE SPEED

Preparation

1. Warm up the engine to normal operating temperature.
2. Turn all electric loads OFF.
3. Connect the **SST** to the diagnosis connector.
4. Connect the timing light.
5. Connect a tachometer to the diagnosis connector **IG-** terminal as shown.

6. Set switch **(A)** to position 1.
7. Set TEST SW to SELF-TEST.

Note

- If the SST is not used, jump across the (TEN) terminal and the (GND) terminal of the diagnosis connector.

Ignition Timing

Inspection / Adjustment

1. Perform preparation. (Refer to above.)
2. Check if the timing mark (Yellow) on the crankshaft pulley and the mark on the timing belt cover are aligned.

Ignition timing: (at idle speed)

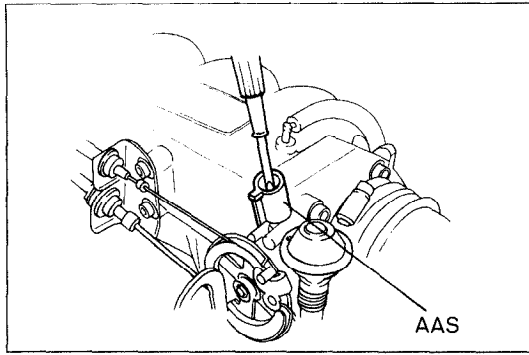
	B6 SOHC	BP SOHC
BTDC	$7^{\circ} \pm 1^{\circ}$	$5^{\circ} \pm 1^{\circ}$

3. If the marks are not aligned, loosen the distributor lock bolts and turn the distributor to make the adjustment.
4. Tighten the distributor lock bolts to the specified torque.

Tightening torque:

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

5. Disconnect the **SST**.

**Idle Speed**

1. Perform "Preparation". (Refer to page B1-8.)
2. Apply parking brake.
3. Check that the idle speed is within specification.

Idle speed (Neutral or P range): 750 ± 50 rpm

Caution

- Check the idle speed without the electric cooling fan operating.

Note

- When the parking brake is not applied, the idle speed for ATX model (Canada) is approx. 800 rpm.

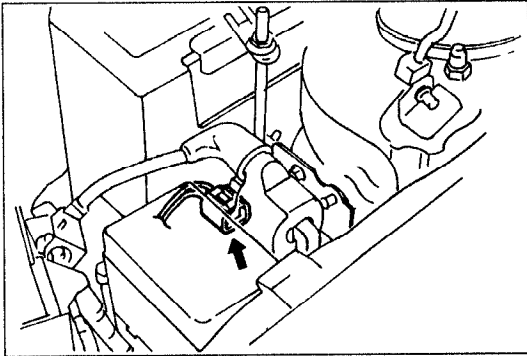
4. If not within the specification, adjust the idle by turning the air adjusting screw.
5. Disconnect the **SST**.

COMPRESSION

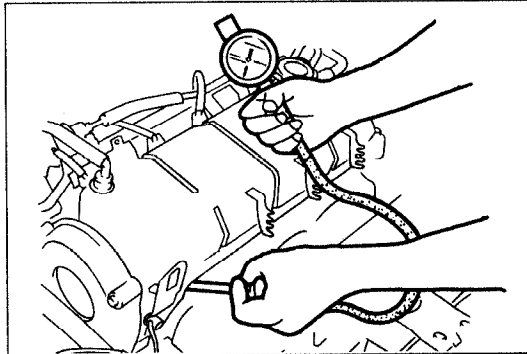
If the engine exhibits low power, poor fuel economy, or poor idle, check the following:

1. Ignition system (Refer to Section G.)
2. Compression
3. Fuel system (Refer to Section F.)

23U0B1-012



23U0B1-013



23U0B1-062

INSPECTION

1. Check that the battery is fully charged. Recharge it if necessary. (Refer to Section G.)
2. Warm up the engine to normal operating temperature.
3. Turn the engine OFF.
4. Remove all spark plugs.
5. Disconnect the ignition coil connector.
6. Connect a compression gauge to the No.1 spark plug hole.
7. Fully depress the accelerator pedal and crank the engine.
8. Record the maximum gauge reading.
9. Check each cylinder.

Compression

kPa (kg/cm², psi)-rpm

	B6 SOHC	BP SOHC
Standard	1,236 (12.6, 179)-300	1,197 (12.2, 173)-300
Minimum	863 (8.8, 125)-300	834 (8.5, 121)-300
Max. difference between cylinders	196 (2.0, 28)	

10. If the compression in one or more cylinders is low, pour a small amount of engine oil into the cylinder and recheck the compression.
 - (1) If the compression increases, the piston, piston rings, or cylinder wall may be worn.
 - (2) If the compression stays low, the valve may be stuck or seating improperly.
 - (3) If the compression in adjacent cylinders stays low, the cylinder head gasket may be defective or the cylinder head distorted.

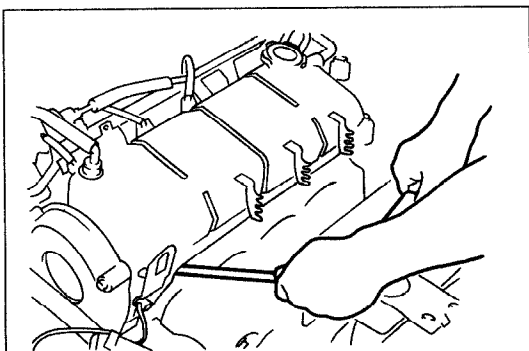
11. Connect the ignition coil connector.

05U0BX-020

12. Install the spark plugs.

Tightening torque:

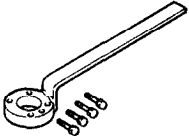
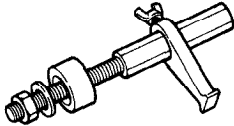
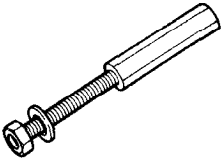


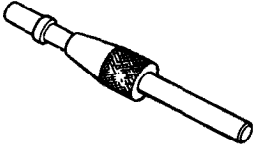
15—23 N·m (1.5—2.3 m·kg, 11—17 ft·lb)



23U0B1-014

ON-VEHICLE MAINTENANCE

PREPARATION
SST

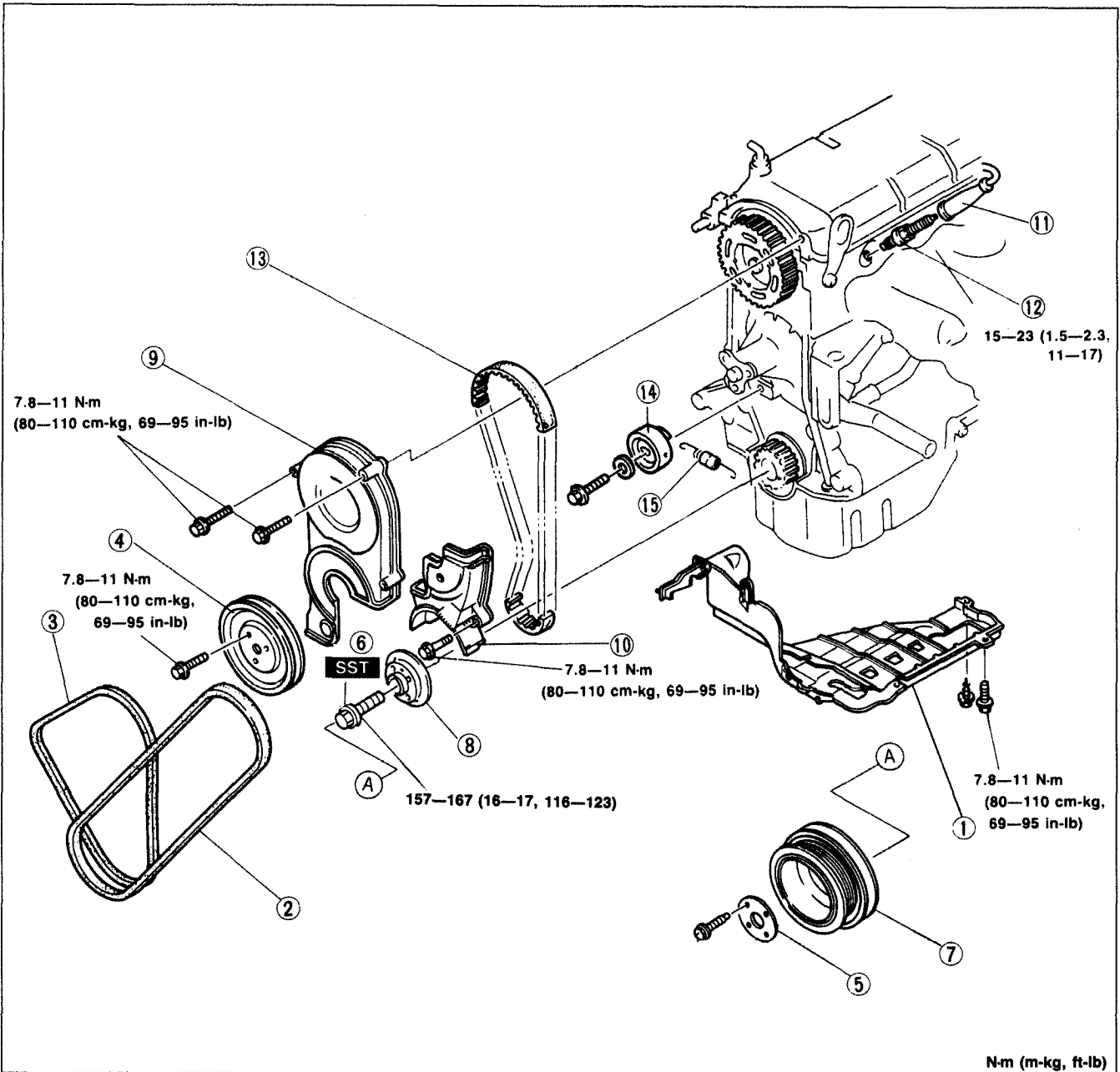
<p>49 D011 102 Lock tool, crankshaft</p> 	<p>For removal and installation of timing belt pulley</p>	<p>49 E011 1A0 Ring gear brake set</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 103 Shaft (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 105 Stopper (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 104 Collar (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 SE01 310A Centering tool, clutch disc</p> 	<p>For installation of clutch disc</p>

23U0B1-015

TIMING BELT

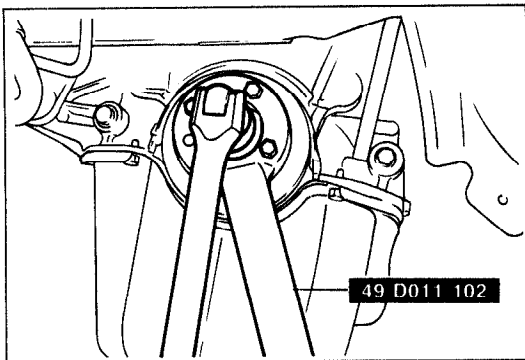
Removal / Installation

1. Disconnect the negative battery cable.
2. Raise the vehicle on a lift and remove the right front wheel.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



23U0B1-016

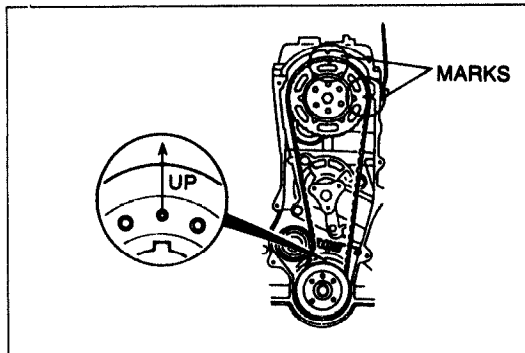
- | | |
|-----------------------------------|-----------------------------------|
| 1. Under cover and side cover | 10. Timing belt cover, lower |
| 2. P/S and/or A/C drive belt | 11. High-tension leads |
| 3. Alternator drive belt | 12. Spark plugs |
| 4. Water pump pulley | 13. Timing belt |
| 5. Plate | Removal Note..... page B1-13 |
| 6. Pulley lock bolt | Installation Note..... page B1-13 |
| Removal Note..... page B1-13 | 14. Tensioner |
| Installation Note..... page B1-14 | Installation Note..... page B1-13 |
| 7. Crankshaft pulley | 15. Tensioner spring |
| 8. Pulley boss | Installation Note..... page B1-13 |
| 9. Timing belt cover, upper | |



13E0B1-010

**Removal Note
Pulley lock bolt**

1. Hold the pulley with the **SST**.
2. Using the **SST**, loosen the pulley lock bolt.
3. Remove the pulley lock bolt and pulley boss.



13E0B1-020

Timing belt

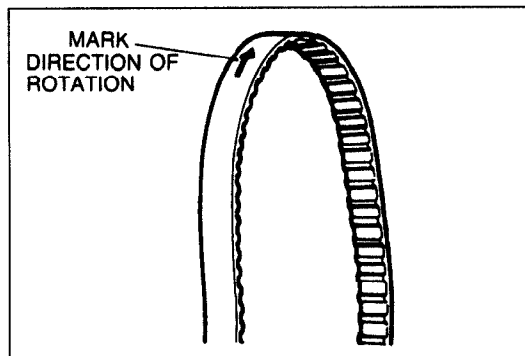
1. Install the pulley boss and pulley lock bolt.
2. Turn the crankshaft to align the timing marks.

Note

- The pin on the pulley boss must face upward.

Caution

- After setting the marks, do not turn the crankshaft when removing the pulley lock bolt and pulley boss.

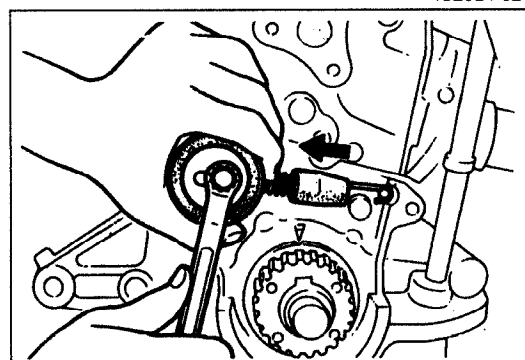


13E0B1-021

3. Remove the timing belt.

Note

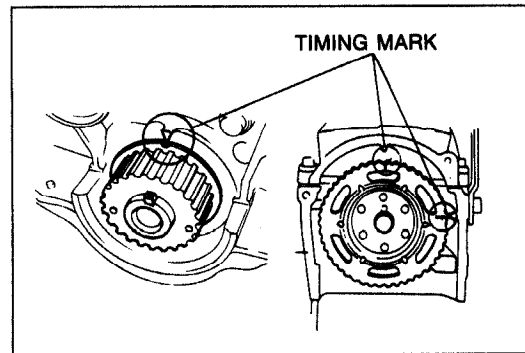
- Mark the timing belt rotation for proper reinstallation.



05U0BX-027

**Installation Note
Tensioner, tensioner spring**

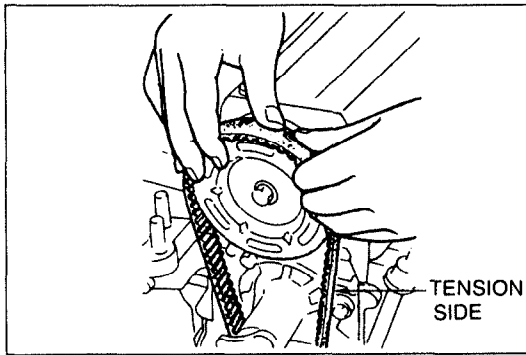
1. Install the tensioner and the tensioner spring.
2. Temporarily secure the tensioner with the spring fully extended.



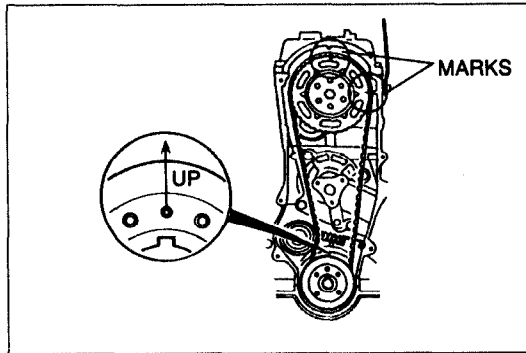
13E0B1-022

Timing belt

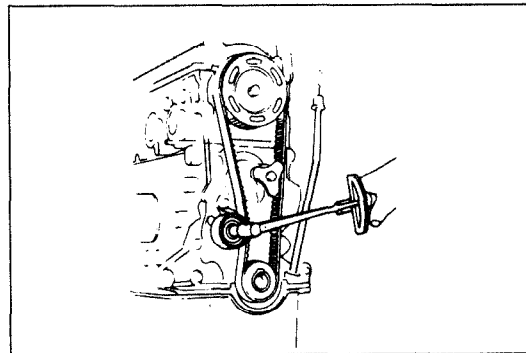
1. Verify that the timing belt pulley and camshaft pulley mark is aligned with the timing mark.



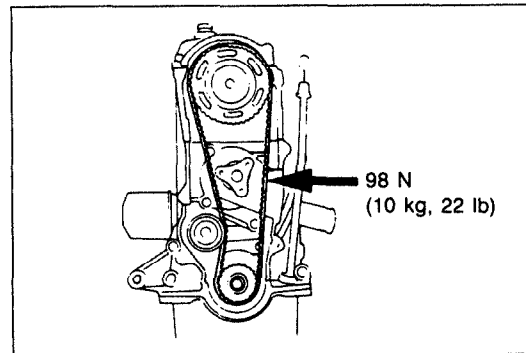
13E0B1-023



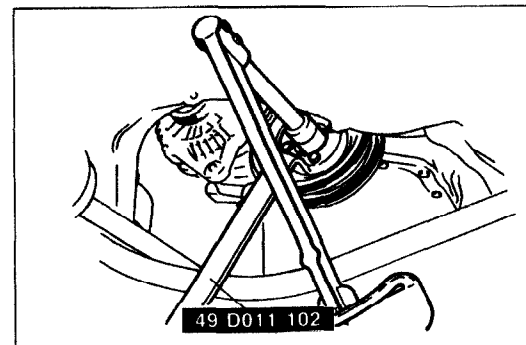
13E0B1-024



03U0B1-023



13E0B1-025



23U0B1-017

2. Install the timing belt so that there is no looseness at the tension side.

Caution

- Do not turn the crankshaft.

3. Install the pulley boss and lock bolt.
4. Turn the crankshaft two turns clockwise, and face the pin on the pulley boss upward.
5. Verify that the camshaft pulley marks are aligned with the cylinder head cover marks.
If not aligned, remove the timing belt and repeat from tensioner installation.

6. Loosen the tensioner lock bolt to apply tension to the timing belt.

Caution

- Be sure not to apply tension other than that of the tensioner spring.

7. Tighten the tensioner lock bolt.

Tightening torque:

19–25 N·m (1.9–2.6 m·kg, 14–19 ft·lb)

8. Turn the crankshaft 2 turns clockwise and verify that the marks are again correctly aligned.
9. Check the timing belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the crankshaft pulley and the camshaft pulley.
If the timing belt deflection is not correct, temporarily secure tensioner lock bolt so the spring is fully extended. Repeat Steps 4–8 above or, if necessary, replace the tensioner spring.

Deflection:

11.0–13.0mm (0.43–0.51 in) at 98 N (10 kg, 22 lb)

10. Using the **SST** remove the pulley lock bolt and pulley boss.

Pulley lock bolt

1. Install the crankshaft pulley boss, and using the **SST**, tighten the pulley lock bolt.

Tightening torque:

157–167 N·m (16–17 m·kg, 116–123 ft·lb)

Steps After Installation

1. Connect the negative battery cable.
2. Start the engine and check as follows:
 - Ignition timing. (Refer to page B1-8.)

03U0B1-026

CYLINDER HEAD GASKET

Replacement

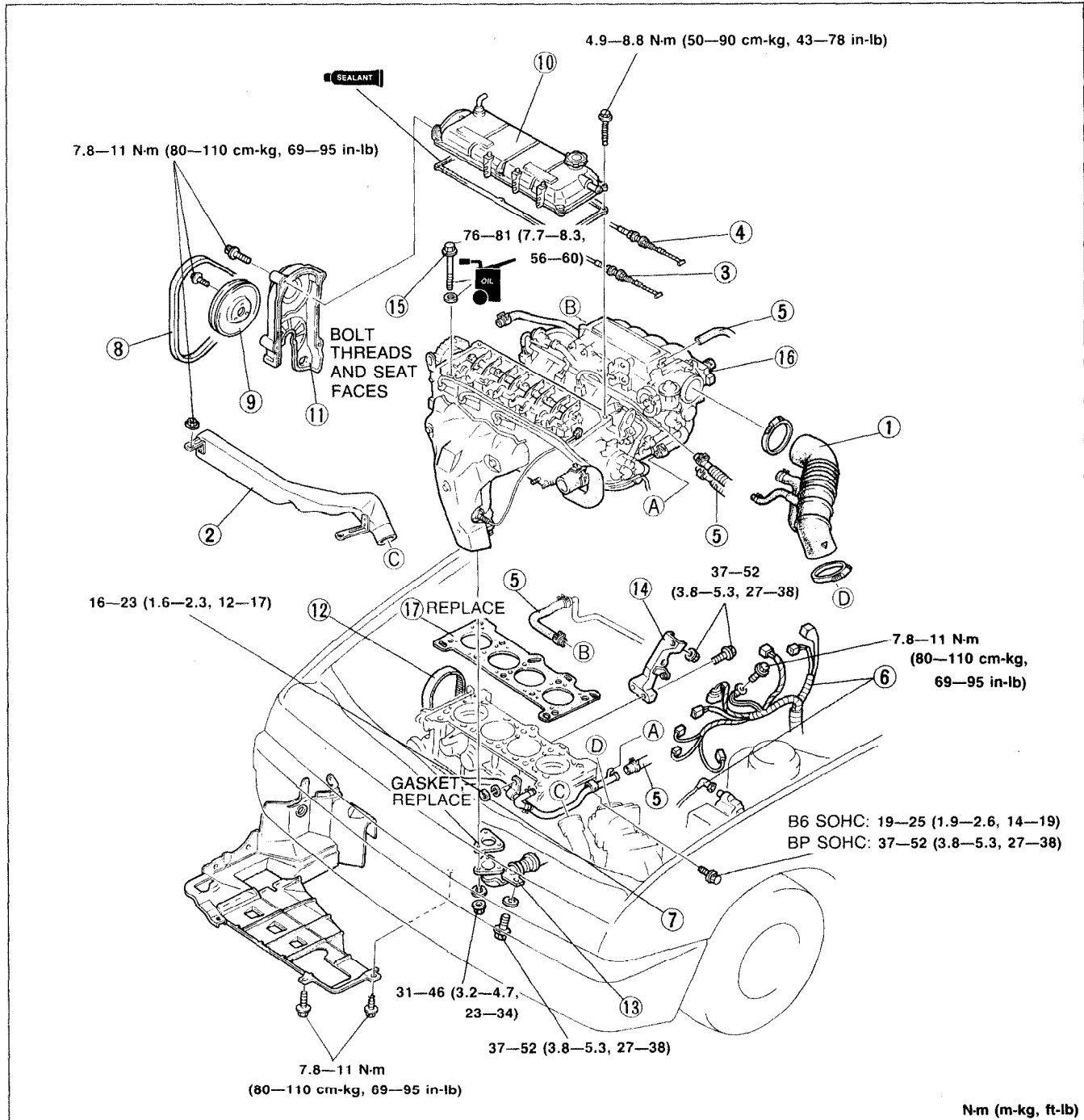
Warning

- Release the fuel pressure. (Refer to Section F.)
- Keep sparks and open flame away from the fuel area.

Caution

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

1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



23U0B1-018

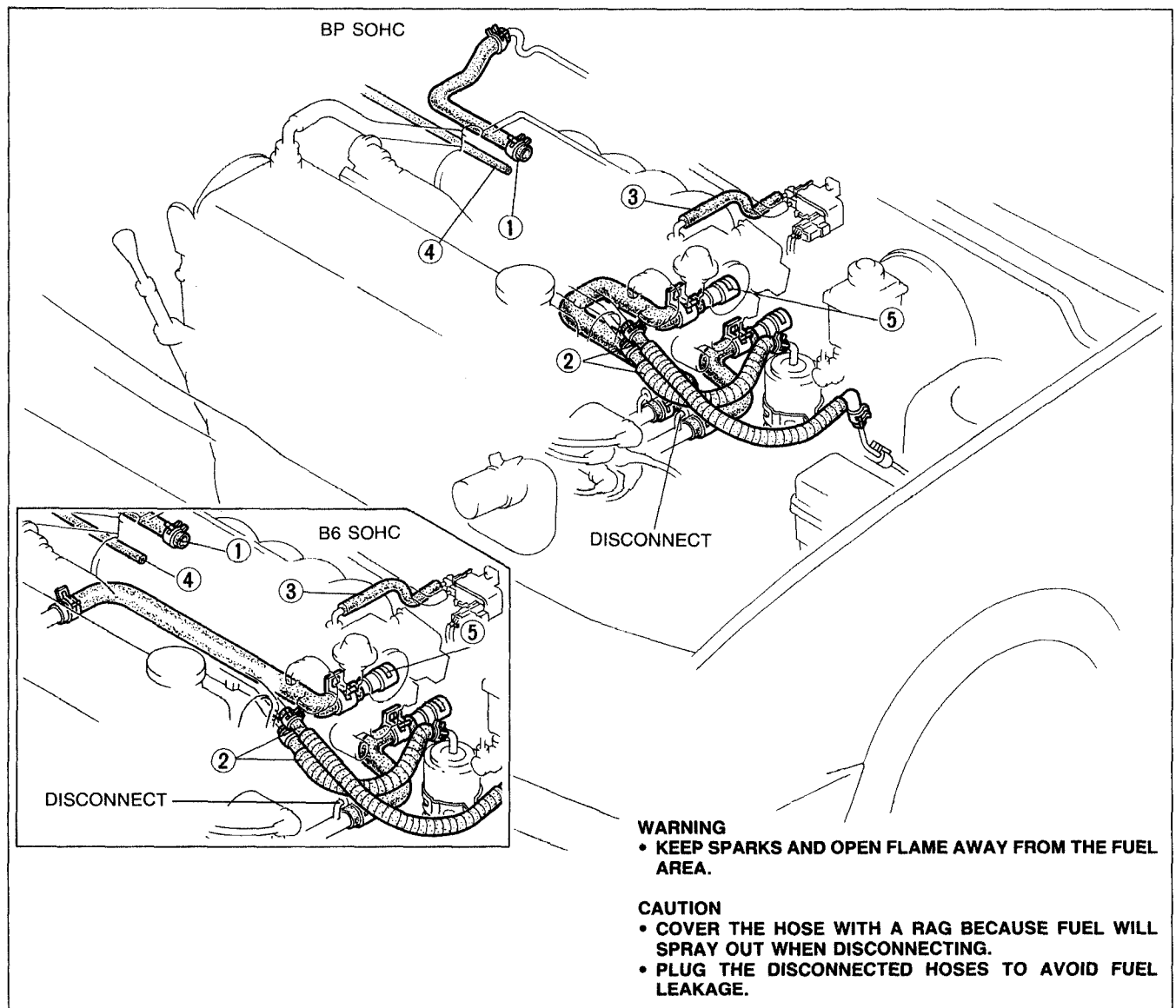
- | | |
|---|--|
| 1. Air hose assembly | 11. Timing belt cover, upper |
| 2. Resonance chamber | 12. Timing belt |
| 3. Accelerator cable | Removal / Installation..... page B1-12 |
| Installation Note..... page B1-19 | 13. Front exhaust pipe |
| 4. Throttle cable (ATX) | 14. Intake manifold bracket |
| Removal / Installation..... Section K | 15. Cylinder head bolt |
| 5. Hoses | Removal Note..... page B1-18 |
| Removal / Installation Note..... below | Installation Note..... page B1-19 |
| 6. Harnesses | 16. Cylinder head |
| Removal / Installation Note..... page B1-18 | Disassembly..... page B1-43 |
| 7. Water bypass pipe nut | Inspection..... page B1-54 |
| 8. Drive belt | Assembly..... page B1-79 |
| 9. Water pump pulley | 17. Cylinder head gasket |
| 10. Cylinder head cover | |

23U0B1-019

Removal / Installation note

Hoses

1. Disconnect the hoses shown in the figure.

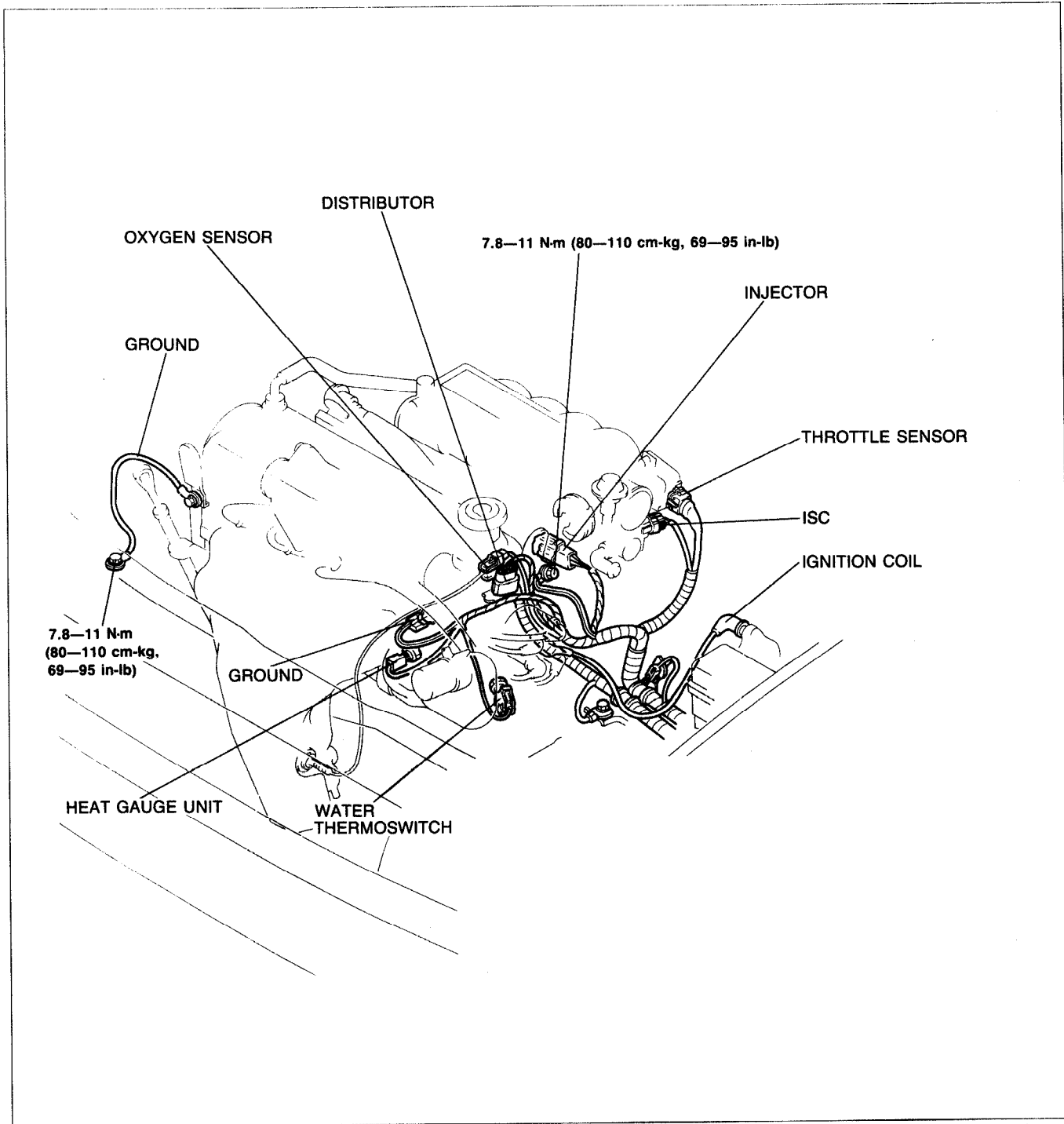


05U0BX-039

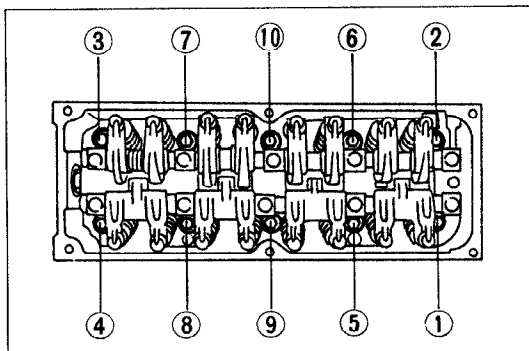
- | | |
|--------------------------------|---------------------------------|
| 1. Brake vacuum hose | 4. Vacuum hose (Cruise control) |
| 2. Fuel hose | 5. Heater hose |
| 3. Vacuum hose (Purge control) | |

Harnesses

1. Disconnect the harness connectors shown in the figure.



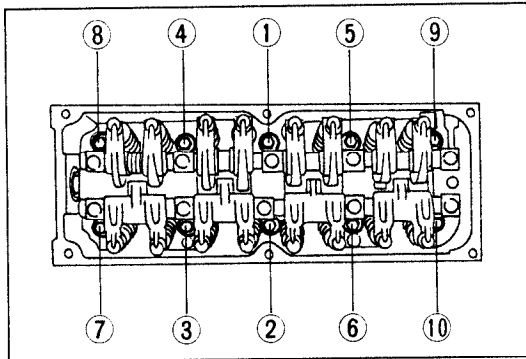
05U0BX-040



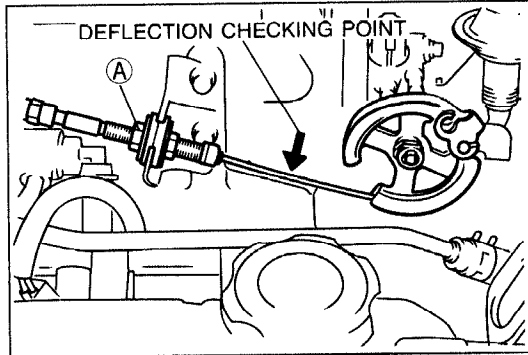
05U0BX-042

Cylinder head bolt

1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.
2. Remove the cylinder head bolts.



05U0BX-043



05U0BX-045

Installation note**Cylinder head bolt**

1. Apply clean engine oil to the bolt threads and seat faces.
2. Install the cylinder head bolts.
3. Tighten the cylinder head bolts in two or three steps in the order shown in the figure.

Tightening torque:

76—81 N·m (7.7—8.3 m·kg, 56—60 ft·lb)

Accelerator cable

1. Install the accelerator cable.
2. Check the accelerator cable deflection.
If the deflection is not correct, adjust by turning nut A.

Deflection: 1—3mm (0.04—0.12 in)

Steps After Installation

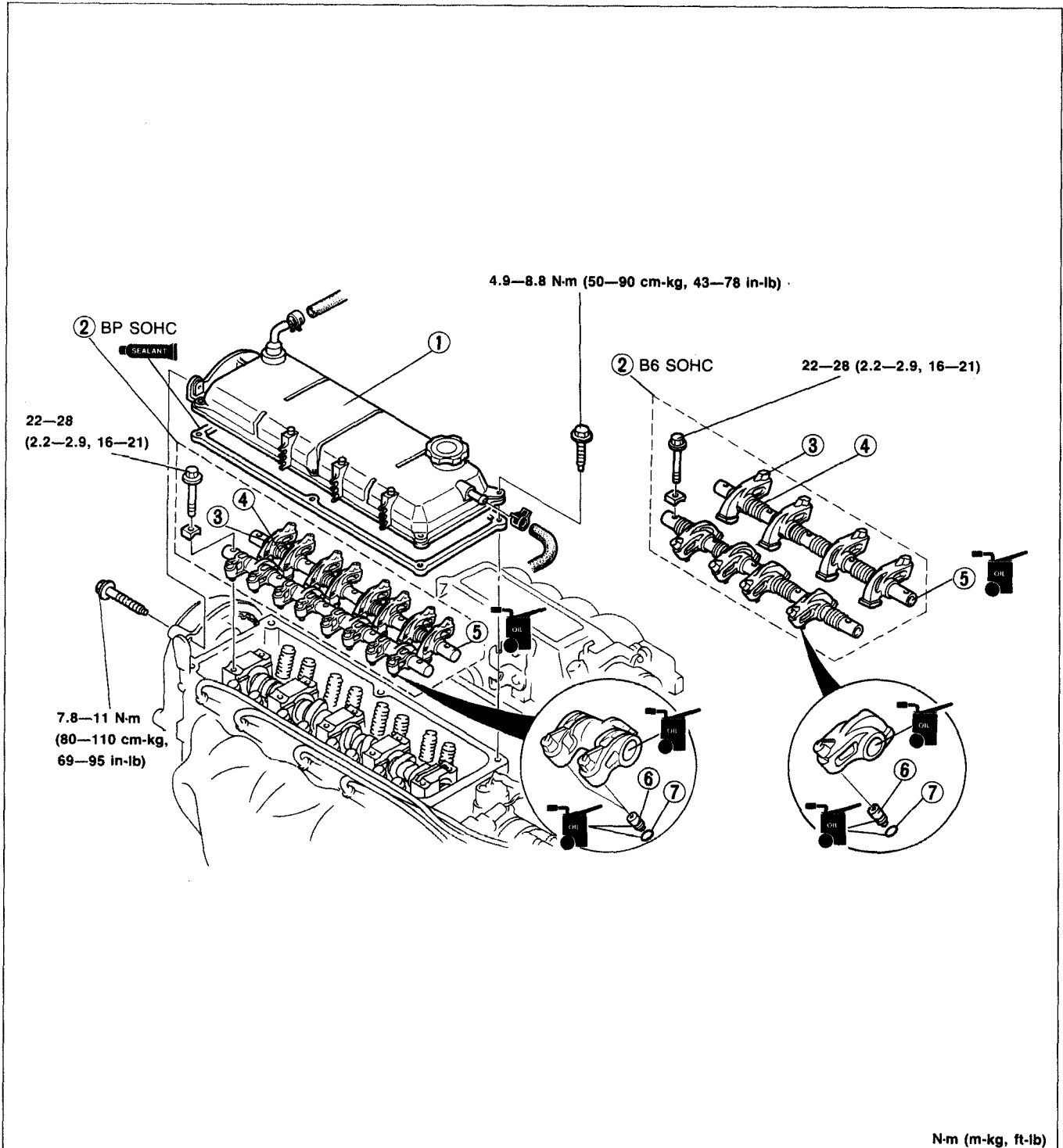
1. Fill the radiator with the specified amount and type of engine coolant. (Refer to Section E.)
2. Connect the negative battery cable.
3. Start the engine and check as follows:
 - (1) Engine oil and engine coolant leakage.
 - (2) Ignition timing, idle speed. (Refer to page B1-8.)
 - (3) Operation of emission control system.
4. Recheck the engine coolant levels.

23U0B1-020

HLA

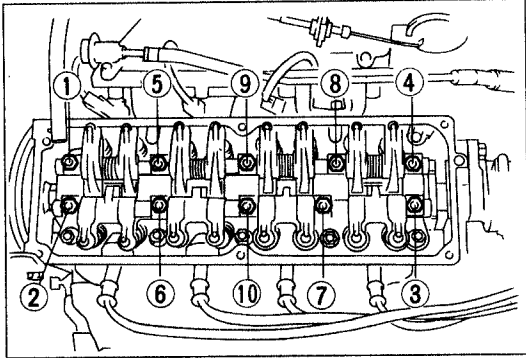
Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.



03U0B1-031

- | | |
|--|---|
| 1. Cylinder head cover
Installation Note..... page B1-22 | 4. Rocker arm spring |
| 2. Rocker arm and rocker shaft assembly
Removal Note..... page B1-21
Installation Note..... page B1-21 | 5. Rocker shaft |
| 3. Rocker arm | 6. HLA
Installation Note..... page B1-21 |
| | 7. O-ring |

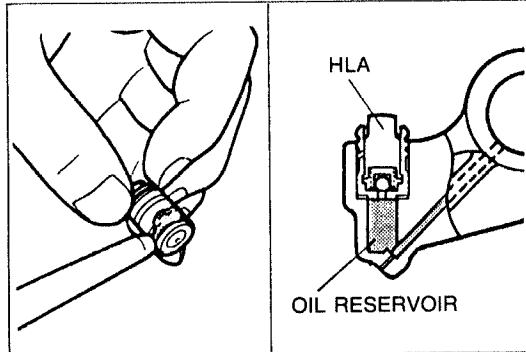


23U0B1-021

Removal note

Rocker arm and rocker shaft assembly

1. Loosen the rocker arm bolts in two or three steps in the order shown in the figure.
2. Remove the rocker arms and rocker shaft assembly.
3. Code all rocker arms and springs so that they can be reinstalled in the same places from which they were removed.



03U0B1-033

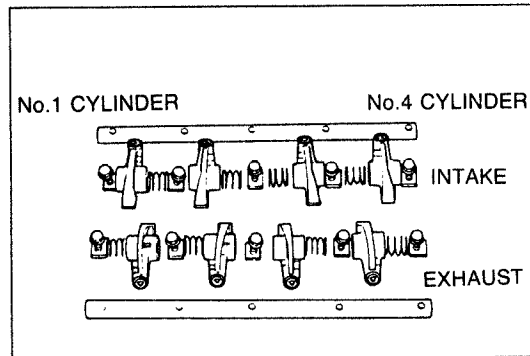
Installation note

HLA

1. Pour engine oil into the oil reservoir in the rocker arm.
2. Apply engine oil to the new HLA.
3. Install the HLA in the rocker arm.

Caution

- Be careful not to damage the O-ring when installing.

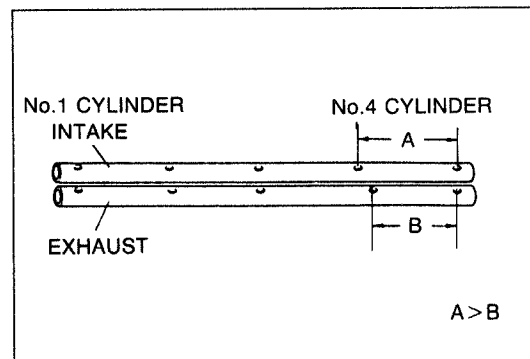


03U0B1-034

Rocker arm and rocker shaft assembly

B6 SOHC

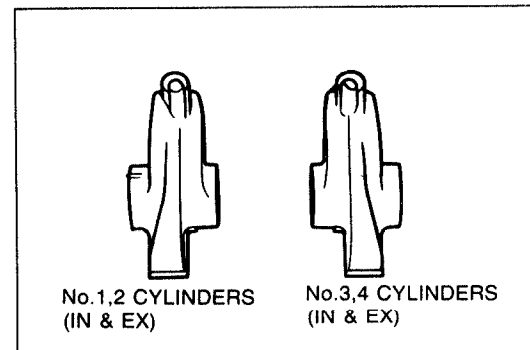
1. Assemble the rocker arm and rocker shaft assembly as shown in the figure.



63U01X-115

Caution

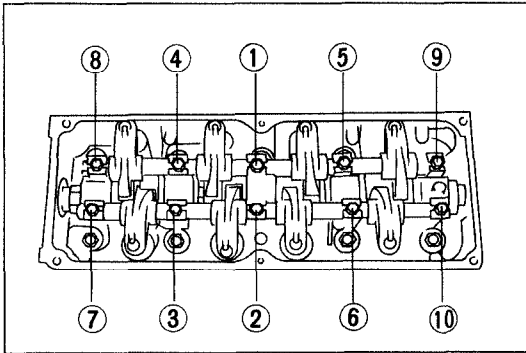
- Be sure both rocker arm shaft oil holes face downward.
- The installation bolt holes are different for the exhaust and intake sides as shown in the figure.



93U01A-083

Note

- There are two types of rocker arms with different offsets. One type for No.1 and No.2 cylinders exhaust and intake. And the other for cylinders No.3 and No.4.



93U01A-084

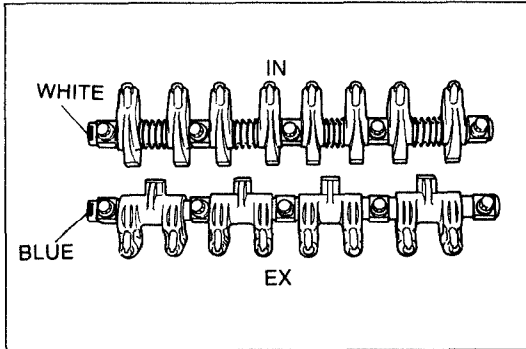
2. Install the rocker arm and rocker shaft assembly.

Caution

- The bolts must be tightened gradually and in the order shown in the figure.

Tightening torque:

22—28 N·m (2.2—2.9 m·kg, 16—21 ft·lb)



03U0B1-035

BP SOHC

1. Assemble the rocker arm and rocker shaft assembly as shown in the figure.

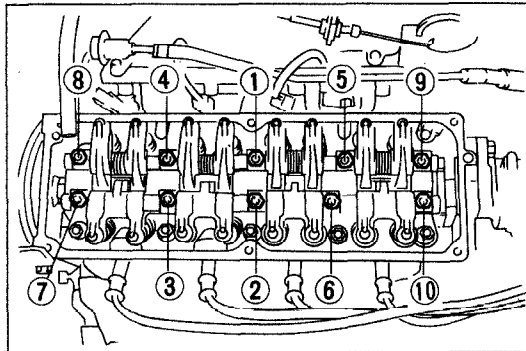
Caution

- Face the rocker shaft identification mark upward.
- The installation bolt holes are different for the exhaust and intake sides.

Identification mark

IN White

EX Blue

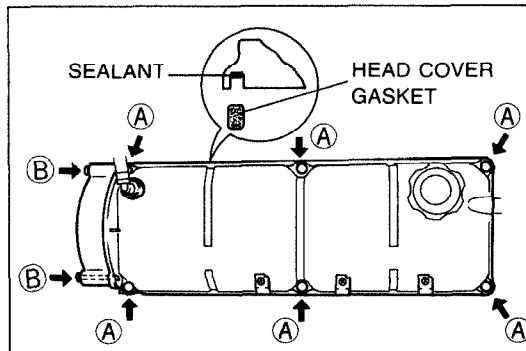


23U0B1-022

2. Install the rocker arm and rocker shaft assembly.
3. Tighten the rocker arm bolts in two or three steps in the order shown in the figure.

Tightening torque:

22—28 N·m (2.2—2.9 m·kg, 16—21 ft·lb)



23U0B1-023

Cylinder head cover

1. Install the cylinder head cover.

Tightening torque

Bolt (A):

4.9—8.8 N·m (50—90 cm·kg, 43—78 in·lb)

Bolt (B):

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Caution

- If the head cover gasket is reused, apply sealant in the groove as shown.

Steps After Installation

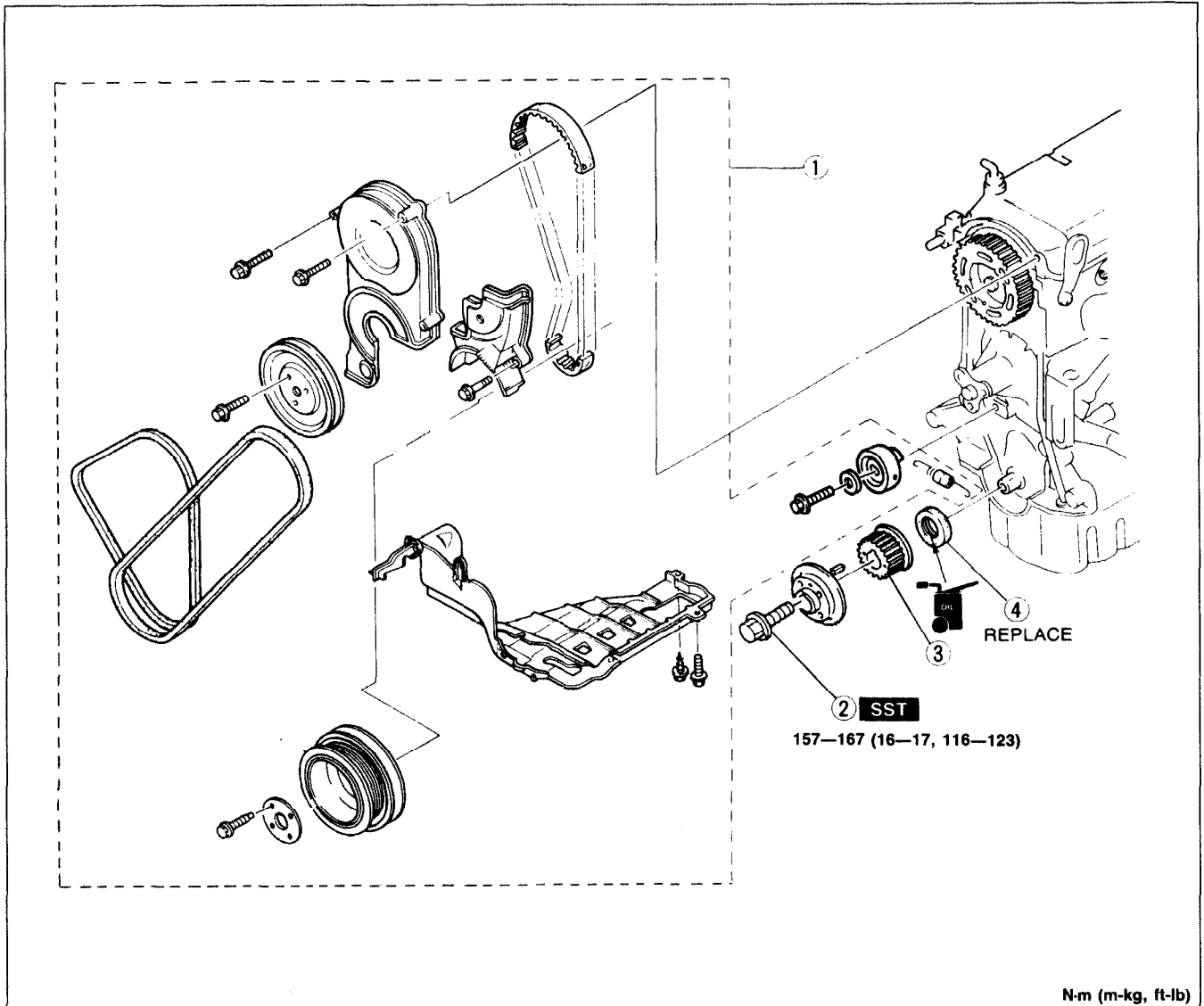
1. Connect the negative battery cable.
2. Start the engine and fully warm up.
3. Verify that there is no tappet noise.

03U0B1-038

FRONT OIL SEAL

Replacement

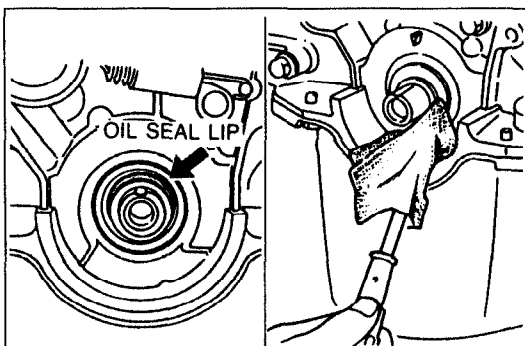
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.



23U0B1-024

1. Timing belt
Removal / Installation..... page B1-12
2. Pulley lock bolt
Installation Note..... page B1-24

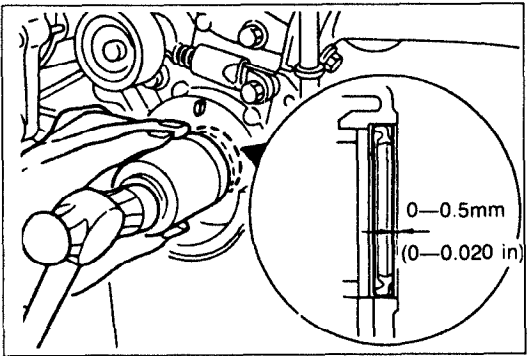
3. Timing belt pulley
Installation Note..... page B1-24
4. Oil seal
Removal Note below
Installation Note..... page B1-24



01E0BX-055

Removal Note
Oil seal

1. Cut the oil seal lip with a razor knife.
2. Remove the oil seal with a screwdriver protected with a rag.



01E0BX-056

Installation Note

Oil seal

1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution

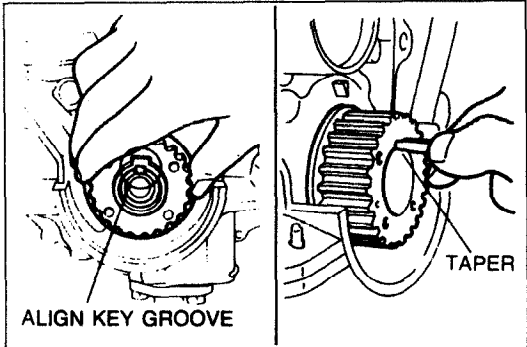
- **The oil seal must be tapped in until it is flush with the edge of the oil pump body.**

3. Tap the oil seal in evenly with a suitable pipe and a hammer.

Oil seal outer diameter: 50.5mm (1.98 in)

Timing belt pulley

1. Install the timing belt pulley.
2. Install the pulley woodruff key with the tapered side toward the oil pump body.



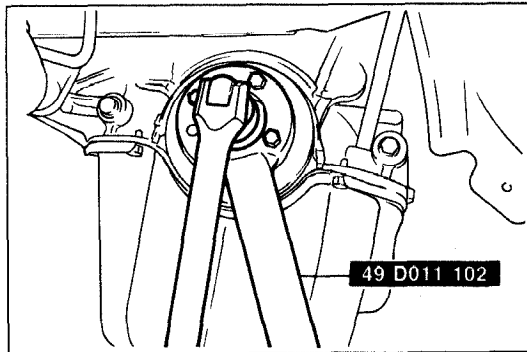
01E0BX-057

Pulley lock bolt

1. Hold the crankshaft with the **SST** and tighten the pulley lock bolt.

Tightening torque:

157—167 N·m (16—17 m·kg, 116—123 ft·lb)



23U0B1-025

Steps After Installation

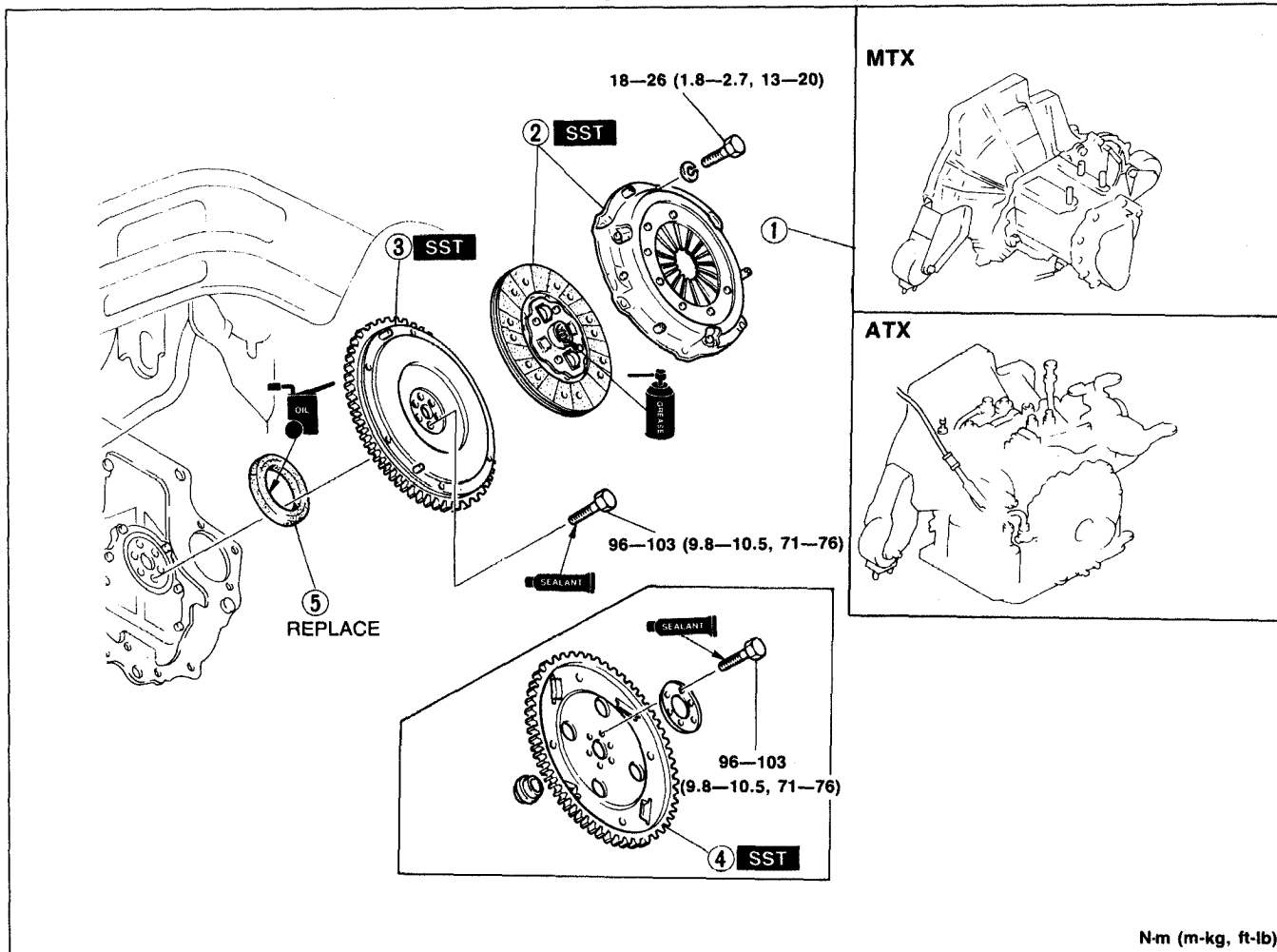
1. Lower the vehicle.
2. Connect the negative battery cable.
3. Start the engine and check the ignition timing.
(Refer to page B1-8)

23U0B1-026

REAR OIL SEAL

Replacement

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

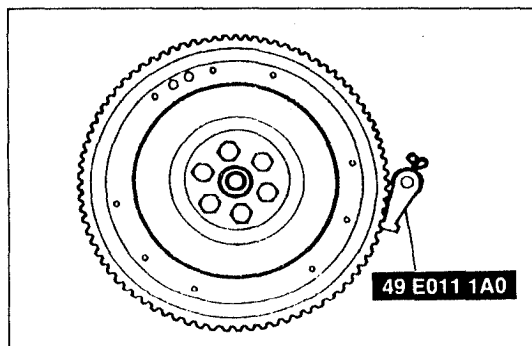


N-m (m-kg, ft-lb)

23U0B1-027

- | | |
|------------------------------|-----------------|
| 1. Transaxle | |
| MTX | |
| Service | Sections J1, J2 |
| ATX | |
| Service | Section K |
| 2. Clutch cover, clutch disc | |
| Service | Section H |

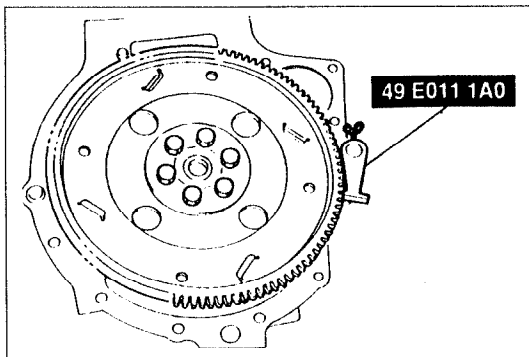
- | | |
|-------------------------|------------|
| 3. Flywheel (MTX) | |
| Removal Note | below |
| Installation Note | page B1-26 |
| 4. Drive plate (ATX) | |
| Removal Note | page B1-26 |
| Installation Note | page B1-27 |
| 5. Oil seal | |
| Removal Note | page B1-26 |
| Installation Note | page B1-26 |



Removal note
Flywheel (MTX)

1. Hold the flywheel with the **SST** or equivalent.
2. Remove the flywheel lock bolts.
3. Remove the flywheel.

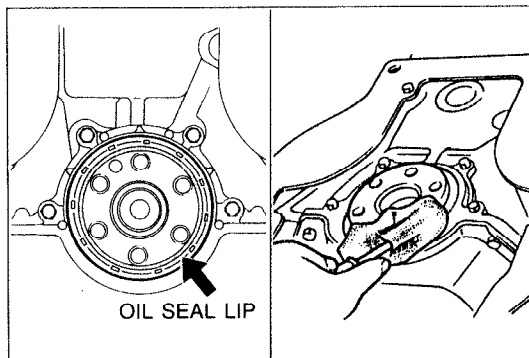
23U0B1-063



23U0B1-064

Drive plate (ATX)

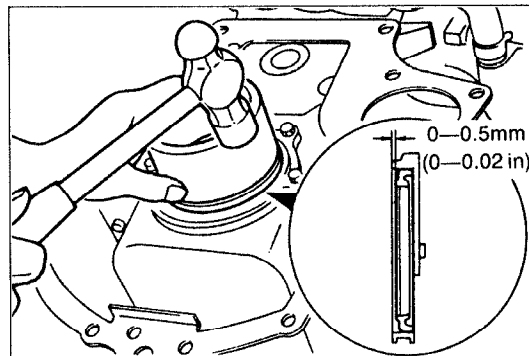
1. Hold the drive plate with the **SST** or equivalent.
2. Remove the drive plate lock bolts.
3. Remove the backing plate, drive plate, and adapter.



05U0BX-063

Oil seal

1. Cut the oil seal lip with a razor knife.
2. Remove the oil seal with a screwdriver protected with a rag.



05U0BX-069

Installation note

Oil seal

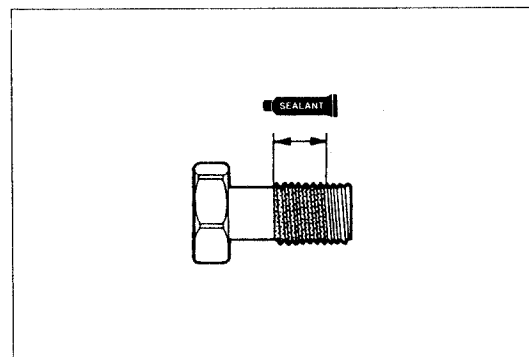
1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution

- The oil seal must be tapped in until it is flush with the edge of the rear cover.

3. Tap the oil seal in evenly with a suitable pipe and a hammer.

Oil seal outer diameter: 100mm (3.94 in)



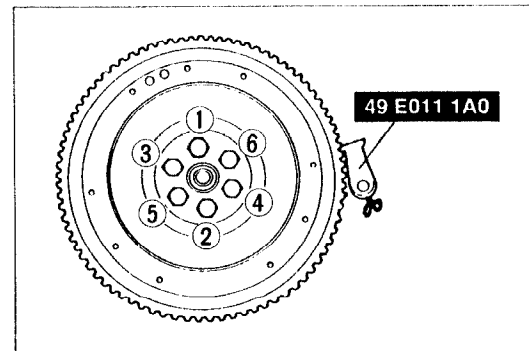
03U0B1-044

Flywheel (MTX)

1. Remove the sealant from the flywheel bolt holes in the crankshaft and from the flywheel bolts.

Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- Do not apply sealant if a new bolt is used.

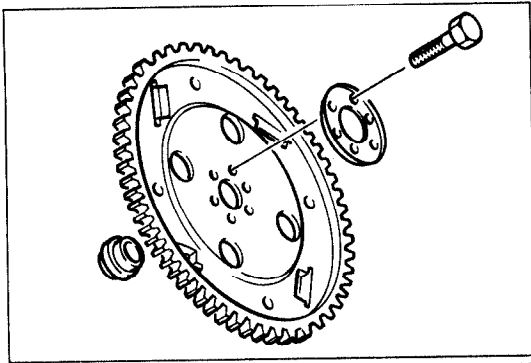


23U0B1-065

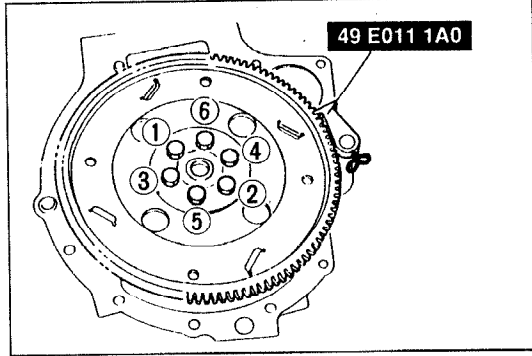
2. Set the flywheel onto the crankshaft.
3. Apply sealant to the flywheel bolts and install them.
4. Hold the flywheel with the **SST** or equivalent.
5. Tighten the bolts in two or three steps in the order shown in the figure.

Tightening torque:

96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)



03U0B1-045



23U0B1-066

Drive plate (ATX)

1. Remove the sealant from the drive plate bolt holes in the crankshaft and from the drive plate bolts.

Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- Do not apply new sealant if a new bolt is used.

2. Install the adapter, drive plate, and backing plate onto the crankshaft.
3. Apply sealant to the drive plate bolts and install them.
4. Hold the drive plate with the **SST** or equivalent.
5. Tighten the bolts in two or three steps in the order shown in the figure.

Tightening torque:

96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)

Steps After Installation

1. Connect the negative battery cable.
2. Start the engine and perform engine adjustments as necessary.

05U0BX-072

REMOVAL

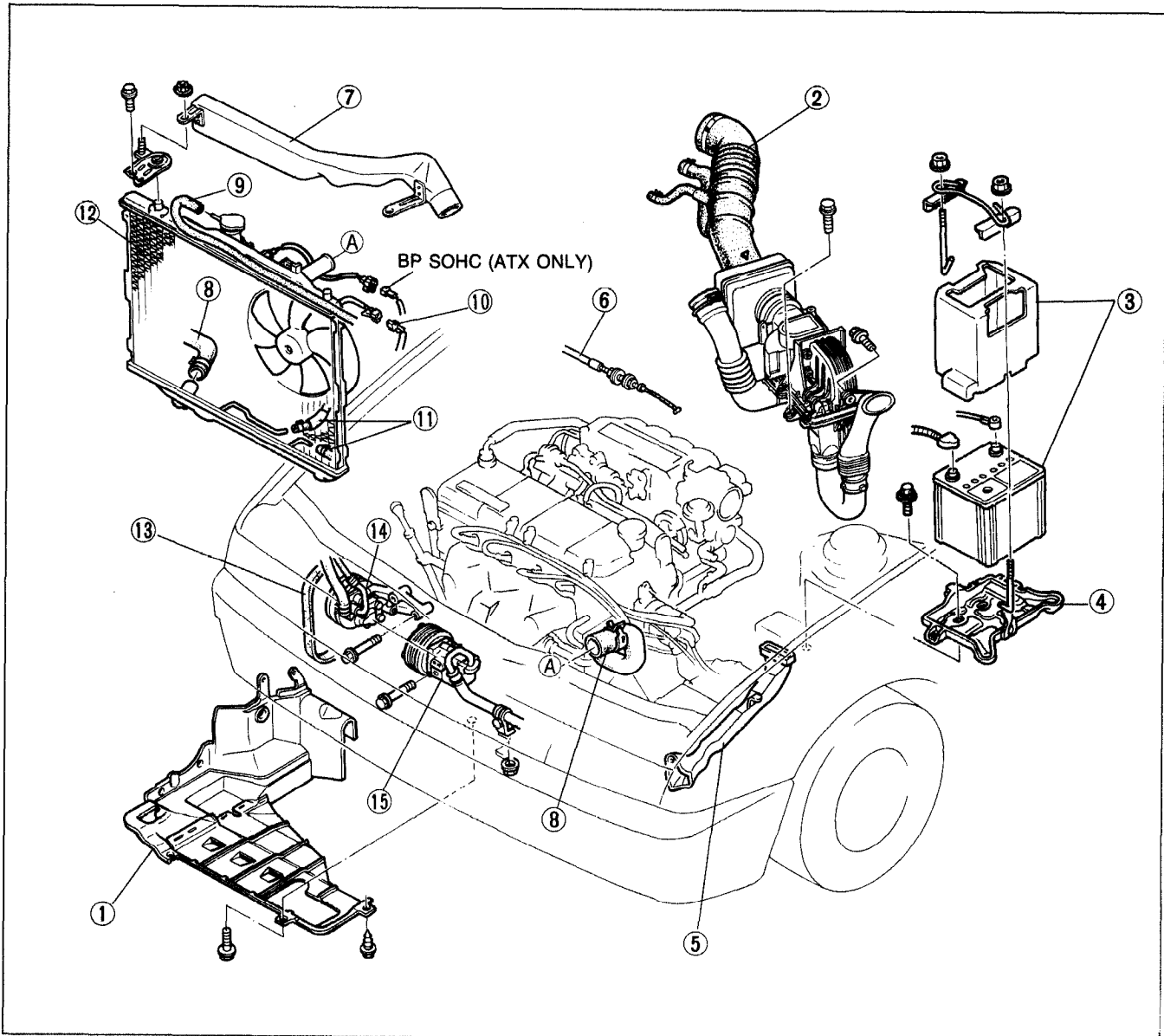
Warning

- Release the fuel pressure. (Refer to Section F.)

PROCEDURE

1. Disconnect the negative battery cable.
2. Drain the engine coolant and transaxle oil.
3. Remove in the order shown in the figure, referring to **Removal Note**.

Step 1

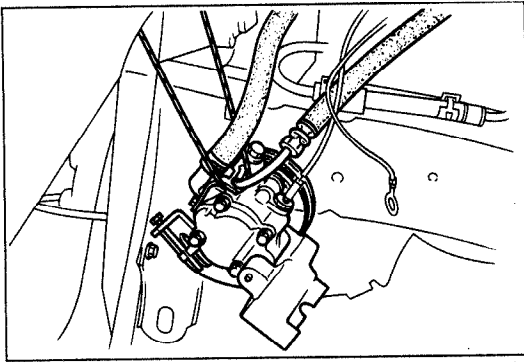


23U0B1-028

1. Undercover and side cover
2. Air cleaner assembly
3. Battery and battery cover
4. Battery carrier
5. Battery duct
6. Accelerator cable
7. Resonance chamber
8. Radiator hose
9. Coolant reservoir hose

10. Cooling fan connector
11. Oil cooler hose (ATX)
12. Radiator and cooling fan assembly
13. P/S and/or A/C drive belt
Removal page B1- 6
14. P/S oil pump and bracket
Removal Note..... page B1-29
15. A/C compressor (if equipped)
Removal Note..... page B1-29

REMOVAL



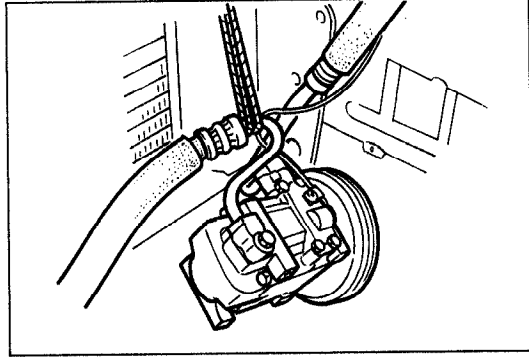
05U0BX-074

Removal note P/S oil pump

Caution

- Do not damage the hoses.

1. Remove the P/S oil pump with the hoses still connected.
2. Position the pump away from the engine and affix it with wire.



23U0B1-029

A/C compressor (if equipped)

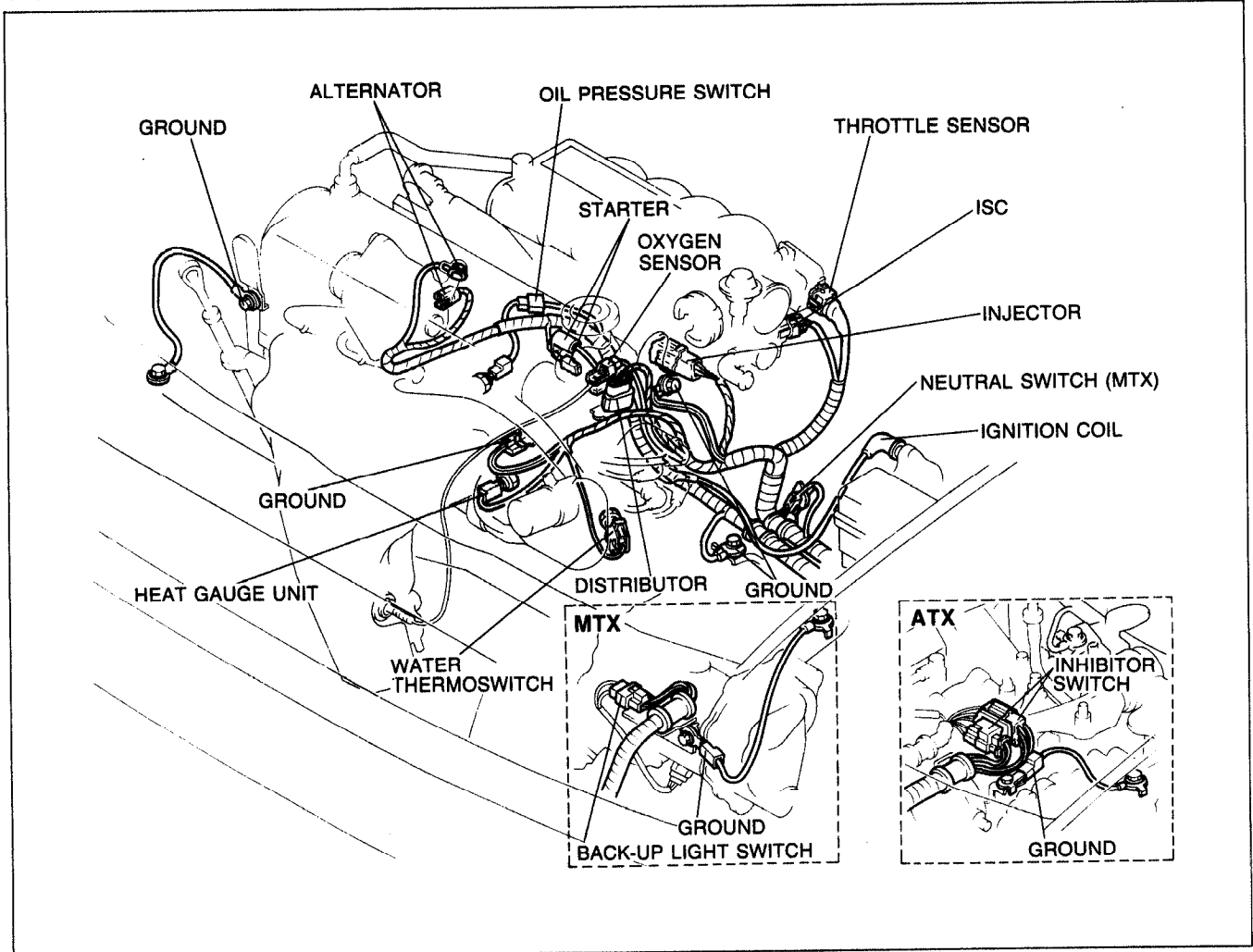
Caution

- Do not damage the hoses.

1. Remove the A/C compressor with the hoses still connected.
2. Position the compressor away from the engine and affix it with wire.

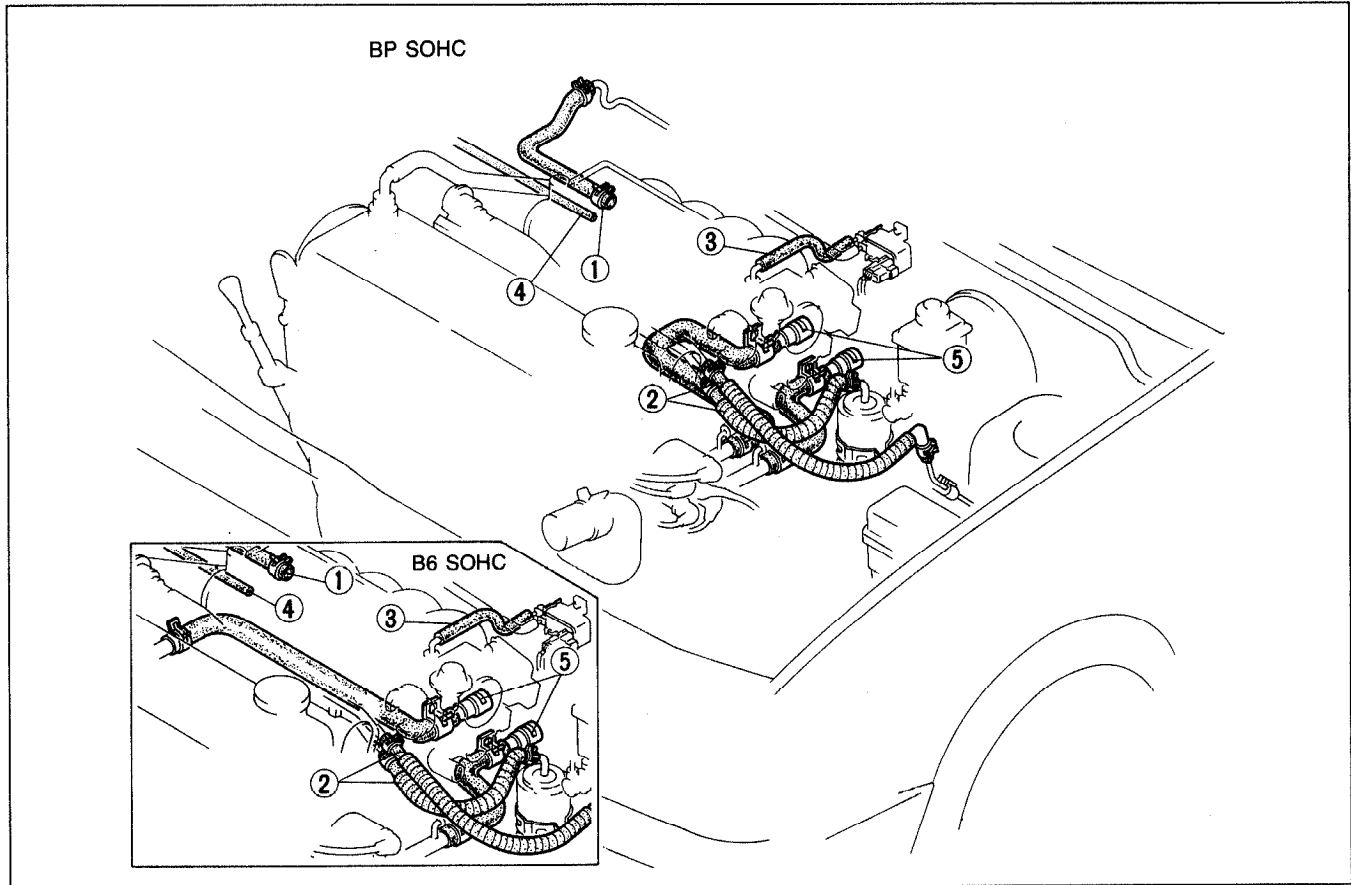
Step 2

1. Disconnect the harness connectors shown in the figure.



Step 3

1. Disconnect the hoses shown in the figure.



13U0B1-042

1. Brake vacuum hose

2. Fuel hose

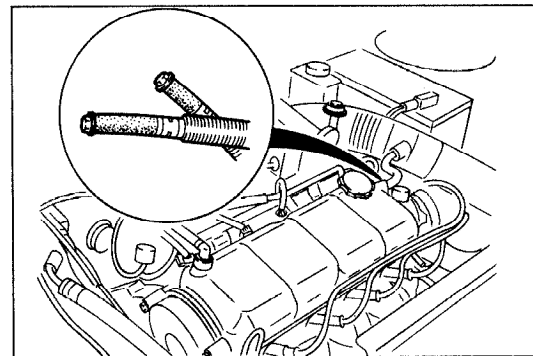
Removal Note below

3. Vacuum hose (Purge control)

4. Vacuum hose (Cruise control)

5. Heater hose

Removal Note below



05U0BX-078

Removal note

Fuel hose

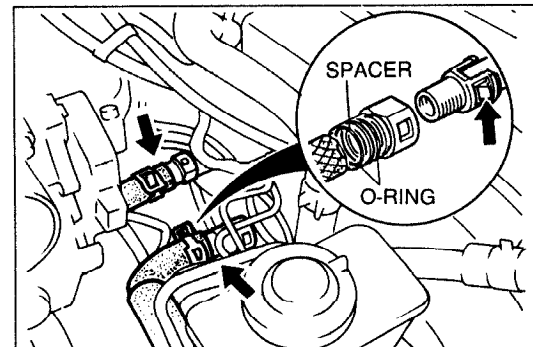
Warning

- Keep sparks and open flame away from the fuel area.

Caution

- Cover the hose with a rag because fuel will spray out when disconnecting.
- Plug the disconnected hoses to avoid fuel leakage.

1. Disconnect the fuel hoses.



03U0B1-050

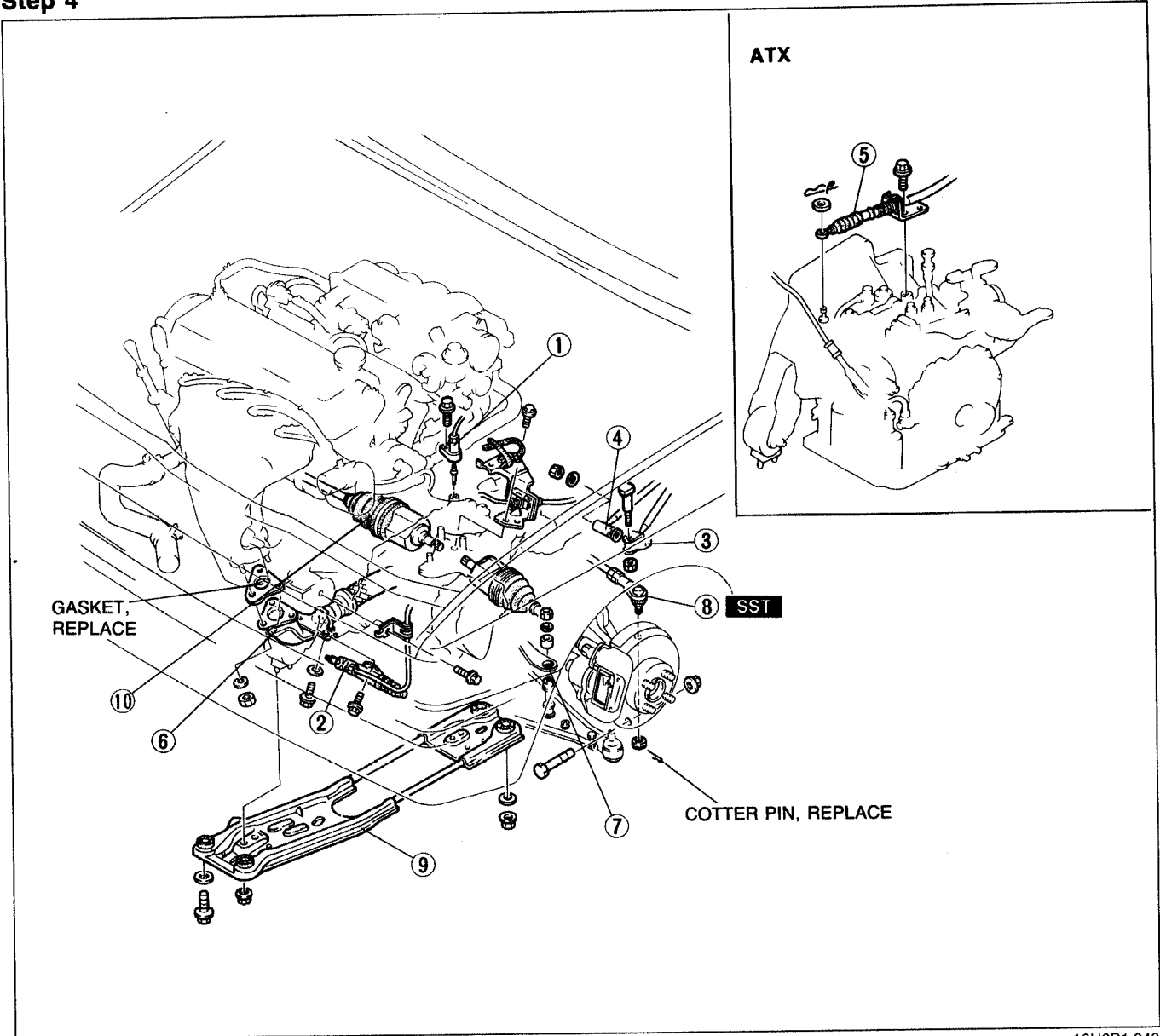
Heater hose

Caution

- Heater hose joint has O-rings and spacer.
- Do not lose them when removing.

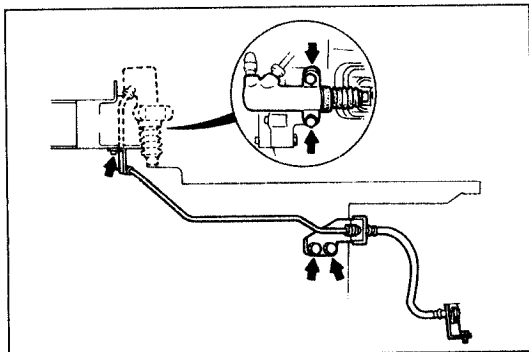
1. Push the heater hose retainer and remove the heater hose.

Step 4



13U0B1-043

- | | |
|--|--|
| 1. Speedometer cable | 7. Stabilizer |
| 2. Clutch release cylinder
Removal Note below | 8. Tie rod end
Removal Note..... page B1-32 |
| 3. Shift control rod (MTX) | 9. Engine mount member
Removal Note..... page B1-32 |
| 4. Extension bar (MTX) | 10. Driveshaft
Removal Note..... page B1-32 |
| 5. Shift control cable (ATX) | |
| 6. Front exhaust pipe | |



13U0B1-044

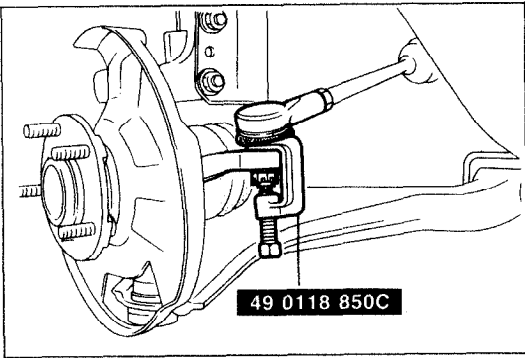
Removal note

Clutch release cylinder (MTX)

1. Remove the release cylinder pipe bracket from the transaxle.
2. Position the release cylinder away from the transaxle for easier removal with the hose still connected.

Caution

- Do not damage the pipe or hose.



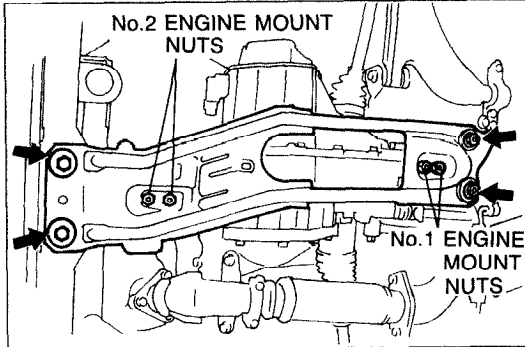
13U0B1-045

Tie-rod end

1. Remove the cotter pin and loosen the nut so that it flushes with the ball joint edge.
2. Separate the knuckle arm and ball-joint with the **SST**.

Caution

- Do not reuse the cotter pin.



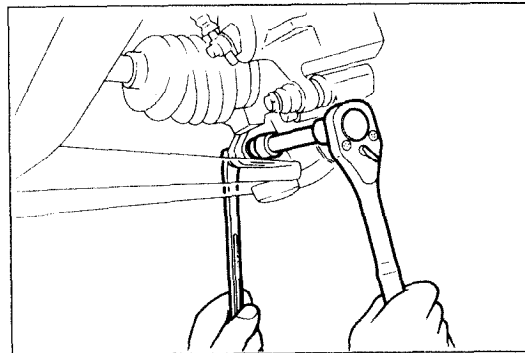
03U0B1-054

Engine mount member

1. Suspend the engine with a chain block.
2. Remove the No.1 and No.2 engine mount nuts.
3. Remove the engine mount member bolts and nuts and the engine mount member.

Caution

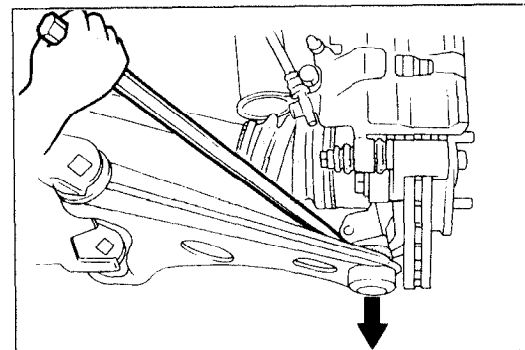
- Be careful so that the engine does not fall when removing the member.



03U0B1-055

Driveshaft

1. Remove the bolts and nuts at the left and right lower arm ball joints.

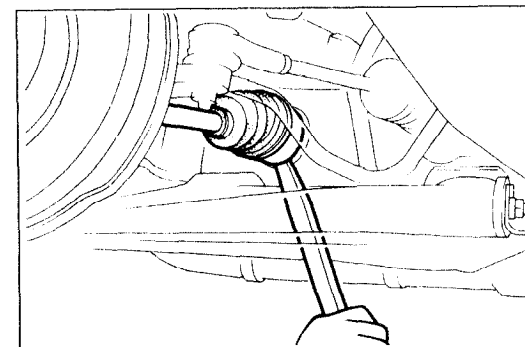


03U0B1-056

2. Pull the lower arm downward to separate them from the knuckles.

Caution

- Do not damage the ball joint dust boots.



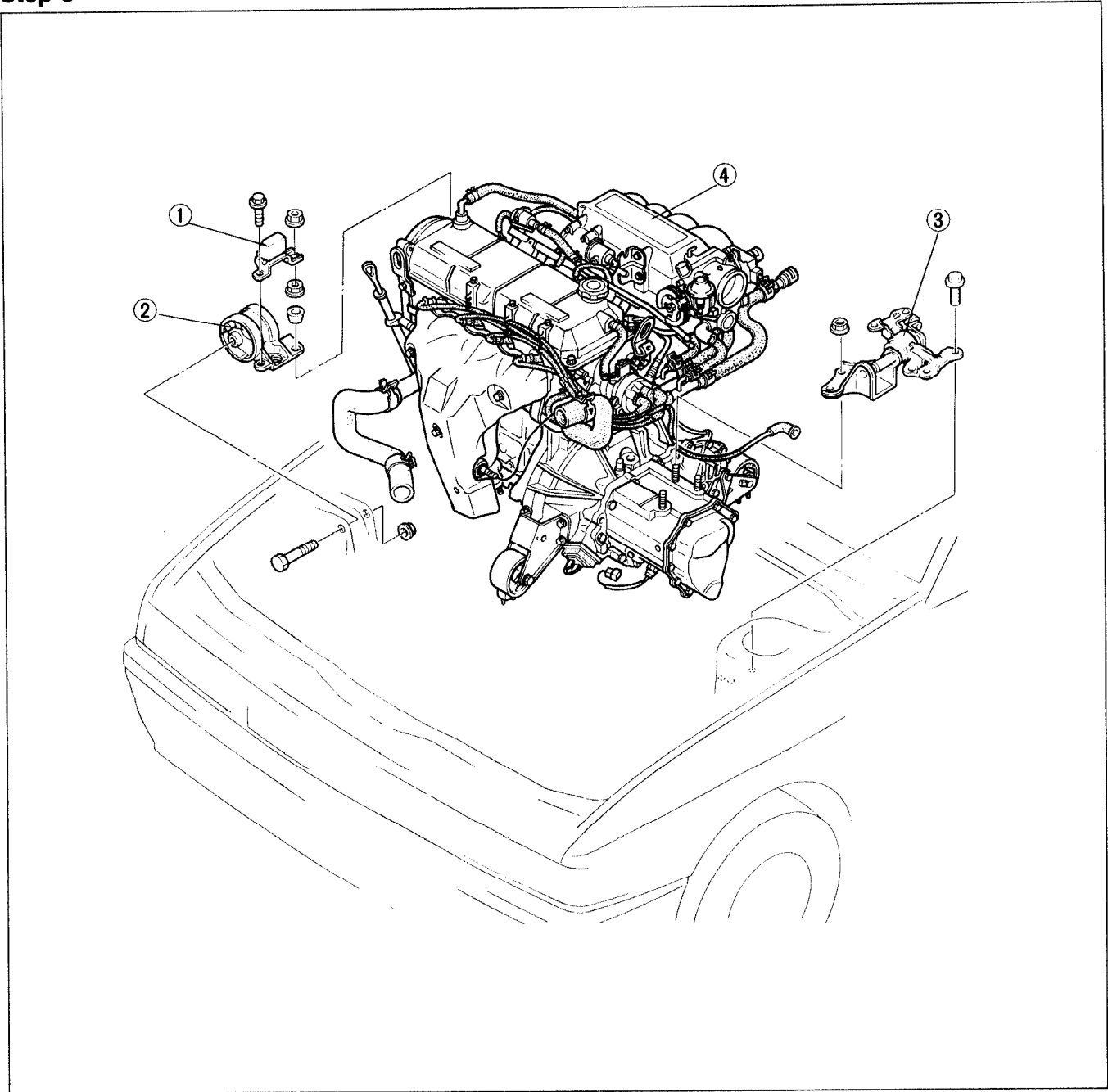
03U0B1-057

3. Separate the driveshafts from the transaxle by prying with a bar inserted between the shaft and the case.

Caution

- Do not damage the oil seal.

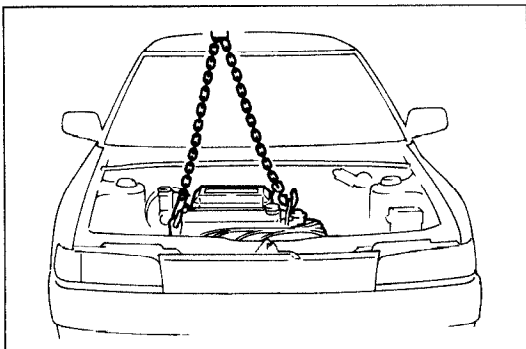
Step 5



13U0B1-046

- 1. Dynamic damper
- 2. No.3 engine mount rubber
- 3. No.4 engine mount rubber and bracket

- 4. Engine and transaxle assembly
Removal note..... below



03U0B1-059

Removal note Engine and transaxle assembly

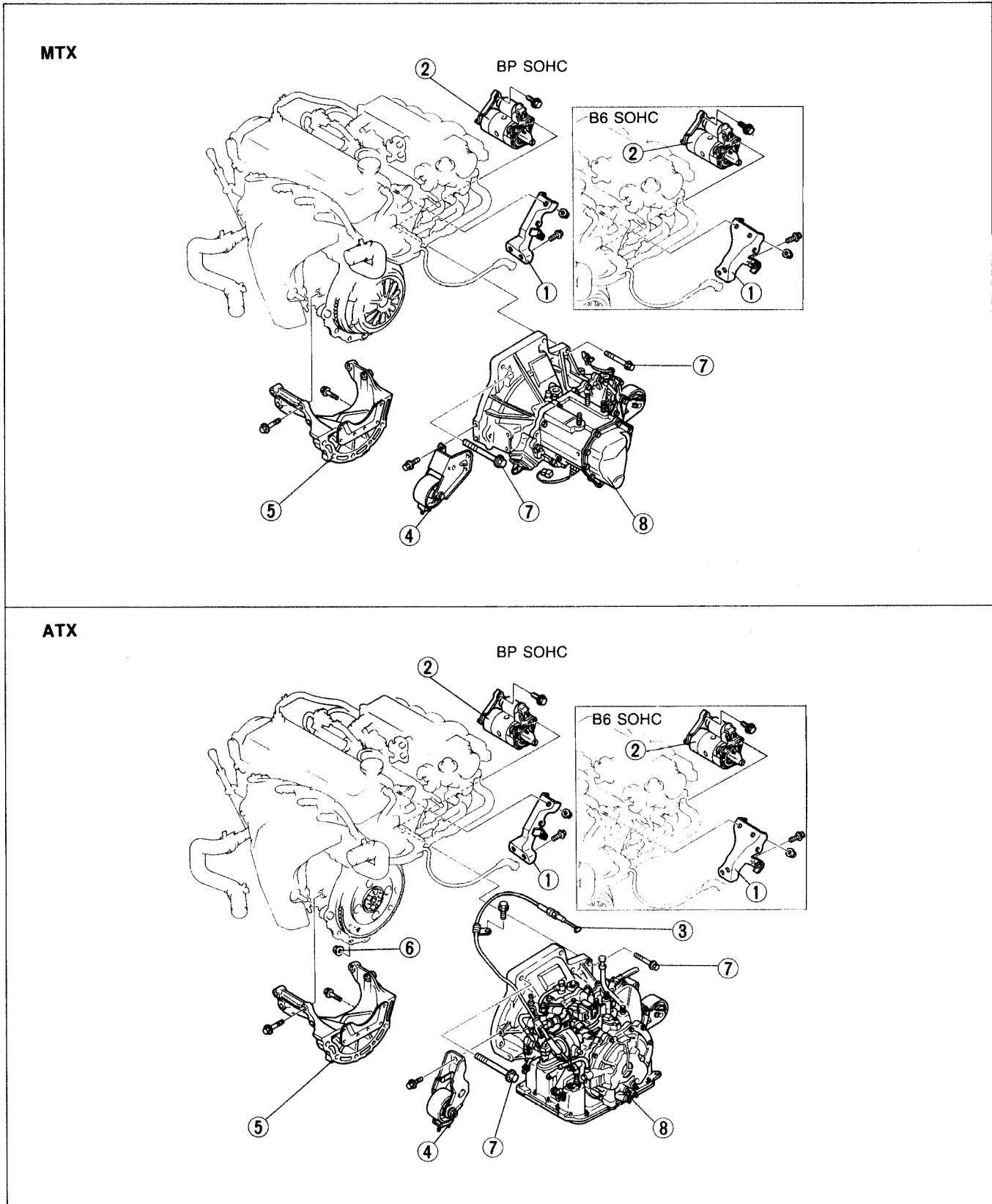
Caution

- Do not damage any components in the engine compartment.

- 1. Lift the engine and transaxle assembly out as a unit.

Step 6

Separate the engine and transaxle in the order shown in the figure.



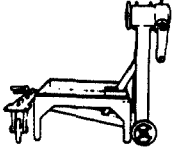
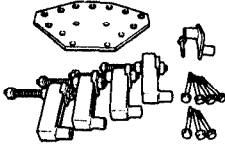
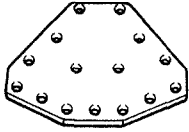



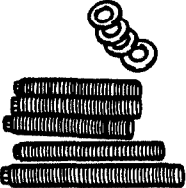

03U0B1-060

1. Intake manifold bracket
2. Starter and bracket
3. Throttle cable (ATX)
4. No.2 engine mount rubber and bracket
5. Integrated stiffener (B6 engine)
6. Torque converter nuts (ATX)
7. Transaxle mounting bolts
8. Transaxle

ENGINE STAND MOUNTING

PREPARATION

SST

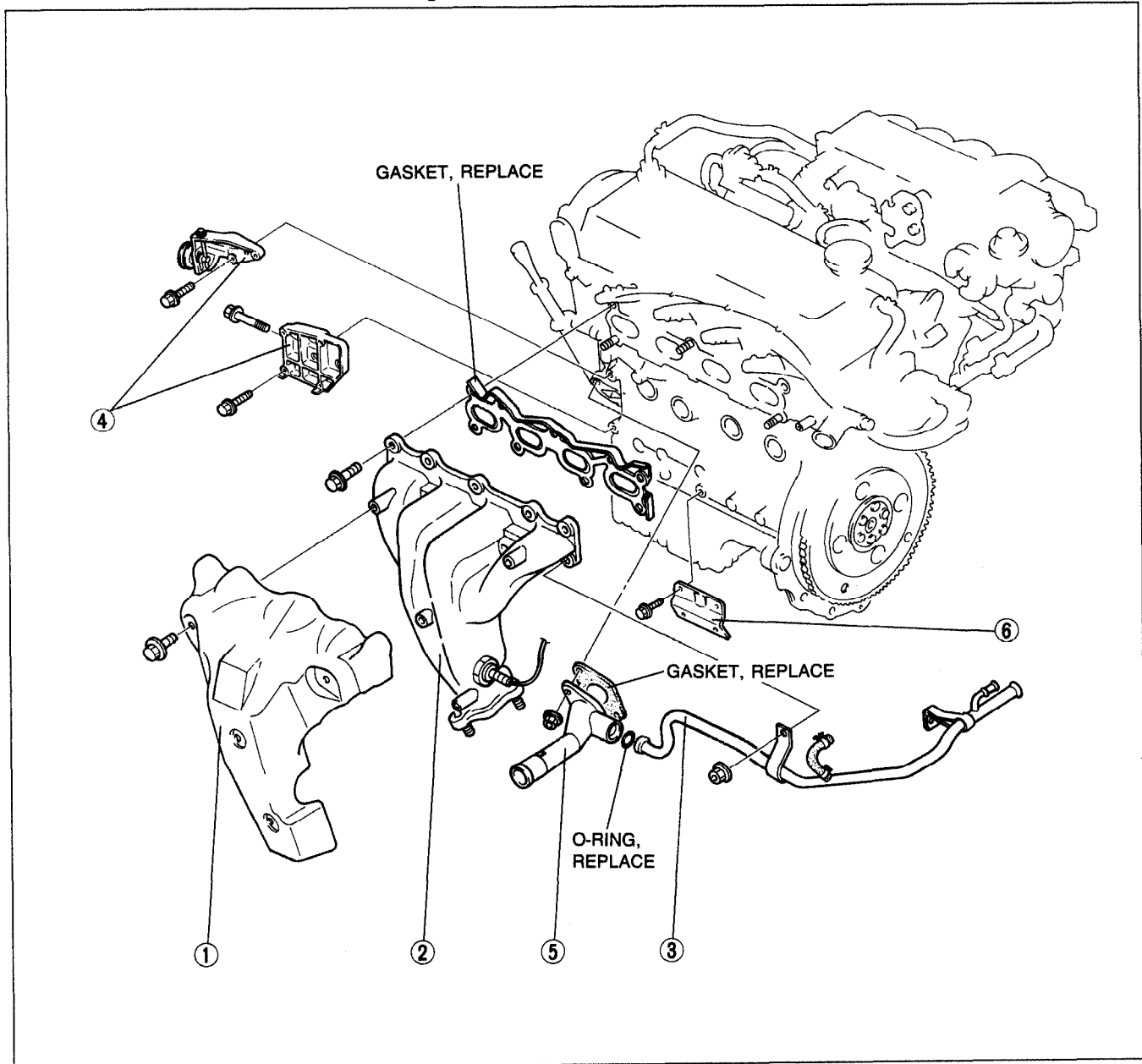
<p>49 0107 680A Engine stand</p> 	<p>For disassembly and assembly of engine</p>	<p>49 L010 1A0 Hanger set, engine stand</p> 	<p>For disassembly and assembly of engine</p>
<p>49 L010 101 Plate (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>	<p>49 L010 102 Arms (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>
<p>49 L010 103 Hooks (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>	<p>49 L010 104 Nuts (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>
<p>49 L010 105 Bolts (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>	<p>49 L010 106 Bolts (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>

05U0BX-082

PROCEDURE

Step 1

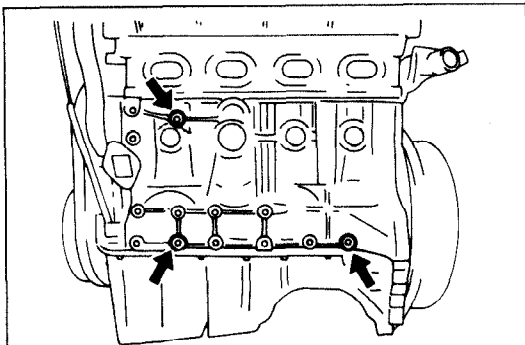
1. Remove in the order shown in the figure.



23U0B1-030

1. Exhaust manifold insulator
2. Exhaust manifold
3. Water bypass pipe

4. A/C compressor bracket (If equipped) and idler
5. Water inlet pipe
6. Exhaust pipe bracket

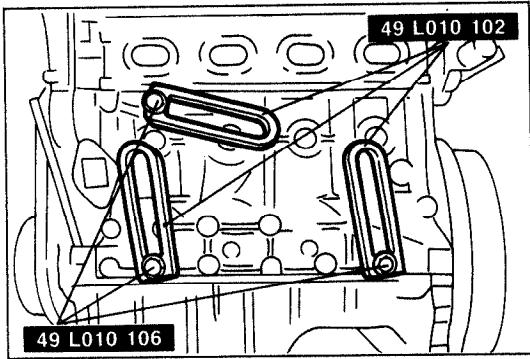


05U0BX-084

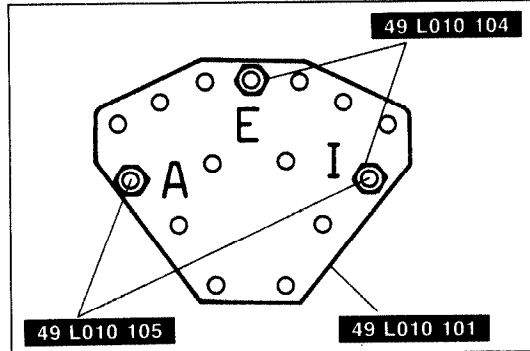
Step 2

Caution

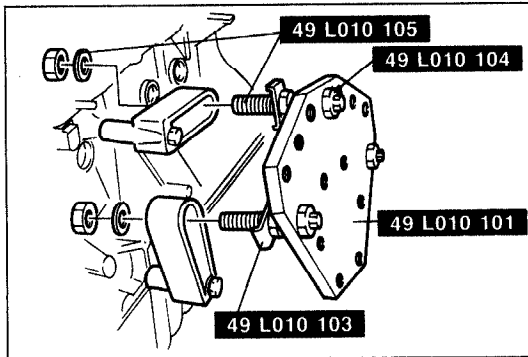
- When installing the SST (engine hanger), use the holes shown in the figure.



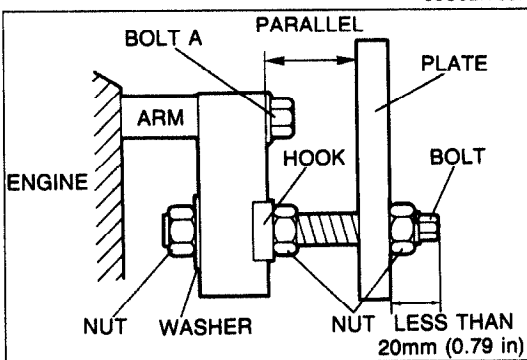
05U0BX-085



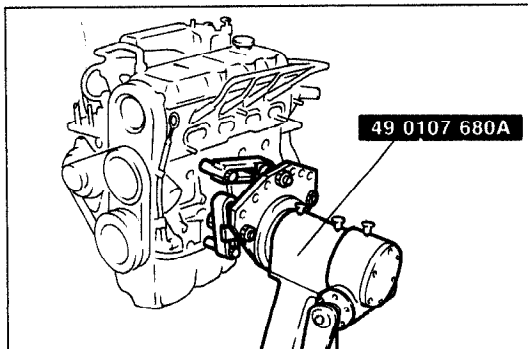
05U0BX-086



05U0BX-087



05U0BX-088



05U0BX-089

1. Install the **SST (arms)** to the holes as shown in the figure, and loosely tighten the **SST (bolts)**.

2. Assemble the **SST (bolts and plate)** in the specified position.

3. Assemble the **SST (nuts, hooks, and bolts)**.

4. Install the **SST** to the respective arms.

Note

- Adjust the **SST (bolts)** so that less than 20mm (0.79 in) of thread is exposed.
- Make the **SST (plate and arms)** parallel by adjusting the **SST (bolts and nuts)**.

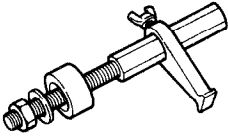
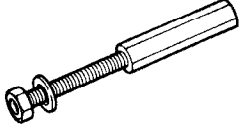


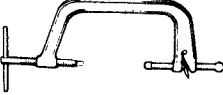
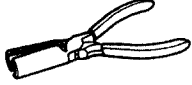
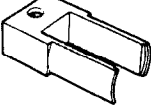
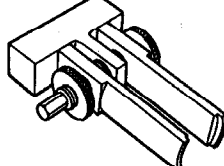
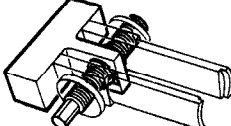
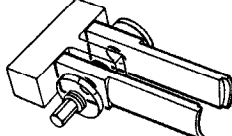
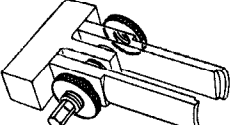
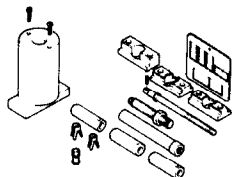

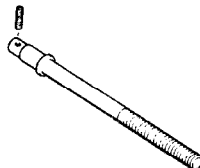
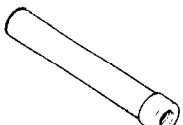

5. Tighten the **SST (bolts and nuts)** to affix the **SST** firmly.



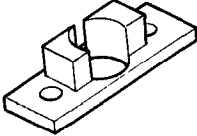
6. Mount the engine on the **SST (engine stand)**.

DISASSEMBLY

PREPARATION

SST

<p>49 E011 1A0</p> <p>Ring gear brake set</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 103</p> <p>Shaft (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 104</p> <p>Collar (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 105</p> <p>Stopper (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 0636 100A</p> <p>Arm, valve spring lifter</p> 	<p>For removal / installation of valves</p>	<p>49 S120 170</p> <p>Remover, valve seal</p> 	<p>For removal of valve seals</p>
<p>49 B012 006</p> <p>Pivot, valve spring lifter</p> 	<p>For removal / installation of valves (BP SOHC)</p>	<p>49 B012 0A2</p> <p>Pivot, valve spring lifter</p> 	<p>For removal / installation of valves</p>
<p>49 B012 012</p> <p>Body (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>	<p>49 B012 013</p> <p>Foot (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>
<p>49 B012 014</p> <p>Locknut (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>	<p>49 L011 0A0</p> <p>Piston pin setting tool set</p> 	<p>For removal / installation of piston pins</p>
<p>49 L011 001</p> <p>Support block body (Part of 49 L011 0A0)</p> 	<p>For removal / installation of piston pins</p>	<p>49 L011 004</p> <p>Screw (Part of 49 L011 0A0)</p> 	<p>For removal / installation of piston pins</p>
<p>49 L011 006</p> <p>Puller & installer (Part of 49 L011 0A0)</p> 	<p>For removal / installation of piston pins</p>	<p>49 L011 007</p> <p>Guide (Part of 49 L011 0A0)</p> 	<p>For removal / installation of piston pins</p>

<p>49 L011 010</p> <p>Centering tool (Part of 49 L011 0A0)</p> 	<p>For removal / installation of piston pins</p>	<p>49 L011 011</p> <p>Holder (Part of 49 L011 0A0)</p> 	<p>For removal / installation of piston pins</p>
<p>49 H011 001A</p> <p>Support block head</p> 	<p>For removal / installation of piston pins</p>	<p>23U0B1-031</p>	

1. Code all identical parts (such as piston, piston rings, connecting rods, and valve springs) so that they can be reinstalled in the cylinder from which they were removed.
2. Clean the parts with a steam cleaner. Blow off any remaining water with compressed air.

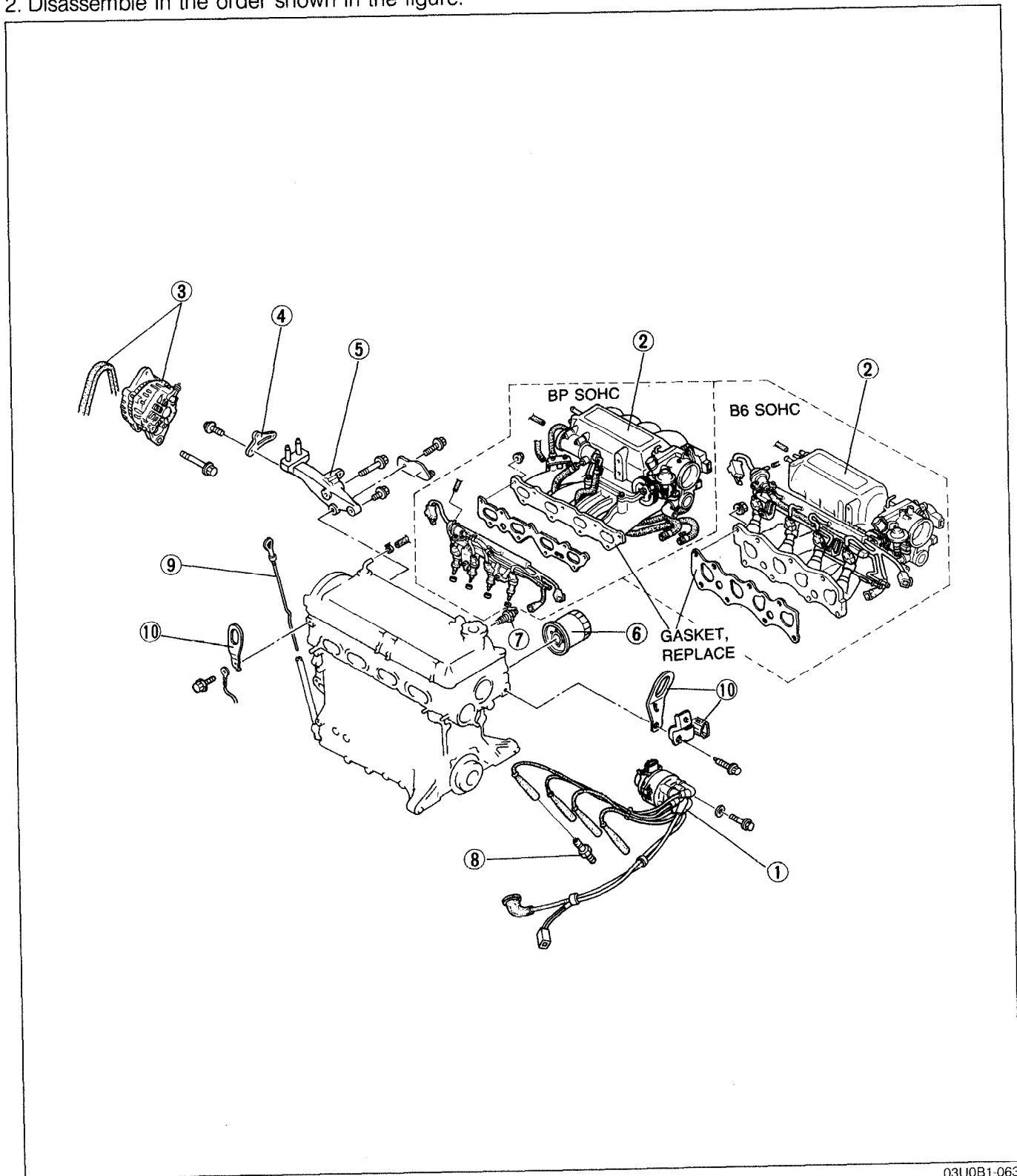
Note

- **During disassembly of any part or system, be sure to study its order of assembly. Also, note any deformation, wear, or damage.**

05U0BX-091

AUXILIARY PARTS

1. Drain the engine oil.
2. Disassemble in the order shown in the figure.



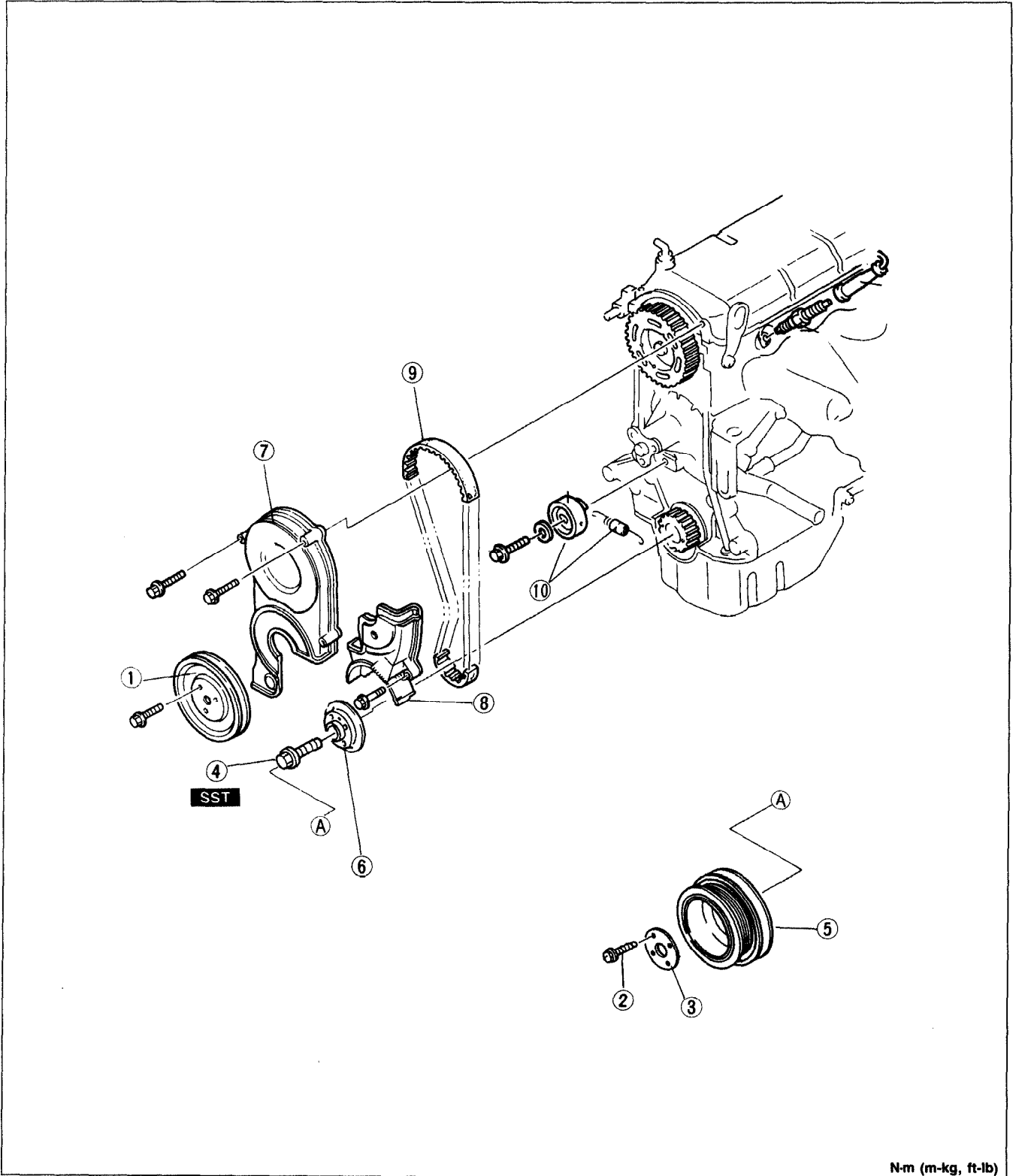
03U0B1-063

1. Distributor and high-tension lead
2. Intake manifold assembly
3. Alternator and drive belt
4. Alternator bracket
5. No.3 engine mount bracket

6. Oil filter
7. Oil pressure switch
8. Spark plug
9. Oil level gauge and pipe
10. Engine hanger

TIMING BELT

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



N-m (m-kg, ft-lb)

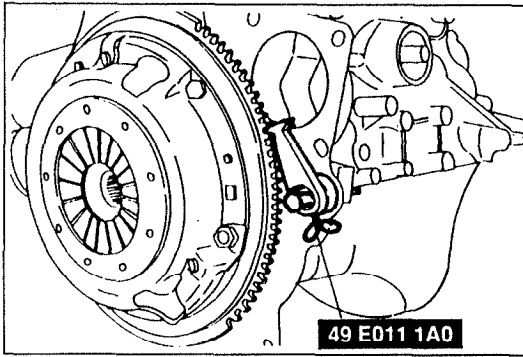
23U0B1-032

- 1. Water pump pulley
- 2. Crank shaft pulley bolt
- 3. Plate
- 4. Pulley lock bolt
- 5. Crankshaft pulley

Disassembly Note page B1-42

- 6. Crankshaft pulley boss
- 7. Timing belt cover, upper
- 8. Timing belt cover, lower
- 9. Timing belt
- 10. Tensioner and tensioner spring

Disassembly Note page B1-42

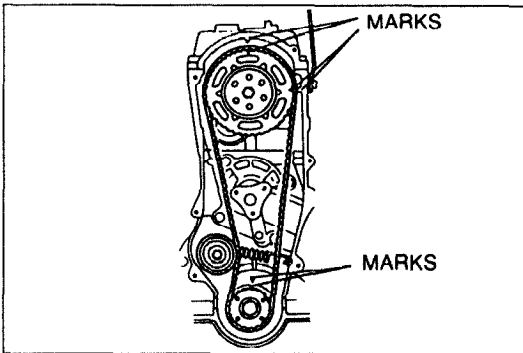


23U0B1-067

Disassembly Note

Pulley lock bolt

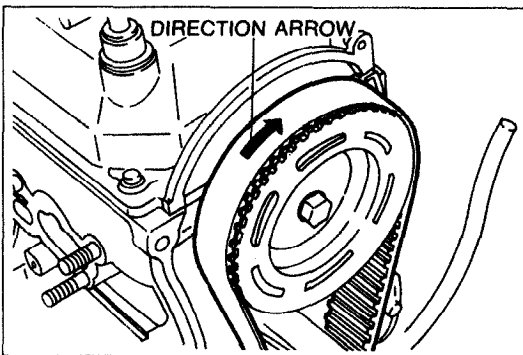
1. Hold the flywheel (MTX) or drive plate (ATX) with the **SST** or equivalent.
2. Remove the pulley lock bolt.



01E0BX-075

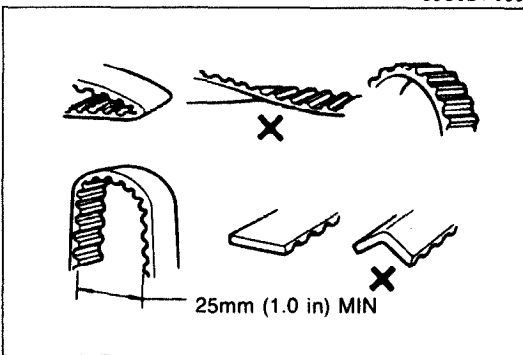
Timing belt

1. Turn the crankshaft and align the marks.



03U0B1-066

2. Mark the timing belt rotation for proper reinstallation.



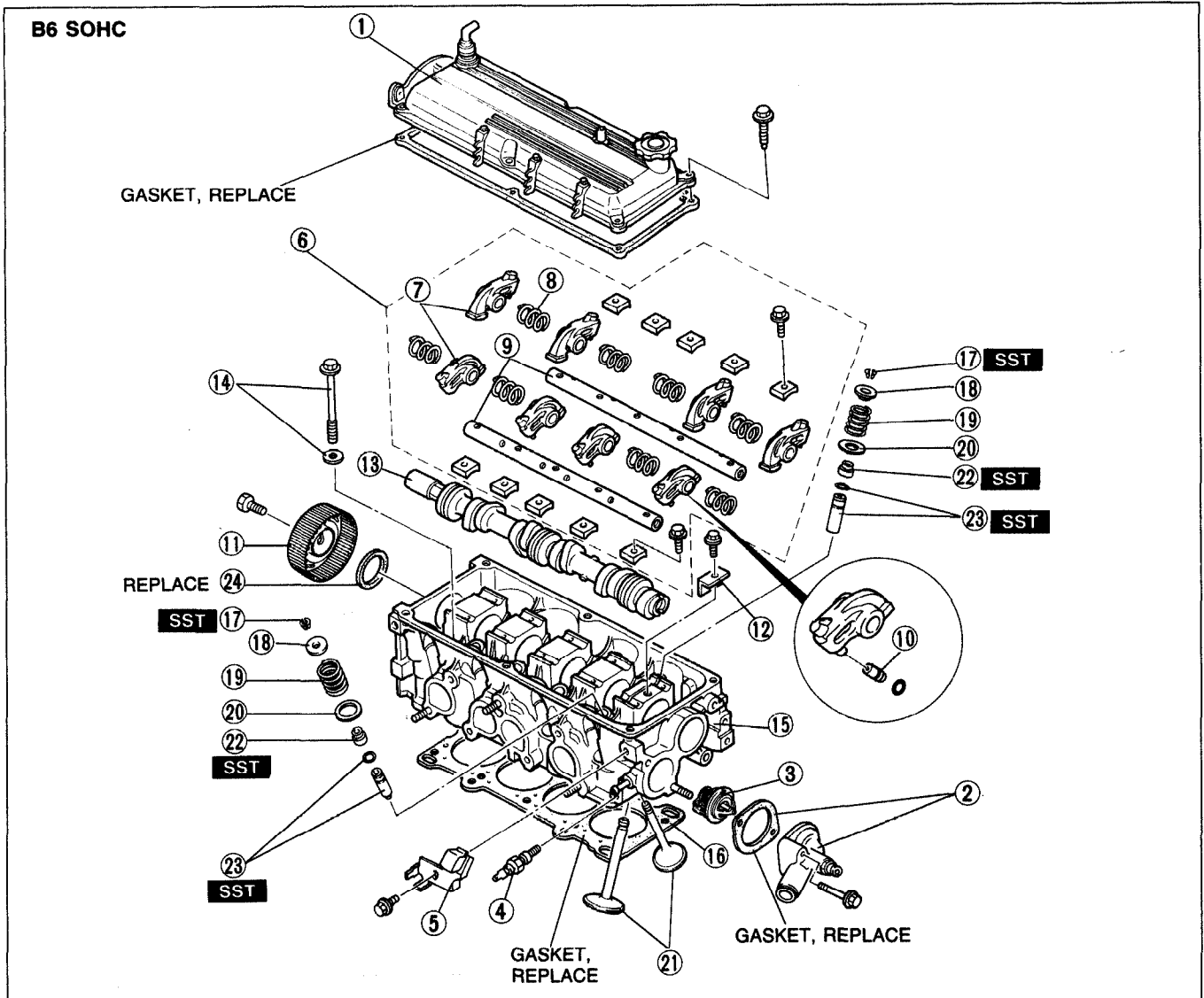
13E0B1-028

Caution

- Never forcefully twist the timing belt. Do not turn it inside out or bend it.
- Do not allow oil or grease on the belt.

CYLINDER HEAD

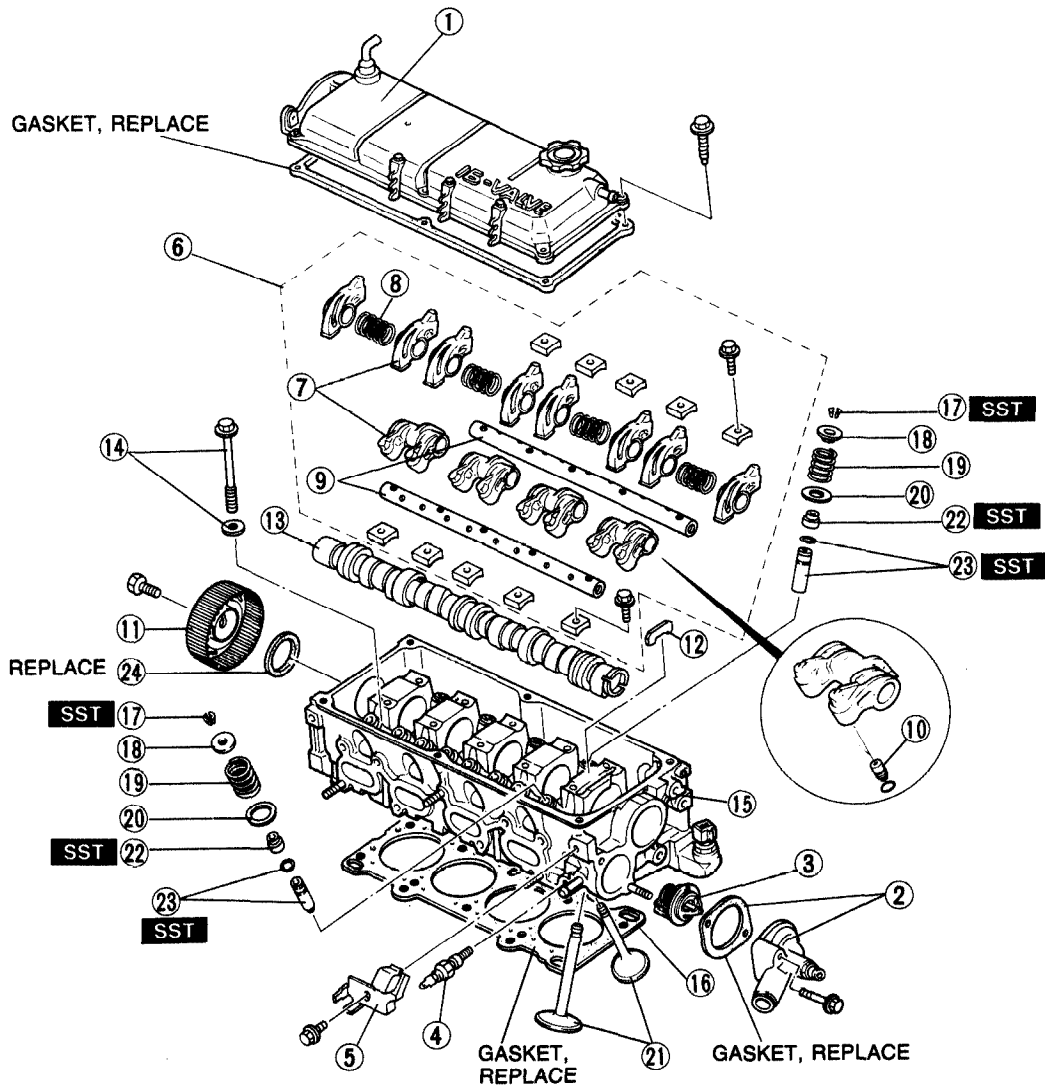
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



23U0B1-033

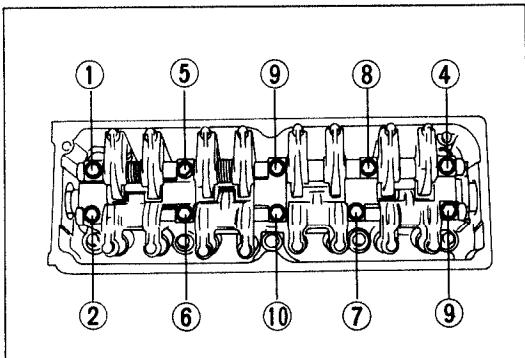
- | | |
|-----------------------------------|------------|
| 1. Cylinder head cover and gasket | |
| 2. Thermostat cover and gasket | |
| 3. Thermostat | |
| 4. Heat gauge unit | |
| 5. Bracket | |
| 6. Rocker arm and shaft assembly | |
| Disassembly Note | page B1-45 |
| 7. Rocker arm | |
| 8. Rocker arm spring | |
| 9. Rocker shaft | |
| 10. Hydraulic lash adjuster (HLA) | |
| Disassembly Note | page B1-45 |
| Inspection | page B1-60 |
| 11. Camshaft pulley | |
| Disassembly Note | page B1-45 |
| Inspection | page B1-65 |
| 12. Thrust plate | |
| 13. Camshaft | |
| Inspection | page B1-58 |
| 14. Cylinder head bolts | |
| Disassembly Note | page B1-45 |
| 15. Cylinder head | |
| Inspection | page B1-54 |
| 16. Cylinder head gasket | |
| 17. Valve keeper | |
| Disassembly Note | page B1-46 |
| 18. Valve spring seat, upper | |
| 19. Valve spring | |
| Inspection | page B1-58 |
| 20. Valve spring seat, lower | |
| 21. Valve | |
| Inspection | page B1-55 |
| 22. Valve seal | |
| Disassembly Note | page B1-46 |
| Inspect for wear or damage | |
| 23. Valve guide | |
| Inspection | page B1-55 |
| Replacement | page B1-56 |
| 24. Camshaft oil seal | |

BP SOHC



23U0B1-034

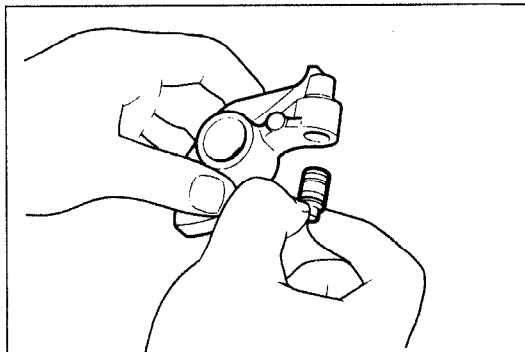
- | | |
|-----------------------------------|-----------------------------------|
| 1. Cylinder head cover and gasket | 14. Cylinder head bolts |
| 2. Thermostat cover and gasket | Disassembly Note page B1-45 |
| 3. Thermostat | 15. Cylinder head |
| 4. Heat gauge unit | Inspection page B1-54 |
| 5. Bracket | 16. Cylinder head gasket |
| 6. Rocker arm and shaft assembly | 17. Valve keeper |
| Disassembly note page B1-45 | Disassembly Note page B1-46 |
| 7. Rocker arm | 18. Valve spring seat, upper |
| 8. Rocker arm spring | 19. Valve spring |
| 9. Rocker shaft | Inspection page B1-58 |
| 10. Hydraulic lash adjuster (HLA) | 20. Valve spring seat, lower |
| Disassembly Note page B1-45 | 21. Valve |
| Inspection page B1-60 | Inspection page B1-54 |
| 11. Camshaft pulley | 22. Valve seal |
| Disassembly Note page B1-45 | Disassembly Note page B1-46 |
| Inspection page B1-65 | Inspect for wear or damage |
| 12. Thrust plate | 23. Valve guide |
| 13. Camshaft | Inspection page B1-54 |
| Inspection page B1-58 | Replacement page B1-56 |
| | 24. Camshaft oil seal |



23U0B1-035

Disassembly Note
Rocker arm and rocker shaft assembly

1. Loosen the rocker arm bolts in two or three steps in the order shown in the figure.
2. Remove the rocker arm and rocker shaft assembly.
3. Code all rocker arms and springs so that they can be reinstalled in the same places from which they were removed.



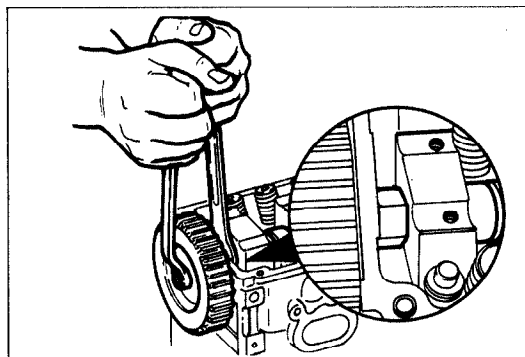
03U0B1-071

Hydraulic lash adjuster (HLA)

Remove the HLA by hand.
 If it is difficult, remove the HLA by using pliers.

Caution

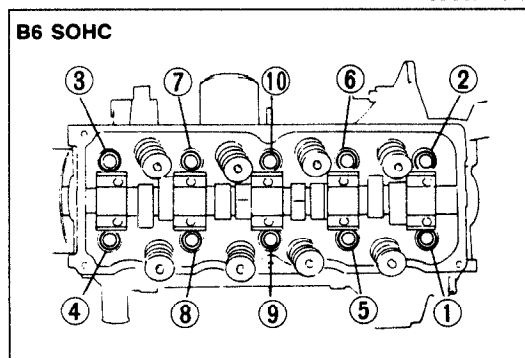
- Do not remove the HLA unless necessary because oil leakage will occur, if the O-ring is damaged.



03U0B1-072

Camshaft pulley

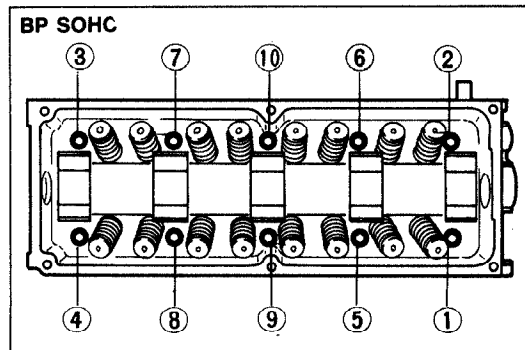
1. Hold the camshaft using a suitable wrench on the cast hexagon.
2. Remove the camshaft pulley lock bolt.
3. Remove the camshaft pulley.



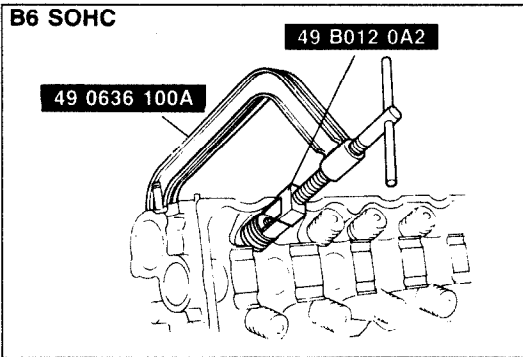
23U0B1-036

Cylinder head bolts

1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.
2. Remove the cylinder head bolts.

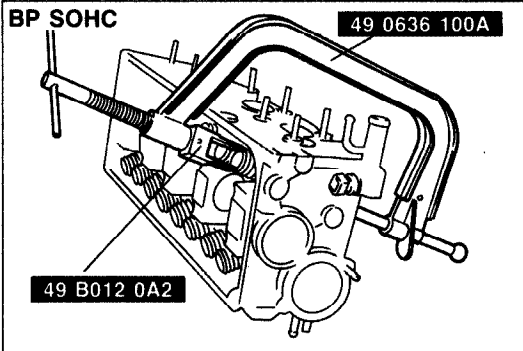


B6 SOHC



05U0BX-101

BP SOHC

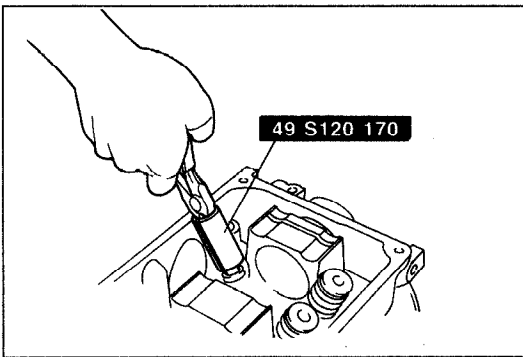


Valve keeper

1. Set the **SST** against the upper valve spring seat as shown in the figure.
2. Remove the valve keepers.

Valve seal

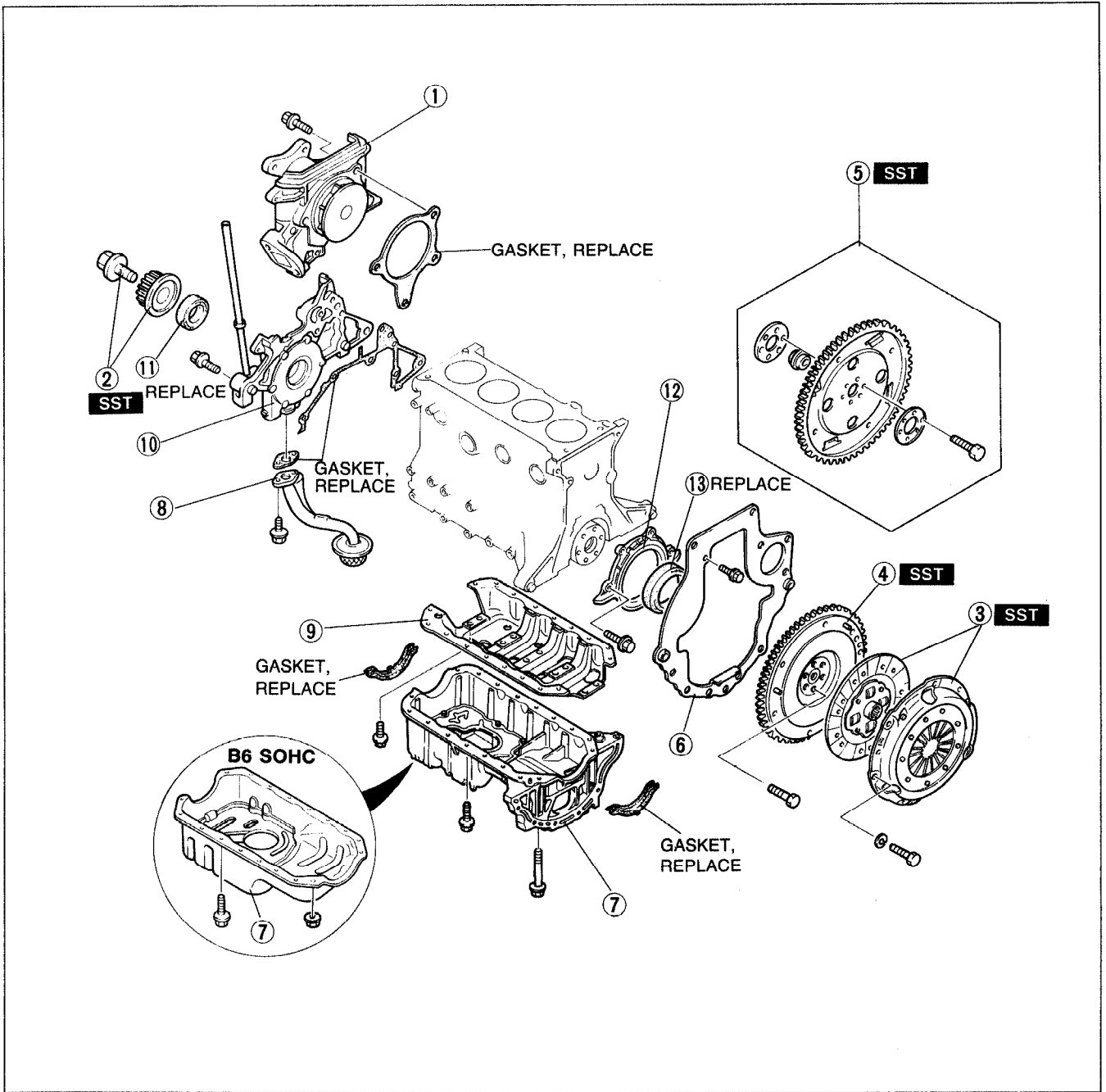
1. Remove the valve seal with the **SST**.



05U0BX-102

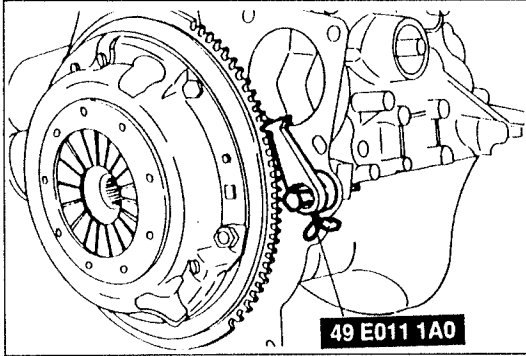
CYLINDER BLOCK (EXTERNAL PARTS)

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



23U0B1-037

- | | |
|---|--|
| <p>1. Water pump
Service Section E</p> <p>2. Timing belt pulley and lock bolt
Disassembly Note page B1-48
Inspection page B1-65</p> <p>3. Clutch cover, clutch disc (MTX)
Service Section H</p> <p>4. Flywheel (MTX)
Disassembly Note page B1-48
Inspect for wear or damage</p> <p>5. Backing plate, drive plate, and adapter (ATX)
Disassembly Note page B1-48</p> <p>6. End plate</p> | <p>7. Oil pan and gasket
Disassembly Note page B1-49
Inspect for damage</p> <p>8. Oil strainer</p> <p>9. Main bearing support plate (MBSP)
Disassembly Note page B1-49
Inspect for damage</p> <p>10. Oil pump
Service Section D</p> <p>11. Front oil seal
Disassembly Note page B1-49</p> <p>12. Rear cover</p> <p>13. Rear oil seal
Disassembly Note page B1-49</p> |
|---|--|



23U0B1-068

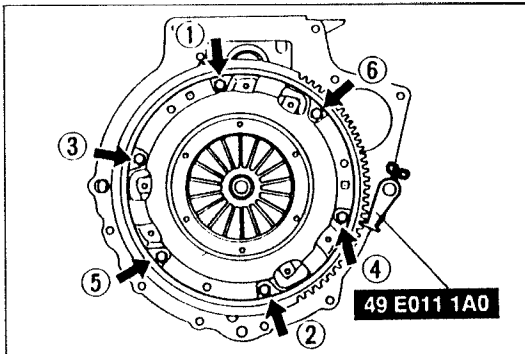
Disassembly Note

Timing belt pulley

1. Hold the flywheel (MTX) or drive plate (ATX) with the **SST** or equivalent.
2. Loosen the pulley lock bolt.
3. Remove the pulley lock bolt.

4. Remove the timing belt pulley.
5. Remove the pulley Woodruff key.

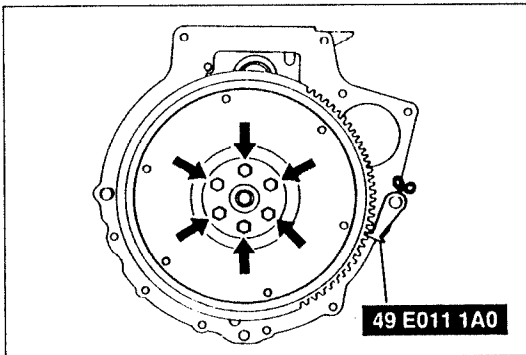
23U0B1-059



23U0B1-069

Clutch cover (MTX)

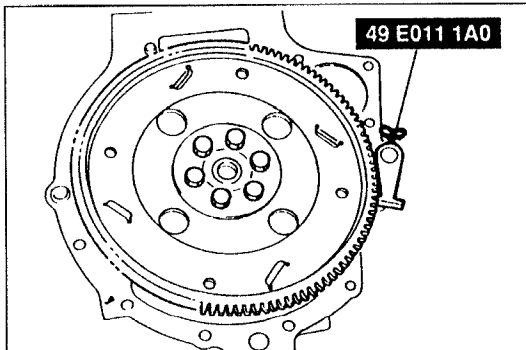
1. Hold the flywheel with the **SST** or equivalent.
2. Loosen the clutch cover lock bolts in two or three steps in the order shown in the figure.
3. Remove the clutch cover.



23U0B1-070

Flywheel (MTX)

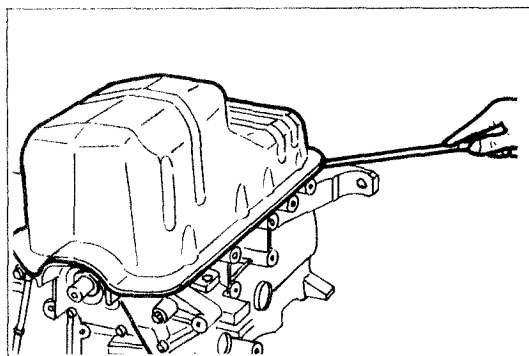
1. Hold the flywheel with the **SST** or equivalent.
2. Remove the flywheel lock bolts.
3. Remove the flywheel.
4. Remove the **SST** or equivalent.



23U0B1-071

Backing plate, drive plate, and adapter (ATX)

1. Hold the drive plate with the **SST** or equivalent.
2. Remove the drive plate lock bolts.
3. Remove the backing plate, drive plate, and adapter.
4. Remove the **SST** or equivalent.



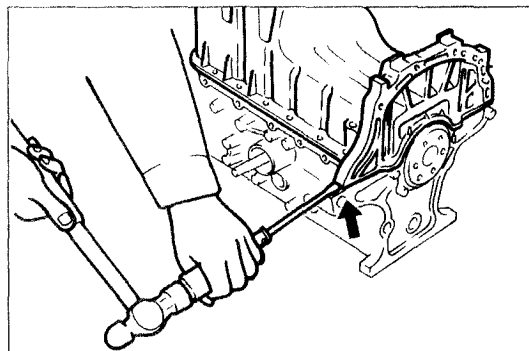
03U0B1-079

Oil pan B6 SOHC

1. Remove the oil pan mounting bolts.
2. Insert a screwdriver or a suitable tool between the MBSP and oil pan, and pry them.

Caution

- Do not insert the prying tool between the MBSP and cylinder block.
- Do not damage or scratch the contact surfaces.



03U0B1-080

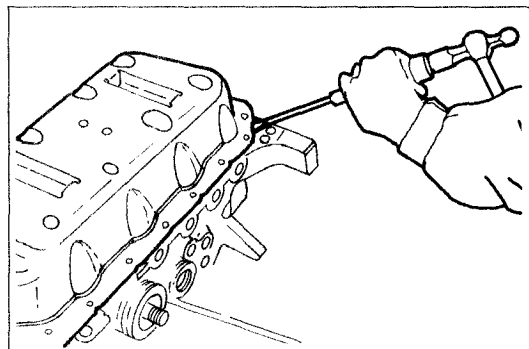
BP SOHC

1. Remove the oil pan mounting bolts.

Caution

- Do not force a prying tool between the cylinder block and the oil pan, which may damage the contact surfaces.
- Do not damage or scratch the contact surfaces when removing the old sealant.

2. Insert a screwdriver or a suitable tool only at the points shown in the figure.
3. Remove the oil pan.



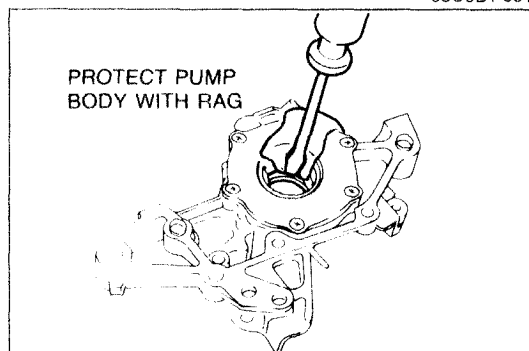
03U0B1-081

Main bearing support plate (MBSP)

1. Remove the MBSP mounting bolts to the main bearing cap.
2. Insert a screwdriver or a suitable tool between the MBSP and cylinder block, and pry them.

Caution

- Do not damage or scratch the contact surfaces when removing old sealant.

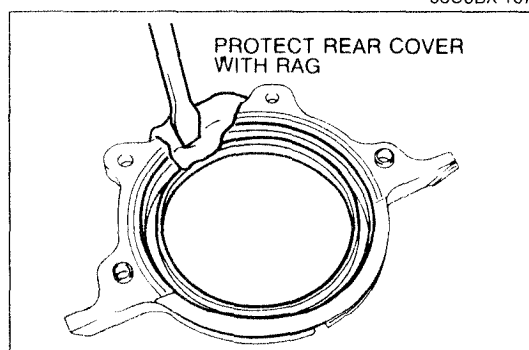


PROTECT PUMP
BODY WITH RAG

05U0BX-107

Front oil seal

1. Remove the oil seal with a screwdriver protected with a rag.



PROTECT REAR COVER
WITH RAG

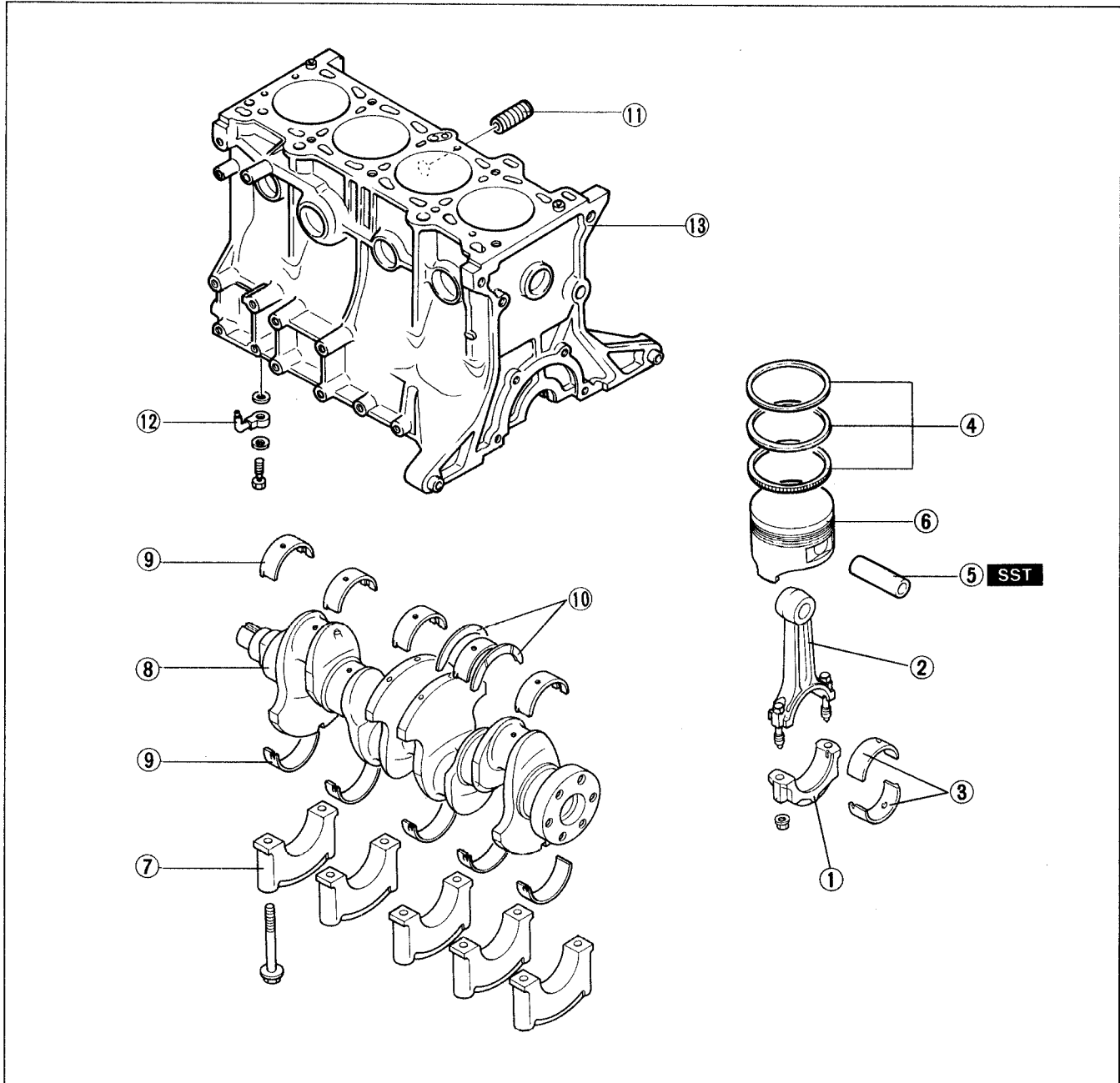
05U0BX-108

Rear oil seal

1. Remove the oil seal with a screwdriver protected with a rag.

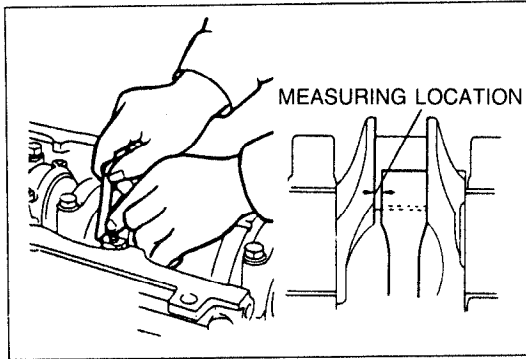
CYLINDER BLOCK (INTERNAL PARTS)

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.

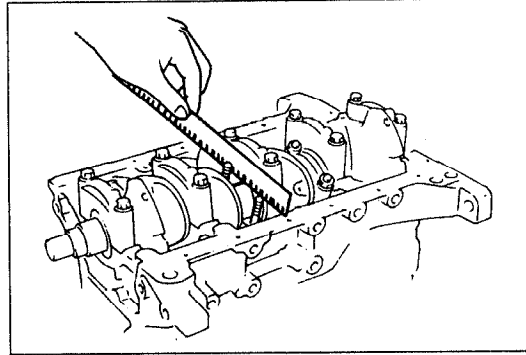


23U0B1-038

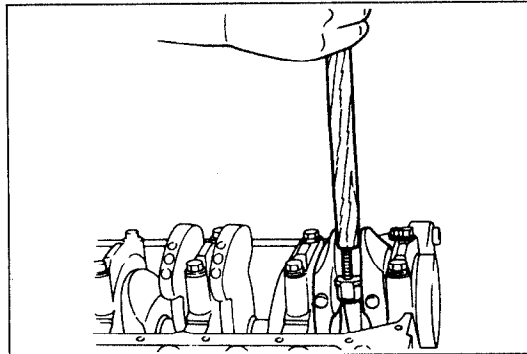
- | | |
|---|---|
| 1. Connecting rod cap
Disassembly Note page B1-51 | 7. Main bearing cap
Disassembly Note page B1-52 |
| 2. Connecting rod
Disassembly Note page B1-51
Inspection page B1-63 | 8. Crankshaft
Disassembly Note page B1-53
Inspection page B1-64 |
| 3. Connecting rod bearing
Inspection page B1-64 | 9. Main bearing
Inspection page B1-64 |
| 4. Piston ring
Disassembly Note page B1-51
Inspection page B1-62 | 10. Thrust bearing |
| 5. Piston pin
Disassembly Note page B1-51
Inspection page B1-63 | 11. Oil filter joint |
| 6. Piston
Inspection page B1-62 | 12. Oil jet
Inspection page B1-61 |
| | 13. Cylinder block
Inspection page B1-60 |



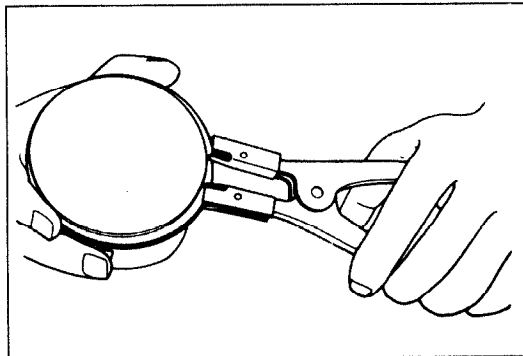
23U0B1-039



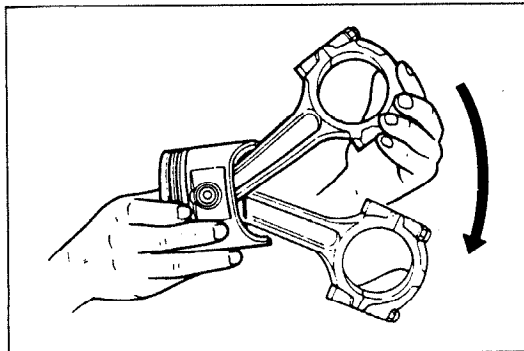
23U0B1-040



05U0BX-112



05U0BX-113



03U0B1-085

Disassembly Note

Connecting rod cap

1. Before removing the connecting rod caps, measure the connecting rod side clearance. (Refer to page B1-73.)

Connecting rod

1. Before removing the connecting rods, measure the connecting rod oil clearance. (Refer to page B1-73.)

2. Remove the Plastigage from the crankpin journals.

Caution

- Do not scratch the crankshaft journal or the cylinder wall.

3. Use the handle of a hammer to remove the piston and connecting rod assembly through the top of the cylinder block.

Piston ring

Caution

- Do not apply excessive tension, which may cause the rings to snap out.

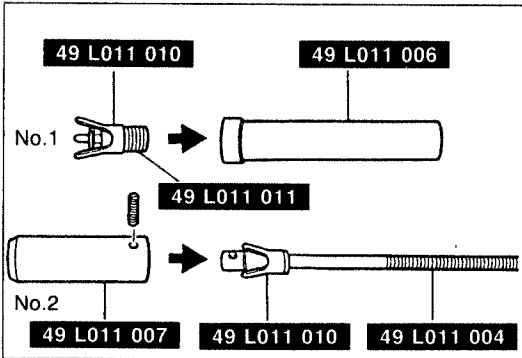
1. Remove the piston rings with a piston ring expander (commercially available).

Piston pin

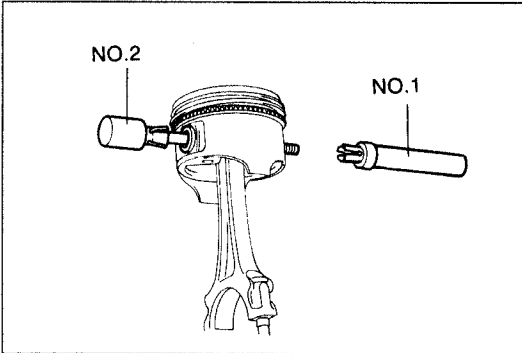
Caution

- Mark the connecting rod direction for proper reassembly.

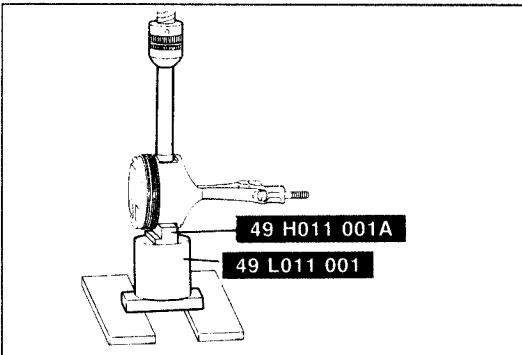
1. Before disassembling the piston and connecting rod, check the oscillation torque as shown. If the large end does not drop by its own weight, replace the piston or the piston pin.



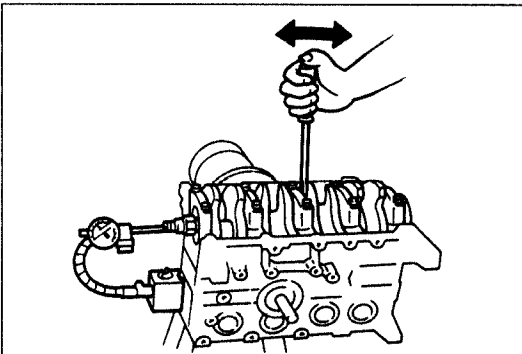
9MU0B2-098



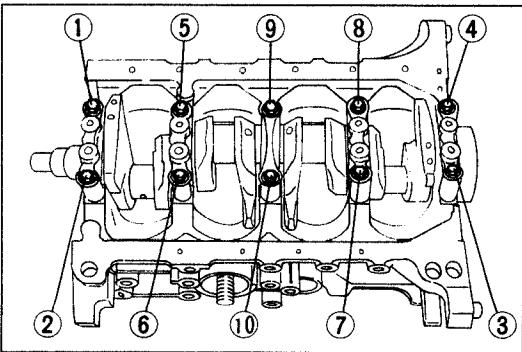
9MU0B2-099



9MU0B2-100



23U0B1-041



05U0BX-116

2. Assemble the **SST** as shown.

3. Insert the **SST** No.2 into the piston pin as shown and fully screw in the **SST** No.1.

4. Mount the piston and connecting rod in the **SST** as shown.

5. Press out the piston pin.

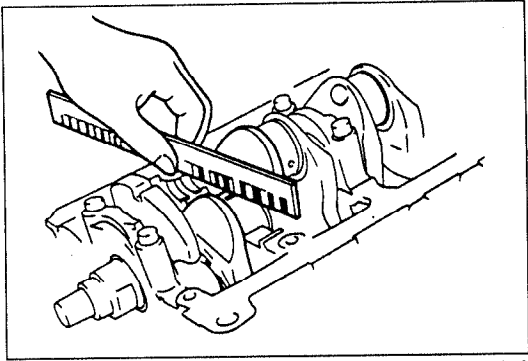
While removing the piston pin, check the pressure. If it is lower than **4.905 N (500 kg, 1,100 lb)**, replace the piston pin or connecting rod.

Main bearing cap

1. Before removing the main bearing caps, measure the crankshaft end play. (Refer to page B1-72.)

2. Loosen the main bearing cap bolts in two or three steps in the order shown in the figure.

3. Remove the main bearing caps.



23U0B1-042

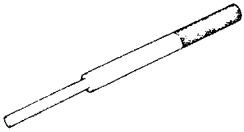
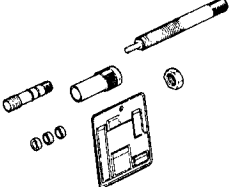
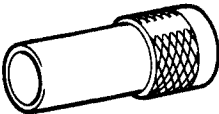
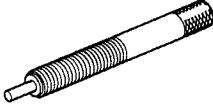

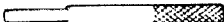
Crankshaft

1. Before removing the crankshaft, measure the main bearing oil clearances. (Refer to page B1-71.)

INSPECTION / REPAIR

PREPARATION

SST

<p>49 B012 005</p> <p>Remover & installer, valve guide</p> 	<p>For removal of valve guide (BP SOHC)</p>	<p>49 L012 0A0</p> <p>Installer set, valve seal & valve guide</p> 	<p>For installation of valve guide</p>
<p>49 L012 002</p> <p>Body (Part of 49 L012 0A0)</p> 	<p>For installation of valve guide</p>	<p>49 L012 003</p> <p>Installer (Part of 49 L012 0A0)</p> 	<p>For installation of valve guide</p>
<p>49 L012 004</p> <p>Nut (Part of 49 L012 0A0)</p> 	<p>For installation of valve guide</p>	<p>49 0249 010A</p> <p>Remover and installer, valve guide</p> 	<p>For removal of valve guide (B6 SOHC)</p>

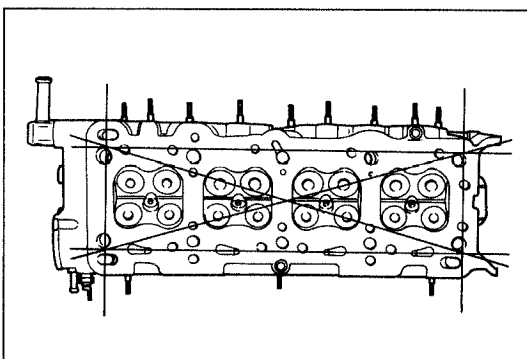
03U0B1-088

1. Clean all parts, being sure to remove all gasket fragments, dirt, oil or grease, carbon, moisture residue, and other foreign materials.
2. Inspection and repairs must be performed in the order specified.

Caution

- Do not damage the joints or friction surfaces of aluminum alloy components (such as the cylinder head or pistons).

05U0BX-119



03U0B1-089

CYLINDER HEAD

1. Inspect the cylinder head for damage, cracks, and leakage of water and oil. Replace the cylinder head if necessary.
2. Measure the cylinder head distortion in the six directions shown in the figure.

Distortion B6 SOHC: 0.15mm (0.006 in) max.

BP SOHC: 0.10mm (0.004 in) max.

Caution

- Before grinding the cylinder head, check the following and repair or replace the cylinder head as necessary.

Sinking of valve seats

Damage of manifold contact surface

Camshaft oil clearances and end play

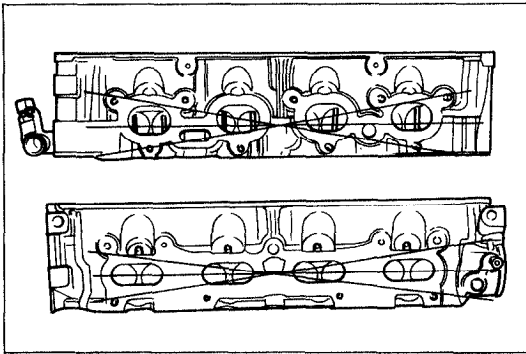
3. If the cylinder head distortion exceeds specification, grind the cylinder head surface.
If the cylinder head height is not within specification, replace it.

Height: 107.4—107.6mm (4.228—4.236 in)

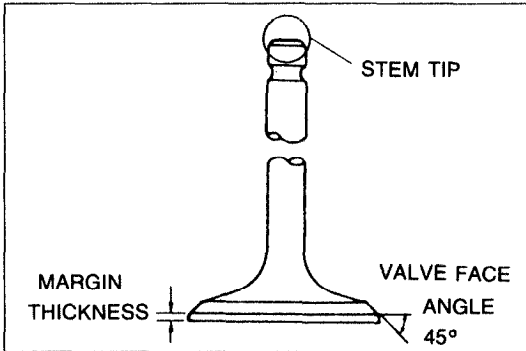
Grinding B6 SOHC: 0.20mm (0.008 in) max.

BP SOHC: 0.10mm (0.004 in) max.

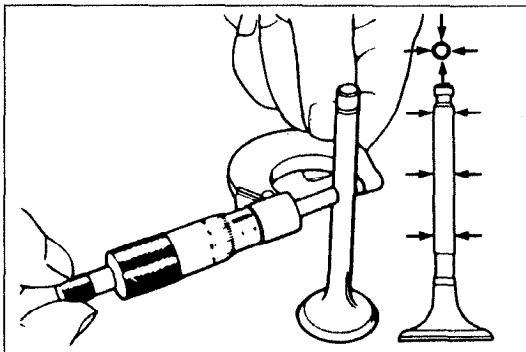
03U0B1-090



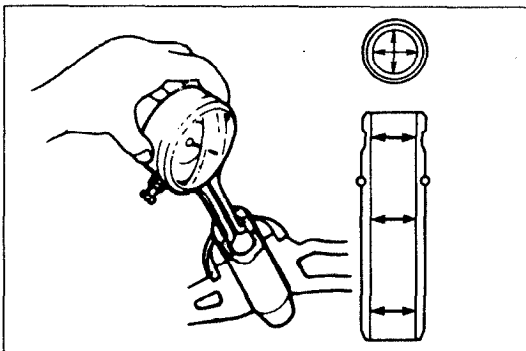
03U0B2-007



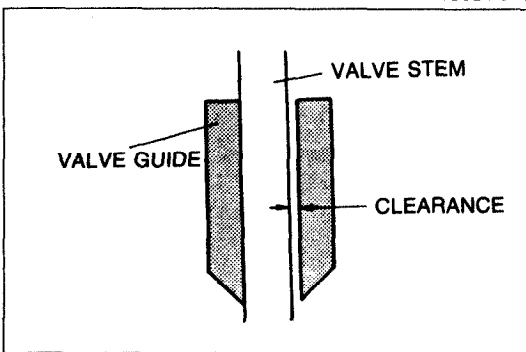
23U0B1-072



23U0B1-043



23U0B1-044



05U0BX-125

4. Measure the manifold contact surface distortion in the six directions shown in the figure.

Distortion: 0.15mm (0.006 in) max.

5. If distortion exceeds specification, grind the surface or replace the cylinder head.

VALVE MECHANISM
Valve and Valve Guide

1. Inspect each valve for the following. Replace or resurface the valve if necessary.

- (1) Damaged or bent stem.
- (2) Rough or damaged face.
- (3) Damaged or unevenly worn stem tip.

2. Measure the valve head margin thickness of each valve. Replace the valve if necessary.

Margin thickness min.

mm (in)

	B6 SOHC	BP SOHC
IN	0.8 (0.031)	0.9 (0.035)
EX	1.1 (0.043)	1.0 (0.039)

3. Measure the length of each valve.

Length

mm (in)

		B6 SOHC	BP SOHC
IN	Standard	103.77 (4.085)	101.77 (4.007)
	Minimum	103.27 (4.066)	101.27 (3.987)
EX	Standard	102.67 (4.042)	102.97 (4.054)
	Minimum	102.17 (4.022)	102.47 (4.034)

4. Measure the stem diameter of each valve at the points shown.

Diameter

mm (in)

		B6 SOHC	BP SOHC
IN		6.970—6.985 (0.2744—0.2750)	5.970—5.985 (0.2350—0.2356)
	EX	6.965—6.980 (0.2742—0.2748)	5.965—5.980 (0.2348—0.2354)

5. Measure the inner diameter of each valve guide at the points shown.

Inner diameter

mm (in)

		B6 SOHC	BP SOHC
IN		7.01—7.03 (0.2760—0.2768)	6.01—6.03 (0.2366—0.2374)
	EX	7.01—7.03 (0.2760—0.2768)	6.01—6.03 (0.2366—0.2374)

6. Calculate the valve stem to guide clearance.

Subtract the outer diameter of the valve stem from the inner diameter of the corresponding valve guide.

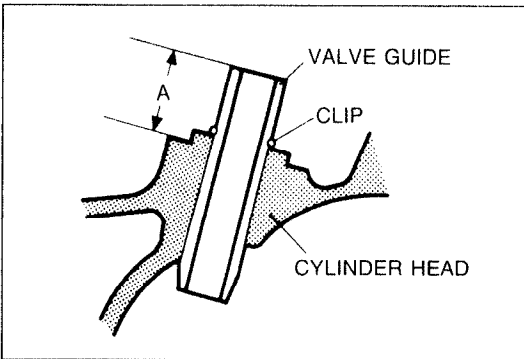
Clearance

IN : 0.025—0.060mm (0.0010—0.0024 in)

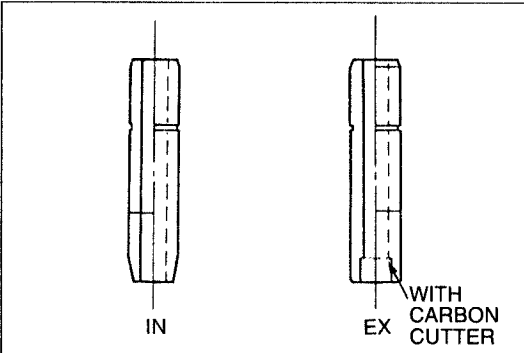
EX: 0.030—0.065mm (0.0012—0.0026 in)

Maximum: 0.20mm (0.008 in)

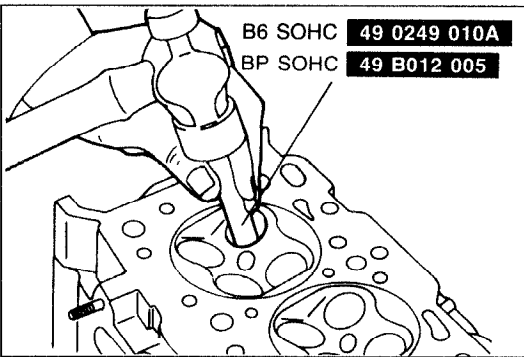
7. If the clearance exceeds specification, replace the valve and/or valve guide.



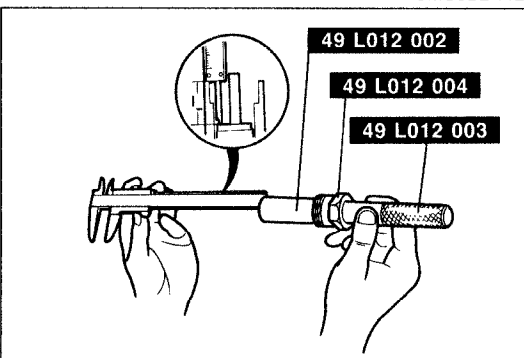
03U0B1-094



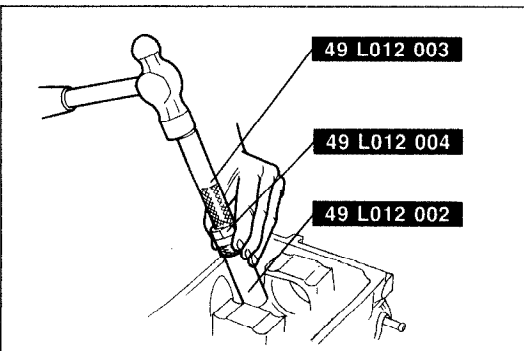
13U0B1-026



9MU0B2-112



03U0B1-096



05U0BX-129

- Measure the protrusion height of each valve guide. Replace the valve guide if necessary.

Height

mm (in)

	B6 SOHC	BP SOHC
IN	13.2—13.8 (0.520—0.543)	18.3—18.9 (0.720—0.744)
EX	13.2—13.8 (0.520—0.543)	16.8—17.4 (0.661—0.685)

Replacement of valve guide

Note

- The valve guides are different between intake and exhaust sides, use the correct valve guide.

Removal

- Remove the valve guide from the side opposite the combustion chamber with the **SST**.

Installation

- Assemble the **SST** so that depth **L** is as specified.

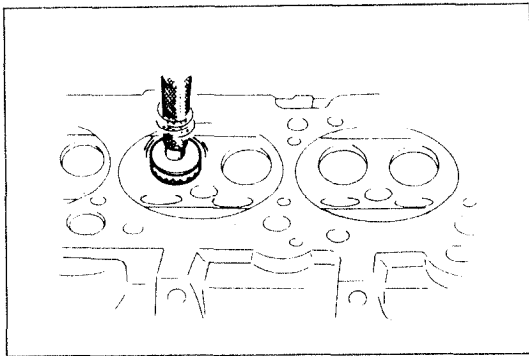
Depth L

mm (in)

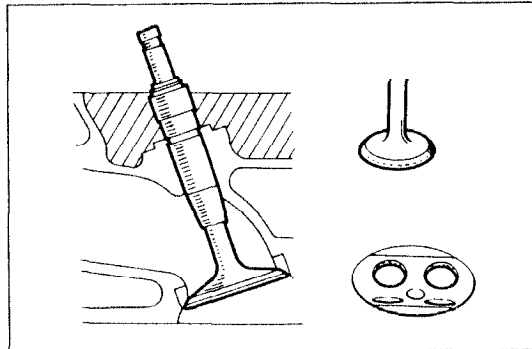
	B6 SOHC	BP SOHC
IN	13.2—13.8 (0.520—0.543)	18.3—18.9 (0.720—0.744)
EX	13.2—13.8 (0.520—0.543)	16.8—17.4 (0.661—0.685)

- Tighten the locknut.

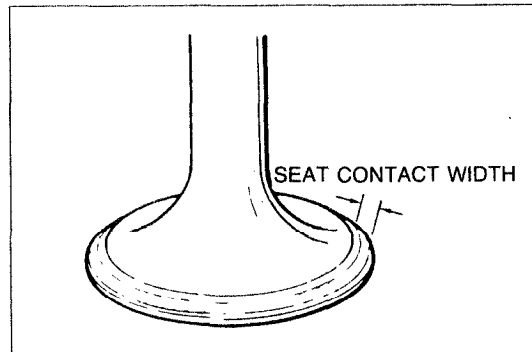
- Tap the valve guide in from the side opposite the combustion chamber until the **SST** contacts the cylinder head.
- Verify that the valve guide height is within specification.
- If not within specification, repeat Steps 1—4.



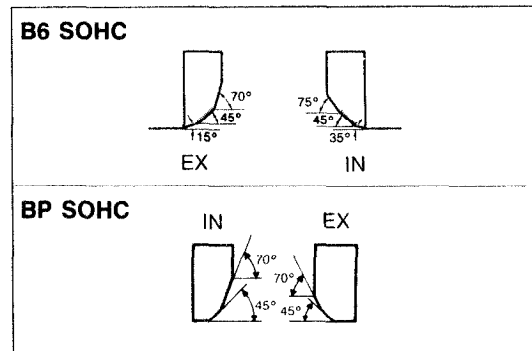
05U0BX-130



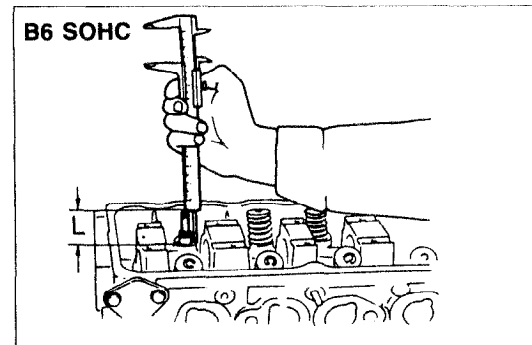
05U0BX-131



03U0B1-097



03U0B1-098



23U0B1-073

Valve Seat

1. Inspect the contact surface of each valve seat and valve face for the following:
 - (1) Roughness.
 - (2) Damage.
2. If necessary, resurface the valve seat with a **45°** valve seat cutter and/or resurface the valve face.

3. Apply a thin coat of Prussian blue to the valve face.
4. Inspect the valve seating by pressing the valve against the seat.
 - (1) If blue does not appear 360° around the valve face, replace the valve.
 - (2) If blue does not appear 360° around the valve seat, resurface the seat.

5. Measure the seat contact width.

Width

mm (in)

	B6 SOHC	BP SOHC
IN	1.1—1.7 (0.043—0.067)	0.8—1.4 (0.031—0.055)
EX	1.1—1.7 (0.043—0.067)	0.8—1.4 (0.031—0.055)

6. Verify that the valve seating position is at the center of the valve face.

B6 SOHC

- (1) If the seating position is too high, correct the valve seat with a **75° (IN)** or **70° (EX)** cutter and a **45°** cutter.
- (2) If the seating position is too low, correct the valve seat with a **35° (IN)** or **15° (EX)** cutter and a **45°** cutter.

BP SOHC

- (1) If the seating position is too high, correct the valve seat with a **70°** cutter and a **45°** cutter.
- (2) If the seating position is too low, correct the valve seat with a **0°** cutter and a **45°** cutter.

7. Seat the valve to the valve seat with lapping compound.

8. Inspect the sinking of the valve seat.

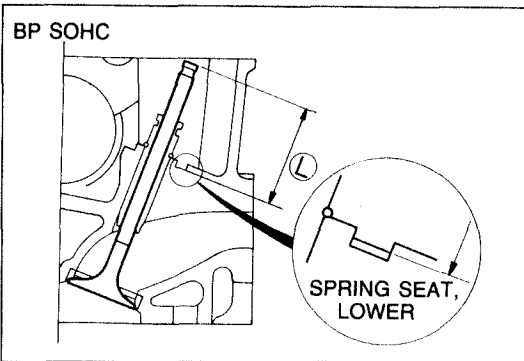
Measure the protruding length (dimension **L**) of the valve stem.

Dimension L

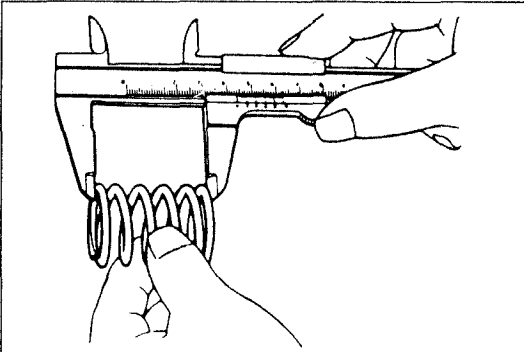
B6 SOHC: 39mm (1.5354 in)

mm (in)

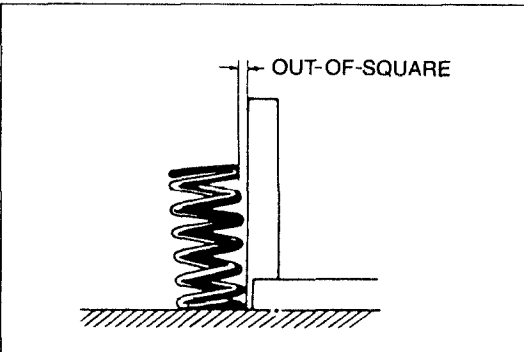
Measurement	Action
39.0—39.5 (1.535—1.555)	No correction needed
39.5—40.5 (1.555—1.594)	Adjust with washer on spring seat area of cylinder head
More than 40.5 (1.594)	Replace cylinder head



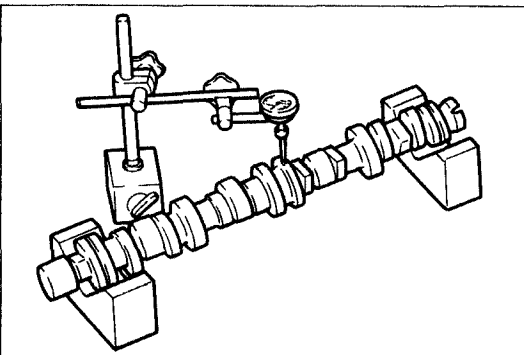
23U0B1-060



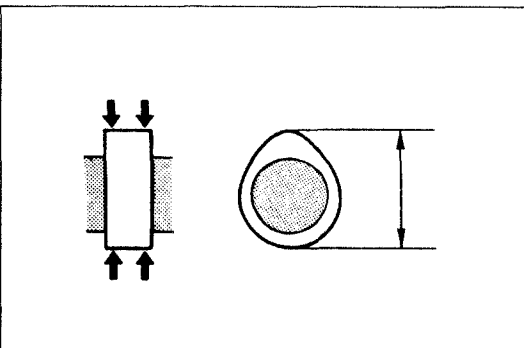
23U0B1-074



03U0B1-102



13U0B1-027



03U0B1-103

BP SOHC, IN: 42.5mm (1.673 in) EX: 41.0mm (1.614 in)

mm (in)

Measurement		Action
IN	42.5—43.0 (1.673—1.693)	No correction needed
	More than 44.0 (1.732)	Replace cylinder head
EX	41.0—41.5 (1.614—1.634)	No correction needed
	More than 42.5 (1.673)	Replace cylinder head

Valve Spring

1. Inspect each valve spring for cracks or damage.
2. Measure the free length and out of square. Replace the valve spring if necessary.

Free length

Standard...mm (in), Minimum...N (kg, lb)/mm (in)

		B6 SOHC	BP SOHC
IN	Standard	43.66 (1.7188)	46.12 (1.8157)
	Minimum	224—253 (22.8—25.8, 50—57)/35.5 (1.398)	205—231 (20.9—23.5, 46—52)/39 (1.535)
EX	Standard	43.66 (1.7188)	43.61 (1.7169)
	Minimum	224—253 (22.8—25.8, 50—57)/35.5 (1.398)	129—147 (13.1—15.0, 29—33)/37.5 (1.476)

Out-of-square max.

mm (in)

		B6 SOHC	BP SOHC
IN		1.52 (0.060)	1.61 (0.063)
EX		1.52 (0.060)	1.52 (0.060)

CAMSHAFT

1. Set the front and rear journals on V-blocks.
2. Measure the camshaft runout. Replace the camshaft if necessary.

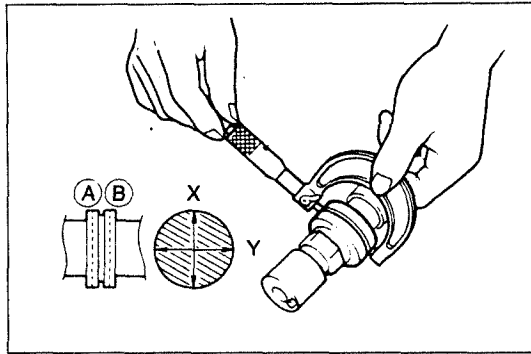
Runout BP SOHC: 0.03mm (0.0012 in) max.
B6 SOHC: 0.01mm (0.0004 in) max.

3. Inspect the camshaft for wear or damage. Replace the camshaft if necessary.
4. Measure the cam lobe heights at the two points as shown.

Height

mm (in)

		B6 SOHC	BP SOHC
IN	Standard	36.451 (1.4351)	35.993 (1.4170)
	Minimum	36.251 (1.4272)	35.793 (1.4092)
EX	Standard	36.451 (1.4351)	36.273 (1.4281)
	Minimum	36.251 (1.4272)	36.073 (1.4202)



23U0B1-075

5. Measure the journal diameters X and Y directions at the two points (A and B) shown.

Diameter
B6 SOHC

mm (in)

Front and Rear	43.440—43.460 (1.7102—1.7110)
Center	43.430—43.455 (1.7098—1.7108)

BP SOHC

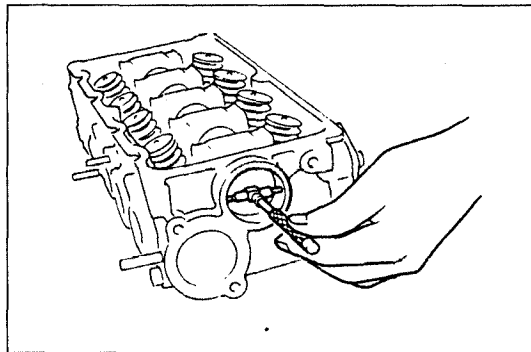
mm (in)

No.1 & No.5	43.440—43.460 (1.7102—1.7110)
No.2 & No.4	43.425—43.450 (1.7096—1.7106)
No.3	43.410—43.435 (1.7091—1.7100)

Out of round: 0.05 (0.002) max.

6. Measure the oil clearances between the camshaft and cylinder head.
- (1) Remove all foreign material and oil from the journals and the camshaft bore.
 - (2) Measure the camshaft bore diameter.

03U0B1-105



23U0B1-076

Diameter
B6 SOHC

mm (in)

Front and Rear	43.515—43.535 (1.7132—1.7139)
Center	43.515—43.535 (1.7132—1.7139)

BP SOHC

mm (in)

No.1 & No.5	43.500—43.515 (1.7126—1.7132)
No.2, No.3, No.4	43.485—43.505 (1.7120—1.7128)

- (3) Subtract the journal diameter from the bore diameter.

Oil clearance
B6 SOHC

mm (in)

Front and Rear	0.055—0.095 (0.0021—0.0037)
Center	0.060—0.105 (0.0023—0.0041)
Maximum	0.15 (0.006)

BP SOHC

mm (in)

No.1 & No.5	0.040—0.075 (0.0016—0.0030)
No.2 & No.4	0.035—0.080 (0.0014—0.0031)
No.3	0.050—0.095 (0.0020—0.0037)
Maximum	0.15 (0.006)

- (4) If the clearance exceeds the maximum, replace the camshaft or cylinder head.

23U0B1-077

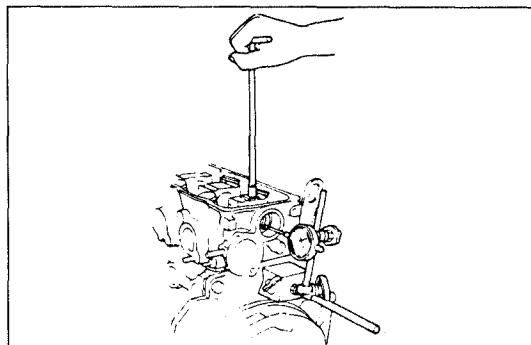
7. Measure the camshaft end play. If it exceeds the maximum, replace the thrust plate or camshaft.

End play

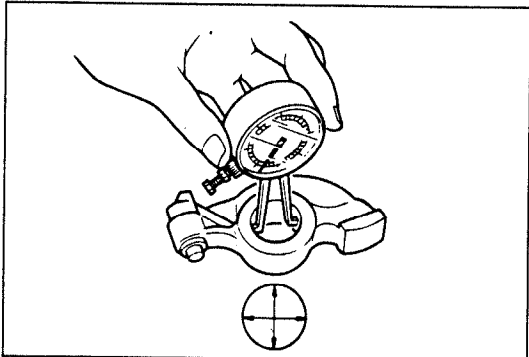
B6 SOHC: 0.05—0.18mm (0.0020—0.0071 in)

BP SOHC: 0.06—0.19mm (0.0024—0.0075 in)

Maximum: 0.20mm (0.008 in)



23U0B1-078



03U0B1-109

Rocker Arm and Rocker Arm Shaft

1. Check for wear or damage to the contact surface of the rocker arm shaft or the rocker arm. Replace if necessary.
2. Check the oil clearance between the rocker arm and shaft, replace if necessary.
 - (1) Measure the rocker arm inner diameter.

Diameter

mm (in)

	B6 SOHC	BP SOHC
IN	18.000—18.027 (0.7087—0.7097)	19.000—19.027 (0.7480—0.7491)
EX	18.000—18.027 (0.7087—0.7097)	19.000—19.033 (0.7480—0.7493)

- (2) Measure the rocker arm shaft diameter.

Diameter

mm (in)

	B6 SOHC	BP SOHC
IN	17.959—17.980 (0.7070—0.7079)	18.959—18.980 (0.7464—0.7472)
EX	17.959—17.980 (0.7070—0.7079)	18.959—18.980 (0.7464—0.7472)

- (3) Subtract the shaft diameter from the rocker arm diameter.

Oil clearance

mm (in)

	B6 SOHC	BP SOHC
IN	0.020—0.068 (0.0008—0.0027)	0.020—0.068 (0.0008—0.0027)
EX	0.020—0.068 (0.0008—0.0027)	0.020—0.074 (0.0008—0.0029)
Maximum	0.10 (0.004)	

HYDRAULIC LASH ADJUSTER (HLA)

Check the HLA face for wear or damage and replace if necessary.

Caution

- To prevent damaging the O-ring, do not remove the HLA unless necessary.

CYLINDER BLOCK

1. Check the cylinder block for the following and repair or replace the cylinder block as necessary.
 - (1) Leakage damage.
 - (2) Cracks.
 - (3) Scoring of wall.
2. Measure the distortion of the top surface of the cylinder block in the six directions shown in figure.

Distortion: 0.15mm (0.006 in) max.

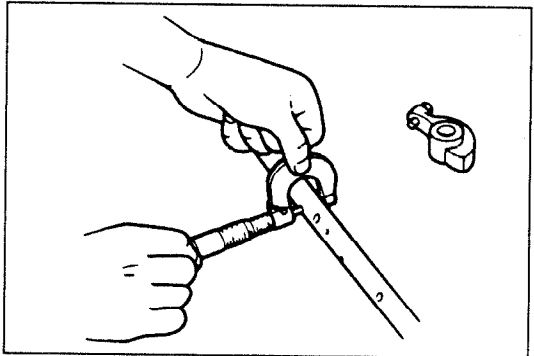
3. If the distortion exceeds the maximum, repair by grinding or replace the cylinder block.

Height

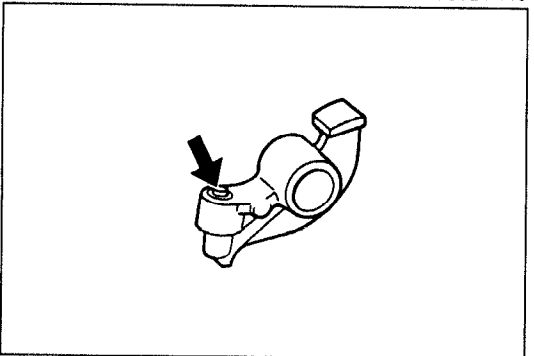
mm (in)

B6 SOHC	BP SOHC
221.5 (8.720)	

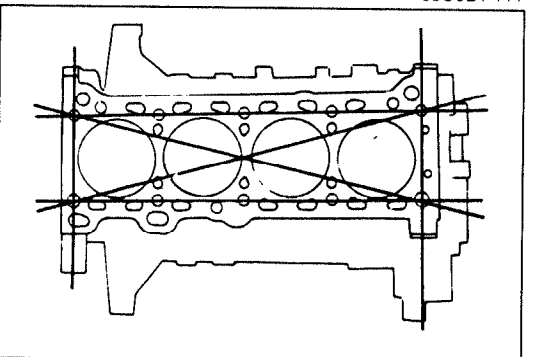
Grinding: 0.20mm (0.008 in) max.



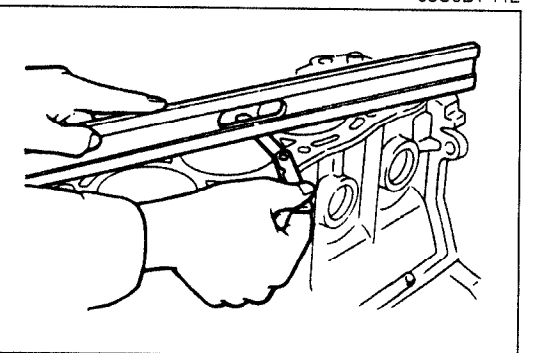
03U0B1-110



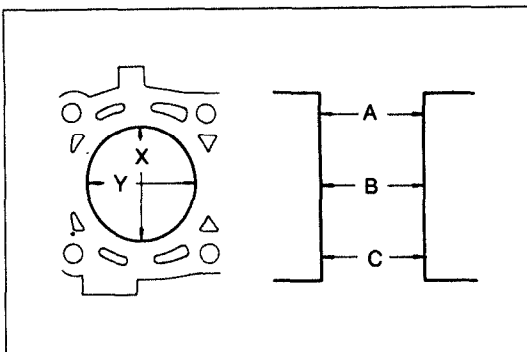
03U0B1-111



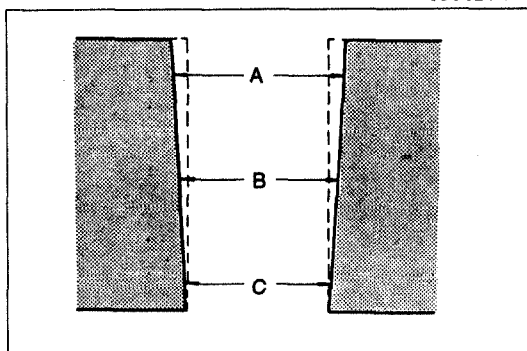
03U0B1-112



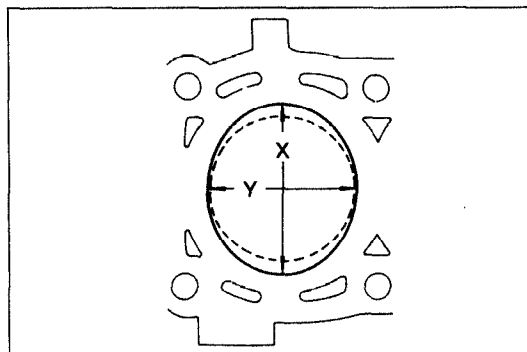
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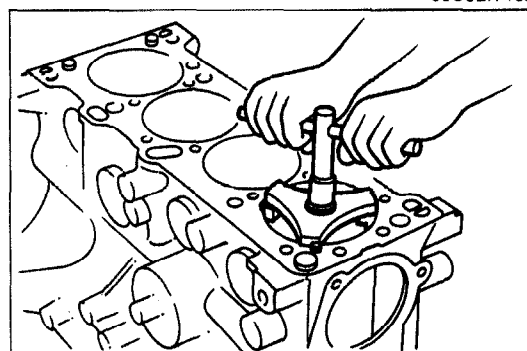
03U0B1-114



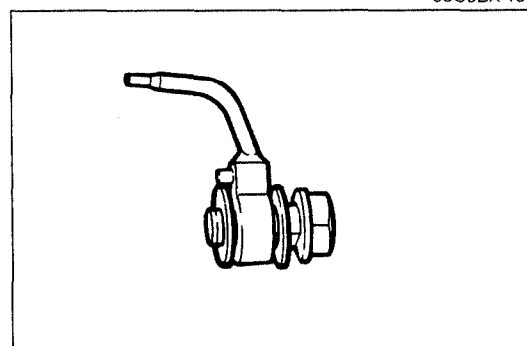
05U0BX-151



05U0BX-152



05U0BX-153



03U0B1-115

4. Measure the cylinder bores in X and Y directions at three levels (A, B, and C) in each cylinder as shown.

Cylinder bore

mm (in)

	B6 SOHC	BP SOHC
Standard	78.006—78.013 (3.0711—3.0714)	83.006—83.013 (3.2679—3.2682)
0.25 (0.010) oversize	78.256—78.263 (3.0809—3.0812)	83.256—83.263 (3.2778—3.2781)
0.50 (0.020) oversize	78.506—78.513 (3.0908—3.0911)	83.506—83.513 (3.2876—3.2879)

Caution

- The boring size should be based on the size of an oversize piston and be the same for all cylinders.

- (1) If the cylinder bore exceeds the maximum, rebore the cylinder to oversize.
- (2) If the difference between measurements A and C exceeds the maximum taper, rebore the cylinder to oversize.

Taper: 0.019mm (0.0007 in) max.

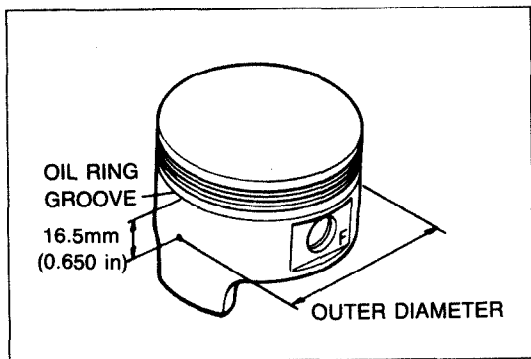
- (3) If the difference between measurements X and Y exceeds the maximum out-of-round, rebore the cylinder to oversize.

Out-of-round: 0.019mm (0.0007 in) max.

5. If the upper part of a cylinder wall shows uneven wear, remove the ridge with a ridge reamer.

OIL JET (BP SOHC)

1. Push the check ball and verify that it moves smoothly.
2. Blow through the oil jet and verify that air flows.



03U0B1-116

PISTON, PISTON RING, AND PISTON PIN

Piston

Caution

- If the piston is replaced, the piston rings must also be replaced.

1. Inspect the outer circumferences of all pistons for seizure or scoring. Replace the piston if necessary.
2. Measure the outer diameter of each piston at a right angle (90°) to the piston pin, **16.5mm (0.650 in)** below the oil ring land lower edge.

Piston diameter

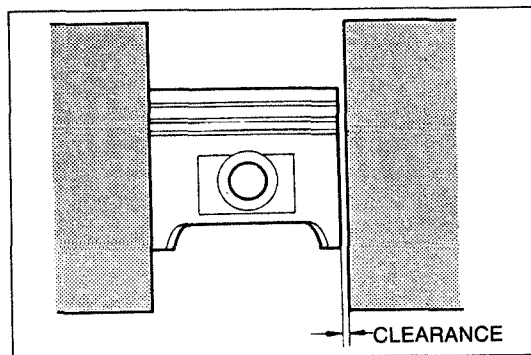
mm (in)

	B6 SOHC	BP SOHC
Standard	77.954—77.974 (3.0690—3.0698)	82.954—82.974 (3.2659—3.2667)
0.25 (0.010) oversize	78.211—78.217 (3.0792—3.0794)	83.211—83.217 (3.2760—3.2763)
0.50 (0.020) oversize	78.461—78.467 (3.0890—3.0892)	83.461—83.467 (3.2859—3.2861)

3. Measure the piston-to-cylinder clearance.

Clearance: 0.039—0.052mm (0.0015—0.0020 in)
Maximum: 0.15mm (0.006 in)

4. If the clearance exceeds the maximum, replace the piston or rebore the cylinders to fit oversize pistons.



05U0BX-156

Piston and Piston Rings

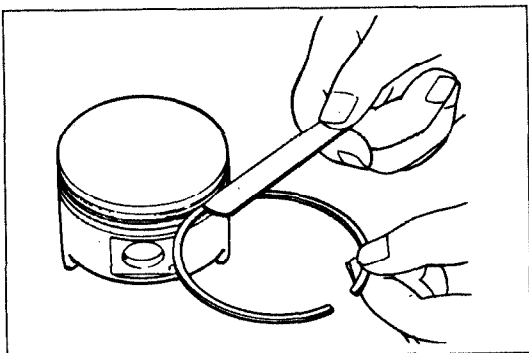
1. Measure the piston ring to ring land clearance around the entire circumference using a new piston ring.

Clearance (Top and Second)

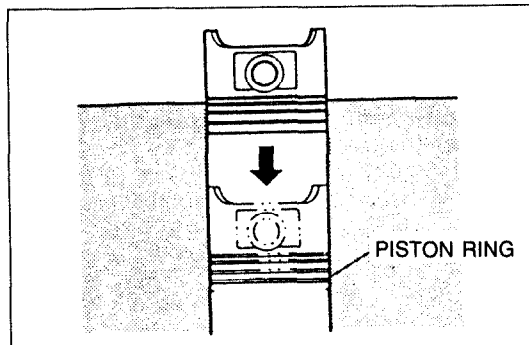
mm (in)

	B6 SOHC	BP SOHC
Standard	0.030—0.065 (0.0012—0.0026)	
Maximum	0.15 (0.006)	

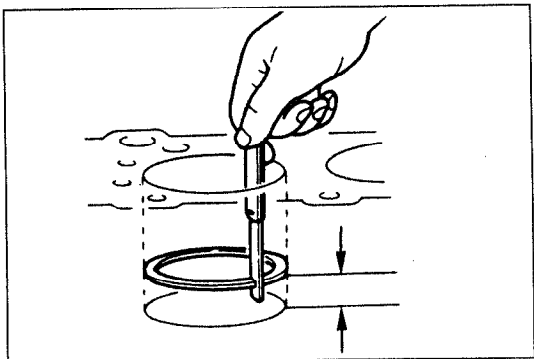
2. If the clearance exceeds the maximum, replace the piston.
3. Inspect the piston rings for damage, abnormal wear, or breakage. Replace the piston rings if necessary.
4. Insert the piston ring into the cylinder by hand and use the piston to push it to the bottom of the ring travel.



03U0B1-117



03U0B1-201

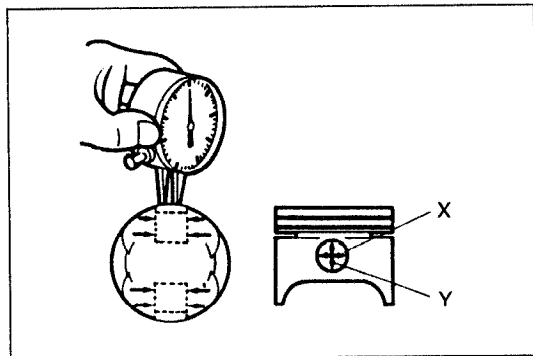


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5. Measure each piston ring end gap with a feeler gauge. Replace the piston ring if necessary.

End gap

Top	: 0.15—0.30mm (0.006—0.012 in)
Second	: 0.15—0.30mm (0.006—0.012 in)
Oil rail	: 0.20—0.70mm (0.008—0.028 in)
Maximum:	1.0mm (0.039 in)

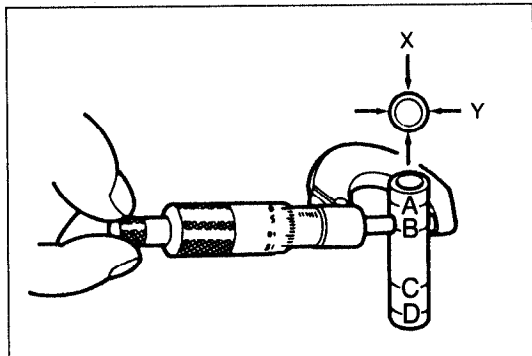


05U0BX-159

Piston and Piston Pin

1. Measure each piston pin hole diameter in X and Y directions at four points.

Diameter: 19.988—20.000mm (0.7869—0.7874 in)



03U0B1-118

2. Measure each piston pin diameter in X and Y directions at four points.

Diameter: 19.974—19.980mm (0.7864—0.7866 in)

3. Calculate the piston pin-to-piston clearance.

Clearance: 0.008—0.026mm (0.0003—0.0010 in)

4. If the clearance exceeds specification, replace the piston and/or piston pin.

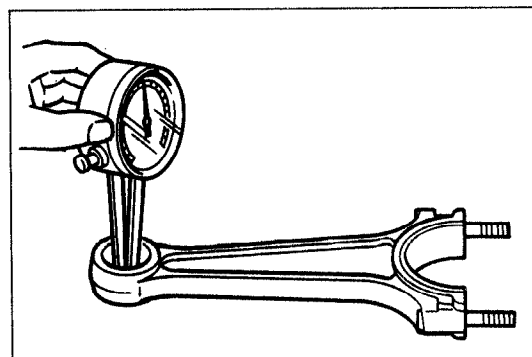
CONNECTING ROD

1. Measure each connecting rod bushing inner diameter.

Diameter: 19.943—19.961mm (0.7852—0.7859 in)

2. Calculate the clearance between the connecting rod bushing and piston pin.

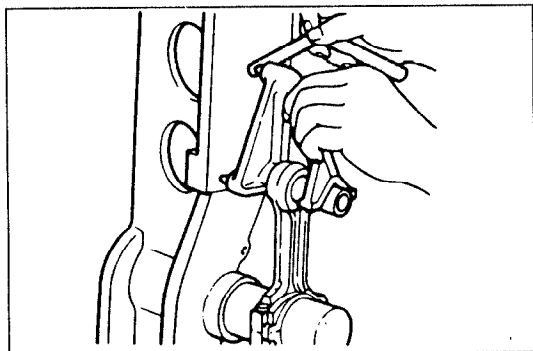
Interference: 0.013—0.037mm (0.0005—0.0015 in)



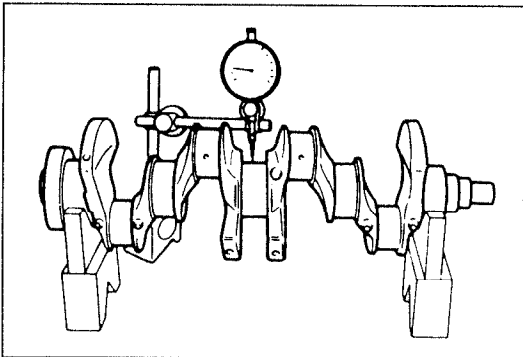
03U0B1-119

3. Measure each connecting rod for bending. Repair or replace the connecting rod if necessary.

Bending: 0.075mm (0.0030 in) max./50mm (1.97 in)



03U0B1-120

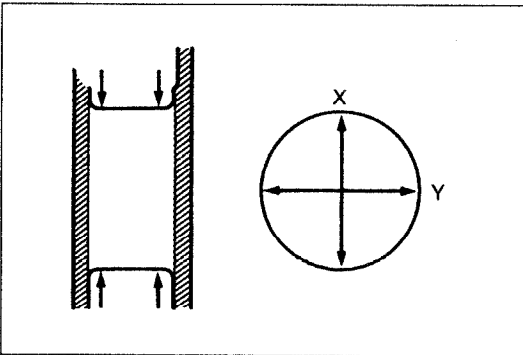


05U0BX-163

CRANKSHAFT

1. Check the journals and pins for damage, scoring, and oil hole clogging.
2. Set the crankshaft on V-blocks.
3. Measure the crankshaft runout at the center journal. Replace the crankshaft if necessary.

Runout: 0.04mm (0.0016 in) max.



03U0B1-211

4. Measure each journal diameter in X and Y directions at two points.

Main journal

Diameter: 49.938—49.956mm (1.9661—1.9668 in)
Out-of-round: 0.05mm (0.0020 in) max.

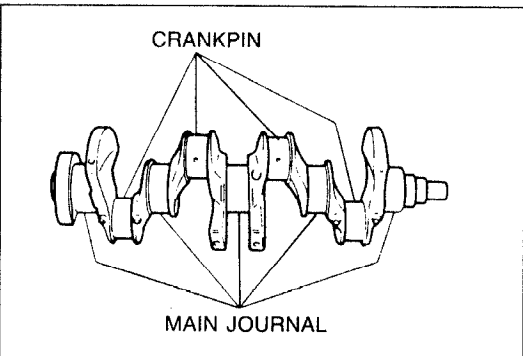
Crankpin journal

Diameter: 44.940—44.956mm (1.7693—1.7699 in)
Out-of-round: 0.05mm (0.0020 in) max.

5. If the diameter is less than the minimum, grind the journals to match an undersize bearing.

Undersize bearing:

0.25mm (0.010 in), 0.50mm (0.020 in), 0.75mm (0.030 in).... B6 Only

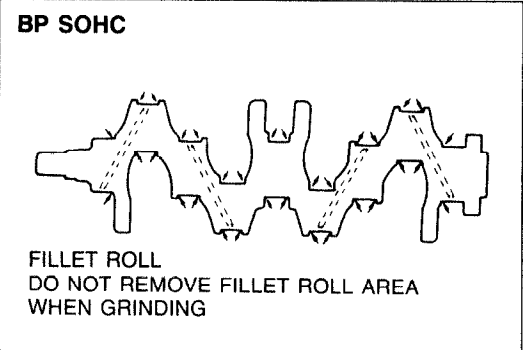


03U0B1-212

Main journal diameter undersize

mm (in)

Bearing size	Journal diameter
0.25 (0.010) undersize	49.704—49.708 (1.9568—1.9570)
0.50 (0.020) undersize	49.454—49.458 (1.9470—1.9472)
0.75 (0.030) undersize (B6 Only)	49.204—49.208 (1.9372—1.9373)



13U0B1-028

Crankpin journal diameter undersize

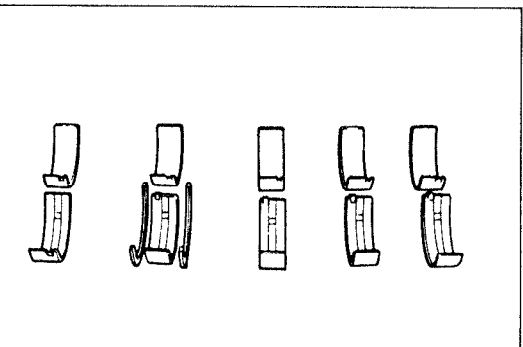
mm (in)

Bearing size	Journal diameter
0.25 (0.010) undersize	44.690—44.706 (1.7594—1.7601)
0.50 (0.020) undersize	44.440—44.456 (1.7496—1.7502)
0.75 (0.030) undersize	44.190—44.206 (1.7398—1.7404)

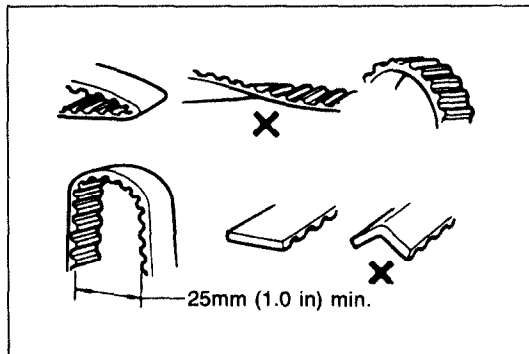
BEARING

Main Bearing and Connecting Rod Bearing

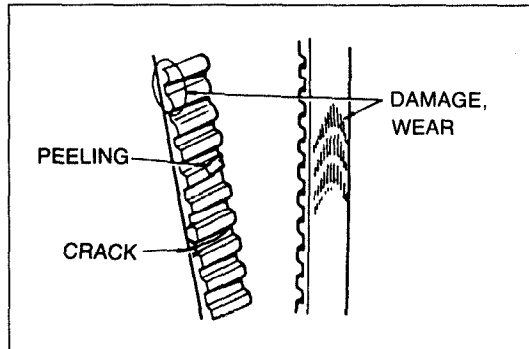
1. Check the main bearings and the connecting rod bearings for peeling, scoring, and other damage.



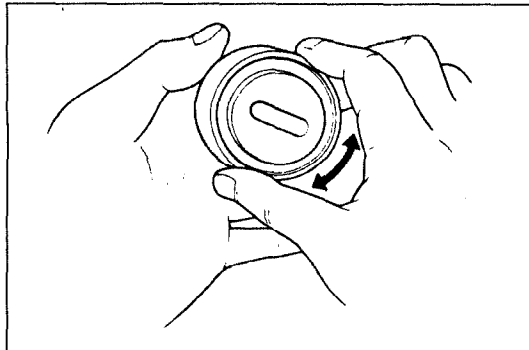
05U0BX-167



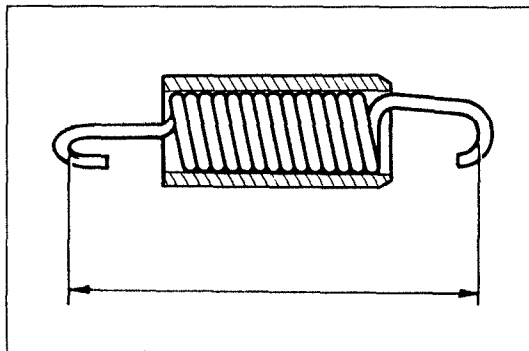
05U0BX-168



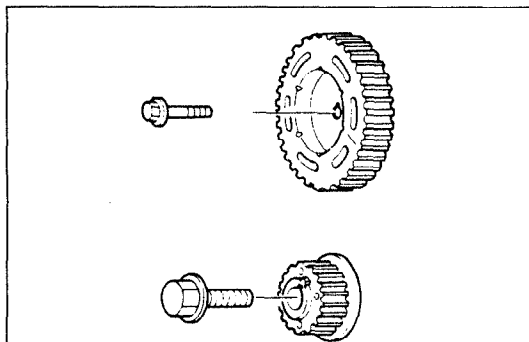
05U0BX-169



05U0BX-170



03U0B1-122



05U0BX-172

TIMING BELT

Caution

- Never forcefully twist, turn inside out, or bend the timing belt.
- Do not allow oil or grease on the belt.

1. Replace the timing belt if there is any oil or grease on it.
2. Check the timing belt for damage, wear, peeling, cracks, and hardening. Replace the timing belt if necessary.

TENSIONER, IDLER

Caution

- Do not clean the tensioner or idler with cleaning fluids. If necessary, use a soft rag to wipe them clean, and avoid scratching them.

1. Check the tensioner and idler for smooth rotation and abnormal noise. Replace the tensioner or idler if necessary.

TENSIONER SPRING

1. Measure the free length of the tensioner spring. Replace the tensioner spring if necessary.

Free length: 64.0mm (2.520 in)

PULLEY

Timing Belt Pulley, Camshaft Pulley

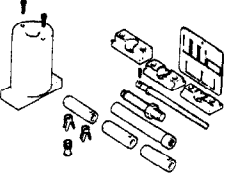
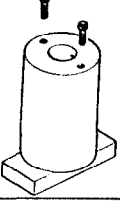
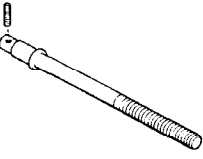
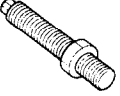
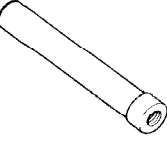



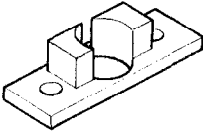
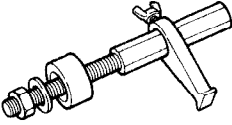
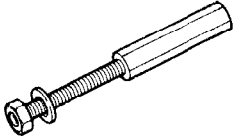


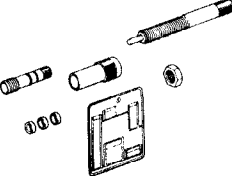
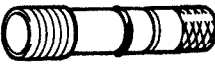

Caution

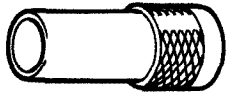

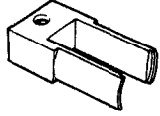
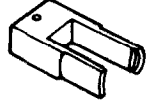
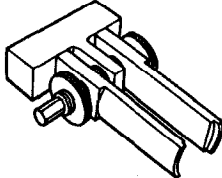
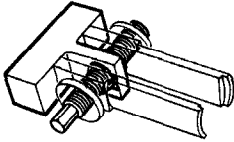
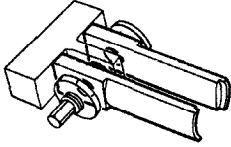
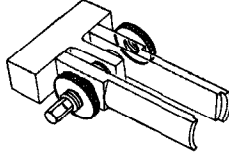
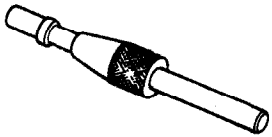
- Do not clean the pulleys with cleaning fluids. If necessary, use a soft rag to wipe them clean, and avoid scratching them.

1. Inspect the pulley teeth for wear, deformation, and other damage. Replace the pulley if necessary.

ASSEMBLY

PREPARATION SST

<p>49 L011 0A0</p> <p>Piston pin setting tool set</p> 	<p>For removal and installation of piston pins</p>	<p>49 L011 001</p> <p>Support block body (Part of 49 L011 0A0)</p> 	<p>For removal and installation of piston pins</p>
<p>49 L011 004</p> <p>Screw (Part of 49 L011 0A0)</p> 	<p>For removal and installation of piston pins</p>	<p>49 L011 005</p> <p>Stopper bolt (Part of 49 L011 0A0)</p> 	<p>For removal and installation of piston pins</p>
<p>49 L011 006</p> <p>Puller & installer (Part of 49 L011 0A0)</p> 	<p>For removal and installation of piston pins</p>	<p>49 L011 007</p> <p>Guide (Part of 49 L011 0A0)</p> 	<p>For removal and installation of piston pins</p>
<p>49 L011 010</p> <p>Centering tool (Part of 49 L011 0A0)</p> 	<p>For removal and installation of piston pins</p>	<p>49 L011 011</p> <p>Holder (Part of 49 L011 0A0)</p> 	<p>For removal and installation of piston pins</p>
<p>49 H011 001A</p> <p>Support block head</p> 	<p>For removal and installation of piston pins</p>	<p>49 E011 1A0</p> <p>Ring gear brake set</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 103</p> <p>Shaft (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 105</p> <p>Stopper (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 104</p> <p>Collar (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 L012 0A0</p> <p>Installer set, valve seal & valve guide</p> 	<p>For installation of valve seals (B6 SOHC)</p>
<p>49 L012 001</p> <p>Installer (Part of 49 L012 0A0)</p> 	<p>For installation of valve seals (B6 SOHC)</p>	<p>49 L012 006</p> <p>Spacer (Part of 49 L012 0A0)</p> 	<p>For installation of valve seals (B6 SOHC)</p>

<p>49 L011 002 Body (Part of 49 L012 0A0)</p> 	<p>For installation of valve seals (B6 SOHC)</p>	<p>49 0636 100A Arm, valve spring lifter</p> 	<p>For removal and installation of valves</p>
<p>49 B012 006 Pivot, valve spring lifter</p> 	<p>For removal and installation of valves (BP SOHC)</p>	<p>49 S120 222 Pivot, valve spring lifter</p> 	<p>For removal and installation of valves (B6 SOHC)</p>
<p>49 B012 0A2 Pivot, valve spring lifter</p> 	<p>For removal / installation of valves</p>	<p>49 B012 012 Body (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>
<p>49 B012 013 Foot (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>	<p>49 B012 014 Locknut (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>
<p>49 SE01 310 Centering tool, clutch disc</p> 	<p>For installation of clutch disc</p>	<p style="text-align: right;">23U0B1-045</p>	

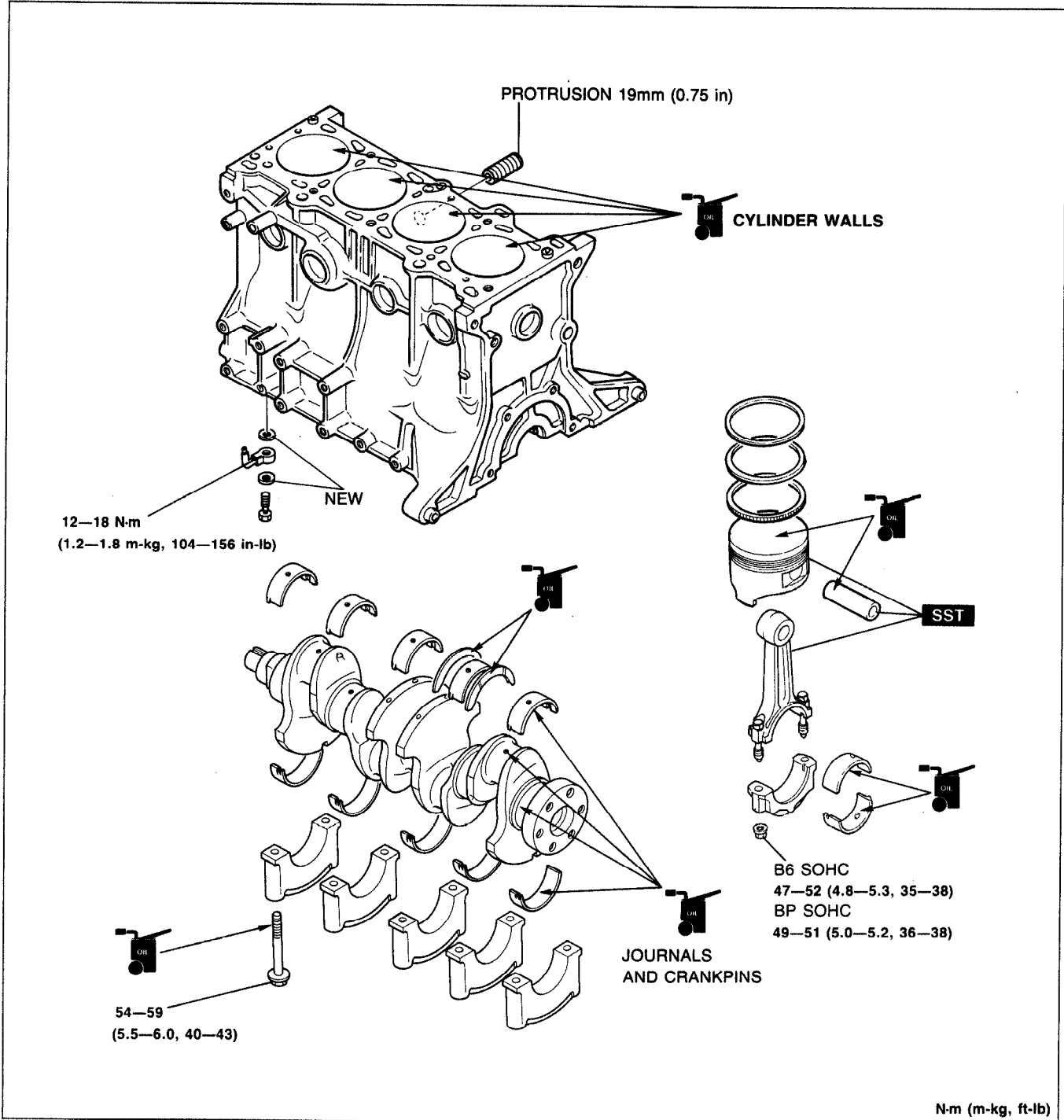
1. Clean all parts before reinstallation.
2. Apply new engine oil to all sliding and rotating parts.
3. Replace plain bearings if they are peeling, burned, or otherwise damaged.
4. Tighten all bolts and nuts to the specified torques.

Caution

- Do not reuse gaskets or oil seals.

05U0BX-174

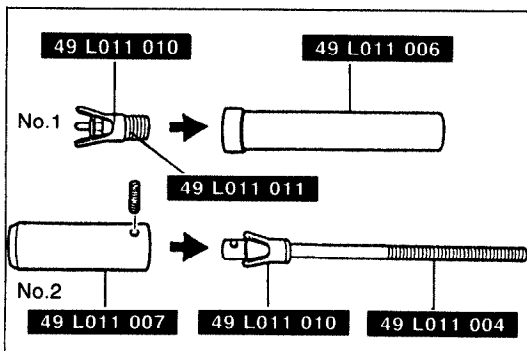
CYLINDER BLOCK (INTERNAL PARTS) Torque Specifications



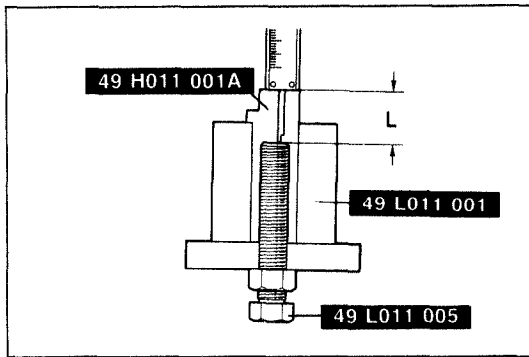
05U0BX-175

Connecting Rod

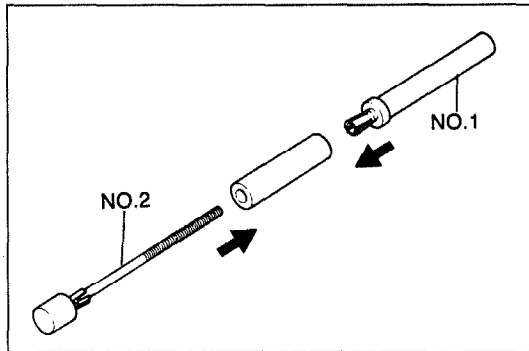
1. Assemble the **SST** as shown.



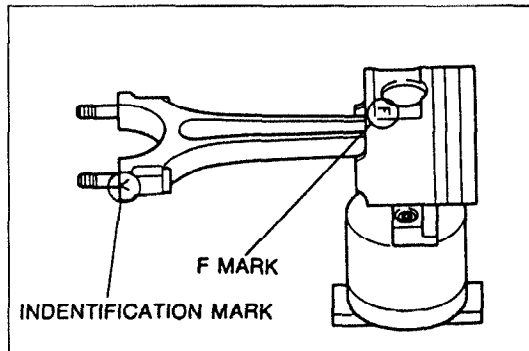
9MU0B2-143



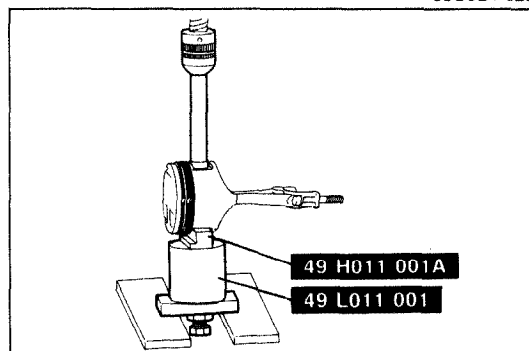
03U0B1-125



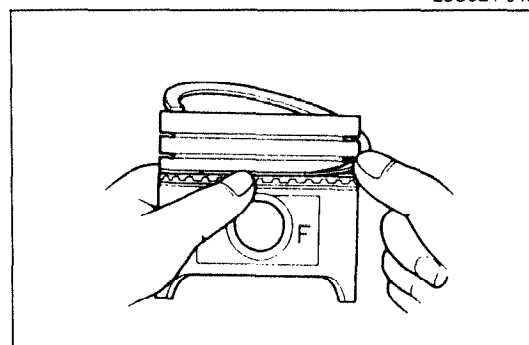
9MU0B2-145



03U0B1-029



23U0B1-046



05U0BX-179

2. Set the **stopper bolt** (49 L011 005) so that the depth **L** is as specified.

Depth L

mm (in)

B6 SOHC	56.9—57.1 (2.240—2.248)
BP SOHC	58.9—59.1 (2.319—2.327)

3. Tighten the locknut.

4. Insert the **SST** No.2 into the piston pin as shown and fully screw in the **SST** No.1.

5. Apply engine oil to the piston pin.

6. Set the piston on the **SST** with the **F** mark facing upward.

7. Assemble the piston and the connecting rod in the direction from which they were disassembled.

8. Press the piston pin into the piston and connecting rod until the **SST** contacts the stopper bolt.

9. While inserting the piston pin, check the pressure force. If it is less than specified, replace the piston pin or the connecting rod.

Pressure force:

4,905—14,715 N (500—1,500 kg, 1,100—3,300 lb)

10. Check the oscillation torque of the connecting rod. (Refer to page B1-51.)

Piston Ring

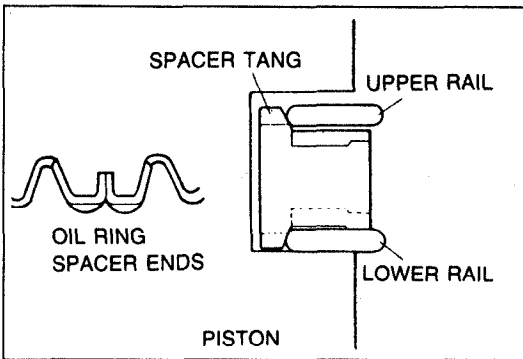
1. Install the three-piece oil rings on the pistons.

- (1) Apply clean engine oil to the oil ring spacer and rails.
- (2) Install the oil ring spacer with the ends upward.

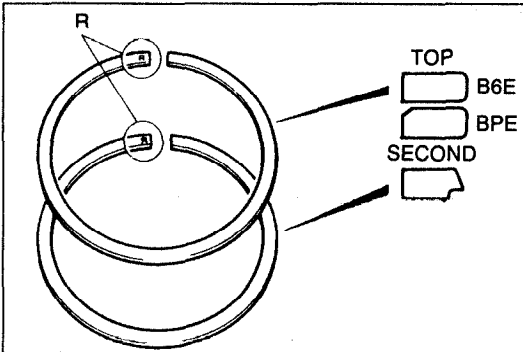
Note

- The upper rail and lower rail are the same.
- The rails may be installed with either face upward.

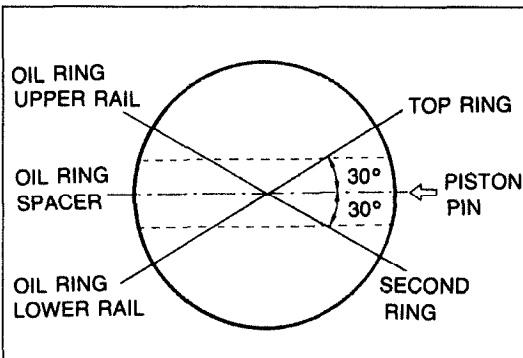
(3) Install the upper rail and lower rail.



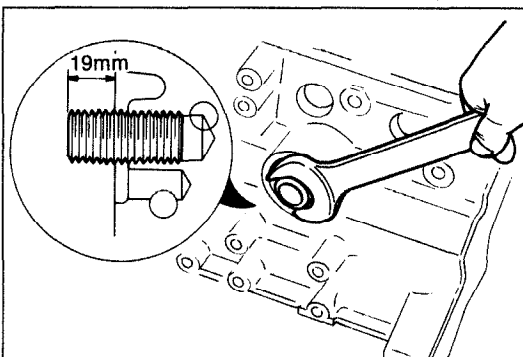
05U0BX-180



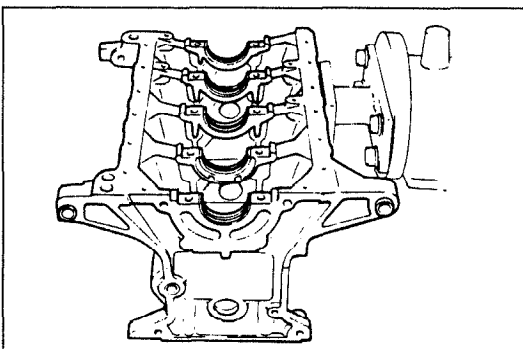
05U0BX-181



05U0BX-182



03U0B1-127



03U0B1-213

2. Verify that both rails are expanded by the spacer tangs as shown in the figure by making certain the rails turn smoothly in both directions.

Caution

- The rings must be installed with the R marks upward.
- The second ring must be installed with the scraper face downward.

3. Apply clean engine oil to the top and second piston rings.
4. Install the second ring to the piston; then install the top ring. Use a piston ring expander (commercially available).

5. Position the end gaps of the rings as shown in the figure.

Oil Filter Joint

1. Install the oil filter joint so that it protrudes as specified.

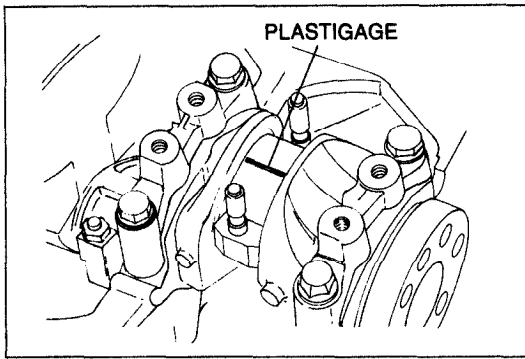
Protrusion: 19mm (0.75 in)

Oil Jet (BP SOHC)

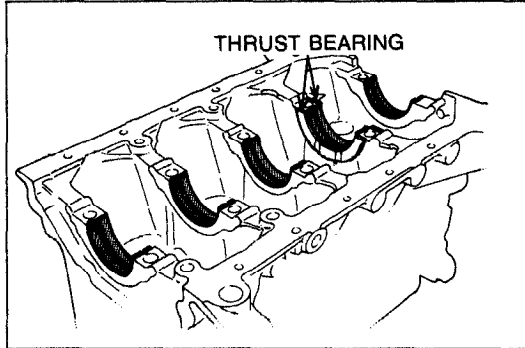
1. Install the oil jets.

Tightening torque:

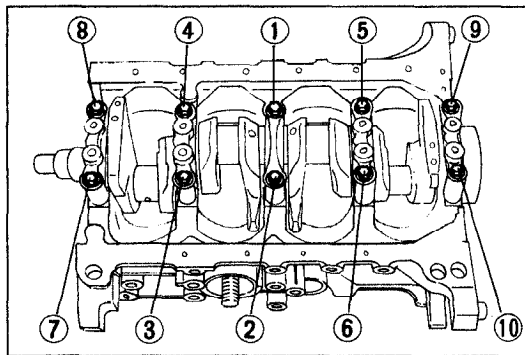
12–18 N·m (1.2–1.8 m·kg, 104–156 in·lb)



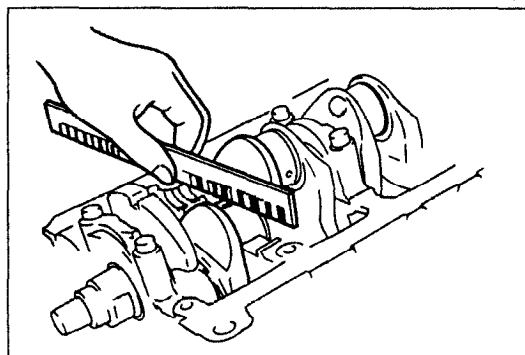
05U0BX-184



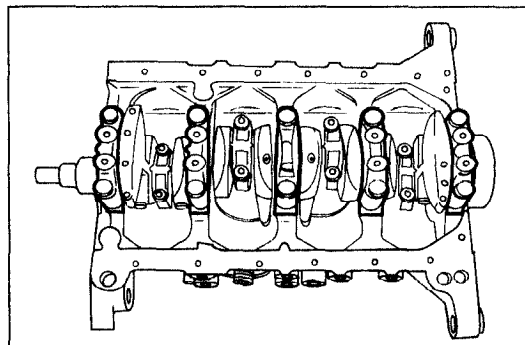
05U0BX-185



05U0BX-186



23U0B1-047



05U0BX-188

Crankshaft

1. Before installing the crankshaft, inspect the main bearing oil clearances as follows.

Oil clearance inspection

- (1) Remove all foreign material and oil from the journals and bearings.

Caution

- Install the grooved upper main bearings in the cylinder block.
- Install the thrust bearings with the oil groove facing the crankshaft.

- (2) Install the upper main bearings and thrust bearings.
- (3) Set the crankshaft in the cylinder block.

Caution

- Do not rotate the crankshaft when measuring the oil clearances.

- (4) Position Plastigage atop the journals in the axial direction.

- (5) Install the lower main bearings and the main bearing caps according to the cap number and \Leftarrow mark.

- (6) Tighten the main bearing cap bolts in two or three steps in the order shown in the figure.

Tightening torque:

54—59 N·m (5.5—6.0 m·kg, 40—43 ft·lb)

- (7) Remove the main bearing caps, and measure the Plastigage at each journal at the widest point for the smallest clearance and at the narrowest point for the largest clearance.

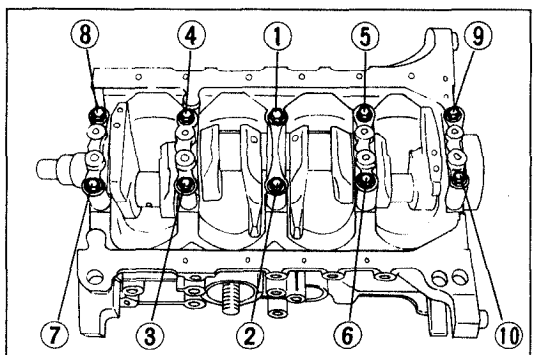
- (8) If the oil clearance exceeds specification, grind the crankshaft and use undersize main bearings. (Refer to page B1-64.)

Oil clearance: 0.018—0.036mm (0.0007—0.0014 in)

Maximum: 0.10mm (0.004 in)

2. Apply a liberal amount of clean engine oil to the main bearings, thrust bearings and main journals.

3. Install the crankshaft and the main bearing caps according to the cap number and \Leftarrow mark.

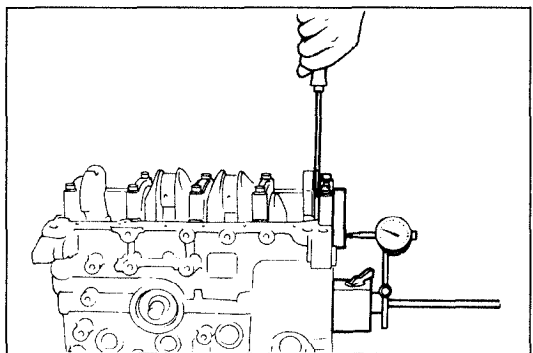


05U0BX-189

4. Tighten the main bearing cap bolts in two or three steps in the order shown in the figure.

Tightening torque:

54—59 N·m (5.5—6.0 m·kg, 40—43 ft·lb)

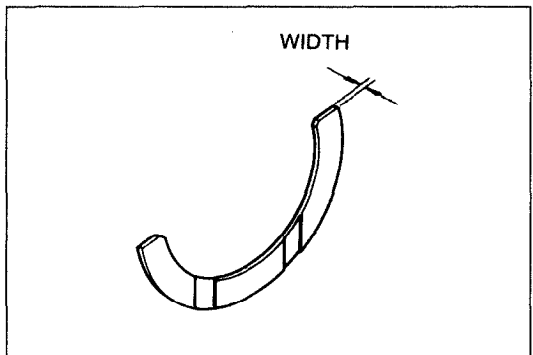


05U0BX-190

5. Measure the crankshaft end play.

End play : 0.080—0.282mm (0.0031—0.0111 in)

Maximum: 0.30mm (0.012 in)



05U0BX-191

6. If the end play exceeds the maximum, grind the crankshaft and install an oversize thrust bearing or replace the crankshaft and thrust bearing.

Thrust bearing width

Standard:

2.500—2.550mm (0.0984—0.1004 in)

0.25mm (0.010 in) oversize:

2.625—2.675mm (0.1033—0.1053 in)

0.50mm (0.020 in) oversize:

2.750—2.800mm (0.1083—0.1102 in)

0.75mm (0.030 in) oversize:

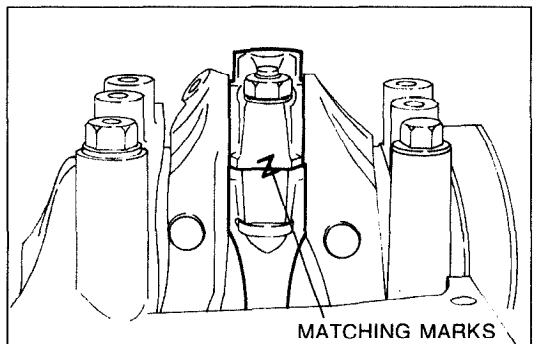
2.875—2.925mm (0.1132—0.1152 in)

Piston and Connecting Rod Assembly

Caution

- **Protect the connecting rod bolts with rubber sleeves to prevent damage to the crankpin journals.**

05U0BX-192



03U0B1-129

Connecting Rod Cap

1. Measure the connecting rod bearing oil clearances using the same procedure as for the main bearing oil clearance.

Caution

- **Align the matching marks on the cap and the connecting rod when installing the connecting rod cap.**

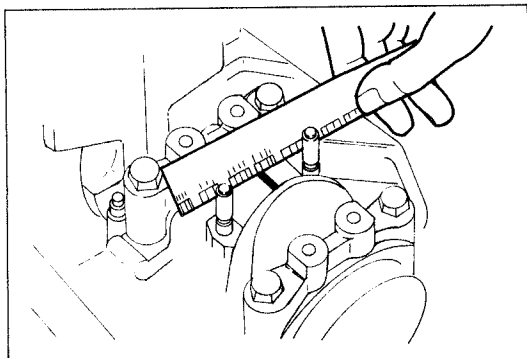
Tightening torque:

47—52 N·m (4.8—5.3 m·kg, 35—38 ft·lb)

..... **B6 SOHC**

49—51 N·m (5.0—5.2 m·kg, 36—38 ft·lb)

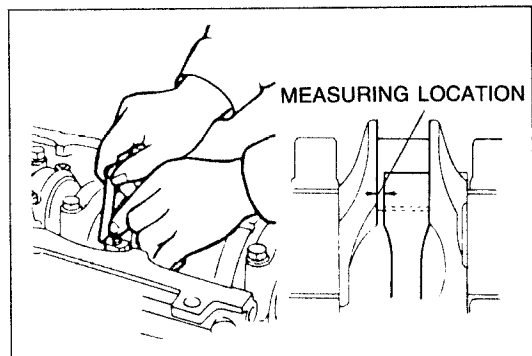
..... **BP SOHC**



23U0B1-048

Oil clearance: 0.028—0.068mm (0.0011—0.0027 in)
Maximum: 0.10mm (0.004 in)

- If the oil clearance exceeds the maximum, grind the crankshaft and use undersize bearings. (Refer to page B1-64.)

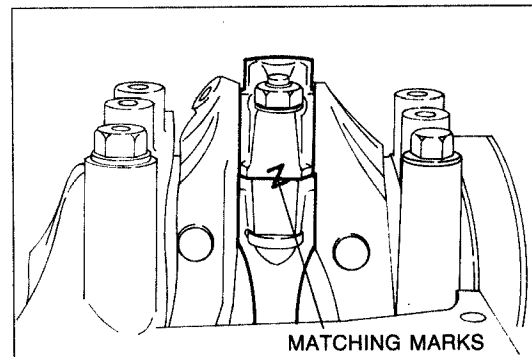


03U0B1-131

- Measure the connecting rod side clearances.

Side clearance: 0.110—0.262mm (0.0043—0.0103 in)
Maximum: 0.30mm (0.012 in)

- If the clearance exceeds the maximum, replace the connecting rod and cap.



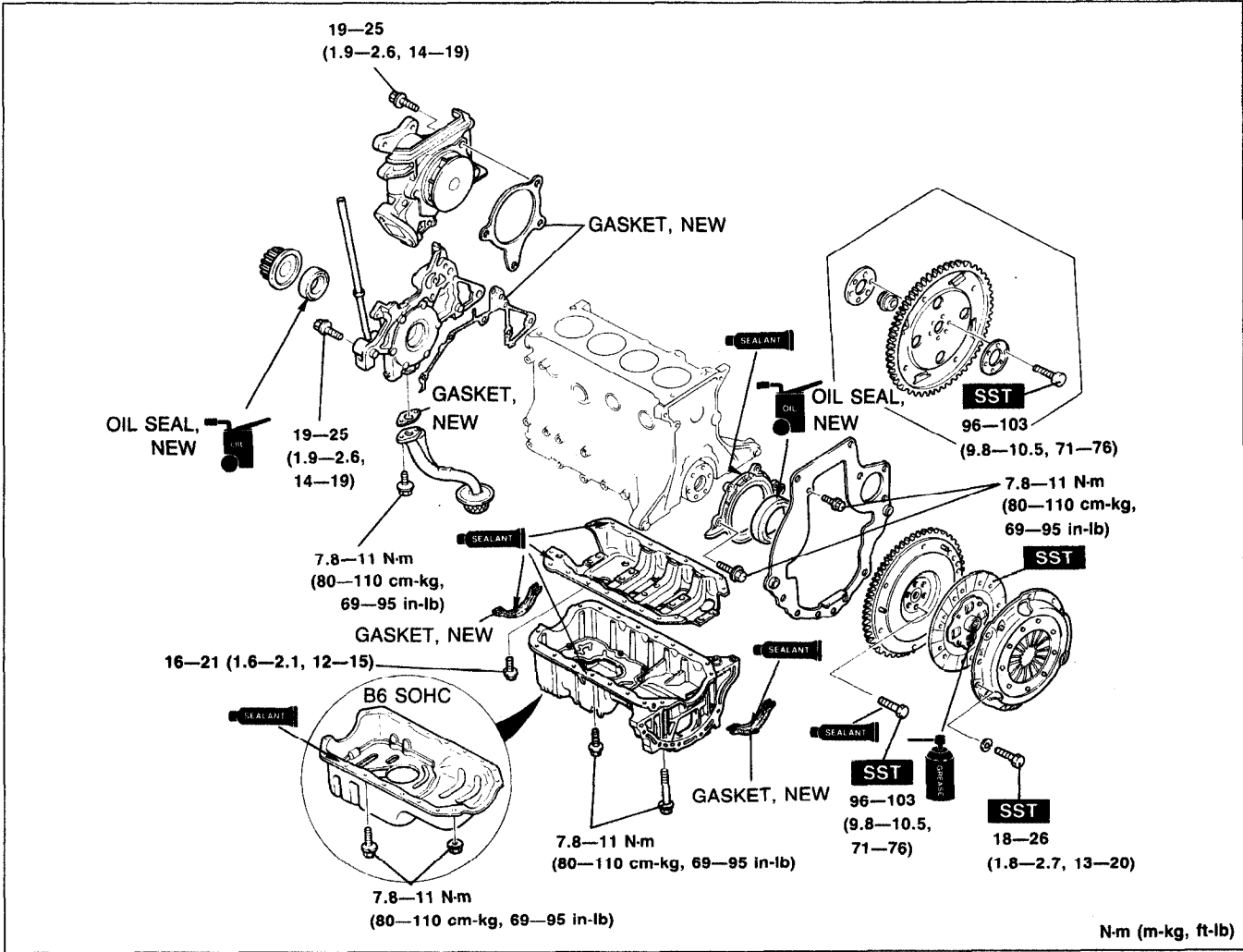
03U0B1-132

- Apply a liberal amount of clean engine oil to the crankpin journals and connecting rod bearings.
- Install the connecting rod caps with the matching marks aligned.
- Tighten the connecting rod cap nuts in two or three steps.

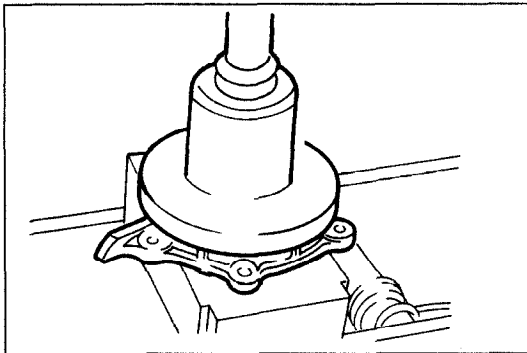
Tightening torque:

47—52 N·m (4.8—5.3 m·kg, 35—38 ft·lb)	B6 SOHC
49—51 N·m (5.0—5.2 m·kg, 36—38 ft·lb)	BP SOHC

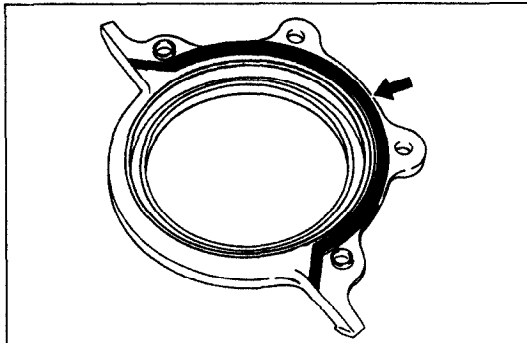
CYLINDER BLOCK (EXTERNAL PARTS) Torque Specifications



03U0B1-133



05U0BX-199



05U0BX-200

Rear Cover

1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

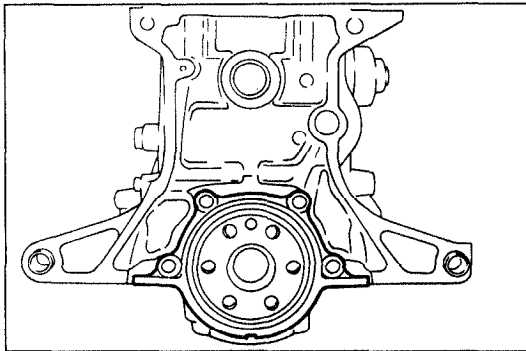
Caution

- The oil seal must be pressed in until it is flush with the edge of the rear cover.

3. Press the oil seal in evenly with a suitable pipe.

Oil seal outer diameter: 100mm (3.94 in)

4. Apply silicone sealant to the shaded area shown in the figure.

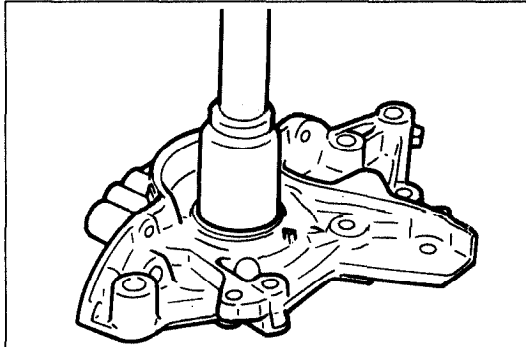


05U0BX-201

5. Install the rear cover.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



05U0BX-202

Oil Pump

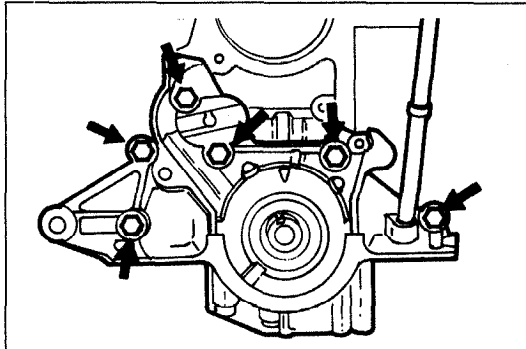
1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution

- The oil seal must be pressed in until it is flush with the edge of the oil pump body.

3. Press the oil seal in evenly with a suitable pipe.

Oil seal outer diameter: 44mm (1.73 in)

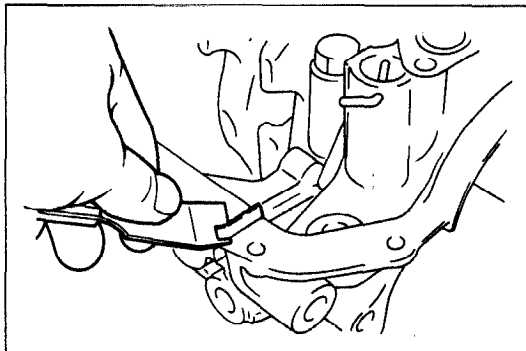


05U0BX-203

4. Install the oil pump and a new gasket.

Tightening torque:

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

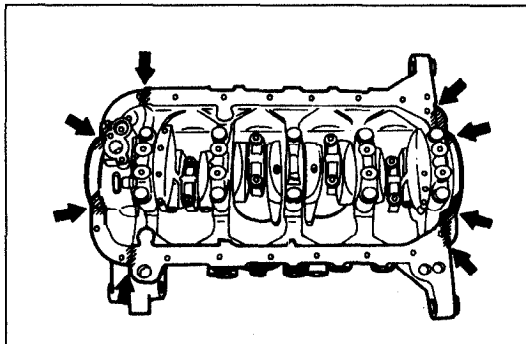


05U0BX-204

Caution

- Do not scratch the oil pump.

5. Cut away the portion of the gasket that projects from the body toward the oil pan side.



23U0B1-049

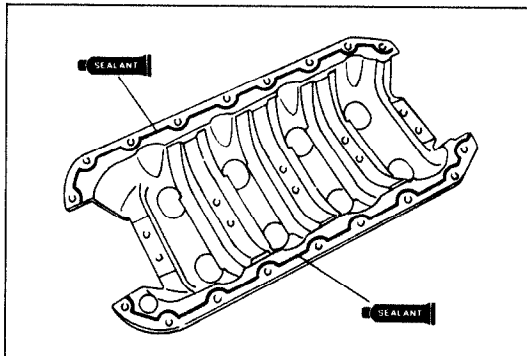
Main Bearing Support Plate (MBSP)

1. Remove all foreign material from the contact surfaces of the cylinder block and the MBSP.

Caution

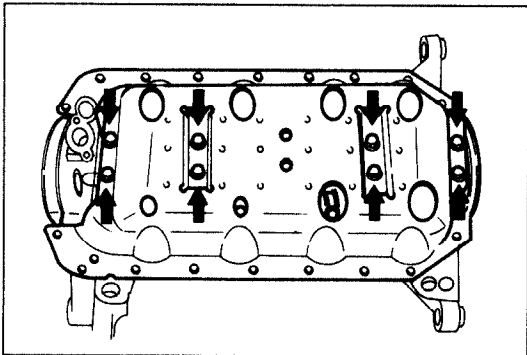
- The oil pan must be secured within 5 minutes after the sealant is applied to the MBSP.

2. Apply silicon sealant to the shaded areas shown in the figure.



03U0B1-135

3. Apply a continuous bead of silicone sealant to the MBSP along the inside of the bolt holes.

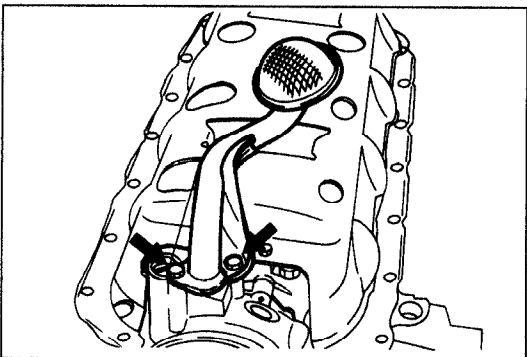


03U0B1-136

4. Install the MBSP onto the cylinder block.
5. Tighten the MBSP bolts in two or three steps in the order shown in the figure.

Tightening torque:

16—21 N·m (1.6—2.1 m·kg, 12—15 ft·lb)



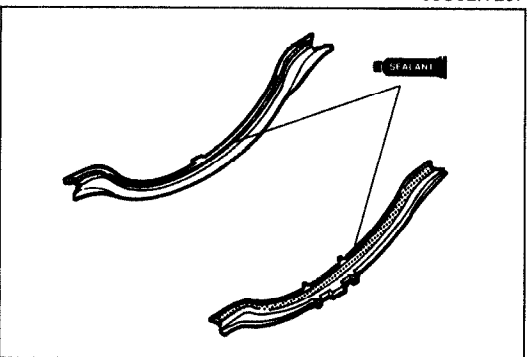
05U0BX-207

Oil Strainer

1. Install the oil strainer and a new gasket.

Tightening torque:

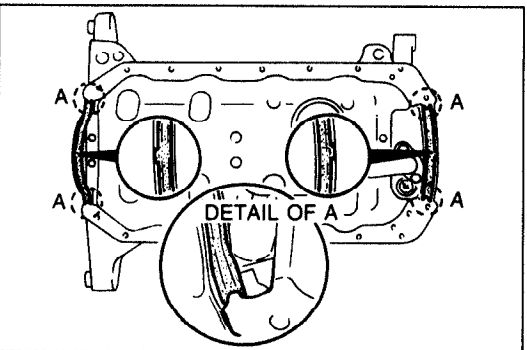
7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



03U0B1-137

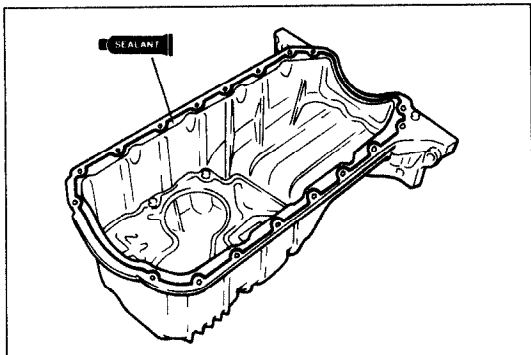
Oil Pan

1. Remove all foreign material from the contact surfaces.
2. Apply silicone sealant to the shaded areas shown in the figure.



05U0BX-209

3. Install new gaskets onto the oil pump body and the rear cover with the projections in the notches shown in the figure.

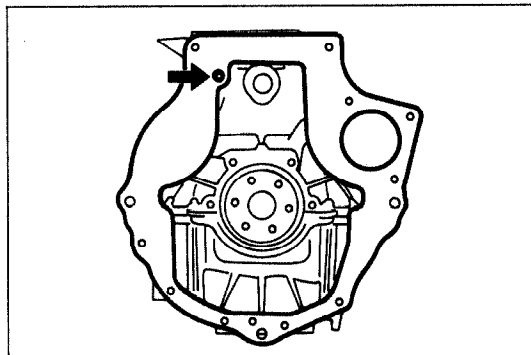


05U0BX-210

4. Apply a continuous bead of silicone sealant to the oil pan along the inside of the bolt holes and overlap the ends.
5. Install the oil pan.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



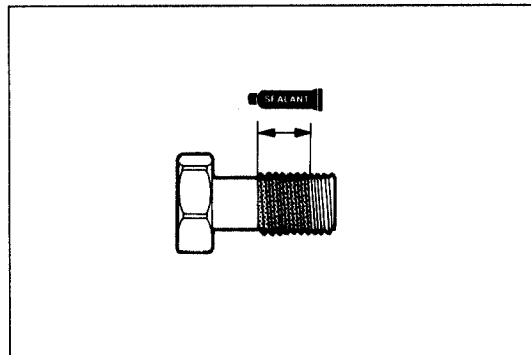
05U0BX-211

End Plate

1. Install the end plate.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



03U0B1-138

Flywheel (MTX)

1. Remove the sealant from the flywheel bolt holes in the crankshaft and from the flywheel bolts.

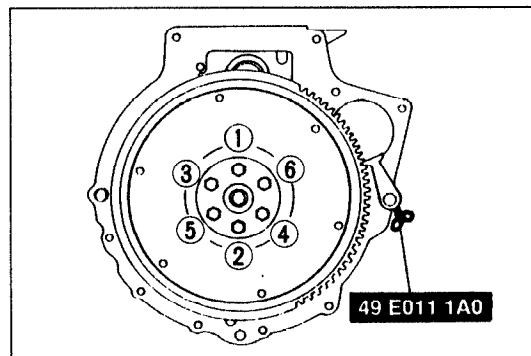
Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- Do not apply sealant if a new bolt is used.

2. Set the flywheel onto the crankshaft.
3. Apply sealant to the flywheel bolts and install them.
4. Hold the flywheel with the **SST** or equivalent.
5. Tighten the bolts in two or three steps in the order shown.

Tightening torque:

96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)



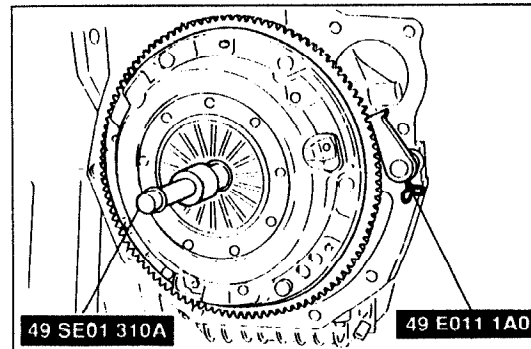
23U0B1-079

Clutch Disc and Clutch Cover (MTX)

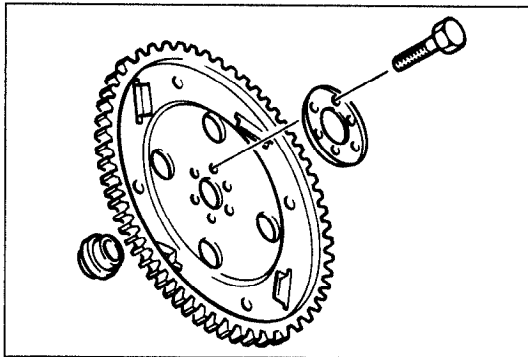
1. Install the clutch disc and clutch cover using the **SST** or equivalent. (Refer to Section H.)

Tightening torque:

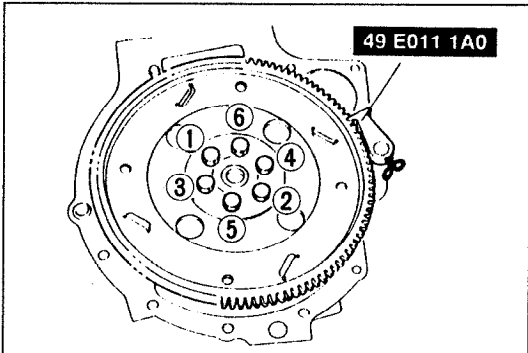
18—26 N·m (1.8—2.7 m·kg, 13—20 ft·lb)



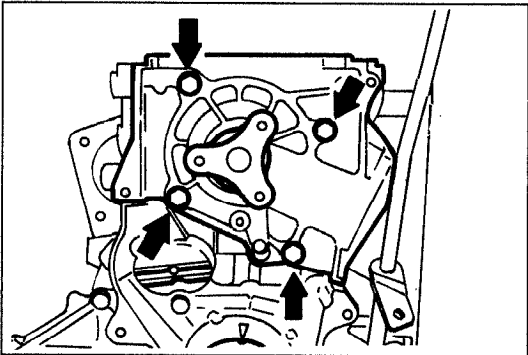
23U0B1-050



03U0B1-140



23U0B1-080



03U0B1-142

Drive Plate (ATX)

1. Remove the sealant from the drive plate bolt holes in the crankshaft and from the drive plate bolts.

Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- Do not apply sealant if a new bolt is used.

2. Install the adapter, drive plate, and backing plate onto the crankshaft.
3. Apply sealant to the drive plate bolts and install them.
4. Hold the drive plate with the **SST** or equivalent.
5. Tighten the bolts in two or three steps in the order shown.

Tightening torque:

96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)

Water Pump

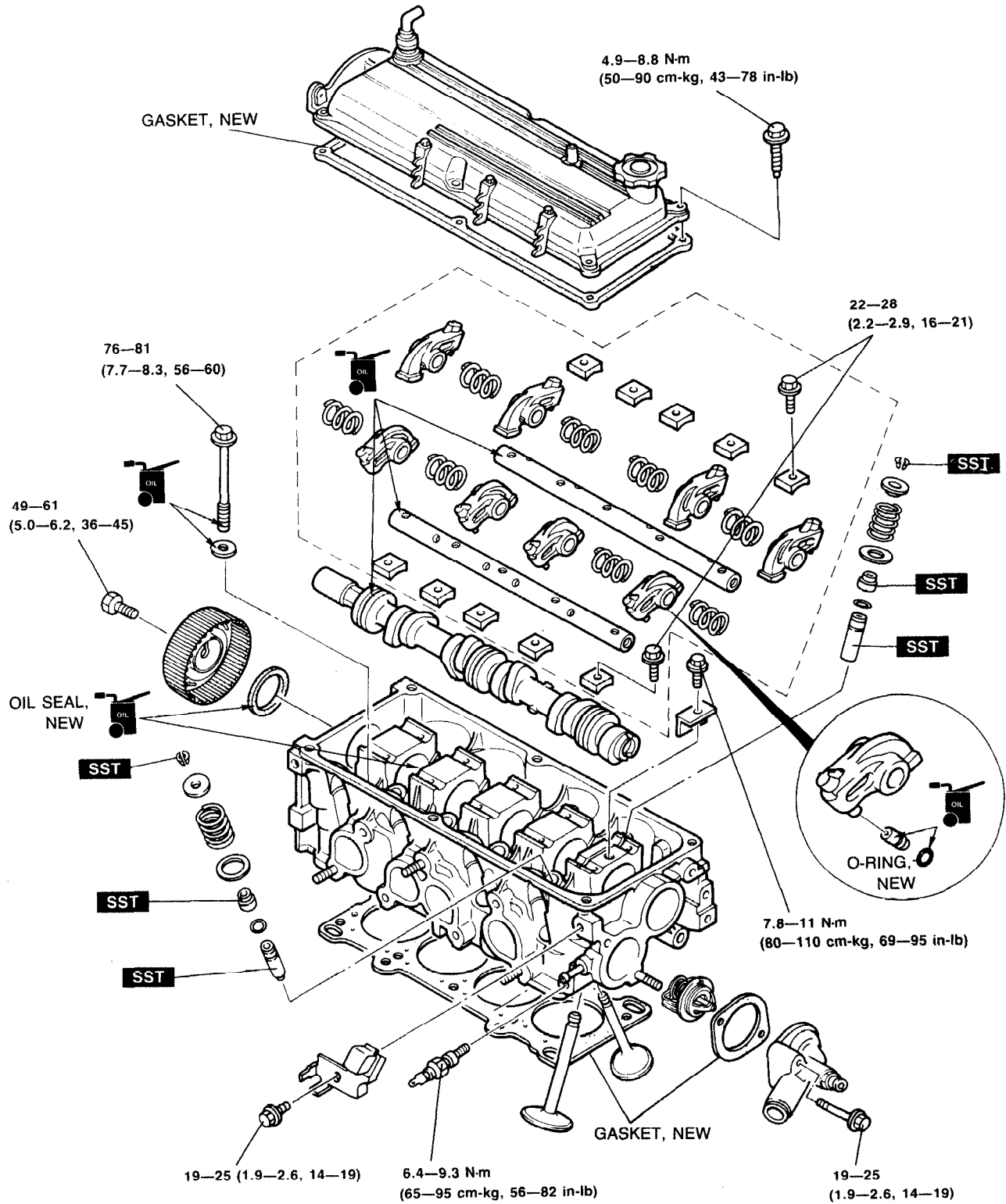
1. Remove all foreign material from the water pump mounting surface.
2. Place a new water pump gasket in position.
3. Install the water pump.

Tightening torque:

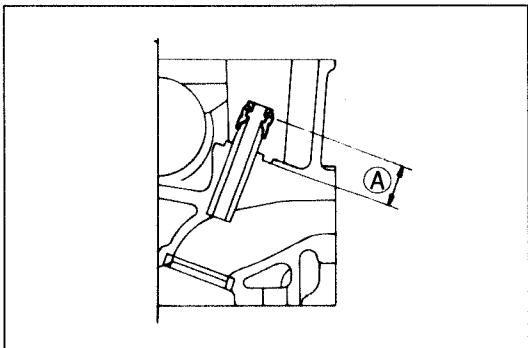
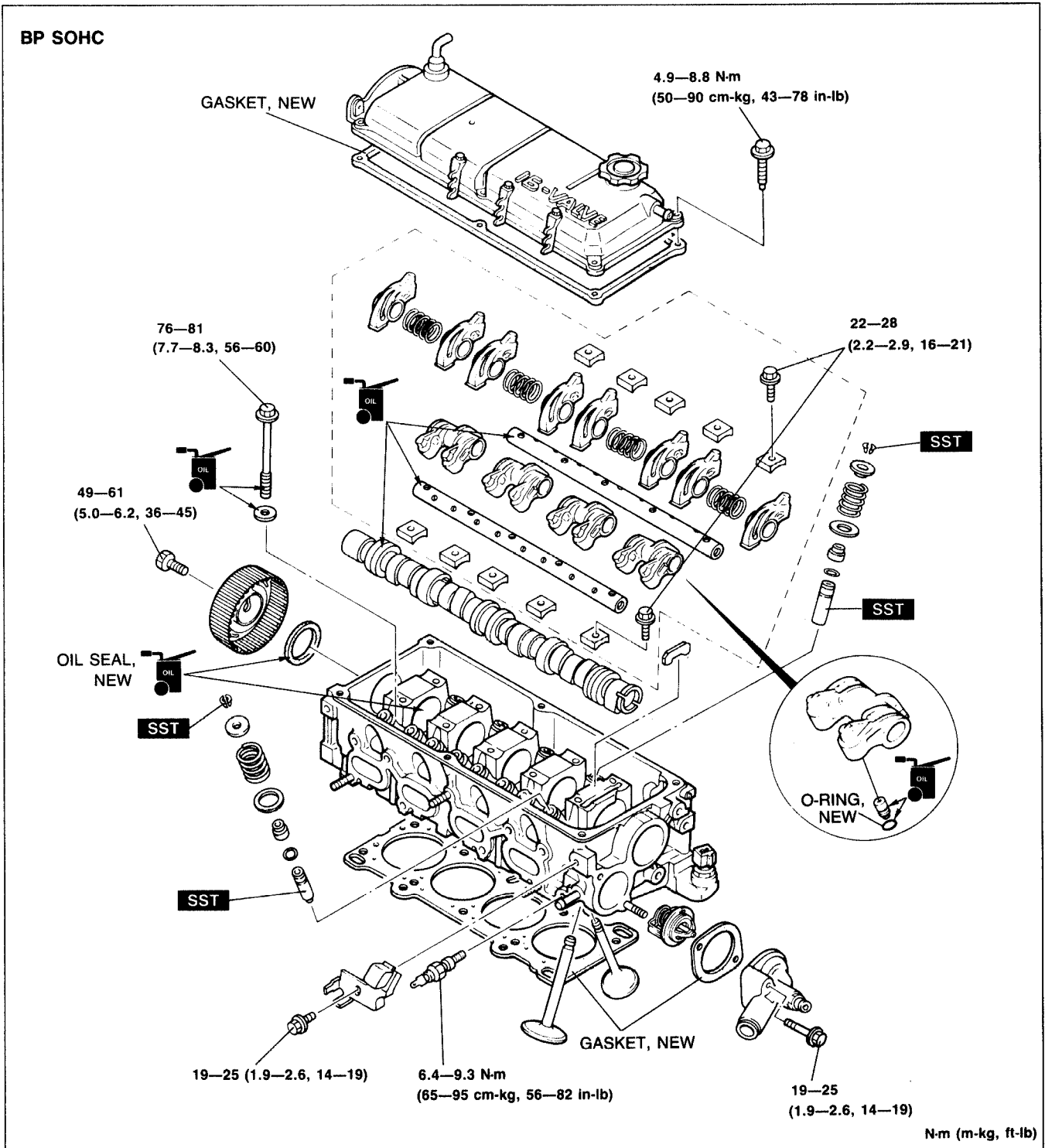
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

CYLINDER HEAD
Torque Specifications

B6 SOHC



N-m (m-kg, ft-lb)

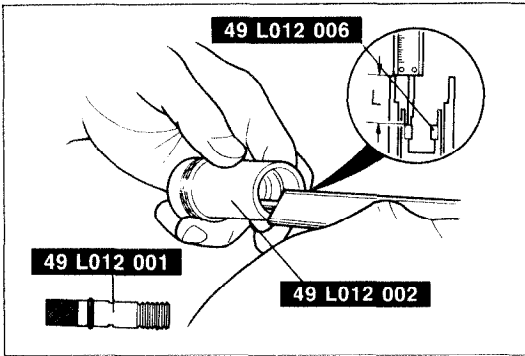


Valve Seal BP SOHC

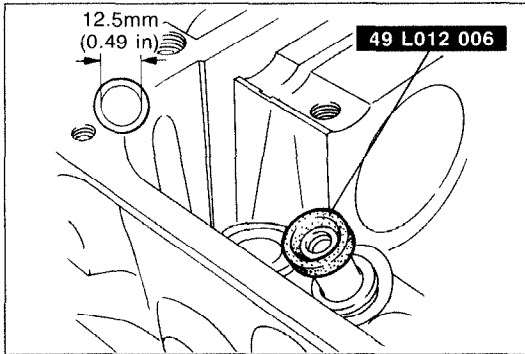
1. Install the new valve seal onto the valve guide by hand.
2. After installation adjust the protrusion A to specification.

Protrusion

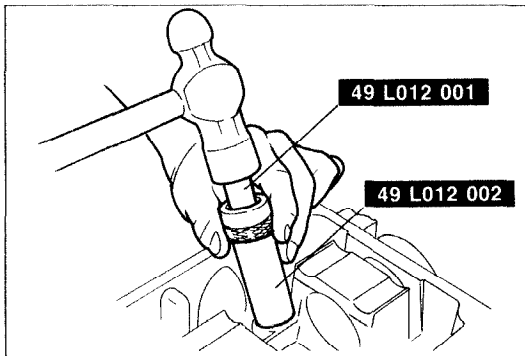
IN : 19.6—20.2mm (0.772—0.795 in)
EX : 18.1—18.7mm (0.713—0.736 in)



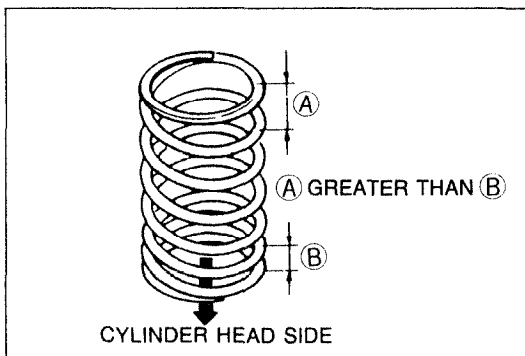
03U0B1-144



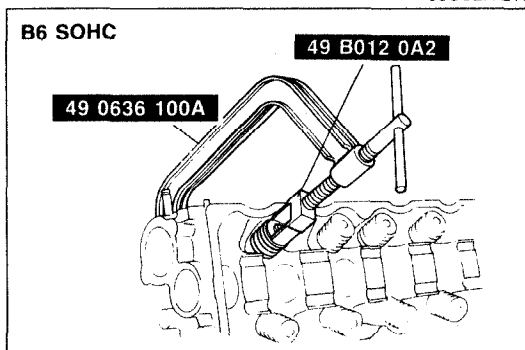
05U0BX-215



03U0B1-214



05U0BX-217



05U0BX-218

B6 SOHC

1. Assemble the **SST** so that depth **L** is as specified.

Depth L

mm (in)

IN	14.9—15.2 (0.587—0.598)
EX	14.9—15.2 (0.587—0.598)

2. Slide the valve seal onto the valve guide.
3. Set the **SST** against the valve seal.

4. Tap the valve seal on until the **SST** contacts the cylinder head.

Valve and Valve Spring

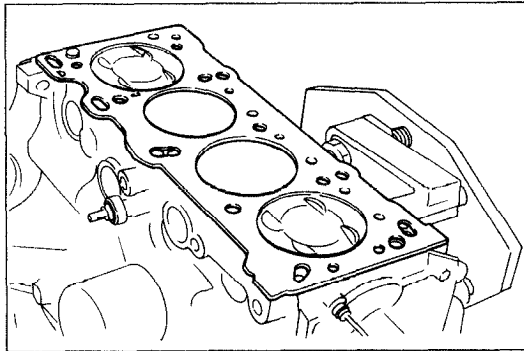
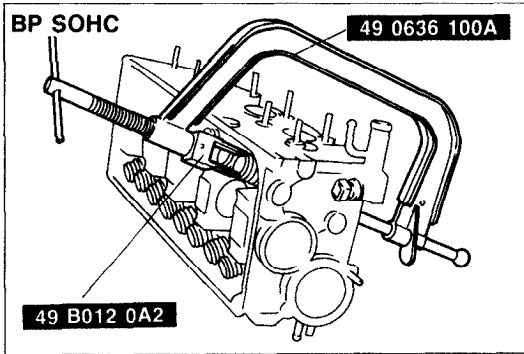
1. Install the lower spring seat.
2. Install the valve.

Caution

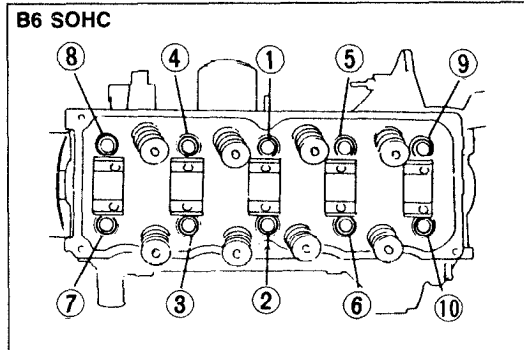
- Install the spring with the closer pitch toward the cylinder head.

3. Install the valve spring and the upper spring seat.

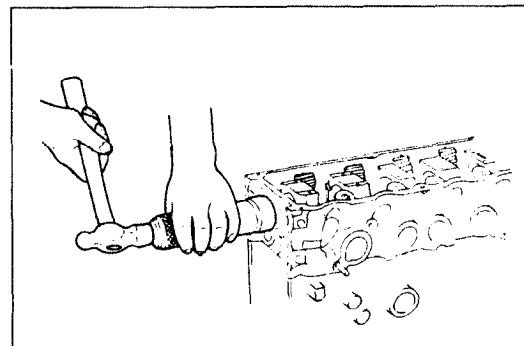
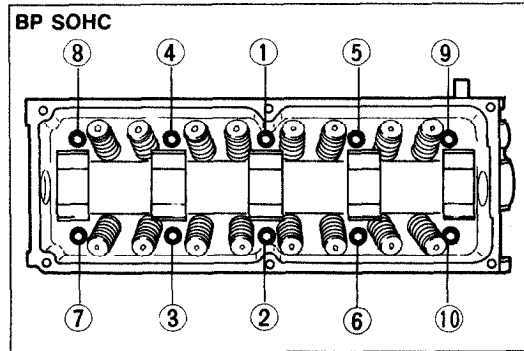
4. Compress the valve spring with the **SST**, and install the valve keepers.
5. Remove the **SST**.
6. Tap the end of the valve stem lightly two or three times with a plastic hammer to verify that the keepers are all fully seated.



05U0BX-219



05U0BX-220



03U0B1-205

Cylinder Head Gasket

1. Remove all foreign material from the top of the cylinder block.
2. Place the new cylinder head gasket in position.

Cylinder Head

1. Install the cylinder head.
2. Apply clean engine oil to the bolt threads and seat faces.
3. Tighten the cylinder head bolts in two or three steps in the order shown.

Tightening torque:

76—81 N·m (7.7—8.3 m·kg, 56—60 ft·lb)

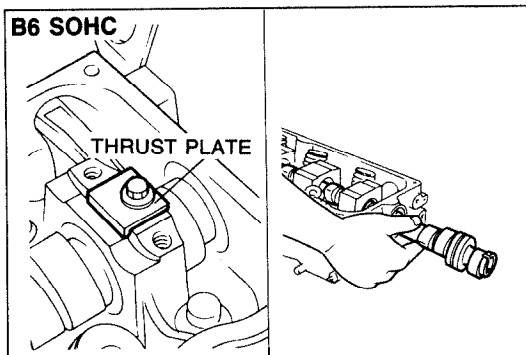
Camshaft Oil Seal

1. Apply a thin coat of engine oil to the camshaft oil seal and cylinder head.
2. Tap the camshaft oil seal into the cylinder head with a suitable pipe.

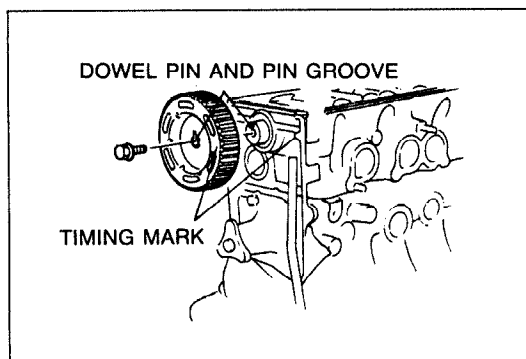
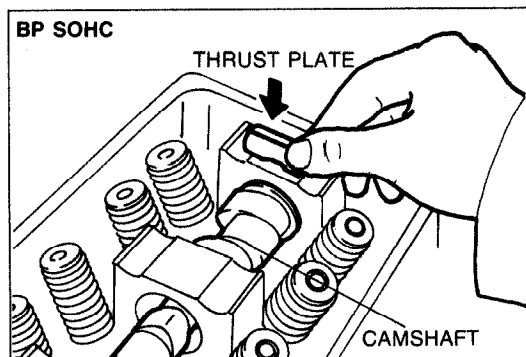
Caution

- The oil seal must be tapped in until it is flush with the cylinder head.

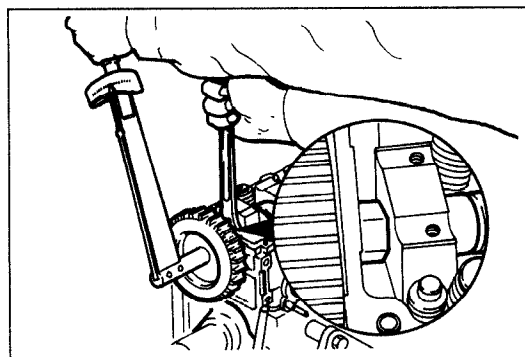
Oil seal outer diameter: 40mm (1.57 in)



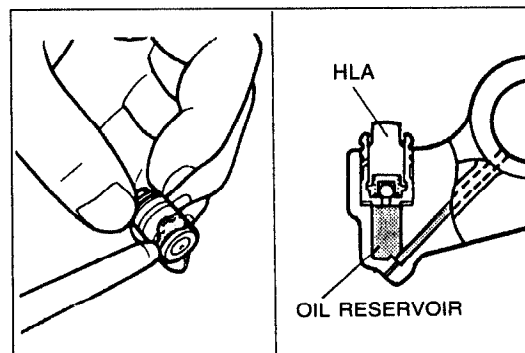
23U0B1-051



63U01X-121



63U01X-122



03U0B1-146

Camshaft

1. Apply engine oil to the journals and bearings; then insert and mount the camshaft into position with the thrust plate.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Camshaft Pulley

1. Install the camshaft pulley onto the dowel pin with the pin groove facing straight upward.

Note

- Be certain that the dowel pin of the camshaft also faces straight upward.

2. Tighten the camshaft pulley bolt. Hold the camshaft using a suitable wrench on the cast hexagon as shown.

Tightening torque:

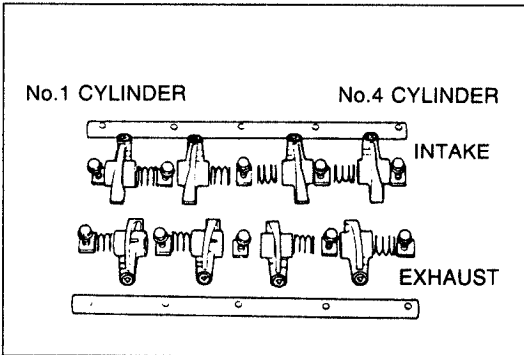
49—61 N·m (5.0—6.2 m·kg, 36—45 ft·lb)

Hydraulic Lash Adjuster (HLA)

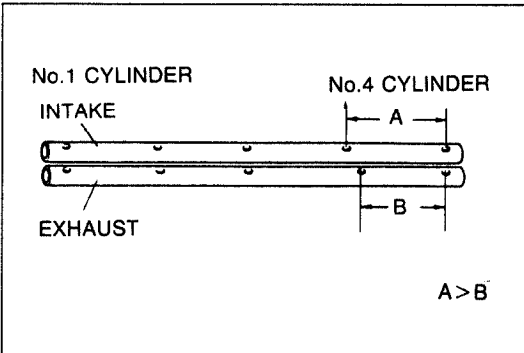
1. Pour engine oil into the oil reservoir in the rocker arm.
2. Apply engine oil to the new HLA.
3. Install the HLA in the rocker arm.

Caution

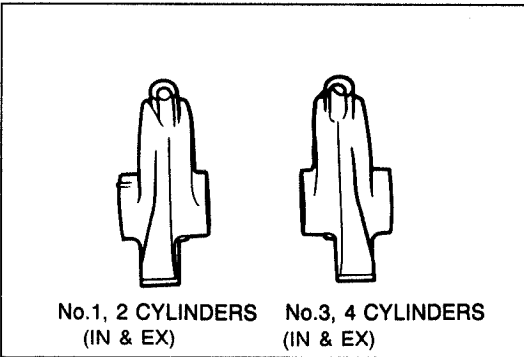
- Be careful not to damage the O-ring when installing.



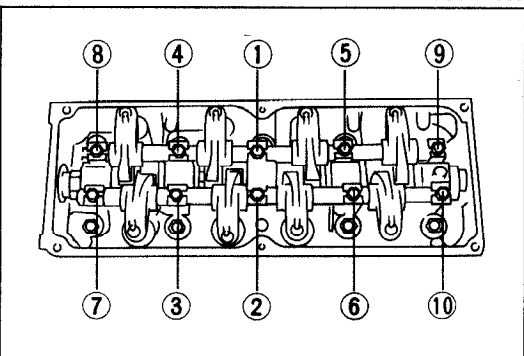
03U0B1-147



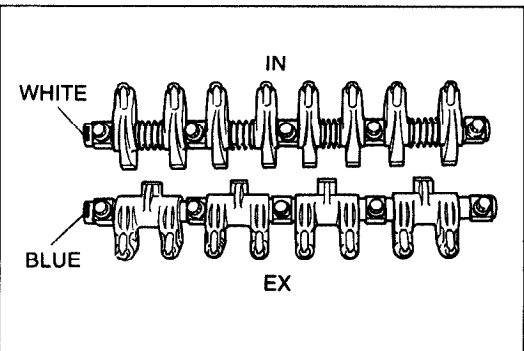
63U01X-115



93U01A-083



93U01A-084



03U0B1-148

Rocker Arm and Rocker Shaft Assembly B6 SOHC

1. Assemble the rocker arm and rocker shaft assembly as shown in the figure.

Caution

- Be sure both rocker arm shaft oil holes face downward.
- The installation bolt holes are different for the exhaust and intake sides as shown in the figure.

Note

- There are two types of rocker arms with different offsets. One type for No.1 and No.2 cylinders exhaust and intake. And the other for cylinders No.3 and No.4.

2. Install the rocker arm and rocker shaft assembly.

Caution

- The bolts must be tightened gradually and in the order shown.

Tightening torque:

22—28 N·m (2.2—2.9 m·kg, 16—21 ft·lb)

BP SOHC

1. Assemble the rocker arm and rocker shaft assembly as shown in the figure.

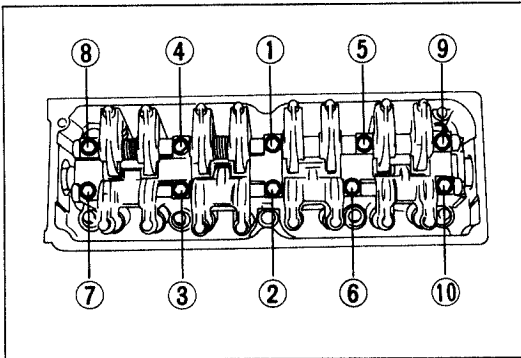
Caution

- Face the rocker shaft identification mark upward.
- The installation bolt holes are different for the exhaust and intake sides.

Identification mark

IN.....White

EX.....Blue



23U0B1-052

2. Install the rocker arm and rocker shaft assembly.

Caution

- The bolts must be tightened gradually and in the order shown.

3. Tighten the rocker arm bolts in two or three steps in the order shown in the figure.

Tightening torque:

22—28 N·m (2.2—2.9 m·kg, 16—21 ft·lb)

Bracket and Heat Gauge Unit

1. Install the heat gauge unit into the cylinder head with seal tape on the threads.

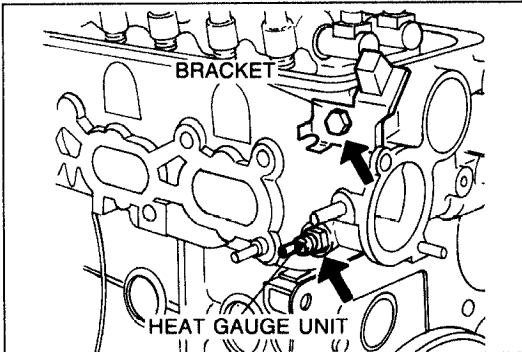
Tightening torque:

6.4—9.3 N·m (65—95 cm·kg, 56—82 in·lb)

2. Install the bracket.

Tightening torque:

19—25 (1.9—2.6 m·kg, 14—19 ft·lb)



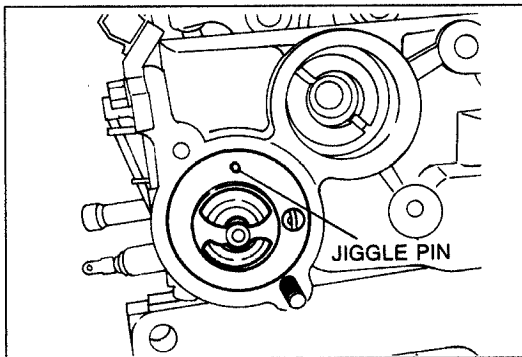
03U0B1-150

Thermostat and Thermostat Cover

1. Remove all foreign material from the thermostat cover mounting surface.
2. Install the thermostat with the jiggle pin facing upward.
3. Install a new gasket and the thermostat cover.

Tightening torque:

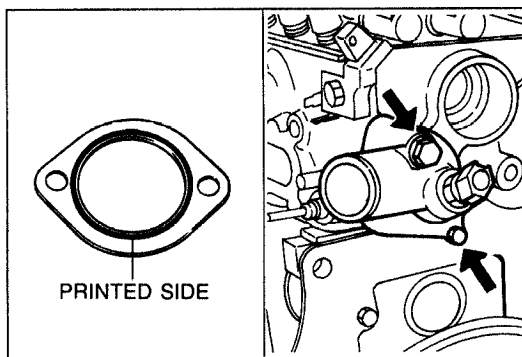
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



03U0B1-206

Caution

- The printed side of the gasket must face the thermostat.



03U0B1-207

Cylinder Head Cover

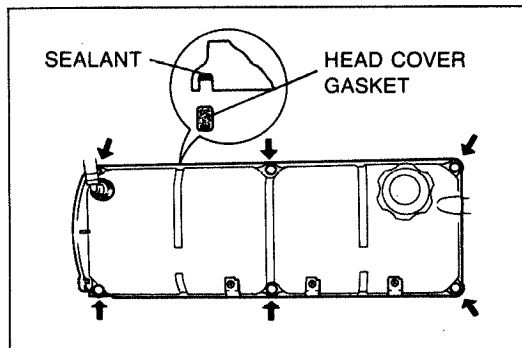
1. Install the cylinder head cover.

Tightening torque:

4.9—8.8 N·m (50—90 cm·kg, 43—78 in·lb)

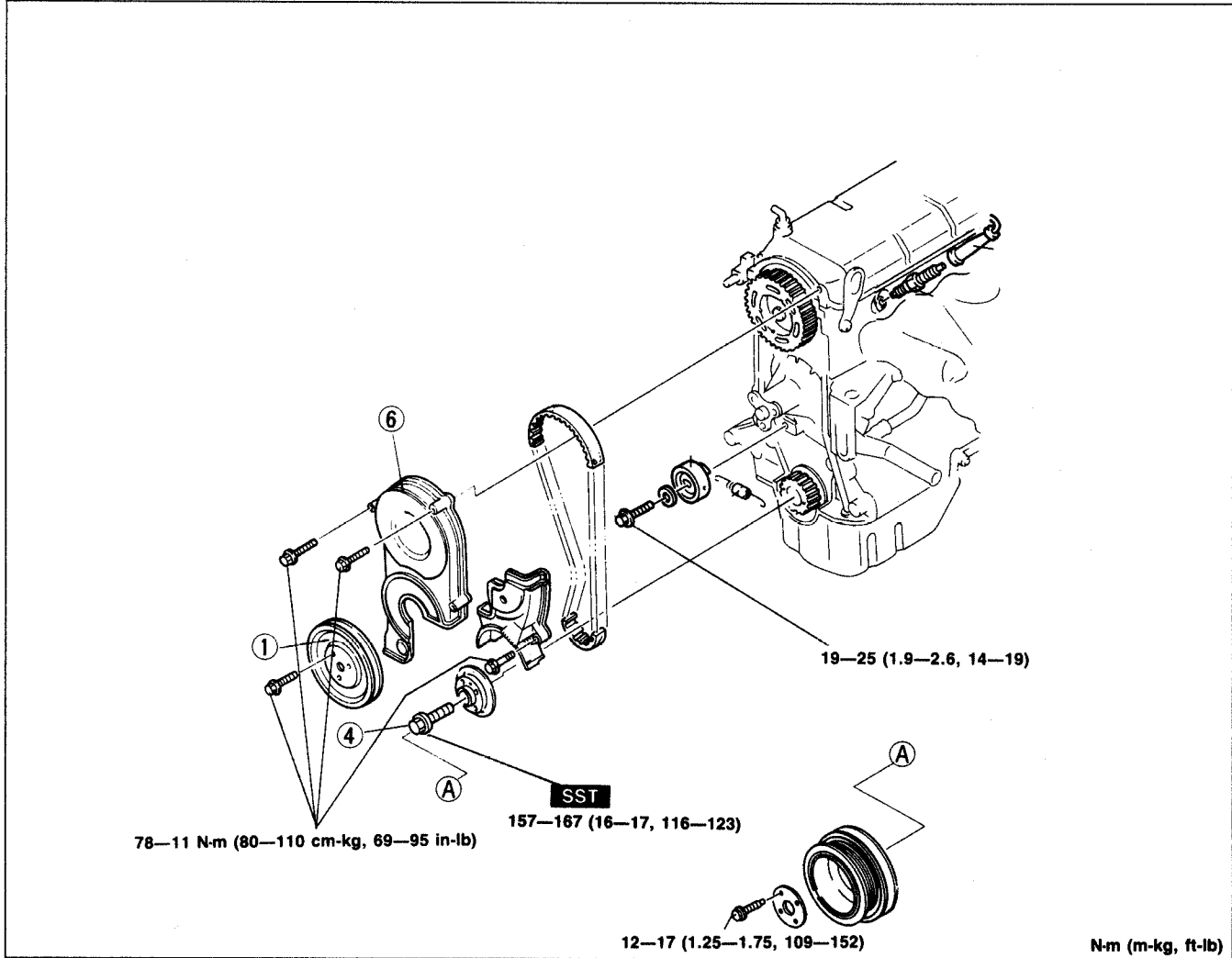
Caution

- If the head cover gasket is reused, apply sealant in the groove as shown.

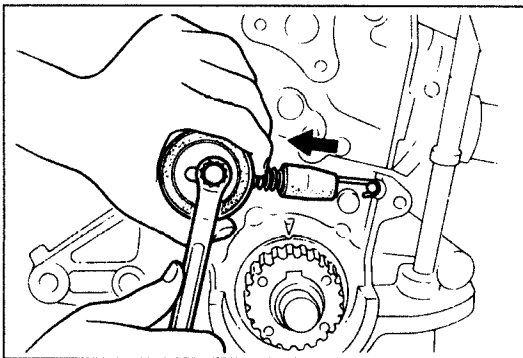


03U0B1-151

TIMING BELT Torque Specifications



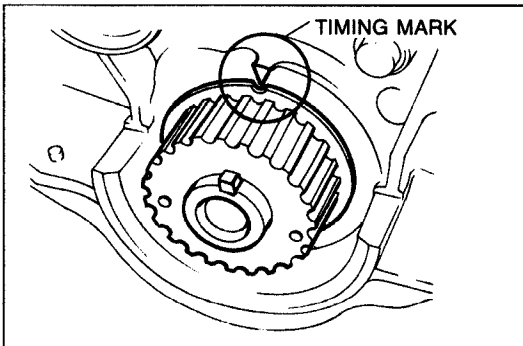
03U0B1-152



03U0B1-153

Timing Belt Tensioner

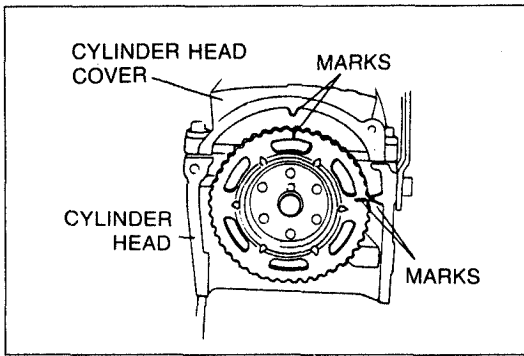
1. Install the tensioner and the tensioner spring.
2. Temporarily secure the tensioner with the spring fully extended.



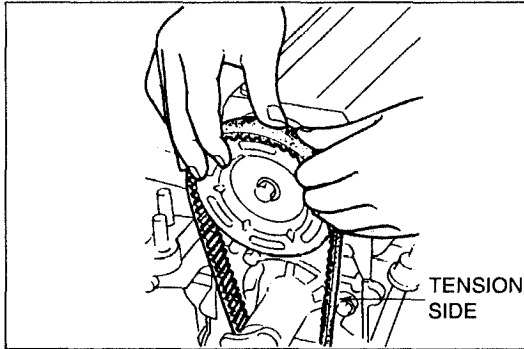
03U0B1-154

Timing Belt

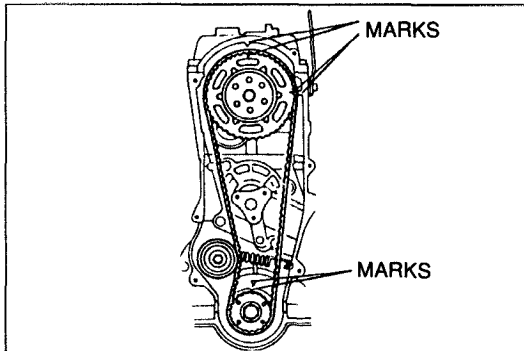
1. Verify that the timing belt pulley mark is aligned with the timing mark.



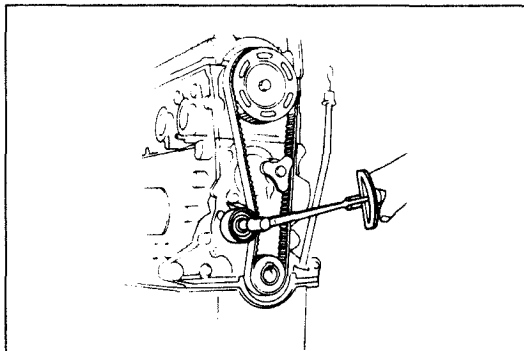
03U0B1-155



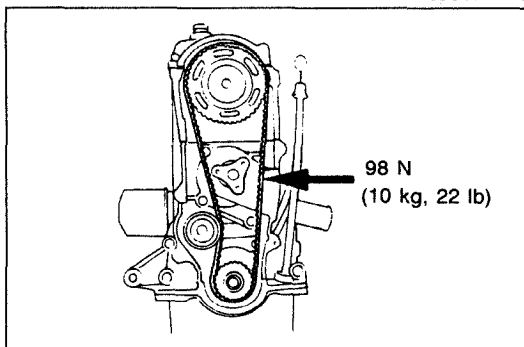
03U0B1-156



03U0B1-157



03U0B1-158



03U0B1-159

2. Verify that the camshaft pulley marks are aligned with the cylinder head cover marks.

3. Install the timing belt so that there is no looseness at the tension side.

Caution

- Do not turn the crankshaft counterclockwise.

4. Turn the crankshaft two turns clockwise, and align the timing belt pulley mark with the timing mark.

5. Verify that the camshaft pulley marks are aligned with the cylinder head cover mark.

If not aligned, remove the timing belt and repeat from tensioner installation.

6. Loosen the tensioner lock bolt to apply tension to the timing belt.

Caution

- Be sure not to apply tension other than that of the tensioner spring.

7. Tighten the tensioner lock bolt.

Tightening torque:

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

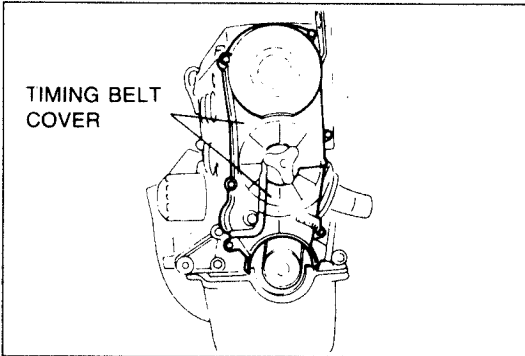
8. Turn the crankshaft 2 turns clockwise and verify that the timing marks are correctly aligned.

9. Measure the timing belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the crankshaft pulley and the camshaft pulley.

If the timing belt deflection is not correct, temporarily secure tensioner lock bolt so the spring is fully extended and repeat steps 4–8 above or replace the tensioner spring.

Deflection:

11.0—13.0mm (0.43—0.51 in) at 98 N (10 kg, 22 lb)



TIMING BELT COVER

23U0B1-053

Timing Belt Cover

1. Install the lower and upper timing belt covers and new gaskets.

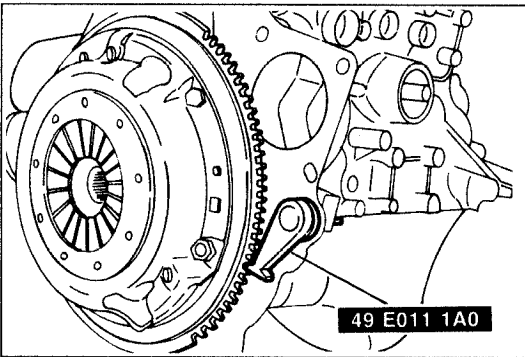
Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Crankshaft Pulley

1. Install the pulley boss.

01E0BX-184



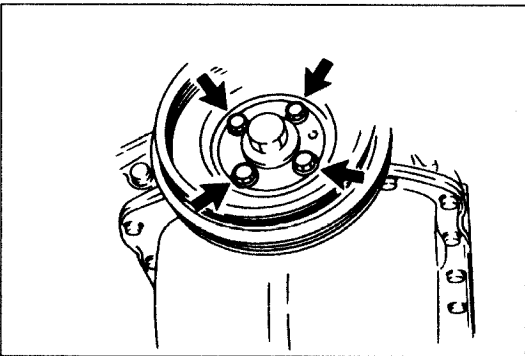
23U0B1-054

2. Mount the **SST** or equivalent and tighten the pulley lock bolt.

Tightening torque:

157—167 N·m (16—17 m·kg, 116—123 ft·lb)

3. Remove the **SST** or equivalent.

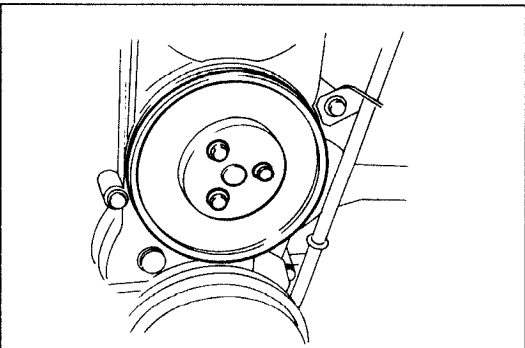


23U0B1-061

4. Install the crankshaft pulley.
5. Install the plate.

Tightening torque:

12—17 N·m (1.25—1.75 m·kg, 109—152 in·lb)



05U0BX-236

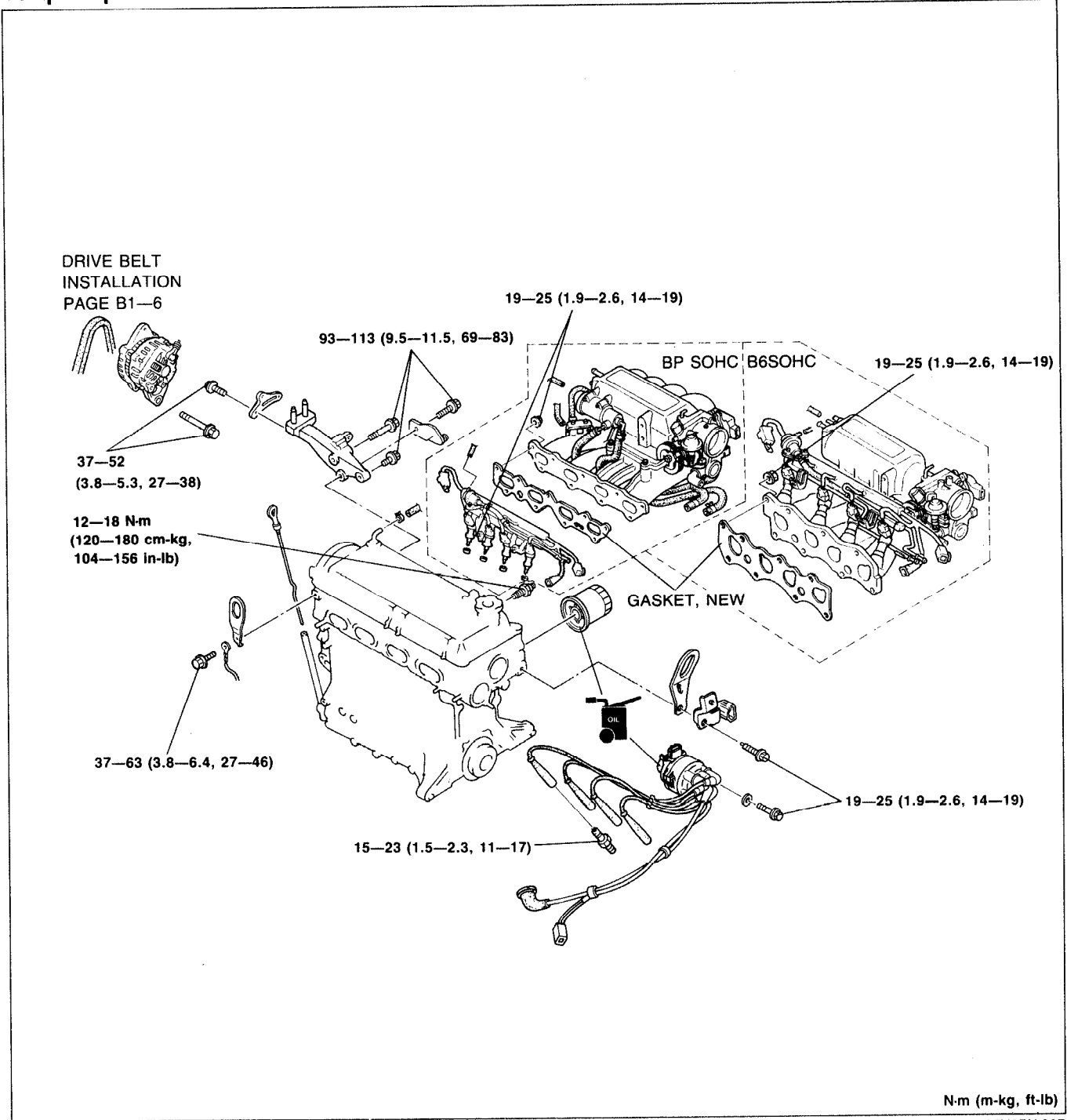
Water Pump Pulley

1. Install the water pump pulley.

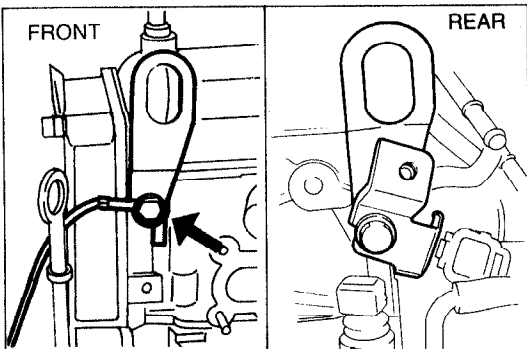
Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

**AUXILIARY PARTS
Torque Specifications**



05U0BX-237



Engine Hanger

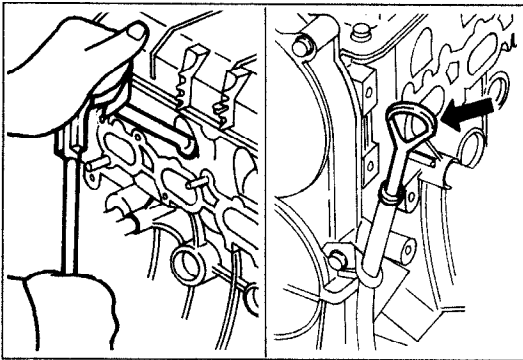
1. Install the front and rear engine hangers.

Tightening torque

Front: 37-63 N-m (3.8-6.4 m-kg, 27-46 ft-lb)

Rear: 19-25 N-m (1.9-2.6 m-kg, 14-19 ft-lb)

03U0B1-161



23U0B1-055

Spark Plug

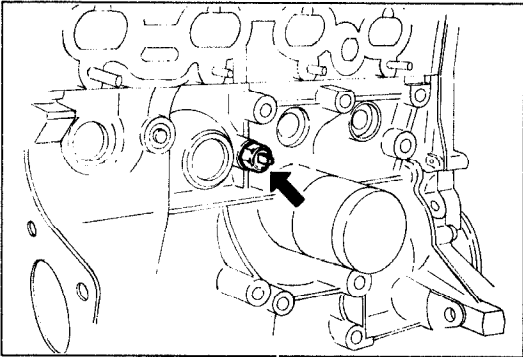
1. Install the spark plugs.

Tightening torque:

15—23 N·m (1.5—2.3 m·kg, 11—17 ft·lb)

Oil Level Gauge

1. Install the oil level gauge.



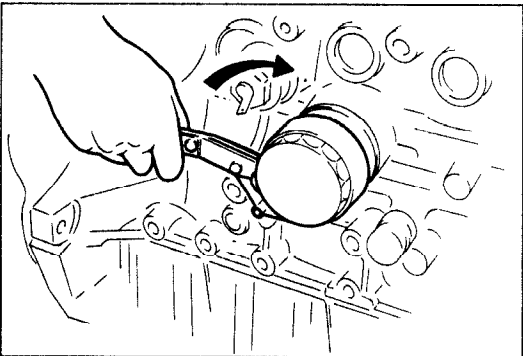
13U0B1-047

Oil Pressure switch

1. Install the oil pressure switch.

Tightening torque:

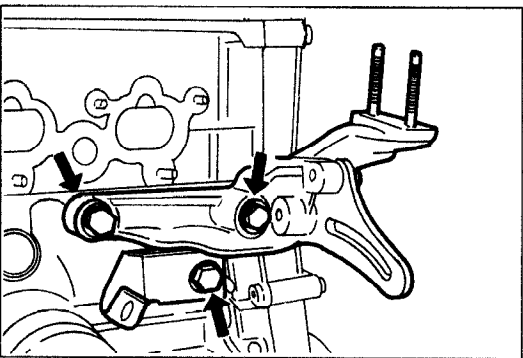
12—18 N·m (120—180 cm·kg, 104—156 in·lb)



05U0BX-243

Oil Filter

1. Remove all foreign material from the oil filter mounting surface.
2. Apply a small amount of clean engine oil to the rubber seal of the oil filter.
3. Install the oil filter and tighten it by hand until the rubber seal contacts the base.
4. Tighten the filter 1 and 1/6 turns with a filter wrench.



03U0B1-164

No.3 Engine Mount Bracket

1. Install the No.3 engine mount bracket.

Tightening torque:

93—113 N·m (9.5—11.5 m·kg, 69—83 ft·lb)

Alternator

1. Install the alternator strap.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

2. Install the alternator and alternator drive belt. Loosely tighten the alternator installation bolt.
3. Adjust the drive belt deflection. (Refer to page B1-6.)

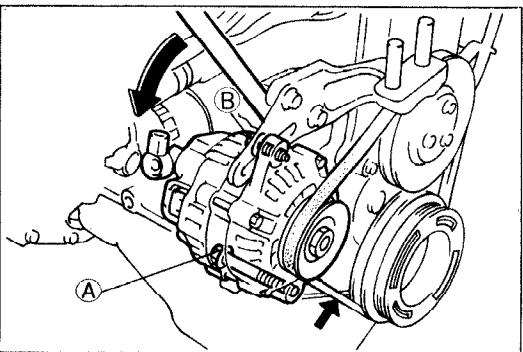
Tightening torque

Alternator installation bolt (A):

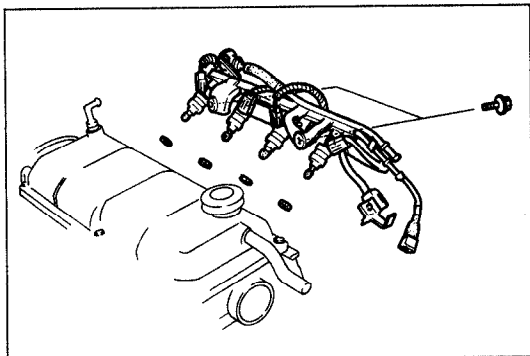
37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

Belt-adjusting bolt (B):

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



03U0B1-165



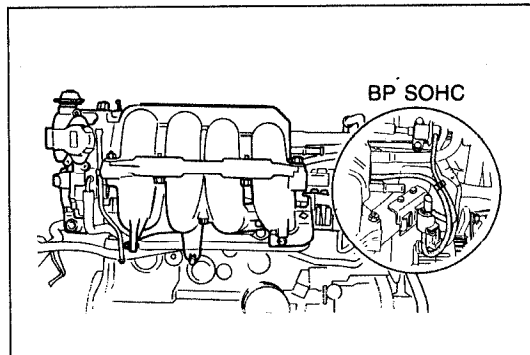
03U0B1-166

Injector and Distribution Pipe Assembly (BP SOHC)

1. Install the injector and distribution pipe assembly with new insulators.

Tightening torque:

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



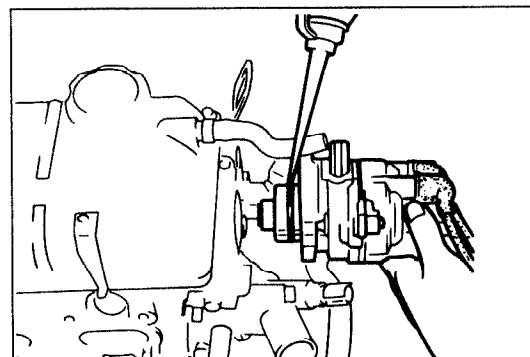
03U0B1-167

Intake Manifold Assembly

1. Remove all foreign material from the intake manifold contact surface.
2. Install a new gasket and the intake manifold assembly.

Tightening torque:

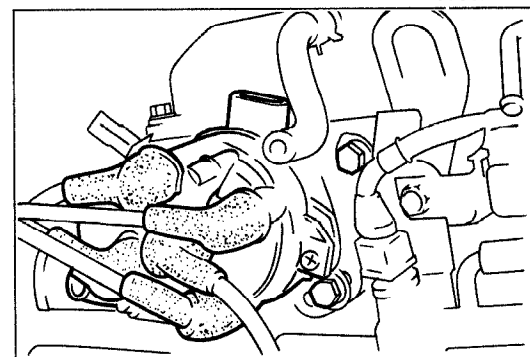
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



03U0B1-168

Distributor and High-tension Lead

1. Apply engine oil to the O-ring, and position it on the distributor.
2. Apply engine oil to the blade.
3. Install the distributor with the blade fit into the camshaft groove.



03U0B1-208

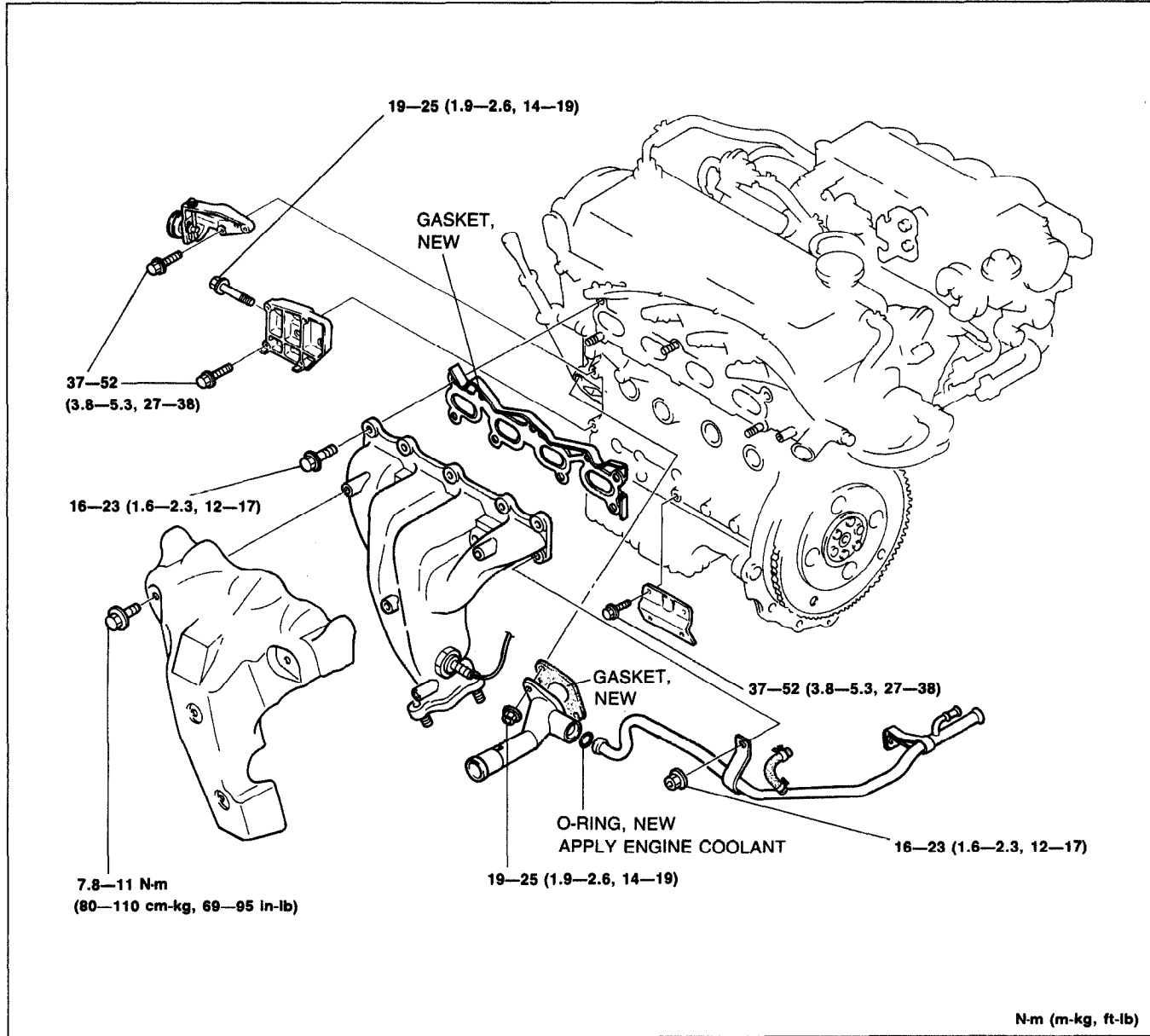
4. Temporarily, loosely tighten the distributor installing bolt.
5. Adjust the ignition timing after engine installation. (Refer to Section G.)
6. Connect the high-tension leads.

ENGINE STAND DISMOUNTING

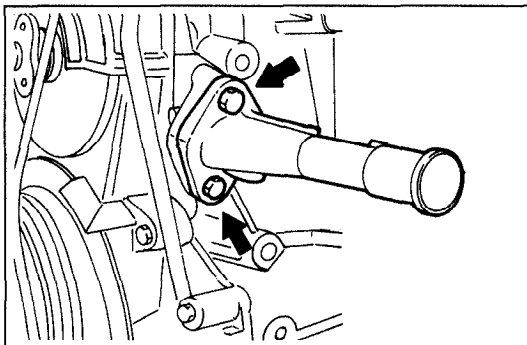
PROCEDURE

1. Remove the engine from the **SST (engine stand)**.
2. Remove the **SST (engine hanger)** from the engine.
3. Install the parts shown in the figure.

Torque Specifications



05U0BX-251

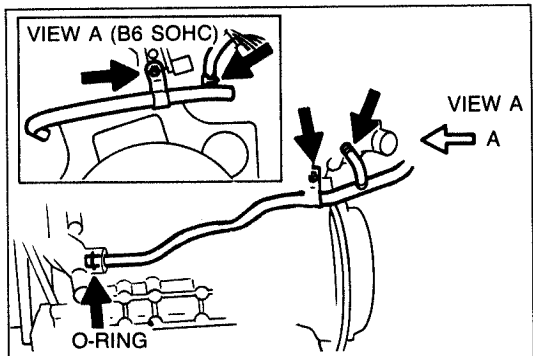


Water Inlet Pipe

1. Remove all foreign material from the water inlet pipe mounting surface.
2. Install a new gasket and the water inlet pipe.

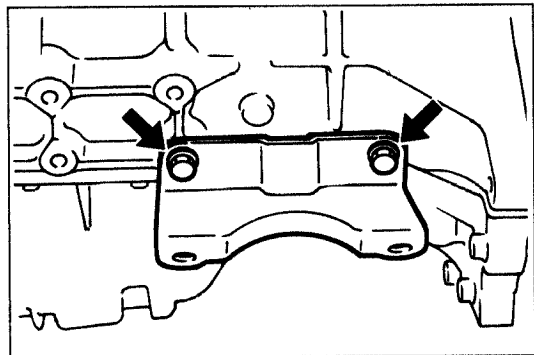
Tightening torque:

19-25 N-m (1.9-2.6 m-kg, 14-19 ft-lb)



03U0B1-170

3. Apply a small amount of engine coolant to the new O-ring.
4. Install the water bypass pipe.



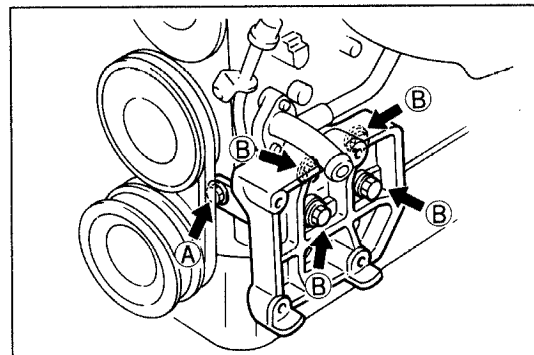
03U0B1-209

Exhaust Pipe Bracket

1. Install the exhaust pipe bracket.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)



05U0BX-255

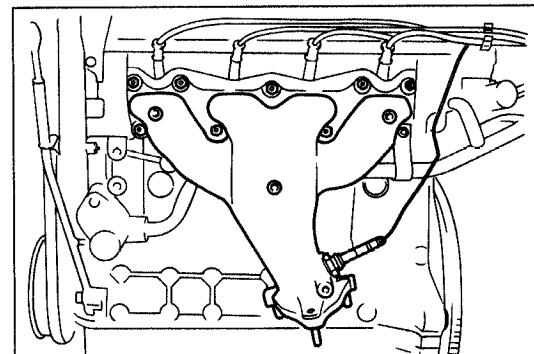
A/C Compressor Bracket

1. Install the A/C compressor bracket.

Tightening torque

(A): 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

(B): 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)



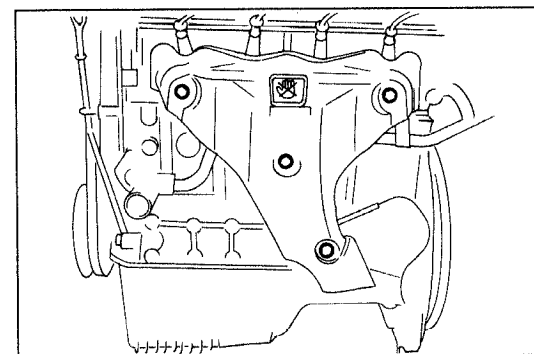
03U0B1-171

Exhaust Manifold

1. Remove all foreign material from the exhaust manifold contact surface.
2. Install a new gasket and the exhaust manifold.

Tightening torque:

16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



05U0BX-257

Exhaust Manifold Insulator

1. Install the exhaust manifold insulator.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

INSTALLATION

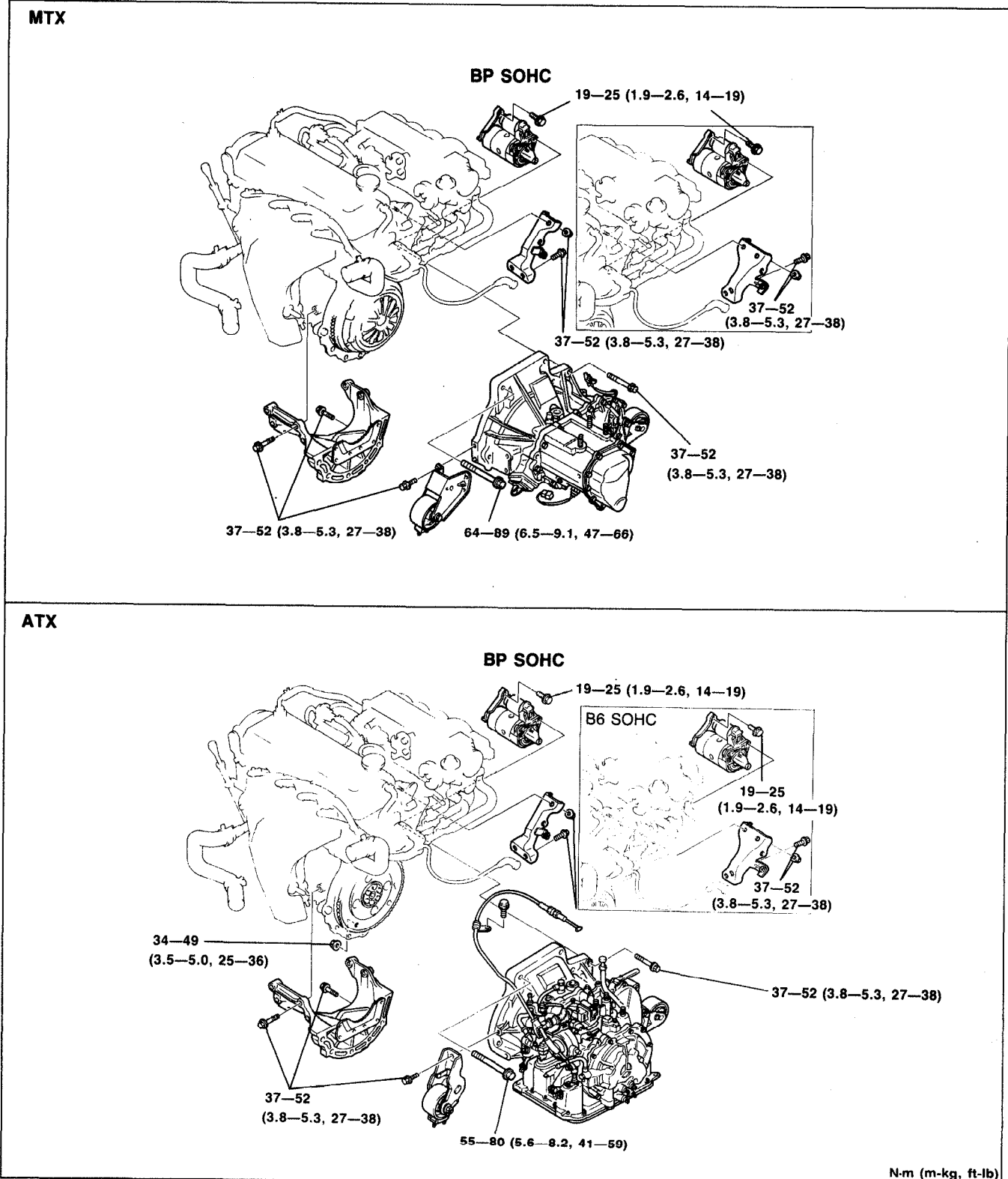
PROCEDURE

Tighten all bolts and nuts to the specified torques.

Step 1

Join the engine and transmission.

Torque Specifications

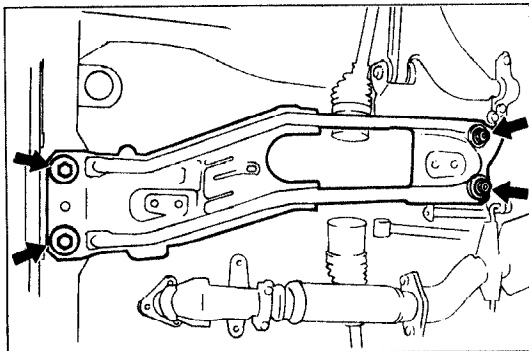
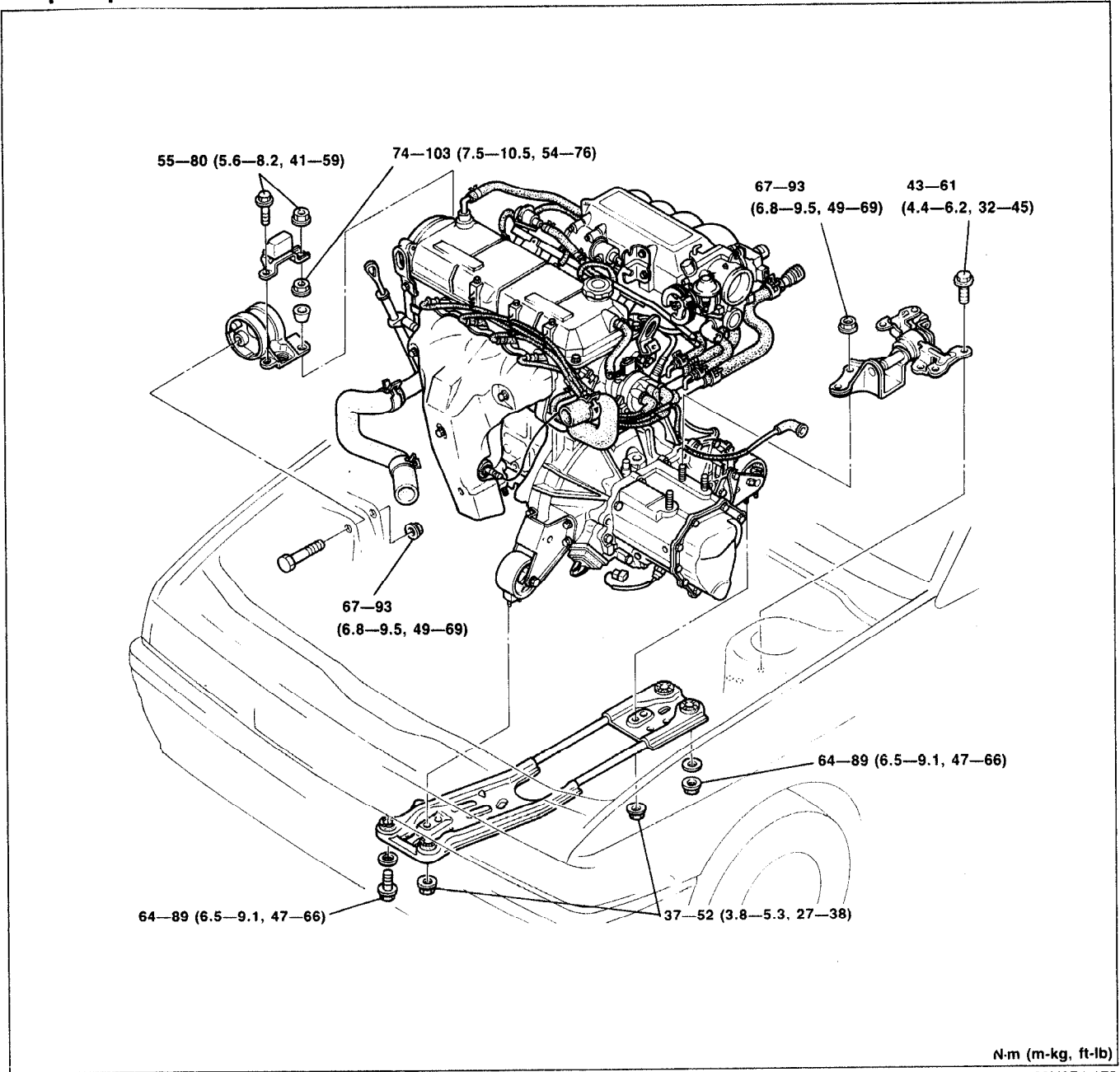


Step 2

Warning

- Be sure the vehicle is securely supported on safety stands.

Torque Specifications

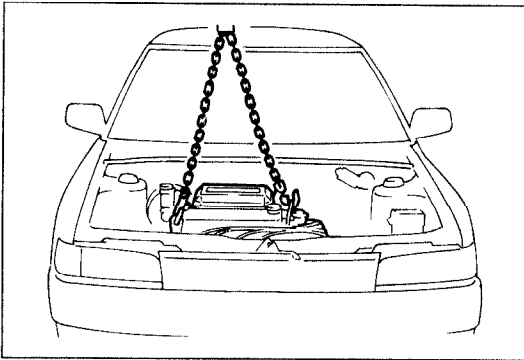


Engine mount member

1. Install the engine mount member.

Tightening torque:

64-89 N-m (6.5-9.1 m-kg, 47-66 ft-lb)



03U0B1-175

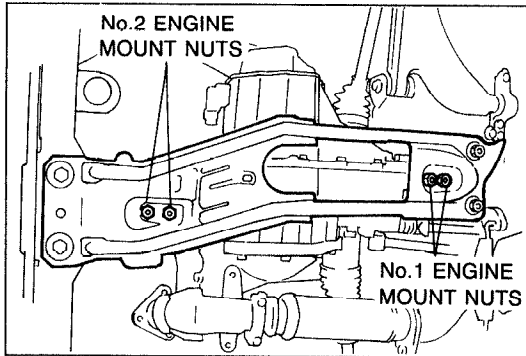
Engine and transaxle assembly

1. Suspend the engine and transaxle assembly.

Caution

- Do not damage any components in the engine compartment.

2. Align the No.1 and No.2 engine mount bolts with the engine mount member mounting holes.



03U0B1-176

Engine mount

1. Install the No.1 engine mount nut and tighten.

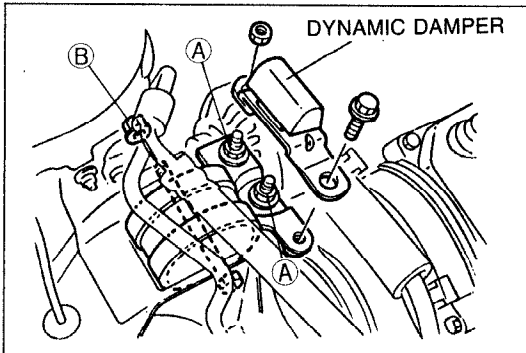
Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

2. Install the No.2 engine mount nut and tighten.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)



03U0B1-177

3. Install the engine mount rubber with new washer and tighten nut (A).

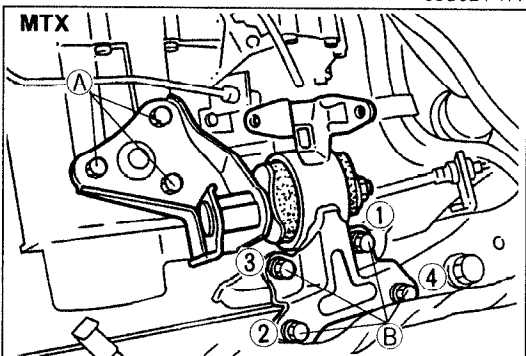
Tightening torque:

74—103 N·m (7.5—10.5 m·kg, 54—76 ft·lb)

4. Install the bolt (B), while aligning the engine location and tighten nut (B).

Tightening torque:

67—93 N·m (6.8—9.5 m·kg, 49—69 ft·lb)



03U0B1-178

5. Install the dynamic damper.

Tightening torque:

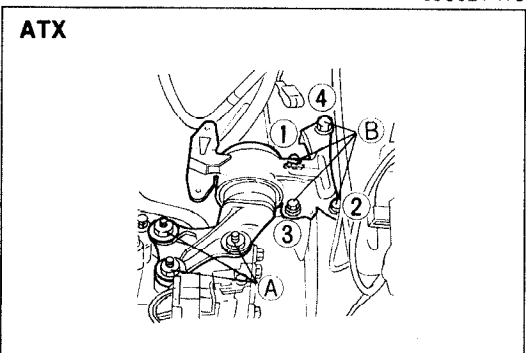
55—80 N·m (5.6—8.2 m·kg, 41—59 ft·lb)

6. Install the No.4 engine mount rubber and bracket and loosely tighten nuts (A).

7. Align the bracket bolt holes with the body side holes, and install the bolt (B) and tighten in the sequence shown in the figure.

Tightening torque:

43—61 N·m (4.4—6.2 m·kg, 32—45 ft·lb)



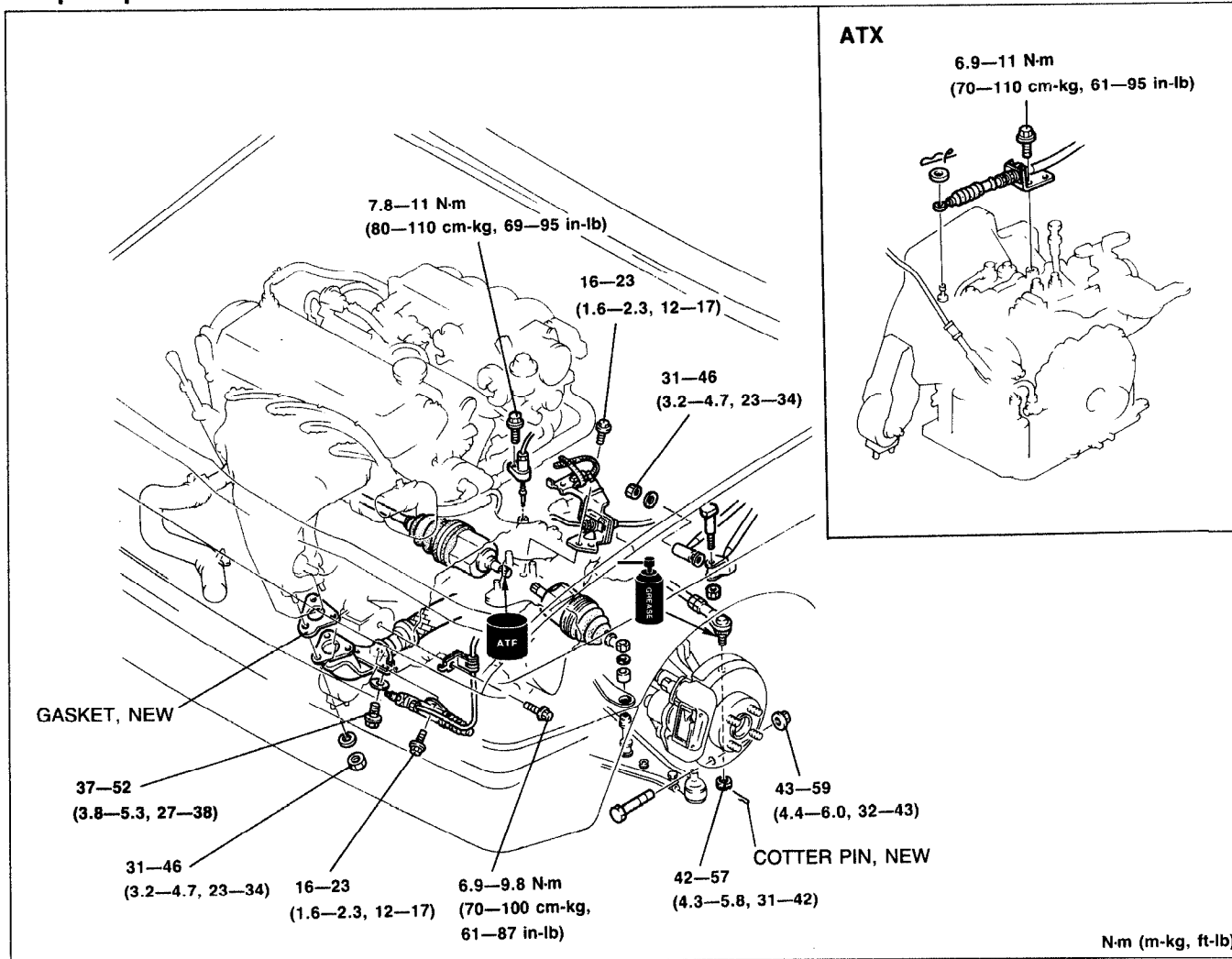
03U0B1-179

8. Tighten the nuts (A).

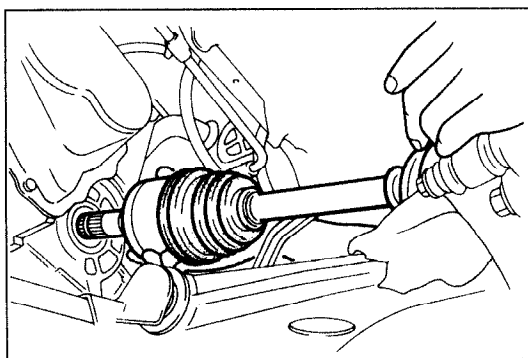
Tightening torque:

67—93 N·m (6.8—9.5 m·kg, 49—69 ft·lb)

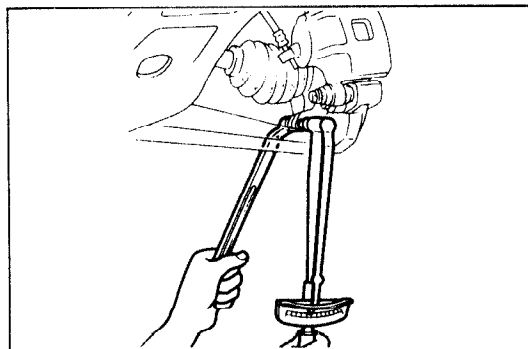
Step 3 Torque Specifications



03U0B1-180



03U0B1-181



03U0B1-182

Driveshaft

1. Apply grease to the end of the driveshaft.

Caution

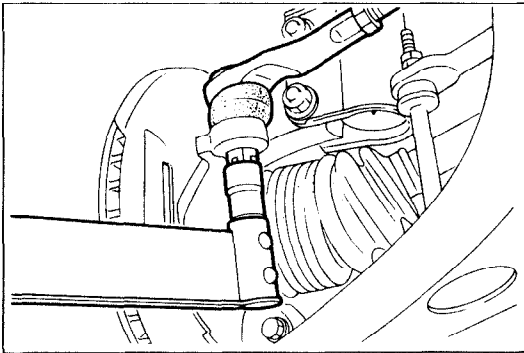
- When installing the driveshaft, be careful not to damage the oil seal.
- After installation, pull the front hub outward to confirm that the driveshaft is securely held by the clip.

2. Install the driveshaft and a new clip.

3. Install the lower arm ball-joint to the knuckle; then tighten the locknut.

Tightening torque:

43—59 N-m (4.4—6.0 m-kg, 32—43 ft-lb)



03U0B1-183

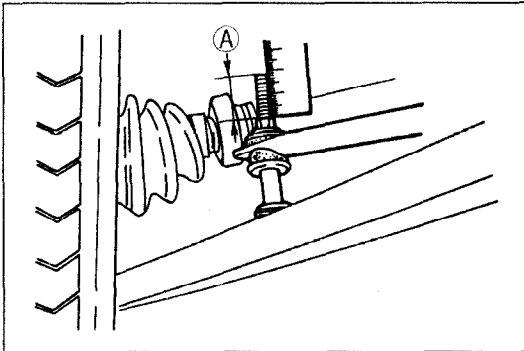
Tie-rod end

1. Install the tie-rod end to the knuckle.

Tightening torque:

42—57 N·m (4.3—5.8 m·kg, 31—42 ft·lb)

2. Install the new split pin.

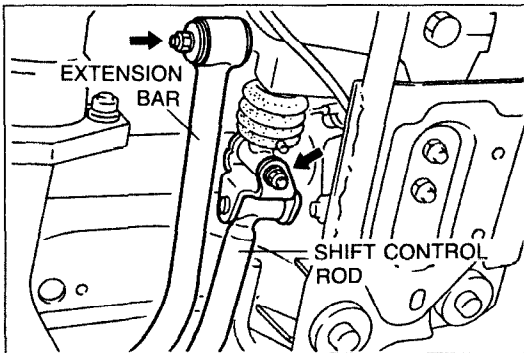


13U0B1-048

Stabilizer

1. Install and adjust the stabilizer.

Dimension (A): 17—19mm (0.67—0.75 in)



03U0B1-185

Extension bar (MTX)

1. Install the extension bar to the transaxle.

Tightening torque:

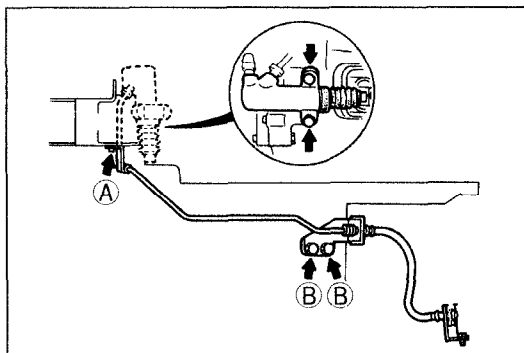
31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

Shift control rod (MTX)

1. Install the shift control rod to the transaxle.

Tightening torque:

16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



03U0B1-186

Clutch release cylinder (MTX)

1. Install the clutch release cylinder.

Tightening torque:

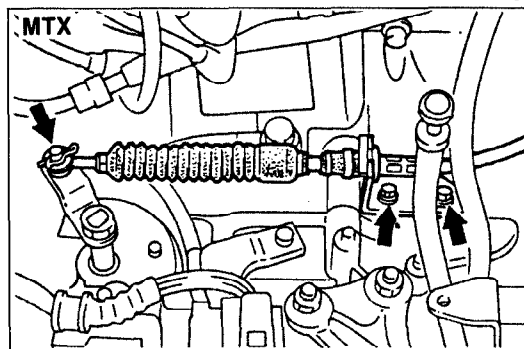
16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)

2. Set the pipe bracket in position.

Tightening torque

(A): 6.9—9.8 N·m (70—100 cm·kg, 61—87 in·lb)

(B): 16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



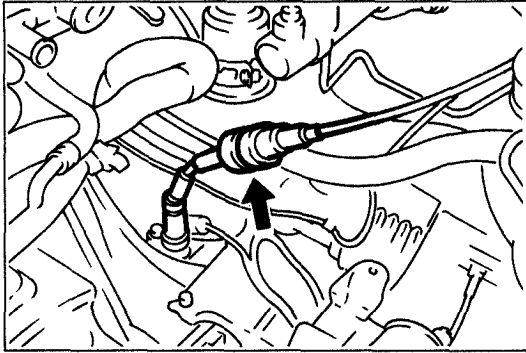
03U0B1-187

Shift control cable (ATX)

1. Install the shift control cable to the transaxle.

Tightening torque:

6.9—11 N·m (70—110 cm·kg, 61—95 in·lb)



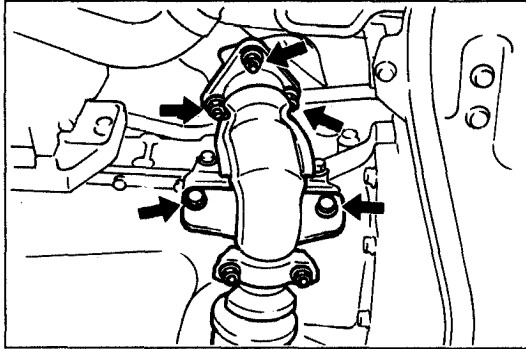
03U0B1-188

Speedometer cable

1. Install the speedometer cable.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



03U0B1-189

Exhaust pipe

1. Install the exhaust pipe and a gasket; then loosely tighten the locknuts.
2. Loosely tighten the bracket bolts.
3. Tighten the locknuts.

Tightening torque:

31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

4. Tighten the bracket bolts.

Tightening torque:

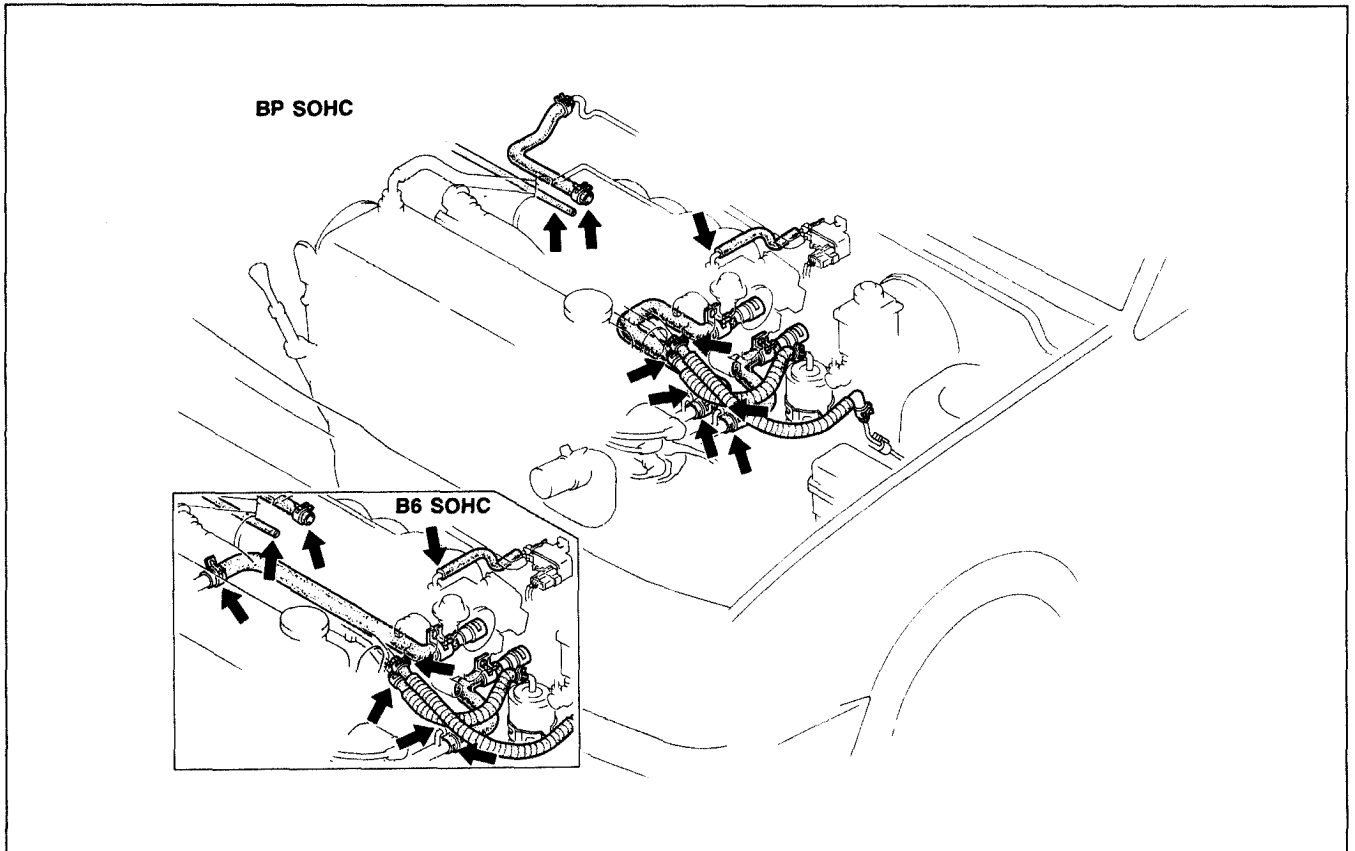
37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

Step 4

1. Connect the hoses shown in the figure.

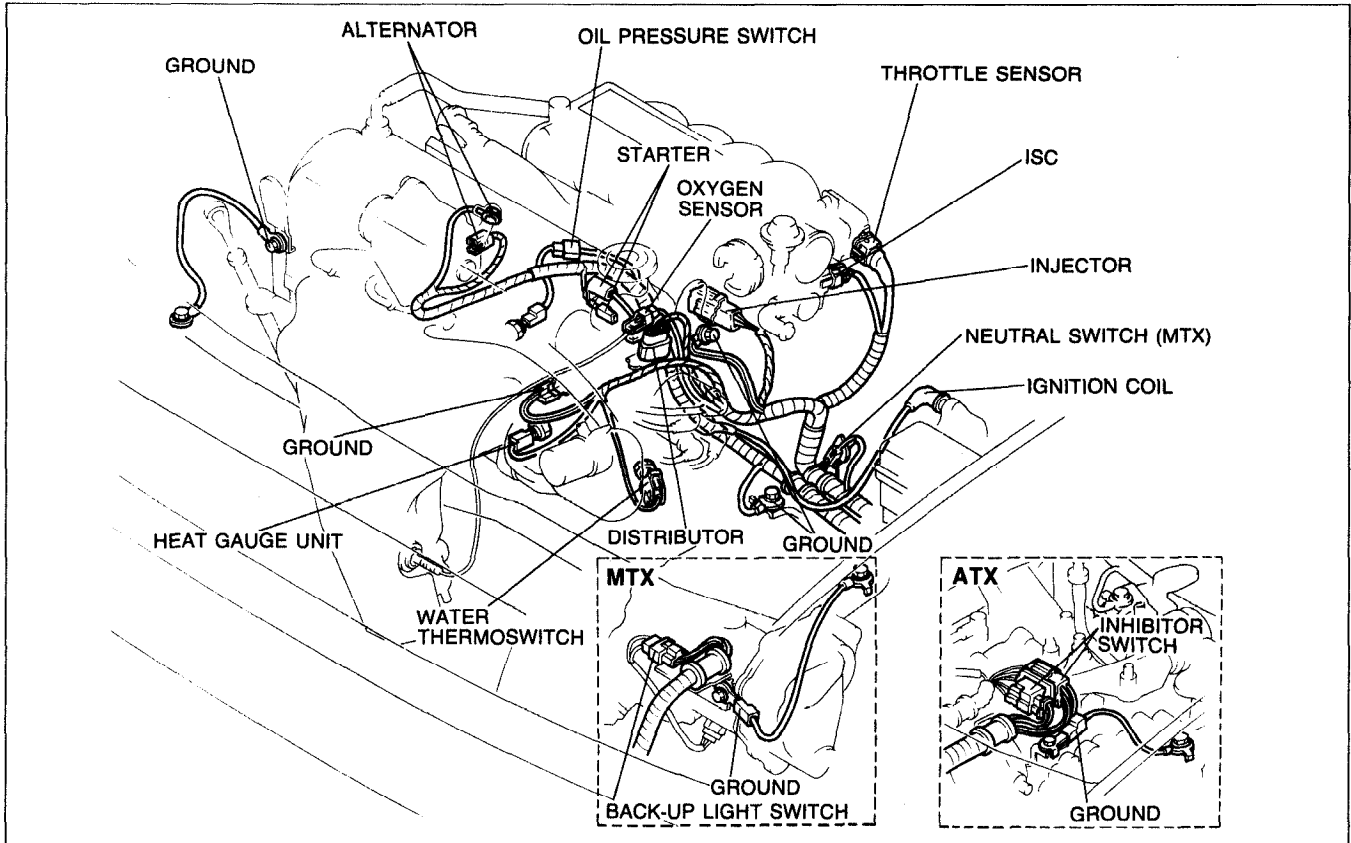
Caution

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



Step 5

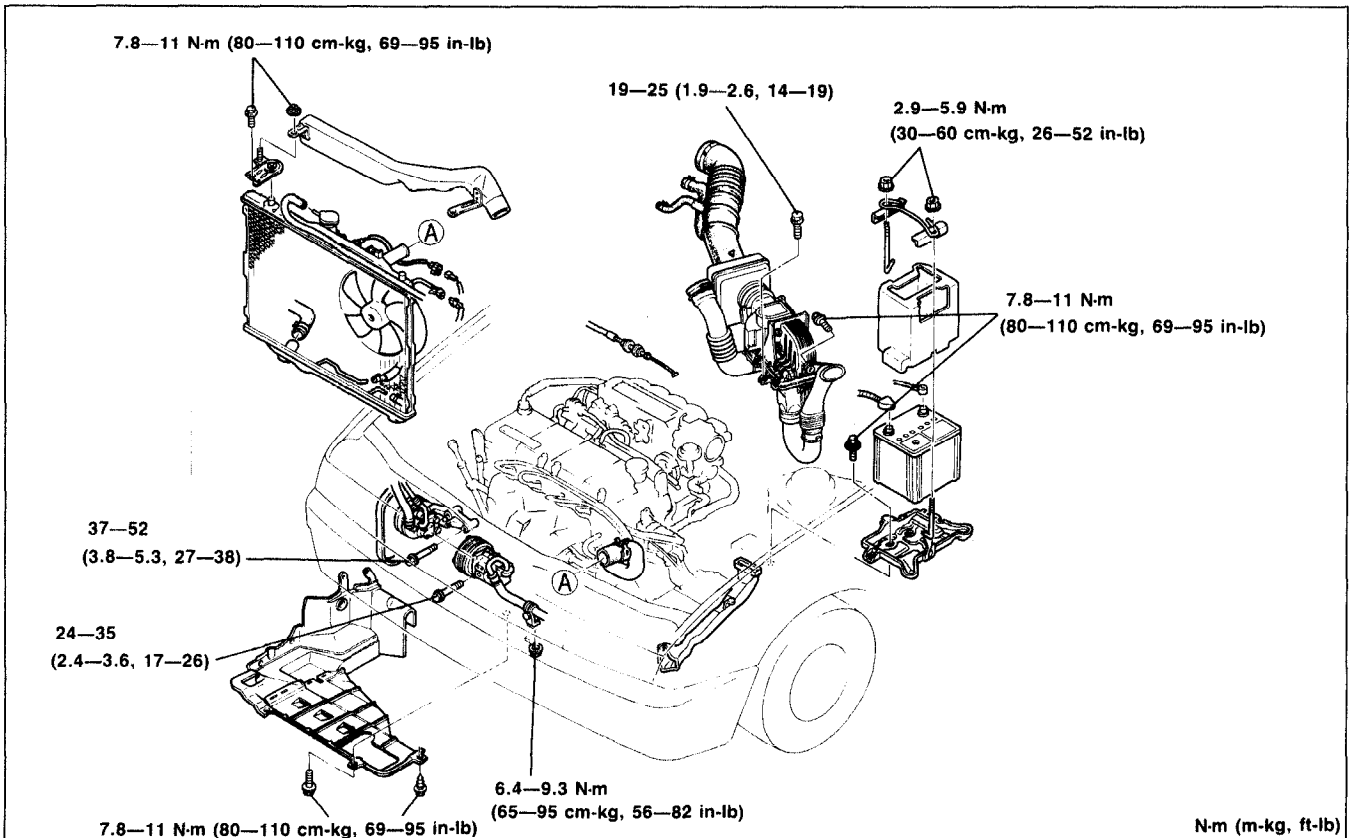
1. Connect the harness connectors shown in the figure.



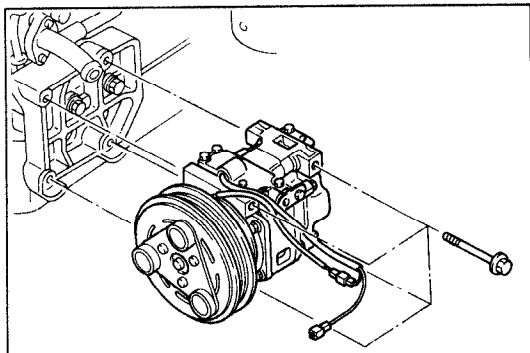
03U0B1-191

Step 6

Torque Specifications



03U0B1-192



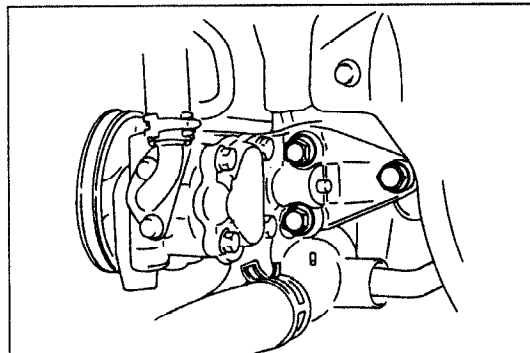
03U0B1-193

A/C compressor

1. Install the A/C compressor.

Tightening torque:

24—35 N·m (2.4—3.6 m·kg, 17—26 ft·lb)



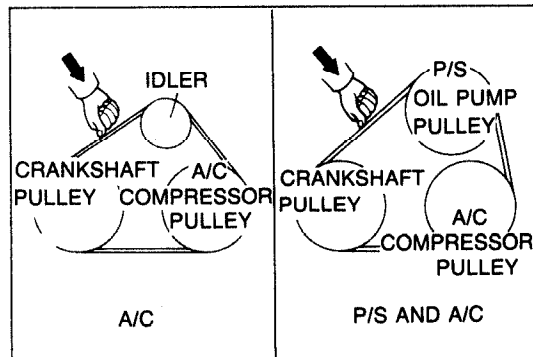
03U0B1-194

P/S oil pump and bracket

1. Install the P/S oil pump and bracket.

Tightening torque:

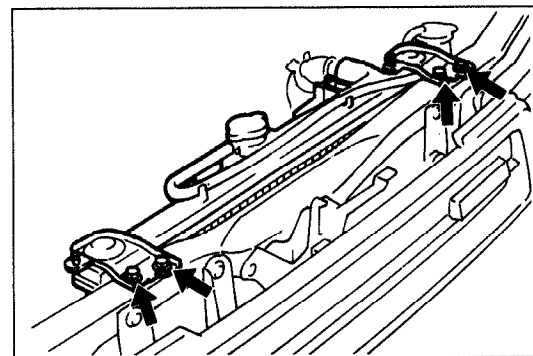
37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)



03U0B1-195

Drive belt

1. Install the P/S and/or A/C drive belt.
2. Adjust the drive belt deflections. (Refer to page B1-6.)



03U0B1-196

Radiator and cooling fan assembly

1. Install the radiator and cooling fan assembly.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

2. Tighten the A/C pipe bracket to the radiator.

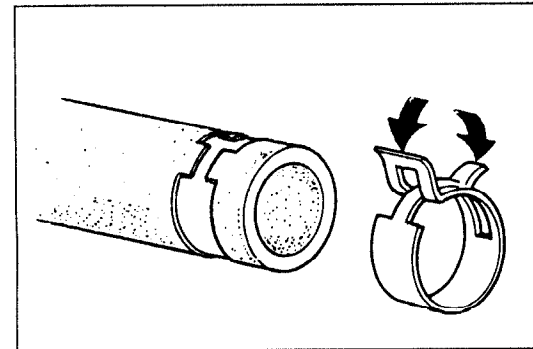
Tightening torque:

6.4—9.3 N·m (65—95 cm·kg, 56—82 in·lb)

3. Connect the upper and lower radiator hoses.

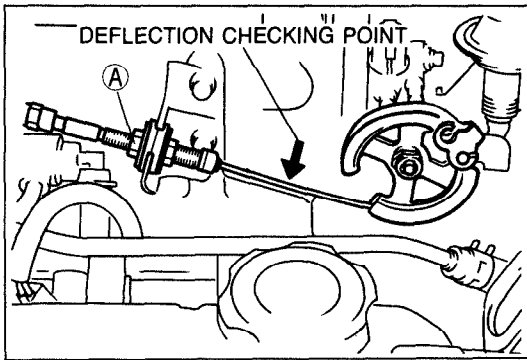
Caution

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



03U0B1-197

4. Connect the coolant reservoir hose.
5. Connect the cooling fan connector.
6. Connect the oil cooler hose. (ATX)

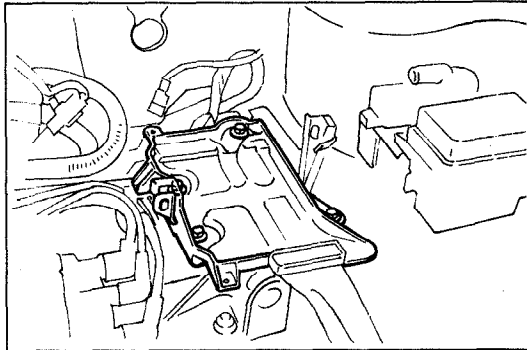


05U0BX-275

Accelerator cable

1. Install the accelerator cable.
2. Adjust the cable deflection by turning nut (A).

Deflection: 1—3mm (0.04—0.12 in)



13U0B1-049

Battery duct, battery carrier, and battery

1. Install the battery duct.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

2. Install the battery carrier.

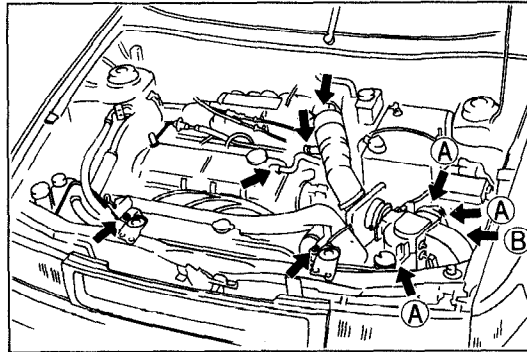
Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

3. Install the battery and the battery bracket.

Tightening torque:

2.9—5.9 N·m (30—60 cm·kg, 26—52 in·lb)



03U0B1-199

Air cleaner assembly

1. Install the air cleaner assembly.

Tightening torque

(A): 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

(B): 7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

2. Connect the airflow sensor connector.

Resonance chamber

1. Install the resonance chamber.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Undercover and side cover

1. Install the undercover and side cover.

Steps After Installation

1. If the engine oil was drained, fill with the specified amount and type of engine oil. (Refer to Section D.)
2. Fill the radiator with the specified amount and type of engine coolant. (Refer to Section E.)
3. If the transaxle oil was drained, fill with the specified amount and type of transaxle oil. (Refer to Sections J, K.)
4. Connect the negative battery cable.
5. Start the engine and check the following
 - (1) Engine oil, transaxle oil, and engine coolant leakage.
 - (2) Ignition timing, idle speed. (Refer to page B1-8.)
 - (3) Operation of emission control system.
6. Perform a road test.
7. Recheck the engine oil and engine coolant levels.

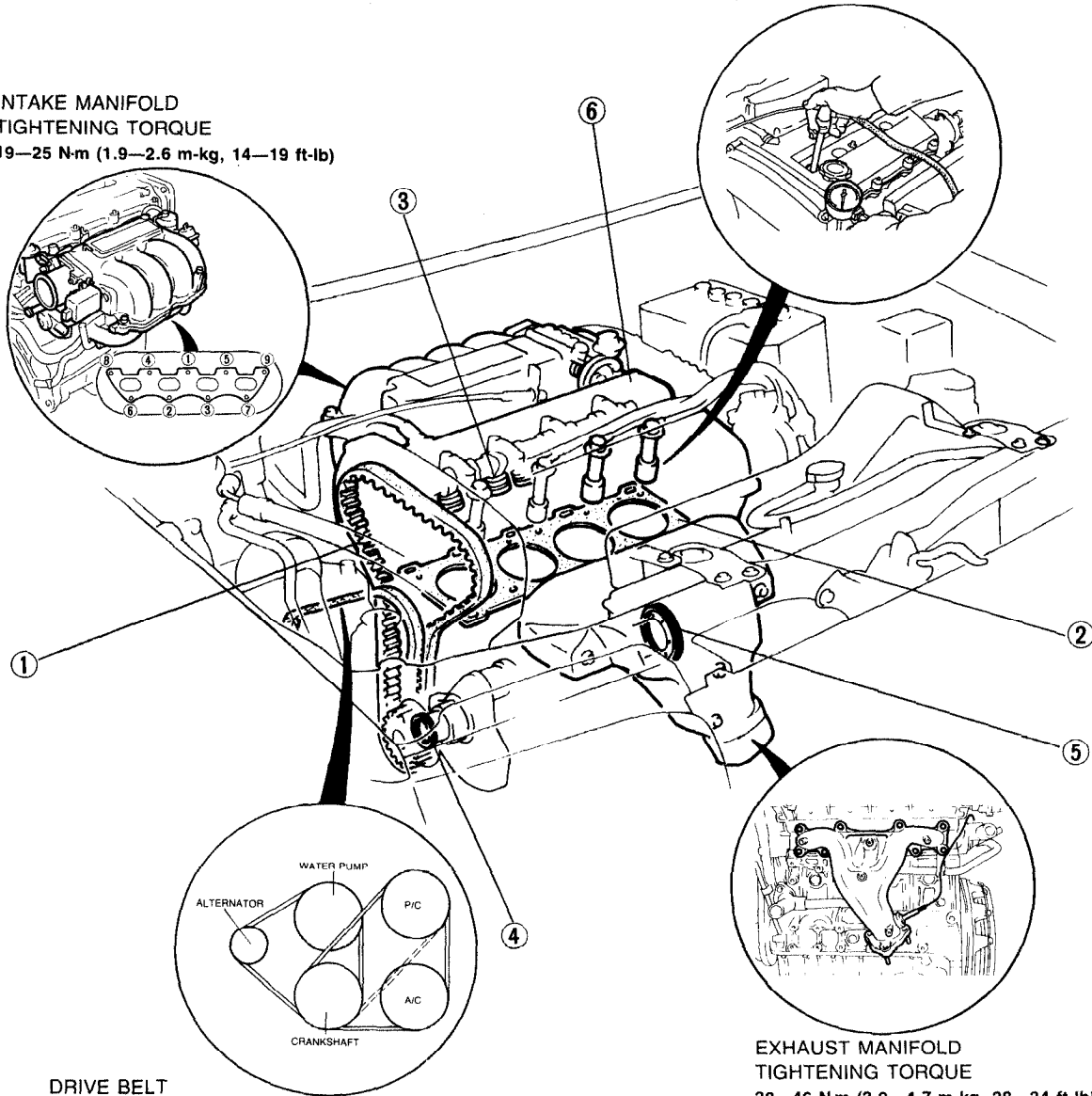
ENGINE (DOHC)

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CYLINDER BLOCK			
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COMPRESSION INSPECTION, PAGE B2-10
 STANDARD: 1,256 kPa (12.8 kg/cm², 182 psi)-300 rpm
 MINIMUM: 883 kPa (9.0 kg/cm², 128 psi)-300 rpm

INTAKE MANIFOLD
 TIGHTENING TORQUE
 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



DRIVE BELT
 ADJUSTMENT, PAGE B2-6

EXHAUST MANIFOLD
 TIGHTENING TORQUE
 38—46 N·m (3.9—4.7 m·kg, 28—34 ft·lb)

DEFLECTION

mm (in)

DRIVE BELT	New	Used	Limit
ALTERNATOR	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	12.5 (0.49)
P/S, P/S + A/C	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	11.5 (0.45)

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1. Timing belt
 Removal / Installation page B2-12
2. Cylinder head gasket
 Replacement page B2-16
3. HLA
 Removal / Installation page B2-22
4. Front oil seal
 Replacement page B2-26
5. Rear oil seal
 Replacement page B2-28

6. Engine
 Removal page B2-31
 Engine stand mounting page B2-38
 Disassembly page B2-41
 Inspection / Repair page B2-54
 Assembly page B2-66
 Engine stand dismounting page B2-91
 Installation page B2-93

OUTLINE

SPECIFICATIONS

Item		Engine	BP DOHC
Type			Gasoline, 4-cycle
Cylinder arrangement and number			In-line, 4 cylinders
Combustion chamber			Pentroof
Valve system			DOHC, belt-driven 16 valves
Displacement		cc (cu in)	1,839 (112.2)
Bore and stroke		mm (in)	83.0 × 85.0 (3.27 × 3.35)
Compression ratio			9.0
Compression pressure		kPa (kg/cm ² , psi)-rpm	1,256 (12.8, 182)-300
Valve timing	IN	Open BTDC	5°
		Close ABDC	48°
	EX	Open BBDC	56°
		Close ATDC	14°
Valve clearance	mm (in)	IN	0: Maintenance-free
		EX	0: Maintenance-free
Idle speed* ¹ * ²	rpm	MTX	700—800
		ATX	700—800 (P range)
Ignition timing* ²		BTDC	9°—11°
Firing order			1—3—4—2

B2

*¹...With parking brake applied. (Canada)
 *²...TEN terminal of diagnosis connector grounded

23U0B2-003

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
Difficult starting	Malfunction of engine-related components Burned valve Worn piston, piston ring, or cylinder Failed cylinder head gasket	Replace Replace or repair Replace	B2-55 B2-60, 62 B2-16
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Poor idling	Malfunction of engine-related components Malfunction of HLA* Poor valve-to-valve seat contact Failed cylinder head gasket	Replace Replace or repair Replace	B2-22 B2-57 B2-16
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Excessive oil consumption	Oil working up Worn piston ring groove or sticking piston ring Worn piston or cylinder	Replace Replace or repair	B2-62 B2-60, 62
	Oil working down Worn valve seal Worn valve stem or guide	Replace Replace	B2-47, 79 B2-55
	Oil leakage	Refer to Section D	

Problem	Possible Cause	Action	Page
Insufficient power	Insufficient compression Malfunction of HLA* Compression leakage from valve seat Seized valve stem Weak or broken valve spring Failed cylinder head gasket Cracked or distorted cylinder head Sticking, damaged, or worn piston ring Cracked or worn piston	Replace Repair Replace Replace Replace Replace Replace Replace	B2-22 B2-57 B2-55 B2-58 B2-16 B2-54 B2-62 B2-62
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
	Others Slipping clutch Dragging brakes Wrong size tires	Refer to Section H Refer to Section P Refer to Section Q	
Abnormal combustion	Malfunction of engine-related components Malfunction of HLA* Sticking or burned valve Weak or broken valve spring Carbon accumulation in combustion chamber	Replace Replace Replace Eliminate carbon	B2-22 B2-55 B2-58 —
	Malfunction of fuel system	Refer to Section F	
	Malfunction of ignition system	Refer to Section G	
Engine noise	Crankshaft- or bearing-related parts Excessive main bearing oil clearance Main bearing seized or heat-damaged Excessive crankshaft end play Excessive connecting rod bearing oil clearance Connecting rod bearing seized or heat-damaged	Replace or repair Replace Replace or repair Replace or repair Replace	B2-70 B2-64 B2-71 B2-72 B2-64
	Piston-related parts Worn cylinder Worn piston or piston pin Seized piston Damaged piston ring Bent connecting rod	Replace or repair Replace Replace Replace Replace	B2-60 B2-63 B2-62 B2-62 B2-63
	Valves or timing-related parts Malfunction of HLA* Broken valve spring Excessive valve guide clearance	Replace Replace Replace	B2-22 B2-58 B2-55
	Malfunction of cooling system	Refer to Section E	
	Malfunction of fuel system	Refer to Section F	
	Others Malfunction of water pump bearing Improper drive belt tension Malfunction of alternator bearing Exhaust gas leakage Malfunction of timing belt tensioner	Refer to Section E Adjust Refer to Section G Refer to Section F Replace	B2- 6 B2-12

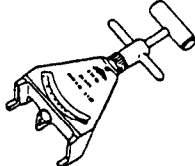
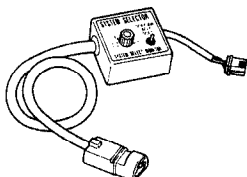
23U0B2-004

* Tappet noise may occur if the engine has set idle for an extended period. The noise should dissipate after the engine has reached normal operating temperature. (HLA troubleshooting: Refer to page B2-7.)

ENGINE TUNE-UP PROCEDURE

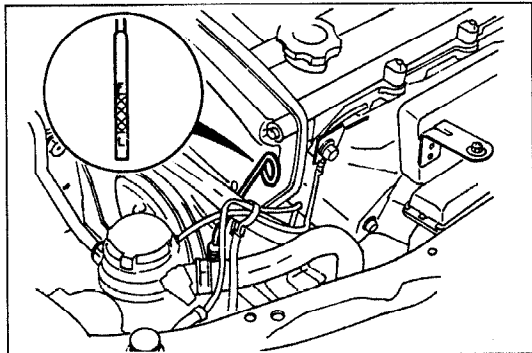
PREPARATION

SST

<p>49 9200 020</p> <p>Tension gauge, V-ribbed belt</p> 	<p>For inspection of drive belt tension</p>	<p>49 B019 9A0</p> <p>System selector</p> 	<p>For inspection of ignition timing and idle speed</p>
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B2

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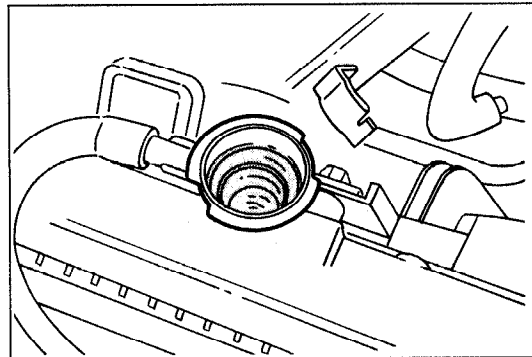
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ENGINE OIL
Inspection

1. Be sure the vehicle is on level ground.
2. Warm up the engine to normal operating temperature and stop it.
3. Wait for 5 minutes.
4. Remove the oil level gauge and check the oil level and condition.
5. Add or replace oil if necessary.

Note

- The distance between the L and F marks on the level gauge represents 0.8 liter (0.85 US qt, 0.70 Imp qt).



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ENGINE COOLANT
Inspection

Coolant level (engine cold)

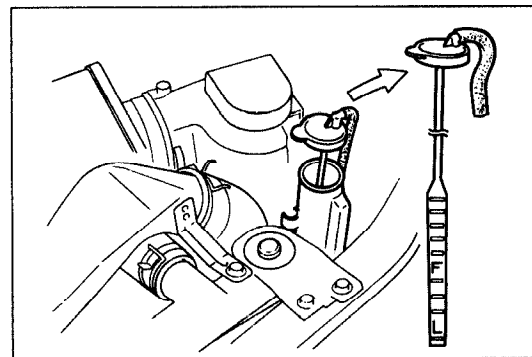
Warning

- Never remove the radiator cap while the engine is hot.
- Wrap a thick cloth around the cap when removing it.

1. Verify that the coolant level is near the radiator filler neck.
2. Remove the coolant level gauge and check the coolant level.
3. Add coolant if necessary.

Coolant quality

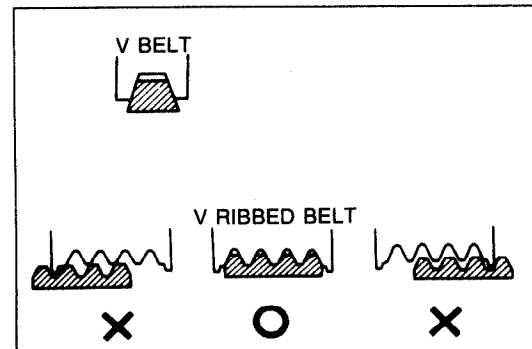
1. Verify that there is no buildup of rust or scale around the radiator cap or radiator filler neck.
2. Verify that the coolant is free of oil.
3. Replace the coolant if necessary.



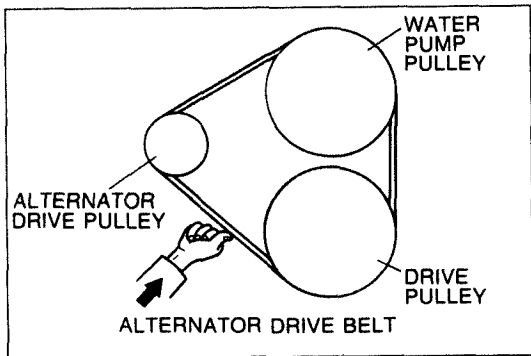
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DRIVE BELT
Inspection

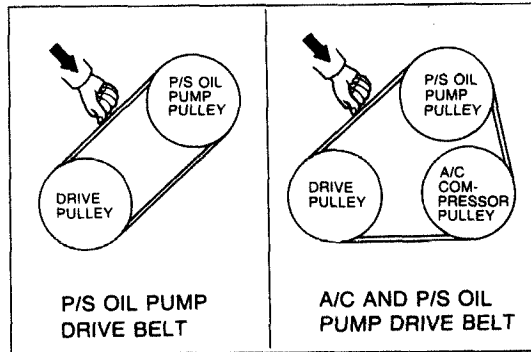
1. Check the drive belts for wear, cracks, and fraying. Replace if necessary.
2. Verify that the drive belts are correctly mounted on the pulleys.



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23U0B2-006

- Check the drive belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the pulleys.

Note

- Measure the belt deflection between the specified pulleys.
- A belt is considered "New" if it has been used on a running engine for less than five minutes. Set the deflection specified below accordingly.
- Check the belt deflection when the engine is cold, or at least 30 minutes after the engine has stopped.

Deflection

mm (in)

Drive belt	New	Used	Limit
Alternator	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	12.5 (0.49)
P/S, P/S + A/C	8.0—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	11.5 (0.45)

- If the deflection is not within specification, adjust it.
- Install the air intake pipe.

Drive belt tension check

Note

- Belt tension can be checked in place of belt deflection.
- Belt tension can be measured between any two pulleys.

- Remove the air intake pipe.
- Using the **SST**, check the belt tension.

Tension

N (kg, lb)

Drive belt	New	Used	Limit
Alternator	383—461 (39—47, 85.8—103.4)	304—383 (31—39, 68.2—85.8)	167 (17, 37)
P/S, P/S + A/C	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)	245 (25, 55)

- If the tension is not within specification, adjust it.
- Install the air intake pipe.

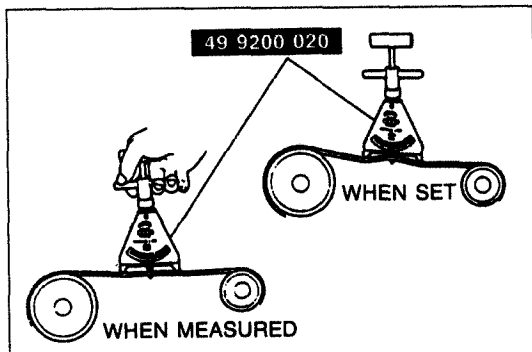
Adjustment

Caution

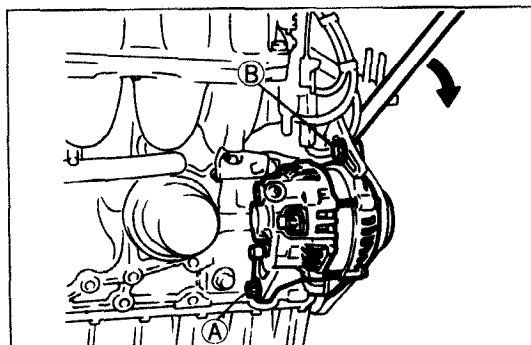
- If a new belt is used, adjust the belt deflection at the midpoint of new belt specification.
- A belt is considered "New" if it has been used on a running engine for less than five minutes.

1. Alternator belt

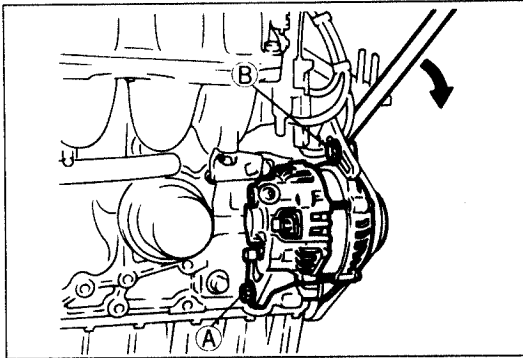
- Loosen the alternator mounting bolt (A) and adjusting lock bolt (B).
- Lever the alternator outward and apply tension to the belt.
- Tighten adjusting lock bolt (B).



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23U0B2-008



23U0B2-009

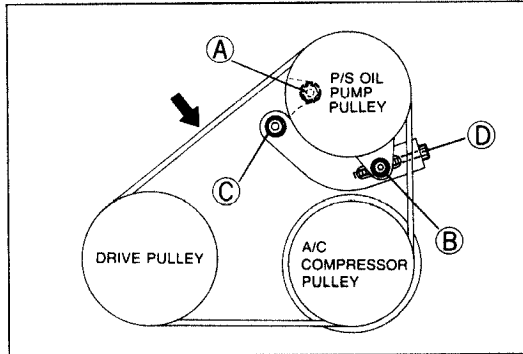
Tightening torque:
 19—25 N·m (1.9—2.6 m·kg, 14—18 ft·lb)

(4) Tighten mounting bolt (A).

Tightening torque:
 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

(5) Recheck the belt tension or deflection.

B2



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2. P/S belt, P/S + A/C belt

- (1) Loosen the P/S oil pump bolt (A) and nuts (B), (C).
- (2) Adjust the belt tension and deflection by turning the adjusting belt (D).
- (3) Tighten the adjusting lock nut (B) and the P/S oil pump bolt (A) and nut (C).

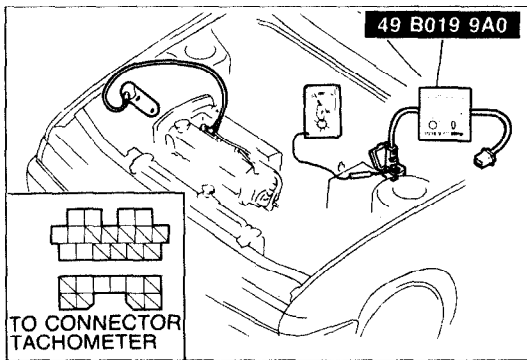
Tightening torque

- (A) : 36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)
- (B) : 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)
- (C) : 31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

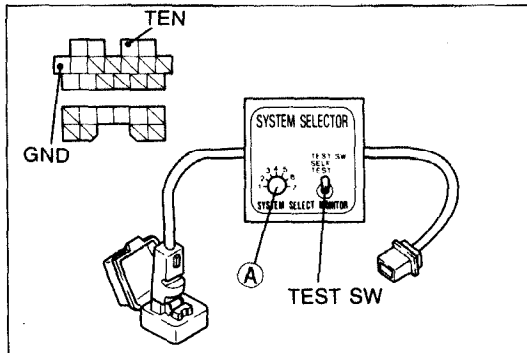
HLA

Problem	Possible Cause	Action
1. Noise when engine is started immediately after oil is changed.	Oil leakage in oil passage	Run engine 2000—3000 rpm. If noise stops after 2 second—10 minutes(*), HLA is normal. If not, replace HLA.
2. Noise when engine is started after setting approx. one day.		
3. Noise when engine is started after cranking for 3 seconds or more.	Oil leakage in HLA	* Time required for engine oil to circulate within engine, includes tolerance for engine oil condition and ambient temperature.
4. Noise when engine is started after new HLA is installed.		
5. Noise continues more than 10 minutes	Insufficient oil pressure	Check oil pressure. If lower than specification, check for cause. Oil pressure; 294—392 kPa (3.0—4.0 kg/cm², 43—57 psi)-3000 rpm
	Faulty HLA	(Refer to page B2-60) Press down HLA by hand. If it does not move, HLA is normal. If it moves, replace HLA. Measure valve clearance. If more than 0mm (0 in), replace HLA.
6. Noise occurs during idle after high-speed running	Incorrect oil amount	Check oil level. Drain or add oil as necessary.
	Deteriorated oil	Check oil quality. If deteriorated, replace with specified type and amount of oil.

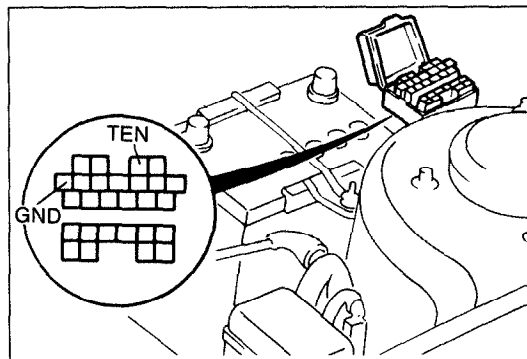
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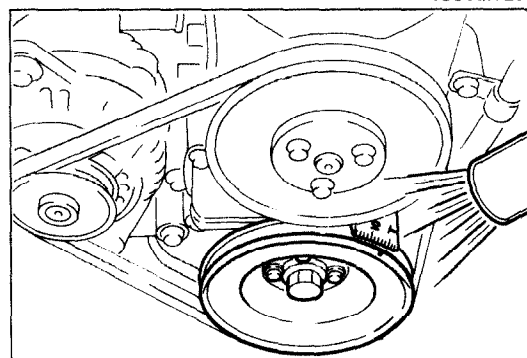
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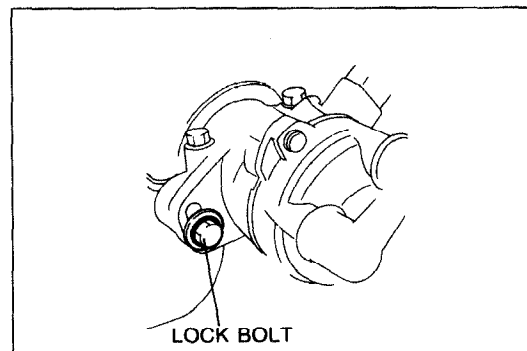
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03U0B2-016



03U0B2-017

IGNITION TIMING, IDLE SPEED

Preparation

1. Warm up the engine to normal operating temperature.
2. Turn all electric loads OFF.
3. Connect the **SST** to the diagnosis connector.
4. Connect the timing light.
5. Connect a tachometer to the diagnosis connector **IG-** terminal as shown.

6. Set switch **(A)** to position 1.
7. Set TEST SW to SELF-TEST.

Note

- If the **SST** is not used, jump across the **TEN** terminal and the **GND** terminal of the diagnosis connector.

Ignition Timing

Inspection / Adjustment

1. Perform "Preparation." (Refer to above.)
2. Check if the timing mark (yellow) on the crankshaft pulley and the mark on the timing belt cover are aligned.

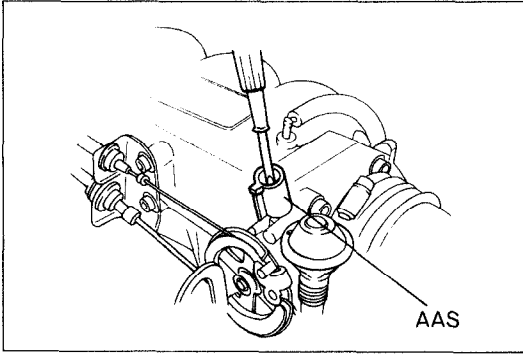
Ignition timing: 10° ± 1° BTDC (at idle speed)

3. If the marks are not aligned, loosen the distributor lock bolts and turn the distributor to make the adjustment.
4. Tighten the distributor lock bolts to the specified torque.

Tightening torque:

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

5. Disconnect the **SST**.



03U0B2-018

Idle Speed

1. Perform "Preparation". (Refer to page B2-8.)
2. Apply parking brake.
3. Check that the idle speed is within specification.

Idle speed (Neutral or P range): 750 ± 50 rpm**Caution**

- Check the idle speed without the electric cooling fan operating.

B2

Note

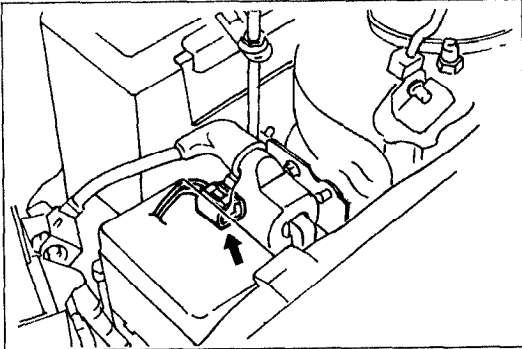
- When the parking brake is not applied, the idle speed for ATX model (Canada) is approx. 800 rpm.
4. If not within the specification, adjust the idle by turning the air adjusting screw.
 5. Disconnect the **SST**.

COMPRESSION

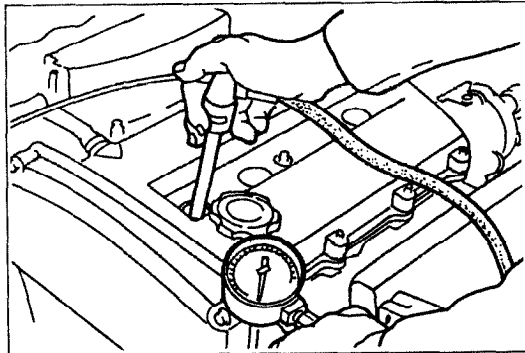
If the engine exhibits low power, poor fuel economy, or poor idle, check the following:

1. Ignition system (Refer to Section G.)
2. Compression
3. Fuel system (Refer to Section F.)

23U0B2-012



23U0B2-013



13U0B2-004

INSPECTION

1. Check that the battery is fully charged. Recharge it if necessary. (Refer to Section G.)
2. Warm up the engine to normal operating temperature.
3. Turn the engine OFF.
4. Remove all spark plugs.
5. Disconnect the ignition coil connector.
6. Connect a compression gauge to the No.1 spark plug hole.
7. Fully depress the accelerator pedal and crank the engine.
8. Record the maximum gauge reading.
9. Check each cylinder.

Compression:

1,256 kPa (12.8 kg/cm², 182 psi)-300 rpm

Minimum:

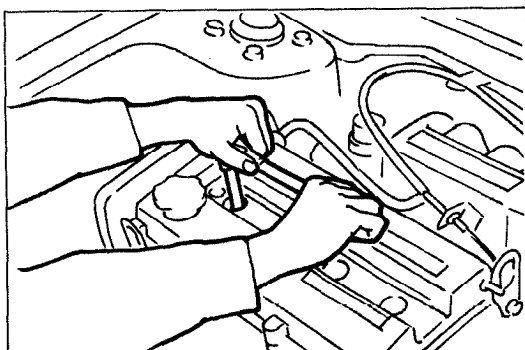
883 kPa (9.0 kg/cm², 128 psi)-300 rpm

Max. difference between cylinders:

196 kPa (2.0 kg/cm², 28 psi)

10. If the compression in one or more cylinders is low, pour a small amount of engine oil into the cylinder and recheck the compression.
 - (1) If the compression increases, the piston, piston rings, or cylinder wall may be worn.
 - (2) If the compression stays low, the valve may be stuck or seating improperly.
 - (3) If the compression in adjacent cylinders stays low, the cylinder head gasket may be defective or the cylinder head distorted.
11. Connect the ignition coil connector.

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23U0B2-014

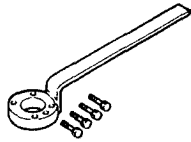
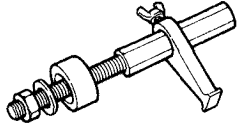
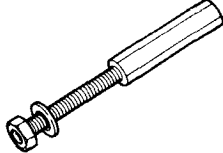


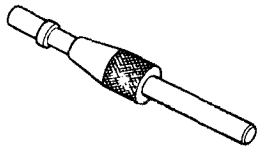
12. Install the spark plugs.

Tightening torque:

15—23 N·m (1.5—2.3 m·kg, 11—17 ft·lb)

ON-VEHICLE MAINTENANCE

PREPARATION
SST

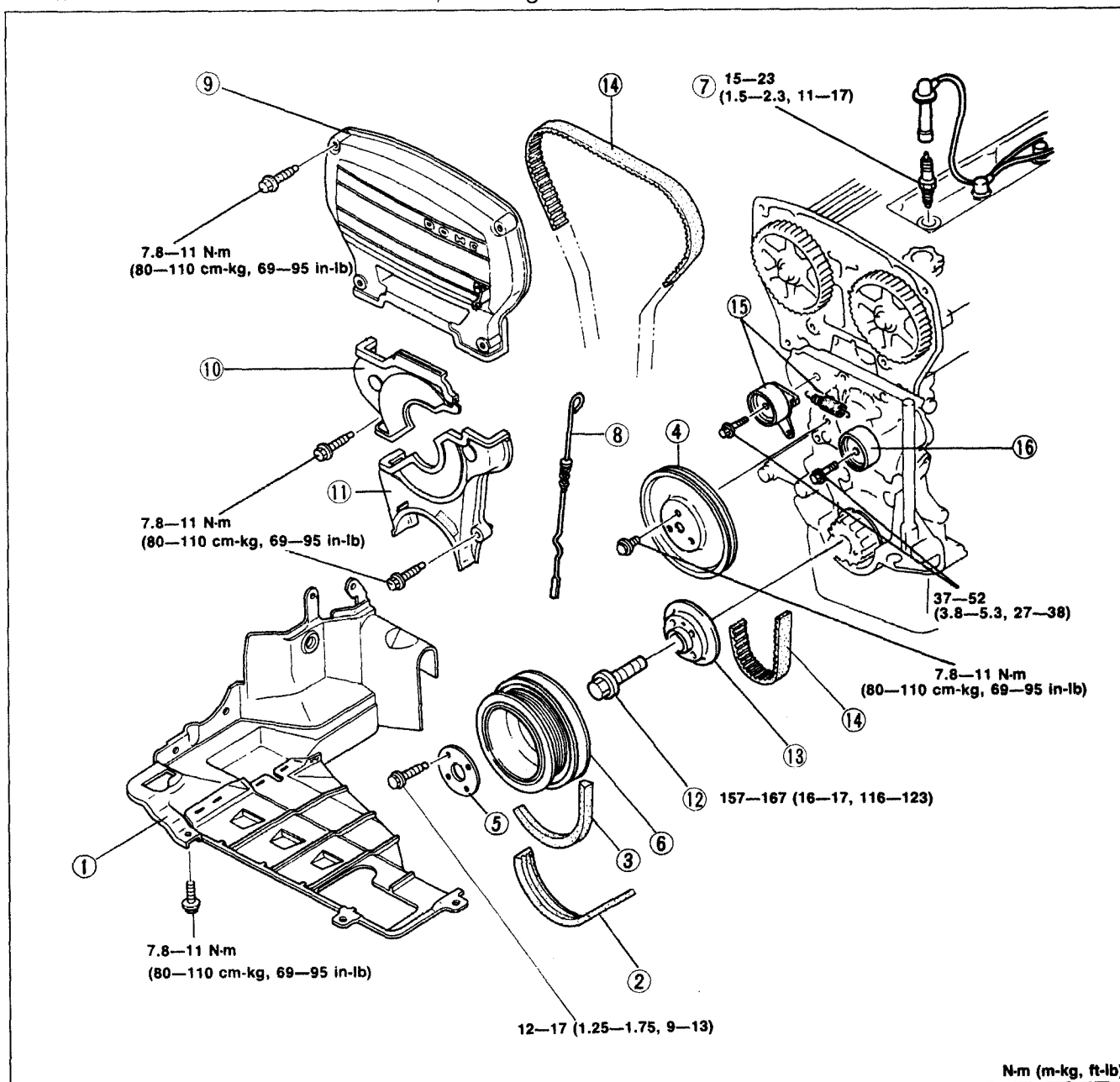
<p>49 D011 102 Lock tool, crankshaft</p> 	<p>For removal and installation of timing belt pulley</p>	<p>49 E011 1A0 Ring gear brake set</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 103 Shaft (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 105 Stopper (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 104 Collar (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 SE01 310A Centering tool, clutch disc</p> 	<p>For installation of clutch disc</p>

23U0B2-015

TIMING BELT

Removal / Installation

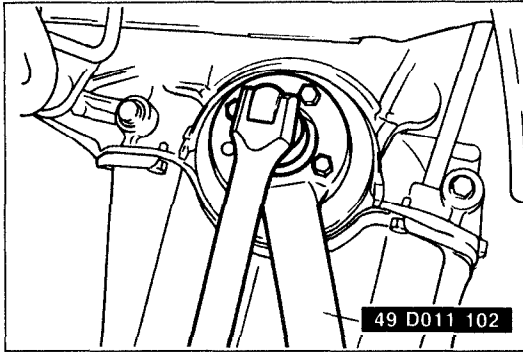
1. Disconnect the negative battery cable.
2. Raise the vehicle on a lift and remove the right front wheel.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



N-m (m-kg, ft-lb)

23U0B2-016

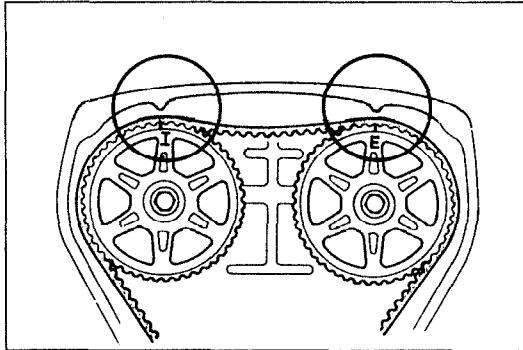
- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Under cover and side cover 2. P/S and/or A/C drive belt 3. Alternator drive belt 4. Water pump pulley 5. Plate 6. Crankshaft pully 7. Spark plugs
Installation Note..... page B2-15 8. Oil dip stick 9. Timing belt cover, upper 10. Timing belt cover, middle | <ol style="list-style-type: none"> 11. Timing belt cover, lower 12. Pulley lock bolt
Removal Note..... page B2-13
Installation Note..... page B2-14 13. Pulley boss 14. Timing belt
Removal Note..... page B2-13
Installation Note..... page B2-14 15. Tensioner and tensioner spring
Installation Note..... page B2-14 16. Idler |
|--|---|



13E0B2-008

Removal Note
Pulley lock bolt

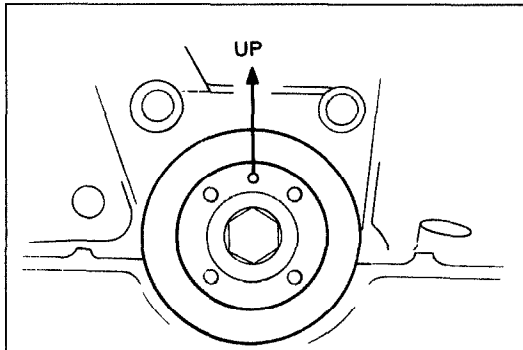
1. Hold the pulley boss with the **SST**.
2. Using the **SST**, loosen the pulley lock bolt.
3. Remove the bolt and the pulley boss.



13E0B2-009

Timing belt

1. Install the pulley boss and pulley lock bolt.
2. Turn the crankshaft to align the timing marks.



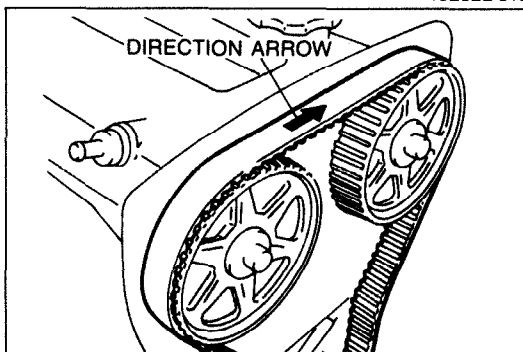
13E0B2-010

Note

- The pin on the pulley boss must face upward.

Caution

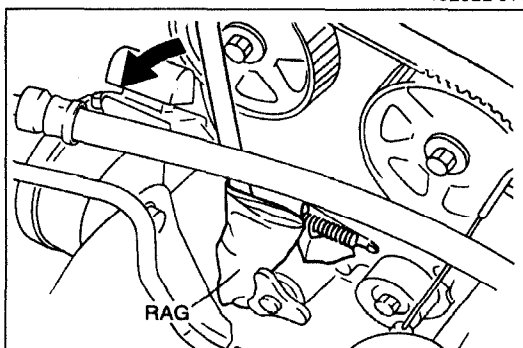
- After setting the marks, do not turn the crankshaft when removing the pulley lock bolt and pulley boss.



13E0B2-011

Note

- Mark the timing belt rotation for proper reinstallation.

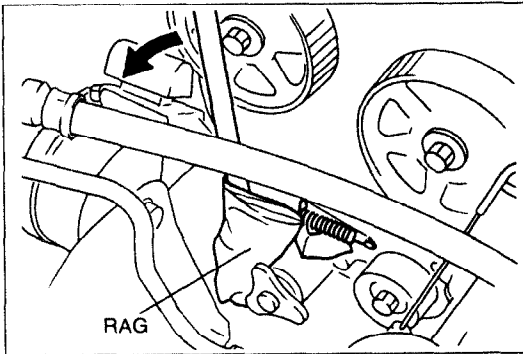


13E0B2-012

Caution

- Protect the tensioner with a rag before prying on it.

3. Loosen the tensioner lock bolt and, using a suitable bar, pry the tensioner outward (arrow).
4. Tighten the lock bolt with the tensioner spring fully extended.
5. Remove the timing belt.



13E0B2-038

Installation Note

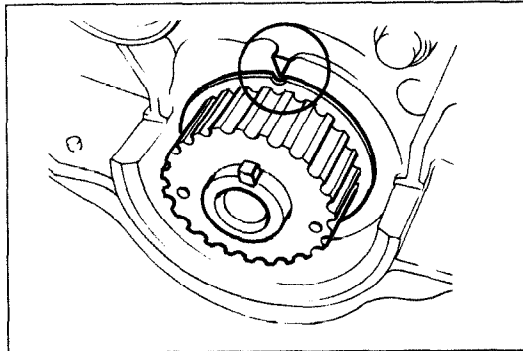
Tensioner and tensioner spring

1. Install the tensioner and the tensioner spring.

Caution

- **Protect the tensioner with a rag before prying on it.**

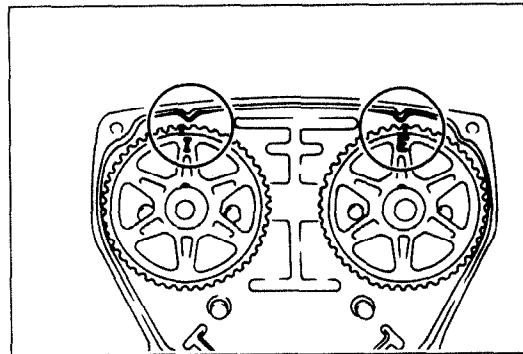
2. Using a suitable bar, pry the tensioner outward (arrow).
3. Temporarily tighten the tensioner lock bolt with the tensioner spring fully extended.



05U0BX-028

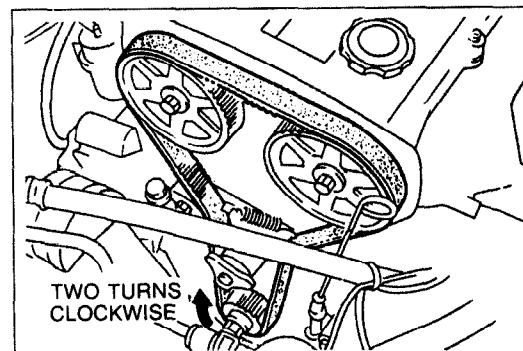
Timing belt

1. Verify that the timing belt pulley mark is aligned with the timing mark.



03U0B2-023

2. Verify that the camshaft pulley marks are aligned with the seal plate marks.



13E0B2-013

3. Install the timing belt so that there is no looseness at the idler side or between the camshaft pulleys.
4. Install the pulley boss and pulley lock bolt.

Caution

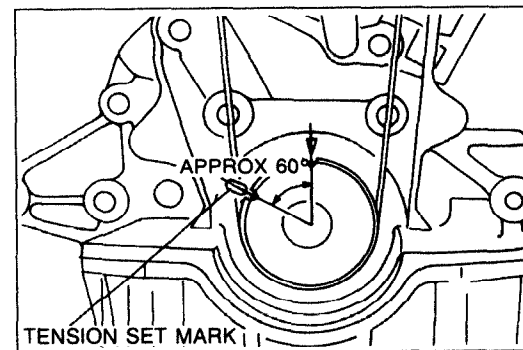
- **Do not turn the crankshaft counterclockwise.**

5. Turn the crankshaft two turns clockwise and face the pin on the pulley boss upright.
6. Verify that the camshaft pulley marks are again aligned with the seal plate marks.
If not aligned, remove the timing belt and repeat from tensioner installation.
7. Turn the crankshaft 1 and 5/6 turns clockwise and align the timing belt pulley mark with the tension set mark for proper timing belt tension adjustment.
8. Using the **SST (49 D011 102)**, loosen the pulley lock bolt and remove the bolt and pulley boss.

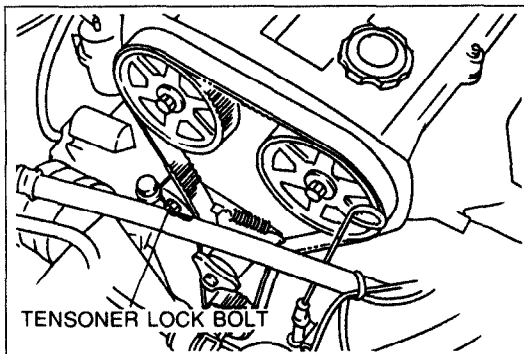
Caution

- **Do not turn the crankshaft.**

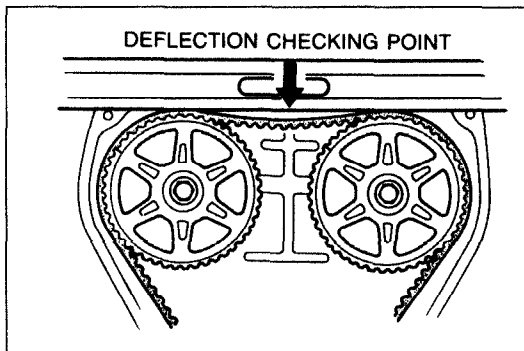
9. Verify that the timing belt pulley mark is aligned with the tension set mark.



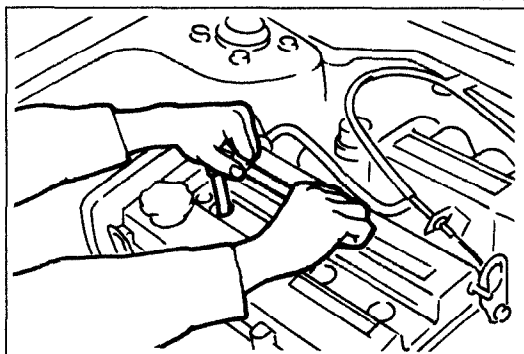
13E0B2-014



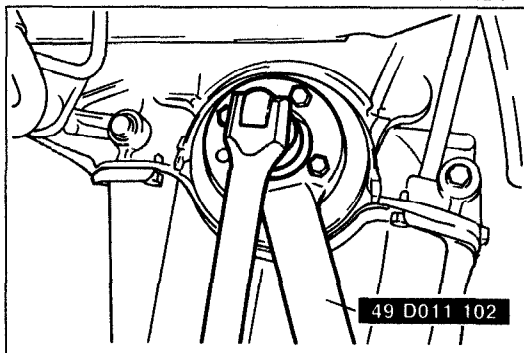
13E0B2-015



13E0B2-016



23U0B2-017



23U0B2-018

10. Loosen the tensioner lock bolt to apply spring tension to the timing belt.
11. Tighten the tensioner lock bolt.

Tightening torque:**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

12. Install the pulley boss and pulley lock bolt.
13. Turn the crankshaft 2 and 1/6 turns clockwise and verify that the timing marks are correctly aligned.

14. Measure the timing belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the camshaft pulleys.

If the deflection is not correct, repeat from Step 10 above.

Deflection:**9.0—11.5mm (0.35—0.45 in) at 98 N (10 kg, 22 lb)****Spark plug**

1. Install the spark plugs.

Tightening torque:**15—23 N·m (1.5—2.3 m·kg, 11—17 ft·lb)****Pulley lock bolt**

1. Hold the crankshaft with the **SST** and tighten the pulley lock bolt.

Tightening torque:**157—167 N·m (16—17 m·kg, 116—123 ft·lb)****Steps After Installation**

1. Connect the negative battery cable.
2. Start the engine and check as follows:
 - Ignition timing. (Refer to page B2—8.)

23U0B2-019

CYLINDER HEAD GASKET Replacement

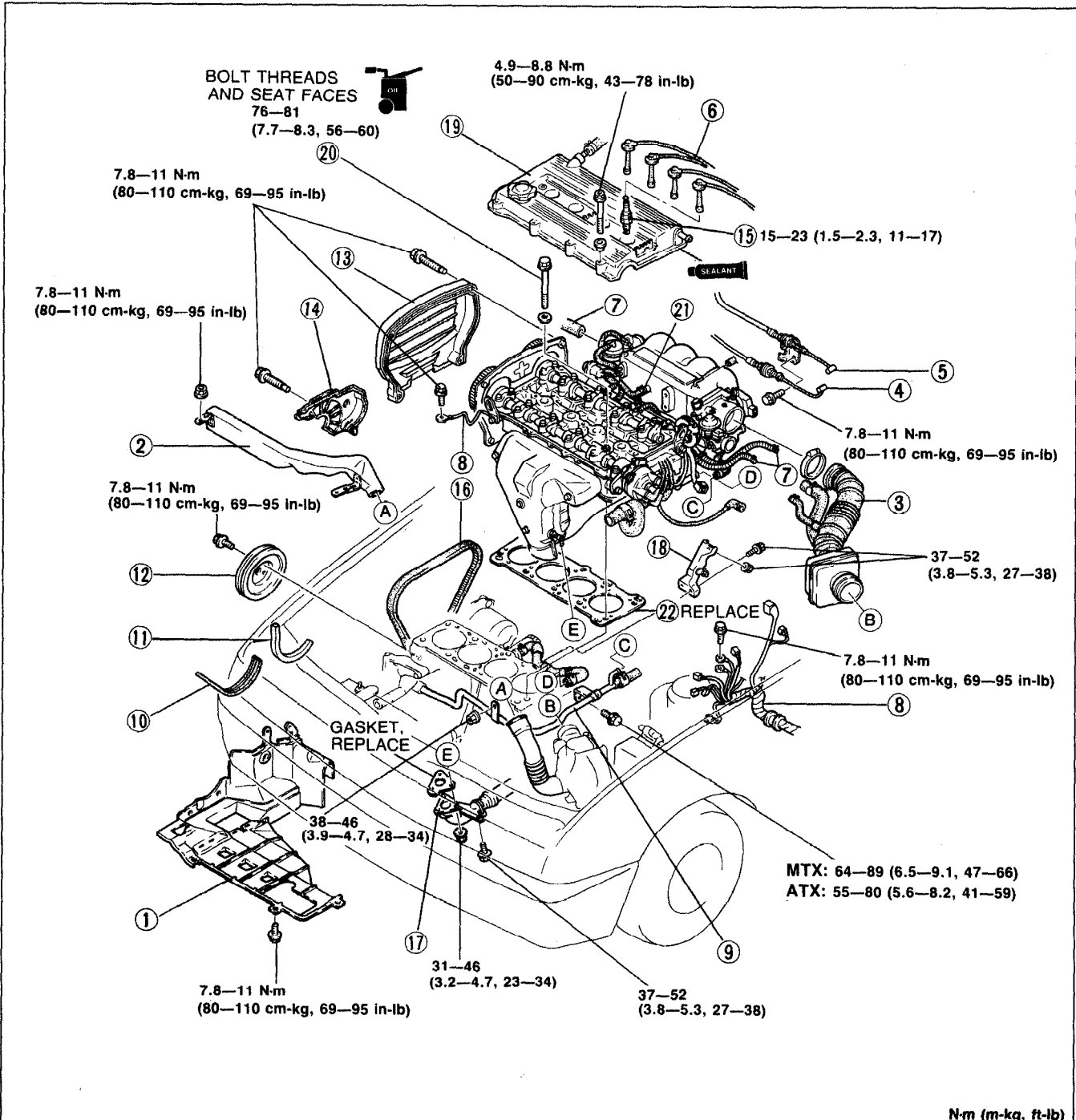
Warning

- Release the fuel pressure. (Refer to Section F.)
- Keep sparks and open flame away from the fuel area.

Caution

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

1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



N-m (m-kg, ft-lb)

23U0B2-020

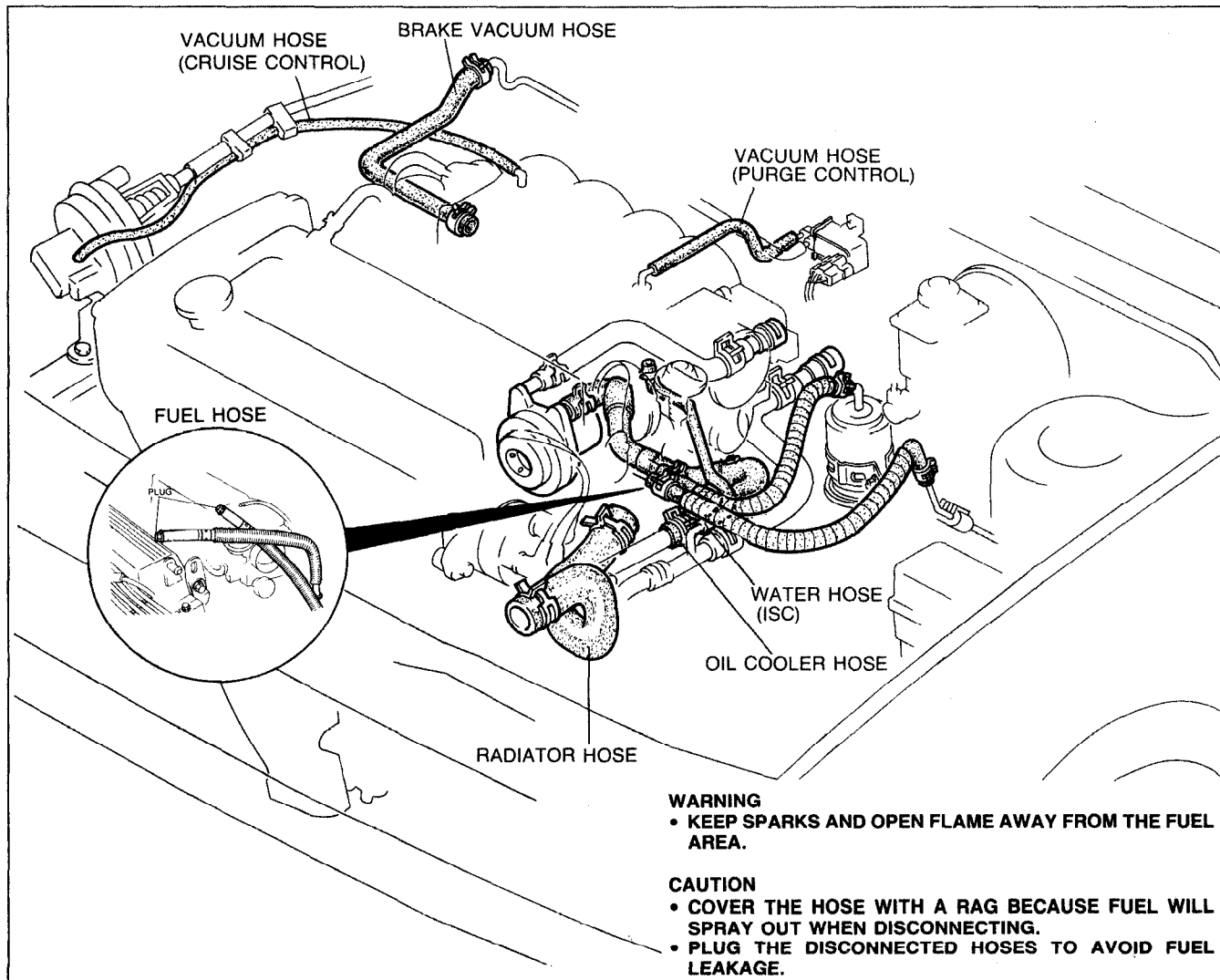
1. Under cover and side cover		12. Water pump pulley	
2. Resonance chamber		13. Timing belt cover, upper	
3. Air hose		14. Timing belt cover, middle	
4. Accelerator cable		15. Spark plug	
Installation Note.....	page B2-21	16. Timing belt	
5. Throttle cable (ATX)		Removal Note.....	page B2-18
Removal / Installation.....	Section K	Installation Note.....	page B2-20
6. High-tension lead		17. Front exhaust pipe	
7. Hoses		18. Intake manifold bracket	
Removal Note.....	below	19. Cylinder head cover	
Installation Note.....	page B2-21	Installation Note.....	page B2-19
8. Harnesses		20. Cylinder head bolt	
Removal Note.....	page B2-18	Removal Note.....	page B2-19
Installation Note.....	page B2-21	Installation Note.....	page B2-19
9. Water bypass pipe		21. Cylinder head	
Removal Note.....	page B2-18	Disassembly.....	page B2-45
10. P/S and/or A/C drive belt		Inspection.....	page B2-54
Removal / Installation.....	page B2- 6	Assembly.....	page B2-79
11. Alternator drive belt		22. Cylinder head gasket	
Removal / Installation.....	page B2- 6		

23U0B2-021

Removal / Installation note

Hoses

1. Disconnect the hoses shown in the figure.



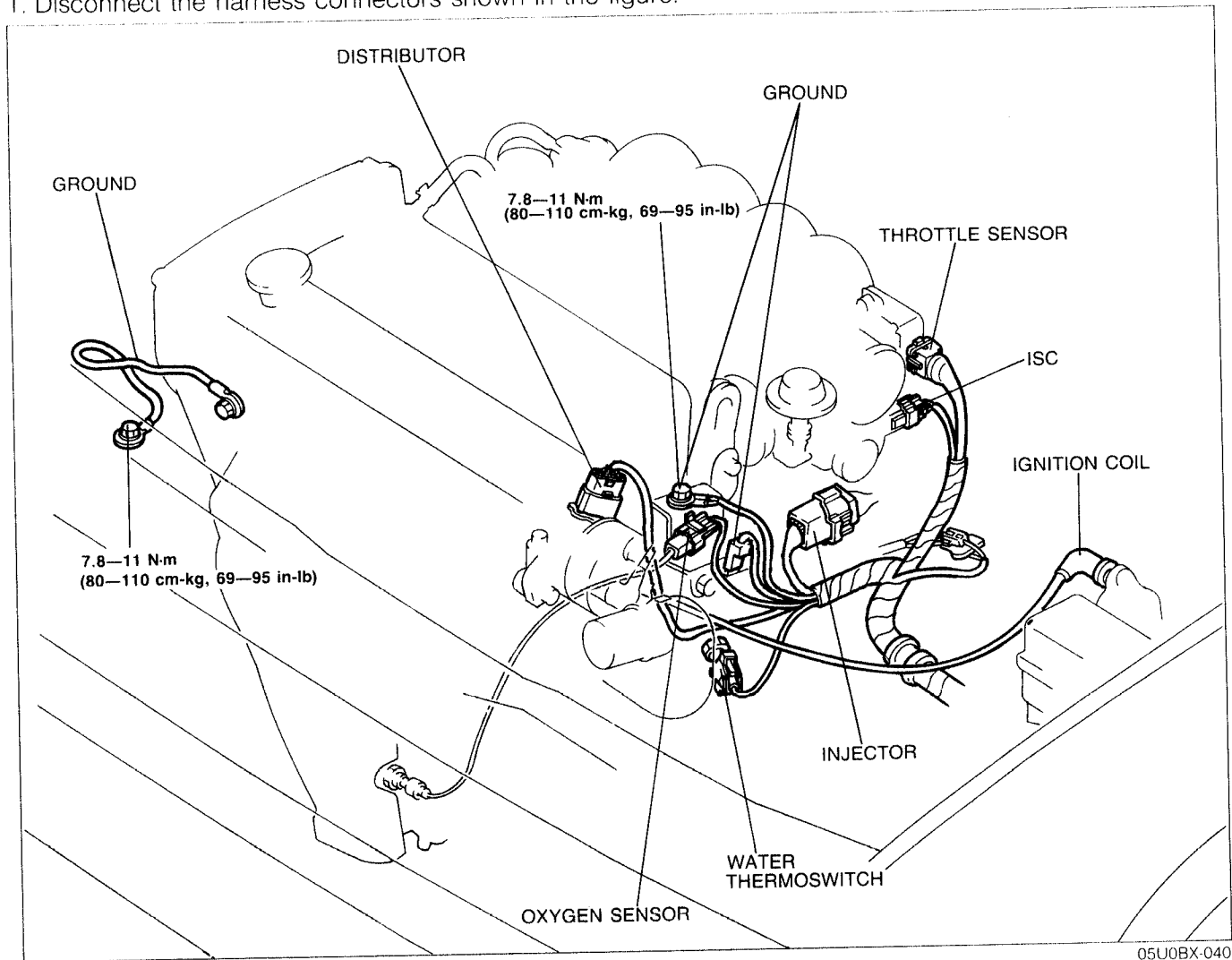
WARNING
 • KEEP SPARKS AND OPEN FLAME AWAY FROM THE FUEL AREA.

CAUTION
 • COVER THE HOSE WITH A RAG BECAUSE FUEL WILL SPRAY OUT WHEN DISCONNECTING.
 • PLUG THE DISCONNECTED HOSES TO AVOID FUEL LEAKAGE.

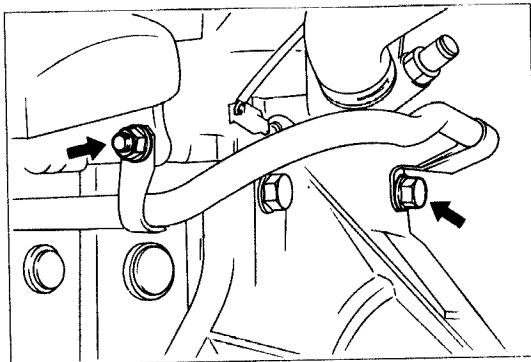
05U0BX-039

Harnesses

1. Disconnect the harness connectors shown in the figure.



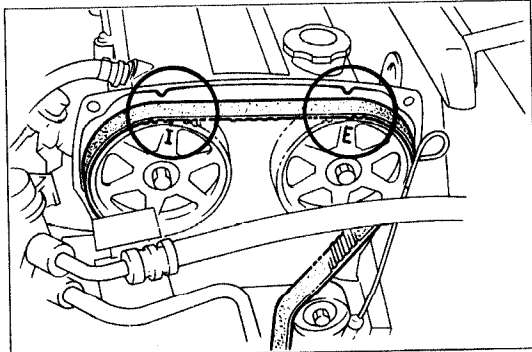
05U0BX-040



03U0B2-028

Water bypass pipe

1. Remove the transaxle installation bolt as shown in the figure.
2. Remove the exhaust manifold nut as shown in the figure.
3. Remove the water bypass pipe from the cylinder head assembly.



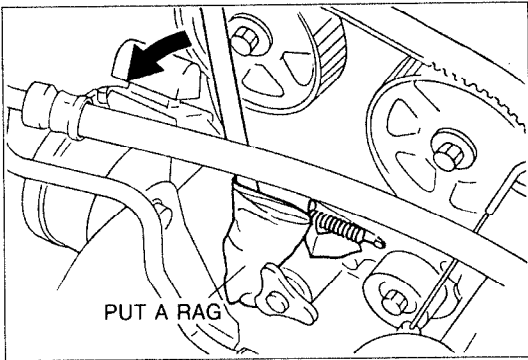
03U0B2-029

Timing belt

Note

- Remove all spark plugs for easier rotation of the crankshaft.

1. Turn the crankshaft and align the marks.



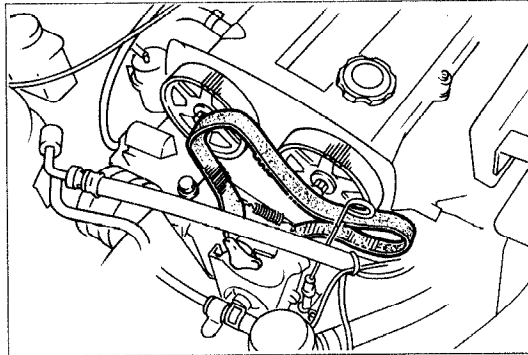
03U0B2-030

2. Loosen the tensioner lock bolt.

Caution

- To prevent damage to the tensioner, secure it with a rag.

3. Temporarily secure the tensioner with the spring fully extended.

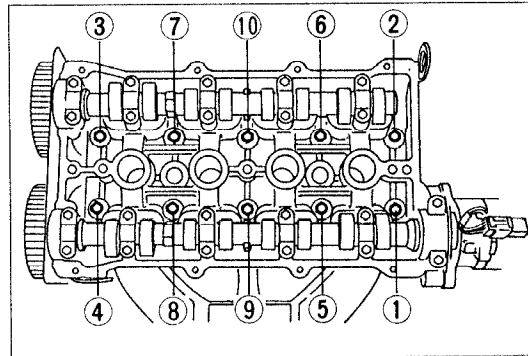


03U0B2-031

Caution

- Do not allow any oil or grease on the timing belt.

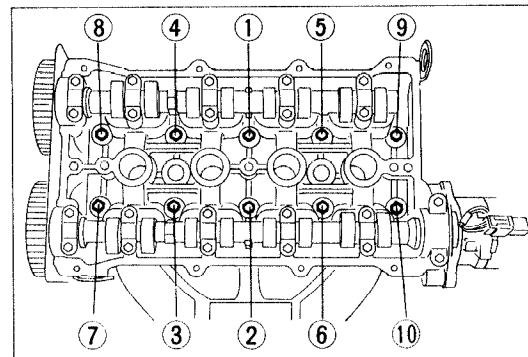
4. Remove the timing belt and secure it out of the way to prevent damage during removal and installation of the cylinder head.



05U0BX-042

Cylinder head bolt

1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.
2. Remove the cylinder head bolts.



05U0BX-043

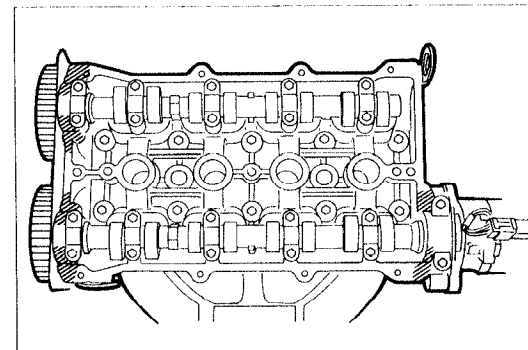
Installation note

Cylinder head bolt

1. Apply clean engine oil to the bolt threads and seat faces.
2. Install the cylinder head bolts.
3. Tighten the cylinder head bolts in two or three steps in the order shown in the figure.

Tightening torque:

76—81 N·m (7.7—8.3 m·kg, 56—60 ft·lb)



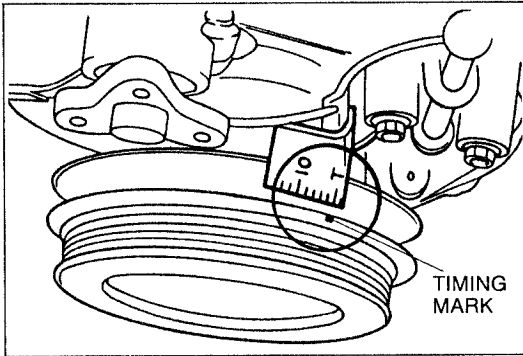
05U0BX-034

Cylinder head cover

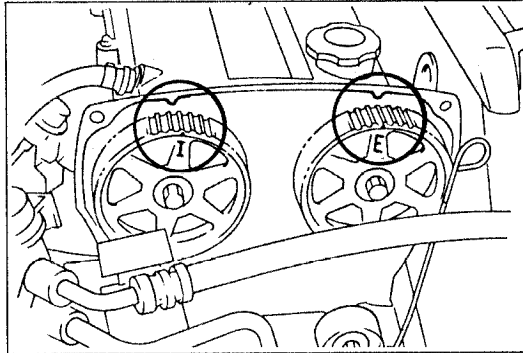
1. Apply silicone sealant to the shaded areas as shown in the figure.
2. Install the cylinder head cover.

Tightening torque:

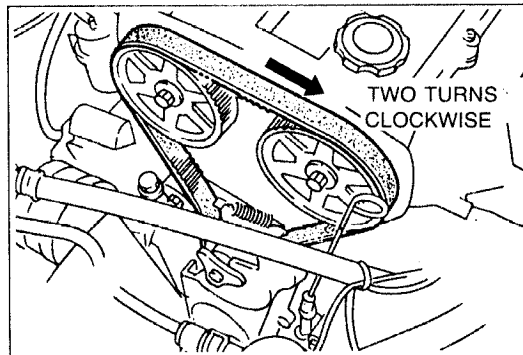
4.9—8.8 N·m (50—90 cm·kg, 43—78 in·lb)



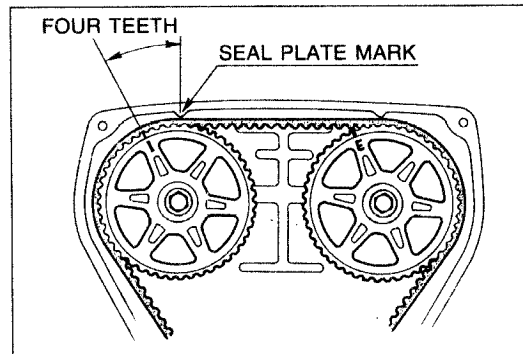
03U0B2-032



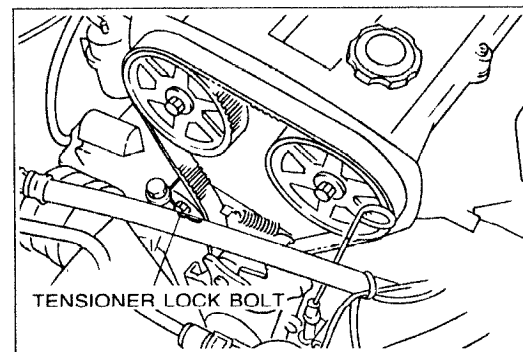
03U0B2-033



05U0BX-030



13U0B2-015



05U0BX-032

Timing belt

1. Check that the ignition timing mark (yellow) on the crankshaft pulley and the timing mark on the timing belt cover are aligned.

2. Verify that the camshaft pulley marks are aligned with the seal plate marks.

Caution

- For intake side, align the I mark.
- For exhaust side, align the E mark.

3. Install the timing belt so that there is no looseness at the idler side or between the two camshaft pulleys.

Caution

- Do not turn the crankshaft counterclockwise.

4. Turn the crankshaft two turns clockwise, and align the timing belt pulley mark with the timing mark.

5. Verify that the camshaft pulley marks are aligned with the seal plate marks.

If not aligned, remove the timing belt and repeat from tensioner installation.

6. Turn the crankshaft 1 and 5/6 turns clockwise, and align the fourth tooth from the I mark with the seal plate mark.

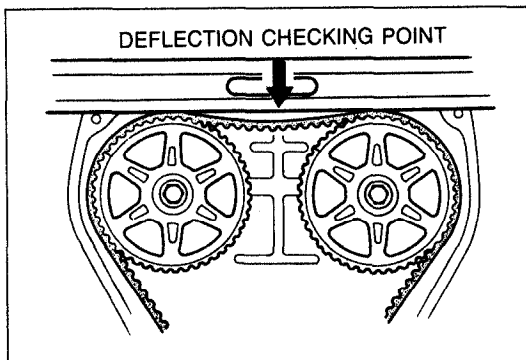
7. Loosen the tensioner lock bolt to apply tension to the timing belt.

8. Tighten the tensioner lock bolt.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

9. Turn the crankshaft 2 and 1/6 turns clockwise and verify that the timing marks are correctly aligned.



05U0BX-033

10. Measure the timing belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the two camshaft pulleys. If the deflection is not correct, repeat from Step 7 above.

Deflection:

9.0—11.5mm (0.35—0.45 in) at 98 N (10 kg, 22 lb)

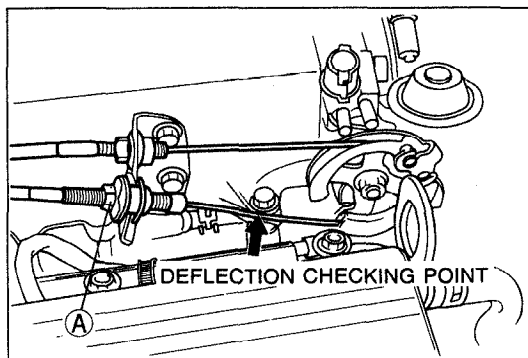
Harness

1. Connect the harness connectors. (Refer to page B2-18.)

Hose

1. Connect the hoses. (Refer to page B2-17.)

03U0B2-035



05U0BX-045

Accelerator cable

1. Install the accelerator cable.
2. Check the accelerator cable deflection. If the deflection is not correct, adjust by turning nut A.

Deflection: 1—3mm (0.04—0.12 in)

Steps After Installation

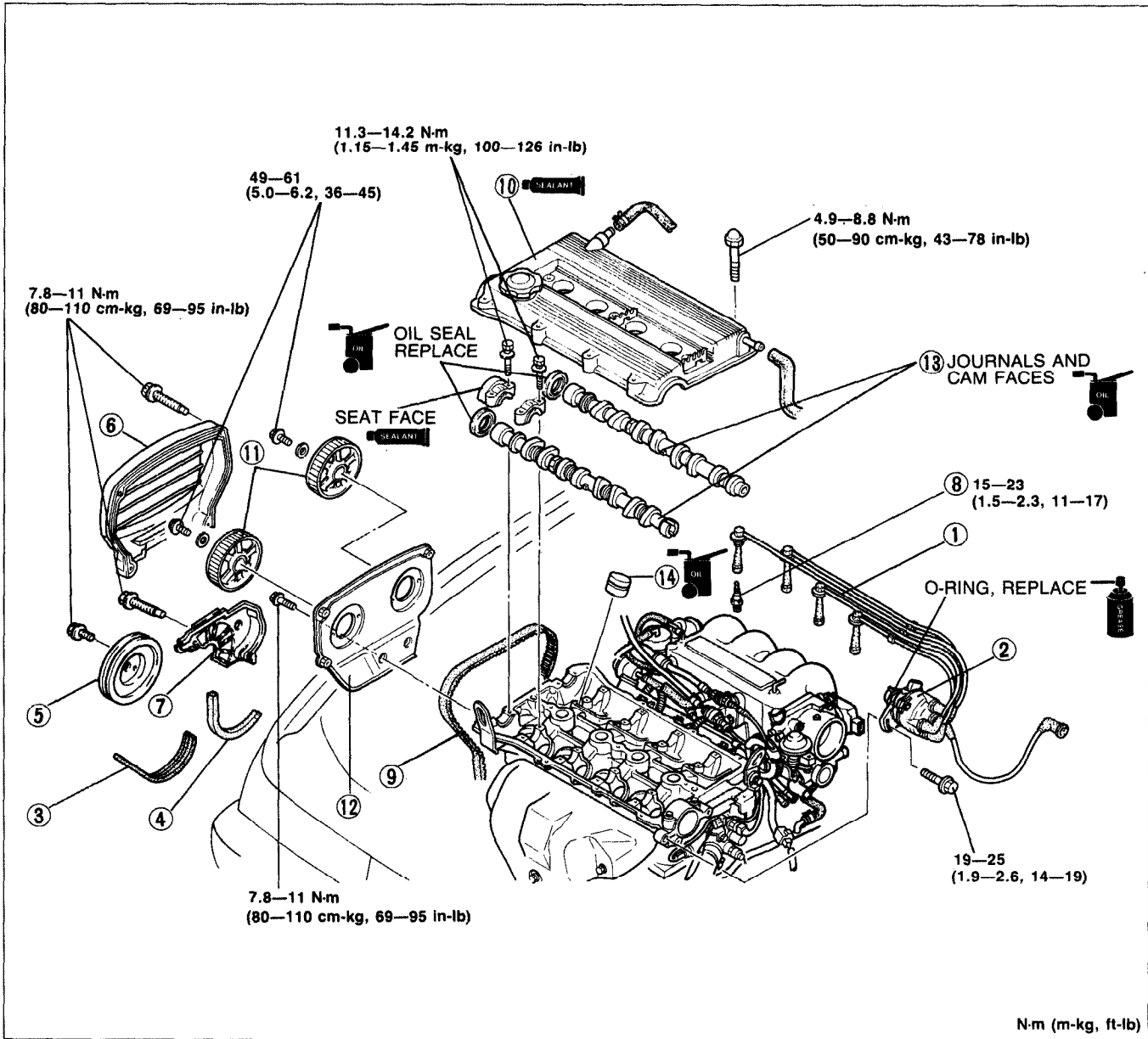
1. Fill the radiator with the specified amount and type of engine coolant. (Refer to Section E.)
2. Connect the negative battery cable.
3. Start the engine and check as follows:
 - (1) Engine oil and engine coolant leakage.
 - (2) Ignition timing, idle speed. (Refer to page B2-8.)
 - (3) Operation of emission control system.
4. Recheck the engine coolant levels.

23U0B2-022

HLA

Removal / Installation

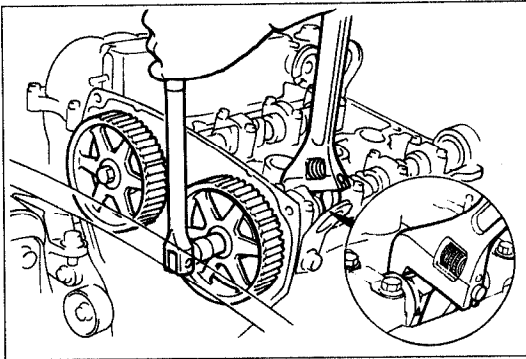
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.



N-m (m-kg, ft-lb)

03U0B2-037

- | | |
|--|-----------------------------------|
| 1. High-tension lead | 10. Cylinder head cover |
| 2. Distributor | Installation Note..... page B2-19 |
| 3. P/S and/or A/C drive belt | 11. Camshaft pulley |
| Installation Note..... page B2-25 | Removal note page B2-23 |
| 4. Alternator drive belt | Installation Note..... page B2-24 |
| Removal / Installation..... page B2- 6 | 12. Seal plate |
| 5. Water pump pulley | 13. Camshaft |
| 6. Timing belt cover, upper | Removal Note..... page B2-23 |
| 7. Timing belt cover, middle | Installation Note..... page B2-23 |
| 8. Spark plug | 14. HLA |
| 9. Timing belt | Removal note page B2-23 |
| Removal Note..... page B2-18 | Installation Note..... page B2-23 |
| Installation Note..... page B2-20 | Inspection page B2-60 |

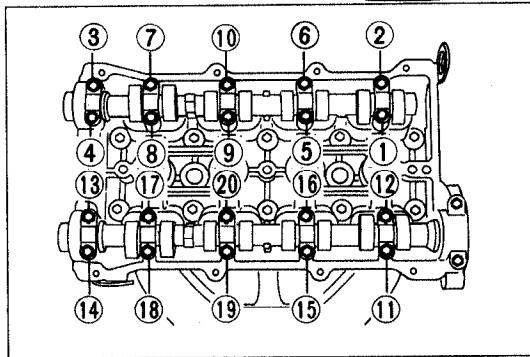


23U0B2-023

Removal note

Camshaft pulley

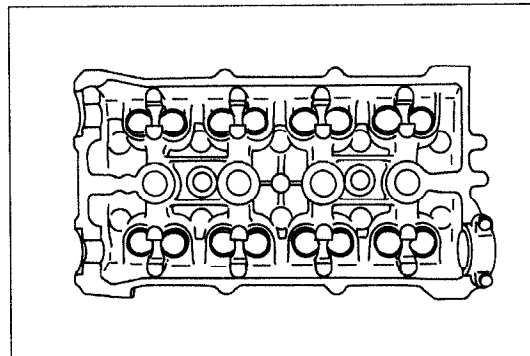
1. Hold the camshaft with a wrench at hexagonal portion.
2. Remove the camshaft pulley lock bolt.
3. Remove the camshaft pulley.



05U0BX-049

Camshaft

1. Loosen the camshaft cap bolts in two or three steps in the order shown in the figure.
2. Remove the camshaft caps.
3. Remove the camshaft.
4. Remove the camshaft oil seal from the camshaft.



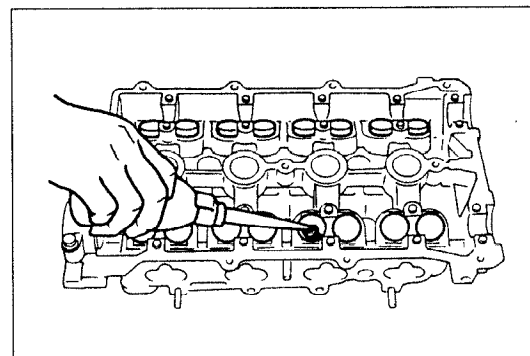
05U0BX-050

HLA

Caution

- Mark the HLA with a felt pen so that they can be reinstalled in the position from which they were removed.

1. Remove the HLA from the cylinder head.

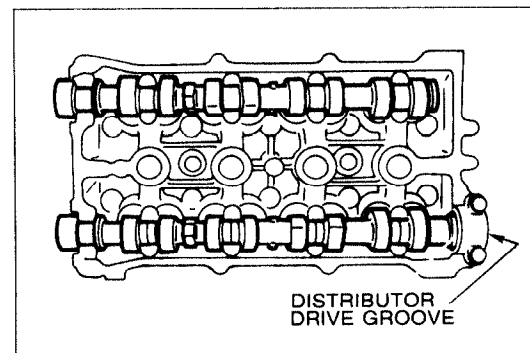


05U0BX-051

Installation note

HLA

1. Apply clean engine oil to the friction surfaces.
2. If the HLA are being reused, install them in the position from which they were removed.
3. Verify that the HLA move smoothly in their bores.



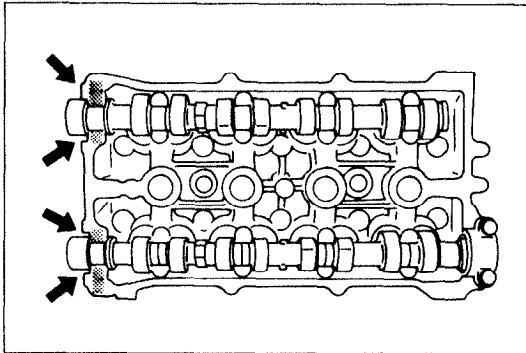
03U0B2-156

Camshaft

Note

- The intake camshaft is grooved for the distributor drive.

1. Apply clean engine oil to the camshaft journals and bearings.
2. Install the camshaft in position.

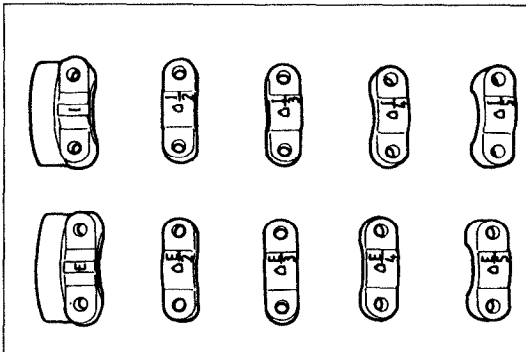


05U0BX-053

Caution

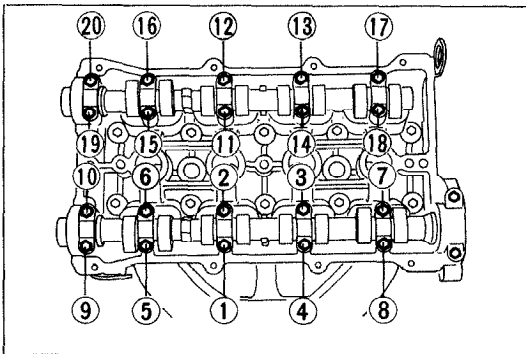
- Do not allow any sealant on the camshaft journal surfaces.

3. Apply silicone sealant to the shaded areas shown in the figure.



05U0BX-054

4. Install the camshaft caps according to the cap number and arrow mark.

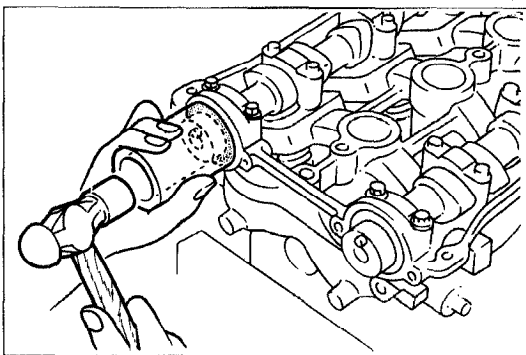


05U0BX-055

5. Install the camshaft cap bolts and tighten them in two or three steps in the order shown in the figure.

Tightening torque:

11.3—14.2 N·m (1.15—1.45 m·kg, 100—126 in·lb)



05U0BX-056

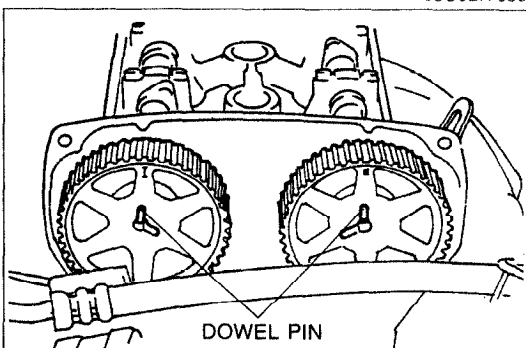
6. Apply a small amount of clean engine oil to the lip of a new camshaft oil seal.
7. Push the oil seal slightly in by hand.

Caution

- The oil seal must be tapped in until it is flush with the edge of the camshaft cap.

8. Tap the oil seal in evenly with a suitable pipe and a hammer.

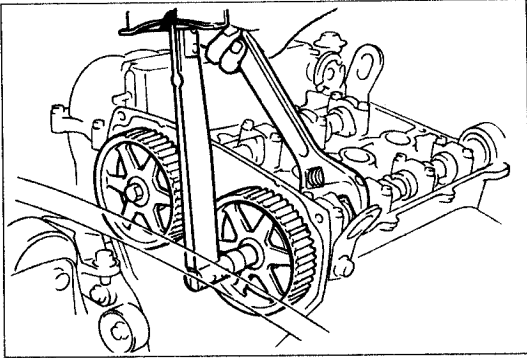
Oil seal outer diameter: 48mm (1.89 in)



05U0BX-057

Camshaft pulley

1. Turn the camshafts until the camshaft dowel pins face straight up.
2. Install the camshaft pulleys with the I mark (intake side) or the E mark (exhaust side) straight up.

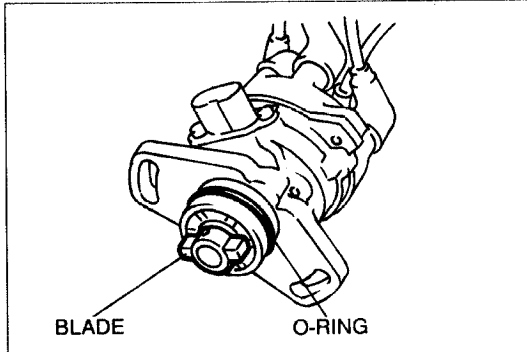


05U0BX-058

3. Install the camshaft pulley lock bolts.
4. Hold the camshaft with a wrench.
5. Tighten the camshaft pulley lock bolt.

Tightening torque:

49—61 N·m (5.0—6.2 m·kg, 36—45 ft·lb)



03U0B2-038

Distributor

1. Apply grease to a new O-ring and the blade.
2. Install the distributor and loosely tighten the installation bolt.
3. Connect the distributor connector.

Steps After Installation

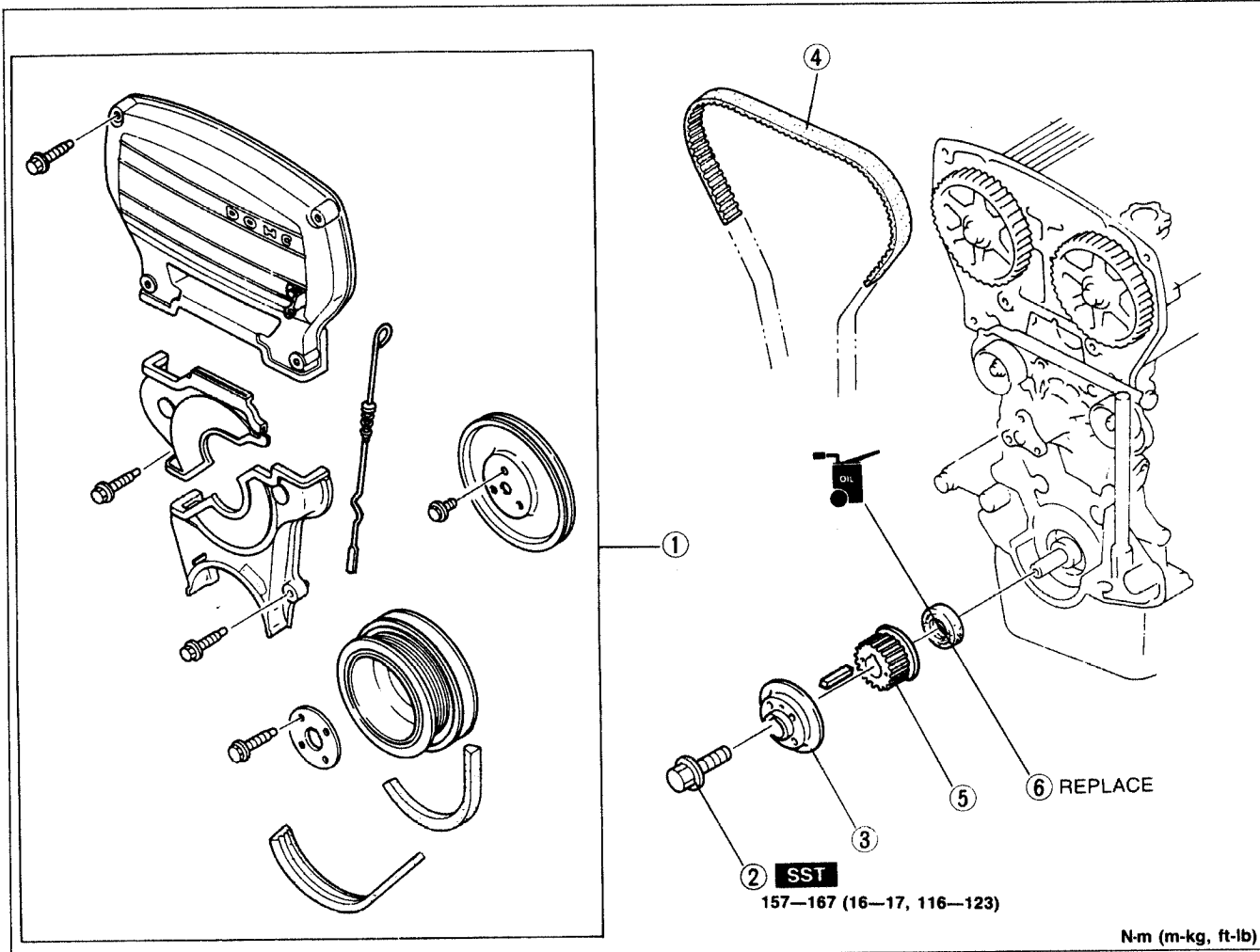
1. Connect the negative battery cable.
2. Start the engine and check as follows:
 - Ignition timing. (Refer to page B2-8.)

03U0B2-039

FRONT OIL SEAL

Replacement

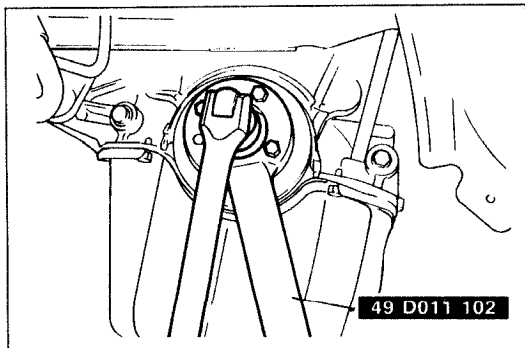
1. Disconnect the negative battery cable.
2. Raise the vehicle on a lift and remove the right front wheel.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.



23U0B2-024

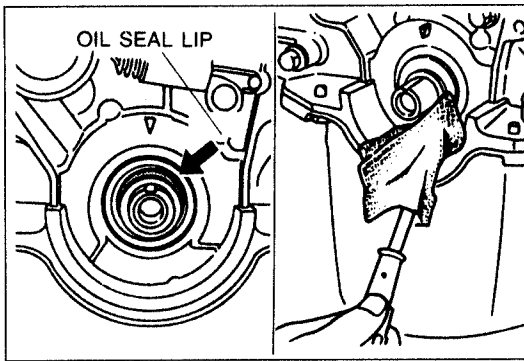
- | | |
|------------------------------------|------------|
| 1. Timing belt related parts | page B2-12 |
| 2. Pulley lock bolt | |
| Removal Note | below |
| Installation Note | page B2-27 |
| 3. Pulley boss | |
| 4. Timing belt | |
| Removal Note | page B2-13 |
| Installation Note | page B2-14 |

- | | |
|-------------------------|------------|
| 5. Timing belt pulley | |
| Installation Note | page B2-27 |
| 6. Oil seal | |
| Removal Note | page B2-27 |
| Installation Note | page B2-27 |

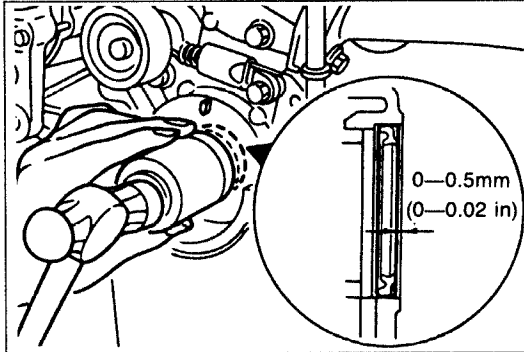


Removal Note Pulley lock bolt

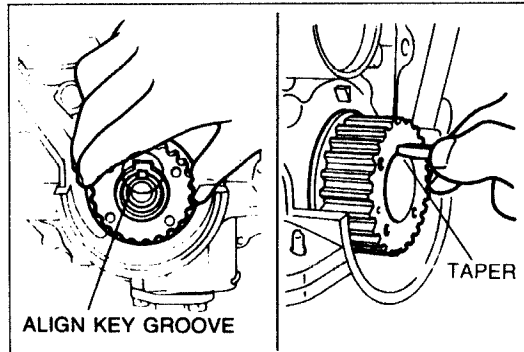
1. Hold the pulley boss with the **SST**.
2. Loosen and remove the pulley lock bolt.



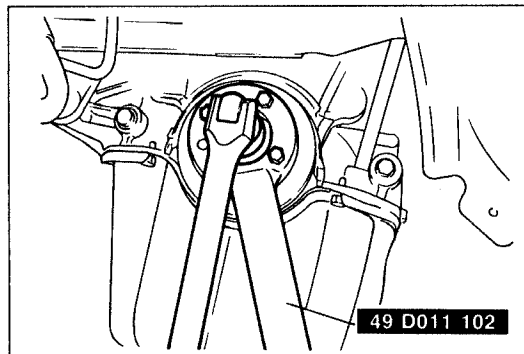
05U0BX-063



13E0B2-022



13E0B2-023



23U0B2-025

Steps After Installation

1. Connect the negative battery cable.
2. Start the engine and check as follows:
 - Ignition timing. (Refer to page B2-8.)

Oil seal

1. Cut the oil seal lip with a razor knife.
2. Remove the oil seal with a screwdriver protected with a rag.

Installation Note

Oil seal

1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.
3. Tap the oil seal in evenly with a suitable pipe and a hammer until it is about flush with the face of the oil pump body.

Oil seal outer diameter: 50.5mm (1.98 in)

Timing belt pulley

1. Install the timing belt pulley.
2. Install the pulley Woodruff key with the tapered side toward the oil pump body.

Pulley lock bolt

1. Hold the crankshaft with the **SST** and tighten the pulley lock bolt.

Tightening torque:

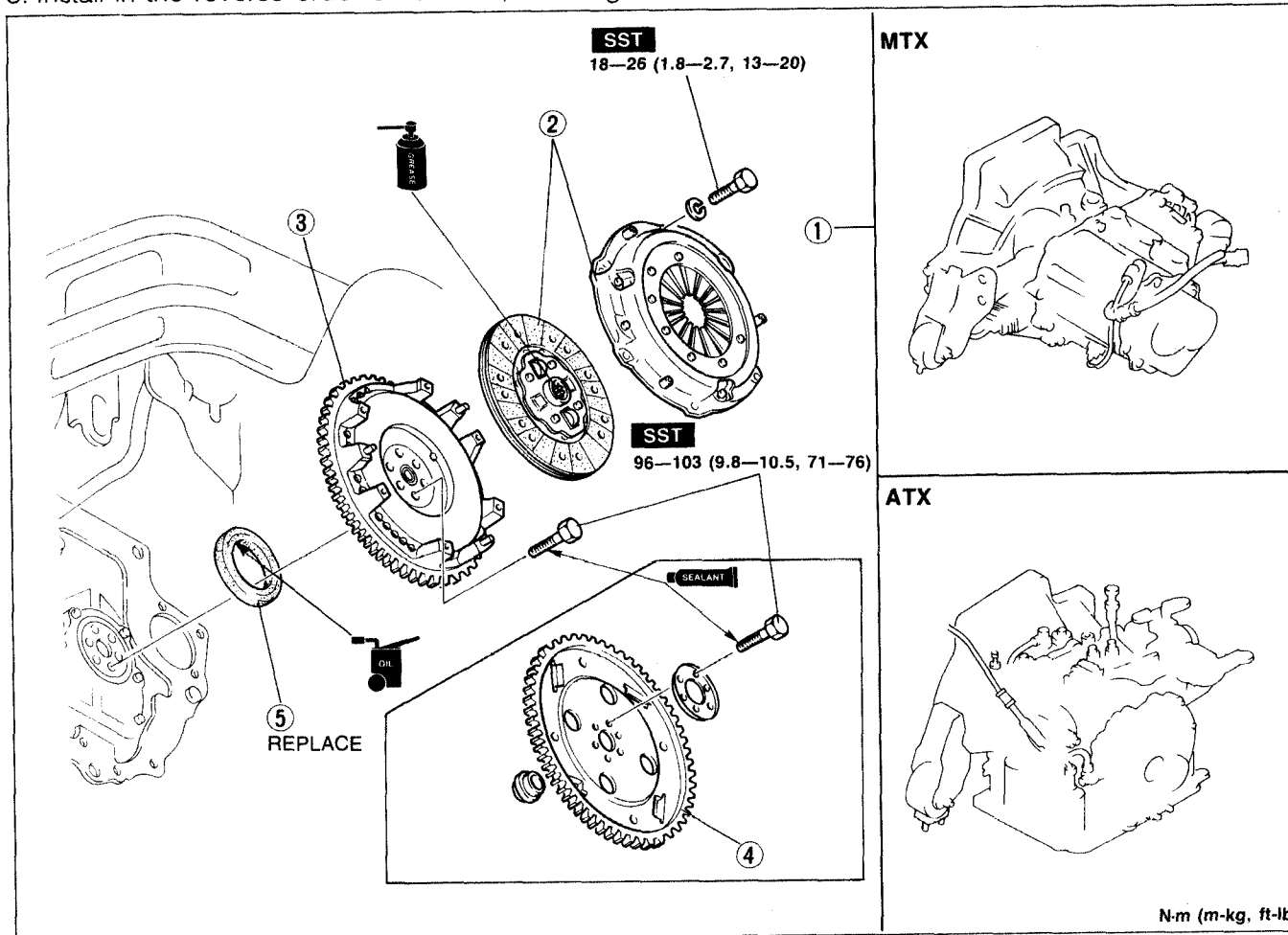
157—167 N·m (16—17 m·kg, 116—123 ft·lb)

23U0B2-026

REAR OIL SEAL

Replacement

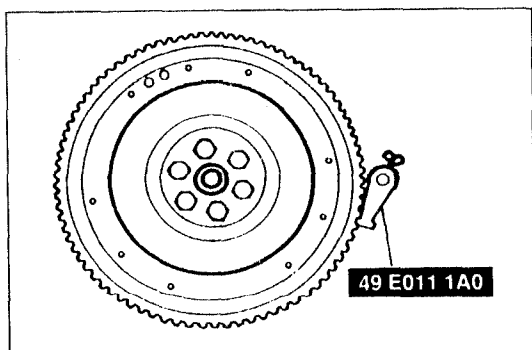
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.



N·m (m·kg, ft·lb)

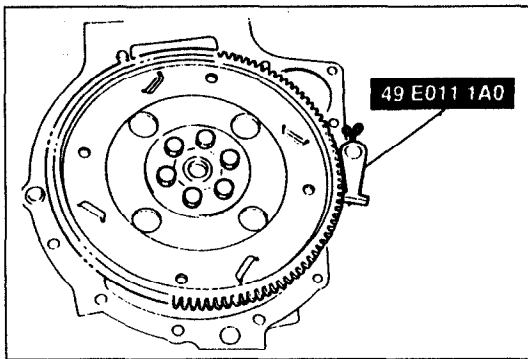
23U0B2-027

- | | |
|------------------------------------|-----------------------------------|
| 1. Transaxle | 4. Drive plate (ATX) |
| MTX | Removal Note..... page B2-29 |
| Service..... Section J2 | Installation Note..... page B2-30 |
| ATX | 5. Oil seal |
| Service..... Section K | Removal Note..... page B2-29 |
| 2. Clutch cover, clutch disc (MTX) | Installation Note..... page B2-29 |
| Service..... Section H | |
| 3. Flywheel (MTX) | |
| Removal Note..... below | |
| Installation Note..... page B2-29 | |



Removal note Flywheel (MTX)

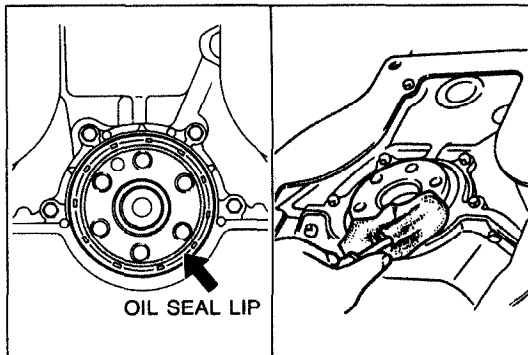
1. Hold the flywheel with the **SST** or equivalent.
2. Remove the flywheel lock bolts.
3. Remove the flywheel.



23U0B2-052

Drive plate (ATX)

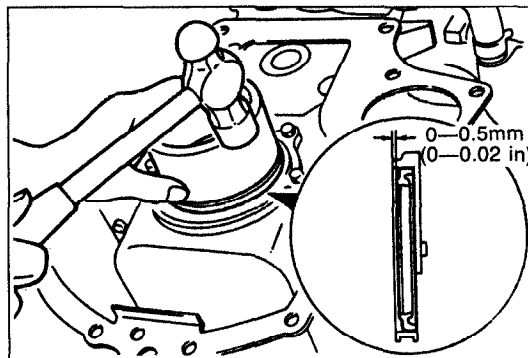
1. Hold the drive plate with the **SST** or equivalent.
2. Remove the drive plate lock bolts.
3. Remove the backing plate, drive plate, and adapter.



05U0BX-063

Oil seal

1. Cut the oil seal lip with a razor knife.
2. Remove the oil seal with a screwdriver protected with a rag.



05U0BX-069

Installation note

Oil seal

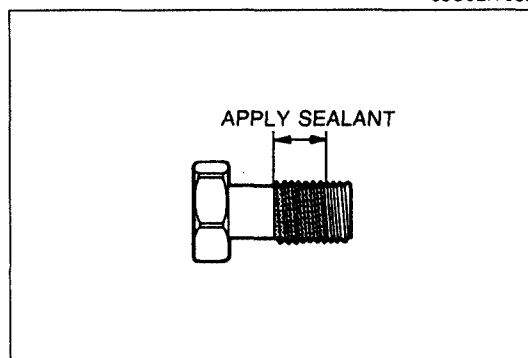
1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution

- The oil seal must be tapped in until it is flush with the edge of the rear cover.

3. Tap the oil seal in evenly with a suitable pipe and a hammer.

Oil seal outer diameter: 100mm (3.94 in)



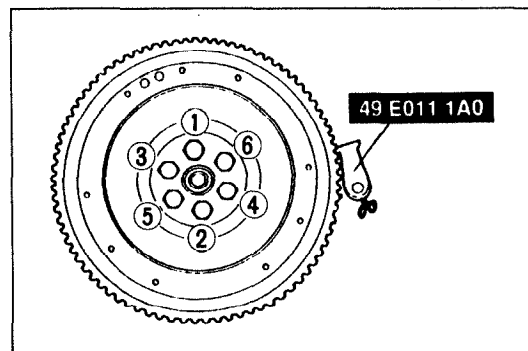
03U0B2-045

Flywheel (MTX)

1. Remove the sealant from the flywheel bolt holes in the crankshaft and from the flywheel bolts.

Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- Do not apply sealant if a new bolt is used.

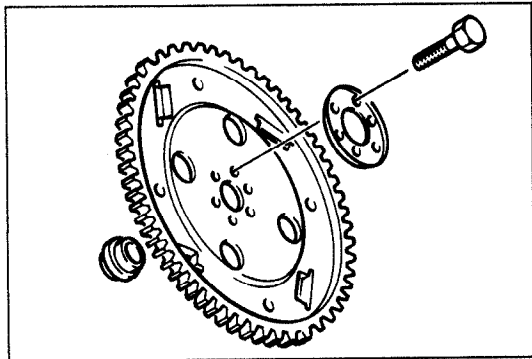


23U0B2-053

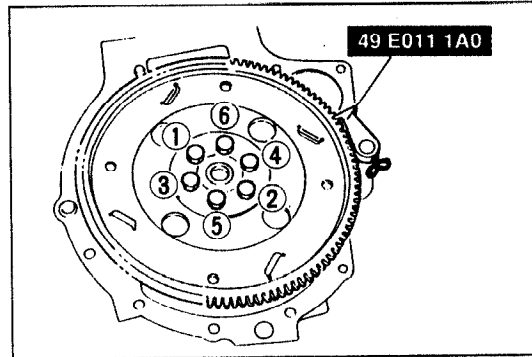
2. Set the flywheel onto the crankshaft.
3. Apply sealant to the flywheel bolts and install them.
4. Hold the flywheel with the **SST** or equivalent.
5. Tighten the bolts in two or three steps in the order shown in the figure.

Tightening torque:

96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)



03U0B2-046



23U0B2-054

Drive plate (ATX)

1. Remove the sealant from the drive plate holes in the crankshaft and from the drive plate lock bolts.

Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- Do not apply sealant if a new bolt is used.

2. Set the adapter, drive plate, and backing plate onto the crankshaft.
3. Apply sealant to the drive plate bolts and install them.
4. Hold the drive plate with the **SST** or equivalent.
5. Tighten the bolts in two or three steps in the order shown in the figure.

Tightening torque:

96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)

Steps After Installation

1. Connect the negative battery cable.
2. Start the engine and perform engine adjustments as necessary.

05U0BX-072

REMOVAL

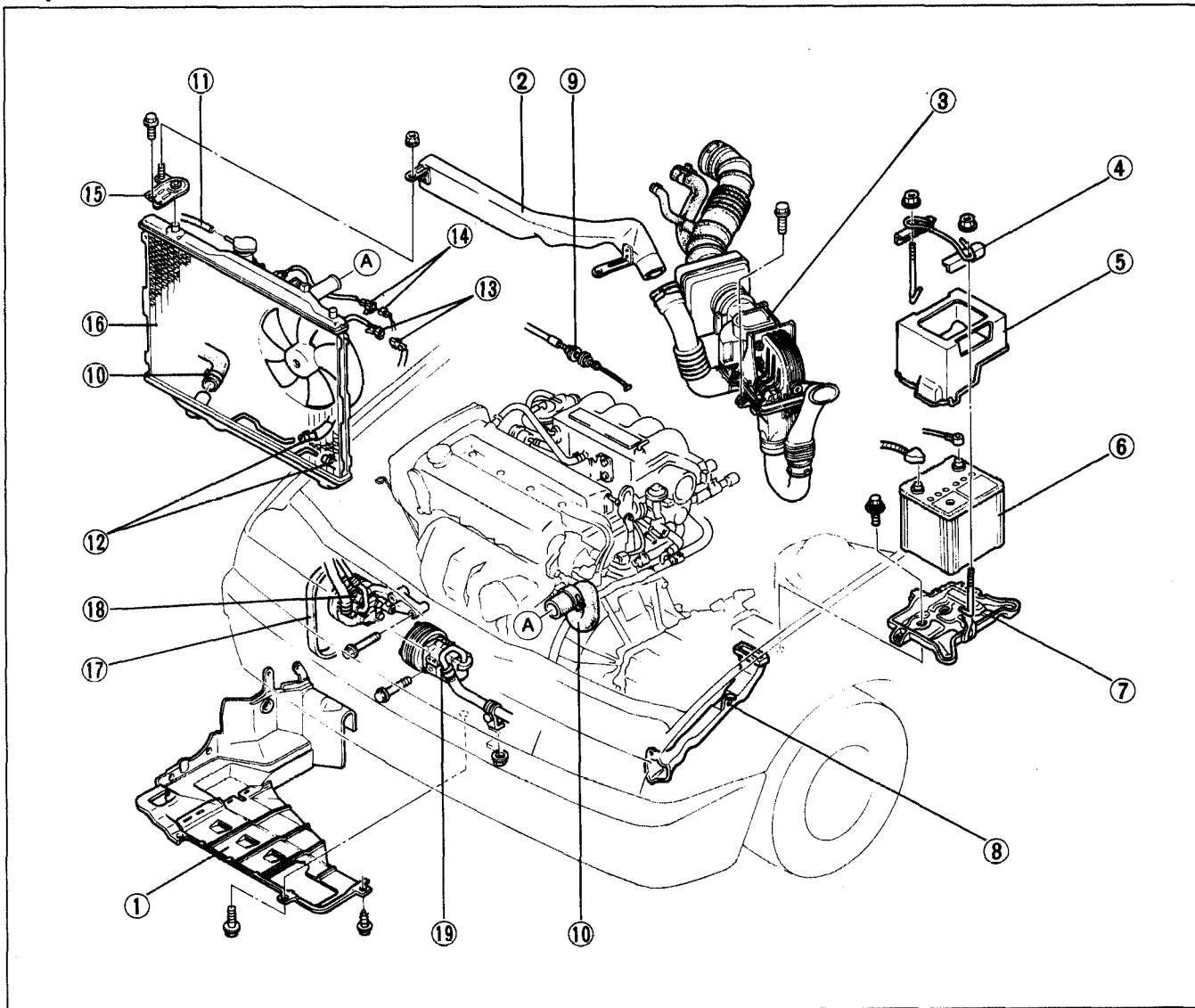
Warning

- Release the fuel pressure. (Refer to Section F.)

PROCEDURE

1. Disconnect the negative battery cable.
2. Drain the engine coolant and transaxle oil.
3. Remove in the order shown in the figure, referring to **Removal Note**.

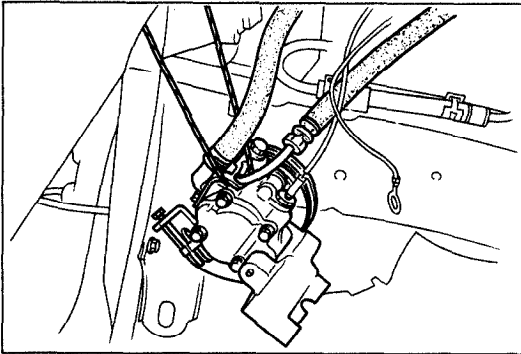
Step 1



23U0B2-028

- | | |
|------------------------------|---------------------------------------|
| 1. Undercover and side cover | 12. Oil cooler hose (ATX) |
| 2. Resonance chamber | 13. Cooling fan connector |
| 3. Air cleaner assembly | 14. Radiator switch connector (ATX) |
| 4. Battery bracket | 15. Radiator bracket |
| 5. Battery cover | 16. Radiator and cooling fan assembly |
| 6. Battery | 17. P/S and/or A/C drive belt |
| 7. Battery carrier | Removal page B2- 6 |
| 8. Battery duct | 18. P/S oil pump and bracket |
| 9. Accelerator cable | Removal Note..... page B2-32 |
| 10. Radiator hose | 19. A/C compressor (if equipped) |
| 11. Coolant reservoir hose | Removal Note..... page B2-32 |

REMOVAL



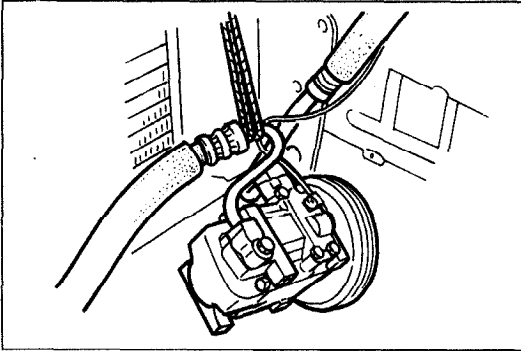
03U0B2-049

Removal note P/S oil pump and bracket

Caution

- Do not damage the hoses.

1. Remove the P/S oil pump and bracket with the hoses still connected.
2. Position the pump away from the engine and affix it with wire.



23U0B2-029

A/C compressor (if equipped)

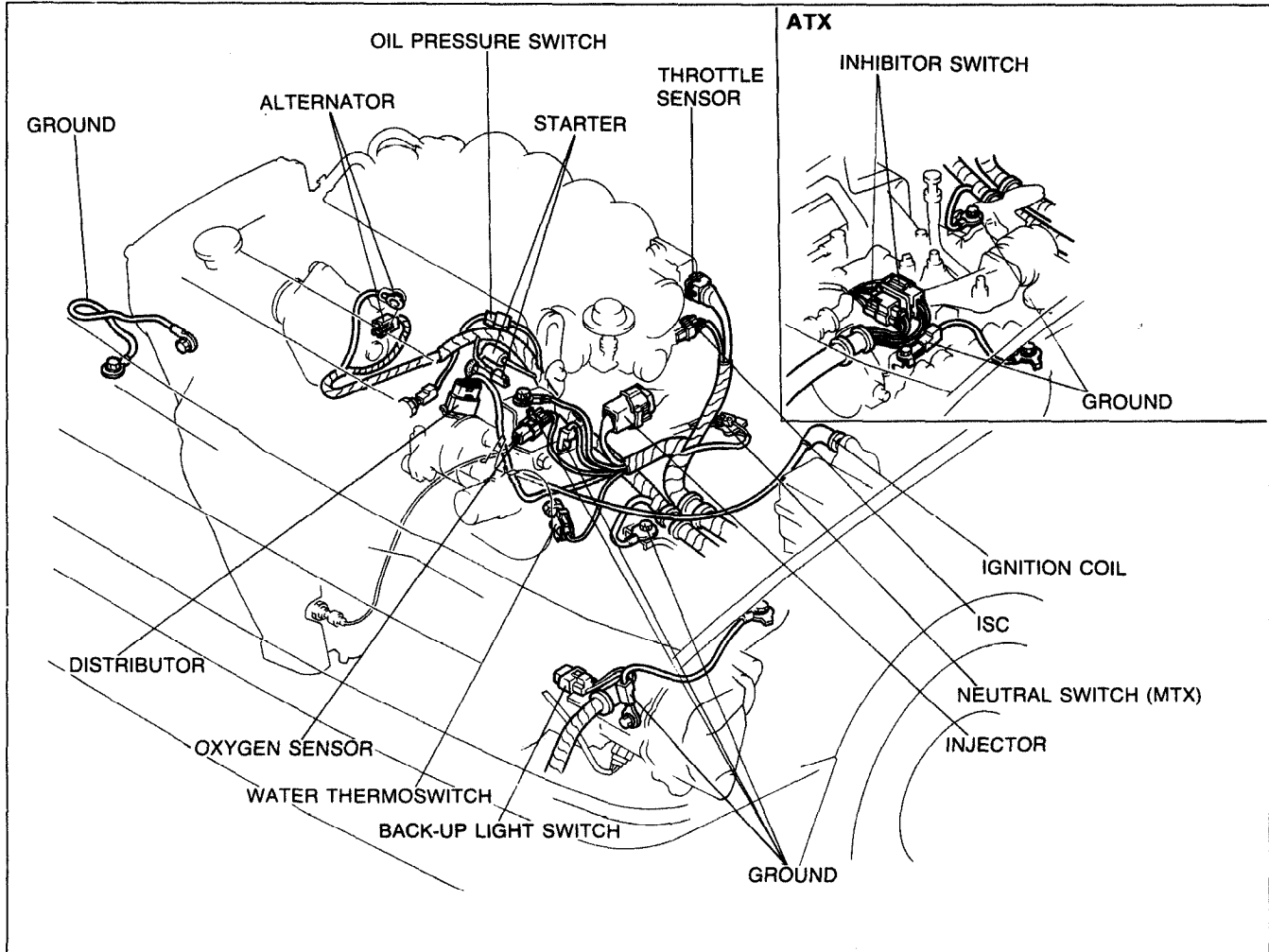
Caution

- Do not damage the hoses.

1. Remove the A/C compressor with the hoses still connected.
2. Position the compressor away from the engine and affix it with wire.

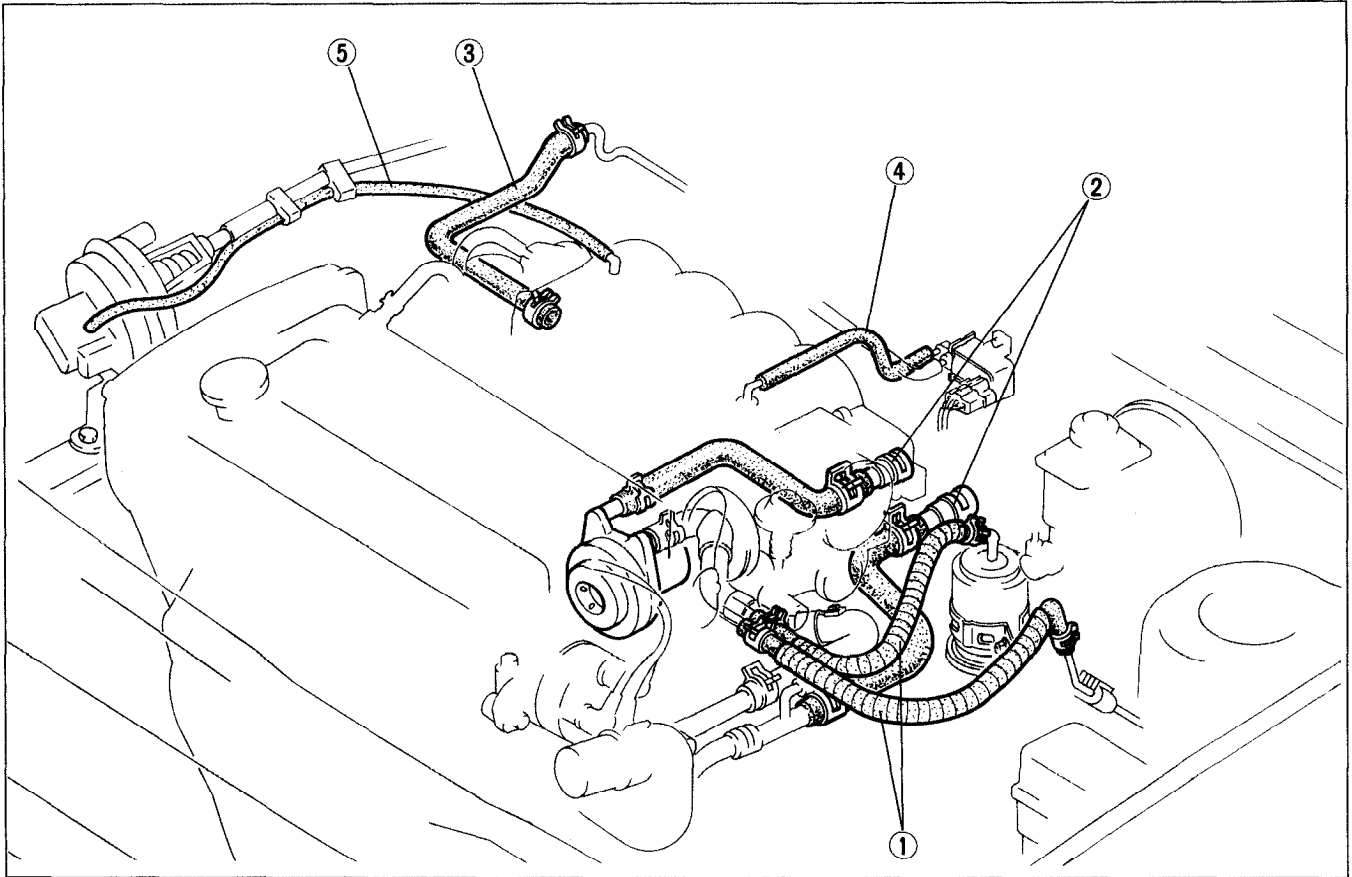
Step 2

1. Disconnect the harness connectors shown in the figure.



Step 3

1. Disconnect the hoses shown in the figure.



13U0B2-017

1. Fuel hose

Removal Note below

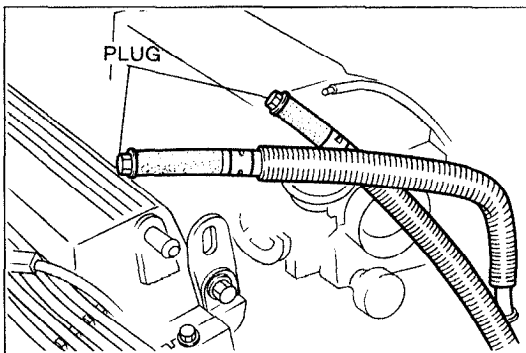
2. Heater hose

Removal Note below

3. Brake vacuum hose

4. Vacuum hose (Purge control)

5. Vacuum hose (Cruise control)



05U0BX-078

Removal note

Fuel hose

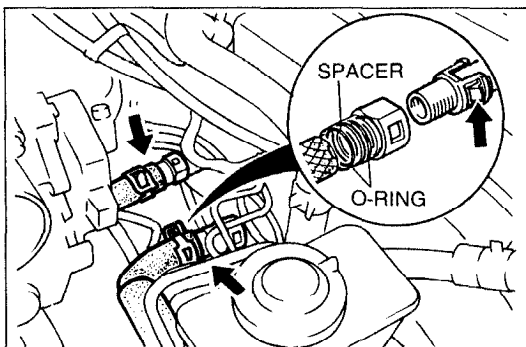
Warning

- Keep sparks and open flame away from the fuel area.

Caution

- Cover the hose with a rag because fuel will spray out when disconnecting.
- Plug the disconnected hoses to avoid fuel leakage.

1. Disconnect the fuel hoses.



03U0B2-052

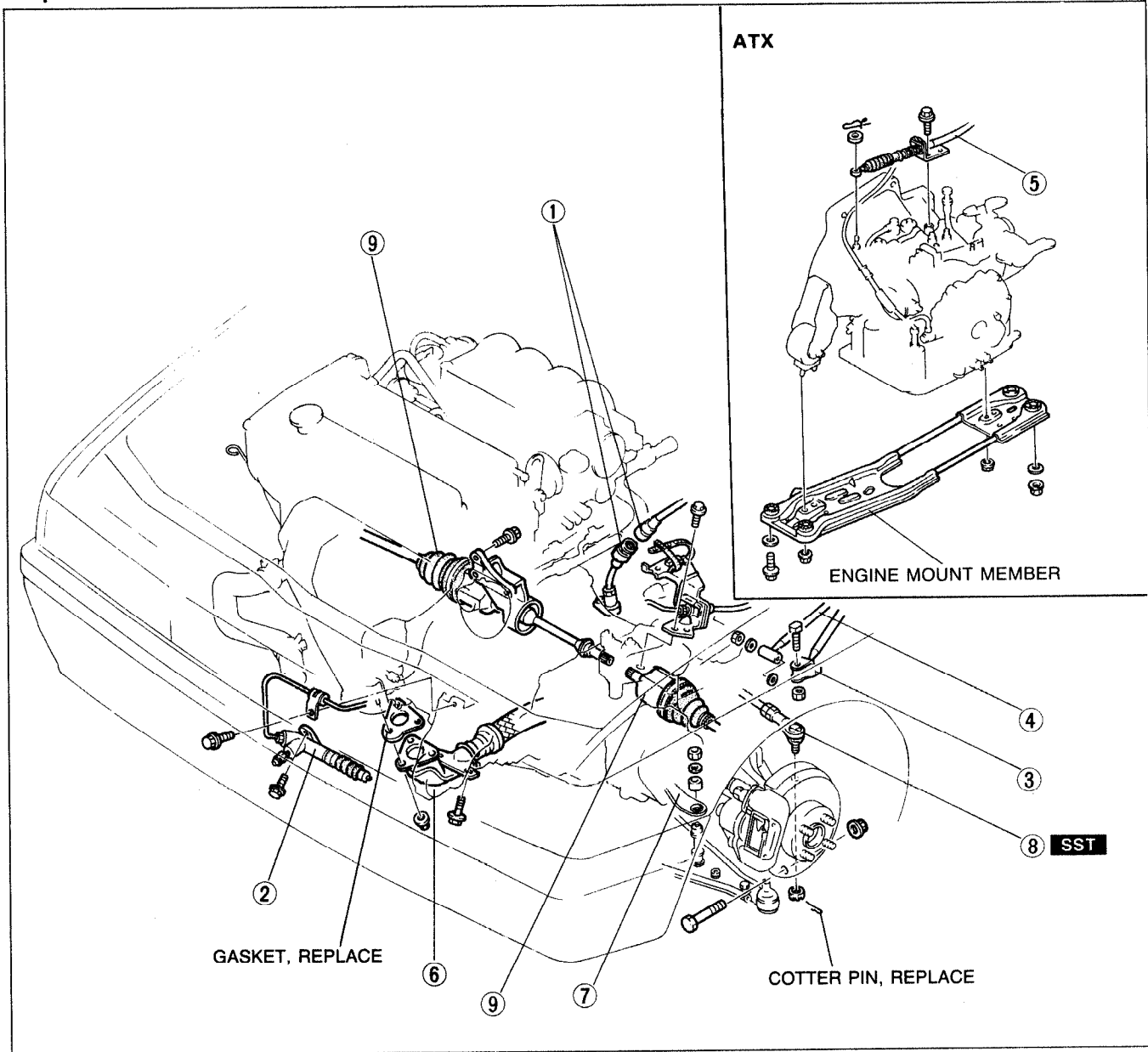
Heater hose

Caution

- Heater hose joint has O-rings and spacer.
- Do not lose them when removing.

1. Push the heater hose retainer and remove the heater hose.

Step 4



ATX

ENGINE MOUNT MEMBER

13U0B2-018

- | | |
|----------------------------------|------------------------------|
| 1. Speedometer cable | 6. Exhaust pipe |
| 2. Clutch release cylinder (MTX) | 7. Stabilizer |
| Removal Note below | 8. Tie-rod end |
| 3. Shift control rod (MTX) | Removal Note..... page B2-35 |
| 4. Extension bar (MTX) | 9. Driveshaft |
| 5. Shift control cable (ATX) | Removal Note..... page B2-35 |

Removal note

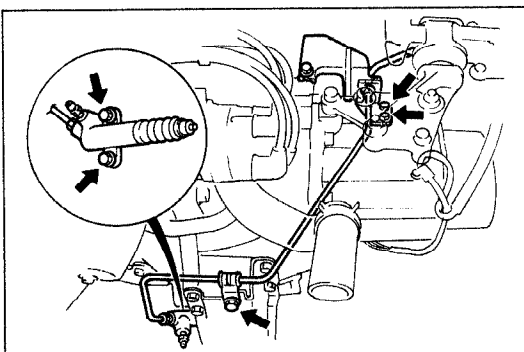
Clutch release cylinder (MTX)

1. Remove the release cylinder pipe bracket from the transaxle.

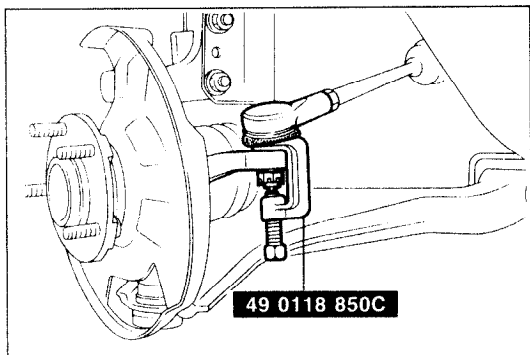
Caution

- Do not damage the pipe or hose.

2. Position the release cylinder away from the transaxle for easier removal with the hose still connected.



13U0B2-019



13U0B2-020

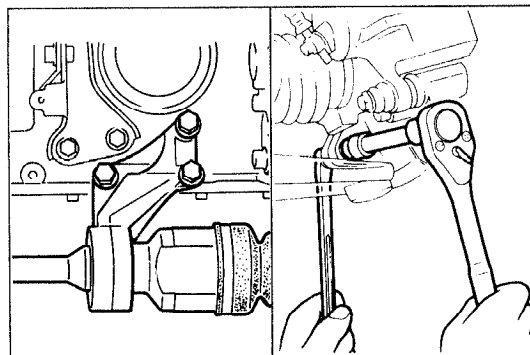
Tie-rod end

1. Remove the cotter pin and loosen the nut so that it flushes with the ball joint edge.

Caution

- Do not reuse the cotter pin.

2. Separate the knuckle arm and ball joint with the **SST**.



03U0B2-056

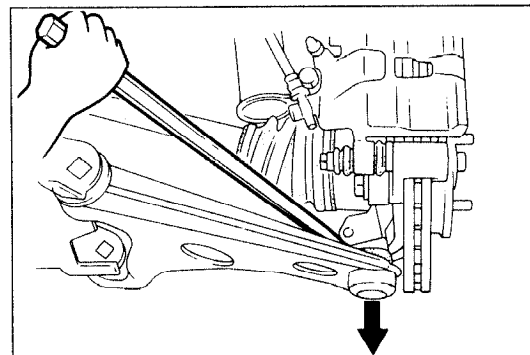
Driveshaft

1. Remove the joint shaft.
2. Remove the bolts and nuts at the left and right lower arm ball joints.

Caution

- Do not damage the ball joint dust boots.

3. Pull the lower arm downward to separate them from the knuckles.



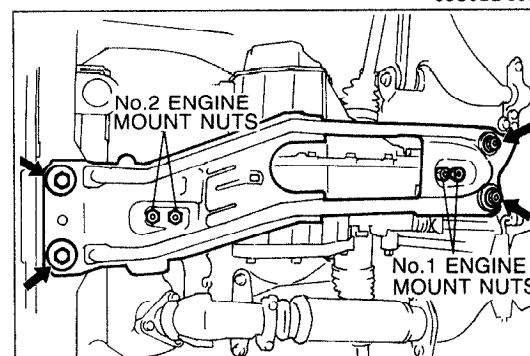
03U0B2-057

4. Remove the engine mount member. (ATX)

Caution

- Support the engine before removing the member.

- (1) Suspend the engine with a chain block.
- (2) Remove the No.1 and No.2 engine mount nuts.
- (3) Remove the engine mount member bolts and nuts and remove the engine mount member.

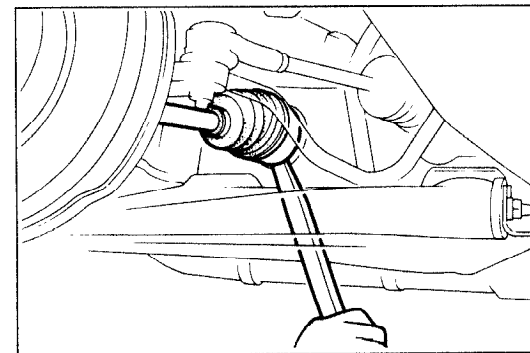


13U0B2-021

Caution

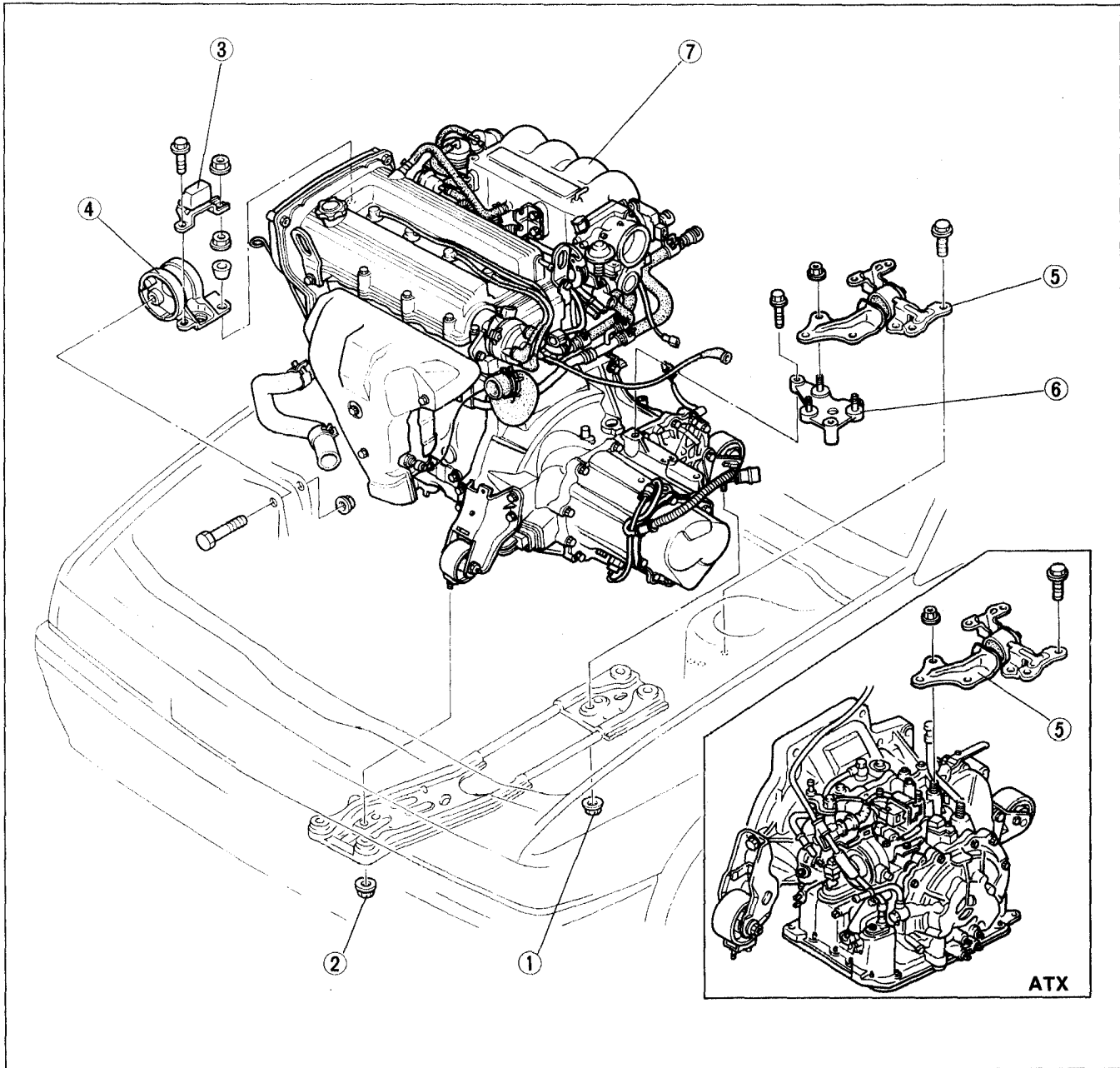
- Do not damage the oil seal.

5. Separate the driveshafts from the transaxle by prying with a bar inserted between the shaft and the case.



03U0B2-059

Step 5

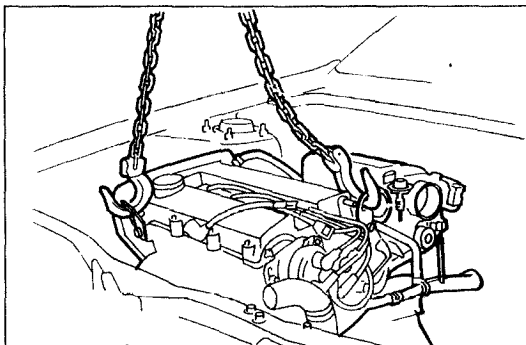


13U0B2-022

- 1. No.1 engine mount nuts (MTX)
- 2. No.2 engine mount nuts (MTX)
- 3. Dynamic damper
- 4. No.3 engine mount rubber

- 5. No.4 engine mount rubber and bracket
- 6. Engine support bracket (MTX)
- 7. Engine and transaxle assembly

Removal Note below



03U0B2-061

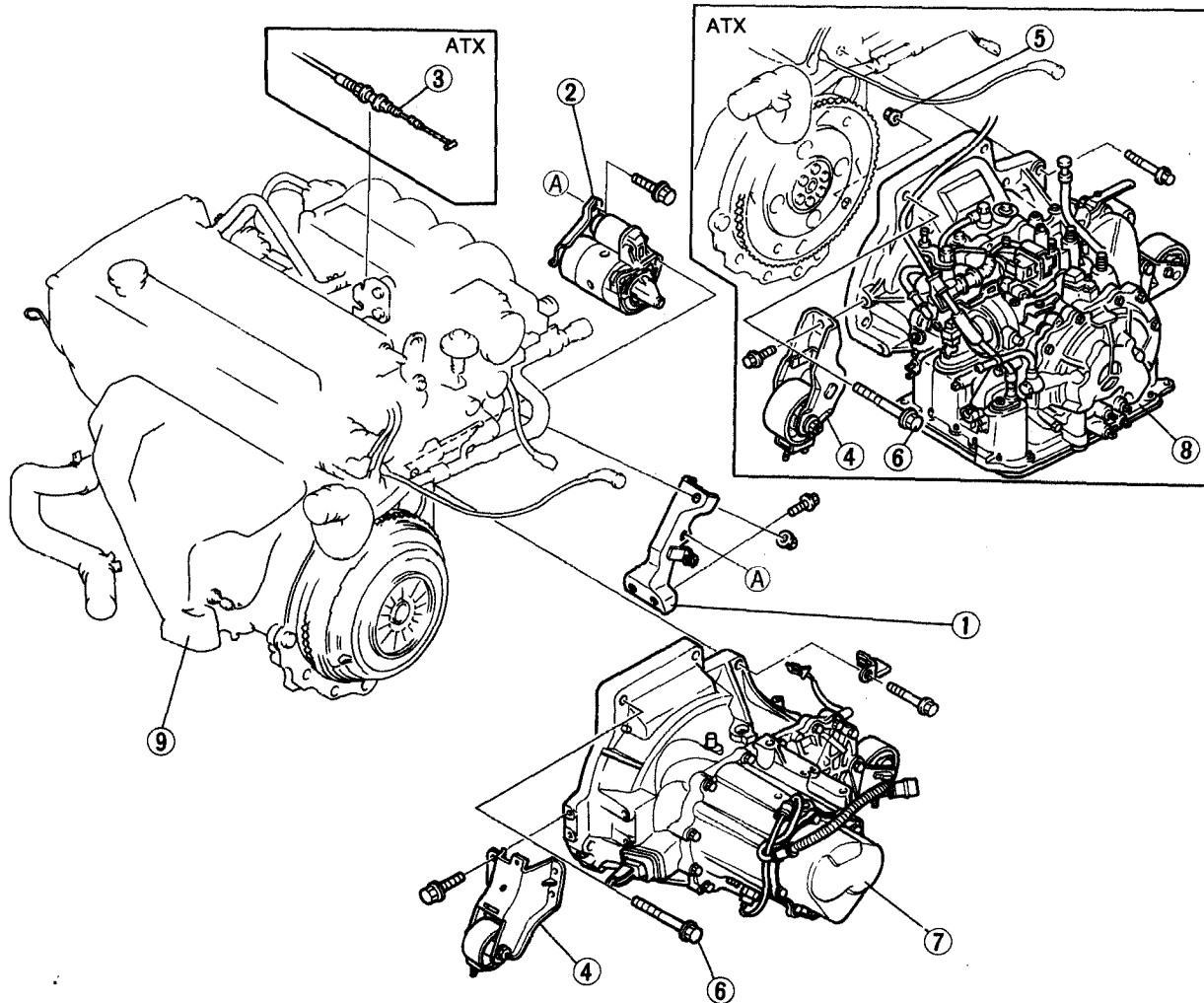
Removal note Engine and transaxle assembly

Caution

- Do not damage any components in the engine compartment.

- 1. Lift the engine and transaxle assembly out as a unit.

Step 6



- 1. Intake manifold bracket
- 2. Starter
- 3. Throttle cable (ATX)
- 4. No.2 engine mount rubber and bracket
- 5. Torque converter nuts (ATX)

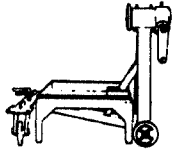
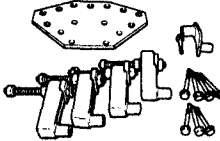
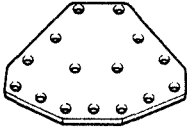



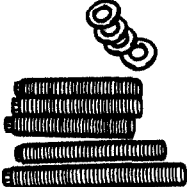

- 6. Transaxle mounting bolts
- 7. Manual transaxle
- 8. Automatic transaxle
- 9. Engine assembly

03U0B2-062

ENGINE STAND MOUNTING

PREPARATION

SST

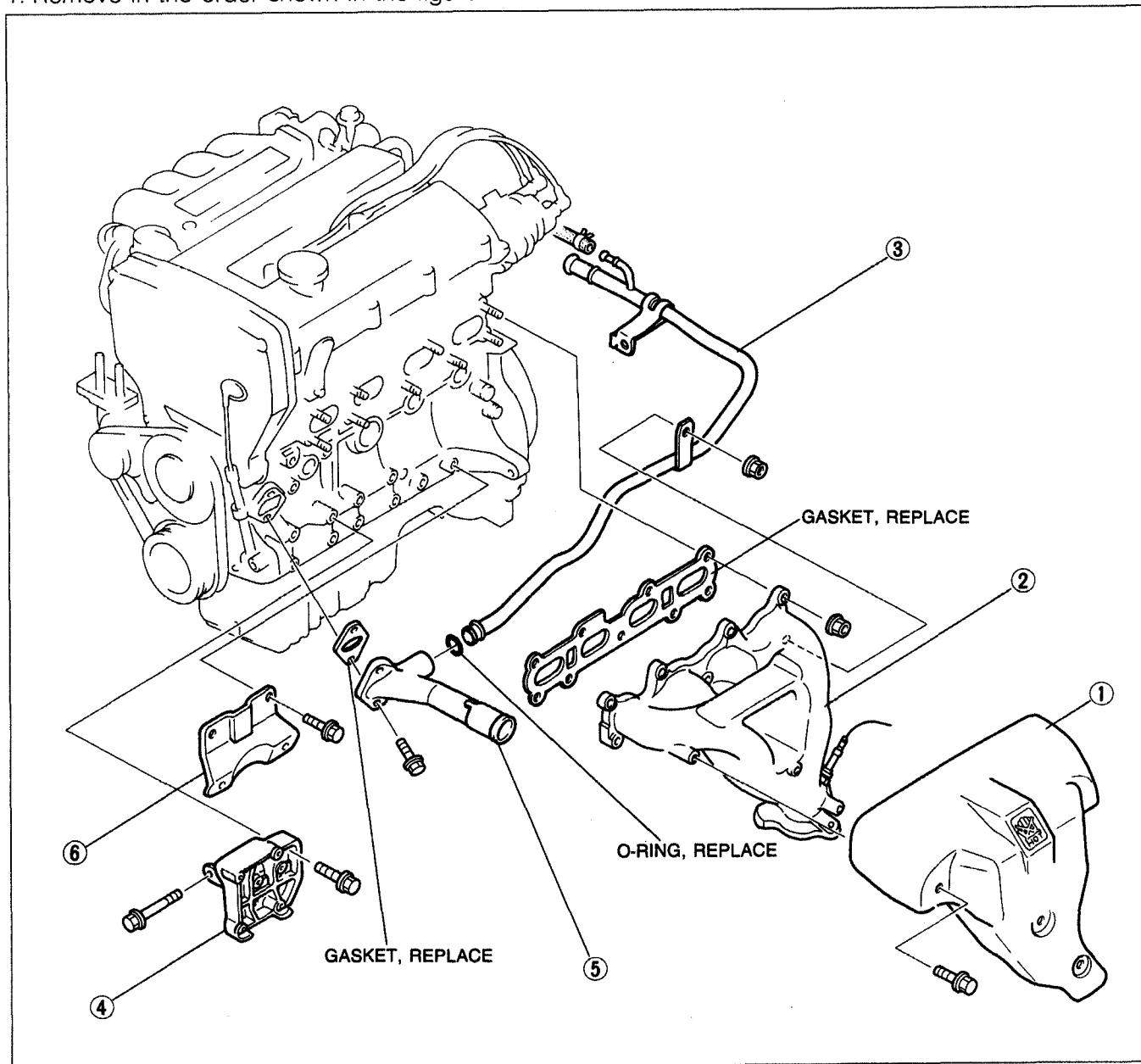
<p>49 0107 680A Engine stand</p> 	<p>For disassembly and assembly of engine</p>	<p>49 L010 1A0 Hanger set, engine stand</p> 	<p>For disassembly and assembly of engine</p>
<p>49 L010 101 Plate (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>	<p>49 L010 102 Arms (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>
<p>49 L010 103 Hooks (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>	<p>49 L010 104 Nuts (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>
<p>49 L010 105 Bolts (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>	<p>49 L010 106 Bolts (Part of 49 L010 1A0)</p> 	<p>For disassembly and assembly of engine</p>

05U0BX-082

PROCEDURE

Step 1

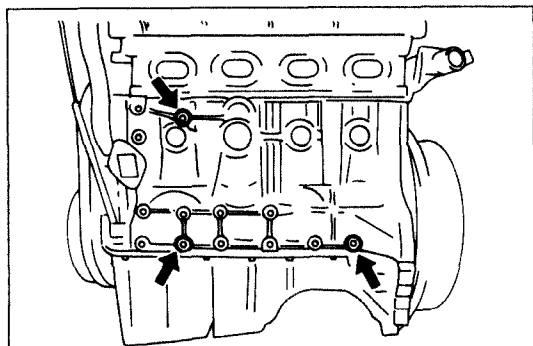
1. Remove in the order shown in the figure.



03U0B2-063

1. Exhaust manifold insulator
2. Exhaust manifold
3. Water bypass pipe

4. A/C compressor bracket (if equipped)
5. Water inlet pipe
6. Exhaust pipe bracket

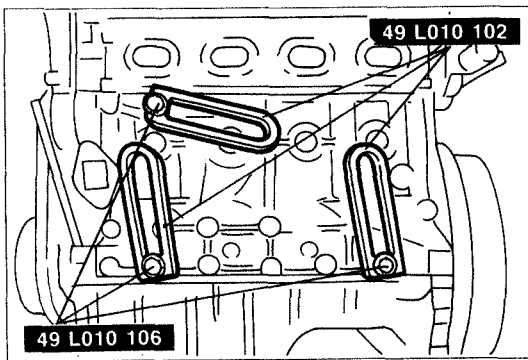


05U0BX-084

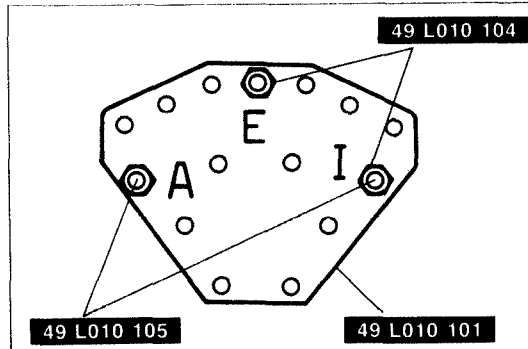
Step 2

Caution

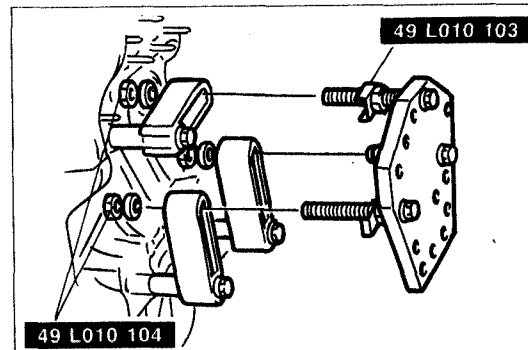
- When installing the SST (engine hanger), use the holes shown in the figure.



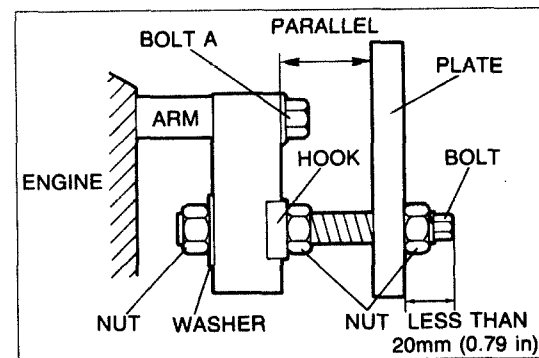
05U0BX-085



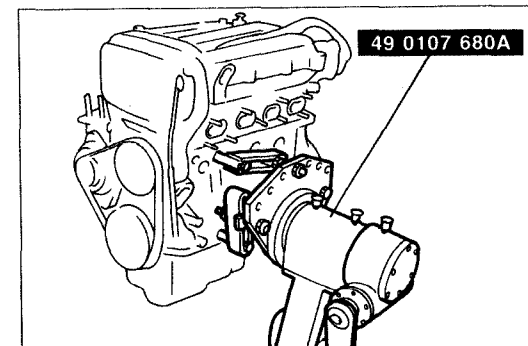
05U0BX-086



05U0BX-087



05U0BX-088



05U0BX-089

1. Install the **SST (arms)** to the holes as shown in the figure, and loosely tighten the **SST (bolts)**.

2. Assemble the **SST (bolts and plate)** in the specified position.

3. Assemble the **SST (nuts, hooks, and bolts)**.

4. Install the **SST** to the respective arms.

Note

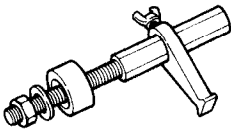
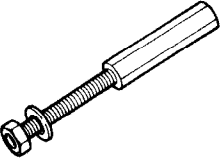


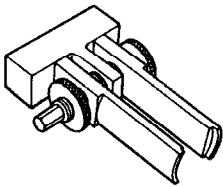
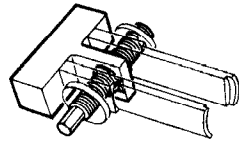
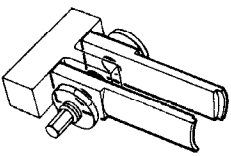
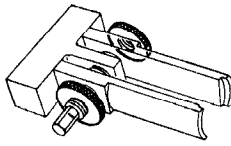
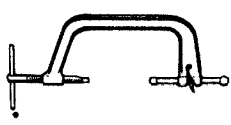
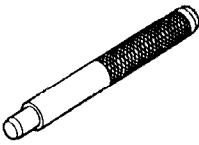
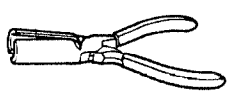
- Adjust the **SST (bolts)** so that less than 20mm (0.79 in) of thread is exposed.
- Make the **SST (plate and arms)** parallel by adjusting the **SST (bolts and nuts)**.

5. Tighten the **SST (bolts and nuts)** to affix the **SST** firmly.

6. Mount the engine on the **SST (engine stand)**.

DISASSEMBLY

PREPARATION
SST

<p>49 E011 1A0 Ring gear brake set</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 103 Shaft (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 104 Collar (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 105 Stopper (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 B012 0A2 Pivot, valve spring lifter</p> 	<p>For removal / installation of valves</p>	<p>49 B012 012 Body (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>
<p>49 B021 013 Foot (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>	<p>49 B012 014 Locknut (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>
<p>49 0636 100A Arm, valve spring lifter</p> 	<p>For removal and installation of valves</p>	<p>49 0221 061A Remover & installer, piston pin</p> 	<p>For removal and installation of piston pins</p>
<p>49 S120 170 Remover, valve seal</p> 	<p>For removal of valve seals</p>	<p>23U0B2-030</p>	

1. Code all identical parts (such as piston, piston rings, connecting rods, and valve springs) so that they can be reinstalled in the cylinder from which they were removed.
2. Clean the parts with a steam cleaner. Blow off any remaining water with compressed air.

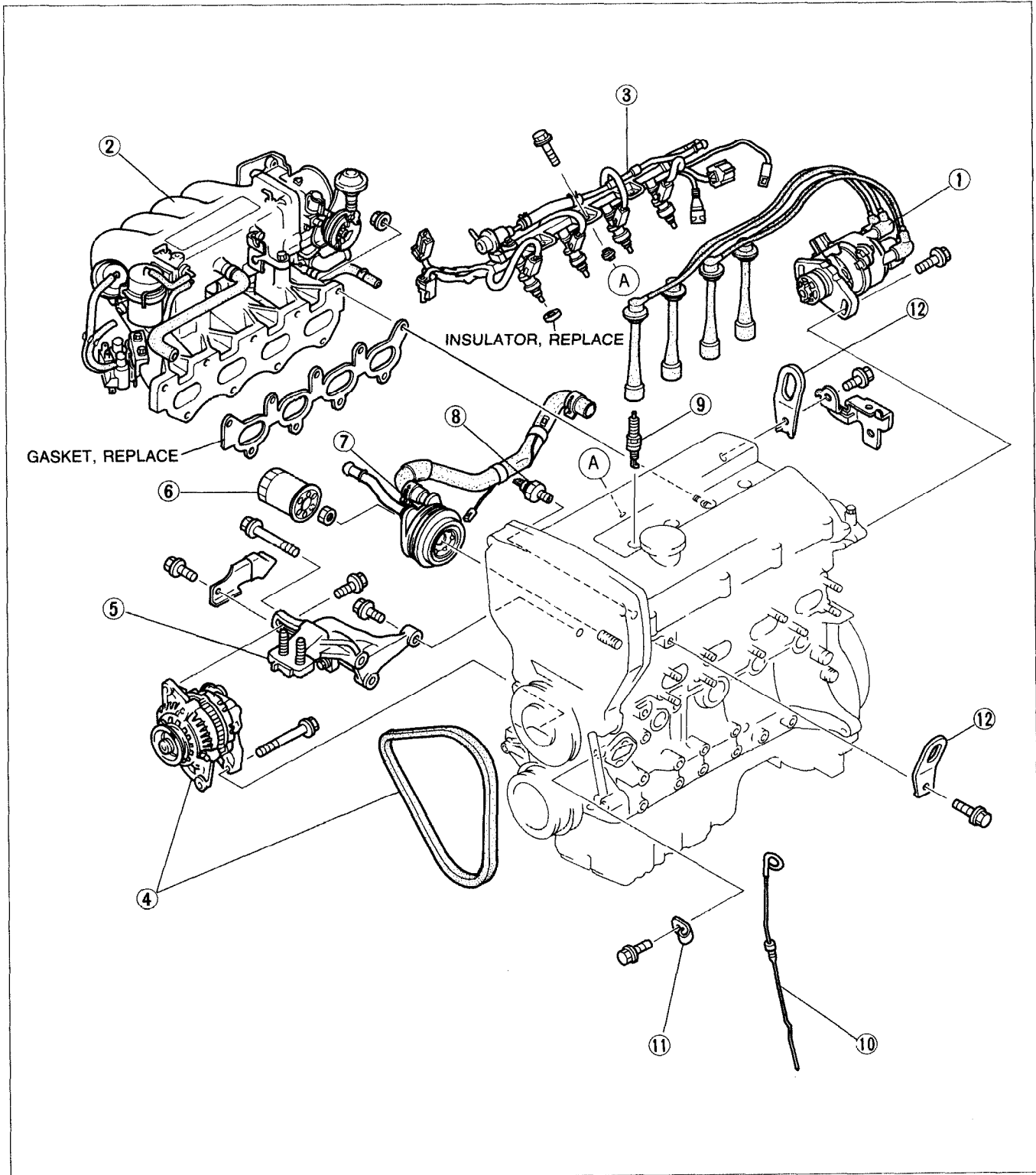
Note

- During disassembly of any part or system, be sure to study its order of assembly. Also, note any deformation, wear, or damage.

05U0BX-091

AUXILIARY PARTS

1. Drain the engine oil.
2. Disassemble in the order shown in the figure.

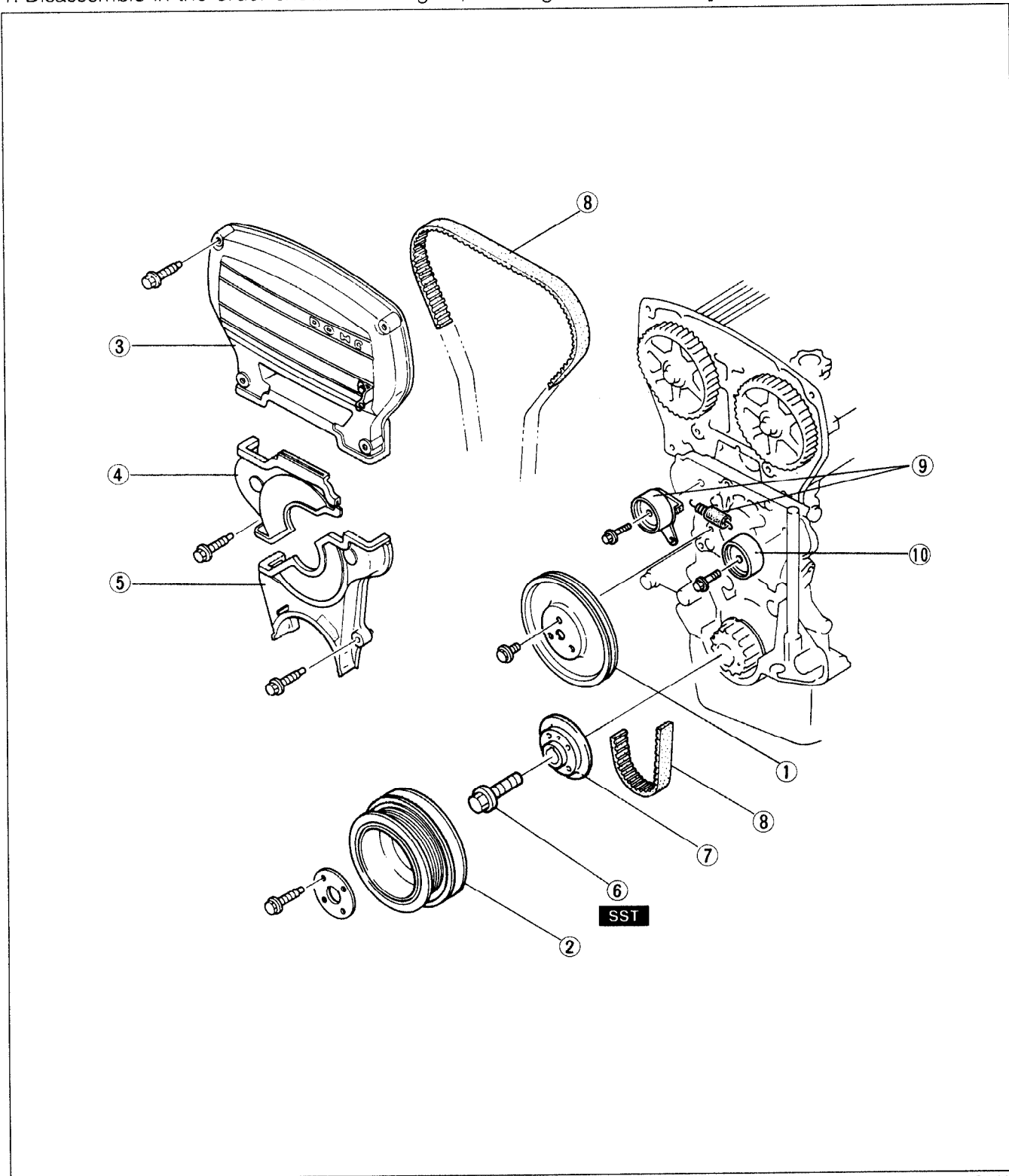


03U0B2-064

- | | |
|--|-------------------------------|
| 1. Distributor and high-tension lead | 7. Oil cooler |
| 2. Intake manifold assembly | 8. Oil pressure switch |
| 3. Injector and distribution pipe assembly | 9. Spark plug |
| 4. Alternator and drive belt | 10. Oil level gauge |
| 5. No.3 engine mount bracket | 11. Oil level gauge pipe stay |
| 6. Oil filter | 12. Engine hanger |

TIMING BELT

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.

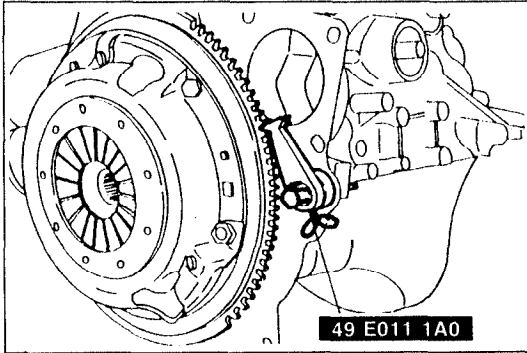


23U0B2-031

- 1. Water pump pulley
- 2. Crankshaft pulley
- 3. Timing belt cover, upper
- 4. Timing belt cover, middle
- 5. Timing belt cover, lower
- 6. Pulley lock bolt

Disassembly Note page B2-44

- 7. Pulley boss
- 8. Timing belt
- Disassembly Note page B2-44
- 9. Tensioner and tensioner spring
- 10. Idler

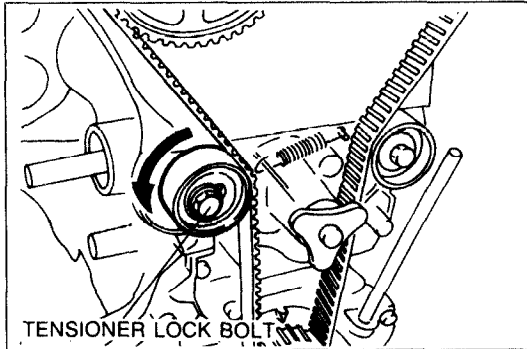


23U0B2-055

Disassembly Note

Pulley lock bolt

1. Hold the flywheel (MTX) or drive plate (ATX) with the **SST** or equivalent.
2. Loosen the pulley lock bolt.
3. Remove the pulley lock bolt.



13E0B2-029

Timing belt

1. Loosen the tensioner lock bolt and using a suitable bar, pry the tensioner outward.

Caution

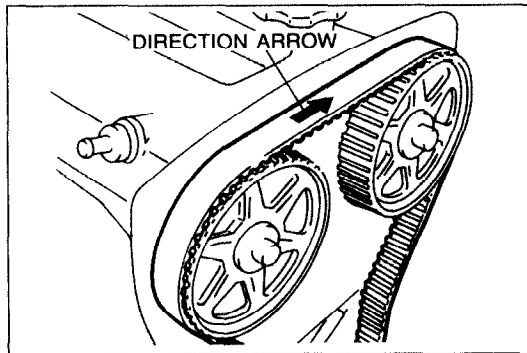
- **Protect the tensioner with a rag before prying.**

2. Tighten the lock bolt with the tensioner spring fully extended.

Note

- **Mark the timing belt rotation for proper reinstallation.**

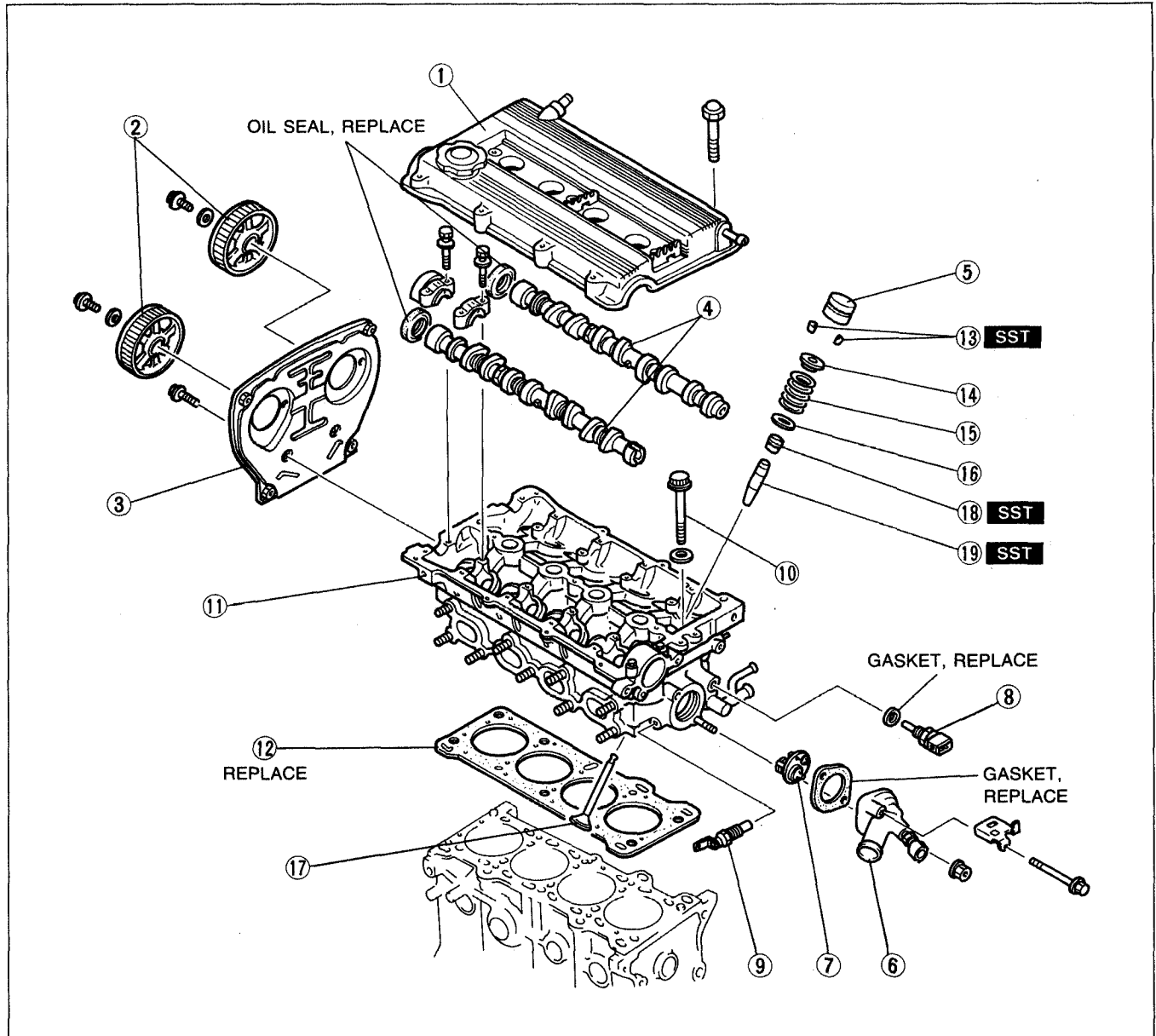
3. Remove the timing belt.



13E0B2-030

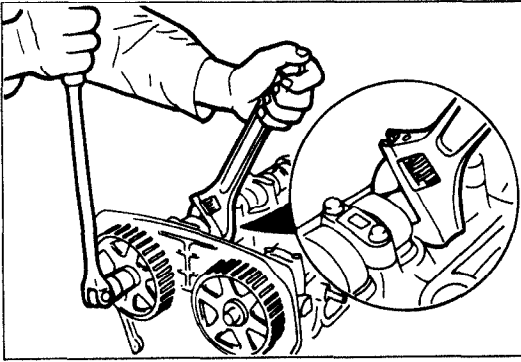
CYLINDER HEAD

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



03U0B2-067

1. Cylinder head cover		11. Cylinder head	
2. Camshaft pulley		Inspection	page B2-54
Disassembly Note	page B2-46	12. Cylinder head gasket	
Inspection	page B2-65	13. Valve keeper	
3. Seal plate		Disassembly Note	page B2-46
4. Camshaft		14. Valve spring seat, upper	
Disassembly Note	page B2-46	15. Valve spring	
Inspection	page B2-58	Inspection	page B2-58
5. HLA		16. Valve spring seat, lower	
Disassembly Note	page B2-46	17. Valve	
Inspection	page B2-60	Inspection	page B2-55
6. Thermostat cover		18. Valve seal	
7. Thermostat		Disassembly Note	page B2-47
8. Water thermostat		Inspect for wear or damage	
9. Heat gauge unit		19. Valve guide	
10. Cylinder head bolt		Inspection	page B2-55
Disassembly Note	page B2-46	Replacement	page B2-56



23U0B2-032

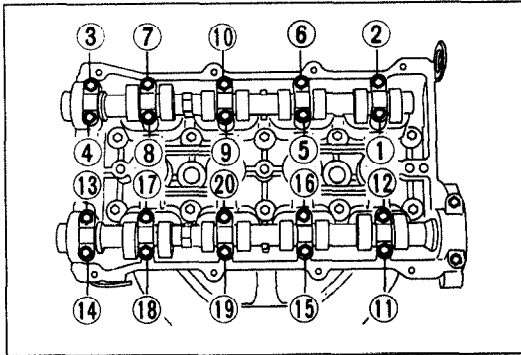
Disassembly Note

Camshaft pulley

1. Hold the camshaft with a wrench at hexagonal portion.
2. Remove the camshaft pulley lock bolt.
3. Remove the camshaft pulley.

Camshaft

1. Loosen the camshaft cap bolts in two or three steps in the order shown in the figure.
2. Remove the camshaft caps.
3. Remove the camshaft.
4. Remove the camshaft oil seal from the camshaft.



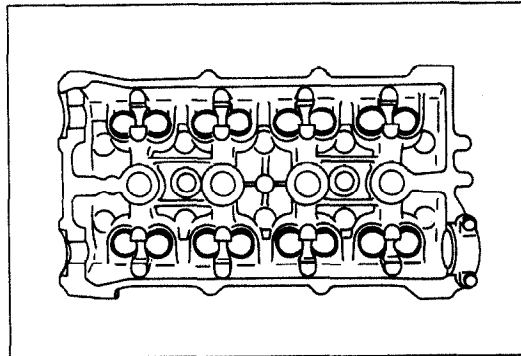
05U0BX-049

HLA

Caution

- Mark the HLA with a felt pen so that they can be reinstalled in the position from which they were removed.

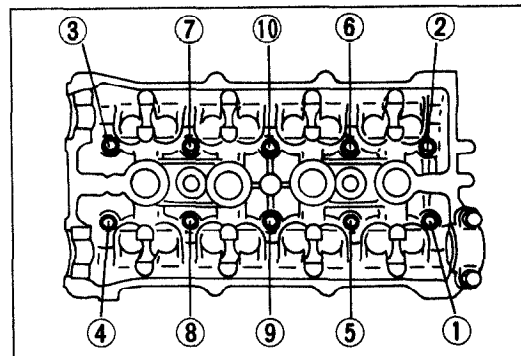
1. Remove the HLA from the cylinder head.



05U0BX-050

Cylinder head bolts

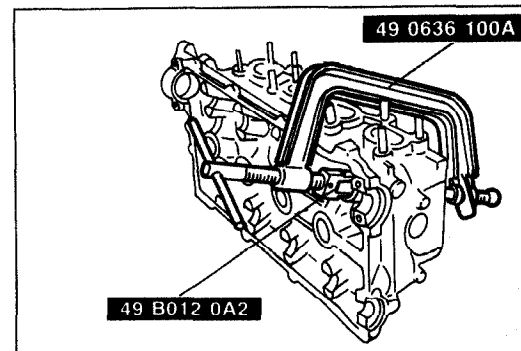
1. Loosen the cylinder head bolts in two or three steps in the order shown in the figure.
2. Remove the cylinder head bolts.



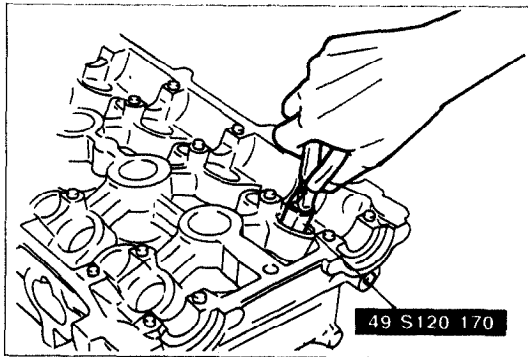
23U0B2-033

Valve keeper

1. Set the **SST** against the upper valve spring seat as shown in the figure.
2. Remove the valve keepers.



05U0BX-101



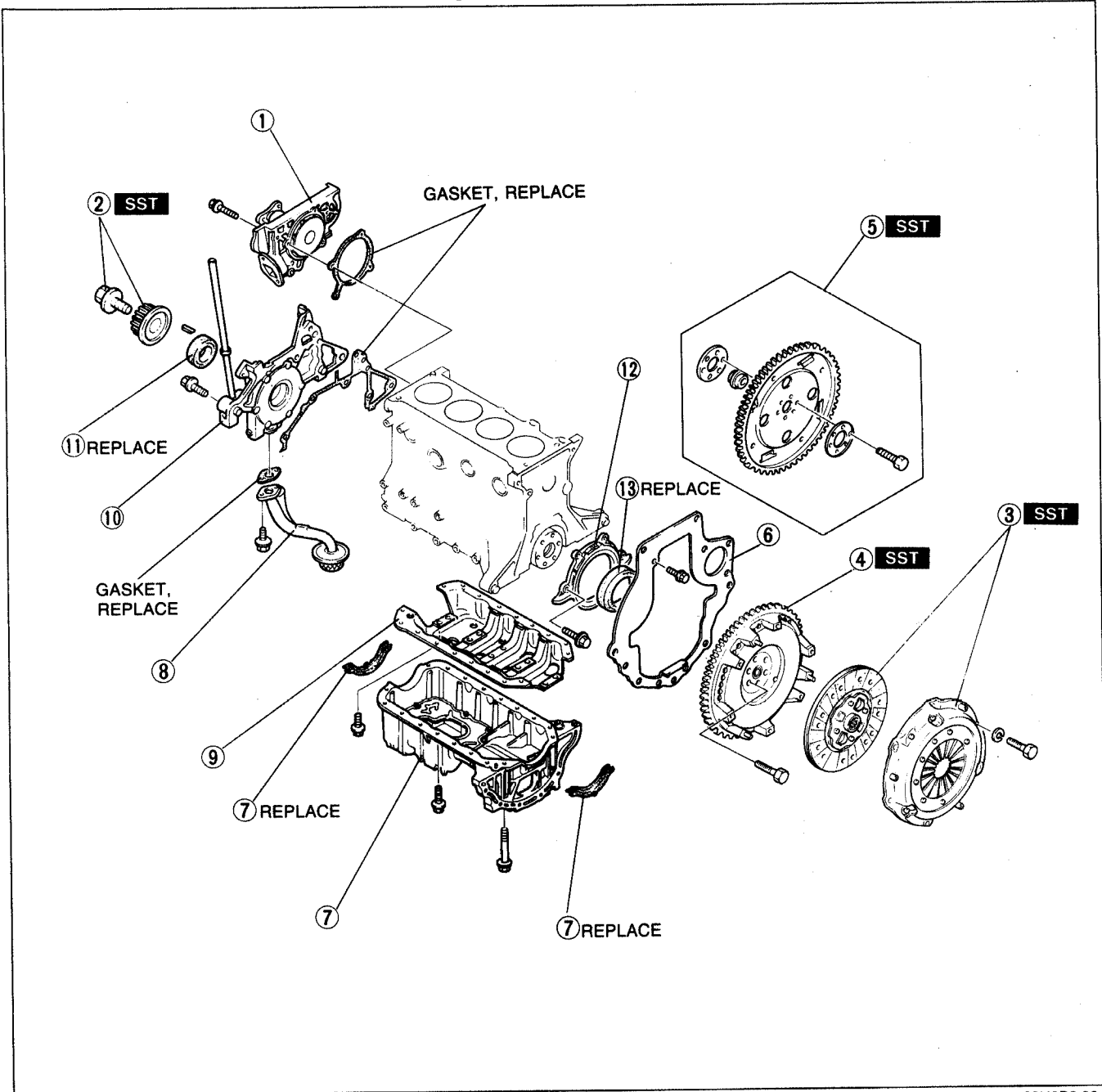
05U0BX-102

Valve seal

1. Remove the valve seal with the **SST**.

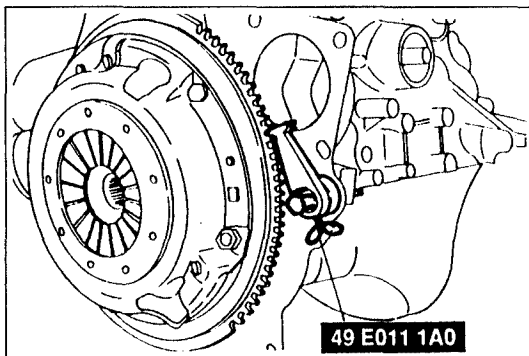
CYLINDER BLOCK (EXTERNAL PARTS)

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



23U0B2-034

- | | |
|---|---|
| 1. Water pump
Service Section E | 7. Oil pan and gasket
Disassembly Note page B2-49
Inspect for damage |
| 2. Timing belt pulley and lock bolt
Disassembly Note page B2-49
Inspection page B2-65 | 8. Oil strainer |
| 3. Clutch cover, clutch disc (MTX)
Service Section H | 9. Main bearing support plate (MBSP)
Disassembly Note page B2-50
Inspect for damage |
| 4. Flywheel (MTX)
Disassembly Note page B2-49
Inspect for wear or damage | 10. Oil pump
Service Section D |
| 5. Backing plate, drive plate, and adapter (ATX)
Disassembly Note page B2-49 | 11. Front oil seal
Disassembly Note page B2-50 |
| 6. End plate | 12. Rear cover |
| | 13. Rear oil seal
Disassembly Note page B2-50 |



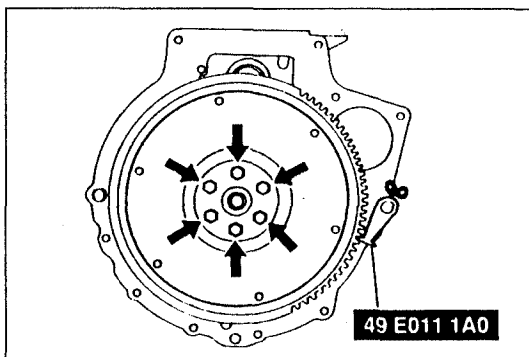
23U0B2-056

Disassembly Note**Timing belt pulley**

1. Hold the flywheel or the drive plate with the **SST** or equivalent.
2. Loosen the pulley lock bolt.
3. Remove the pulley lock bolt.

4. Remove the timing belt pulley.
5. Remove the pulley Woodruff key.

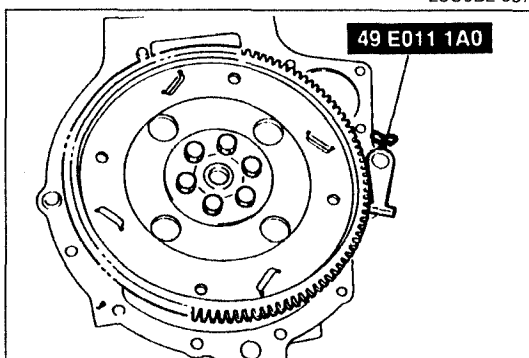
23U0B2-049



23U0B2-057

Flywheel (MTX)

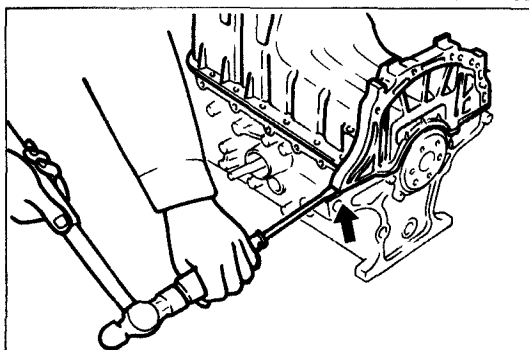
1. Hold the flywheel with the **SST** or equivalent.
2. Remove the flywheel lock bolts.
3. Remove the flywheel.



23U0B2-058

Backing plate, drive plate, and adapter (ATX)

1. Hold the drive plate with the **SST** or equivalent.
2. Remove the drive plate lock bolts.
3. Remove the backing plate, drive plate, and adapter.



03U0B2-073

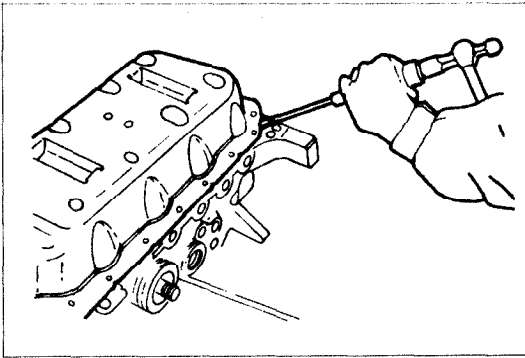
Oil pan

1. Remove the oil pan mounting bolts.

Caution

- Do not force a prying tool between the cylinder block and the oil pan, which may damage the contact surfaces.
- Do not damage or scratch the contact surfaces when removing the old sealant.

2. Insert a screwdriver or a suitable tool only at the points shown in the figure.
3. Remove the oil pan.



03U0B2-074

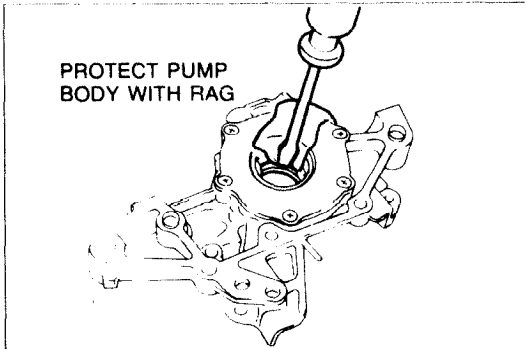
Main bearing support plate (MBSP)

1. Remove the MBSP mounting bolts.

Caution

- Do not damage or scratch the contact surfaces when removing the old sealant.

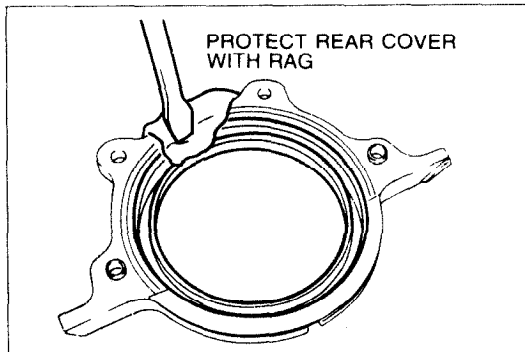
2. Insert a screwdriver or a suitable tool at the points shown in the figure.
3. Remove the MBSP.



05U0BX-107

Front oil seal

1. Remove the oil seal with a screwdriver protected with a rag.



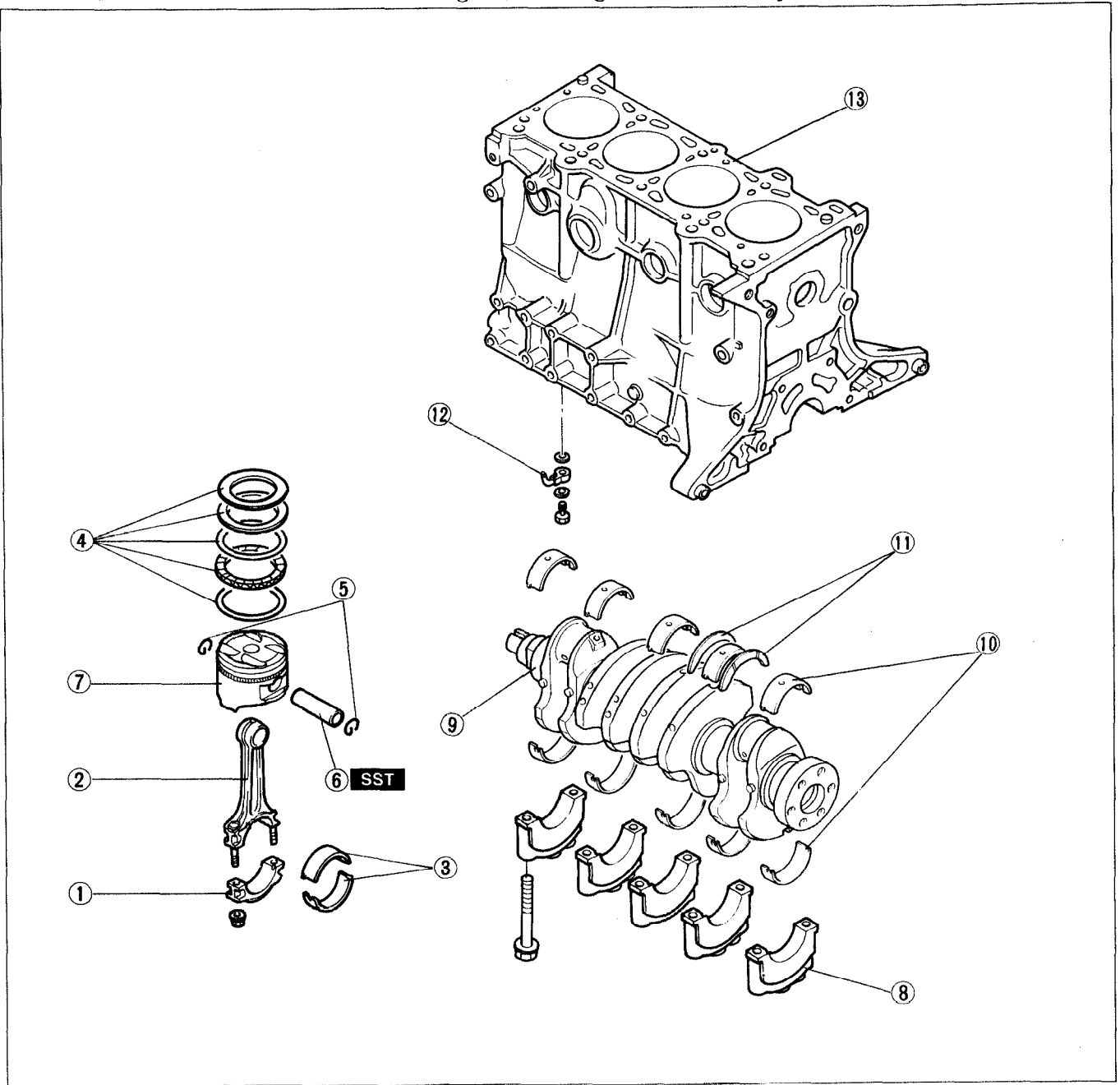
05U0BX-108

Rear oil seal

1. Remove the oil seal with a screwdriver protected with a rag.

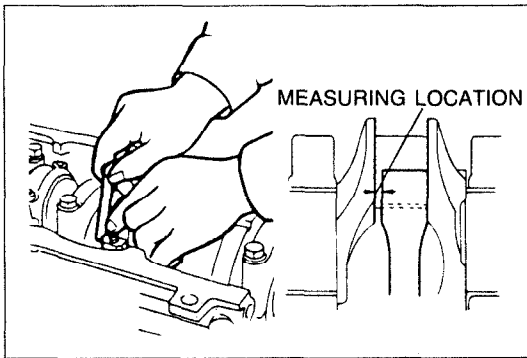
CYLINDER BLOCK (INTERNAL PARTS)

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



03U0B2-075

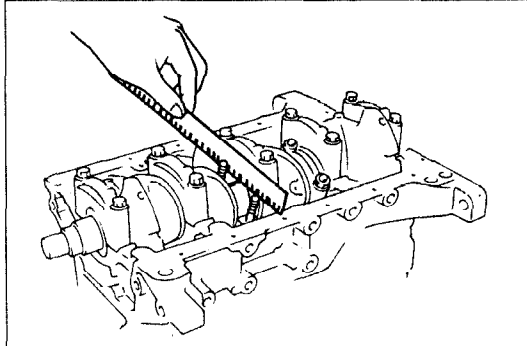
- | | |
|---|---|
| 1. Connecting rod cap
Disassembly Note page B2-52 | 7. Piston
Inspection page B2-62 |
| 2. Connecting rod
Disassembly Note page B2-52
Inspection page B2-63 | 8. Main bearing cap
Disassembly Note page B2-53 |
| 3. Connecting rod bearing
Inspection page B2-64 | 9. Crankshaft
Disassembly Note page B2-53
Inspection page B2-64 |
| 4. Piston ring
Disassembly Note page B2-52
Inspection page B2-62 | 10. Main bearing
Inspection page B2-64 |
| 5. Piston pin clip | 11. Thrust bearing |
| 6. Piston pin
Disassembly Note page B2-52
Inspection page B2-63 | 12. Oil jet
Inspection page B2-61 |
| | 13. Cylinder block
Inspection page B2-60 |



03U0B2-076

Disassembly Note Connecting rod cap

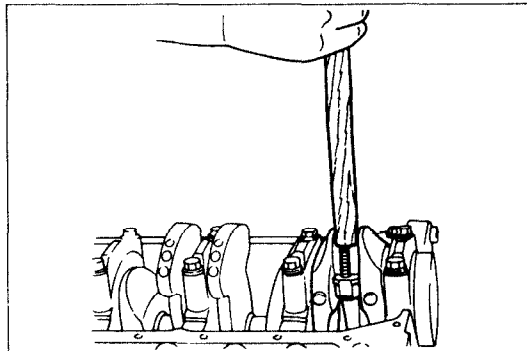
1. Before removing the connecting rod caps, measure the connecting rod side clearance. (Refer to page B2-71.)



03U0B2-077

Connecting rod

1. Before removing the connecting rods, measure the connecting rod oil clearance. (Refer to page B2-71.)



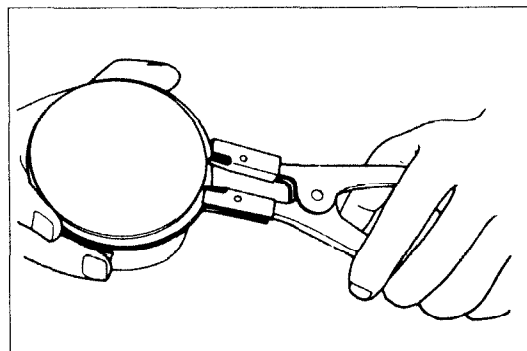
05U0BX-112

2. Remove the Plastigage from the crankpin journals.

Caution

- Do not scratch the crankshaft journal or the cylinder wall.

3. Use the handle of a hammer to remove the piston and connecting rod assembly through the top of the cylinder block.



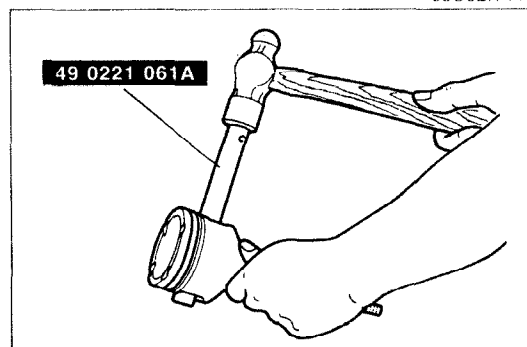
05U0BX-113

Piston ring

Caution

- Do not apply excessive tension, which may cause the rings to snap out.

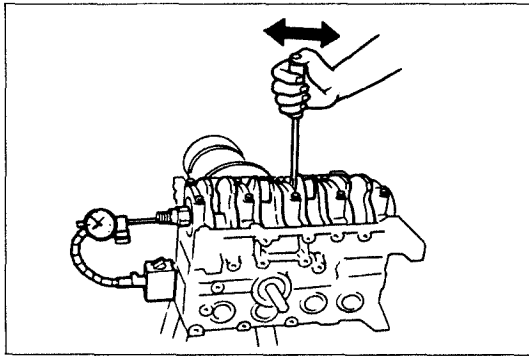
1. Remove the piston rings with a piston ring expander (commercially available).



23U0B2-035

Piston pin

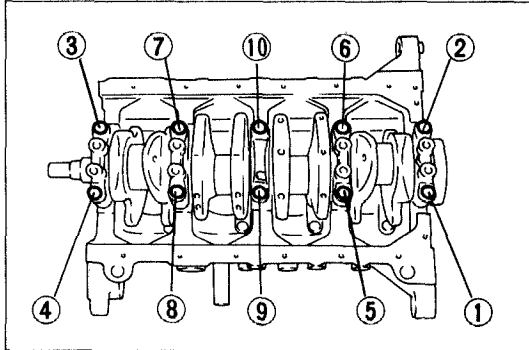
1. Remove the piston pin with the **SST**.



03U0B2-078

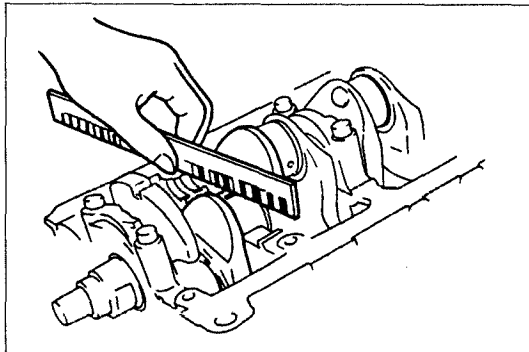
Main bearing cap

1. Before removing the main bearing caps, measure the crankshaft end play. (Refer to page B2-70.)



05U0BX-116

2. Loosen the main bearing cap bolts in two or three steps in the order shown in the figure.
3. Remove the main bearing caps.



03U0B2-079

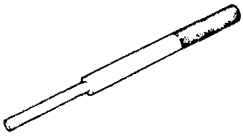
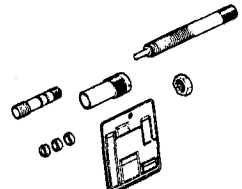
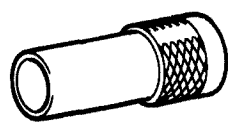
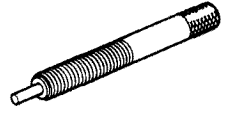

Crankshaft

1. Before removing the crankshaft, measure the main bearing oil clearances. (Refer to page B2-69.)

INSPECTION / REPAIR

PREPARATION

SST

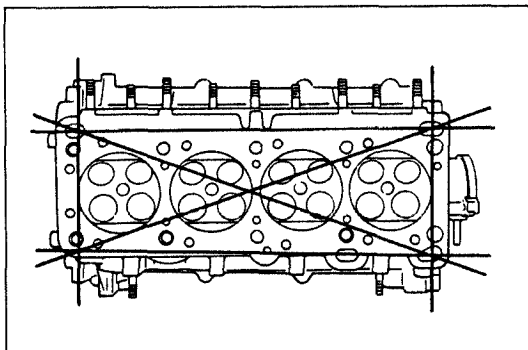
<p>49 B012 005</p> <p>Remover & installer, valve guide</p> 	<p>For removal of valve guide</p>	<p>49 L012 0A0</p> <p>Installer set, valve seal & valve guide</p> 	<p>For installation of valve guide</p>
<p>49 L012 002</p> <p>Body (Part of 49 L012 0A0)</p> 	<p>For installation of valve guide</p>	<p>49 L012 003</p> <p>Installer (Part of 49 L012 0A0)</p> 	<p>For installation of valve guide</p>
<p>49 L012 004</p> <p>Nut (Part of 49 L012 0A0)</p> 	<p>For installation of valve guide</p>	05U0BX-118	

1. Clean all parts, being sure to remove all gasket fragments, dirt, oil or grease, carbon, moisture residue, and other foreign materials.
2. Inspection and repairs must be performed in the order specified.

Caution

- Do not damage the joints or friction surfaces of aluminum alloy components (such as the cylinder head or pistons).

05U0BX-119



03U0B2-162

CYLINDER HEAD

1. Inspect the cylinder head for damage, cracks, and leakage of water and oil. Replace the cylinder head if necessary.
2. Measure the cylinder head distortion in the six directions shown in the figure.

Distortion: 0.10mm (0.004 in) max.

Caution

- Before grinding the cylinder head, check the following and repair or replace the cylinder head as necessary.

Sinking of valve seats

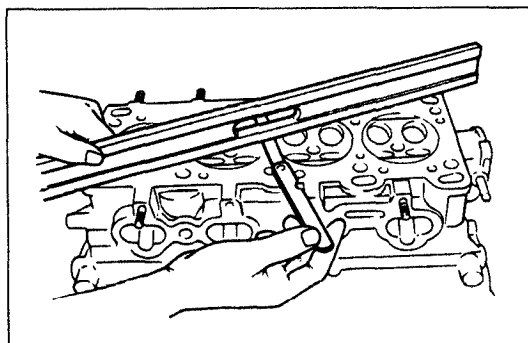
Damage of manifold contact surface

Camshaft oil clearances and end play

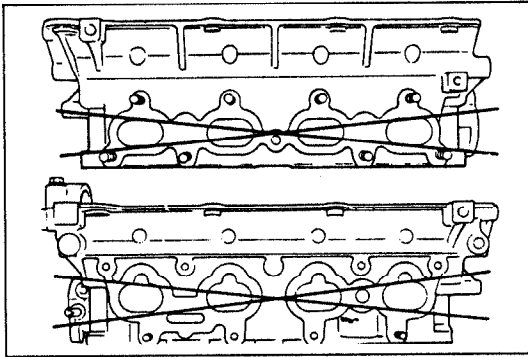
3. If the cylinder head distortion exceeds specification, grind the cylinder head surface.
If the cylinder head height is not within specification, replace it.

Height: 133.8—134.0mm (5.268—5.276 in)

Grinding: 0.10mm (0.004 in) max.



03U0B2-701

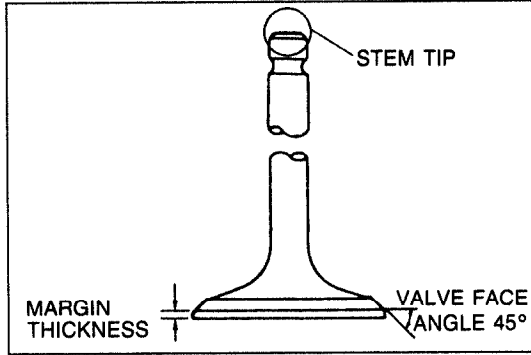


03U0B2-007

4. Measure the manifold contact surface distortion in the four directions shown in the figure.

Distortion: 0.15mm (0.006 in) max.

5. If distortion exceeds specification, grind the surface or replace the cylinder head.



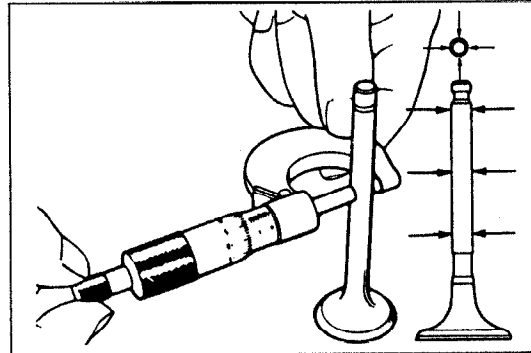
23U0B2-059

VALVE MECHANISM
Valve and Valve Guide

1. Inspect each valve for the following. Replace or resurface the valve if necessary.
 - (1) Damaged or bent stem.
 - (2) Rough or damaged face.
 - (3) Damaged or unevenly worn stem tip.
2. Measure the valve head margin thickness of each valve. Replace the valve if necessary.

Margin thickness

IN : 0.9mm (0.0354 in)
EX : 1.0mm (0.0394 in)



23U0B2-036

3. Measure the length of each valve.

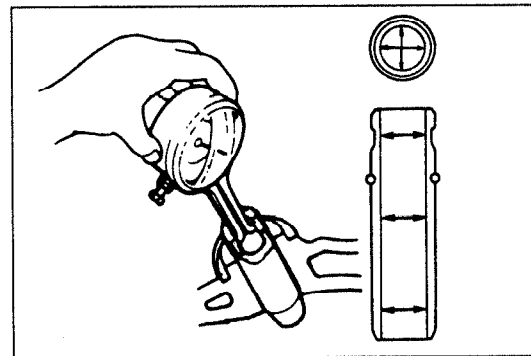
Length

Standard

IN : 101.34mm (3.9898 in)
EX : 101.44mm (3.9937 in)

Minimum

IN : 100.84mm (3.9701 in)
EX : 100.94mm (3.9740 in)



23U0B2-037

4. Measure the stem diameter of each valve at the points shown.

Diameter

IN : 5.970—5.985mm (0.2350—0.2356 in)
EX : 5.965—5.980mm (0.2348—0.2354 in)

5. Measure the inner diameter of each valve guide at the points shown.

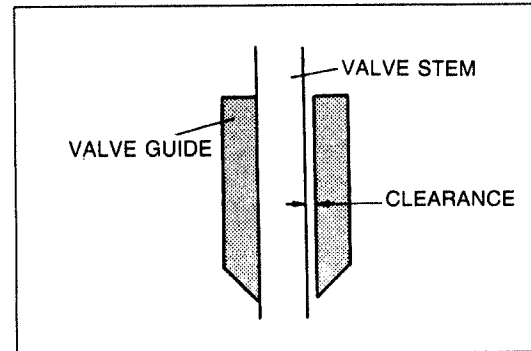
Inner diameter

IN : 6.01—6.03mm (0.2366—0.2374 in)
EX : 6.01—6.03mm (0.2366—0.2374 in)

6. Calculate the valve stem to guide clearance. Subtract the outer diameter of the valve stem from the inner diameter of the corresponding valve guide.

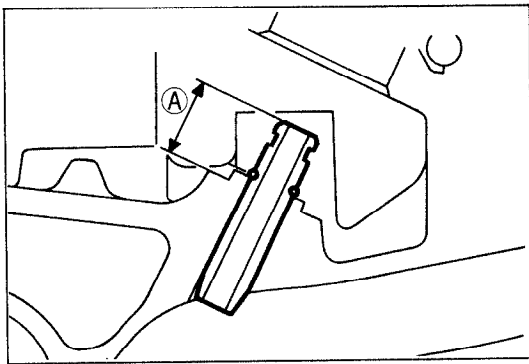
Clearance

IN : 0.025—0.060mm (0.0010—0.0024 in)
EX : 0.030—0.065mm (0.0012—0.0026 in)
Maximum: 0.20mm (0.008 in)



05U0BX-125

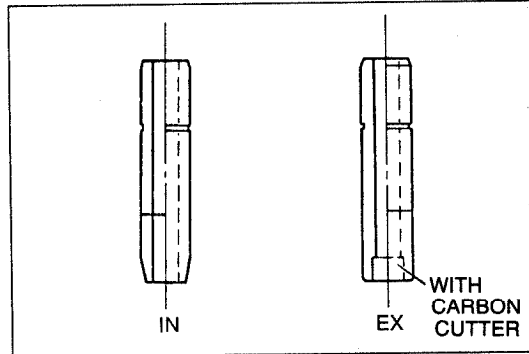
7. If the clearance exceeds specification, replace the valve and/or valve guide.



03U0B2-082

8. Measure the height (A) of each valve guide. Replace the valve guide if necessary.

Height: 18.3—18.9mm (0.720—0.744 in)

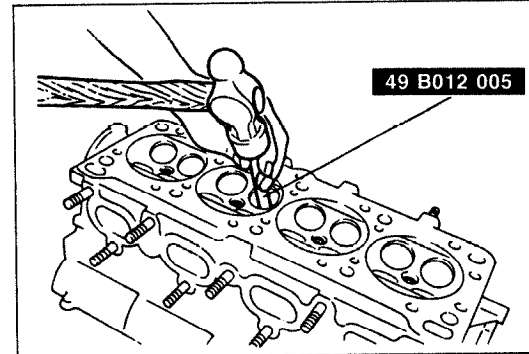


13U0B2-010

Replacement of valve guide

Note

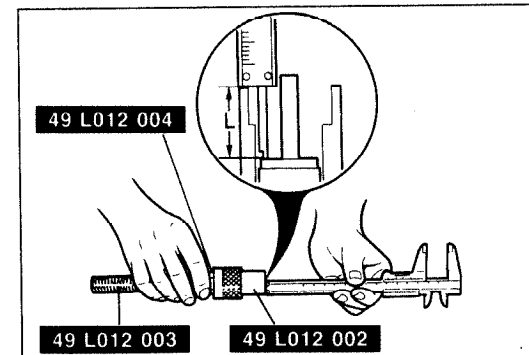
- The valve guides are different between intake and exhaust sides, use the correct valve guide.



9MU0B2-112

Removal

1. Remove the valve guide from the side opposite the combustion chamber with the **SST**.



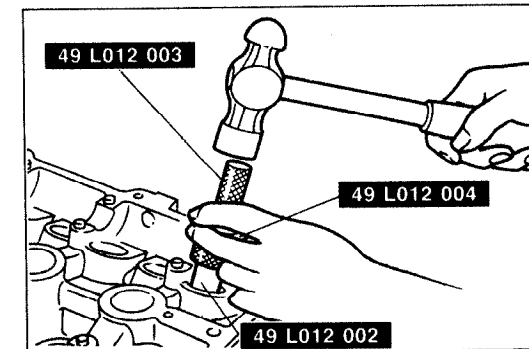
03U0B2-083

Installation

1. Assemble the **SST** so that depth **L** is as specified.

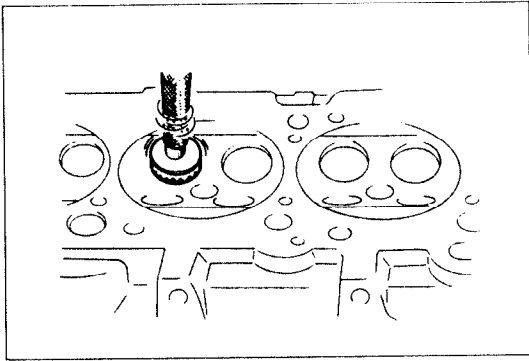
Depth L: 18.3—18.9mm (0.720—0.744 in)

2. Tighten the locknut.

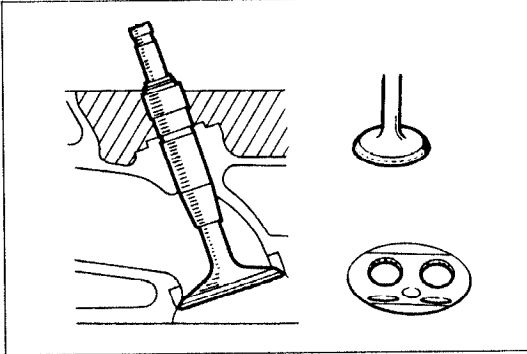


05U0BX-129

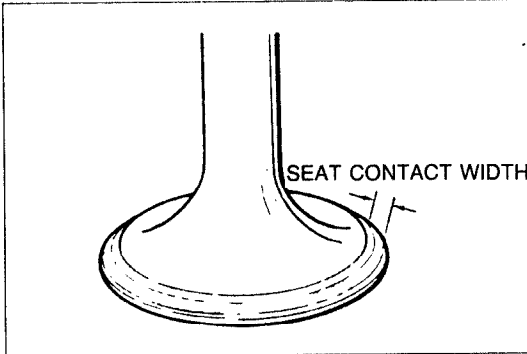
3. Tap the valve guide in from the side opposite the combustion chamber until the **SST** contacts the cylinder head.
4. Verify that the valve guide height is within specification.
5. If not within specification, repeat Steps 1—4.



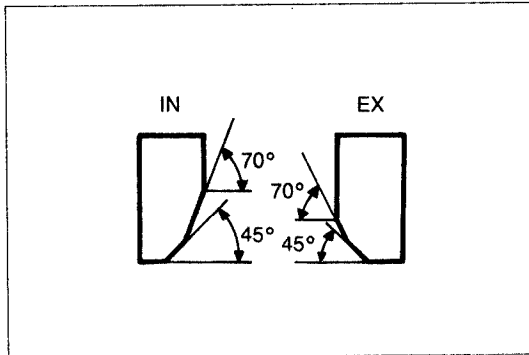
05U0BX-130



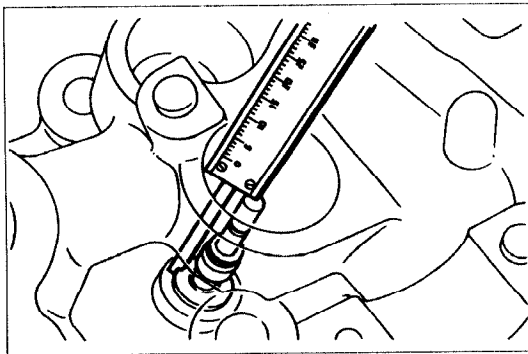
05U0BX-131



05U0BX-132



03U0B2-084



05U0BX-134

Valve Seat

1. Inspect the contact surface of each valve seat and valve face for the following:
 - (1) Roughness.
 - (2) Damage.
2. If necessary, resurface the valve seat with a **45°** valve seat cutter and/or resurface the valve face.

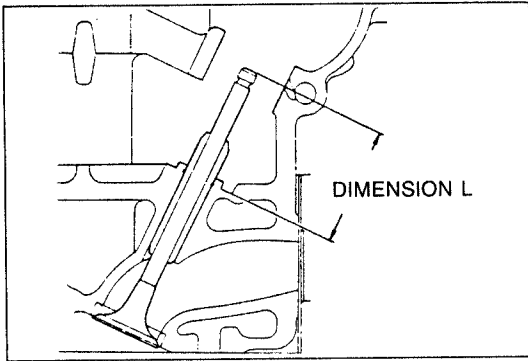
3. Apply a thin coat of Prussian blue to the valve face.
4. Inspect the valve seating by pressing the valve against the seat.
 - (1) If blue does not appear 360° around the valve face, replace the valve.
 - (2) If blue does not appear 360° around the valve seat, resurface the seat.

5. Measure the seat contact width.

Width: 0.8—1.4mm (0.031—0.055 in)

6. Verify that the valve seating position is at the center of the valve face.
 - (1) If the seating position is too high, correct the valve seat with a **70°** cutter and a **45°** cutter.
 - (2) If the seating position is too low, correct the valve seat with a **0°** cutter and a **45°** cutter.
7. Seat the valve to the valve seat with lapping compound.

8. Inspect the sinking of the valve seat.



23U0B2-060

9. Measure the protruding length (dimension **L**) of the valve stem.

Dimension L: 45.0mm (1.7717 in)

- (1) If **L** is 45.0—45.5mm (1.772—1.791 in), no correction needed.
- (2) If **L** is 45.5—46.5mm (1.791—1.831 in), adjust with washer on spring seat area of cylinder head.
- (3) If **L** is 46.5mm (1.831 in) or more, replace cylinder head.

Valve Spring

1. Inspect each valve spring for cracks or damage.
2. Measure the free length and out-of-square. Replace the valve spring if necessary.

Free length

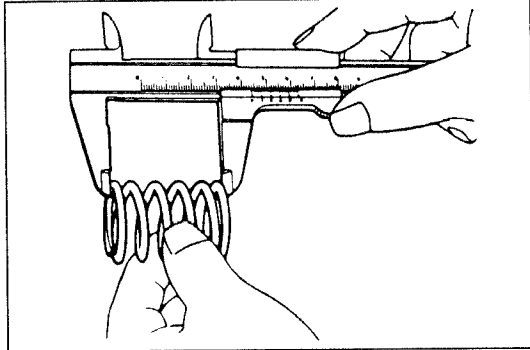
Standard: 46.26mm (1.821 in)

Minimum:

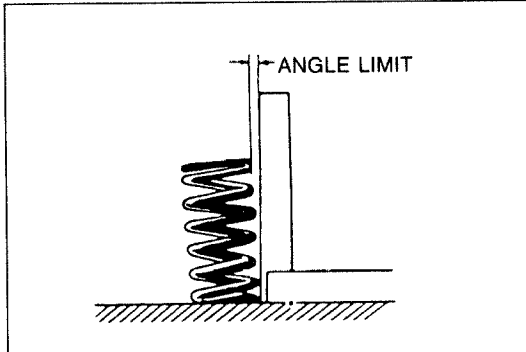
224—253 N (22.8—25.8 kg, 50—57 lb)/

39.5mm (1.555 in)

Out-of-square: 1.62mm (0.064 in) max.



03U0B2-086

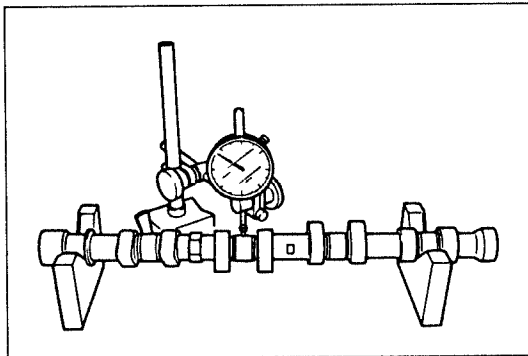


03U0B2-087

CAMSHAFT

1. Set the front and rear journals on V-blocks.
2. Measure the camshaft runout. Replace the camshaft if necessary.

Runout: 0.03mm (0.0012 in) max.



05U0BX-138

3. Inspect the camshaft for wear or damage. Replace the camshaft if necessary.
4. Measure the cam lobe heights at the two points as shown.

Height

Standard

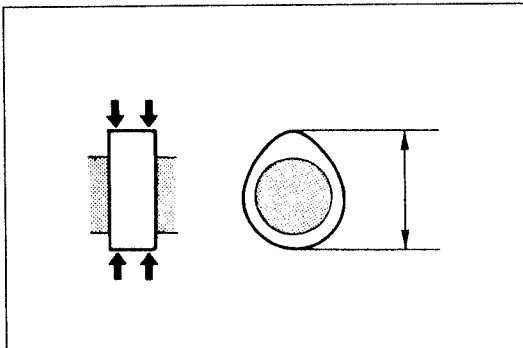
IN : 44.094mm (1.7360 in)

EX: 44.600mm (1.7560 in)

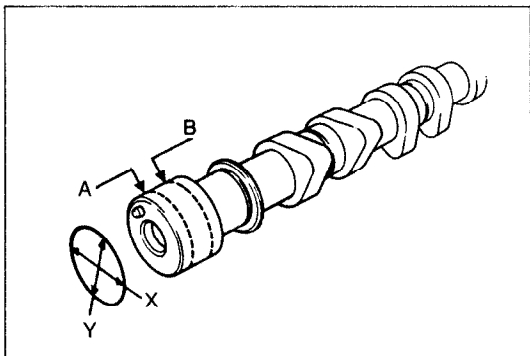
Minimum

IN : 43.894mm (1.7281 in)

EX: 44.400mm (1.7480 in)

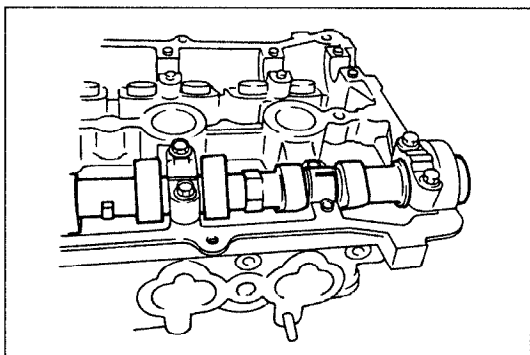


03U0B2-088



23U0B2-061

5. Measure the journal diameters in X and Y directions at the two points (A and B) shown.

Diameter:**25.940—25.965mm (1.0213—1.0222 in)****Out-of-round: 0.03mm (0.001 in) max.**

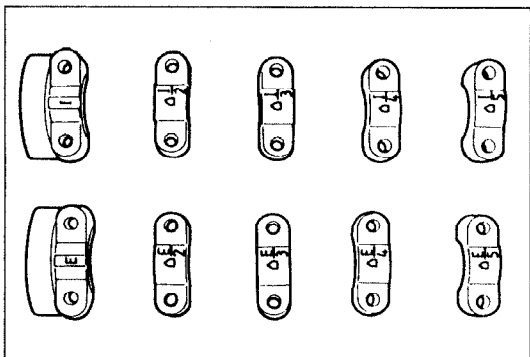
05U0BX-141

6. Measure the camshaft journal oil clearances.

Caution

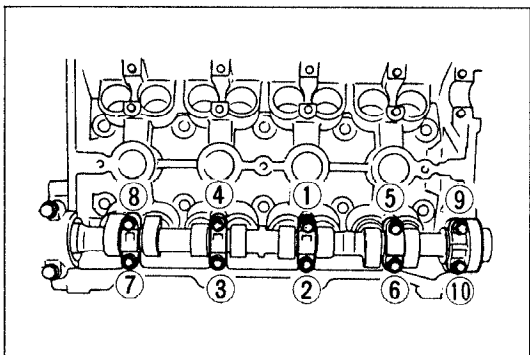
- Do not install the HLA when measuring the oil clearance.

- (1) Remove all foreign material and oil from the journals and bearing surface.
- (2) Set the camshaft onto the cylinder head.
- (3) Position Plastigage atop the journals in the axial direction.
- (4) Install the camshaft caps according to the cap number and arrow mark.



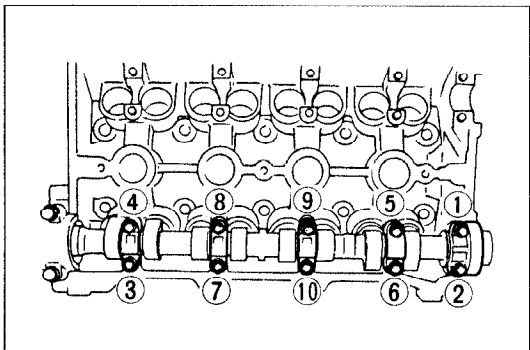
05U0BX-142

- (5) Install the camshaft cap bolts and tighten them in two or three steps in the order shown in the figure.

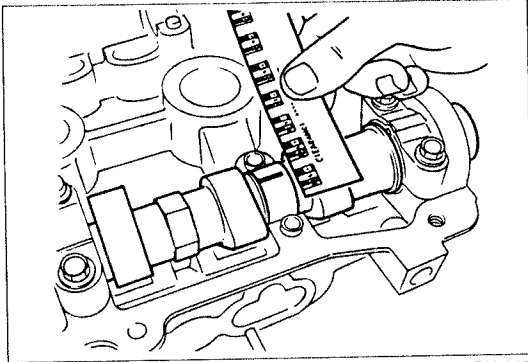
Tightening torque:**11.3—14.2 N·m (1.15—1.45 m·kg, 100—126 in·lb)**

05U0BX-143

- (6) Loosen the camshaft cap bolts in two or three steps in the order shown in the figure.
- (7) Remove the camshaft caps.



05U0BX-144



05U0BX-145

(8) Measure the oil clearances.

Oil clearance:

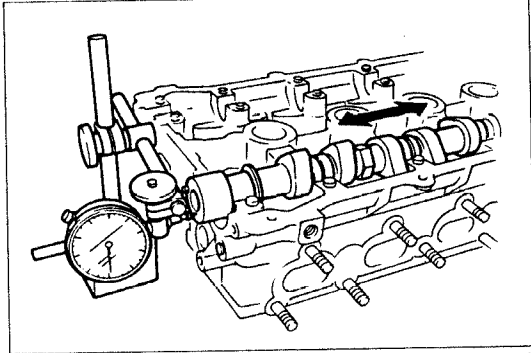
0.035—0.081mm (0.0014—0.0032 in)

Maximum: 0.15mm (0.006 in)

(9) If the oil clearance exceeds specification, replace the cylinder head.

7. Measure the camshaft end play. If the end play exceeds specification, replace the camshaft and/or the cylinder head.

End play : 0.07—0.19mm (0.0028—0.0075 in)
Maximum: 0.20mm (0.008 in)



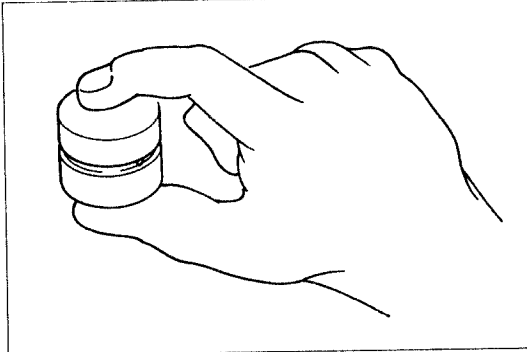
05U0BX-146

HLA

Caution

- Do not attempt to repair the HLA.

1. Inspect the HLA friction surfaces for wear or damage. Replace the HLA if necessary.
2. Hold the bucket body and press the plunger by hand. If the plunger moves, replace the HLA.



05U0BX-147

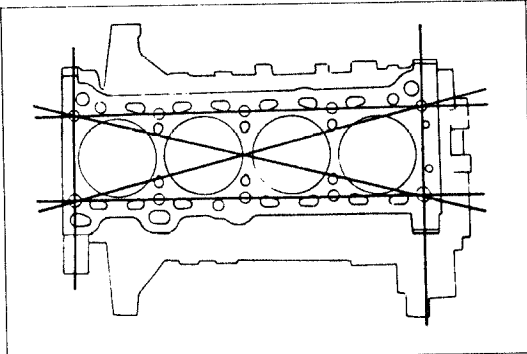
CYLINDER BLOCK

1. Inspect the cylinder block for the following. Repair or replace the cylinder block as necessary.
 - (1) Leakage damage.
 - (2) Cracks.
 - (3) Scoring of wall.
2. Measure the distortion of the top surface of the cylinder block in the six directions shown in the figure.

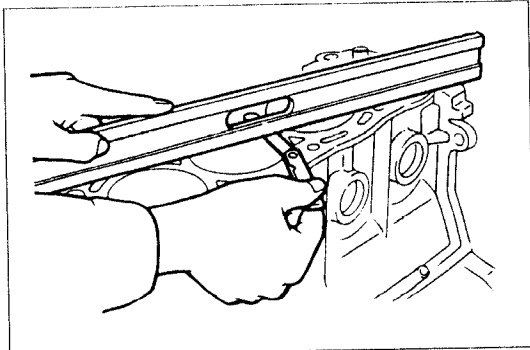
Distortion: 0.15mm (0.006 in) max.

3. If the distortion exceeds specification, repair by grinding or replace the cylinder block.

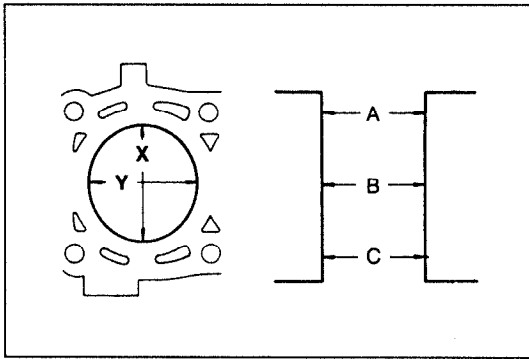
Height : 221.5mm (8.720 in)
Grinding: 0.20mm (0.008 in) max.



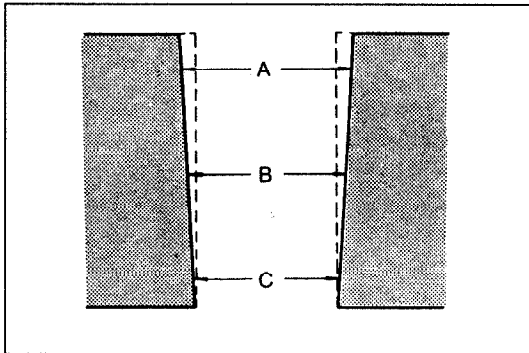
05U0BX-148



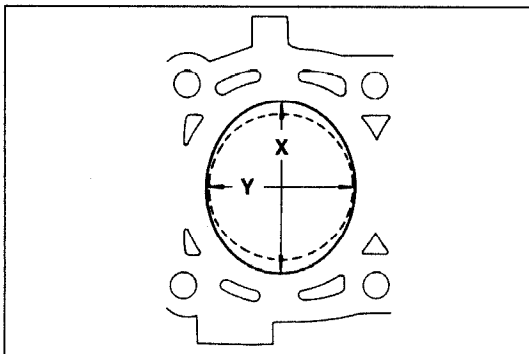
05U0BX-149



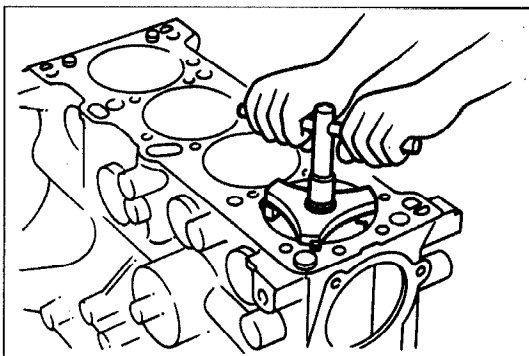
03U0B2-089



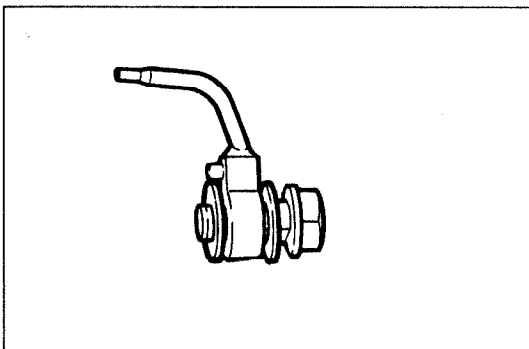
05U0BX-151



05U0BX-152



05U0BX-153



05U0BX-154

4. Measure the cylinder bores in X and Y directions at three levels (A, B, and C) in each cylinder as shown.

Cylinder bore

mm (in)

Bore size	Diameter
Standard	83.006—83.013 (3.2679—3.2682)
0.25 (0.010) oversize	83.256—83.263 (3.2778—3.2781)
0.50 (0.020) oversize	83.506—83.513 (3.2876—3.2879)

Caution

• **The boring size should be based on the size of an oversize piston and be the same for all cylinders.**

- (1) If the cylinder bore exceeds the maximum, rebore the cylinder to oversize.
- (2) If the difference between measurements A and C exceeds the maximum taper, rebore the cylinder to oversize.

Taper: 0.019mm (0.0007 in) max.

- (3) If the difference between measurements X and Y exceeds the maximum out-of-round, rebore the cylinder to oversize.

Out-of-round: 0.019mm (0.0007 in) max.

5. If the upper part of a cylinder wall shows uneven wear, remove the ridge with a ridge reamer.

OIL JET

1. Push the check ball and verify that it moves smoothly.
2. Blow through the oil jet and verify that air flows.

PISTON, PISTON RING, AND PISTON PIN Piston

Caution

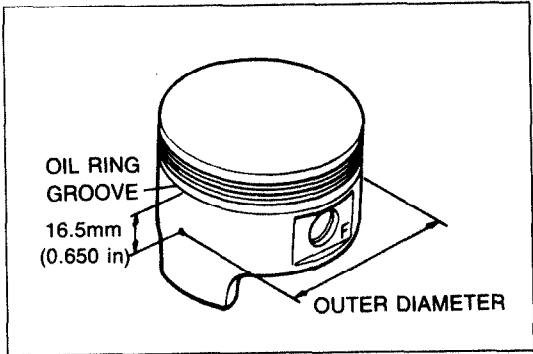
- If the piston is replaced, the piston rings must also be replaced.

1. Inspect the outer circumferences of all pistons for seizure or scoring. Replace the piston if necessary.
2. Measure the outer diameter of each piston at a right angle (90°) to the piston pin, **16.5mm (0.650 in)** below the oil ring land lower edge.

Piston diameter

mm (in)

Piston size	Diameter
Standard	82.954—82.974 (3.2659—3.2667)
0.25 (0.010) oversize	83.211—83.217 (3.2760—3.2763)
0.50 (0.020) oversize	83.461—83.467 (3.2859—3.2861)



03U0B2-090

3. Measure the piston-to-cylinder clearance.

Clearance: 0.039—0.052mm (0.0015—0.0020 in)
Maximum: 0.15mm (0.006 in)

4. If the clearance exceeds the maximum, replace the piston or rebores the cylinders to fit oversize pistons.

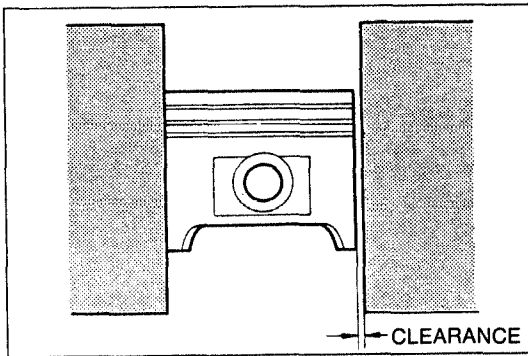
Piston and Piston Rings

1. Measure the piston ring to ring land clearance around the entire circumference using a new piston ring.

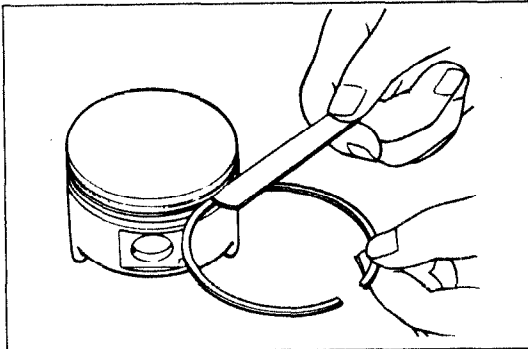
Clearance

Top: 0.030—0.065mm (0.0012—0.0026 in)
Second: 0.030—0.070mm (0.0012—0.0028 in)
Maximum: 0.15mm (0.006 in)

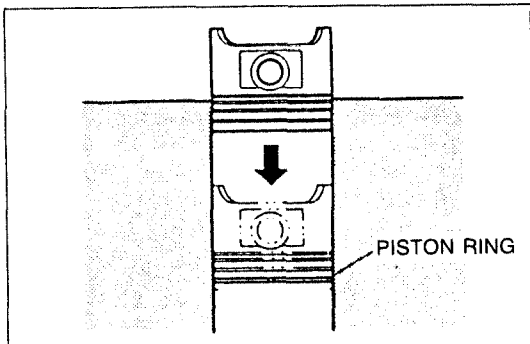
2. If the clearance exceeds the maximum, replace the piston.
3. Inspect the piston rings for damage, abnormal wear, or breakage. Replace the piston rings if necessary.
4. Insert the piston ring into the cylinder by hand and use the piston to push it to the bottom of the ring travel.



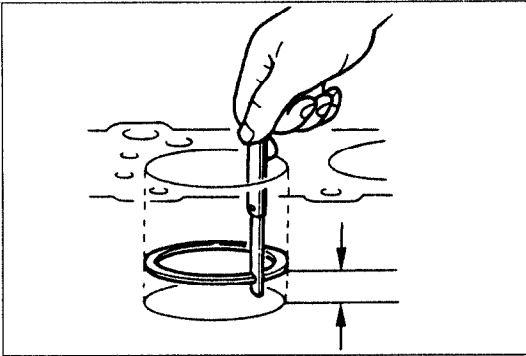
05U0BX-156



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03U0B2-157

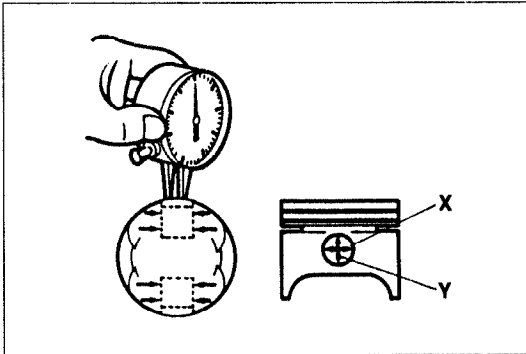


05U0BX-158

5. Measure each piston ring end gap with a feeler gauge. Replace the piston ring if necessary.

End gap

Top	: 0.15—0.30mm (0.006—0.012 in)
Second	: 0.15—0.30mm (0.006—0.012 in)
Oil rail	: 0.20—0.70mm (0.008—0.028 in)
Maximum	: 1.0mm (0.039 in)

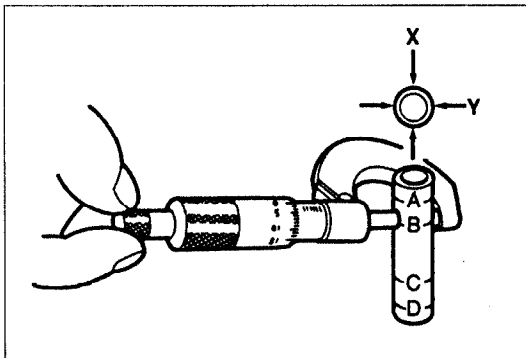


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Piston and Piston Pin

1. Measure each piston pin hole diameter in X and Y directions at four points.

Diameter: 19.988—20.000mm (0.7869—0.7874 in)



05U0BX-160

2. Measure each piston pin diameter in X and Y directions at four points.

Diameter: 19.987—19.993mm (0.7869—0.7871 in)

3. Calculate the piston pin-to-piston clearance.

Clearance: -0.005—0.013mm (-0.0002—0.0005 in)

4. If the clearance exceeds specification, replace the piston and/or piston pin.

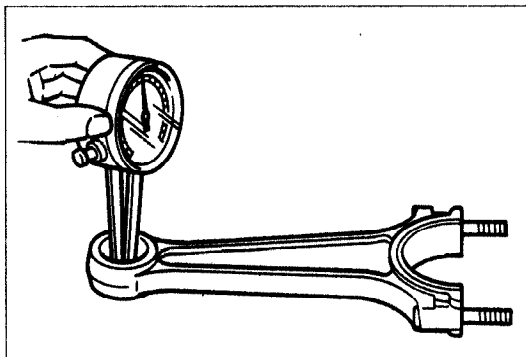
CONNECTING ROD

1. Measure each connecting rod bushing inner diameter.

Diameter: 20.003—20.014mm (0.7875—0.7880 in)

2. Calculate the clearance between the connecting rod bushing and piston pin.

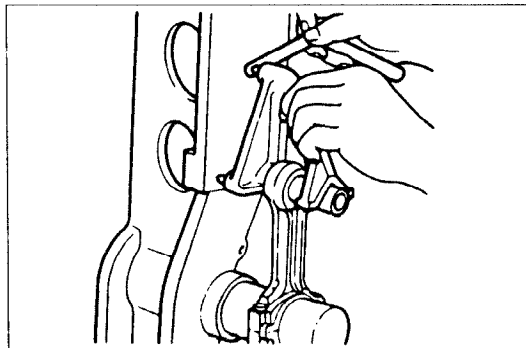
Clearance: 0.010—0.027mm (0.0004—0.0011 in)



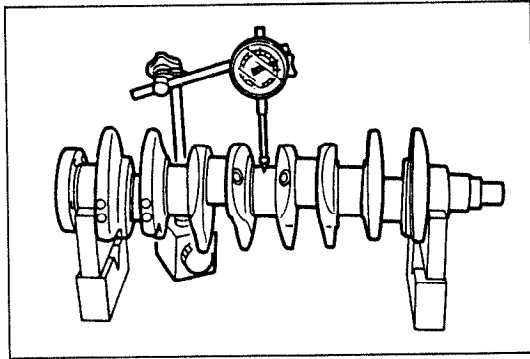
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3. Measure each connecting rod for bending. Repair or replace the connecting rod if necessary.

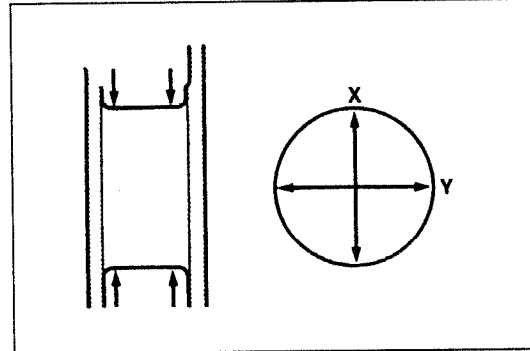
Bending: 0.075mm (0.0030 in) max./50mm (1.97 in)



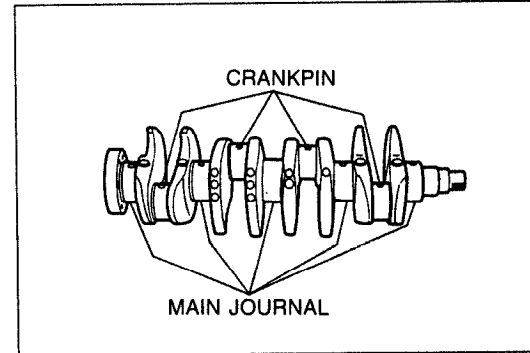
05U0BX-162



05U0BX-163



03U0B2-164



05U0BX-165

CRANKSHAFT

1. Check the journals and pins for damage, scoring, and oil hole clogging.
2. Set the crankshaft on V-blocks.
3. Measure the crankshaft runout at the center journal.
Replace the crankshaft if necessary.

Runout: 0.04mm (0.0016 in) max.

4. Measure each journal diameter in X and Y directions at two points.

Main journal

Diameter: 49.938—49.956mm (1.9661—1.9668 in)
Out-of-round: 0.05mm (0.0020 in) max.

Crankpin journal

Diameter: 44.940—44.956mm (1.7693—1.7699 in)
Out-of-round: 0.05mm (0.0020 in) max.

5. If the diameter is less than the minimum, grind the journals to match an undersize bearing.

Undersize bearing:

**0.25mm (0.010 in), 0.50mm (0.020 in),
0.75mm (0.030 in)**

Main journal diameter undersize

mm (in)

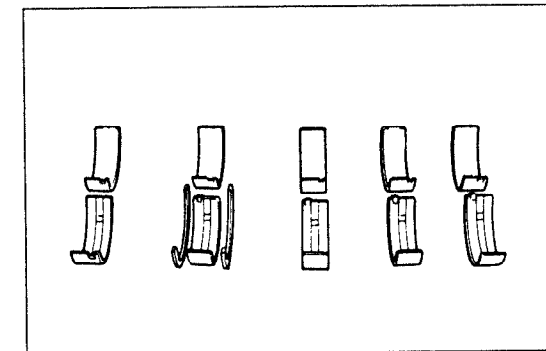
Bearing size	Journal diameter
0.25 (0.010) undersize	49.704—49.708 (1.9568—1.9570)
0.50 (0.020) undersize	49.454—49.458 (1.9470—1.9472)
0.75 (0.030) undersize	49.204—49.208 (1.9372—1.9373)

Crankpin journal diameter undersize

mm (in)

Bearing size	Journal diameter
0.25 (0.010) undersize	44.690—44.706 (1.7594—1.7601)
0.50 (0.020) undersize	44.440—44.456 (1.7496—1.7502)
0.75 (0.030) undersize	44.190—44.206 (1.7398—1.7404)

05U0BX-166

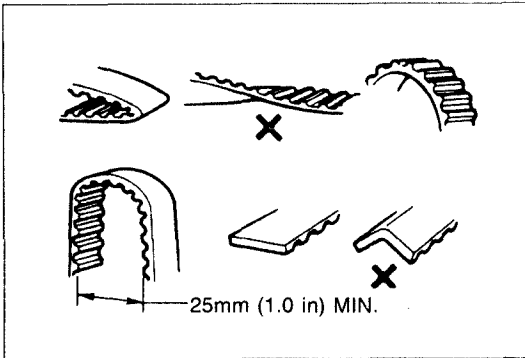


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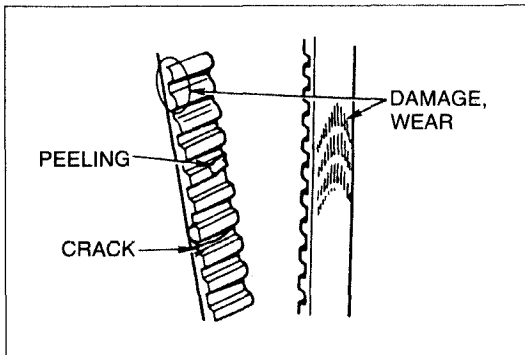
BEARING

Main Bearing and Connecting Rod Bearing

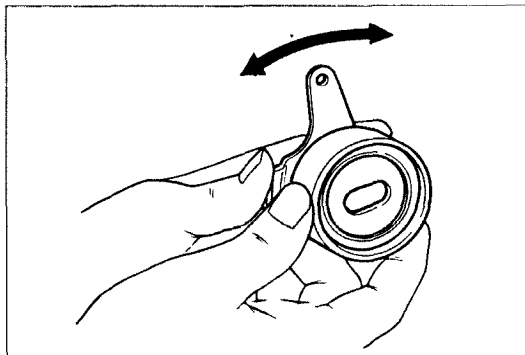
1. Check the main bearings and the connecting rod bearings for peeling, scoring, and other damage.



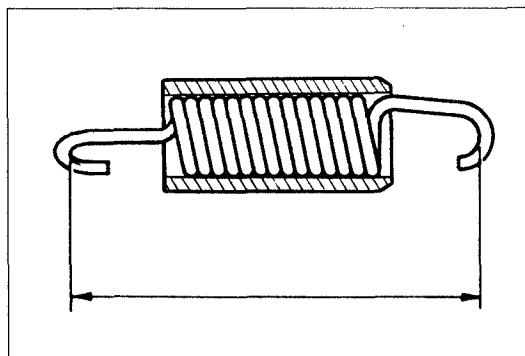
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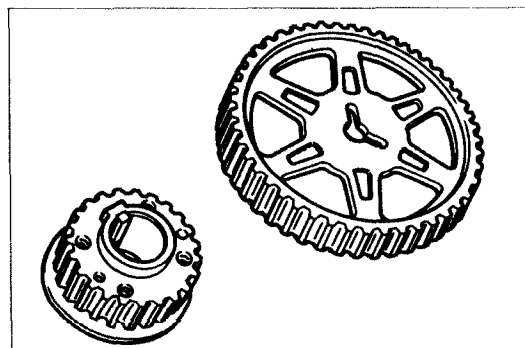
05U0BX-169



05U0BX-170



05U0BX-171



05U0BX-172

TIMING BELT

Caution

- Never forcefully twist, turn inside out, or bend the timing belt.
- Do not allow oil or grease on the belt.

1. Replace the timing belt if there is any oil or grease on it.
2. Check the timing belt for damage, wear, peeling, cracks, and hardening. Replace the timing belt if necessary.

TENSIONER, IDLER

Caution

- Do not clean the tensioner or idler with cleaning fluids. If necessary, use a soft rag to wipe them clean, and avoid scratching them.

1. Check the tensioner and idler for smooth rotation and abnormal noise. Replace the tensioner or idler if necessary.

TENSIONER SPRING

1. Measure the free length of the tensioner spring. Replace the tensioner spring if necessary.

Free length: 58.8mm (2.315 in)

PULLEY

Timing Belt Pulley, Camshaft Pulley


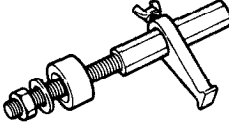
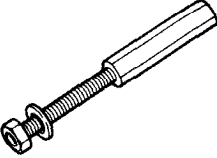


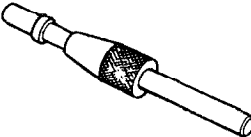
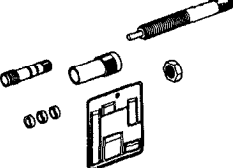

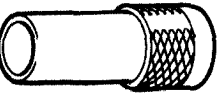

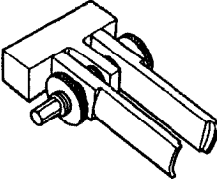
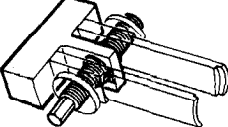
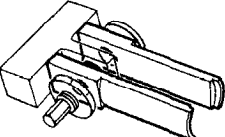
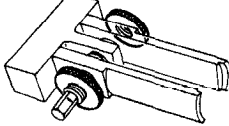

Caution

- Do not clean the pulleys with cleaning fluids. If necessary, use a soft rag to wipe them clean, and avoid scratching them.

1. Inspect the pulley teeth for wear, deformation, and other damage. Replace the pulley if necessary.

ASSEMBLY

PREPARATION SST

<p>49 0221 061A</p> <p>Remover & installer, piston pin</p> 	<p>For removal and installation of piston pin</p>	<p>49 E011 1A0</p> <p>Ring gear brake set</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 103</p> <p>Shaft (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 104</p> <p>Collar (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 105</p> <p>Stopper (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 SE01 310A</p> <p>Centering tool, clutch disc</p> 	<p>For installation of clutch disc</p>
<p>49 L012 0A0</p> <p>Installer set, valve seal & valve guide</p> 	<p>For installation of valve seal</p>	<p>49 L012 001</p> <p>Installer (Part of 49 L012 0A0)</p> 	<p>For installation of valve seal</p>
<p>49 L012 002</p> <p>Body (Part of 49 L012 0A0)</p> 	<p>For installation of valve seal</p>	<p>49 L012 005</p> <p>Spacer (Part of 49 L012 0A0)</p> 	<p>For installation of valve seal</p>
<p>49 B012 0A2</p> <p>Pivot, valve spring lifter</p> 	<p>For removal / installation of valves</p>	<p>49 B012 012</p> <p>Body (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>
<p>49 B012 013</p> <p>Foot (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>	<p>49 B012 014</p> <p>Locknut (Part of 49 B012 0A2)</p> 	<p>For removal / installation of valves</p>
<p>49 0636 100A</p> <p>Arm, valve spring lifter</p> 	<p>For removal and installation of valve</p>	<p style="text-align: right;">23U0B2-038</p>	

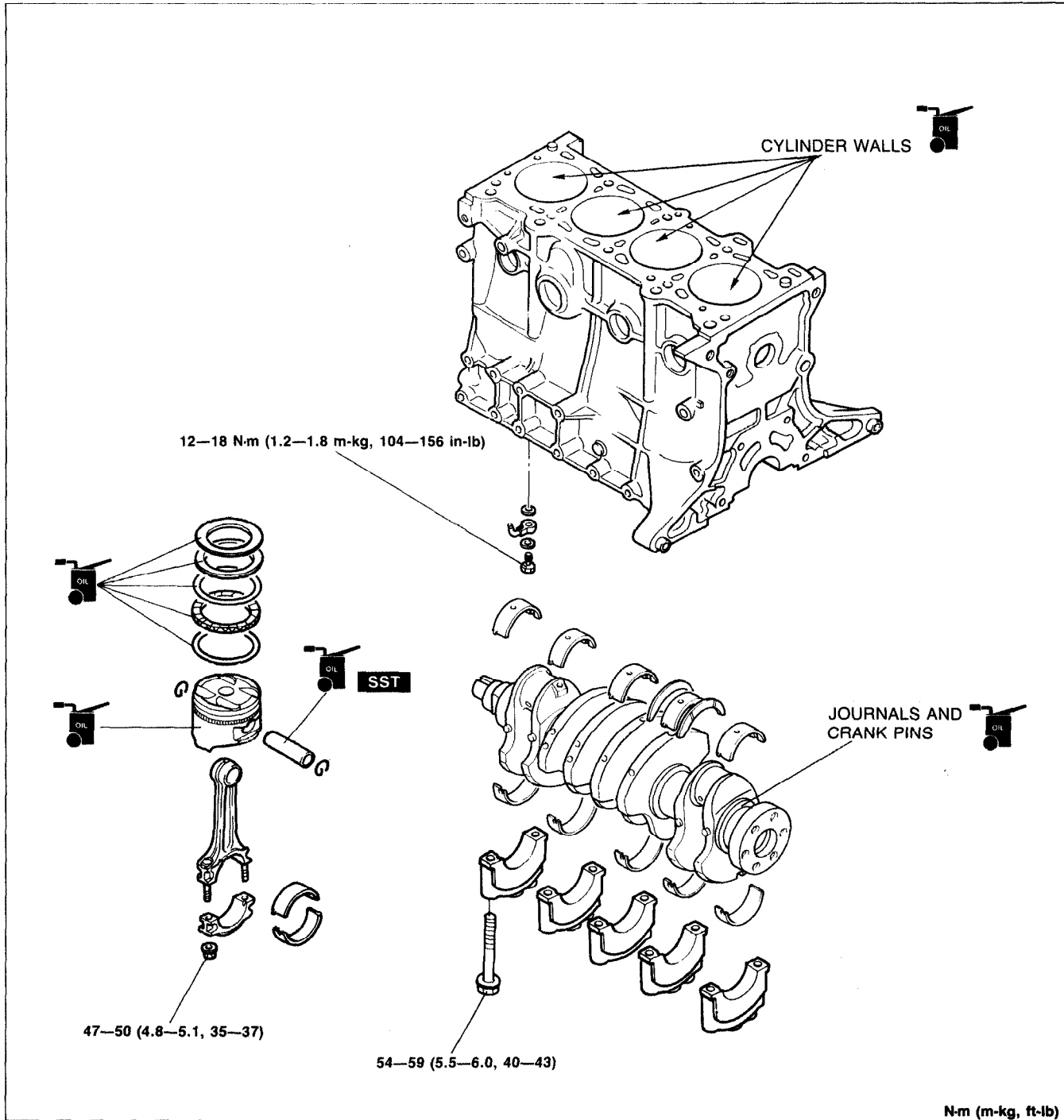
1. Clean all parts before reinstallation.
2. Apply new engine oil to all sliding and rotating parts.
3. Replace plain bearings if they are peeling, burned, or otherwise damaged.
4. Tighten all bolts and nuts to the specified torques.

Caution

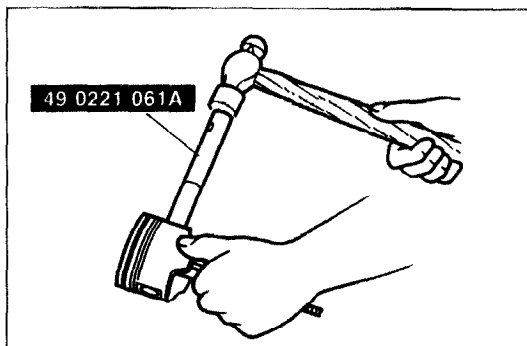
- **Do not reuse gaskets or oil seals.**

93G0B1-082

CYLINDER BLOCK (INTERNAL PARTS) Torque Specifications



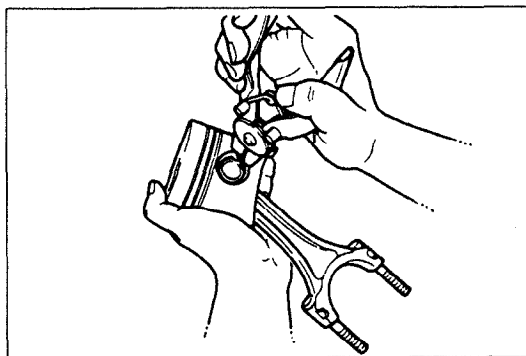
05U0BX-175



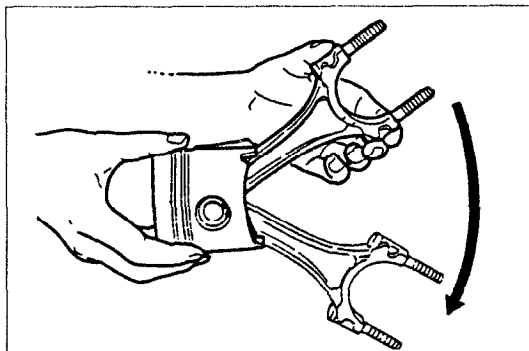
Connecting Rod

1. Install one piston pin clip into the clip groove in the piston.
2. Assemble the piston and the connecting rod, aligning the oil groove in the large end of connecting rod opposite the "F" mark on the piston.
3. Apply clean engine oil to the piston pin.
4. Install the piston pin from the side opposite the clip.

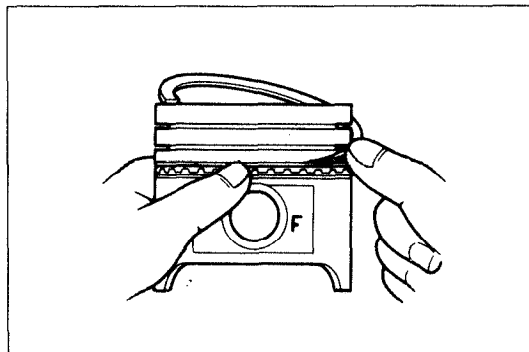
23U0B2-039



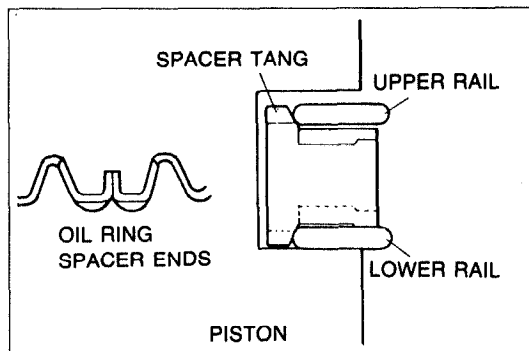
23U0B2-040



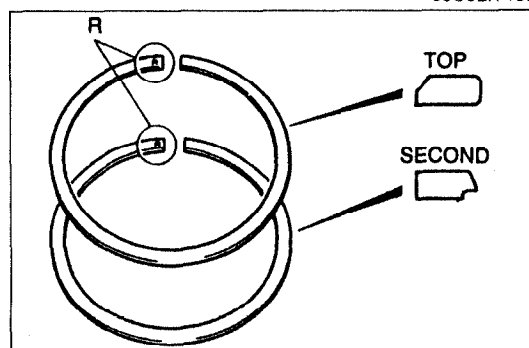
05U0BX-178



05U0BX-179



05U0BX-180



05U0BX-181

5. Tap the piston pin in with the **SST** until the pin contacts the clip.
If the pin cannot be installed easily, replace the connecting rod.
6. Install the second clip into the clip groove in the piston.

7. Check the oscillation torque of the connecting rod. If the large end does not drop by its own weight, replace the piston and/or piston pin.

Piston Ring

1. Install the three-piece oil rings on the pistons.
 - (1) Apply clean engine oil to the oil ring spacer and rails.
 - (2) Install the oil ring spacer with the ends upward.

Note

- **The upper rail and lower rail are the same.**
- **The rails may be installed with either face upward.**

- (3) Install the upper rail and lower rail.

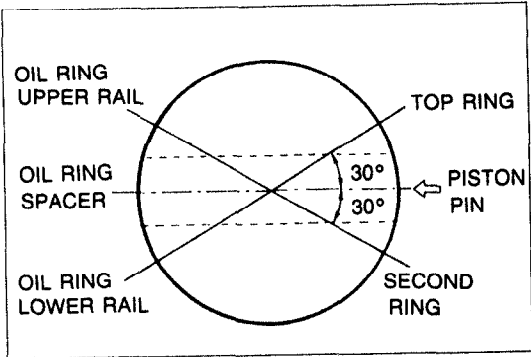
2. Verify that both rails are expanded by the spacer tangs as shown in the figure by making certain the rails turn smoothly in both directions.

Caution

- **The rings must be installed with the R marks upward.**
- **The second ring must be installed with the scraper face downward.**

3. Apply clean engine oil to the top and second piston rings.
4. Install the second ring to the piston; then install the top ring. Use a piston ring expander (commercially available).

5. Position the end gaps of the rings as shown in the figure.



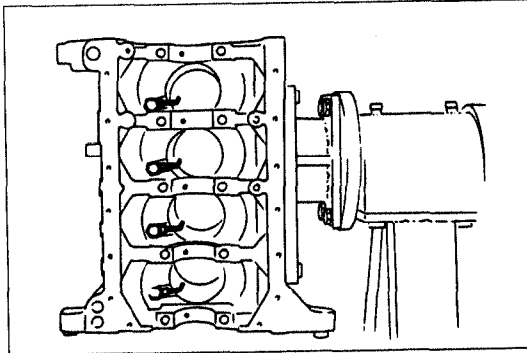
05U0BX-182

Oil Jet

1. Install the oil jets.

Tightening torque:

12—18 N·m (1.2—1.8 m·kg, 104—156 in·lb)



05U0BX-183

Crankshaft

1. Before installing the crankshaft, inspect the main bearing oil clearances as follows.

Oil clearance inspection

(1) Remove all foreign material and oil from the journals and bearings.

Caution

- Install the grooved upper main bearings in the cylinder block.
- Install the thrust bearings with the oil groove facing the crankshaft.

(2) Install the upper main bearings and thrust bearings.

(3) Set the crankshaft in the cylinder block.

Caution

- Do not rotate the crankshaft when measuring the oil clearances.

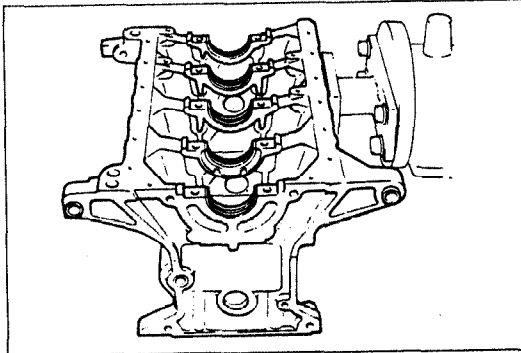
(4) Position Plastigage atop the journals in the axial direction.

(5) Install the lower main bearings and the main bearing caps according to the cap number and \Leftarrow mark.

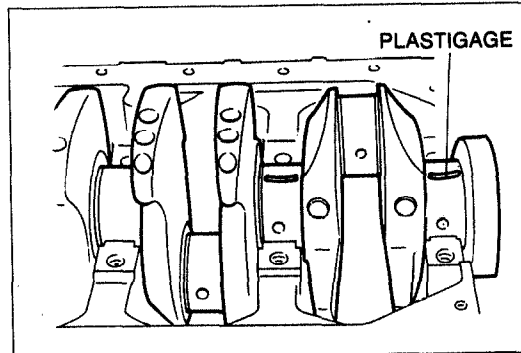
(6) Tighten the main bearing cap bolts in two or three steps in the order shown in the figure.

Tightening torque:

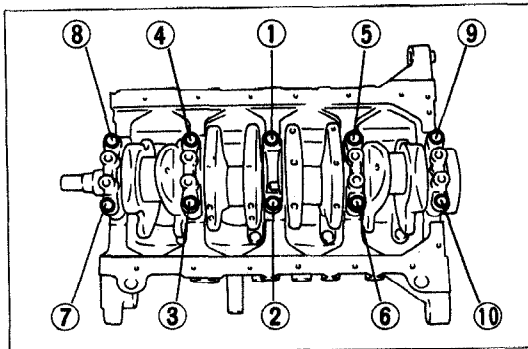
54—59 N·m (5.5—6.0 m·kg, 40—43 ft·lb)



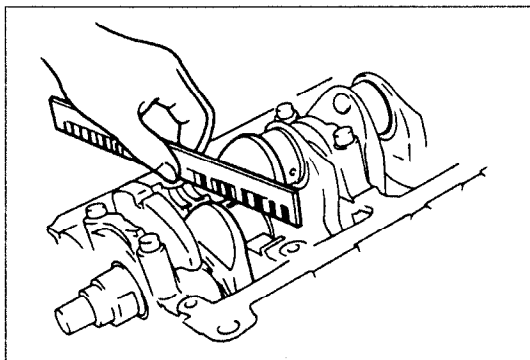
05U0BX-184



05U0BX-185



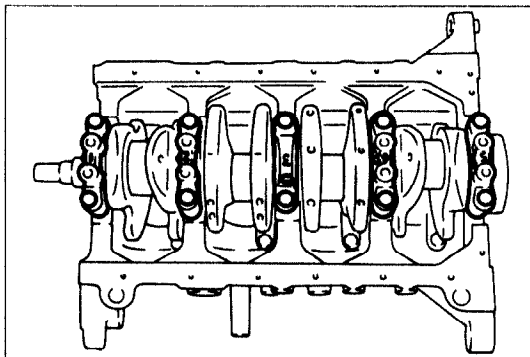
05U0BX-186



03U0B2-091

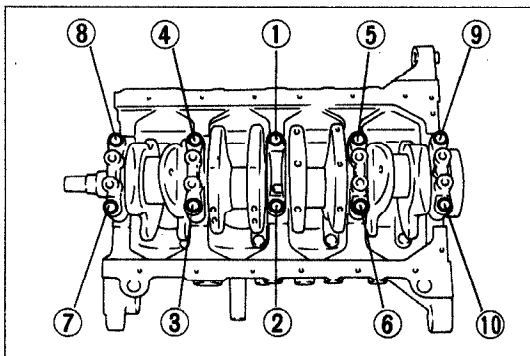
- (7) Remove the main bearing caps, and measure the Plastigage at each journal at the widest point for the smallest clearance, and at the narrowest point for the largest clearance.
- (8) If the oil clearance exceeds specification, grind the crankshaft and use undersize main bearings. (Refer to page B2-64.)

Oil clearance: 0.018—0.036mm (0.0007—0.0014 in)
Maximum: 0.10mm (0.004 in)



05U0BX-188

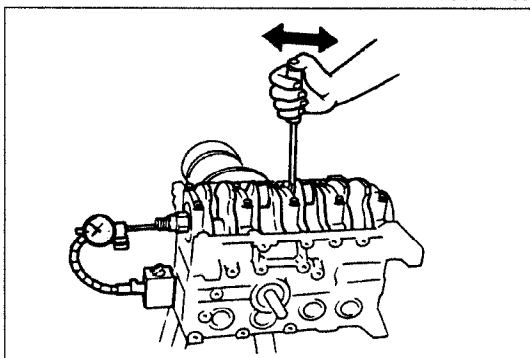
- 2. Apply a liberal amount of clean engine oil to the main bearings, thrust bearings and main journals.
- 3. Install the crankshaft and the main bearing caps according to the cap number and ← mark.



05U0BX-189

- 4. Tighten the main bearing cap bolts in two or three steps in the order shown in the figure.

Tightening torque:
54—59 Nm (5.5—6.0 m-kg, 40—43 ft-lb)

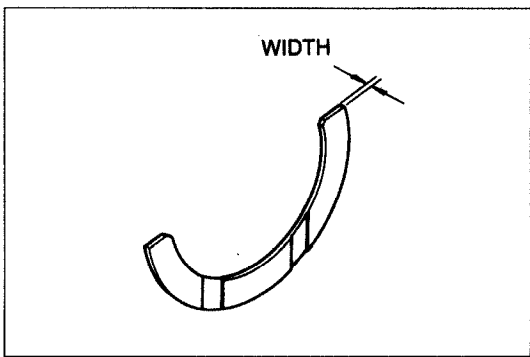


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- 5. Measure the crankshaft end play.

End play : 0.080—0.282mm (0.0031—0.0111 in)
Maximum: 0.30mm (0.012 in)

- 6. If the end play exceeds the maximum, grind the crankshaft and install an oversize thrust bearing or replace the crankshaft and thrust bearing.



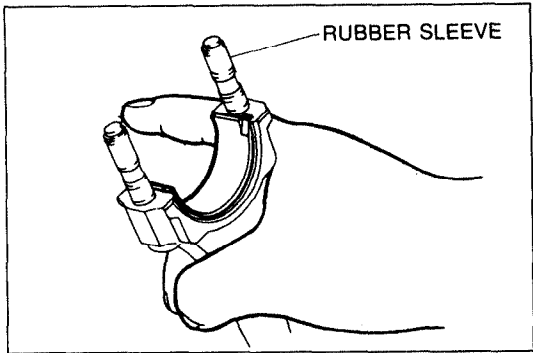
05U0BX-191

Thrust bearing width
Standard:
2.500—2.550mm (0.0984—0.1004 in)
0.25mm (0.010 in) oversize:
2.625—2.675mm (0.1033—0.1053 in)
0.50mm (0.020 in) oversize:
2.750—2.800mm (0.1083—0.1102 in)
0.75mm (0.030 in) oversize:
2.875—2.925mm (0.1132—0.1152 in)

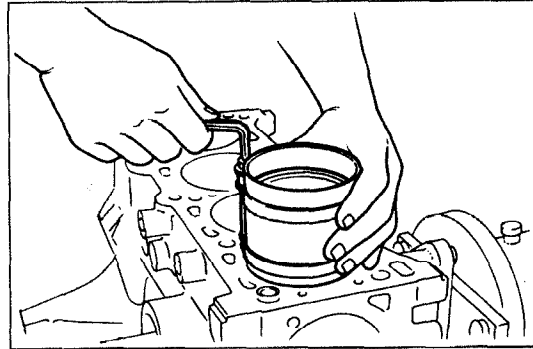
Piston and Connecting Rod Assembly

Caution

- Protect the connecting rod bolts with rubber sleeves to prevent damage to the crankpin journals.



05U0BX-192



05U0BX-193

1. Apply a liberal amount of clean engine oil to the cylinder walls, pistons, and piston rings.
2. Check the piston rings for correct end gap alignment.
3. Insert each piston assembly into the cylinder block with the **F** mark facing the front of the engine. Use a piston ring compressor (commercially available).

Connecting Rod Cap

1. Measure the connecting rod bearing oil clearances using the same procedure as for the main bearing oil clearance.

Caution

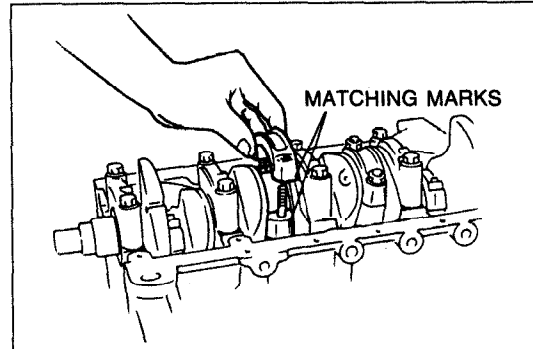
- Align the matching marks on the cap and the connecting rod when installing the connecting rod cap.

Tightening torque:

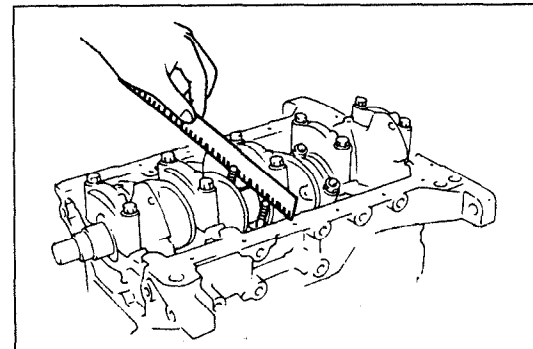
47—50 N·m (4.8—5.1 m·kg, 35—37 ft·lb)

Oil clearance: 0.028—0.068mm (0.0011—0.0027 in)
Maximum: 0.10mm (0.004 in)

2. If the oil clearance exceeds the maximum, grind the crankshaft and use undersize bearings. (Refer to page B2-64.)



03U0B2-170

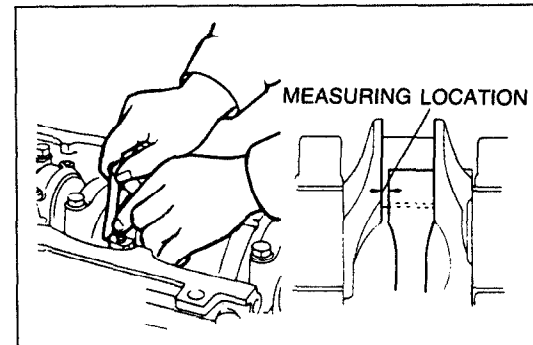


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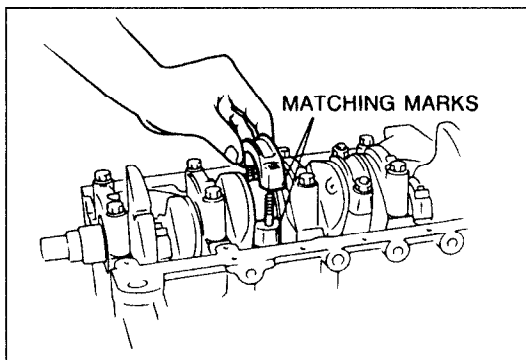
3. Measure the connecting rod side clearances.

Side clearance: 0.110—0.262mm (0.0043—0.0103 in)
Maximum: 0.30mm (0.012 in)

4. If the clearance exceeds the maximum, replace the connecting rod and cap.



05U0BX-196



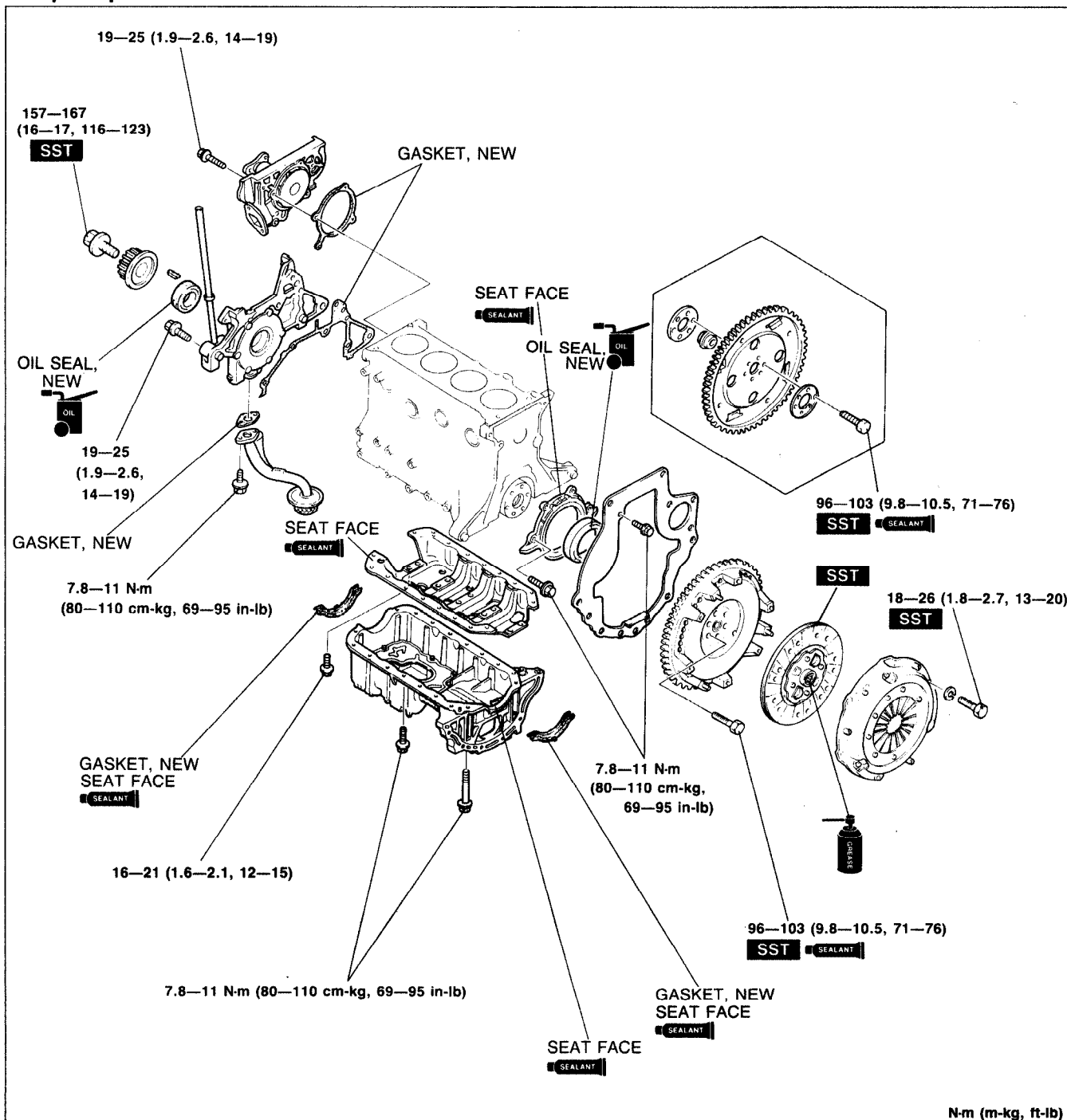
03U0B2-171

5. Apply a liberal amount of clean engine oil to the crankpin journals and connecting rod bearings.
6. Install the connecting rod caps with the matching marks aligned.
7. Tighten the connecting rod cap nuts in two or three steps.

Tightening torque:

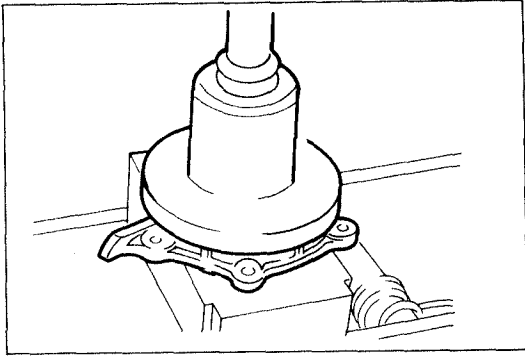
47—50 N·m (4.8—5.1 m·kg, 35—37 ft·lb)

**CYLINDER BLOCK (EXTERNAL PARTS)
Torque Specifications**



N·m (m·kg, ft·lb)

05U0BX-198



05U0BX-199

Rear Cover

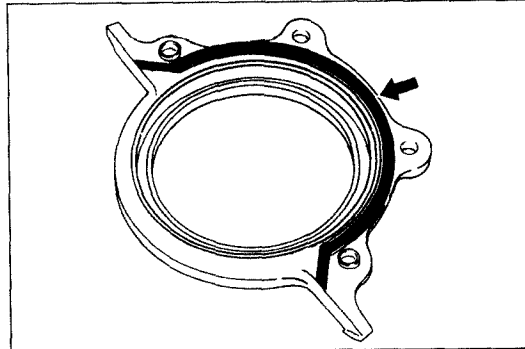
1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution

- The oil seal must be pressed in until it is flush with the edge of the rear cover.

3. Press the oil seal in evenly with a suitable pipe.

Oil seal outer diameter: 100mm (3.94 in)



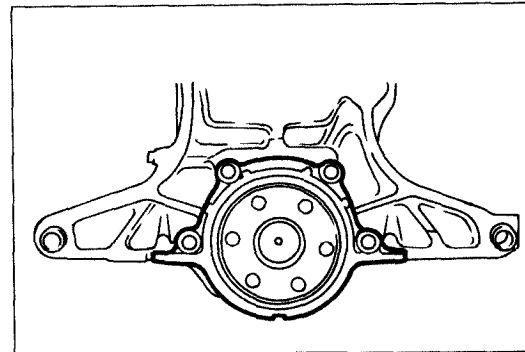
05U0BX-200

4. Apply silicone sealant to the shaded area shown in the figure.

5. Install the rear cover.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



05U0BX-201

Oil Pump

1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution

- The oil seal must be pressed in until it is flush with the edge of the oil pump body.

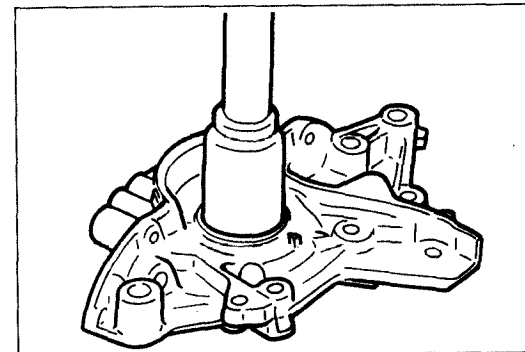
3. Press the oil seal in evenly with a suitable pipe.

Oil seal outer diameter: 44mm (1.73 in)

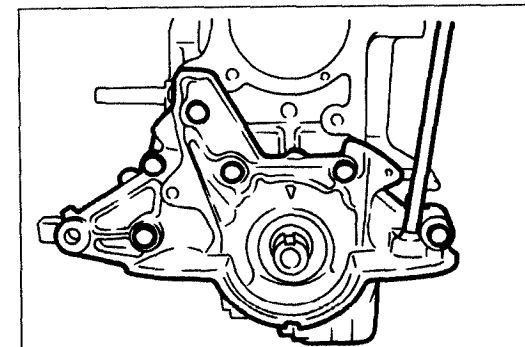
4. Install the oil pump and a new gasket.

Tightening torque:

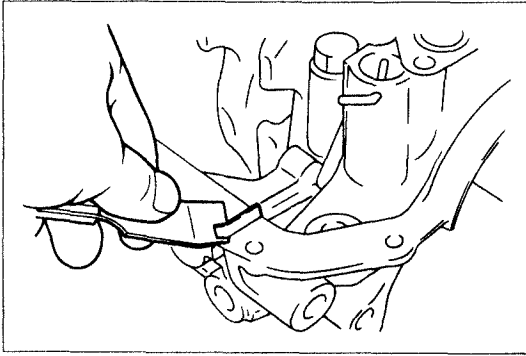
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



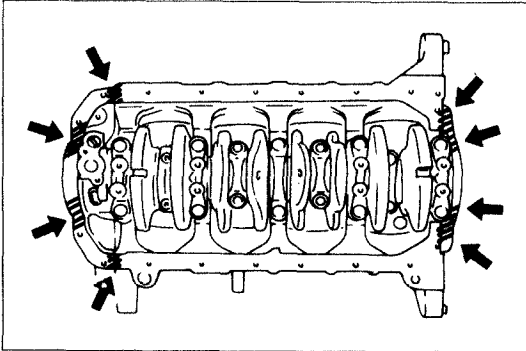
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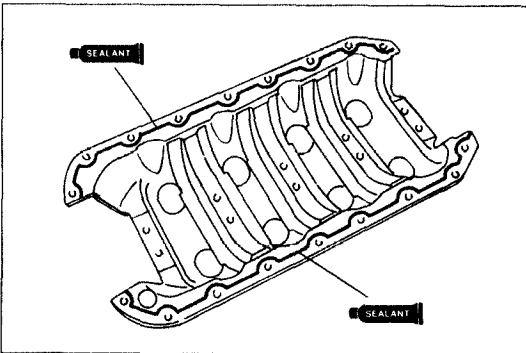
05U0BX-203



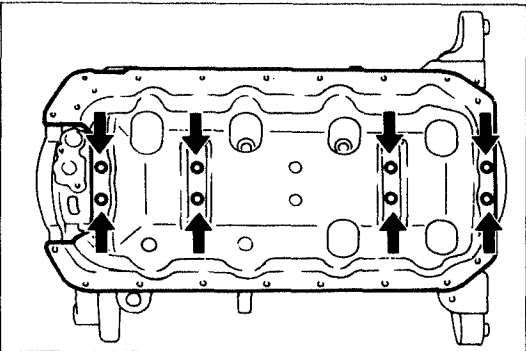
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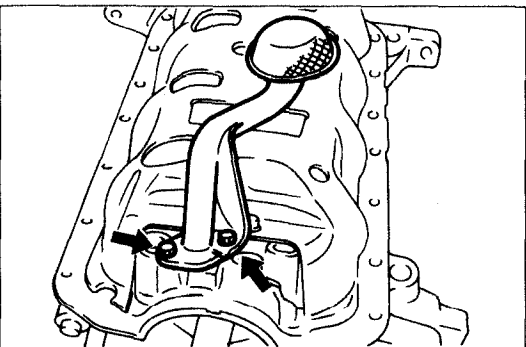
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03U0B2-094



03U0B2-095



05U0BX-207

Caution

- Do not scratch the oil pump.

5. Cut away the portion of the gasket that projects from the body toward the oil pan side.

Main Bearing Support Plate (MBSP)

1. Remove all foreign material from the contact surfaces.

Caution

- The oil pan must be secured within 30 minutes after the sealant is applied to the MBSP.

2. Apply silicone sealant to the shaded areas shown in the figure.

3. Apply a continuous bead of silicone sealant to the MBSP along the inside of the bolt holes.

4. Install the MBSP.

5. Install the MBSP bolts and tighten them in two or three steps in the order shown.

Tightening torque:

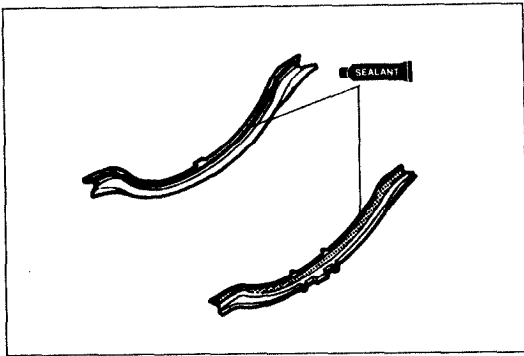
16–21 N·m (1.6–2.1 m·kg, 12–15 ft·lb)

Oil Strainer

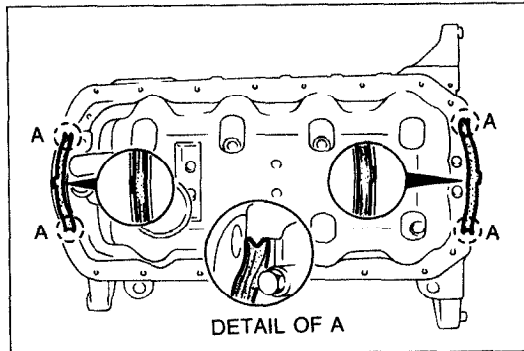
1. Install the oil strainer and a new gasket.

Tightening torque:

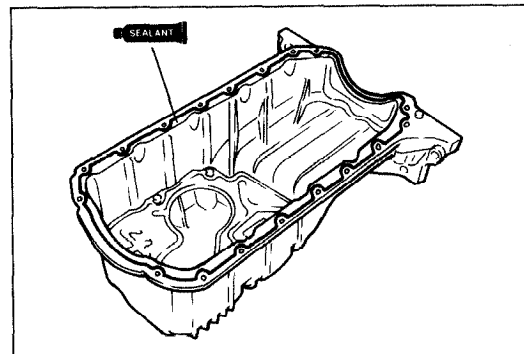
7.8–11 N·m (80–110 cm·kg, 69–95 in·lb)



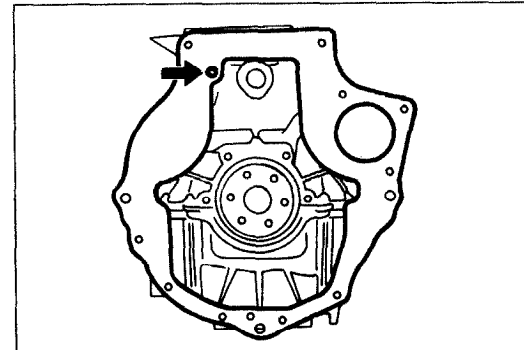
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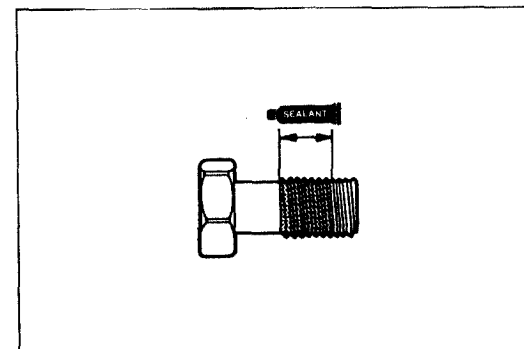
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05U0BX-210



05U0BX-211



03U0B2-097

Oil Pan

1. Remove all foreign material from the contact surfaces.
2. Apply silicone sealant to the shaded areas shown in the figure.

3. Install new gaskets onto the oil pump body and the rear cover with the projections in the notches shown in the figure.

4. Apply a continuous bead of silicone sealant to the oil pan along the inside of the bolt holes and overlap the ends.
5. Install the oil pan.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

End Plate

1. Install the end plate.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

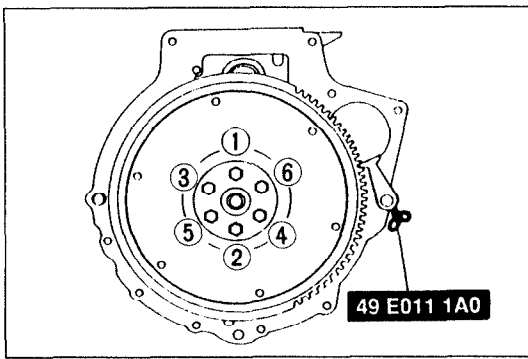
Flywheel (MTX)

1. Remove the sealant from the flywheel bolt holes in the crankshaft and from the flywheel bolts.

Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- Do not apply sealant if a new bolt is used.

2. Set the flywheel onto the crankshaft.
3. Apply sealant to the flywheel bolts and install them.

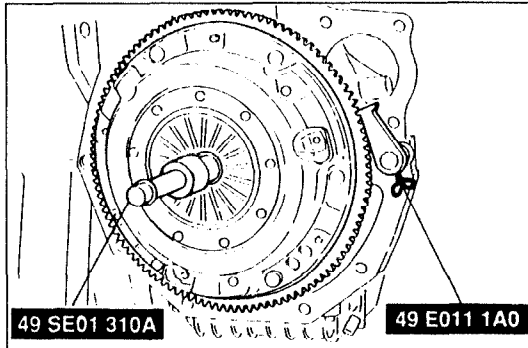


23U0B2-062

4. Hold the flywheel with the **SST** or equivalent.
5. Tighten the bolts in two or three steps in the order shown.

Tightening torque:

96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)



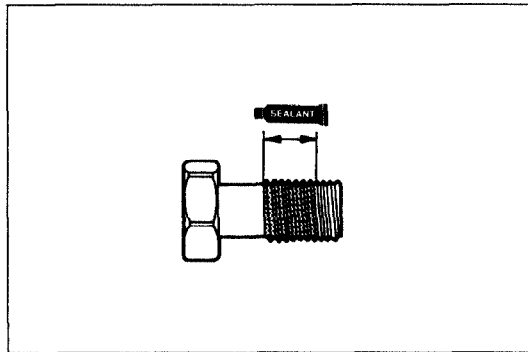
23U0B2-041

Clutch Disc and Clutch Cover (MTX)

1. Install the clutch disc and clutch cover using the **SST** or equivalent. (Refer to Section H.)

Tightening torque:

18—26 N·m (1.8—2.7 m·kg, 13—20 ft·lb)



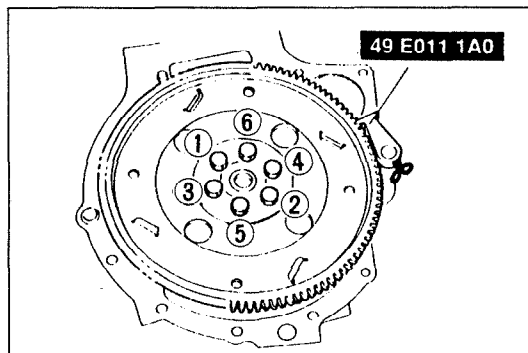
03U0B2-099

Drive Plate (ATX)

1. Remove the sealant from the drive plate holes in the crankshaft and from the drive plate lock bolts.

Caution

- If all the previous sealant cannot be removed from a bolt, replace the bolt.
- Do not apply sealant if a new bolt is used.

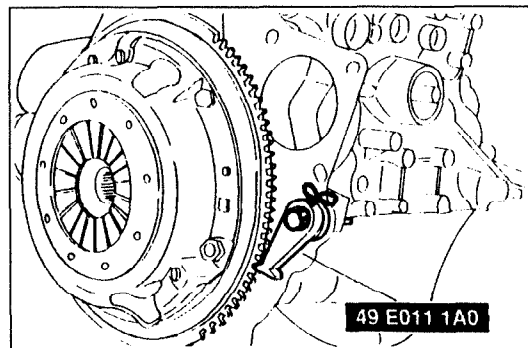


23U0B2-063

2. Set the adapter, drive plate, and backing plate onto the crankshaft.
3. Apply sealant to the drive plate bolts and install them.
4. Hold the drive plate with the **SST** or equivalent.
5. Tighten the bolts in two or three steps in the order shown.

Tightening torque:

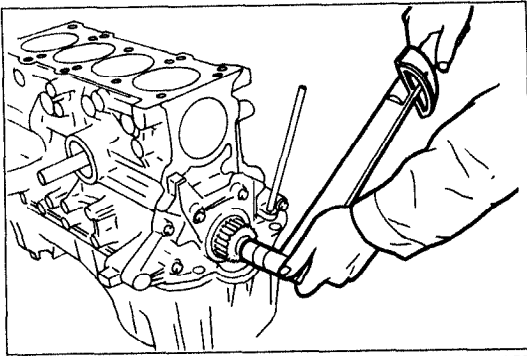
96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)



23U0B2-064

Timing Belt Pulley

1. Reverse the direction of the **SST** or equivalent on the flywheel.

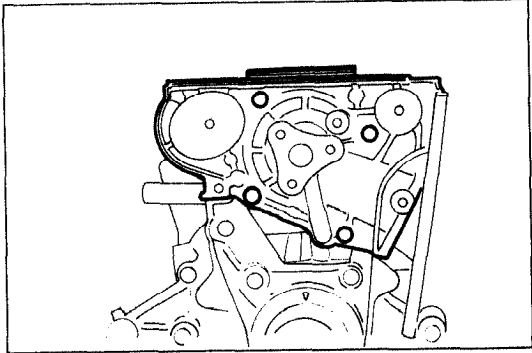


23U0B2-050

2. Install the timing belt pulley.
3. Install the pulley Woodruff key with the tapered side toward the oil pump body.
4. Install the pulley lock bolt.
5. Tighten the pulley lock bolt.

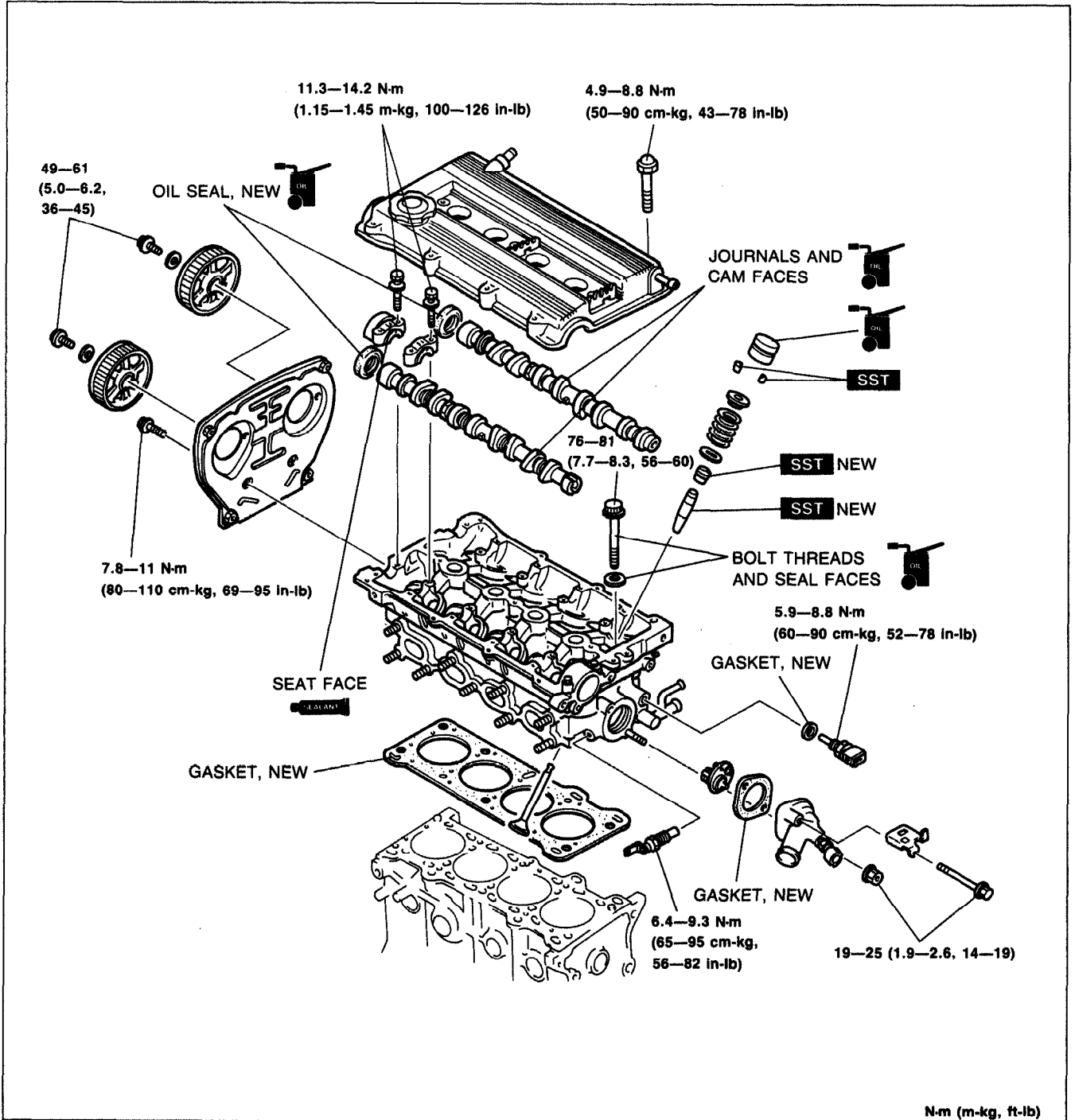
Tightening torque:**157—167 N·m (16—17 m·kg, 116—123 ft·lb)****Water Pump**

1. Remove all foreign material from the water pump mounting surface.
2. Install the water pump and a new gasket.

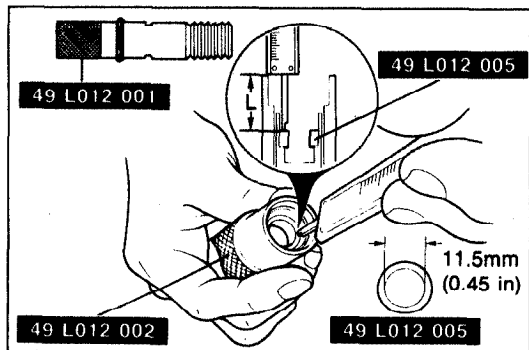
Tightening torque:**19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

03U0B2-101

CYLINDER HEAD
Torque Specifications



03U0B2-102

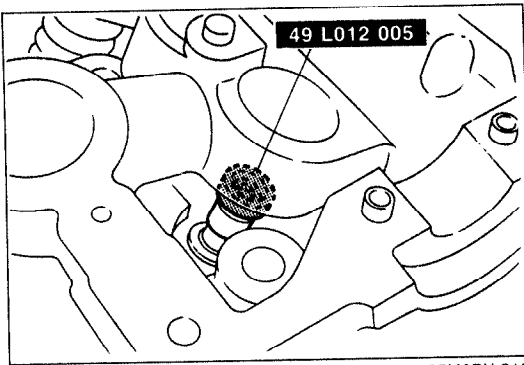


03U0B2-103

Valve Seal

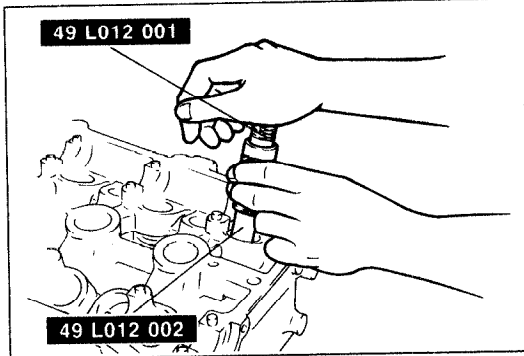
1. Assemble the **SST** so that depth **L** is as specified.

Depth L: 19.8—20.0mm (0.780—0.787 in)



05U0BX-215

2. Slide the valve seal onto the valve guide.
3. Set the **SST** against the valve seal.



05U0BX-216

Caution

- Do not use a hammer.

4. Press the valve seal on until the **SST** contacts the cylinder head.

Valve and Valve Spring

1. Install the lower spring seat.
2. Install the valve.

Caution

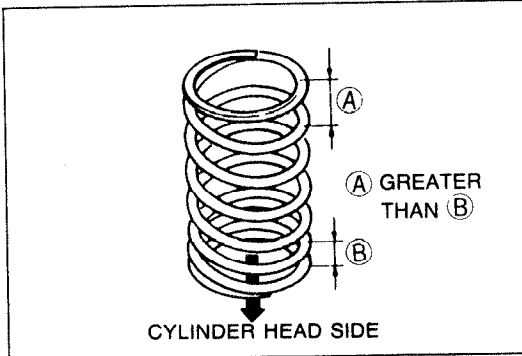
- Install the spring with the closer pitch toward the cylinder head.

3. Install the valve spring and the upper spring seat.

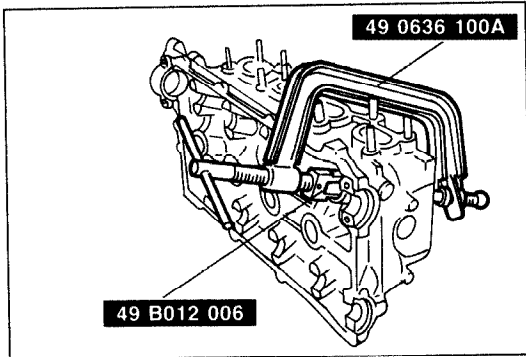
4. Compress the valve spring with the **SST**, and install the valve keepers.
5. Remove the **SST**.
6. Tap the end of the valve stem lightly two or three times with a plastic hammer to verify that the keepers are all fully seated.

Cylinder Head Gasket

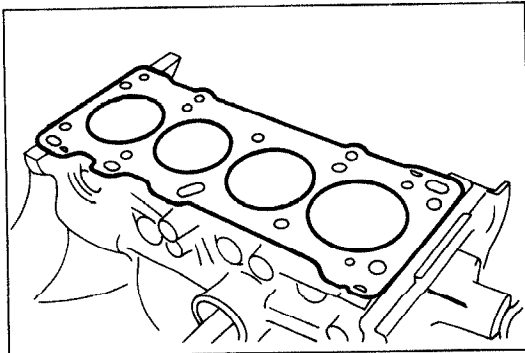
1. Remove all foreign material from the top of the cylinder block.
2. Place the new cylinder head gasket in position.



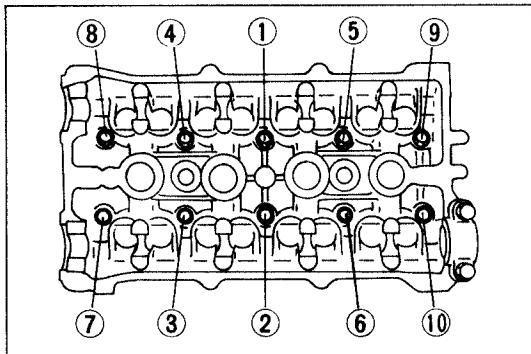
05U0BX-217



05U0BX-218



05U0BX-219



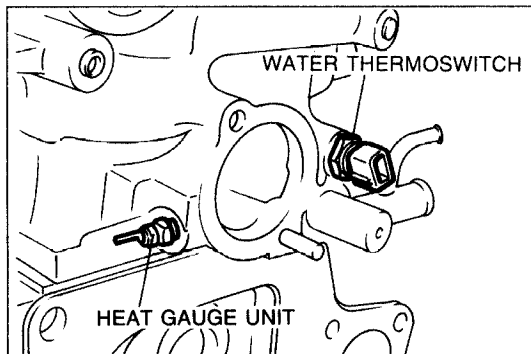
05U0BX-220

Cylinder Head

1. Install the cylinder head.
2. Apply clean engine oil to the bolt threads and seat faces.
3. Tighten the cylinder head bolts in two or three steps in the order shown.

Tightening torque:

76—81 N·m (7.7—8.3 m·kg, 56—60 ft·lb)



03U0B2-104

Water Thermostat, Heat Gauge Unit

1. Install the water thermostat.

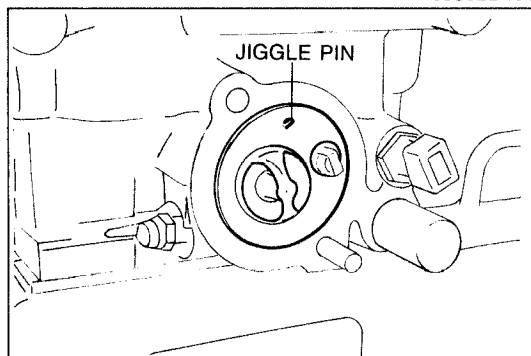
Tightening torque:

5.9—8.8 N·m (60—90 cm·kg, 52—78 in·lb)

2. Install the heat gauge unit.

Tightening torque:

6.4—9.3 N·m (65—95 cm·kg, 56—82 in·lb)



03U0B2-105

Thermostat, Thermostat Cover

1. Remove all foreign material from the thermostat cover mounting surface.
2. Install the thermostat with the jiggle pin facing upward.

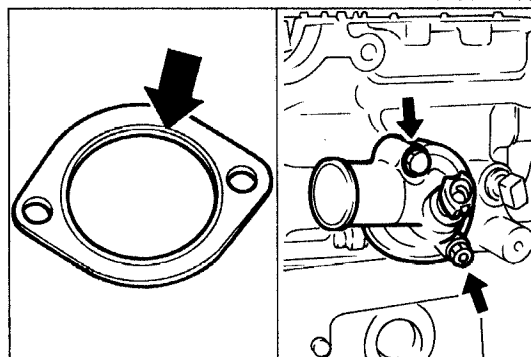
Caution

- The printed side of the gasket must face the thermostat.

3. Install a new gasket and the thermostat cover.

Tightening torque:

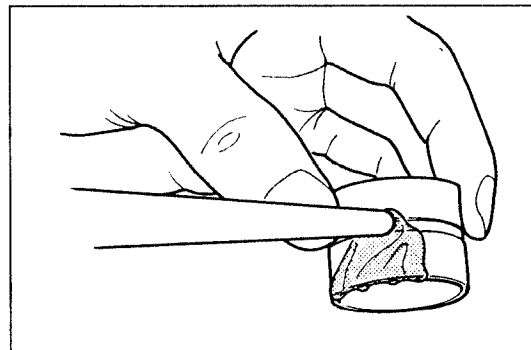
19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



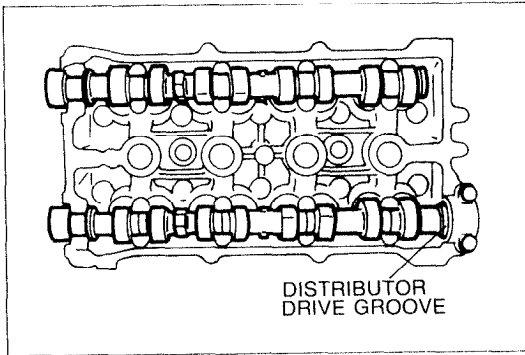
03U0B2-106

HLA

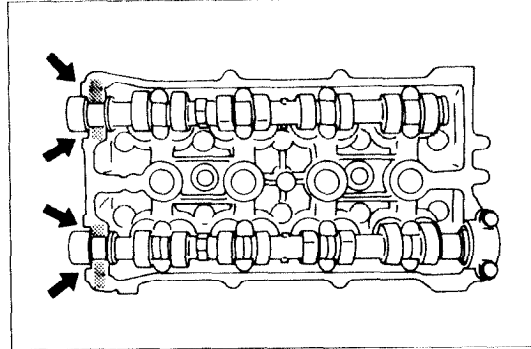
1. Apply clean engine oil to the friction surfaces.
2. If the HLA are being reused, install them in the position from which they were removed.
3. Verify that the HLA move smoothly in their bores.



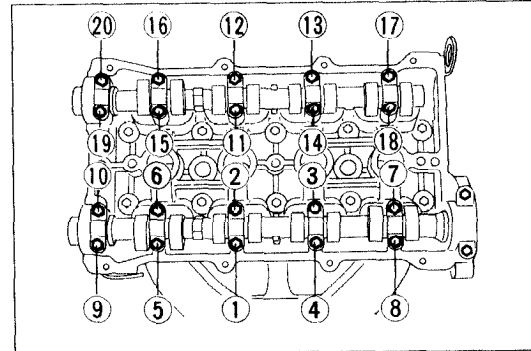
05U0BX-223



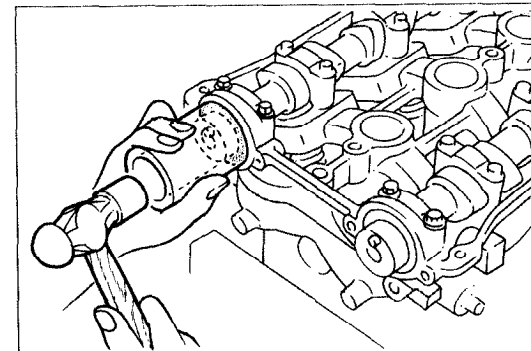
03U0B2-108



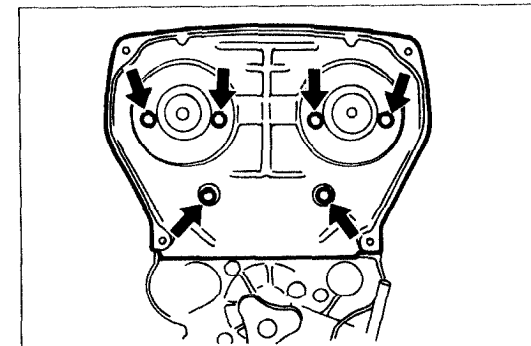
03U0BX-011



05U0BX-055



05U0BX-056



03U0B2-107

Camshaft

Note

- The exhaust camshaft is grooved for the distributor drive.

1. Apply clean engine oil to the camshaft journals and bearings.
2. Install the camshaft in position.

Caution

- Do not allow any sealant on the camshaft journal surfaces.

3. Apply silicone sealant to the shaded areas shown in the figure.
4. Install the camshaft caps according to the cap number and arrow mark.

5. Install the camshaft cap bolts and tighten them in two or three steps in the order shown in the figure.

Tightening torque:

11.3—14.2 N·m (1.15—1.45 m·kg, 100—126 in·lb)

6. Apply a small amount of clean engine oil to the lip of a new camshaft oil seal.
7. Push the oil seal slightly in by hand.

Caution

- The oil seal must be tapped in until it is flush with the edge of the camshaft cap.

8. Tap the oil seal in evenly with a suitable pipe and a hammer.

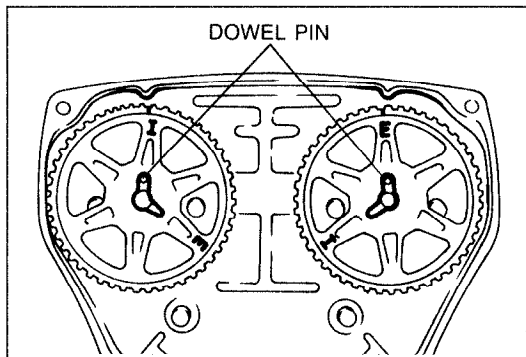
Oil seal outer diameter: 48mm (1.89 in)

Seal Plate

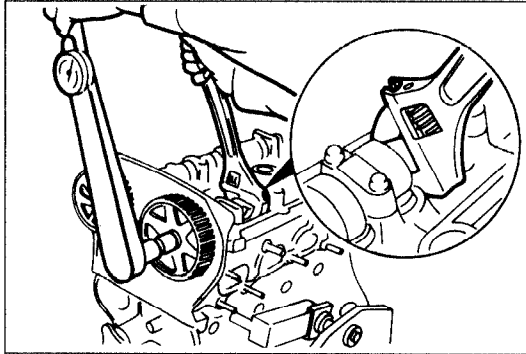
1. Install the seal plate on the cylinder head.

Tightening torque:

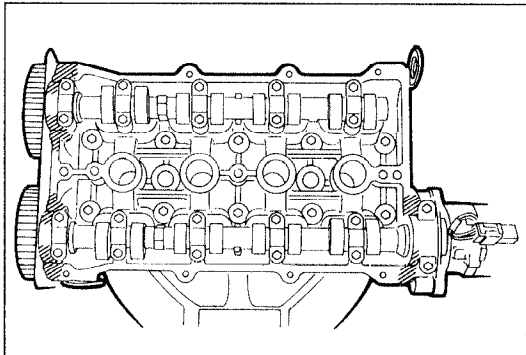
7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



05U0BX-225



23U0B2-042



03U0B2-109

Camshaft Pulley

1. Turn the camshafts until the camshaft dowel pins face straight up.
2. Install the camshaft pulleys with the I mark (intake side) or the E mark (exhaust side) straight up.

3. Install the camshaft pulley lock bolts.
4. Hold the camshaft with a wrench at hexagonal portion.
5. Tighten the camshaft pulley lock bolt.

Tightening torque:

49—61 N·m (5.0—6.2 m·kg, 36—45 ft·lb)

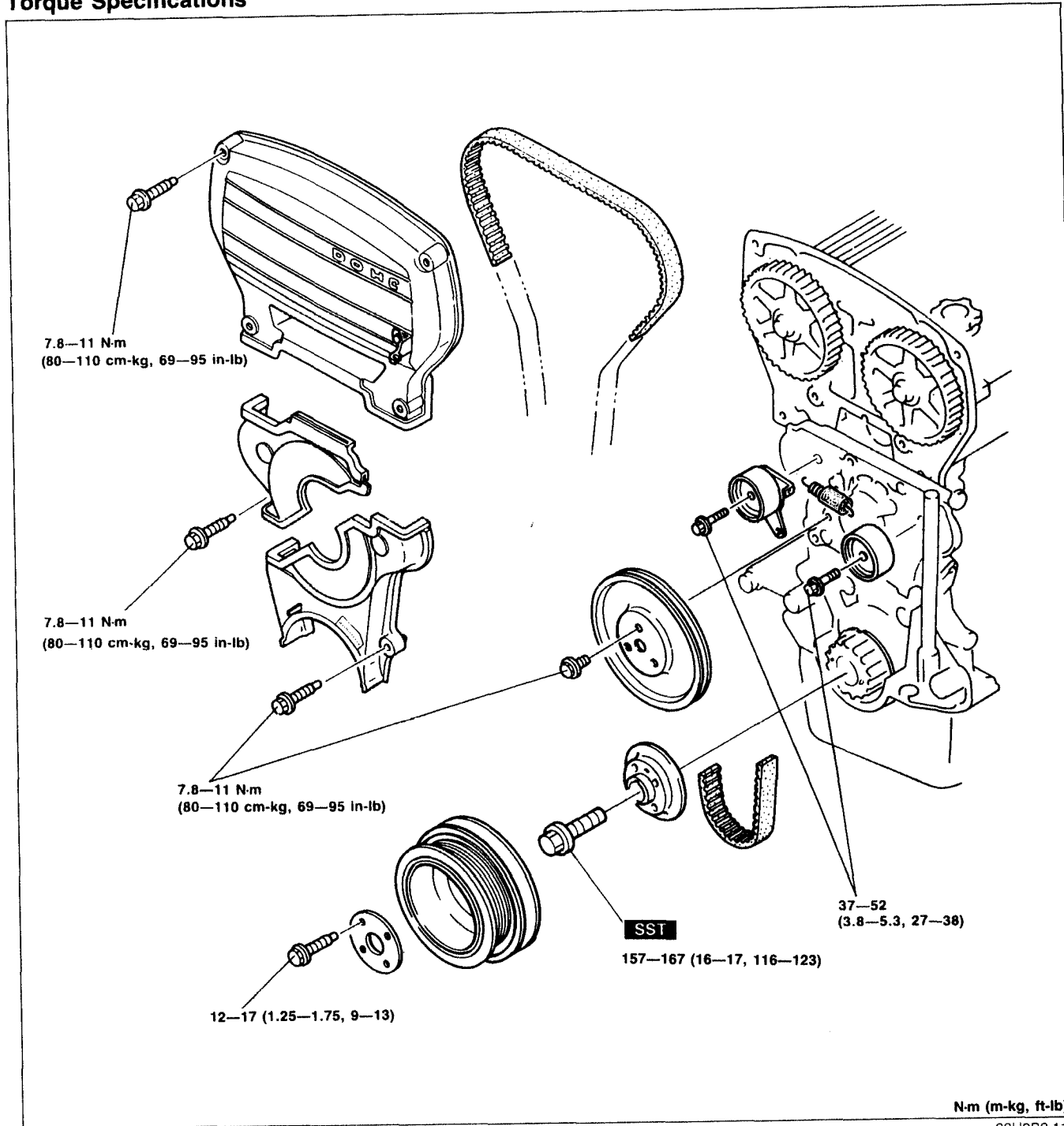
Cylinder Head Cover

1. Apply silicone sealant to the shaded areas shown in the figure.
2. Install the cylinder head cover.

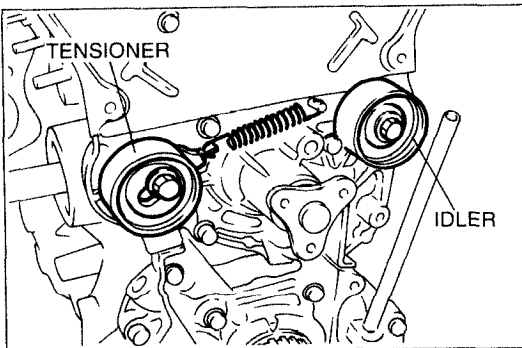
Tightening torque:

4.9—8.8 N·m (50—90 cm·kg, 43—78 in·lb)

TIMING BELT Torque Specifications



03U0B2-110



05U0BX-229

Idler

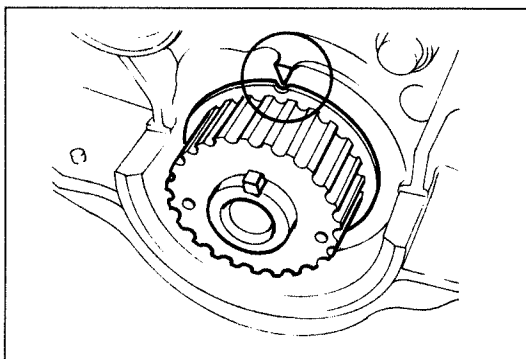
1. Install the idler.

Tightening torque:

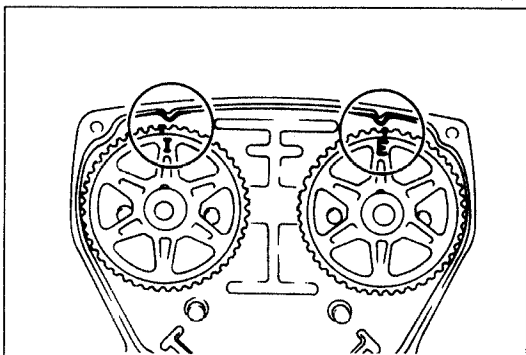
37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

Tensioner and Tensioner Spring

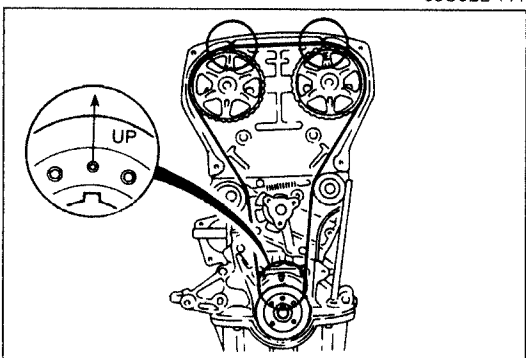
1. Install the tensioner and the tensioner spring.
2. Temporarily secure the tensioner with the spring fully extended.



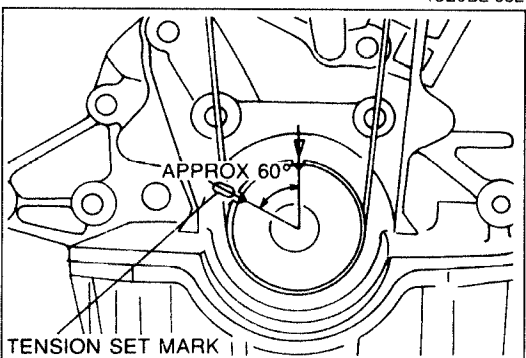
13E0B2-031



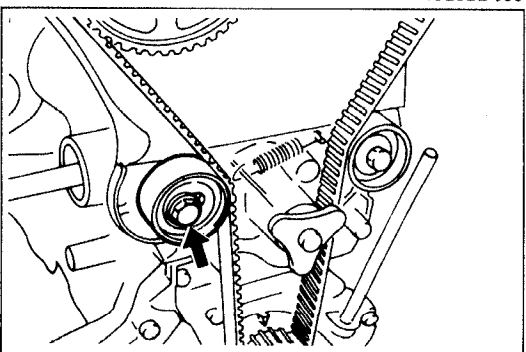
03U0B2-111



13E0B2-032



13E0B2-033



23U0B2-043

Timing Belt

1. Verify that the timing belt pulley mark is aligned with the timing mark.
2. Verify that the camshaft pulley marks are aligned with the seal plate marks.
3. Install the timing belt so that there is no looseness at the idler side or between the camshaft pulleys.
4. Install the pulley boss and pulley lock bolt.

Caution

- Do not turn the crankshaft counterclockwise.

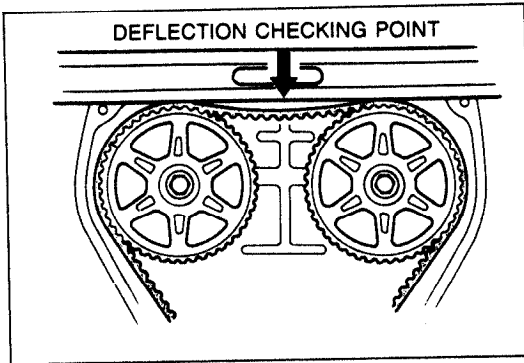
5. Turn the crankshaft two turns clockwise and face the pin on the pulley boss upright.
6. Verify that the camshaft pulley marks are aligned with the seal plate marks.
If not aligned, remove the timing belt and repeat from tensioner installation.
7. Turn the crankshaft 1 and 5/6 turns clockwise, and align the timing belt pulley mark with the tension set mark for proper timing belt tension adjustment.

8. Loosen the tensioner lock bolt to apply tension to the timing belt.
9. Tighten the tensioner lock bolt.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

10. Turn the crankshaft 2 and 1/6 turns clockwise and verify that the timing marks are correctly aligned.

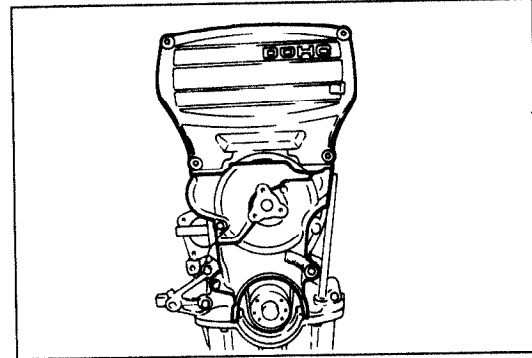


23U0B2-044

11. Measure the timing belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the two camshaft pulleys.
If the deflection is not correct, repeat from Step 7 above.

Deflection:

9.0—11.5mm (0.35—0.45 in) at 98 N (10 kg, 22 lb)



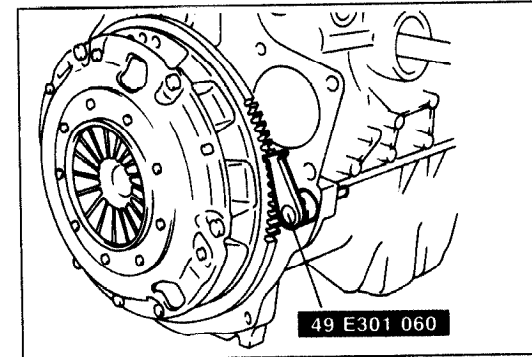
05U0BX-231

Timing Belt Cover

1. Install the lower, middle, and upper covers.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



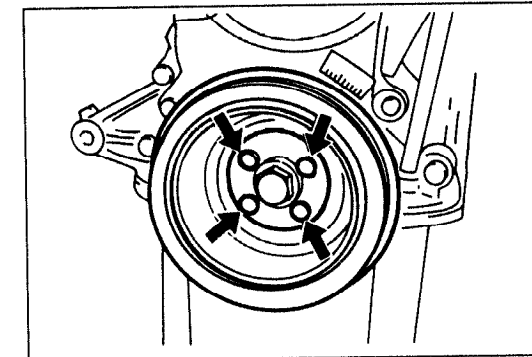
23U0B2-045

Pulley lock bolt

1. Hold the flywheel (MTX) or drive plate (ATX) with the **SST** and tighten the pulley lock bolt.

Tightening torque:

157—167 N·m (16—17 m·kg, 116—123 ft·lb)



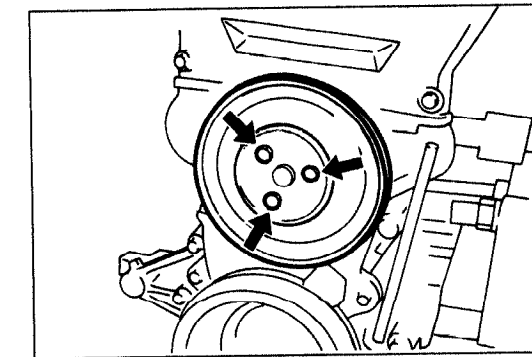
13E0B2-037

Crankshaft pulley

1. Install the crankshaft pulley.
2. Install the plate.
3. Tighten the pulley bolts.

Tightening torque:

12—17 N·m (1.25—1.75 m·kg, 9—13 ft·lb)



05U0BX-236

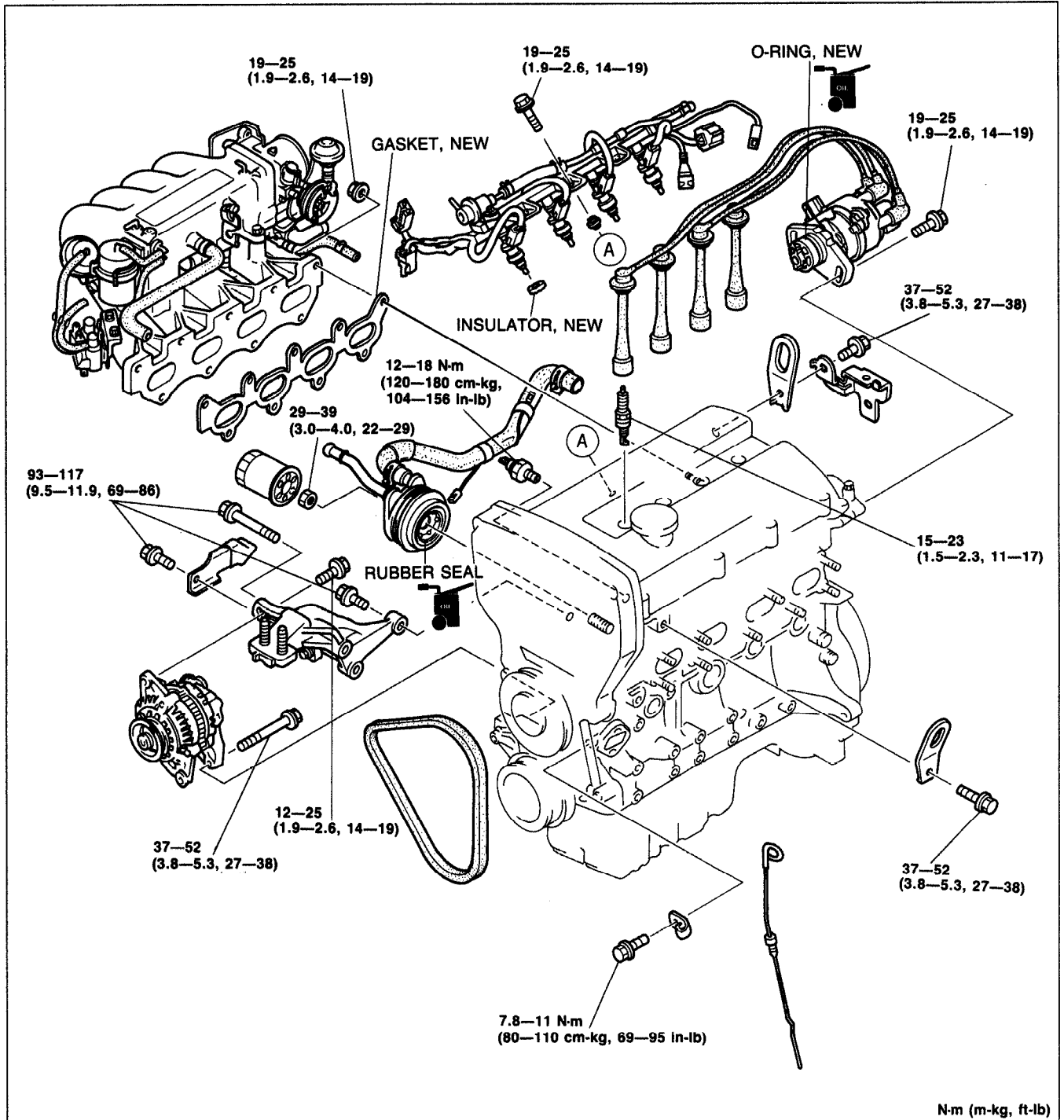
Water Pump Pulley

1. Install the water pump pulley.

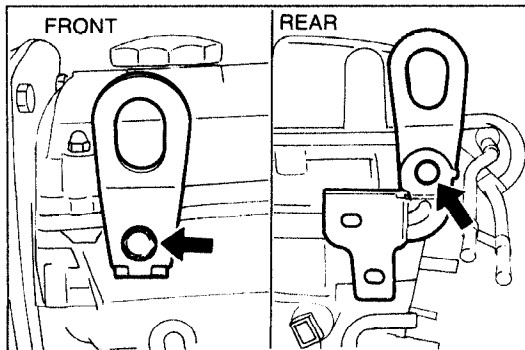
Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

AUXILIARY PARTS
Torque Specifications



05U0BX-237



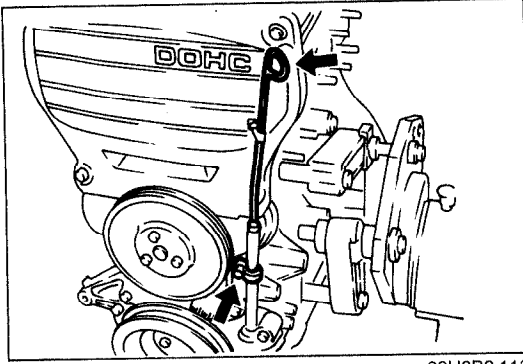
05U0BX-238

Engine Hanger

1. Install the front and rear engine hangers.

Tightening torque:

37-52 N-m (3.8-5.3 m-kg, 27-38 ft-lb)



03U0B2-113

Oil Level Gauge Pipe Stay

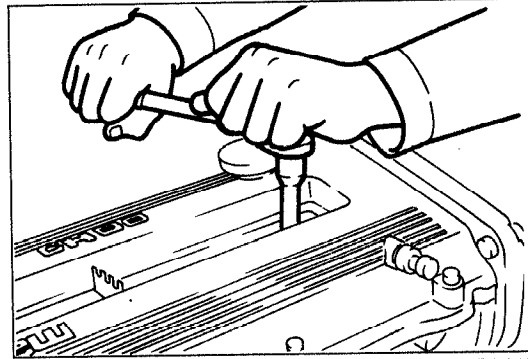
1. Install the oil level gauge pipe stay.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Oil Level Gauge

1. Install the level gauge.



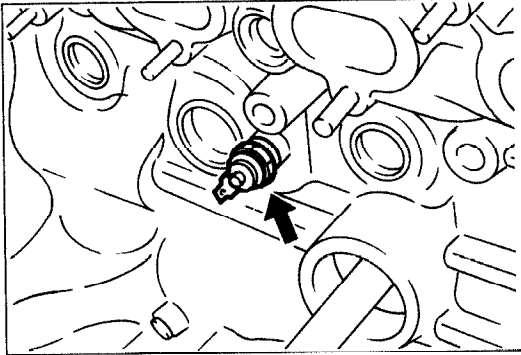
23U0B2-046

Spark Plug

1. Install the spark plugs.

Tightening torque:

15—23 N·m (1.5—2.3 m·kg, 11—17 ft·lb)



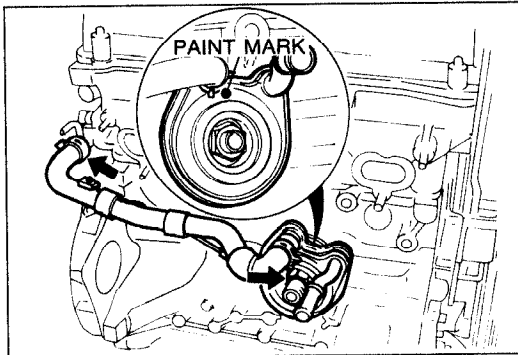
13U0B2-023

Oil Pressure Switch

1. Install the oil pressure switch.

Tightening torque:

12—18 N·m (120—180 cm·kg, 104—156 in·lb)



03U0B2-114

Oil Cooler

1. Remove all foreign material from the oil cooler mounting surface.
2. Apply a small amount of clean engine oil to the rubber seal of the oil cooler.
3. Install the oil cooler with paint mark (white) facing up.
4. Tighten the oil cooler lock nut.

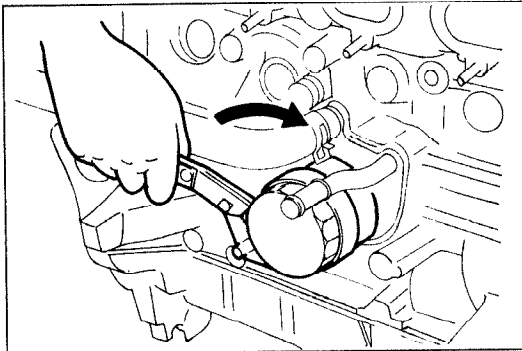
Tightening torque:

29—39 N·m (3.0—4.0 m·kg, 22—29 ft·lb)

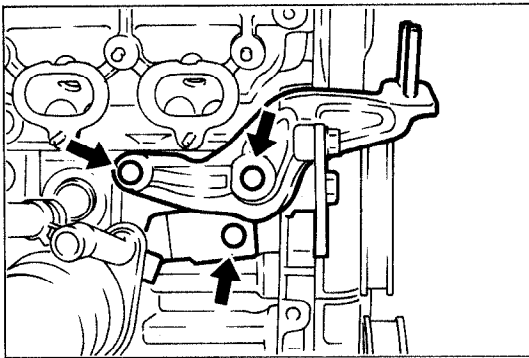
5. Connect the harness to oil pressure switch.

Oil Filter

1. Remove all foreign material from the oil filter mounting surface.
2. Apply a small amount of clean engine oil to the rubber seal of the oil filter.
3. Install the oil filter and tighten it by hand until the rubber seal contacts the base.
4. Tighten the filter 1 and 1/6 turns with a filter wrench.



05U0BX-243



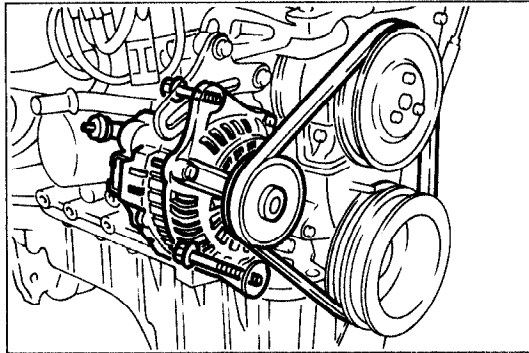
03U0B2-115

No.3 Engine Mount Bracket

1. Install the No.3 engine mount bracket.

Tightening torque:

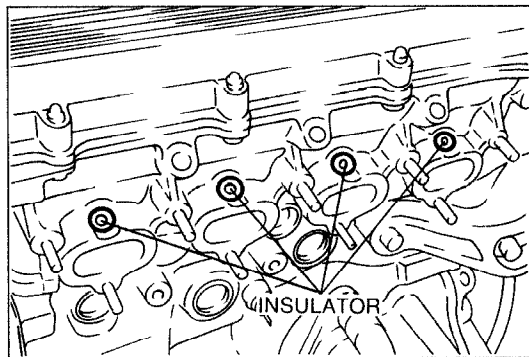
93—117 N·m (9.5—11.9 m·kg, 69—86 ft·lb)



03U0B2-116

Alternator and Drive Belt

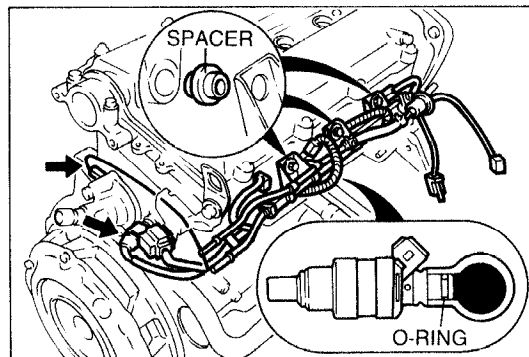
1. Install the alternator and loosely tighten the mounting bolts.
2. Install the alternator drive belt.
3. Adjust the drive belt deflections. (Refer to page B2-6.)



03U0B2-117

Injector and Distribution Pipe Assembly

1. Install the new injector insulators to the cylinder head.

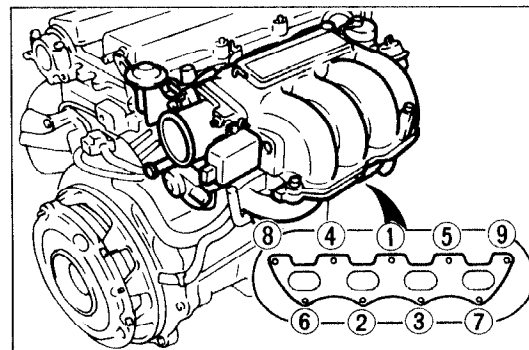


03U0B2-118

2. Install the injector and distribution pipe assembly to the cylinder head.

Tightening torque:

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



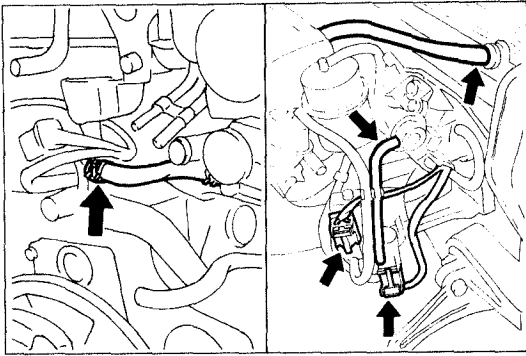
03U0B2-119

Intake Manifold Assembly

1. Remove all foreign material from the intake manifold contact surface.
2. Install a new gasket and the intake manifold assembly.

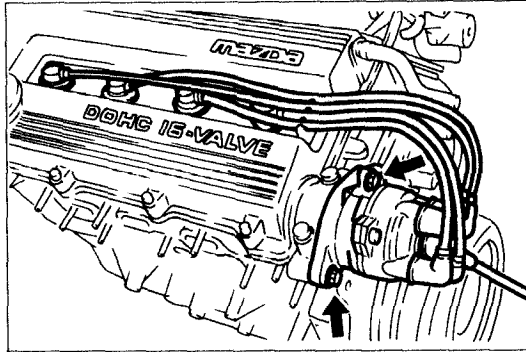
Tightening torque:

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



03U0B2-159

3. Connect the harness and hose.



03U0B2-120

Distributor and High-tension Lead

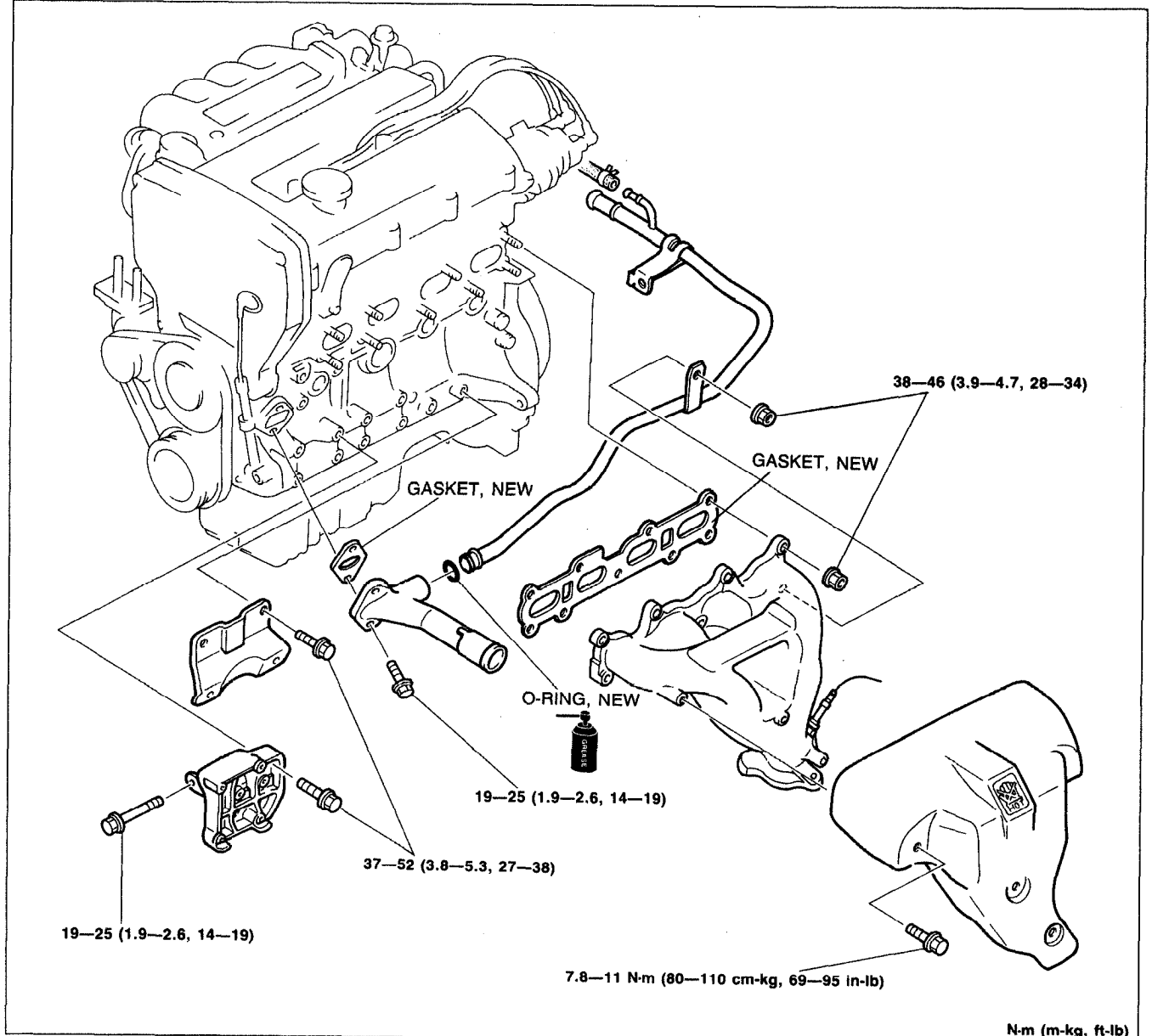
1. Apply grease to a new O-ring and the blade.
2. Install the distributor and loosely tighten the installation bolts.
3. Connect the high-tension leads.

ENGINE STAND DISMOUNTING

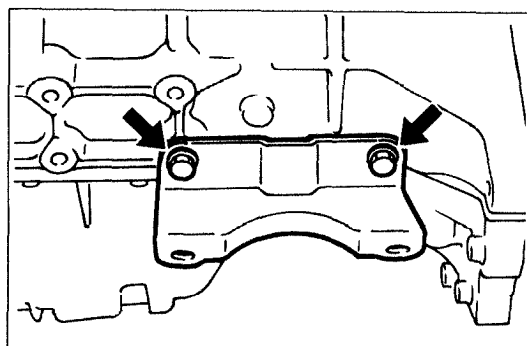
PROCEDURE

1. Remove the engine from the **SST (engine stand)**.
2. Remove the **SST (engine hanger)** from the engine.
3. Install the parts shown in the figure.

Torque Specifications



05U0BX-251



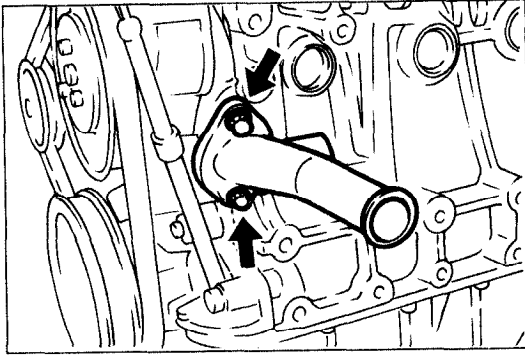
03U0B2-160

Exhaust Pipe Bracket

1. Install the exhaust pipe bracket.

Tightening torque:

37-52 N-m (3.8-5.3 m-k-g, 27-38 ft-lb)



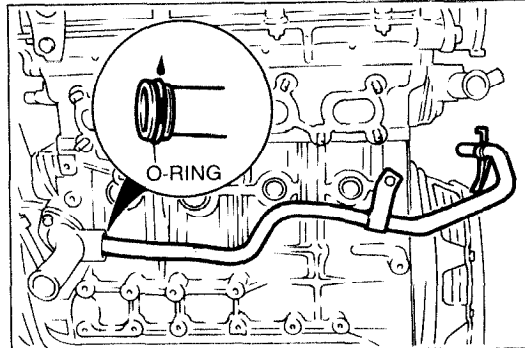
03U0B2-121

Water Inlet Pipe

1. Remove all foreign material from the water inlet pipe mounting surface.
2. Install a new gasket and the water inlet pipe.

Tightening torque:

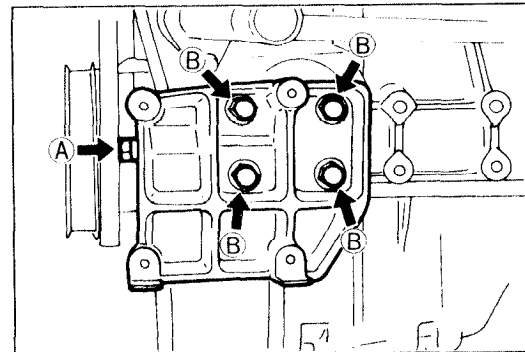
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



03U0B2-122

Water Bypass Pipe

1. Apply a small amount of engine coolant to the new O-ring.
2. Install the water bypass pipe.



03U0B2-702

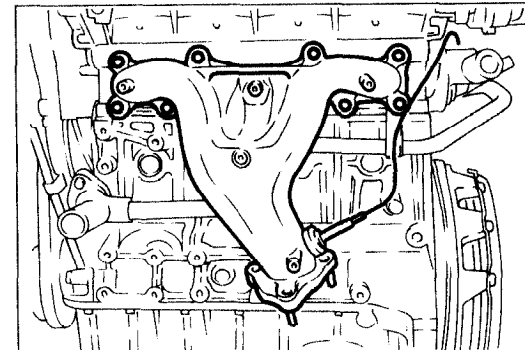
A/C Compressor Bracket (If equipped)

1. Install the A/C compressor bracket.

Tightening torque

Ⓐ: 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

Ⓑ: 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)



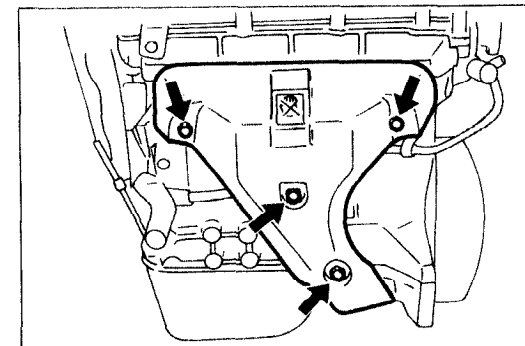
05U0BX-256

Exhaust Manifold

1. Remove all foreign material from the exhaust manifold contact surface.
2. Install a new gasket and the exhaust manifold.

Tightening torque:

38—46 N·m (3.9—4.7 m·kg, 28—34 ft·lb)



05U0BX-257

Exhaust Manifold Insulator

1. Install the exhaust manifold insulator.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

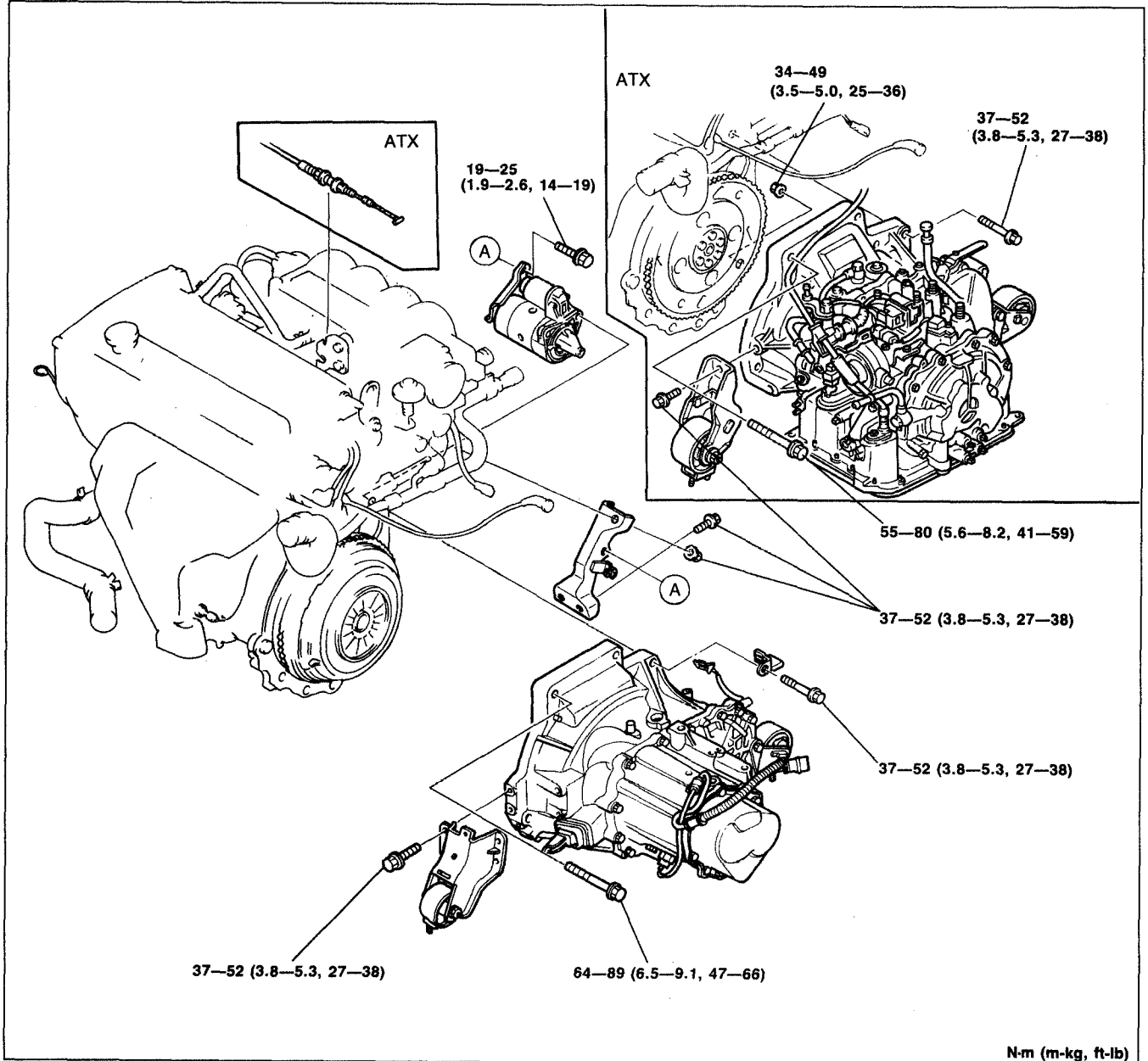
INSTALLATION

PROCEDURE

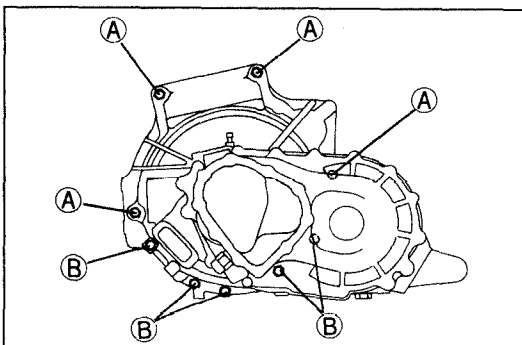
1. Tighten all bolts and nuts to the specified torques.

Step 1

Torque Specifications



03U0B2-123



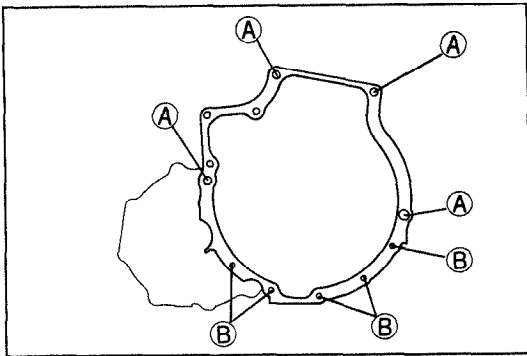
03U0B2-124

Manual transaxle

1. Join the engine and transaxle.
2. Install the transaxle mounting bolts shown in the figure.
3. Tighten the bolts.

Tightening torque

- Ⓐ: 64-89 N-m (6.5-9.1 m-kg, 47-66 ft-lb)
- Ⓑ: 37-52 N-m (3.8-5.3 m-kg, 27-38 ft-lb)



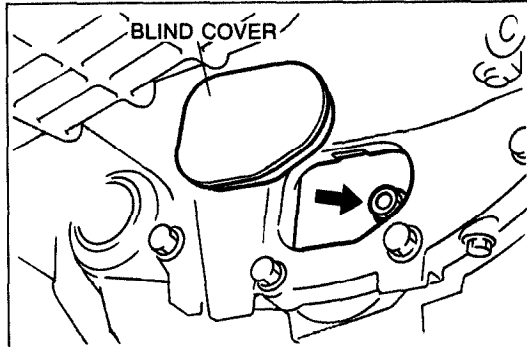
03U0B2-125

Automatic transaxle

1. Join the engine and transaxle.
2. Install the transaxle mounting bolts shown in the figure.
3. Tighten the bolts.

Tightening torque

- Ⓐ: 55—80 N·m (5.6—8.2 m·kg, 41—59 ft·lb)
- Ⓑ: 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

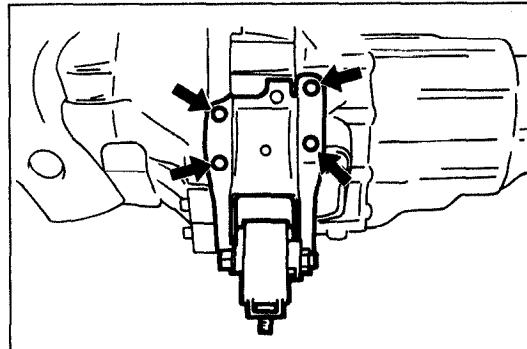


03U0B2-126

4. Align the torque converter bolts and drive plate holes.
5. Install the torque converter nuts and tighten them.

Tightening torque:

- 34—49 N·m (3.5—5.0 m·kg, 25—36 ft·lb)



13U0B2-011

No.2 engine mount rubber and bracket

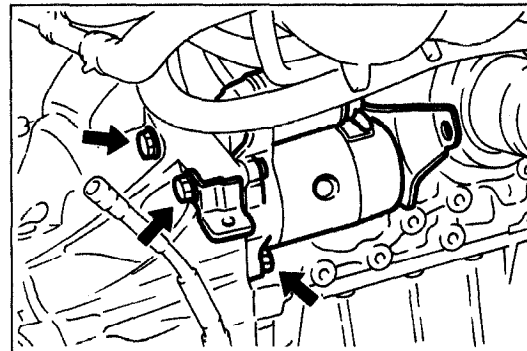
1. Install the mount rubber and bracket.

Tightening torque:

- 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

Throttle Cable (ATX)

1. Connect the throttle cable and adjust it. (Refer to Section K1.)



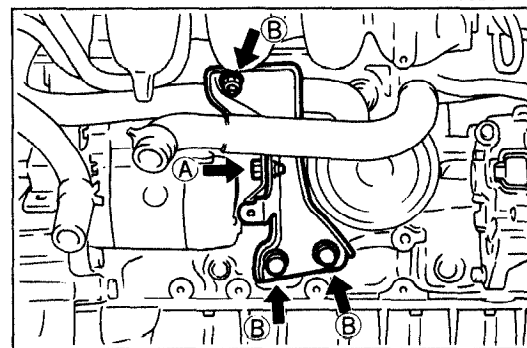
03U0B2-128

Starter

1. Install the starter to the transaxle housing.

Tightening torque:

- 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)



03U0B2-129

Intake manifold bracket

1. Install the intake manifold bracket.

Tightening torque

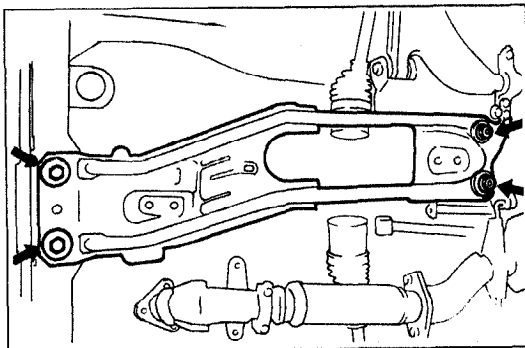
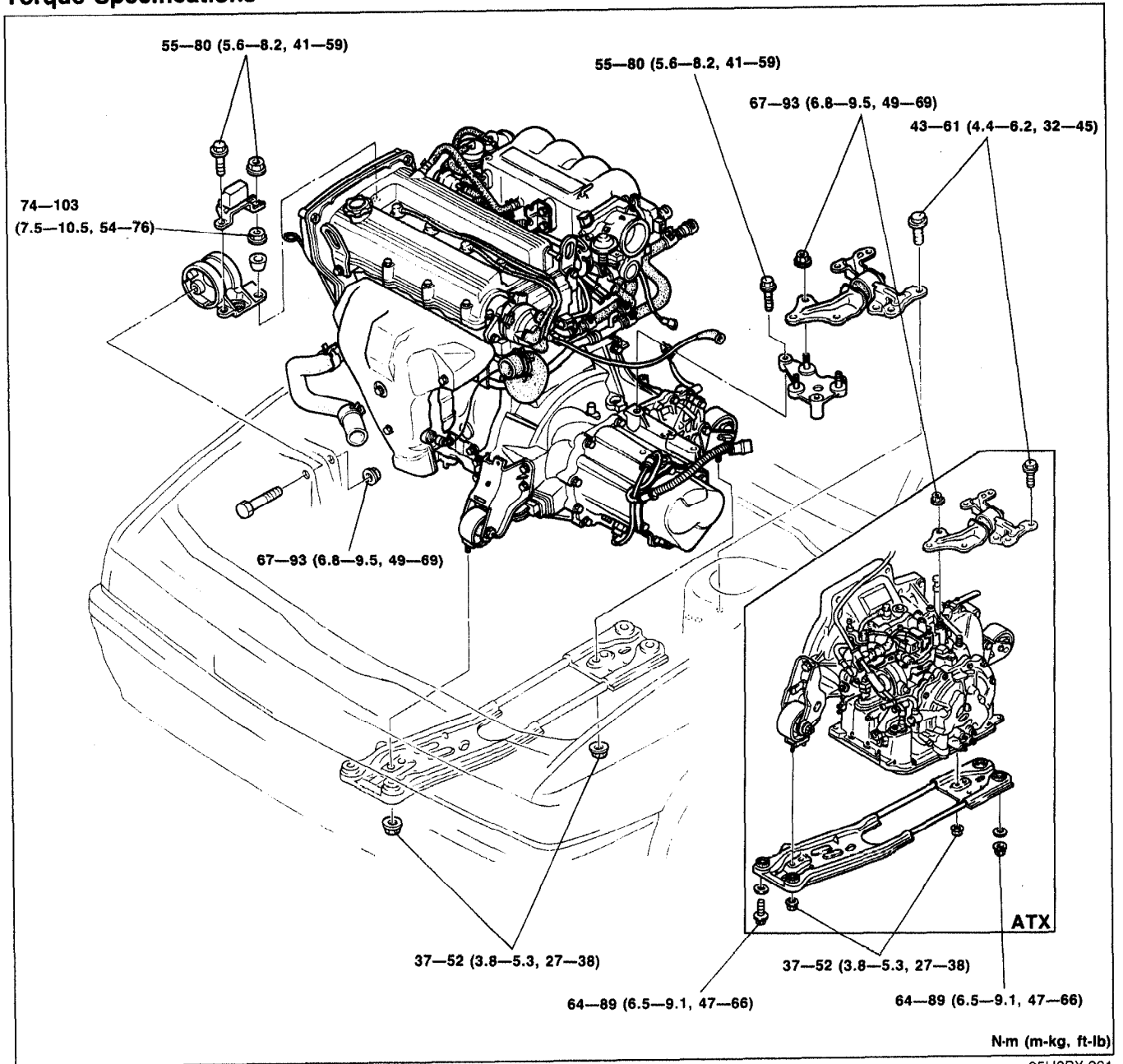
- Ⓐ: 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)
- Ⓑ: 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

Step 2

Warning

- Be sure the vehicle is securely supported on safety stands.

Torque Specifications



Engine mount member (ATX)

1. Install the engine mount member.

Tightening torque:

64-89 N-m (6.5-9.1 m-kg, 47-66 ft-lb)

Engine and transaxle assembly

1. Suspend the engine and transaxle assembly.

Caution

- Do not damage any components in the engine compartment.

2. Install the engine and transaxle assembly in the engine room.
3. Align the engine mounts with the engine mount member mounting holes.

Engine mount

1. Install the engine mount nuts of the No.2 and No.3 mounts and tighten them.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

2. Install the No.3 engine mount rubber.

Tightening torque

Ⓐ: 74—103 N·m (7.5—10.5 m·kg, 54—76 ft·lb)

Ⓑ: 67—93 N·m (6.8—9.5 m·kg, 49—69 ft·lb)

3. Install the dynamic damper.

Tightening torque:

55—80 N·m (5.6—8.2 m·kg, 41—59 ft·lb)

Caution

- Before installing the engine support bracket, arrange the clutch release cylinder and pipe assembly.

4. Install the engine support bracket (MTX).

Tightening torque:

55—80 N·m (5.6—8.2 m·kg, 41—59 ft·lb)

5. Install the No.4 engine mount rubber and bracket, and loosely tighten nuts Ⓐ.
6. Install bolts Ⓑ on the body side, and tighten them in two or three steps in the order shown.

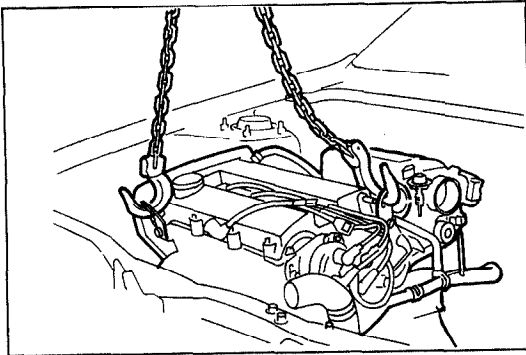
Tightening torque:

43—61 N·m (4.4—6.2 m·kg, 32—45 ft·lb)

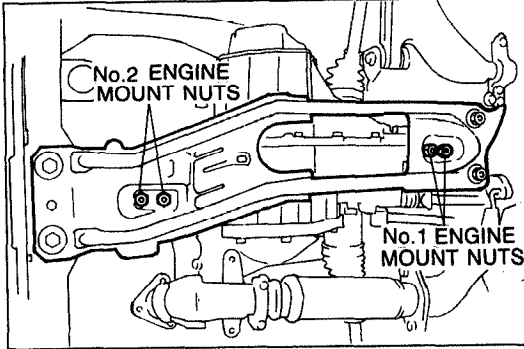
7. Tighten nuts Ⓐ.

Tightening torque:

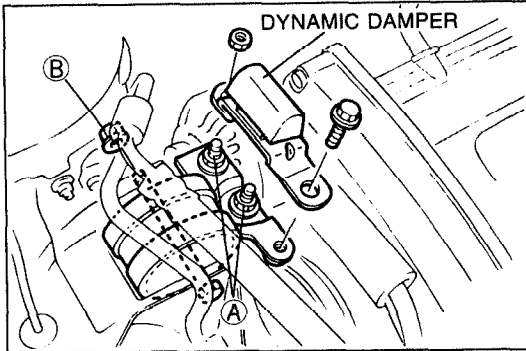
67—93 N·m (6.8—9.5 m·kg, 49—69 ft·lb)



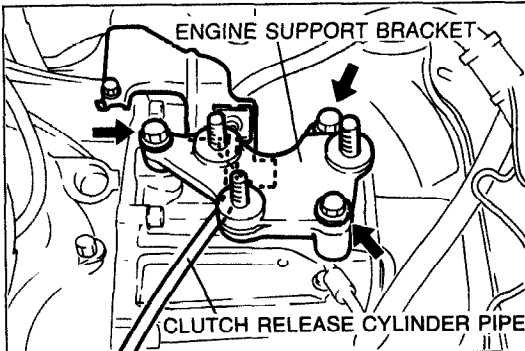
03U0B2-131



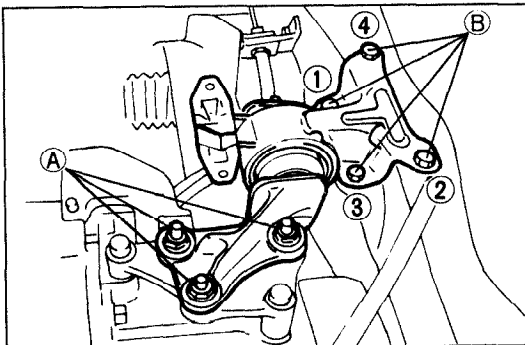
03U0B2-132



03U0B2-133

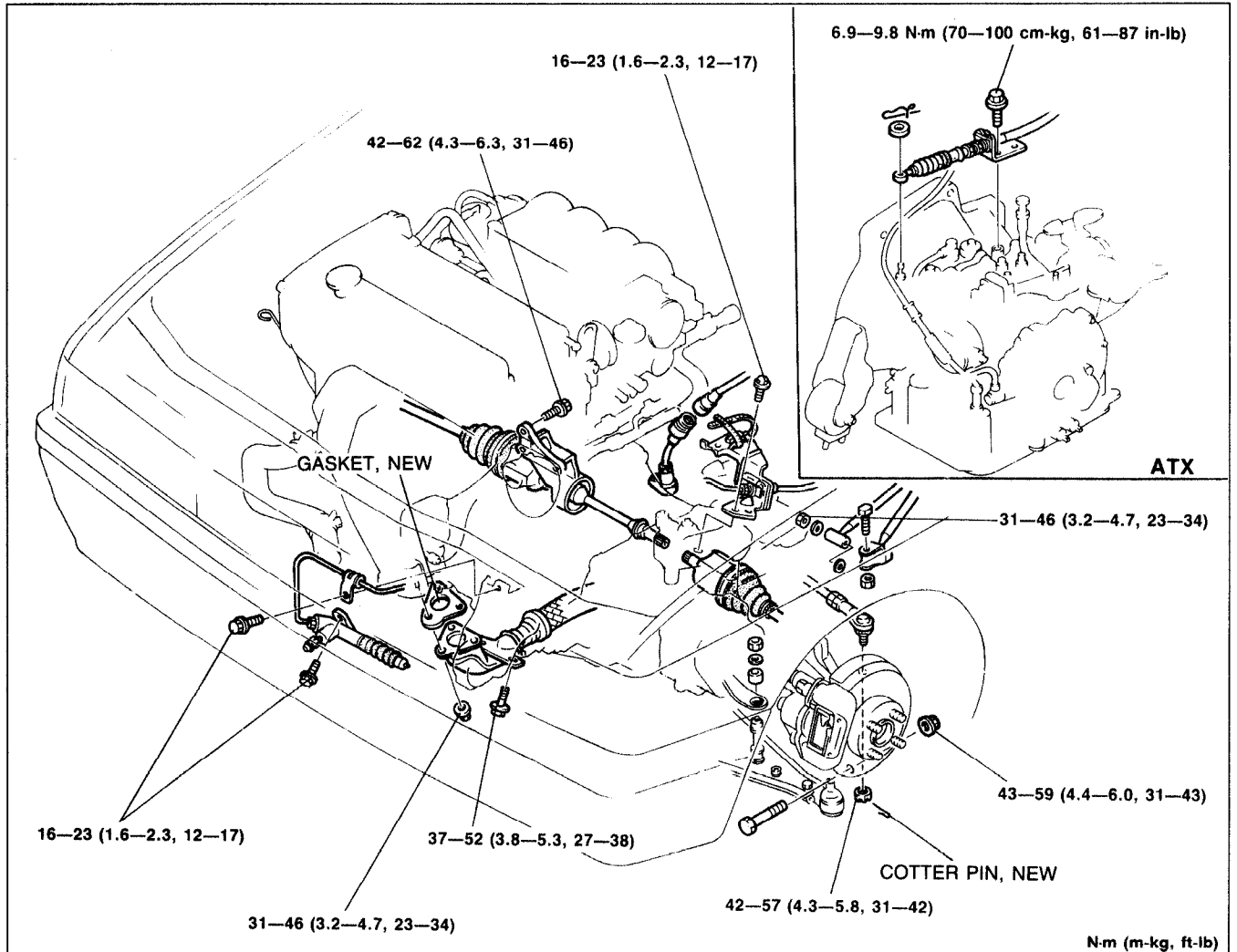


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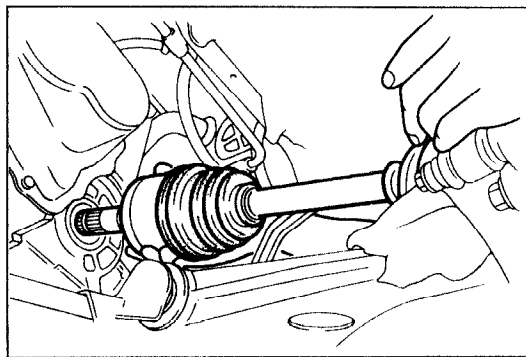


03U0B2-161

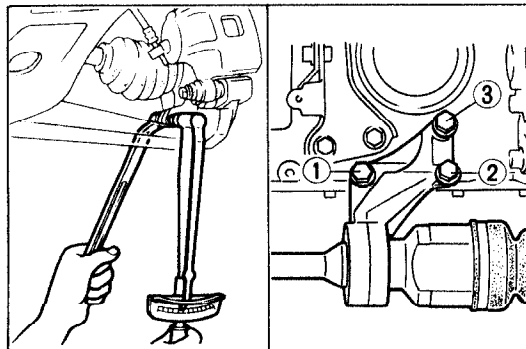
Step 3 Torque Specifications



03U0B2-135



03U0B2-136



03U0B2-137

Driveshaft

1. Apply grease to the end of the driveshaft.

Caution

- When installing the driveshaft, be careful not to damage the oil seal.
- After installation, pull the front hub outward to confirm that the driveshaft is securely held by the clip.

2. Install the driveshaft and a new clip.

3. Install the lower arm ball-joint to the knuckle; then tighten the lock nut.

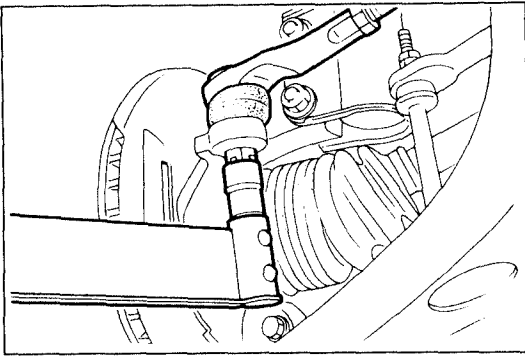
Tightening torque:

43—59 N-m (4.4—6.0 m-kg, 31—43 ft-lb)

4. Install the joint shaft.
5. Tighten the bolts in the order shown.

Tightening torque:

42—62 N-m (4.3—6.3 m-kg, 31—46 ft-lb)



03U0B2-138

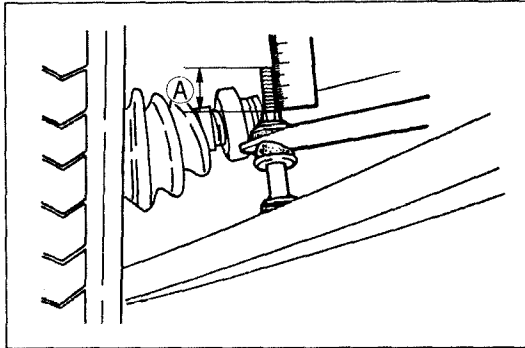
Tie-rod end

1. Install the tie-rod end to the knuckle.

Tightening torque:

42—57 N·m (4.3—5.8 m·kg, 31—42 ft·lb)

2. Install the new split pin.

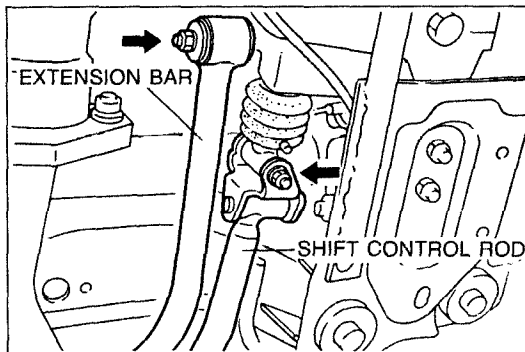


13U0B2-024

Stabilizer

1. Install and adjust the stabilizer.

Dimension A: 17—19mm (0.67—0.75 in)



03U0B2-140

Extension bar (MTX)

1. Install the extension bar to the transaxle.

Tightening torque:

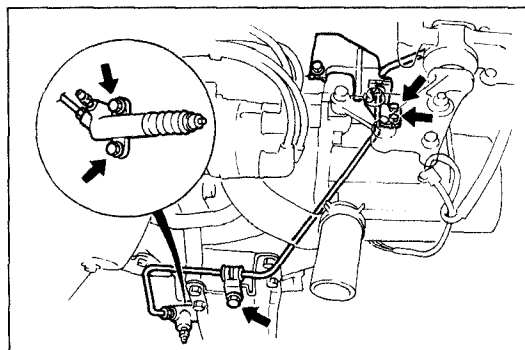
31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

Shift control rod (MTX)

1. Install the shift control rod to the transaxle.

Tightening torque:

16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



03U0B2-141

Clutch release cylinder (MTX)

1. Install the clutch release cylinder.

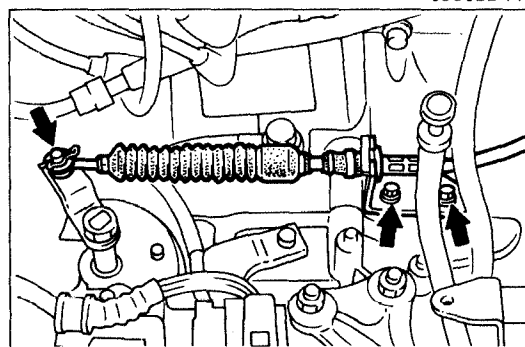
Tightening torque:

16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)

2. Set the pipe bracket in position.

Tightening torque:

16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



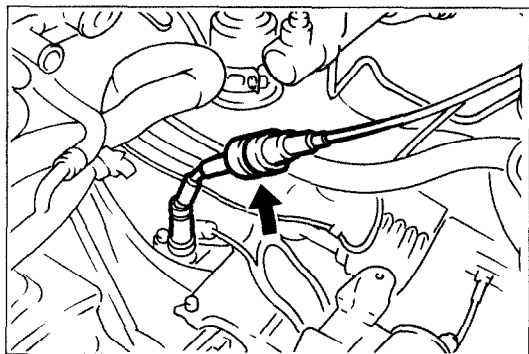
03U0B2-142

Shift control cable (ATX)

1. Install the shift control cable to the transaxle.

Tightening torque:

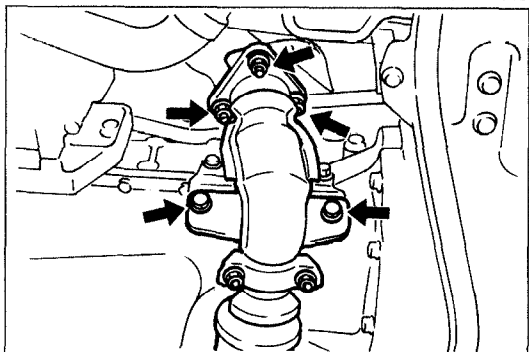
6.9—9.8 N·m (70—100 cm·kg, 61—87 in·lb)



03U0B2-143

Speedometer cable

1. Install the speedometer cable.



03U0B2-144

Exhaust pipe

1. Install the exhaust pipe and a gasket; then loosely tighten the lock nuts.
2. Loosely tighten the bracket bolts.
3. Tighten the lock nuts.

Tightening torque:

31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

4. Tighten the bracket bolts.

Tightening torque:

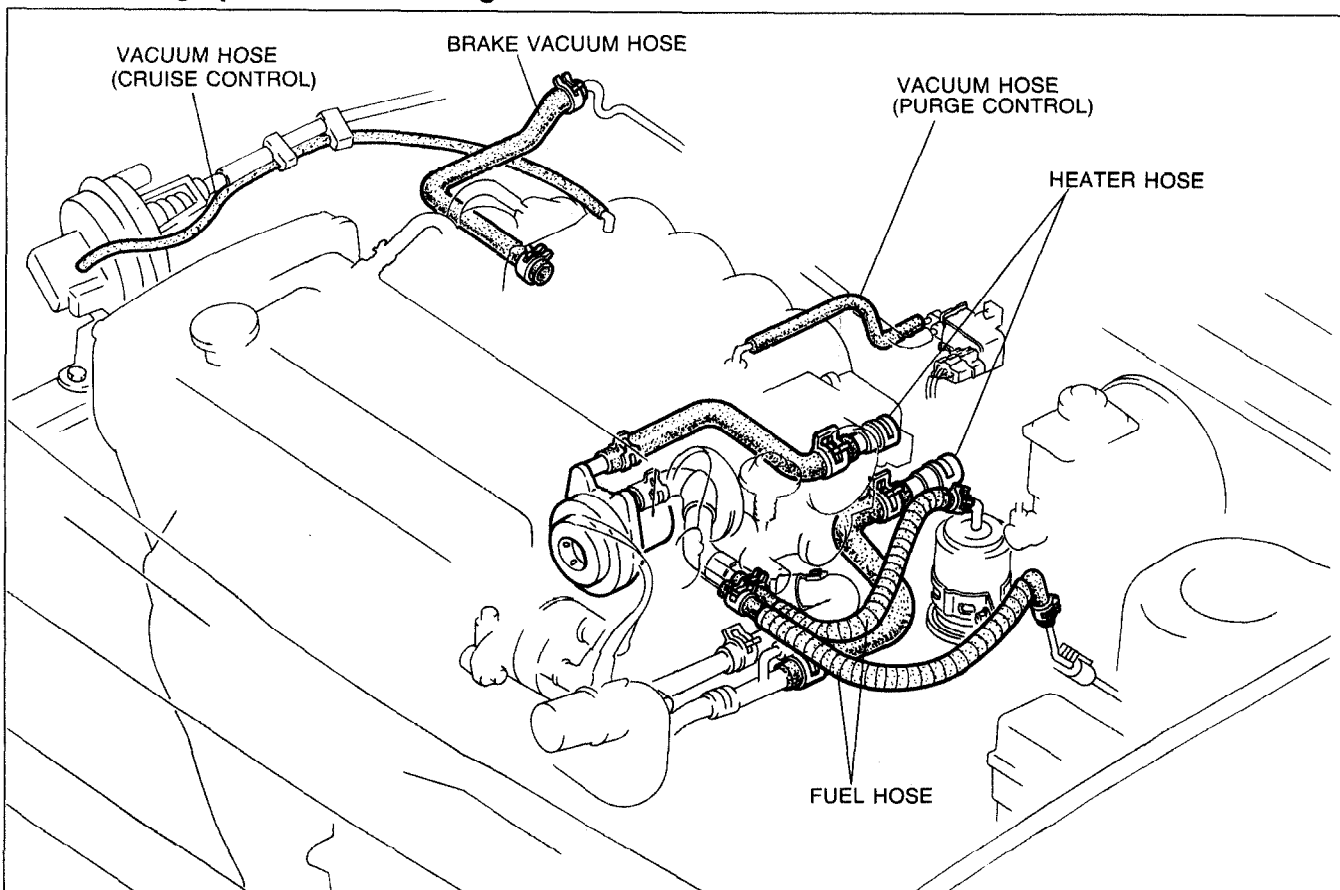
37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

Step 4

1. Connect the hoses shown in the figure.

Caution

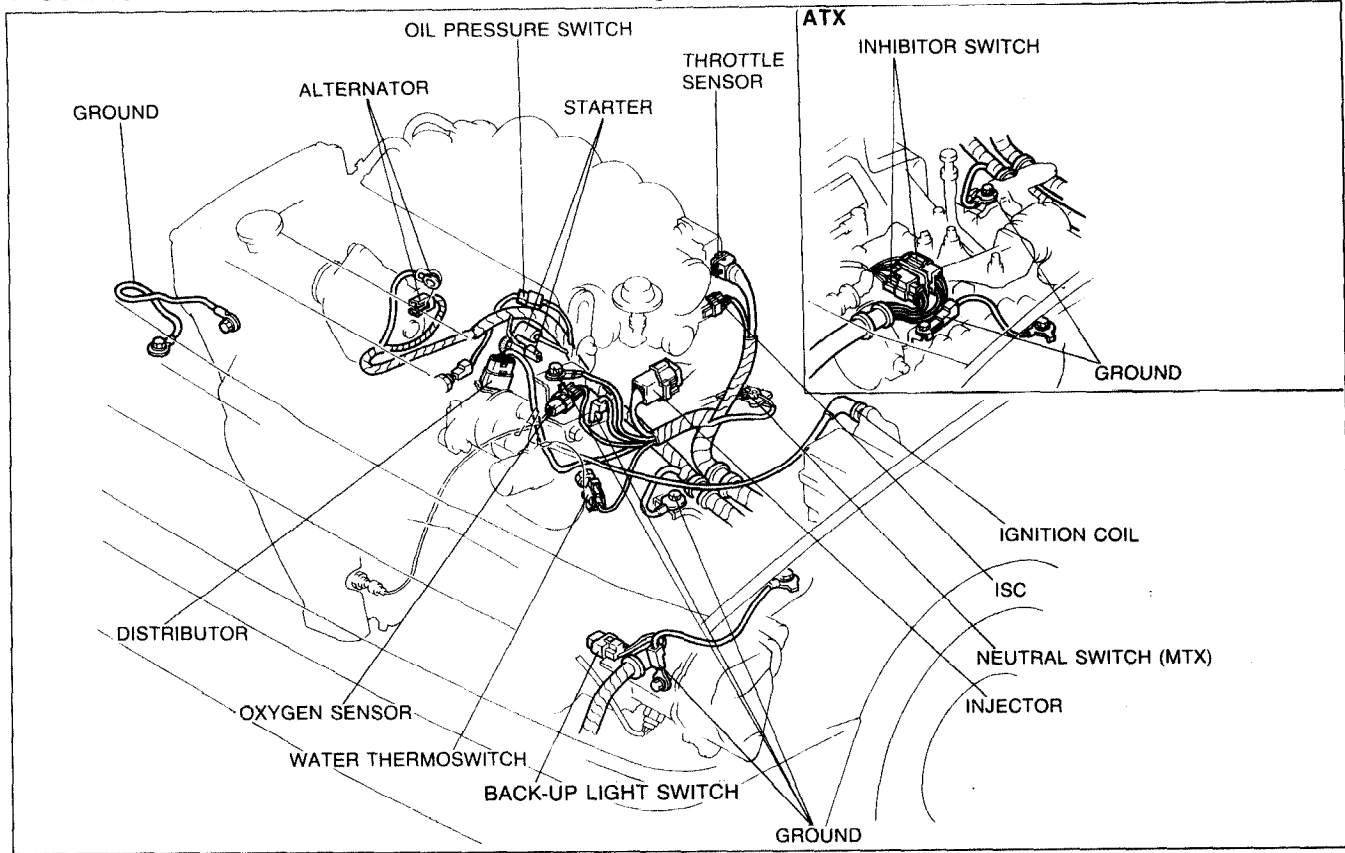
- Position the hose clamp in the original location on the hose, and squeeze the clamp lightly with large pliers to ensure a good fit.



03U0B2-145

Step 5

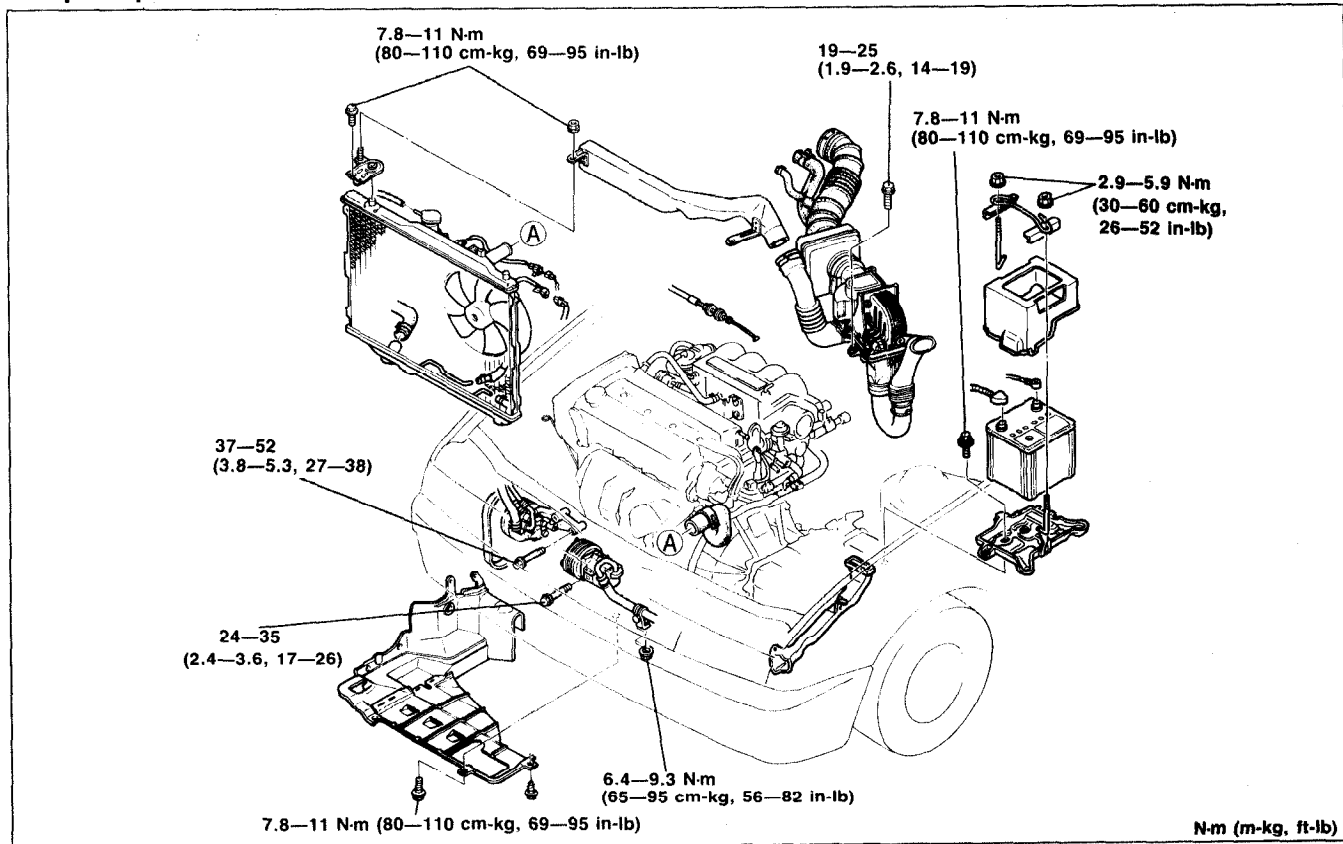
1. Connect the harness connectors shown in the figure.



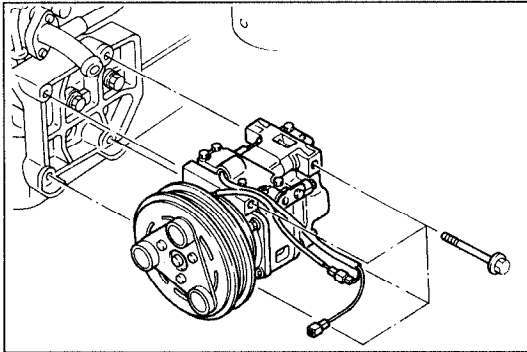
03U0B2-146

Step 6

Torque Specifications



03U0B2-147



03U0B2-148

A/C compressor (If equipped)

1. Install the A/C compressor.

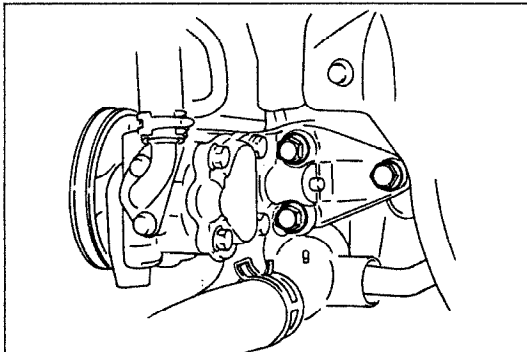
Tightening torque:

24—35 N·m (2.4—3.6 m·kg, 17—26 ft·lb)

2. Tighten the A/C pipe bracket to the engine mount member.

Tightening torque:

6.4—9.3 N·m (65—95 cm·kg, 56—82 in·lb)



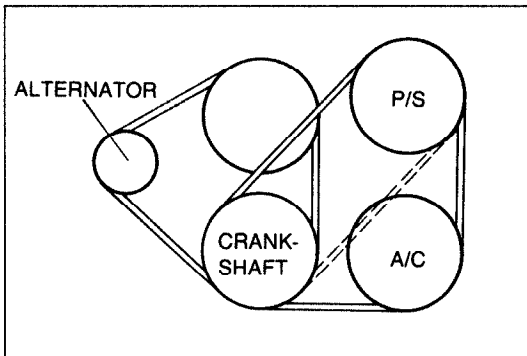
03U0B2-149

P/S oil pump and bracket

1. Install the P/S oil pump and bracket.

Tightening torque:

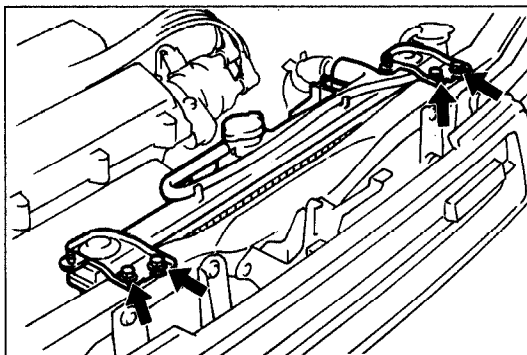
37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)



03U0B2-150

Drive belt

1. Install the P/S and/or A/C drive belt.
2. Adjust the drive belt deflections. (Refer to page B2-6.)



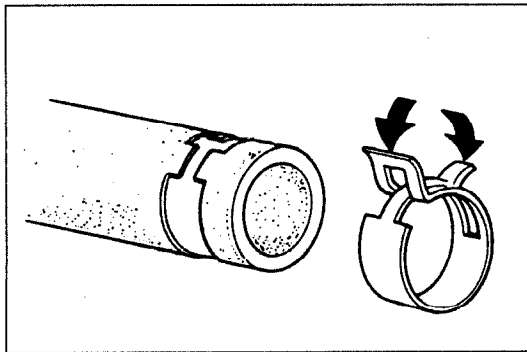
03U0B2-151

Radiator and cooling fan assembly

1. Install the radiator and cooling fan assembly.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



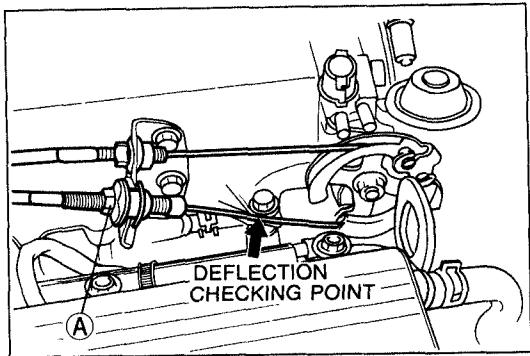
03U0B2-152

2. Connect the upper and lower radiator hoses.

Caution

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

3. Connect the coolant reservoir hose.
4. Connect the cooling fan connector.
5. Connect the oil cooler hose. (ATX)

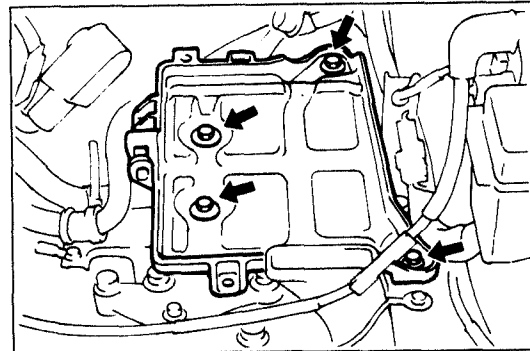


05U0BX-275

Accelerator cable

1. Install the accelerator cable.
2. Adjust the cable deflection by turning nut A.

Deflection: 1—3mm (0.04—0.12 in)



13U0B2-025

Battery duct, battery carrier, and battery

1. Install the battery duct.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

2. Install the battery carrier.

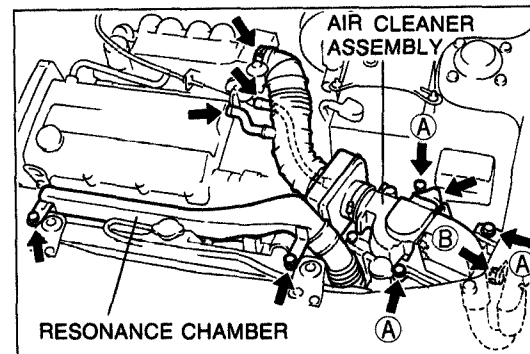
Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

3. Install the battery and the battery bracket.

Tightening torque:

2.9—5.9 N·m (30—60 cm·kg, 26—52 in·lb)



03U0B2-154

Air cleaner assembly

1. Install the air cleaner assembly.

Tightening torque

A: 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

B: 7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

2. Connect the air flow sensor connector.

Resonance chamber

1. Install the resonance chamber.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Under cover and side cover

1. Install the under cover and side cover.

Steps After Installation

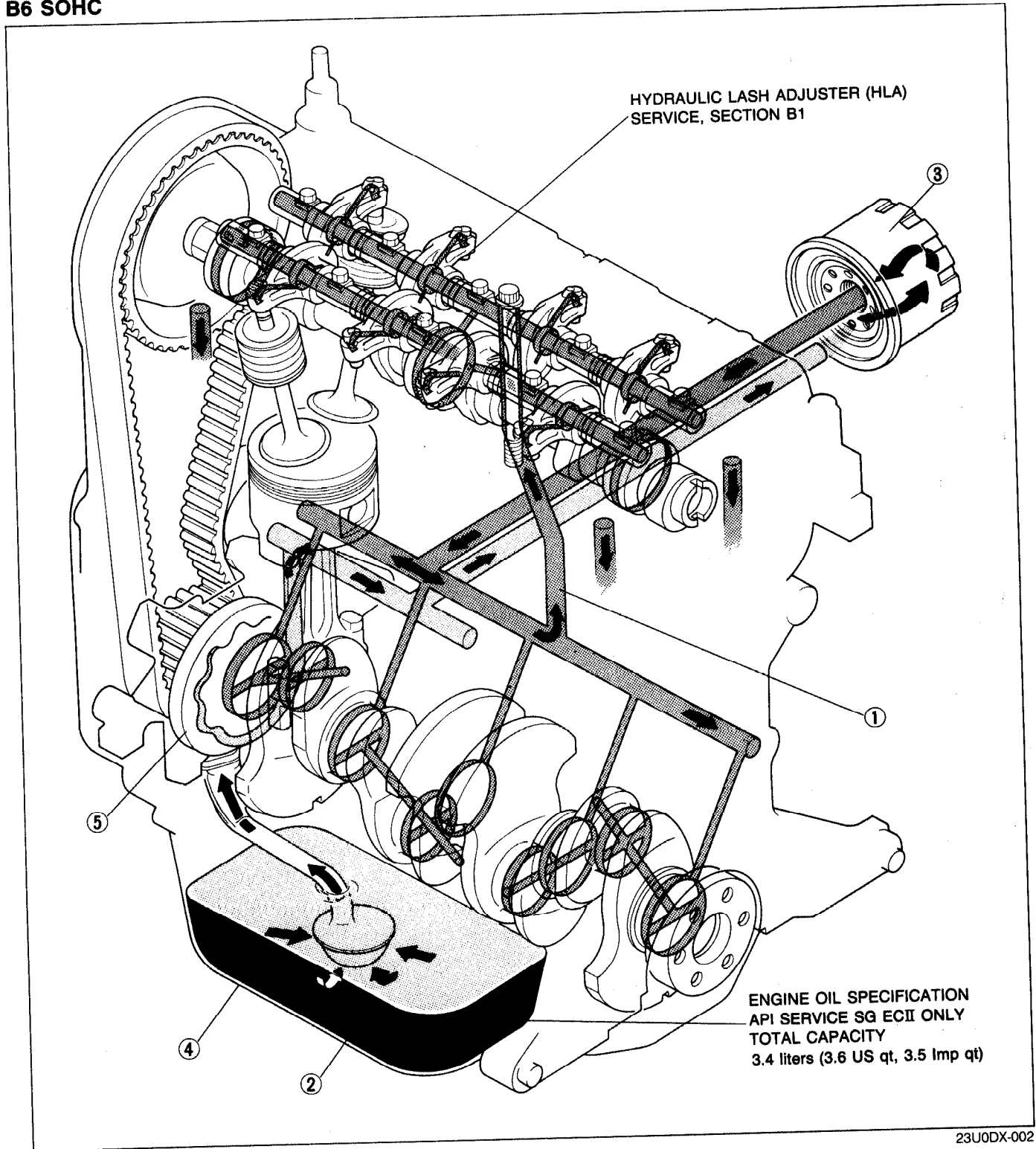
1. If the engine oil was drained, fill with the specified amount and type of engine oil. (Refer to Section D.)
2. Fill the radiator with the specified amount and type of engine coolant. (Refer to Section E.)
3. If the transaxle oil was drained, fill with the specified amount and type of transaxle oil. (Refer to Sections J2, K.)
4. Connect the negative battery cable.
5. Start the engine and check the following:
 - (1) Engine oil, transaxle oil, and engine coolant leakage.
 - (2) Ignition timing, idle speed. (Refer to page B2-8.)
 - (3) Operation of emission control system.
6. Perform a road test.
7. Recheck the engine oil and engine coolant levels.

LUBRICATION SYSTEM

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B6 SOHC

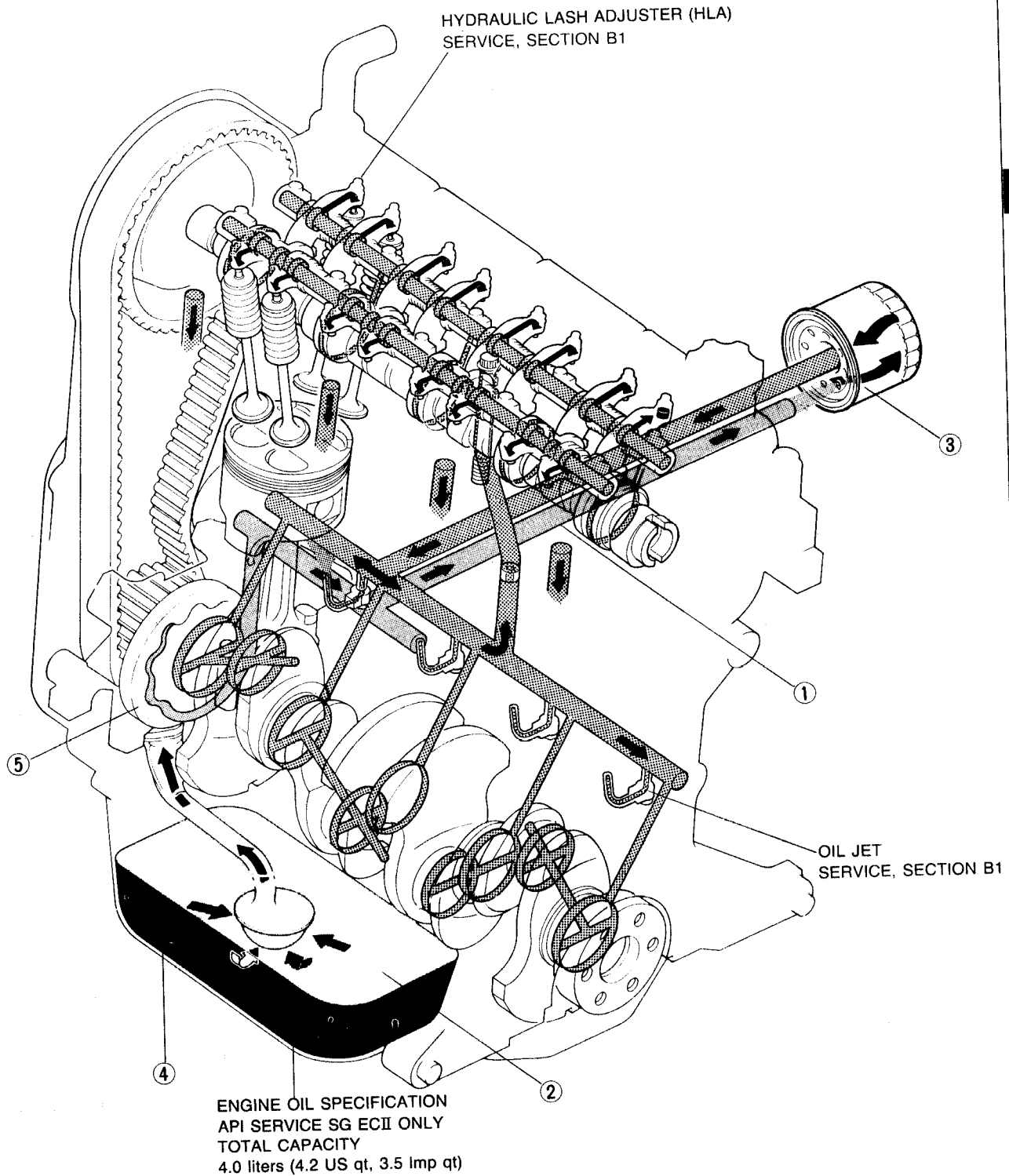


23U0DX-002

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Replacement..... page D- 8

- 4. Oil pan and main bearing support plate
(MBSP)
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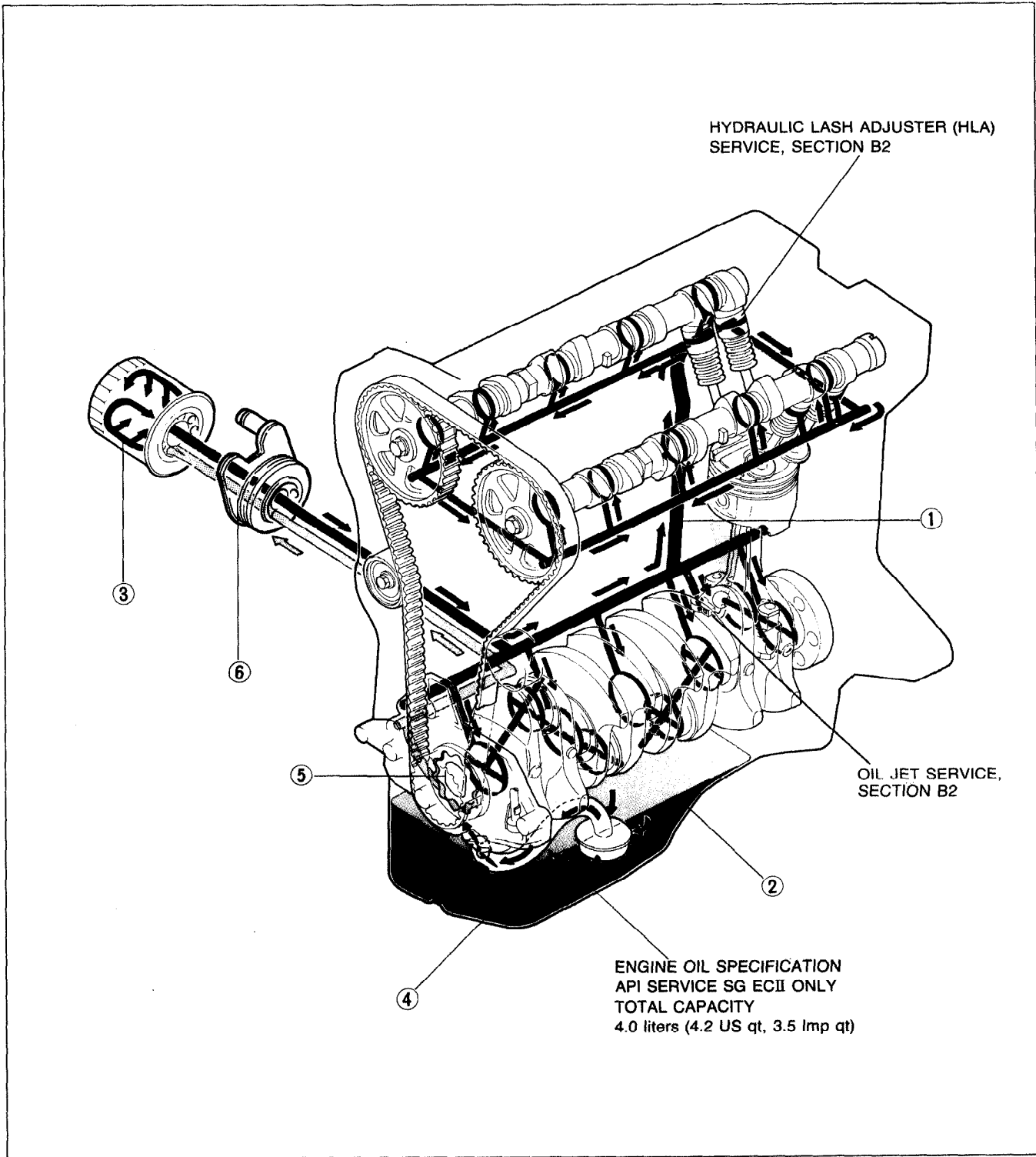
BP SOHC



23U0DX-003

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BP DOHC



23U0DX-004

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2. Engine oil Inspection.....	page D- 7	5. Oil pump Disassembly / Assembly.....	page D-13
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3. Oil filter Replacement.....	page D- 8	6. Oil cooler Removal / Installation.....	page D- 8

OUTLINE

SPECIFICATIONS

Item		Engine	B6 SOHC	BP SOHC	BP DOHC
Lubrication system			Force-fed type		
Oil pump	Type		Trochoid gear		
	Relief pressure	kPa (kg/cm ² , psi)	343—441 (3.5—4.5, 50—64)		
Oil filter	Type		Full-flow, paper element		
	Relief pressure differential	kPa (kg/cm ² , psi)	78—118 (0.8—1.2, 11—17)		
Oil pressure switch activation pressure		kPa (kg/cm ² , psi)	25 (0.25, 3.6)		
Oil capacity	Total (dry engine)	liters (US qt, Imp qt)	3.4 (3.6, 3.0)	4.0 (4.2, 3.5)	
	Oil pan	liters (US qt, Imp qt)	3.0 (3.2, 2.6)	3.6 (3.8, 3.2)	
	Oil filter	liter (US qt, Imp qt)	0.17 (0.18, 0.15)		
Engine oil			API service SG Energy ConservingII (ECII) only		
Viscosity number	Above -25°C (-13°F)		SAE 10W-30		
	Below 0°C (32°F)		SAE 5W-30		

23U0DX-005

TROUBLESHOOTING GUIDE

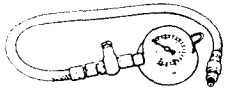
Problem	Possible Cause	Remedy	Page
Engine hard starting	Improper engine oil Insufficient engine oil	Replace Add oil	D- 7 D- 7
Excessive oil consumption	Oil working up or down Oil leakage	Refer to Section B Repair	—
Oil pressure drop	Insufficient oil Oil leakage Worn and/or damaged oil pump gear Worn plunger (inside oil pump) or weak spring Clogged oil strainer Excessive main bearing or connecting rod bearing clearance	Add oil Repair Replace Replace Clean Refer to Section B	D- 7 — D-13, 14 D-13, 14 —
Warning lamp illuminates while engine is running	Oil pressure drop Malfunction of oil pressure switch Malfunction of electrical system	As described above Refer to Section T Refer to Section T	—

23U0DX-015

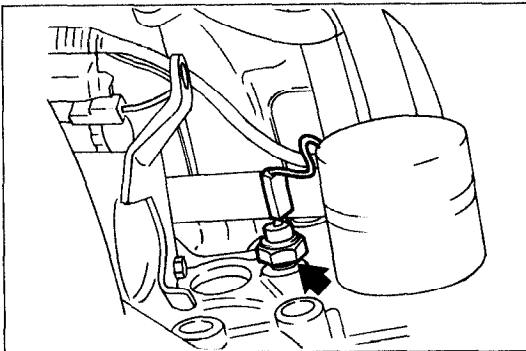
OIL PRESSURE

PREPARATION
SST

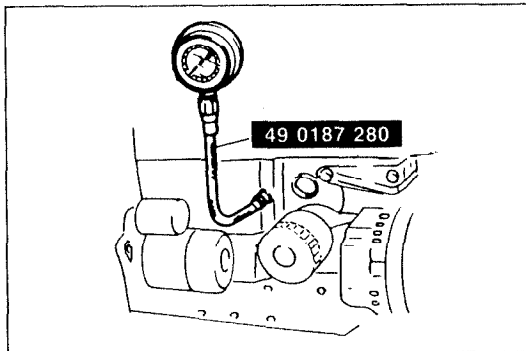
49 (187 280

Gauge,
oil pressureFor
inspection of oil
pressure

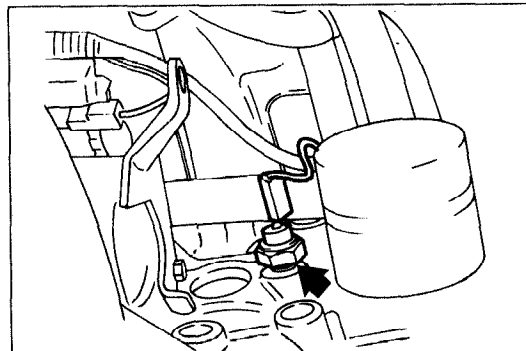
05U0DX-006



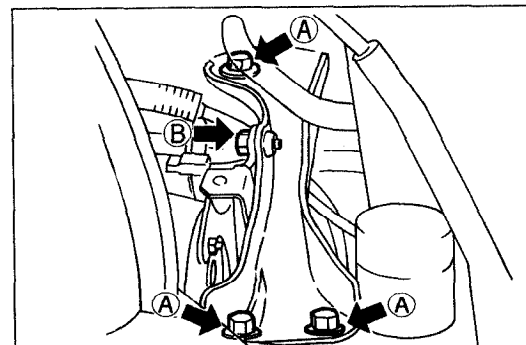
03U0DX-031



03U0DX-032



03U0DX-007



03U0DX-030

INSPECTION

1. Remove the intake manifold bracket.
2. Remove the oil pressure switch.

3. Screw the **SST** into the oil pressure switch installation hole.
4. Warm up the engine to normal operating temperature.
5. Run the engine at 1,000 rpm and 3,000 rpm, and note the gauge reading.

Oil pressure:

196—294 kPa (2.0—3.0 kg/cm², 28—43 psi)-1,000 rpm
294—392 kPa (3.0—4.0 kg/cm², 43—57 psi)-3,000 rpm

6. If the pressure is not as specified, check for the cause and repair. (Refer to Troubleshooting Guide.)

7. Remove the **SST** and install the oil pressure switch.

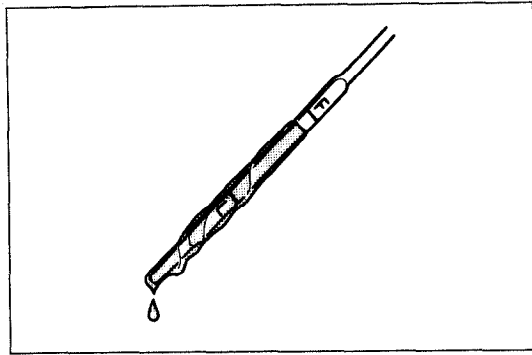
Tightening torque:

12—18 N·m (1.2—1.8 m·kg, 104—156 in·lb)

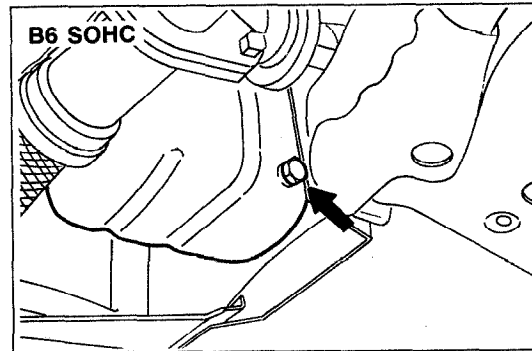
8. Install the intake manifold bracket.

Tightening torque

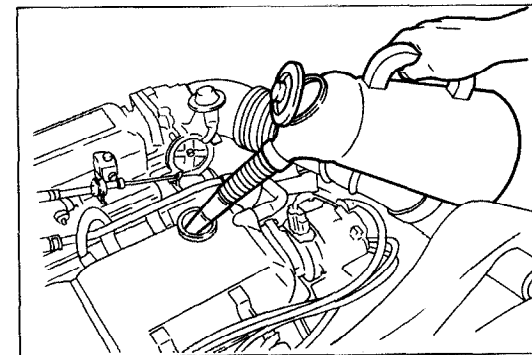
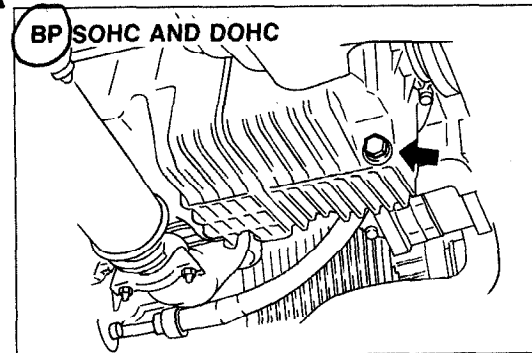
- (A): 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**
(B): 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



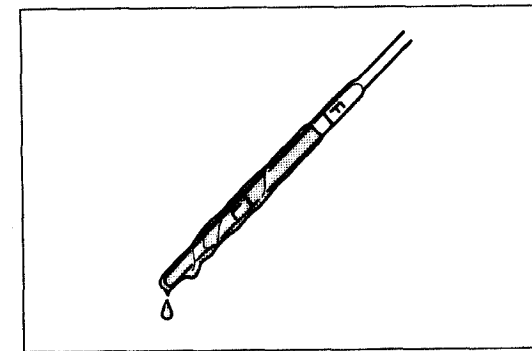
03U0DX-008



05U0DX-011



03U0DX-010



03U0DX-011

ENGINE OIL

INSPECTION

1. Be sure the vehicle is on level ground.
2. Warm up the engine to normal operating temperature and stop it.
3. Wait for five minutes.
4. Remove the oil level gauge and check the oil level and condition.
5. Add or replace oil as necessary.

Note

- The distance between the L and F marks on the level gauge represents 0.8 liter (0.85 US qt, 0.70 Imp qt).

REPLACEMENT

Warning

- Be careful when draining; the oil is hot.

1. Warm up the engine to normal operating temperature and stop it.
2. Remove the oil filler cap and the oil pan drain plug.
3. Drain the oil into a suitable container.
4. Install a new gasket and the drain plug.

Tightening torque:

29—41 N·m (3.0—4.2 m·kg, 22—30 ft·lb)

5. Refill the engine with the specified type and amount of engine oil.
6. Refit the oil filler cap.

7. Run the engine and check for leaks.
8. Check the oil level and add oil if necessary.

Oil pan capacity

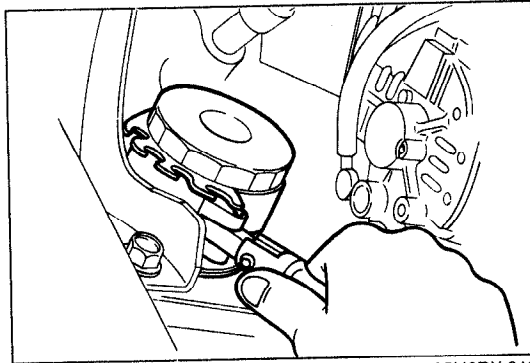
liters (US qt, Imp qt)

B6 SOHC	3.0 (3.2, 2.6)
BP SOHC and DOHC	3.6 (3.8, 3.2)

OIL FILTER

REPLACEMENT

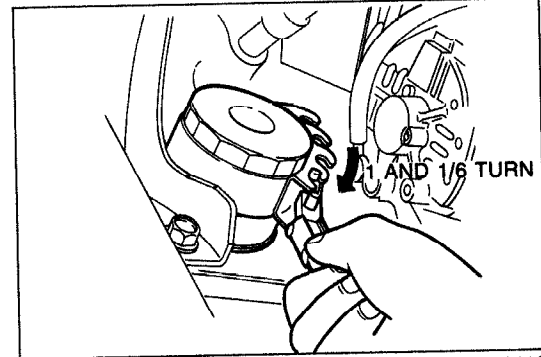
1. Remove the oil filter with a suitable wrench.
2. Use a clean rag to wipe off the mounting surface on the engine.
3. Apply a small amount of clean engine oil to the rubber seal of the new filter.



05U0DX-013

4. Install the oil filter and tighten it by hand until the rubber seal contacts the base.
5. Tighten the filter 1 and 1/6 turns with a filter wrench.
6. Start the engine and check for leaks.
7. Check the oil level and add oil if necessary.

Oil filter capacity: 0.17 liter (0.18 US qt, 0.15 Imp qt)

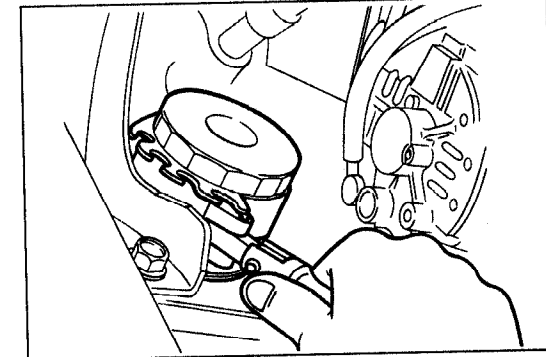


03U0DX-012

OIL COOLER (BP DOHC)

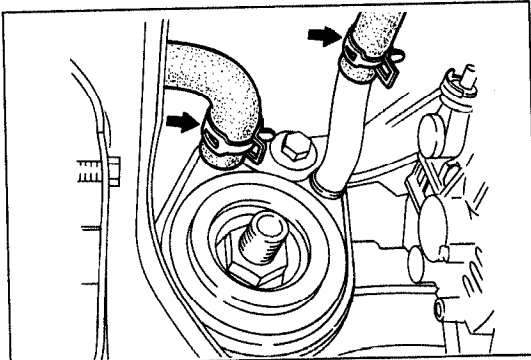
REMOVAL

1. Drain the engine oil.
2. Remove the oil filter with an oil filter wrench.



03U0DX-013

3. Disconnect the water hoses.
4. Remove the oil cooler.



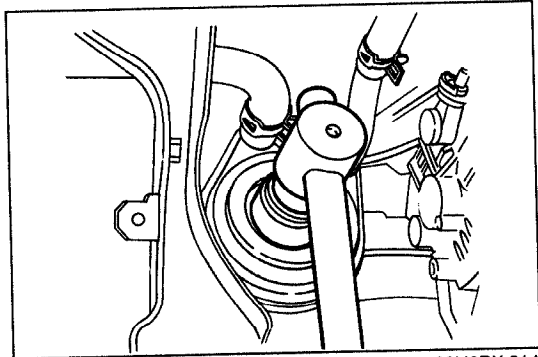
03U0DX-009

INSTALLATION

1. Install the oil cooler.

**Tightening torque:
29—39 N·m (3.0—4.0 m·kg, 22—29 ft·lb)**

2. Install the oil filter. (Refer to page D-8.)
3. Add engine oil to the correct level.
4. After installing the filter, check that there is no oil leakage while the engine is running.
5. Recheck the oil level using the dipstick. (Refer to page D-7.)

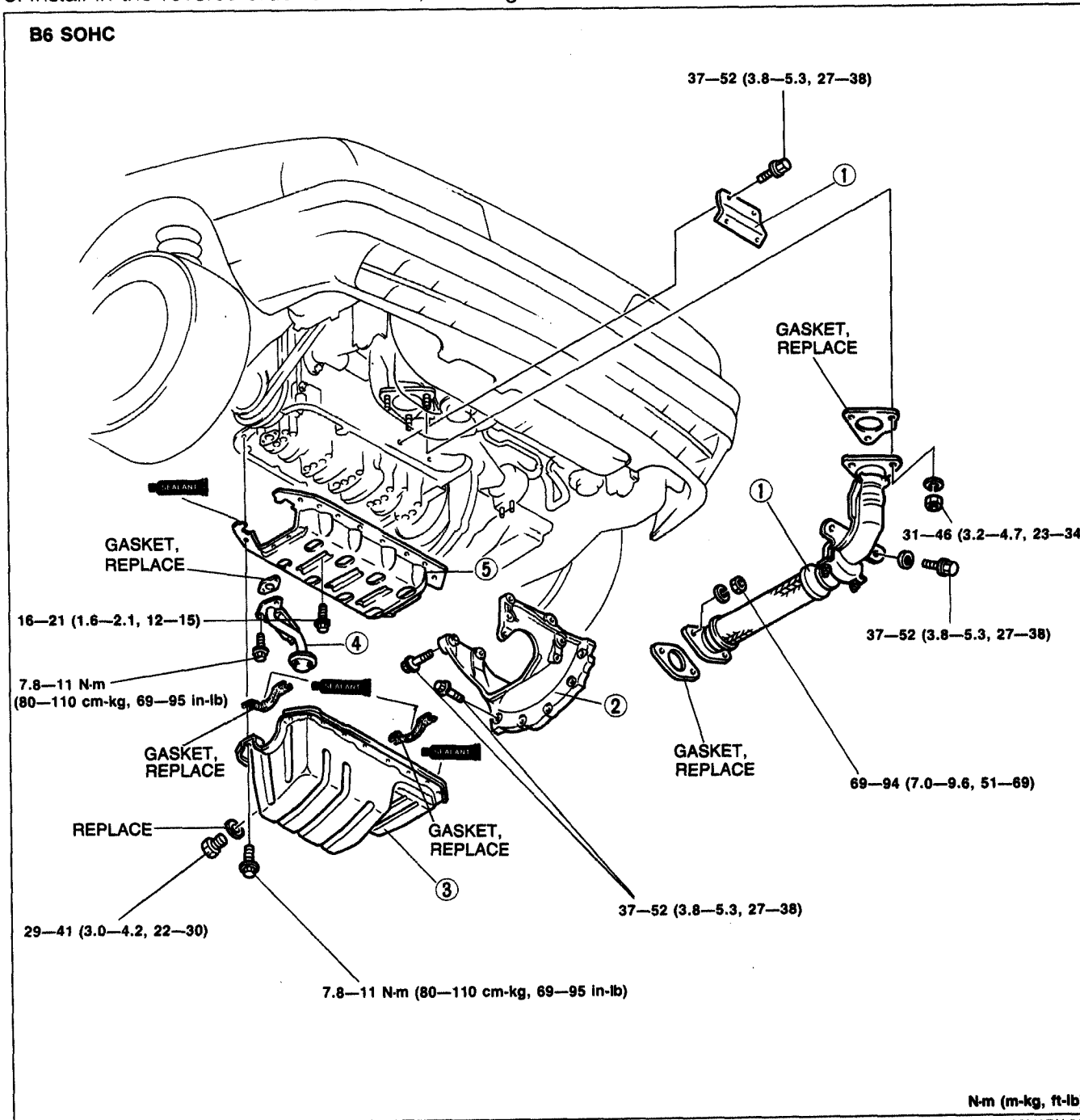


03U0DX-014

OIL PAN

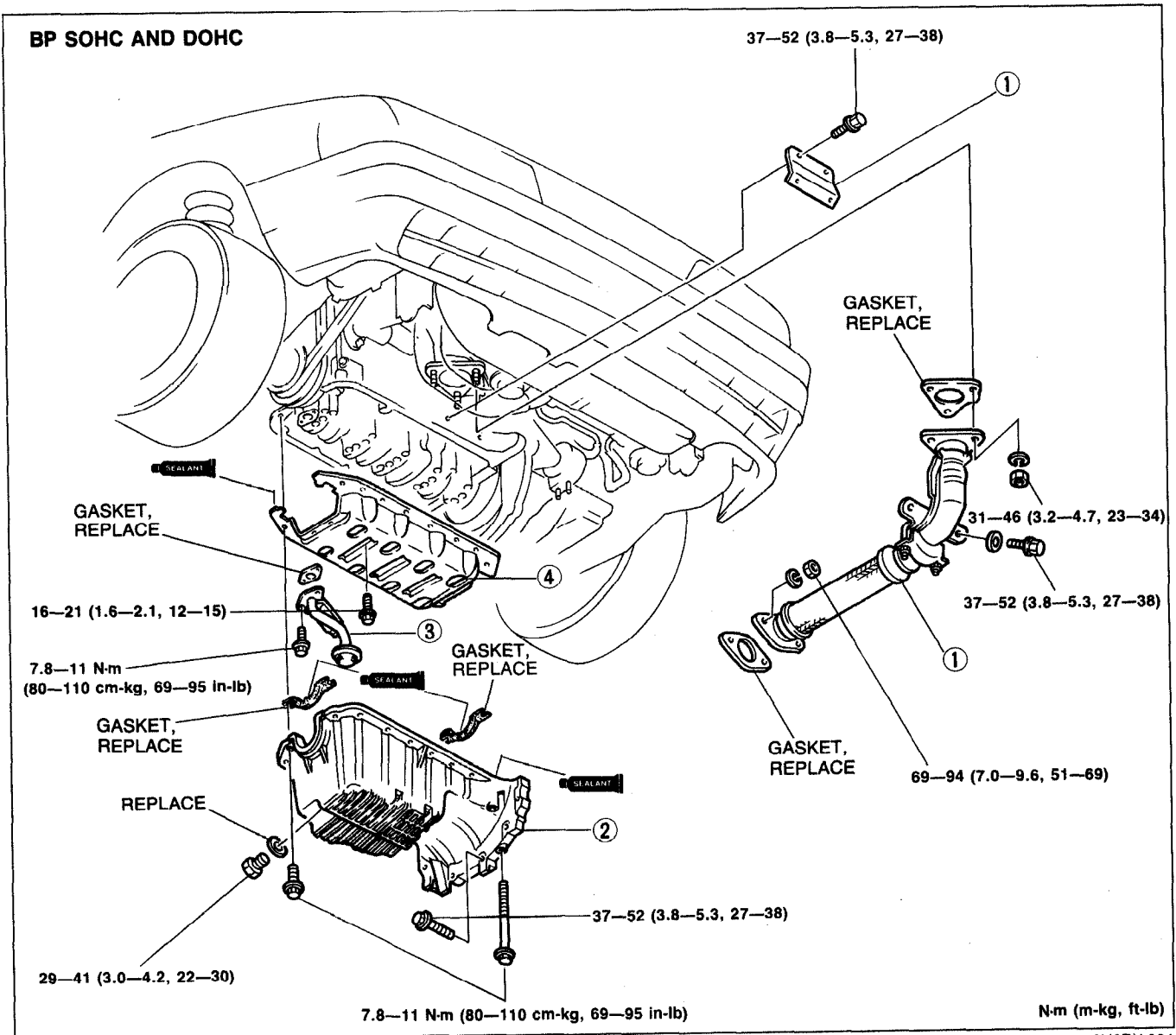
REMOVAL / INSTALLATION

1. Disconnect the negative battery cable.
2. Drain the engine oil.
3. Remove the under cover and side cover.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Install in the reverse order of removal, referring to **Installation Note**.



1. Front exhaust pipe and bracket
2. Integrated stiffener
3. Oil pan
Removal Note page D-10
Inspect for cracks, deformation or damage
Installation Note Page D-11

4. Oil strainer
5. Main bearing support plate (MBSP)
Removal Note page D-11
Installation Note page D-11



13U0DX-004

- 1. Front exhaust pipe and bracket
- 2. Oil pan

Removal Note below
 Inspect for cracks, deformation and damage
 Installation Note..... page D-11

- 3. Oil strainer
- 4. Main bearing support plate (MBSP)

Removal Note page D-11
 Installation Note..... page D-11

Removal Note

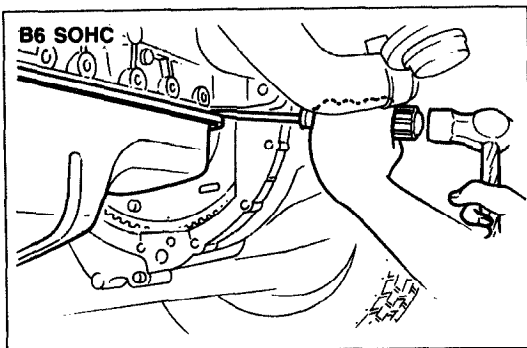
**Oil pan
 B6 SOHC**

1. Remove the oil pan mounting bolt.
2. Insert a screwdriver or a suitable tool between the MBSP and oil pan, and pry them.

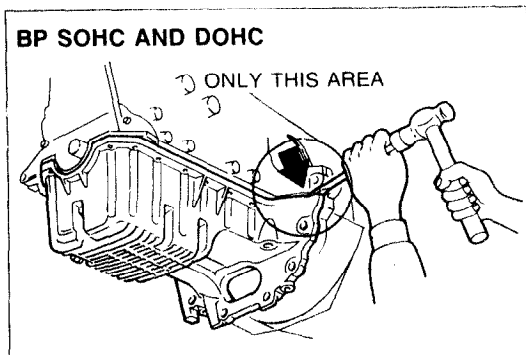
Caution

- Do not insert the prying tool between the MBSP and cylinder block.
- Do not damage or scratch the contact surfaces.

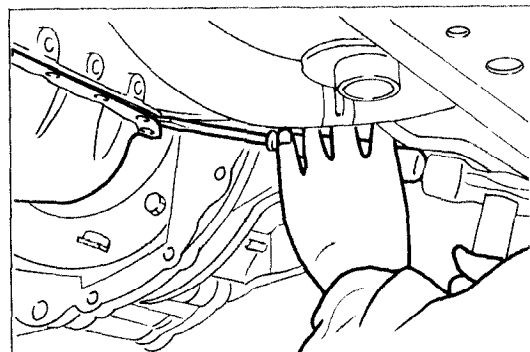
3. Remove the oil pan.



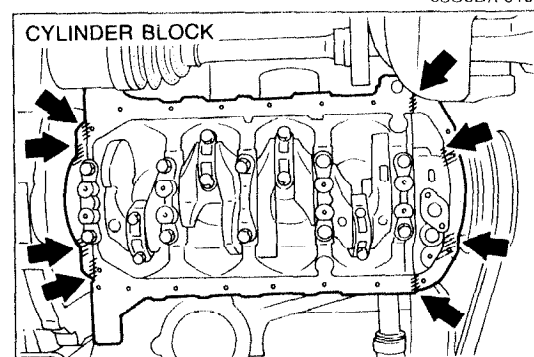
03U0DX-017



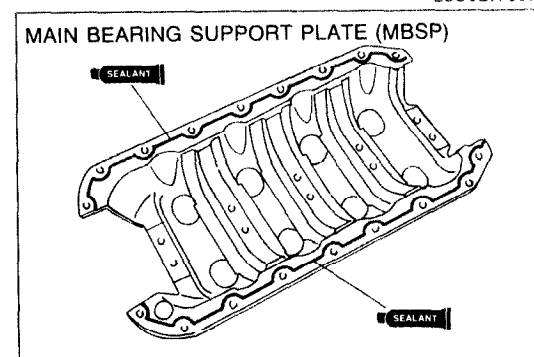
03U0DX-018



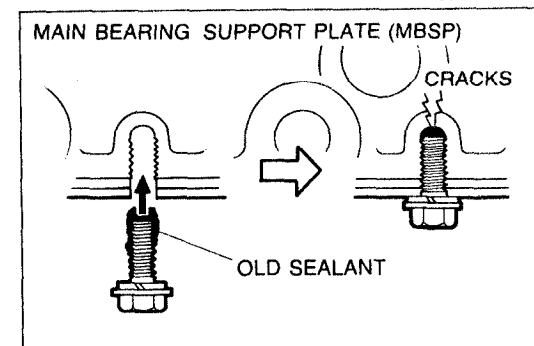
03U0DX-019



23U0DX-007



03U0DX-021



03U0DX-022

BP SOHC AND DOHC

1. Remove the oil pan mounting bolts.

Caution

- Do not force a prying tool between the cylinder block and the oil pan, which may damage the contact surfaces.
- Do not damage or scratch the contact surfaces when removing the old sealant.

2. Insert a screwdriver or a suitable tool only at the points shown in the figure.
3. Remove the oil pan.

Main bearing support plate (MBSP)

1. Remove the MBSP mounting bolt to the main bearing cap.
2. Insert a screwdriver or other suitable tool between the MBSP and cylinder block, and pry them.

Caution

- Do not damage or deform the MBSP.
- Do not damage or scratch the contact surfaces.

Installation Note**Main bearing support plate (MBSP)**

1. Remove all foreign material from the contact surfaces of the cylinder block and MBSP.

Caution

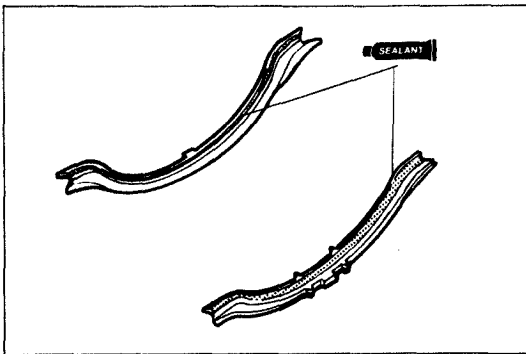
- The oil pan must be secured within 5 minutes after the sealant is applied to the MBSP.

2. Apply a continuous bead of silicone sealant to the MBSP along the inside of the bolt holes.
3. Install the MBSP.

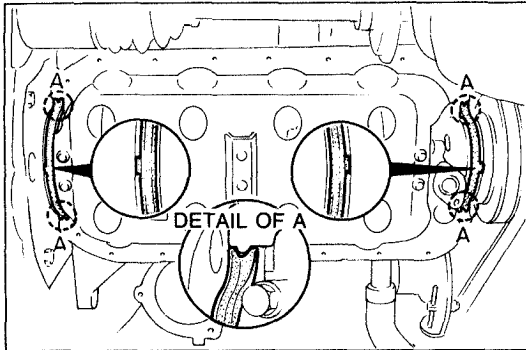
4. Tighten the MBSP bolts in two or three steps in the order shown in the figure.

Tightening torque:

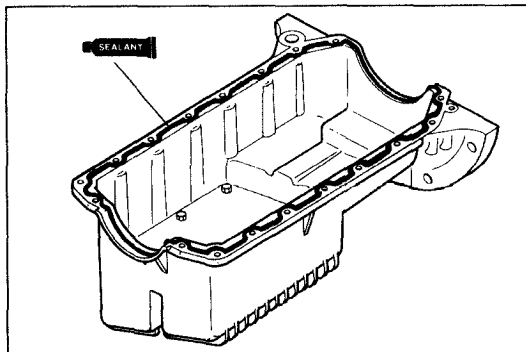
16—21 N·m (1.6—2.1 m·kg, 12—15 ft·lb)



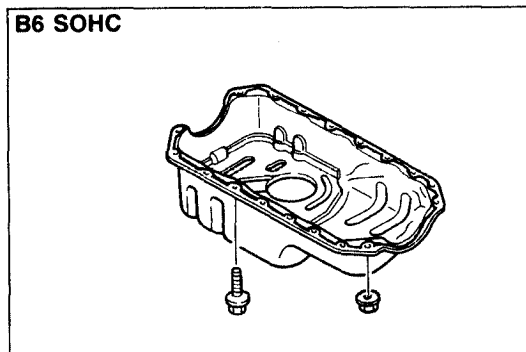
03U0DX-023



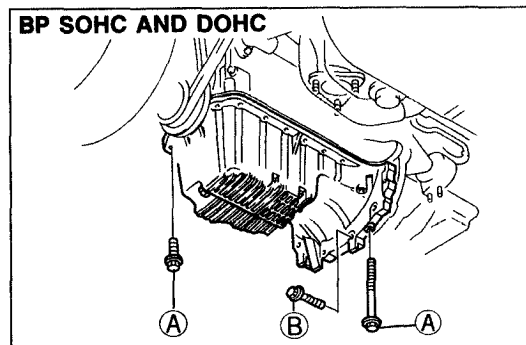
05U0BX-209



05U0DX-020



03U0DX-024



03U0DX-025

1. Remove all foreign material from the contact surfaces.
2. Apply silicone sealant to the contact surfaces of a new oil pan gasket, shown in the figure.

3. Install new gaskets onto the oil pump body and the rear cover with the projections in the notches shown in the figure.

4. Apply a continuous bead of silicone sealant to the oil pan along the inside of the bolt holes and overlap the ends.

5. Install the oil pan.

B6 SOHC

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

BP SOHC

Tightening torque

A): 7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

B): 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

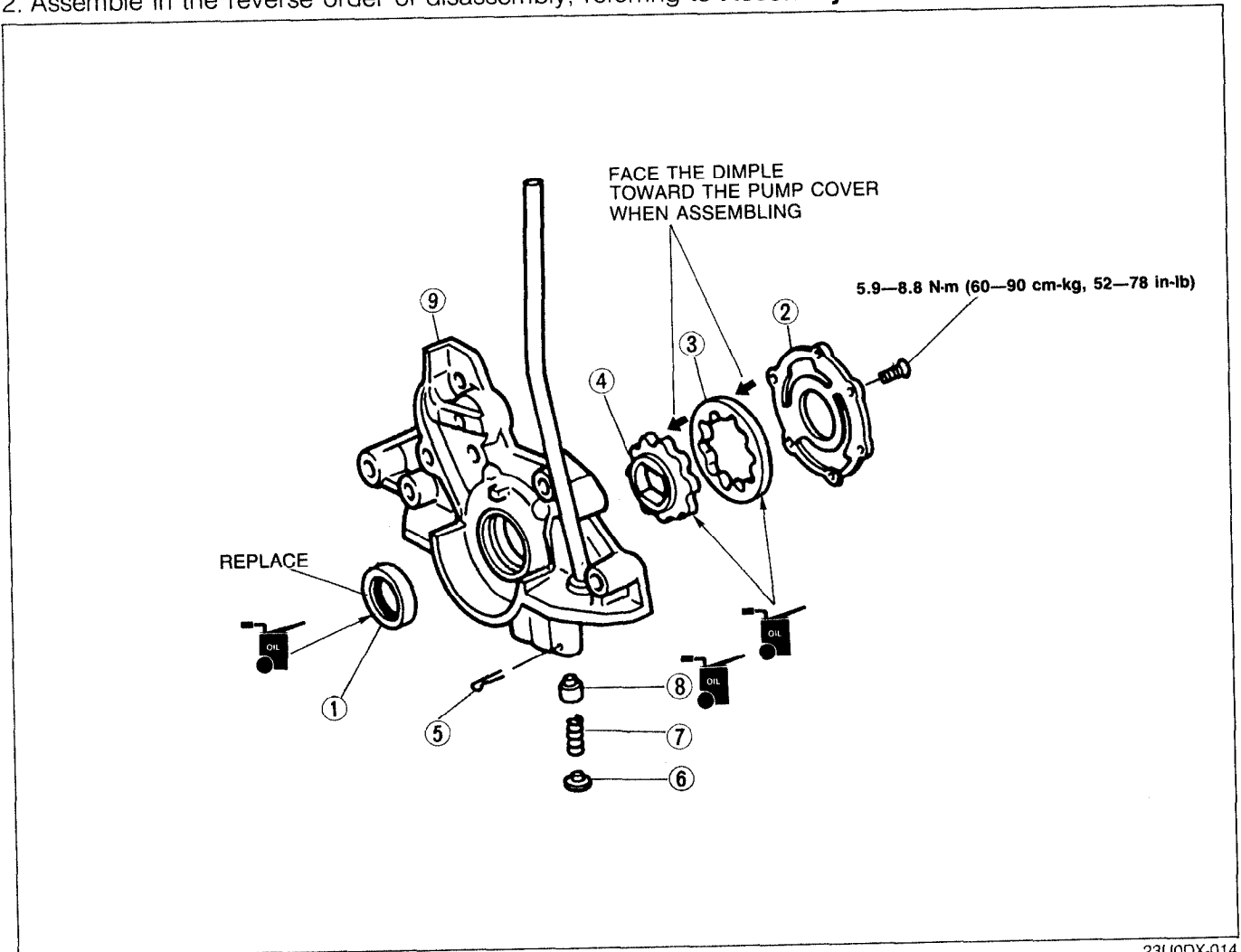
Steps After Installation

1. Install the under cover and side cover.
2. Fill with the specified amount and type of engine oil.
3. Connect the negative battery cable.
4. Start the engine and check for leaks.
5. Check the oil level and add oil if necessary.

OIL PUMP

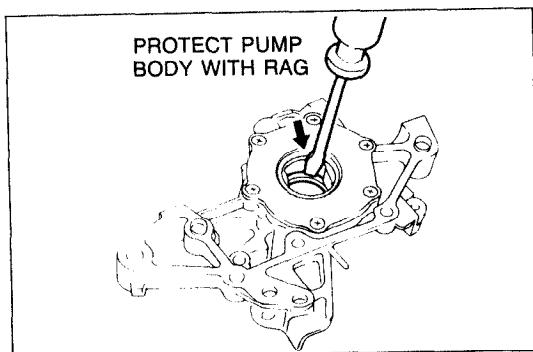
DISASSEMBLY / ASSEMBLY

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



23U0DX-014

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Oil seal
Disassembly Note below
Assembly Note page D-14 2. Pump cover
Inspect for distortion or damage 3. Outer rotor 4. Inner rotor 5. Roll pin | <ol style="list-style-type: none"> 6. Spring seat 7. Pressure spring
Inspection page D-14 8. Control plunger
Inspect for wear or damage 9. Pump body
Inspect for distortion or damage |
|---|---|



05U0DX-030

Disassembly Note

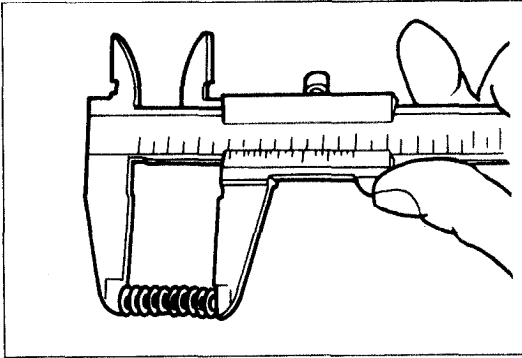
Oil seal

1. Remove the oil seal with a screwdriver protected with a rag.

INSPECTION**Pressure Spring**

1. Inspect the spring for weakness or breakage.
2. Measure the free length. Replace the spring if necessary.

Free length: 45.5mm (1.791 in)

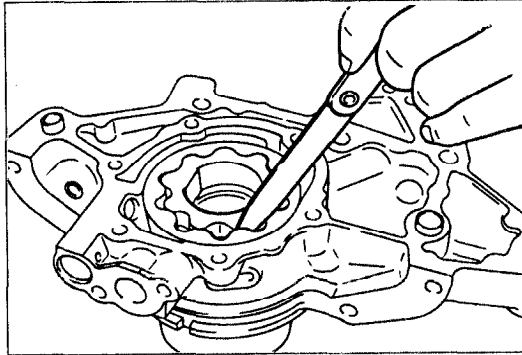


05U0DX-031

Rotor Clearance

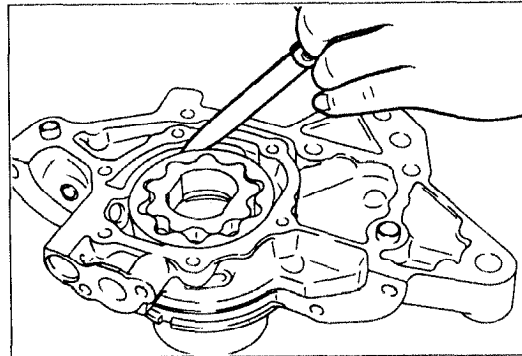
1. Measure the following clearances. Replace the rotor if necessary.

Tooth tip clearance: 0.20mm (0.0079 in) max.



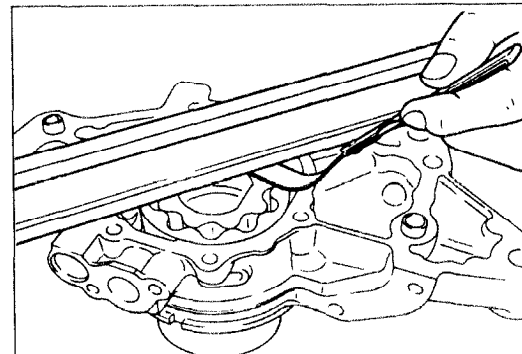
05U0DX-032

**Outer rotor to pump body clearance:
0.22mm (0.0087 in) max.**



05U0DX-033

Side clearance: 0.14mm (0.0055 in) max.



05U0DX-034

Assembly Note**Oil seal**

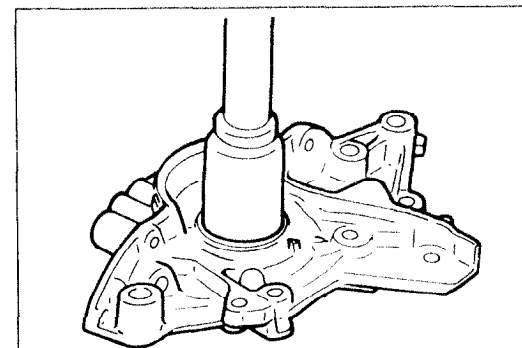
1. Apply a small amount of clean engine oil to the lip of a new oil seal.
2. Push the oil seal slightly in by hand.

Caution

- The oil seal must be pressed in until it is flush with the edge of the oil pump body.

3. Press the oil seal in evenly with a suitable pipe.

Oil seal outer diameter: 44mm (1.73 in)



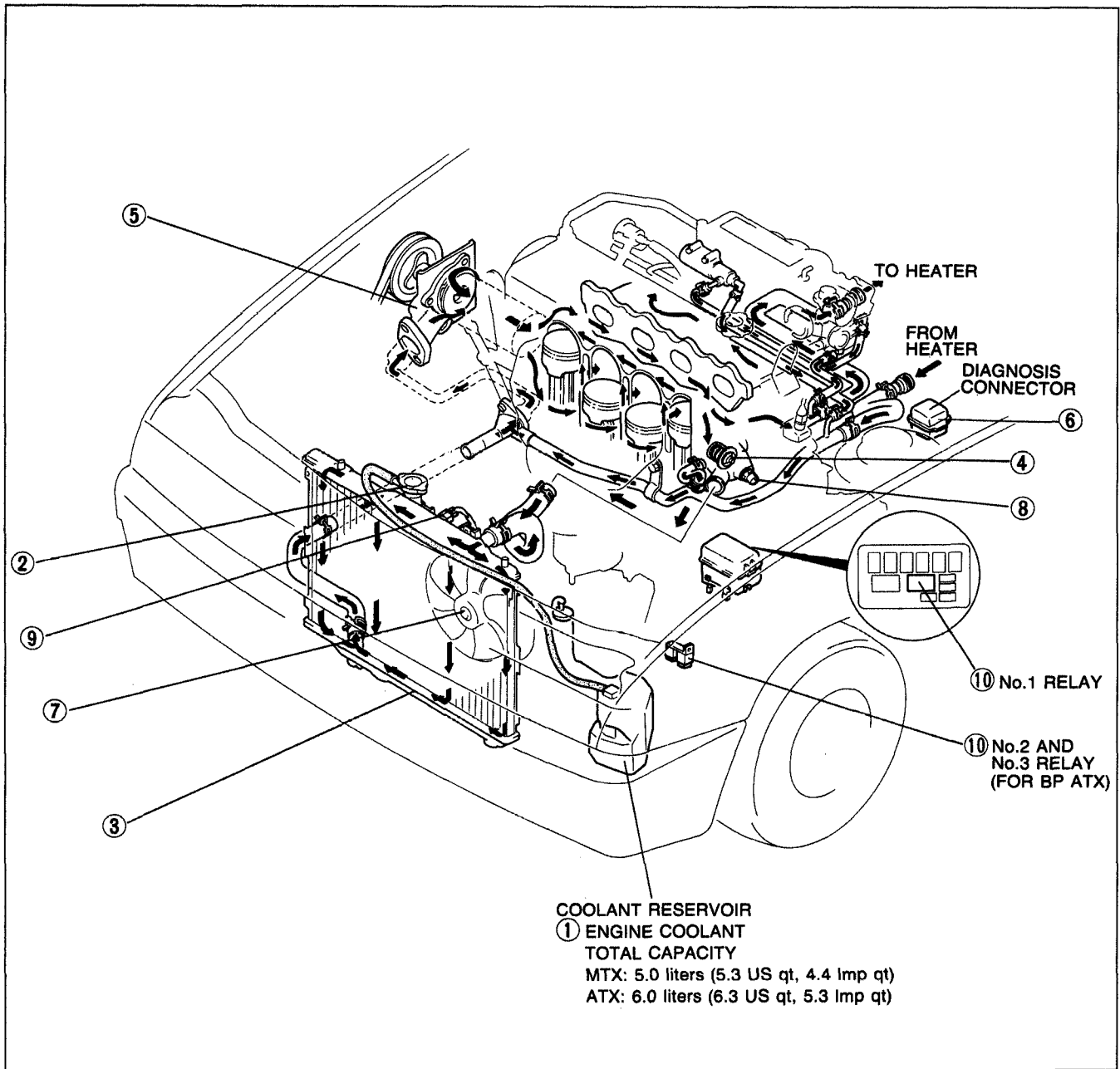
05U0DX-035

COOLING SYSTEM

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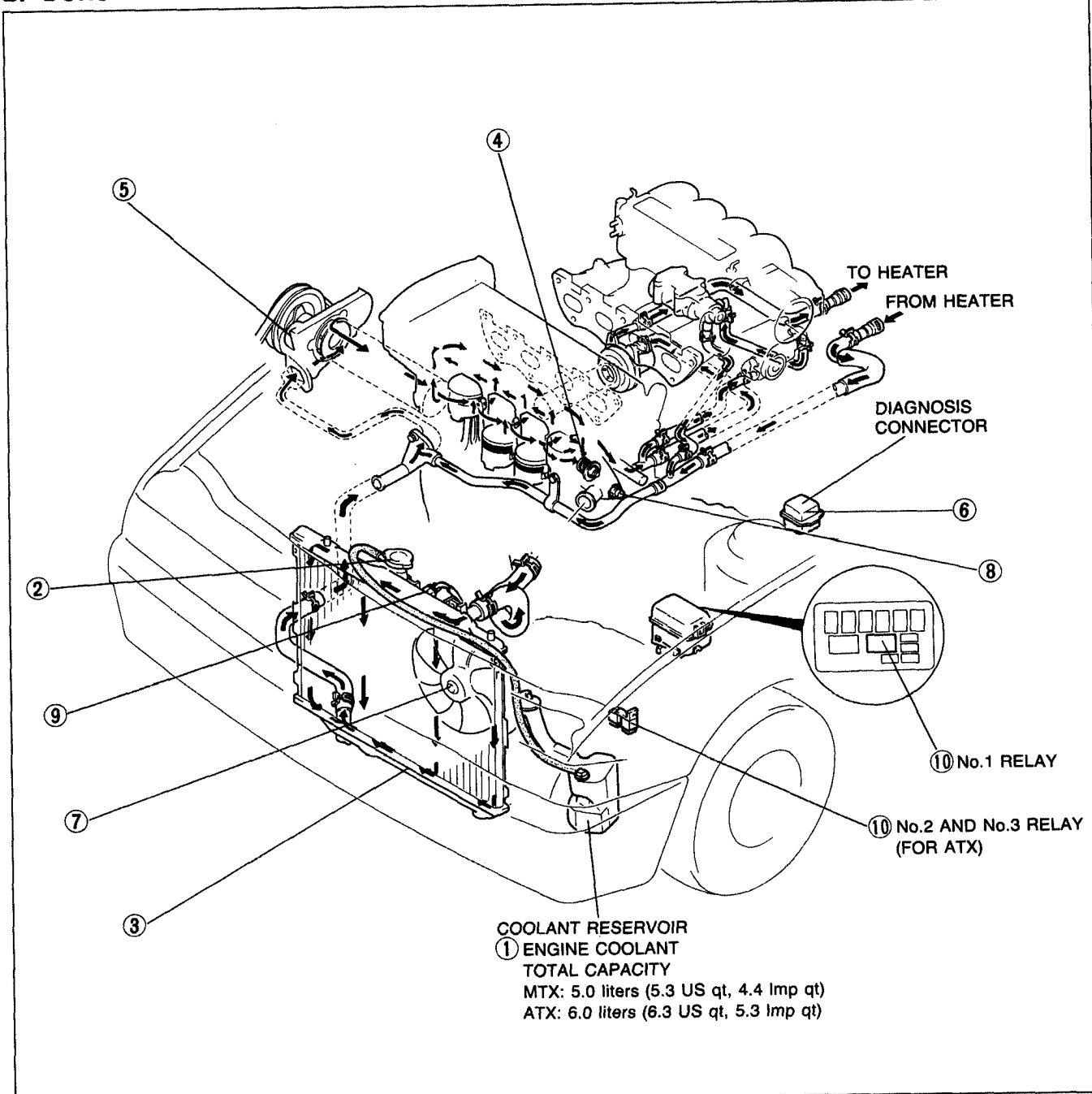
B6 SOHC AND BP SOHC



23U0EX-002

1. Engine coolant		6. Electric cooling fan system	
Inspection	page E- 5	System circuit	page E-13
Replacement.....	page E- 6	System inspection.....	page E-14
2. Radiator cap		7. Fan motor	
Inspection	page E- 7	Inspection	page E-14
3. Radiator		Replacement.....	page E-15
Removal / Installation	page E- 8	8. Water thermostswitch	
Inspection	page E- 9	Removal / Installation	page E-16
4. Thermostat		Inspection	page E-16
Removal / Installation	page E- 9	9. Radiator thermostswitch (BP ATX)	
Inspection	page E- 9	Removal / Installation	page E-17
5. Water pump		Inspection	page E-17
Removal / Installation	page E-11	10. Fan relay	
		Removal / Inspection	page E-18

BP DOHC



COOLANT RESERVOIR
 ① ENGINE COOLANT
 TOTAL CAPACITY
 MTX: 5.0 liters (5.3 US qt, 4.4 Imp qt)
 ATX: 6.0 liters (6.3 US qt, 5.3 Imp qt)

23U0EX-003

1. Engine coolant		6. Electric cooling fan system	
Inspection	page E- 5	System circuit	page E-13
Replacement.....	page E- 6	System inspection.....	page E-14
2. Radiator cap		7. Fan motor	
Inspection	page E- 7	Inspection	page E-14
3. Radiator		Replacement.....	page E-15
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4. Thermostat		Inspection	page E-16
Removal / Installation	page E- 9	9. Radiator thermostatic switch (ATX)	
Inspection	page E- 9	Removal / Installation	page E-17
5. Water pump		Inspection	page E-17
Removal / Installation	page E-11	10. Fan relay	
		Inspection	page E-18

OUTLINE

SPECIFICATIONS

Engine/Transaxle		B6 SOHC		BP SOHC		BP DOHC		
		MTX	ATX	MTX	ATX	MTX	ATX	
Cooling system		Water-cooled, forced circulation						
Coolant capacity liters (US qt, Imp qt)		5.0 (5.3, 4.4)	6.0 (6.3, 5.3)	5.0 (5.3, 4.4)	6.0 (6.3, 5.3)	5.0 (5.3, 4.4)	6.0 (6.3, 5.3)	
Water pump	Type	Centrifugal						
	Water seal	Unified mechanical seal						
Thermostat	Type	Wax, two-stage						
	Opening temperature °C (°F)	Main: 86.5—89.5 (188—193) Sub : 83.5—86.5 (182—188)						
	Full-open temperature °C (°F)	100 (212)						
	Full-open lift mm (in)	Main: 8.0 (0.31) min. Sub : 1.5 (0.06) min.						
Radiator	Type	Corrugated fin						
	Cap valve opening pressure kPa (kg/cm ² , psi)	74—103 (0.75—1.05, 11—15)						
	Core size mm (in)	Width	647 (25.47)					
		Height	390 (15.35)					
		Depth	16 (0.63)	25 (0.98)	16 (0.63)	25 (0.98)	16 (0.63)	25 (0.98)
	Fin pitch mm (in)	1.3 (0.051)						
	Heat dissipation capacity kcal/h	38,800	43,800	38,800	43,800	38,800	43,800	
	Transaxle oil cooler	Type	—	Laminated	—	Laminated	—	Laminated
Heat dissipation capacity kcal/h		—	1,700	—	1,700	—	1,700	
Cooling fan	Type	Electric						
	Number of blades	4						
	Outer diameter mm (in)	320 (12.6)						
	Capacity W-V	80-12	160-12	80-12	160-12	80-12	160-12	
	Current A	6.6 ± 1	Hi: 13.3 + 10% max. Low: 8.8 + 10% max.	6.6 ± 1	Hi: 13.3 + 10% max. Low: 8.8 + 10% max.	6.6 ± 1	Hi: 13.3 + 10% max. Low: 8.8 + 10% max.	

23U0EX-004

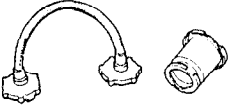
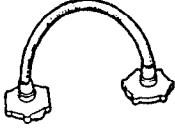
TROUBLESHOOTING GUIDE

Problem	Possible Cause	Remedy	Page
Overheating	Coolant level insufficient	Add	E- 6
	Coolant leakage	Repair	—
	Radiator fins clogged	Clean	E- 9
	Radiator cap malfunction	Replace	E- 7
	Cooling fan malfunction	Replace	E-13
	Thermostat malfunction	Replace	E- 9
	Water passage clogged	Clean	E- 6
	Water pump malfunction	Replace	E-11
Corrosion	Impurities in coolant	Replace	E- 6

03U0EX-005

ENGINE COOLANT

PREPARATION SST

<p>49 9200 145</p> <p>Adapter set, radiator cap tester</p> 	<p>For inspection of cooling system pressure</p>	<p>49 9200 146</p> <p>Adapter A (Part of 49 9200 145)</p> 	<p>For inspection of cooling system pressure</p>
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05U0EX-005

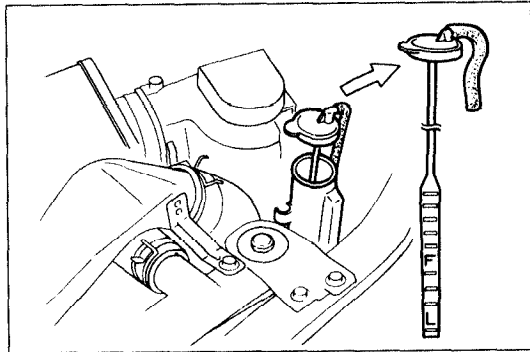
E

INSPECTION

Warning

- Never remove the radiator cap while the engine is hot.
- Wrap a thick cloth around the cap when removing it.
- When removing the radiator cap, loosen it slowly to the first stop until the pressure in the radiator is released, and then remove it.

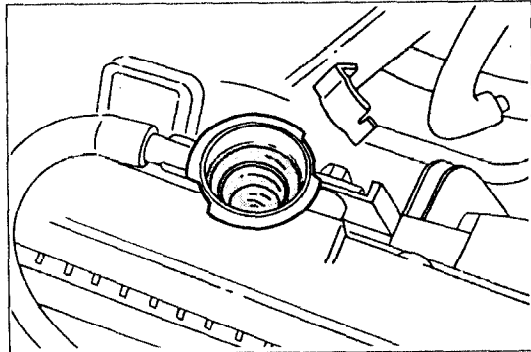
03U0EX-006



03U0EX-007

Coolant Level (Engine cold)

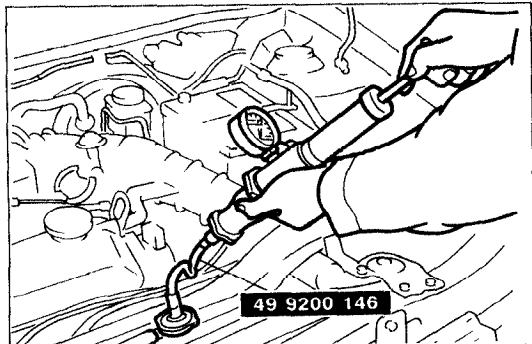
1. Verify that the coolant level is near the radiator filler neck.
2. Remove the coolant level gauge and check the coolant level.



03U0EX-008

Coolant Quality

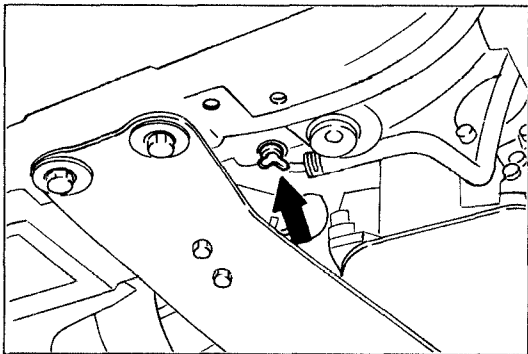
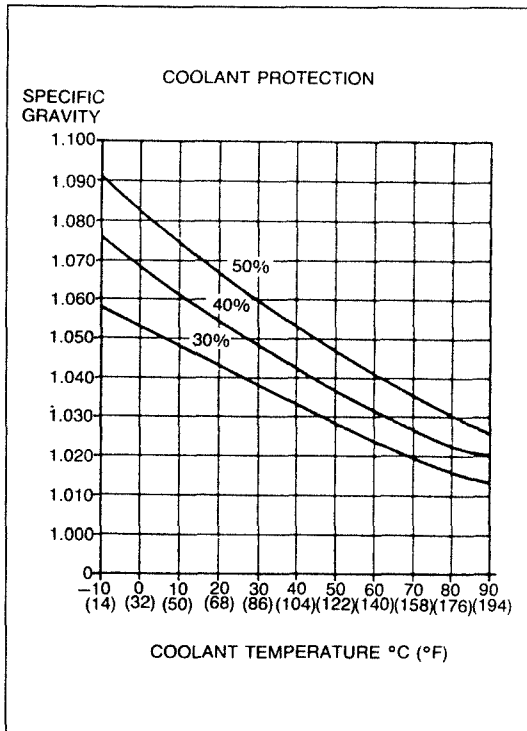
1. Verify that there is no buildup of rust or scale around the radiator cap or radiator filler neck.
2. Verify that coolant is free of oil. Replace the coolant if necessary.



03U0EX-009

Coolant Leakage

1. Connect a radiator tester (commercially available) and the **SST** to the radiator filler neck.
2. Apply **103 kPa (1.05 kg/cm², 15 psi)** pressure to the system.
3. Verify that the pressure is held.
If not, check for coolant leakage.



Coolant Protection

Caution

- Do not use alcohol- or methanol-based coolant.
- Use only soft (demineralized) water in the coolant mixture.

1. Measure the coolant temperature and specific gravity with a thermometer and a hydrometer.
2. Determine the coolant protection by referring to the graph shown.
If the coolant protection is not proper, add water or coolant.

Antifreeze solution mixture percentage

Coolant protection	Volume percentage		Gravity at 20°C (68°F)
	Water	Coolant	
Above -16°C (3°F)	65	35	1.054
Above -26°C (-15°F)	55	45	1.066
Above -40°C (-40°F)	45	55	1.078

05U0EX-010

REPLACEMENT

Warning

- Never open the radiator cap while the engine is hot.
- Wrap a thick cloth around the cap when loosening.
- Use caution when draining hot coolant.

Caution

- Do not use alcohol- or methanol-based coolant.
- Use only soft (demineralized) water in the coolant mixture.

1. Remove the radiator cap and loosen the drain plug.
2. Drain the coolant into a suitable container.
3. Flush the cooling system with water until all traces of color are gone; then let the system drain completely.
4. Install the drain plug.
5. Fill with the proper amount and mixture of ethylene glycol based coolant by referring to the table above.

Coolant capacity

MTX: 5.0 liters (5.3 US qt, 4.4 Imp qt)

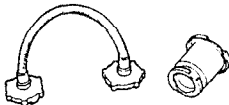

ATX: 6.0 liters (6.3 US qt, 5.3 Imp qt)

6. Run the engine with the radiator cap removed until the upper radiator hose is hot.
7. With the engine idling, add coolant to the radiator until it reaches the bottom of the filler neck.
8. Install the radiator cap.

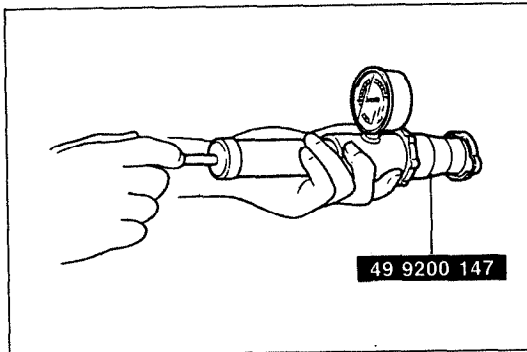
03U0EX-010

RADIATOR CAP

PREPARATION SST

49 9200 145 Adapter set, radiator cap tester		For inspection of radiator cap valve	49 9200 147 Adapter B (Part of 49 9200 145)		For inspection of radiator cap valve
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05U0EX-014

E


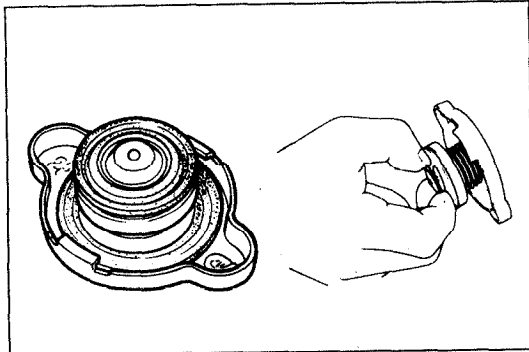
49 9200 147

05U0EX-015

INSPECTION

Radiator Cap Valve

1. Remove foreign material (such as water residue) from between the radiator cap valve and the valve seat.
2. Attach the radiator cap to a radiator cap tester (commercially available) with the **SST**. Apply pressure gradually to **74—103 kPa (0.75—1.05 kg/cm², 11—15 psi)**.
3. Wait about **10 seconds**. Verify that the pressure has not decreased.



05U0EX-013

Negative Pressure Valve

1. Pull the negative pressure valve to open it. Verify that it closes completely when released.
2. Check for damage on the contact surfaces and for cracked or deformed seal packing.
3. Replace the radiator cap if necessary.

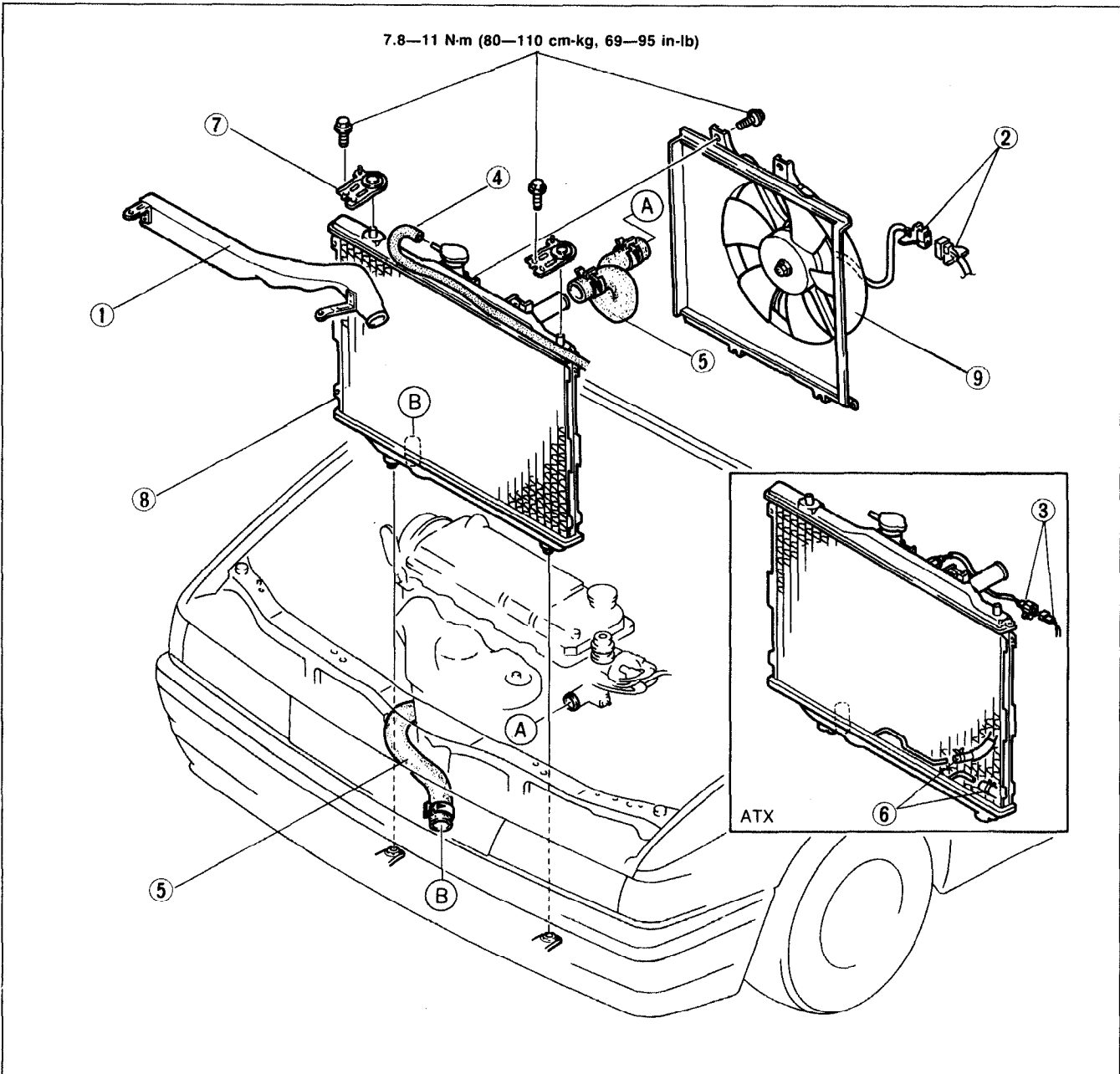
RADIATOR

REMOVAL / INSTALLATION

Caution

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

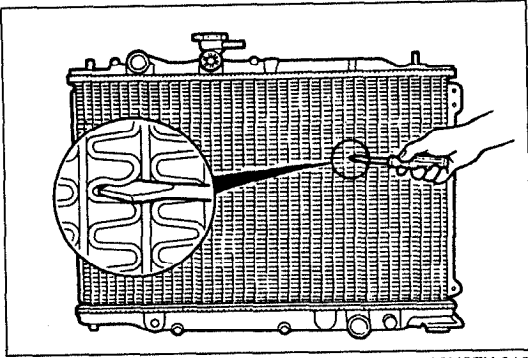
1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.



23UOEX-005

1. Resonance chamber
2. Cooling fan connector
3. Radiator thermoswitch connector (BP ATX)
4. Coolant reservoir hose
5. Radiator hose

6. Oil cooler hose (ATX)
7. Radiator bracket
8. Radiator
- Inspection page E-9
9. Cooling fan and radiator cowling assembly



03U0EX-012

INSPECTION

Check for the following and repair or replace as necessary.

1. Cracks, damage, and water leakage.
2. Bent fins (repair with a screwdriver).
3. Distorted or bent radiator inlet.

Steps After Installation

1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E-6.)
2. Connect the negative battery cable.
3. Start the engine and check for leaks.

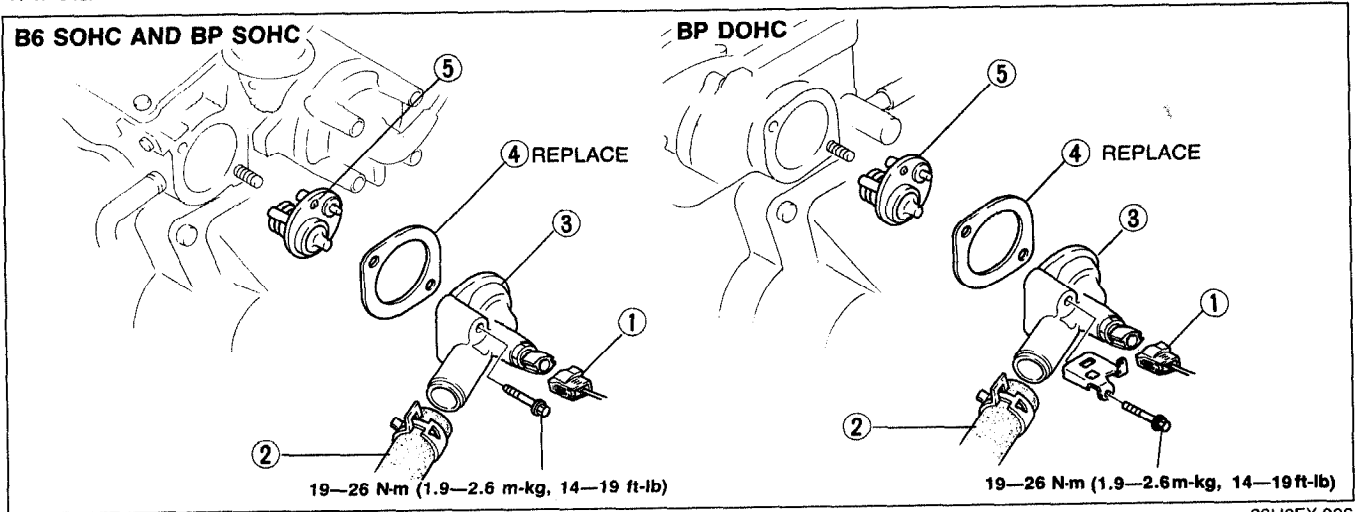
THERMOSTAT

REMOVAL / INSTALLATION

Caution

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

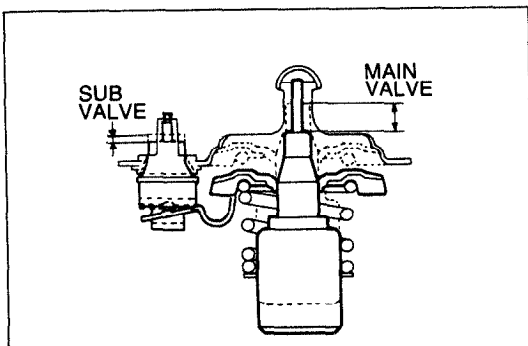
1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.



23U0EX-006

1. Water thermostwitch connector
 2. Radiator hose upper
 3. Thermostat cover
 4. Thermostat gasket
- Installation Note page E-10

5. Thermostat
- Inspection..... below
Installation Note..... page E-10



05U0EX-019

INSPECTION

1. Visually check that the thermostat valve is airtight.
2. Place the thermostat and a thermometer in water.
3. Heat the water and check the following:

Initial-opening temperature

Main: 86.5—89.5°C (188—193°F)

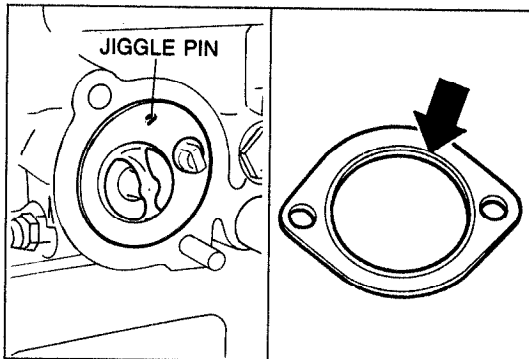
Sub : 83.5—86.5°C (182—188°F)

Full-open temperature: 100°C (212°F)

Full-open lift

Main: 8.0mm (0.31 in) min.

Sub : 1.5mm (0.06 in) min.



03U0EX-014

Installation Note**Thermostat**

1. Install the thermostat into the cylinder head with the jiggle pin at the top.

Thermostat gasket

1. Install a new gasket with the seal print side facing the cylinder head.

Steps After Installation

1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E-6.)
2. Connect the negative battery cable.
3. Start the engine and check for leaks.

03U0EX-015

WATER PUMP

REMOVAL / INSTALLATION

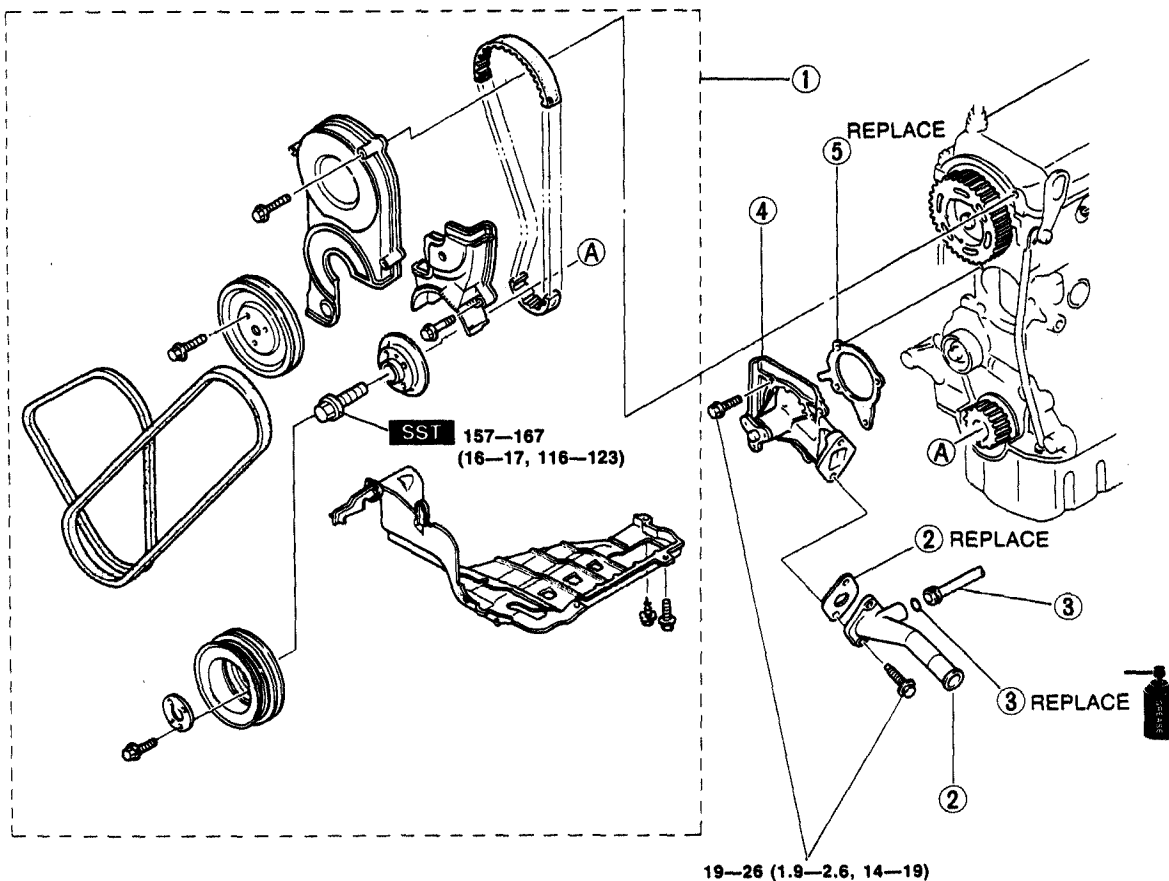
Caution

- Do not disassemble the water pump. If a problem is found, replace the pump as a unit.

1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal.

B6 SOHC AND BP SOHC

B3, B6, BP SOHC



N-m (m-kg, ft-lb)

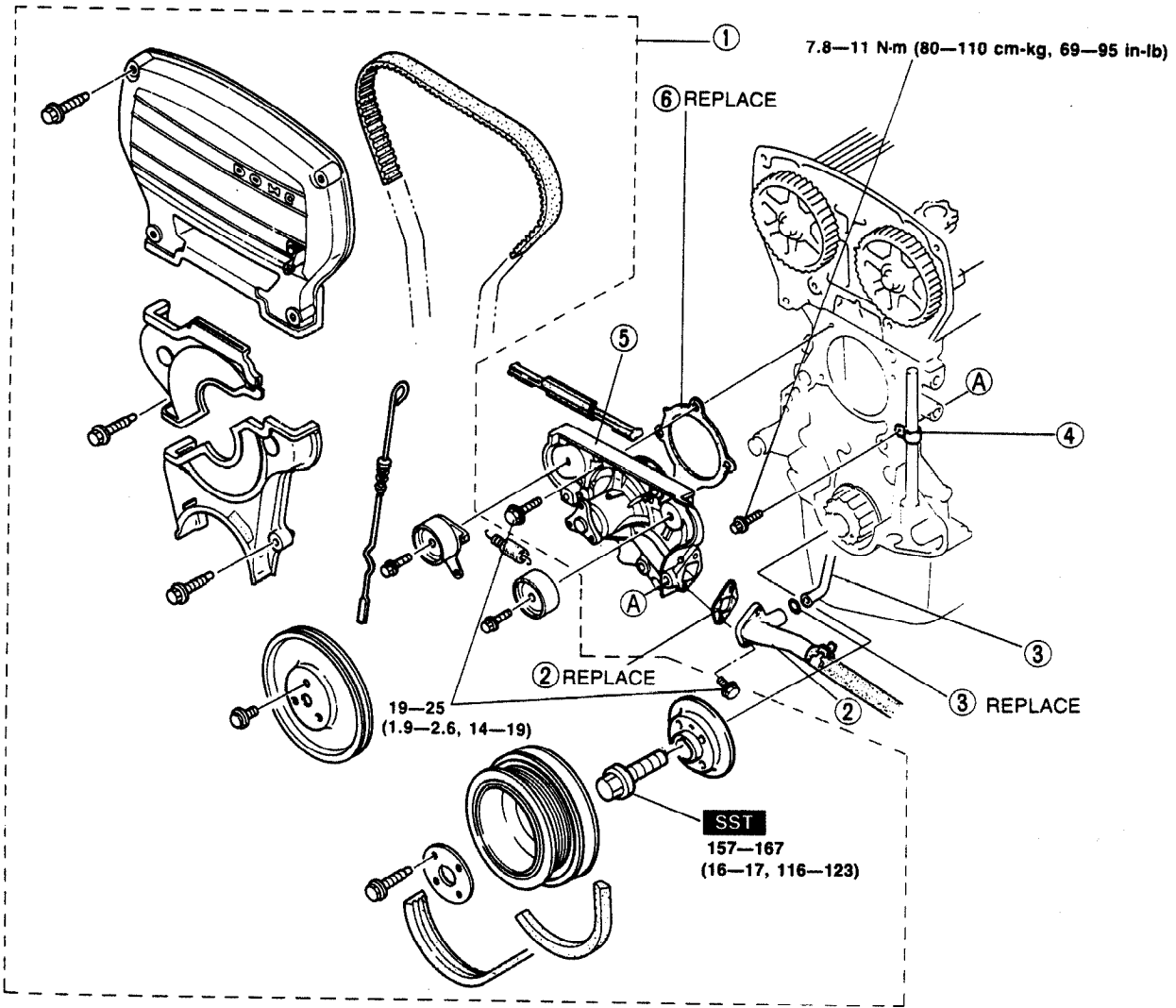
23U0EX-007

1. Timing belt
Service Section B1
2. Water inlet pipe and gasket
3. Water bypass pipe and O-ring

4. Water pump assembly
Inspect for cracks, damaged mounting surface, bearing condition, and leakage
5. Water pump gasket

WATER PUMP

BP DOHC



N-m (m-kg, ft-lb)

23U0EX-008

- | | |
|--|--|
| 1. Timing belt
Service Section B2 | 5. Water pump assembly
Inspect for cracks, damaged mounting surface, bearing condition, and leakage |
| 2. Water inlet pipe and gasket | 6. Water pump gasket |
| 3. Water bypass pipe and O-ring | |
| 4. Oil dip stick pipe bracket | |

Steps After Installation

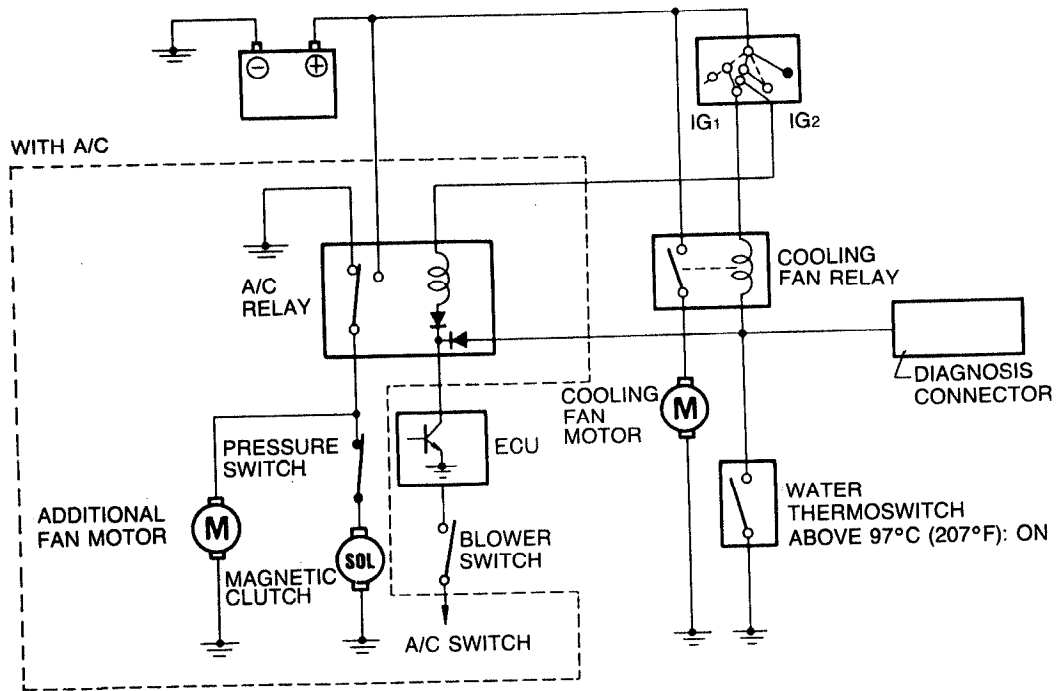
1. Fill the radiator with the specified amount and type of engine coolant. (Refer to page E-6.)
2. Connect the negative battery cable.
3. Start the engine and check for leaks.

03U0EX-018

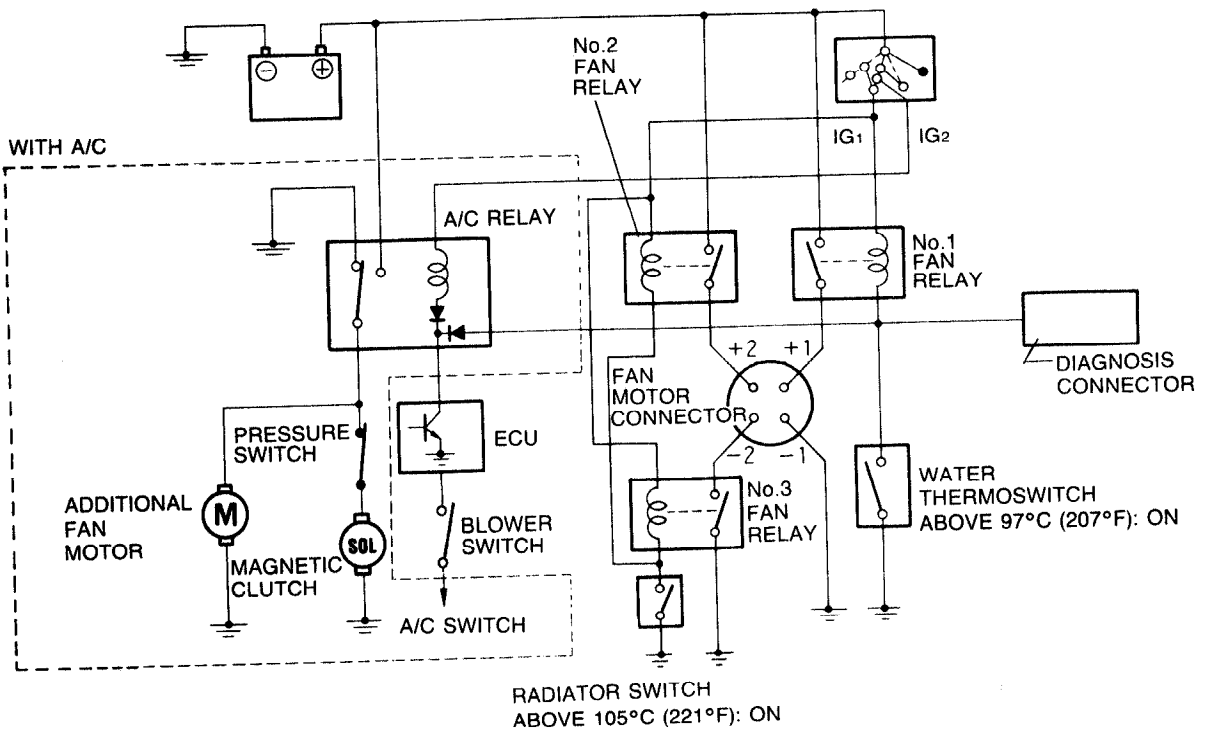
ELECTRIC COOLING FAN SYSTEM

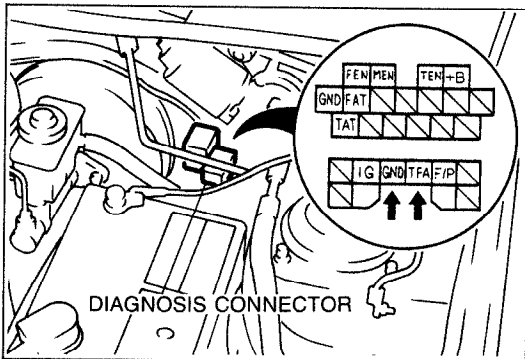
SYSTEM CIRCUIT

SINGLE-SPEED TYPE



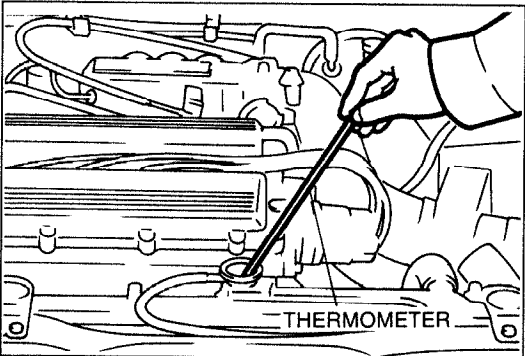
TWO-SPEED TYPE





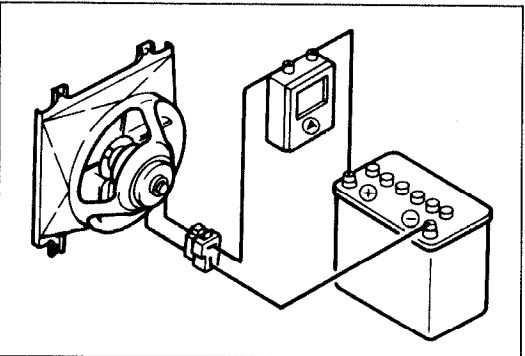
DIAGNOSIS CONNECTOR

05U0EX-024



THERMOMETER

03U0EX-020



03U0EX-021

SYSTEM INSPECTION

1. Jump across the fan test (TFA) terminal and the ground (GND) terminal of the diagnosis connector.
2. Turn the ignition switch ON and verify that the fan operates. If the fan does not operate, inspect the cooling fan system components and wire harness.
3. Remove the radiator cap and place a thermometer in the radiator filler neck.
4. Start the engine.
5. Verify that the fan operates when the coolant temperature reaches **approx. 97°C (207°F)**. If it does, check the water thermostat. (Refer to page E-16.)

FAN MOTOR

INSPECTION

Single-Speed Type

1. Check that the battery is fully charged.
2. Disconnect the fan motor connector.
3. Connect the battery and an ammeter to the fan motor connector.
4. Verify that current is as specified.

Current (A)

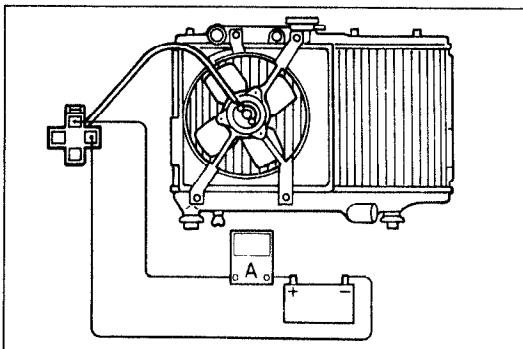
	MTX	ATX
B6 SOHC	6.6 ± 1	6.6 ± 1
BP SOHC	6.6 ± 1	—
BP DOHC	6.6 ± 1	—

5. If current is not within specification and/or the fan does not turn smoothly, replace the fan motor.

Two-Speed Type

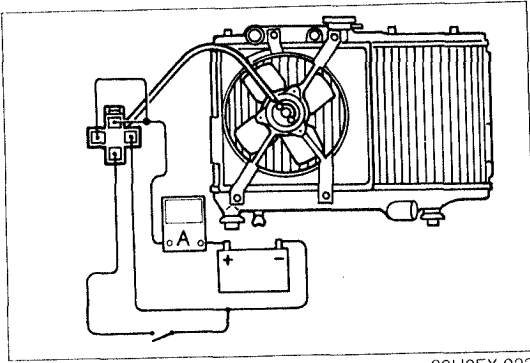
1. Check that the battery is fully charged.
2. Disconnect the fan motor connector.
3. Connect the battery and an ammeter to the fan motor connectors for low-speed inspection.
4. Verify that the fan motor operates smoothly at the standard current.

Current (A): 8.8 + 10% MAX



03U0EX-022

FAN MOTOR



03U0EX-023

5. Connect the battery, an ammeter, and switch to the fan motor connectors for high-speed inspection.
6. Verify that the fan motor operates smoothly at the standard current or less with the switch ON.

Current (A): 13.3 + 10% MAX

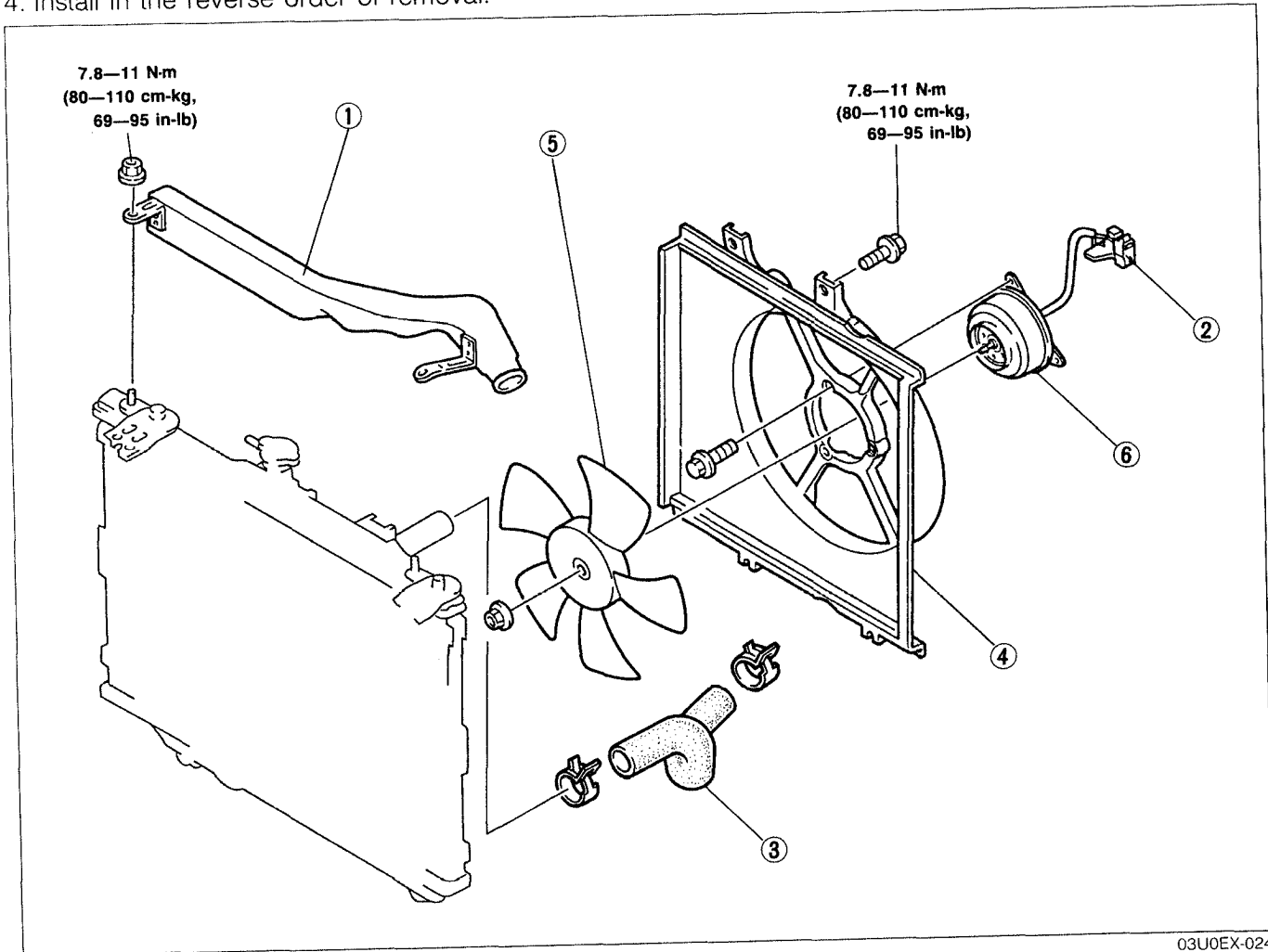
7. If the fan motor is faulty, replace it.

REPLACEMENT

Caution

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

1. Disconnect the negative battery cable.
2. Drain the engine coolant.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.



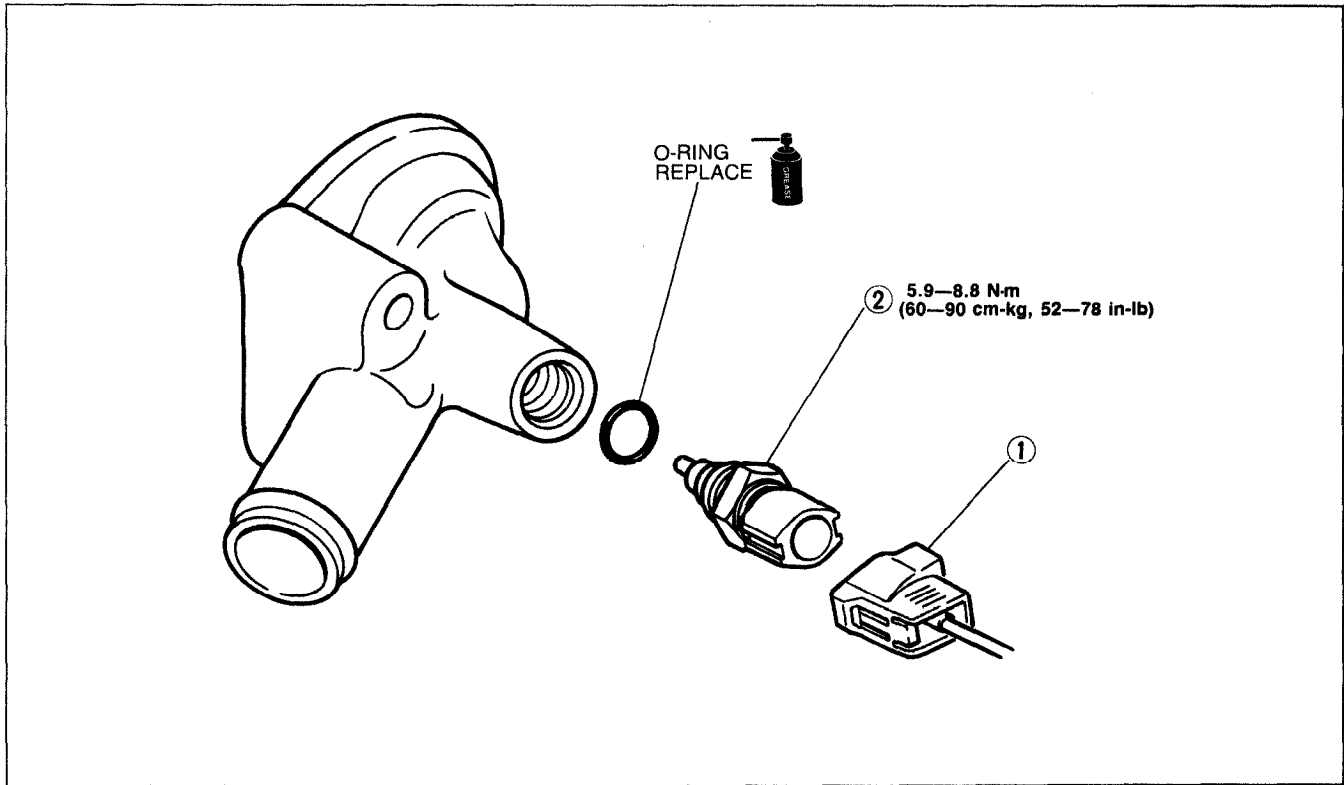
1. Resonance chamber
2. Cooling fan connector
3. Radiator hose upper

4. Radiator cowling
5. Cooling fan
6. Fan motor

WATER THERMOSWITCH

REMOVAL / INSTALLATION

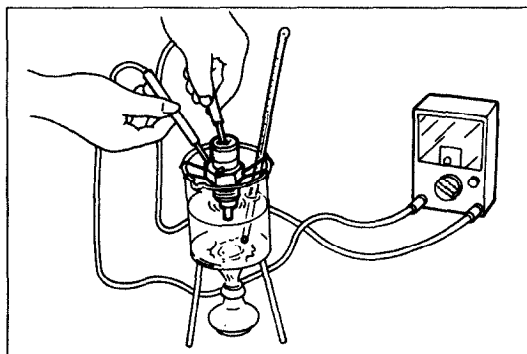
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal, referring to **Installation Note**.



23U0EX-009

1. Water thermostat connector

2. Water thermostat
 Inspection..... below
 Installation Note below



05U0EX-030

INSPECTION

1. Place the switch and a thermometer in water.
2. Heat the water gradually and check continuity of the switch with an ohmmeter.

Coolant temperature	°C (°F)	Continuity
More than 97	(207)	Yes
Less than 90	(194)	No

3. If not as specified, replace the water thermostat.

Installation Note
Water thermostat

1. Apply a small amount of engine coolant to the new O-ring.

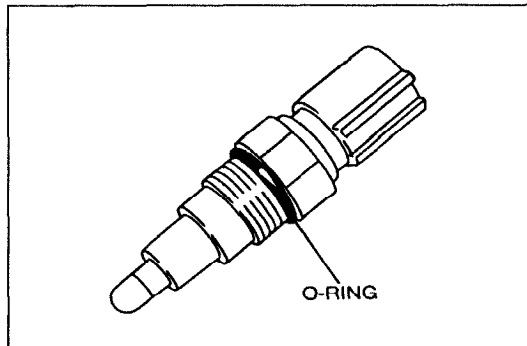
Caution

- Do not use an impact wrench for installation.

2. Install the water thermostat.

Tightening torque:

5.9—8.8 N·m (60—90 cm·kg, 52—78 in·lb)

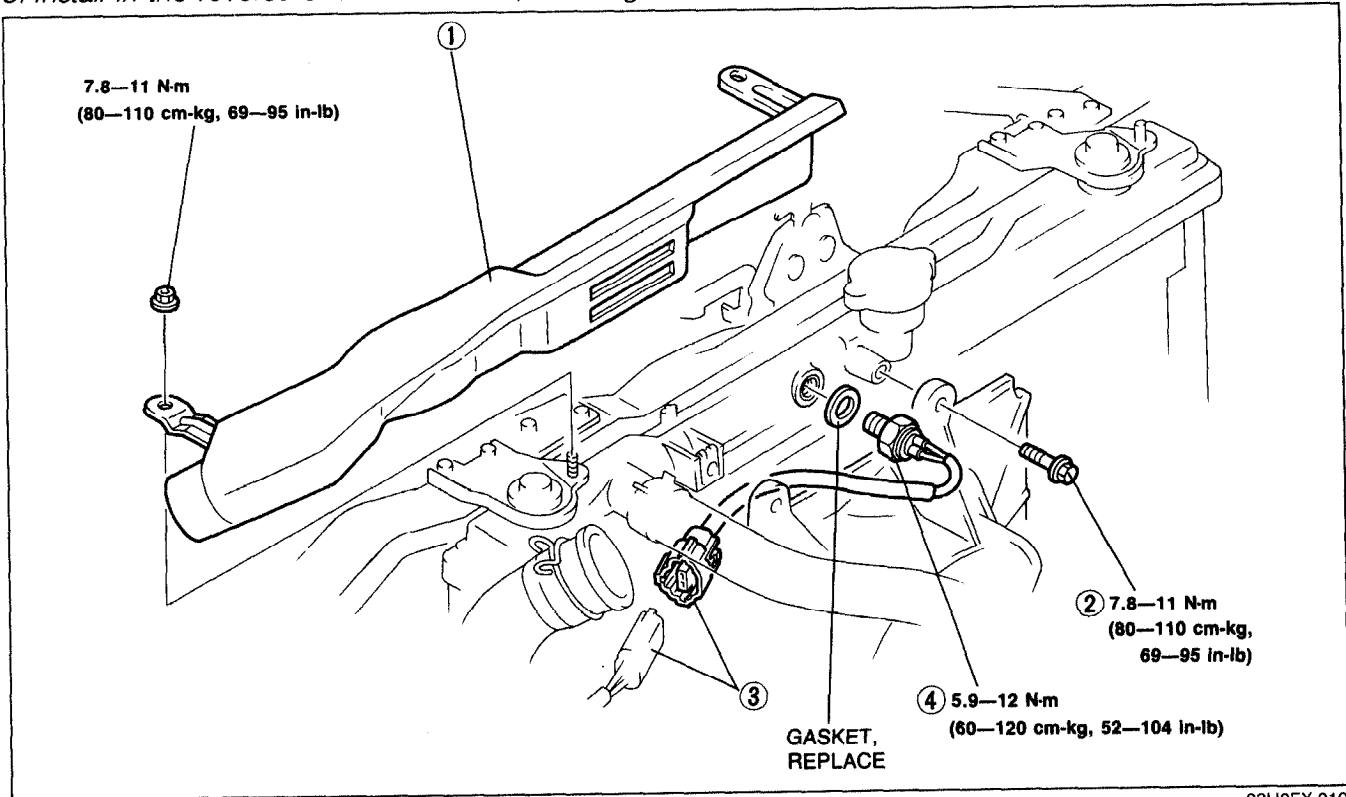


05U0EX-031

RADIATOR THERMOSWITCH

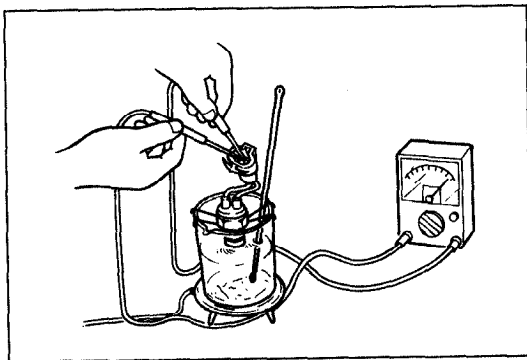
REMOVAL / INSTALLATION

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal, referring to **Installation Note**.



1. Resonance chamber
2. Radiator cowling installation bolts
3. Radiator thermostat connector

4. Radiator thermostat
 Inspection..... below
 Installation Note below



INSPECTION

1. Place the switch and a thermometer in engine oil.

Warning

- Do not heat the engine oil above 120°C (248°F)

2. Heat the engine oil gradually and check continuity of the switch with an ohmmeter.

Engine oil temperature °C (°F)	Continuity
More than 105 (221)	Yes
Less than 96 (205)	No

3. If not as specified, replace the radiator thermostat.

Installation Note

Radiator thermostat

Caution

- Do not use an impact wrench for installation.

1. Install the radiator thermostat along with a new gasket.

Tightening torque:

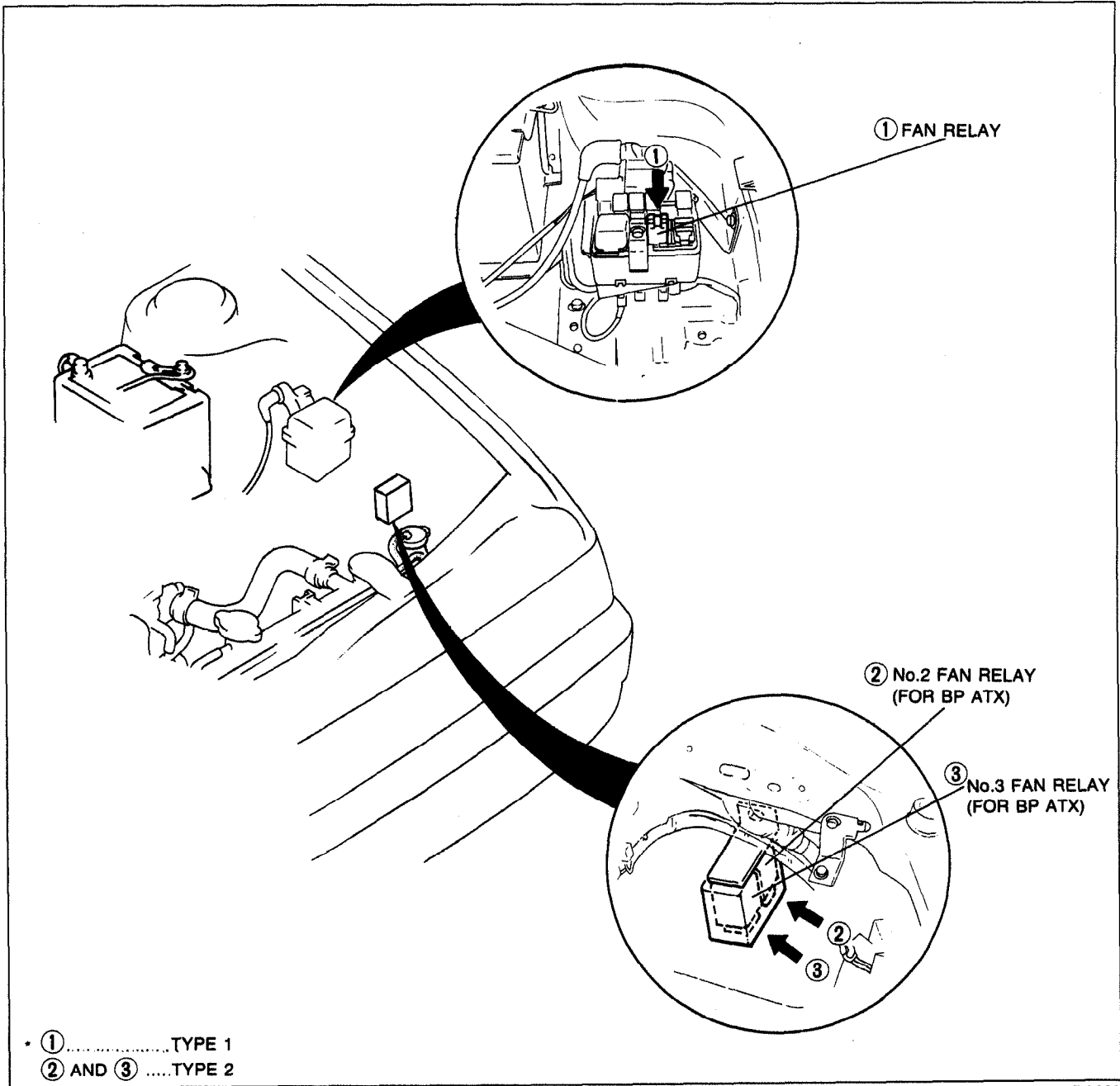
5.9—12 N·m (60—120 cm·kg, 52—104 in·lb)

13U0EX-005

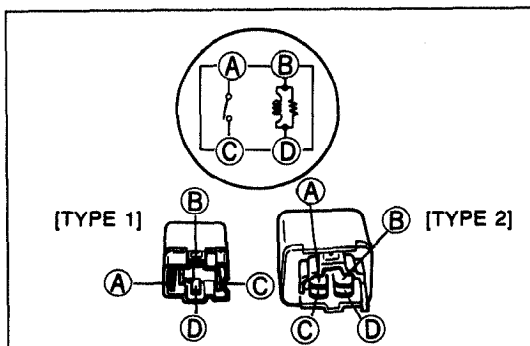
FAN RELAY

REMOVAL / INSPECTION

1. Disconnect the negative battery cable.
2. Remove the fan relay in a place shown in the figure.



03U0EX-029



03U0EX-030

INSPECTION

1. Check continuity as shown with an ohmmeter.

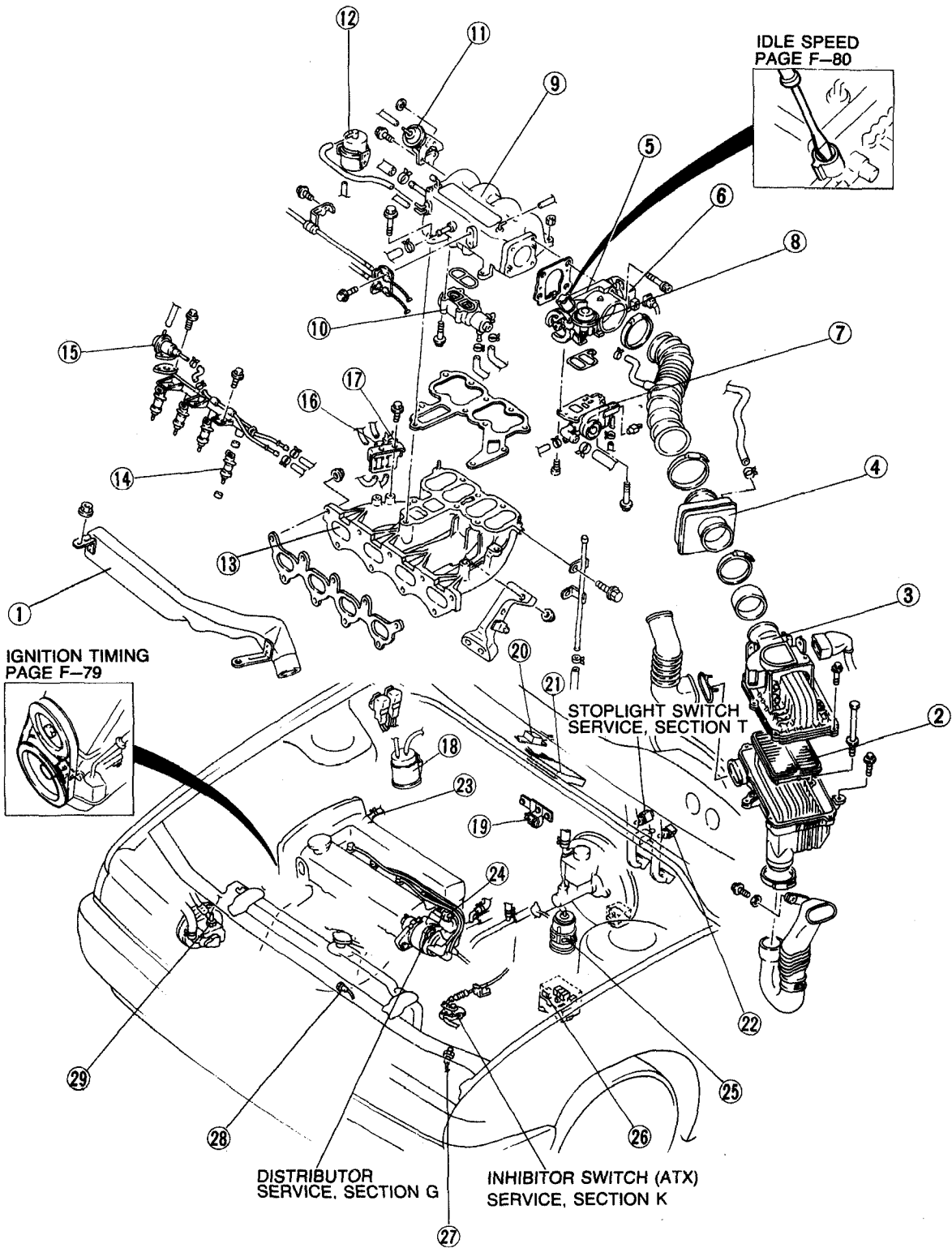
Terminal	Continuity
A—C	No
B—D	Yes

2. Apply 12V between terminals (B) and (D).
Check for continuity between terminals (A) and (C).
3. If not as specified, replace the fan relay.

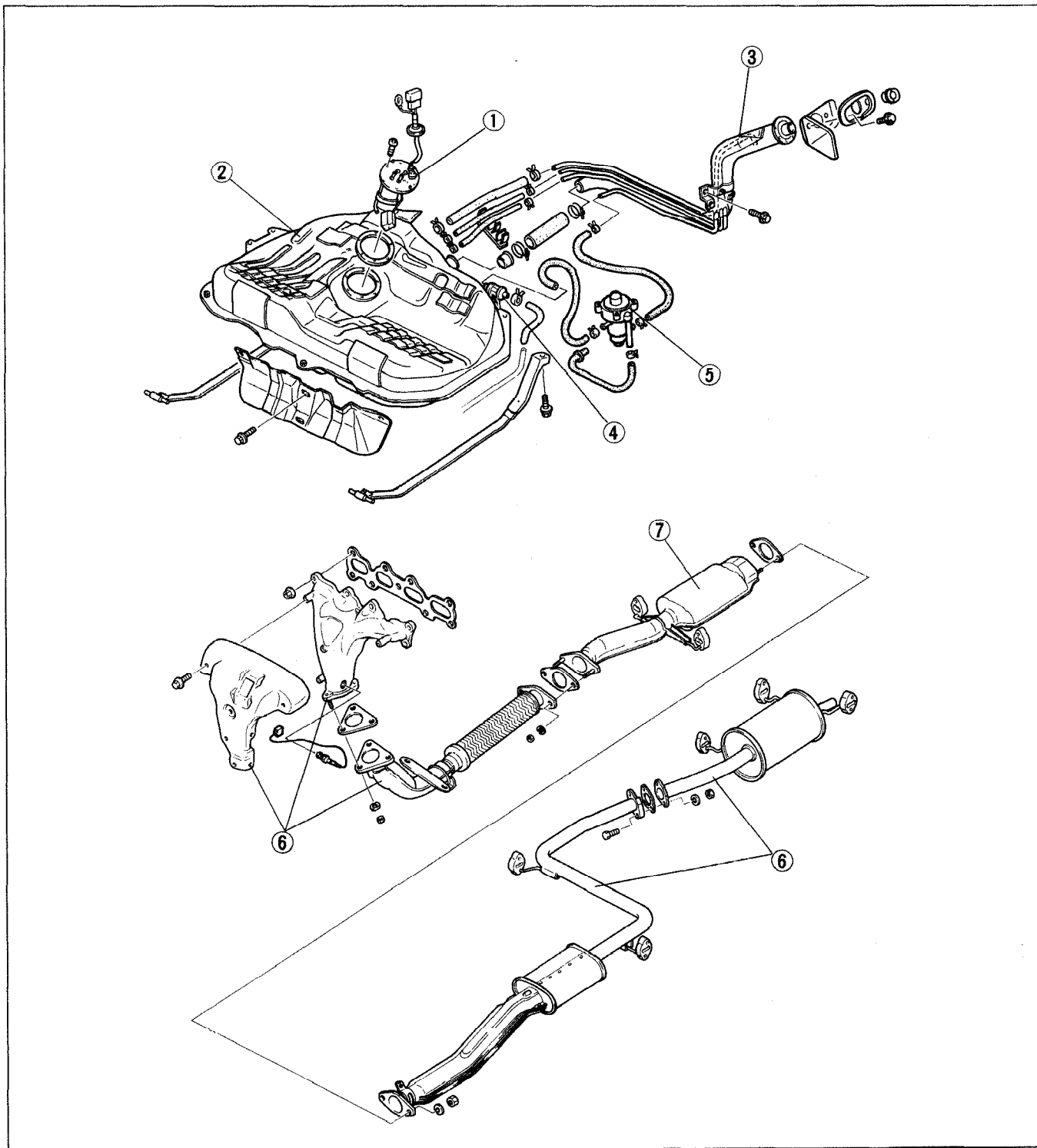
FUEL AND EMISSION CONTROL SYSTEM

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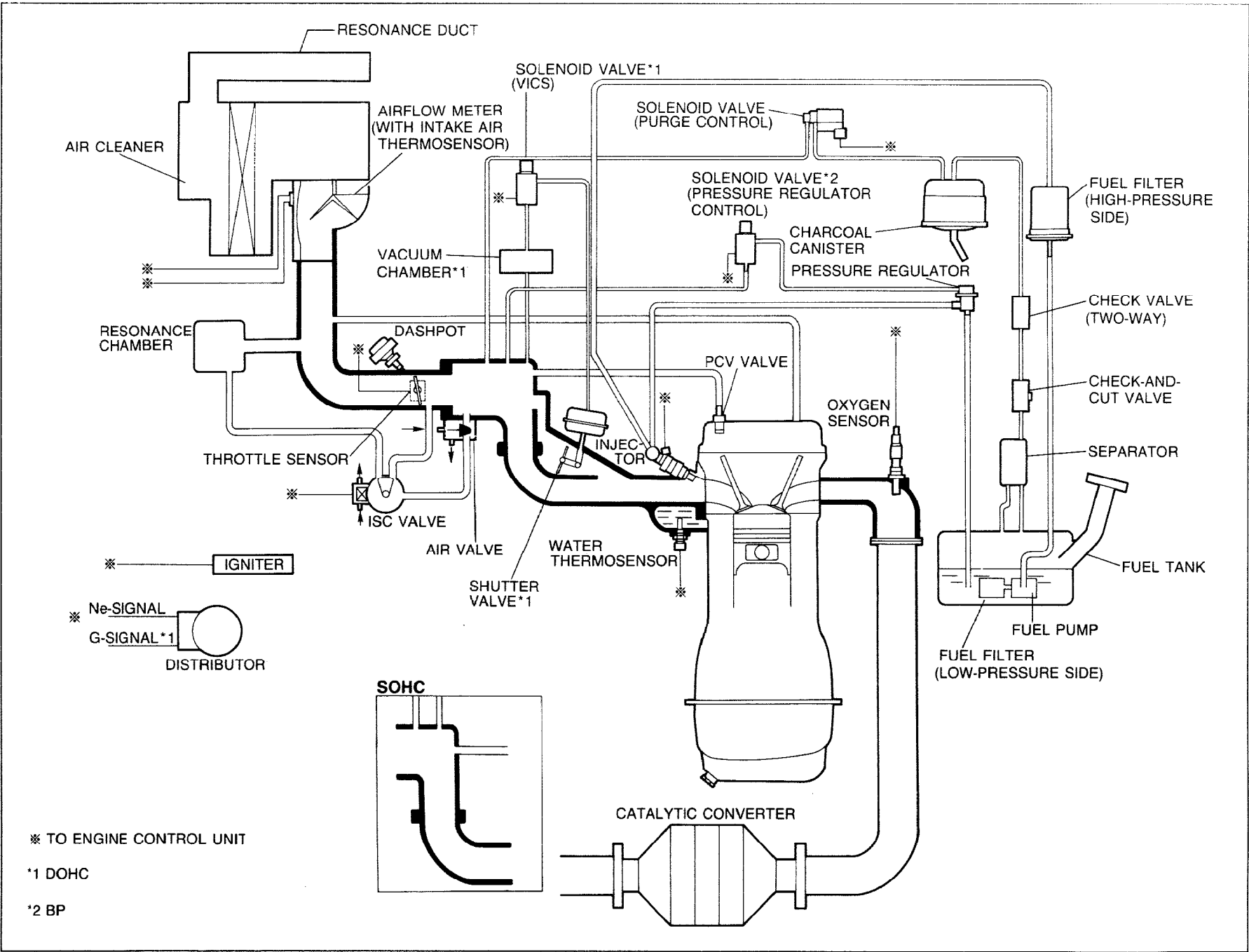


- | | | | |
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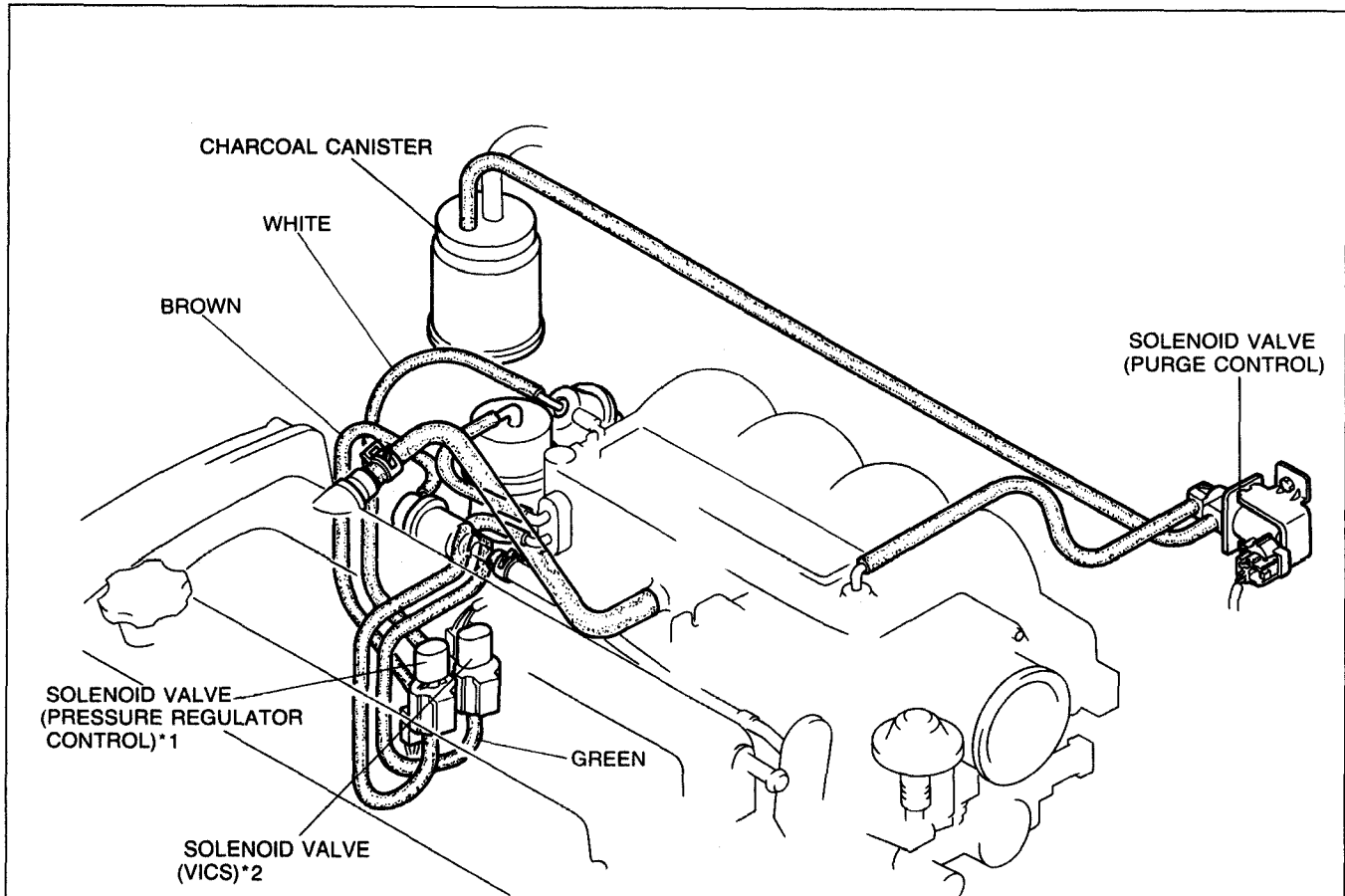


23U0FX-003

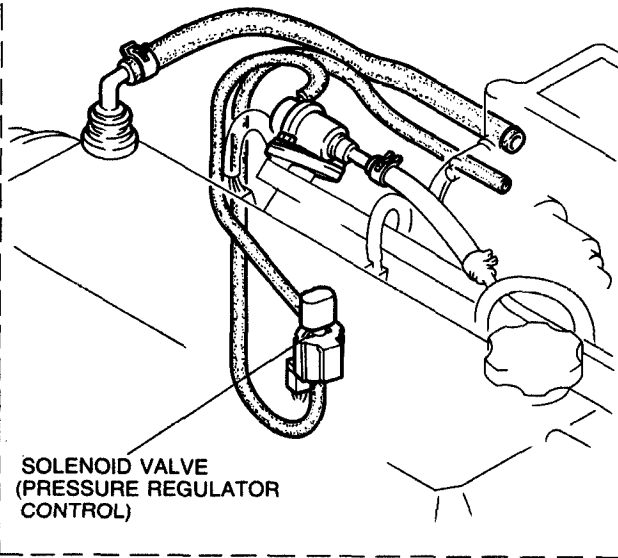
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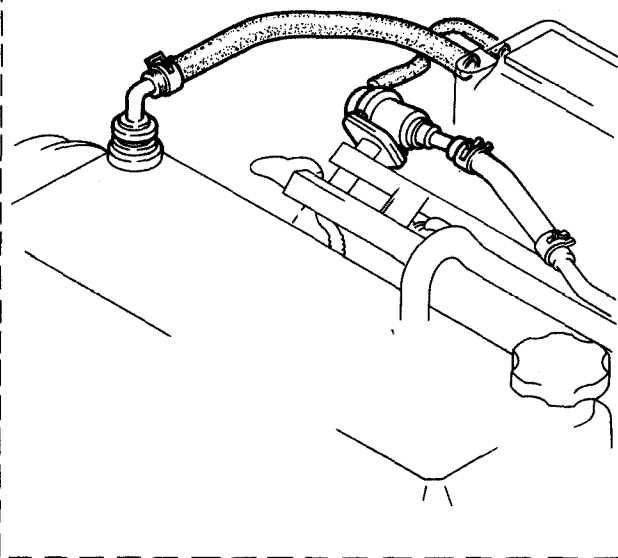
VACUUM HOSE ROUTING DIAGRAM



BP SOHC



B6



*1 BP

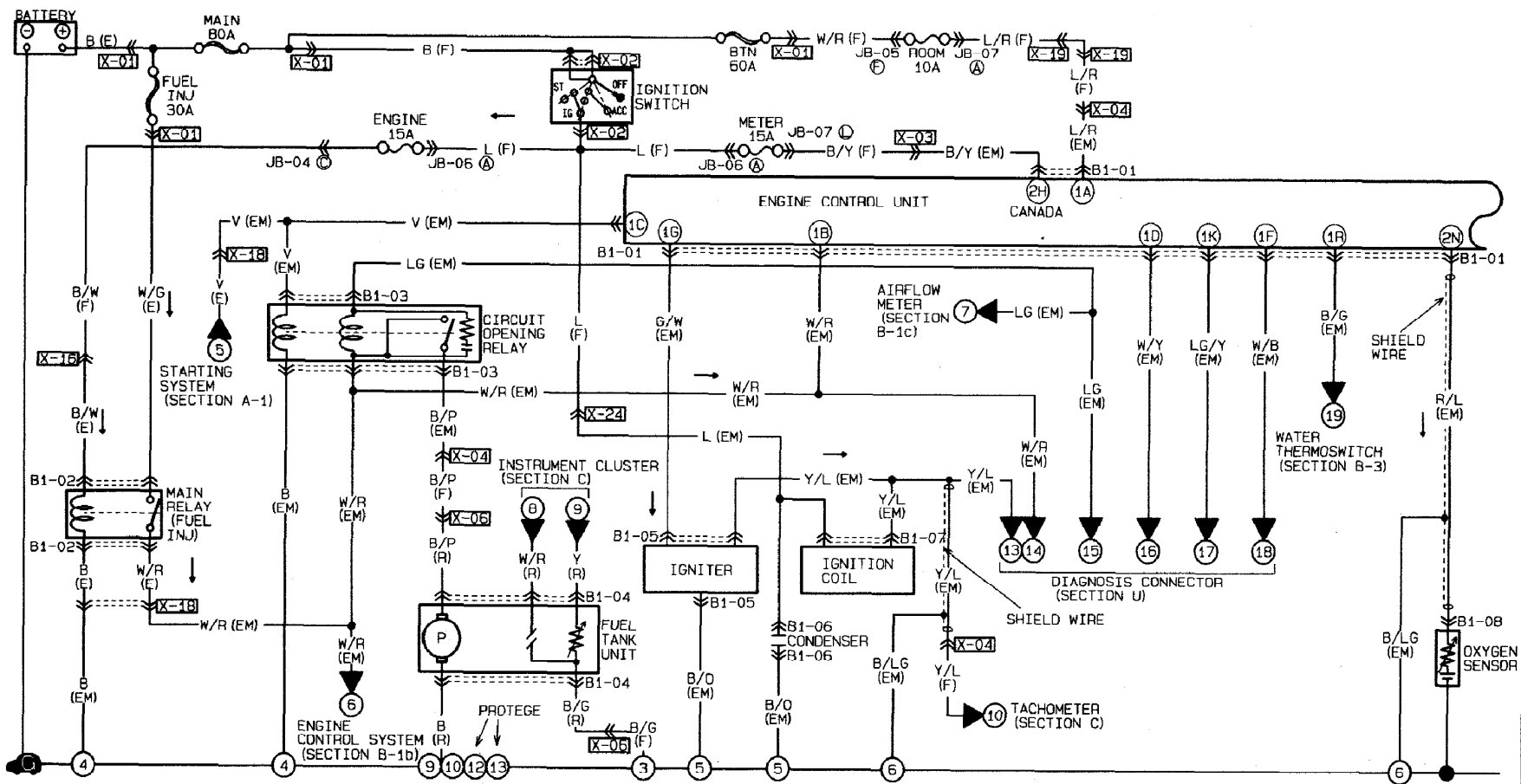
*2 DOHC

EGI MT ■ ENGINE CONTROL SYSTEM (1/3)

◇ ...DOHC
() ...CANADA

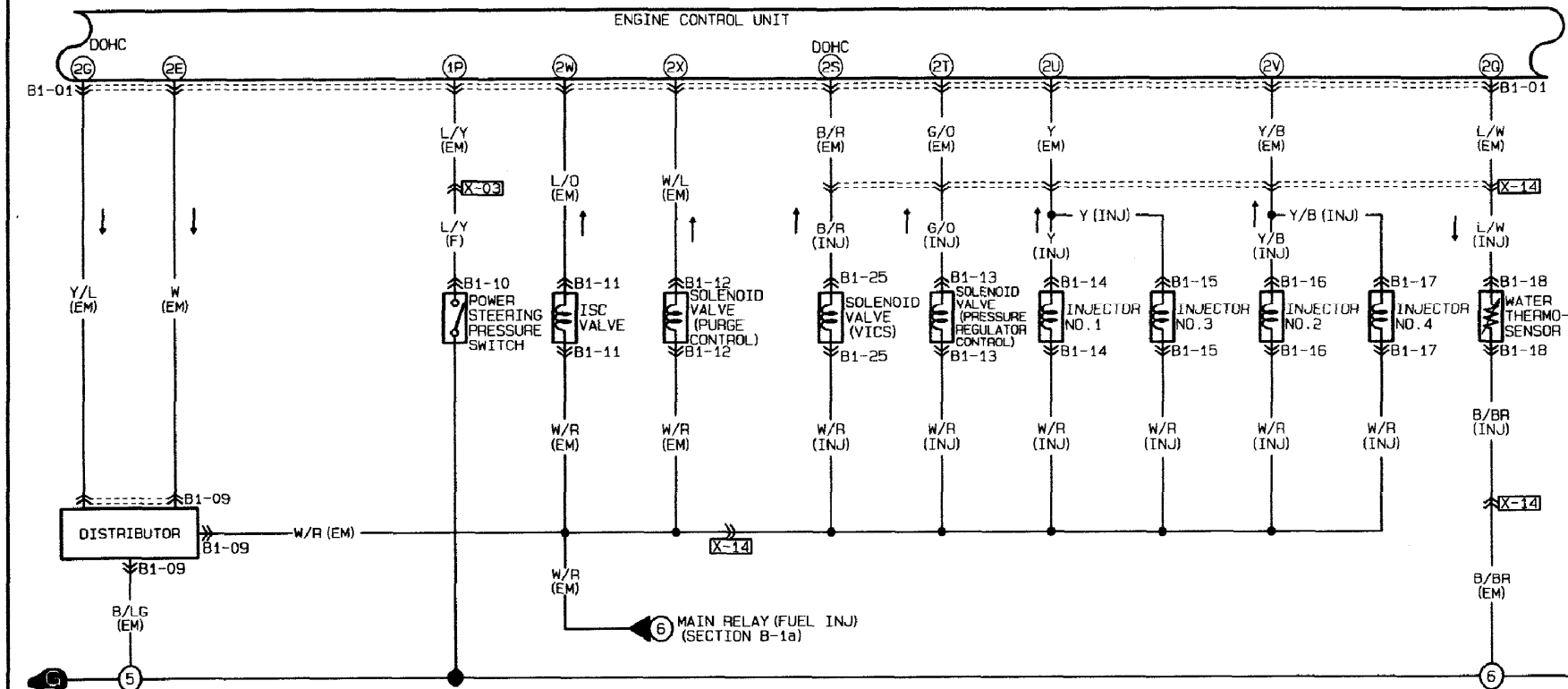
B-1a

WIRING DIAGRAM
MTX



B1-01 ENGINE CONTROL UNIT (EM) <table border="1"> <tr> <td>1U</td><td>1S</td><td>1Q</td><td>1D</td><td>1M</td><td>1K</td><td>1I</td><td>1G</td><td>1E</td><td>1C</td><td>1A</td> <td>2Y</td><td>2W</td><td>2U</td><td>2S</td><td>2Q</td><td>2O</td><td>2M</td><td>2K</td><td>2I</td><td>2G</td><td>2E</td><td>2C</td><td>2A</td> </tr> <tr> <td>R/B</td><td>O/L</td><td>G/B</td><td>G</td><td>*</td><td>LG/Y</td><td>*</td><td>G/W</td><td>Y/B</td><td>V</td><td>L/R</td> <td>*</td><td>L/O</td><td>Y</td><td>B/R</td><td>L/W</td><td>R</td><td>*</td><td>LG/R</td><td>*</td><td>Y/L</td><td>W</td><td>B/LG</td><td>B/O</td> </tr> <tr> <td>BR/Y</td><td>B/L</td><td>B/G</td><td>L/Y</td><td>R/W</td><td>(BR/W)</td><td>L/B</td><td>*</td><td>W/B</td><td>W/Y</td><td>W/R</td> <td>*</td><td>W/L</td><td>Y/B</td><td>G/D</td><td>*</td><td>R/B</td><td>R/L</td><td>LG/W</td><td>*</td><td>(B/Y)</td><td>B</td><td>*</td><td>B/BR</td><td>B/O</td> </tr> <tr> <td>1V</td><td>1T</td><td>1R</td><td>1P</td><td>1N</td><td>1L</td><td>1J</td><td>1H</td><td>1F</td><td>1D</td><td>1B</td> <td>22</td><td>2X</td><td>2V</td><td>2T</td><td>2R</td><td>2P</td><td>2N</td><td>2L</td><td>2U</td><td>2H</td><td>2F</td><td>2D</td><td>2B</td> </tr> </table>	1U	1S	1Q	1D	1M	1K	1I	1G	1E	1C	1A	2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	R/B	O/L	G/B	G	*	LG/Y	*	G/W	Y/B	V	L/R	*	L/O	Y	B/R	L/W	R	*	LG/R	*	Y/L	W	B/LG	B/O	BR/Y	B/L	B/G	L/Y	R/W	(BR/W)	L/B	*	W/B	W/Y	W/R	*	W/L	Y/B	G/D	*	R/B	R/L	LG/W	*	(B/Y)	B	*	B/BR	B/O	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	22	2X	2V	2T	2R	2P	2N	2L	2U	2H	2F	2D	2B	B1-02 MAIN RELAY (F) (FUEL INJ) <table border="1"> <tr> <td>W/G</td><td>B/W</td> </tr> <tr> <td>B/W</td><td>B</td> </tr> <tr> <td>W/R</td><td>B</td> </tr> </table>	W/G	B/W	B/W	B	W/R	B	B1-03 CIRCUIT OPENING RELAY (EM) <table border="1"> <tr> <td>V</td><td>W/R</td><td>B/P</td> </tr> <tr> <td>B</td><td>*</td><td>LG</td> </tr> </table>	V	W/R	B/P	B	*	LG
1U	1S	1Q	1D	1M	1K	1I	1G	1E	1C	1A	2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A																																																																																								
R/B	O/L	G/B	G	*	LG/Y	*	G/W	Y/B	V	L/R	*	L/O	Y	B/R	L/W	R	*	LG/R	*	Y/L	W	B/LG	B/O																																																																																								
BR/Y	B/L	B/G	L/Y	R/W	(BR/W)	L/B	*	W/B	W/Y	W/R	*	W/L	Y/B	G/D	*	R/B	R/L	LG/W	*	(B/Y)	B	*	B/BR	B/O																																																																																							
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	22	2X	2V	2T	2R	2P	2N	2L	2U	2H	2F	2D	2B																																																																																								
W/G	B/W																																																																																																														
B/W	B																																																																																																														
W/R	B																																																																																																														
V	W/R	B/P																																																																																																													
B	*	LG																																																																																																													
B1-04 FUEL TANK UNIT (R) <table border="1"> <tr> <td>B/G</td><td>X</td><td>Y</td> </tr> <tr> <td>B</td><td>*</td><td>W/R</td><td>B/P</td> </tr> </table>	B/G	X	Y	B	*	W/R	B/P	B1-05 IGNITER (EM) 	B1-06 CONDENSER (FM) 	B1-07 IGNITION COIL (EM) 	B1-08 OXYGEN SENSOR (EM) 																																																																																																				
B/G	X	Y																																																																																																													
B	*	W/R	B/P																																																																																																												

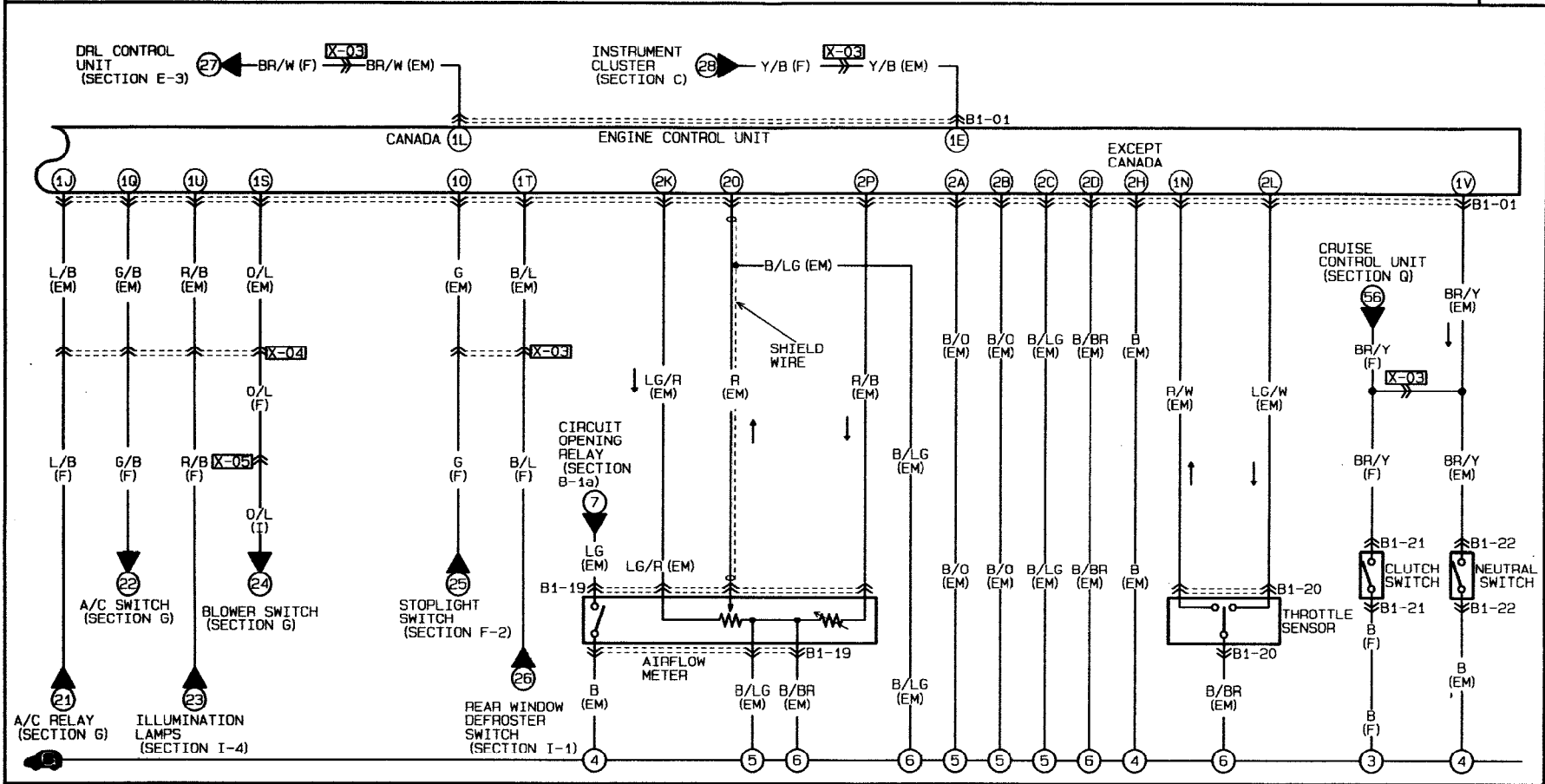
OUTLINE



B1-01 ENGINE CONTROL UNIT (EM) <table border="1"> <tr> <td>1U</td><td>1S</td><td>1Q</td><td>1D</td><td>1M</td><td>1K</td><td>1I</td><td>1G</td><td>1E</td><td>1C</td><td>1A</td><td>2Y</td><td>2W</td><td>2U</td><td>2S</td><td>2Q</td><td>2O</td><td>2M</td><td>2K</td><td>2I</td><td>2G</td><td>2E</td><td>2C</td><td>2A</td> </tr> <tr> <td>R/B</td><td>O/L</td><td>G/B</td><td>G</td><td>*</td><td>LG/Y</td><td>*</td><td>G/W</td><td>Y/B</td><td>V</td><td>L/R</td><td>*</td><td>L/D</td><td>Y</td><td>RB/R</td><td>L/W</td><td>R</td><td>*</td><td>LG/R</td><td>*</td><td>Y/L</td><td>W</td><td>B/LGB/D</td><td></td> </tr> <tr> <td>BR/Y</td><td>B/L</td><td>B/G</td><td>L/Y</td><td>R/W</td><td>(BR/W)</td><td>L/B</td><td>*</td><td>W/B</td><td>W/Y</td><td>W/R</td><td>*</td><td>W/L</td><td>Y/B</td><td>G/O</td><td>*</td><td>R/B</td><td>R/L</td><td>LG/W</td><td>*</td><td>(B/Y)</td><td>B</td><td>*</td><td>B/BR/B/D</td> </tr> <tr> <td>1V</td><td>1T</td><td>1R</td><td>1P</td><td>1N</td><td>1L</td><td>1J</td><td>1H</td><td>1F</td><td>1D</td><td>1B</td><td>2Z</td><td>2X</td><td>2V</td><td>2T</td><td>2R</td><td>2P</td><td>2N</td><td>2L</td><td>2J</td><td>2H</td><td>2F</td><td>2D</td><td>2B</td> </tr> </table>														1U	1S	1Q	1D	1M	1K	1I	1G	1E	1C	1A	2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	R/B	O/L	G/B	G	*	LG/Y	*	G/W	Y/B	V	L/R	*	L/D	Y	RB/R	L/W	R	*	LG/R	*	Y/L	W	B/LGB/D		BR/Y	B/L	B/G	L/Y	R/W	(BR/W)	L/B	*	W/B	W/Y	W/R	*	W/L	Y/B	G/O	*	R/B	R/L	LG/W	*	(B/Y)	B	*	B/BR/B/D	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	B1-09 DISTRIBUTOR (EM) 			B1-10 POWER STEERING PRESSURE SWITCH (F) 		
1U	1S	1Q	1D	1M	1K	1I	1G	1E	1C	1A	2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A																																																																																												
R/B	O/L	G/B	G	*	LG/Y	*	G/W	Y/B	V	L/R	*	L/D	Y	RB/R	L/W	R	*	LG/R	*	Y/L	W	B/LGB/D																																																																																													
BR/Y	B/L	B/G	L/Y	R/W	(BR/W)	L/B	*	W/B	W/Y	W/R	*	W/L	Y/B	G/O	*	R/B	R/L	LG/W	*	(B/Y)	B	*	B/BR/B/D																																																																																												
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B																																																																																												
B1-11 ISC VALVE (EM) 		B1-12 SOLENOID VALVE (PURGE CONTROL) (EM) 		B1-13 SOLENOID VALVE (PRESSURE REGULATOR CONTROL) (INJ) 		B1-14 INJECTOR NO.1 (INJ) 		B1-15 INJECTOR NO.3 (INJ) 		B1-16 INJECTOR NO.2 (INJ) 		B1-17 INJECTOR NO.4 (INJ) 																																																																																																							
B1-18 WATER THERMOSENSOR (INJ) 		B1-25 SOLENOID VALVE (VICS) (INJ) 																																																																																																																	

EGI MT ■ ENGINE CONTROL SYSTEM (3/3)

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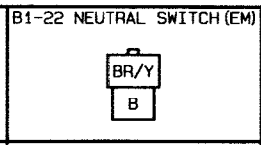
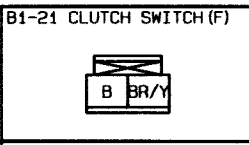
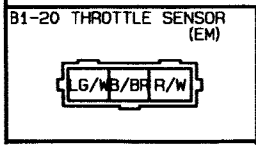


B1-01 ENGINE CONTROL UNIT (EM)

1U	1S	1Q	1O	1M	1K	1J	1G	1E	1C	1A	2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	
R/B	O/L	G/B	G	*	LG/Y	*	G/W	Y/B	V	L/R	*	L/O	Y	B/BR	L/W	R	*	G/R	*	K/Y/L	*	W	B/LG	B/O
BR/Y	B/L	B/G	L/Y	R/W	BR/W	*	L/B	*	W/B	W/Y	W/R	*	W/L	Y/B	G/O	*	R/B	R/L	LG/W	*	(B/Y)	*	B/BR	B/O
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	

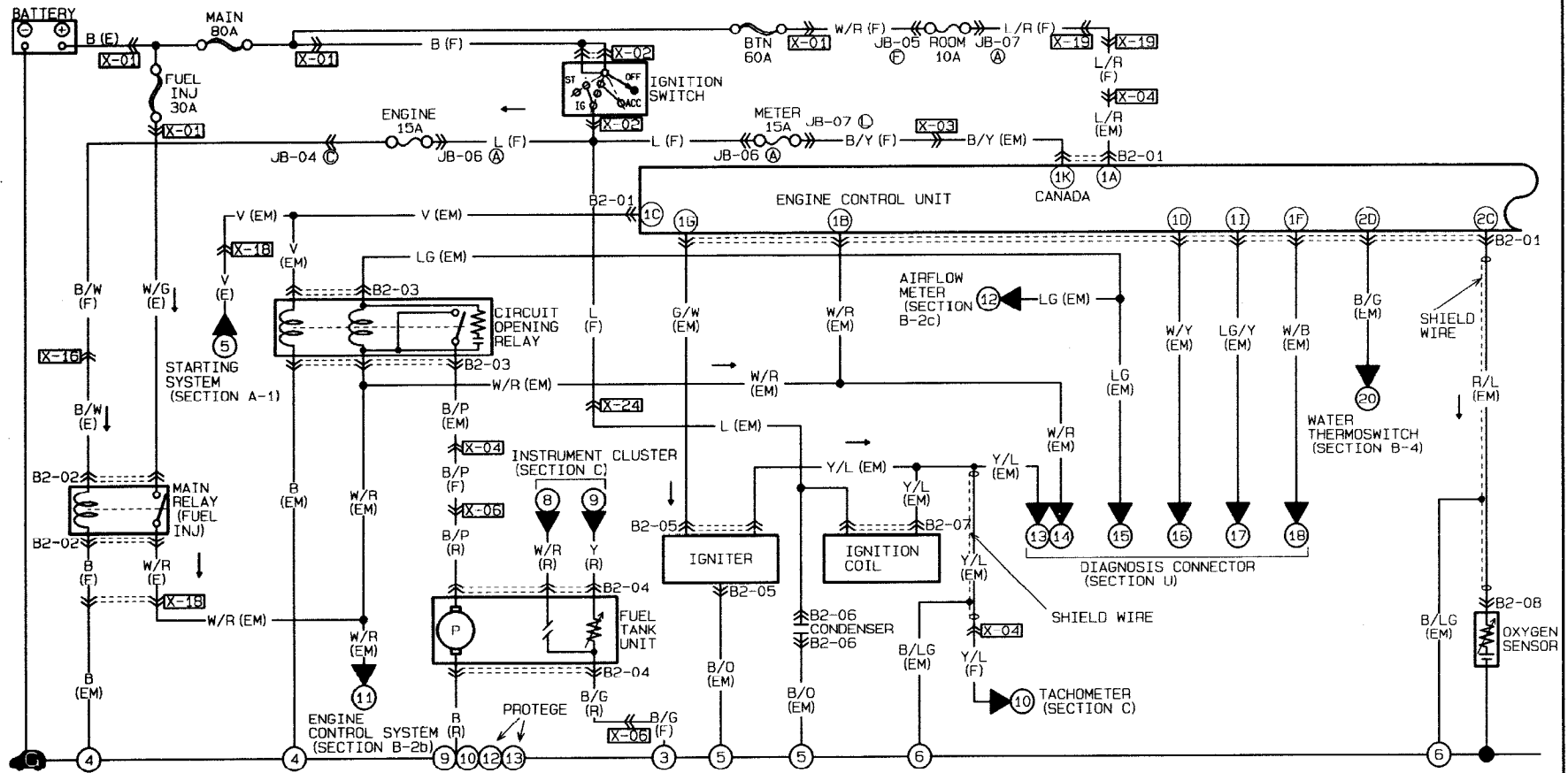
B1-19 AIRFLOW METER (EM)

R/B	R	B/BR	LG/RB	LG	B	LG
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OUTLINE

EGI EC-AT ■ ENGINE CONTROL SYSTEM & EC-AT CONTROL SYSTEM (1/3)



B2-01 ENGINE CONTROL UNIT (EM)

1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
*	W	G	G/B	G/R	(G/Y) B	LG/Y	G/W	Y/B	V	L/R
*	R/W	B/L	O/L	L/Y	L/B	B/L	R/B	W/B	W/Y	W/R
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

2O	2M	2K	2I	2G	2E	2C	2A
W/L	W/L	R/B	LG/R	W/B	L/W	R/L	W
BR/Y	Y/L	*	Y/L	*	BR/BLG/W	B/G	R
2P	2N	2L	2J	2H	2F	2D	2B

3Y	3W	3U	3S	3O	3D	3M	3K	3I	3G	3E	3C	3A
O	L/O	Y	*	L/O	*	G/O	*	KB/RP	Y/W	Y	B/LG	B/O
L	L/Y	Y/B	*	*	*	*	*	*	Y/R	(BR/W)	B/BR	B/O
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

B2-02 MAIN RELAY (E)
(FUEL INJ)

W/G	B/W
W/R	B

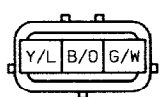
B2-03 CIRCUIT OPENING RELAY (EM)

V	W/R	B/P
B	*	LG

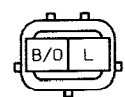
B2-04 FUEL TANK UNIT (R)

B/G	X	Y	
B	*	W/R	B/P

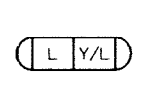
B2-05 IGNITER (EM)



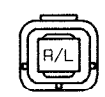
B2-06 CONDENSER (EM)



B2-07 IGNITION COIL (EM)

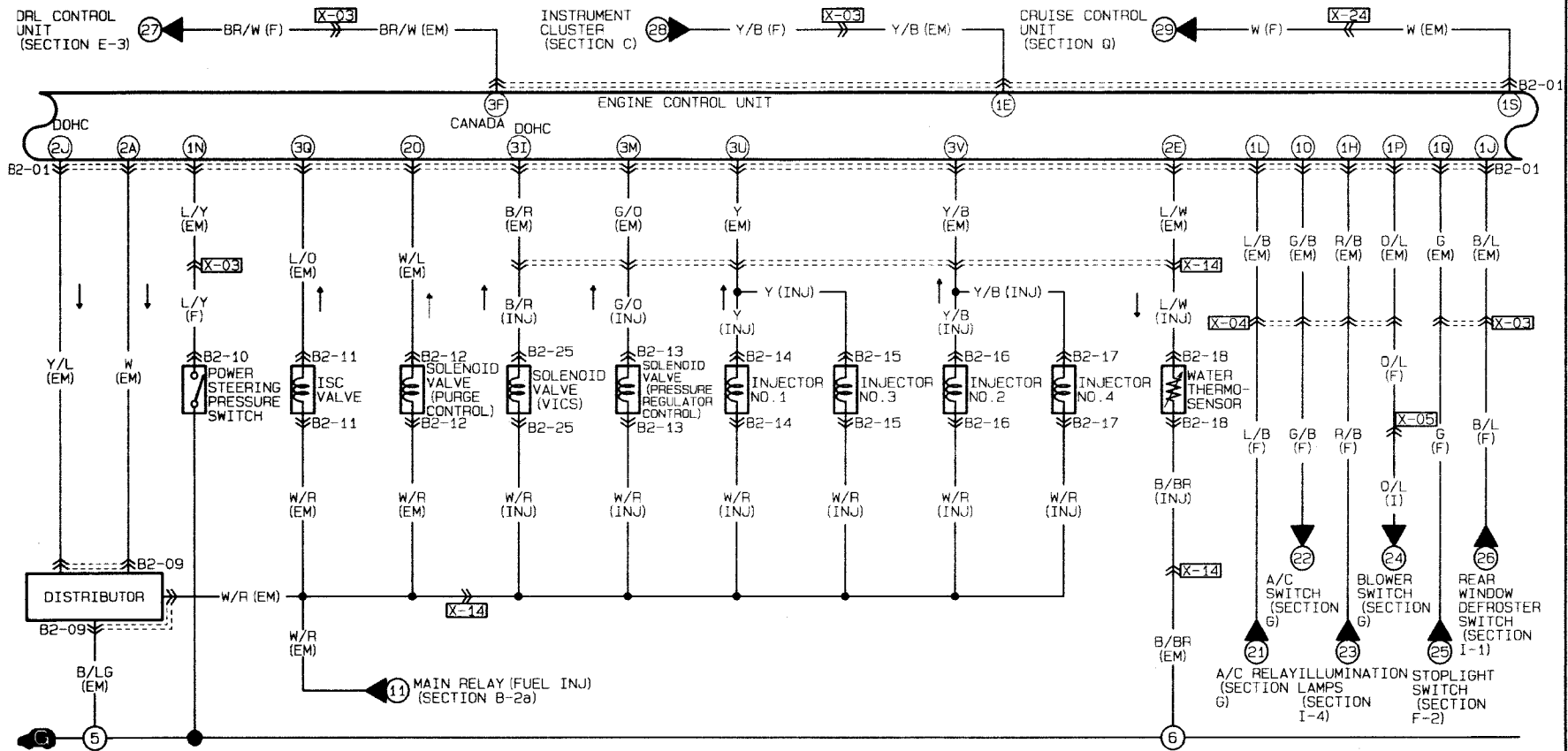


B2-08 OXYGEN SENSOR (EM)



EGI EC-AT ■ ENGINE CONTROL SYSTEM & EC-AT CONTROL SYSTEM (2/3)

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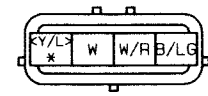
B2-01 ENGINE CONTROL UNIT (EM)

B2-09 DISTRIBUTOR (EM)

1U	1S	1Q	1D	1M	1K	1I	1G	1E	1C	1A
*	W	G	G/B	G/R	^(G/Y) B	LG/Y	G/W	Y/B	V	L/R
*	R/W	B/L	D/L	L/Y	L/B	B/L	R/B	W/B	W/Y	W/R
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

20	2M	2K	2I	2G	2E	2C	2A
W/L	W/L	R/B	LG/R	W/B	L/W	R/L	W
BR/Y	Y/L	*	^(Y/L) *	BR/B	LG/W	B/G	R
2P	2N	2L	2J	2H	2F	2D	2B

3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
O	L/O	Y	*	L/O	*	G/O	*	^(B/R) *	Y/W	Y	B/LG	B/O
L	L/Y	Y/B	*	*	*	*	*	*	Y/R	^(BR/W) *	B/BR	B/O
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B



B2-10 POWER STEERING PRESSURE SWITCH (F)

B2-11 ISC VALVE (EM)

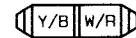
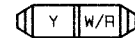
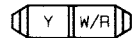
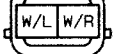
B2-12 SOLENOID VALVE (PURGE CONTROL) (EM)

B2-13 SOLENOID VALVE (PRESSURE REGULATOR CONTROL) (INJ)

B2-14 INJECTOR NO. 1 (INJ)

B2-15 INJECTOR NO. 3 (INJ)

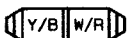
B2-16 INJECTOR NO. 2 (INJ)



B2-17 INJECTOR NO. 4 (INJ)

B2-18 WATER THERMOSENSOR (INJ)

B2-25 SOLENOID VALVE (VICS) (INJ)



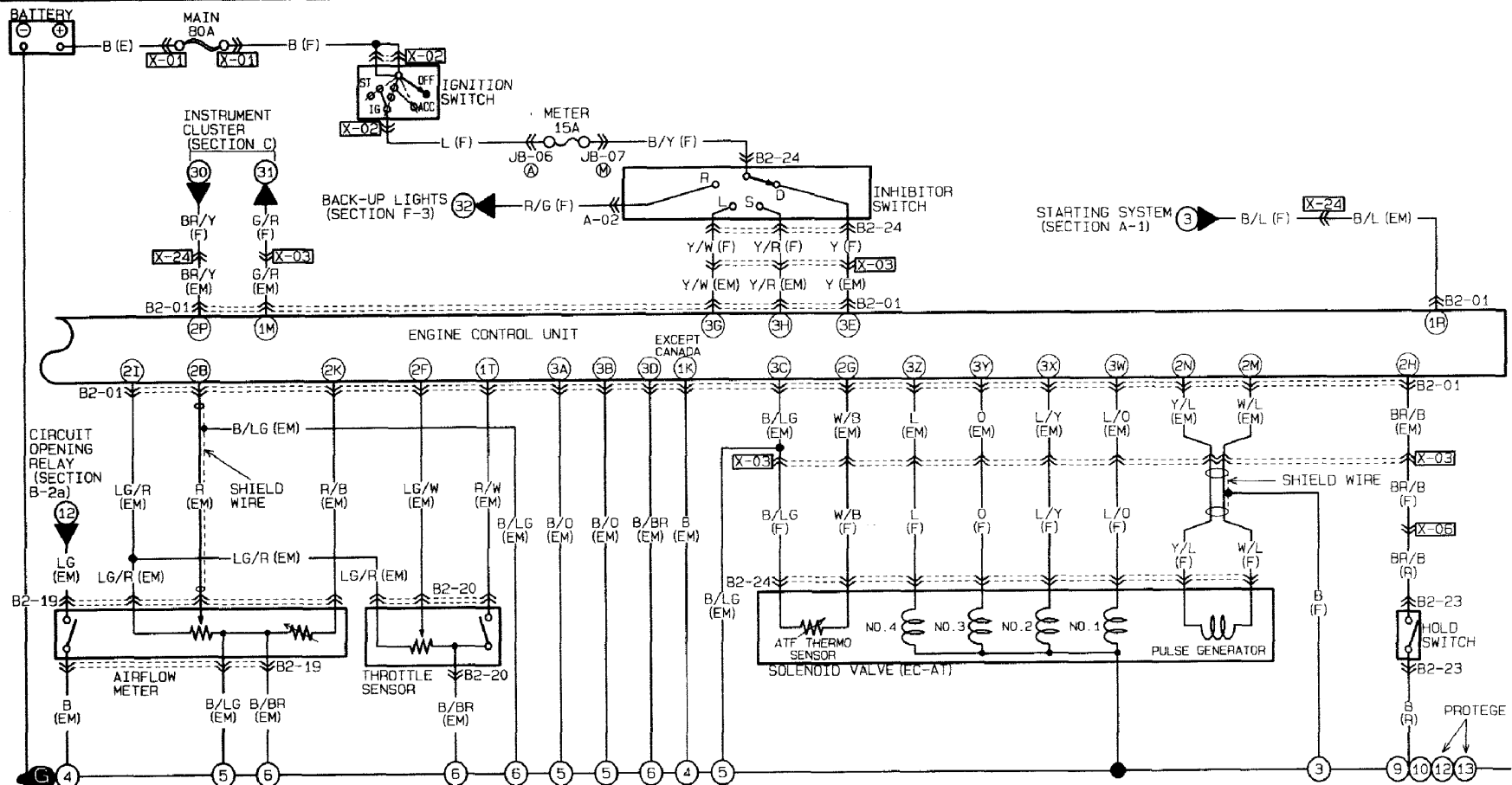
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EGI EC-AT • ENGINE CONTROL SYSTEM & EC-AT CONTROL SYSTEM (3/3)

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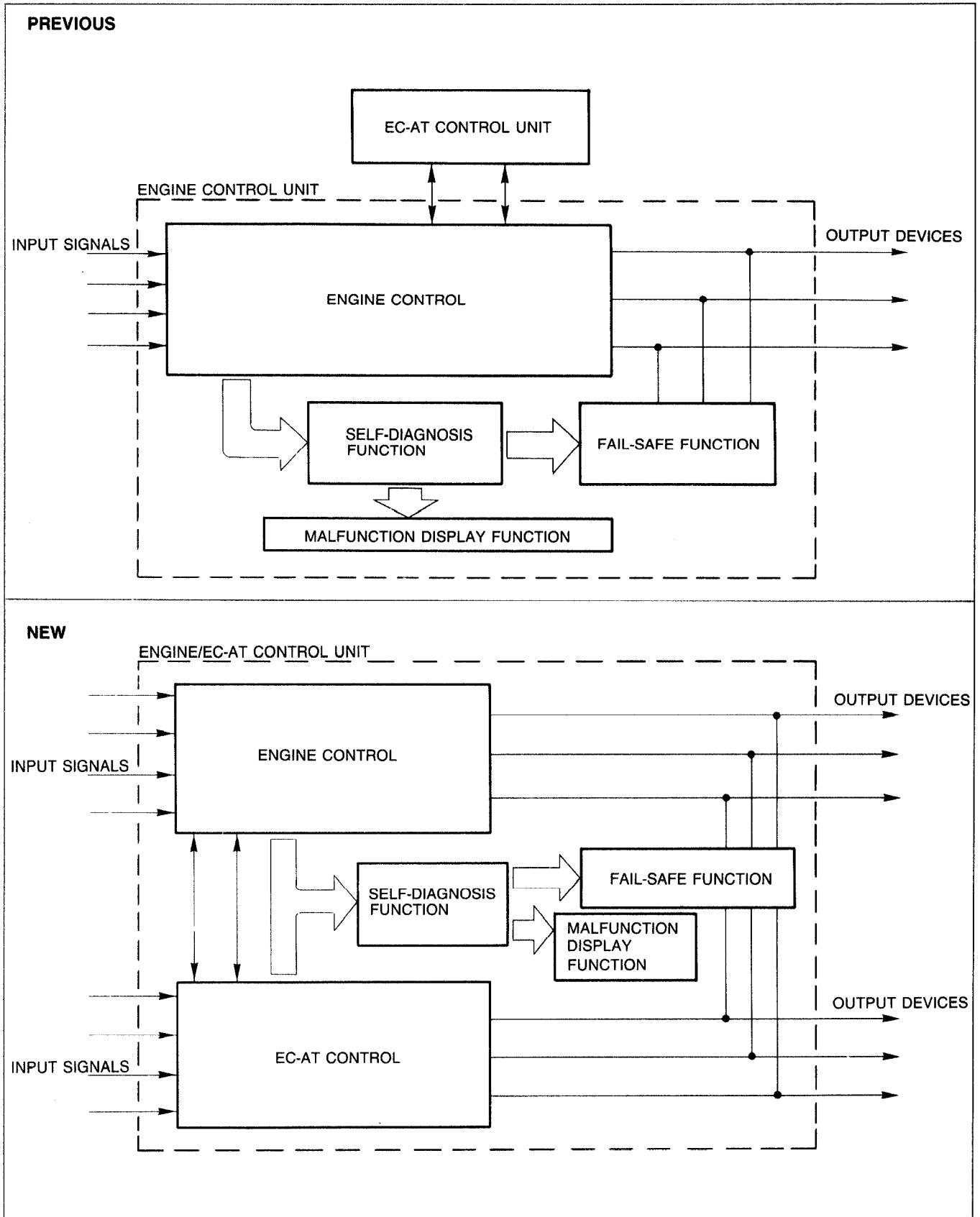


OUTLINE

B2-01 ENGINE CONTROL UNIT (EM) <table border="1"> <tr> <td>1U</td><td>1S</td><td>10</td><td>10</td><td>1M</td><td>1K</td><td>1I</td><td>1G</td><td>1E</td><td>1C</td><td>1A</td> </tr> <tr> <td>*</td><td>W</td><td>G</td><td>G/B</td><td>G/R</td><td>(B/Y) B</td><td>G/Y</td><td>G/W</td><td>Y/B</td><td>V</td><td>L/R</td> </tr> <tr> <td>*</td><td>R/W</td><td>B/L</td><td>D/L</td><td>L/Y</td><td>L/B</td><td>B/L</td><td>R/B</td><td>W/B</td><td>W/Y</td><td>W/R</td> </tr> <tr> <td>1V</td><td>1T</td><td>1R</td><td>1P</td><td>1N</td><td>1L</td><td>1J</td><td>1H</td><td>1F</td><td>1D</td><td>1B</td> </tr> </table>										1U	1S	10	10	1M	1K	1I	1G	1E	1C	1A	*	W	G	G/B	G/R	(B/Y) B	G/Y	G/W	Y/B	V	L/R	*	R/W	B/L	D/L	L/Y	L/B	B/L	R/B	W/B	W/Y	W/R	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	<table border="1"> <tr> <td>20</td><td>2M</td><td>2K</td><td>2I</td><td>2G</td><td>2E</td><td>2C</td><td>2A</td> </tr> <tr> <td>W/L</td><td>W/L</td><td>R/B</td><td>LG/R</td><td>W/B</td><td>L/W</td><td>R/L</td><td>W</td> </tr> <tr> <td>BR/Y</td><td>Y/L</td><td>*</td><td>(Y/L) *</td><td>BR/BLG</td><td>W/B</td><td>G</td><td>R</td> </tr> <tr> <td>2P</td><td>2N</td><td>2L</td><td>2J</td><td>2H</td><td>2F</td><td>2D</td><td>2B</td> </tr> </table>										20	2M	2K	2I	2G	2E	2C	2A	W/L	W/L	R/B	LG/R	W/B	L/W	R/L	W	BR/Y	Y/L	*	(Y/L) *	BR/BLG	W/B	G	R	2P	2N	2L	2J	2H	2F	2D	2B	<table border="1"> <tr> <td>3Y</td><td>3W</td><td>3U</td><td>3S</td><td>3G</td><td>3O</td><td>3M</td><td>3K</td><td>3I</td><td>3G</td><td>3E</td><td>3C</td><td>3A</td> </tr> <tr> <td>O</td><td>L/O</td><td>Y</td><td>*</td><td>L/O</td><td>*</td><td>G/O</td><td>*</td><td>(B/R) *</td><td>Y/W</td><td>Y</td><td>B/LG</td><td>B/O</td> </tr> <tr> <td>L</td><td>L/Y</td><td>Y/B</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>Y/R</td><td>(BR/W) *</td><td>B/BR</td><td>B/O</td> </tr> <tr> <td>3Z</td><td>3X</td><td>3V</td><td>3T</td><td>3R</td><td>3P</td><td>3N</td><td>3L</td><td>3J</td><td>3H</td><td>3F</td><td>3D</td><td>3B</td> </tr> </table>										3Y	3W	3U	3S	3G	3O	3M	3K	3I	3G	3E	3C	3A	O	L/O	Y	*	L/O	*	G/O	*	(B/R) *	Y/W	Y	B/LG	B/O	L	L/Y	Y/B	*	*	*	*	*	*	Y/R	(BR/W) *	B/BR	B/O	3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B	A-02 INHIBITOR SWITCH (F) <table border="1"> <tr> <td>B/R</td> </tr> <tr> <td>R/G</td> </tr> <tr> <td>B/L</td> </tr> </table>			B/R	R/G	B/L
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B2-19 AIRFLOW METER (EM) <table border="1"> <tr> <td>R/B</td><td>R</td><td>B/BR</td><td>LG/R</td><td>B/LG</td><td>B</td><td>LG</td> </tr> </table>				R/B	R	B/BR	LG/R	B/LG	B	LG	B2-20 THROTTLE SENSOR (EM) <table border="1"> <tr> <td>B/BR</td><td>R/W</td><td>LG/W</td><td>LG/R</td> </tr> </table>				B/BR	R/W	LG/W	LG/R	B2-23 HOLD SWITCH (R) <table border="1"> <tr> <td>B/BR</td><td>B/R</td><td>*</td> </tr> <tr> <td>B</td><td>R</td><td>*</td> </tr> </table>				B/BR	B/R	*	B	R	*	B2-24 SOLENOID VALVE (EC-AT) & INHIBITOR SWITCH (F) <table border="1"> <tr> <td>B/Y</td><td>W/B</td><td>Y/R</td><td>W/L</td><td>L/O</td><td>O</td> </tr> <tr> <td>B/LG</td><td>Y</td><td>Y/W</td><td>Y/L</td><td>L/Y</td><td>L</td> </tr> </table>					B/Y	W/B	Y/R	W/L	L/O	O	B/LG	Y	Y/W	Y/L	L/Y	L																																																																																																																						
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ENGINE CONTROL UNIT (ATX)

The engine control unit (ECU) is united with the EC-AT control unit for simplification of the system.



23U0FX 010

Signals input to the combined engine/EC-AT control unit are classified into engine and EC-AT control signals within the unit.

The operation of the engine control and EC-AT control are unchanged from the previous model.

A comparison of the new and previous models is as follows.

Engine Control Unit Terminal Relation Ship Chart

Connected to	Terminal		Connected to	Terminal	
	New	Previous		New	Previous
Headlight switch	1H	1U	Water thermosensor	2E	2Q
Diagnosis connector (TEN terminal)	1I	1K	Throttle sensor	2F	2M
Rear window defroster switch	1J	1T	Throttle sensor Airflow meter	2I	2K
Ground (California) Main relay (Canada)	1K	2H	Distributor (G-signal) [DOHC]	2J	2G
A/C relay	1L	1J	Intake air thermosensor	2K	2P
Vehicle speed sensor	1M	—	Solenoid valve (Purge control)	2O	2X
P/S pressure switch	1N	1P	Ground (Injector)	3A	2A
A/C switch	1O	1Q	Ground (Output)	3B	2B
Blower control switch	1P	1S	Ground (CPU)	3C	2C
Stoplight switch	1Q	1O	Ground (Input)	3D	2D
Cruise control main switch	1S	—	DRL relay (Canada)	3F	1L
Throttle sensor (Idle switch)	1T	1N	Solenoid valve (VICS)	3I	2S
Distributor (Ne-signal)	2A	2E	Solenoid valve (Pressure regulator) [BP]	3M	2T
Airflow meter	2B	2O	ISC valve	3Q	2W
Oxygen sensor	2C	2N	Injector (Nos. 1, 3)	3U	3U
Fan switch	2D	1R	Injector (Nos. 2, 4)	3V	2V

23U0FX-011

SPECIFICATIONS

Item		Engine	B6 SOHC	BP SOHC	BP DOHC	
Idle speed*1 *2		rpm	700—800			
Ignition timing*2		BTDC	6°—8°	4°—6°	9°—11°	
Fuel pump						
Maximum output pressure		kPa (kg/cm ² , psi)	441—637 (4.5—6.5, 64—92)			
Fuel filter						
Type	Low-pressure side		Nylon element (in fuel pump)			
	High-pressure side		Paper element			
Pressure regulator						
Regulating pressure		kPa (kg/cm ² , psi)	265—314 (2.7—3.2, 38—46)			
Injector						
Type		High-ohmic				
Type of drive		Electromechanical				
Resistance		Ω	12—16			
Idle speed control (ISC) valve						
Type		Rotary				
Resistance		Ω	11—13			
Purge control solenoid valve						
Resistance		Ω	23—27			
Water thermosensor						
Resistance	kΩ	-20°C (-4°F)		14.6—17.8		
		20°C (68°F)		2.21—2.69		
		40°C (104°F)		1.0—1.3		
		80°C (176°F)		0.29—0.35		
Airflow meter						
Resistance	Ω	E2↔Vs	Fully closed	20—600		
			Fully open	20—1,000		
	E2↔THAA (Intake air thermosensor)	Ω	E2↔Vc	200—400		
				-20°C (-4°F)		13,600—18,400
				20°C (68°F)		2,210—2,690
				60°C (140°F)		493—667
	E1↔Fc	Ω	Fully closed	∞		
Fully open			0			
Fuel tank						
Capacity		liters (US gal, Imp gal)	Hatchback....50 (13.2, 11.0), PROTEGÉ....55 (14.5, 12.1)			
Air cleaner						
Element type		Oil permeated				
Fuel						
Specification		Unleaded regular (RON 91 or higher)				

*1 With parking brake applied (Canada)

23U0FX-012

*2 TEN terminal of diagnosis connector grounded

COMPONENT DESCRIPTIONS

Component	Function	Remark
Air cleaner	Filters air entering throttle body	
Airflow meter	Detects amount of intake air; sends signal to ECU	Intake air thermosensor and fuel pump switch included
Air valve	Supplies bypass air into dynamic chamber when engine is cold	<ul style="list-style-type: none"> • Engine speed increased to shorten warm-up period • Thermowax type • Installed in dynamic chamber
Atmospheric pressure sensor	Detects atmospheric pressure; sends signal to ECU	Built in ECU
Catalytic converter	Reduces HC, CO, and NOx by chemical reaction	Monolith type
Charcoal canister	Stores fuel tank fumes while engine stopped	
Check valve	Controls pressure in fuel tank	Two-way type
Circuit opening relay	Voltage for fuel pump while engine running	
Clutch switch (MTX)	Detects clutch condition; sends signal to ECU	Switch OFF when clutch pedal released
Diagnosis connector	Concentrated service connector Concentrated terminals: <ol style="list-style-type: none"> 1. EGI self-diagnostic terminal 2. EC-AT self-diagnostic terminal 3. Test terminal 4. Fuel pump check terminal 5. Cooling fan check terminal 6. Engine rpm output terminal 	25-pin (located near left suspension mounting block)
Dynamic chamber	Interconnects all cylinders	
Engine control unit (ECU)	Detects the following: <ol style="list-style-type: none"> 1. A/C operation 2. Air/fuel ratio (Oxygen concentration) 3. ATF thermosensor 4. Atmospheric pressure 5. Braking signal 6. Cranking signal 7. DRL (Daytime Running Light) operation 8. E/L operation 9. Engine coolant temperature 10. Engine speed 11. Ignition ON signal 12. In-gear condition 13. Inhibitor switch (ATX) 14. Intake air amount 15. Intake air temperature 16. No.1 piston TDC of compression 17. P/S operation 18. Shift solenoid (ATX) 19. Test signal (Ignition timing, idle speed, Malfunction code No.) 20. Throttle valve fully closed/fully open condition 21. Throttle valve opening angle 22. Turbine sensor 	<ol style="list-style-type: none"> 1. A/C switch 2. Oxygen sensor 4. Atmospheric pressure sensor 5. Stoplight switch (MTX) 6. Ignition switch (START Position) 7. DRL relay (Canada) 8. Blower motor switch, cooling fan relay, headlight switch, and rear window defroster switch 9. Water thermosensor 10. Distributor (Ne-signal) 11. Ignition switch 12. Neutral and clutch switches (MTX) 13. N range, D range, S range, L range switch 14. Airflow meter 15. Intake air thermosensor (In airflow meter) 16. Distributor (G-signal) DOHC) 17. P/S pressure switch 18. 1-2, 2-3, 3-4, Lockup solenoid 19. Diagnosis connector (TEN terminal) 20. Throttle sensor (MTX) 21. Throttle sensor (ATX)

Component	Function	Remark
Engine control unit (ECU) (Cont'd)	Controls operation of the following: 1. A/C (Cut-off) 2. Fail-safe function 3. Fuel injection system 4. Idle speed control 5. Ignition timing control system 6. Monitor function 7. Pressure regulator control system 8. Purge control system 9. VICS	1. A/C relay 2. Self-Diagnosis Checker and MIL 3. Injector 4. Idle speed control (ISC) valve 5. Igniter 6. Monitor lamp (Self-Diagnosis Checker) 7. Solenoid valve (Pressure regulator control) (BP) 8. Purge control solenoid valve 9. Solenoid valve (VICS) (DOHC)
Fuel filter	Filters particles from fuel	
Fuel pump	Provides fuel to injectors	<ul style="list-style-type: none"> Operates while engine running Installed in fuel tank
Igniter	Receives spark signal from ECU and generates high voltage in ignition coil	
Ignition switch (START position)	Engine cranking signal sent to ECU	
Inhibitor switch (ATX)	Detects in-gear condition; sends signal to ECU	Switch ON in N or P range
Injector	Injects fuel into intake port	<ul style="list-style-type: none"> Controlled by signals from ECU High-ohmic injector
Intake air thermosensor	Detects intake air temperature; sends signal to ECU	Installed on dynamic chamber
Idle speed control (ISC) valve	Controls bypass air amount	Controlled by duty signal from ECU
Main relay (FUEL INJ relay)	Supplies electric current to injectors, ECU, etc.	
MIL (Malfunction indicator lamp)	Lamp flashes to indicate malfunction code number of input and output devices	TEN terminal grounded
Neutral switch (MTX)	Detects in-gear condition; sends signal to ECU	Switch ON in neutral
Oxygen sensor	Detects oxygen concentration; sends signal to ECU	Zirconia ceramic and platinum coating
PCV valve	Controls blowby gas introduced into engine	
P/S pressure switch	Detects P/S operation; sends signal to ECU	P/S: ON when steering wheel turned right or left
Pressure regulator	Adjusts fuel pressure supplied to injectors	
Resonance chamber	Reduces intake air noise	
Resonance duct	Reduces intake air noise	
Separator	Prevents fuel from flowing into charcoal canister	
Stoplight switch	Detects braking operation (deceleration), sends signal to ECU	
Solenoid valve (Purge control)	Controls evaporative fumes from canister to intake manifold	Controlled by duty signal from ECU
Shutter valve actuator (DOHC)	Closes/opens shutter valve to improve torque characteristics	For Variable inertia charging system (VICS*)
Throttle body	Controls intake air quantity	Integrated throttle sensor, dashpot, and ISC valve
Throttle sensor	<ul style="list-style-type: none"> Detects throttle valve fully closed/fully opened condition (MTX) Detects throttle valve opening angle (ATX) Sends signals to ECU 	

Component		Function	Remark
Three-way solenoid valve	VICS*	Controls vacuum to shutter valve actuator	Cuts vacuum when engine speed above 5,000 rpm
	Pressure regulator control	Controls vacuum to pressure regulator	Cuts vacuum just after starting when engine hot starting
Vacuum chamber (DOHC)		Stores vacuum for use during wide open throttle	For VICS*
Water thermosensor		Detects coolant temperature; sends signal to ECU	

* VICS: Variable Inertia Charging System

23U0FX-013

MEMO

TROUBLESHOOTING GUIDE

ENGINE CONTROL OPERATION CHART Input Device and Engine Conditions

Note

- The data in this chart is for reference only.

ENGINE CONDITIONS	APPROXIMATE TIME (BASED ON 10—16°C, 50—60°F AMBIENT)	SENSORS							
		DIS-TRIBUTOR (G-SIGNAL)* ¹ (Ne-SIGNAL)	WATER THERMO-SENSOR	OXYGEN SENSOR	AIRFLOW METER	INTAKE AIR THERMO-SENSOR	THROTTLE SENSOR		
							V _T TERMINAL (ATX)	POW TERMINAL (MTX)	IDL TERMINAL
CRANKING —COLD ENGINE • COLD AIR • COLD COOLANT	Zero	↑	↑	Signal has no effect on ECU	Signal has no effect on ECU	Signal has no effect on ECU	Signal has no effect on ECU	Signal has no effect on ECU	Signal has no effect on ECU
COLD START —FAST IDLE • COLD AIR • COLD COOLANT	One minute	↑	Cool to warm: Medium voltage (3.5V and dropping)	Sensor cold: Low to high voltage (0—0.9V)	Low volume airflow: High voltage (Above 3.0V)	↑	Closed throttle: Low voltage (0.2—0.8V)	Closed throttle: Low voltage (4.5—5.5V)	Closed throttle: Low voltage (0V)
COLD DRIVEAWAY —PART THROTTLE • COLD AIR • COLD COOLANT	Two minutes	↑	↓	↓	↑	Cool [Below 20°C (68°F)]: Above 2.3V	↑	↑	↑
WARM DRIVEAWAY —PART THROTTLE • WARM AIR • WARM COOLANT	Three minutes	Ne-SIGNAL Sends all cylinders TDC signal to ECU	Warm: Medium voltage (Approx 0.7V and dropping)	Sensor hot: switching from high voltage (0.9V)	Moderate volume airflow: Low to medium voltage (1.0—3.5V)	↑	Part throttle: Medium voltage (0.8—3.0V)	Part throttle: Medium voltage (4.5—5.5V)	↑
HOT CRUISE • WARM AIR • WARM COOLANT	↑	G-SIGNAL* ¹ Sends No. 1 cylinder TDC (compression) signal to ECU	↑	↕ to low voltage (0.1V)	↓	↑	↓	↓	Open throttle: High voltage (battery voltage)
HOT ACCELERATION —60% THROTTLE	↑	↑	↑	↑	Moderate to strong volume of airflow: Low voltage (0.5—1.5V)	↑	↓	↓	↑
HOT ACCELERATION —WIDE OPEN THROTTLE	More than four minutes	↑	Hot: Low voltage (Below 0.5V)	High voltage (0.9V)	↓	Cool to warm [-20—40°C (-4—104°F)]: 1.5—4.3V	Wide open throttle: High voltage (Above 3.0V)	Wide open throttle: High voltage (0V)	↓
DECELERATION —CLOSED THROTTLE	↓	↓	↓	Low voltage (0V)	↑	↓	↑	↑	↑
HOT CURB IDLE —EXTENDED	↓	↓	↓	Switching from high to low voltage (0.75—0.25V)	Low volume of airflow: (Above 3.0V)	↓	Closed throttle: Low voltage (0.2—0.8V)	Closed throttle: Low voltage (4.5—5.5V)	Closed throttle: Low voltage (0V)
HOT ENGINE SHUTDOWN	—	OFF	OFF	Sensor hot: Low voltage (0.1V) until sensor cools	OFF	OFF	OFF	OFF	OFF

*¹ DOHC

SENSORS									DRL (Daytime Running Light) CONTROL UNIT (CANADA)
STOP-LIGHT SWITCH	NEUTRAL AND CLUTCH SWITCHES (MTX)	INHIBITOR SWITCH (ATX)	A/C SWITCH	P/S PRESSURE SWITCH	E/L SIGNAL	IGNITION SWITCH		DIAGNOSIS CONNECTOR TEN TERMINAL (TEST TERMINAL)	
						START POSITION	ON POSITION		
Signal has no effect on ECU	Signal has no effect on ECU	Signal has no effect on ECU	Signal has no effect on ECU	Signal has no effect on ECU	Signal has no effect on ECU	Sends signal to ECU (Battery voltage)	Signal has no effect on ECU	Signal has no effect on ECU	OFF (Battery voltage)
Brake pedal depressed: Sends signal to ECU (Battery voltage)	In neutral: Low voltage signal to ECU (0V)	In N or P range: No signal to ECU (0V)	↑	↑	↑	↑	↑	↑	↑
No signal sent to ECU (Below 1.5V)	Driving in any gear: High voltage signal to ECU (Battery voltage)	In D range: No signal to ECU (Battery voltage)	A/C switch ON: Sends signal to ECU (Below 1.5V) A/C switch OFF: No signal to ECU (Battery voltage)	Steering wheel turned: Low voltage signal to ECU (Below 1.5V) Steering wheel straight ahead: High voltage signal to ECU (Battery voltage)	Headlight or rear window defroster switch ON: High voltage signal to ECU (Battery voltage) OFF: Low voltage signal to ECU (Below 1.5V) Blower switch*2 or Electrical fan ON: Low voltage signal to ECU (Below 1.5V) OFF: High voltage signal to ECU (Battery voltage)	No signal to ECU (Below 1.5V)	Sends signal to ECU (Battery voltage)	Terminal not grounded: High voltage signal to ECU (Battery voltage) Terminal grounded: Low voltage signal to ECU (Below 1.5V)	DRL ON: (0V) DRL OFF: (Battery voltage)
Brake pedal depressed: Sends signal to ECU (Battery voltage)	In neutral: Low voltage signal to ECU (0V)	In N or P range: Sends signal to ECU (0V)	↓	↓	↓	↓	↓	↓	↓
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

*2 Blower switch: 2nd position or more

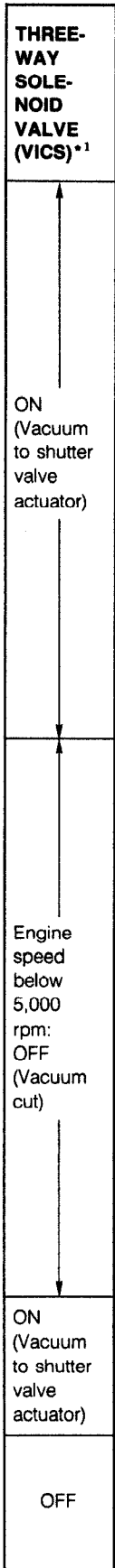
Output Devices and Engine Conditions

Note

- The data in this chart is for reference only.

ENGINE CONDITIONS	OUTPUT DEVICES APPROXIMATE TIME (BASED ON 10–16°C, 50–60°F AMBIENT)	INJECTOR		AIR VALVE	ISC VALVE	SOLENOID VALVE (PURGE CONTROL)	THREE-WAY SOLENOID VALVE (PRESSURE REGULATOR CONTROL) ^{*3}	A/C RELAY	IGNITER
		INJECTION	INJECTION TIMING						
CRANKING —COLD ENGINE • COLD AIR • COLD COOLANT	Zero	↑	All cylinders each ignition pulse	↑	↑	OFF (Purge cut)	↑	OFF (A/C OFF)	IGNITION TIMING: BTDC 6°–8° (B6) 4°–6° (BP) 9°–11° (DOHC)
COLD START —FAST IDLE • COLD AIR • COLD COOLANT	One minute	Rich	↑	Open: coolant tem- perature: Below 40°C (104°F)	Large amount of bypass air	↑	↑	OFF (A/C OFF: Ap- prox. 5 sec. [DOHC] 10 sec. [SOHC])	↑
COLD DRIVEAWAY —PART THROTTLE • COLD AIR • COLD COOLANT	Two minutes	↓	↑	↑	↓	↑	↑	↑	↑
WARM DRIVEAWAY —PART THROTTLE • WARM AIR • WARM COOLANT	Three minutes	Rich and lean	2-group ^{*1} 1-group ^{*2}	↑	↑	Operates (Duty values [purge gas amount] change)	OFF (Vacuum to pressure regulator)	ON (A/C ON)	↑
HOT CRUISE • WARM AIR • WARM COOLANT	↑	↓	↑	↑	↑	↑	↑	↑	↑
HOT ACCELERATION —60% THROTTLE	↑	Rich	↑	↑	Small amount of bypass air	↑	↑	↑	↑
HOT ACCELERATION —WIDE OPEN THROTTLE	More than four minutes	↓	↑	↑	↑	↑	↑	OFF (A/C cut)	↑
DECELERATION —CLOSED THROTTLE	↓	Fuel cut		Closed	↑	OFF (Purge cut)	↑	ON (A/C ON)	↑
HOT CURB IDLE —EXTENDED	↓	Rich and lean	2-group ^{*1} 1-group ^{*2}	↑	↑	↑	After start- ing: ON dur- ing hot start only (Vacu- um cut)	↑	↑
HOT ENGINE SHUTDOWN	—	Does not inject		↑	OFF	OFF	OFF	OFF	OFF

*1 DOHC, *2 SOHC, *3 BP



23U0FX-015

RELATIONSHIP CHART

OUTPUT DEVICE		INJECTOR		ISC VALVE	SOLENOID VALVE (PURGE CONTROL)	A/C RELAY (A/C CUT-OFF)	SOLENOID VALVE (LOCK-UP CONTROL)	IGNITER (IGNITION TIMING CONTROL)	THREE-WAY SOLENOID VALVE		SELF-DIAGNOSIS CHECKER/MIL *3 (MALFUNCTION CODE)	SELF-DIAGNOSIS CHECKER (MONITOR LAMP)
		FUEL INJECTION AMOUNT	FUEL INJECTION TIMING						PRESSURE REGULATOR*1	VICS*2		
INPUT DEVICE												
DIAGNOSIS CONNECTOR (TEN TERMINAL)				○				○			○	○
IGNITION SWITCH (START POSITION)		○	○	○		○		○	○			
E/L SIGNAL *4				○								○
P/S PRESSURE SWITCH				○		○						
A/C SWITCH				○		○						○
INHIBITOR SWITCH (ATX)		○		○	○	○		○	○			○
NEUTRAL AND CLUTCH SWITCHES (MTX)		○		○	○	○		○	○			○
STOPLIGHT SWITCH		○										○
ATMOSPHERIC PRESSURE SENSOR (IN ECU)		○		○	○	○					○	
THROTTLE SENSOR		○	○	○	○	○		○	○		○ (ATX)	○
INTAKE AIR THERMOSENSOR		○		○	○				○		○	
AIRFLOW METER		○	○		○			○			○	
OXYGEN SENSOR		○			○						○	○
WATER THERMOSENSOR		○		○	○		○	○	○		○	
DISTRIBUTOR	G-SIGNAL *2		○								○	
	Ne-SIGNAL	○	○	○	○	○		○		○	○	

*1 BP

*2 DOHC

*3 MIL: Malfunction Indicator Lamp

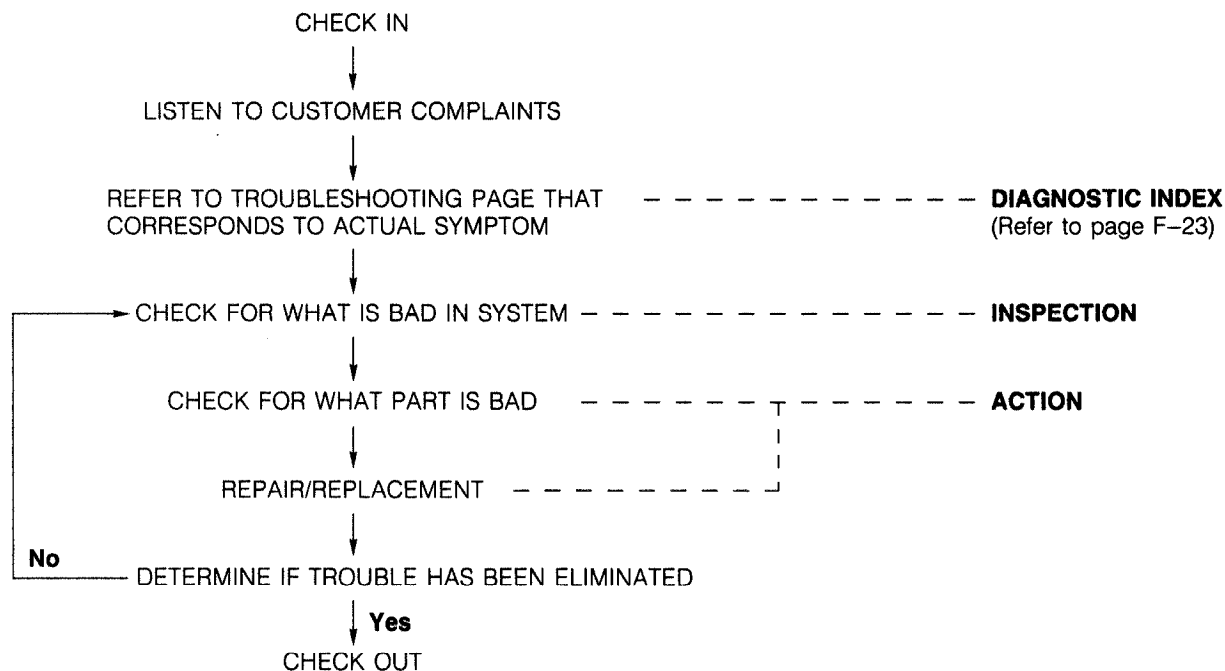
*4 E/L SIGNAL: Blower fan control switch second position or higher, cooling fan operating, headlights ON, or rear window defroster switch ON

USING THIS SECTION

Introduction

Most of the fuel and emission control system is electrically controlled, often making it difficult to diagnose problems in the system, especially intermittent problems. Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a drivability complaint. The customer is often a good source of information on such problems, especially intermittent ones. Through talks with the customer, one can find out what the symptoms are and under what conditions they occur.

Work flow



13U0FX-008

Diagnostic index

No.:

Each troubleshooting item is assigned a number.

DESCRIPTION:

Describes each troubleshooting item.

F TROUBLESHOOTING GUIDE			
No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE

PAGE:

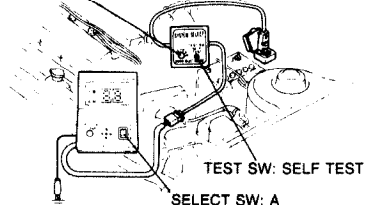
Shows the reference page.

TROUBLESHOOTING ITEM:

There are 29 troubleshooting items. Choose the item that most closely corresponds to the actual symptom.

05U0FX 014

Troubleshooting chart

6 CRANKS NORMALLY BUT HARD TO START — WHEN ENGINE COLD		
DESCRIP-TION	<ul style="list-style-type: none"> • Engine cranks at normal speed but requires excessive cranking time before starting • Battery in normal condition • Restarts OK after warm-up • Engine runs normally at idle [If idle condition is not OK, refer to "Rough idle" (Nos. 8–12)] 	
[TROUBLESHOOTING HINTS]		
<ul style="list-style-type: none"> ① Air/Fuel mixture too rich <ul style="list-style-type: none"> • Airflow meter sticking • Air cleaner element clogged • Idle speed control malfunction ② Air/Fuel mixture too lean <ul style="list-style-type: none"> • Fuel injection control malfunction (Correction for coolant temperature) ③ Poor atomization <ul style="list-style-type: none"> • Low RVP (summer) fuel is used in cold weather 		
STEP	INSPECTION	ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-78	Yes Go to next step
	<p>SYSTEM SELECT: 1</p> 	No Malfunction Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-79 "88" flashes Check ECU terminal 1F voltage ☞ page F-144 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-143 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker
2	Check if ECU terminal voltages are OK (Especially 1C, 2D, and 2Q) ☞ page F-144	Yes Go to next step
		No Check for cause ☞ page F-145
3	Check if engine starts easily when throttle valve	Yes Check if ISC valve is OK ☞ page F-103

13U0FX-009

DESCRIPTION:

Further describes the symptom. Confirm that the chart addresses the actual symptom before beginning troubleshooting.

TROUBLESHOOTING HINTS:

This describes the possible point of malfunction.

STEP:

This shows the order of troubleshooting. Proceed with troubleshooting as indicated.

INSPECTION:

This describes an inspection to quickly determine the malfunction of parts. If a detailed procedure is necessary to perform the INSPECTION, refer to the page shown by the "☞" mark.

ACTION:

This recommends the appropriate action to take as a result (Yes/No) of the INSPECTION. How to perform the action is described on the reference page shown by the "☞" mark.

05U0FX-016

DIAGNOSTIC INDEX

No.	TROUBLESHOOTING ITEM	DESCRIPTION	PAGE
1	Will not crank or cranks slowly	Refer to Engine Electrical System	G- 4
2	Crank normally but will not start	No combustion	F-30
3		Partial combustion— When engine cold	F-32
4		Partial combustion— After warm-up	F-34
5	Crank normally but hard to start	Always	F-36
6		When engine is cold	F-38
7		After warm-up	F-40
8	Rough idle (Low idle speed)/ Engine stalls at idle	Always	F-42
9		Before warm-up	F-44
10		After warm-up	F-46
11		When A/C, P/S, or E/L ON	F-48
12	Rough idle/Engine stalls just after starting	Engine stalls or vibrates excessively only just after starting (acceleration from idle)	F-49
13	High idle speed after warm-up	Idle speed excessive after warm-up	F-50
14	Idle moves up and down/Idle hunting	Engine speeds up and down periodically at idle	F-52
15	Engine stalls on deceleration	Engine unexpectedly stops running while decelerating or after deceleration	F-54
16	Engine stalls suddenly (Intermittent)	Engine intermittently stops running	F-56
17	Hesitates/Stumbles on acceleration	Flat spot occurs just after accelerator depressed or mild jerking occurs during acceleration	F-57
18	Surges while cruising	Unexpected change in engine speed which is usually repetitive	F-59
19	Lack of power	Performance poor under load when throttle valve wide open Maximum speed reduced	F-61
20	Poor acceleration	Performance poor while accelerating	F-65
21	Runs rough on deceleration/Backfire	Engine runs rough while decelerating and abnormal combustion occurs in exhaust system	F-69
22	Knocking	Abnormal combustion accompanied by audible "pinging" noise	F-71
23	Fuel odor	Gasoline odor in cabin	F-73
24	Exhaust sulfur smell	Exhaust gas smells abnormal	F-74
25	High oil consumption	Oil consumption excessive	F-74
26	Poor fuel economy	Fuel economy unsatisfactory	F-75
27	MIL always ON	Self-Diagnosis Checker does not indicate malfunction Code No. but MIL always ON	F-77
28	MIL never ON	Self-Diagnosis Checker indicates malfunction	F-77
29	A/C does not work	Blower fan operates but magnetic clutch does not operate	F-77

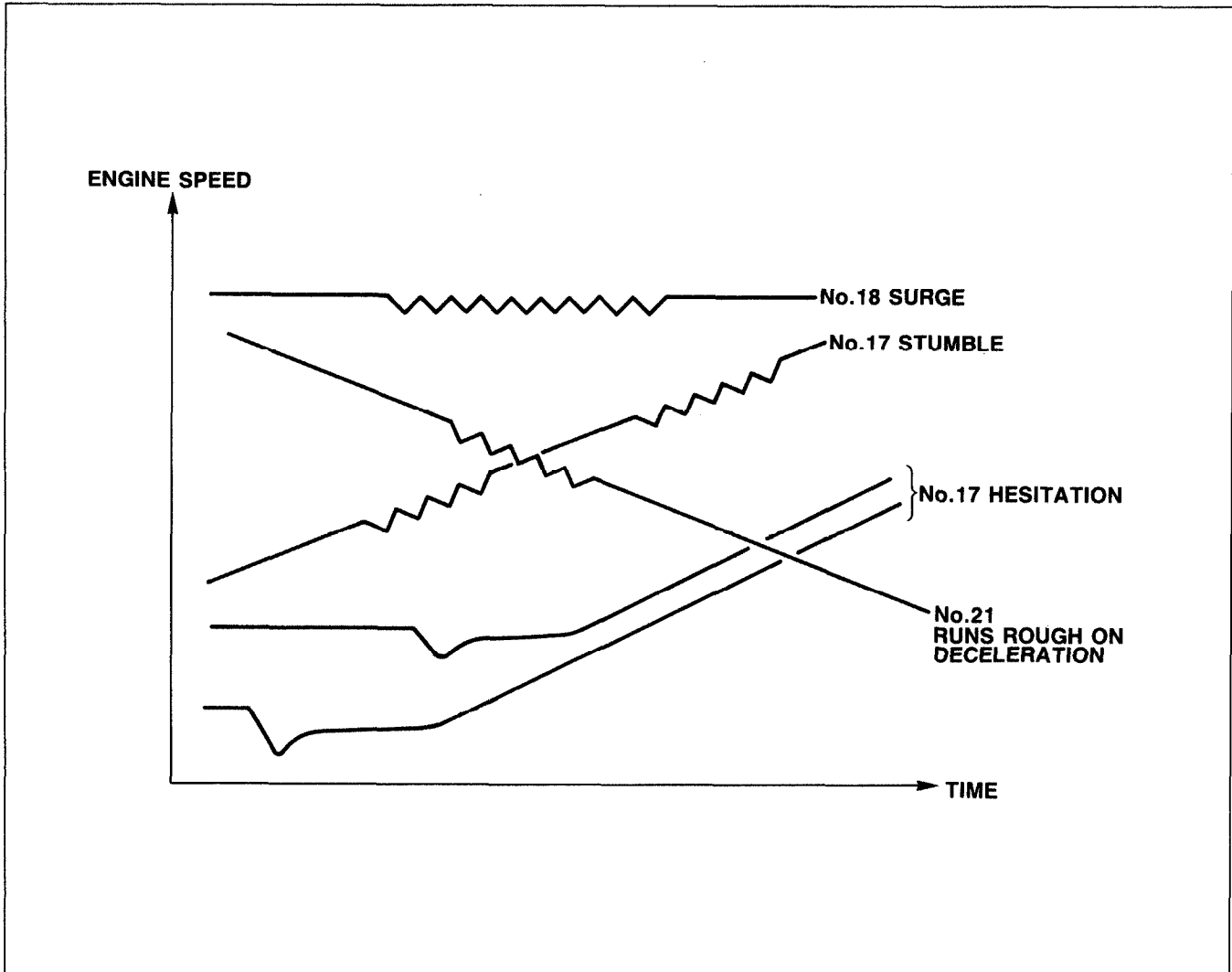
Description of Drivability

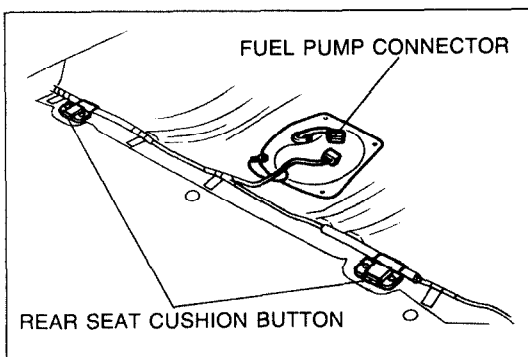
STUMBLE : Mild jerking during acceleration.

HESITATION: Flat spot occurring just after the accelerator pedal is depressed.

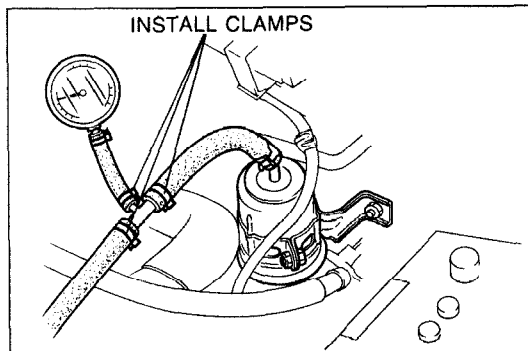
SURGE : Continuous soft jerking during cruise.

03U0FX-233

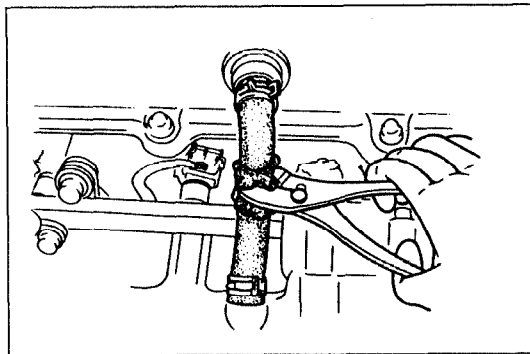




03U0FX-015



9MU0F2-122



03U0FX-016

PRECAUTION**Fuel Pressure Release and Servicing Fuel System**

Fuel in the fuel system remains under high pressure even when the engine is not running.

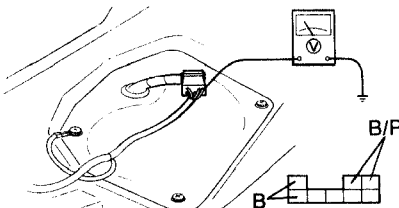
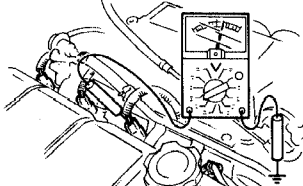
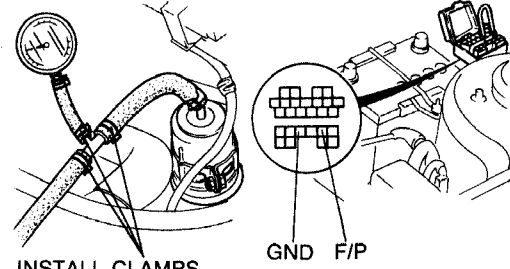
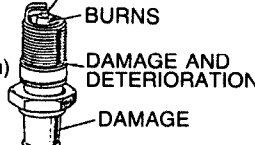
- a) Before disconnecting any fuel line, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.
 1. Start the engine.
 2. Push the rear seat cushion buttons and remove the cushion.
 3. Disconnect the fuel pump connector.
 4. After the engine stalls, turn off the ignition switch.
 5. Reconnect fuel pump connector and install the rear seat cushion.
- b) Use a rag as protection from fuel spray when disconnecting the hoses.
Plug the hoses after removal.
- c) When inspecting the fuel system, use a suitable fuel pressure gauge.

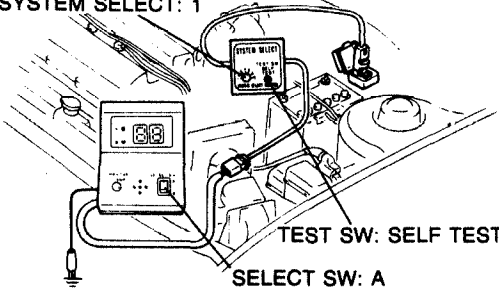
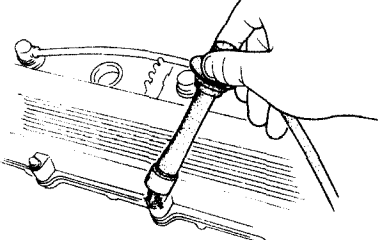
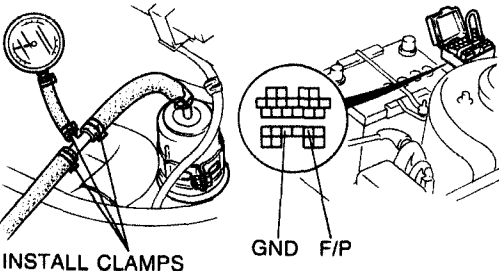
Caution

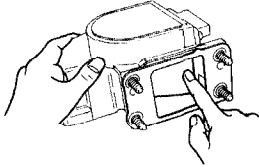
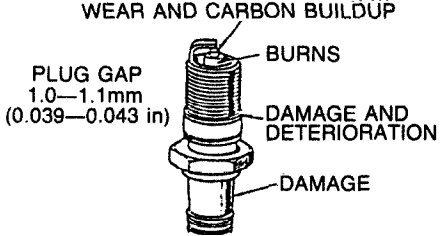
- Install hose clamps to secure the fuel pressure gauge to the fuel filter and the fuel main hose to prevent fuel leakage.

Pinching Hose

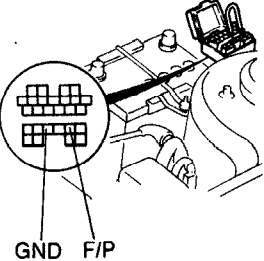
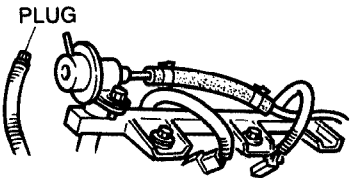
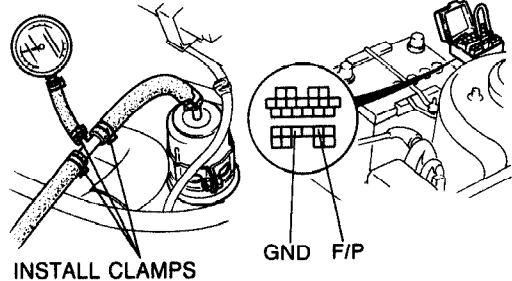
When pinching an air hose or a fuel hose with pliers, wrap the hose with a rag to prevent damage.

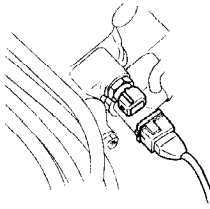
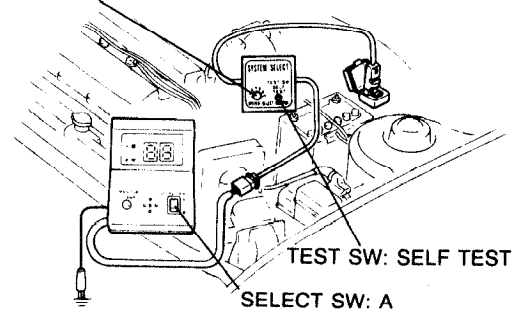
STEP	INSPECTION		ACTION
4	Check if battery voltage exists at fuel pump connector B/P wire with ignition switch ON 	Yes	Check continuity of fuel pump (Between terminals B/P and B) ☞ page F-125
		No	Check circuit opening relay ☞ page F-129
5	Check for injector operating sound while cranking engine	Yes	Go to Step 7
		No	Go to next step
6	Check if battery voltage exists at injector connector (W/R) wire with ignition switch ON 	Yes	Check ECU terminal voltages MTX... 1N, 2A, 2U, 2V ATX... 1T, 3A, 3U, 3V ☞ page F-150
		No	Check for open circuit in wiring between main relay (FUEL INJ relay) and injector ☞ page F-172
7	Connect diagnosis connector terminals F/P and GND with jumper wire and check for correct fuel line pressure with ignition switch ON ☞ page F-122 Fuel Line pressure: 265—314 kPa (2.7—3.2 kg/cm ² , 38—46 psi)	Yes	Go to next step
		No	Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ page F-126
			High pressure Check if fuel return hose is clogged or restricted ☞ page F-120 ⇒ If OK, replace pressure regulator ☞ page F-130 ⇒ If not OK, repair or replace
8	Check for correct engine compression ☞ page B1-10 B2-10 Engine compression: <ul style="list-style-type: none"> • BP SOHC 834 kPa (8.5 kg/cm², 121 psi)-300 rpm • BP DOHC 883 kPa (9.0 kg/cm², 128 psi)-300 rpm • B6 932 kPa (9.5 kg/cm², 135 psi)-300 rpm 	Yes	Go to next step
		No	Check engine condition ☞ page B1-10 B2-10 <ul style="list-style-type: none"> • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
9	Check if all spark plugs are OK WEAR AND CARBON BUILDUP ☞ page G-18 PLUG GAP 1.0—1.1mm (0.039—0.043 in) 	Yes	Go to next step
		No	Clean or replace ☞ page G-18
10	Try known good ECU and check if condition improves ☞ page F-149		

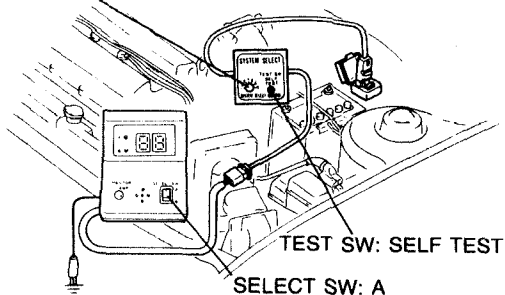
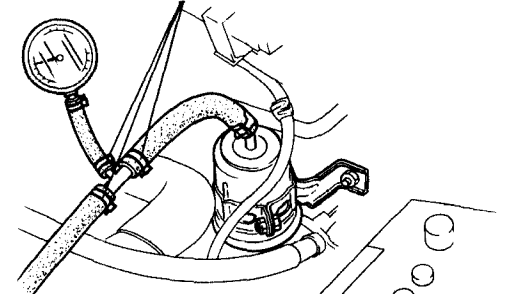
3		CRANKS NORMALLY BUT WILL NOT START (PARTIAL COMBUSTION) — WHEN ENGINE COLD	
DESCRIP-TION		<ul style="list-style-type: none"> • Engine cranks at normal speed but shows only partial combustion and will not continue to run • Battery in normal condition • Fuel in tank 	
[TROUBLESHOOTING HINTS]			
① Air/Fuel mixture too rich <ul style="list-style-type: none"> • Air cleaner element clogged • Airflow meter stuck ② Air/Fuel mixture too lean <ul style="list-style-type: none"> • Fuel injection control malfunction (Correction for coolant temperature) • Low fuel line pressure • Air leakage of intake air system 		③ Low engine compression	
STEP	INSPECTION	ACTION	
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1 	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83 "88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker
2	Check if strong blue spark is visible at each disconnected high-tension lead 	Yes	Go to next step
		No	Check distributor cap and rotor ☞ page G-22
3	Connect diagnosis connector terminals F/P and GND with jumper wire and check for correct fuel line pressure with ignition switch ON ☞ page F-122 Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) 	Yes	Go to next step
		No	Low pressure Check fuel line pressure while pinching fuel return hose <ul style="list-style-type: none"> ⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ page F-126
		High pressure Check if fuel return hose is clogged or restricted <ul style="list-style-type: none"> ⇒ If OK, replace pressure regulator ☞ page F-130 ⇒ If not OK, repair or replace 	

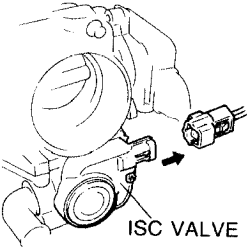
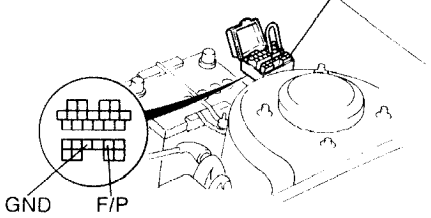
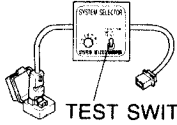
STEP	INSPECTION		ACTION
4	Check if ECU terminal voltages are OK MTX... Especially 1C, 2D and 2Q ATX... Especially 1C, 2E and 3D ☞ page F-150	Yes	Go to next step
		No	Check for cause ☞ page F-151
5	Check for air leakage of intake air system components	Yes	Repair or replace
		No	Go to next step
6	Check if engine starts when water thermosensor is disconnected	Yes	Check water thermosensor ☞ page F-158
		No	Go to next step
7	Manually check if airflow meter moves smoothly from fully closed to fully open ☞ page F-158 	Yes	Go to next step
		No	Repair or replace
8	Check for correct engine compression ☞ page B1-10 B2-10 Engine compression: <ul style="list-style-type: none"> • BP SOHC 834 kPa (8.5 kg/cm², 121 psi)-300 rpm • BP DOHC 883 kPa (9.0 kg/cm², 128 psi)-300 rpm • B6 932 kPa (9.5 kg/cm², 135 psi)-300 rpm 	Yes	Go to next step
		No	Check engine condition ☞ page B1-10 B2-10 <ul style="list-style-type: none"> • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
9	Check if spark plugs are OK ☞ page G-18 	Yes	Go to next step
		No	Clean, or replace ☞ page G-18
10	Try known good ECU and check if condition improves ☞ page F-149		

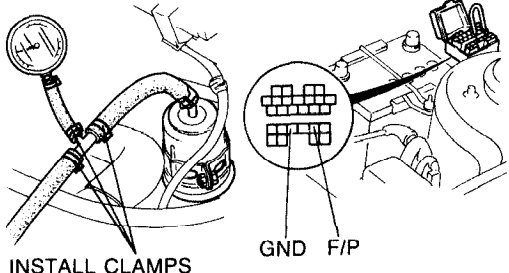
23U0FX-019

4 CRANKS NORMALLY BUT WILL NOT START (PARTIAL COMBUSTION) — AFTER WARM-UP		
DESCRIP-TION	<ul style="list-style-type: none"> • Engine cranks at normal speed and shows partial combustion but will not continue to run after running and hot soaked • Battery in normal condition • Engine starts normally when cold 	
[TROUBLESHOOTING HINTS]		
① Air/Fuel mixture too rich <ul style="list-style-type: none"> • Insufficient fuel injection control (Correction for coolant temperature) • Injector fuel leakage 		
② Vapor lock <ul style="list-style-type: none"> • Fuel pressure not held in fuel line after engine stopped • High RVP (winter) fuel used in warm weather 		
③ Pressure regulator control system malfunction [BP]		
STEP	INSPECTION	ACTION
1	Warm-up engine to normal operating temperature and stop it Connect diagnosis connector terminals F/P and GND with jumper wire for 3 minutes with ignition switch ON, then check if engine starts 	Yes Change fuel to another brand
		No BP engine Go to next step
		B6 engine Go to Step 3
2	Remove vacuum hose from pressure regulator and plug it Check if engine starts 	Yes Check pressure regulator control system ☞ page F-134
		No Go to next step
3	Connect diagnosis connector terminals F/P and GND with jumper wire and check for correct fuel line pressure with ignition switch ON ☞ page F-122 Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) 	Yes Go to next step
		No Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ⇒ If fuel line pressure gradually increases, check fuel line and filter for clogging If not clogged, check fuel pump maximum pressure ☞ page F-126
		High pressure Check if fuel return hose is clogged or restricted ⇒ If OK, replace pressure regulator ☞ page F-130 ⇒ If not OK, repair or replace
4	In same condition as Step 2, check if fuel line pressure is held after ignition switch is turned OFF ☞ page F-121 Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.	Yes Go to Step 6
		No Go to next step

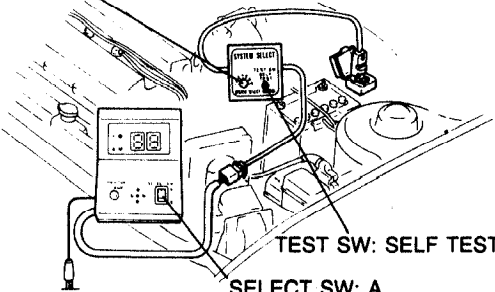
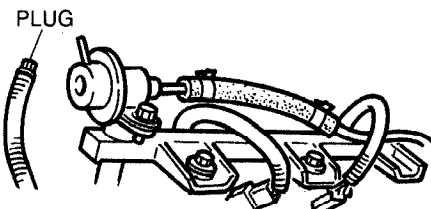
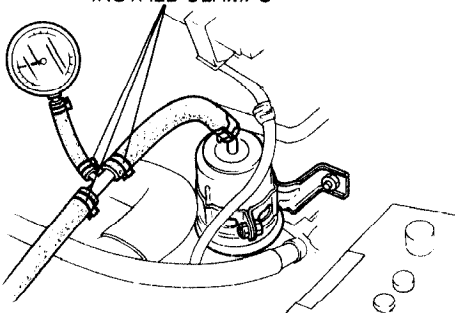
STEP	INSPECTION		ACTION
5	Plug outlet of pressure regulator and check if fuel line pressure is held after ignition switch is turned OFF <div style="text-align: right;">☞ page F-130</div> Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.	Yes	Replace pressure regulator <div style="text-align: right;">☞ page F-130</div>
		No	Check fuel pump hold pressure <div style="text-align: right;">☞ page F-125</div> ⇨ If OK, check injector for fuel leakage <div style="text-align: right;">☞ page F-132</div> ⇨ If not OK, replace fuel pump <div style="text-align: right;">☞ page F-127</div>
6	Disconnect water thermosensor connector and check if engine starts 	Yes	Check water thermosensor <div style="text-align: right;">☞ page F-158</div> ⇨ If OK, check connections of water thermosensor and ECU 2Q terminal (MTX) ⇨ If OK, check connections of water thermosensor and ECU 2E terminal (ATX) ⇨ If not OK, replace water thermosensor <div style="text-align: right;">☞ page F-158</div>
		No	Go to next step
7	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON <div style="text-align: right;">☞ page F-82</div> SYSTEM SELECT: 1 	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) <div style="text-align: right;">☞ page F-83</div>
		"88" flashes	Check ECU terminal 1F voltage <div style="text-align: right;">☞ page F-150</div> Specification: Battery voltage (Ignition switch ON) ⇨ If OK, replace ECU <div style="text-align: right;">☞ page F-149</div> ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker
8	Check if ECU terminal voltages are OK MTX...Especially 1C, 2D and 2Q ATX... Especially 1C, 2E and 3D <div style="text-align: right;">☞ page F-150</div>	Yes	Go to next step
		No	Check for cause ☞ page F-151
9	Try known good ECU and check if condition improves <div style="text-align: right;">☞ page F-149</div>	Yes	Replace ECU ☞ page F-149
		No	Change fuel to another brand

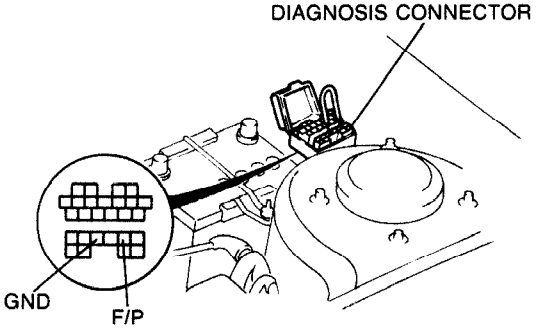
5	CRANKS NORMALLY BUT HARD TO START — ALWAYS	
DESCRIPTION	<ul style="list-style-type: none"> • Engine cranks at normal speed but requires excessive cranking time before starting • Battery in normal condition • Engine runs normally at idle [If idle condition not OK, refer to "Rough idle" (Nos. 8—12)] 	
[TROUBLESHOOTING HINTS]		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>① Air/Fuel mixture too lean</p> <ul style="list-style-type: none"> • Fuel injection control malfunction (Correction for coolant temperature) • Low fuel line pressure • Air leakage </div> <div style="width: 45%;"> <p>② Air/Fuel mixture too rich</p> <ul style="list-style-type: none"> • Air cleaner element clogged • Airflow meter stuck </div> </div> <p>③ Poor ignition spark</p>		
STEP	INSPECTION	ACTION
1	<p>Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON</p> <p style="text-align: right;">☞ page F-82</p> <p>SYSTEM SELECT: 1</p>  <p>TEST SW: SELF TEST SELECT SW: A</p>	<p>Yes: Go to next step</p> <p>No: Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83</p> <p>"88" flashes Check ECU terminal 1F voltage ☞ page F-150</p> <p>Specification: Battery voltage (Ignition switch ON)</p> <p>⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker</p>
2	<p>Check for correct intake manifold vacuum at idle</p> <p>Vacuum: More than 450 mmHg (17.7 inHg)</p>	<p>Yes: Go to next step</p> <p>No: Check for air leakage of intake air system components</p>
3	<p>Check if air cleaner element is clean</p> <p style="text-align: right;">☞ page F-79</p>	<p>Yes: Go to next step</p> <p>No: Replace air cleaner element</p>
4	<p>Check if engine starts easily when throttle valve quarter open</p>	<p>Yes: Check throttle valve for carbon deposit and then go to Step 6</p> <p>No: Go to next step</p>
5	<p>Check for correct fuel line pressure at idle</p> <p style="text-align: right;">☞ page F-129</p> <p>Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)</p> <p>INSTALL CLAMPS</p> 	<p>Yes: Go to next step</p> <p>No: Low pressure Check fuel line pressure while pinching fuel return hose</p> <p>⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ page F-126</p>

STEP	INSPECTION		ACTION
6	Disconnect ISC valve connector at idle and check if engine speed increases ☞ page F-116 	Yes	Go to next step
		No	Replace ISC valve ☞ page F-109
7	Check if ECU terminal voltages are OK MTX...Especially 1C, 2D and 2Q ATX... Especially 1C, 2E and 3D ☞ page F-150	Yes	Go to next step
		No	Check for cause ☞ page F-150
8	Connect diagnosis connector terminals F/P and GND with jumper wire and check if engine starts normally DIAGNOSIS CONNECTOR 	Yes	Check circuit opening relay ☞ page F-129 ⇒ If relay OK, repair or replace wire harness ⇒ If relay not OK, replace relay
		No	Go to next step
9	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ☞ page F-79 Ignition timing (BTDC) • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8° 	Yes	Go to next step
		No	Adjust ignition timing ☞ page F-79
10	Check for correct engine compression ☞ page B1-10 B2-10 Engine compression (Minimum): • BP DOHC 883 kPa (9.0 kg/cm ² , 128 psi)-300 rpm • BP SOHC 834 kPa (8.5 kg/cm ² , 121 psi)-300 rpm • B6 932 kPa (9.5 kg/cm ² , 135 psi)-300 rpm	Yes	Go to next step
		No	Check engine condition ☞ page B1-10 B2-10 • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
11	Try known good ECU and check if condition improves ☞ page F-149		

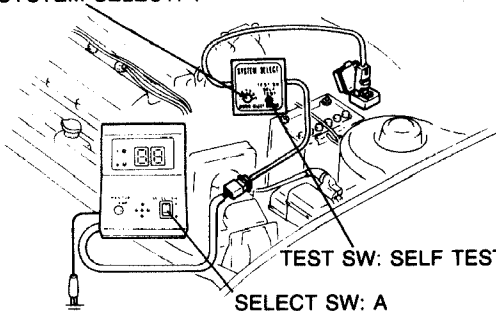
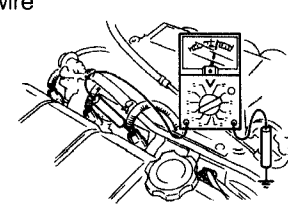
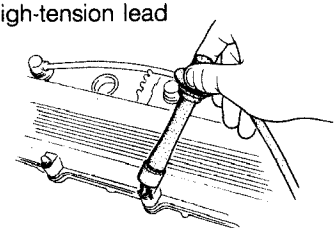
STEP	INSPECTION	ACTION	
7	Connect diagnosis connector terminals F/P and GND with jumper wire and check for correct fuel line pressure with ignition switch ON ☞ page F-122 Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm ² , 38—46 psi) 	Yes	Go to next step
		No	Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ⇒ If fuel line pressure gradually increases, check fuel line for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ page F-126
			High pressure Check if fuel return hose is clogged or restricted ⇒ If OK, replace pressure regulator ☞ page F-130 ⇒ If not OK, repair or replace hose
8	Try known good ECU and check if condition improves ☞ page F-149	Yes	Replace ECU ☞ page F-149
		No	Change fuel to another brand

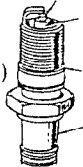
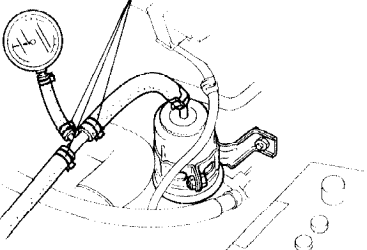
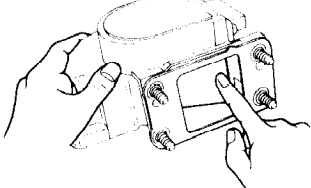
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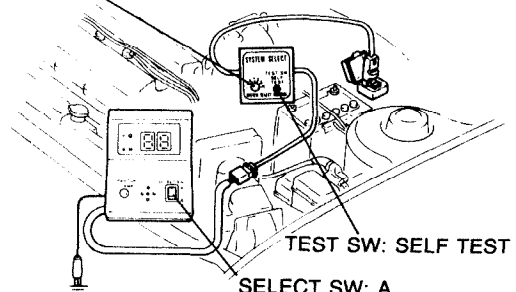
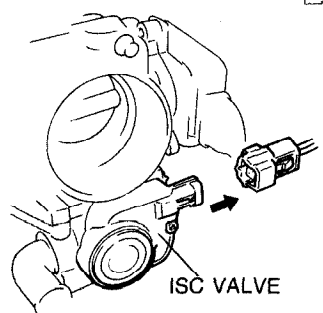
7	CRANKS NORMALLY BUT HARD TO START — AFTER WARM-UP											
DESCRIPTION	<ul style="list-style-type: none"> • Engine cranks at normal speed but requires excessive cranking time before starting after running and hot soaked • Battery in normal condition • Engine starts normally when cold • Engine runs normally at idle [If idle condition not OK, refer to "Rough idle" (Nos. 8–12)] 											
[TROUBLESHOOTING HINTS] ① Air/Fuel mixture too rich <ul style="list-style-type: none"> • Fuel injection control malfunction • Injector fuel leakage ② Vapor lock <ul style="list-style-type: none"> • Fuel pressure not held in fuel line after engine stopped • High RVP (winter) fuel used in warm weather • Pressure regulator control system malfunction [BP] 												
STEP	INSPECTION	ACTION										
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1 	<table border="1"> <tr> <td>Yes</td> <td> BP engine Go to next step </td> </tr> <tr> <td></td> <td> B6 engine Go to Step 3 </td> </tr> <tr> <td>No</td> <td> Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83 </td> </tr> <tr> <td></td> <td> "88" flashes Check ECU terminal 1F voltage ☞ page F-150 </td> </tr> <tr> <td></td> <td> Specification: Battery voltage (Ignition switch ON) ⇨ If OK, replace ECU ☞ page F-149 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker </td> </tr> </table>	Yes	BP engine Go to next step		B6 engine Go to Step 3	No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83		"88" flashes Check ECU terminal 1F voltage ☞ page F-150		Specification: Battery voltage (Ignition switch ON) ⇨ If OK, replace ECU ☞ page F-149 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker
Yes	BP engine Go to next step											
	B6 engine Go to Step 3											
No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83											
	"88" flashes Check ECU terminal 1F voltage ☞ page F-150											
	Specification: Battery voltage (Ignition switch ON) ⇨ If OK, replace ECU ☞ page F-149 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker											
2	Remove vacuum hose from pressure regulator and plug hose Check if engine starts normally 	<table border="1"> <tr> <td>Yes</td> <td> Check pressure regulator control system ☞ page F-134 </td> </tr> <tr> <td>No</td> <td>Go to next step</td> </tr> </table>	Yes	Check pressure regulator control system ☞ page F-134	No	Go to next step						
Yes	Check pressure regulator control system ☞ page F-134											
No	Go to next step											
3	Check if ECU terminal voltages are OK MTX... Especially 1C, 2D, 2Q, and 2T [BP] ATX... Especially 1C, 2E, 3D, and 3M [BP] ☞ page F-150	<table border="1"> <tr> <td>Yes</td> <td>Go to next step</td> </tr> <tr> <td>No</td> <td>Check for cause ☞ page F-151</td> </tr> </table>	Yes	Go to next step	No	Check for cause ☞ page F-151						
Yes	Go to next step											
No	Check for cause ☞ page F-151											
4	Run engine at idle and check if fuel line pressure is held after ignition switch turned OFF ☞ page F-121 Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min. INSTALL CLAMPS 	<table border="1"> <tr> <td>Yes</td> <td>Go to next step</td> </tr> <tr> <td>No</td> <td> Plug outlet of pressure regulator and check if fuel line pressure is held after ignition switch is turned OFF ☞ page F-130 ⇨ If OK, replace pressure regulator ☞ page F-130 ⇨ If not OK, check fuel pump hold pressure ☞ page F-125 If fuel pump is OK, check injectors for fuel leakage ☞ page F-132 </td> </tr> </table>	Yes	Go to next step	No	Plug outlet of pressure regulator and check if fuel line pressure is held after ignition switch is turned OFF ☞ page F-130 ⇨ If OK, replace pressure regulator ☞ page F-130 ⇨ If not OK, check fuel pump hold pressure ☞ page F-125 If fuel pump is OK, check injectors for fuel leakage ☞ page F-132						
Yes	Go to next step											
No	Plug outlet of pressure regulator and check if fuel line pressure is held after ignition switch is turned OFF ☞ page F-130 ⇨ If OK, replace pressure regulator ☞ page F-130 ⇨ If not OK, check fuel pump hold pressure ☞ page F-125 If fuel pump is OK, check injectors for fuel leakage ☞ page F-132											


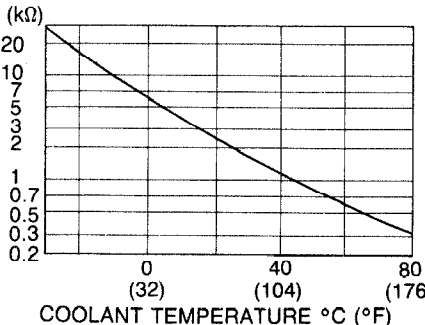


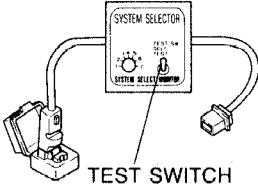


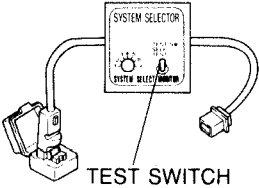



STEP	INSPECTION	ACTION	
5	Warm-up engine to normal operating temperature and stop it Connect diagnosis connector terminals F/P and GND with jumper wire for 3 minutes with ignition switch ON, then check if engine starts easily 	Yes	Change fuel to another brand
		No	Go to next step
6	Try known good ECU and check if condition improves ⇨ page F-149	Yes	Replace ECU ⇨ page F-149
		No	Change fuel to another brand

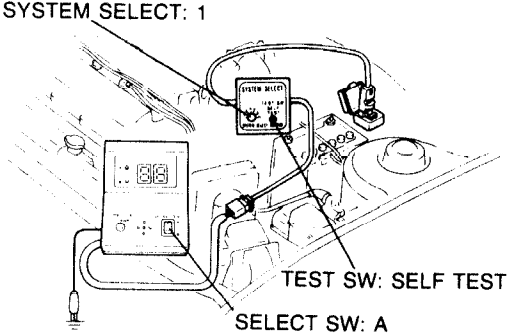
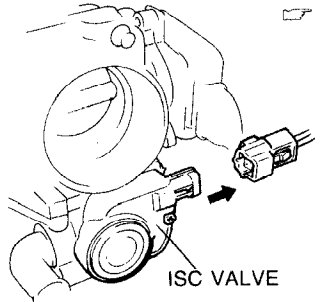
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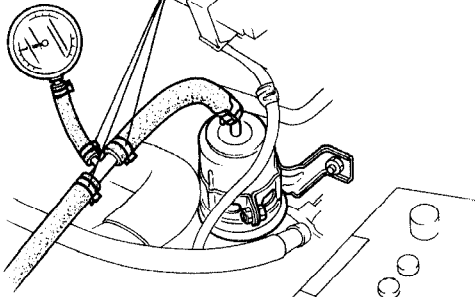
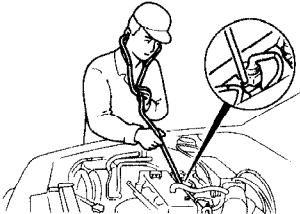
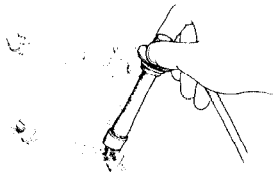
8		ROUGH IDLE/ENGINE STALLS AT IDLE — ALWAYS	
DESCRIPTION		• Engine starts normally but stalls or vibrates excessively at idle in every condition	
[TROUBLESHOOTING HINTS]			
① Air/Fuel mixture too lean <ul style="list-style-type: none"> • Air leakage • Fuel injection control malfunction • Low fuel line pressure ② One or more injectors clogged or not operating ③ Low intake air amount		④ Incorrect idle speed <ul style="list-style-type: none"> • Idle speed misadjustment • Idle speed control malfunction ⑤ One or more spark plugs not firing ⑥ Low engine compression ⑦ Airflow meter stuck	
STEP	INSPECTION		ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1 	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83
		"88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	
2	Check if ECU terminal voltages are OK MTX...Especially 2D, 2O and 2Q ATX... Especially 2B, 2E and 3D ☞ page F-150	Yes	Go to next step
		No	Check for cause ☞ page F-151
3	Disconnect high-tension lead at idle and check if engine speed decreases equally at each cylinder	Yes	Go to Step 8
		No	Go to next step
4	Check for injector operating sound at idle	Yes	Go to Step 6
		No	Go to Step 5
5	Check if battery voltage exists at injector connector (W/R) wire 	Yes	Check if injector resistance is OK ☞ page F-131 Resistance: Approx. 12—16Ω ⇒ If OK, check wiring between ECU and injector ⇒ If not OK, replace injector ☞ page F-131
		No	Check wiring between ECU and injector
6	Check if strong blue spark is visible at disconnected high-tension lead 	Yes	Go to next step
		No	Check high-tension lead ☞ page G-17 ⇒ If OK, check distributor cap and rotor ☞ page G-22 ⇒ If not OK, replace high-tension lead

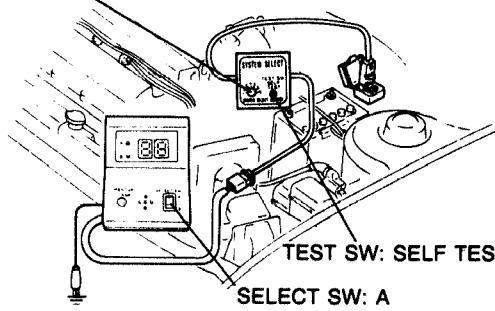
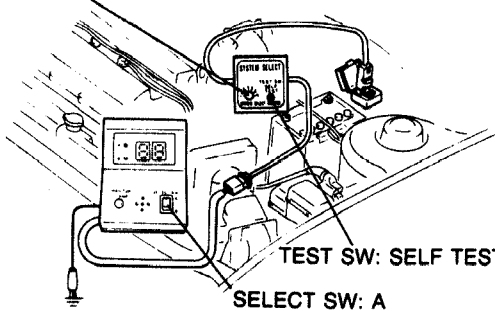

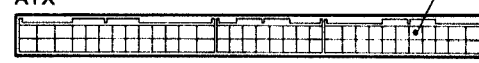
STEP	INSPECTION		ACTION
7	<p>Check if spark plugs are OK ☞ page G-18</p> <p>WEAR AND CARBON BUILDUP</p> <p>PLUG GAP 1.0—1.1mm (0.039—0.043 in)</p> 	Yes	<p>Check for correct engine compression ☞ page B1-10 B2-10</p> <p>⇒ If OK, replace injector ☞ page F-131</p> <p>⇒ If not OK, check for cause ☞ page B1-10 B2-10</p>
		No	<p>Clean or replace ☞ page G-18</p>
8	<p>Check for correct fuel line pressure at idle ☞ page F-122</p> <p>Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—48 psi) (Vacuum hose to pressure regulator dis- connected)</p> <p>INSTALL CLAMPS</p> 	Yes	<p>Go to next step</p>
		No	<p>Low pressure Check fuel line pressure while pinching fuel return hose</p> <p>⇒ If fuel line pressure quickly in- creases, check pressure regulator ☞ page F-129</p> <p>⇒ If fuel line pressure gradually in- creases, check for clogging be- tween fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ page F-126</p>
9	<p>Manually check if airflow meter moves smoothly from fully closed to fully open ☞ page F-158</p> 	Yes	<p>Go to next step</p>
		No	<p>Repair or replace</p>
10	<p>Check for air leakage at intake air system com- ponents</p>	Yes	<p>Repair or replace</p>
		No	<p>Go to next step</p>
11	<p>Check for correct engine compression ☞ page B1-10 B2-10</p> <p>Engine compression (Minimum):</p> <ul style="list-style-type: none"> • BP SOHC 834 kPa (8.5 kg/cm², 121 psi)-300 rpm • BP DOHC 883 kPa (9.0 kg/cm², 128 psi)-300 rpm • B6 932 kPa (9.5 kg/cm², 135 psi)-300 rpm 	Yes	<p>Go to next step</p>
		No	<p>Check for cause ☞ page B1-10 B2-10</p>
12	<p>Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ☞ page F-79</p> <p>Ignition timing (BTDC) BP DOHC : 9°—11° BP SOHC : 4°—6° B6 : 6°—8°</p>	Yes	<p>Try known good ECU and check if con- dition improves ☞ page F-149</p>
		No	<p>Adjust ignition timing ☞ page F-79</p>

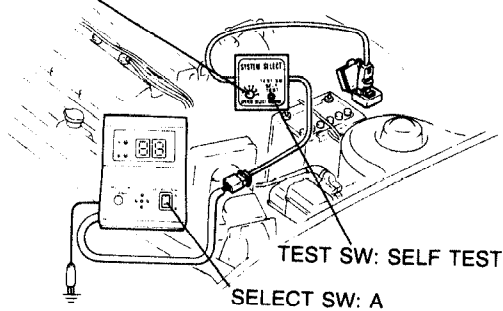
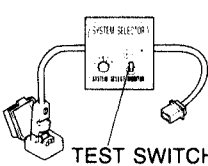
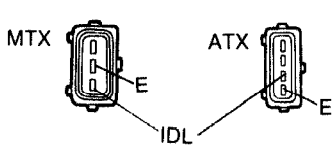
9	ROUGH IDLE/ENGINE STALLS AT IDLE — BEFORE WARM-UP	
DESCRIPTION	• Engine speed low or engine stalls or vibrates excessively at idle during warm-up	
[TROUBLESHOOTING HINTS] ① Low intake air amount • Airflow meter stuck • Air cleaner element clogged • Air valve ② Low fuel injection control • Fuel injection control malfunction (Correction for coolant temperature) ③ Poor atomization • Low RVP (summer) fuel used in cold weather		
STEP	INSPECTION	ACTION
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1  TEST SW: SELF TEST SELECT SW: A	Yes Go to next step No Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83 "88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇨ If OK, replace ECU ☞ page F-149 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker
2	Check for correct intake manifold vacuum at idle after warm-up Vacuum: More than 450 mmHg (17.7 inHg)	Yes Go to next step No Check for air leakage of intake air system components
3	Check if air cleaner element is clean ☞ page F-79	Yes Go to next step No Replace air cleaner element
4	Check if ECU terminal voltages are OK MTX... Especially 2D, 2O and 2Q ATX... Especially 2B, 2E and 3D ☞ page F-150	Yes Go to next step No Check for cause ☞ page F-151
5	Disconnect ISC valve connector and check if engine speed increases after warm-up ☞ page F-116  ISC VALVE	Yes Go to next step No Replace ISC valve ☞ page F-109

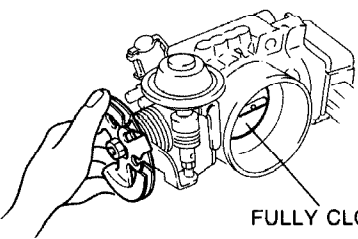
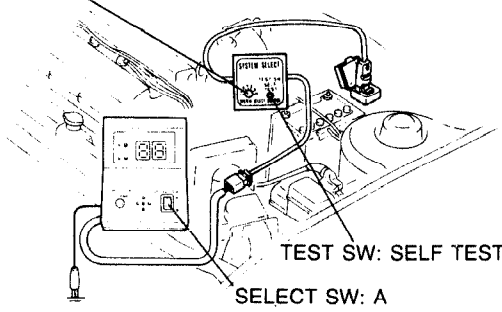
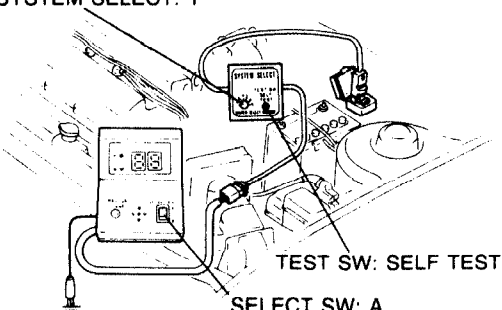
STEP	INSPECTION		ACTION
6	<p>Check for correct water thermosensor resistance  page F-158</p> <p>RESISTANCE</p>  <p>COOLANT TEMPERATURE °C (°F)</p>	Yes	Go to next step
		No	Replace water thermosensor  page F-158
7	<p>Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" when engine is cold Check if engine speed decreases as engine warms up  page F-116</p>  <p>TEST SWITCH</p>	Yes	Go to next step
		No	Check air valve  page F-116
8	<p>Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up  page F-79</p> <p>Ignition timing (BTDC)</p> <ul style="list-style-type: none"> • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8°  <p>TEST SWITCH</p>	Yes	Go to next step
		No	Adjust ignition timing  page F-79
9	<p>Try known good ECU and check if condition improves  page F-149</p>	Yes	Replace ECU  page F-149
		No	Change fuel to another brand

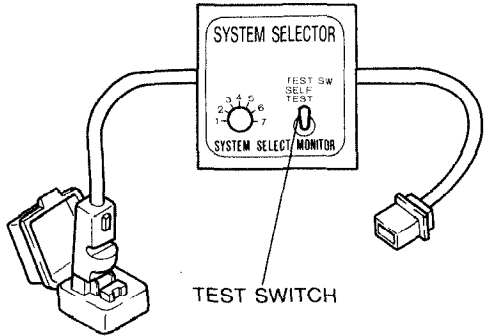
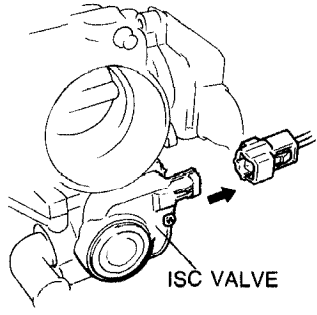
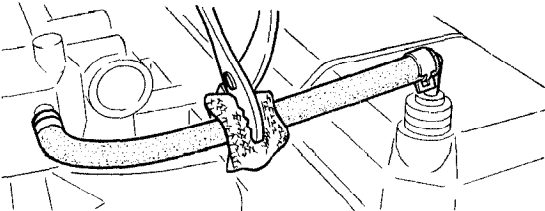
10		ROUGH IDLE/ENGINE STALLS AT IDLE — AFTER WARM-UP	
DESCRIPTION		• Engine runs normally at idle during warm-up but engine stalls or vibrates excessively after warm-up	
[TROUBLESHOOTING HINTS]			
① Idle speed control system malfunction		③ Air/Fuel mixture too rich	
② Air/Fuel mixture too lean		• Fuel injection control malfunction (Correction for coolant temperature)	
• Air leakage		④ Poor ignition	
• Low fuel line pressure		⑤ Low engine compression	
STEP	INSPECTION	ACTION	
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1  TEST SW: SELF TEST SELECT SW: A	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83
		"88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	
2	Check if ECU terminal voltages are OK MTX...Especially 2D, 2O and 2Q ATX...Especially 2B, 2E and 3D ☞ page F-150	Yes	Go to next step
		No	Check for cause ☞ page F-151
3	Disconnect high-tension lead at idle and check if engine speed decreases equally at all cylinders	Yes	Go to next step
		No	Go to Step 10
4	Check for correct intake manifold vacuum at idle Vacuum: More than 450 mmHg (17.7 inHg)	Yes	Go to next step
		No	Check for air leakage of intake air system components ☞ page F-110
5	Check if air cleaner element is clean ☞ page F-79	Yes	Go to next step
		No	Replace air cleaner element
6	Disconnect ISC valve connector at idle and check if engine speed increases ☞ page F-116  ISC VALVE	Yes	Go to next step
		No	Replace ISC valve ☞ page F-109

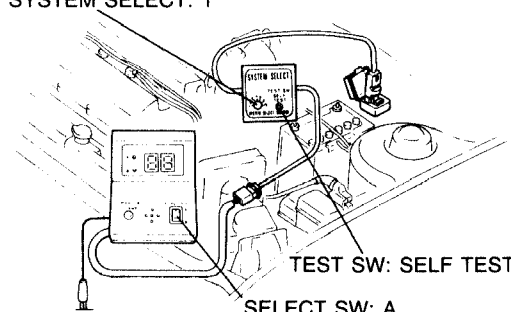
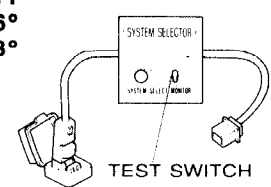
STEP	INSPECTION		ACTION
7	<p>Check for correct fuel line pressure at idle ☞ page F-129</p> <p>Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)</p> <p>INSTALL CLAMPS</p> 	Yes	Go to next step
		No	<p>Low pressure Check fuel line pressure while pinching fuel return hose</p> <p>⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129</p> <p>⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator</p> <p>If not clogged, check fuel pump maximum pressure ☞ page F-126</p>
8	<p>Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ☞ page F-79</p> <p>Ignition timing (BTDC)</p> <ul style="list-style-type: none"> • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8° 	Yes	Go to next step
		No	Adjust ignition system ☞ page F-79
9	Disconnect water thermosensor connector and check if engine condition improves	Yes	Replace water thermosensor
		No	Try known good ECU and check if condition improves ☞ page F-149
10	<p>Check for injector operating sound at idle</p> 	Yes	Go to next step
		No	<p>Check if injector resistance is OK ☞ page F-131</p> <p>Resistance: 12—16Ω</p> <p>⇒ If OK, check wiring between ECU and injector</p> <p>⇒ If not OK, replace injector ☞ page F-131</p>
11	<p>Check for correct engine compression ☞ page B1-10 B2-10</p> <p>Engine compression (Minimum):</p> <ul style="list-style-type: none"> • BP SOHC : 834 kPa (8.5 kg/cm², 121 psi)-300 rpm • BP DOHC : 883 kPa (9.0 kg/cm², 128 psi)-300 rpm • B6 : 932 kPa (9.5 kg/cm², 135 psi)-300 rpm 	Yes	Go to next step
		No	Check engine ☞ page B1-10 B2-10
12	<p>Check if strong blue spark is visible at disconnected high-tension lead</p> 	Yes	Go to next step
		No	<p>Check high-tension lead ☞ page G-17</p> <p>⇒ If OK, check distributor cap and rotor ☞ page G-22</p> <p>⇒ If not OK, replace high-tension lead</p>
13	<p>Check if spark plugs are OK ☞ page G-18</p>	Yes	Try known good ECU and check if condition improves ☞ page F-149
		No	Repair or replace ☞ page G-18

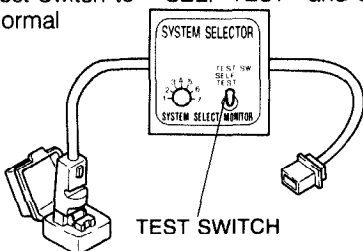
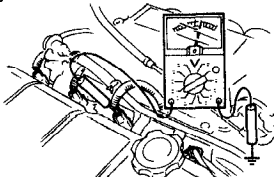
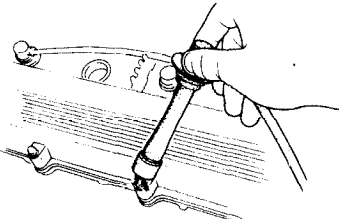
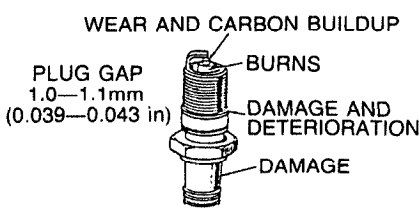
11	ROUGH IDLE/ENGINE STALLS AT IDLE — WHEN A/C, P/S, OR E/L ON		
DESCRIP- TION	<ul style="list-style-type: none"> • Engine stalls or vibrates excessively at idle when A/C, P/S, or E/L ON • A/C, P/S, daytime running lights (Canada), headlights, blower fan and electric cooling fan operate normally • Idle condition is normal when A/C, P/S, and E/L is OFF 		
[TROUBLESHOOTING HINTS]			
① Idle speed control system malfunction <ul style="list-style-type: none"> • Engine speed feedback control inoperative 			
STEP	INSPECTION	ACTION	
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1 	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83
			"88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker
2	Check switches for correct operation by Self-Diagnosis Checker Monitor Lamp with ignition switch ON ☞ page F-105 SYSTEM SELECT: 1 	Yes	Go to next step
		No	Lamp not ON or OFF with specified switch Check for cause (Refer to specified check sequence) ☞ page F-106
			Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker
3	Check if ECU terminal 1K (MTX) 1I (ATX) voltage is OK ☞ page F-150 Specification: Battery voltage (at idle) 1K (LG/Y) MTX  1I (LG/Y) ATX 	Yes	Try known good ECU and check if condition improves ☞ page F-149
		No	Check for short circuit in wiring between diagnosis connector terminal TEN and ground

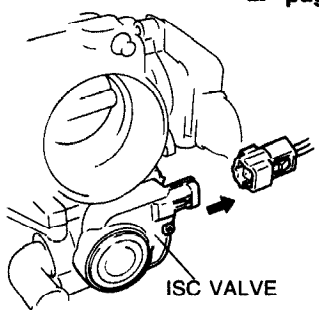
12	ROUGH IDLE/ENGINE STALLS JUST AFTER STARTING													
DESCRIP-TION	<ul style="list-style-type: none"> • Engine starts normally but vibrates excessively or stalls just after starting (acceleration from idle) • Idle conditions are normal in the other conditions 													
[TROUBLESHOOTING HINTS]														
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>① Fuel injection control system or idle speed control system malfunction</p> <ul style="list-style-type: none"> • Start signal not input to ECU </div> <div style="width: 45%;"> <p>② Idle speed misadjustment</p> <p>③ Ignition timing misadjustment</p> </div> </div>														
STEP	INSPECTION	ACTION												
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82	Yes Go to next step												
	No Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83	"88" flashes Check ECU terminal 1F voltage ☞ page F-150												
	<div style="text-align: center;">  </div>	Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker												
2	Check if ECU terminal voltages are OK MTX...Especially 1N ATX... Especially 1T ☞ page F-150	Yes Go to next step												
	No Check for cause ☞ page F-151	No Check for cause ☞ page F-151												
3	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ☞ page F-79	Yes In same condition as Step 3 inspection and apply parking brake Check for correct idle speed ☞ page F-80												
	Ignition timing (BTDC) <ul style="list-style-type: none"> • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8° <div style="text-align: center;">  </div>	Idle speed: 700—800 rpm ⇒ If OK, go to next step ⇒ If not OK, adjust idle speed ☞ page F-80												
4	Check continuity between throttle sensor terminals IDL and E ☞ page F-159	Yes Go to next step												
	<div style="text-align: center;">  </div> <table border="1" style="margin-top: 10px; width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 35%;">Clearance between throttle lever and stopper</th> <th style="width: 50%;">Continuity</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center;">MTX</td> <td style="text-align: center;">0.1mm (0.004 in)</td> <td style="text-align: center;">Yes</td> </tr> <tr> <td style="text-align: center;">1.0mm (0.039 in)</td> <td style="text-align: center;">No</td> </tr> <tr> <td rowspan="2" style="text-align: center;">ATX</td> <td style="text-align: center;">0.1mm (0.004 in)</td> <td style="text-align: center;">Yes</td> </tr> <tr> <td style="text-align: center;">0.6mm (0.024 in)</td> <td style="text-align: center;">No</td> </tr> </tbody> </table>		Clearance between throttle lever and stopper	Continuity	MTX	0.1mm (0.004 in)	Yes	1.0mm (0.039 in)	No	ATX	0.1mm (0.004 in)	Yes	0.6mm (0.024 in)	No
	Clearance between throttle lever and stopper	Continuity												
MTX	0.1mm (0.004 in)	Yes												
	1.0mm (0.039 in)	No												
ATX	0.1mm (0.004 in)	Yes												
	0.6mm (0.024 in)	No												
5	Try known good ECU and check if condition improves ☞ page F-149													

13	HIGH IDLE SPEED AFTER WARM-UP	
DESCRIPTION	<ul style="list-style-type: none"> Idle speed excessive after warm-up 	
<p>[TROUBLESHOOTING HINTS] Excessive intake air supplied to engine</p> <ul style="list-style-type: none"> ① Throttle valve not fully closed ② Idle speed control malfunction <ul style="list-style-type: none"> Air valve not closed ISC valve stuck ISC valve connector disconnected A/C, P/S, or E/L signal sent to ECU Incorrect coolant temperature signal 		
STEP	INSPECTION	ACTION
1	Check if throttle valve is fully closed when accelerator released 	Yes: Go to Step 3 No: Check if throttle linkage is correctly installed and operates freely ☞ page F-114 ⇒ If OK, go to Step 2 ⇒ If not OK, clean, adjust or replace linkage ☞ page F-114
2	Check if dashpot is correctly adjusted ☞ page F-142 Dashpot set speed: B6..... Approx. 3,000 rpm BP SOHC..... Approx. 2,700 rpm BP DOHC..... Approx. 3,500 rpm	Yes: Check if throttle valve is contaminated ⇒ If contaminated, clean throttle body ⇒ If not contaminated, replace throttle body ☞ page F-109 No: Adjust ☞ page F-142
3	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1 	Yes: Go to next step No: Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83 "88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker
4	Check switches for correct operation by Self-Diagnosis Checker Monitor Lamp with ignition switch ON ☞ page F-105 SYSTEM SELECT: 1 	Yes: Go to next step No: Lamp not ON or OFF with specified switch Check for cause (Refer to specified check sequence) ☞ page F-106 Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker
5	Check if ECU terminal voltages are OK MTX... Especially 2Q ATX... Especially 2E ☞ page F-150	Yes: Try known good ECU and check if condition improves ☞ page F-149 No: Check for cause ☞ page F-151

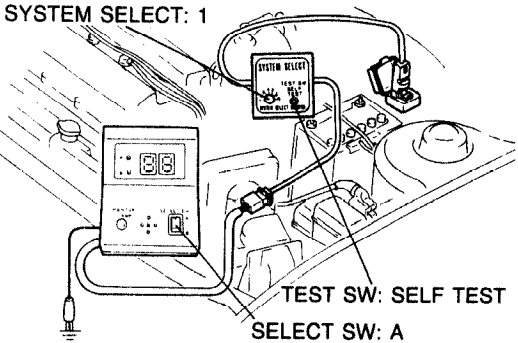
STEP	INSPECTION		ACTION
6	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" when engine is cold Check if engine speed decreases as engine warms up  SYSTEM SELECTOR TEST SWITCH page F-116	Yes	Go to next step
		No	Check air valve page F-116
7	Disconnect ISC valve connector at idle and check if idle speed increases  ISC VALVE page F-116	Yes	Go to next step
		No	Check ISC valve page F-116
8	Pinch PCV hose with pliers and check if engine speed decreases  page F-138	Yes	Check PCV valve page F-138
		No	Go to next step
9	Check if ECU terminal voltages are OK MTX...Especially 2D, 2O and 2Q ATX... Especially 2B, 2E and 3D page F-152	Yes	Try known good ECU and check if condition improves page F-149
		No	Check for cause page F-153

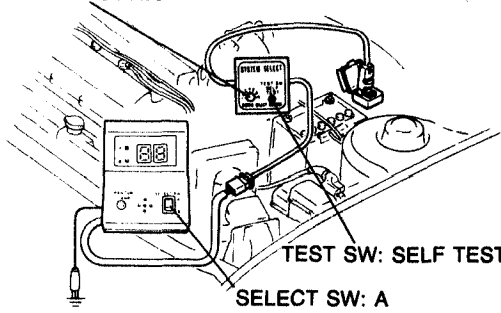
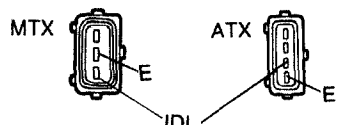
14		IDLE MOVES UP AND DOWN/IDLE HUNTING	
DESCRIP-TION		• Engine speeds up and down periodically at idle	
[TROUBLESHOOTING HINTS]			
① Idle switch (built in throttle sensor) OFF at idle ② Air leakage ③ Fuel injection amount inconstant • Poor contact point inside airflow meter ④ Poor ignition			
STEP	INSPECTION	ACTION	
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1  TEST SW: SELF TEST SELECT SW: A	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83
		"88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇨ If OK, replace ECU ☞ page F-149 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker	
2	Check for correct intake manifold vacuum at idle Intake manifold vacuum: More than 450 mmHg (17.7 inHg)	Yes	Go to next step
		No	Low vacuum Check for air leakage at intake air system
3	Check if air cleaner element is clean ☞ page F-79	Yes	Go to next step
		No	Replace air cleaner element
4	Disconnect high-tension lead at idle and check if engine speed decreases equally at each cylinder	Yes	Go to next step
		No	Go to Step 9
5	Check if ECU terminal voltages are OK ☞ page F-150	Yes	Go to next step
		No	Check for cause ☞ page F-151
6	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ☞ page F-79 Ignition timing (BTDC) • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8°  TEST SWITCH	Yes	Go to next step
		No	Adjust ignition timing ☞ page F-79

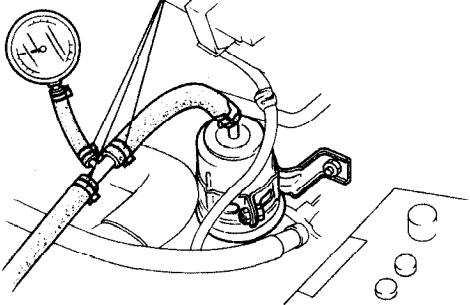
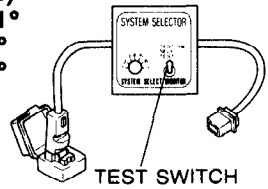
STEP	INSPECTION		ACTION
7	Connect System Selector to diagnosis connector and set Test Switch to " SELF TEST" and check if idle is normal 	Yes	Try known good ECU
		No	Go to next step
8	Check if airflow meter is OK ☞ page F-158	Yes	Go to Step 14
		No	Replace airflow meter
9	Check for injector operating sound at idle	Yes	Go to Step 11
		No	Go to next Step
10	Check if battery voltage exists at injector connector (W/R) wire 	Yes	Check if injector resistance is OK ☞ page F-131 Resistance: 12—16Ω ⇒ If OK, check wiring between ECU and injector ⇒ If not OK, replace injector ☞ page F-131
		No	Check wiring between ECU and injector
11	Check if strong blue spark is visible at disconnected high-tension lead 	Yes	Go to next step
		No	Check high-tension lead ⇒ If OK, check distributor cap and rotor ☞ page G-22 ⇒ If not OK, replace high-tension lead
12	Check if spark plugs are OK ☞ page G-18 	Yes	Check for correct engine compression ☞ page B1-10 B2-10 Compression (Minimum): <ul style="list-style-type: none"> • BP SOHC 834 kPa (8.5 kg/cm², 121 psi)-300 rpm • BP DOHC 883 kPa (9.0 kg/cm², 128 psi)-300 rpm • B6 932 kPa (9.5 kg/cm², 135 psi)-300 rpm ⇒ If OK, go to next step ⇒ If not OK, check for cause ☞ page B1-10 B2-10
		No	Clean or replace ☞ page G-18
13	Check for injector leakage ☞ page F-132	Yes	Replace injector ☞ page F-131
		No	Go to next step
14	Try known good ECU and check if condition improves ☞ page F-149		

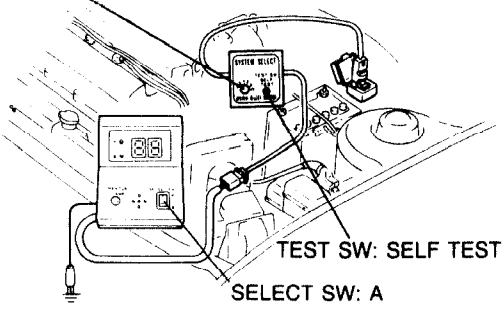
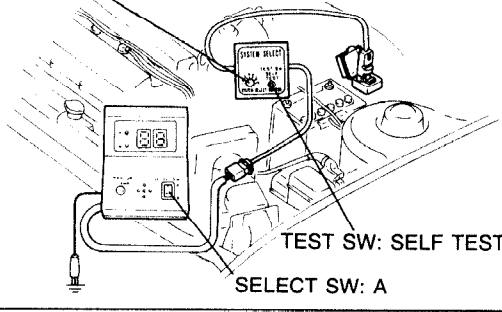
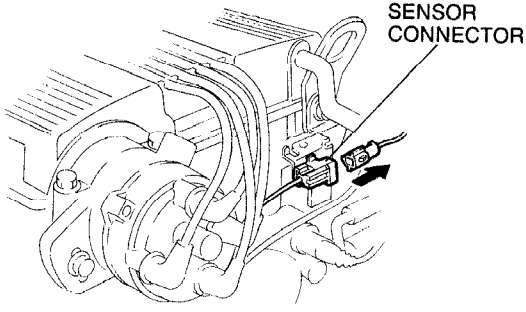
STEP	INSPECTION		ACTION
6	Check if dashpot is correctly adjusted ☞ page F-142 Dashpot set speed: B6..... Approx. 3,000 rpm BP SOHC..... Approx. 2,700 rpm BP DOHC..... Approx. 3,500 rpm	Yes	Go to next step
		No	Adjust dashpot ☞ page F-142
7	Disconnect ISC valve connector at idle and check if engine speed increases ☞ page F-116 	Yes	Go to next step
		No	Replace ISC valve ☞ page F-109
8	Try known good ECU and check if condition improves ☞ page F-149		

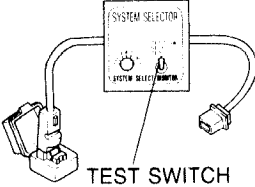
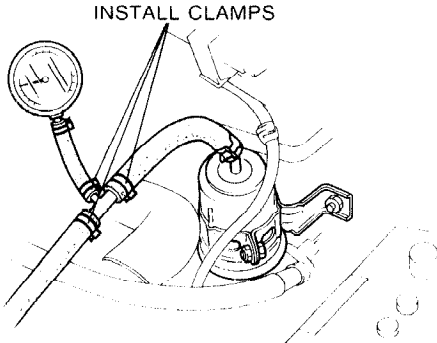
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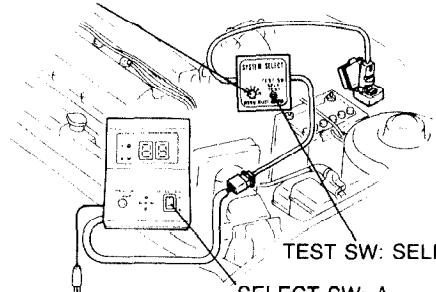
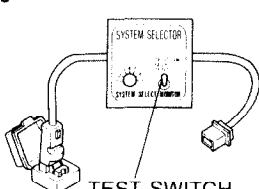
16		ENGINE STALLS SUDDENLY (INTERMITTENT)	
DESCRIPTION		<ul style="list-style-type: none"> • Engine intermittently stops running • Before stalling, engine condition OK 	
[TROUBLESHOOTING HINTS]			
① Intermittently no spark or no fuel injection caused by vehicle vibration, acceleration, or deceleration <ul style="list-style-type: none"> • Poor connection in wire harness 			
STEP	INSPECTION	ACTION	
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83 Note • When checking wiring harness and connectors, tap, move, and wiggle suspect sensor and/or harness to recreate problem
		"88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇨ If OK, replace ECU ☞ page F-149 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker	
2	Check for poor connection of following parts <ul style="list-style-type: none"> • Ignition coil • Igniter • Distributor • High-tension lead • Injector • Circuit opening relay • ECU 	Yes	Repair or replace
		No	Go to next step
3	Check if ECU terminal voltages are OK MTX... Especially 1B, 2A, 2B and 2C ATX... Especially 1B, 3A, 3B and 3C ☞ page F-150 Note • When checking voltages, tap, move, and wiggle harness and connector to recreate problem	Yes	Go to Troubleshooting No.2 "CRANKS NORMALLY BUT WILL NOT START (NO COMBUSTION)" ☞ page F-30
		No	Check for cause ☞ page F-151

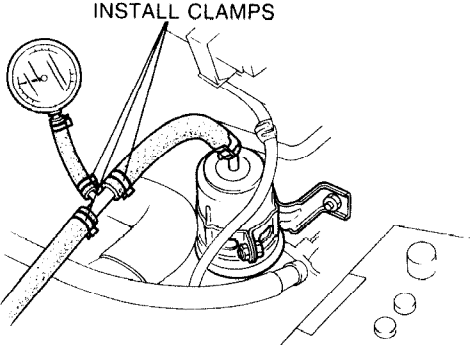
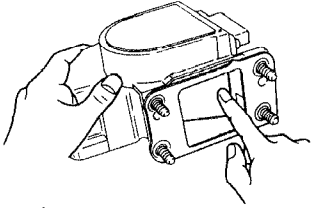
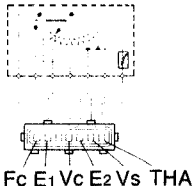
17	HESITATES/STUMBLES ON ACCELERATION														
DESCRIP-TION	• Flat spot occurs just after accelerator depressed or mild jerking occurs during acceleration														
[TROUBLESHOOTING HINTS]															
① Air/Fuel mixture becomes lean when depressing accelerator <ul style="list-style-type: none"> • Fuel injection control malfunction (Correction for accelerating condition) • Air leakage • Fuel line pressure decreases • Spark advance control malfunction 															
STEP	INSPECTION	ACTION													
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82	Yes Go to next step													
	SYSTEM SELECT: 1 	No Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83													
		"88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇨ If OK, replace ECU ☞ page F-149 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker													
2	Check for correct intake manifold vacuum at idle Vacuum: More than 450 mmHg (17.7 inHg)	Yes Go to next step No Check for air leakage at intake air system components													
3	Check if air cleaner element is clean ☞ page F-79	Yes Go to next step													
		No Replace air cleaner element													
4	Check if ECU terminal voltages are OK MTX...Especially 2L ATX... Especially 1T, 2F, and 2I ☞ page F-150	Yes Go to next step													
		No Check for cause ☞ page F-151													
5	Check if throttle linkage is correctly installed and operates freely ☞ page F-114	Yes Go to next step													
		No Correct, clean, or replace as required any binding or damaged linkage and adjust cable deflection at throttle body ☞ page F-114													
6	Check continuity between throttle sensor terminals IDL and E <div style="text-align: center;">  </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">Clearance between throttle lever and stopper</th> <th>Continuity</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center;">MTX</td> <td style="text-align: center;">0.1mm (0.004 in)</td> <td style="text-align: center;">Yes</td> </tr> <tr> <td style="text-align: center;">1.0mm (0.039 in)</td> <td style="text-align: center;">No</td> </tr> <tr> <td rowspan="2" style="text-align: center;">ATX</td> <td style="text-align: center;">0.1mm (0.004 in)</td> <td style="text-align: center;">Yes</td> </tr> <tr> <td style="text-align: center;">0.6mm (0.024 in)</td> <td style="text-align: center;">No</td> </tr> </tbody> </table>	Clearance between throttle lever and stopper		Continuity	MTX	0.1mm (0.004 in)	Yes	1.0mm (0.039 in)	No	ATX	0.1mm (0.004 in)	Yes	0.6mm (0.024 in)	No	Yes Go to next step
		Clearance between throttle lever and stopper		Continuity											
MTX	0.1mm (0.004 in)	Yes													
	1.0mm (0.039 in)	No													
ATX	0.1mm (0.004 in)	Yes													
	0.6mm (0.024 in)	No													
No	Adjust ☞ page F-169														

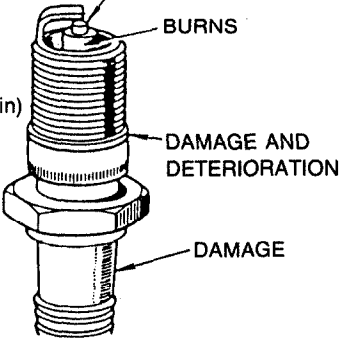
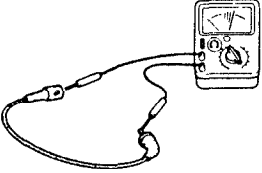
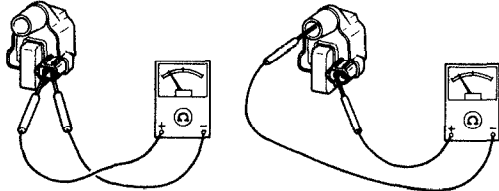
STEP	INSPECTION	ACTION
7	<p>Check for correct fuel line pressure at idle ☞ page F-129</p> <p>Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)</p> <p style="text-align: center;">INSTALL CLAMPS</p> 	<p>Yes Check if fuel line pressure decreases when accelerating quickly</p> <ul style="list-style-type: none"> ⇒ If decreases, check fuel line and filter for clogging ⇒ If no decrease, go to next step <hr/> <p>No Low pressure Check fuel line pressure while pinching fuel return hose</p> <ul style="list-style-type: none"> ⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator <p>If not clogged, check fuel pump maximum pressure ☞ page F-126</p>
8	<p>Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ☞ page F-79</p> <p>Ignition timing (BTDC)</p> <ul style="list-style-type: none"> • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8° 	<p>Yes Check if ignition timing advances when accelerating</p> <ul style="list-style-type: none"> ⇒ If advances, go to next step ⇒ If not advance, replace ECU ☞ page F-149 <hr/> <p>No Adjust ☞ page F-79</p>
9	<p>Check if air duct and air hoses are correctly installed ☞ page F-109</p>	<p>Yes Go to next step</p> <hr/> <p>No Repair</p>
10	<p>Check if exhaust system is restricted ☞ page F-136</p>	<p>Yes Repair or replace</p> <hr/> <p>No SOHC Go to Step 12</p> <p>DOHC Go to next step</p>
11	<p>Check if variable inertia control system (VICS) is OK ☞ page F-118</p>	<p>Yes Go to next step</p> <hr/> <p>No Repair or replace</p>
12	<p>Try known good ECU and check if condition improves ☞ page F-149</p>	

18	SURGES WHILE CRUISING		
DESCRIP- TION	<ul style="list-style-type: none"> • Unexpected change in engine speed which is usually repetitive 		
[TROUBLESHOOTING HINTS]			
<ul style="list-style-type: none"> ① Air/Fuel mixture too lean ② Misfire ③ Poor connection in wiring harness 			
STEP	INSPECTION	ACTION	
1	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1 	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83
		No	"88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker
2	Check switches for correct operation by Self-Diagnosis Checker Monitor Lamp with ignition switch ON ☞ page F-105 SYSTEM SELECT: 1 	Yes	Go to next step
		No	Lamp not ON or OFF with specified input switch Check for cause (Refer to specified check sequence) ☞ page F-106
		No	Lamp always ON Check ECU terminal 1D voltage ☞ page F-150
3	Check if throttle sensor is OK ☞ page F-169	Yes	Go to next step
		No	Adjust ☞ page F-169
4	Disconnect oxygen sensor connector and check if condition improves 	Yes	Check oxygen sensor ☞ page F-171
		No	Go to next step
5	Check if ECU terminal voltages are OK ☞ page F-150	Yes	Go to next step
		No	Check for cause ☞ page F-157

STEP	INSPECTION		ACTION
6	Check if throttle linkage is correctly installed and operates freely ⇨ page F-114	Yes	Go to next step
		No	Correct, clean, or replace as required any binding or damaged linkage, and adjust cable deflection at throttle body ⇨ page F-112
7	Check for correct intake manifold vacuum at idle Vacuum: More than 450 mmHg (17.7 inHg)	Yes	Go to next step
		No	Check for air leakage of intake air system components
8	Check if air cleaner element is clean ⇨ page F-79	Yes	Go to next step
		No	Replace air cleaner element
9	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ⇨ page F-79 Ignition timing (BTDC) • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8° 	Yes	Check if ignition timing advances when accelerating ⇨ If advances, go to next step ⇨ If not advance, replace ECU ⇨ page F-149
		No	Adjust ⇨ page F-79
10	Check for correct fuel line pressure at idle ⇨ page F-129 Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected) 	Yes	Check if fuel line pressure decreases when accelerating quickly ⇨ If decreases, check for fuel pump maximum pressure ⇨ If OK, check fuel line and filter for clogging ⇨ If no decrease, go to next step ⇨ page F-126 ⇨ page F-122
		No	Low pressure Check fuel line pressure by pinching fuel return hose ⇨ If fuel line pressure quickly increases, check pressure regulator ⇨ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ⇨ page F-129 ⇨ page F-126
			High pressure Check if fuel return line is clogged ⇨ If OK, replace pressure regulator ⇨ If not OK, replace ⇨ page F-130
11	Check if exhaust system is restricted ⇨ page F-136	Yes	Repair or replace
		No	Go to next step
12	Try known good ECU and check if condition improves ⇨ page F-149		

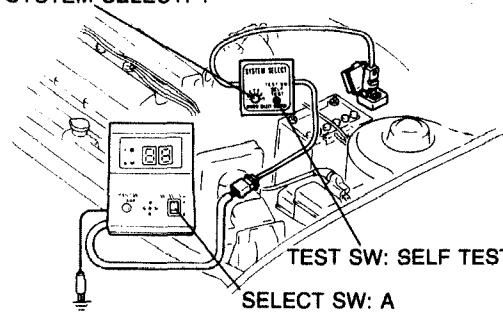
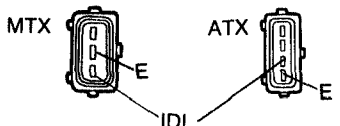
19		LACK OF POWER	
DESCRIP-TION		<ul style="list-style-type: none"> • Performance poor under load when throttle valve wide open • Reduced maximum speed • Idle condition normal 	
[TROUBLESHOOTING HINTS]			
① Factors other than engine malfunction <ul style="list-style-type: none"> • Clutch slipping • ATX slipping • Brake dragging • Low tire pressure • Incorrect tire size • Overloaded ② Low intake air amount <ul style="list-style-type: none"> • Throttle valve not open fully • Clogged intake air system 		③ Air/Fuel mixture too lean <ul style="list-style-type: none"> • Fuel line pressure decreases • Fuel injection malfunction ④ Poor ignition ⑤ Low engine compression ⑥ Alcohol blended fuel used	
STEP	INSPECTION	ACTION	
1	Check factors other than engine <ul style="list-style-type: none"> • Clutch slipping • ATX slipping • Brake dragging • Low tire pressure • Incorrect tire size Section H Section K Section P Section Q Section Q	Yes	Go to next step
		No	Repair
2	Check if throttle valve fully opened when accelerator depressed fully	Yes	Go to next step
		No	Check if accelerator cable is correctly installed ☞ page F-114 ⇒ If OK, check throttle body ☞ page F-112 ⇒ If not OK, install accelerator cable correctly ☞ page F-114
3	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1 	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83
		"88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker	
4	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ☞ page F-79 Ignition timing (BTDC) <ul style="list-style-type: none"> • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8° 	Yes	Check if ignition timing advances when accelerating ⇒ If advances, go to next step ⇒ If not advance, check ECU terminal voltages ☞ page F-150
		No	Adjust ☞ page F-79
5	Check if ECU terminal voltages are OK MTX... Especially 1K, 1N, 2L, 2K, and 2S (BPD) ATX... Especially 1I, 1T, 2F, 2I and 3I (BPD) ☞ page F-150	Yes	Go to next step
		No	Check for cause ☞ page F-151

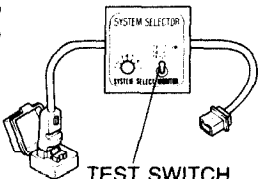
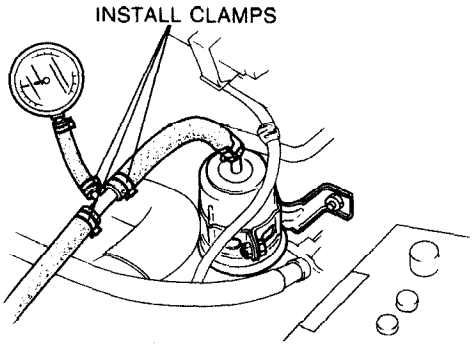
STEP	INSPECTION	ACTION															
6	Check for correct intake manifold vacuum at idle Intake manifold vacuum: More than 450 mmHg (17.7 inHg)	Yes	Go to next step														
		No	Check for air leakage of intake air system components														
7	Check if air cleaner element is clean ☞ page F-79	Yes	Go to next step														
		No	Replace air cleaner element														
8	Check for correct fuel line pressure at idle ☞ page F-129 Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)  INSTALL CLAMPS	Yes	Check if fuel line pressure decreases when accelerating quickly ☞ If decreases, check fuel pump maximum pressure ☞ page F-126 ☞ If OK, check fuel line and filter for clogging ☞ If not decrease, go to next step														
		No	Low pressure Check fuel line pressure while pinching fuel return hose ☞ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ☞ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ page F-126														
			High pressure Check if fuel return line is clogged ☞ If OK, replace pressure regulator ☞ page F-130 ☞ If not OK, replace														
9	Check if airflow meter is OK ☞ page F-168 I. Check if measuring plate moves smoothly  II. Check resistance  <table border="1"> <thead> <tr> <th rowspan="2">Terminal</th> <th colspan="2">Resistance (Ω)</th> </tr> <tr> <th>Fully closed</th> <th>Fully open</th> </tr> </thead> <tbody> <tr> <td>E2↔Vs</td> <td>20—600</td> <td>20—1,000</td> </tr> <tr> <td>E2↔Vc</td> <td colspan="2">200—400</td> </tr> <tr> <td>E1↔Fc</td> <td>∞</td> <td>0</td> </tr> </tbody> </table>	Terminal	Resistance (Ω)		Fully closed	Fully open	E2↔Vs	20—600	20—1,000	E2↔Vc	200—400		E1↔Fc	∞	0	Yes	Go to next step
			Terminal	Resistance (Ω)													
Fully closed	Fully open																
E2↔Vs	20—600	20—1,000															
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E1↔Fc	∞	0															
No	Repair or replace																

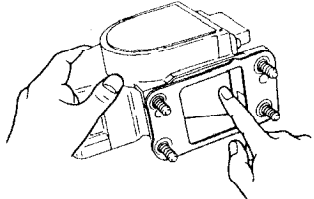
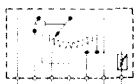

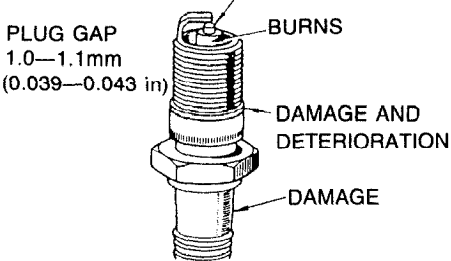
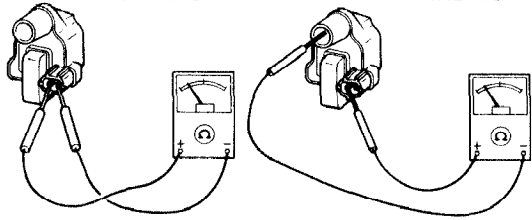
STEP	INSPECTION		ACTION
10	<p>Check if spark plugs are OK ☞ page G-18</p> <p>WEAR AND CARBON BUILDUP</p> <p>BURNS</p> <p>DAMAGE AND DETERIORATION</p> <p>DAMAGE</p> <p>PLUG GAP 1.0—1.1mm (0.039—0.043 in)</p> 	Yes	Go to next step
		No	Clean or replace
11	<p>Check if resistance of high-tension leads are OK</p> <p>Resistance: 16 kΩ per 1 m (3.28 ft)</p> 	Yes	Go to next step
		No	Replace
12	<p>Check if resistance of ignition coil is OK ☞ page G-19</p> <p>Resistance (at 20°C [68°F]): Primary coil winding..... 0.81—0.99Ω Secondary coil winding.... 10—16 kΩ</p> <p>PRIMARY COIL WINDING SECONDARY COIL WINDING</p> 	Yes	Go to next step
		No	Replace
13	<p>Check for correct engine compression ☞ page B1-10 B2-10</p> <p>Engine compression:</p> <ul style="list-style-type: none"> • BP DOHC 883 kPa (9.0 kg/cm², 128 psi)-300 rpm • BP SOHC 834 kPa (8.5 kg/cm², 121 psi)-300 rpm • B6 932 kPa (9.5 kg/cm², 135 psi)-300 rpm 	Yes	Go to next step
		No	<p>Check engine condition ☞ page B1-10 B2-10</p> <ul style="list-style-type: none"> • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide
14	<p>Change fuel and check if condition improves</p>	Yes	Change fuel to another brand
		No	<p>SOHC Go to Step 16</p>
			<p>DOHC Go to next step</p>

STEP	INSPECTION		ACTION
15	Check if variable inertia charging system (VICS) is OK (BPD) ☞ page F-118	Yes	Go to next step
		No	Repair or replace
16	Try known good ECU and check if condition improves ☞ page F-149		

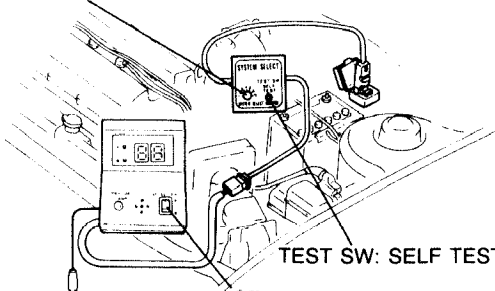
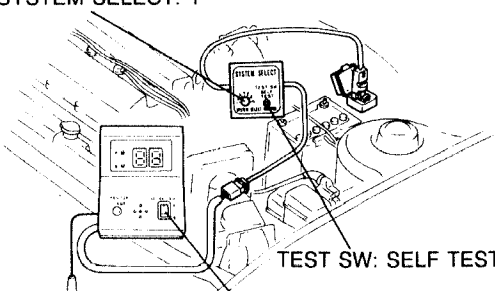
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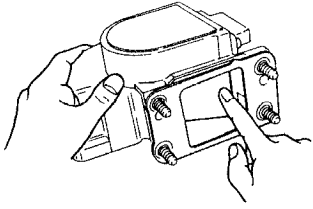
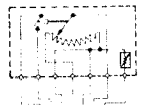
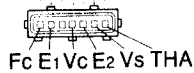
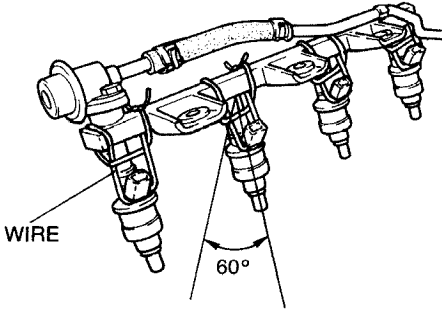
20		POOR ACCELERATION														
DESCRIPTION		<ul style="list-style-type: none"> • Performance poor while accelerating • Idle condition normal 														
[TROUBLESHOOTING HINTS]																
<p>① Factors other than engine malfunction</p> <ul style="list-style-type: none"> • Clutch slipping • ATX slipping • Brake dragging • Low tire pressure • Incorrect tire size • Over-loaded <p>② Low intake air amount</p> <ul style="list-style-type: none"> • Throttle valve not open fully • Clogging in intake air system <p>③ Air/Fuel mixture too lean</p> <ul style="list-style-type: none"> • Fuel line pressure decreases • Fuel injection malfunction <p>④ Poor ignition</p> <p>⑤ Low engine compression</p> <p>⑥ Alcohol blended fuel used</p>																
STEP	INSPECTION	ACTION														
1	Check factors other than engine <ul style="list-style-type: none"> • Clutch slipping • Brake dragging • Low tire pressure • Incorrect tire size • ATX slipping <input type="checkbox"/> Section H <input type="checkbox"/> Section P <input type="checkbox"/> Section Q <input type="checkbox"/> Section Q <input type="checkbox"/> Section K	Yes	Go to next step													
		No	Repair													
2	Check if throttle valve fully opens when depressing accelerator fully	Yes	Go to next step													
		No	Check if accelerator cable is correctly installed <input type="checkbox"/> page F-114 ⇨ If OK, check throttle body <input type="checkbox"/> page F-112 ⇨ If not OK, install accelerator cable correctly <input type="checkbox"/> page F-114													
3	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON <input type="checkbox"/> page F-82 SYSTEM SELECT: 1 	Yes	Go to next step													
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) <input type="checkbox"/> page F-83													
		"88" flashes Check ECU terminal 1F voltage <input type="checkbox"/> page F-150 Specification: Battery voltage (Ignition switch ON) ⇨ If OK, replace ECU <input type="checkbox"/> page F-149 ⇨ If not OK, check wiring between ECU and Self-Diagnosis Checker														
4	Check continuity between throttle sensor terminals IDL and E <input type="checkbox"/> page F-169 	Yes	Go to next step													
		No	Adjust <input type="checkbox"/> page F-169													
<table border="1"> <thead> <tr> <th colspan="2">Clearance between throttle lever and stopper</th> <th>Continuity</th> </tr> </thead> <tbody> <tr> <td rowspan="2">MTX</td> <td>0.1mm (0.004 in)</td> <td>Yes</td> </tr> <tr> <td>1.0mm (0.039 in)</td> <td>No</td> </tr> <tr> <td rowspan="2">ATX</td> <td>0.1mm (0.004 in)</td> <td>Yes</td> </tr> <tr> <td>0.6mm (0.024 in)</td> <td>No</td> </tr> </tbody> </table>		Clearance between throttle lever and stopper		Continuity	MTX	0.1mm (0.004 in)	Yes	1.0mm (0.039 in)	No	ATX	0.1mm (0.004 in)	Yes	0.6mm (0.024 in)	No		
Clearance between throttle lever and stopper		Continuity														
MTX	0.1mm (0.004 in)	Yes														
	1.0mm (0.039 in)	No														
ATX	0.1mm (0.004 in)	Yes														
	0.6mm (0.024 in)	No														

STEP	INSPECTION		ACTION
5	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ☞ page F-79 Ignition timing (BTDC) • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8° 	Yes	Check if ignition timing advances when accelerating ⇒ If advances, go to next step ⇒ If not advance, check ECU terminal voltages ☞ page F-150
		No	Adjust ☞ page F-79
6	Check if ECU terminal voltages are OK ☞ page F-150	Yes	Go to next step
		No	Check for cause ☞ page F-151
7	Check for correct intake manifold vacuum at idle Intake manifold vacuum: More than 450 mmHg (17.7 inHg)	Yes	Go to next step
		No	Check for air leakage of intake air system components
8	Check for correct fuel line pressure at idle ☞ page F-129 Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected) 	Yes	Check if fuel line pressure decreases when accelerating quickly ⇒ If decreases, check fuel pump maximum pressure If OK, check fuel line and filter for clogging ⇒ If not decrease, go to next step ☞ page F-126
		No	Low pressure Check for fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ page F-126
			High pressure Check if fuel line is clogged ⇒ If OK, replace pressure regulator ☞ page F-130 ⇒ If not OK, replace

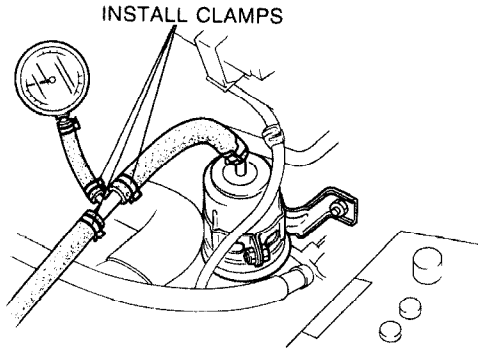
STEP	INSPECTION		ACTION														
9	<p>Check if airflow meter is OK ☞ page F-168</p> <p>I. Check if measuring plate moves smoothly</p>  <p>II. Check resistance</p>   <table border="1"> <thead> <tr> <th rowspan="2">Terminal</th> <th colspan="2">Resistance (Ω)</th> </tr> <tr> <th>Fully closed</th> <th>Fully open</th> </tr> </thead> <tbody> <tr> <td>E2↔Vs</td> <td>20—600</td> <td>20—1,000</td> </tr> <tr> <td>E2↔Vc</td> <td colspan="2">200—400</td> </tr> <tr> <td>E1↔Fc</td> <td>∞</td> <td>0</td> </tr> </tbody> </table>	Terminal	Resistance (Ω)		Fully closed	Fully open	E2↔Vs	20—600	20—1,000	E2↔Vc	200—400		E1↔Fc	∞	0	Yes	Go to next step
Terminal	Resistance (Ω)																
	Fully closed	Fully open															
E2↔Vs	20—600	20—1,000															
E2↔Vc	200—400																
E1↔Fc	∞	0															
		No	Repair or replace														
10	<p>Check if spark plugs are OK ☞ page G-18</p> <p>WEAR AND CARBON BUILDUP</p> 	Yes	Go to next step														
		No	Clean or replace														
11	<p>Check if resistance of ignition coil is OK ☞ page G-19</p> <p>Resistance (at 20°C [68°F]): Primary coil winding..... 0.81—0.99Ω Secondary coil winding.... 10—16 kΩ</p> <p>PRIMARY COIL WINDING SECONDARY COIL WINDING</p> 	Yes	Go to next step														
		No	Replace														
12	<p>Check for correct engine compression ☞ page B1-10 B2-10</p> <p>Engine compression (Minimum):</p> <ul style="list-style-type: none"> • BP DOHC 883 kPa (9.0 kg/cm², 128 psi)-300 rpm • BP SOHC 834 kPa (8.5 kg/cm², 121 psi)-300 rpm • B6 932 kPa (9.5 kg/cm², 135 psi)-300 rpm 	Yes	Go to next step														
		No	<p>Check engine condition ☞ page B1-10 B2-10</p> <ul style="list-style-type: none"> • Worn piston, piston rings or cylinder wall • Defective cylinder head gasket • Distorted cylinder head • Improper valve seating • Valve sticking in guide 														

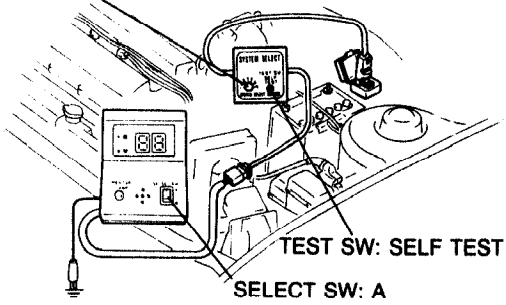
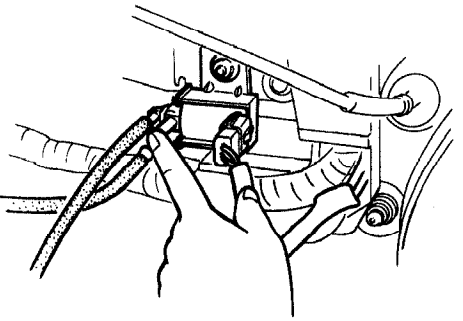
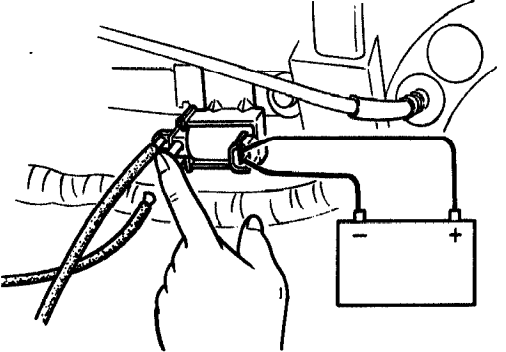
STEP	INSPECTION		ACTION
13	Change fuel and check if acceleration improves	Yes	Change fuel to another brand
		No	Go to next step
14	Check if A/C cut-off control system is OK	Yes	SOHC Go to Step 16
			DOHC Go to next step
		No	Repair or replace
15	Check if variable inertia charging system (VICS) is OK (BPD) ☞ page F-118	Yes	Go to next step
		No	Repair or replace
16	Try known good ECU and check if condition improves ☞ page F-149		

21	RUNS ROUGH ON DECELERATION/BACKFIRE					
DESCRIPTION	<ul style="list-style-type: none"> • Engine runs rough while decelerating and abnormal combustion occurs in exhaust system • Transaxle in normal condition 					
<p>[TROUBLESHOOTING HINTS]</p> <p>① Air/Fuel mixture too rich</p> <ul style="list-style-type: none"> • Air cleaner element clogged • Fuel injection control malfunction (Fuel cut control) • Injector fuel leakage • Throttle sensor (IDL terminal) malfunction • Dashpot malfunction 						
STEP	INSPECTION	ACTION				
1	<p>Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON</p> <p style="text-align: right;">☞ page F-82</p> <p>SYSTEM SELECT: 1</p>  <p style="text-align: center;">TEST SW: SELF TEST SELECT SW: A</p>	<table border="1"> <tr> <td>Yes</td> <td>Go to next step</td> </tr> <tr> <td>No</td> <td> <p>Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83</p> <p>"88" flashes Check ECU terminal 1F voltage ☞ page F-150</p> <p>Specification: Battery voltage (Ignition switch ON)</p> <p>⇒ If OK, replace ECU ☞ page F-149</p> <p>⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker</p> </td> </tr> </table>	Yes	Go to next step	No	<p>Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83</p> <p>"88" flashes Check ECU terminal 1F voltage ☞ page F-150</p> <p>Specification: Battery voltage (Ignition switch ON)</p> <p>⇒ If OK, replace ECU ☞ page F-149</p> <p>⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker</p>
Yes	Go to next step					
No	<p>Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83</p> <p>"88" flashes Check ECU terminal 1F voltage ☞ page F-150</p> <p>Specification: Battery voltage (Ignition switch ON)</p> <p>⇒ If OK, replace ECU ☞ page F-149</p> <p>⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker</p>					
2	<p>Check switches for correct operation by Self-Diagnosis Checker Monitor Lamp with ignition switch ON</p> <p style="text-align: right;">☞ page F-105</p> <p>SYSTEM SELECT: 1</p>  <p style="text-align: center;">TEST SW: SELF TEST SELECT SW: A</p>	<table border="1"> <tr> <td>Yes</td> <td>Go to next step</td> </tr> <tr> <td>No</td> <td> <p>Lamp not ON or OFF with specified switch Check for cause (Refer to specified check sequence) ☞ page F-106</p> <p>Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker</p> </td> </tr> </table>	Yes	Go to next step	No	<p>Lamp not ON or OFF with specified switch Check for cause (Refer to specified check sequence) ☞ page F-106</p> <p>Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker</p>
Yes	Go to next step					
No	<p>Lamp not ON or OFF with specified switch Check for cause (Refer to specified check sequence) ☞ page F-106</p> <p>Lamp always ON Check wiring between ECU terminal 1D and Self-Diagnosis Checker</p>					
3	<p>Check for correct intake manifold vacuum at idle</p> <p>Vacuum: More than 450 mmHg (17.7 inHg)</p>	<table border="1"> <tr> <td>Yes</td> <td>Go to next step</td> </tr> <tr> <td>No</td> <td>Check for air leakage at intake air system components</td> </tr> </table>	Yes	Go to next step	No	Check for air leakage at intake air system components
Yes	Go to next step					
No	Check for air leakage at intake air system components					
4	<p>Check if air cleaner element is clean</p> <p style="text-align: right;">☞ page F-79</p>	<table border="1"> <tr> <td>Yes</td> <td>Go to next step</td> </tr> <tr> <td>No</td> <td>Replace air cleaner element</td> </tr> </table>	Yes	Go to next step	No	Replace air cleaner element
Yes	Go to next step					
No	Replace air cleaner element					
5	<p>Check if ECU terminal voltages are OK MTX... Especially 1N, 2A, 2U and 2V ATX... Especially 1T, 3A, 3U and 3V</p> <p style="text-align: right;">☞ page F-150</p>	<table border="1"> <tr> <td>Yes</td> <td>Go to next step</td> </tr> <tr> <td>No</td> <td>Check for cause ☞ page F-151</td> </tr> </table>	Yes	Go to next step	No	Check for cause ☞ page F-151
Yes	Go to next step					
No	Check for cause ☞ page F-151					

STEP	INSPECTION	ACTION															
6	Check if fuel cut operation is OK ☞ page F-143	Yes	Go to next step														
		No	Try known good ECU and check if condition improves ☞ page F-149														
7	Check if airflow meter is OK ☞ page F-168 I. Check if measuring plate moves smoothly  II. Check resistance   <table border="1"> <thead> <tr> <th rowspan="2">Terminal</th> <th colspan="2">Resistance (Ω)</th> </tr> <tr> <th>Fully closed</th> <th>Fully open</th> </tr> </thead> <tbody> <tr> <td>E2↔Vs</td> <td>20—600</td> <td>20—1,000</td> </tr> <tr> <td>E2↔Vc</td> <td colspan="2">200—400</td> </tr> <tr> <td>E1↔Fc</td> <td>∞</td> <td>0</td> </tr> </tbody> </table>	Terminal	Resistance (Ω)		Fully closed	Fully open	E2↔Vs	20—600	20—1,000	E2↔Vc	200—400		E1↔Fc	∞	0	Yes	Go to next step
			Terminal	Resistance (Ω)													
Fully closed	Fully open																
E2↔Vs	20—600	20—1,000															
E2↔Vc	200—400																
E1↔Fc	∞	0															
No	Repair or replace																
8	Check if throttle sensor IDL terminal is OK ☞ page F-169	Yes	Go to next step														
		No	Adjust ☞ page F-169														
9	Check if dashpot is correctly adjusted ☞ page F-142 Dashpot set speed: B6..... Approx. 3,000 rpm BP SOHC..... Approx. 2,700 rpm BP DOHC..... Approx. 3,500 rpm	Yes	Check if throttle valve is contaminated ⇨ If contaminated, clean throttle body ⇨ If not contaminated, replace throttle body														
		No	Adjust ☞ page F-142														
10	Check injector for fuel leakage ☞ page F-132 	Yes	Replace														
		No	Go to next step														
11	Try known good ECU and check if condition improves ☞ page F-149																

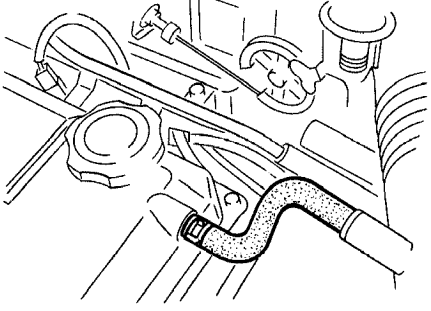
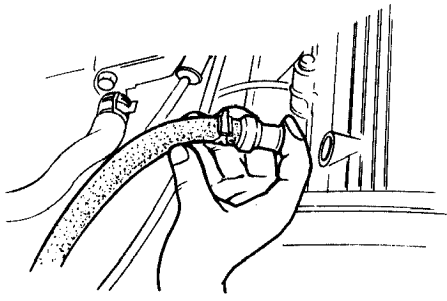
STEP	INSPECTION	ACTION	
5	Check for correct fuel line pressure at idle ☞ page F-129	Yes	Check if fuel line pressure decreases when accelerating quickly ⇒ If it decreases, check for clogging between fuel pump and pressure regulator ⇒ If not decrease, go to next step
	Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)	No	Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ page F-126
6	Check if cooling system is OK ☞ page E-13	Yes	Go to next step
	No	Repair or replace • Thermostat ☞ page E-9 • Electric cooling fan ☞ page E-15 • Radiator ☞ page E-8	
7	Try known good ECU and check if condition improves ☞ page F-149	Yes	Replace ECU ☞ page F-149
	No	Change fuel to another brand or use higher octane fuel	



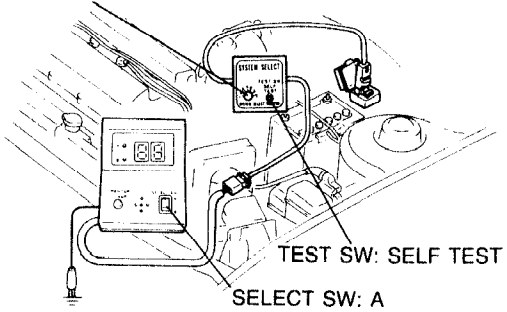
23	FUEL ODOR	
DESCRIPTION	• Gasoline odor in cabin	
[TROUBLESHOOTING HINTS]		
① Poor connection or damaged at fuel system or evaporative emission control system ② Charcoal canister overflow due to evaporative emission control system malfunction		
STEP	INSPECTION	ACTION
1	Check if fuel leakage or damage of fuel system and evaporative emission control system ☞ page F-120	Yes: Repair or replace No: Go to next step
2	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1 	Yes: Go to next step No: <ul style="list-style-type: none"> Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83 "88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker
3	Check if vacuum is felt at solenoid valve (purge control) with engine running and throttle valve opened (Neutral switch connector disconnected) 	Yes: Go to Step 5 No: <ul style="list-style-type: none"> Check for solenoid valve operating sound ⇒ If OK, check vacuum hoses for clogging ⇒ If not OK, go to next step
4	Apply battery voltage and ground to solenoid valve (purge control) and check if vacuum is felt at solenoid valve at idle 	Yes: Check ECU terminal voltages ☞ page F-150 No: Replace solenoid valve
5	Try known good ECU and check if condition improves ☞ page F-150	

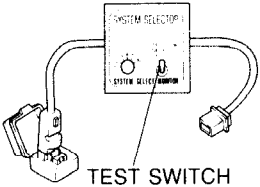
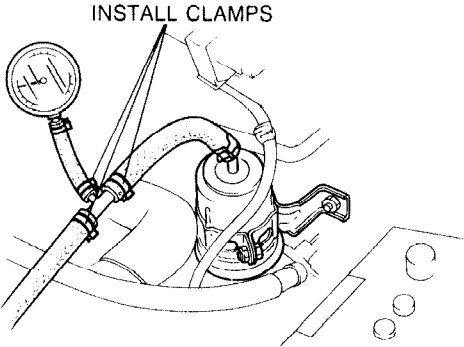
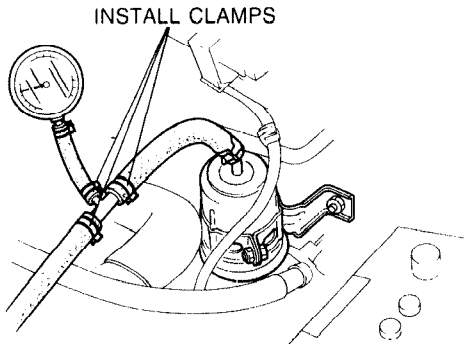
24	EXHAUST SULFUR SMELL	
DESCRIP-TION	• Exhaust gas smells abnormally	
[TROUBLESHOOTING HINTS] High sulfur content fuel used		
STEP	INSPECTION	ACTION
1	Change fuel to another brand	

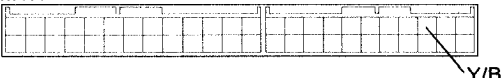

03U0FX-039

25	HIGH OIL CONSUMPTION		
DESCRIP-TION	• Oil consumption excessive		
[TROUBLESHOOTING HINTS] ① PCV system malfunction ② Engine malfunction (Oil working up, working down, or leakage)			
STEP	INSPECTION	ACTION	
1	Check if PCV hose, ventilation hose or their attaching nipples are separated, damaged, clogged, or restricted ☞ page F-138	Yes	Repair or replace
		No	Go to next step
2	Check if air pressure or oil is present at ventilation hose 	Yes	Go to next step
		No	Check engine condition ☞ page B1-3 B2-3 • Oil leakage • Worn valve seal • Worn valve stem • Worn valve guide
3	Check if vacuum is felt at PCV valve at idle ☞ page F-138 	Yes	Check engine condition ☞ page B1-3 B2-3 • Worn piston ring groove • Stuck piston rings • Worn piston or cylinder
		No	Replace PCV valve

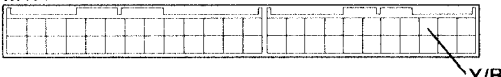

23U0FX-040

26	POOR FUEL ECONOMY		
DESCRIP- TION	<ul style="list-style-type: none"> • Fuel economy unsatisfactory 		
[TROUBLESHOOTING HINTS]			
<p>While fuel consumption is drastically increased by city driving, short-run operation, stop and go driving, extended winter warm-up periods, etc., as opposed to "trip" mileage, an attempt should be made to determine these factors when confronted with "poor mileage" conditions. However, since the operator is not always at fault, the following is offered.</p>			
<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>① Operator depressing accelerator more than usual due to low engine power</p> <ul style="list-style-type: none"> • Poor ignition • Low intake air amount • Electronic spark advance control system malfunction • Clutch slipping/ATX slipping • Exhaust component restricted </div> <div style="width: 48%;"> <p>② Air/Fuel mixture too rich</p> <ul style="list-style-type: none"> • High fuel line pressure <p>③ Alcohol blended fuel used</p> <p>④ High vehicle load</p> <ul style="list-style-type: none"> • Low tire pressure • Incorrect tire size • Brake dragging </div> </div>			
STEP	INSPECTION		ACTION
1	Check factors other than engine <ul style="list-style-type: none"> • Low tire pressure ☞ Section Q • Unrecommended tire size ☞ Section Q • Clutch slipping ☞ Section H • Brake dragging ☞ Section P • Exhaust component restricted ☞ page F-136 	Yes	Go to next step
		No	Repair
2	Check if air hoses are connected correctly ☞ page F-109	Yes	Go to next step
		No	Repair
3	Check if "00" is displayed on Self-Diagnosis Checker with ignition switch ON ☞ page F-82 SYSTEM SELECT: 1 	Yes	Go to next step
		No	Service Code No. displayed Check for cause (Refer to specified check sequence) ☞ page F-83
		No	"88" flashes Check ECU terminal 1F voltage ☞ page F-150 Specification: Battery voltage (Ignition switch ON) ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, check wiring between ECU and Self-Diagnosis Checker
4	Check for correct intake manifold vacuum at idle Vacuum: More than 450 mmHg (17.7 inHg)	Yes	Go to next step
		No	Check for air leakage at intake air system components
5	Check if air cleaner element is clean ☞ page F-79	Yes	Go to next step
		No	Replace air cleaner element


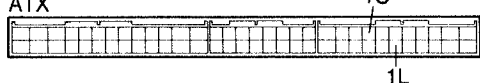
STEP	INSPECTION		ACTION
6	Check if ECU terminal voltages are OK MTX... Especially 2D, 2N, 2O, 2Q, 2U and 2V ATX... Especially 2B, 2C, 2E, 3D, 3U and 3V ☞ page F-150	Yes	Go to next step
		No	Check for cause ☞ page F-151
7	Connect System Selector to diagnosis connector and set Test Switch to "SELF TEST" and check for correct ignition timing at idle after warm-up ☞ page F-79 Ignition timing (BTDC) • BP DOHC : 9°—11° • BP SOHC : 4°—6° • B6 : 6°—8°	Yes	Go to next step
	 <p style="text-align: center;">TEST SWITCH</p>	No	Adjust ☞ page F-79
8	Check for correct fuel line pressure at idle ☞ page F-129 Fuel line pressure: 216—265 kPa (2.2—2.7 kg/cm², 31—38 psi)	Yes	Go to next step
	 <p style="text-align: center;">INSTALL CLAMPS</p>	No	High pressure Check if vacuum hose to pressure regulator is damaged or poorly connected ⇨ If OK, replace pressure regulator ☞ page F-130 ⇨ If not OK, repair or replace hose
9	Run engine at idle and check if fuel line pressure is held after ignition switch turned OFF ☞ page F-121 Fuel line pressure: More than 147 kPa (1.5 kg/cm², 21 psi) for 5 min.	Yes	Go to next step
	 <p style="text-align: center;">INSTALL CLAMPS</p>	No	Check injectors for fuel leakage ☞ page F-132
10	Change fuel to another brand		

27	MIL ALWAYS ON	
DESCRIP-TION	<ul style="list-style-type: none"> • Self-Diagnosis Checker does not indicate Malfunction Code No. but MIL always ON 	
[TROUBLESHOOTING HINTS]		
<ul style="list-style-type: none"> • Short circuit in wiring harness • ECU malfunction 		
STEP	INSPECTION	ACTION
1	Disconnect (Y/B) wire from ECU and check if MIL goes off MTX  ATX 	Yes Replace ECU ☞ page F-149
	No Check for short circuit in wiring between instrument cluster and ECU	

23U0FX-042

28	MIL NEVER ON	
DESCRIP-TION	<ul style="list-style-type: none"> • Self-Diagnosis Checker indicates Malfunction Code No. of input device but MIL never ON • Other indicator and warning lamps OK 	
[TROUBLESHOOTING HINTS]		
<ul style="list-style-type: none"> • Bulb burned • Open circuit in wiring harness • ECU malfunction 		
STEP	INSPECTION	ACTION
1	Ground (Y/B) wire at ECU with jumper wire and check if MIL comes on MTX  ATX 	Yes Check connection of ECU connector ⇨ If OK, replace ECU ☞ page F-149 ⇨ If not OK, repair ECU connector
	No Check if bulb is OK ⇨ If OK, repair (Y/B) wire between ECU and instrument cluster ⇨ If not OK, replace bulb ☞ page T-63	

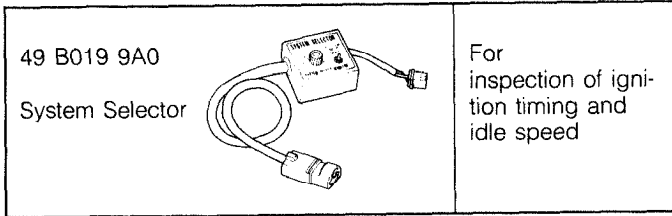
23U0FX-043

29	A/C DOES NOT WORK	
DESCRIP-TION	<ul style="list-style-type: none"> • Blower fan operates but magnet clutch does not operate 	
[TROUBLESHOOTING HINTS]		
<ul style="list-style-type: none"> • Open or short circuit in wiring harness • A/C relay, A/C switch, or magnetic clutch malfunction • ECU malfunction 		
STEP	INSPECTION	ACTION
1	Check ECU terminal 1Q (MTX) 1O (ATX) voltage OK ☞ page F-152 MTX  ATX 	Yes Check ECU terminal 1J (MTX) 1L (ATX) voltage OK ☞ page F-152 ⇨ If OK, check A/C system ☞ page U-30 ⇨ If not OK, replace ECU ☞ page F-149
	No Check for cause ☞ page F-153	

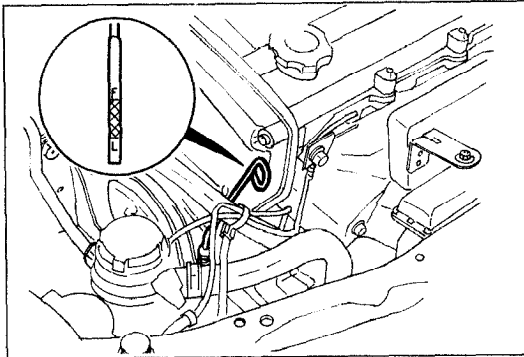
23U0FX-044

ENGINE TUNE-UP

PREPARATION SST



03U0FX-045

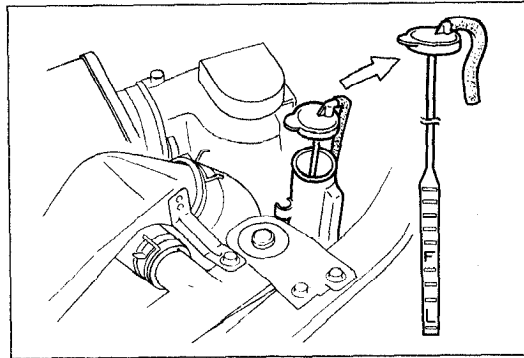


03U0FX-046

BASIC INSPECTION

Engine Oil

1. Remove the engine oil level gauge and check the engine oil level and oil condition.
2. Add or change the oil as necessary.



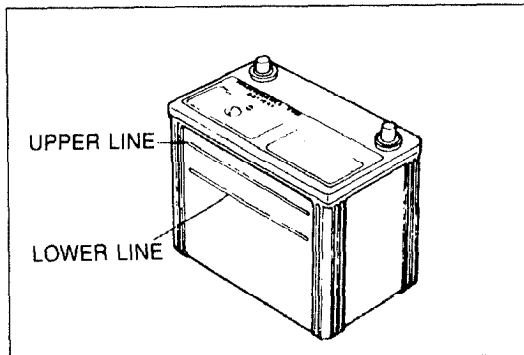
03U0FX-047

Coolant

Warning

- Never remove the radiator cap while the engine is hot.
- Wrap a thick cloth around the cap before carefully removing it.

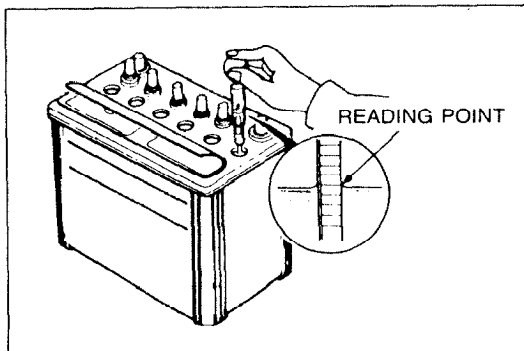
1. Remove the coolant level gauge from the coolant reservoir.
2. Check that the coolant level is between the L and F marks of the gauge.
3. Add coolant if necessary.



03U0FX-048

Battery

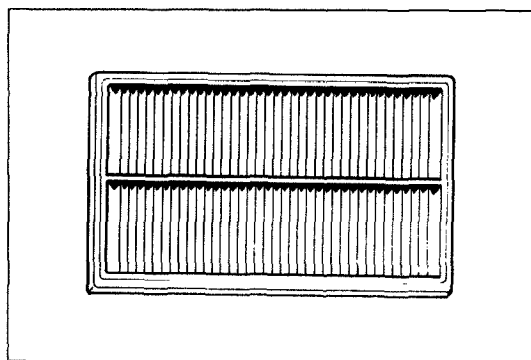
1. Check for corrosion on the terminals and for loose cable connections. If necessary, clean the clamps and tighten them firmly.
2. Check that the electrolyte level is between the UPPER LEVEL and LOWER LEVEL marks.
3. Add distilled water if necessary.



03U0FX-049

4. Check the specific gravity with a hydrometer.

Gravity: 1.27—1.29 (at 20°C [68°F])



03U0FX-050

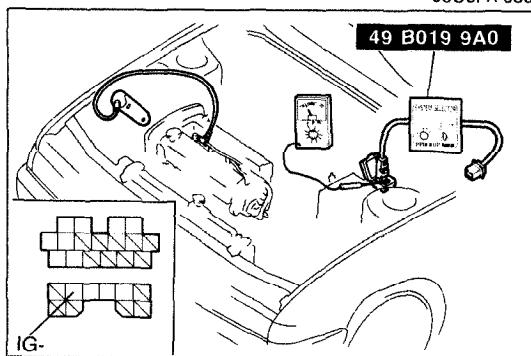
Air Cleaner Element Inspection

1. Check the air cleaner element for excessive dirt, damage, or oil.

Caution

- Do not use compression air to clean the element.

2. Replace the element if necessary.

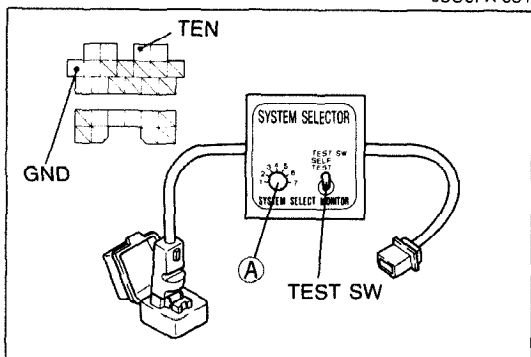


03U0FX-051

ADJUSTMENT

Preparation

1. Warm up the engine to normal operating temperature.
2. Turn all electric loads OFF.
3. Connect the **SST** to the diagnosis connector.
4. Connect a timing light.
5. Connect a tachometer to the diagnosis connector **IG-** terminal as shown.

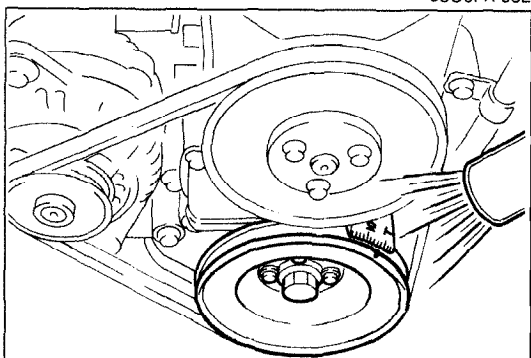


03U0FX-052

6. Set switch (A) to position 1.
7. Set TEST SW to SELF-TEST.

Note

- If the **SST** is not used, jump across the **TEN** terminal and the **GND** terminal of the diagnosis connector.



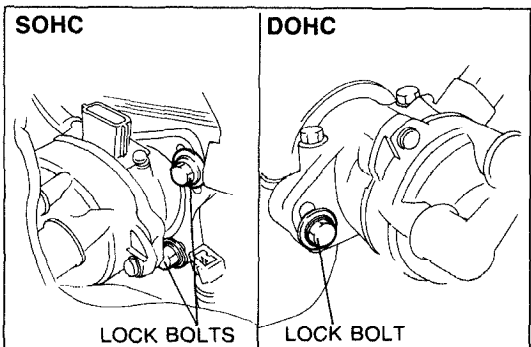
23U0FX-045

Ignition Timing

1. Perform "Preparation". (Refer to above.)
2. Check if the timing mark (yellow) on the crankshaft pulley and the mark on the timing belt cover are aligned.

Specification:

Engine	B6	BP SOHC	BP DOHC
Ignition Timing BTDC	6°—8°	4°—6°	9°—11°



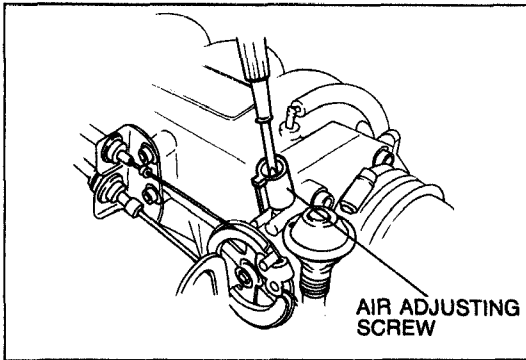
03U0FX-054

3. If the marks are not aligned, loosen the distributor lock bolts, and turn the distributor to make the adjustment.
4. Tighten the distributor lock bolts to the specified torque.

Tightening torque:

19—25 Nm (1.9—2.6 m·kg, 14—19 ft·lb)

5. Disconnect the **SST**.



23U0FX-046

Idle Speed

1. Perform "Preparation". (Refer to page F-79.)
2. Apply parking brake.
3. Check that the idle speed is within specification.

Idle speed (Neutral or P range): 700—800 rpm**Caution**

- Check the idle speed without the electric cooling fan operating.

Note

- When the parking brake is not applied, the idle speed for ATX model (Canada) is approx. 800 rpm.
4. If not within the specification, adjust the idle by turning the air adjusting screw.
 5. Disconnect the **SST**.

MEMO

SELF-DIAGNOSIS FUNCTION

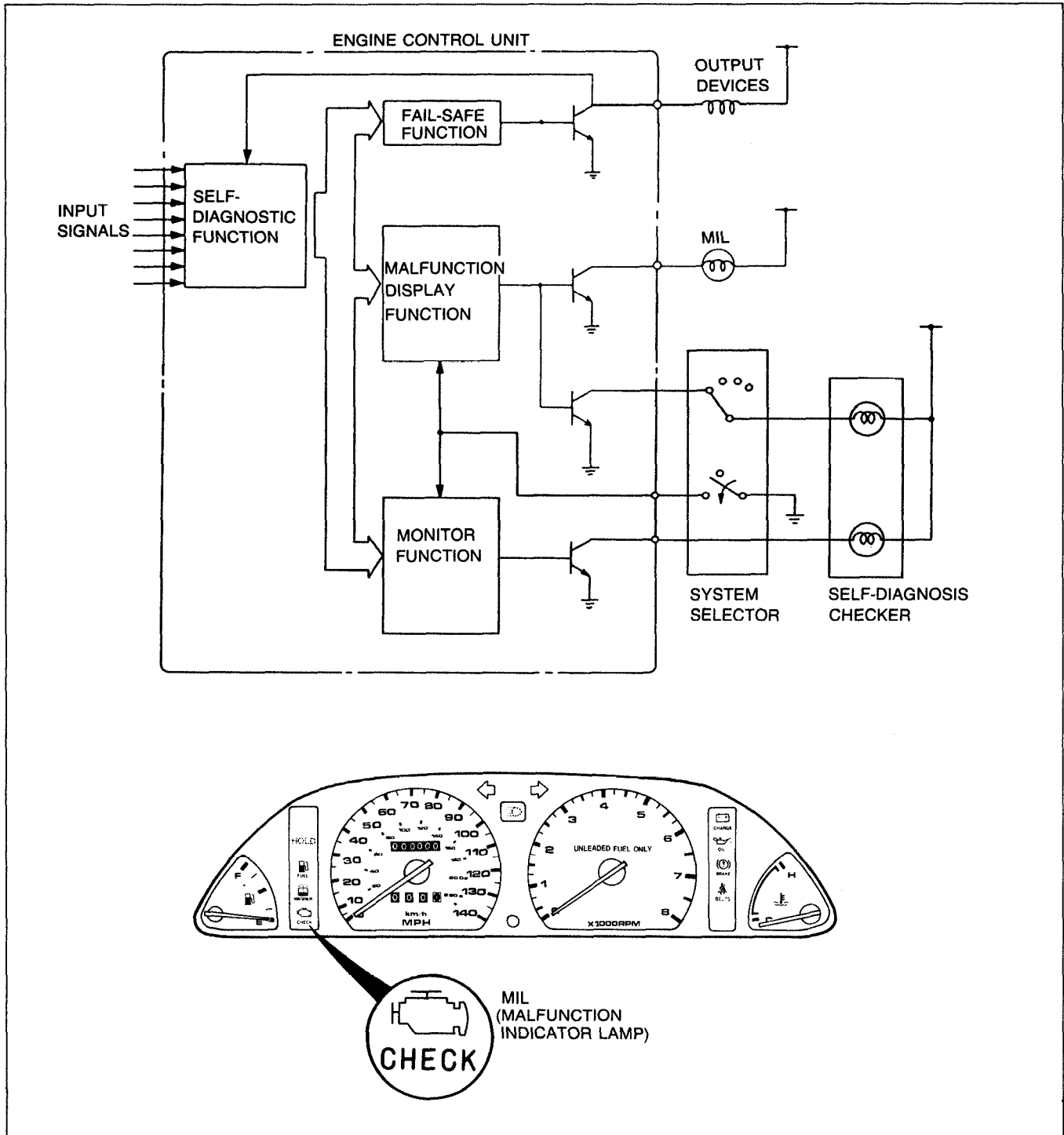
DESCRIPTION

The engine control unit (integrated with the EC-AT control unit) has built-in Self-Diagnosis function the same as for the previous models. When trouble occurs in the main input devices or output devices, they are indicated and retrieved from the engine control unit (ECU) as service code numbers.

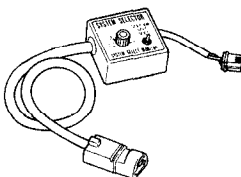
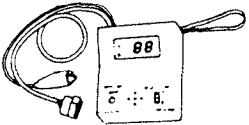
When inspecting for service code(s) memorized in the ECU use the Self-Diagnosis checker and system selector (SST).

Note

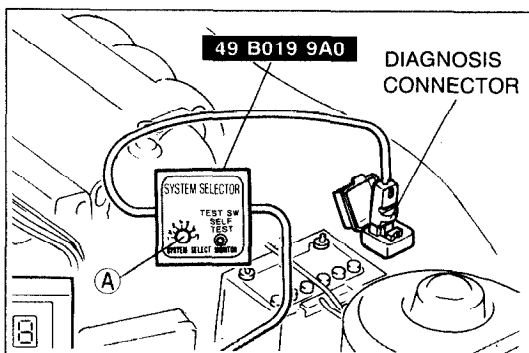
- The ECU constantly checks for malfunction of the in put devices. But, the ECU checks for malfunction of output devices only in a three second period after the ignition switch is turned ON and the TEN terminal of the diagnosis connector is grounded.



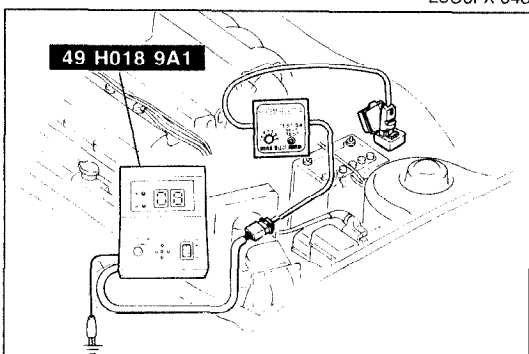
PREPARATION
SST

<p>49 B019 9A0 System Selector</p> 	<p>For diagnosis</p>	<p>49 H018 9A1 Self-Diagnosis Checker</p> 	<p>For diagnosis</p>
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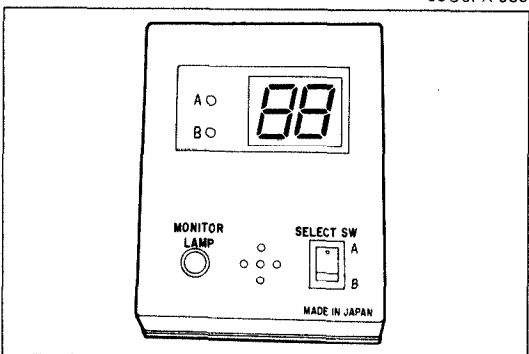
03U0FX-057



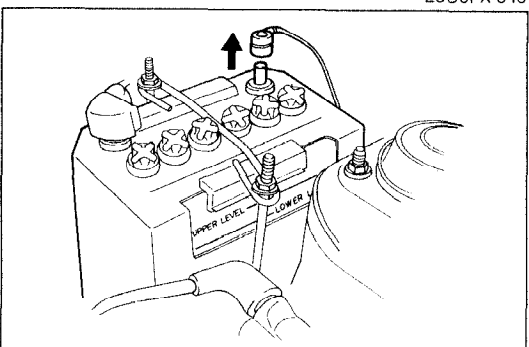
23U0FX-048



03U0FX-059



23U0FX-049



23U0FX-050

SERVICE CODE NUMBER

Inspection Procedure

1. Connect the **SST** to the diagnosis connector.
2. Set switch (A) to position 1.
3. Set TEST SW to SELF-TEST position.
4. Connect the **SST** to the System Selector and a ground.
5. Set the select switch to position A.
6. Turn the ignition switch to ON.
7. Verify that 88 flashes on the digital display and the buzzer sounds for **3 sec.** after turning the ignition switch ON.
8. If 88 does not flash, check the main relay (FUEL INJ relay) (Refer to page F-172), power supply circuit, and diagnosis connector wiring.
9. If 88 flashes and the buzzer sounds continuously for more than **20 sec.**, check for a short circuit between the engine control unit terminal 1F and the diagnosis connector. Replace the engine control unit if necessary and perform Steps 3 and 7 again.
10. Note any code numbers and check for the causes by referring to the check sequences shown on pages **F-86** through **F-103**. Repair as necessary.

Note

- **Cancel the code numbers by performing the after-repair procedure following repairs. (Refer to page F-104.)**







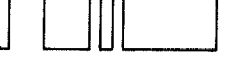



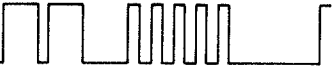
F

SELF-DIAGNOSIS FUNCTION






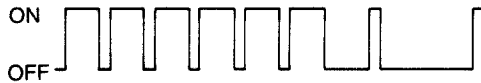
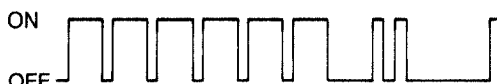
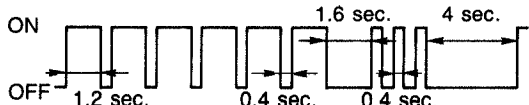
Troubleshooting

If a service code number is shown on the **SST**, check for the cause by using the chart related to the code number shown.

Service code number

CODE NO.	LOCATION OF MALFUNCTION	OUTPUT SIGNAL PATTERN	SELF-DIAGNOSIS	FAIL-SAFE
02	Ne-signal	ON  OFF	No Ne-signal	—
03	G-signal (DOHC)	ON  OFF	No G-signal	Cancels 2-group injection
06*	Vehicle speed sensor	ON  OFF	No input signal from vehicle speed sensor	Shifting performed normally
08	Airflow meter	ON  OFF	Open or short circuit	Basic fuel injection amount fixed as for two driving modes (1) Idle switch ON (2) Idle switch OFF
09	Water thermosensor	ON  OFF		Maintains constant 20°C (68°F) command
10	Intake air thermosensor	ON  OFF		Maintains constant 20°C (68°F) command
12	Throttle sensor	ON  OFF		Throttle opening judged as full stroke lockup not provided
14	Atmospheric pressure sensor (in ECU)	ON  OFF		Maintains constant command of sea level pressure
15	Oxygen sensor (Inactivation)	ON  OFF	Sensor output continues less than 0.55V 95 sec. after engine starts (1500 rpm)	Cancels engine feedback operation
17	Oxygen sensor (Inversion)	ON  OFF	Sensor output continues uncharged 50 sec. after engine exceeds 1500 rpm	Cancels engine feedback operation
25	Solenoid valve (pressure regulator)	ON  OFF	Open or short circuit	—

*If the marked code numbers appear, refer to Section K

CODE NO.	LOCATION OF MALFUNCTION	OUTPUT SIGNAL PATTERN	SELF-DIAGNOSIS	FAIL-SAFE
26	Solenoid valve (purge control)		Open or short circuit	—
34	ISC valve			—
41	Solenoid valve (VICS) [DOHC]			—
55*	Pulse generator		No input signal from pulse generator	Shifting performed in accordance with signals from vehicle speed sensor
60*	1-2 shift solenoid valve		Open or short circuit	Solenoid valve(s) performs the shifting with as little interference as possible with driving performance Lockup not provided
61*	2-3 shift solenoid valve			
62*	3-4 shift solenoid valve			
63*	Lockup solenoid valve			

*If the marked code numbers appear, refer to Section K

Note

- The HOLD indicator does not flash the service code numbers.
- If there is more than one failure present, the code numbers will be indicated in numerical order, lowest number first.
- After repairing a problem, turn the ignition switch OFF and disconnect the negative battery cable at least 20 seconds to erase the service code numbers from the engine control unit (ECU) memory.

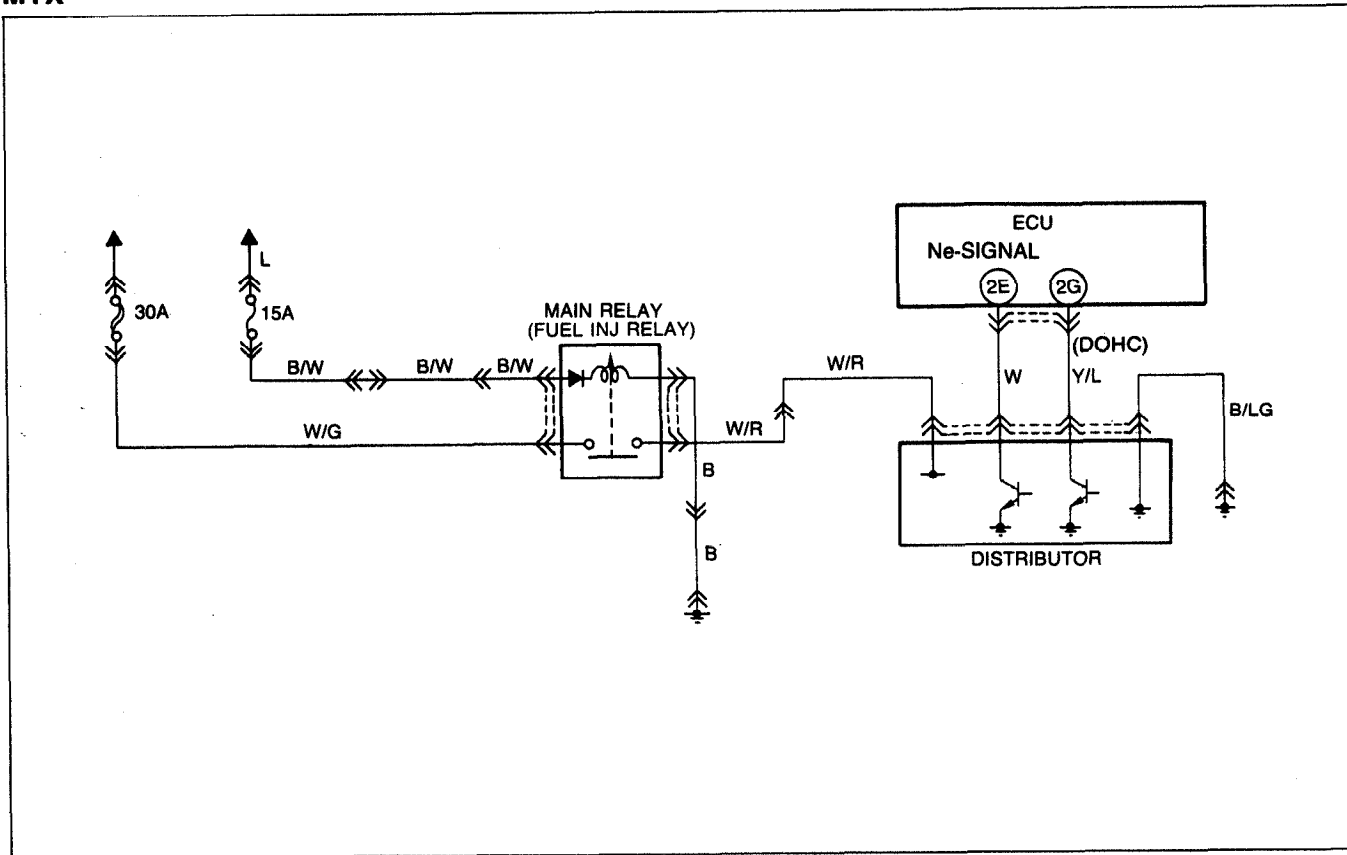
Troubleshooting

If a service code number is shown on the **SST**, check for the cause by using the chart related to the code number shown.

CODE No.	02 (DISTRIBUTOR Ne-SIGNAL)		
STEP	INSPECTION		ACTION
1	Check distributor circuit for poor connection	Yes	Repair or replace connector
		No	SOHC Go to Step 3 DOHC Go to next step
2	Check if Code No.03 is also present	Yes	Go to next step
		No	Go to Step 5
3	Check terminal-wire for continuity	Yes	Go to next step
		No	Repair or replace
4	Check if battery voltage exists at distributor terminal-wire	Yes	Go to next step
		No	Check for open circuit in wiring from distributor to main relay (FUEL INJ relay)
5	Check terminal-wire between distributor and ECU terminal 2E (MTX) 2A (ATX) for continuity and ground	Yes	Go to next step
		No	Repair or replace
6	Check if ECU terminal 2E (MTX) 2A (ATX) voltage is OK ☞ page F-152	Yes	Replace ECU ☞ page F-149
		No	Go to next step
7	Check if 0V or 4.5V—5.5V exists at distributor terminal-wire (W)	Yes	Replace distributor
		No	Go to next step
8	Check if 4.5V—5.5V exists at ECU terminal 2E (MTX) 2A (ATX) (With distributor connector disconnected)	Yes	Check for short circuit in wiring from distributor to ECU
		No	Replace ECU ☞ page F-149

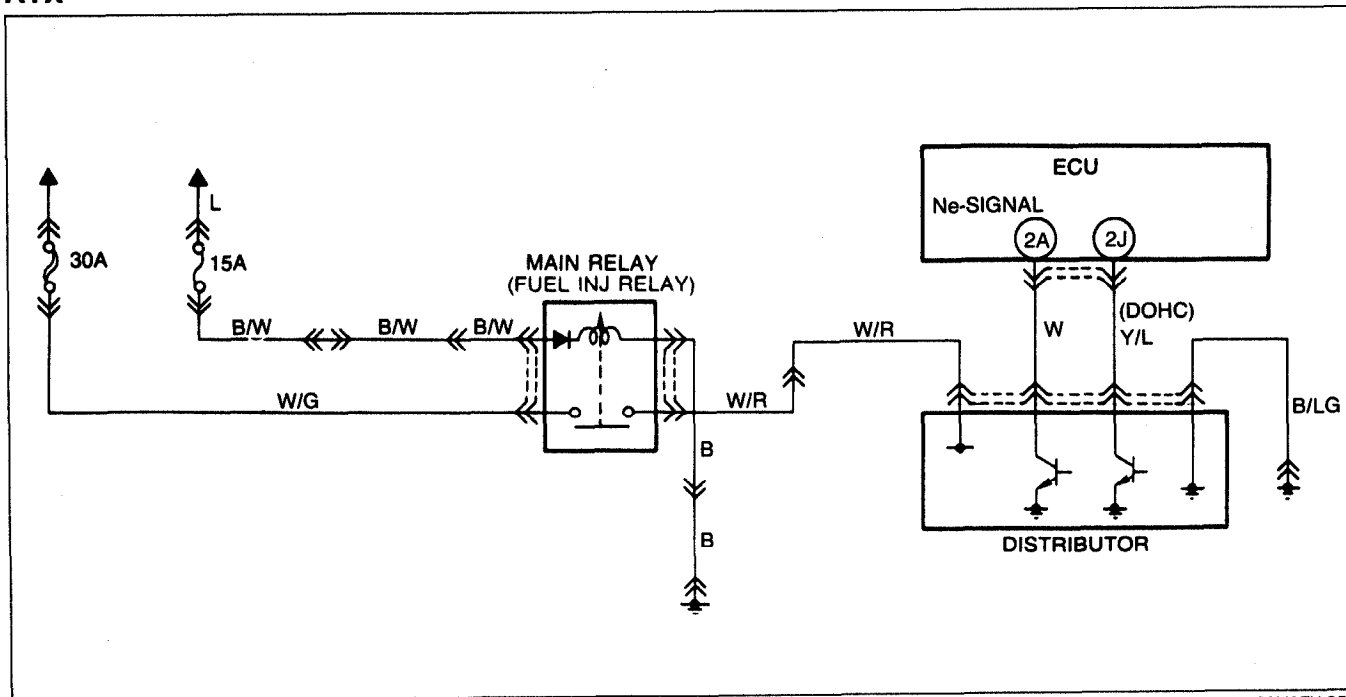
23U0FX-052

Circuit Diagram
MTX



23U0FX-053

ATX

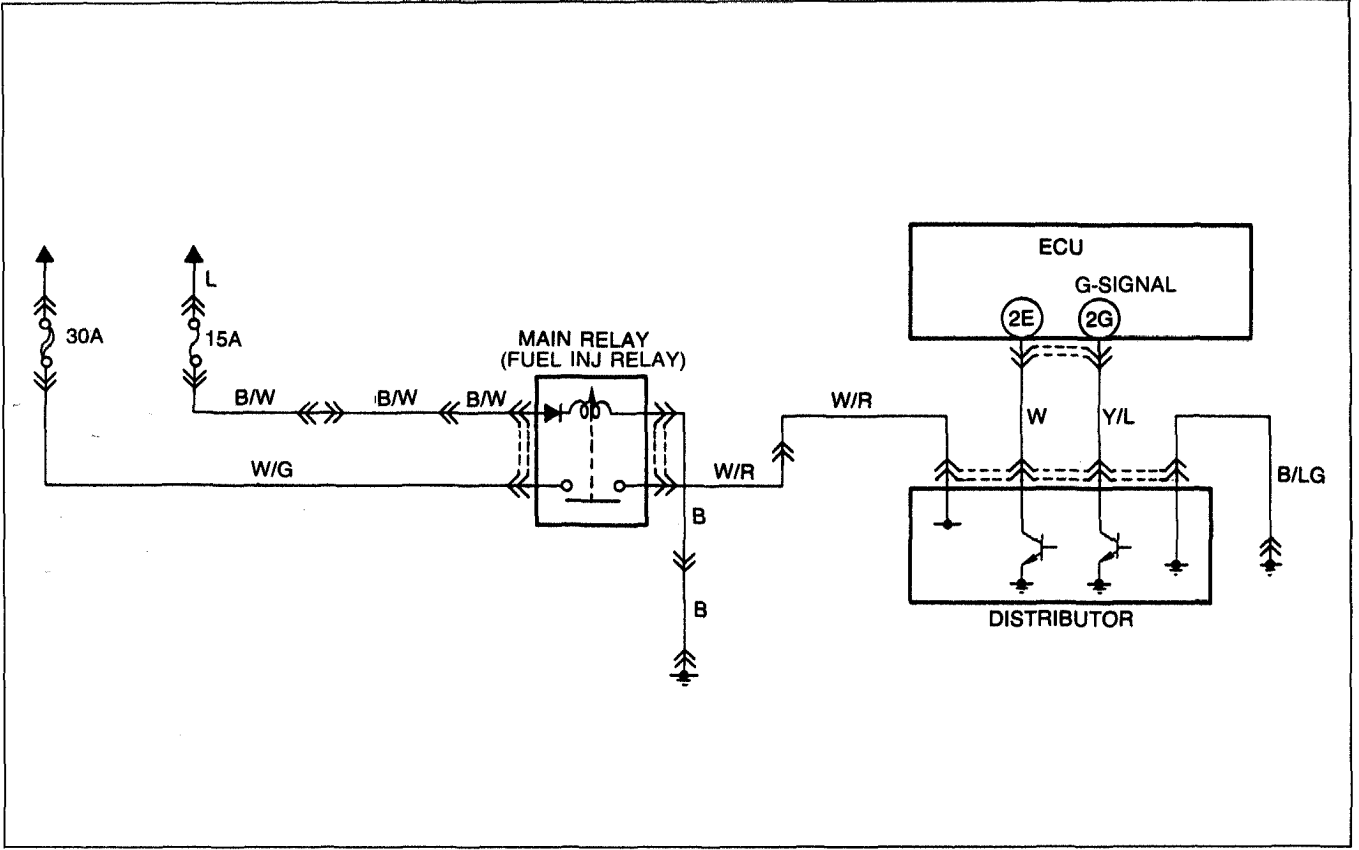


23U0FX-054

CODE No.		03 (DISTRIBUTOR G-SIGNAL) — DOHC	
STEP	INSPECTION	ACTION	
1	Check distributor circuit for poor connection	Yes	Repair or replace connector
		No	Go to next step
2	Check if Code No.02 is also present	Yes	Go to next step
		No	Go to Step 5
3	Check terminal-wire for continuity	Yes	Go to next step
		No	Repair or replace
4	Check if battery voltage exists at distributor terminal-wire	Yes	Go to next step
		No	Check for open circuit in wiring from distributor to main relay
5	Check terminal-wire between distributor and ECU terminal 2G (MTX) 2J (ATX) for continuity and ground	Yes	Go to next step
		No	Repair or replace
6	Check if ECU terminal 2G (MTX) 2J (ATX) voltage is OK ☞ page F-154	Yes	Replace ECU ☞ page F-149
		No	Go to next step
7	Check if 0V or 4.5V—5.5V exists at distributor terminal-wire	Yes	Replace distributor
		No	Go to next step
8	Check if 4.5V—5.5V exists at ECU terminal 2G (MTX) 2J (ATX) (With distributor connector disconnected)	Yes	Check for short circuit in wiring from distributor to ECU
		No	Replace ECU ☞ page F-149

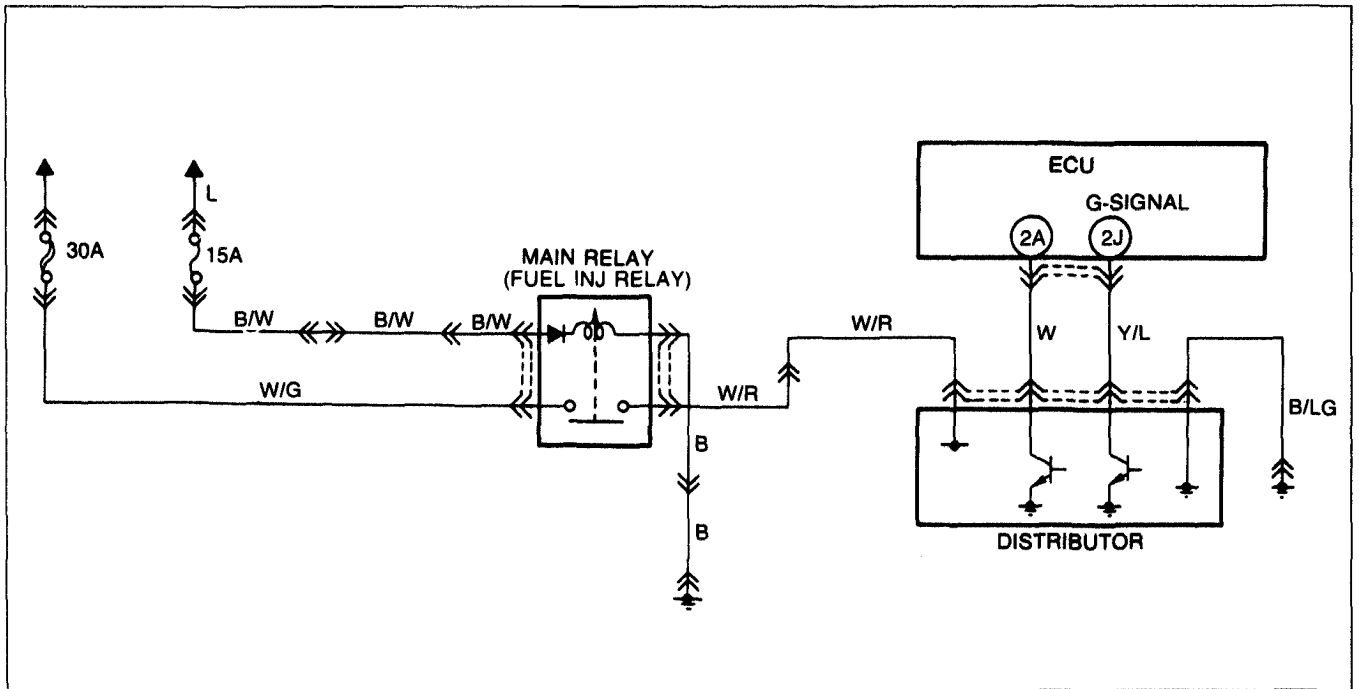
23U0FX-055

Circuit Diagram
MTX



23U0FX-056

ATX

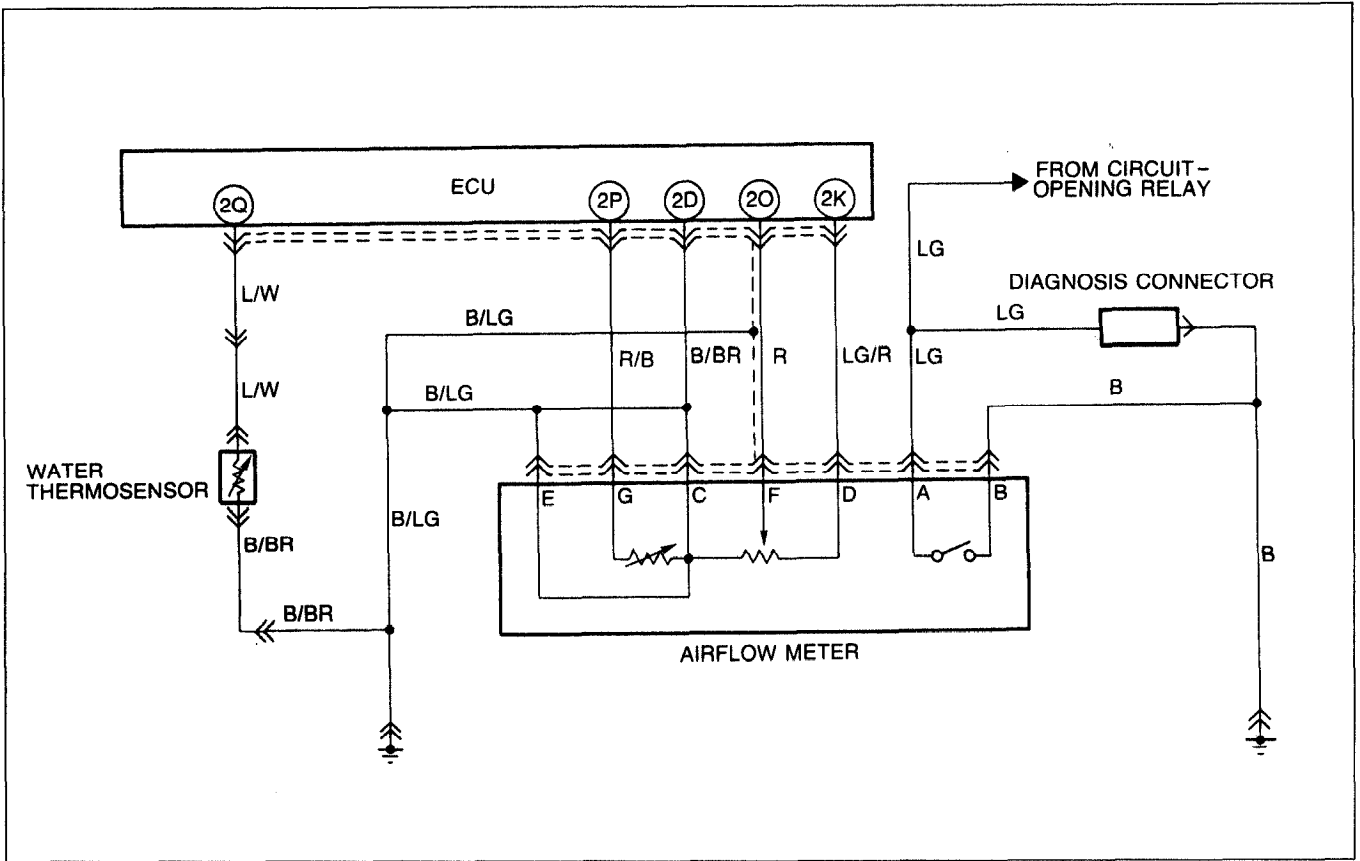


23U0FX-057

CODE No.		08 (AIRFLOW METER)										
STEP	INSPECTION		ACTION									
1	Check airflow meter circuit for poor connection	Yes	Repair or replace connector									
		No	Go to next step									
2	Check if Code No.10 is also present	Yes	Check for open circuit in wiring from airflow meter terminal-wire (B/LG) to ground									
		No	Go to next step									
3	Check if resistance of airflow meter is OK <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Airflow meter</th> <th style="width: 30%;">Fully closed (Ω)</th> <th style="width: 30%;">Fully open (Ω)</th> </tr> </thead> <tbody> <tr> <td>D(LG/R)—F(R)</td> <td>20—600</td> <td>20—1,000</td> </tr> <tr> <td>D(LG/R)—C(B/LG)</td> <td colspan="2" style="text-align: center;">200—400</td> </tr> </tbody> </table>	Airflow meter	Fully closed (Ω)	Fully open (Ω)	D(LG/R)—F(R)	20—600	20—1,000	D(LG/R)—C(B/LG)	200—400		Yes	Go to next step
		Airflow meter	Fully closed (Ω)	Fully open (Ω)								
		D(LG/R)—F(R)	20—600	20—1,000								
D(LG/R)—C(B/LG)	200—400											
No	Replace airflow meter											
4	Check wire harness between airflow meter and ECU for continuity <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Airflow meter</th> <th style="width: 60%;">ECU</th> </tr> </thead> <tbody> <tr> <td>D (LG/R)</td> <td>2K (MTX) 2I (ATX)</td> </tr> <tr> <td>F (R)</td> <td>2O (MTX) 2B (ATX)</td> </tr> </tbody> </table>	Airflow meter	ECU	D (LG/R)	2K (MTX) 2I (ATX)	F (R)	2O (MTX) 2B (ATX)	Yes	Go to next step			
		Airflow meter	ECU									
		D (LG/R)	2K (MTX) 2I (ATX)									
F (R)	2O (MTX) 2B (ATX)											
No	Repair or replace wire harness											
5	Check if ECU terminals voltages are OK MTX...2D, 2K and 2O ATX... 2B, 2I and 3D ☞ page F-152	Yes	Replace ECU ☞ page F-149									
		No	Check for short circuit in wiring from airflow meter to ECU									

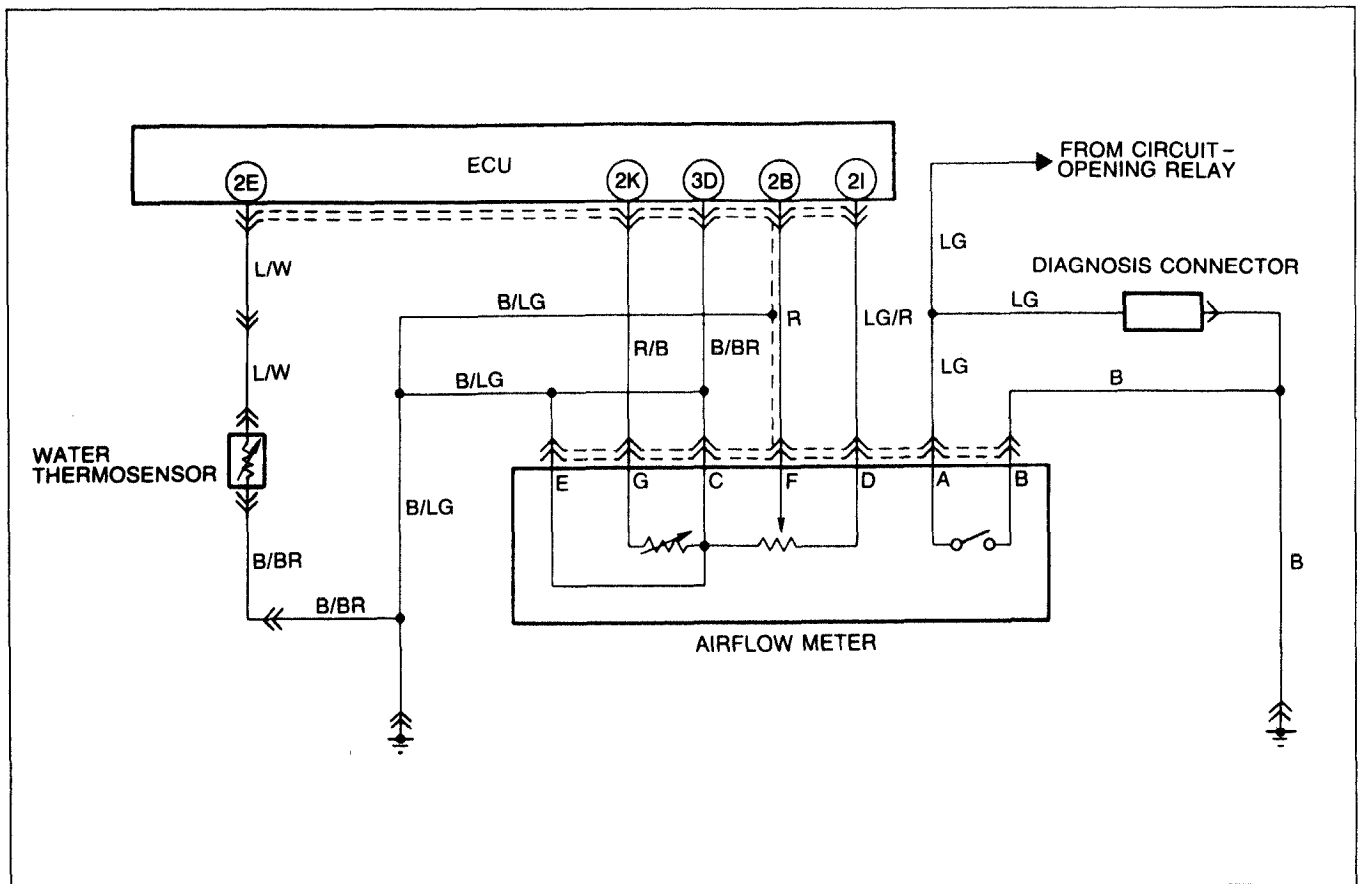
23U0FX-058

Circuit Diagram
MTX



23U0FX-059

ATX

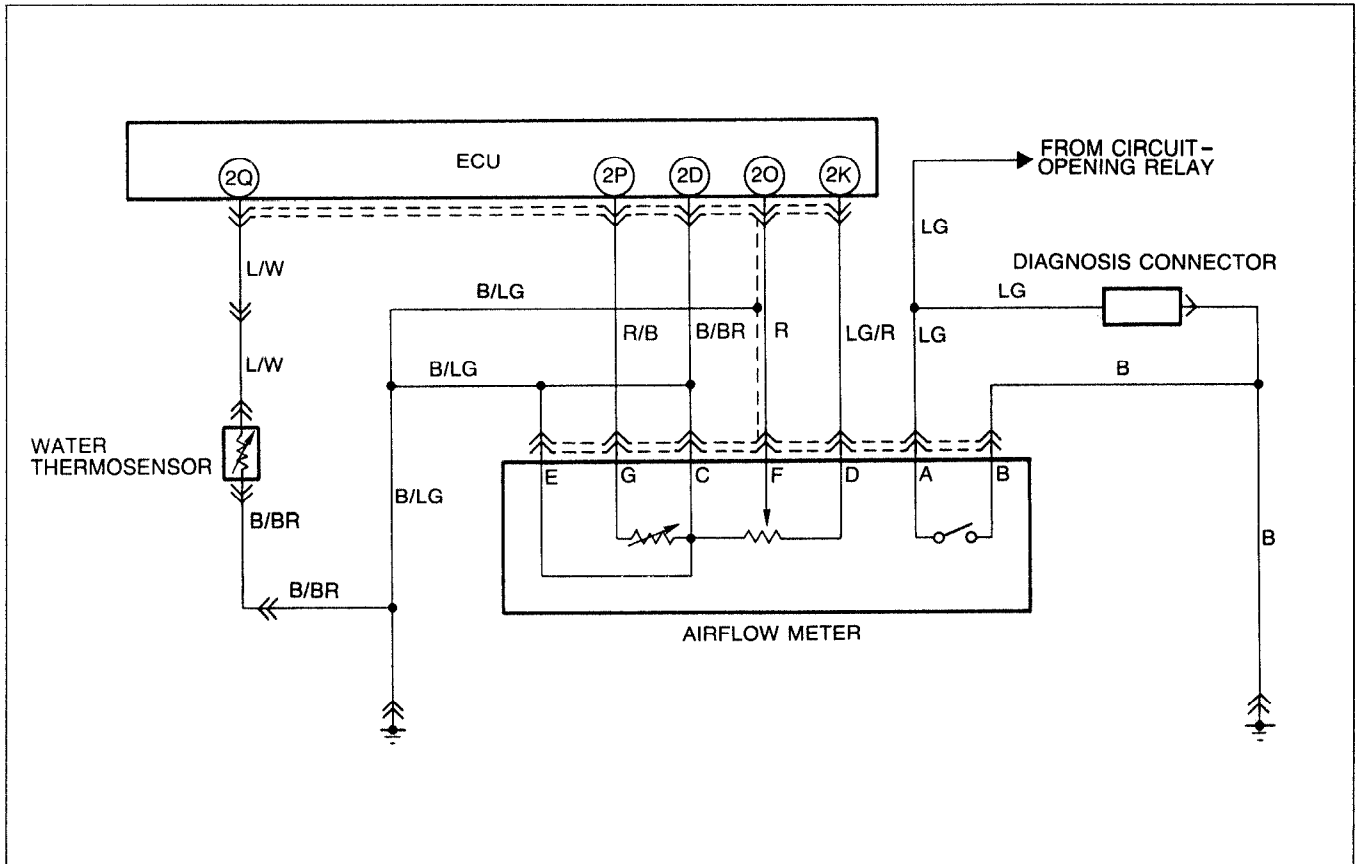


23U0FX-060

CODE No.		09 (WATER THERMOSENSOR)									
STEP	INSPECTION	ACTION									
1	Check water thermosensor circuit for poor connection	Yes	Repair or replace connector								
		No	Go to next step								
2	Check wire harness between water thermosensor and ECU for continuity <table border="1"> <thead> <tr> <th>Water thermosensor</th> <th>ECU</th> </tr> </thead> <tbody> <tr> <td>A (L/W)</td> <td>2Q (MTX) 2E (ATX)</td> </tr> <tr> <td>B (B/BR)</td> <td>2D (MTX) 3D (ATX)</td> </tr> </tbody> </table>	Water thermosensor	ECU	A (L/W)	2Q (MTX) 2E (ATX)	B (B/BR)	2D (MTX) 3D (ATX)	Yes	Go to next step		
		Water thermosensor	ECU								
A (L/W)	2Q (MTX) 2E (ATX)										
B (B/BR)	2D (MTX) 3D (ATX)										
		No	Repair or replace								
3	Check if resistance of water thermosensor is OK <table border="1"> <thead> <tr> <th>Coolant temp.</th> <th>Resistance (kΩ)</th> </tr> </thead> <tbody> <tr> <td>-20°C (-4°F)</td> <td>14.6—17.8</td> </tr> <tr> <td>20°C (68°F)</td> <td>2.21—2.69</td> </tr> <tr> <td>80°C (176°F)</td> <td>0.29—0.35</td> </tr> </tbody> </table>	Coolant temp.	Resistance (kΩ)	-20°C (-4°F)	14.6—17.8	20°C (68°F)	2.21—2.69	80°C (176°F)	0.29—0.35	Yes	Go to next step
		Coolant temp.	Resistance (kΩ)								
-20°C (-4°F)	14.6—17.8										
20°C (68°F)	2.21—2.69										
80°C (176°F)	0.29—0.35										
		No	Replace water thermosensor								
4	Check if same Code No. is present following after-repair procedure ☞ page F-104	Yes	Go to next step								
		No	Water thermosensor and circuit OK								
5	Check if ECU terminals voltages are OK MTX...2D and 2Q ATX...2E and 3D ☞ page F-152	Yes	Replace ECU ☞ page F-149								
		No	Check for short circuit in wiring from water thermosensor to ECU								

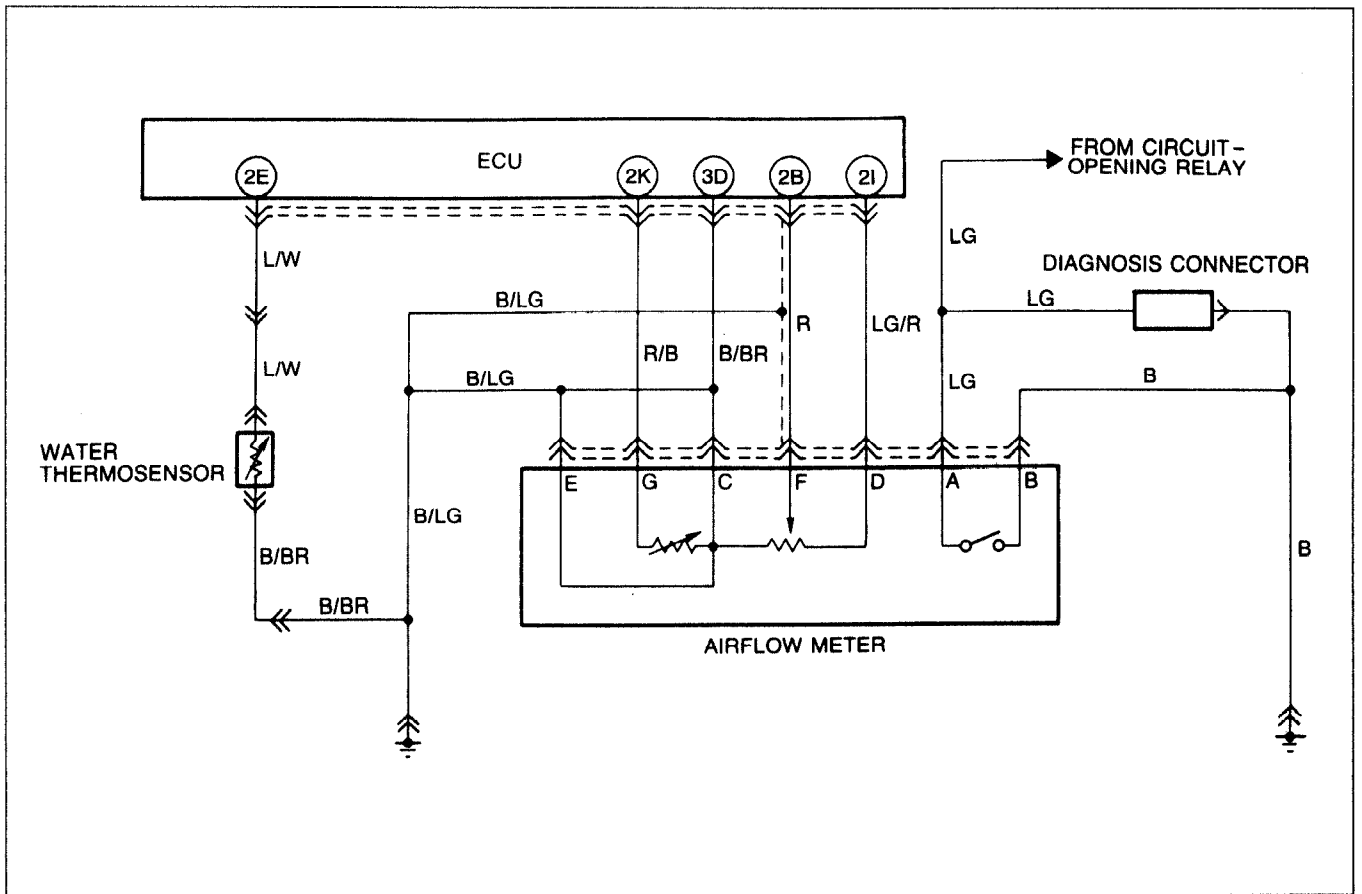
23U0FX-061

Circuit Diagram
MTX



23U0FX-062

ATX



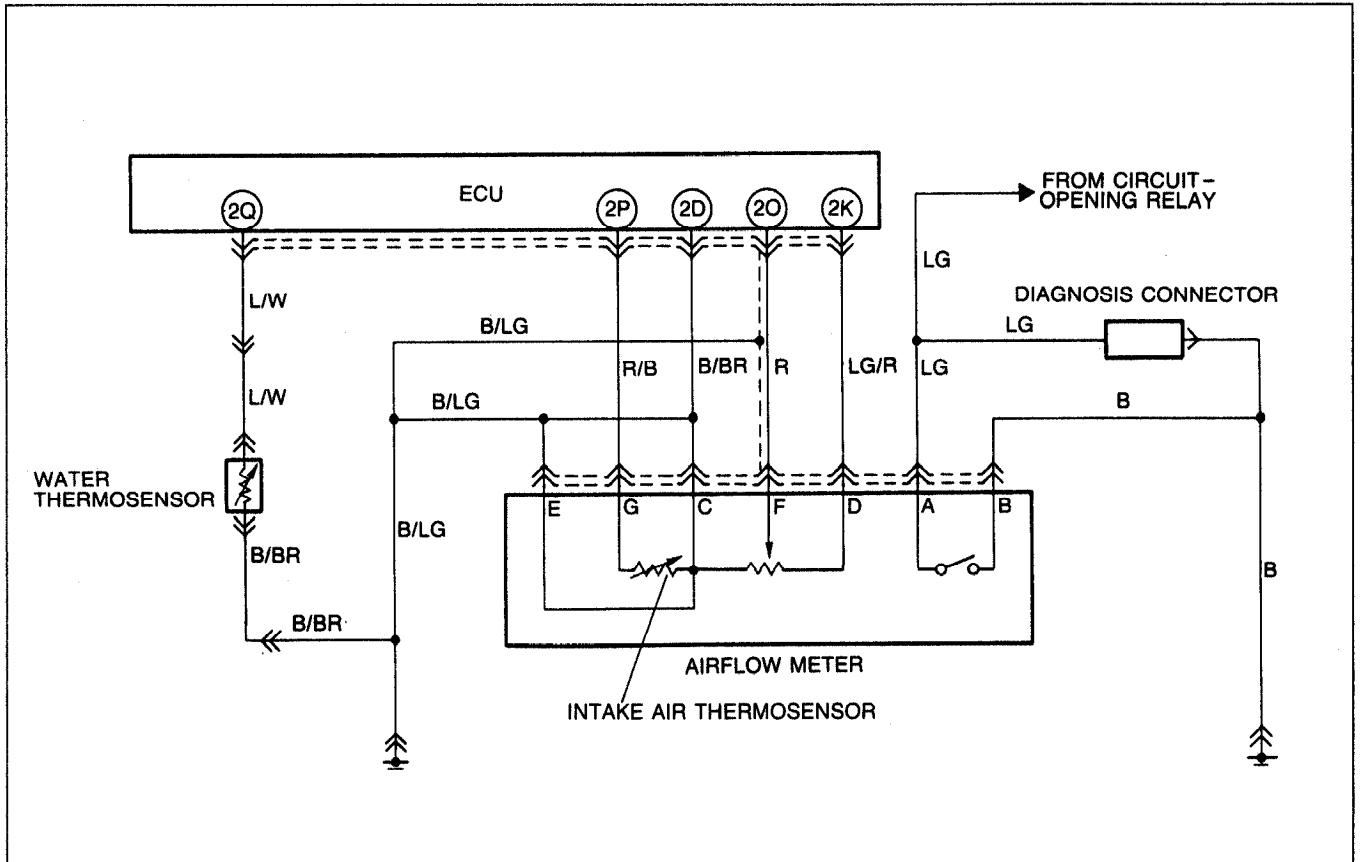
23U0FX-063

SELF-DIAGNOSIS FUNCTION

CODE No.	10 (INTAKE AIR THERMOSENSOR — IN AIRFLOW METER)										
STEP	INSPECTION	ACTION									
1	Check intake air thermosensor circuit for poor connection	Yes	Repair or replace connector								
		No	Go to next step								
2	Check if Code No.08 is also present	Yes	Check for open circuit in wiring from airflow meter terminal wires (B/LG) and (B/BR) to ground								
		No	Go to next step								
3	Check wire harness between intake air thermosensor and ECU for continuity	Yes	Go to next step								
		No	Repair or replace								
<table border="1"> <tr> <td>Intake air thermosensor (In airflow meter)</td> <td>ECU</td> </tr> <tr> <td>C (B/BR)</td> <td>2D (MTX) 3D (ATX)</td> </tr> <tr> <td>G (R/B)</td> <td>2P (MTX) 2K (ATX)</td> </tr> </table>		Intake air thermosensor (In airflow meter)	ECU	C (B/BR)	2D (MTX) 3D (ATX)	G (R/B)	2P (MTX) 2K (ATX)				
Intake air thermosensor (In airflow meter)	ECU										
C (B/BR)	2D (MTX) 3D (ATX)										
G (R/B)	2P (MTX) 2K (ATX)										
4	Check if resistance of airflow meter between terminals C (B/BR) and G (R/B) is OK	Yes	Go to next step								
		No	Replace airflow meter								
<table border="1"> <tr> <td>Temperature</td> <td>Resistance (kΩ)</td> </tr> <tr> <td>-20°C</td> <td>13.6—18.4</td> </tr> <tr> <td>20°C</td> <td>2.21—2.69</td> </tr> <tr> <td>60°C</td> <td>0.493—0.667</td> </tr> </table>		Temperature	Resistance (kΩ)	-20°C	13.6—18.4	20°C	2.21—2.69	60°C	0.493—0.667		
Temperature	Resistance (kΩ)										
-20°C	13.6—18.4										
20°C	2.21—2.69										
60°C	0.493—0.667										
5	Check if same Code No. is present following after-repair procedure ☞ page F-104	Yes	Go to next step								
		No	Intake air thermosensor and circuit OK								
6	Check if ECU terminals voltages are OK MTX...2D and 2P ATX... 2K and 3D ☞ page F-152	Yes	Replace ECU ☞ page F-149								
		No	Check for short circuit in wiring from intake air thermosensor to ECU								

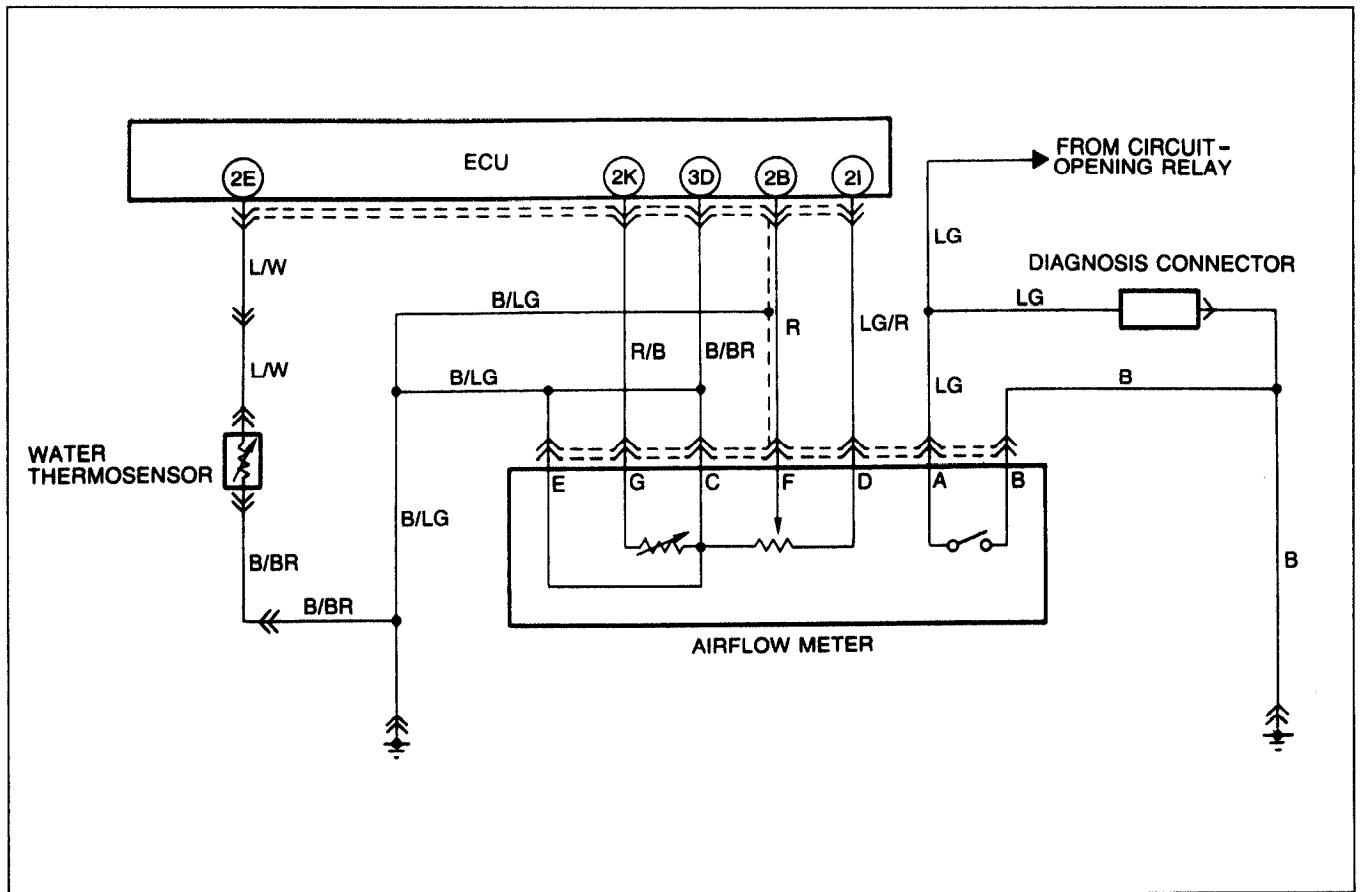
23U0FX-064

Circuit Diagram
MTX



23U0FX-065

ATX

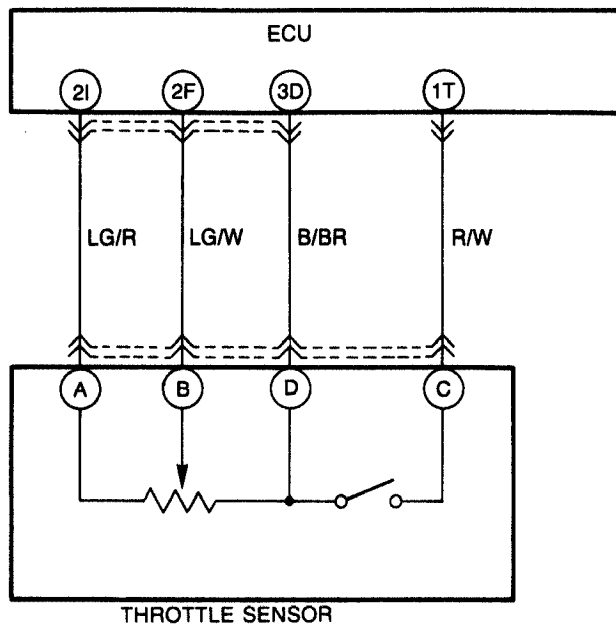


23U0FX-066

CODE No.		12 (THROTTLE SENSOR — ATX)									
STEP	INSPECTION	ACTION									
1	Check throttle sensor circuit for poor connection	Yes	Repair or replace connector								
		No	Go to next step								
2	Check wire harness between throttle sensor and ECU for continuity	Yes	Go to next step								
		No	Repair or replace								
<table border="1"> <thead> <tr> <th>Throttle sensor</th> <th>ECU</th> </tr> </thead> <tbody> <tr> <td>A (LG/R)</td> <td>2K (MTX) 2I (ATX)</td> </tr> <tr> <td>B (LG/W)</td> <td>2M (MTX) 2F (ATX)</td> </tr> <tr> <td>D (B/BR)</td> <td>2D (MTX) 3D (ATX)</td> </tr> </tbody> </table>		Throttle sensor	ECU	A (LG/R)	2K (MTX) 2I (ATX)	B (LG/W)	2M (MTX) 2F (ATX)	D (B/BR)	2D (MTX) 3D (ATX)		
Throttle sensor	ECU										
A (LG/R)	2K (MTX) 2I (ATX)										
B (LG/W)	2M (MTX) 2F (ATX)										
D (B/BR)	2D (MTX) 3D (ATX)										
3	Check if resistances between terminals B (LG/W) and D (B/BR) are OK	Yes	Go to next step								
		No	Adjust or replace throttle sensor <input type="checkbox"/> page F-169								
<table border="1"> <thead> <tr> <th>Throttle valve</th> <th>Resistance</th> </tr> </thead> <tbody> <tr> <td>Fully closed</td> <td>Below 1 kΩ</td> </tr> <tr> <td>Fully open</td> <td>Approx. 5 kΩ</td> </tr> </tbody> </table>		Throttle valve	Resistance	Fully closed	Below 1 kΩ	Fully open	Approx. 5 kΩ				
Throttle valve	Resistance										
Fully closed	Below 1 kΩ										
Fully open	Approx. 5 kΩ										
4	Check if ECU terminal 2M (MTX) 2F (ATX) voltage is OK <input type="checkbox"/> page F-154	Yes	Replace ECU <input type="checkbox"/> page F-149								
		No	Check for short circuit in wiring from throttle sensor to ECU								

23U0FX-067

Circuit Diagram
ATX



23U0FX-068

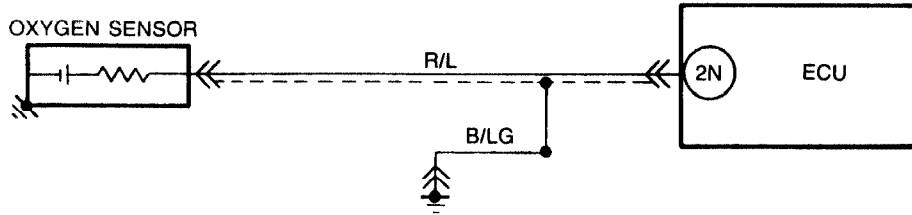
CODE No.	14 (ATMOSPHERIC PRESSURE SENSOR — IN ECU)	
STEP	ACTION	
1	Replace ECU	☞ page F-149

23U0FX-069

CODE No.	15 (OXYGEN SENSOR — INACTIVATION)		
Note			
•If Code Nos. 15 and 17 are both present, first perform the checking procedure for Code No.17			
STEP	INSPECTION	ACTION	
1	Check oxygen sensor circuit for poor connection	Yes	Repair or replace connector
		No	Go to next step
2	Check if oxygen sensor output voltage is OK ☞ page F-171	Yes	Go to next step
		No	Replace oxygen sensor
3	Check wire harness between oxygen sensor and ECU terminal 2N (MTX) 2C (ATX) for continuity	Yes	Go to next step
		No	Repair or replace
4	Check if ECU terminal 2N (MTX) 2C (ATX) voltage is OK ☞ page F-154	Yes	Go to next step
		No	Check for short circuit in wiring from oxygen sensor to ECU
5	Check if sensitivity of oxygen sensor is OK ☞ page F-171	Yes	Replace ECU ☞ page F-149
		No	Try known good oxygen sensor and check if condition improves ☞ page F-172

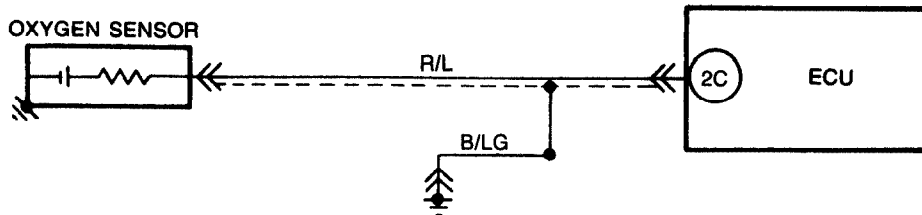
23U0FX-070

Circuit Diagram
MTX



23U0FX-071

ATX

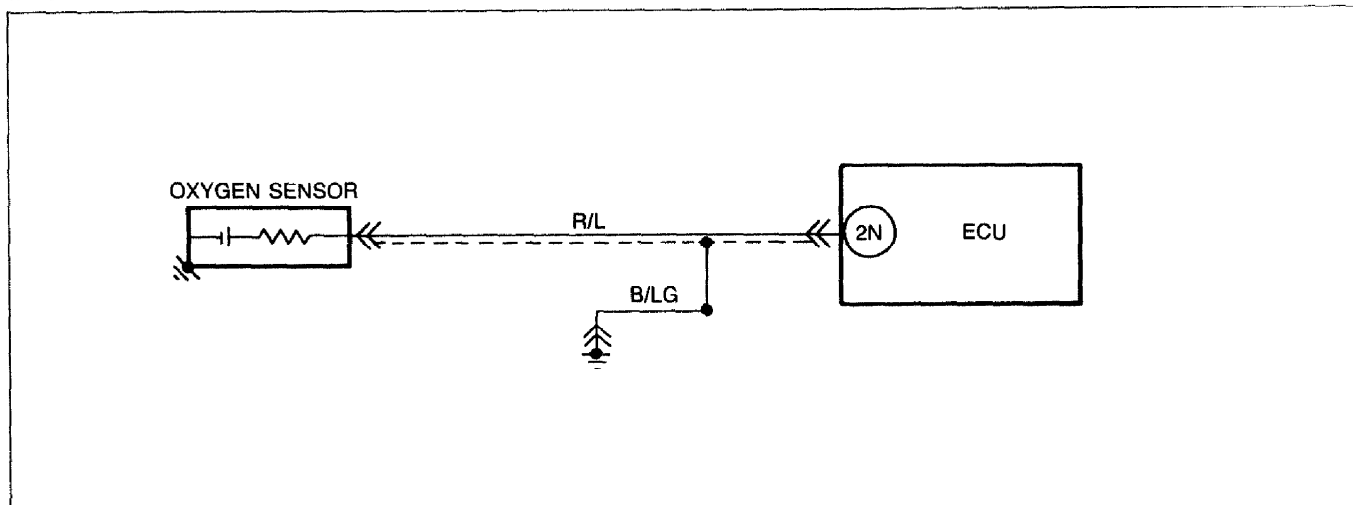


23U0FX-072

CODE No.		17 (Oxygen sensor—Inversion)	
STEP	INSPECTION		ACTION
1	Check if same Code No. is present after performing after-repair procedure ☞ page F-104	Yes	Go to next step
		No	Check oxygen sensor circuit for poor connection ⇒ If OK, perform troubleshooting Code No.15 ⇒ If not OK, repair or replace connector ☞ page F-98
2	Check monitor lamp of Self-Diagnosis Checker illuminate at idle after warming-up engine and running it at 2,500—3,000 rpm for 3 minutes	Yes	Go to next step Note • A/F mixture rich
		No	Go to Step 5 Note • A/F mixture is lean or misfire occurring
3	Check for correct fuel line pressure at idle ☞ page F-129 Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)	Yes	Go to next step
		No	High pressure Check if fuel return hose is clogged or restricted ⇒ If OK, replace pressure regulator ☞ page F-130 ⇒ If not OK, repair or replace
4	Check injectors for fuel leakage ☞ page F-132	Yes	Replace injector
		No	Check if water thermosensor is OK ☞ page F-168 ⇒ If OK, Go to Step 11 ⇒ If not OK, replace water thermosensor ☞ page F-168
5	Disconnect each high-tension lead at idle and check if engine speed decreases equally at each cylinder	Yes	Go to next step
		No	Go to Step 8

23U0FX-073

Circuit Diagram
MTX

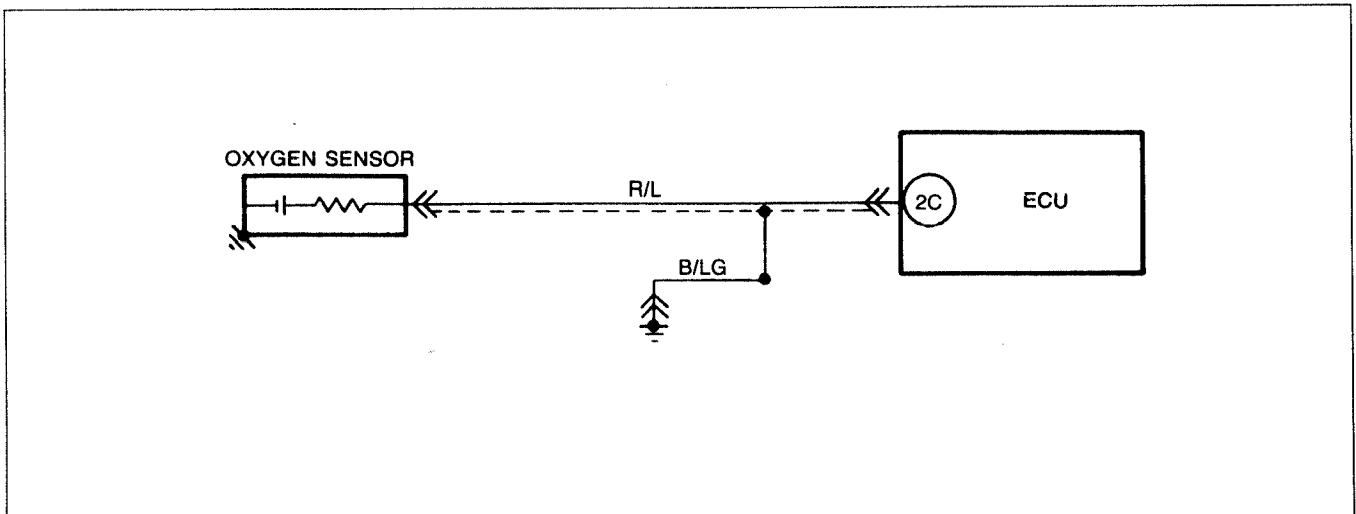


23U0FX-074

STEP	INSPECTION		ACTION
6	Check for correct fuel line pressure at idle ☞ page F-122 Fuel line pressure: 265—314 kPa (2.7—3.2 kg/cm², 38—46 psi) (Vacuum hose to pressure regulator disconnected)	Yes	Go to next step
		No	Low pressure Check fuel line pressure while pinching fuel return hose ⇒ If fuel line pressure quickly increases, check pressure regulator ☞ page F-129 ⇒ If fuel line pressure gradually increases, check for clogging between fuel pump and pressure regulator If not clogged, check fuel pump maximum pressure ☞ page F-126
7	Check intake air system components for air leakage	Yes	Go to Step 11
		No	Replace
8	Check for misfire of dead cylinder from Step 5 inspection	Yes	Repair or replace ignition system
		No	Go to next step
9	Check for injector operating sound at idle of dead cylinder from Step 5 inspection	Yes	Go to next step
		No	Check for battery voltage at injector connector terminal-wire (W/R) ⇒ If Yes, replace injector ☞ page F-131 ⇒ If No, check wire harness for short or open
10	Replace injector at dead cylinder from Step 5 inspection ☞ page F-131 Check if same Code No. is present following performing after-repair procedure ☞ page F-104	Yes	Go to next step
		No	Removed injector at fault
11	Try known good ECU and check if condition improves ☞ page F-149		

23U0FX-075

Circuit Diagram ATX



23U0FX-076

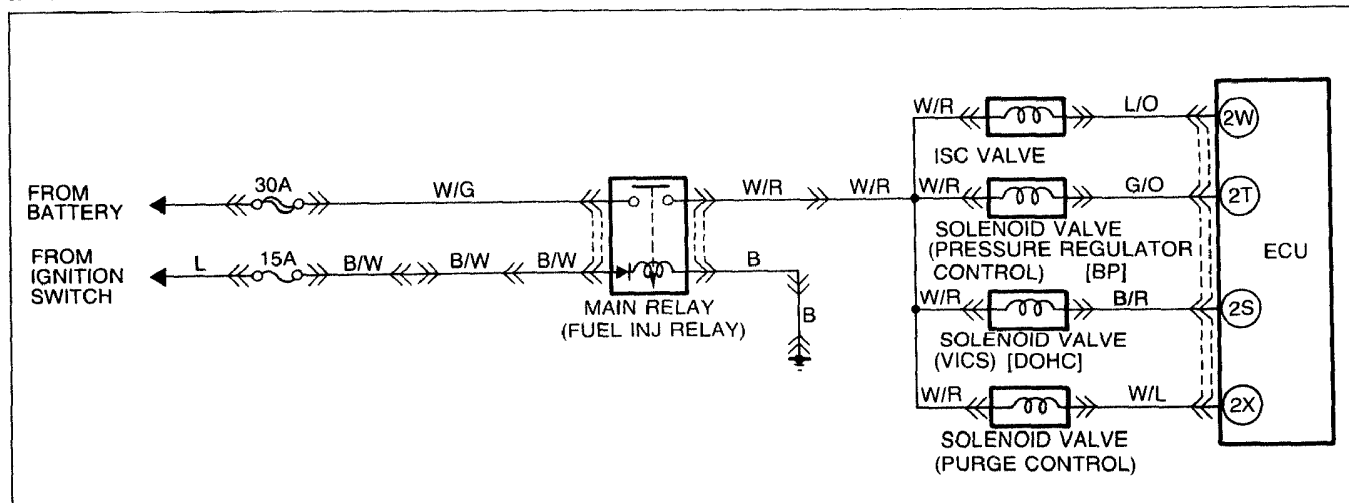
CODE No.		25 (SOLENOID VALVE — PRESSURE REGULATOR CONTROL)—BP ENGINE	
STEP	INSPECTION		ACTION
1	Disconnect connector from ECU and check if battery voltage exists at ECU terminal 2T (MTX) 3M (ATX) wire (G/O) with ignition switch ON	Yes	Check ECU terminal connector for poor connection ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, repair or replace connector
		No	Go to next step
2	In same condition as Step 1, check if battery voltage exists at solenoid valve connector terminal-wire (G/O)	Yes	Repair or replace wire (G/O)
		No	Go to next step
3	Check if solenoid valve is OK ☞ page F-135	Yes	Check for short or open circuit in wiring from main relay (FUEL INJ relay) to solenoid valve
		No	Replace solenoid valve

23U0FX-077

CODE No.		26 (SOLENOID VALVE — PURGE CONTROL)	
STEP	INSPECTION		ACTION
1	Disconnect connector from ECU and check if battery voltage exists at ECU terminal 2X (MTX) 2O (ATX) wire harness (W/L) with ignition switch ON	Yes	Check ECU terminal connector for poor connection ⇒ If OK, replace ECU ☞ page F-149 ⇒ If not OK, repair or replace connector
		No	Go to next step
2	In same condition as Step 1, check if battery voltage exists at solenoid valve connector terminal-wire (W/L)	Yes	Repair or replace wire harness (W/L)
		No	Go to next step
3	Check if solenoid valve is OK ☞ page F-140	Yes	Check for short or open circuit in wiring from main relay (FUEL INJ relay) to solenoid valve
		No	Replace solenoid valve

23U0FX-078

Circuit Diagram MTX



23U0FX-079

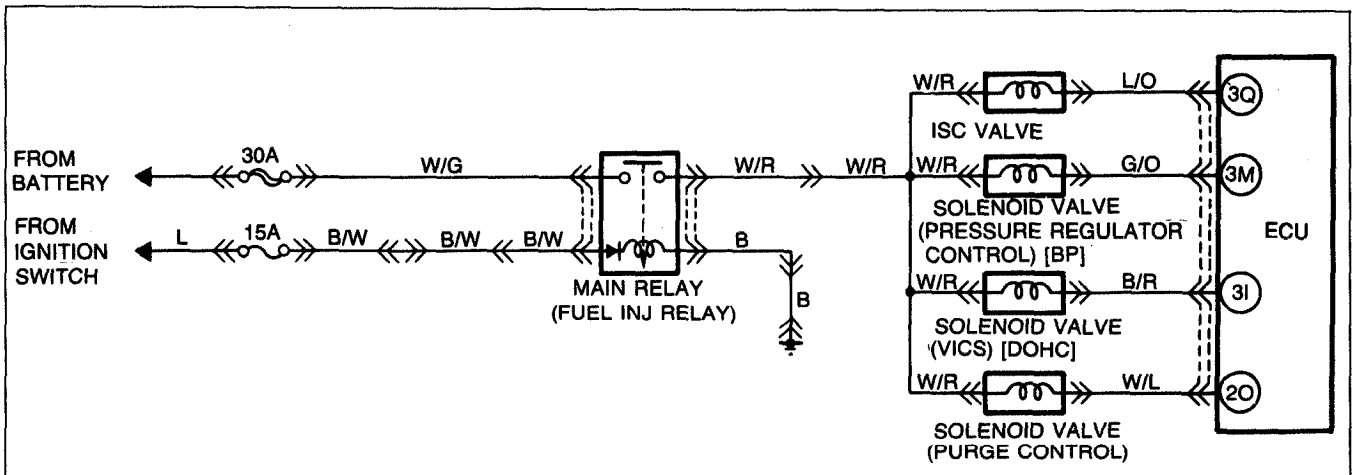
CODE No.		34 (ISC VALVE)	
STEP	INSPECTION		ACTION
1	Disconnect connector from ECU and check if battery voltage exists at ECU terminal 2W (MTX) 3Q (ATX) wire (L/O) with ignition switch ON	Yes	Check ECU terminal connector for poor connection ⇒ If OK, replace ECU ⇒ If not OK, repair or replace connector ☞ page F-149
		No	Go to next step
2	In same condition as Step 1, check if battery voltage exists at ISC valve connector terminal-wire (L/O)	Yes	Repair or replace wire (L/O)
		No	Go to next step
3	Check ISC valve for correct resistance ☞ page F-116 Resistance: 11—13Ω [at 20°C(68°F)]	Yes	Check for short or open circuit in wiring from main relay (FUEL INJ relay) to ISC valve
		No	Replace ISC valve

23U0FX-080

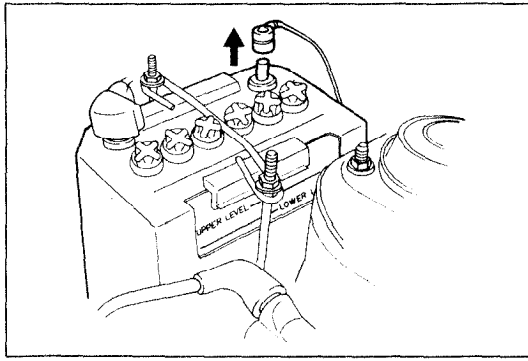
CODE No.		41 (SOLENOID VALVE — VICS)—DOHC	
STEP	INSPECTION		ACTION
1	Disconnect connector from ECU and check if battery voltage exists at ECU terminal 2S (MTX) 3I (ATX) wire (B/R) with ignition switch ON	Yes	Check ECU terminal connector for poor connection ⇒ If OK, replace ECU ⇒ If not OK, repair or replace connector ☞ page F-149
		No	Go to next step
2	In same condition as Step 1, check if battery voltage exists at solenoid valve connector terminal-wire (B/R)	Yes	Repair or replace wire (B/R)
		No	Go to next step
3	Check if solenoid valve is OK ☞ page F-118	Yes	Check for short or open circuit in wiring from main relay to solenoid valve
		No	Replace solenoid valve

23U0FX-081

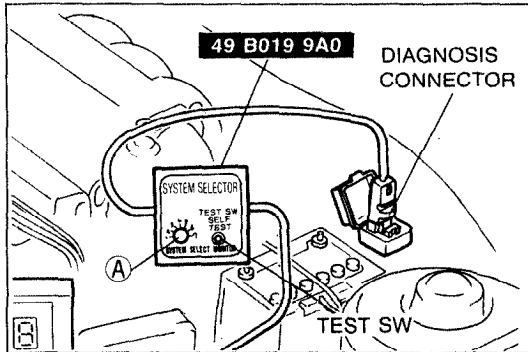
**Circuit Diagram
ATX**



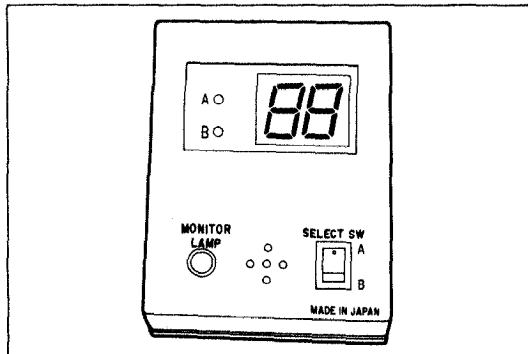
23U0FX-082



23U0FX-083



03U0FX-086



03U0FX-087

After-repair Procedure

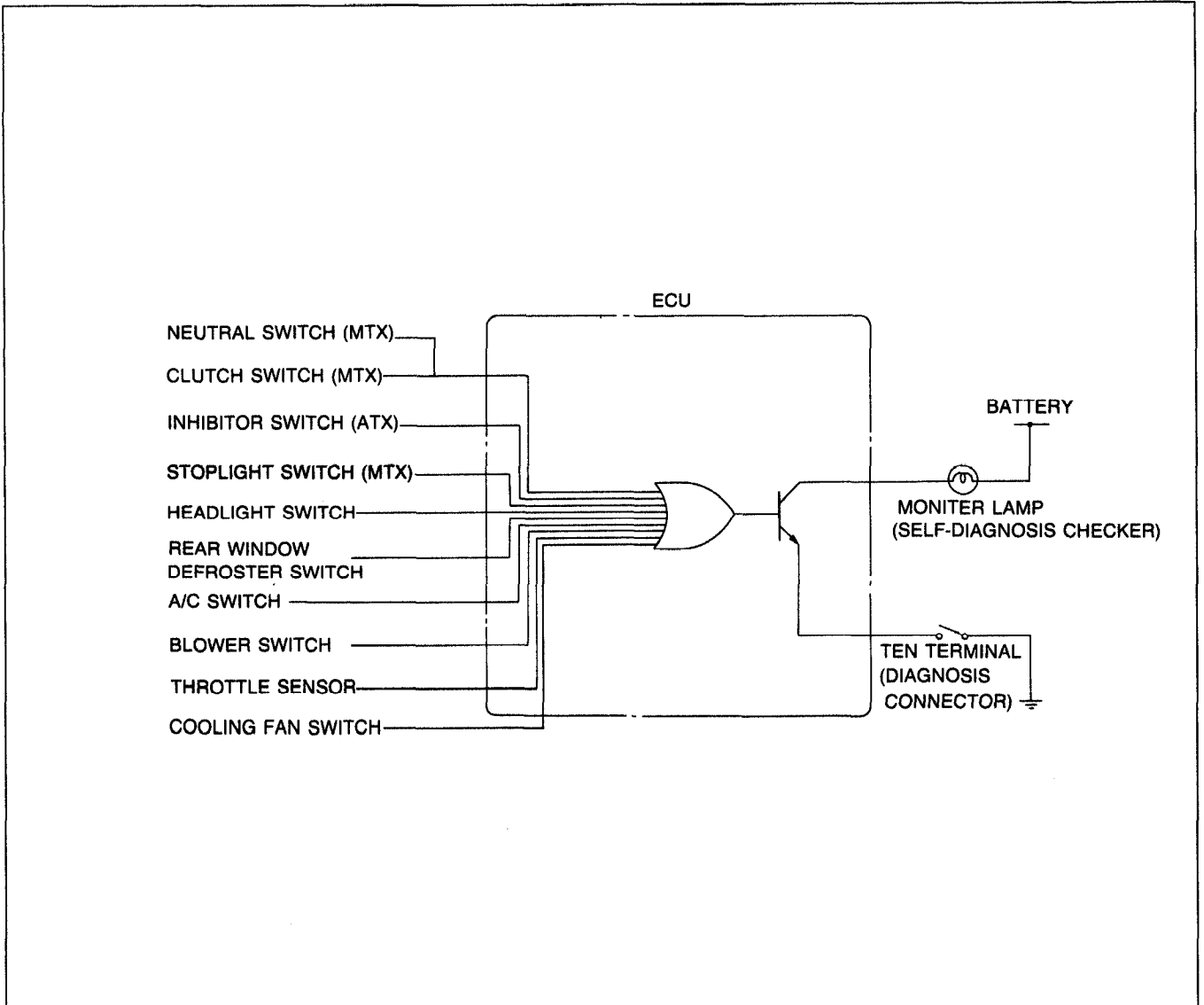
1. Cancel the memory of malfunctions by disconnecting the negative battery cable for **at least 20 seconds**. Reconnect the negative battery cable.
2. Connect the **SST** (System Selector) to the diagnosis connector.
3. Set the switch (A) to position 1.
4. Set TEST SW to SELF-TEST.
5. Connect the **SST** (Self-Diagnosis Checker) to the System Selector and a ground.
6. Set the select switch of the Self-Diagnosis Checker to position A.
7. Turn the ignition switch ON.
8. Start and warm up the engine, then run it at **2,000 rpm for three minutes**.
9. Verify that no code numbers are displayed.

SWITCH MONITOR FUNCTION

Individual switches can be inspected by the **SST** (Self-Diagnosis checker).

Note

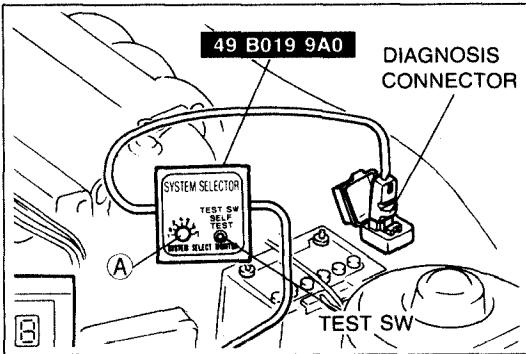
- The **TEN terminal of the diagnosis connector must be grounded and the ignition switch ON (engine stopped).**
- **If either of the switches remain activated, the monitor lamp will be illuminated.**



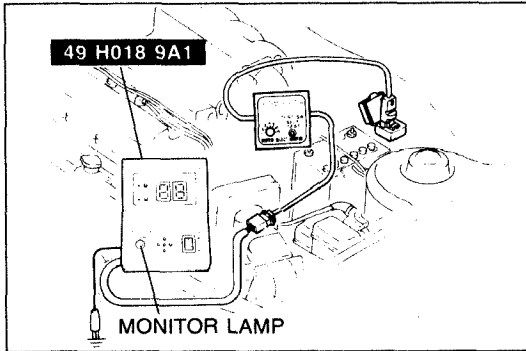
03U0FX-088

Switch	Self-Diagnosis Checker (Monitor lamp)		Remark
	Light ON	Light OFF	
Clutch switch (MTX)	Pedal released	Pedal depressed	In gear
Neutral switch (MTX)	In gear	Neutral	Clutch pedal released
Inhibitor switch (ATX)	L, S, D or R range	N or P range	—
Throttle sensor	Pedal depressed (Not fully)	Pedal released/fully depressed	—
Stoplight switch	Pedal depressed	Pedal released	—
Headlight switch	ON	OFF	Headlights/parking lights: ON
Blower switch	ON	OFF	Blower switch at 2nd or above position
A/C switch	ON	OFF	Fan speed control at 1st position
Rear window defroster switch	ON	OFF	—
Water thermoswitch	Fan operating	Fan not operating	—

23U0FX-084



03U0FX-090



03U0FX-091

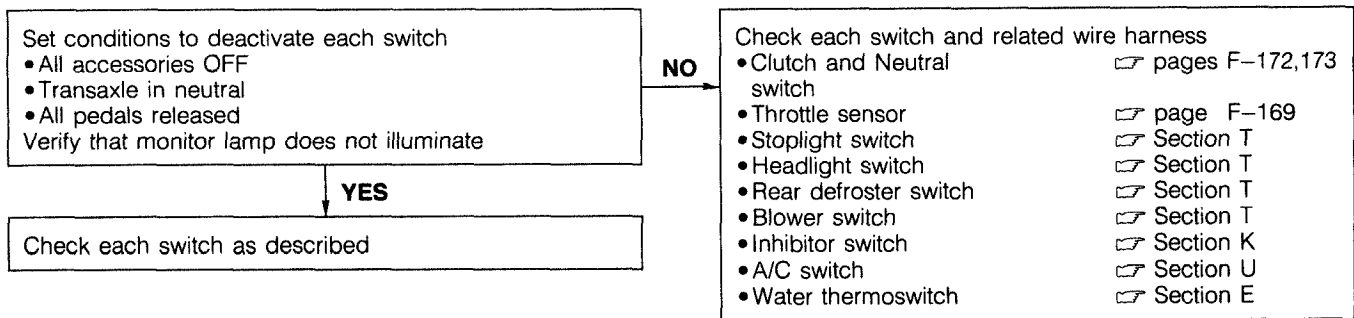
Inspection Procedure

1. Connect the **SST** (System Selector) to the diagnosis connector.
2. Set the switch (A) to position 1.
3. Set TEST SW to SELF-TEST.
4. Connect the **SST** (Self-Diagnosis Checker) to the System Selector and a ground.
5. Set the select switch of the Self-Diagnosis Checker to position A.
6. Turn the ignition switch ON.
7. Check if Monitor Lamp illuminates when each switch is made to function as described below.

Caution

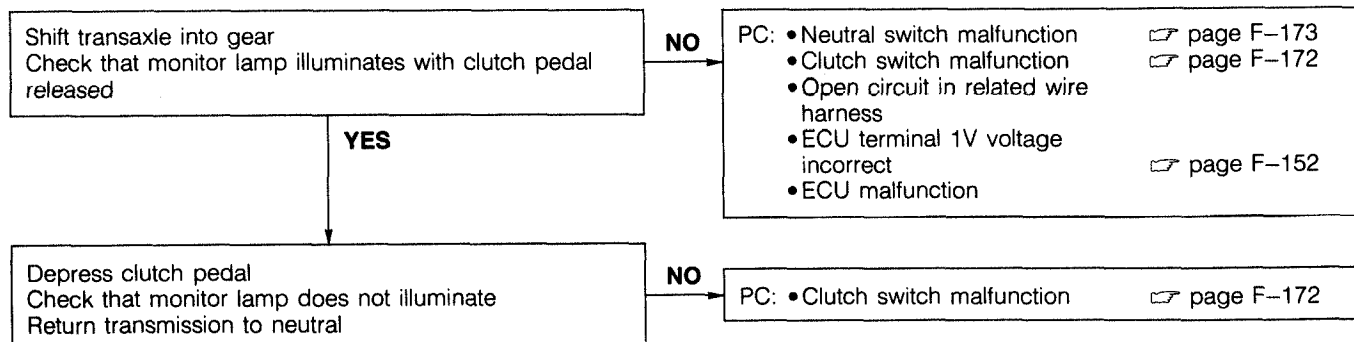
- If either of the switches remain activated, the monitor lamp will be illuminated.
- Do not start the engine.

Procedure



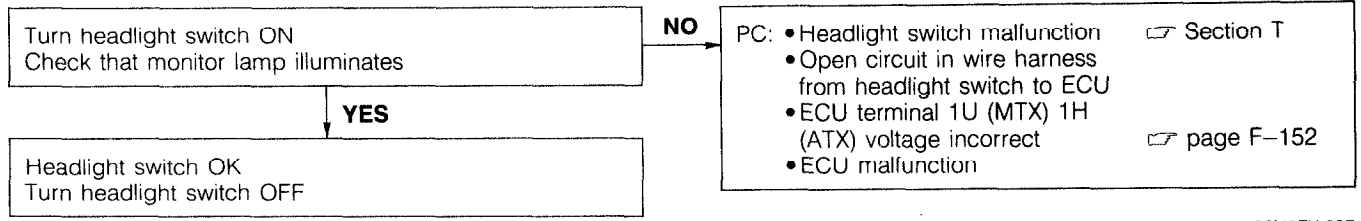
23U0FX-085

Neutral and Clutch switch (MTX)



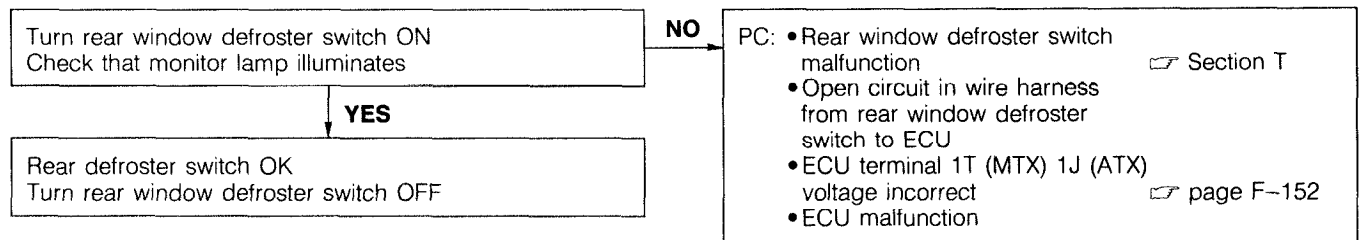
23U0FX-086

Headlight switch



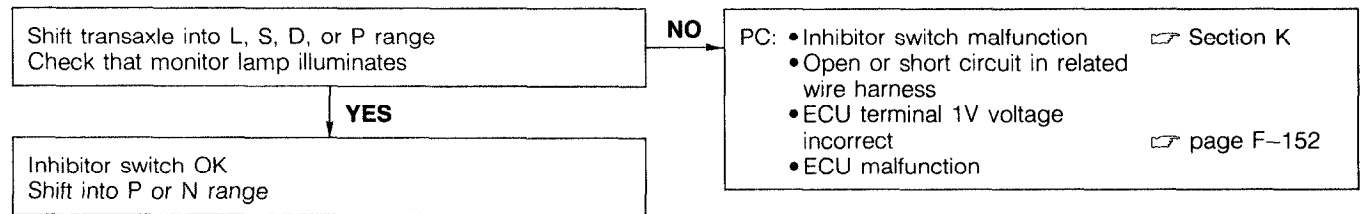
23U0FX-087

Rear window defroster switch



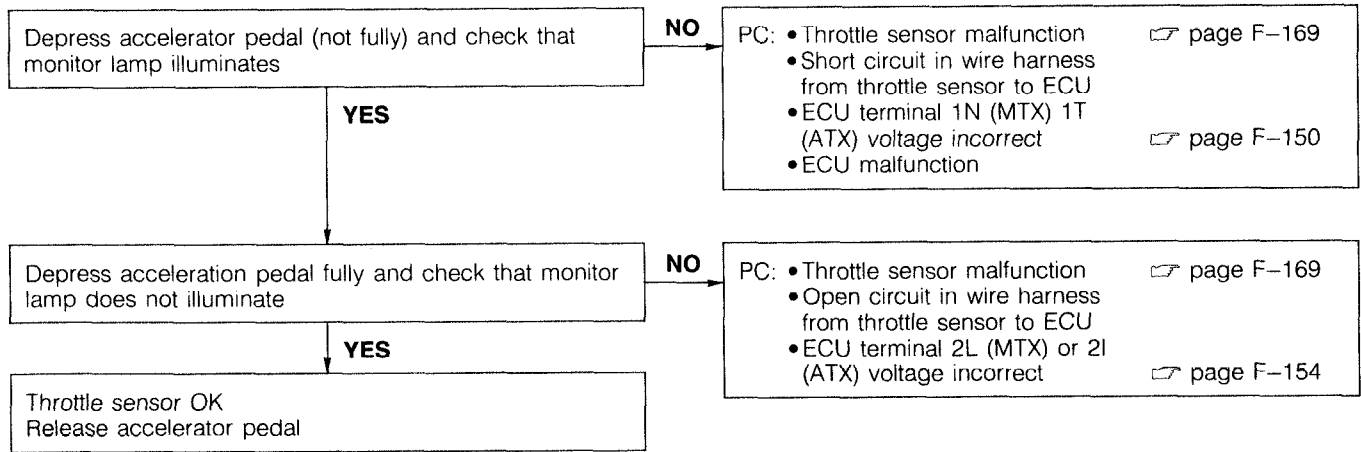
23U0FX-088

Inhibitor switch (ATX)



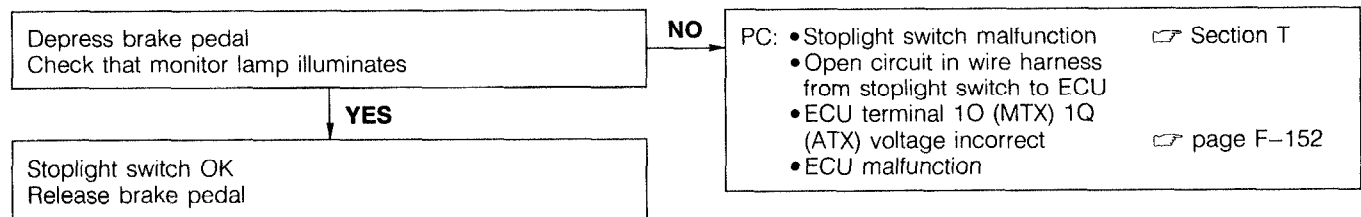
23U0FX-089

Throttle sensor



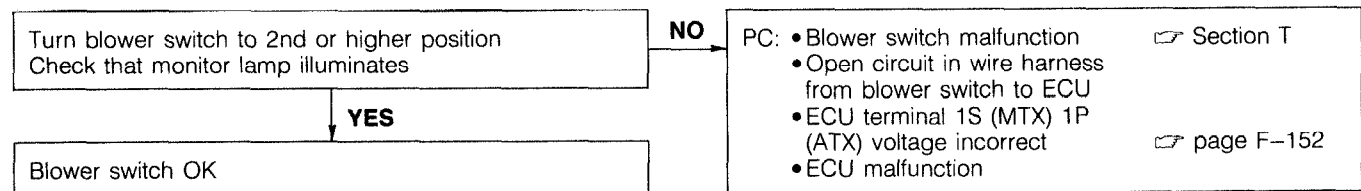
23U0FX-090

Stoplight switch



23U0FX-091

Blower switch



23U0FX-092

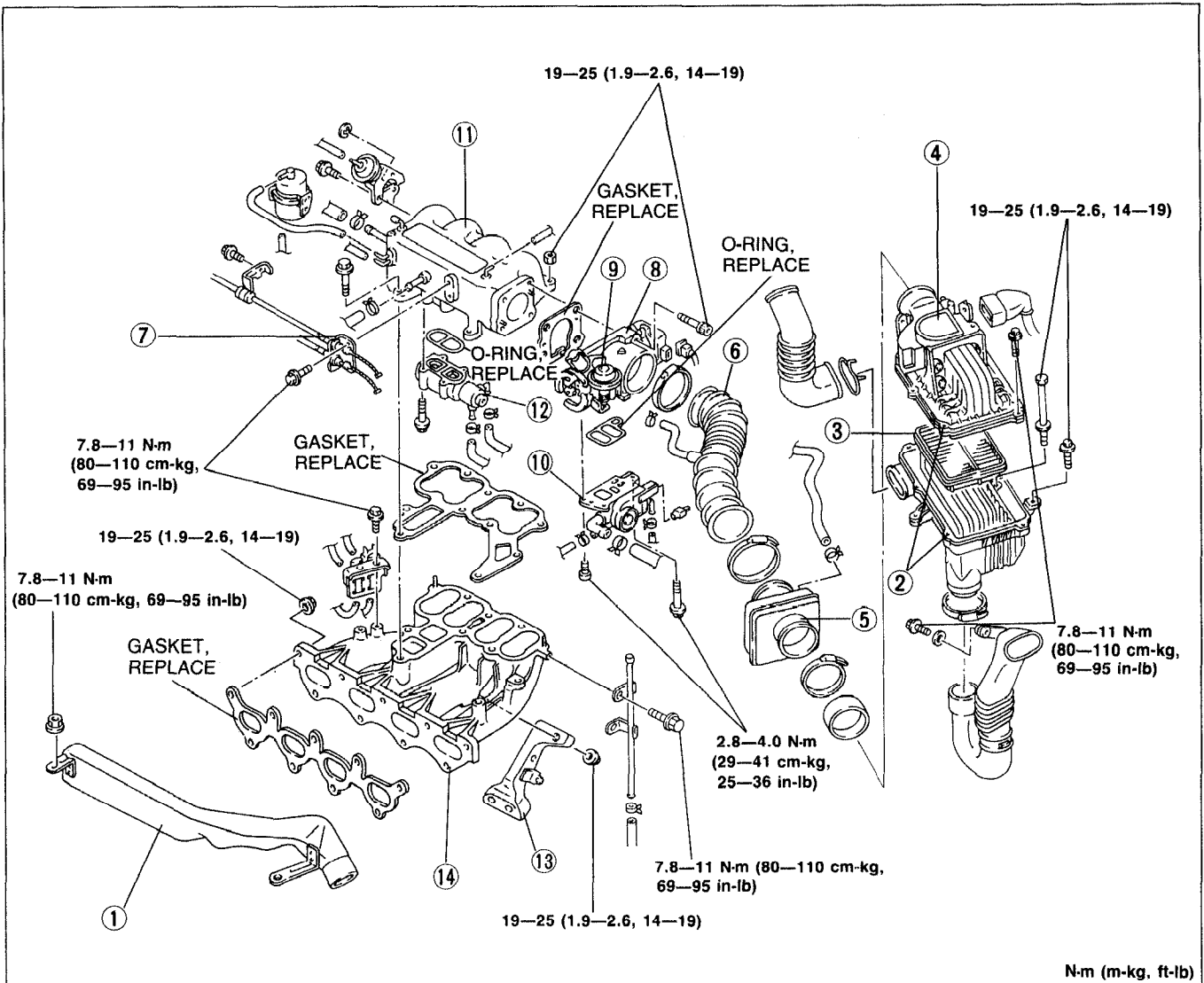
INTAKE AIR SYSTEM

COMPONENT PARTS

Removal / Inspection / Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Inspect the intake air system components visually and repair or replace if necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.

BP DOHC

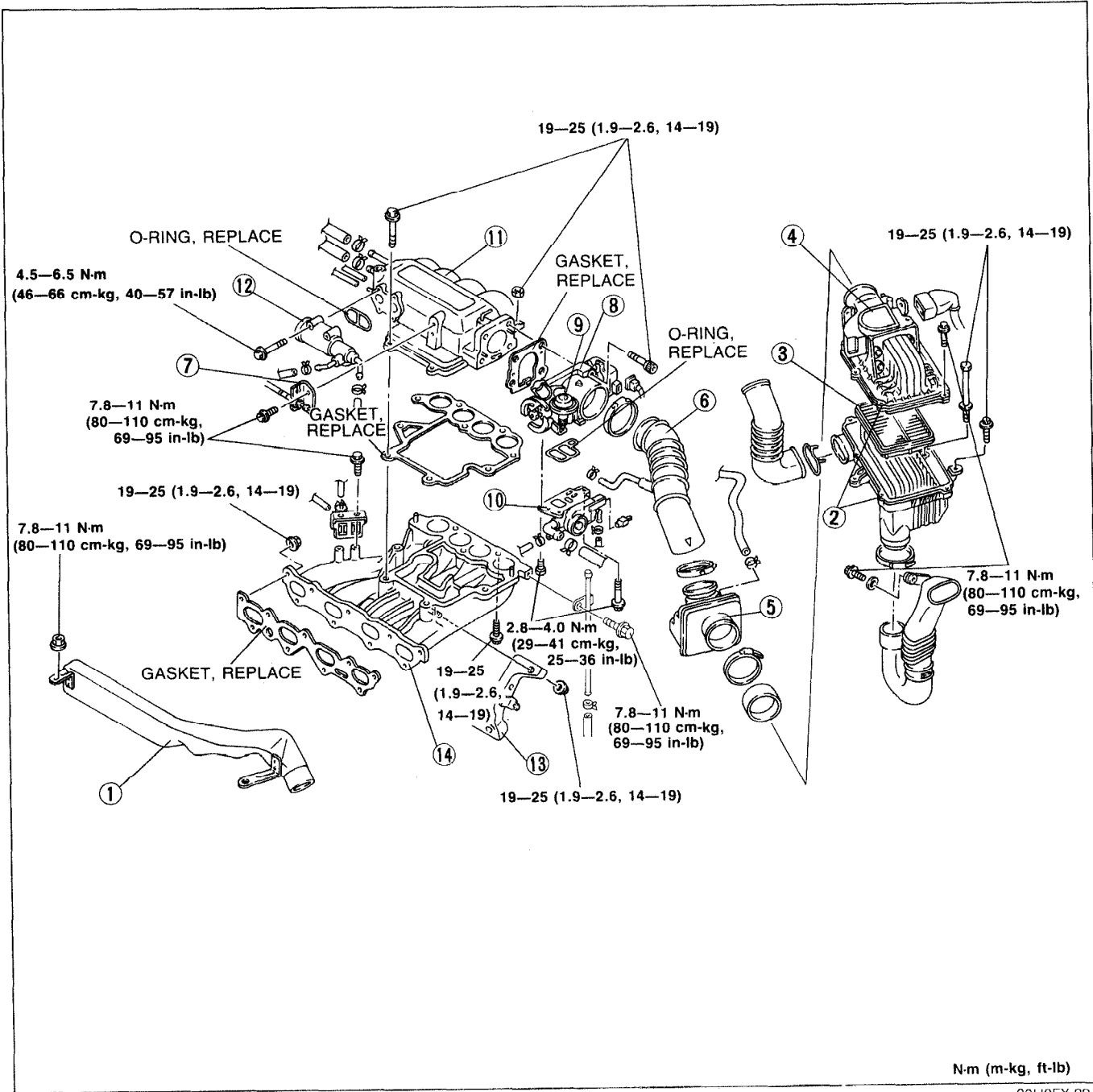


N-m (m-kg, ft-lb)

23U0FX-093

1. Resonance duct Inspect for damage	8. Throttle body Inspection	page F-112
2. Air cleaner Inspect for excessive dirt or damage	9. Dashpot Inspection	page F-142
3. Air cleaner element Inspection	10. ISC valve Inspection	page F- 79
4. Airflow meter Inspection	11. Dynamic chamber Removal note.....	page F-168
5. Resonance chamber Inspect for damage	12. Air valve Inspection	page F-116
6. Air hose Inspect for damage	13. Intake manifold bracket	
7. Accelerator cable Inspection / Adjustment.....	14. Intake manifold Installation note.....	page F-114

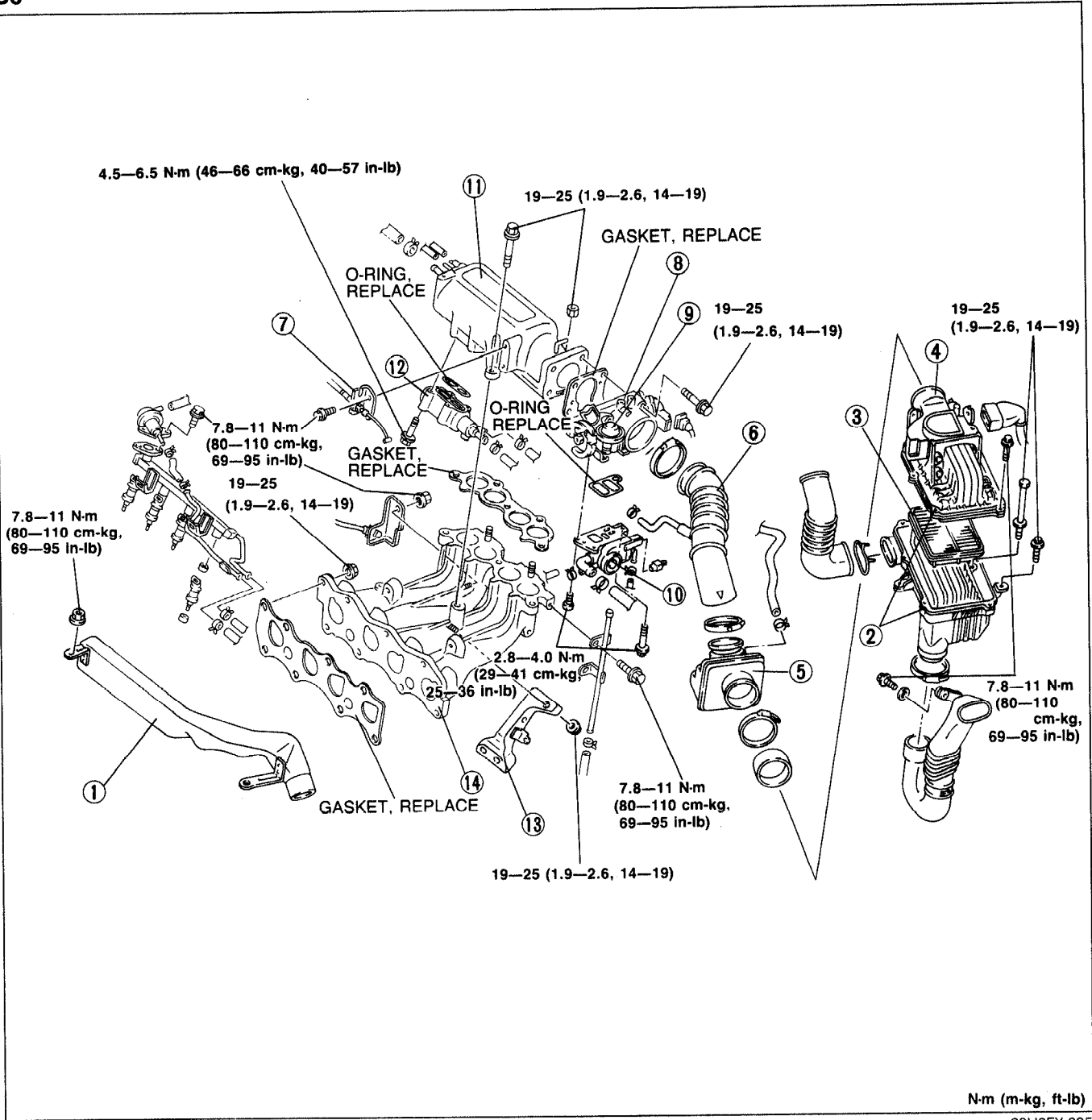
BP SOHC



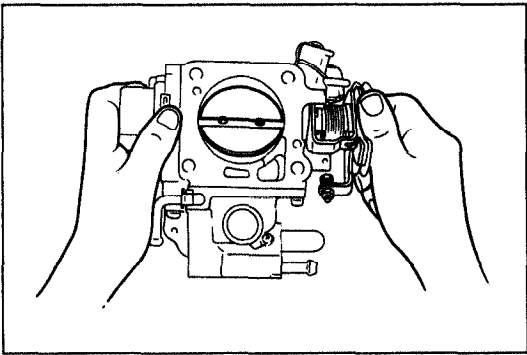
23U0FX-094

- | | |
|---|---|
| <p>1. Resonance duct
Inspect for damage</p> <p>2. Air cleaner
Inspect for excessive dirt or damage</p> <p>3. Air cleaner element
Inspection page F- 79</p> <p>4. Airflow meter
Inspection page F-168</p> <p>5. Resonance chamber
Inspect for damage</p> <p>6. Air hose
Inspect for damage</p> <p>7. Accelerator cable
Inspection / Adjustment..... page F-114</p> | <p>8. Throttle body
Inspection page F-112</p> <p>9. Dashpot
Inspection page F-142</p> <p>10. ISC valve
Inspection page F-116</p> <p>11. Dynamic chamber
Removal note..... page F-112</p> <p>12. Air valve
Inspection page F-116</p> <p>13. Intake manifold bracket</p> <p>14. Intake manifold
Installation note..... page F-113</p> |
|---|---|

B6



- | | |
|---|---|
| <p>1. Resonance duct
Inspect for damage</p> <p>2. Air cleaner
Inspect for excessive dirt or damage</p> <p>3. Air cleaner element
Inspection page F- 79</p> <p>4. Airflow meter
Inspection page F-168</p> <p>5. Resonance chamber
Inspect for damage</p> <p>6. Air hose
Inspect for damage</p> <p>7. Accelerator cable
Inspection / Adjustment..... page F-114</p> | <p>8. Throttle body
Inspection page F-112</p> <p>9. Dashpot
Inspection page F-142</p> <p>10. ISC valve
Inspection page F-116</p> <p>11. Dynamic chamber
Removal note..... page F-112</p> <p>12. Air valve
Inspection page F-116</p> <p>13. Intake manifold bracket</p> <p>14. Intake manifold
Installation note..... page F-113</p> |
|---|---|



03U0FX-103

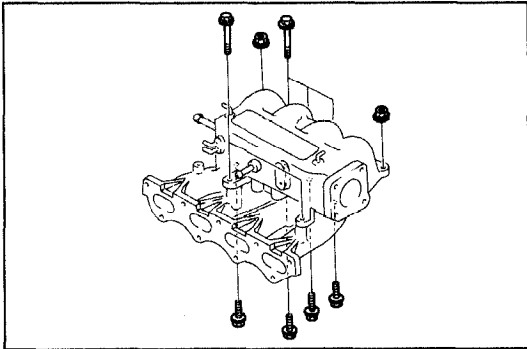
THROTTLE BODY

Inspection

1. Check the throttle body for wear and deposits.
2. Check if the throttle valve moves smoothly when the throttle lever is moved from fully closed to fully open.
3. Replace the throttle body if necessary.

Caution

- Do not remove the thin seal coating from the throttle valves or bore.



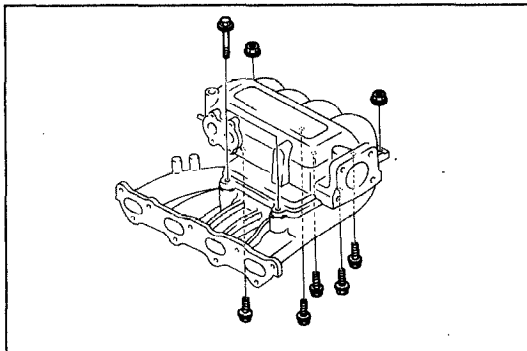
03U0FX-104

DYNAMIC CHAMBER

Removal Note

BP DOHC

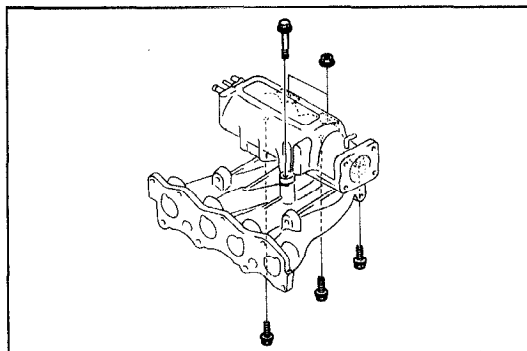
- Raise the vehicle to remove the four bolts shown in the figure.



03U0FX-105

BP SOHC

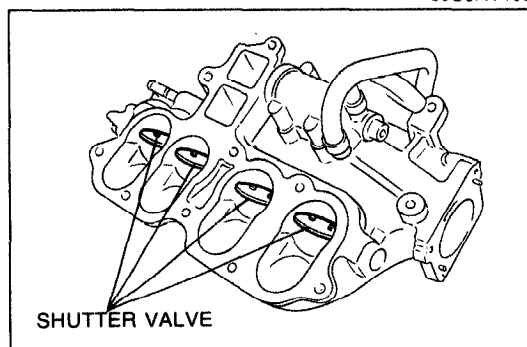
- Raise the vehicle to remove the five bolts shown in the figure.



03U0FX-106

B6

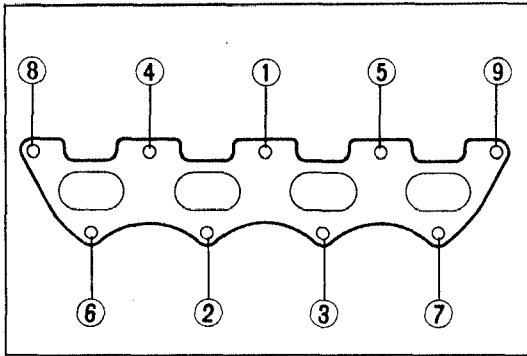
- Raise the vehicle to remove the three bolts shown in the figure.



03U0FX-107

Inspection (BP DOHC)

1. Check the shutter valve for wear and deposits.
2. Check if the shutter valve is fully open and moves smoothly from fully open to fully closed.



03U0FX-108

INTAKE MANIFOLD

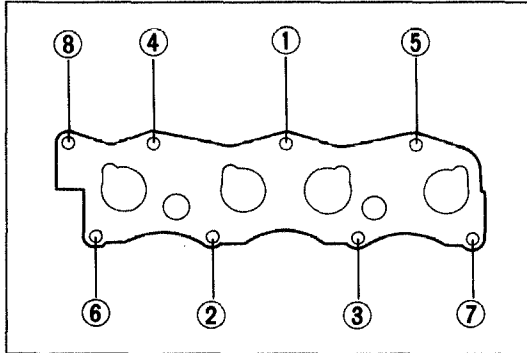
Installation Note

BP

1. Tighten the bolts in the order shown in the figure.

Tightening torque:

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



23U0FX-096

B6

1. Tighten the bolts in the order shown in the figure.

Tightening torque:

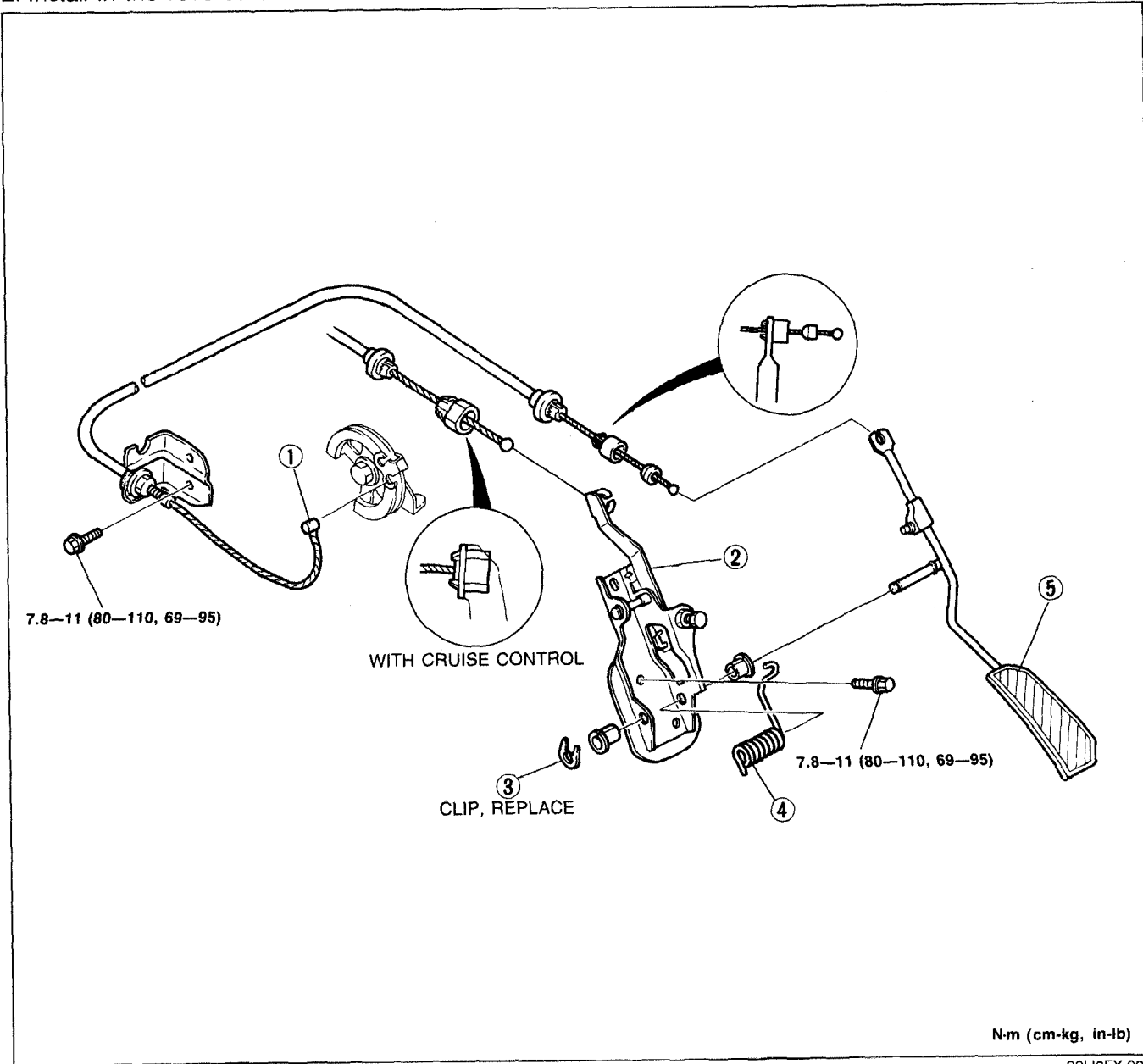
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

2. Refill the radiator with the specified engine coolant. (Refer to page F-78.)
3. Check for engine coolant leakage.

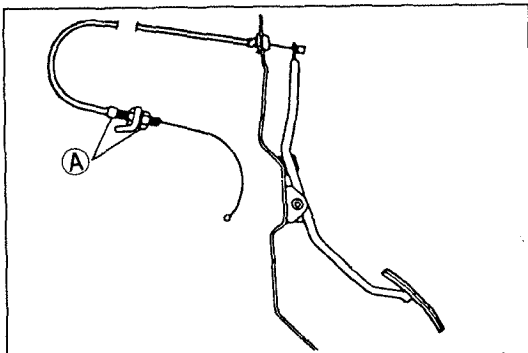
ACCELERATOR PEDAL

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Accelerator cable
Inspection / Adjustment..... page F-114 2. Retainer | <ol style="list-style-type: none"> 3. Clip 4. Return spring 5. Accelerator pedal |
|---|---|



ACCELERATOR CABLE
Inspection / Adjustment

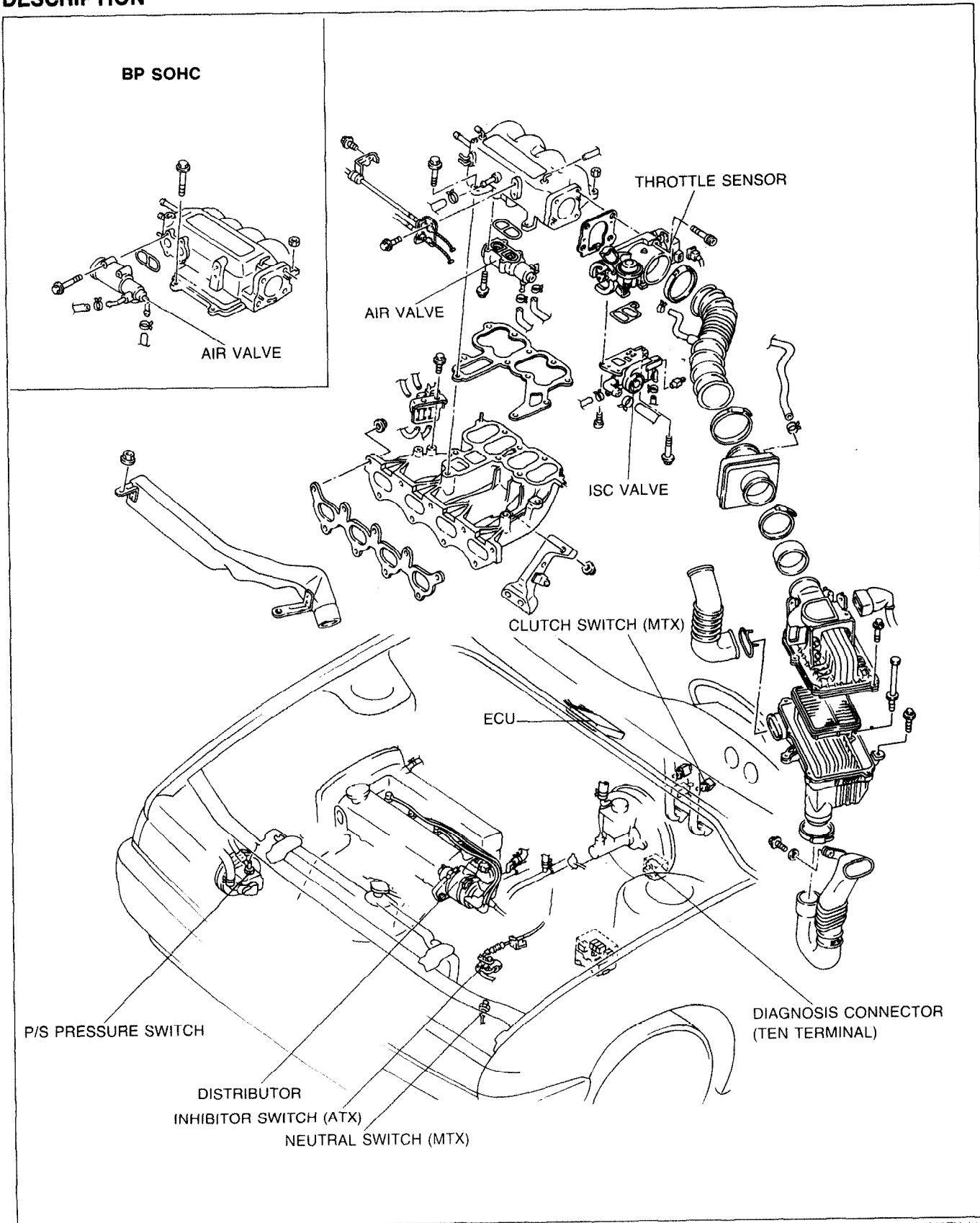
1. Depress the accelerator pedal fully. Check if the throttle valve is fully opened.
2. Inspect the play of the accelerator cable.

Play: 1.0—3.0mm (0.04—0.12 in)

3. Loosen the nuts (A) to adjust the play if necessary.

IDLE SPEED CONTROL (ISC) SYSTEM

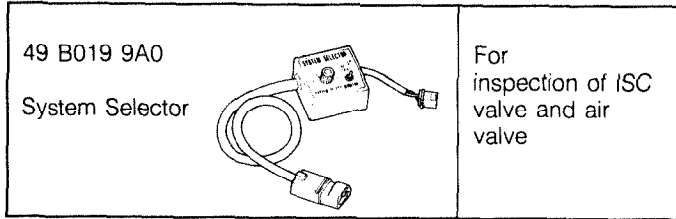
DESCRIPTION



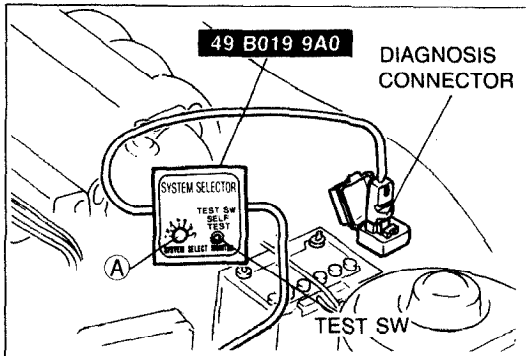
03U0FX-112

To improve idle smoothness, the ISC system controls the intake air amount by regulating the bypass air amount that passes through the throttle body. This system consists of the ISC valve, air valve, ECU and input devices.

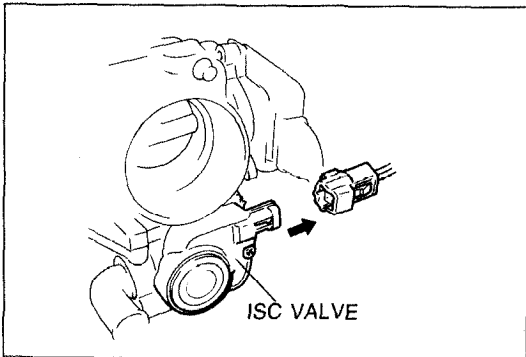
PREPARATION SST



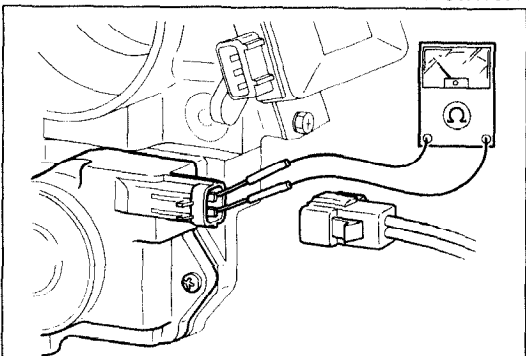
03U0FX-113



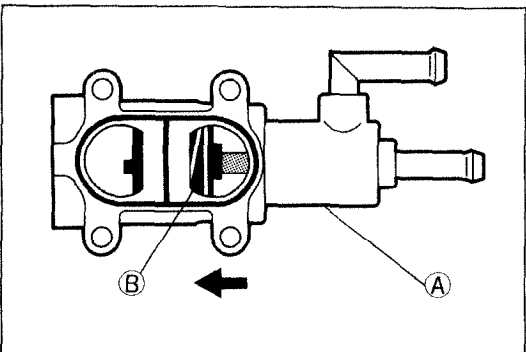
03U0FX-114



23U0FX-099



03U0FX-116



23U0FX-100

SYSTEM OPERATION Air Valve

Note

- This inspection must be done with the engine cold.
— Engine coolant below 20°C (68°F).

1. Connect the **SST** to the diagnosis connector.
2. Set the switch (A) to position 1 and TEST SW to SELF-TEST.
3. Start the engine.
4. Check if the idle speed decreases gradually as the engine warms up.

ISC Valve

1. Warm up the engine.
2. Check if a click sound is heard and the engine speed increases to **approx. 1,200 rpm** when the ISC valve connector is disconnected at idle.
3. If the engine speed does not change, replace the ISC valve.
4. Reconnect the connector.

ISC VALVE Inspection

1. Disconnect the ISC valve connector.
2. Check the resistance of the ISC valve.

Resistance: 11—13Ω (at 20°C [68°F])

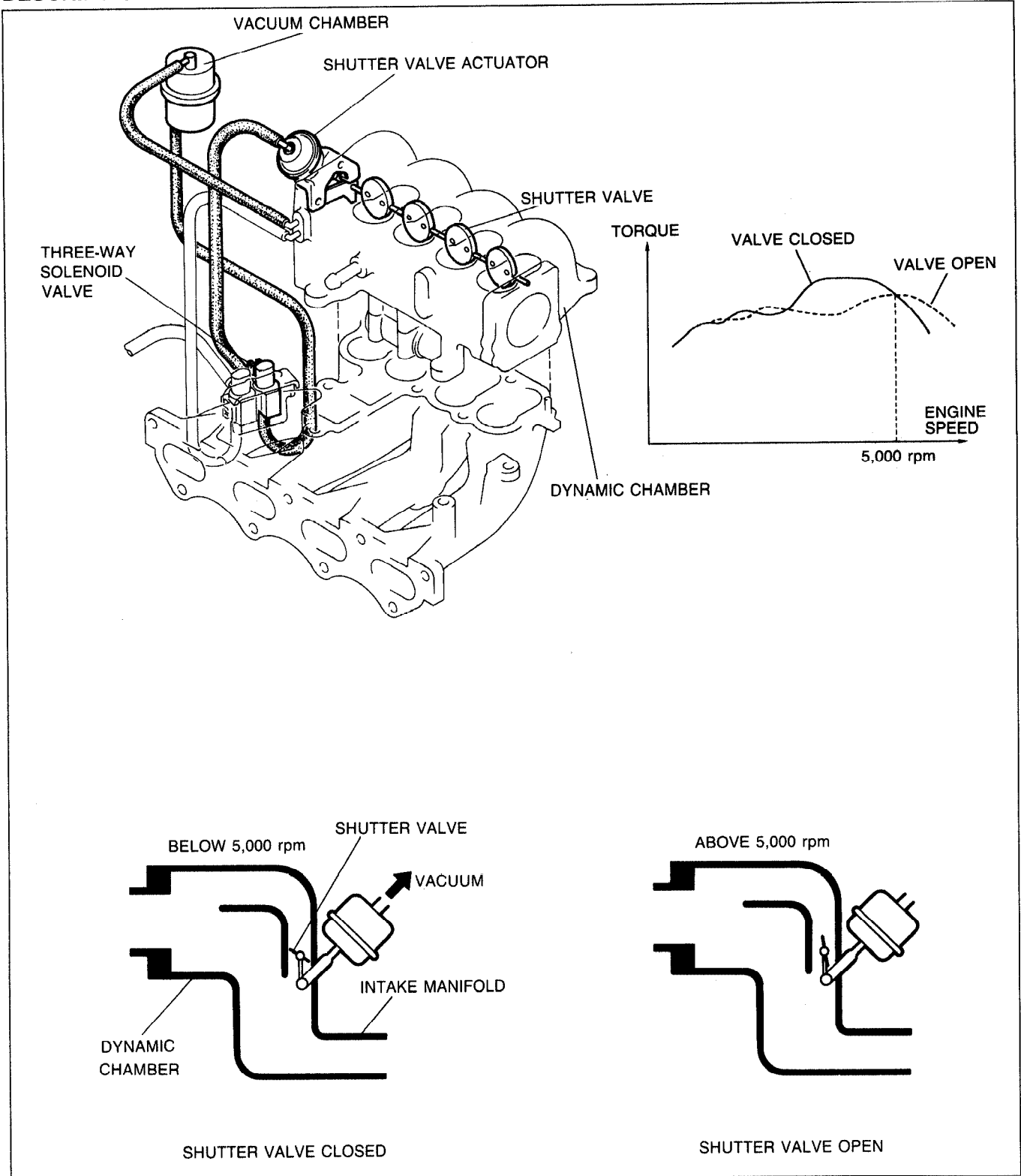
3. If not as specified, replace the ISC valve.

AIR VALVE Inspection

1. Remove the air valve. (Refer to page F-109.)
2. Cool the air valve at below 0°C (32°F).
3. Heat the air valve at (A) by using a drier and verify that part (B) moves in the direction of the arrow in the figure.

VARIABLE INERTIA CHARGING SYSTEM (VICS) [DOHC]

DESCRIPTION



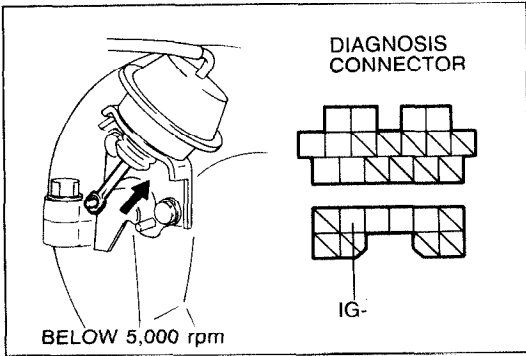
03U0FX-118

By varying the length of the intake air path in the intake manifold and dynamic chamber, the resonance induced inertia charging effect is improved, yielding higher torque and a wider torque band.

The length of the intake track is controlled within the intake manifold and dynamic chamber by opening and closing the shutter valve at 5,000 rpm.

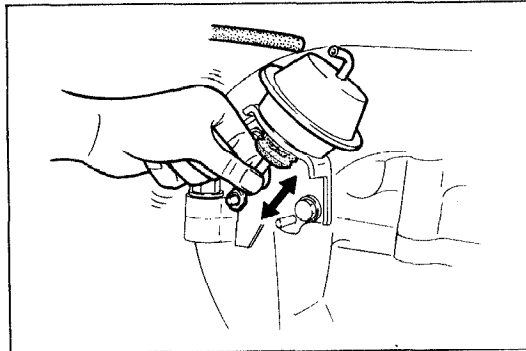
The VICS consists of the shutter valves, shutter valve actuator, three-way solenoid valve, vacuum chamber, and ECU.

F VARIABLE INERTIA CHARGING SYSTEM (VICS)



SYSTEM OPERATION

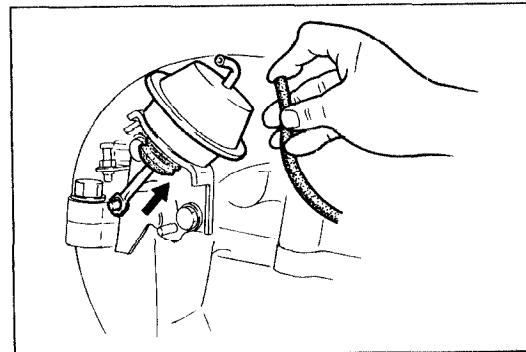
1. Connect the tachometer to the **IG-** terminal of the diagnosis connector.
2. Start the engine and run it at idle.
3. Verify that the rod of the shutter valve actuator has pulled inward.
4. Increase the engine speed gradually and verify that the rod is extended when the engine speed reaches **5,000 rpm**.



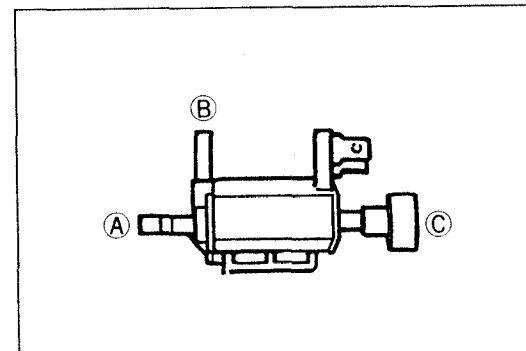
SHUTTER VALVE ACTUATOR

Inspection

1. Remove the vacuum hose from the actuator.
2. Verify that the rod can move in and out smoothly.



3. Start the engine and run it at idle.
4. Place a finger over the end of vacuum hose and verify that there is vacuum.
5. Install the vacuum hose and verify that the rod is pulled inward.

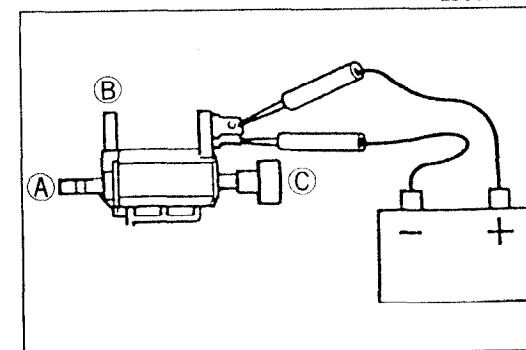


SOLENOID VALVE (VICS)

Inspection

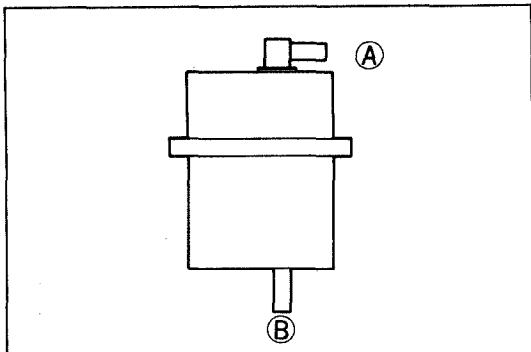
1. Remove the three-way solenoid valve.
2. Verify that air flows between each port as below.

Port	Air flow
(A) — (B)	No
(A) — (C)	No
(B) — (C)	Yes



3. Connect battery voltage and a ground to the terminals of the solenoid valve.
4. Verify that air flows between each port as below.

Port	Air flow
(A) — (B)	Yes
(A) — (C)	No
(B) — (C)	No



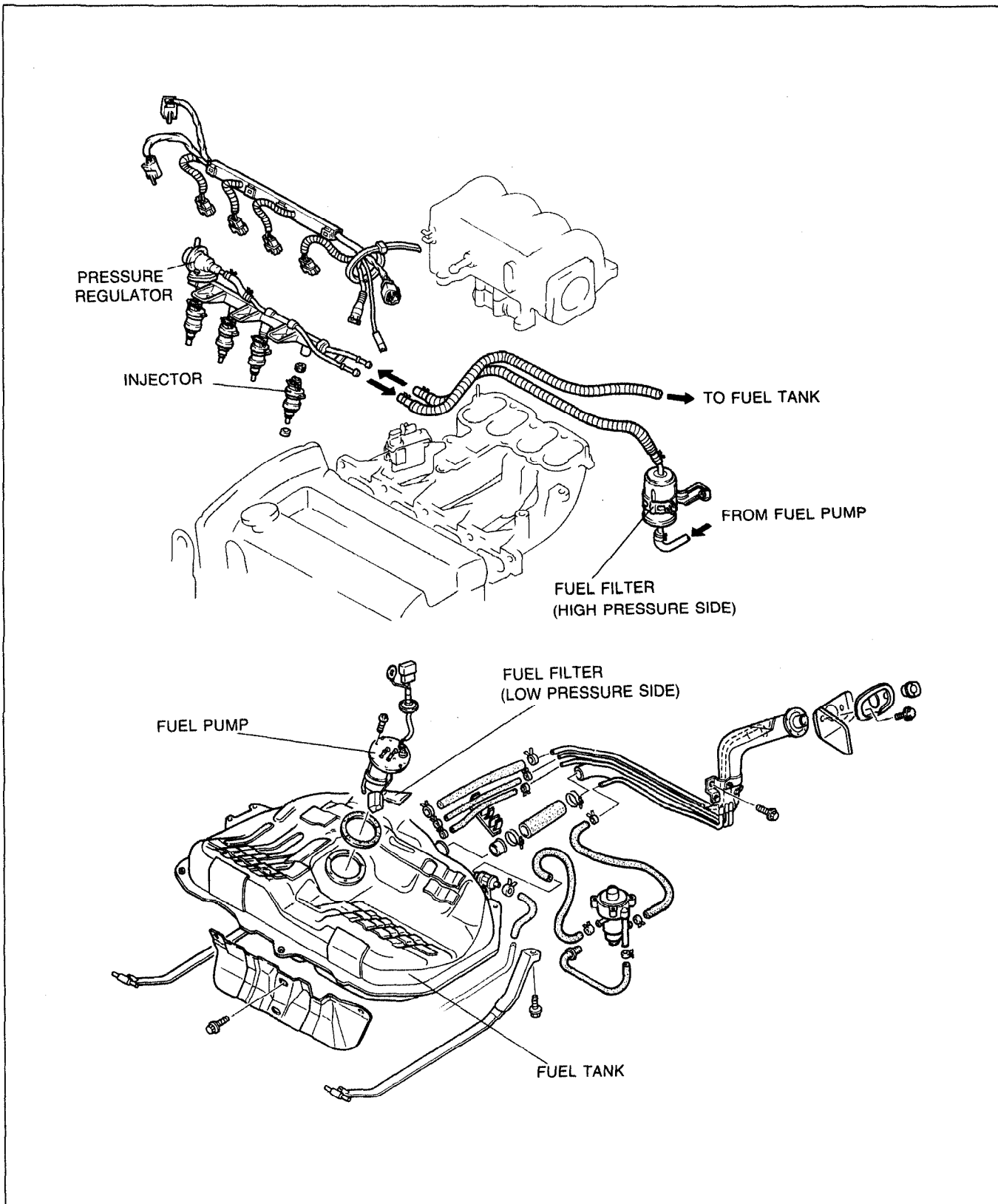
03U0FX-124

VACUUM CHAMBER**Inspection**

1. Remove the vacuum chamber.
2. Blow through the vacuum chamber from the port (A) and verify that air does not flow.
3. Blow through the vacuum chamber from the port (B) and verify that air flows.

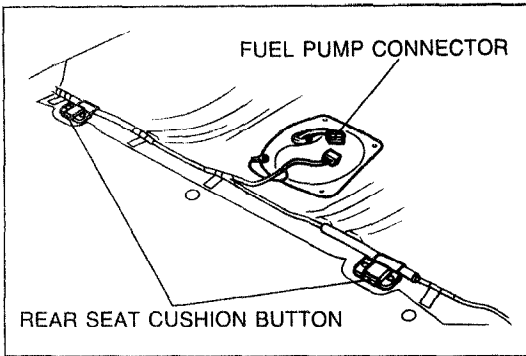
FUEL SYSTEM

DESCRIPTION



03U0FX-125

This system supplies the necessary fuel for combustion at a constant pressure to the fuel injectors. Fuel is metered and injected into the engine intake ports according to injection control signals from the engine control unit. The system consists of the fuel tank, the fuel pump, the fuel filters, the delivery pipe, the pressure regulator, the fuel injectors, and the circuit opening relay.



03U0FX-126

PRECAUTION

Fuel Pressure Release and Servicing Fuel System

Fuel in the fuel system remains under high pressure even when the engine is not running.

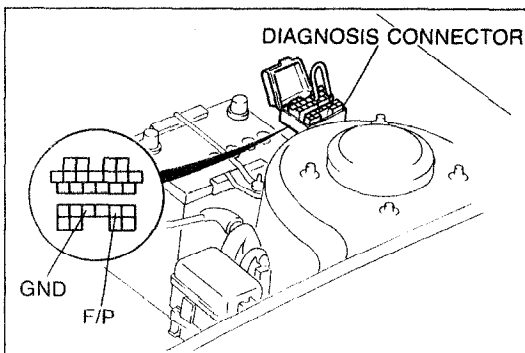
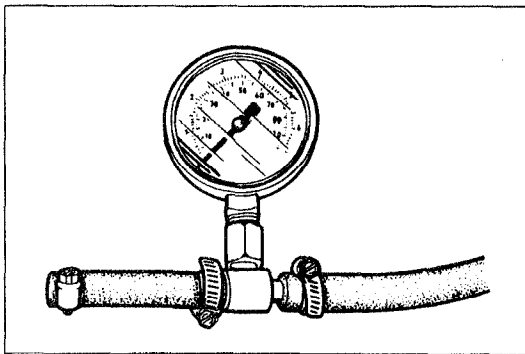
- a) Before disconnecting any fuel line, release the fuel pressure from the fuel system to reduce the possibility of injury or fire.
 1. Start the engine.
 2. Push the rear seat cushion buttons and remove the cushion.
 3. Disconnect the fuel pump connector.
 4. After the engine stalls, turn off the ignition switch.
 5. Reconnect the fuel pump connector and install the rear seat cushion.

- b) Use a rag as protection from fuel spray when disconnecting the hoses.
Plug the hoses after removal.
- c) When inspecting the fuel system, use a suitable fuel pressure gauge.

Caution

- Install hose clamps to secure the fuel pressure gauge to the fuel filter and the fuel main hose to prevent fuel leakage.

9MU0F2-122



03U0FX-127

Priming Fuel System

After releasing the fuel pressure for repairs or inspection, the system must be primed to avoid excessive cranking when first starting the engine. Follow the steps below.

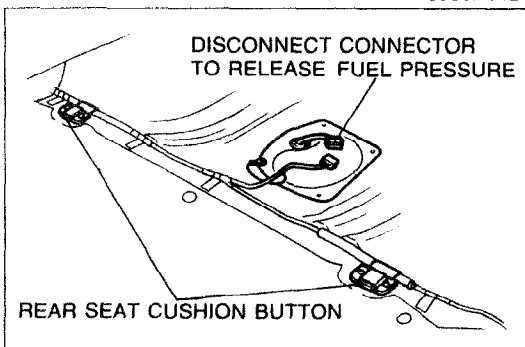
1. Connect the diagnosis connector terminals **F/P** and **GND** with a jumper wire.
2. Turn the ignition switch ON for **approx. 10 sec.** and check for fuel leaks.
3. Turn the ignition switch OFF and remove the jumper wire.

SYSTEM OPERATION

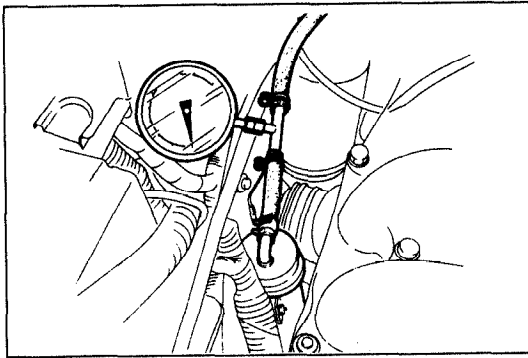
Fuel Pressure Hold Inspection

Warning

- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to above.)

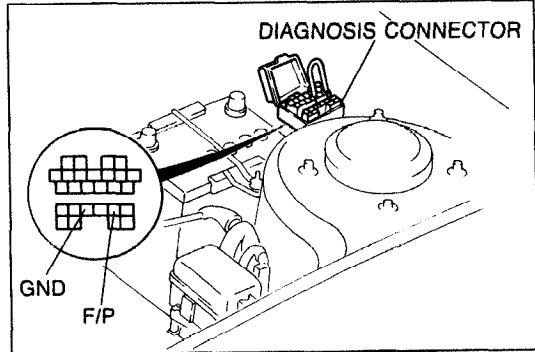


03U0FX-128



03U0FX-129

1. Disconnect the negative battery terminal.
2. Install a fuel pressure gauge between the fuel pipe and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.



23U0FX-104

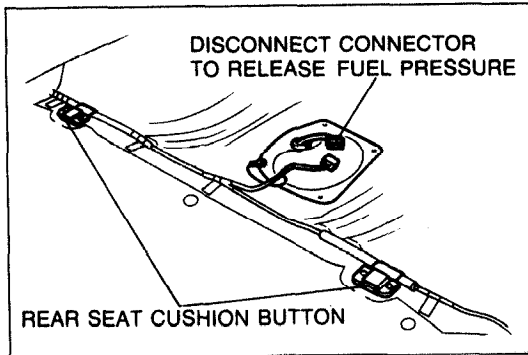
4. Connect the diagnosis connector terminals **F/P** and **GND** with a jumper wire.
5. Turn the ignition switch ON for **10 sec.** to operate the fuel pump.
6. Turn the ignition switch OFF and disconnect the jumper wire.
7. Observe the fuel pressure **after 5 min.**

Fuel pressure:**More than 147 kPa (1.5 kg/cm², 21 psi)**

8. If not as specified, perform the following inspections.
 - Fuel pump hold pressure. (Refer to page F-125.)
 - Pressure regulator hold pressure. (Refer to page F-129.)
 - Injector fuel leakage. (Refer to page F-132.)

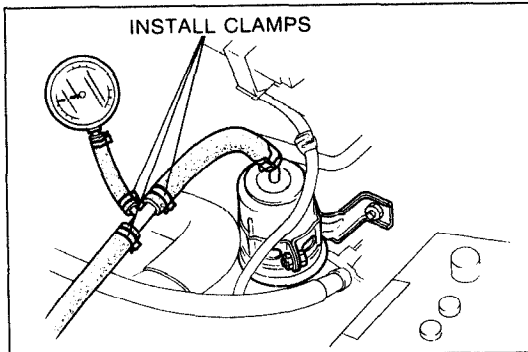
Fuel Line Pressure Inspection**Warning**

- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-121.)**



23U0FX-105

1. Disconnect the negative battery cable.
2. Install a fuel pressure gauge between the filter and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery cable.



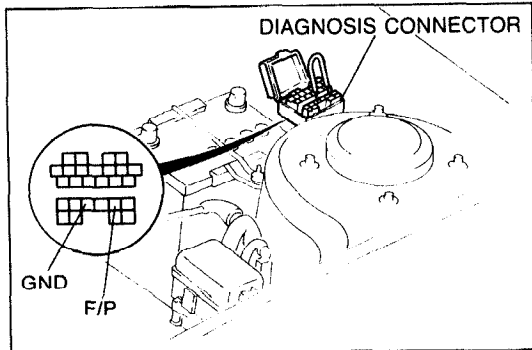
03U0FX-132

4. Connect diagnosis connector terminals **F/P** and **GND** with a jumper wire.
5. Turn the ignition switch ON.
6. Measure the fuel line pressure.

Fuel line pressure:**265—314 kPa (2.7—3.2 kg/cm², 38—46 psi)**

Pressure low — Measure fuel pump maximum pressure. (Refer to page F-126.) If as specified, fuel line or fuel filter might be clogged or restricted.

Pressure high — Replace pressure regulator. (Refer to page F-130.)



23U0FX-106

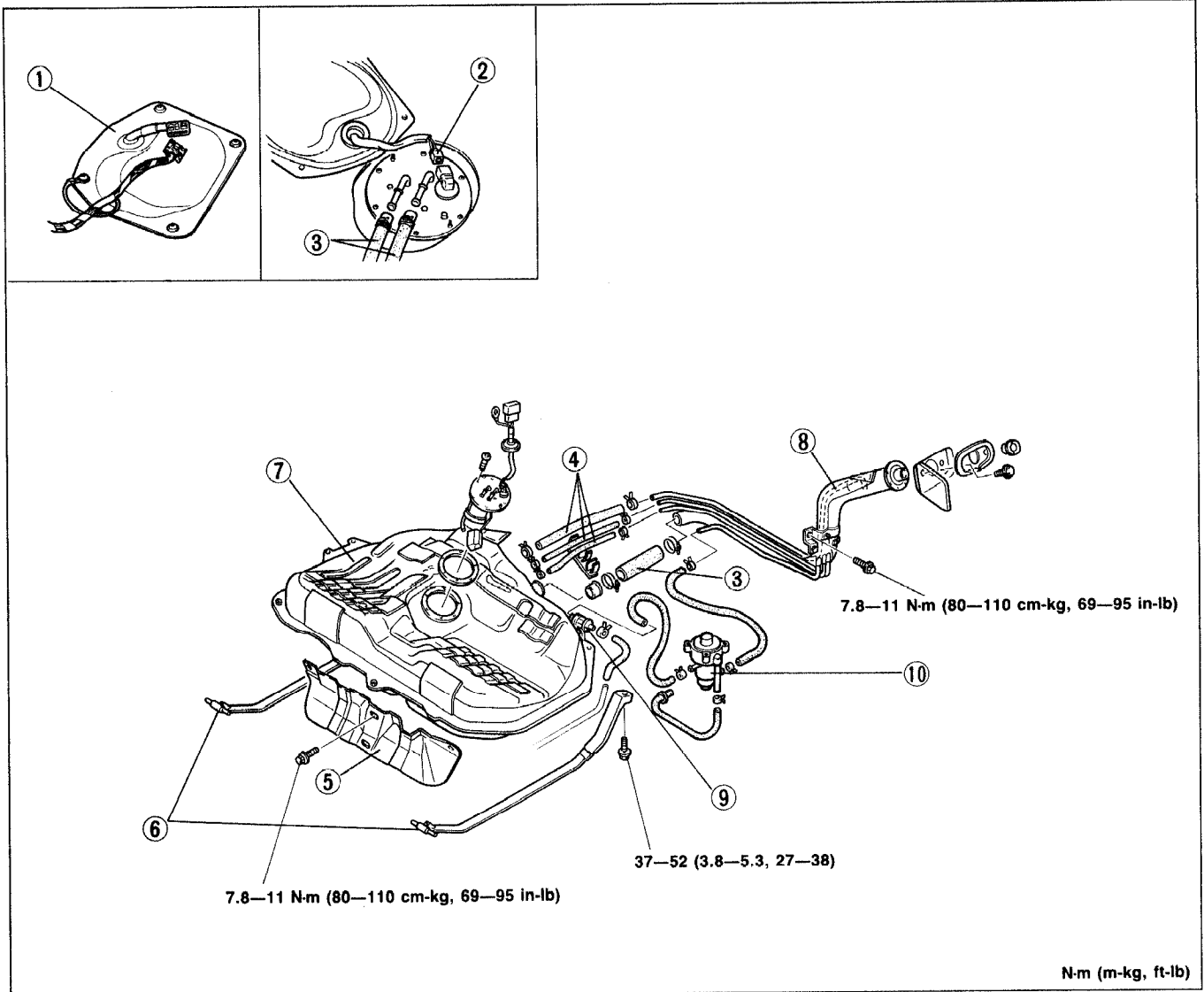
FUEL TANK

Removal / Inspection / Installation

Warning

- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-121.)
- When removing the fuel tank, keep sparks, cigarettes, and open flames away from it.
- Before repair the fuel tank, clean it thoroughly with steam to remove all explosive gas.

1. Remove in the order shown in the figure.
2. Inspect the fuel tank components visually and repair or replace if necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.



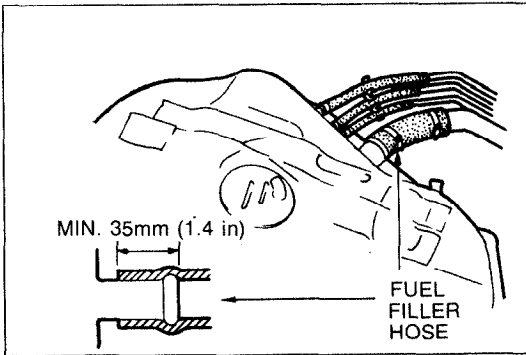
N-m (m-kg, ft-lb)

23U0FX-107

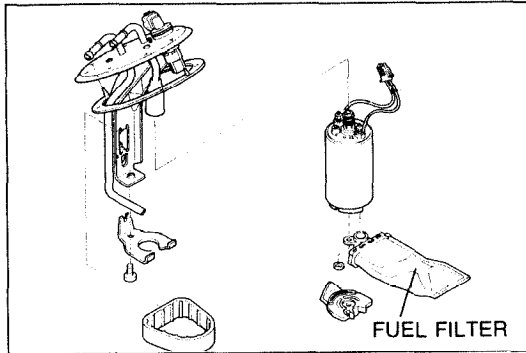
Note

- Drain the fuel from the fuel tank before removing the tank.

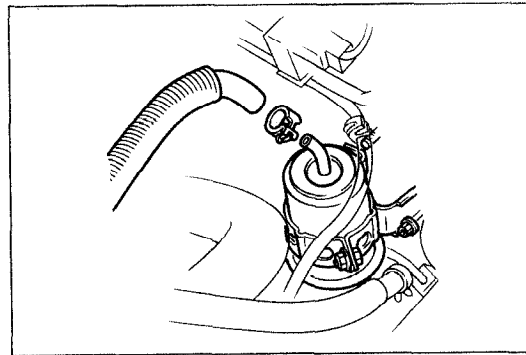
- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Fuel pump cover 2. Fuel pump connector 3. Fuel hoses
Installation Note page F-124 4. Evaporative hoses
Installation Note page F-124 5. Insulator 6. Fuel tank straps | <ol style="list-style-type: none"> 7. Fuel tank
Inspect for cracks and corrosion 8. Separator
Inspect for cracks and corrosion 9. Check valve (Two-way)
Inspection page F-140 10. Check-and-cut valve
Inspection page F-141 |
|--|---|



23U0FX-108



23U0FX-109



03U0FX-137

Installation Note**Fuel hoses**

1. Push the ends of the main fuel hose, fuel return hose, and evaporative hoses onto the fuel tank fittings **at least 25mm (1.0 in)**.
2. Push the fuel filler hose onto the fuel tank pipe and filler pipe **at least 35mm (1.4 in)**.

FUEL FILTER**Replacement****Low-pressure side (In-tank filter)**

(Refer to page F-128.)

High-pressure side

The fuel filter must be replaced at the intervals outlined in the maintenance schedule.

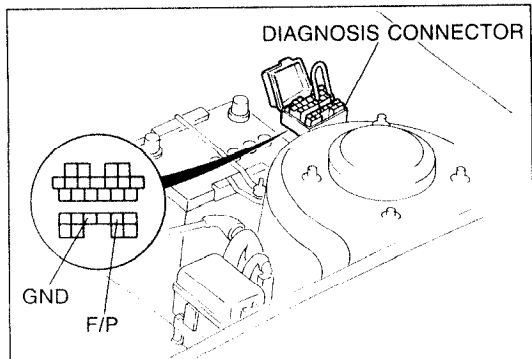
Warning

- **Always work away from sparks or open flames.**

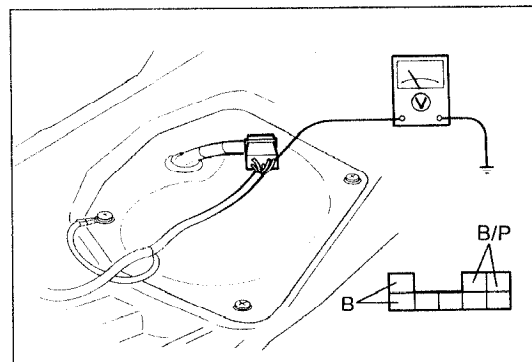
1. Disconnect the fuel hoses from the fuel filter.
2. Remove the fuel filter and bracket.
3. Install in the reverse order of removal.

Note

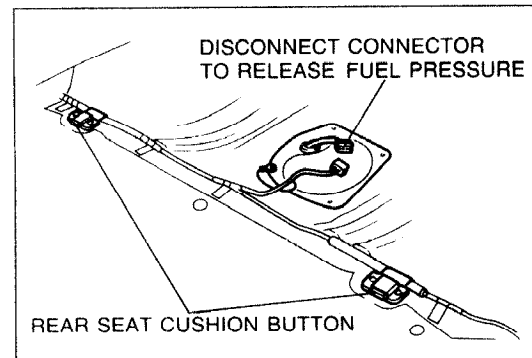
- **When installing the filter, push the fuel hoses fully onto the fuel filter.**



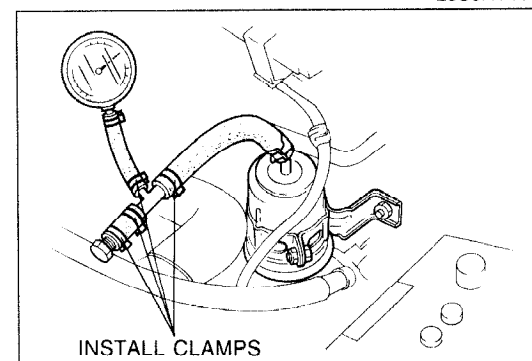
03U0FX-138



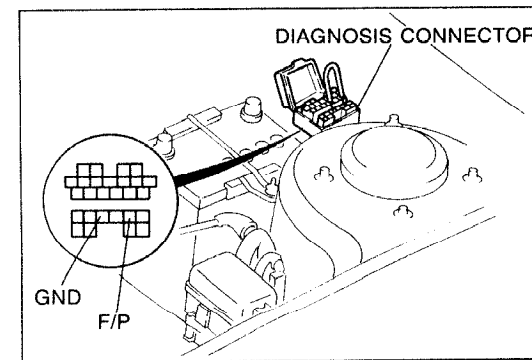
23U0FX-110



23U0FX-111



03U0FX-141



03U0FX-142

FUEL PUMP

Inspection

Fuel pump operation

1. Connect the diagnosis connector terminals **F/P** and **GND** with a jumper wire.
2. Remove the fuel filler cap.
3. Turn the ignition switch ON.
4. Listen for operational sound of the fuel pump at the filler inlet.
5. Install the fuel filler cap.
6. If no sound was heard, measure the voltage between the fuel pump connector wire B/P to ground.

Specification: Battery voltage

7. If not correct, check the circuit opening relay and its circuits. (Refer to page F-129.)
8. If the voltage is normal, check for continuity between fuel pump connector B/P and B.
9. If there is continuity, replace the fuel pump.
10. If there is no continuity, repair the ground circuit.

Hold pressure

Perform this inspection if the fuel pressure hold inspection is not as specified. (Refer to page F-121.)

Warning

- **Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-121.)**

1. Disconnect the negative battery terminal.
2. Connect a fuel pressure gauge to the fuel main pipe and plug the outlet of the fuel pressure gauge as shown. (Install clamps as shown.)
3. Connect the negative battery terminal.
4. Connect diagnosis connector terminals **F/P** and **GND** with a jumper wire.
5. Turn the ignition switch ON **for 10 sec.** to operate the fuel pump.
6. Turn the ignition switch OFF and disconnect the jumper wire.
7. Observe the fuel pressure **after 5 min.**

Fuel pressure:

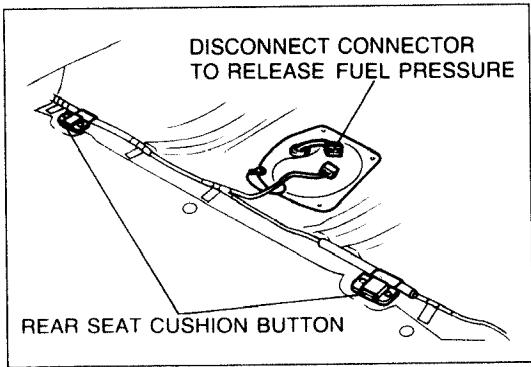
More than 343 kPa (3.5 kg/cm², 50 psi)

8. If not as specified, replace the fuel pump.

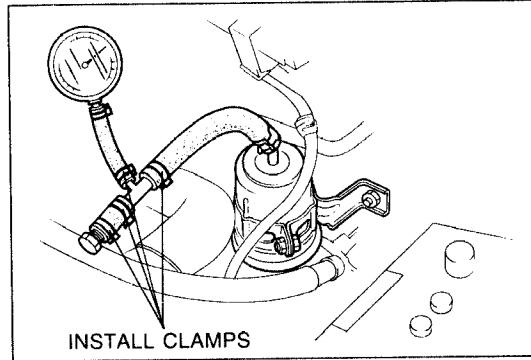
Fuel pump maximum pressure

Warning

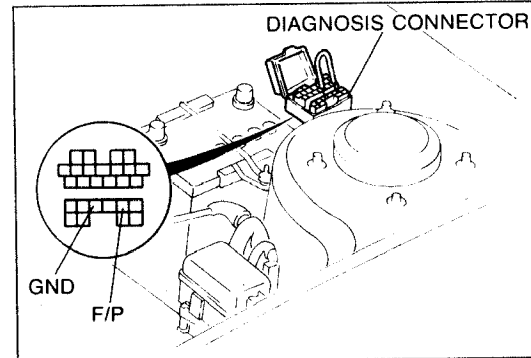
- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-121.)



23U0FX-112



03U0FX-144



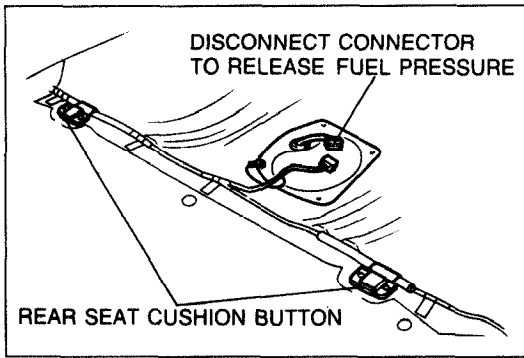
23U0FX-157

1. Disconnect the negative battery terminal.
2. Connect a fuel pressure gauge to the fuel main pipe and plug the outlet of the fuel pressure gauge as shown. (Install clamps as shown.)
3. Connect the negative battery terminal.
4. Connect diagnosis connector terminals **F/P** and **GND** with a jumper wire.
5. Turn the ignition switch ON to operate the fuel pump.
6. Measure the pump maximum pressure.

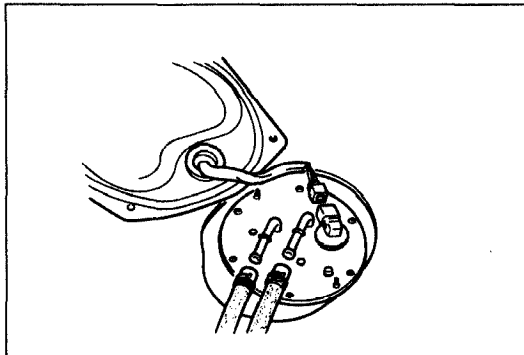
Fuel pump maximum pressure:

441—637 kPa (4.5—6.5 kg/cm², 64—92 psi)

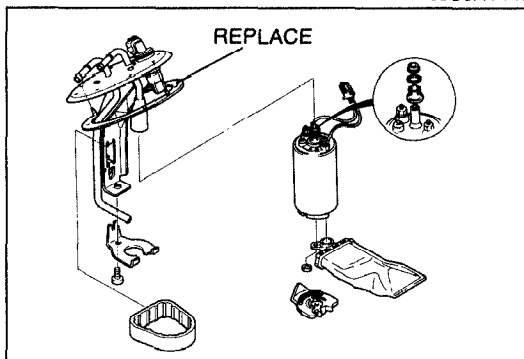
7. Turn the ignition switch OFF and disconnect the jumper wire.
8. If not as specified, replace the fuel pump.



23U0FX-113



03U0FX-147



03U0FX-148

Replacement

Warning

- Before performing the following procedures, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-121.)
- When replacing the fuel system parts, keep sparks, cigarettes, and open flames away from the fuel.

1. Push the rear seat cushion buttons and remove the cushion.
2. Remove the fuel pump cover.
3. Disconnect the fuel pump connector.
4. Disconnect the fuel hoses.
5. Remove the fuel pump and fuel tank gauge sender unit assembly.

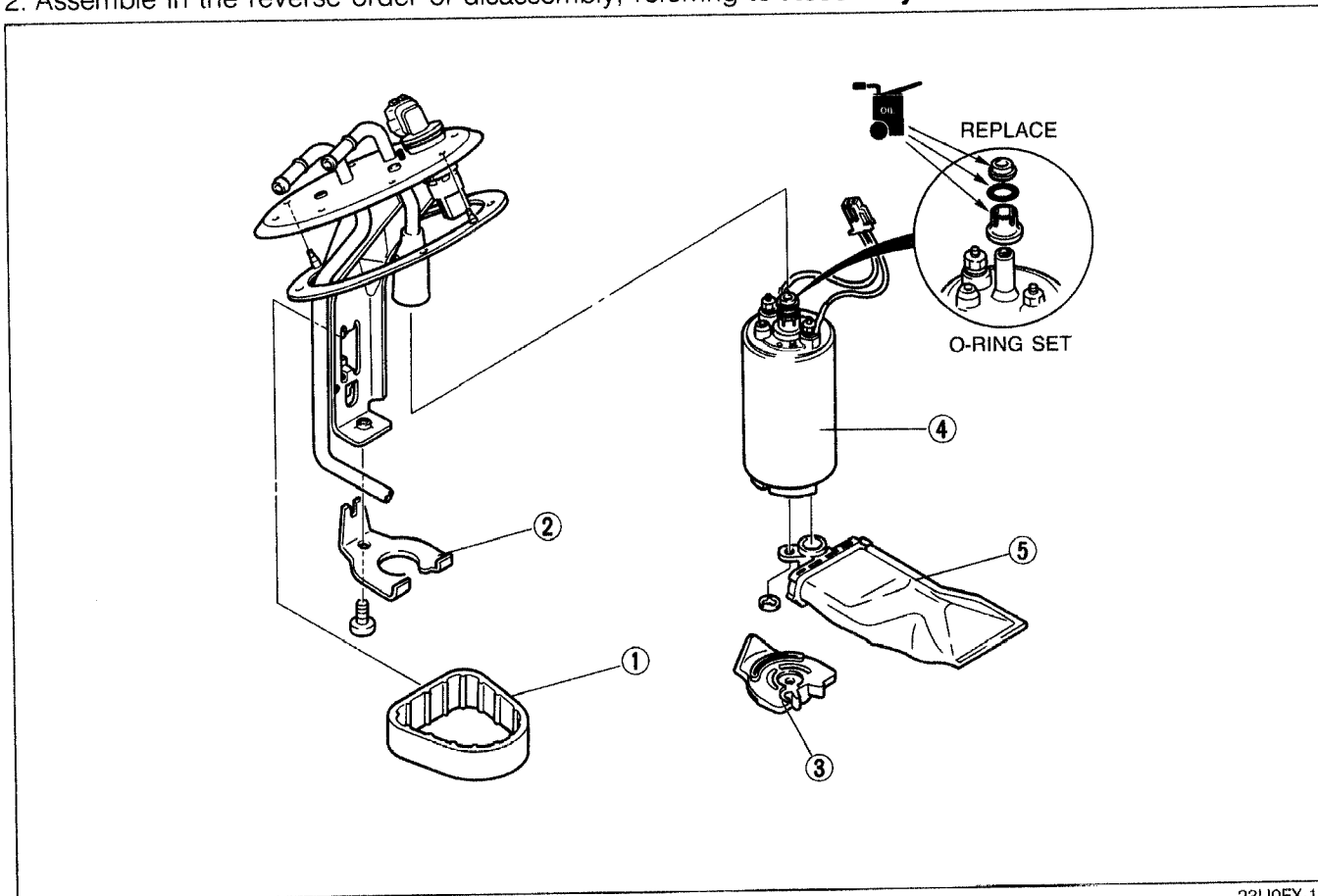
Caution

- Secure the fuel hoses tightly.
- Use a new seal rubber.

6. Install in the reverse order of removal.

Disassembly / Assembly

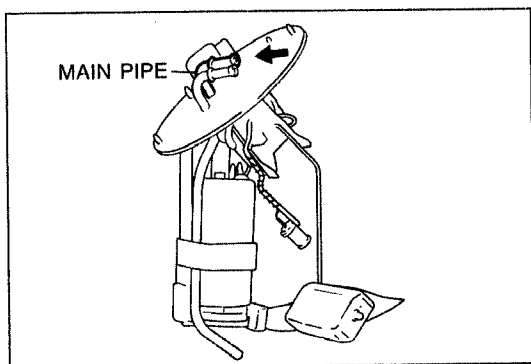
1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



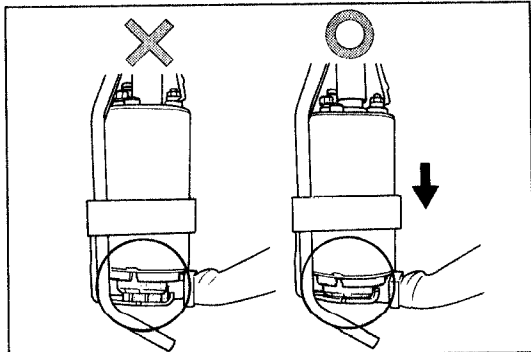
23U0FX-114

1. Band
2. Bracket
3. Rubber mount

4. Fuel pump
Assembly note..... page F-128
5. Fuel filter



03U0FX-151



03U0FX-152

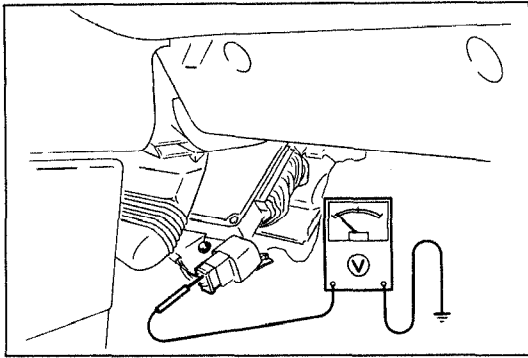
Assembly note

O-ring set

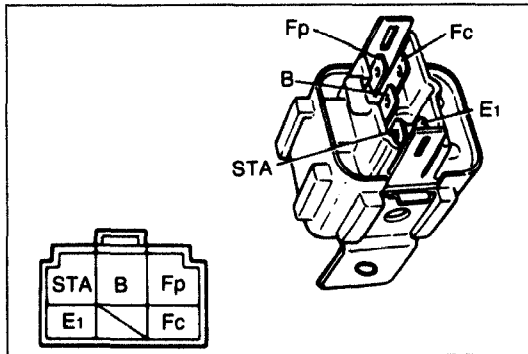
1. Use a new O-ring set. (O-ring, cap, and spacer)
2. Apply oil or fuel to the O-ring set before installing.
3. To confirm sealing of the O-ring, blow air through the main pipe after assembling the fuel pump and fuel tank gauge sender unit, and verify that no air flows past the O-ring. If air flows through the pump, the check ball may be stuck. Shake the fuel pump two or three times and recheck.

Fuel pump

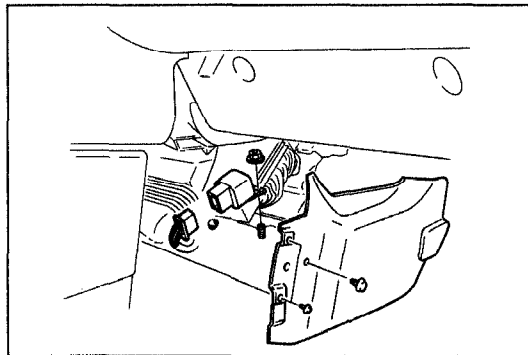
1. After installing the fuel pump to the bracket, pull the pump down so that it is tight against the bracket.



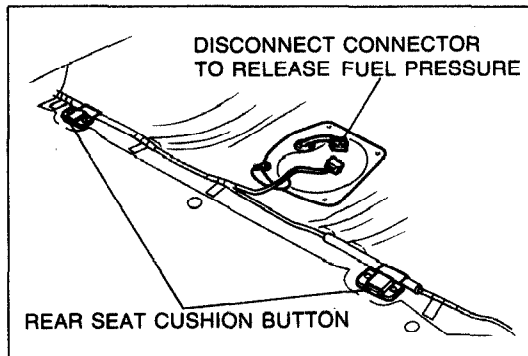
23U0FX-115



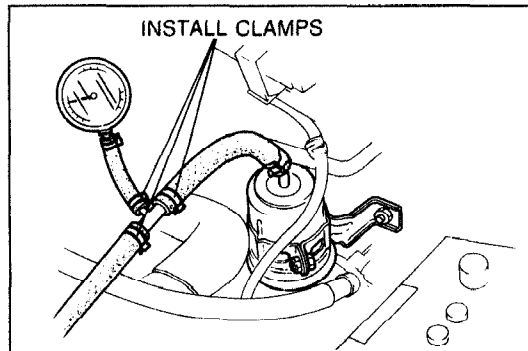
03U0FX-154



03U0FX-155



23U0FX-116



03U0FX-157

CIRCUIT OPENING RELAY

Inspection

Voltage inspection

1. Check voltage between the following terminals and a ground using a voltmeter.

V_B: Battery voltage

Terminal	Condition	Ignition switch		Idling (V)
		ON (V)	START (V)	
Fp (B/P)		0	V _B	V _B
Fc (LG)		V _B	0	0
B (W/R)		V _B	V _B	V _B
STA (V)		0	V _B	0
E1 (B)		0	0	0

Resistance inspection

1. Check resistance between the terminals using an ohmmeter.

Terminal	Resistance (Ω)
STA—E1	21—43
B—Fc	109—226
B—Fp	∞

Replacement

1. Remove the passenger side wall.
2. Disconnect the relay connector.
3. Remove the relay from ECU bracket.
4. Install in the reverse order of removal.

PRESSURE REGULATOR

Inspection

Fuel line pressure

Warning

- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-121.)

1. Disconnect the negative battery terminal.
2. Connect a fuel pressure gauge between the fuel filter and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.
4. Start the engine and run it at idle.
5. Measure the fuel line pressure.

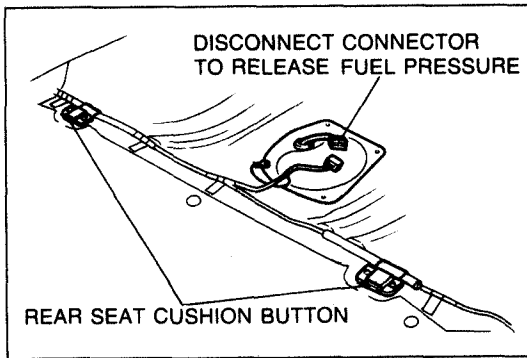
Fuel line pressure:

206—255 kPa (2.1—2.6 kg/cm², 30—37 psi)

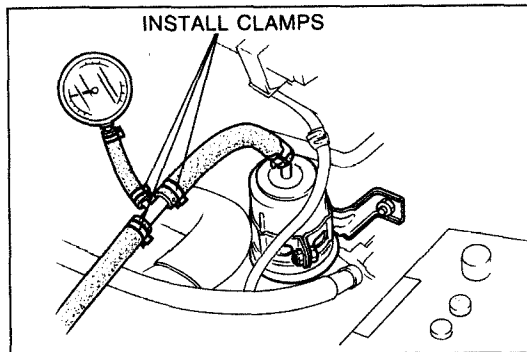
6. Disconnect the vacuum hose from the pressure regulator and measure the fuel line pressure.

Fuel line pressure:

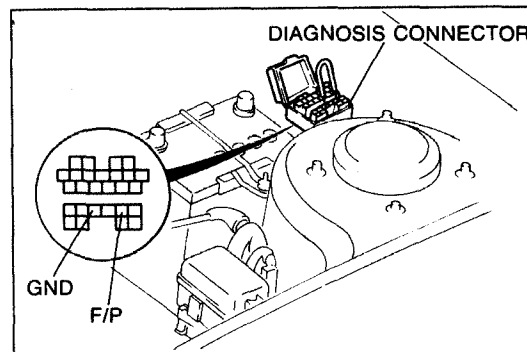
265—314 kPa (2.7—3.2 kg/cm², 38—46 psi)



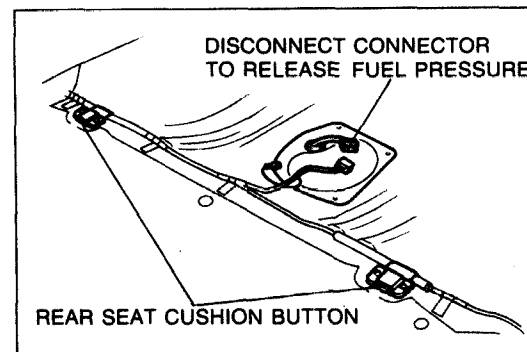
23U0FX-117



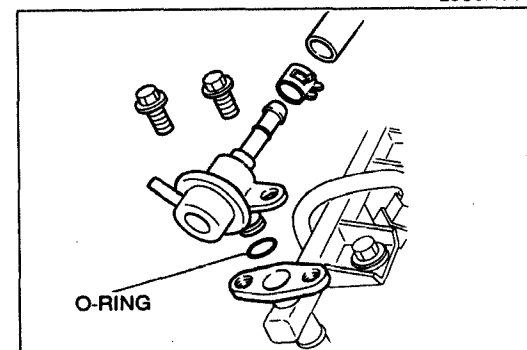
03U0FX-159



13U0FX-102



23U0FX-118



03U0FX-162

Hold pressure

Perform this inspection if the fuel pressure hold inspection is not as specified. (Refer to page F-121.)

Warning

- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-121.)

1. Disconnect the negative battery terminal.
2. Connect a fuel pressure gauge between the fuel filter and the fuel main hose. (Install clamps as shown.)
3. Connect the negative battery terminal.
4. Connect the diagnosis connector terminals **F/P** and **GND** with a jumper wire.
5. Turn the ignition switch **ON for 10 seconds** to operate the fuel pump.
6. Turn the ignition switch **OFF** and disconnect the jumper wire.
7. Pinch the fuel return hose with pliers.
8. Observe the fuel pressure **for 5 minutes**.

Fuel pressure:

More than 147 kPa (1.5 kg/cm², 21 psi)

9. If not as specified, replace the pressure regulator.

Replacement**Warning**

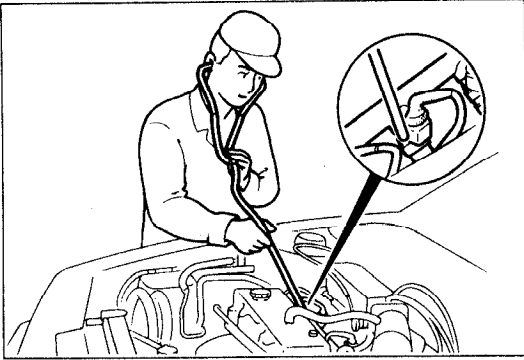
- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-121.)
- When replacing fuel system components, keep sparks, cigarettes, and open flames away from the fuel.

1. Disconnect the vacuum hose.
2. Disconnect the fuel return hose.
3. Remove the pressure regulator.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

4. Install a new O-ring.
5. Install in the reverse order of removal.



23U0FX-119

INJECTOR Inspection Operation check

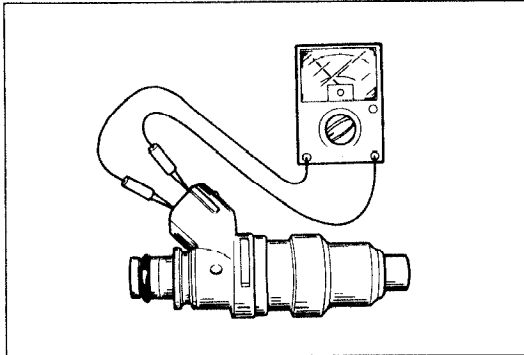
1. Warm up the engine and run it at idle.
2. Listen for operational sound of each injector with a screwdriver or a sound scope.
3. If no sound is heard, measure injector resistance.
4. If the injector resistance is OK, check wiring to the injector and the voltages of the ECU terminals MTX (2A, 2U and 2V) ATX (3A, 3U and 3V).
(Refer to page F-152.)

Injector resistance

1. Disconnect the injector harness.
2. Measure resistance of the injector with an ohmmeter.

Resistance: 12—16Ω

3. If not as specified, replace the injector.

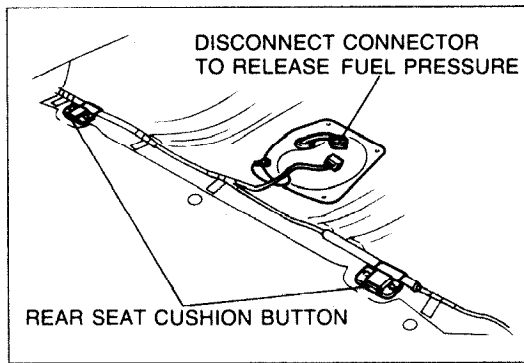


03U0FX-164

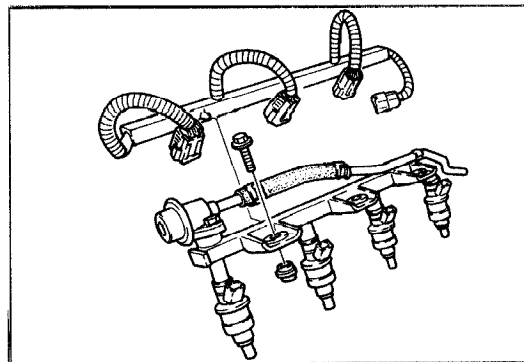
Removal

Warning

- Before performing the following operation, release the fuel pressure from the fuel system to reduce the possibility of injury or fire. (Refer to page F-121.)
- When removing the fuel system components, keep sparks, cigarettes, and open flames away from the fuel.

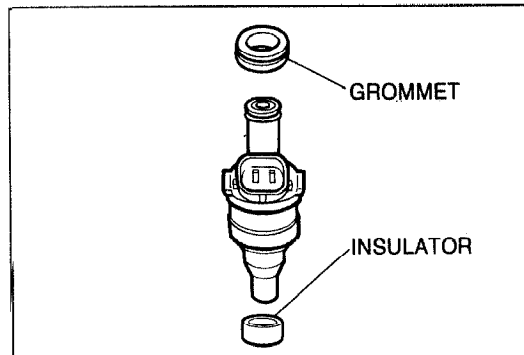


23U0FX-120



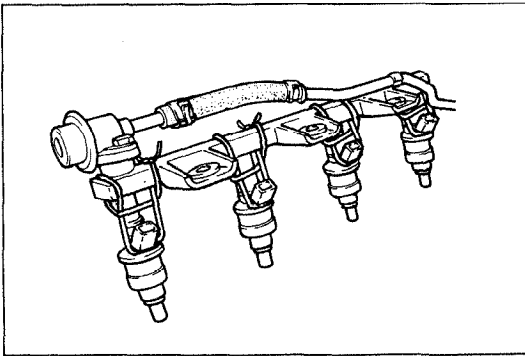
03U0FX-166

1. Disconnect the connectors from the injectors.
2. Remove the injector harness from the delivery pipe.
3. Remove the bolts from the intake manifold.
4. Remove the delivery pipe with the injectors and the pressure regulator.

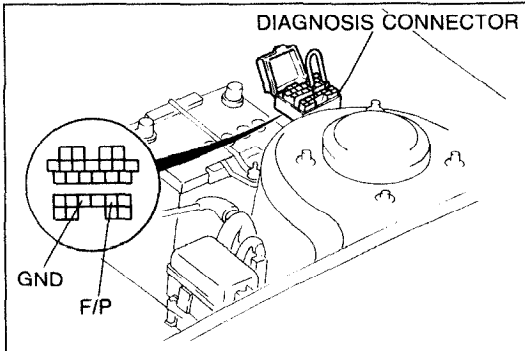


03U0FX-167

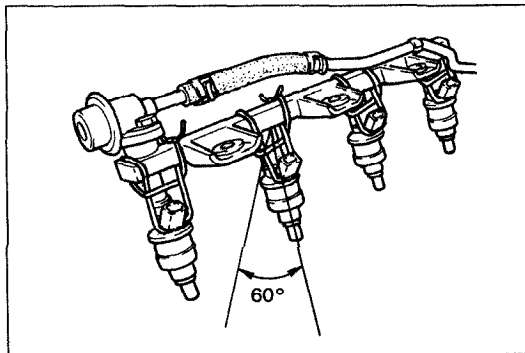
5. Remove the injectors, grommets, and insulators.



23U0FX-121



03U0FX-169



23U0FX-122

Fuel leakage test

1. Remove the injectors with the delivery pipe.
(Refer to page F-131.)
2. Affix the injectors to the delivery pipe with wire.

Caution

- **Affix the injectors firmly to the delivery pipe so that no movement of the injectors is possible.**

Warning

- **Be extremely careful when working with fuel. Always work away from sparks or open flames.**

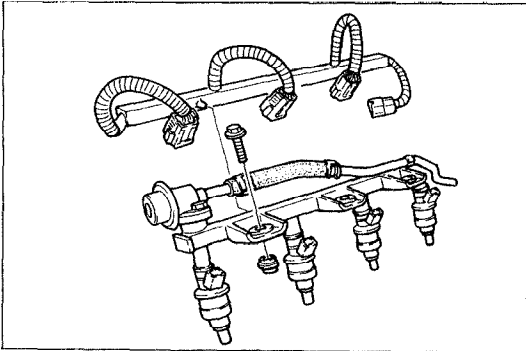
3. Connect the diagnosis connector terminals **F/P** and **GND** with a jumper wire.
4. Turn the ignition switch ON.

5. Tilt the injectors **approx. 60 degrees** and verify that no fuel leaks from the injector nozzles.
6. If fuel leaks from an injector, replace it.

Note

- **After 1 minute a small amount of fuel leakage from the injector is acceptable.**

7. Turn the ignition switch OFF and remove the jumper wire.



9MU0F2-172

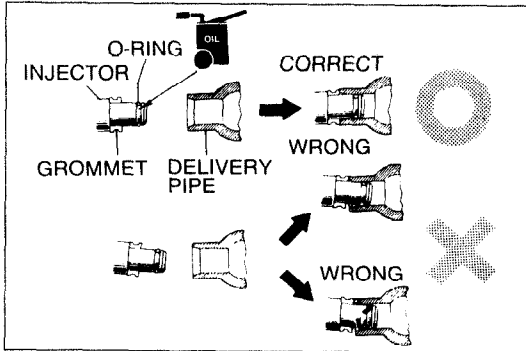
Installation

Install in the reverse order of removal, referring to **Installation Note**.

Tightening torque:

Delivery pipe

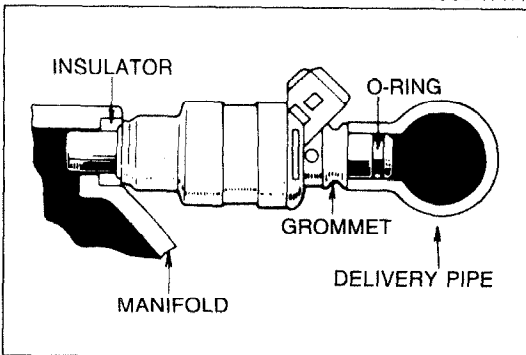
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



05U0FX-177

Installation note

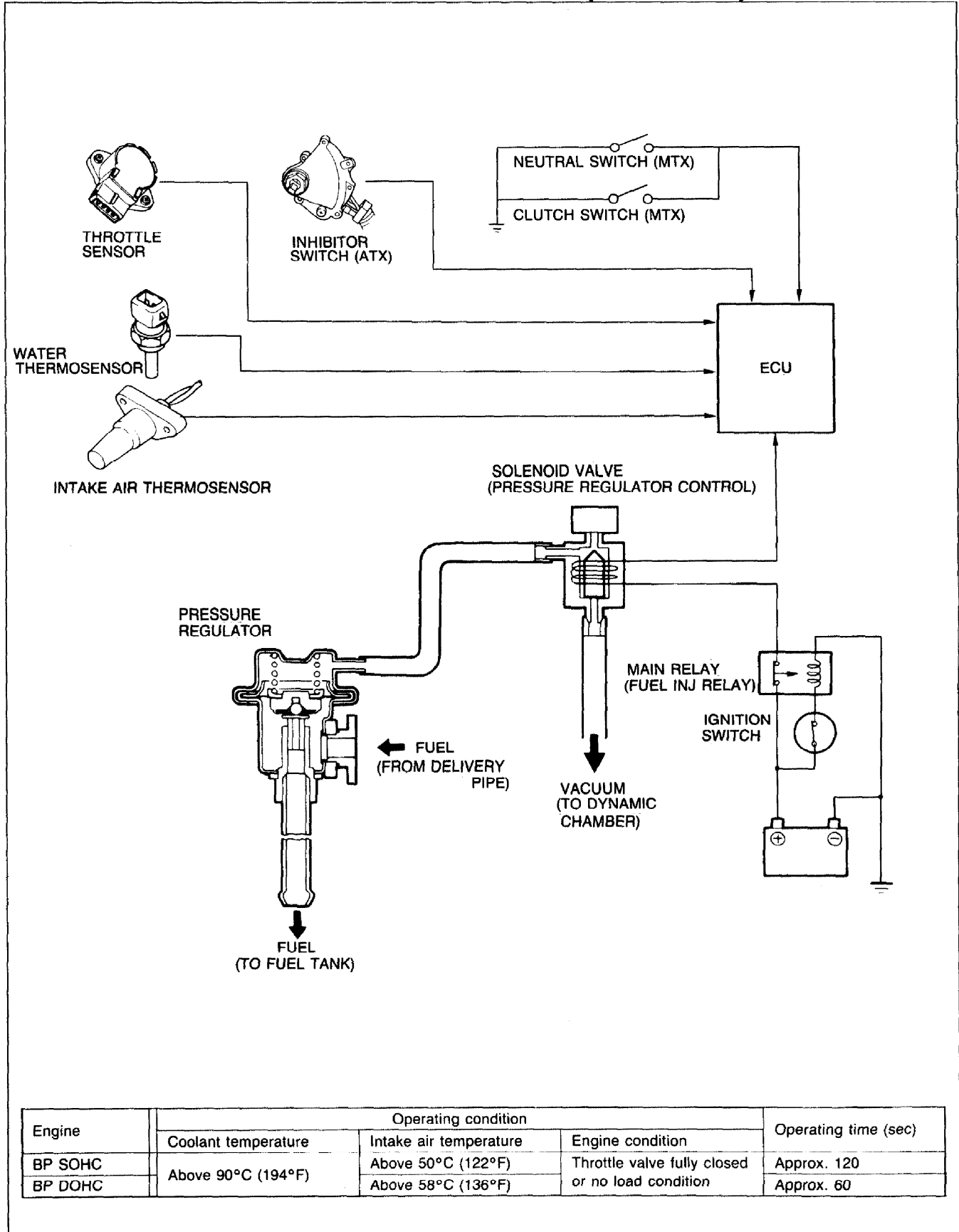
1. Use new injector O-rings.
2. Apply a small amount of clean engine oil to the O-rings before installing.



03U0FX-171

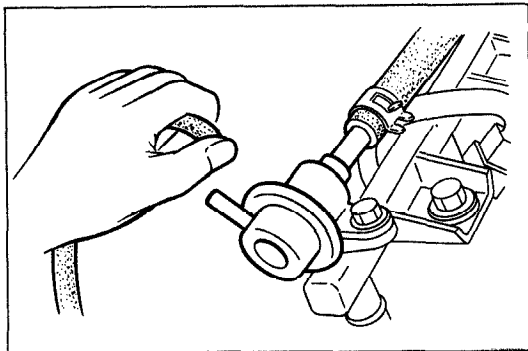
3. Install new injector insulators.
4. Install the injectors.

PRESSURE REGULATOR CONTROL SYSTEM (BP ENGINE)

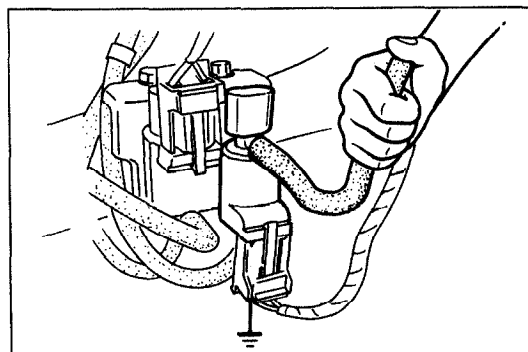


03U0FX-172

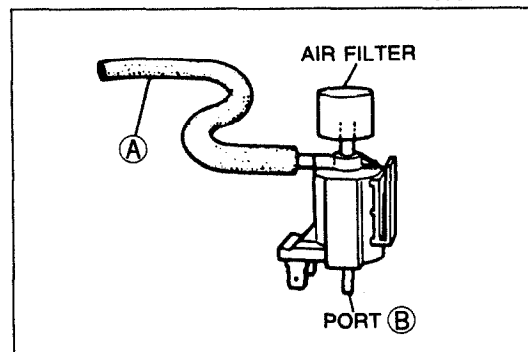
To prevent percolation of the fuel during hot restart idle, vacuum to the pressure regulator is momentarily cut, and the fuel injection pressure is increased to slightly more than **284 kPa (2.9 kg/cm², 41.2 psi)**.



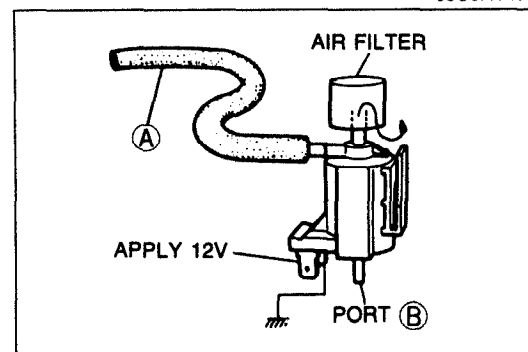
03U0FX-173



03U0FX-149



03U0FX-174



23U0FX-123

SOLENOID VALVE (PRESSURE REGULATOR CONTROL)

Inspection

On-vehicle

1. Start the engine and run it at idle.
2. Disconnect the vacuum hose (Orange) from the pressure regulator. Verify that vacuum is felt.
3. Ground the solenoid valve terminal-wire G/O with a jumper wire. Verify that no vacuum is felt.
4. If vacuum exists, check the solenoid valve.

Solenoid Valve

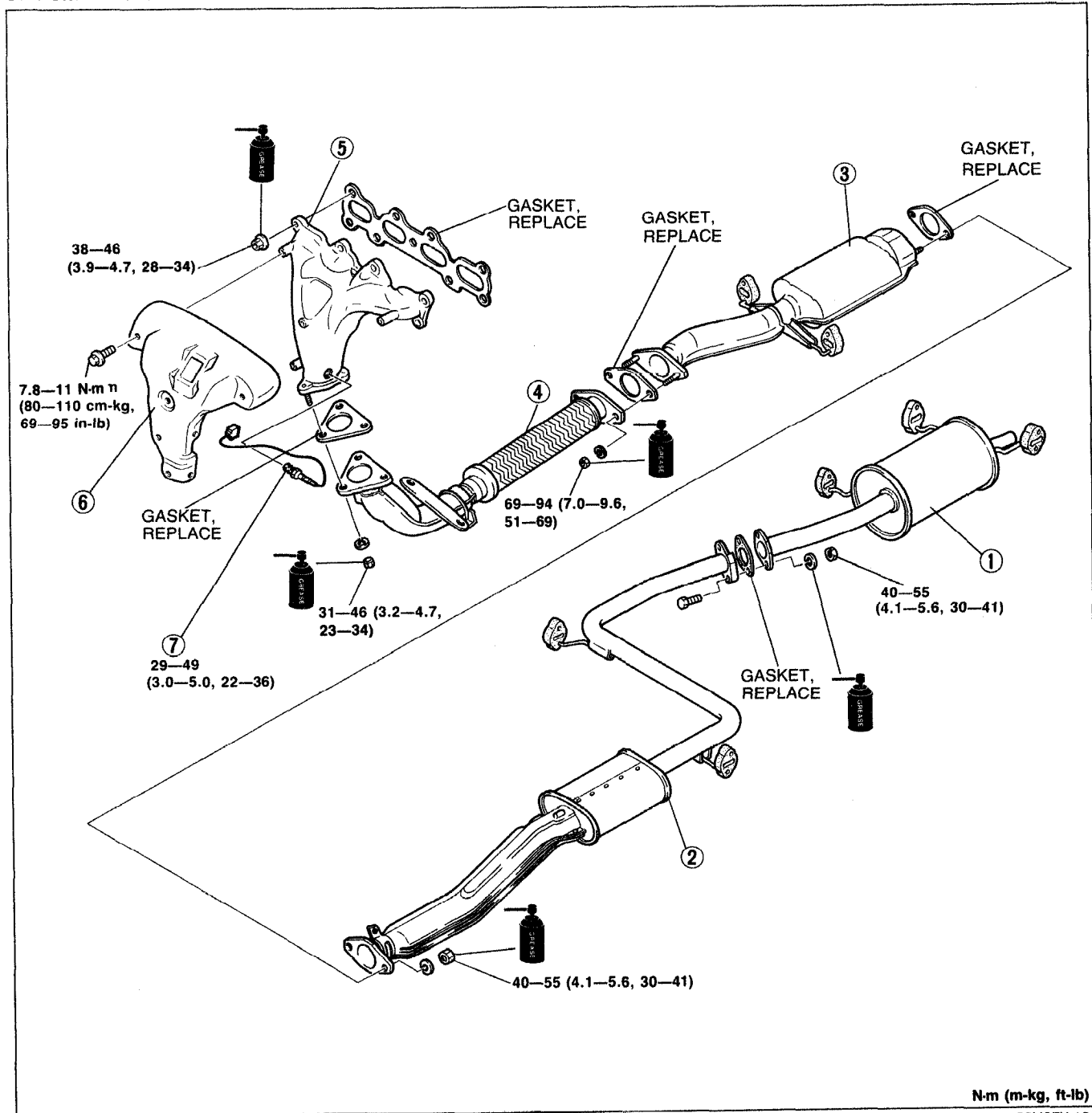
1. Disconnect the vacuum hose from the solenoid valve and vacuum pipe.
2. Blow through the solenoid valve from port (A).
3. Verify that air flows from port (B).
4. Disconnect the solenoid valve connector.
5. Connect battery voltage and a ground to the terminals of the solenoid valve.
6. Blow through the solenoid valve from the port (A).
7. Verify that air flows from the valve air filter.
8. If not as specified, replace the solenoid valve.

EXHAUST SYSTEM

COMPONENT PARTS

Removal / Inspection / Installation

1. Remove in the order shown in the figure.
2. Check the exhaust component parts and repair or replace if necessary.
3. Install in the reverse order of removal.



N-m (m-kg, ft-lb)

23U0FX-124

1. Main silencer
Inspect for deterioration and restriction
2. Pre-silencer
Inspect for deterioration and restriction
3. Catalytic converter
Inspect for deterioration and restriction

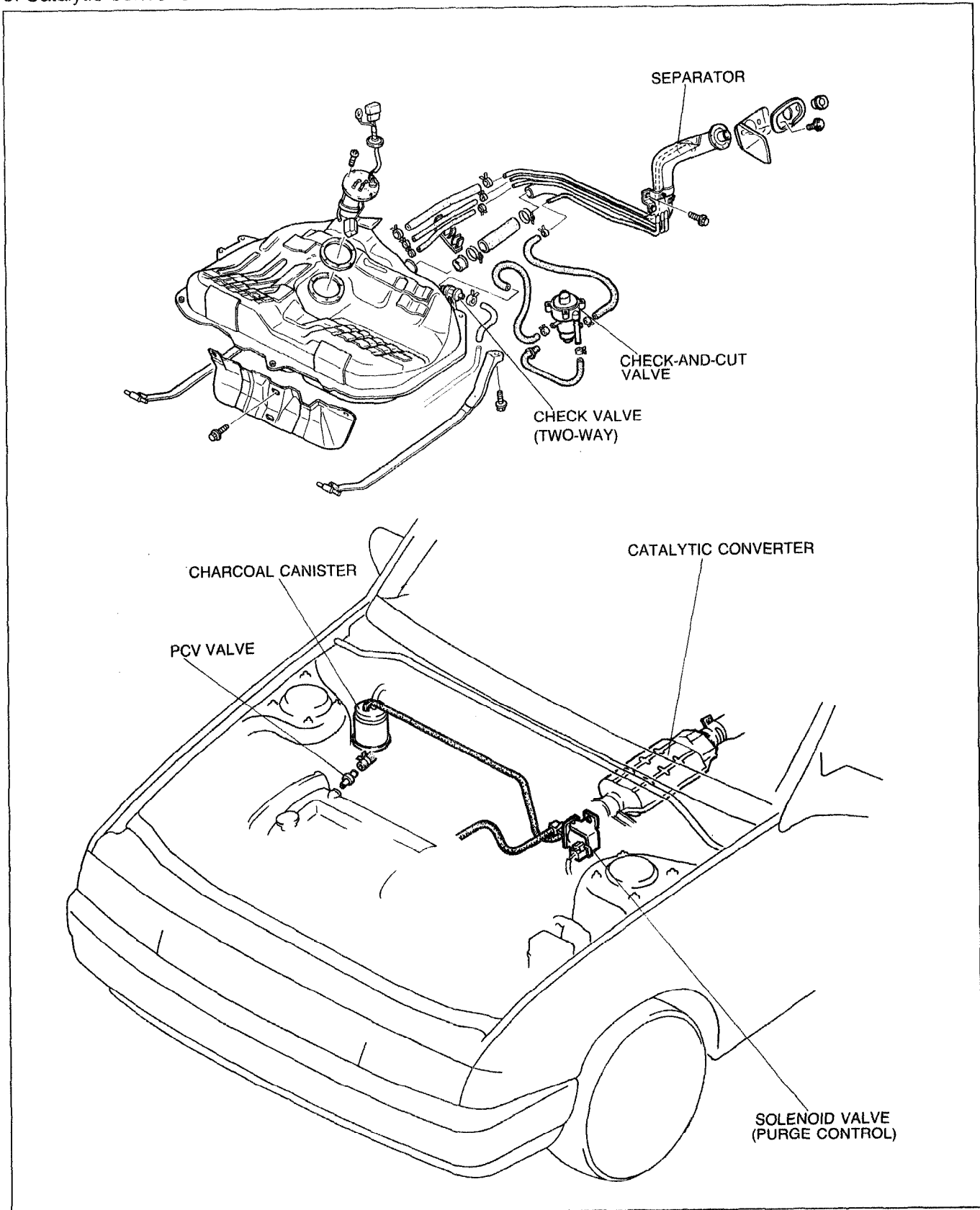
4. Front pipe assembly
Inspect for deterioration and restriction
5. Exhaust manifold
Inspect for deterioration and cracks
6. Exhaust manifold insulator
7. Oxygen sensor
Inspection..... page F-171

OUTLINE OF EMISSION CONTROL SYSTEM

STRUCTURAL VIEW

To reduce CO, HC, and NO_x emissions, the following systems are employed.

1. Positive crankcase ventilation (PCV) system
2. Evaporative emission control system
3. Catalytic converter



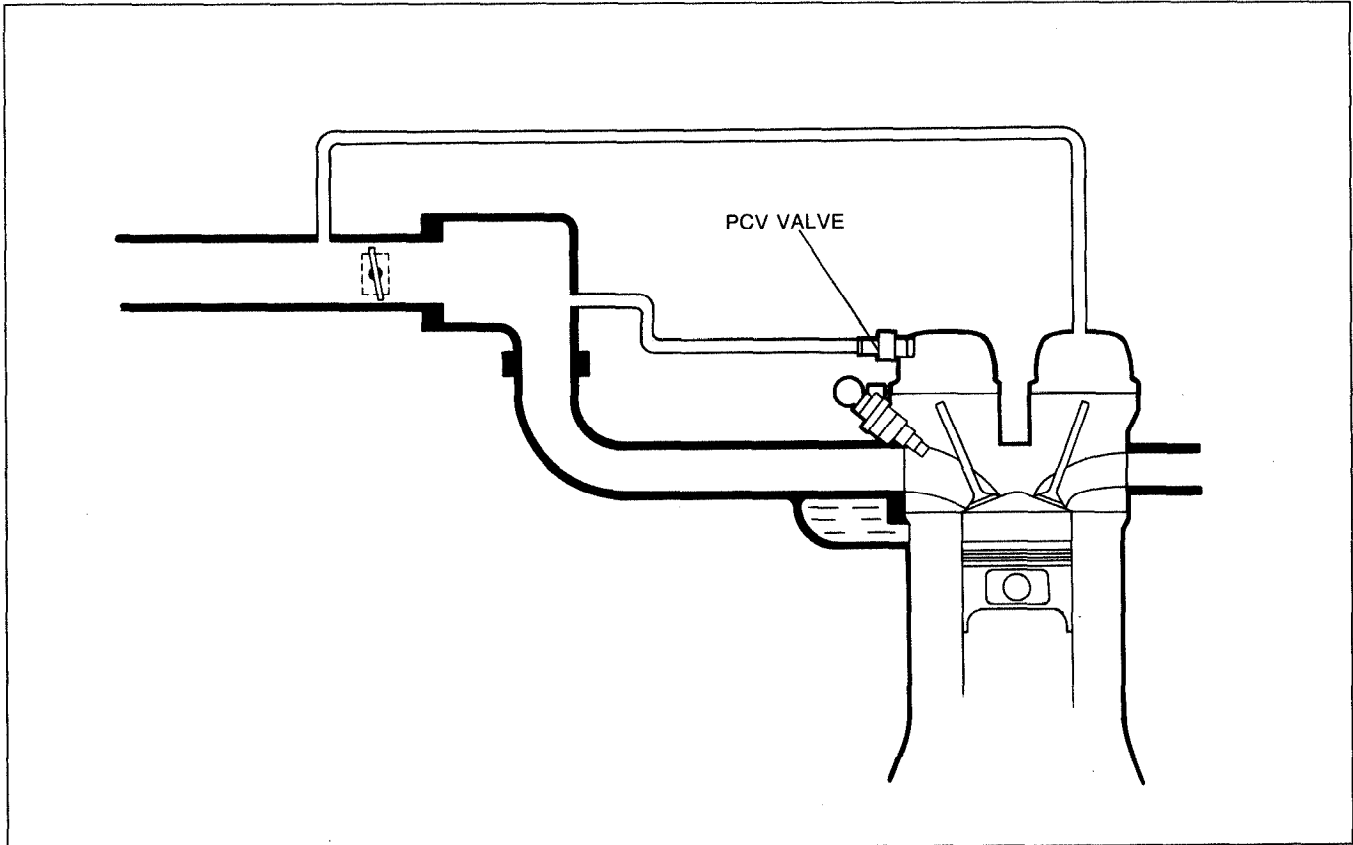
POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

DESCRIPTION

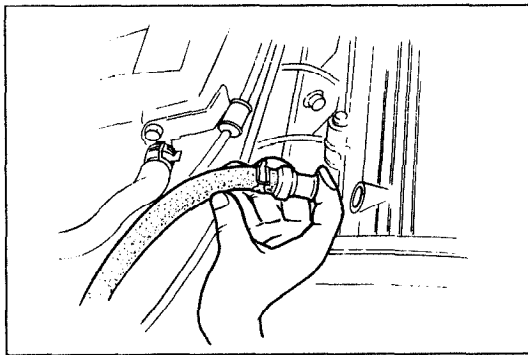
The PCV valve is operated by the intake manifold vacuum.

When the engine is running at idle, the PCV valve is opened slightly and a small amount of blowby gas is drawn into the dynamic chamber to be burned.

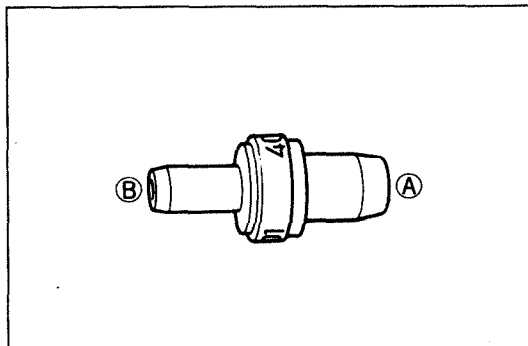
As the engine speed rises the PCV valve is opened further, allowing a larger amount of blowby gas to be drawn into the dynamic chamber.



03U0FX-176



23U0FX-125



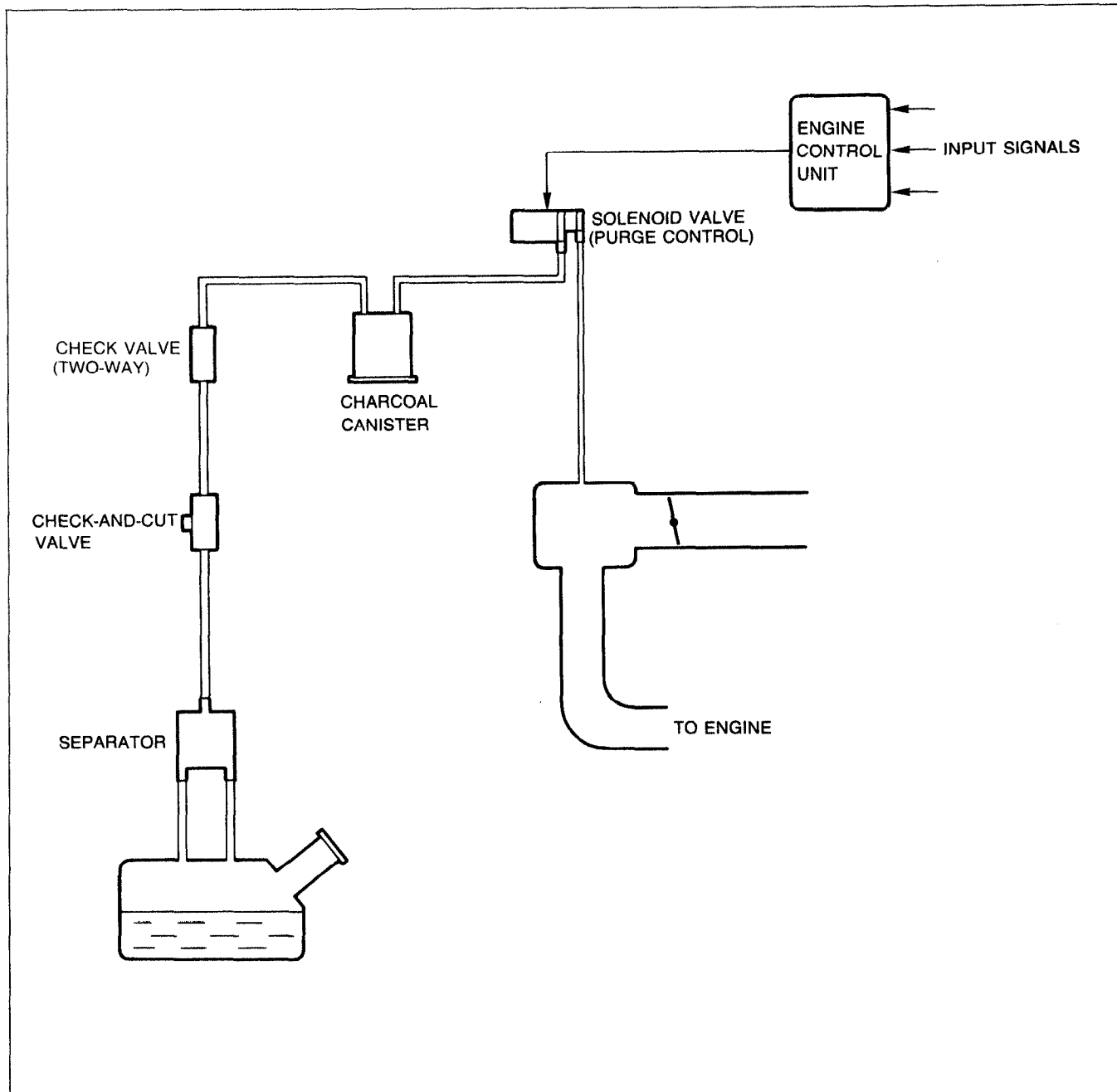
9MU0F2-184

PCV VALVE Inspection

1. Warm up the engine to the normal operating temperature and run it at idle.
2. Disconnect the PCV valve with the ventilation hose from the cylinder head cover.
3. Block the PCV valve opening.
4. Verify that there is vacuum.
5. Remove the PCV valve.
6. Blow through the valve from port (A) and verify that air comes out of port (B).
7. Blow through the valve from port (B) and verify that no air comes out of port (A).
8. Replace the PCV valve if necessary.

EVAPORATIVE EMISSION CONTROL SYSTEM

DESCRIPTION



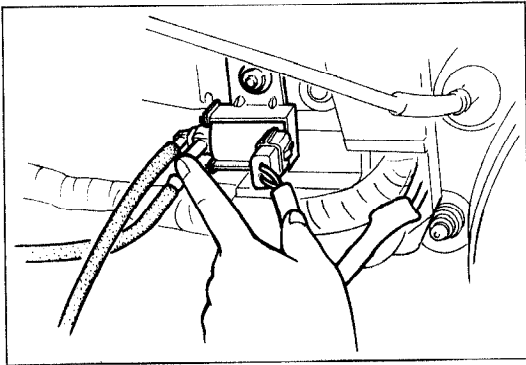
03U0FX-178

The evaporative emission control system consists of the separator, the check-and-cut valve, the two-way check valve, the charcoal canister, the purge control solenoid valve, the engine control unit (ECU), and the input devices. The amount of evaporative fumes introduced into the engine and burned is controlled by the solenoid valve to correspond to the engine's operating conditions. To maintain best engine performance, the solenoid valve is controlled by the ECU.

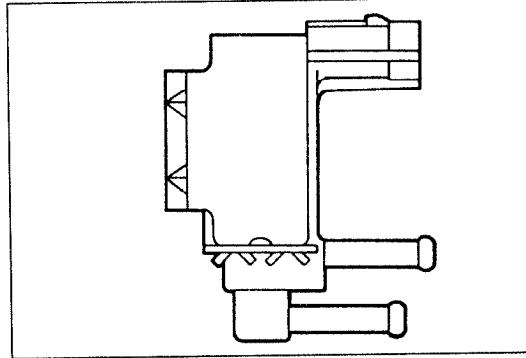
Operation

The solenoid valve (purge control) is controlled by duty signals from the ECU to perform purging of the charcoal canister. Purging is done when these conditions are met:

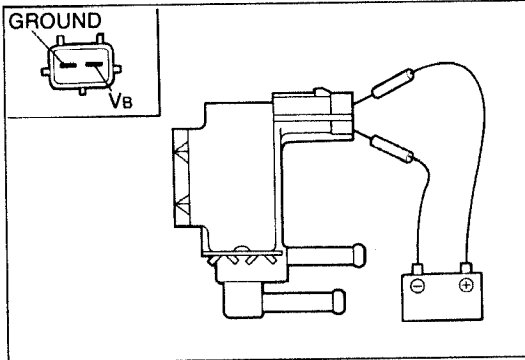
- (1) After warm-up
- (2) Driving in gear
- (3) Accelerator pedal depressed (idle switch OFF)
- (4) Oxygen sensor functioning normally



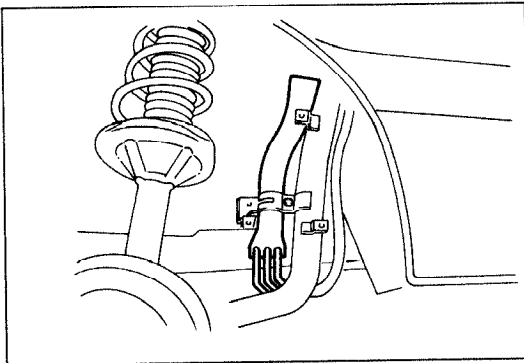
03U0FX-179



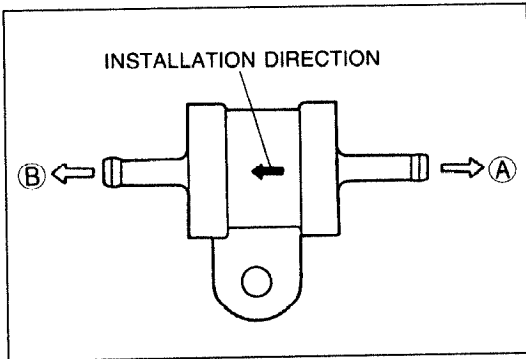
03U0FX-180



23U0FX-126



03U0FX-182



03U0FX-183

SYSTEM OPERATION

- 1 Warm up the engine to normal operating temperature and run it at idle.
2. Disconnect the vacuum hose from the solenoid valve as shown in the figure, and verify that no vacuum is felt at the solenoid valve.
3. If not as specified, check the solenoid valve.

SOLENOID VALVE (PURGE CONTROL)

Inspection

1. Disconnect the vacuum hoses from the solenoid valve.
2. Verify that no air flows through the valve.

3. Disconnect the solenoid valve connector and supply battery voltage as shown in the figure.
4. Verify that air flows through the valve.
5. If not as specified, replace the solenoid valve.

SEPARATOR

Inspection

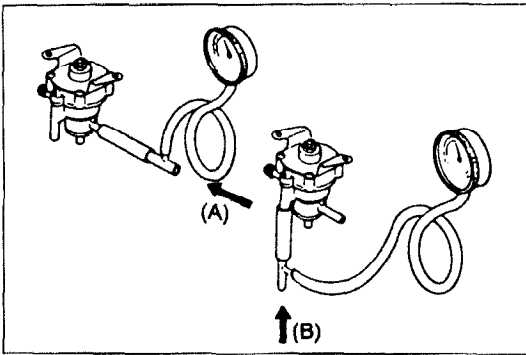
1. Remove the left side trim.
2. Remove the separator.
3. Visually check the separator for damage. Replace it if necessary.

CHECK VALVE (TWO-WAY)

Inspection

1. Remove the valve.
2. Check the operation of the valve with a vacuum pump.

Apply approx. 37 mmHg (1.46 inHg) vacuum at port A	Airflow
Apply approx. 44 mmHg (1.73 inHg) vacuum at port B	Airflow



9MU0F2-194

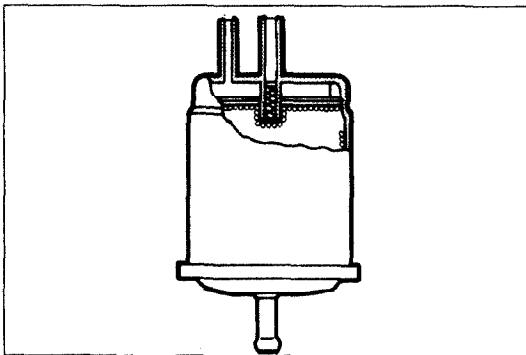
CHECK-AND-CUT VALVE

Inspection

1. Remove the check-and-cut valve.
2. Connect a pressure gauge to the passage connected to the fuel tank.
3. Blow through the valve from port A and verify that the valve opens at **6.38—8.34 kPa (0.065—0.085 kg/cm², 0.92—12.09 psi)**.
4. Remove the pressure gauge and connect it to the passage to atmosphere.
5. Blow through the valve from port B and verify that the valve opens at **0.98—4.91 kPa (0.01—0.05 kg/cm², 0.14—0.71 psi)**.

Note

- **The test must be performed with the valve held horizontally. Otherwise, the ball in the valve will move out of position and close the passage.**



03U0FX-184

CHARCOAL CANISTER

Inspection

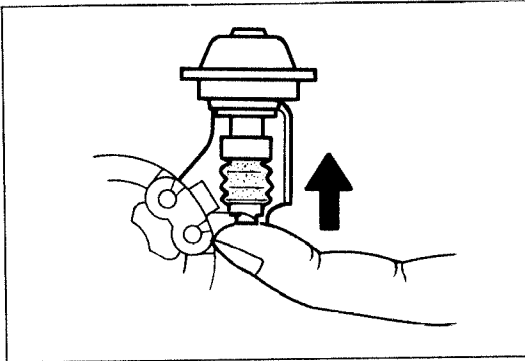
1. Visually check for damage and replace the charcoal canister if necessary.

DECELERATION CONTROL SYSTEM

DESCRIPTION

The dashpot is used to prevent the throttle valve from suddenly closing.

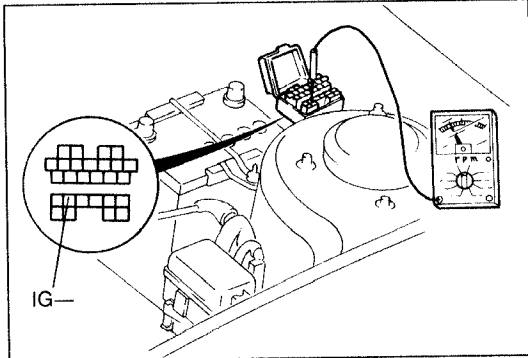
03U0FX-185



03U0FX-186

DASHPOT Inspection

1. Open the throttle valve fully. Push the dashpot rod with a finger and verify that it goes into the dashpot slowly.
2. Release the rod and check that it comes out quickly.
3. Replace the dashpot if not as specified.



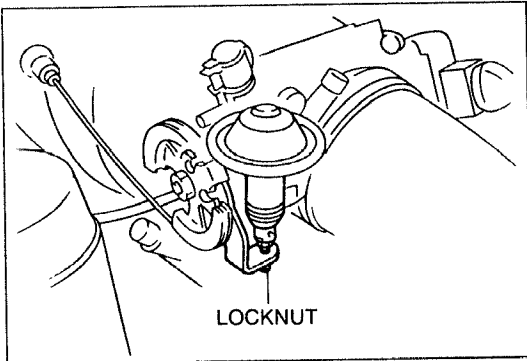
03U0FX-187

4. Warm up the engine and run it at idle.
5. Connect a tachometer to the diagnosis connector **IG-** terminal and increase engine speed to **4,000 rpm**.
6. Slowly decrease the engine speed and check that the lever touches the dashpot rod at the specified speed.

Specification:

- B6 **Approx. 3,000 rpm**
- BP SOHC **Approx. 2,700 rpm**
- BP DOHC **Approx. 3,500 rpm**

7. If not as specified, loosen the locknut and turn the dashpot to adjust.



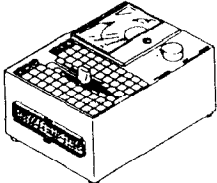
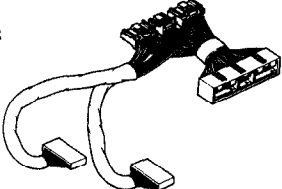
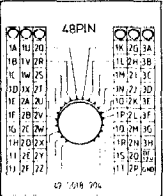
FUEL CUT CONTROL SYSTEM

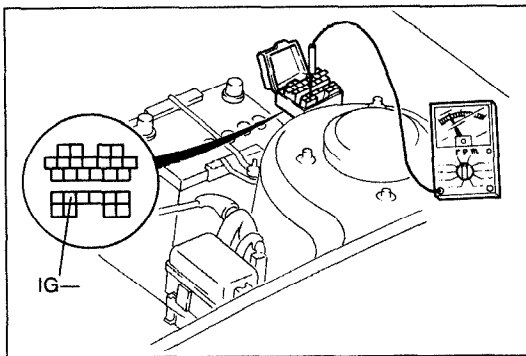
DESCRIPTION

This system is used to improve the fuel economy, to prevent engine bucking during deceleration, and to protect the engine from overspeeding.

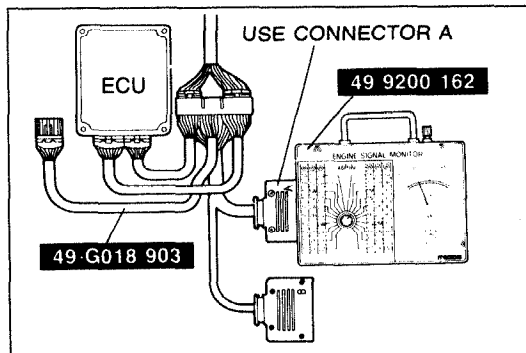
23U0FX-127

PREPARATION
SST

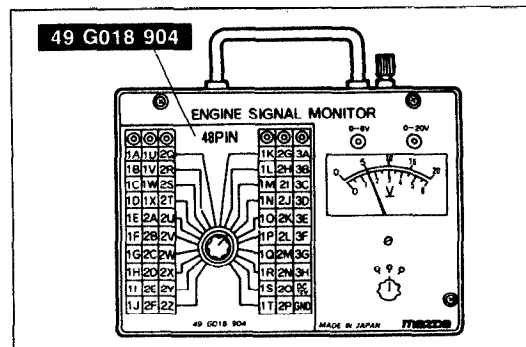
<p>49 9200 162 Engine Signal Monitor</p> 	<p>For inspection of ECU</p>	<p>49 G018 903 Adapter harness</p> 	<p>For inspection of ECU</p>
<p>49 G018 904 Sheet</p> 	<p>For inspection of ECU</p>	<p>03U0FX-189</p>	



03U0FX-190



03U0FX-191



23U0FX-128

SYSTEM OPERATION

1. Connect a tachometer to the diagnosis connector IG-terminal.

2. Connect the **SSTs (Engine Signal Monitor and Adapter)** to the engine control unit (ECU).

3. Warm-up the engine to normal operating temperature and run it at idle.

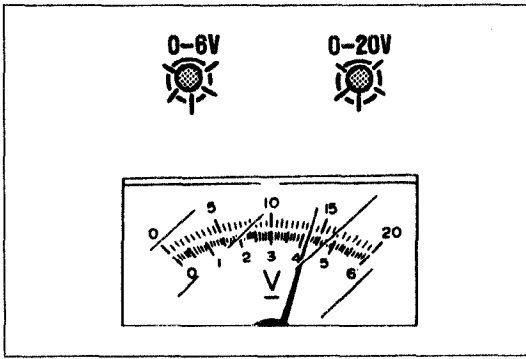
Warning

- Confirm that transmission is in Neutral (MTX) or P range (ATX).

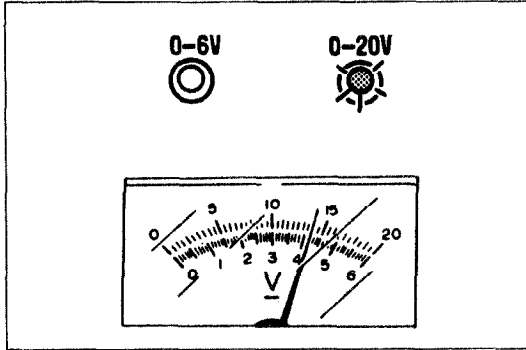
4. Set the **SST (Sheet)** on the **Engine Signal Monitor** with the specified side facing up as shown.

Note

- MTX...48 PIN
- ATX... 64 PIN



23U0FX-129



23U0FX-130

- Set the **SST** to the terminal 2U or 2V (MTX), 3U or 3V (ATX) and check that the green and red lamps flash alternately.

Note

- Injector No.1 and No.3.....ECU terminal 2U (MTX)
3U (ATX)
- Injector No.2 and No.4.....ECU terminal 2V (MTX)
3V (ATX)

- Increase the engine speed to **4,000 rpm** and then suddenly release the throttle.
- Verify that the red indicator lamp illuminates while the engine speed is above approx. **1,900 rpm** on deceleration.

Caution

- **Do not hold maximum rpm over 3 sec.**

- Increase the engine speed and verify that the maximum rpm does not exceed specification.

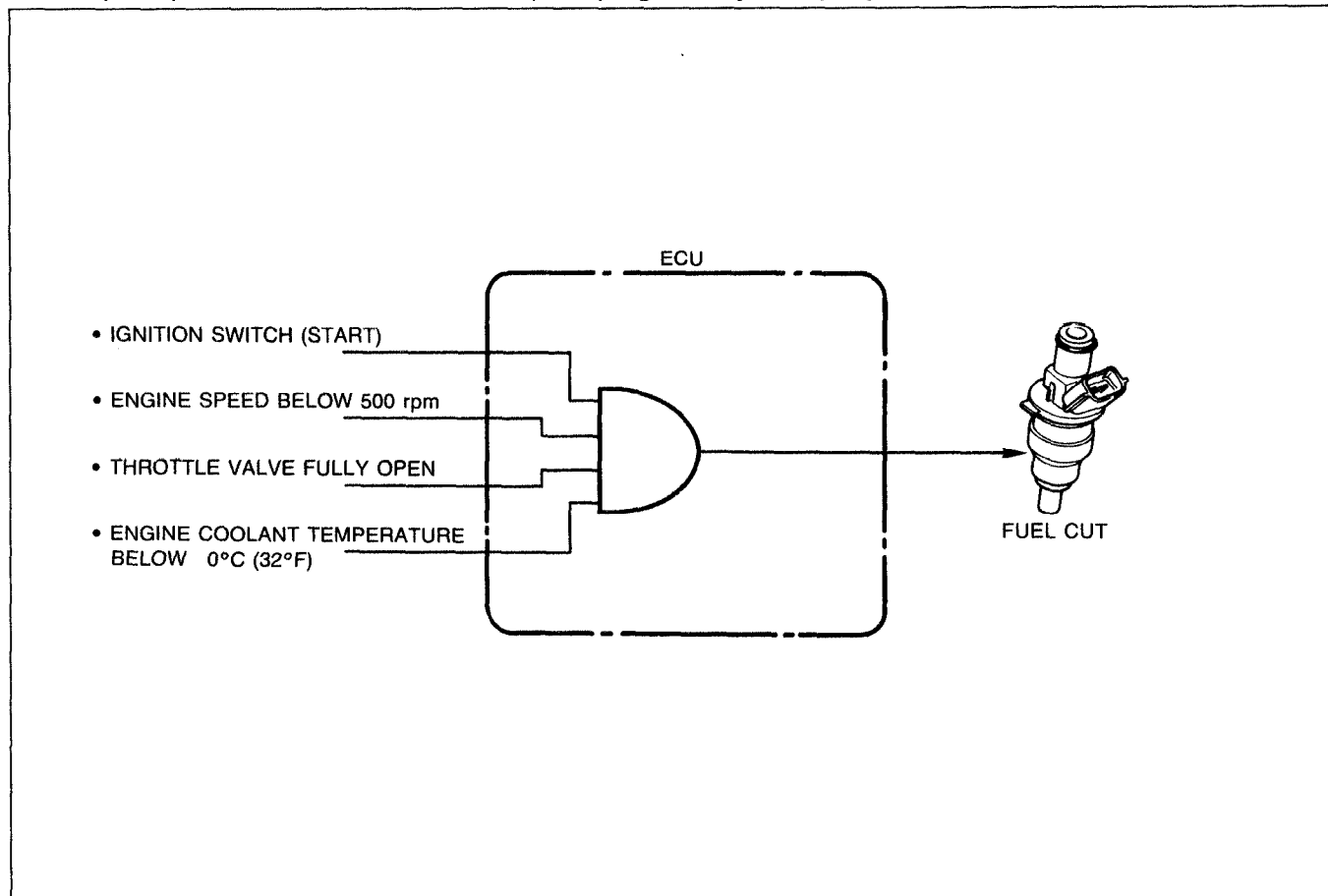
Specification:

- DOHC **Approx. 7,300 rpm**
- SOHC **Approx. 6,300 rpm**

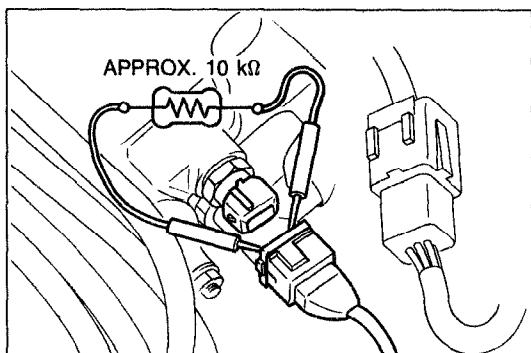
DECHOKE CONTROL SYSTEM

DESCRIPTION

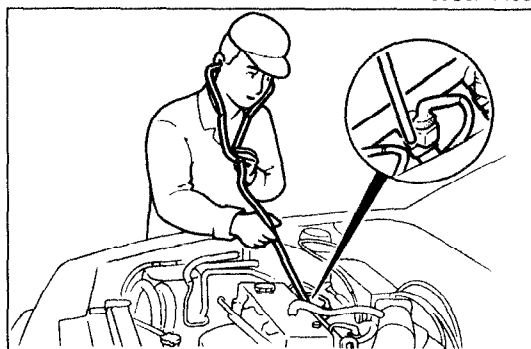
To facilitate starting the engine when the spark plugs become fouled, such as when the engine is flooded, fuel injection is cut if the throttle valve is held wide open while cranking and the engine coolant temperature is 0°C (32°F) or below. This allows the spark plugs to dry and purges excess fuel from the cylinders.



03U0FX-197



03U0FX-198



03U0FX-199

SYSTEM OPERATION

1. Check if the engine coolant temperature is **below 0°C (32°F)**.
2. If the engine coolant temperature is **above 0°C (32°F)**, disconnect the water thermosensor connector and connect an **approx. 10 kΩ** resistor to the connector.
3. Turn the ignition switch to **START** and verify that the injector operating sound is heard.
4. Depress the accelerator pedal fully and turn the ignition switch **START**. Verify that no injector operating sound is heard.

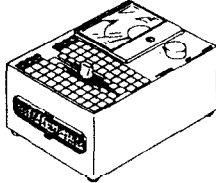
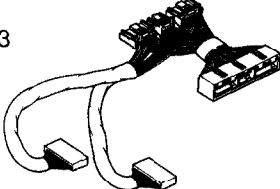
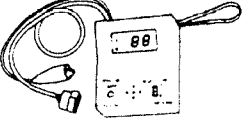
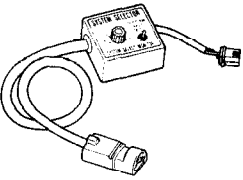
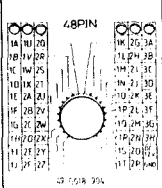
F

DECHOKE CONTROL SYSTEM

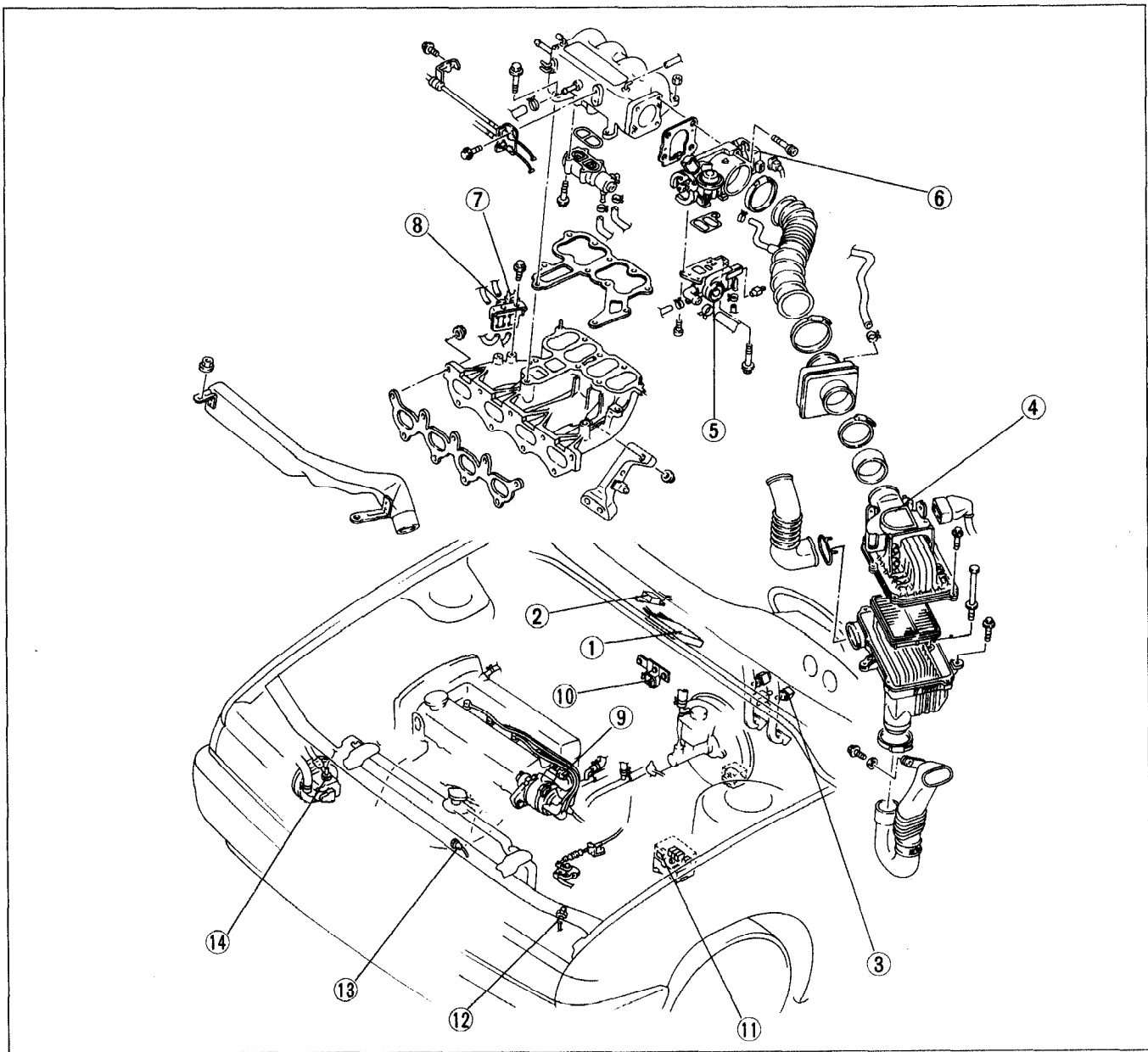
MEMO

CONTROL SYSTEM

PREPARATION
SST

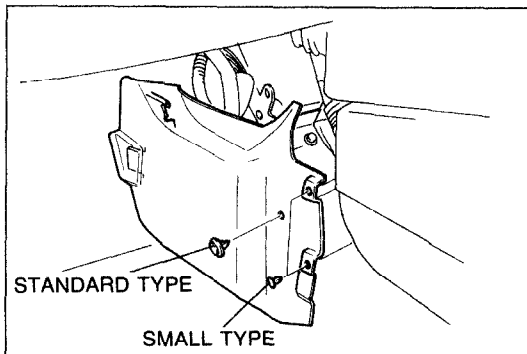
<p>49 9200 162 Engine Signal Monitor</p> 	<p>For inspection of ECU</p>	<p>49 G018 903 Adapter harness</p> 	<p>For inspection of ECU</p>
<p>49 H018 9A1 Self-Diagnosis Checker</p> 	<p>For inspection of oxygen sensor</p>	<p>49 B019 9A0 System Selector</p> 	<p>For inspection of oxygen sensor</p>
<p>49 G018 904 Sheet</p> 	<p>For inspection of ECU</p>	<p>03U0FX-200</p>	

STRUCTURAL VIEW

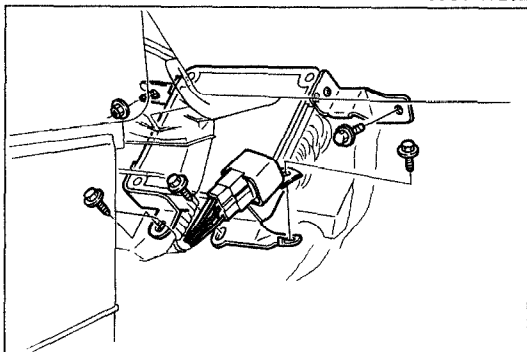


23U0FX-131

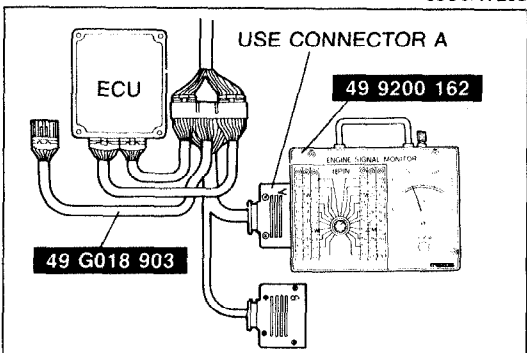
- | | |
|---|--|
| 1. Engine control unit (ECU) | 8. Solenoid valve (Pressure regulator control) |
| Removal / Installation page F-149 | Inspection page F-135 |
| Inspection page F-149 | |
| 2. Circuit opening relay | 9. Water thermosensor |
| Replacement page F-129 | Inspection page F-168 |
| Inspection page F-129 | Removal / Installation page F-168 |
| 3. Clutch switch (MTX) | 10. Solenoid valve (Purge control) |
| Inspection page F-172 | Inspection page F-140 |
| 4. Airflow meter (With intake air thermosensor) | 11. Main relay (FUEL INJ relay) |
| Inspection page F-168 | Inspection page F-172 |
| 5. ISC valve | 12. Neutral switch (MTX) |
| Inspection page F-116 | Inspection page F-173 |
| Removal / Installation page F-109 | Replacement page F-173 |
| 6. Throttle sensor | 13. Oxygen sensor |
| Inspection page F-169 | Inspection page F-171 |
| Replacement page F-109 | Replacement page F-172 |
| 7. Solenoid valve (VICS) [DOHC] | 14. P/S pressure switch |
| Inspection page F-118 | Inspection page F-173 |
| | Replacement page F-173 |



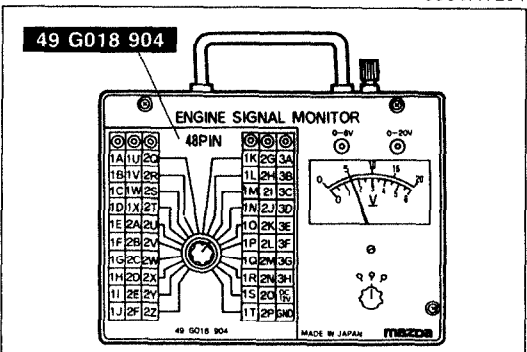
03U0FX-202



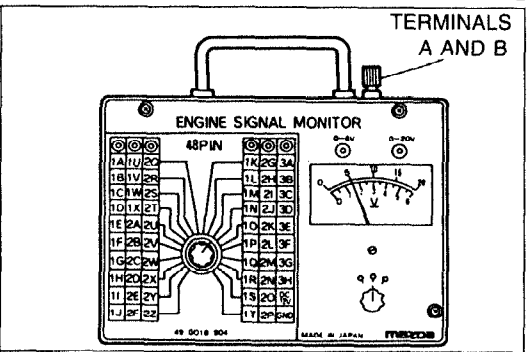
03U0FX-203



03U0FX-204



23U0FX-132



03U0FX-206

ENGINE CONTROL UNIT (ECU)

Removal / Installation

1. Remove the side walls (driver's side and passenger's side). (Refer to page S-94.)
2. Remove the bolts and nuts.
3. Disconnect the ECU connectors.
4. Install a new ECU in the reverse order of removal.

Inspection

1. Disconnect the ECU connectors.
2. Connect the **SSTs (Engine Signal Monitor and Adapter)** to the ECU as shown.

3. Set the **SST (Sheet)** on the **Engine Signal Monitor** with the specified side facing up as shown.

Note

- **MTX...48 PIN**
- **ATX...64 PIN**

4. Measure the voltage at each terminal. (Refer to pages F-150 to F-167.)
5. If any ECU terminal voltage is incorrect, check the related input or output devices and wiring. If no problem is found, replace the ECU. (Refer to above.)

Caution

- **Never apply voltage to SST terminals A and B.**

Terminal voltage (MTX)

V_B: Battery voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark	
1A	—	—	Battery	Constant	V _B	For backup	
1B	○		Main relay (FUEL INJ relay)	Ignition switch	OFF	0V	—
					ON	V _B	
1C	○		Ignition switch (START)	While cranking	Approx. 10V	—	
				Ignition switch ON	0V		
1D		○	Self-Diagnosis Checker (Monitor lamp)	Test switch at "SELF-TEST" Lamp illuminated for 3 sec. after ignition switch OFF→ON	4.5—5.5V	With Self- Diagnosis Check- er and System Selector	
				Lamp not illuminated after 3 sec.	V _B		
				Test switch at "O ₂ MONITOR" at idle Monitor lamp illuminated	4.5—5.5V		
				Test switch at "O ₂ MONITOR" at idle Monitor lamp not illuminated	V _B		
1E		○	Malfunction indica- tor lamp (MIL)	Lamp illuminated for 3 sec. after ignition switch OFF→ON	Below 2.5V	With System Selector test switch at "SELF-TEST"	
				Lamp not illuminated after 3 sec.	V _B		
				Lamp illuminated	Below 2.5V		
				Lamp not illuminated	V _B		
1F		○	Self-Diagnosis Checker (Code Number)	Buzzer sounded for 3 sec. after ignition switch OFF→ON	Below 2.5V	• With Self- Diagnosis Checker and System Selector • With System Selector test switch at "SELF-TEST"	
				Buzzer not sounded after 3 sec.	V _B		
				Buzzer sounded	Below 2.5V		
				Buzzer not sounded	V _B		
1G		○	Igniter	Ignition switch ON	0V	—	
				Idle	Approx. 0.2V		
1H	—	—	—	—	—	—	
1I	—	—	—	—	—	—	
1J		○	A/C relay	Ignition switch ON	V _B	—	
				A/C switch ON at idle	Below 2.5V		
				A/C switch OFF at idle	V _B		
1K	○		Diagnosis connector (TEN terminal)	System Selector test switch at "O ₂ MONITOR"	V _B	Ignition switch ON	
				System Selector test switch at "SELF-TEST"	0V		
1L	○		DRL relay (Canada)	Parking brake pulled with ignition switch ON (DRL OFF)	V _B	• DRL: Daytime Running Lights	
				Idle (DRL ON)	Below 2.5V		

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2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

V_B: Battery voltage

Incorrect voltage		Possible cause
Always 0V		<ul style="list-style-type: none"> ROOM 10A fuse burned Open circuit in wiring from ROOM 10A fuse to ECU terminal 1A
Always 0V		<ul style="list-style-type: none"> Main relay malfunction (Refer to page F-171) Open or short circuit in wiring from main relay to ECU terminal 1B
Always 0V (Starter turns)		<ul style="list-style-type: none"> Open or short circuit in wiring from starter interlock switch (USA), ignition switch (CANADA), to ECU terminal 1C
Always 0V		<ul style="list-style-type: none"> Main relay (FUEL INJ relay) malfunction (Refer to page F-171) Open circuit in wiring from main relay to diagnosis connector terminal +B Open or short circuit in wiring from diagnosis connector terminal MEN to ECU terminal 1D
Always V _B		<ul style="list-style-type: none"> Poor connection at ECU connector ECU malfunction
Always approx. 5V		<ul style="list-style-type: none"> ECU malfunction
Always below 2.5V	MIL always ON	<ul style="list-style-type: none"> Short circuit in wiring from combination meter to ECU terminal 1E ECU malfunction
	MIL never ON	<ul style="list-style-type: none"> Open circuit in wiring from combination meter to ECU terminal 1E
Always V _B		<ul style="list-style-type: none"> Poor connection at ECU connector ECU malfunction
Always below 2.5V	No display on Self-Diagnosis Checker	<ul style="list-style-type: none"> Main relay (FUEL INJ relay) malfunction (Refer to page F-171) Open circuit in wiring from main relay to diagnosis connector terminal +B
	"88" displayed and buzzer sounds continuously	<ul style="list-style-type: none"> Open or short circuit in wiring from diagnosis connector terminal FEN to ECU terminal 1F
Always V _B		<ul style="list-style-type: none"> Poor connection at ECU connector ECU malfunction
Always 0V		<ul style="list-style-type: none"> Short circuit in wiring from igniter to ECU terminal 1G
—		—
—		—
Always below 2.5V	A/C does not operate	<ul style="list-style-type: none"> A/C relay malfunction (Refer to page U-55) Open circuit in wiring from ignition switch to A/C relay Open circuit in wiring from A/C relay to ECU terminal 1J
	A/C switch OFF but A/C operates	<ul style="list-style-type: none"> Short circuit in wiring from A/C relay to ECU terminal 1J ECU malfunction
Always V _B		<ul style="list-style-type: none"> Poor connection at ECU connector ECU malfunction
Always below 1.0V		<ul style="list-style-type: none"> Short circuit in wiring from diagnosis connector terminal TEN to ECU terminal 1K
Always V _B		<ul style="list-style-type: none"> Open circuit in wiring from diagnosis connector terminal TEN to ECU terminal 1K Open circuit in wiring from diagnosis connector terminal GND to ground
Always below 2.5V	DRL ON when ignition switch ON	<ul style="list-style-type: none"> Short circuit in wiring from DRL relay to ECU terminal 1L Short circuit in wiring from DRL relay to DRL unit
	DRL never ON	<ul style="list-style-type: none"> Open circuit in wiring from DRL relay to ignition switch
Always V _B		<ul style="list-style-type: none"> Parking brake switch always ON DRL unit malfunction (Refer to page T-33)

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V_B: Battery voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
1M	—	—	—	—	—	—
1N	○		Throttle sensor (Idle switch)	Accelerator pedal released	0V	Ignition switch ON
				Accelerator pedal depressed	V _B	
1O	○		Stoplight switch	Brake pedal released	0V	—
				Brake pedal depressed	V _B	
1P	○		P/S pressure switch	Ignition switch ON	V _B	—
				P/S ON at idle	0V	
				P/S OFF at idle	V _B	
1Q	○		A/C switch	A/C switch ON	Below 2.5V	Ignition switch ON and blower motor ON
				A/C switch OFF	V _B	
1R	○		Fan switch	Fan operating (Engine coolant temperature over 97°C (207°F) or diagnosis connector terminal TFA grounded)	0V	—
				Fan not operating (Idle)	V _B	
1S	○		Blower control switch	Blower control switch OFF or 1st position	V _B	Ignition switch ON
				Blower control switch 2nd or higher position	0V	
1T	○		Rear window defroster switch	Rear window defroster switch OFF	0V	Ignition switch ON
				Rear window defroster switch ON	V _B	
1U	○		Headlight switch	Headlights ON	V _B	—
				Headlights OFF	0V	
1V	○		Neutral/Clutch switches	Neutral position or clutch pedal depressed	0V	—
				Others	V _B	

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2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

Vb: Battery voltage

Incorrect voltage	Possible cause	
—	—	
Always below 1.0V	<ul style="list-style-type: none"> • Throttle sensor misadjustment (Refer to page F-169) • Short circuit in wiring from throttle sensor to ECU terminal 1N • ECU malfunction 	
Always Vb	<ul style="list-style-type: none"> • Throttle sensor misadjustment (Refer to page F-169) • Open circuit in wiring from throttle sensor to ECU terminal 1N • Open circuit in wiring from throttle sensor to ECU terminal 2D 	
Always below 1.0V (Stoptlight OK)	<ul style="list-style-type: none"> • Open circuit in wiring from stoptlight switch to ECU terminal 1O 	
Always below 1.0V	<ul style="list-style-type: none"> • P/S pressure switch malfunction (Refer to page F-173) • Short circuit in wiring from P/S pressure switch to ECU terminal 1P • ECU malfunction 	
Always Vb	<ul style="list-style-type: none"> • P/S pressure switch malfunction (Refer to page F-173) • Open circuit in wiring from P/S pressure switch to ECU terminal 1P • Open circuit in wiring from P/S pressure switch to ground 	
Always below 2.5V (Blower fan OK)	<ul style="list-style-type: none"> • A/C switch malfunction (Refer to page U-55) • Short circuit in wiring from A/C switch to ECU terminal 1Q • Poor connection at ECU connector • ECU malfunction 	
Always Vb (Blower fan OK)	<ul style="list-style-type: none"> • A/C switch malfunction (Refer to page U-55) • Open circuit in wiring from A/C switch to ECU terminal 1Q • Open circuit in wiring from A/C switch to blower control switch 	
Always below 1.0V (Electrical cooling fan OK)	<ul style="list-style-type: none"> • Open or short circuit in wiring from fan relay to ECU terminal 1R • ECU malfunction 	
Always below 1.0V (Blower fan OK)	<ul style="list-style-type: none"> • Short circuit in wiring from blower control switch to ECU terminal 1S • Poor connection at ECU connector • ECU malfunction 	
Always Vb (Blower fan OK)	<ul style="list-style-type: none"> • Open circuit in wiring from blower control switch to ECU terminal 1S 	
Always below 1.0V	Illumination lamp ON when rear window defroster switch ON	<ul style="list-style-type: none"> • Open or short circuit in wiring from rear window defroster switch to ECU terminal 1T
	Illumination lamp never ON	<ul style="list-style-type: none"> • Open circuit in wiring from ignition switch to rear window defroster switch • Rear window defroster switch malfunction (Refer to page T-21)
Always below 1.0V (Headlights OK)	<ul style="list-style-type: none"> • Open or short circuit in wiring from headlight relay to ECU terminal 1U (Refer to page F-152) 	
Always below 1.0V	<ul style="list-style-type: none"> • Neutral switch malfunction (Refer to page F-173) • Clutch switch malfunction (Refer to page F-172) • Short circuit in wiring from ECU terminal 1V to neutral or clutch switch 	
Always Vb	<ul style="list-style-type: none"> • Neutral switch malfunction (Refer to page F-173) • Clutch switch malfunction (Refer to page F-172) • Open circuit in wiring from ECU terminal 1V to neutral or clutch switch • Poor connection at ECU connector 	

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Vb: Battery voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
2A	—	—	Ground (Injector)	Constant	0V	—
2B	—	—	Ground (Output)	Constant	0V	—
2C	—	—	Ground (CPU)	Constant	0V	—
2D	—	—	Ground (Input)	Constant	0V	—
2E	○		Distributor (Ne-signal)	Ignition switch ON	Approx. 0V or 4.5—5.5V	—
				Idle	Approx. 2V	
2F	—	—	—	—	—	—
2G	○		Distributor (G-signal) [DOHC]	Ignition switch ON	Approx. 0V or 4.5—5.5V	
				Idle	Approx. 1.5V	
2H	○		Ground (California)	Constant	0V	—
			Main relay (Canada)	Ignition switch ON	Vb	
2I	—	—	—	—	—	—
2J	○		Open	Constant	Approx. 1—2.5V	—
2K	○		Throttle sensor (ATX)/Airflow meter	Constant	4.5—5.5V	—
2L	○		Throttle sensor (Power switch)	Accelerator pedal released	Approx. 4.5—5.5V	—
				Accelerator pedal fully depressed	0V	
2M	○		Throttle sensor	Accelerator pedal released	Approx. 0.5V	—
				Accelerator pedal fully depressed	Approx. 4.0V	
2N	○		Oxygen sensor	Ignition switch ON	0V	—
				Idle (Cold engine)	0V	
				Idle (After warm-up)	0—1.0V	
				Increasing engine speed (After warm-up)	0.5—1.0V	
				Deceleration	0—0.4V	
2O	○		Airflow meter	Ignition switch ON	Approx. 3.8V	—
				Idle	Approx. 3.3V	
2P	○		Intake air thermosensor	Ambient air temperature 20°C (68°F)	Approx. 2.5V	Built in airflow meter
2Q	○		Water thermosensor	Engine coolant temperature 20°C (68°F)	Approx. 2.5V	—
				After warm-up	Below 0.5V	
2R	—	—	—	—	—	—

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2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

Vb: Battery voltage

Incorrect voltage	Possible cause
Above 0V	<ul style="list-style-type: none"> • Poor contact at ground terminal • Open circuit in wiring from ECU to ground
Always approx. 0V or approx. 2V	<ul style="list-style-type: none"> • Refer to Code No.02 Troubleshooting (Refer to page F-86)
—	—
Always approx. 0V or approx. 1.5V	<ul style="list-style-type: none"> • Refer to Code No.03 Troubleshooting (Refer to page F-88)
Approx. 4.5—5.5V (California)	<ul style="list-style-type: none"> • Open circuit in wiring from ECU terminal 2H to ground
Always 0V (Canada)	<ul style="list-style-type: none"> • Short circuit in wiring from ECU terminal 2H to main relay (FUEL INJ relay)
—	—
Approx. 4.5—5.5V	<ul style="list-style-type: none"> • ECU malfunction
Always 0V	<ul style="list-style-type: none"> • Short circuit in wiring from ECU terminal 2K to throttle sensor, or airflow meter • Poor connection at ECU connector • ECU malfunction
Below 4.5V or above 5.5V	<ul style="list-style-type: none"> • ECU malfunction
Always 0V	<ul style="list-style-type: none"> • Throttle sensor malfunction (Refer to page F-169) • Short circuit in wiring from ECU terminal 2L to throttle sensor • Poor connection at ECU connector • ECU malfunction
Always 4.5—5.5V	<ul style="list-style-type: none"> • Throttle sensor misadjustment (Refer to page F-169) • Open circuit in wiring from ECU terminal 2L to throttle sensor • Open circuit in wiring from ECU terminal 2L to ECU terminal 2D
Always constant	<ul style="list-style-type: none"> • Open circuit in wiring from ECU terminal 2M to throttle sensor • Open circuit in wiring from ECU terminal 2K to throttle sensor • Open circuit in wiring from ECU terminal 2D to throttle sensor
Always above 1V	<ul style="list-style-type: none"> • Throttle sensor misadjustment
0V after warm-up	<ul style="list-style-type: none"> • Refer to Code No.15 Troubleshooting (Refer to page F-98)
Always approx. 1V after warm-up	<ul style="list-style-type: none"> • Refer to Code No.17 Troubleshooting (Refer to page F-100)
Always 0V or 4.5—5.5V	<ul style="list-style-type: none"> • Refer to Code No.08 Troubleshooting (Refer to page F-90)
Always 0V or 4.5—5.5V	<ul style="list-style-type: none"> • Refer to Code No.10 Troubleshooting (Refer to page F-94)
Always 0V or 4.5—5.5V	<ul style="list-style-type: none"> • Refer to Code No.09 Troubleshooting (Refer to page F-92)
—	—

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Vb: Battery voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
2S		○	Solenoid valve (VICS)	Engine speed below 5,000 rpm	0V	VICS: Variable Inertia Charging System [DOHC]
				Engine speed above 5,000 rpm	Vb	
2T		○	Solenoid valve (Pressure regulator) [BP]	60 [DOHC]/120 [SOHC] seconds after engine started when engine coolant temperature above 90°C (194°F) and intake air temperature above 58°C (136°F) [DOHC]/50°C (122°F) [SOHC]	0V	—
				Other condition at idle	Vb	
2U		○	Injector (Nos. 1, 3)	Ignition switch ON	Vb	* Engine Signal Monitor: Green and red lamps flash
				Idle	Vb	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	Vb	
2V		○	Injector (Nos. 2, 4)	Ignition switch at idle	Vb	
				Idle	Vb	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	Vb	
2W		○	ISC valve	Ignition switch ON	Approx. 7V	—
				Idle	Approx. 9V	
2X		○	Solenoid valve (Purge control)	Ignition switch ON	Vb	—
				Idle	Vb	
2Y	—	—	—	—	—	—

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2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

V_B: Battery voltage

Incorrect voltage	Possible cause
Always 0V or V _B	<ul style="list-style-type: none"> • Refer to Code No.41 Troubleshooting (Refer to page F-103)
Always 0V or V _B	<ul style="list-style-type: none"> • Refer to Code No.25 Troubleshooting (Refer to page F-102)
Always 0V	<ul style="list-style-type: none"> • Main relay (FUEL INJ relay) malfunction (Refer to page F-172) • Open or short circuit in wiring from injector to ECU terminal 2U or 2V
Always V _B	<ul style="list-style-type: none"> • ECU malfunction
Always 0V or V _B	<ul style="list-style-type: none"> • Refer to Code No.34 Troubleshooting (Refer to page F-103)
Always 0V or V _B	<ul style="list-style-type: none"> • Refer to Code No.26 Troubleshooting (Refer to page F-102)
—	—

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Terminal voltage (ATX)

V_B: Battery voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
1A	—	—	Battery	Constant	V _B	For backup
1B	○		Main relay (FUEL INJ relay)	Ignition switch OFF	0V	—
				ON	V _B	
1C	○		Ignition switch (START)	While cranking	Approx. 10V	—
				Ignition switch ON	0V	
1D		○	Self-Diagnosis Checker (Monitor lamp)	Test switch at "SELF-TEST" Lamp illuminated for 3 sec. after ignition switch OFF → ON	4.5–5.5V	With Self-Diagnosis Checker and System Selector
				Lamp not illuminated after 3 sec.	V _B	
				Test switch at "O ₂ MONITOR" at idle Monitor lamp illuminated	4.5–5.5V	
				Test switch at "O ₂ MONITOR" at idle Monitor lamp not illuminated	V _B	
1E		○	Malfunction indicator lamp (MIL)	Lamp illuminated for 3 sec. after ignition switch OFF → ON	Below 2.5V	With System Selector test switch at "SELF-TEST"
				Lamp not illuminated after 3 sec.	V _B	
				Lamp illuminated	Below 2.5V	
				Lamp not illuminated	V _B	
1F		○	Self-Diagnosis Checker (Code Number)	Buzzer sounded for 3 sec. after ignition switch OFF → ON	Below 2.5V	<ul style="list-style-type: none"> • With Self-Diagnosis Checker and System Selector • With System Selector test switch at "SELF-TEST"
				Buzzer not sounded after 3 sec.	V _B	
				Buzzer sounded	Below 2.5V	
				Buzzer not sounded	V _B	
1G		○	Igniter	Ignition switch ON	0V	—
				Idle	Approx. 0.2V	
1H	○		Headlight switch	Headlights ON	V _B	—
				Headlights OFF	Below 1.0V	
1I	○		Diagnosis connector (TEN terminal)	System Selector test switch at "O ₂ MONITOR"	V _B	Ignition switch ON
				System Selector test switch at "SELF-TEST"	0V	
1J	○		Rear window defroster switch	Rear window defroster switch OFF	0V	Ignition switch ON
				Rear window defroster switch ON	V _B	
1K	○		Ground (California)	Constant	0V	—
			Main relay (Canada)	Ignition switch ON	V _B	

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3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

Vb: Battery voltage

Incorrect voltage		Possible cause
Always 0V		<ul style="list-style-type: none"> ROOM 10A fuse burned Open circuit in wiring from ROOM 10A fuse to ECU terminal 1A
Always 0V		<ul style="list-style-type: none"> Main relay malfunction (Refer to page F-171) Open or short circuit in wiring from main relay to ECU terminal 1B
Always 0V (Starter turns)		<ul style="list-style-type: none"> Open or short circuit in wiring from or inhibitor switch (ATX) to ECU terminal 1C
Always 0V		<ul style="list-style-type: none"> Main relay (FUEL INJ relay) malfunction (Refer to page F-171) Open circuit in wiring from main relay to diagnosis connector terminal +B Open or short circuit in wiring from diagnosis connector terminal MEN to ECU terminal 1D
Always Vb		<ul style="list-style-type: none"> Poor connection at ECU connector ECU malfunction
Always 4.5—5.5V		<ul style="list-style-type: none"> ECU malfunction
Always below 2.5V	MIL always ON	<ul style="list-style-type: none"> Short circuit in wiring from combination meter to ECU terminal 1E ECU malfunction
	MIL never ON	<ul style="list-style-type: none"> Open circuit in wiring from combination meter to ECU terminal 1E
Always Vb		<ul style="list-style-type: none"> Poor connection at ECU connector ECU malfunction
Always below 2.5V	No display on Self-Diagnosis Checker	<ul style="list-style-type: none"> Main relay (FUEL INJ relay) malfunction (Refer to page F-171) Open circuit in wiring from main relay to diagnosis connector terminal +B
	"88" displayed and buzzer sounds continuously	<ul style="list-style-type: none"> Open or short circuit in wiring from diagnosis connector terminal FEN to ECU terminal 1F
Always Vb		<ul style="list-style-type: none"> Poor connection at ECU connector ECU malfunction
Always 0V		<ul style="list-style-type: none"> Short circuit in wiring from igniter to ECU terminal 1G
Always below 1.0V (Headlights OK)		<ul style="list-style-type: none"> Open or short circuit in wiring from headlight relay to ECU terminal 1H (Refer to page F-171)
Always 0V		<ul style="list-style-type: none"> Short circuit in wiring from diagnosis connector terminal TEN to ECU terminal 1I
Always Vb		<ul style="list-style-type: none"> Open circuit in wiring from diagnosis connector terminal TEN to ECU terminal 1I Open circuit in wiring from diagnosis connector terminal GND to ground
Always 0V	Illumination lamp ON when rear window defroster switch ON	<ul style="list-style-type: none"> Open or short circuit in wiring from rear window defroster switch to ECU terminal 1J
	Illumination lamp never ON	<ul style="list-style-type: none"> Open circuit in wiring from ignition switch to rear window defroster switch Rear window defroster switch malfunction (Refer to page T-21)
Approx. 5V (California)		<ul style="list-style-type: none"> Open circuit in wiring from ECU terminal 1K to ground
Always 0V (Canada)		<ul style="list-style-type: none"> Short circuit in wiring from ECU terminal 1K to main relay (FUEL INJ relay)

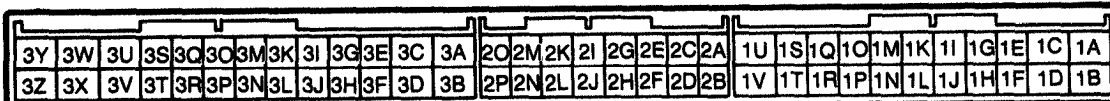
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CONTROL SYSTEM

Vb: Battery voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
1L		○	A/C relay	Ignition switch ON	Vb	—
				A/C switch ON at idle	Below 2.5V	
				A/C switch OFF at idle	Vb	
1M	○		Vehicle speed sensor	While driving	4–5V	—
				Vehicle stopped	0 or 8V	
1N	○		P/S pressure switch	Ignition switch ON	Vb	—
				P/S ON at idle	0V	
				P/S OFF at idle	Vb	
1O	○		A/C switch	A/C switch ON	Below 2.5V	Ignition switch ON and blower motor ON
				A/C switch OFF	Vb	
1P	○		Blower control switch	Blower control switch OFF or 1st position	Vb	Ignition switch ON
				Blower control switch 2nd or higher position	Below 1.0V	
1Q	○		Stoplight switch	Brake pedal released	Below 1.0V	—
				Brake pedal depressed	Vb	
1R	○		Inhibitor switch (P, N ranges)	N or P range	0V	Ignition switch ON
				Other range	Vb	
1S	○		Cruise control main switch	Normal condition	Vb	Ignition switch ON
				Set or Resume switch ON or vehicle speed 8 km/h (5 mph) lower than preset speed (Driving vehicle cruise control operation)	Below 1.0V	
1T	○		Throttle sensor (Idle switch)	Accelerator pedal released	Below 1.0V	Ignition switch ON
				Accelerator pedal depressed	Vb	
1U	—	—	—	—	—	—
1V	—	—	—	—	—	—
2A	○		Distributor (Ne-signal)	Ignition switch ON	Approx. 0V or 5V	—
				Idle	Approx. 2V	

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Vb: Battery voltage

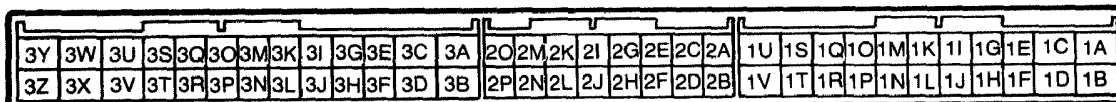
Incorrect voltage		Possible cause
Always below 2.5V	A/C does not operate	<ul style="list-style-type: none"> • A/C relay malfunction (Refer to page U-55) • Open circuit in wiring from ignition switch to A/C relay • Open circuit in wiring from A/C relay to ECU terminal 1L
	A/C switch OFF but A/C operates	<ul style="list-style-type: none"> • Short circuit in wiring from A/C relay to ECU terminal 1L • ECU malfunction
Always Vb		<ul style="list-style-type: none"> • Poor connection at ECU connector • ECU malfunction
Always 0V		<ul style="list-style-type: none"> • Vehicle speed sensor malfunction (Refer to page K-143) • Short circuit in wiring from vehicle speed sensor to ECU terminal 1M
		<ul style="list-style-type: none"> • Vehicle speed sensor malfunction (Refer to page K-143) • Open circuit in wiring from vehicle speed sensor to ECU terminal 1M
Always 0V		<ul style="list-style-type: none"> • P/S pressure switch malfunction (Refer to page F-173) • Short circuit in wiring from P/S pressure switch to ECU terminal 1P • ECU malfunction
Always Vb		<ul style="list-style-type: none"> • P/S pressure switch malfunction (Refer to page F-173) • Open circuit in wiring from P/S pressure switch to ECU terminal 1P • Open circuit in wiring from P/S pressure switch to ground
Always below 2.5V (Blower fan OK)		<ul style="list-style-type: none"> • A/C switch malfunction (Refer to page U-55) • Short circuit in wiring from A/C switch to ECU terminal 1Q • Poor connection at ECU connector • ECU malfunction
Always Vb (Blower fan OK)		<ul style="list-style-type: none"> • A/C switch malfunction (Refer to page U-55) • Open circuit in wiring from A/C switch to ECU terminal 1Q • Open circuit in wiring from A/C switch to blower control switch
Always 0V (Blower fan OK)		<ul style="list-style-type: none"> • Short circuit in wiring from blower control switch to ECU terminal 1S • Poor connection at ECU connector • ECU malfunction
Always Vb (Blower fan OK)		<ul style="list-style-type: none"> • Open circuit in wiring from blower control switch to ECU terminal 1S
Always below 1.0V (Stoplight OK)		<ul style="list-style-type: none"> • Open circuit in wiring from stoplight switch to ECU terminal 1O
Always 0V		<ul style="list-style-type: none"> • Inhibitor switch malfunction (Refer to page K-141) • Short circuit in wiring from inhibitor switch to ECU terminal 1R
Always Vb		<ul style="list-style-type: none"> • Inhibitor switch malfunction (Refer to page K-141) • Open circuit in wiring from inhibitor switch to ECU terminal 1R
Always 0V		<ul style="list-style-type: none"> • Cruise switch malfunction (Refer to page T-21) • Short circuit in wiring from cruise switch to ECU terminal 1S
		<ul style="list-style-type: none"> • Cruise switch malfunction (Refer to page T-21) • Open circuit in wiring from cruise switch to ECU terminal 1S
Always 0V		<ul style="list-style-type: none"> • Throttle sensor misadjustment (Refer to page F-169) • Short circuit in wiring from throttle sensor to ECU terminal 1T • ECU malfunction
Always Vb		<ul style="list-style-type: none"> • Throttle sensor misadjustment (Refer to page F-169) • Open circuit in wiring from throttle sensor to ECU terminal 1T
—		—
—		—
Always approx. 0V or approx. 2V		<ul style="list-style-type: none"> • Refer to Code No.02 Troubleshooting (Refer to page F-86)

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V_B: Battery voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark	
2B	○		Airflow meter	Ignition switch ON	Approx. 3.8V	—	
				Idle	Approx. 3.3V		
2C	○		Oxygen sensor	Ignition switch ON	0V	—	
				Idle (Cold engine)	0V		
				Idle (After warm-up)	0—1.0V		
				Increasing engine speed (After warm-up)	0.5—1.0V		
				Deceleration	0—0.4V		
2D	○		Fan switch	Fan operating (Engine coolant temperature over 97°C (207°F) or diagnosis connector terminal TFA grounded)	0V	—	
				Fan not operating (Idle)	V _B		
2E	○		Water thermostat	Engine coolant temperature 20°C (68°F)	Approx. 2.5V	Ignition switch ON	
				After warm-up	Below 0.5V		
2F	○		Throttle sensor	Accelerator pedal released	Approx. 0.5V	—	
				Accelerator pedal fully depressed	Approx. 4.0V		
2G	○		ATF thermosensor	ATF Temp	-30°C (-20°F) -150°C (302°F)	Approx. 4.95—1.12V	Ignition switch ON
					20°C (68°F)	Approx. 4.6V	
					130°C (266°F)	Approx. 1.54V	
2H	○		Hold switch	Switch depressed	0V	Ignition switch ON	
				Switch released	V _B		
2I	○		Throttle sensor	Constant	4.5—5.5V	Ignition switch ON	
2J	○		Distributor (G-signal) [DOHC]	Ignition switch ON	Approx. 0V or 5V	—	
				Idle	Approx. 1.5V		
2K	○		Intake air thermostat	Ambient air temperature 20°C (68°F)	Approx. 2.5V	Built in airflow meter	
2L	—	—	—	—	—	—	
2M	○		Pulse generator (IN)	Engine running at idle (N range)	Above 0.6V	—	
				Engine stopped (Ignition switch ON)	0V		
2N			Pulse generator ground	Constant	0V	—	
2O		○	Solenoid valve (Purge control)	Ignition switch ON	V _B	—	
				Idle	V _B		
2P		○	Hold indicator	Hold mode	Below 2V	Ignition switch ON	
				Normal mode	V _B		

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Vb: Battery voltage

Incorrect voltage	Possible cause
Always approx. 0V or approx. 5V	<ul style="list-style-type: none"> Refer to Code No.08 Troubleshooting (Refer to page F-90)
0V after warm-up	<ul style="list-style-type: none"> Refer to Code No.15 Troubleshooting (Refer to page F-98)
Always approx. 1V after warm-up	<ul style="list-style-type: none"> Refer to Code No.17 Troubleshooting (Refer to page F-100)
Always 0V (Electrical cooling fan OK)	<ul style="list-style-type: none"> Open or short circuit in wiring from fan relay to ECU terminal 2D ECU malfunction
Always approx. 0V or approx. 5V	<ul style="list-style-type: none"> Refer to Code No.09 Troubleshooting (Refer to page F-92)
Always constant	<ul style="list-style-type: none"> Open circuit in wiring from ECU terminal 2F to throttle sensor Open circuit in wiring from ECU terminal 2I to throttle sensor Open circuit in wiring from ECU terminal 3D to throttle sensor
Always above 1V	<ul style="list-style-type: none"> Throttle sensor misadjustment
Always constant	<ul style="list-style-type: none"> ATF termosensor malfunction (Refer to page K-142) Open or short circuit in wiring from ATF termosensor to ECU terminal 2G
Always 0V	<ul style="list-style-type: none"> Hold switch malfunction (Refer to page K-140) Short circuit in wiring from hold switch to ECU terminal 2H
Always Vb	<ul style="list-style-type: none"> Hold switch malfunction (Refer to page K-140) Open circuit in wiring from hold switch to ECU terminal 2H
Always 0V	<ul style="list-style-type: none"> Short circuit in wiring from ECU terminal 2I to throttle sensor airflow meter, or water termosensor Poor connection at ECU connector ECU malfunction
Below 4.5V or above 5.5V	<ul style="list-style-type: none"> ECU malfunction
Always approx. 0V or approx. 1.5V	<ul style="list-style-type: none"> Refer to Code No.03 Troubleshooting (Refer to page F-88)
Always approx. 0V or approx. 5V	<ul style="list-style-type: none"> Refer to Code No.10 Troubleshooting (Refer to page F-94)
—	—
Always constant	<ul style="list-style-type: none"> Pulse genrotor malfunction (Refer to page K-142) Open or short circuit in wiring from pulse generator to ECU terminal 2M
Above 0V	<ul style="list-style-type: none"> Poor connection at ground terminal Open circuit in wiring from ECU terminal 2N to ground
Always 0V or Vb	<ul style="list-style-type: none"> Refer to Code No.26 Troubleshooting (Refer to page F-102)
Always 0V	<ul style="list-style-type: none"> Hold indicator or malfunction (Refer to page K-100) Short circuit in wiring from hold indicator to ECU terminal 2P
Always Vb	<ul style="list-style-type: none"> Hold indicator malfunction (Refer to page K-100) Open circuit in wiring from hold indicator to ECU terminal 2P

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Vb: Battery voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
3A	—	—	Ground (Injector)	Constant	0V	—
3B	—	—	Ground (Output)	Constant	0V	—
3C	—	—	Ground (CPU)	Constant	0V	—
3D	—	—	Ground (Input)	Constant	0V	—
3E	○		Inhibitor switch (D range)	D range	Vb	Ignition switch ON
				Other ranges	0V	
3F	○		DRL relay (Canada)	Parking brake pulled with ignition switch ON (DRL OFF)	Vb	•DRL: Daytime Running Lights
				Idle (DRL ON)	Below 2.5V	
3G	○		Inhibitor switch (L range)	L range	Vb	Ignition switch ON
				Other ranges	0V	
3H	○		Inhibitor switch (S range)	S range	Vb	Ignition switch ON
				Other ranges	0V	
3I		○	Solenoid valve (VICS)	Engine speed below 5,000 rpm	Below 1.5V	VICS: Variable Inertia Charging System [DOHC]
				Engine speed above 5,000 rpm	Vb	
3J	—	—	—	—	—	—
3K	—	—	—	—	—	—
3L	—	—	—	—	—	—
3M		○	Solenoid valve (Pressure regulator) [BP]	60 [DOHC]/120 [SOHC] seconds after engine started when engine coolant temperature above 90°C (194°F) and intake air temperature above 58°C (136°F) [DOHC]/50°C (122°F) [SOHC]	Below 1.5V	—
				Other condition at idle	Vb	
3N	—	—	—	—	—	—
3O	—	—	—	—	—	—
3P	—	—	—	—	—	—
3Q		○	ISC valve	Ignition switch ON	Vb	• Engine signal Monitor: Green and red lamps flash
				Idle	Approx. 10V	
3R	—	—	—	—	—	—
3S	—	—	—	—	—	—
3T	—	—	—	—	—	—

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3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

Vb: Battery voltage

Incorrect voltage		Possible cause
Above 0V		<ul style="list-style-type: none"> • Poor connect at ground terminal • Open circuit in wiring from ECU to ground
Always 0V		<ul style="list-style-type: none"> • Inhibitor switch malfunction (Refer to page K-141) • Short circuit in wiring from inhibitor switch to ECU terminal 3E
Always Vb		<ul style="list-style-type: none"> • Inhibitor switch malfunction (Refer to page K-141) • Open circuit in wiring from inhibitor switch to ECU terminal 3E
Always below 2.5V	DRL ON when ignition switch ON	<ul style="list-style-type: none"> • Short circuit in wiring from DRL relay to ECU terminal 1L • Short circuit in wiring from DRL relay to DRL unit
	DRL never ON	<ul style="list-style-type: none"> • Open circuit in wiring from DRL relay to ignition switch
Always Vb		<ul style="list-style-type: none"> • Parking brake switch always ON • DRL unit malfunction (Refer to page T-33)
Always 0V		<ul style="list-style-type: none"> • Inhibitor switch malfunction (Refer to page K-141) • Short circuit in wiring from inhibitor switch to ECU terminal 3G
Always Vb		<ul style="list-style-type: none"> • Inhibitor switch malfunction (Refer to page K-141) • Short circuit in wiring from inhibitor switch to ECU terminal 3G
Always 0V		<ul style="list-style-type: none"> • Inhibitor switch malfunction (Refer to page K-141) • Short circuit in wiring from inhibitor switch to ECU terminal 3H
Always Vb		<ul style="list-style-type: none"> • Inhibitor switch malfunction (Refer to page K-141) • Open circuit in wiring from inhibitor switch to ECU terminal 2H
Always approx. 0V or Vb		<ul style="list-style-type: none"> • Refer to Code No.41 Troubleshooting (Refer to page F-103)
—		—
—		—
—		—
Always 0V or Vb		<ul style="list-style-type: none"> • Refer to Code No.25 Troubleshooting (Refer to page F-102)
—		—
—		—
—		—
Always 0V or Vb		<ul style="list-style-type: none"> • Refer to Code No.34 Troubleshooting (Refer to page F-103)
—		—
—		—
—		—

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Vb: Battery voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
3U		○	Injector (Nos. 1, 3)	Ignition switch ON	VB	* Engine Signal Monitor: Green and red lamps flash
				Idle	VB	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	VB	
3V		○	Injector (Nos. 2, 4)	Ignition switch at idle	VB	
				Idle	VB	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	VB	
3W		○	1-2 shift solenoid valve	Solenoid valve ON	VB	AT running
				Solenoid valve OFF	0V	
3X		○	2-3 shift solenoid valve	Solenoid valve ON	VB	AT running
				Solenoid valve OFF	0V	
3Y		○	3-4 shift solenoid valve	Solenoid valve ON	VB	AT running
				Solenoid valve OFF	0V	
3Z		○	Lockup solenoid valve	Solenoid valve ON	VB	AT running
				Solenoid valve OFF	0V	

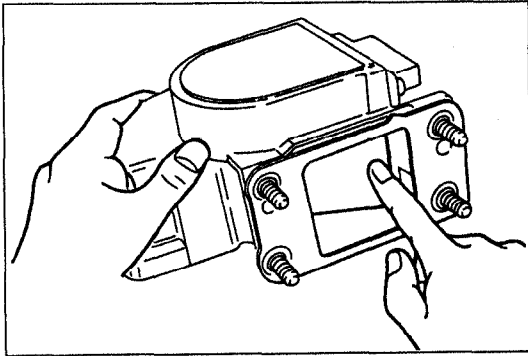
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3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A	2O	2M	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B	2P	2N	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

Vb: Battery voltage

Incorrect voltage	Possible cause
Always 0V	<ul style="list-style-type: none"> • Main relay (FUEL INJ relay) malfunction (Refer to page F-172) • Open or short circuit in wiring from injector to ECU terminal 3U or 3V
Always Vb	<ul style="list-style-type: none"> • ECU malfunction
Always 0V	<ul style="list-style-type: none"> • 1-2 shift solenoid valve malfunction (Refer to page K-143) • Short circuit in wiring from solenoid valve to ECU terminal 3W
Always Vb	<ul style="list-style-type: none"> • 1-2 shift solenoid valve malfunction (Refer to page K-143) • Open circuit in wiring from solenoid valve to ECU terminal 3W
Always 0V	<ul style="list-style-type: none"> • 2-3 shift solenoid valve malfunction (Refer to page K-143) • Short circuit in wiring from solenoid valve to ECU terminal 3X
Always Vb	<ul style="list-style-type: none"> • 2-3 shift solenoid valve malfunction (Refer to page K-143) • Open circuit in wiring from solenoid valve to ECU terminal 3X
Always 0V	<ul style="list-style-type: none"> • 3-4 shift solenoid valve malfunction (Refer to page K-143) • Short circuit in wiring from solenoid valve to ECU terminal 3Y
Always Vb	<ul style="list-style-type: none"> • 3-4 shift solenoid valve malfunction (Refer to page K-143) • Open circuit in wiring from solenoid valve to ECU terminal 3Y
Always 0V	<ul style="list-style-type: none"> • Lockup solenoid valve malfunction (Refer to page K-143) • Short circuit in wiring from solenoid valve to ECU terminal 3Z
Always Vb	<ul style="list-style-type: none"> • Lockup solenoid valve malfunction (Refer to page K-143) • Open circuit in wiring from solenoid valve to ECU terminal 3Z

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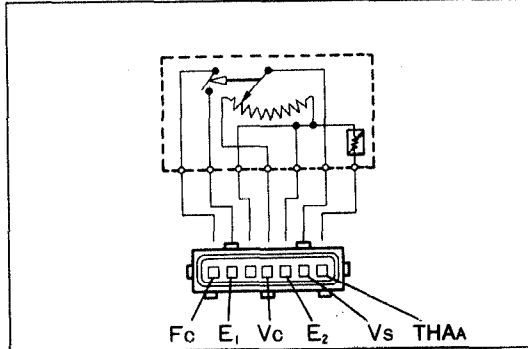
AIRFLOW METER (WITH INTAKE AIR THERMOSENSOR)

Inspection

1. Remove the airflow meter. (Refer to page F-109.)
2. Check the airflow meter body for cracks.
3. Verify that the measuring plate moves smoothly.
4. Move the measuring plate and check for resistance between the terminals with an ohmmeter.

Specification

Terminal	Resistance (Ω)	
	Fully closed	Fully open
E2 ↔ Vs	20—600	20—1,000
E2 ↔ Vc	200—400	
E2 ↔ THAA (Intake air thermosensor)	-20°C (-4°F): 13.6—18.4 KΩ 20°C (68°F): 2.21—2.69 kΩ 60°C (140°F): 493—667Ω	
E1 ↔ Fc	∞	0



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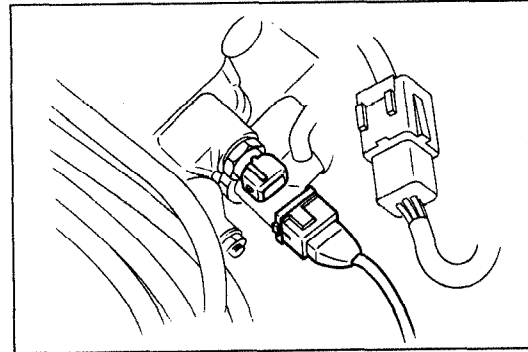
WATER THERMOSENSOR

Removal

Note

- Water thermosensor is placed at:
 - Rear of engine** BP
 - Intake manifold** B6

1. Disconnect the water thermosensor connector.
2. Remove the water thermosensor.



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Inspection

1. Place the sensor in water with a thermometer and heat the water gradually.
2. Measure resistance of the sensor with an ohmmeter.

Coolant	Resistance (kΩ)
-20°C (-4°F)	14.6 —17.8
20°C (68°F)	2.2 — 2.7
40°C (104°F)	1.0 — 1.3
60°C (140°F)	0.50— 0.65
80°C (176°F)	0.29— 0.35

3. If not as specified, replace the water thermosensor.

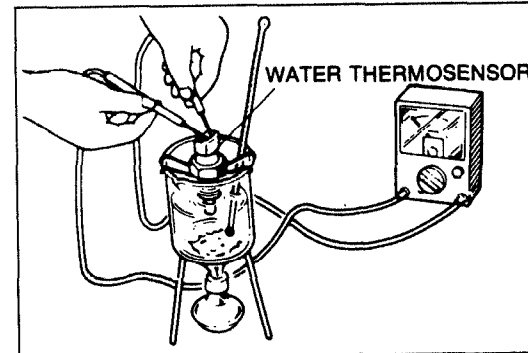
Installation

1. Install a new washer and the water thermosensor.

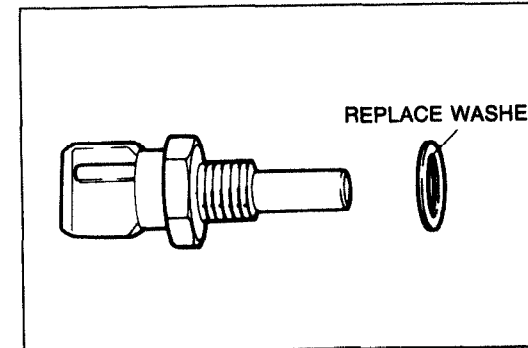
Tightening torque:

25—29 N·m (2.5—3.0 m·kg, 18—22 ft·lb)

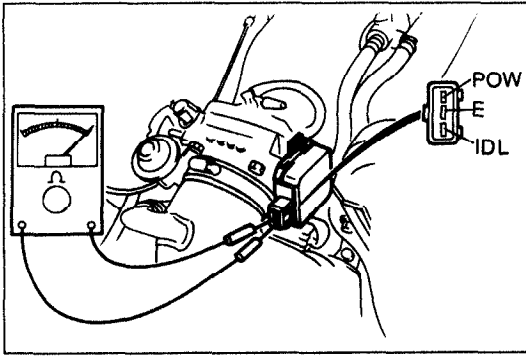
2. Connect the water thermosensor connector.
3. Start the engine and check for coolant leakage.



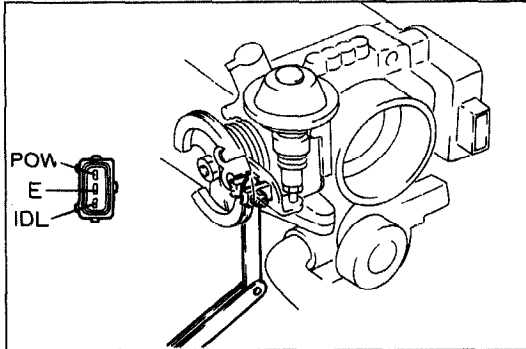
03U0FX-218



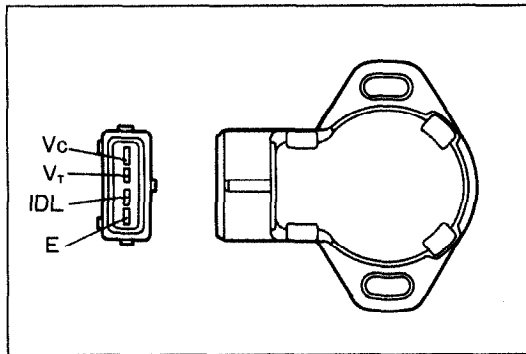
03U0FX-219



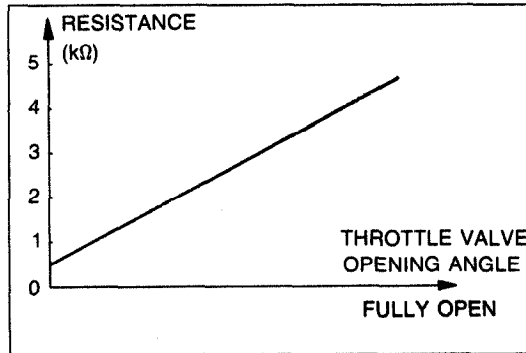
03U0FX-220



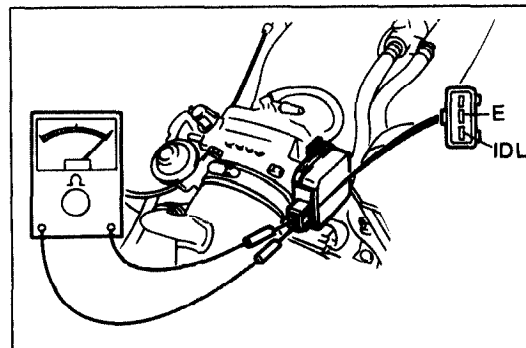
03U0FX-221



03U0FX-222



03U0FX-223



03U0FX-224

THROTTLE SENSOR

Inspection (MTX)

1. Disconnect the connector from the throttle sensor.
2. Connect an ohmmeter to the throttle sensor.

3. Insert a feeler gauge between the throttle stop screw and the stop lever and check the continuity between terminals.

Feeler gauge	Continuity between terminals	
	IDL ↔ E	POW ↔ E
0.1mm (0.004 in)	Yes	No
1.0mm (0.039 in)	No	No
Wide-open throttle	No	Yes

Inspection (ATX)

1. Disconnect the connector from the throttle sensor.
2. Connect an ohmmeter between the throttle sensor terminals E and IDL.
3. Insert a feeler gauge between the throttle stop screw and the stop lever.
4. Check the continuity between terminals.

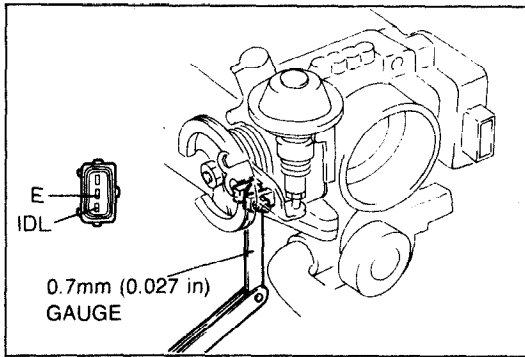
Feeler gauge	Continuity
0.1mm (0.004 in)	Yes
0.6mm (0.024 in)	No

5. Connect an ohmmeter to the throttle sensor terminal Vr and E.
6. Verify that the resistance increases lineally according to throttle valve opening angle.

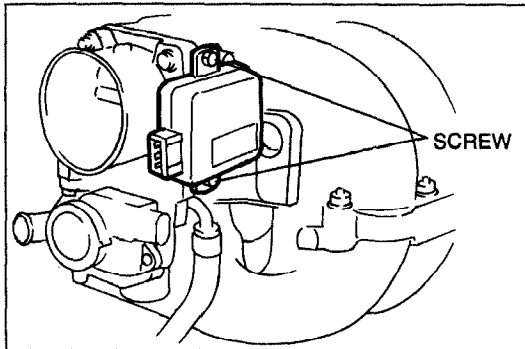
Throttle valve condition	Resistance (kΩ)
Fully closed	Below 1
Fully open	Approx. 5

Adjustment (MTX)

1. Disconnect the connector from the throttle sensor.
2. Connect an ohmmeter to the throttle sensor terminals IDL and E.
3. Insert a **0.4mm (0.016 in)** feeler gauge between the throttle stop screw and the stop lever.



4. Loosen the two attaching screws.
5. Rotate the throttle sensor clockwise **approx. 30 degrees**, then rotate it back counterclockwise until the continuity exists.
6. Replace the feeler gauge with a **0.7mm (0.027 in)** gauge.
7. Verify that the continuity does not exist.
8. If it exists, repeat Steps 3 through 6.

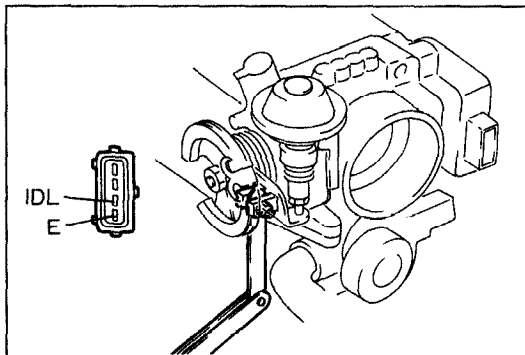


9. Tighten the two attaching screws.

Note

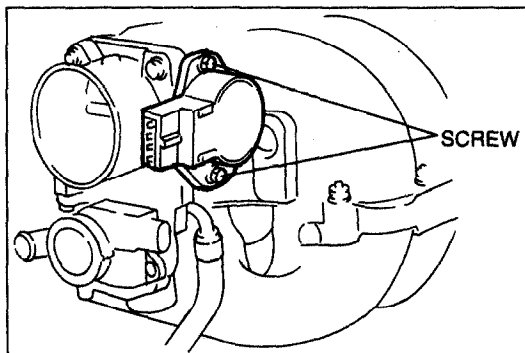
- Do not move the throttle sensor from the set position when tightening the screws.

10. Open the throttle valve fully a few times.
11. Recheck the adjustment of the throttle sensor.



Adjustment (ATX)

1. Disconnect the connector from the throttle sensor.
2. Connect an ohmmeter between the throttle sensor terminals E and IDL.
3. Loosen the two attaching screws.
4. Insert a **0.25mm (0.01 in)** feeler gauge between the throttle stop screw and the stop lever.
5. Rotate the throttle sensor clockwise **approx. 30 degrees**, then rotate it back counterclockwise until there is continuity.

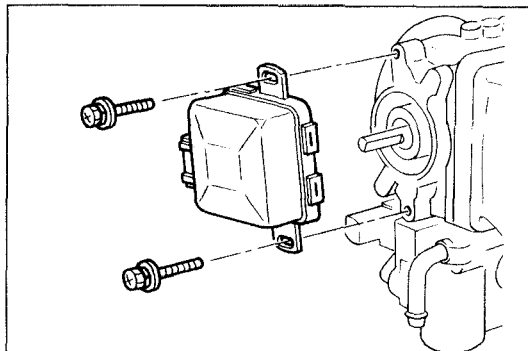


6. Replace the feeler gauge with a **0.4mm (0.016 in)** gauge and verify that there is no continuity.
7. If there is continuity, repeat Steps 4 through 6.
8. Tighten the two attaching screws.

Note

- Do not move the throttle sensor from the set position when tightening the screws.

9. Open the throttle valve fully and verify that the resistance between the throttle sensor terminals E and V_r is **approx. 5 kΩ**.



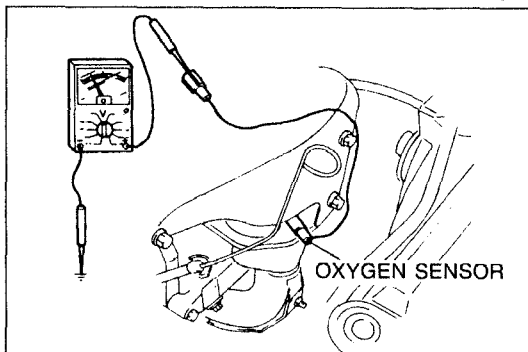
03U0FX-227

Replacement

1. Disconnect the throttle sensor connector.
2. Remove the throttle sensor mounting screws.
3. Remove the throttle sensor.
4. Install in the reverse order of removal.

Tightening torque:

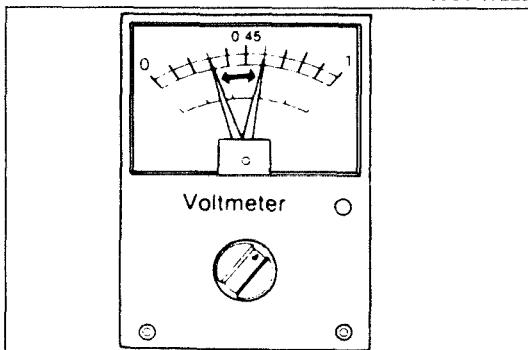
1.6—2.4 N·m (16—24 cm·kg, 14—21 in·lb)



03U0FX-228

OXYGEN SENSOR**Inspection of Terminal Voltage**

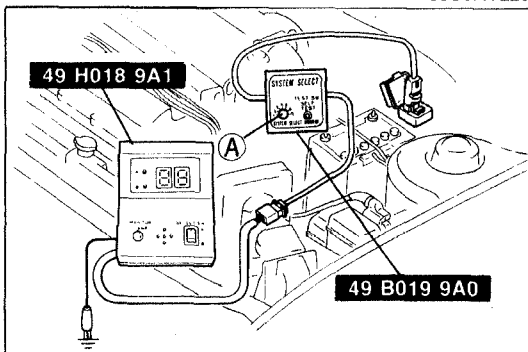
1. Warm up the engine to normal operating temperature and run it at idle.
2. Disconnect the oxygen sensor connector.
3. Connect a voltmeter between the oxygen sensor and a ground.
4. Run the engine **at 3,000 rpm** until the voltmeter indicates **approx. 0.55V**.



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5. Increase and decrease the engine speed suddenly several times. Verify that when the speed is increased the meter reads **0.5V—1.0V**, and when the speed is decreased it reads **0V—0.4V**.

6. If not as specified, replace the oxygen sensor.



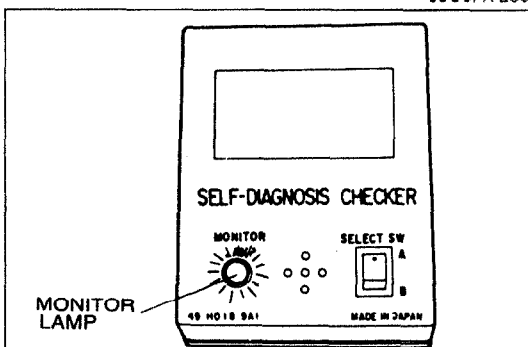
03U0FX-230

Inspection of Sensitivity

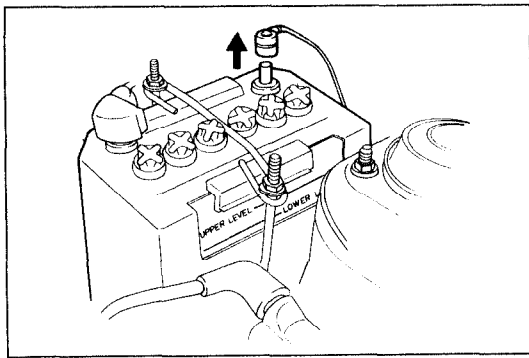
1. Warm up the engine to normal operating temperature.
2. Connect the **SSTs (System Selector and Self-Diagnosis Checker)** to the diagnosis connector as shown.
3. Set the switch (A) to position 1.
4. Set TEST SW to O2 MONITOR.

5. Increase the engine speed to **between 2,000 and 3,000 rpm**, and verify that the monitor lamp flashes for **10 sec.**. If not as specified, replace the oxygen sensor. (Refer to page F-171.)

Monitor lamp: Flashes more than 8 times/10 seconds



23U0FX-152



23U0FX-153

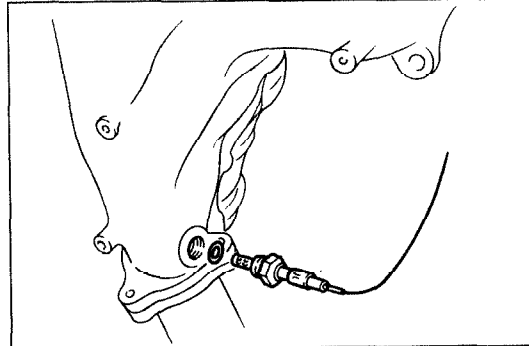
6. Turn the ignition switch OFF.
7. Disconnect the negative battery terminal for **at least 20 sec.** to eliminate the malfunction code that was created during inspection from the control unit memory.

Replacement

1. Disconnect the oxygen sensor connector.
2. Remove the oxygen sensor.
3. Install in the reverse order of removal.

Tightening torque:

29—49 N·m (3—5 m·kg, 22—36 ft·lb)



05U0FX-222

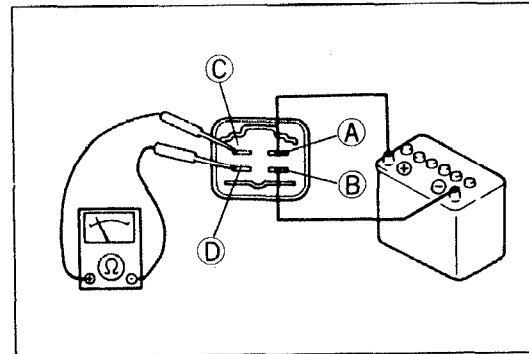
MAIN RELAY (FUEL INJ RELAY)

Inspection

1. Verify that the main relay clicks when turning the ignition switch ON and OFF.
2. Apply battery voltage to terminal A and ground terminal B of the main relay.
3. Check continuity of the terminals as shown.

V_B: Battery voltage

Terminals	V _B not applied	V _B applied
C—D	No continuity	Continuity



23U0FX-154

4. If not as specified, replace the main relay.

CLUTCH SWITCH (MTX)

Inspection

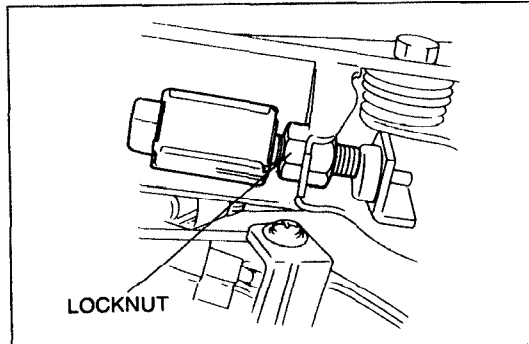
1. Disconnect the clutch switch connector.
2. Connect an ohmmeter to the switch.
3. Check continuity of the switch.

Pedal	Continuity
Depressed	Yes
Released	No

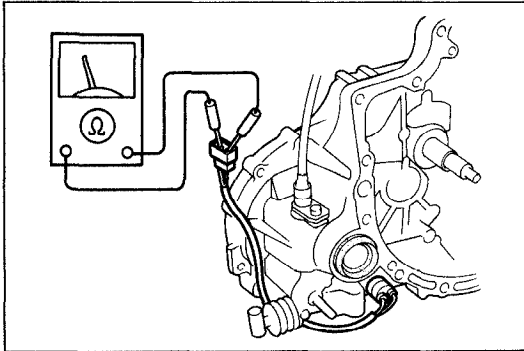
4. If not as specified, replace the clutch switch.

Replacement

1. Disconnect the clutch switch connector.
2. Loosen the locknuts.
3. Remove the clutch switch.
4. Install in the reverse order of removal.
5. Adjust the pedal height. (Refer to page H-6.)



13U0FX-099



23U0FX-156

NEUTRAL SWITCH (MTX)

Inspection

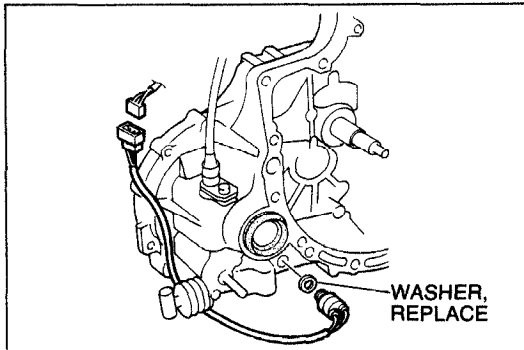
1. Disconnect the neutral switch connector.
2. Connect an ohmmeter to the switch.
3. Check continuity of the switch.

Transmission	Continuity
Neutral	Yes
Other ranges	No

4. If not as specified, replace the neutral switch.

Replacement

Replace the neutral switch as shown in the figure.



9MU0F2-240

WASHER,
REPLACE

POWER STEERING PRESSURE SWITCH

Inspection

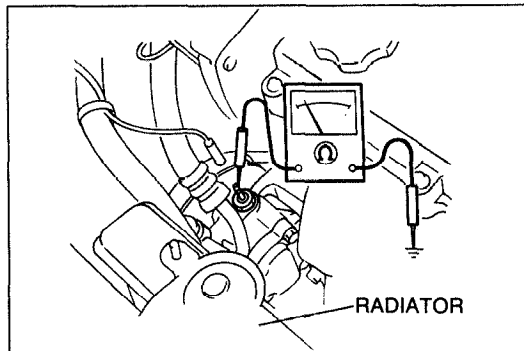
1. Disconnect the P/S pressure switch connector.
2. Connect an ohmmeter to the switch.
3. Start the engine and let it idle. Check continuity of the switch while turning the steering wheel.

P/S	Continuity
Turning	Yes
Not turning	No

4. If not as specified, replace the P/S pressure switch.

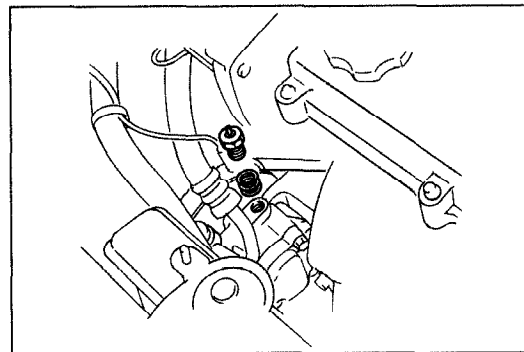
Replacement

Replace the P/S pressure switch as shown in the figure.



05U0FX-227

RADIATOR



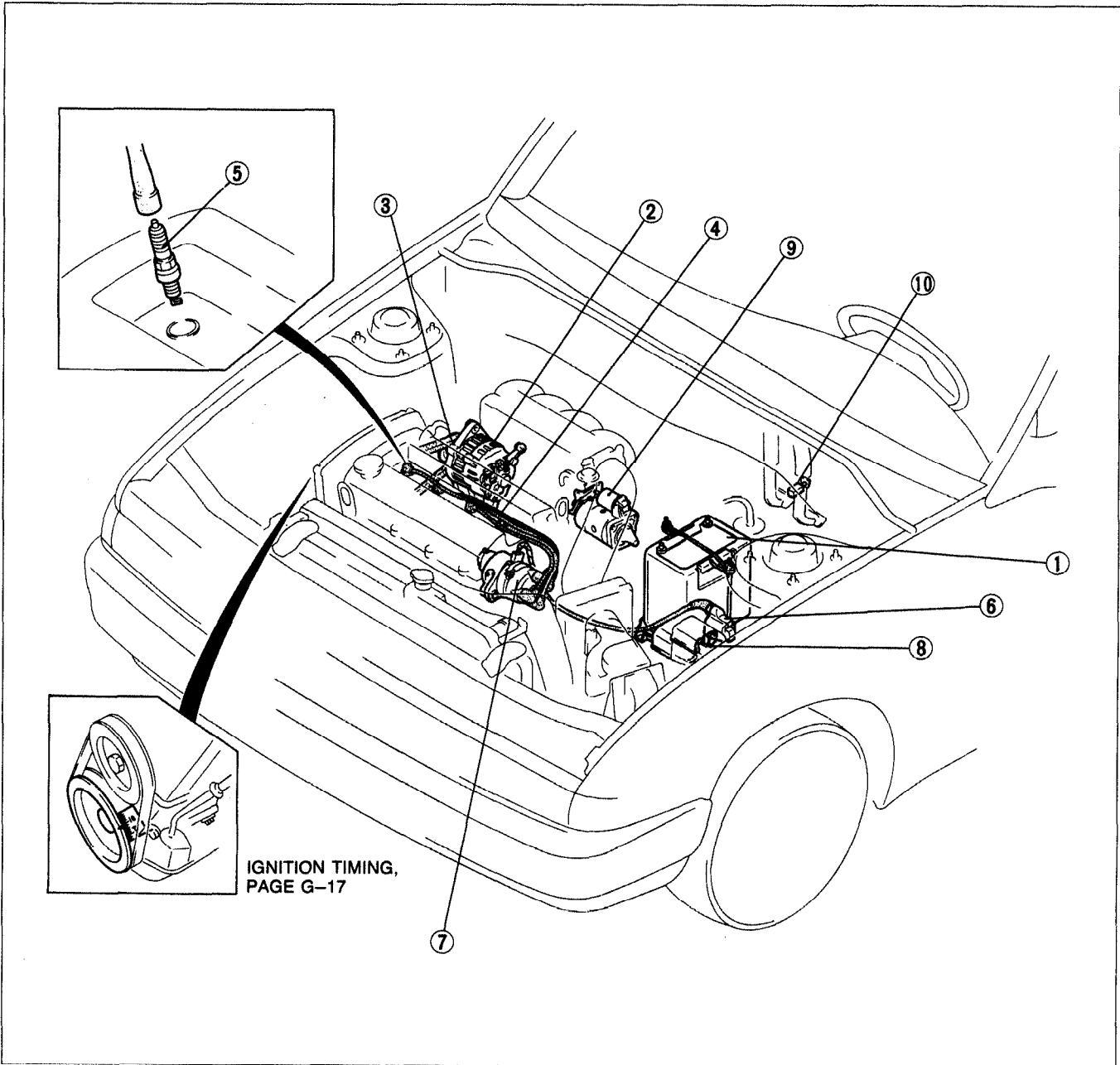
9MU0F2-242

ENGINE ELECTRICAL SYSTEM

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03U0GX-001

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Inspection.....	page G-	31	

OUTLINE

SPECIFICATIONS

Item		Engine/Transaxle		B6 SOHC	BP SOHC		BP DOHC	
					MTX	ATX	MTX	ATX
Battery	Voltage	V		12				
	Type and capacity (20-hour rate)			55D23L (60AH)	55D23L (60AH)			
Dark current* ¹		mA		Max. 20.0				
Alternator	Type			A.C				
	Output	V-A		12-65				
	Regulator type			Transistorized (built-in IC regulator)				
	Regulated voltage	V		14.1—14.7				
	Brush length	mm (in)	Standard	21.5 (0.846)				
			Minimum	8.0 (0.315)				
Drive belt deflection 98 N (10 kg, 22 lb)	mm (in)	New	8—9 (0.31—0.35)					
		Used	9—10 (0.35—0.39)					
Starter	Type			Direct	Direct	Coaxial reduction	Direct	Coaxial reduction
	Output	V-kW		12-0.95	12-0.95	12-1.4	12-0.95	12-1.4
	Brush length	mm (in)	Standard	17 (0.67)	17 (0.67)	17.5 (0.69)	17 (0.67)	17.5 (0.69)
			Minimum	11.5 (0.453)	11.5 (0.453)	10.0 (0.39)	11.5 (0.453)	10.0 (0.39)
Distributor				Electronic spark advance (photo diode)				
Ignition timing (TEN terminal of diagnosis connector grounded)		BTDC		6°—8°	4°—6°		9°—11°	
Ignition coil	Resistance (at 20°C [68°F])	Primary coil winding		0.81—0.99Ω				
		Secondary coil winding		10—16 kΩ				
Spark plug	Type	NGK	BKR5E-11 BKR6E-11	BKR5E11 BKR6E11		BKR5E11 BKR6E11 BKR7E11		
		NIPPON-DENSON	K16PR-U11 K20PR-U11	K16PR-U11 K20PR-U11		K16PR-U11 K20PR-U11 K22PR-U11		
	Plug gap	mm (in)		1.0—1.1 (0.039—0.043)				
	Firing order			1—3—4—2				

*¹ Dark current is the constant flow of current while the ignition switch is OFF. (i.e. engine control unit, audio, etc.)

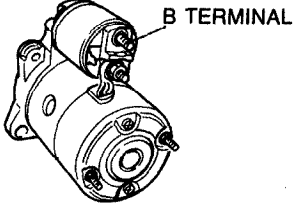
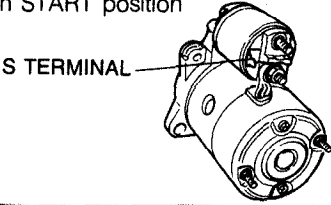
TROUBLESHOOTING GUIDE

DIAGNOSTIC INDEX

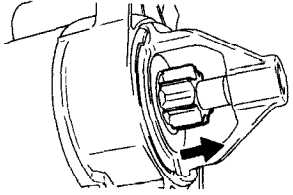
No.	Troubleshooting items	Page
1	Will not crank—starter motor does not operate	G-4
2	Will not crank—starter motor spins	G-4
3	Cranks slowly	G-5
4	Alternator warning lamp illuminates when engine running	G-5
5	Discharged battery	G-5
6	Misfire	G-5

03U0GX-004

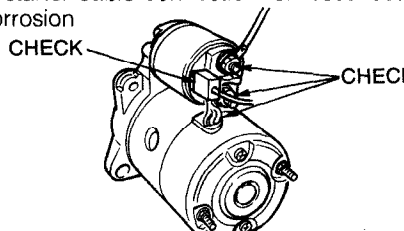
SYMPTOM TROUBLESHOOTING

1 Will not crank—Starter motor does not operate			
STEP	INSPECTION	ACTION	
1	Check if engine cranks with fully charged battery	Yes	Check charging system <input type="checkbox"/> page G-7
		No	Go to next step
2	Check if battery voltage is applied at B terminal	Yes	Go to next step
		No	Check wire harness
3	Check if battery voltage is applied at S terminal when clutch pedal depressed (MTX) and ignition switch in START position	Yes	<ul style="list-style-type: none"> • Check magnetic switch <input type="checkbox"/> page G-28 • Check field coil <input type="checkbox"/> page G-29 • Check armature <input type="checkbox"/> page G-29
		No	<ul style="list-style-type: none"> • Check starter interlock switch (MTX) <input type="checkbox"/> page G-31 • Check inhibitor switch (ATX) <input type="checkbox"/> Section K • Check ignition switch <input type="checkbox"/> Section T • Check wire harness

23U0GX-008

2 Will not crank—starter motor spins			
STEP	INSPECTION	ACTION	
1	Check if drive pinion is pulled out while cranking (Click heard when pulled out)	Yes	Remove starter and check flywheel ring gear teeth and starter drive pinion teeth
		No	<ul style="list-style-type: none"> • Check magnetic switch <input type="checkbox"/> page G-28 • Check field coil <input type="checkbox"/> page G-29

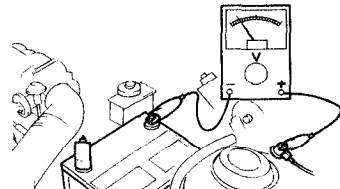
03U0GX-006

3	Crank slowly		
STEP	INSPECTION	ACTION	
1	Check if engine cranks normally with fully charged battery	Yes	Check charging system ☞ page G-7
		No	Go to next step
2	Check starter cable connection for looseness and corrosion 	Yes	Repair or replace connection
		No	Check for stuck starter (brush, armature, etc.)

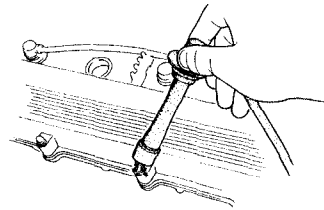
03U0GX-007

4	Alternator warning lamp illuminates when engine running		
STEP	INSPECTION	ACTION	
1	Check for correct battery voltage at idle Specification: 14.1—14.7V	Yes	Check wire harness between alternator L terminal and alternator warning lamp
		No	Check charging system ☞ page G-7

03U0GX-008

5	Discharged battery		
STEP	INSPECTION	ACTION	
1	Check charging system ☞ page G-7	Yes	Turn ignition switch ON and check dark current as shown  Dark current: Below 20mA
		No	Repair or replace parts as necessary

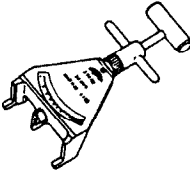
03U0GX-009

6	Misfire		
STEP	INSPECTION	ACTION	
1	Disconnect high-tension lead from each spark plug and check for strong blue spark while cranking 	Yes	Check spark plug ⇨ If OK, engine electrical system normal ⇨ If not OK, clean or replace spark plug ☞ page G-18
		No	Check ignition system ☞ page G-16

03U0GX-010

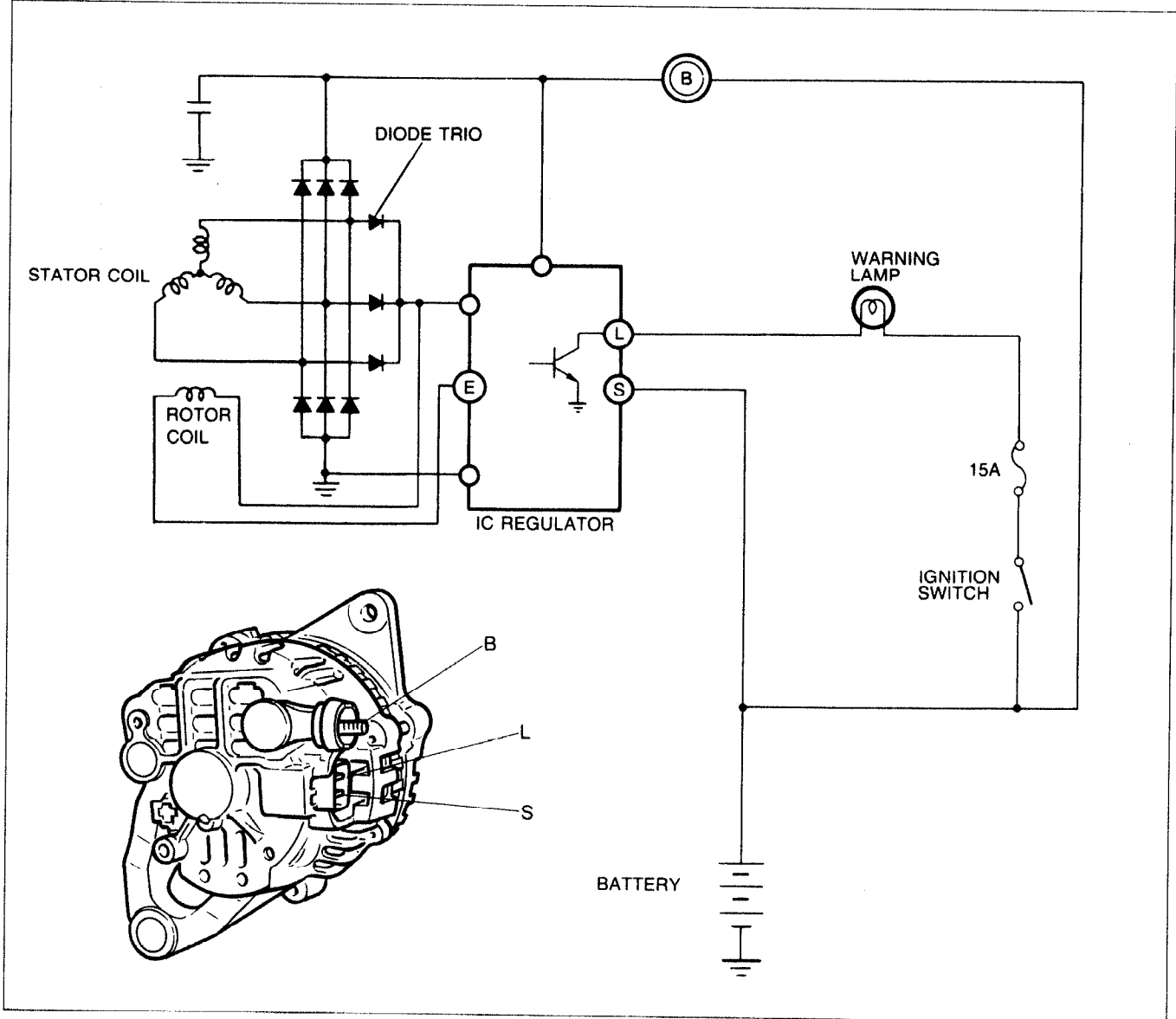
CHARGING SYSTEM

PREPARATION SST

<p>49 9200 020 Tension gauge, V-ribbed belt</p>		<p>For inspection of drive belt tension</p>
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03U0GX-011

CIRCUIT DIAGRAM

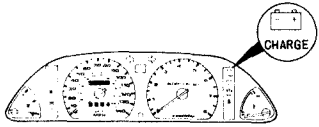
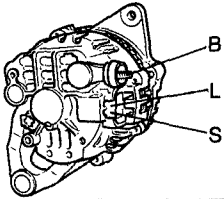
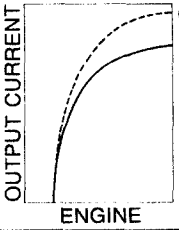
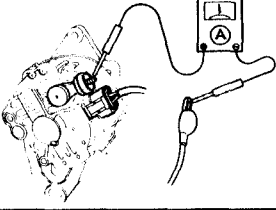


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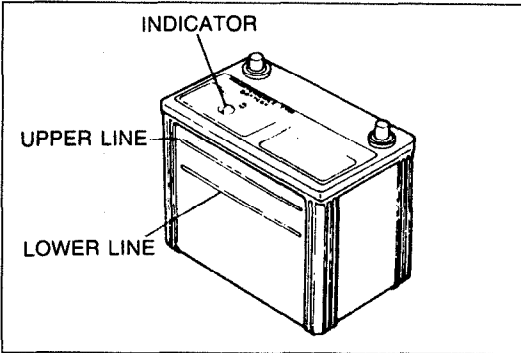
The alternator has a self-diagnostic function to warn of the following problems in the charging system. If a problem arises, the alternator warning lamp illuminates.

1. S terminal circuit open
2. No voltage output
3. Field coil circuit open
4. B terminal circuit open
5. Voltage output too high

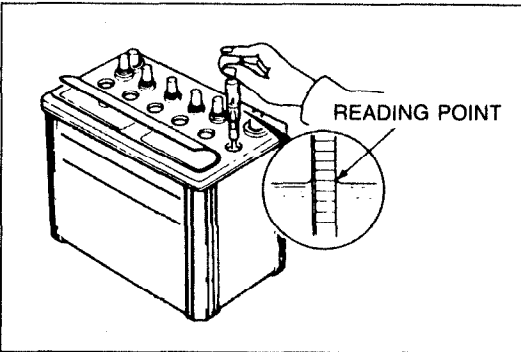
TROUBLESHOOTING

STEP	INSPECTION		ACTION												
1	Check battery voltage Specification: Above 12.4V	Yes	Go to next step												
		No	Check battery ☞ page G-8												
2	Start engine and check if alternator warning lamp goes out 	Yes	Go to Step 4												
		No	Go to next step												
3	Check if voltages at alternator terminals are correct Specification : <div style="text-align: center; margin: 5px 0;">V_B: Battery voltage</div> <table border="1" style="margin: 0 auto; border-collapse: collapse;"> <thead> <tr> <th>Terminal</th> <th>Ign : on (V)</th> <th>Idle (V)</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>V_B</td> <td>14.1—14.7</td> </tr> <tr> <td>L</td> <td>Approx. 1</td> <td>14.1—14.7</td> </tr> <tr> <td>S</td> <td>V_B</td> <td>14.1—14.7</td> </tr> </tbody> </table> 	Terminal	Ign : on (V)	Idle (V)	B	V _B	14.1—14.7	L	Approx. 1	14.1—14.7	S	V _B	14.1—14.7	Yes	Check wire harness between battery and terminal B
		Terminal	Ign : on (V)	Idle (V)											
B	V _B	14.1—14.7													
L	Approx. 1	14.1—14.7													
S	V _B	14.1—14.7													
No	<ul style="list-style-type: none"> • Check wiring harness • Replace alternator ☞ page G-10														
4	1. Connect an ammeter (70A min.) between terminal B and harness 2. Start engine 3. Turn all electrical loads ON and depress brake pedal 4. Check if output current is 65A or more at 2,500—3,000 rpm Caution • Do not ground terminal B  	Yes	Charging system normal												
		No	Go to next step												
5	Check if drive belt tension is OK <table border="1" style="margin: 0 auto; border-collapse: collapse;"> <thead> <tr> <th>Drive belt</th> <th>New</th> <th>Used</th> </tr> </thead> <tbody> <tr> <td>Alternator N (kg, lb)</td> <td>383—461 (39—47, 85.8—103.4)</td> <td>304—383 (31—39, 68.2—85.8)</td> </tr> <tr> <td>A/C and P/S N (kg, lb)</td> <td>491—589 (50—60, 110—132)</td> <td>422—491 (43—50, 95—110)</td> </tr> </tbody> </table>	Drive belt	New	Used	Alternator N (kg, lb)	383—461 (39—47, 85.8—103.4)	304—383 (31—39, 68.2—85.8)	A/C and P/S N (kg, lb)	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)	Yes	Replace alternator ☞ page G-10			
		Drive belt	New	Used											
Alternator N (kg, lb)	383—461 (39—47, 85.8—103.4)	304—383 (31—39, 68.2—85.8)													
A/C and P/S N (kg, lb)	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)													
No	Adjust drive belt tension														

G



03U0GX-014



03U0GX-015

BATTERY

Inspection

Indicator sign (If equipped)

1. Check that the indicator is blue.
2. If the indicator is not blue, check if the electrolyte level lies between the upper and lower lines.
3. If low, add distilled water, being careful not to overfill.
4. If the electrolyte level is acceptable and yet the indicator is not blue, the battery must be recharged.

Specific gravity of electrolyte

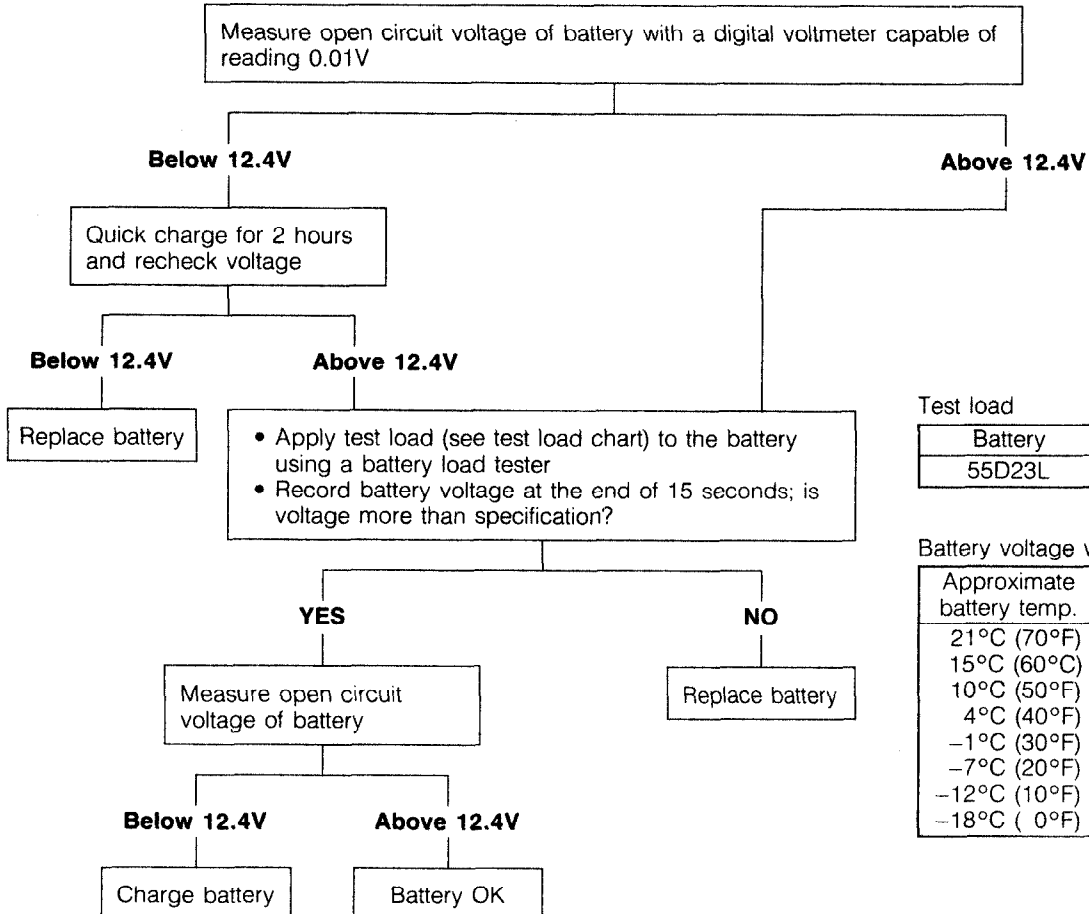
Measure the specific gravity with a hydrometer.

Specification: 1.27—1.29 (at 20°C [68°F])

Note

- If the battery charge indicator is not blue when the specific gravity is normal, the indicator could be defective.

Battery discharge test

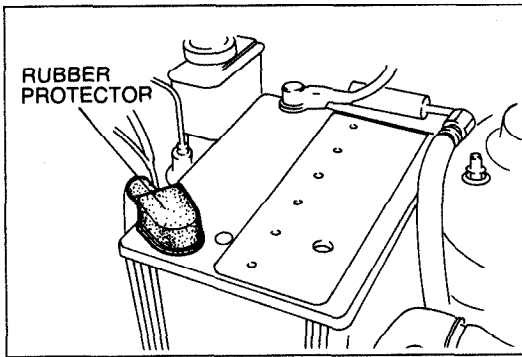


Test load

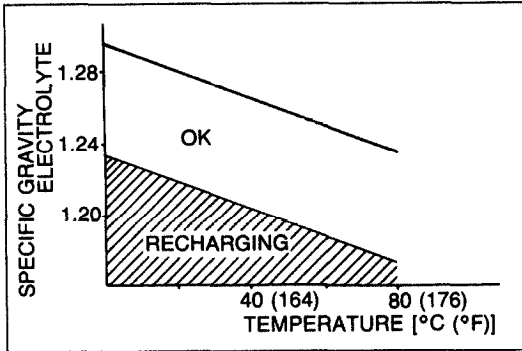
Battery	Load (A)
55D23L	180

Battery voltage with load

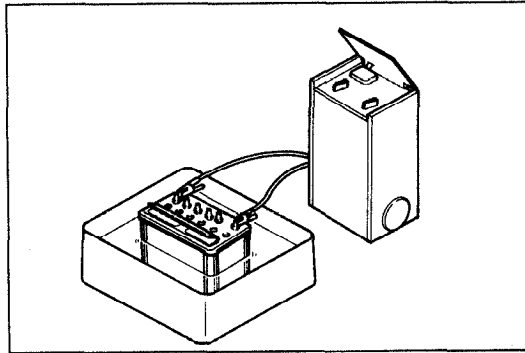
Approximate battery temp.	Minimum voltage (V)
21°C (70°F)	9.6
15°C (60°C)	9.5
10°C (50°F)	9.4
4°C (40°F)	9.3
-1°C (30°F)	9.1
-7°C (20°F)	8.9
-12°C (10°F)	8.7
-18°C (0°F)	8.5



03U0GX-017



23U0GX-004



03U0GX-019

Terminal and cable

1. Check the tightness of the terminals to ensure good electrical connections.
2. Check for corroded or frayed battery cables.
3. Check the rubber protector on the positive terminal for proper coverage.
4. Clean the terminals if necessary, and coat them with grease.

Recharging

Battery	Slow charge (A)	Quick charge (A)
55D23L	Under 6	Max. 20

G

Slow charging

It is not necessary to remove the vent caps to perform a slow charge.

Quick charging

Remove the battery from the vehicle and remove the vent caps to perform a quick charge.

Warning

- Before performing maintenance or recharging the battery, turn off all accessories and stop the engine.
- The negative cable must be removed first and installed last.
- Set the battery in water when quick charging to prevent overheating the battery.

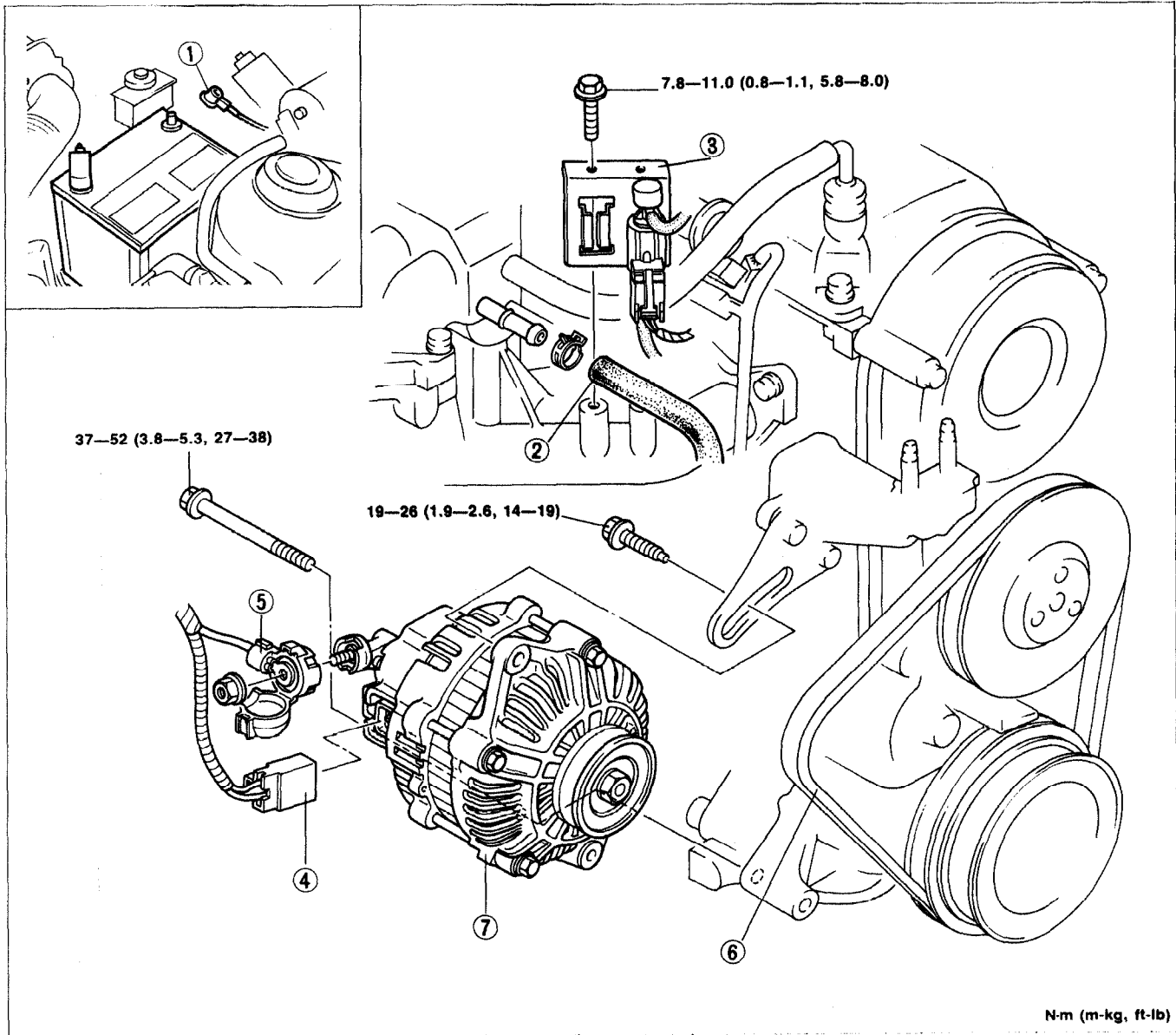
ALTERNATOR

Removal / Installation

Caution

- Be sure the battery connections are not reversed, because this will damage the rectifier.
- Do not use high-voltage testers such as a megger, because they will damage the rectifier.
- Remember that battery voltage is always applied to the alternator B terminal.
- Do not ground the L terminal while the engine is running.
- Do not start the engine while the connector is disconnected from the L and S terminals.

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.



N-m (m-kg, ft-lb)

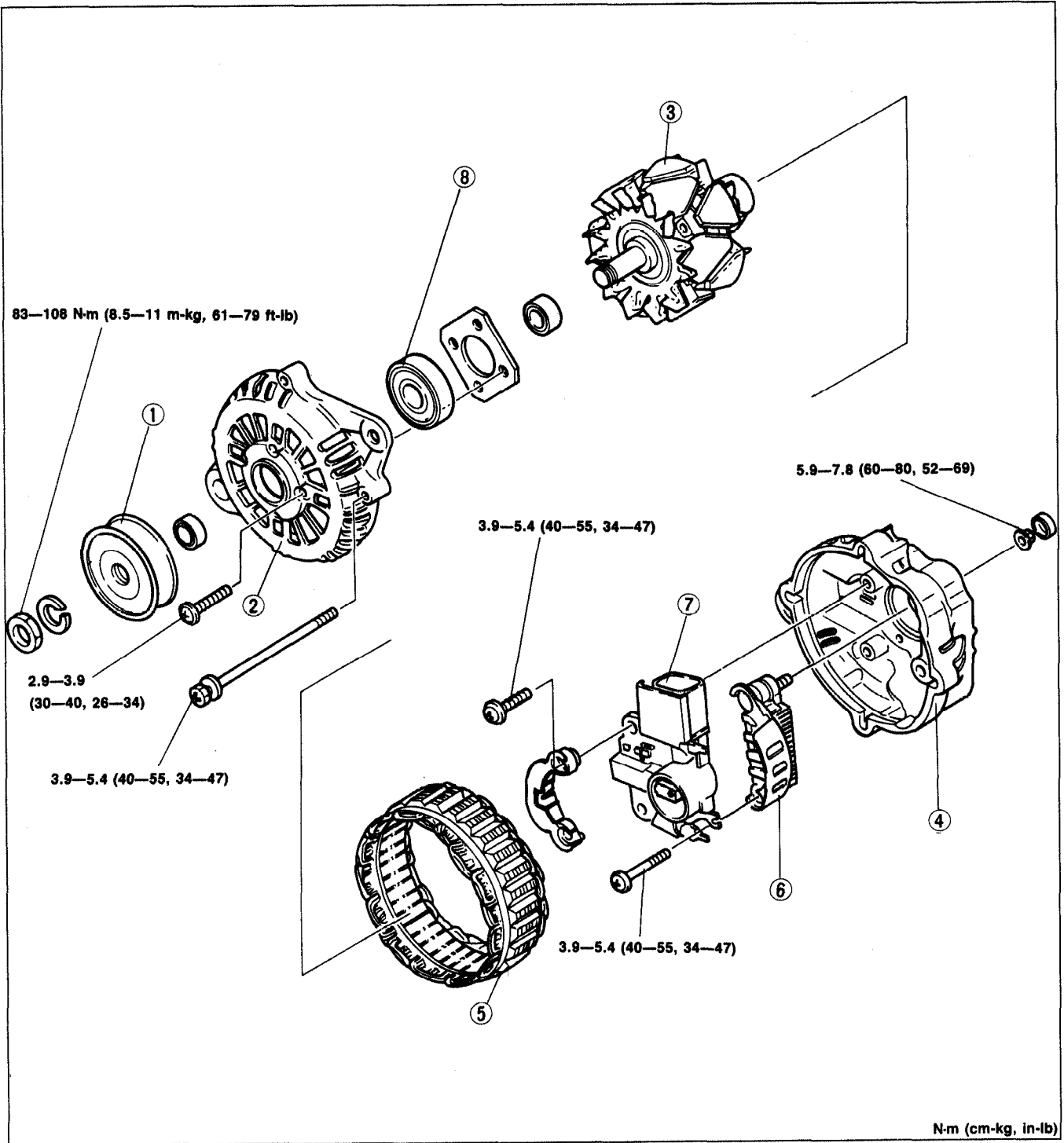
03U0GX 020

1. Negative battery cable
2. Vacuum hose
3. Solenoid bracket (If equipped)
4. Connector
5. B terminal wire
Inspect for damage and corrosion

6. Drive belt
 Inspection..... page G-14
 Adjustment..... page G-14
 Replacement..... page G-14
7. Alternator
 Disassembly / Assembly..... page G-11
 Inspection..... page G-12

Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly.

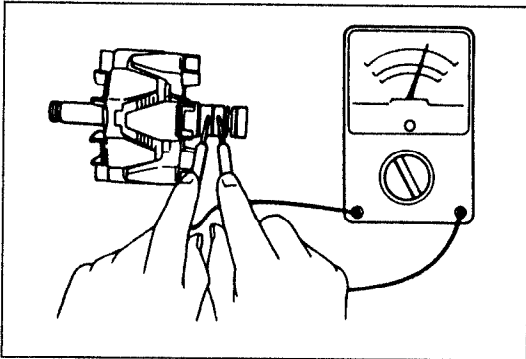


N·m (cm·kg, in·lb)

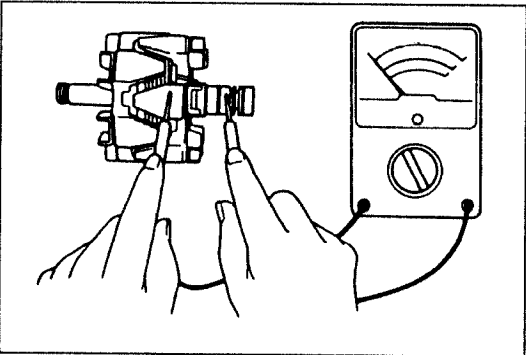
03U0GX-021

1. Pulley
2. Front cover
3. Rotor
Inspection..... page G-12
4. Rear bracket
5. Stator
Inspection..... page G-12

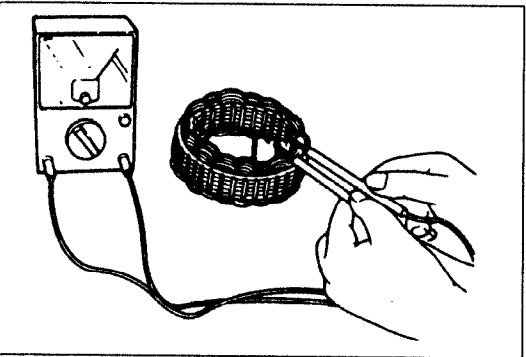
6. Rectifier
Inspection..... page G-13
7. Brush holder assembly
Inspection
(Brush and brush spring)..... page G-13
8. Bearing
Inspection..... page G-13



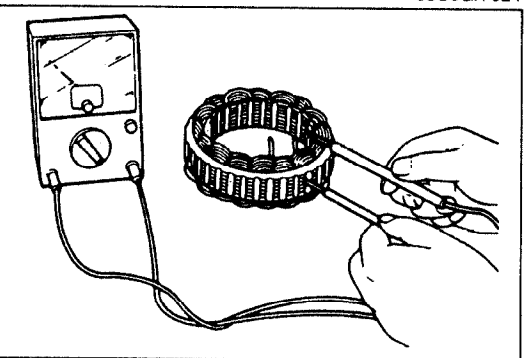
23U0GX-005



23U0GX-006



03U0GX-024



03U0GX-025

Inspection**Rotor**

1. Measure the resistance between the slip rings with an ohmmeter.

Specification: 3.5—4.5Ω [at 20°C (68°F)]

2. If not within specification, replace the rotor.

3. (1) Check continuity between each slip ring and the core with an ohmmeter.

(2) Replace the rotor if there is continuity.

4. Check if the slip ring surface is rough. Use fine sandpaper to repair it if necessary.

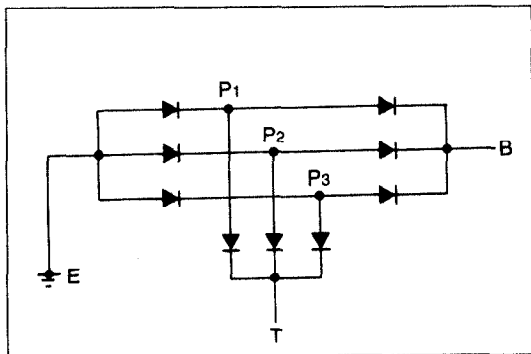
Stator

1. Check for continuity between the stator coil leads with an ohmmeter.

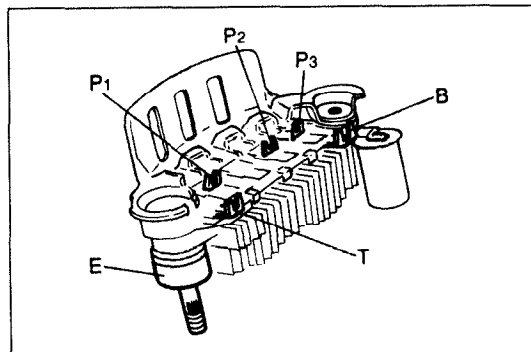
2. Replace the stator if there is no continuity.

3. Check continuity between the stator coil leads and the core with an ohmmeter.

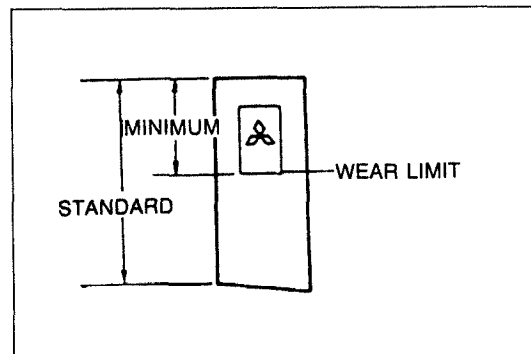
4. Replace the stator if there is continuity.



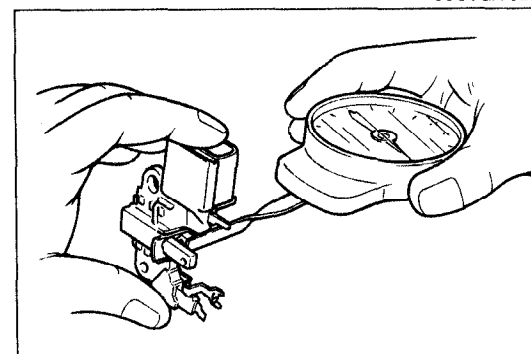
23U0GX-009



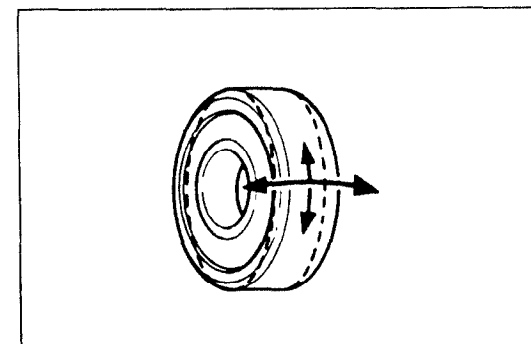
03U0GX-027



03U0GX-028



03U0GX-029



03U0GX-030

Rectifier

1. Check continuity of the diodes with an ohmmeter.

Negative	Positive	Continuity
E	P1, P2, P3	Yes
B		No
T		No
P1, P2, P3	E	No
	B	Yes
	T	Yes

2. Replace the rectifier if necessary.

Brush

If a brush is worn almost to or beyond the limit, replace the brushes.

Standard: 21.5mm (0.846 in)

Minimum: 8.0mm (0.315 in)

Brush spring

1. Measure the force of the brush spring with a spring pressure gauge.

2. Replace the spring if necessary.

Standard force:

3.1—4.3 N (320—440 g, 11.3—15.5 oz)

Minimum: 1.6—2.4 N (160—240 g, 5.6—8.5 oz)

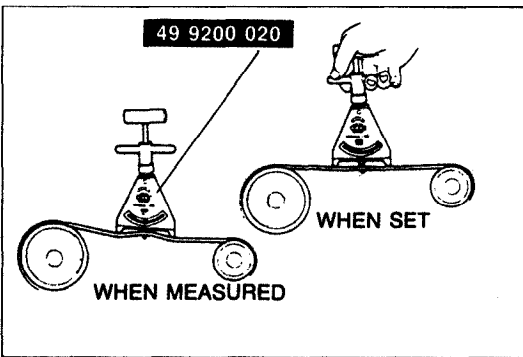
Note

- Read the spring pressure with the brush tip projecting 2mm (0.079 in).

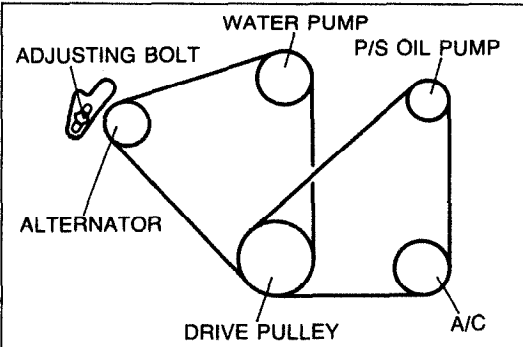
Bearing

1. Check for abnormal noise, looseness, or sticking.

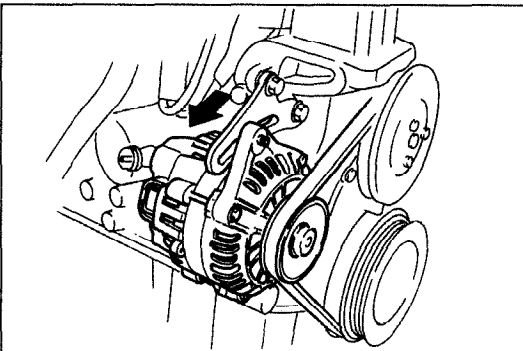
2. Replace the bearing(s) if necessary.



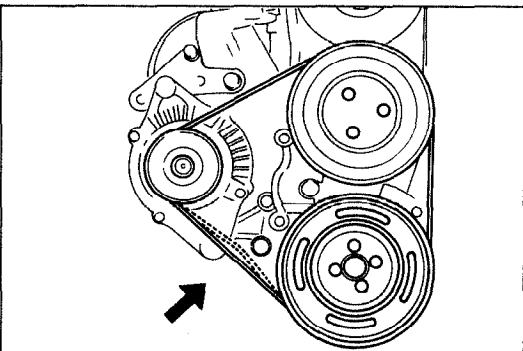
13U0GX-002



03U0GX-032



03U0GX-033



03U0GX-034

DRIVE BELT

Inspection

1. Check the drive belt and pulley for wear, cracks, and fraying. Replace if necessary.
2. Measure the drive belt tension with a tension gauge.

Tension

N (kg, lb)

Drive belt	New	Used
Alternator	383—461 (39—47, 85.8—103.4)	304—383 (31—39, 68.2—85.8)
A/C and P/S	491—589 (50—60, 110—132)	422—491 (43—50, 95—110)

3. Measure the deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the pulleys. Adjust if necessary.

Deflection

mm (in)

Drive belt	New	Used
Alternator	8—9 (0.31—0.35)	9—10 (0.35—0.39)
A/C and P/S	8—9 (0.31—0.35)	9—10 (0.35—0.39)

Adjustment

1. Loosen the alternator mounting bolt and adjusting bolt.
2. Move the alternator to set the specified deflection.
3. Tighten all bolts and recheck the tension.

Replacement

1. Remove the A/C and P/S drive belt, if equipped.

Note

- Refer to pages B1-5 and B2-5.

2. Loosen the alternator mounting bolt and adjusting bolt.
3. Remove the alternator belt.
4. Install the new alternator belt and adjust it to specification.
5. Tighten all bolts to the specified torque.

Tightening torque

Alternator bolt:

37—52 N-m (3.8—5.3 m-kg, 27—38 ft-lb)

Adjusting bolt:

19—25 N-m (1.9—2.6 m-kg, 14—19 ft-lb)

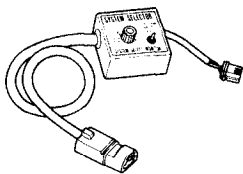
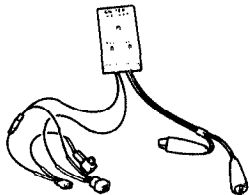
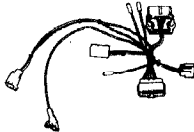
6. Install the A/C and P/S drive belt if equipped, and adjust to specification.

Note

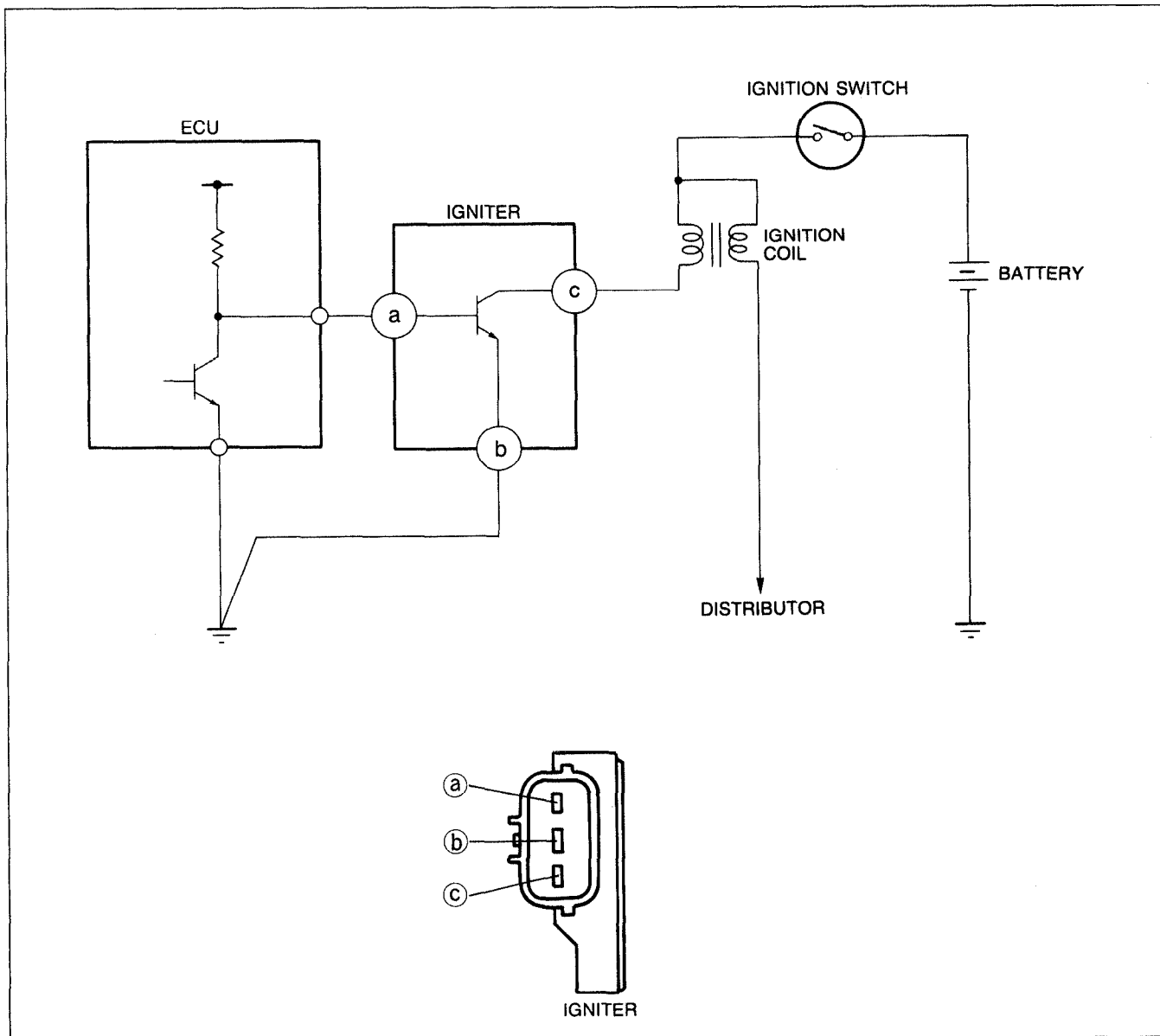
- Refer to pages B1-5 and B2-5.

IGNITION SYSTEM

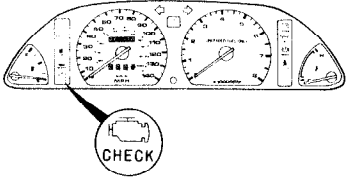
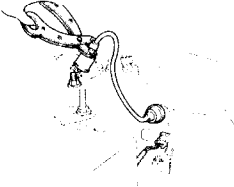
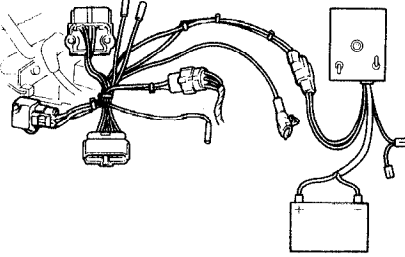
PREPARATION SST

49 B019 9A0 System Selector		For inspection of ignition timing	49 F018 002 Igniter Checker		For inspection of igniter
49 N018 001 Adapter Harness		For inspection of igniter	03U0GX-035		

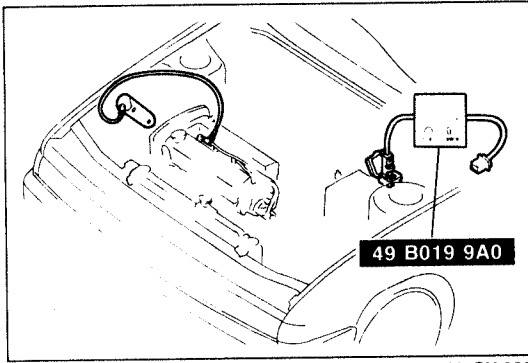
CIRCUIT DIAGRAM



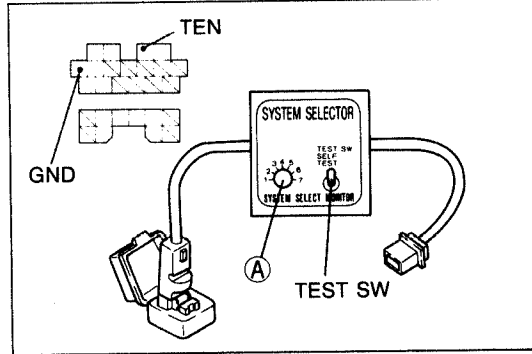
TROUBLESHOOTING

STEP	INSPECTION		ACTION
1	Check if MIL illuminates when engine is running 	Yes	Check for malfunction code number and perform troubleshooting (TEN terminal grounded) ☞ Section F
		No	Go to next step
2	Disconnect high-tension lead from distributor and check for strong blue spark while cranking engine ☞ page G-19 	Yes	<ul style="list-style-type: none"> ☞ Check distributor cap and rotor ☞ page G-22 ☞ Check high-tension lead ☞ page G-17 ⇒ Ignition system normal
		No	Go to next step
3	Check if resistance of ignition coil is OK ☞ page G-19 Specification (at 20°C [68°F]): Primary coil winding: 0.81—0.99Ω Secondary coil winding: 10—16 kΩ	Yes	Go to next step
		No	Replace ignition coil
4	Check if resistance of high-tension leads is OK ☞ page G-17 Specification: 16 kΩ per 1 m (3.28 ft)	Yes	Go to next step
		No	Replace high-tension lead
5	Check if igniter is OK ☞ page G-23 	Yes	Replace ECU
		No	Replace igniter

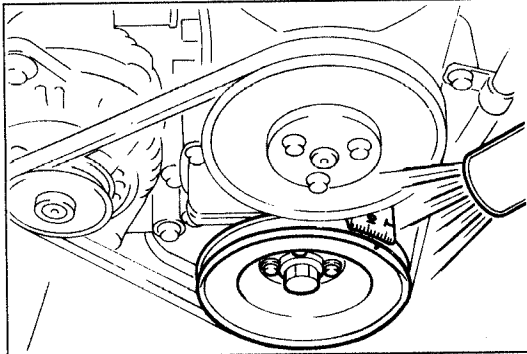
03U0GX-037



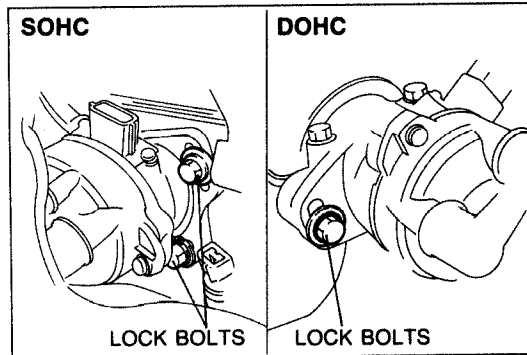
03U0GX-038



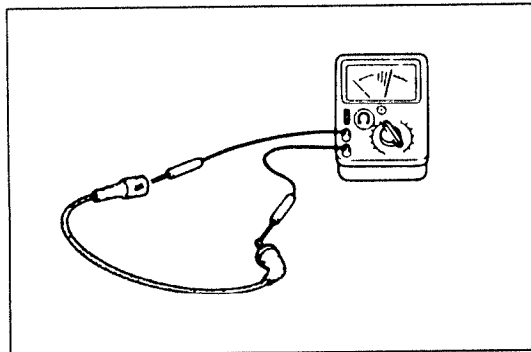
03U0GX-039



23U0GX-010



03U0GX-085



03U0GX-041

IGNITION TIMING

Adjustment

1. Warm up the engine to normal operating temperature.
2. Turn all electrical loads OFF.
3. Turn the A/C switch OFF.
4. Connect the **SST**.

5. Set switch A on the System Selector to position 1 and TEST SWITCH to SELF-TEST.

Note

- To create the test condition without using the System Selector, connect terminals TEN and GND of the diagnosis connector with a jumper wire.

6. Check the ignition timing.

Specification

Engine	B6 SOHC	BP SOHC	BP DOHC
Ignition timing BTDC	6°—8°	4°—6°	9°—11°

7. If the ignition timing is not as specified, loosen the distributor lock bolts and turn the distributor to make the adjustment.
8. Tighten the distributor lock bolts to the specified torque.

Tightening torque:

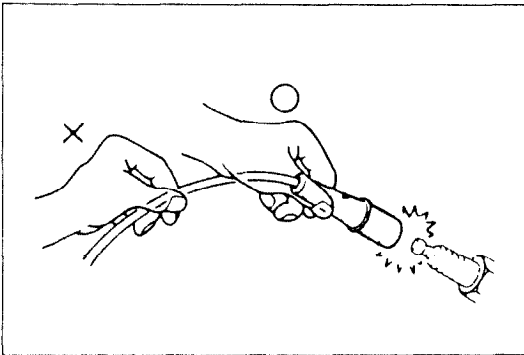
19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

HIGH-TENSION LEAD

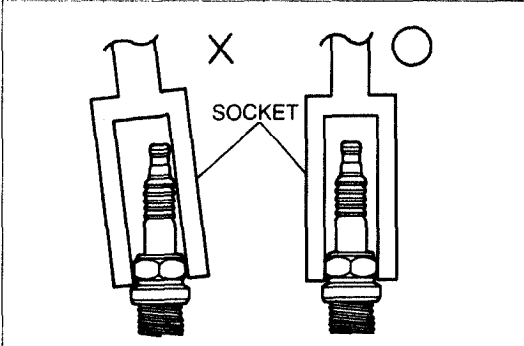
Inspection

1. Measure resistance of the high-tension leads.

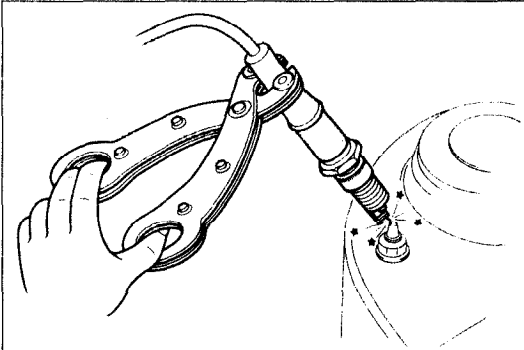
Specification: 16 kΩ per 1 m (3.28 ft)



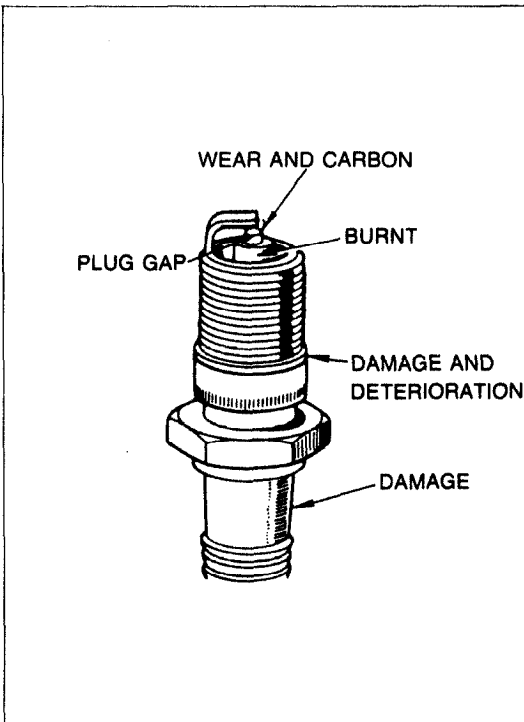
03U0GX-042



03U0GX-043



03U0GX-044



03U0GX-045

SPARK PLUGS

Removal / Installation

1. Remove and install the high-tension leads carefully.

Caution

- When the spark plug lead is to be pulled off, be sure to pull the boot itself, not the wire.

2. Remove and install the spark plug with a plug socket.

Caution

- Be sure the socket is fit squarely over the spark plug.

3. Apply anti-seize compound or molybdenum-based lubricant to the spark plug threads.
4. Tighten the spark plug to the specified torque.

Spark plug Tightening torque:

15—23 N·m (1.5—2.3 m·kg, 11—17 ft·lb)

Inspection

1. Remove the spark plug.
2. Connect the spark plug to a high-tension lead.
3. Hold the spark plug with insulated pliers **5—10mm (0.20—0.39 in)** from a ground.
4. Crank the engine and verify that there is a strong blue spark.

Note

- If there is no spark, replace the spark plug.

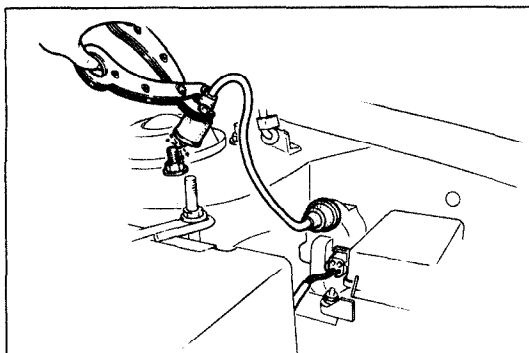
5. Check the following points. If a problem is found, replace the spark plug.

- Damaged insulation.
- Worn electrodes.
- Carbon deposits.

If cleaning is necessary, use a plug cleaner or a wire brush. Clean the upper insulator also.

- Damaged gasket.
- Burnt condition.

Plug gap: 1.0—1.1mm (0.039—0.043 in)



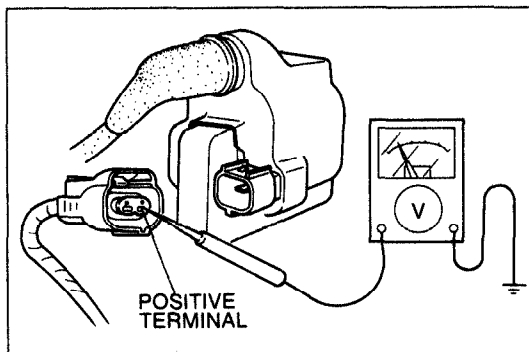
03U0GX-046

IGNITION COIL

Inspection

Spark test

1. Disconnect the high-tension lead from the distributor.
2. Hold it with insulated pliers **5—10mm (0.20—0.39 in)** from a ground.
3. Crank the engine and verify that a strong blue spark is visible.

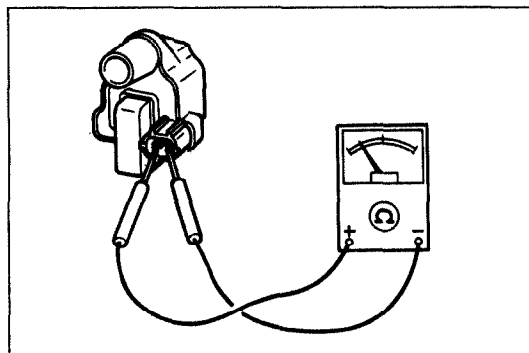


23U0GX-007

4. If there is no spark, disconnect the connector from the ignition coil and check for voltage at the positive (+) terminal of the connector with the ignition switch in the ON position.

Specification: Battery voltage

5. If there is no voltage, check the main fuse, ignition switch, and wire harness.

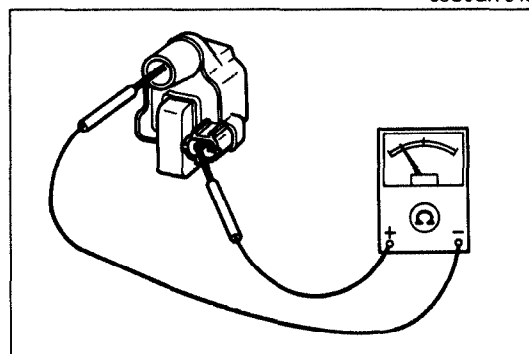


03U0GX-048

Primary coil winding

1. Use an ohmmeter and measure resistance of the primary coil winding. If not within specification, replace the coil.

Primary coil resistance: 0.81—0.99Ω (at 20°C [68°F])

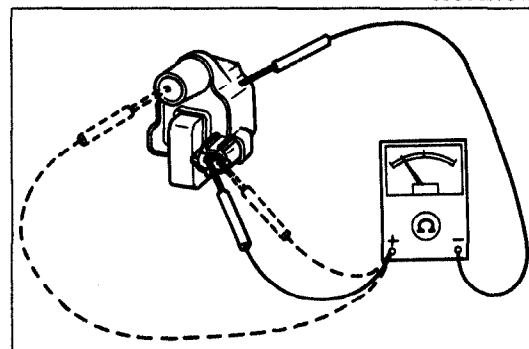


03U0GX-049

Secondary coil winding

1. Use an ohmmeter and measure resistance of the secondary coil winding. If not within specification replace the coil.

Secondary coil resistance: 10—16 kΩ (at 20°C [68°F])

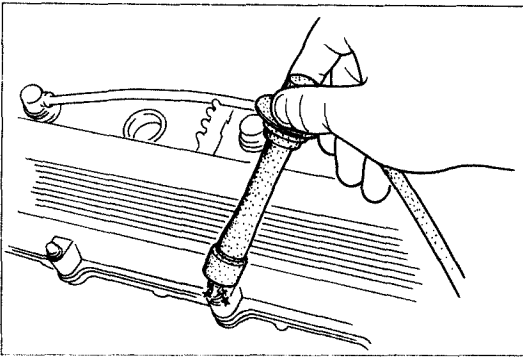


03U0GX-050

Insulation of case

1. Use a 500V megger tester to measure the insulation resistance between each terminal and the case.

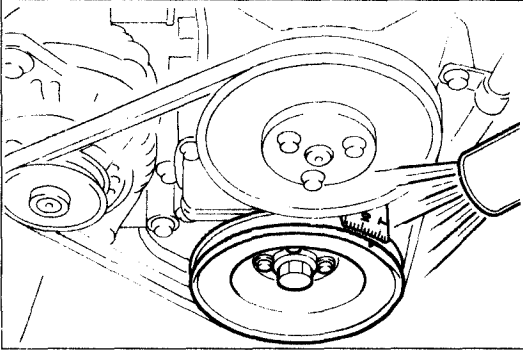
Specification: 10 MΩ min.



03U0GX-051

**DISTRIBUTOR
Spark Test**

1. Disconnect the high-tension lead from each spark plug.
2. Hold each insulator with pliers **5—10mm (0.20—0.39 in)** from a ground.
3. Crank the engine and verify that a strong blue spark is visible.



03U0GX-052

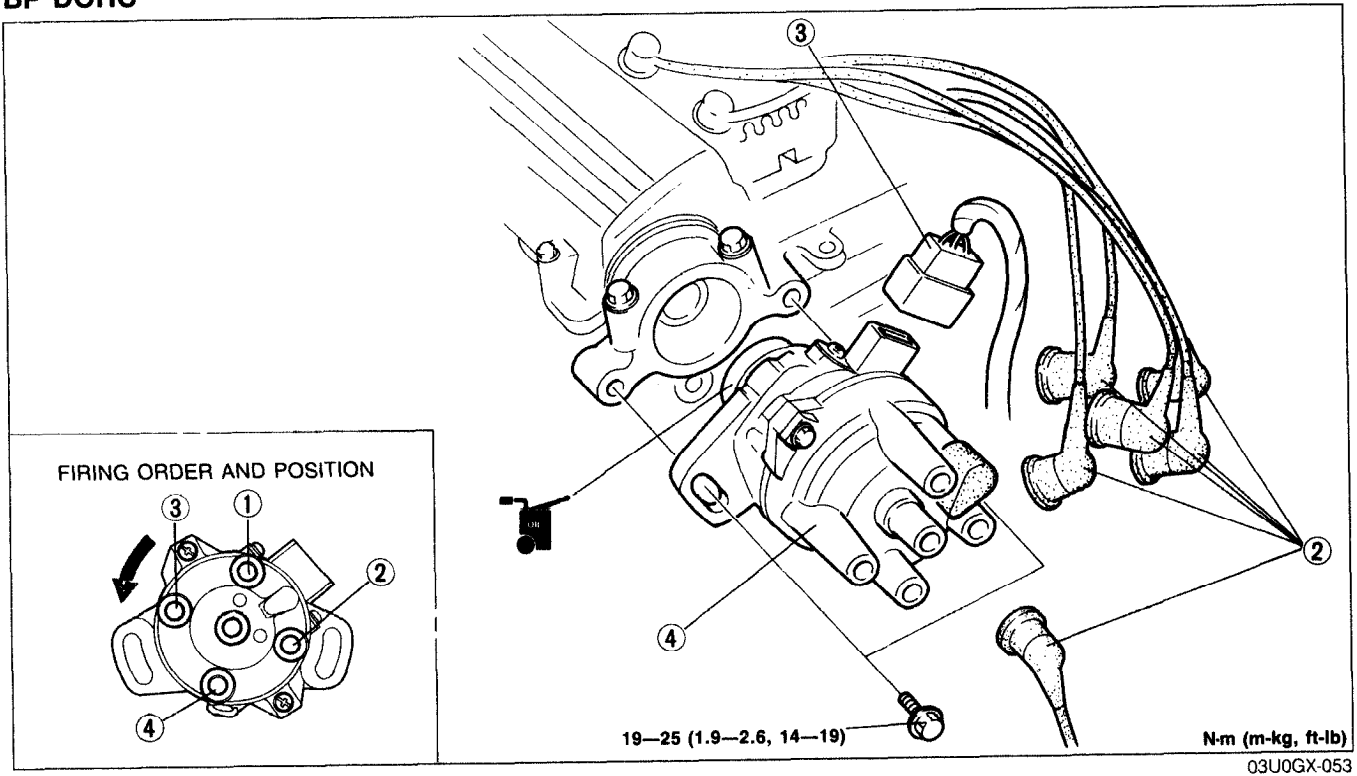
Electronic Advance Inspection

1. Verify that the ignition timing advances with engine acceleration.

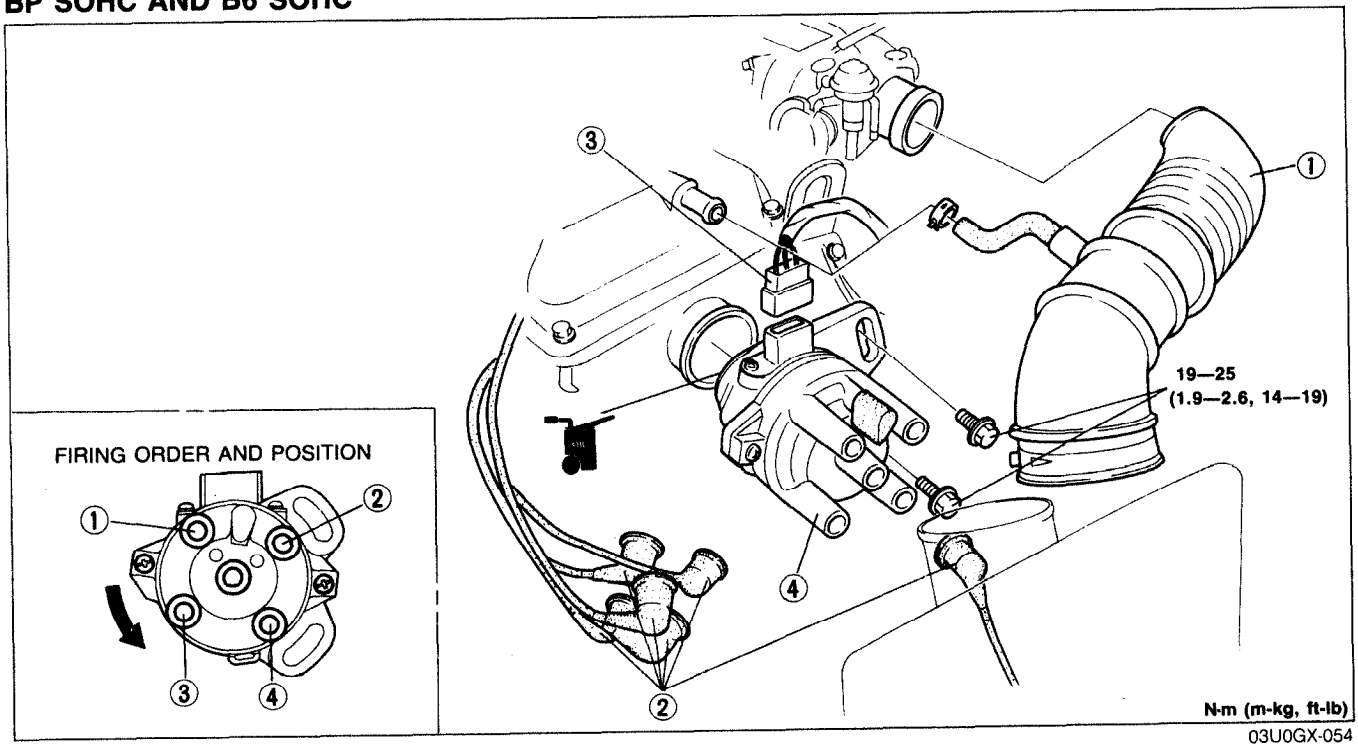
Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

BP DOHC



BP SOHC AND B6 SOHC

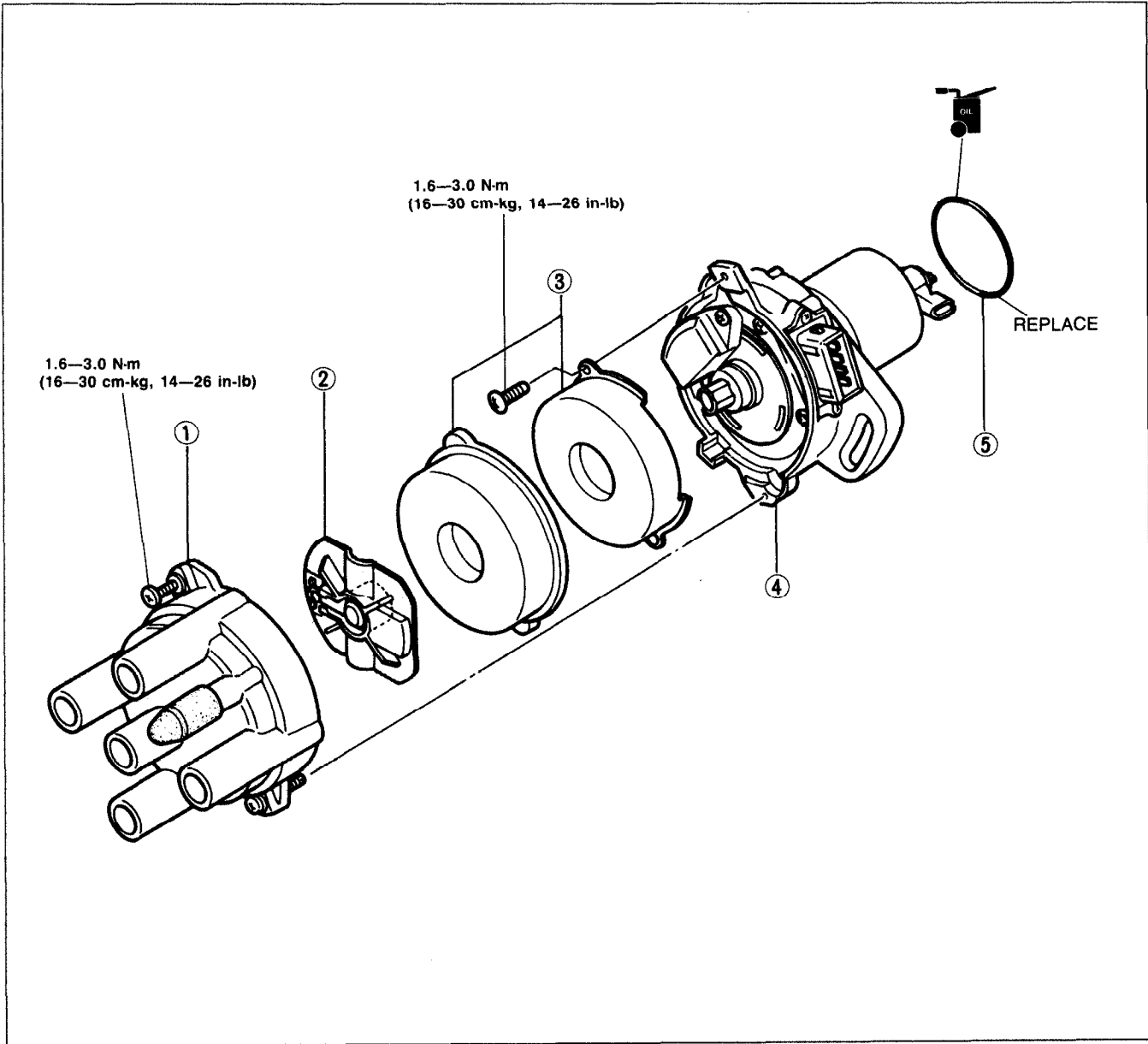


1. Air hose
2. High-tension lead
Inspection..... page G-17
3. Connector

4. Distributor
Disassembly / Assembly..... page G-22
Inspection..... page G-22

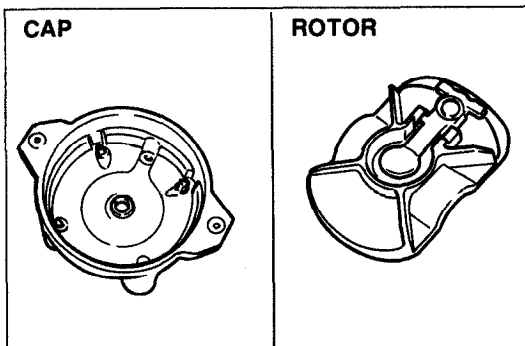
Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.



13U0GX-004

- | | | | |
|----------|-----------------------|-----------|-----------------------|
| 1. Cap | Inspection..... below | 3. Cover | 4. Crank angle sensor |
| 2. Rotor | Inspection..... below | 5. O-ring | |

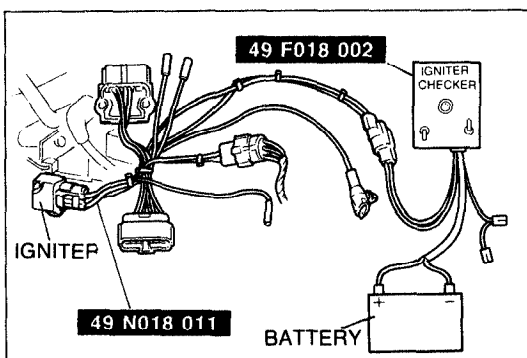


Inspection

Cap and rotor

1. Check for corrosion, damage, and cracks.
2. Replace if necessary.

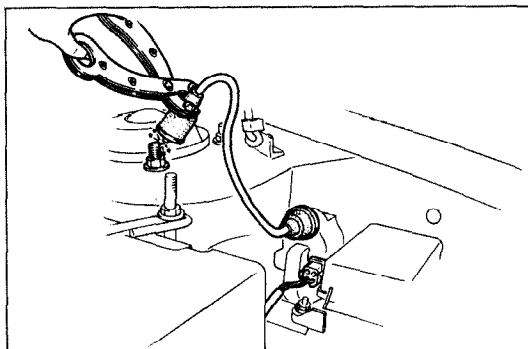
03U0GX-056



03U0GX-057

IGNITER Inspection

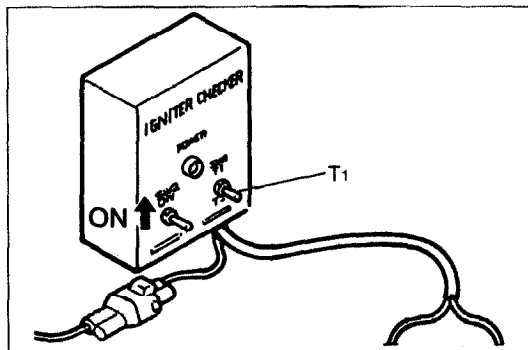
1. Disconnect the igniter connector.
2. Connect the **SST** between the igniter and the wire harness.
3. Connect the connector (4-pin) of the Igniter Checker to the adapter harness.
4. Connect the power leads of the **SST (Igniter Checker)** to the battery.



03U0GX-058

Spark test

1. Turn the ignition switch ON.
2. Disconnect the high-tension coil lead from the distributor and hold it **5—10mm (0.20—0.39in)** from a ground.

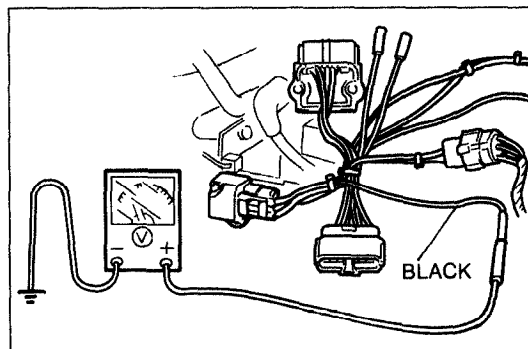


03U0GX-059

Caution

- Hold the SW2 ON for no longer than one second.

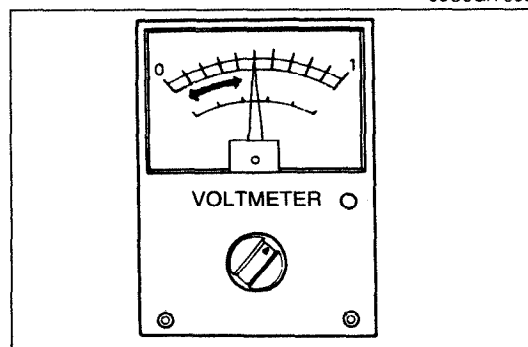
3. Flip the SW2 ON and OFF, and verify that strong blue sparks are discharged from the high-tension lead.



03U0GX-060

Voltage test

1. Turn the ignition switch ON.
2. Connect a voltmeter to the terminal of the black wire of the adapter harness.



03U0GX-061

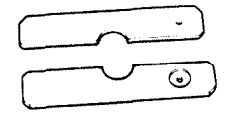
Caution

- Hold the SW2 ON for no longer than one second.

3. Flip the SW2 ON and OFF, and verify that the voltmeter pointer fluctuates.

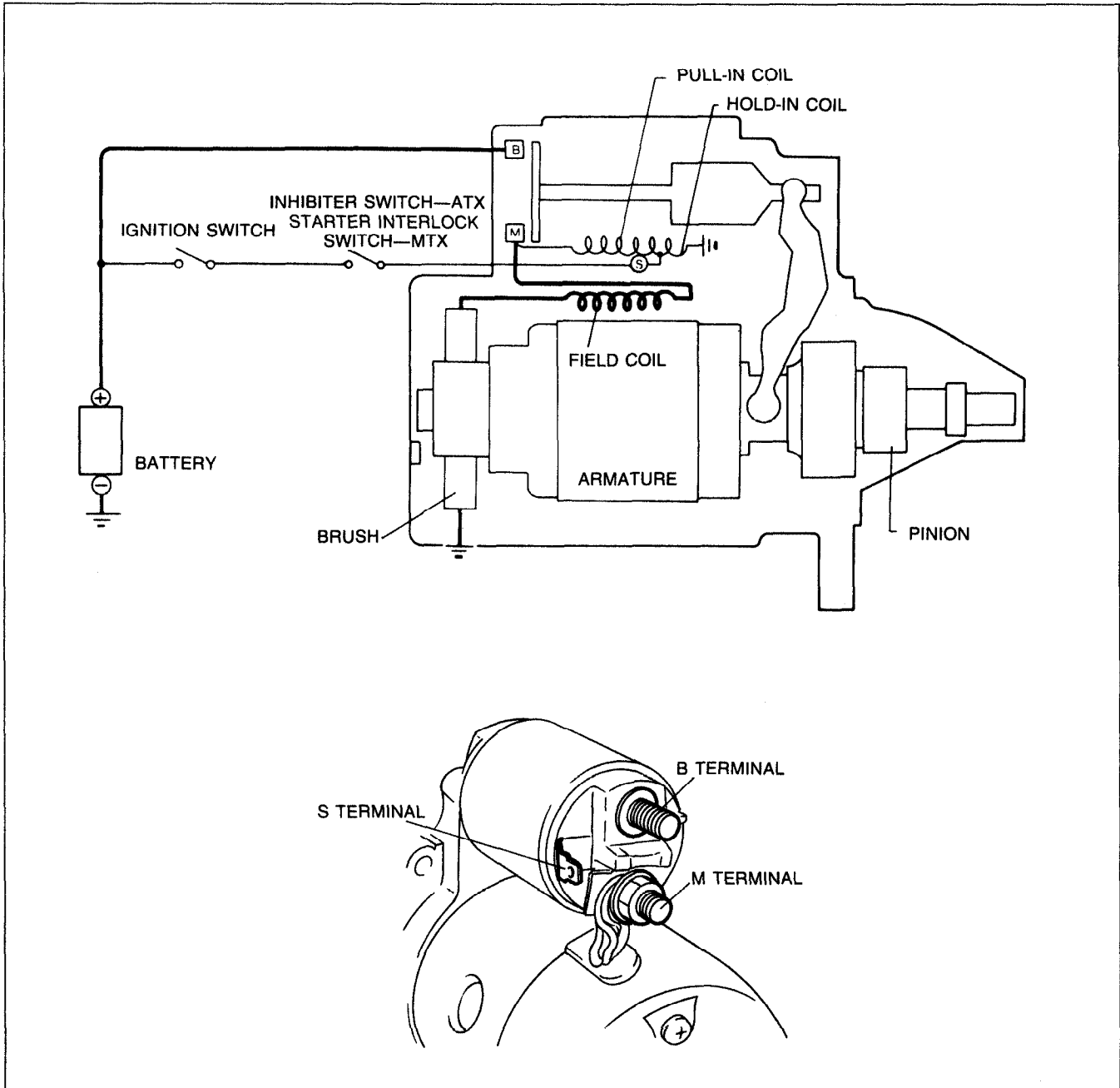
STARTING SYSTEM

PREPARATION SST

<p>49 E301 144 Removing plate</p>		<p>For installation of overrunning clutch</p>
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03U0GX-062

CIRCUIT DIAGRAM



03U0GX-063

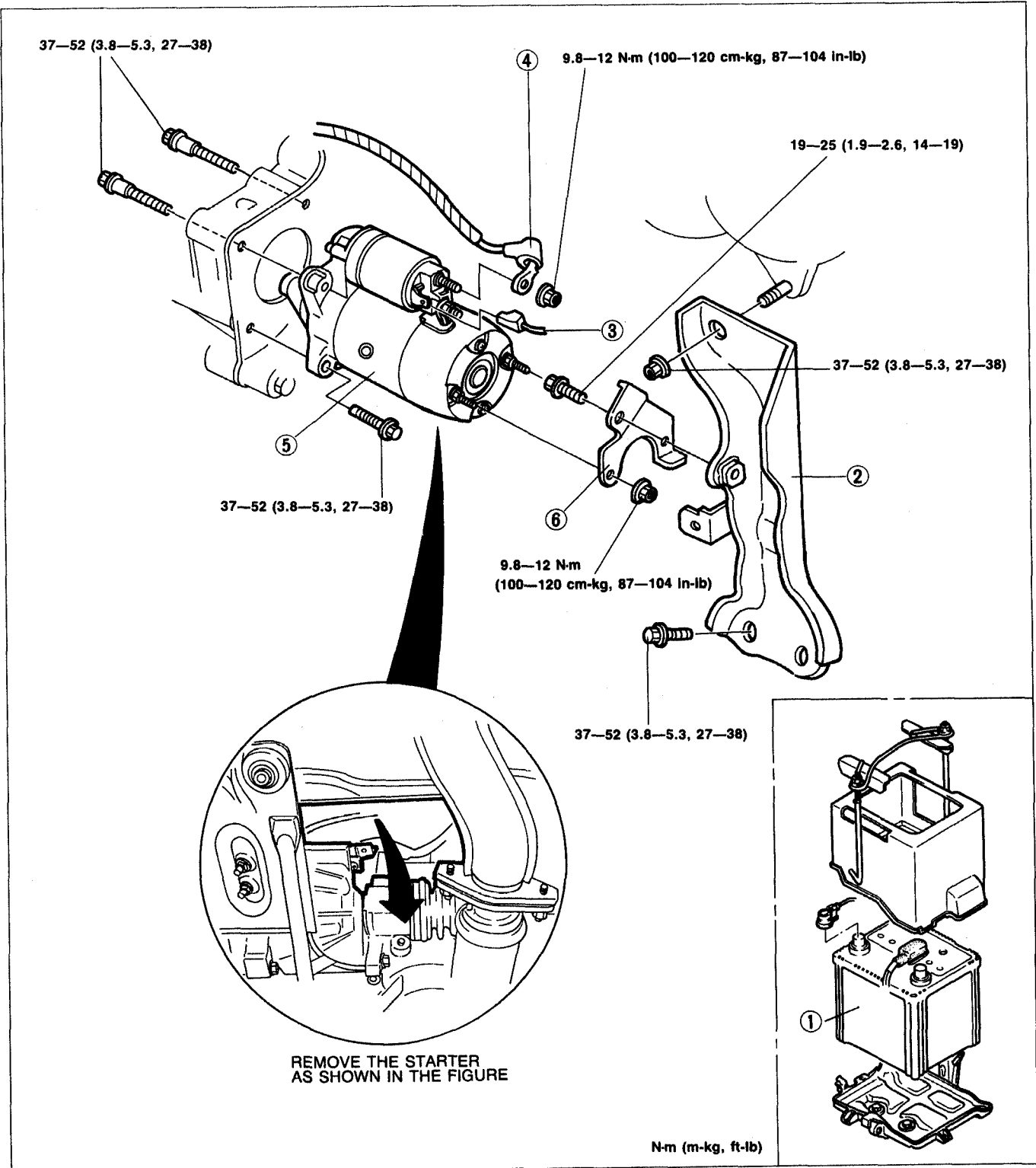
Note

- BP ATX vehicles use a coaxial reduction starter.

STARTER

Removal / Installation

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.



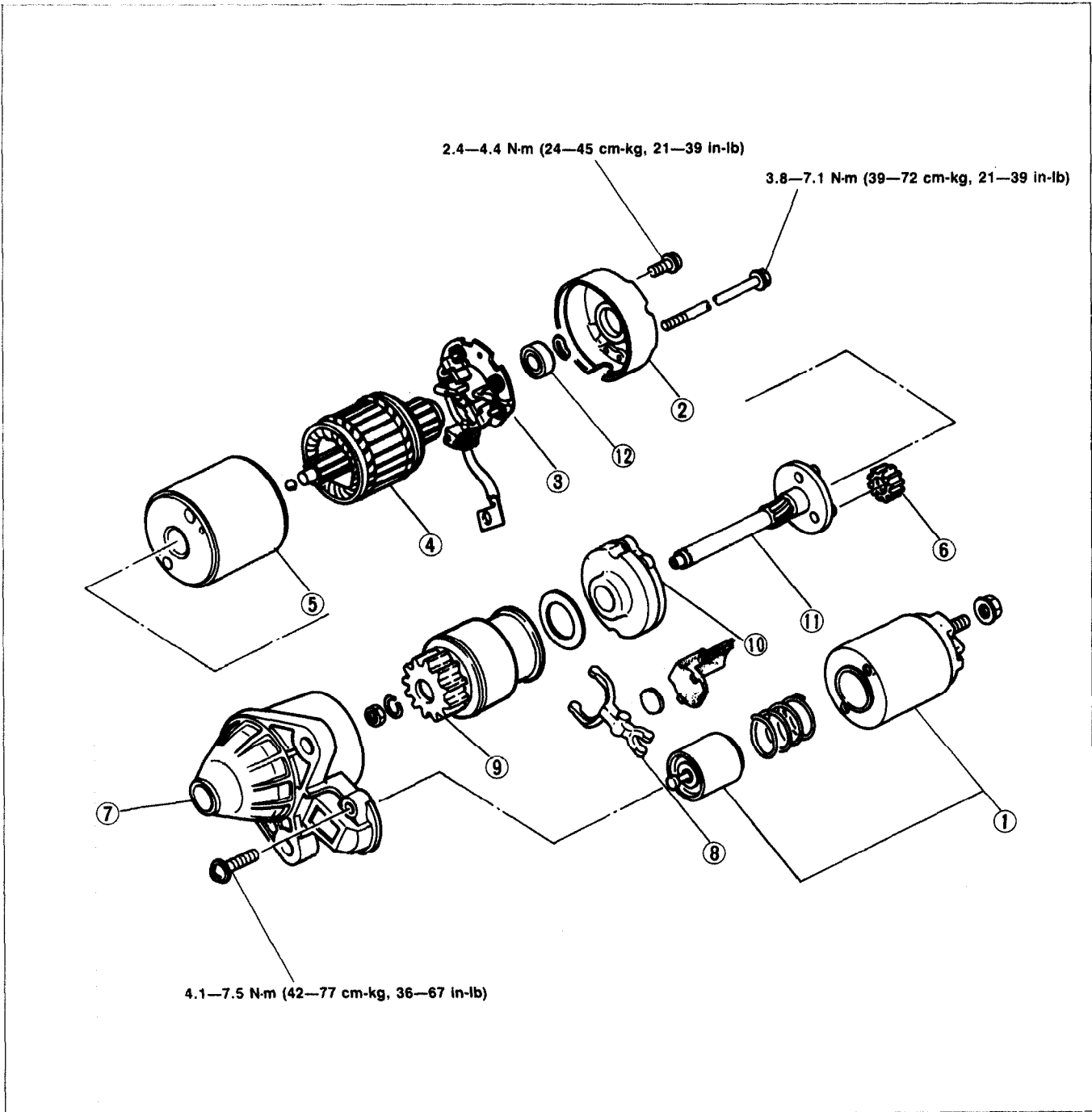
1. Battery
2. Intake manifold bracket
3. S terminal wire
4. B terminal wire

5. Starter
Disassembly / Assembly page G-26
Inspection page G-28
6. Starter bracket

Disassembly / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.

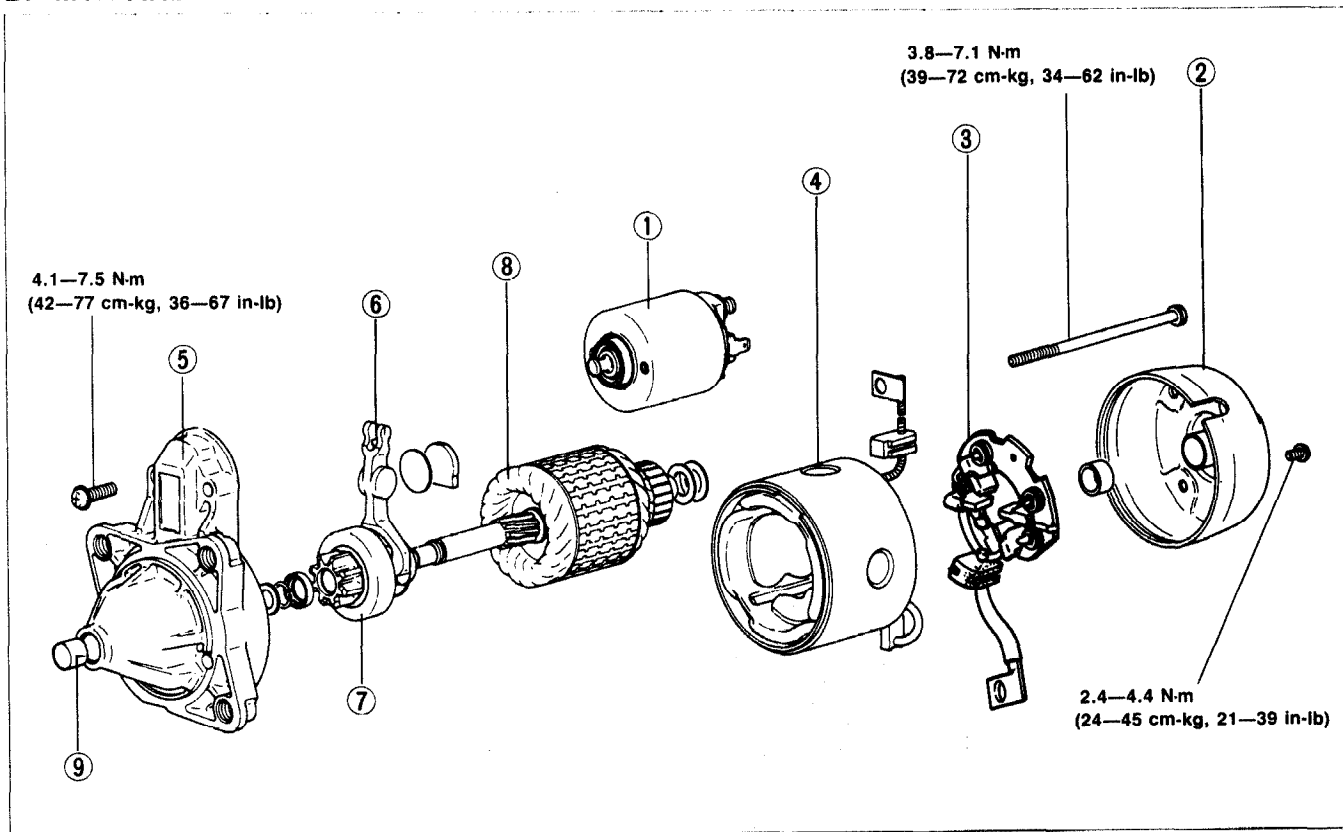
BP ATX



03U0GX-065

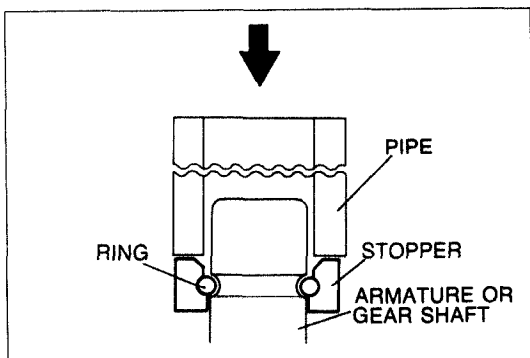
- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Magnetic switch
Inspection..... page G-28 2. Rear cover 3. Brush holder assembly
Inspection..... page G-28 4. Armature
Inspection..... page G-29 5. Yoke assembly | <ol style="list-style-type: none"> 6. Planetary gear 7. Front cover 8. Lever 9. Drive pinion 10. Internal gear 11. Gear shaft 12. Bearing
Inspection..... page G-30 |
|--|--|

BP MTX AND B6



03U0GX-066

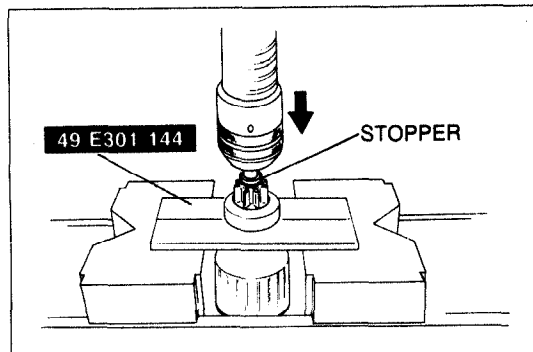
- | | |
|---|---|
| 1. Magnetic switch
Inspection..... page G-28 | 5. Front cover |
| 2. Rear cover | 6. Lever |
| 3. Brush holder assembly
Inspection..... page G-28 | 7. Drive pinion |
| 4. Field coil
Inspection..... page G-29 | 8. Armature
Inspection..... page G-29 |
| | 9. Bearing (if equipped)
Inspection..... page G-30 |



03U0GX-067

Disassembly Note
Drive pinion

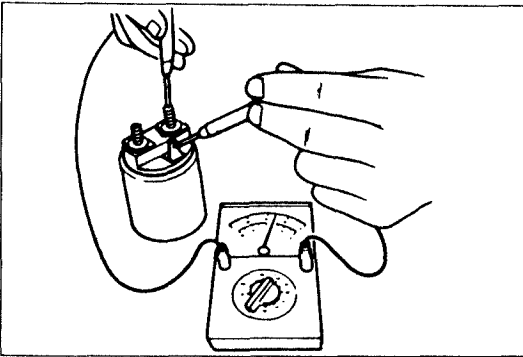
1. Remove the stopper for the overrunning clutch with a pipe as shown in the figure.



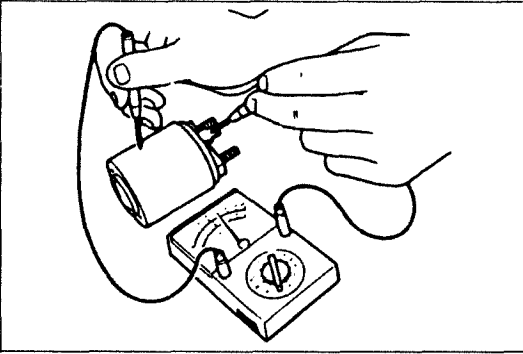
03U0GX-068

Assembly Note
Drive pinion

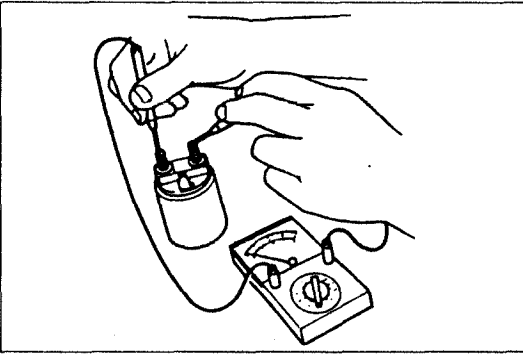
1. Set the drive pinion onto the armature (B6, BP SOHC) or gear shaft (BP DOHC), and install the ring.
2. Install the stopper with the **SST** and an arbor press as shown in the figure.



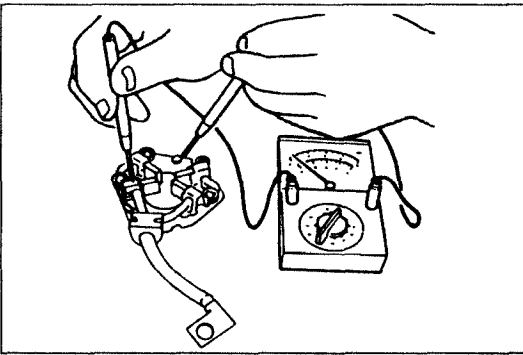
03U0GX-069



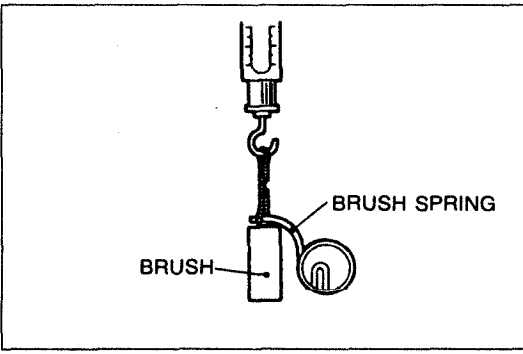
03U0GX-070



03U0GX-071



03U0GX-072



03U0GX-073

Inspection

Magnetic switch

1. Continuity (S terminal—M terminal)
Check for continuity between S and M terminals with ohmmeter. Replace the magnetic switch if there is no continuity.
2. Continuity (S terminal—Body)
Check for continuity between the S terminal and the body with ohmmeter. Replace the magnetic switch if there is no continuity.
3. Grounding
Check continuity between M and B terminals with an ohmmeter. Replace the magnetic switch if there is continuity.

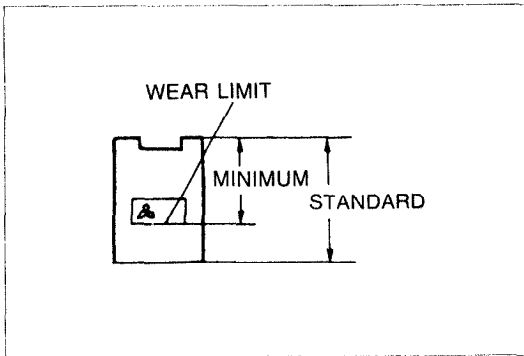
Brush and brush holder

1. Insulation
Check continuity between each insulated brush and the plate with an ohmmeter. Replace the brush holder if there is continuity.

2. Measure the force of the brush spring with a spring balance.

Specification	B6 AND BP MTX	BP ATX
Standard N (kg, lb)	18.9—23.1 (1.89—2.31, 4.18—5.12)	13—25 (1.3—2.5, 2.9—5.5)
Maximum N (kg, lb)	7 (0.7, 1.5)	7 (0.7, 1.5)

3. Replace the spring if necessary.

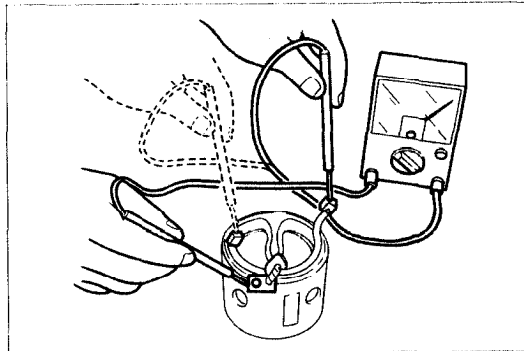


03U0GX-074

Brush

If a brush is worn almost to or beyond the wear limit, replace all of the brushes.

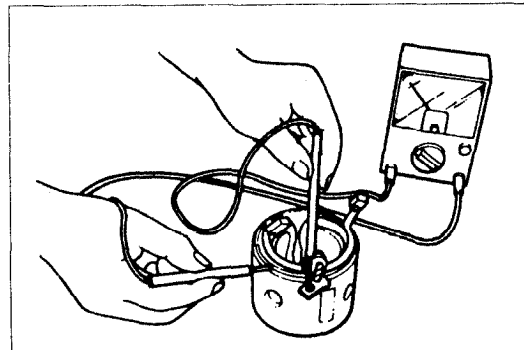
Type		B6 AND BP MTX	BP ATX
Standard	mm (in)	17 (0.67)	17.5 (0.69)
Minimum	mm (in)	11.5 (0.453)	10.0 (0.39)



03U0GX-075

Field coil

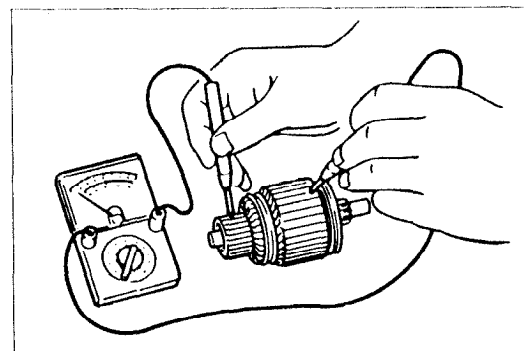
1. Check for continuity between the M terminal wire and brushes with an ohmmeter. Replace the yoke assembly if there is no continuity.



03U0GX-076

2. Check continuity between the M terminal wire and yoke with an ohmmeter. Replace the yoke assembly if there is continuity.

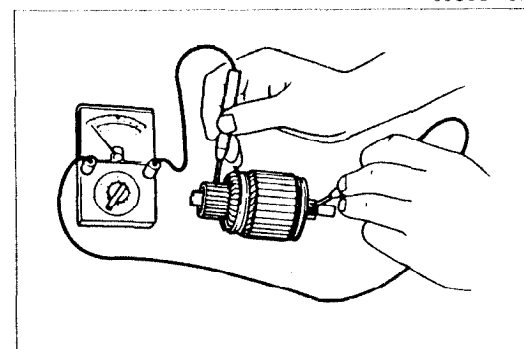
3. Check if the field coil is loose. Replace the yoke assembly if necessary.



03U0GX-077

Armature

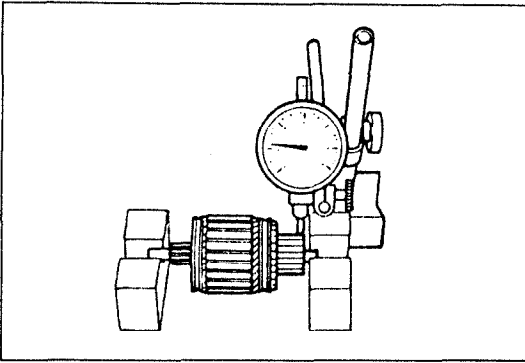
1. Check continuity between the commutator and the core with an ohmmeter. Replace the armature if there is continuity.



03U0GX-078

2. Check continuity between the commutator and the shaft with an ohmmeter. Replace the armature if there is continuity.

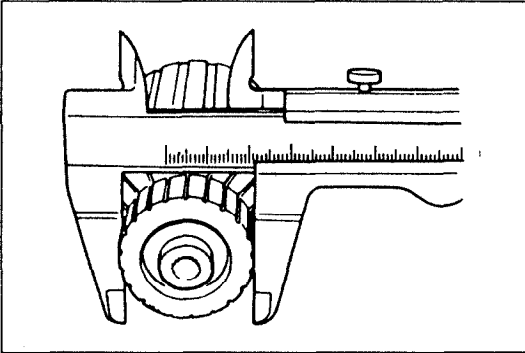
STARTING SYSTEM



03U0GX-079

- Place the armature on V-blocks, and measure the runout with a dial indicator.
If the runout is not within specification, repair it with a lathe or replace the armature.

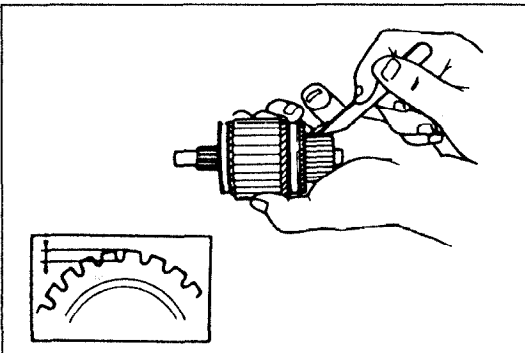
Runout: 0.05mm (0.002 in)
Maximum: 0.1mm (0.004 in)



23U0GX-011

- Replace the armature if the outer diameter of the commutator is almost at or less than the grind limit.
- If the commutator surface is dirty, wipe it with a cloth; if it is rough, repair it with a lathe or fine sandpaper.

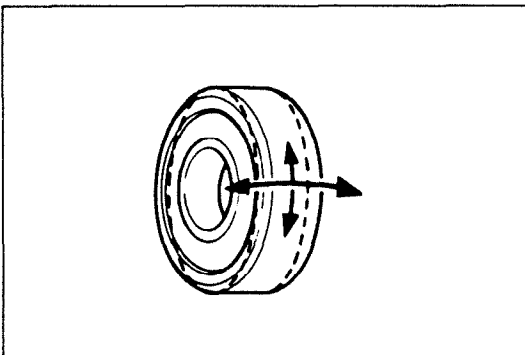
Engine	B6	BP (MTX)	BP (ATX)
Grind limit mm (in)	31.4 (1.24)		28.8 (1.13)



03U0GX-081

- Segment groove depth
If the depth of the mold between segments is almost at or less than the minimum, undercut the grooves to the standard depth.

Depth: 0.5—0.8mm (0.02—0.03 in)
Minimum: 0.2mm (0.008 in)

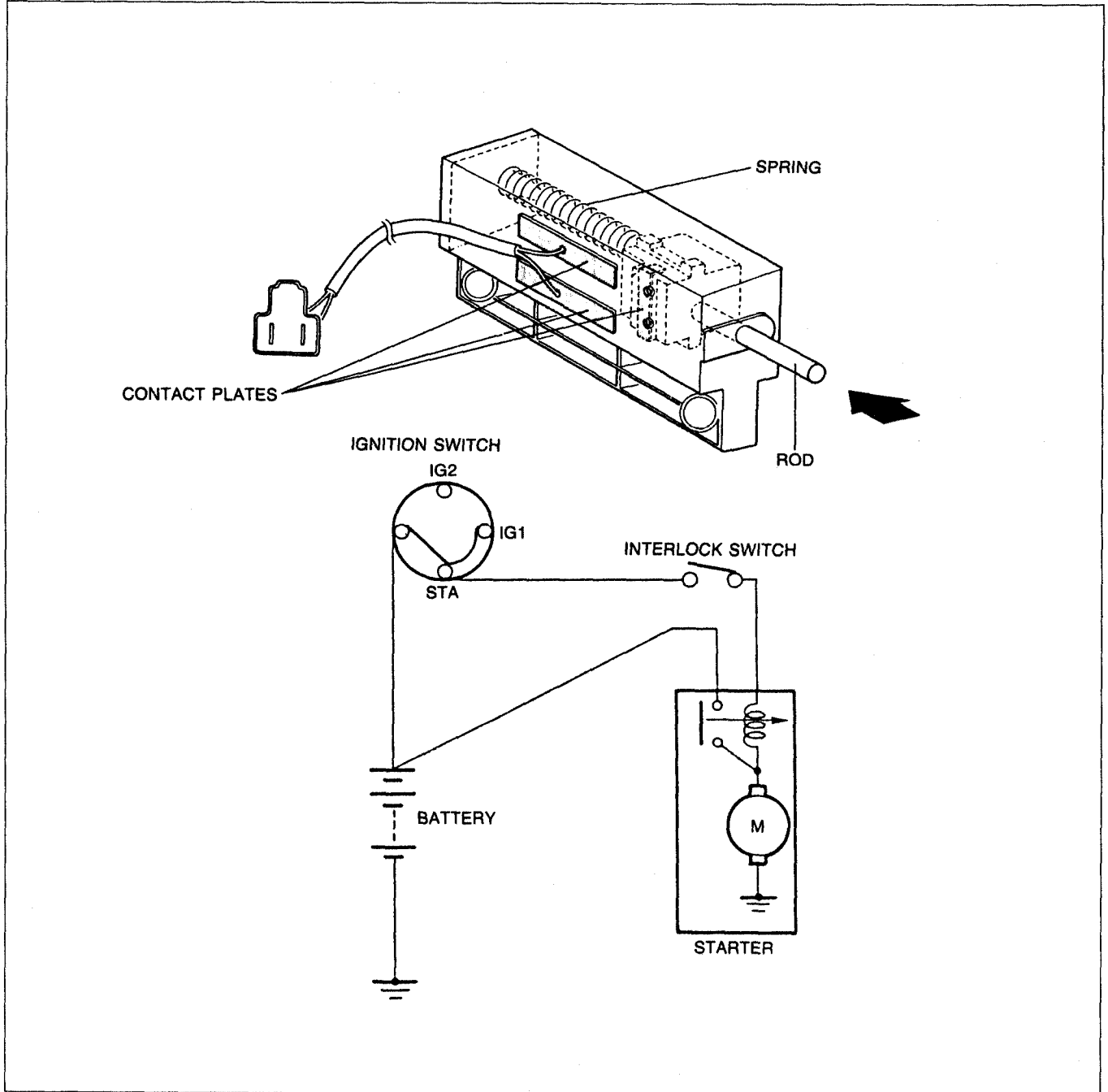


03U0GX-082

Bearing (if equipped)

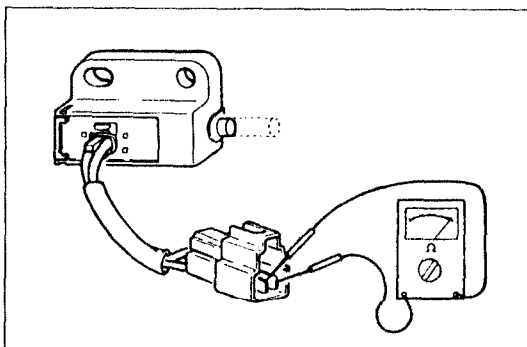
- Check for abnormal noise, looseness, or sticking.
- Replace the bearing(s) if necessary.

STARTER INTERLOCK SWITCH (MTX)



03U0GX-083

For operator safety, if the clutch pedal is not depressed during starting, battery power will not be supplied to the starter and the engine will not crank.



03U0GX-084

Interlock Switch Inspection

1. Disconnect the interlock switch connector.
2. Connect an ohmmeter to the switch.
3. Check the continuity.

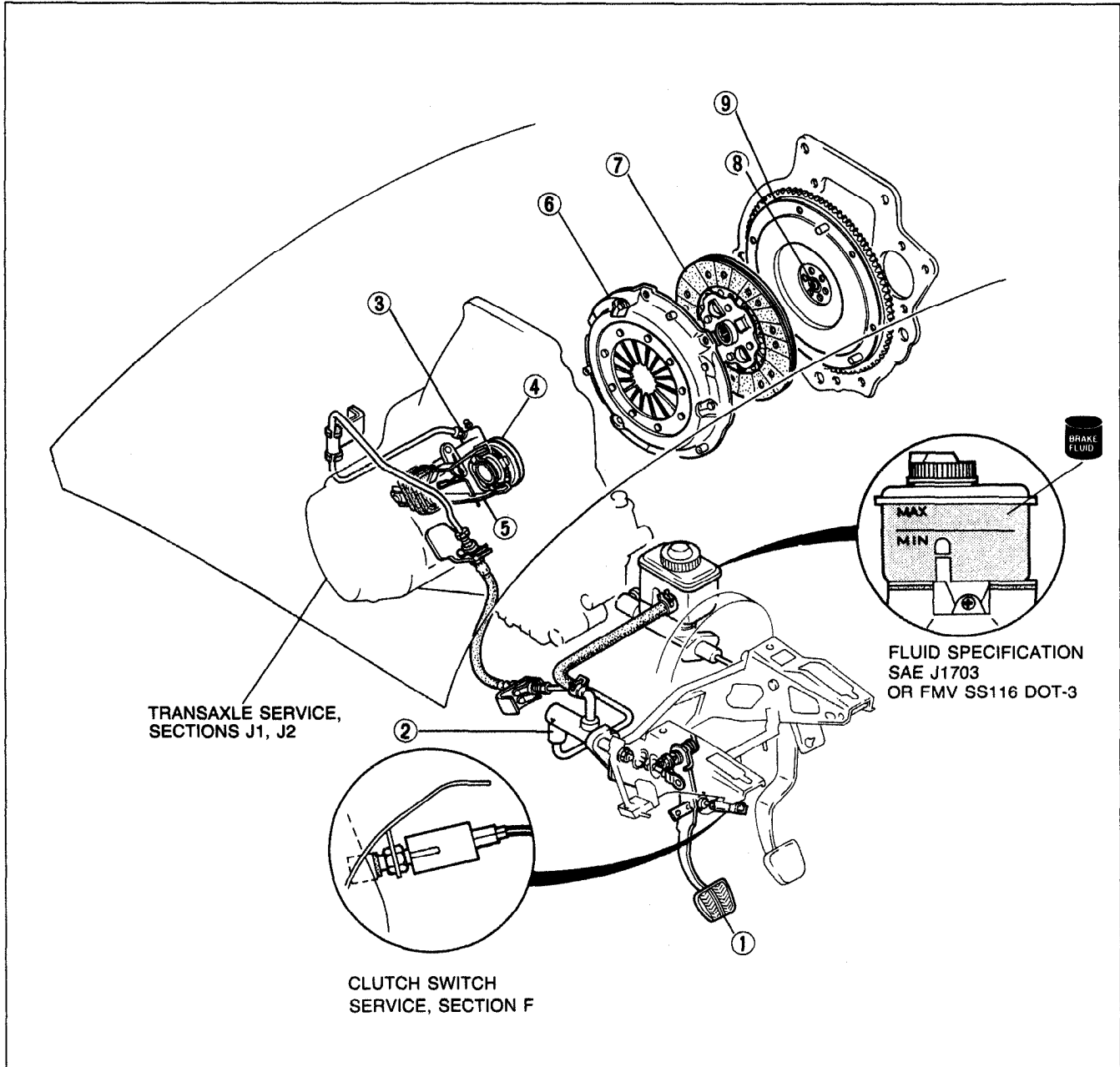
Clutch pedal	Continuity
Depressed	Yes
Released	No

4. Replace the switch if necessary.

CLUTCH

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23U0HX-002

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4. Release bearing	
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5. Clutch release fork	
Removal / Installation.....	page H-15
6. Clutch cover	
Removal / Installation.....	page H-15
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7. Clutch disc	
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8. Pilot bearing	
Inspection.....	page H-18
Removal / Installation.....	page H-15
9. Flywheel	
Removal / Installation.....	page H-15
Inspection.....	page H-18

OUTLINE

SPECIFICATIONS

Item		Engine/Transaxle	B6 SOHC	BP SOHC	BP DOHC	
			F5M-R		G5M-R	
Clutch control			Hydraulic			
Clutch cover	Type		Diaphragm spring			
	Set load	N (kg, lb)	3,630 (370, 814)	3,826 (390, 858)	3,846 (392, 862)	
Clutch disc	Outer diameter	mm (in)	190 (7.48)	200 (7.87)	215 (8.46)	
	Inner diameter	mm (in)	130 (5.12)		150 (5.91)	
	Thickness	Pressure plate side	mm (in)	3.5 (0.138)	3.8 (0.150)	
		Flywheel side	mm (in)	3.5 (0.138)		
Clutch pedal	Type		Suspended			
	Pedal ratio		6.55			
	Full stroke	mm (in)	135 (5.32)			
	Height (With carpet)	mm (in)	196–204 (7.72–8.03)			
Master cylinder	Inner diameter	mm (in)	15.87 (0.625)			
Release cylinder	Inner diameter	mm (in)	19.05 (0.750)			
Clutch fluid			SAE J1703 or FMVSS116 DOT-3			

23U0HX-003

H

TROUBLESHOOTING GUIDE


Problem	Possible Cause	Remedy	Page
Slipping	Clutch disc facing worn excessively	Replace	H-15, 17
	Clutch disc facing surface hardened or oil on surface	Repair or replace	H-15
	Pressure plate damaged	Repair or replace	H-15
	Diaphragm spring damaged or weakened	Replace	H-15
	Insufficient clutch pedal play	Adjust	H- 5
	Clutch pedal sticking	Repair or replace	H- 6
	Flywheel damaged	Repair or replace	H-15, 17
Faulty disengagement	Excessive runout or damaged clutch disc	Replace	H-15, 17
	Clutch disc splines rusted or worn	Remove rust or replace	H-15
	Oil on facing	Repair or replace	H-15
	Diaphragm spring weakened	Replace	H-15
	Excessive clutch pedal play	Adjust	H- 5
	Insufficient clutch fluid	Add fluid	H- 3
	Leakage of clutch fluid	Locate and repair or replace	—
Clutch vibrates when accelerating	Oil on facing	Repair or replace	H-15
	Torsion rubbers weakened	Replace	H-15
	Clutch disc facing hardened or damaged	Repair or replace	H-15
	Clutch disc facing rivets loose	Replace	H-15
	Pressure plate damaged or excessive runout	Replace	H-15
	Flywheel surface hardened or damaged	Repair or replace	H-15
	Loose or worn engine mount	Tighten or replace	—
Clutch pedal sticking	Pedal shaft not properly lubricated	Lubricate or replace	H- 6
Abnormal noise	Clutch release bearing damaged	Replace	H-15, 17
	Poor lubrication of release bearing sleeve	Lubricate or replace	H-15
	Torsion rubbers weakened	Replace	H-15
	Excessive crankshaft end play	Repair	Refer to Section B
	Pilot bearing worn or damaged	Replace	H-15, 18
	Worn pivot points of release fork	Repair or replace	H-15

23U0HX-004

CLUTCH FLUID

PREPARATION

SST

<p>49 0259 770B</p> <p>Wrench, flare nut</p> 	<p>For air bleeding</p>
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03U0HX-005

REPLACEMENT

Note

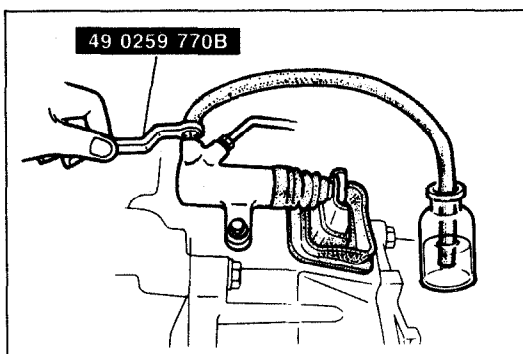
- A common reservoir is used for the clutch and brake system fluids.
- The fluid in the reservoir must be maintained at the 3/4 level or higher during replacement.

Caution

- Be careful not to spill the fluid on a painted surface. If this should happen, wash it off immediately.
- Do not mix different brands of fluid.
- Do not reuse the clutch fluid that was drained.

1. Drain the brake fluid from the master cylinder through a wheel cylinder.
2. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder plug.

03U0HX-006



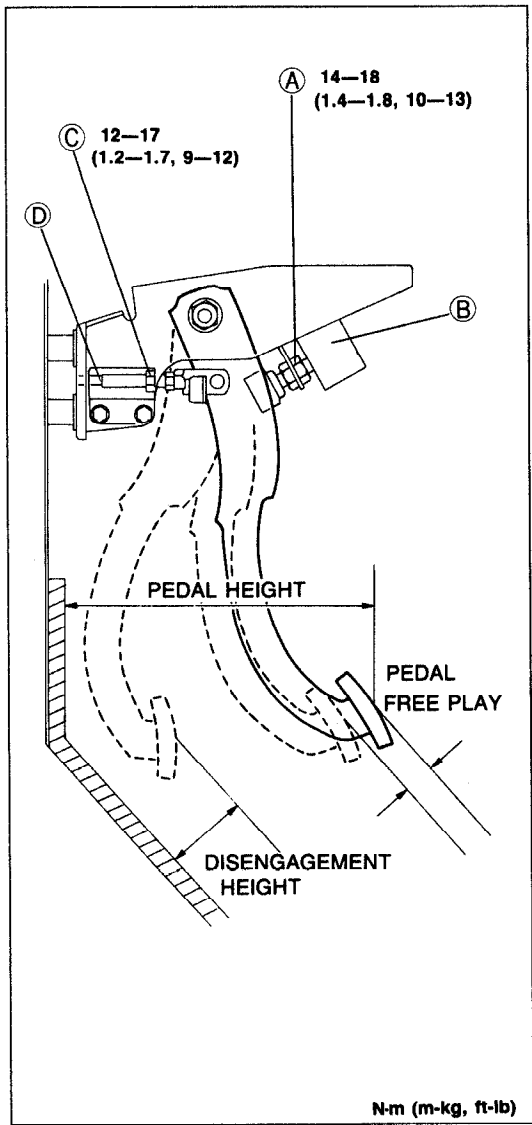
03U0HX-007

3. Place the other end of the vinyl hose in a clear container.
4. Slowly pump the clutch pedal several times.
5. With the clutch pedal depressed, loosen the bleeder screw with the **SST** to let the fluid escape. Close the bleeder screw with the **SST**.
6. Repeat Steps 4 and 5 until only clean fluid is seen.
7. Tighten the bleeder screw.

Tightening torque:

5.9—8.8 N·m (60—90 cm·kg, 52—78 in·lb)

8. Add fluid to the MAX mark.
9. Slowly pump the clutch pedal several times. Verify that there is no fluid leakage.
10. Check operation of the clutch system.
11. Check operation of the brake system.



CLUTCH PEDAL

ADJUSTMENT

Clutch Pedal Height Inspection

1. Measure the distance from the upper surface of the pedal pad to the carpet.

**Pedal height: 196—204mm (7.72—8.03 in)
(With carpet)**

2. If necessary, adjust the pedal height.

Adjustment

1. Disconnect the clutch switch connector.
2. Loosen locknut (A) and turn clutch switch (B) until the height is correct.
3. Tighten locknut (A).

Tightening torque:

14—18 N-m (1.4—1.8 m-kg, 10—13 ft-lb)

4. After adjustment, measure the pedal free play.

Clutch Pedal Free Play

Inspection

1. Depress the clutch pedal by hand until clutch resistance is felt.

Pedal free play: 0.7—3.3mm (0.03—0.13 in)

Total pedal free play: 5.0—13mm (0.197—0.512 in)

2. If necessary, adjust the pedal free play.

Adjustment

1. Loosen locknut (C) and turn push-rod (D) until pedal free play is correct.
2. Check that the disengagement height (from the upper surface of the pedal to the carpet) is correct when the pedal is fully depressed.

**Minimum disengagement height: 41mm (1.61 in)
(With carpet)**

3. Tighten locknut (C).

Tightening torque:

12—17 N-m (1.2—1.7 m-kg, 9—12 ft-lb)

4. After adjustment, inspect the pedal height.

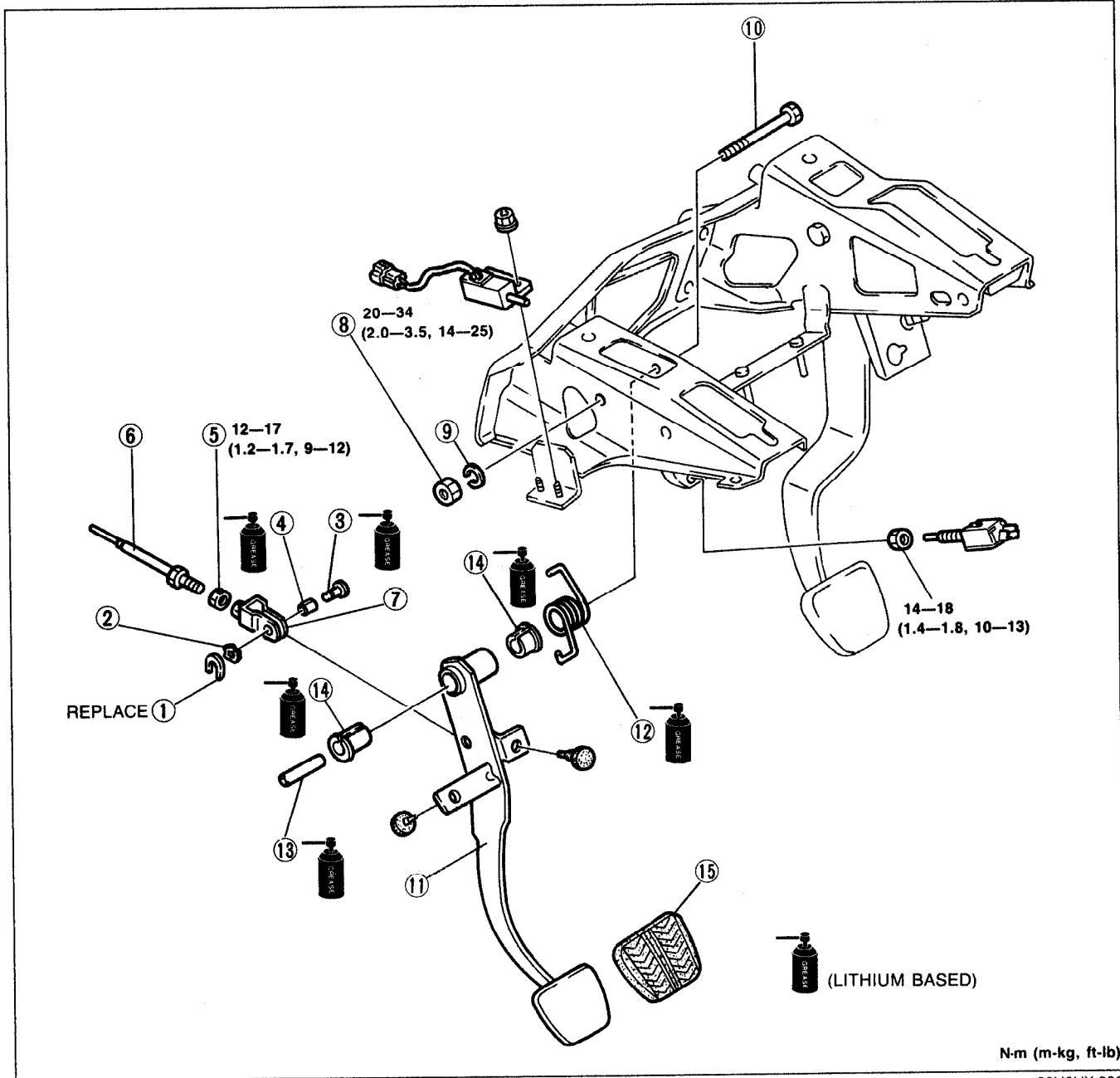
REMOVAL / INSPECTION / INSTALLATION

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Inspect all parts and repair or replace as necessary.

Note

- Apply lithium based grease to the bushing and pins before installation.

3. Install in the reverse order of removal, referring to **Installation Note**.



N-m (m-kg, ft-lb)

23U0HX-006


1. Clip
2. Spacer
3. Pin
4. Spacer
5. Nut
6. Push rod
Inspect for damage and bending
7. Clutch fork
8. Nut

9. Washer
10. Bolt
11. Clutch pedal
Adjustment page H-5
12. Spring
13. Spacer
14. Bushing
15. Pedal pad

CLUTCH MASTER CYLINDER

PREPARATION

SST

49 0259 770B Wrench, flare nut		For disconnecting and connecting clutch pipe
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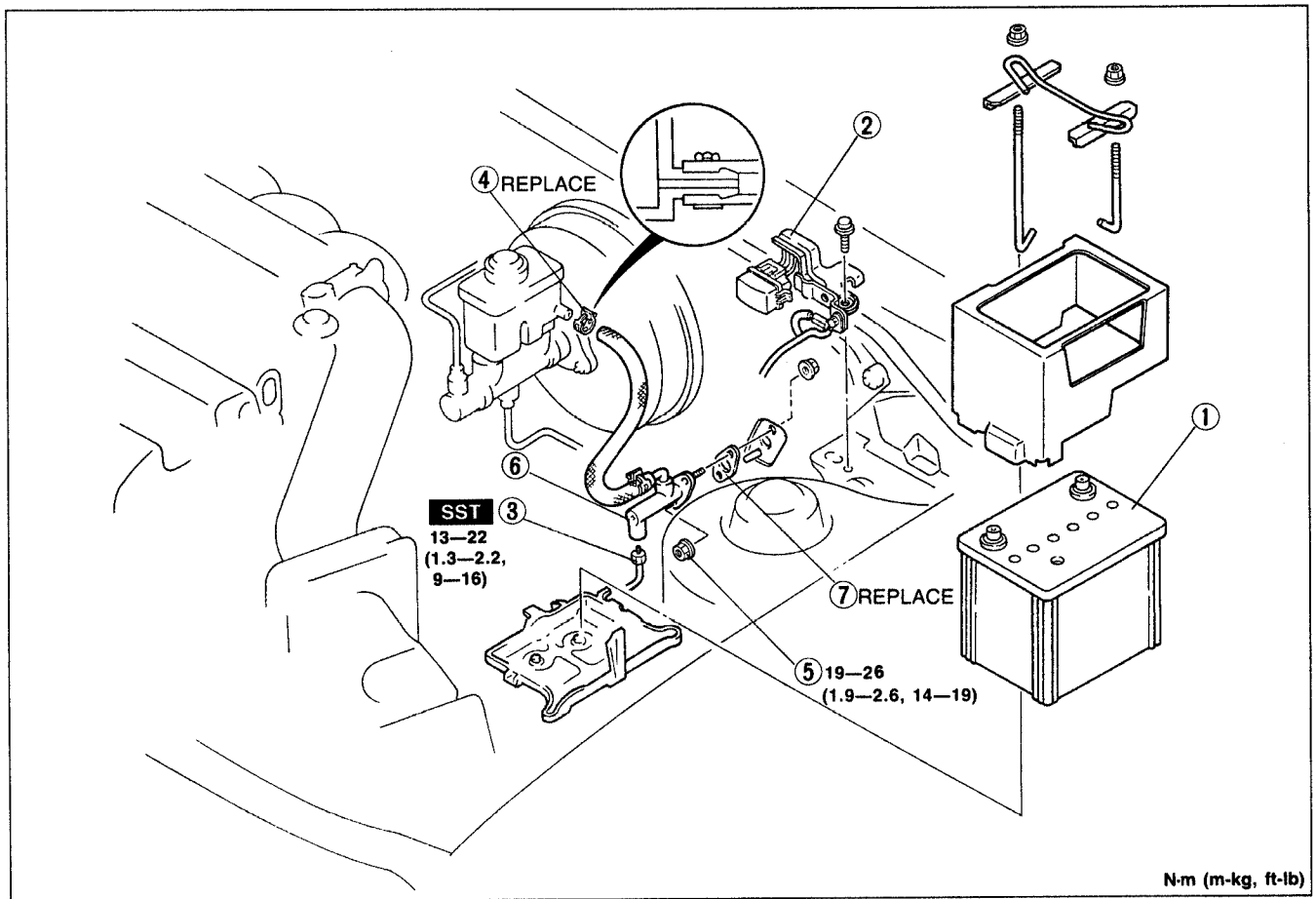
03U0HX-010

REMOVAL / INSPECTION / INSTALLATION

Caution

- Clutch fluid will damage painted surfaces. Be sure to use a container or rags to collect it. If fluid gets on a painted surface, wipe it off immediately with a rag.

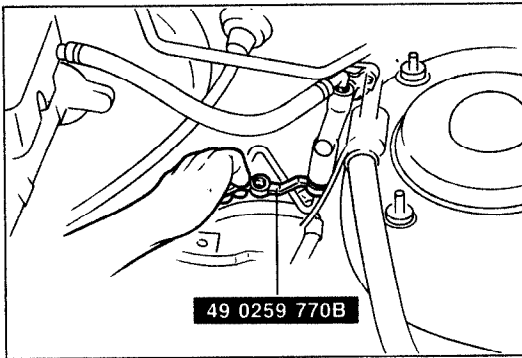
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.



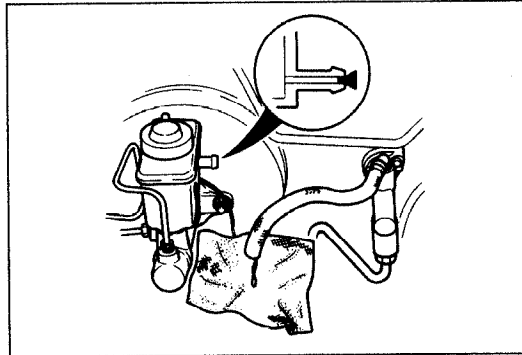
N·m (m·kg, ft·lb)

23U0HX-007

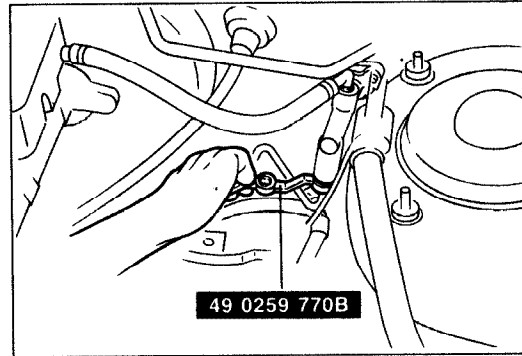
- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Battery 2. Diagnosis connector 3. Clutch pipe
 Removal Note page H- 8
 Installation Note..... page H- 8 4. Clip | <ol style="list-style-type: none"> 5. Nut 6. Clutch master cylinder
 Check for fluid leakage from the cylinder
 bore
 Overhaul page H-10
 Air bleeding..... page H- 8 7. Gasket |
|---|--|



03U0HX-016



03U0HX-012



23U0HX-008

Removal Note**Clutch pipe**

1. Disconnect the clutch pipe with the **SST**.

2. Disconnect the clutch hose from the reservoir.

3. Plug the outlet of the reservoir.

Installation Note**Clutch pipe**

1. Tighten the clutch pipe with the **SST**.

Tightening torque:

13—22 N·m (1.3—2.2 m·kg, 9—16 ft·lb)

Air Bleeding

1. After installation, bleed the clutch system.
(Refer to page below.)

Inspection and Adjustment**Clutch pedal height and free play**

(Refer to page H-5.)

AIR BLEEDING

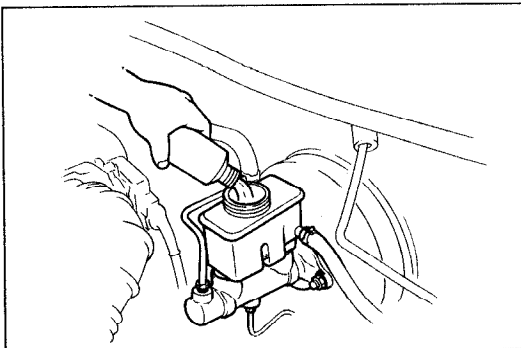
The clutch hydraulic system must be bled to remove air introduced whenever a hydraulic line is disconnected.

Note

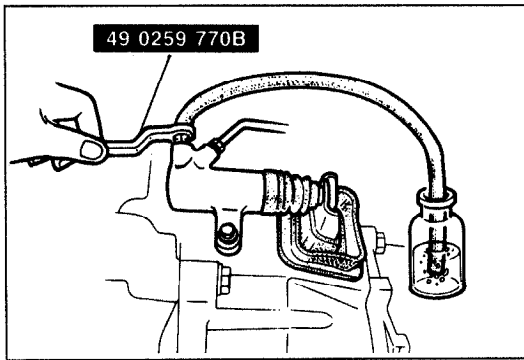
- The fluid in the reservoir must be maintained at the 3/4 level or higher during air bleeding.

Caution

- Clutch fluid will damage a painted surface. If fluid does get on a painted surface, wipe it off immediately.
- Do not mix different brands of clutch fluid.
- Do not reuse the clutch fluid that was drained.



03U0HX-014



1. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder plug.
2. Insert the other end of the vinyl hose in a clear container.
3. Slowly pump the clutch pedal several times.
4. While depressing the pedal, loosen the bleeder screw with the **SST** to let fluid and air escape.
Close the bleeder screw with the **SST**.
5. Repeat Steps 3 and 4 until no air bubbles are seen in the fluid.
6. Tighten the bleeder screw.

Tightening torque:

5.9—8.8 N·m (60—90 cm·kg, 52—78 in·lb)

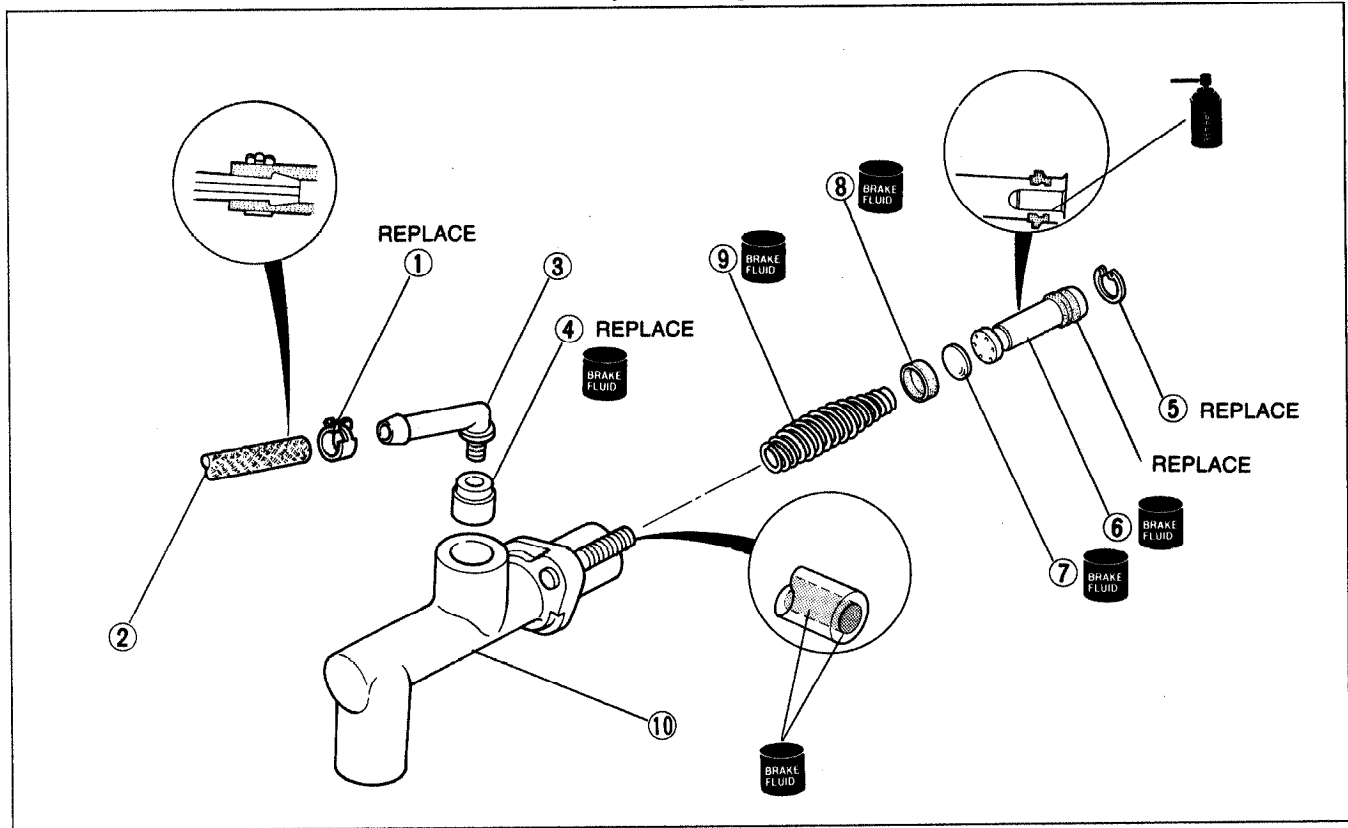
7. Check for correct clutch operation.
8. Verify that there is no fluid leakage.

OVERHAUL

Caution

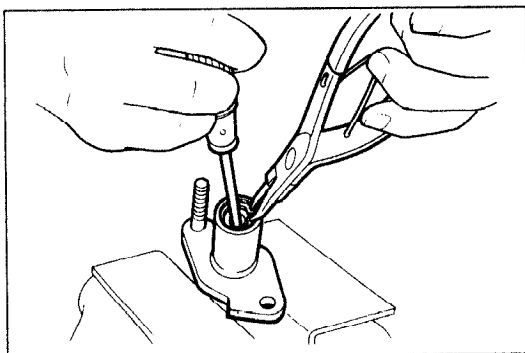
- Clean the disassembled parts in solvent and blow through all ports and passages with compressed air.

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



23U0HX-009

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Clip 2. Hose 3. Joint 4. Bushing 5. Snap ring 6. Piston and secondary cup assembly | <ol style="list-style-type: none"> 7. Spacer 8. Primary cup
Inspect for wear and cracks 9. Return spring 10. Master cylinder body
Inspect cylinder bore for scoring and corrosion |
|--|---|
- Disassembly Note below
 Assembly Note page H-11
- Disassembly Note page H-11
 Assembly Note page H-11
 Inspect for wear, scoring and cracks



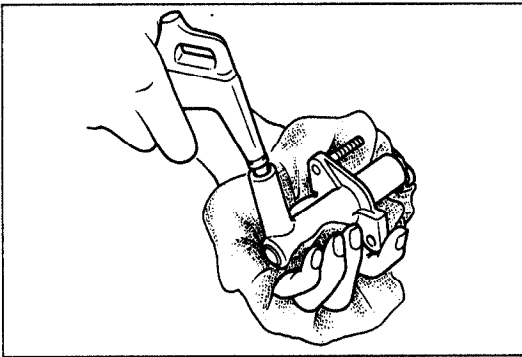
03U0HX-018

Disassembly Note Snap ring

Caution

- Do not damage the push rod contact surface of the piston.

1. Press the piston down and remove the snap ring with snap-ring pliers.



9MU0HX-019

Piston and secondary cup assembly

Caution

- Hold a rag over the master cylinder to prevent the piston and secondary cup assembly from jumping out.

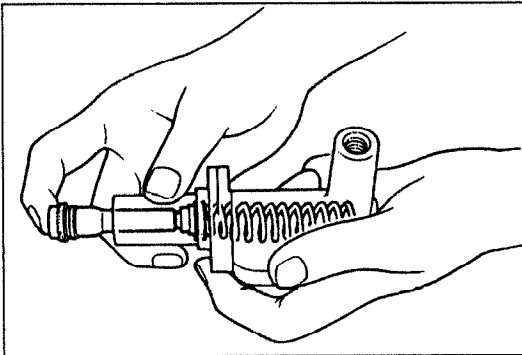
1. Remove the piston and secondary cup assembly, spacer, and primary cup by applying compressed air through the clutch pipe installation hole.

Assembly Note

Caution

- Before assembly, make sure all parts are completely clean.
- Do not mix different brands of clutch fluid.
- Do not reuse the clutch fluid that was drained.
- Apply the specified clutch fluid to the piston and secondary cup assembly, spacer, primary cup, and cylinder bore before assembly.
- Replace parts with new ones whenever specified to do so.

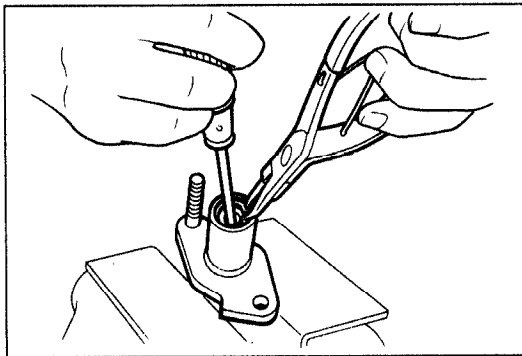
03U0HX-019



03U0HX-020

Piston and secondary cup assembly

1. Install the spring, primary cup, spacer, and piston and secondary cup assembly, noting the proper direction of the parts.



03U0HX-021

Snap ring

Caution


- Do not damage the push rod contact surface of the piston.

1. While pressing the piston, install the snap ring.

CLUTCH RELEASE CYLINDER

PREPARATION

SST

49 0259 770B		For disconnecting and connecting clutch pipe
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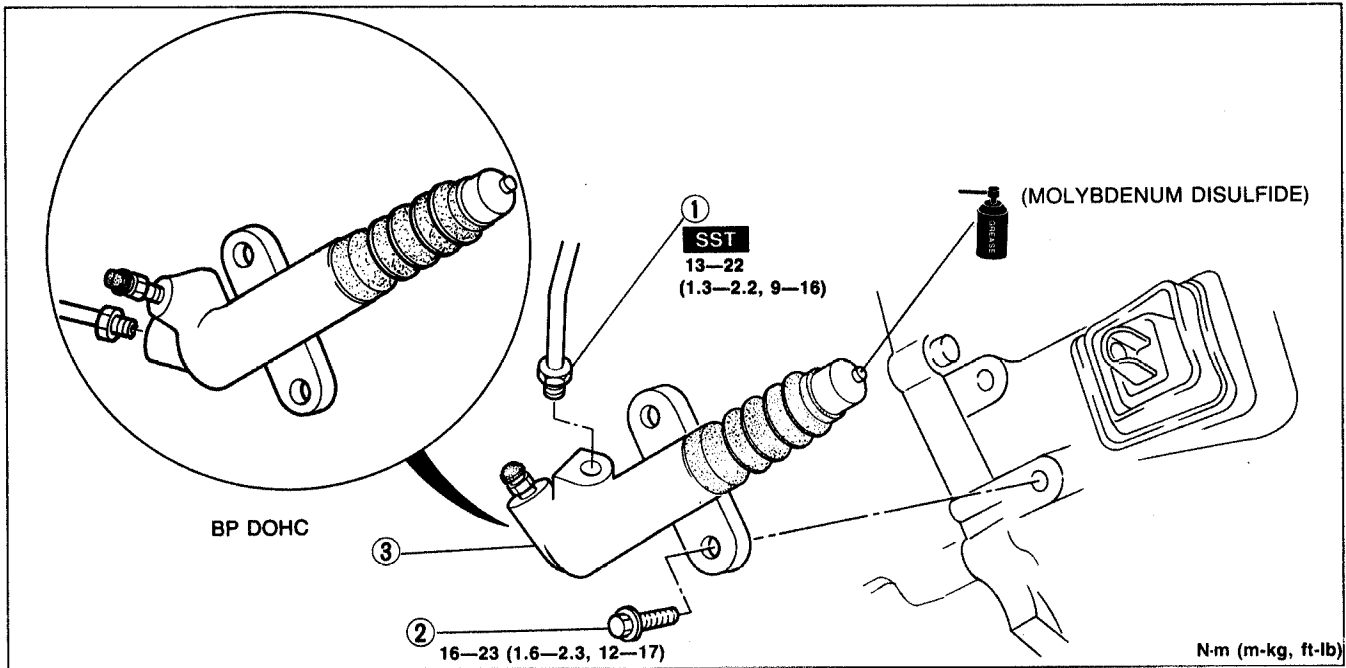
03U0HX-022

REMOVAL / INSTALLATION

Caution

- Clutch fluid will damage painted surfaces. Be sure to use a container or rags to collect it. If fluid does get on a painted surface, wipe it off immediately with a rag.

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



N-m (m-kg, ft-lb)

23U0HX-010

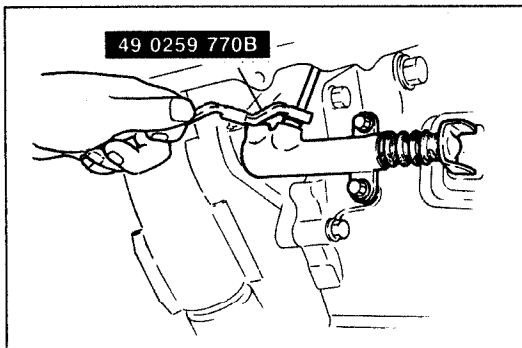
- | | |
|----------------------------------|---|
| 1. Clutch pipe | 2. Bolt |
| Removal Note below | 3. Clutch release cylinder |
| Installation Note..... page H-13 | Remove boot and check for fluid leakage |
| | Overhaul..... page H-13 |

Removal Note Clutch pipe

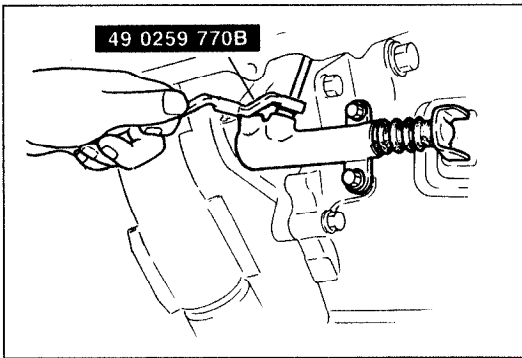
Caution

- After removing the clutch pipe, plug the clutch pipe to avoid fluid leakage.

1. Disconnect the clutch pipe with the SST.



03U0HX-024



23U0HX-011

Installation Note

Clutch pipe

1. Tighten the clutch pipe with the **SST**.

Tightening torque:

13—22 N·m (1.3—2.2 m·kg, 9—16 ft·lb)

Air Bleeding

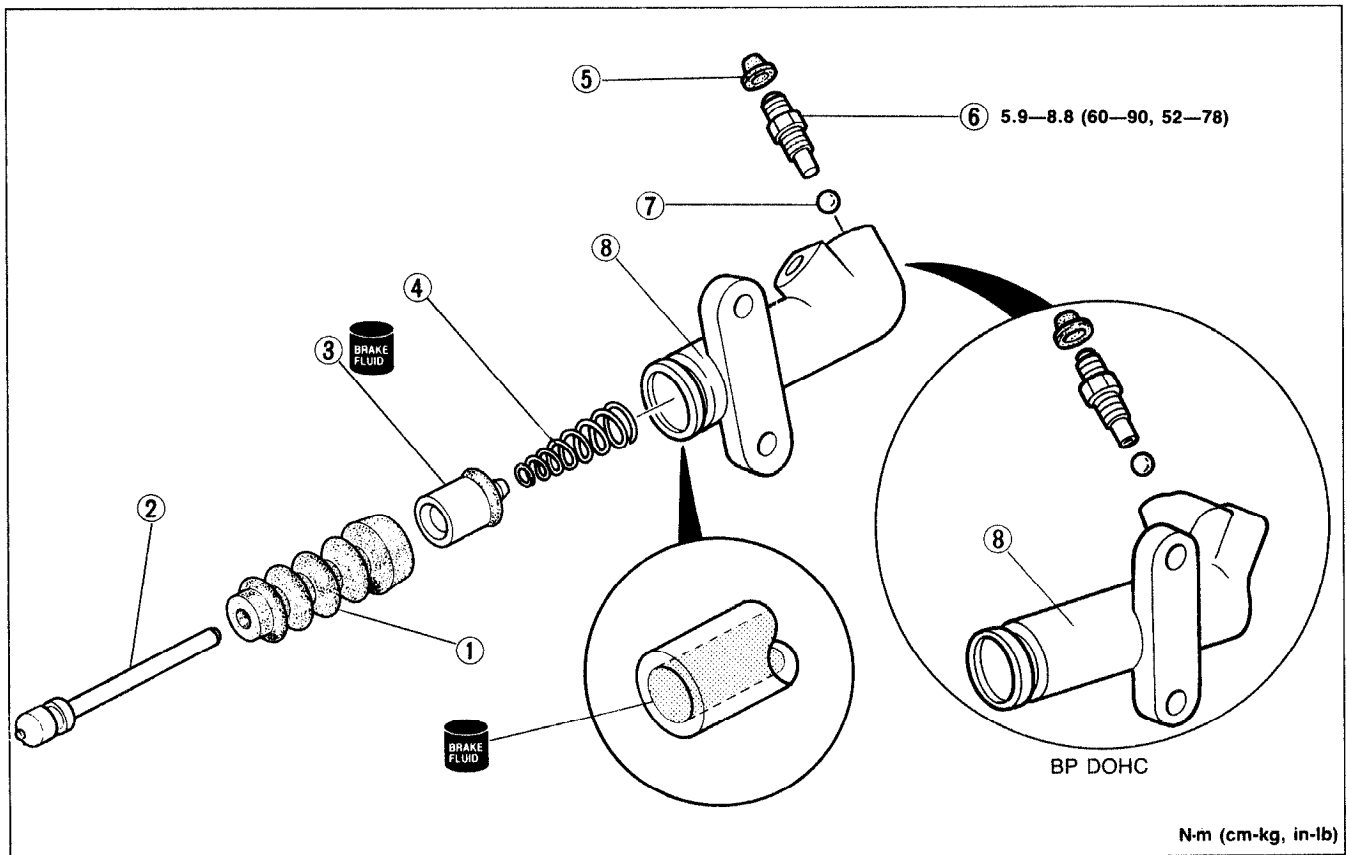
1. After installation, bleed the clutch system.
(Refer to page below.)

OVERHAUL

Caution

- Clean the disassembled parts in solvent and blow through all ports and passages with compressed air.
- Before assembly, make sure all parts are completely clean.
- Apply the specified clutch fluid to the piston and cup assembly and cylinder bore before assembly.

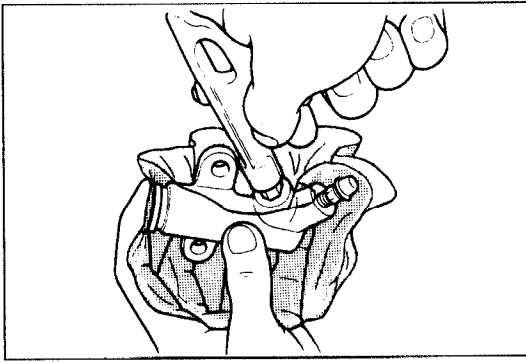
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly.



23U0HX-012

1. Boot
2. Push rod
3. Piston and cup assembly
Disassembly Note page H-14
Inspect for wear, scoring and cracks
4. Spring

5. Bleeder cap
6. Bleeder screw
7. Steel ball
8. Release cylinder body
Inspect cylinder bore for scoring and corrosion



13U0HX-017

Disassembly Note Piston and cup assembly

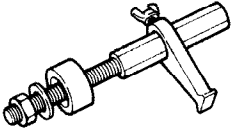
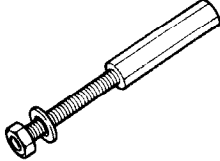


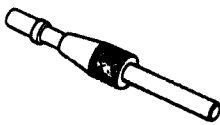
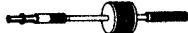
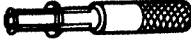
Caution

- Hold a rag over the release cylinder to prevent the piston and cup assembly from suddenly popping out.

1. Remove the piston and cup assembly by applying compressed air through the clutch pipe installation hole.

CLUTCH UNIT

PREPARATION SST

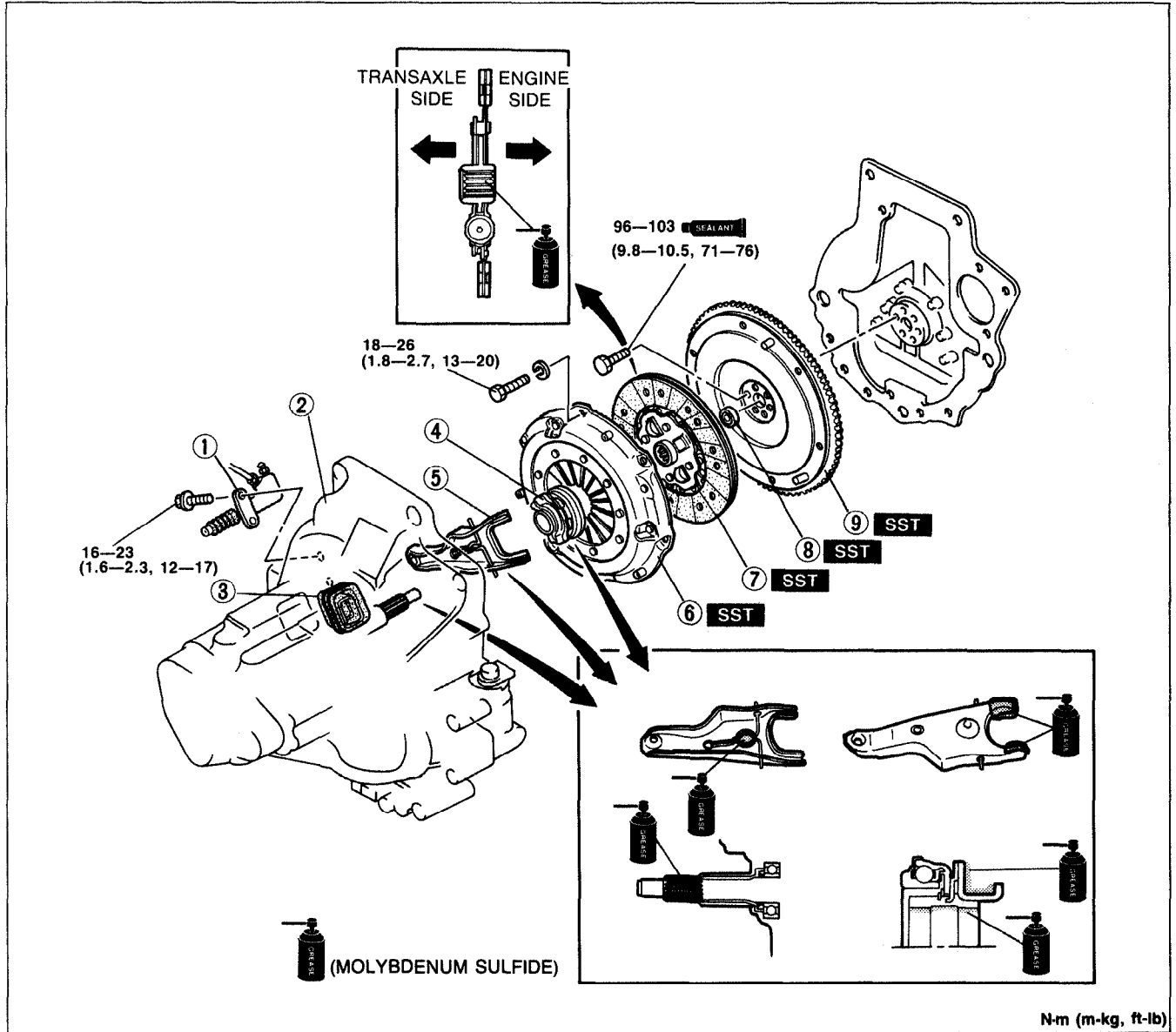
<p>49 E011 1A0</p> <p>Brake set, ring gear</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 103</p> <p>Shaft (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 E011 104</p> <p>Collor (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>	<p>49 E011 105</p> <p>Stopper (Part of 49 E011 1A0)</p> 	<p>For prevention of engine rotation</p>
<p>49 SE01 310A</p> <p>Clutch disc centering tool</p> 	<p>For installation of clutch disc</p>	<p>49 1285 071</p> <p>Puller, bearing</p> 	<p>For removal of pilot bearing</p>
<p>49 1285 073</p> <p>Chuck (Part of 49 1285 071)</p> 	<p>For removal of pilot bearing</p>	<p>23U0HX-013</p>	

REMOVAL / INSTALLATION

Note

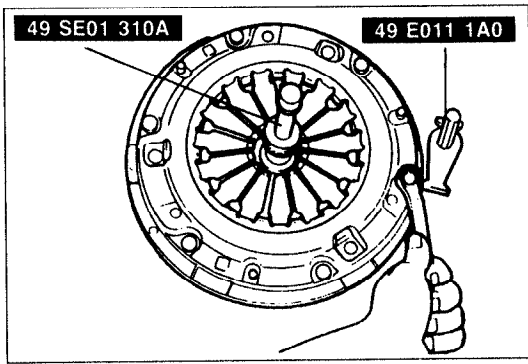
- Remove the clutch release cylinder with the clutch pipe connected.
- Do not remove the pilot bearing if not necessary.

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.

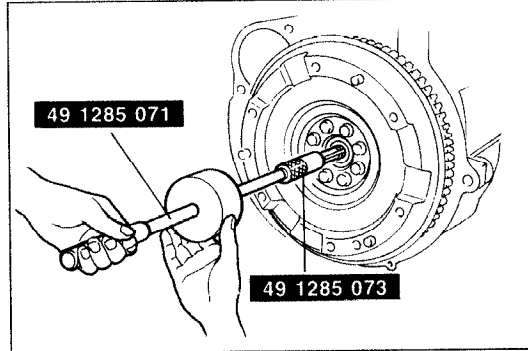


- | | |
|----------------------------|-----------------|
| 1. Clutch release cylinder | |
| 2. Transaxle | |
| Service | Sections J1, J2 |
| 3. Boot | |
| 4. Release bearing | |
| Inspection | page H-17 |
| 5. Clutch release fork | |
| 6. Clutch cover | |
| Removal Note | page H-16 |
| Inspection | page H-17 |
| Installation Note | page H-17 |

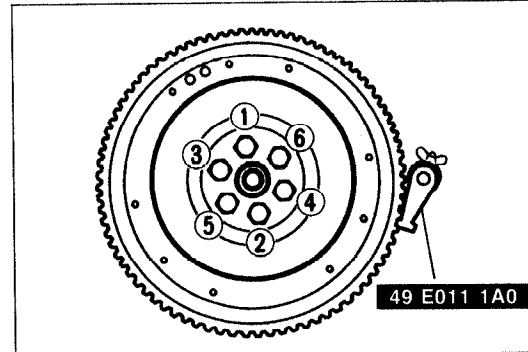
- | | |
|-------------------------|-----------|
| 7. Clutch disc | |
| Removal Note | page H-16 |
| Inspection | page H-17 |
| Installation Note | page H-17 |
| 8. Pilot bearing | |
| Inspection | page H-18 |
| Removal Note | page H-16 |
| Installation Note | page H-16 |
| 9. Flywheel | |
| Removal Note | page H-16 |
| Inspection | page H-18 |
| Installation Note | page H-16 |



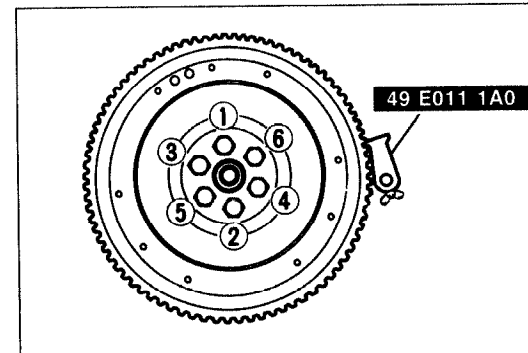
23U0HX-015



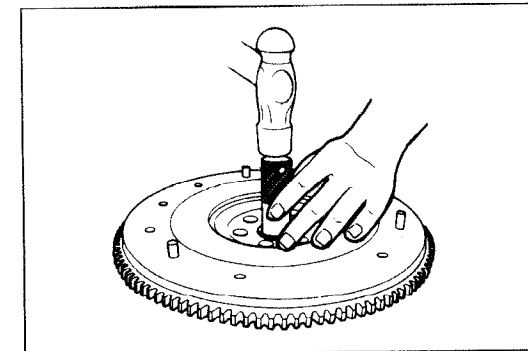
03U0HX-028



23U0HX-016



23U0HX-017



13U0HX-015

Removal Note**Clutch cover and disc**

1. Install the **SST** or equivalent.
2. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released. Then remove the clutch cover and disc.

Pilot bearing

1. Remove the pilot bearing with the **SST** if necessary.

Flywheel**Note**

- After removing the flywheel, inspect for oil leakage past the crankshaft rear oil seal. If necessary, replace the oil seal. (Refer to Section B.)

1. Hold the flywheel with the **SST** or equivalent.
2. Remove the flywheel.

Installation Note**Flywheel**

1. Wipe the bolts clean and apply sealant to the bolt threads.
2. Install the flywheel and the **SST** or equivalent.
3. Tighten the bolts in the pattern shown.

Tightening torque:

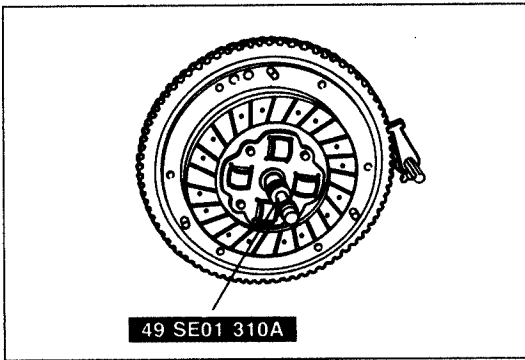
96—103 N·m (9.8—10.5 m·kg, 71—76 ft·lb)

Pilot bearing**Note**

- Install the pilot bearing flush with the flywheel.

1. Install the new bearing with a suitable pipe.

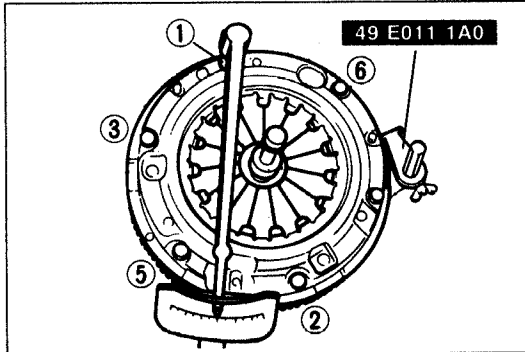
Bearing outer diameter: 35mm (1.378 in)



13U0HX-018

Clutch disc

1. Clean the clutch disc splines and main drive gear splines; then apply organic molybdenum sulfide grease.
2. Hold the clutch disc in position with the **SST**.



23U0HX-018

Clutch cover

1. Install the **SST** or equivalent.
2. Align the dowel holes with the flywheel dowels.
3. Tighten the bolts evenly and gradually in the pattern shown.

Tightening torque:

18—26 N·m (1.8—2.7 m·kg, 13—20 ft·lb)

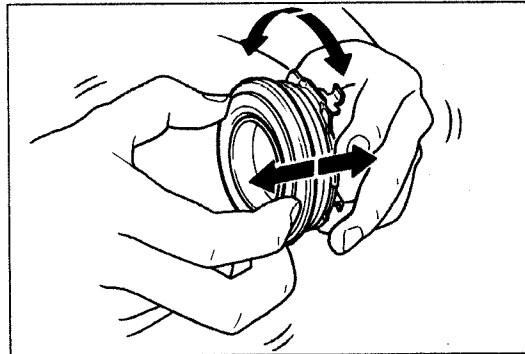
RELEASE BEARING

INSPECTION

Note

- **The clutch release bearing is a sealed bearing and must not be washed in solvent.**

1. Turn the bearing while applying force in the axial direction. If the bearing sticks or has excessive resistance, replace it.



03U0HX-035

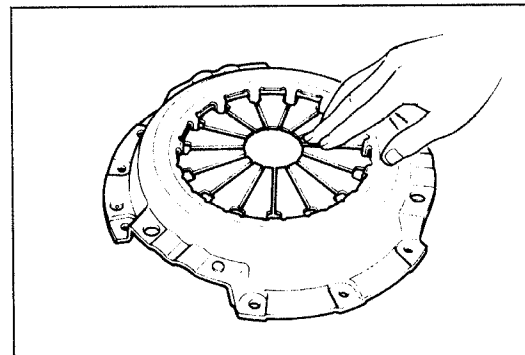
CLUTCH COVER

INSPECTION

Note

- **Minor scoring or burning should be removed with emery paper.**

1. Inspect the contact surface of the clutch disc for scoring, cracks, and burning. Repair or replace as necessary.
2. Inspect the contact surface of the clutch release bearing for wear and cracks. If there is wear or cracks, replace the clutch cover.



03U0HX-032

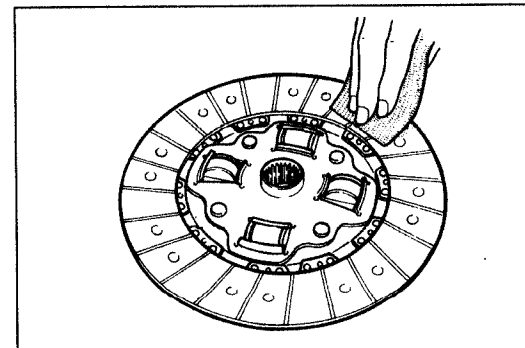
CLUTCH DISC

INSPECTION

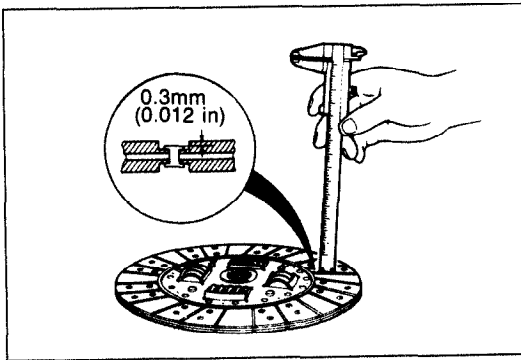
Note

- **Use sandpaper if the trouble is minor.**

1. Inspect the lining surface for burning and oil contamination. Replace the clutch disc if it is badly burned or oil soaked.
2. Inspect for loose facing rivets and rubbers. Replace the clutch disc if either is loose.



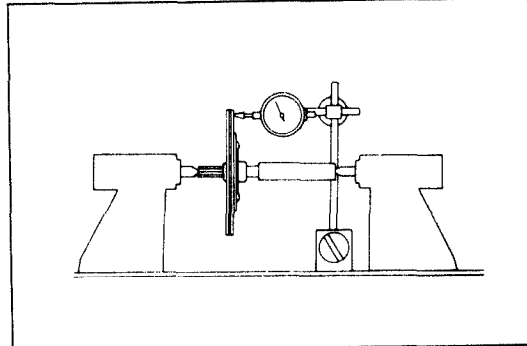
03U0HX-033



13U0HX-019

3. Measure the thickness of the lining at a rivet head on both sides with vernier calipers.
Replace the clutch disc if its thickness is less than minimum.

Thickness: 0.3mm (0.012 in) min.



13U0HX-020

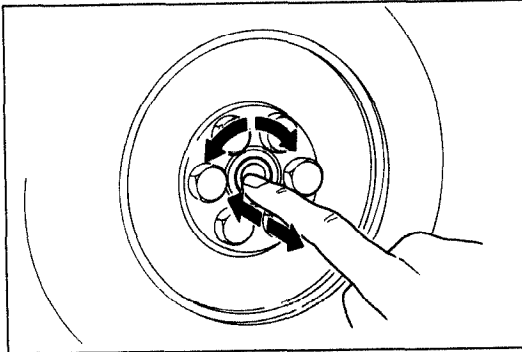
4. Measure the clutch disc runout with a dial indicator.
Replace the clutch disc if runout is excessive.

Runout: 0.7mm (0.027 in) max.

PILOT BEARING

INSPECTION

1. Turn the bearing while applying force in the axial direction.
If the bearing sticks or has excessive resistance, replace it.



03U0HX-036

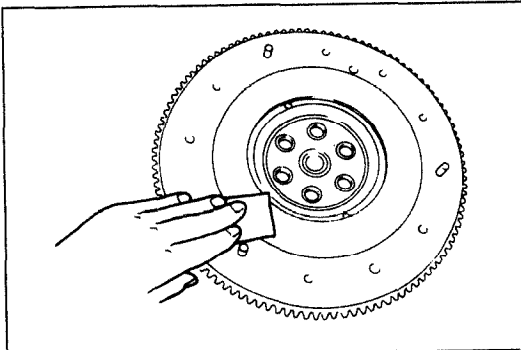
FLYWHEEL

INSPECTION

Note

- Minor scoring or burning should be removed with emery paper.

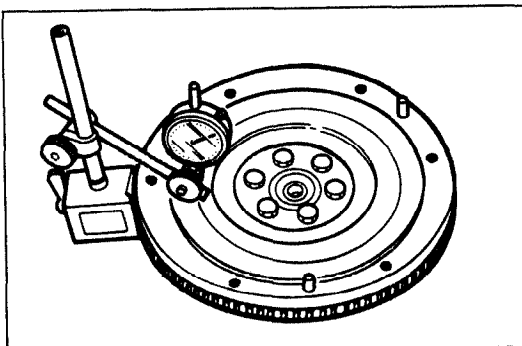
1. Inspect the contact surface of the clutch disc for scoring, cracks, and burning; repair or replace as necessary.



03U0HX-037

2. Inspect the ring gear teeth for wear and damage. If necessary, replace the ring gear.
3. Measure the flywheel runout with a dial indicator. Replace the flywheel if runout is excessive.

Runout: 0.2mm (0.008 in) max.



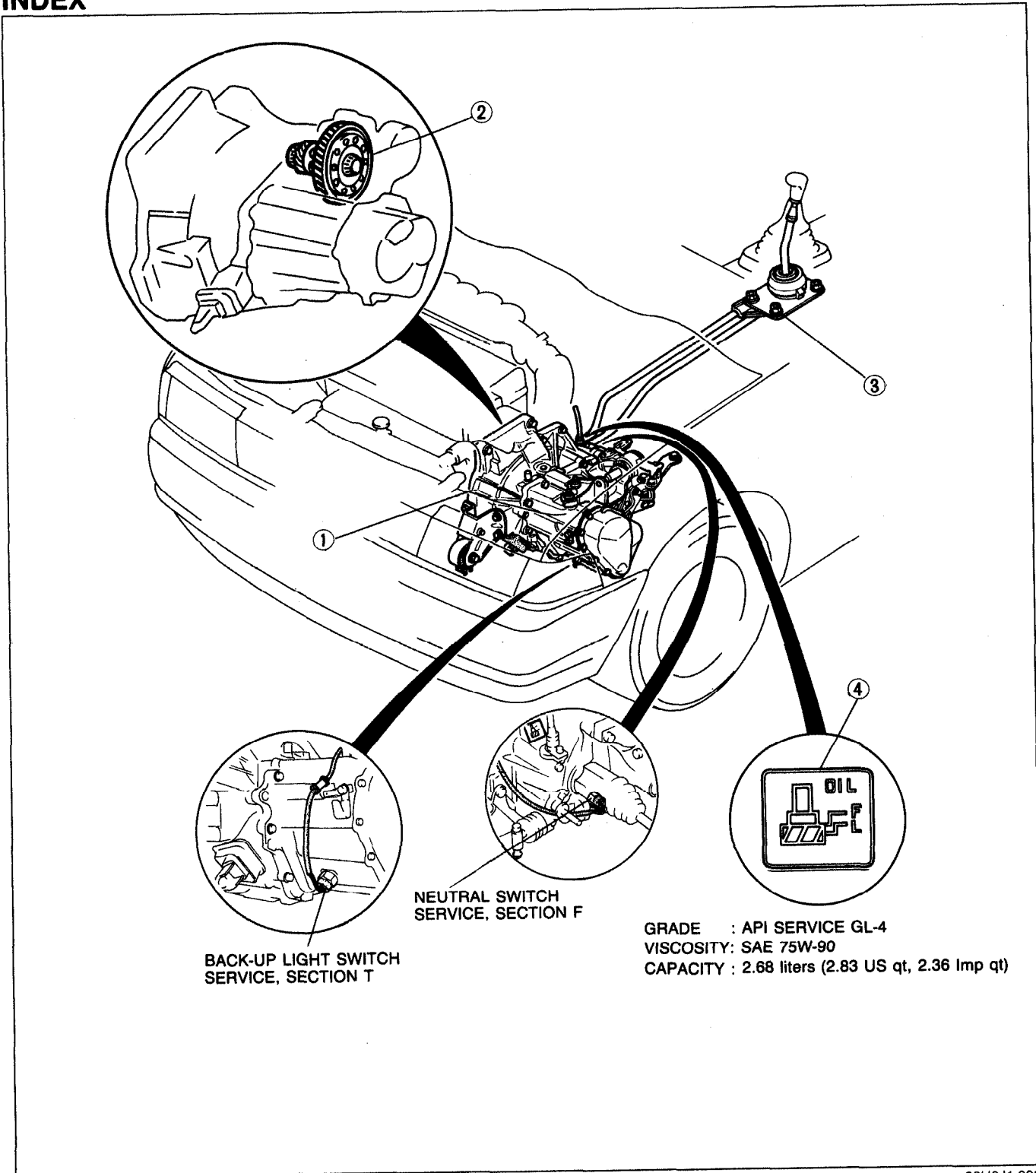
13U0HX-021

MANUAL TRANSAXLE (F5M-R)

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03U0J1-001

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03U0J1-002

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3. Shift mechanism	
Overhaul.....	page J1-56
4. Transaxle oil	
Inspection.....	page J1- 7
Replacement.....	page J1- 7

OUTLINE

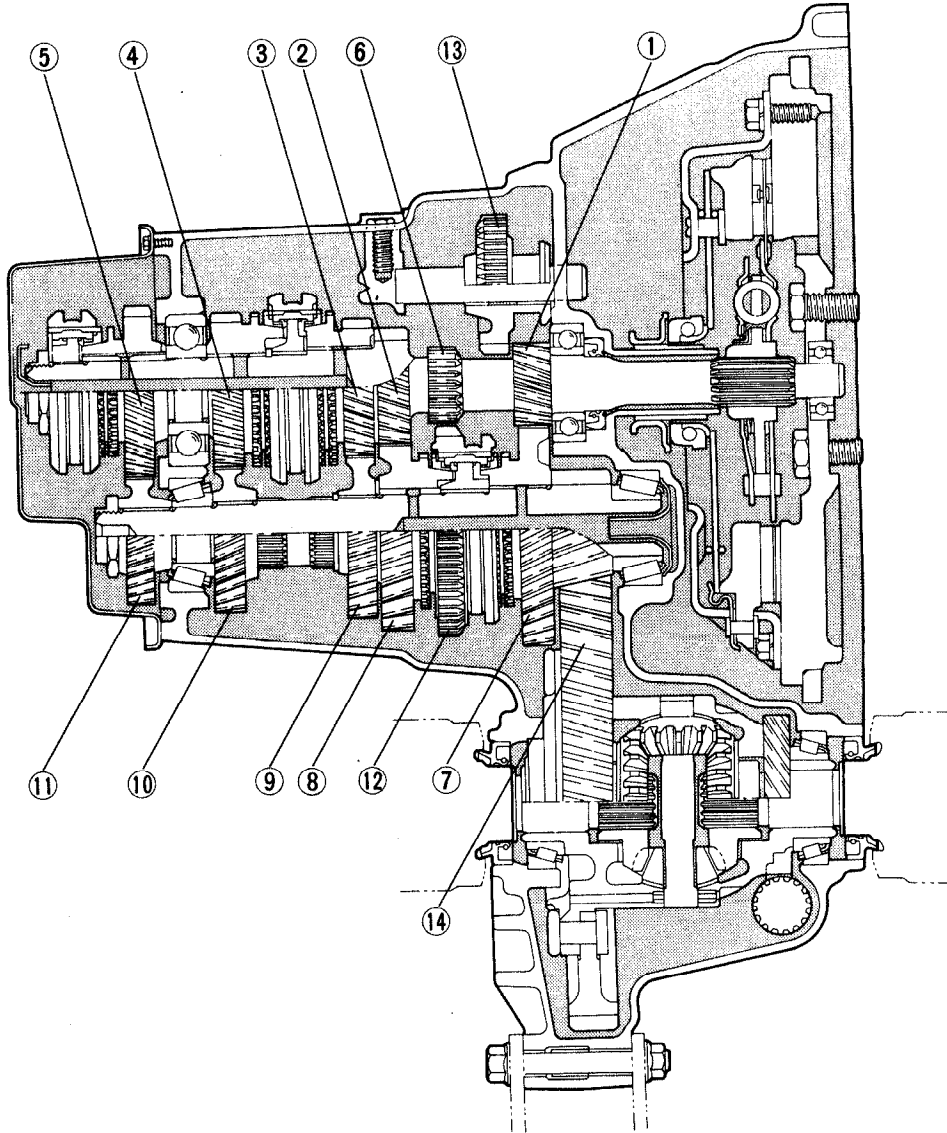
SPECIFICATIONS

Engine/Transaxle		B6 SOHC	BP SOHC
		F5M-R	
Transaxle control		Floor shift	
Synchronesh system		Forward: Synchronesh Reverse: Selective sliding	
Gear ratio	1st	3.416	
	2nd	1.842	
	3rd	1.290	
	4th	0.918	
	5th	0.731	
	Reverse	3.214	
Final gear ratio		4.105	3.619
Oil	Grade	API service GL-4	
	Viscosity	SAE 75W-90	
	Capacity liters (US qt, Imp qt)	2.68 (2.83, 2.36)	

J1

13U0J1-001

STRUCTURAL VIEW



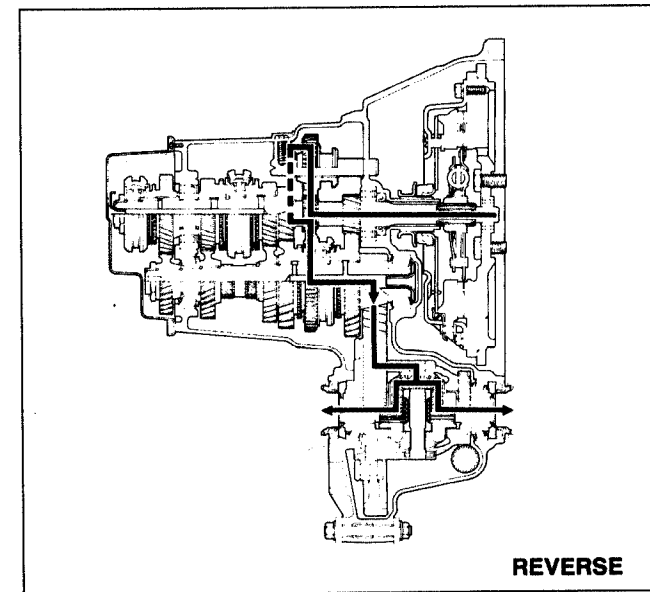
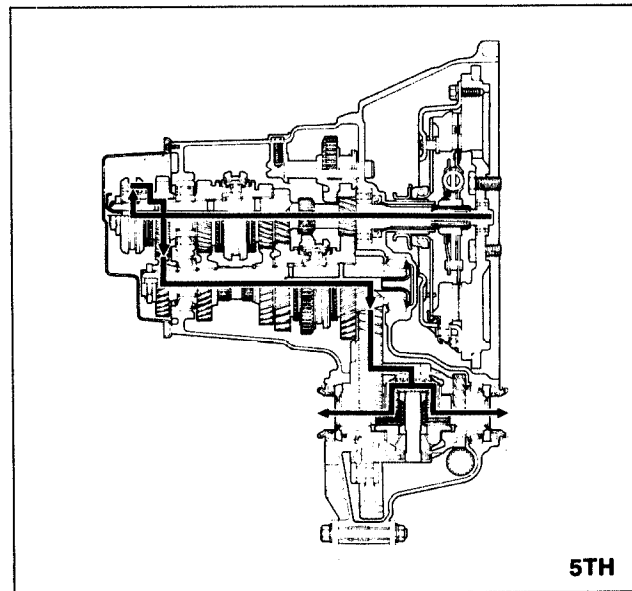
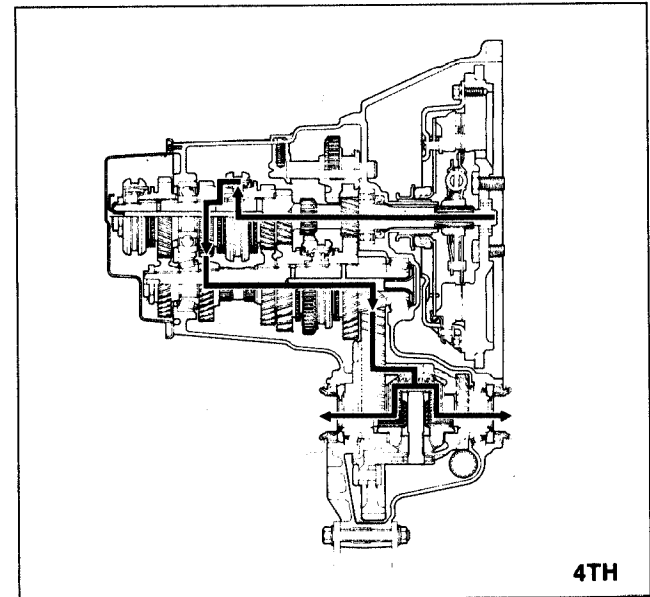
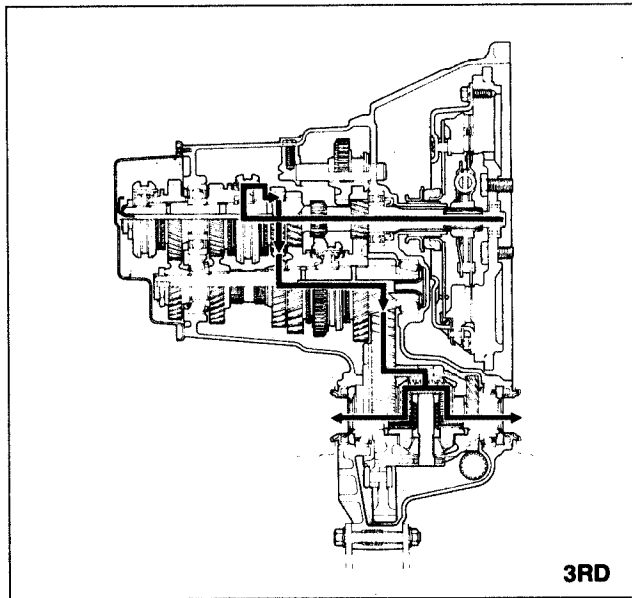
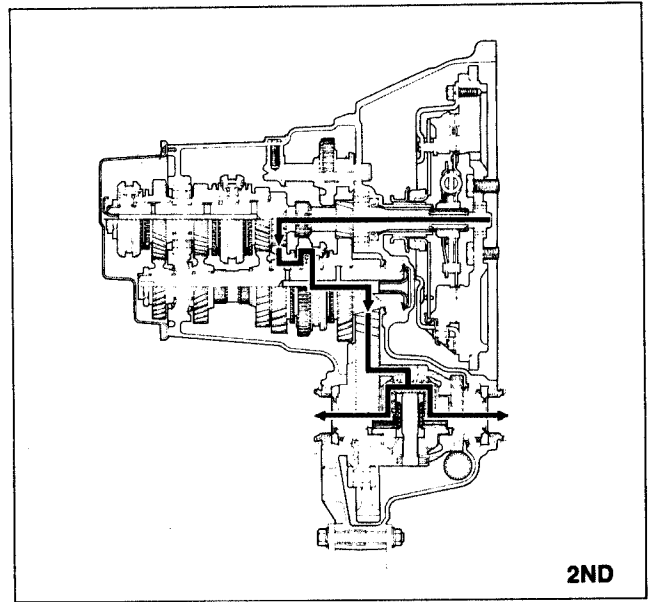
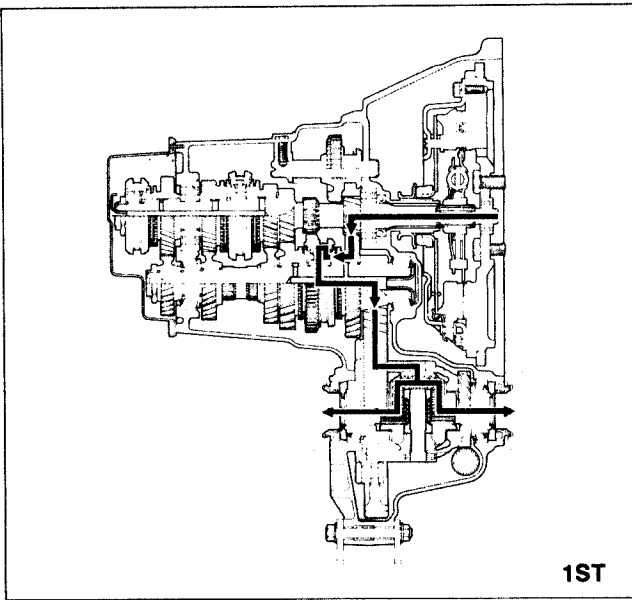
03U0J1-004

- 1. Primary 1st gear
- 2. Primary 2nd gear
- 3. Primary 3rd gear
- 4. Primary 4th gear
- 5. Primary 5th gear

- 6. Primary reverse gear
- 7. Secondary 1st gear
- 8. Secondary 2nd gear
- 9. Secondary 3rd gear
- 10. Secondary 4th gear

- 11. Secondary 5th gear
- 12. Secondary reverse gear
- 13. Reverse idler gear
- 14. Differential

POWER FLOW

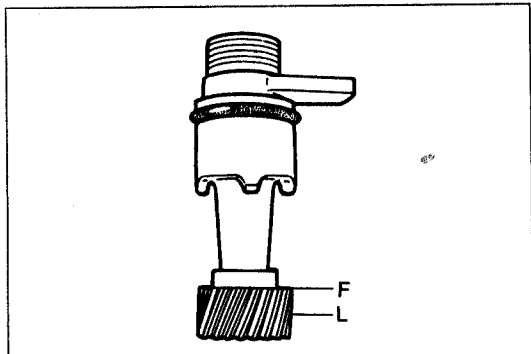


J1

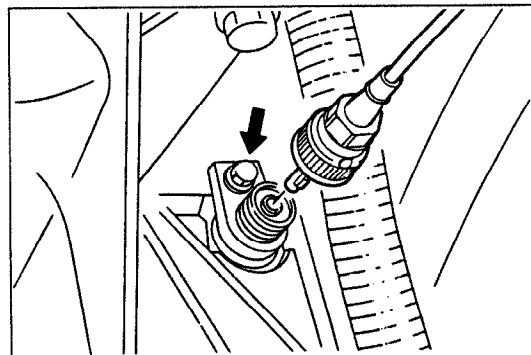
TROUBLESHOOTING GUIDE

Problem	Possible cause	Remedy	Page
Shift lever won't shift smoothly or is hard to shift	Seized shift lever ball	Replace	J1-56
	Seized change control rod joint	Replace	J1-56
	Bent change control rod	Replace	J1-56
Too much play in shift lever	Worn change control rod bushing	Replace	J1-56
	Weak shift lever ball spring	Replace	J1-56
	Worn shift lever ball bushing	Replace	J1-56
Difficult to shift	Bent change rod	Replace	J1-56
	No grease in transaxle control	Lubricate with grease	J1-56
	Insufficient oil	Add oil	J1- 7
	Deterioration of oil quality	Replace with oil of specified quality	J1- 7
	Wear or play of shift fork or shift rod	Replace	J1-14
	Worn synchronizer ring	Replace	J1-22, 24
	Worn synchronizer cone of gear	Replace	J1-22, 24
	Bad contact of synchronizer ring and cone of gear	Replace	J1-22, 24
	Excessive longitudinal play of gears	Replace	J1-22, 24
	Worn bearing	Replace	J1-22, 24
	Worn synchronizer key spring	Replace	J1-22, 24
	Excessive primary shaft gear bearing preload	Adjust	J1-36
	Improperly adjusted change guide plate	Adjust	J1-17
	Won't stay in gear	Bent change control rod	Replace
Worn change control rod bushing		Replace	J1-56
Weak shift lever ball spring		Replace	J1-56
Improperly installed extension bar		Tighten	J1-56
Worn shift fork		Replace	J1-14
Worn clutch hub		Replace	J1-22, 24
Worn clutch hub sleeve		Replace	J1-22, 24
Worn gear sliding part of both shaft gears		Replace	J1-22, 24
Worn gear sliding part of each gear		Replace	J1-22, 24
Worn steel sliding groove of control end		Replace	J1-14
Weak spring pressing against steel ball		Replace	J1-14
Excessive thrust clearance		Replace	J1-22, 24
Worn bearing		Replace	J1-22, 24
Improperly installed engine mount		Tighten	J1-48
Abnormal noise	Insufficient oil	Add oil	J1- 7
	Deterioration of oil quality	Replace	J1- 7
	Worn bearing	Adjust or replace	J1-22, 24
	Worn sliding surfaces of gears or shafts	Replace	J1-22, 24
	Excessive gear backlash	Replace	J1-22, 24
	Damaged gear teeth	Replace with oil of specified quality	J1-22, 24
	Foreign material in gears	Replace	J1-22, 24
	Damaged differential gear or excessive backlash	Adjust or replace	J1-53

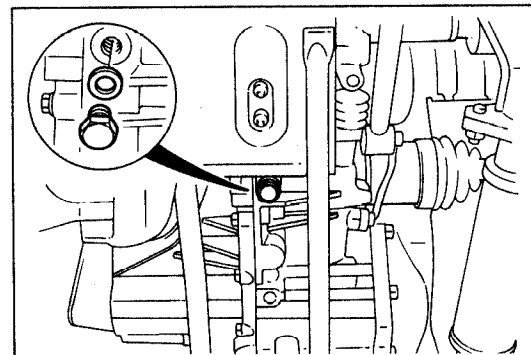
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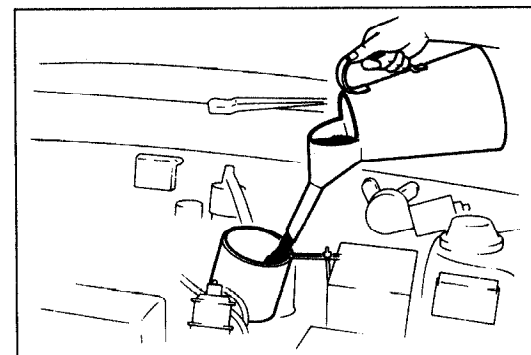
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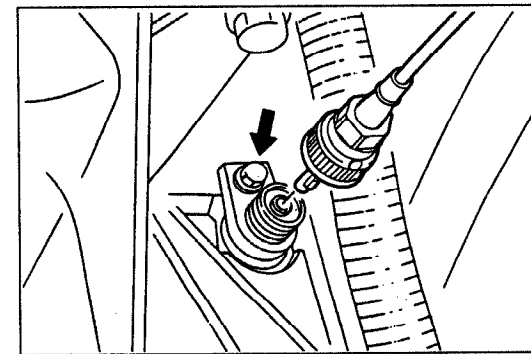
03U0J1-008



03U0J1-009



13U0J1-002



03U0J2-011

TRANSAXLE OIL

INSPECTION

Note

- Park the vehicle on level ground.

1. Disconnect the speedometer cable and remove the speedometer driven gear.
2. Verify that the oil level is between the F and L.
3. Install the speedometer driven gear.

Tightening torque:

7.8—12 N·m (80—120 cm·kg, 69—104 in·lb)

4. Connect the speedometer cable.

J1

REPLACEMENT

1. Disconnect the speedometer cable and remove the speedometer driven gear.
2. Remove the drain plug and washer. Drain the oil into a suitable container.
3. Install a new washer and the drain plug.

Tightening torque:

39—54 N·m (4.0—5.5 m·kg, 29—40 ft·lb)

4. Add the necessary amount of the specified oil through the speedometer driven gear mounting.

Specified oil

Grade: API service GL-4

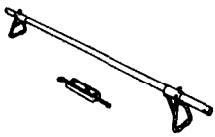
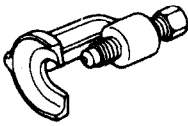
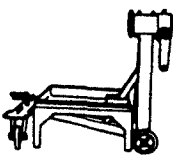
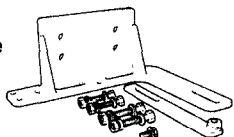
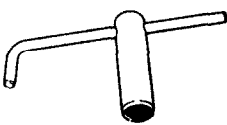
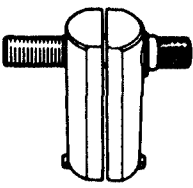
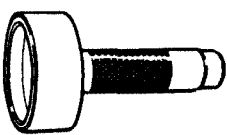
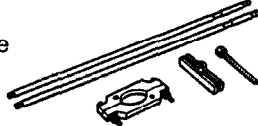
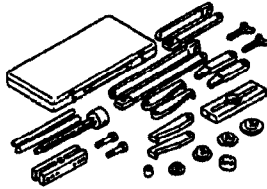
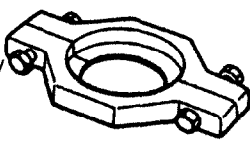
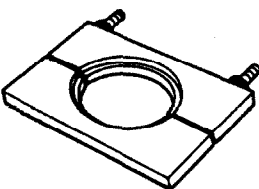
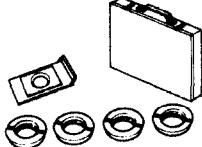
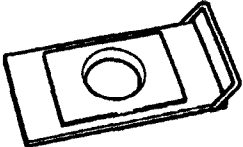
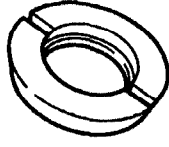
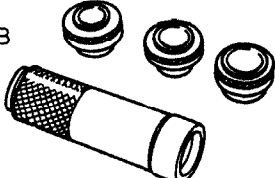

Viscosity: SAE 75W-90

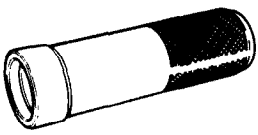


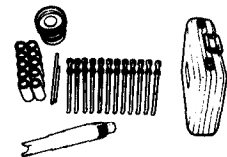




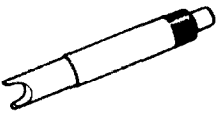
Capacity: 2.68 liters (2.83 US qt, 2.36 Imp qt)

5. Verify the oil level.
6. Install the speedometer driven gear and connect the speedometer cable.

TRANSAXLE

PREPARATION SST

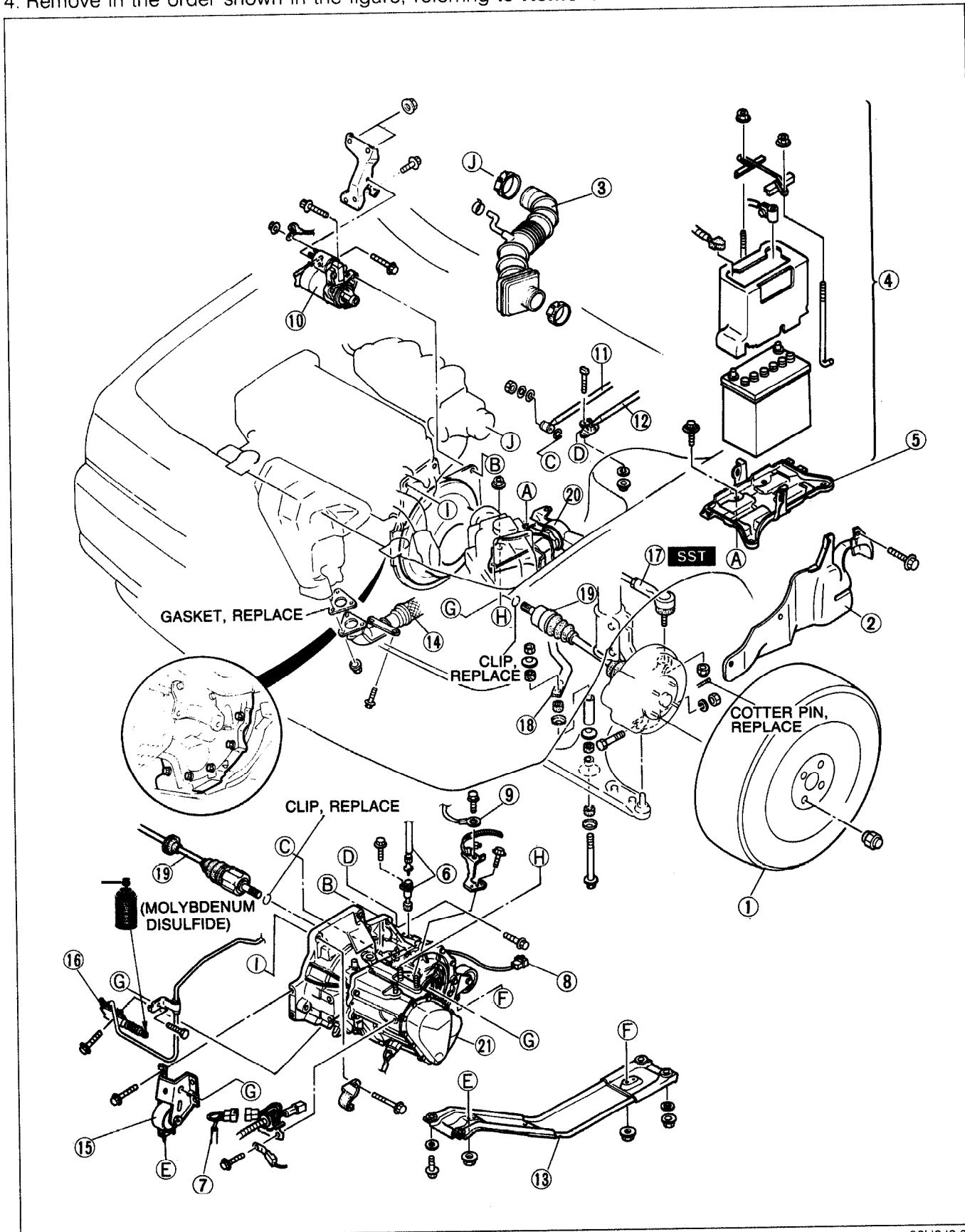
<p>49 G017 5A0 Support, engine</p> 	<p>For support of engine</p>	<p>49 0118 850C Puller, ball joint</p> 	<p>For removal of tie-rod end</p>
<p>49 0107 680A Engine stand</p> 	<p>For disassembly and assembly of transaxle</p>	<p>49 G019 0A0 Hanger, transaxle</p> 	<p>For disassembly and assembly of transaxle</p>
<p>49 F401 440 Holder, primary shaft</p> 	<p>For holding primary shaft</p>	<p>49 FT01 361 Remover, bearing</p> 	<p>For removal of bearing outer race</p>
<p>49 B001 795 Installer, oil seal</p> 	<p>For installation of oil seal</p>	<p>49 0187 520 Puller, rear axle shaft bearing</p> 	<p>For removal of bearing and gears</p>
<p>49 0839 425C Puller set, bearing</p> 	<p>For removal of bearing</p>	<p>49 0636 145 Puller, fan pulley boss</p> 	<p>For removal of gears</p>
<p>49 G030 370 Removing plate</p> 	<p>For removal of gears</p>	<p>49 G017 1A0 Remover set, bearing</p> 	<p>For removal of bearing</p>
<p>49 F401 366A Plate (Part of 49 G017 1A0)</p> 	<p>For removal of bearing</p>	<p>49 B092 374 Attachment H (Part of 49 G017 1A0)</p> 	<p>For removal of bearing</p>
<p>49 F401 330B Installer set, bearing</p> 	<p>For installation of bearing</p>	<p>49 F401 335A Attachment A (Part of 49 F401 330B)</p> 	<p>For installation of bearing inner race and gear</p>

<p>49 F401 331 Body (Part of 49 F401 330B)</p> 	<p>For installation of gear and bearing inner race</p>	<p>49 F401 337A Attachment C (Part of 49 F401 330B)</p> 	<p>For installation of gear</p>
<p>49 F401 336B Attachment B (Part of 49 F401 330B)</p> 	<p>For installation of bearing</p>	<p>49 D017 2A2A Shim selector set</p> 	<p>For adjustment of bearing preload</p>
<p>49 F401 381B Selector (Part of 49 D017 2A2A)</p> 	<p>For adjustment of bearing preload</p>	<p>49 F401 384 Collar (Part of 49 D017 2A2A)</p> 	<p>For adjustment of bearing preload</p>
<p>49 F401 385 Bar (Part of 49 D017 2A2A)</p> 	<p>For adjustment of bearing preload</p>	<p>49 G019 019 Bolt set (Part of 49 D017 2A2A)</p> 	<p>For adjustment of bearing preload</p>
<p>49 FT01 515A Adapter, preload</p> 	<p>For adjustment of bearing preload</p>	<p>23U0J1-001</p>	

J1

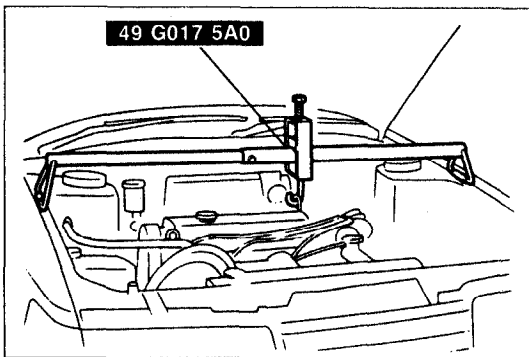
REMOVAL

1. Disconnect the negative battery cable.
2. Raise the vehicle and support it with safety stands.
3. Drain the transaxle oil into a suitable container.
4. Remove in the order shown in the figure, referring to **Removal Note**.



- | | |
|-----------------------------------|-------------------------------|
| 1. Wheel and tire | 14. Exhaust pipe |
| 2. Splash shield | 15. Engine mount No.2 |
| 3. Air hose and resonance chamber | 16. Clutch release cylinder |
| 4. Battery | Removal Note page J1-11 |
| 5. Battery carrier | 17. Tie-rod end |
| 6. Speedometer cable | Removal Note page J1-12 |
| 7. Back-up light switch connector | 18. Stabilizer (BP SOHC) |
| 8. Neutral switch connector | 19. Driveshaft |
| 9. Ground | Removal Note page J1-12 |
| 10. Starter | 20. Engine mount No.4 |
| 11. Extension bar | 21. Transaxle |
| 12. Control rod | Removal Note page J1-12 |
| 13. Engine mount member | |
| Removal Note page J1-11 | |

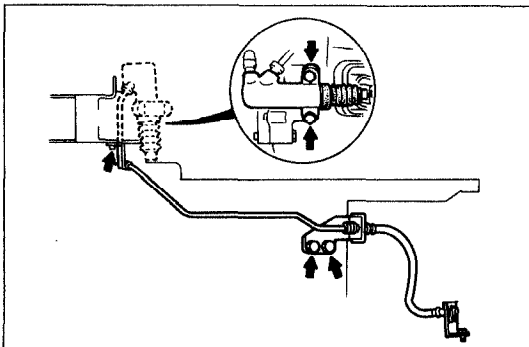
03U0J1-012



03U0J2-015

Removal Note
Engine mount member

1. Suspend the engine with the **SST** and remove the engine mount member.



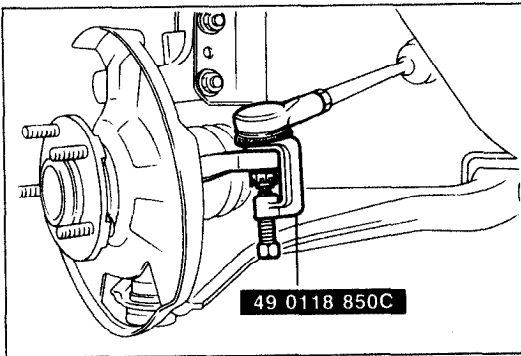
03U0J1-013

Clutch release cylinder

Caution

- Do not damage the clutch pipe.

1. Remove the bolts shown.
2. Lay aside the clutch release cylinder and the clutch pipe when removing the transaxle.

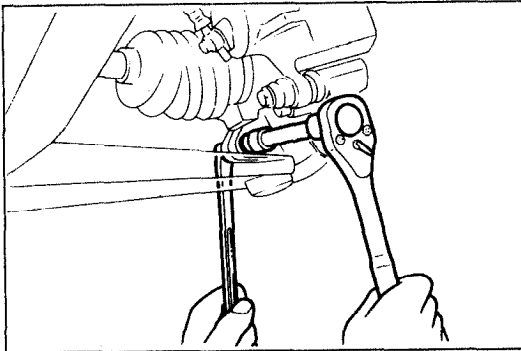


03U0J1-014

Tie-rod end**Caution**

- Do not damage the dust boot.

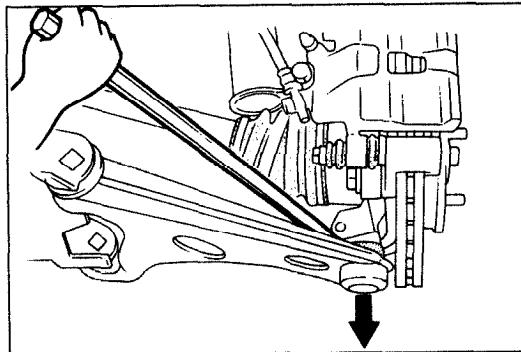
1. Remove the cotter pin and loosen the nut.
2. Disconnect the tie-rod end with the **SST**.



03U0J1-015

Driveshaft

1. Remove the clinch bolt.

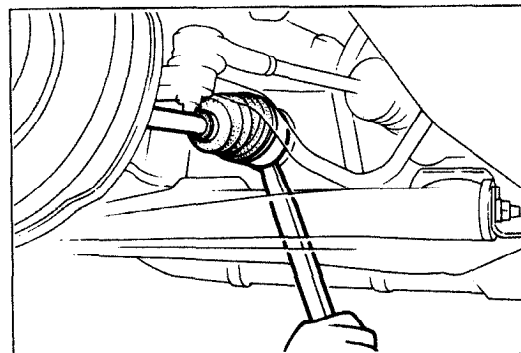


03U0J1-016

Caution

- Wrap a rag around the ball joint dust boot to protect it from damage.

2. Disconnect the lower arm from the knuckle with a pry bar.

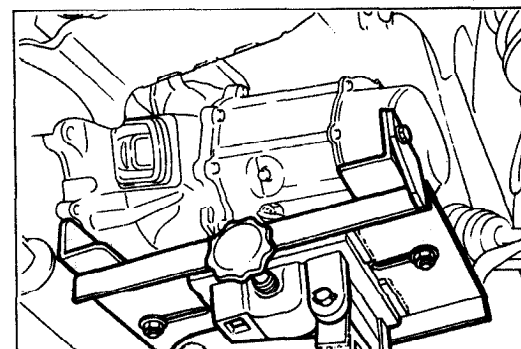


23U0J1-002

Caution

- Do not subject the tripod joint to shock when removing the driveshaft.

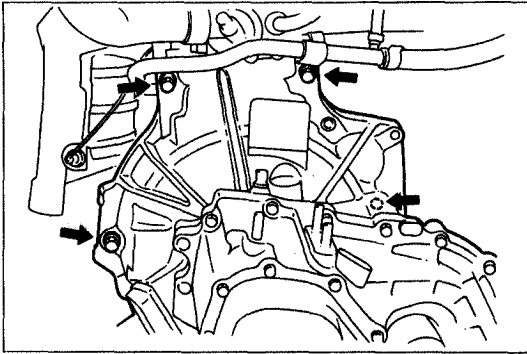
3. Separate the driveshaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle.
4. Suspend the driveshaft with a rope.



03U0J1-018

Transaxle

1. Loosen the **SST** (engine support) and lean the engine toward the transaxle.
2. Support the transaxle with a jack.



03U0J1-019

3. Remove the transaxle mounting bolts.
4. Remove the transaxle.

DISASSEMBLY

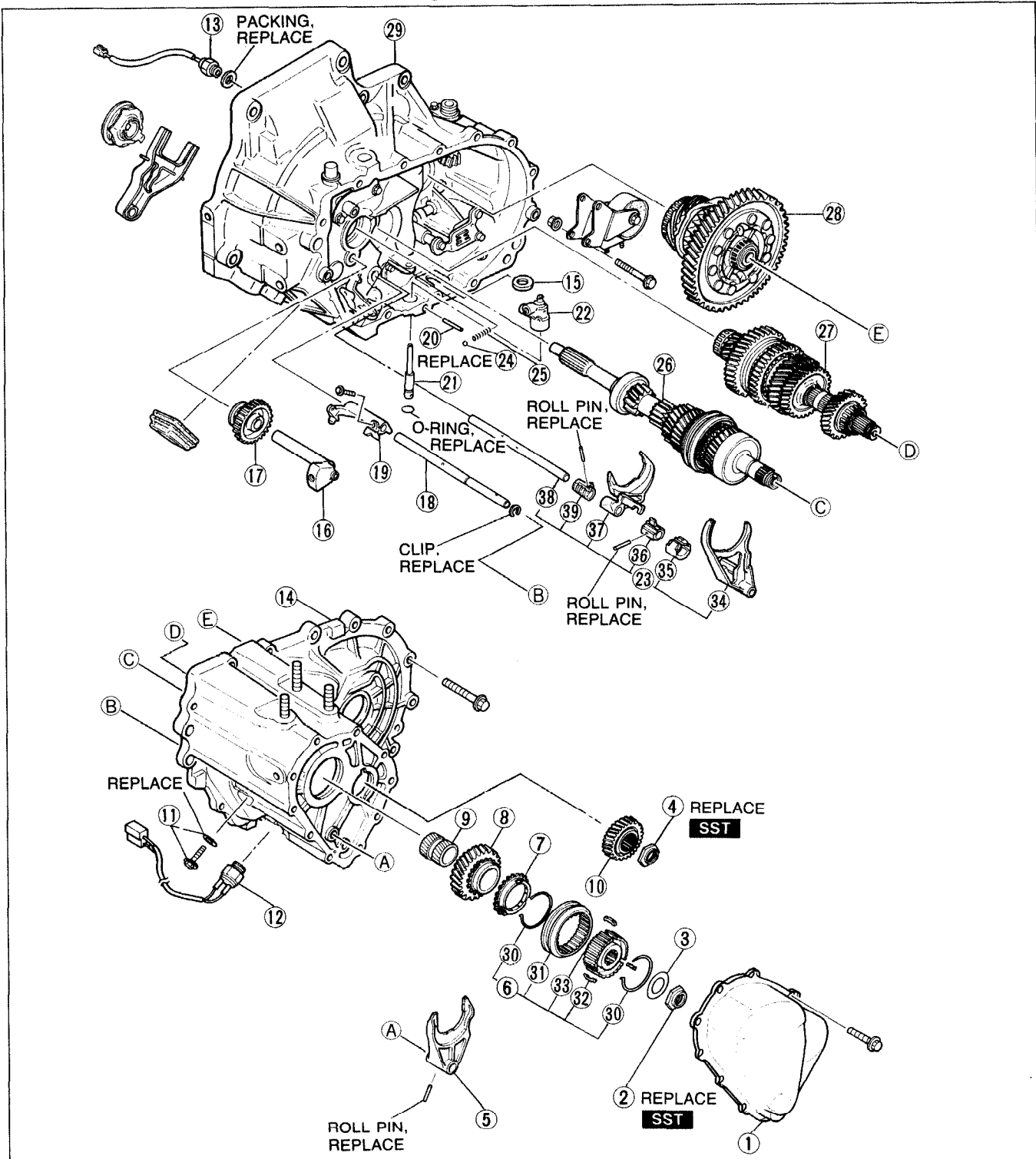
Precaution

1. Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvent before disassembly.
2. Clean the removed parts (except sealed bearings) and all sealing surfaces with cleaning solvent, and dry with compressed air. Clean out all holes and passages with a compressed air, and check that there are no obstructions.
3. Wear eye protection when using compressed air to clean components.

03U0J2-020

5th/Reverse Gear and Housing Parts

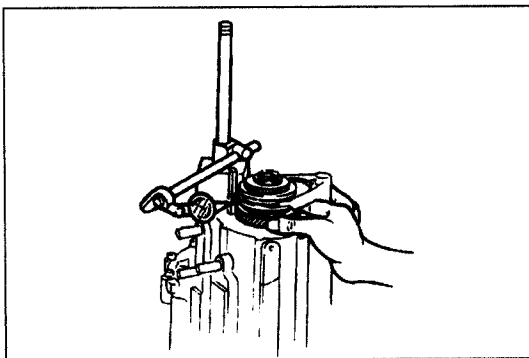
1. Measure the thrust clearance between 5th gear and the transaxle case, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



03U0J1-020

- | | |
|---|--|
| 1. Rear cover | 18. 5th shift rod |
| 2. Locknut (Primary shaft)
Disassembly Note page J1-15 | 19. 5th shift rod end |
| 3. Stop plate | 20. Pin |
| 4. Locknut (Secondary shaft)
Disassembly Note page J1-15 | 21. Crank lever shaft |
| 5. 5th shift fork | 22. Crank lever assembly |
| 6. Clutch hub assembly (5th)
Inspection..... page J1-29 | 23. Shift fork and shift rod assembly
Disassembly Note page J1-16 |
| 7. Synchronizer ring (5th)
Inspection..... page J1-27 | 24. Steel ball |
| 8. 5th gear
Inspection..... page J1-28 | 25. Spring |
| 9. Gear sleeve
Inspection..... page J1-28 | 26. Primary shaft gear assembly |
| 10. Secondary 5th gear | 27. Secondary shaft gear assembly |
| 11. Lock bolt and washer | 28. Differential assembly |
| 12. Back-up light switch | 29. Clutch housing |
| 13. Neutral switch | 30. Synchronizer spring |
| 14. Transaxle case assembly | 31. Clutch hub sleeve |
| 15. Magnet | 32. Synchronizer key |
| 16. Reverse idler shaft | 33. Clutch hub |
| 17. Reverse idler gear
Inspection..... page J1-27 | 34. 3rd/4th shift fork |
| | 35. Interlock sleeve |
| | 36. Control lever |
| | 37. 1st/2nd shift fork |
| | 38. Control rod |
| | 39. Control end |

03U0J1-021



03U0J1-022

Preinspection

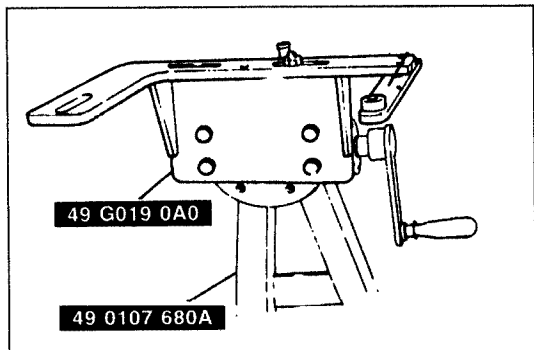
5th gear thrust clearance

1. Measure the 5th gear thrust clearance with a dial indicator.

Clearance: 0.06—0.26mm (0.0024—0.0102 in)

Maximum: 0.31mm (0.0122 in)

2. If the clearance exceeds the the maximum, check the contact surfaces of 5th gear and the clutch hub. Replace worn or damaged parts.

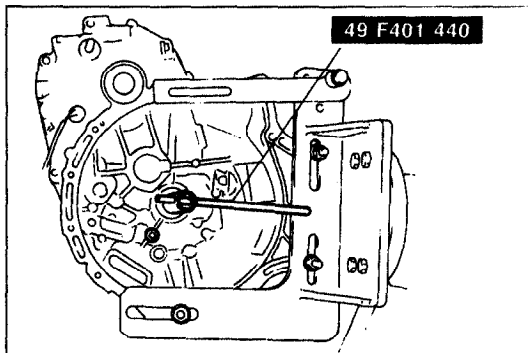


03U0J1-023

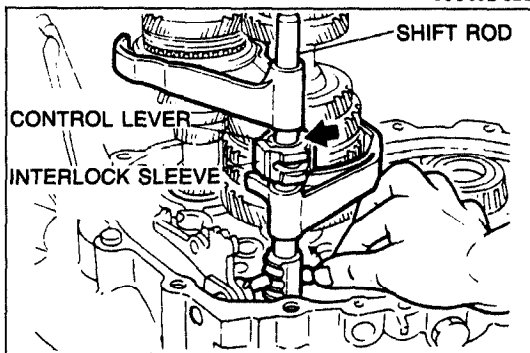
Disassembly note

Locknut

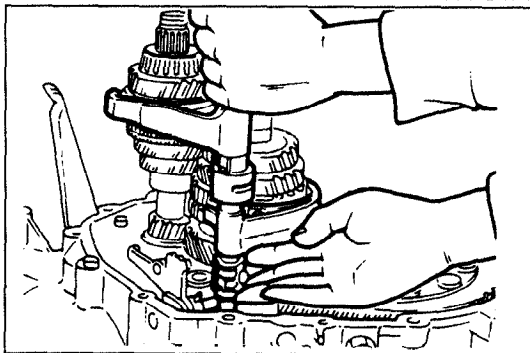
1. Mount the transaxle on the **SST**.



03U0J2-023



03U0J2-024



76U07A-227

2. Lock the primary shaft with the **SST**.
3. Shift to 1st or 2nd gear to lock the rotation of the primary shaft.

Caution

- Do not reuse the removed locknut.

4. Uncrimp the tabs of the locknuts.
5. Remove the locknuts from the primary and secondary shafts.

Shift fork and shift rod assembly

1. Align the ends of the interlock sleeve and of the control lever (arrow). Turn the shift rod counterclockwise.
2. While holding the 1st-2nd shift fork with one hand and the 3rd-4th shift fork with the other, raise them both at the same time and shift each of the clutch hub sleeves.

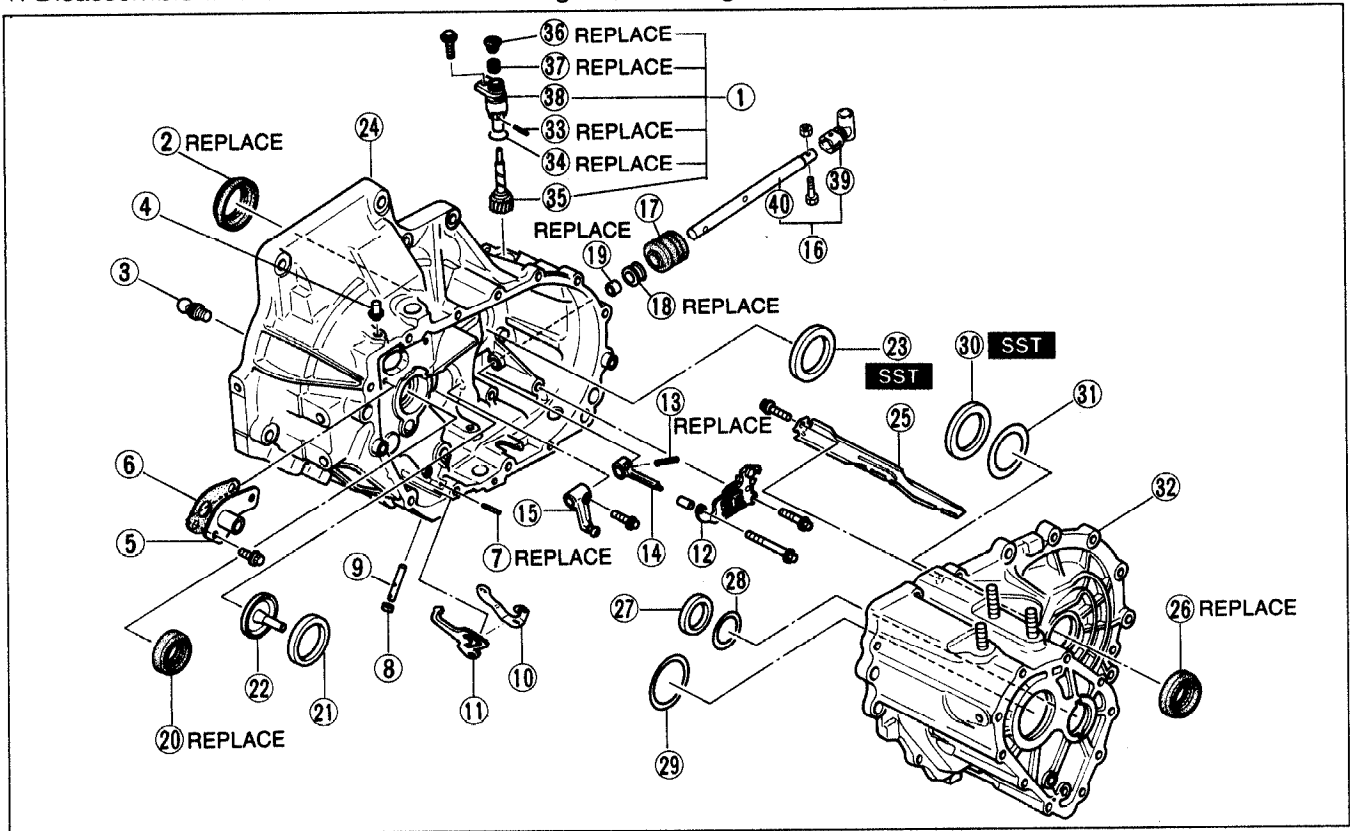
3. Lift the control end and remove the steel ball, and, at the same time, remove the shift rod from the clutch housing.
4. Separate the shift rod and shift fork assembly from each of the clutch hub sleeves.

Clutch Housing and Transaxle Case Components

Caution

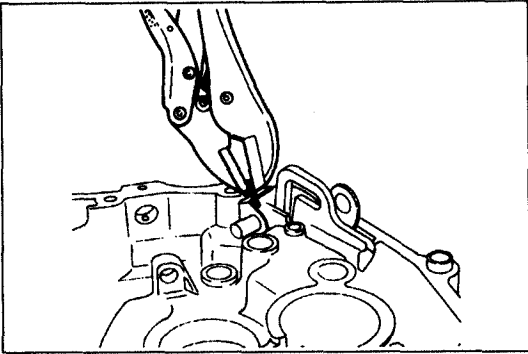
- Do not remove oil seals unless necessary.

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



23U0J1-003

- | | | |
|--|---|---|
| 1. Speedometer driven gear assembly | 17. Boot | 28. Adjust shim |
| 2. Oil seal (Differential)
Disassembly Note
..... page J1-19 | 18. Oil seal (Change rod)
Disassembly Note
..... page J1-18 | 29. Adjust shim |
| 3. Pivot | 19. Bushing | 30. Bearing outer race (Differential)
Disassembly Note
..... page J1-19 |
| 4. Bleeder | 20. Oil seal (Primary shaft)
Disassembly Note
..... page J1-19 | 31. Adjust shim (Differential)
Disassembly Note
..... page J1-19 |
| 5. Bleeder cover | 21. Bearing outer race
Disassembly Note
..... page J1-18 | 32. Transaxle case |
| 6. Gasket | 22. Funnel
Disassembly Note
..... page J1-18 | 33. Roll pin |
| 7. Roll pin | 23. Bearing outer race (Differential)
Disassembly Note
..... page J1-19 | 34. O-ring |
| 8. Blind plug
Disassembly Note
..... page J1-18 | 24. Clutch housing | 35. Driven gear |
| 9. Reverse lever shaft
Disassembly Note
..... page J1-18 | 25. Oil passage | 36. Packing |
| 10. Lever set spring | 26. Oil seal (Differential)
Disassembly Note
..... page J1-19 | 37. Oil seal (Speedometer gear case)
Disassembly Note
..... page J1-19 |
| 11. Reverse lever
Inspection page J1-27 | 27. Bearing outer race | 38. Gear case |
| 12. Guide plate assembly | | 39. Joint |
| 13. Roll pin | | 40. Change rod |
| 14. Selector
Replacement (On-vehicle)
..... page J1-20 | | |
| 15. Change arm | | |

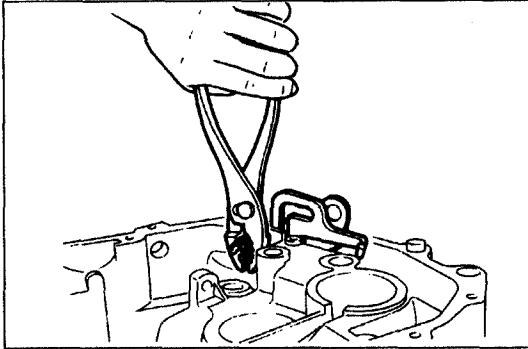


03U0J1-025

Disassembly note

Blind plug

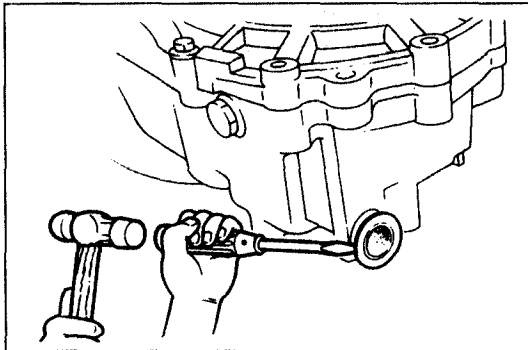
1. Remove the roll pin with pliers.



03U0J1-026

Reverse lever shaft

1. Protect the reverse lever shaft with a rag and remove the shaft with pliers.



03U0J1-027

Oil seal (Change rod)

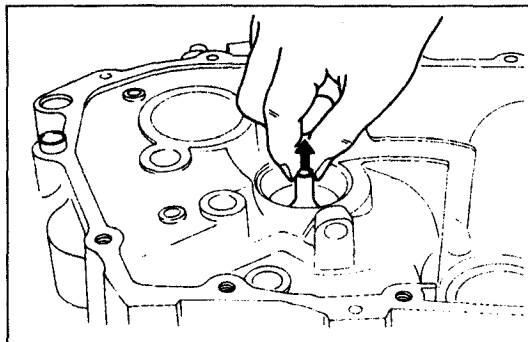
1. Remove the oil seal with a screwdriver.

Funnel and bearing outer race (Secondary shaft)

Note

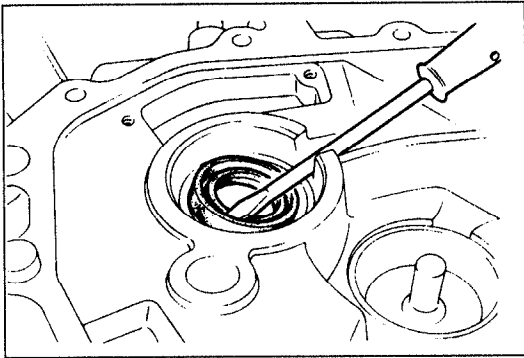
- Remove the bearing outer race with a screwdriver if necessary.
 - 1) Insert a screwdriver between the clutch housing and bearing outer race.
 - 2) Pry the bearing outer race free.

03U0J1-028



03U0J1-029

1. Remove the bearing outer race by lifting out the funnel and race together.



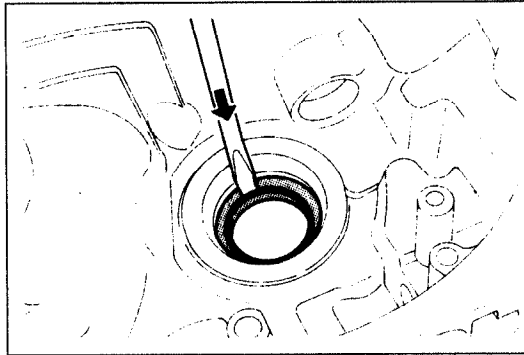
03U0J1-030

Oil seal (Primary shaft)

Caution

- Do not damage the clutch housing.

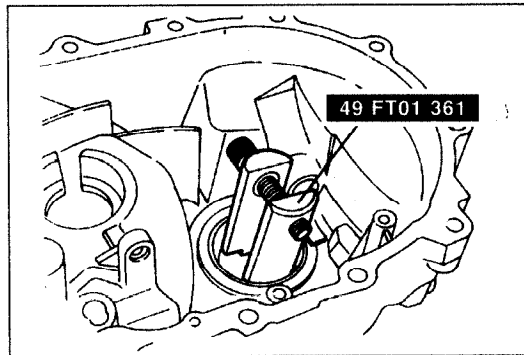
1. Remove the oil seal with a screwdriver.



03U0J1-031

Oil seal (Differential)

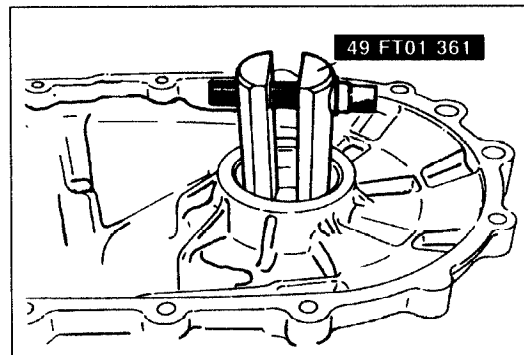
1. Remove the oil seal with a screwdriver.



23U0J1-004

Bearing outer race (Differential)

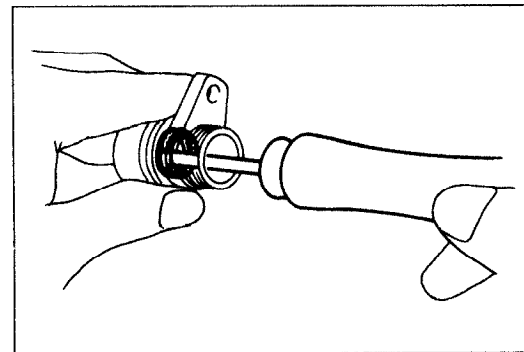
1. Remove the bearing outer race with the **SST**.



03U0J1-033

Bearing outer race and adjust shim (Differential)

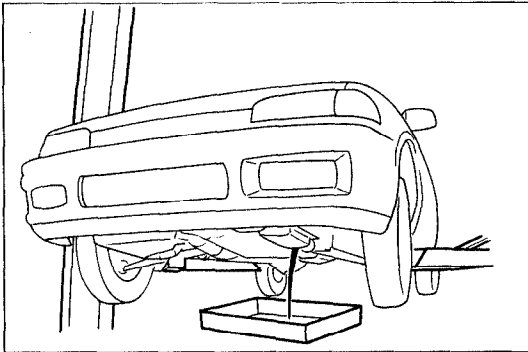
1. Install the **SST** to the bearing outer race.
2. Remove the bearing outer race and adjust shim.



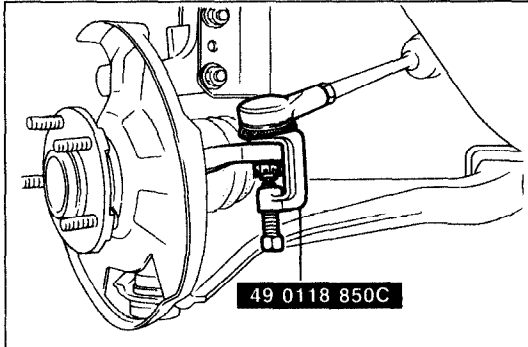
03U0J1-034

Oil seal (Speedometer gear case)

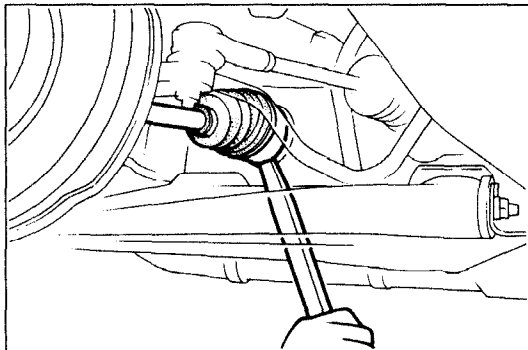
1. Remove the oil seal as shown in the figure.



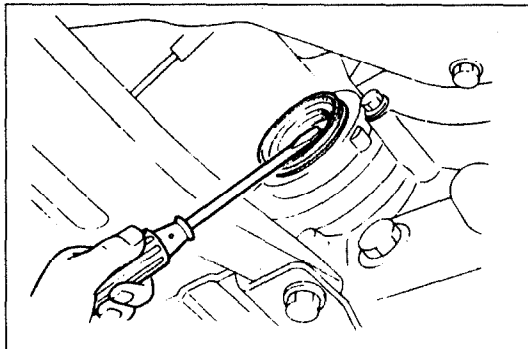
03U0J2-028



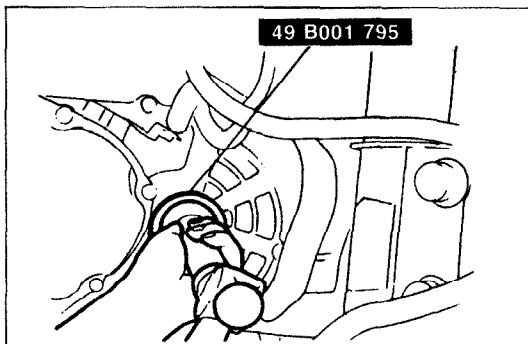
03U0J1-035



03U0J1-036



03U0J2-031



03U0J1-037

Oil seal Replacement (On-vehicle)

Jack up the vehicle and support it with safety stands. Drain the transaxle oil. Next, use the following procedure to replace the driveshaft oil seal:

1. Remove the front wheel.
2. Remove the splash shield.
3. Separate the front stabilizer from the lower arm.

Caution

- Do not damage the dust boots.

4. Remove the clinch bolt and pull the lower arm downward. Separate the knuckle from the lower arm ball joint.
5. Loosen the nut and disconnect the tie-rod end with the **SST**.

Caution

- Do not subject the tripod joint to shock when removing the driveshaft.

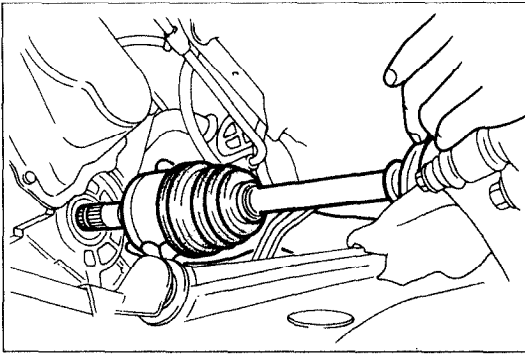
6. Disconnect the driveshaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle.
7. Suspend the driveshaft with a rope.

8. Remove the oil seal with a screwdriver.

Note

- Tap in until the oil seal installer contacts the case.
- Coat the oil seal lip with transaxle oil.

9. Tap the new oil seal into the transaxle case with the **SST**.

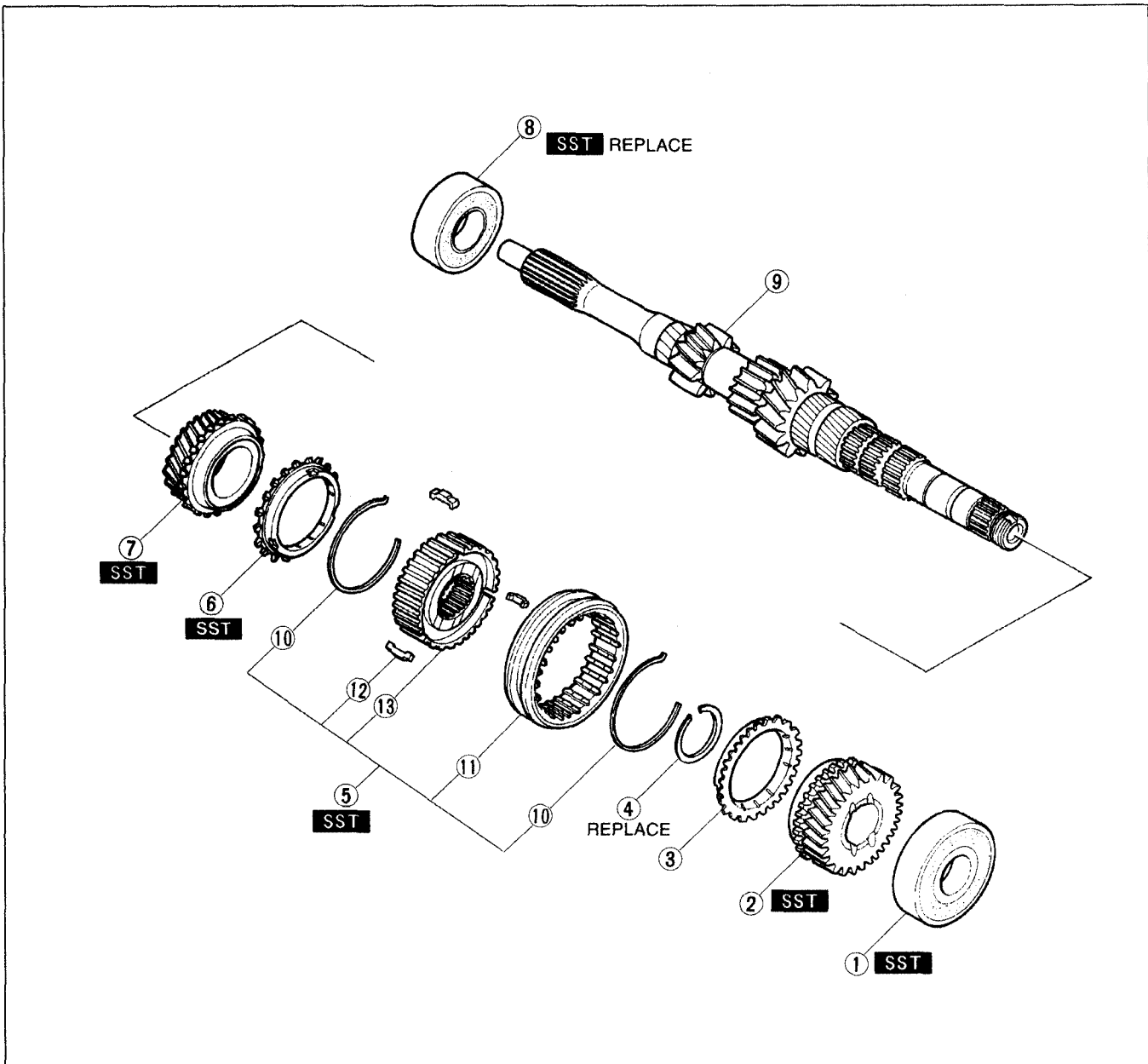


03U0J2-032

10. Replace the driveshaft end clip with a new one. Insert the driveshaft with the end-gap of the clip facing upward.

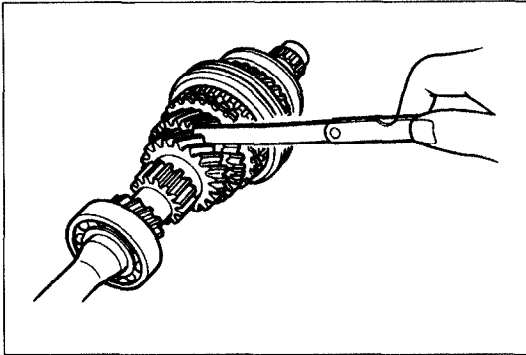
Primary Shaft Assembly

1. Measure the thrust clearances of all gears before disassembly, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



03U0J1-038

- | | | | |
|----------------------------------|------------|-------------------------|------------|
| 1. Bearing | | 7. 3rd gear | |
| Disassembly Note..... | page J1-23 | Disassembly Note..... | page J1-23 |
| Inspection..... | page J1-28 | Inspection..... | page J1-28 |
| 2. 4th gear | | 8. Bearing | |
| Disassembly Note..... | page J1-23 | Disassembly Note..... | page J1-23 |
| Inspection..... | page J1-28 | 9. Primary shaft | |
| 3. Synchronizer ring (4th) | | Inspection..... | page J1-27 |
| Inspection..... | page J1-27 | 10. Synchronizer spring | |
| 4. Retaining ring | | 11. Clutch hub sleeve | |
| 5. Clutch hub assembly (3rd/4th) | | 12. Synchronizer key | |
| Disassembly Note..... | page J1-23 | 13. Clutch hub | |
| Inspection..... | page J1-29 | | |
| 6. Synchronizer ring (3rd) | | | |
| Disassembly Note..... | page J1-23 | | |
| Inspection..... | page J1-27 | | |



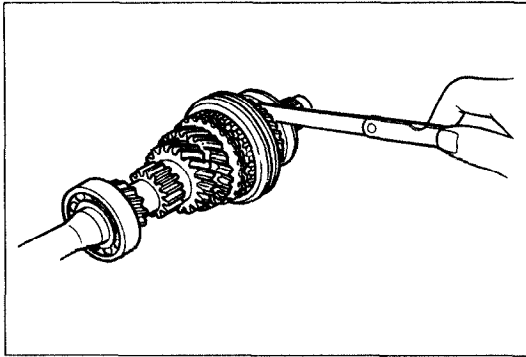
03U0J1-039

**Preinspection
3rd gear thrust clearance**

1. Measure the clearance between 3rd gear and 2nd gear.

Clearance: 0.06—0.21mm (0.002—0.008 in)
Maximum: 0.26mm (0.010 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 3rd gear, 2nd gear and clutch hub (3rd/4th). Replace worn or damaged parts.



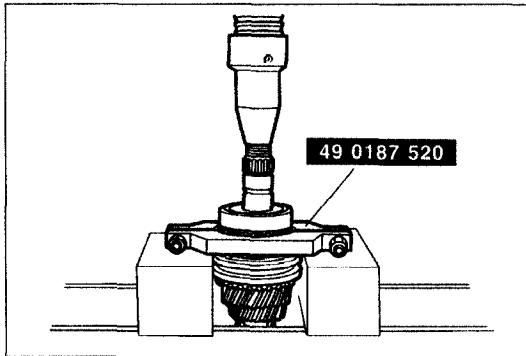
03U0J1-040

4th gear thrust clearance

1. Measure the clearance between 4th gear and the ball bearing.

Clearance: 0.21—0.61mm (0.008—0.024 in)
Maximum: 0.66mm (0.026 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 4th gear, ball bearing, and clutch hub (3rd/4th). Replace worn or damaged parts.



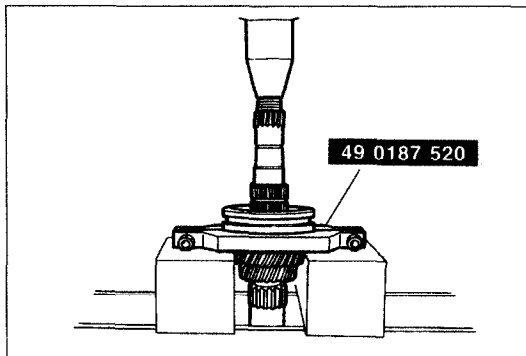
03U0J1-041

**Disassembly note
Bearing and 4th gear**

Caution

- Hold the shaft with one hand so that it does not fall.

1. Remove the ball bearing and 4th gear with the **SST**.



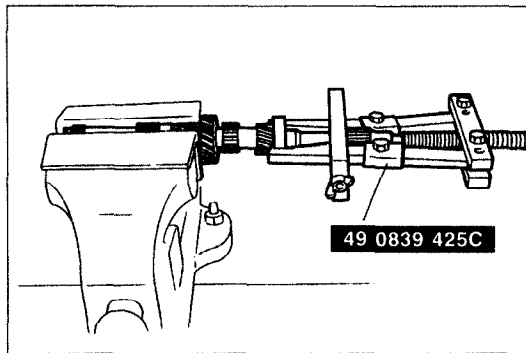
03U0J1-042

Clutch hub assembly (3rd/4th), synchronizer ring (3rd) and 3rd gear

Caution

- Hold the shaft with one hand so that it does not fall.

1. Remove the retaining ring.
2. Remove the clutch hub assembly (3rd/4th), synchronizer ring (3rd) and 3rd gear with the **SST**.



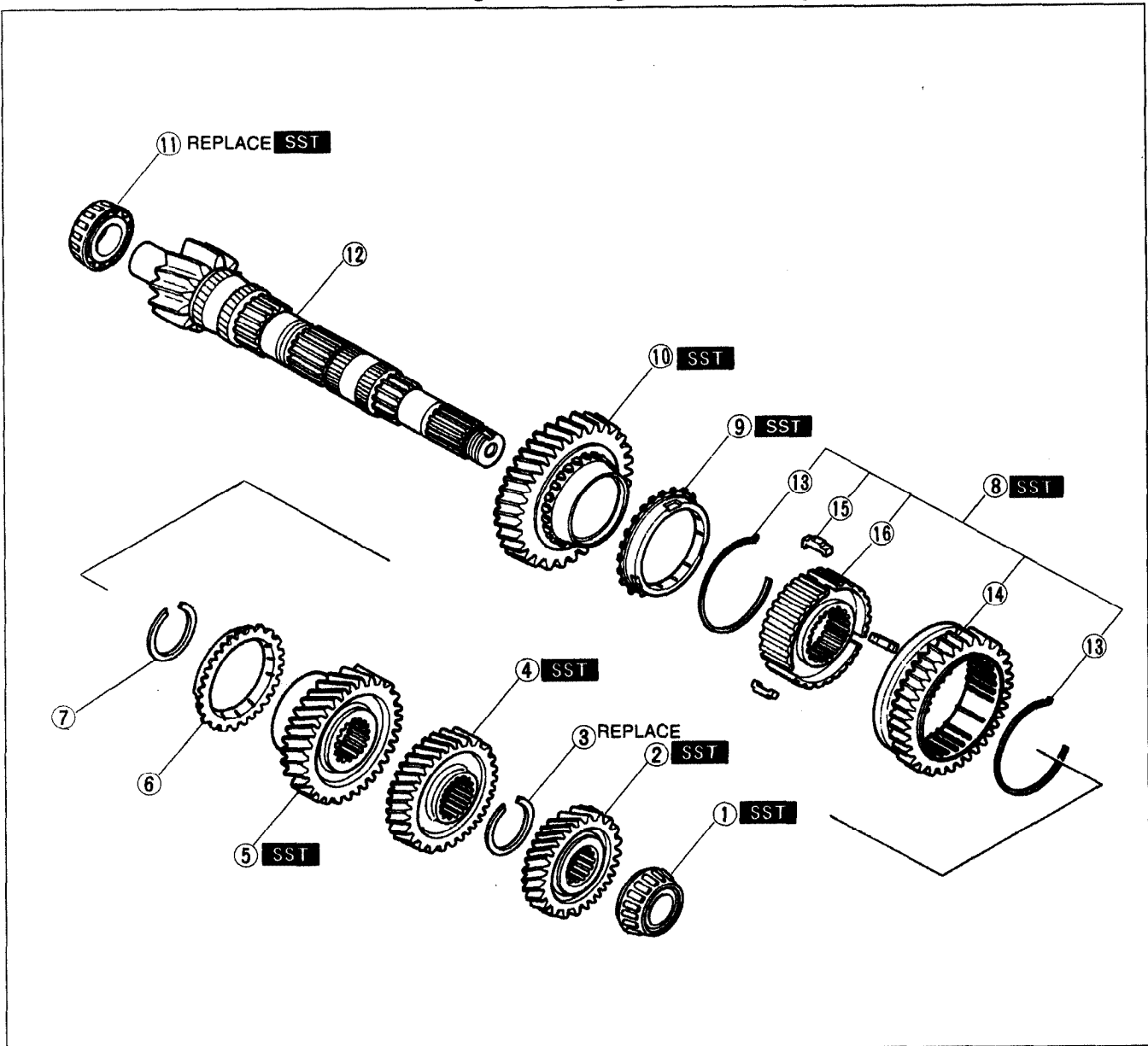
03U0J1-043

Bearing

1. Remove the bearing with the **SST**.

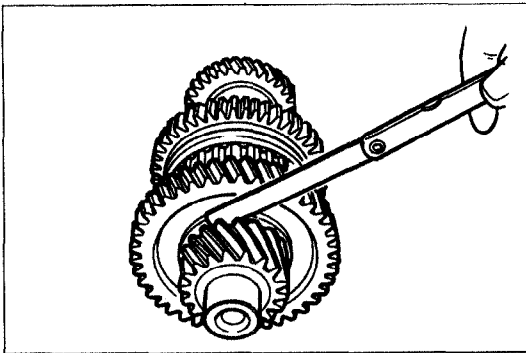
Secondary Shaft Assembly

1. Measure the thrust clearance of 1st gear and 2nd gear, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



23U0J1-005

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Bearing inner race
Disassembly Note..... page J1-25 2. Secondary 4th gear
Disassembly Note..... page J1-25 3. Retaining ring 4. Secondary 3rd gear
Disassembly Note..... page J1-25 5. 2nd gear
Disassembly Note..... page J1-25
Inspection..... page J1-29 6. Synchronizer ring (2nd)
Inspection..... page J1-27 7. Retaining ring 8. Clutch hub assembly (1st/2nd)
Disassembly Note..... page J1-25
Inspection..... page J1-29 | <ol style="list-style-type: none"> 9. Synchronizer ring (1st)
Disassembly Note..... page J1-25
Inspection..... page J1-27 10. 1st gear
Disassembly Note..... page J1-25
Inspection..... page J1-29 11. Bearing inner race
Disassembly Note..... page J1-26 12. Secondary shaft
Inspection..... page J1-28 13. Synchronizer spring 14. Clutch hub sleeve 15. Synchronizer key 16. Clutch hub |
|--|---|



03U0J1-045

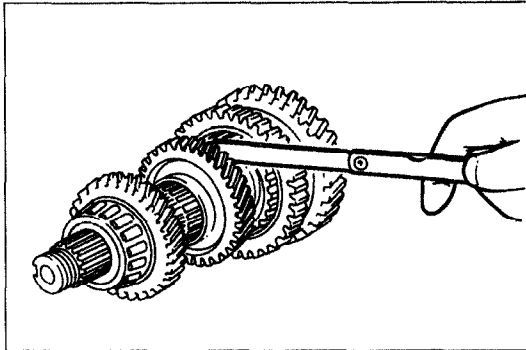
Preinspection

1st gear thrust clearance

1. Measure the clearance between 1st gear and the differential drive gear.

Clearance: 0.05—0.28mm (0.002—0.011 in)
Maximum: 0.33mm (0.013 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 1st gear, differential drive gear of the secondary shaft gear, and clutch hub assembly (1st/2nd). Replace worn or damaged parts.



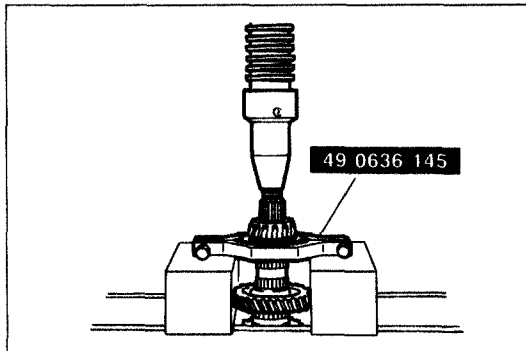
03U0J1-046

2nd gear thrust clearance

1. Measure the clearance between 2nd gear and secondary 3rd gear.

Clearance: 0.18—0.51mm (0.007—0.020 in)
Maximum: 0.56mm (0.022 in)

2. If the clearance exceeds the maximum, check the contact surfaces of the 2nd gear, secondary 3rd gear, and clutch hub assembly (1st/2nd). Replace worn or damaged parts.



03U0J1-047

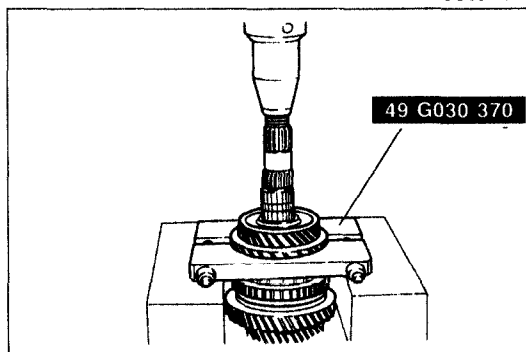
Disassembly note

Bearing inner race and secondary 4th gear

Caution

- Hold the shaft with one hand so that it does not fall.

1. Remove the bearing inner race and secondary 4th gear with the **SST**.



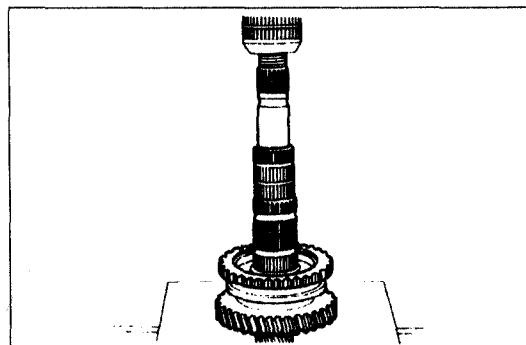
03U0J1-048

Secondary 3rd gear and 2nd gear

Caution

- Hold the shaft with one hand so that it does not fall.

1. Remove the retaining ring.
2. Remove the secondary 3rd gear and 2nd gear with the **SST**.



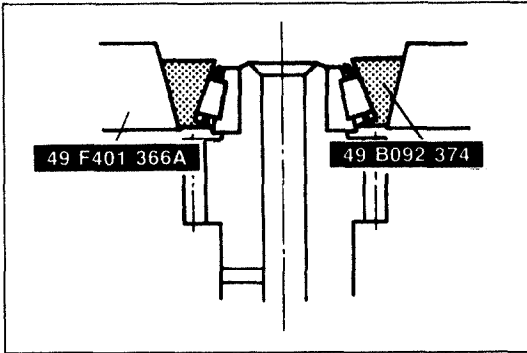
03U0J1-049

Clutch hub assembly (1st/2nd), synchronizer ring (1st) and 1st gear

Caution

- Hold the shaft with one hand so that it does not fall.

1. Remove the clutch hub assembly (1st/2nd), synchronizer ring (1st) and 1st gear with the **SST**.



03U0J1-050

Bearing inner race (Secondary shaft end)

Caution

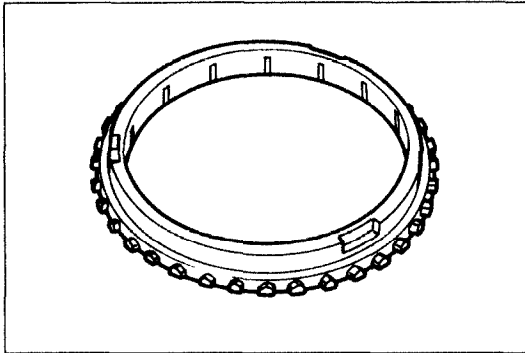
- Hold the shaft with one hand so that it does not fall.

1. Remove the bearing inner race with the **SST**.

INSPECTION

Inspect all parts and repair or replace as necessary.

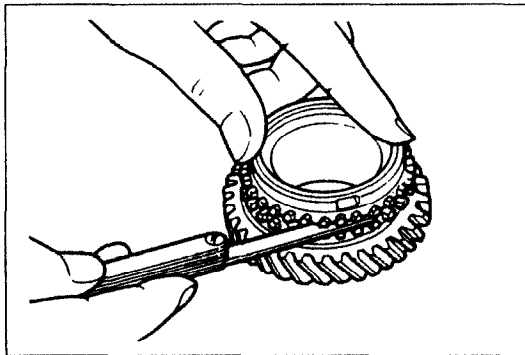
03U0J1-051



03U0J1-052

Synchronizer Ring

1. Inspect individual synchronizer ring teeth for damage, wear, cracks.
2. Inspect taper surface for wear or cracks.



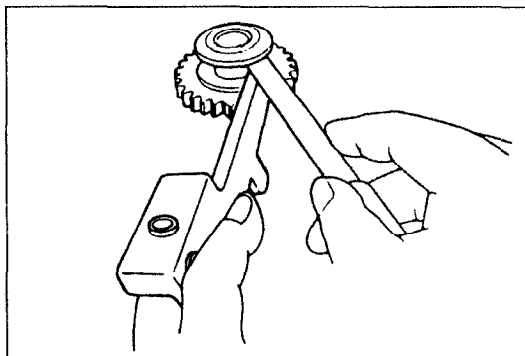
03U0J1-053

Note

- Set the synchronizer ring squarely in the gear; then measure around the circumference.

3. Measure the clearance between the synchronizer ring and flank surface of the gear.

Standard clearance: 1.12—1.88mm (0.044—0.074 in)
Minimum: 0.8mm (0.032 in)

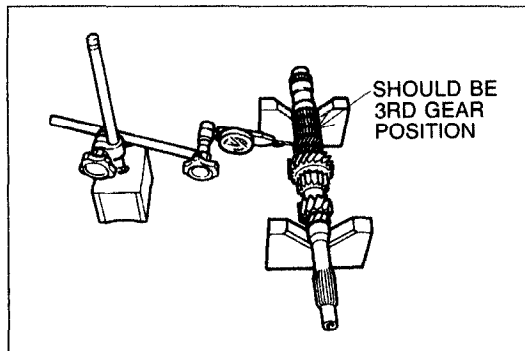


03U0J1-054

Reverse Idler Gear and Reverse Lever

1. Inspect gear teeth for damage, wear, and cracks.
2. Measure the clearance between the reverse idler gear bushing and the reverse lever.

Standard clearance: 0.10—0.32mm (0.004—0.013 in)
Maximum: 0.37mm (0.015 in)



13U0J1-006

Primary Shaft

Note

- If the shaft gear is replaced, adjust the bearing preload. (Refer to page J1-37.)

1. Inspect the shaft gear runout.

Maximum runout: 0.05mm (0.002 in)

2. Inspect the splines for damage and wear.
3. Inspect the gear teeth for damage, wear, and cracks.

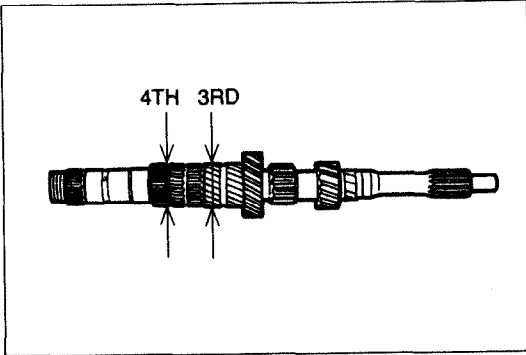
3rd Gear, 4th Gear, 5th Gear, and Gear Sleeve (5th gear)

1. Measure the clearance between the shaft gears and gears.

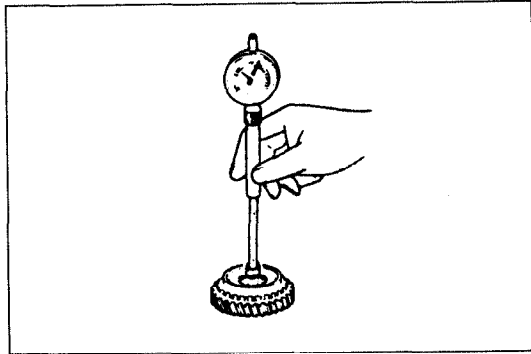
Oil Clearance

mm (in)

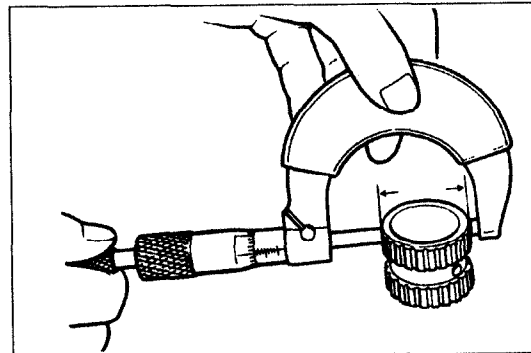
	Shaft (A) (outer diameter)	Gear (B) (inner diameter)	Sleeve (C) (outer diameter)	Oil (D) Clearance
3rd Gear	35.15—35.17 (1.384—1.385)	35.20—35.22 (1.386—1.387)	—	(D) = (B) - (A) 0.03—0.07 (0.001—0.003)
4th Gear	31.95—31.97 (1.258—1.259)	32.00—32.02 (1.260—1.261)	—	(D) = (B) - (A) 0.03—0.07 (0.001—0.003)
5th Gear	—	34.00—34.02 (1.338—1.339)	33.94—33.97 (1.336—1.337)	(D) = (B) - (C) 0.03—0.08 (0.001—0.003)



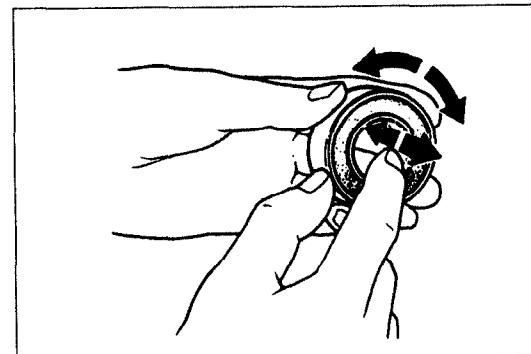
03U0J1-057



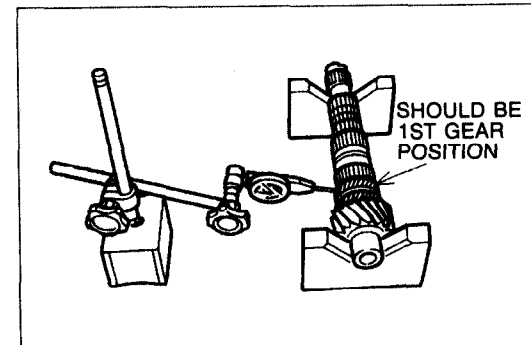
03U0J1-058



03U0J1-059



9MU0JX-063



03U0J1-060

2. Inspect the synchronizer cones for wear.
3. Inspect the gear teeth for damage, wear, and cracks.

Bearing

1. Inspect for damage or rough rotation.

Secondary Shaft

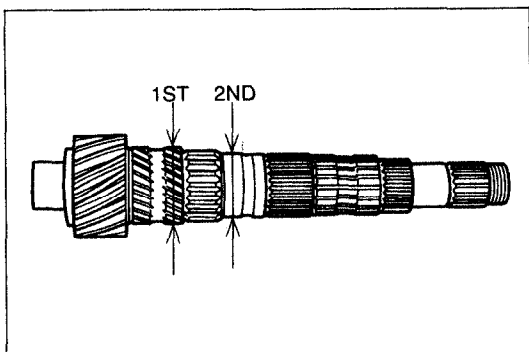
Note

- If the shaft gear is replaced, adjust the bearing preload. (Refer to page J1-37.)

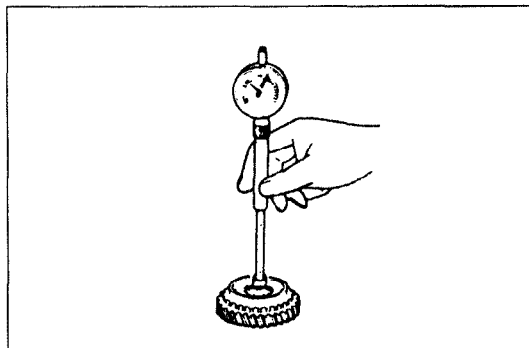
1. Inspect the shaft gear runout.

Maximum runout: 0.015mm (0.001 in)

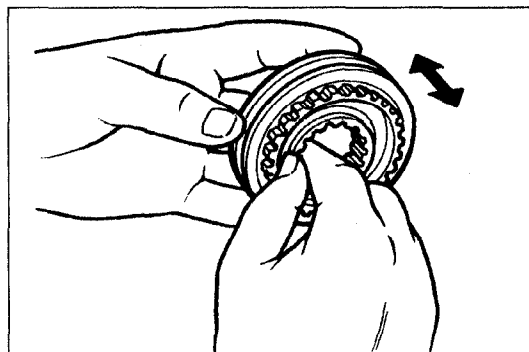
2. Inspect the gear teeth for damage, wear, and cracks.



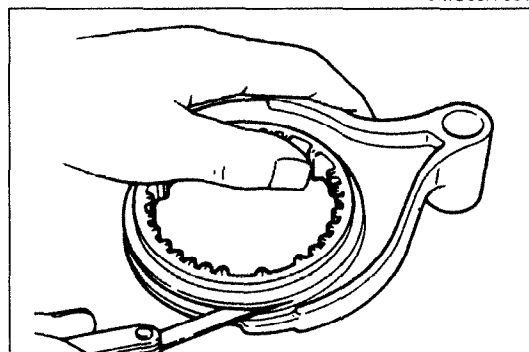
03U0J1-061



03U0J1-062



9MU0JX-059



03U0J1-055

1st Gear and 2nd Gear

1. Measure the clearance between the shaft gears and the gears.

Oil Clearance

mm (in)

	Shaft (A) (outer diameter)	Gear (B) (inner diameter)	Sleeve (C) (outer diameter)	Oil (D) Clearance
1st Gear	39.45—39.47 (1.553—1.554)	39.50—39.52 (1.555—1.556)	—	(D) = (B) - (A) 0.03—0.07 (0.001—0.003)
2nd Gear	35.15—35.17 (1.384—1.385)	35.20—35.22 (1.386—1.387)	—	(D) = (B) - (A) 0.03—0.07 (0.001—0.003)

2. Inspect the synchronizer cones for wear.
3. Inspect the gear teeth for damage, wear, and cracks.

Clutch hub assembly

1. Inspect the clutch hub sleeve and hub operation.
2. Inspect the individual gear teeth for damage, wear, and cracks.
3. Inspect the synchronizer key for damage, wear, and cracks.

4. Measure the clearance between the hub sleeve and the shift fork.

mm (in)

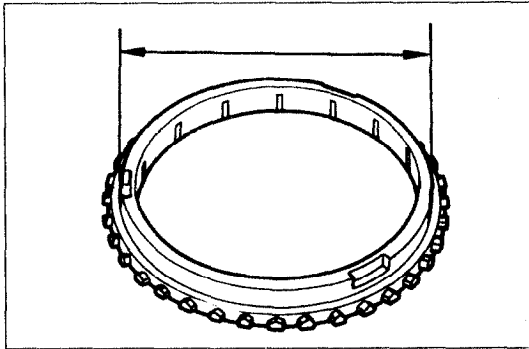
	Standard clearance	Maximum
1st/2nd	0.10—0.36 (0.004—0.014)	0.86 (0.034)
3rd/4th	0.20—0.50 (0.008—0.020)	1.00 (0.039)
5th	0.40—0.75 (0.016—0.030)	1.25 (0.049)

ASSEMBLY

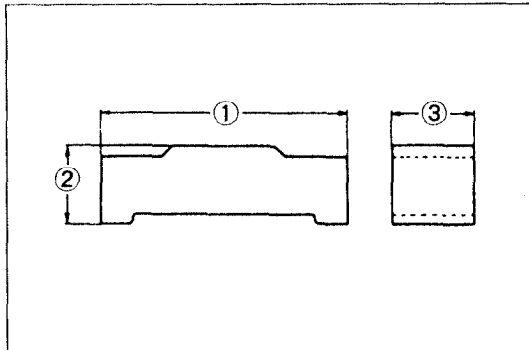
Precaution

1. All O-rings and gaskets must be replaced with the new ones included in the overhaul kit.
2. Verify that all parts are completely clean before assembly.
3. Assemble parts within 10 minutes after applying sealant.
Allow all sealant to cure at least 30 minutes after assembly before filling the transaxle with transaxle oil.
4. The bearing outer race and bearing inner race must be replaced as a unit.

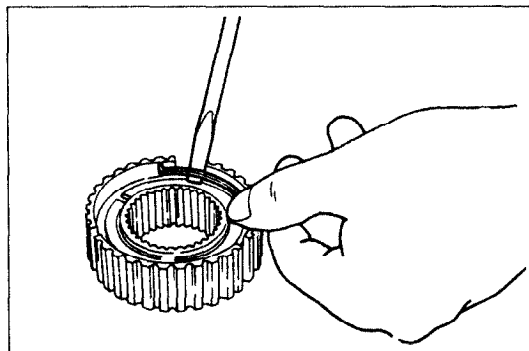
03U0J1-063



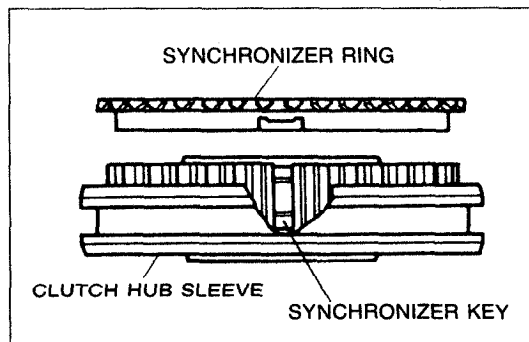
03U0J1-064



03U0J1-065



03U0J1-066



03U0J1-067

Clutch hub assembly

Note

- Synchronizer ring diameters are as follows.

mm (in)

1st and 2nd	61.7 (2.429)
3rd and 4th	61.7 (2.429)
5th	49.7 (1.957)

- Synchronizer key dimensions are as follows.

mm (in)

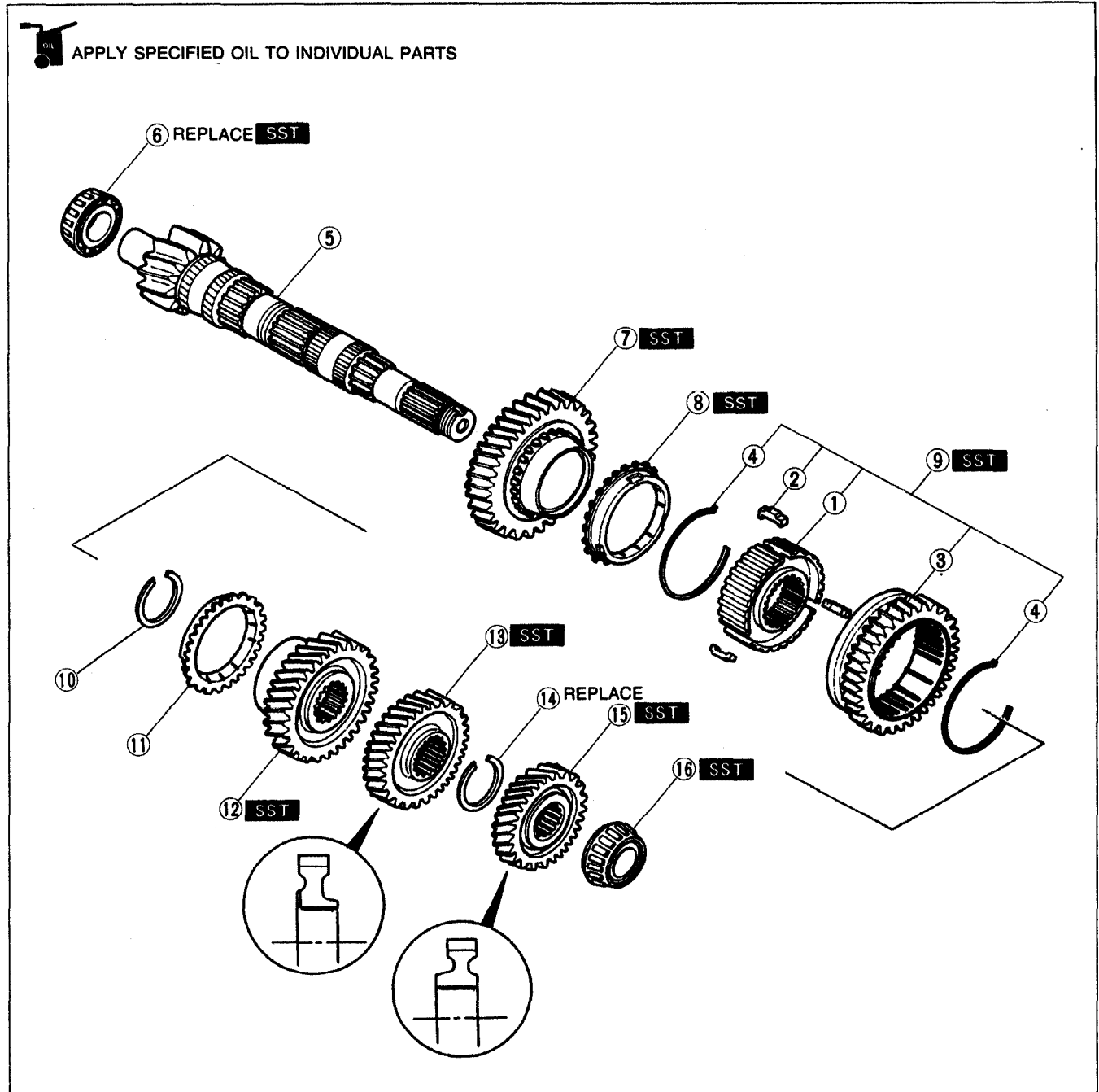
	①	②	③
1st/2nd	19.00 (0.748)	4.25 (0.167)	5.00 (0.197)
3rd/4th	17.00 (0.669)	4.25 (0.167)	5.00 (0.197)
5th	17.00 (0.669)	5.55 (0.219)	5.00 (0.197)

1. Install the synchronizer key springs in the clutch hub with the hooks in the grooves to hold the three synchronizer keys in place.

2. Align the synchronizer ring grooves with the synchronizer key during assembly.

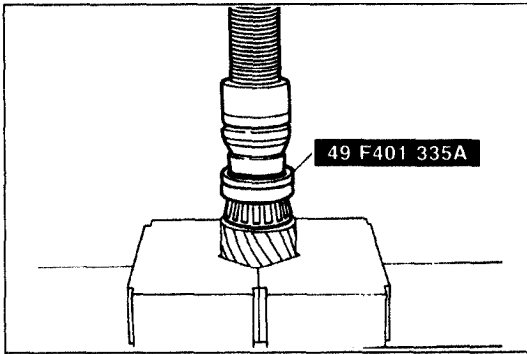
Secondary Shaft Assembly

1. Assemble in the order shown in the figure, referring to **Assembly Note**.



23U0J1-006

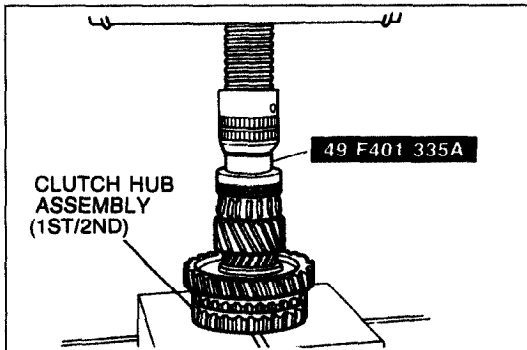
- | | |
|---|--|
| 1. Clutch hub | 10. Retaining ring |
| 2. Synchronizer key | 11. Synchronizer ring (2nd)
Assembly Note..... page J1-32 |
| 3. Clutch hub sleeve | 12. 2nd gear
Assembly Note..... page J1-32 |
| 4. Synchronizer spring | 13. Secondary 3rd gear
Assembly Note..... page J1-32 |
| 5. Secondary shaft | 14. Retaining ring |
| 6. Bearing inner race
Assembly Note..... page J1-32 | 15. Secondary 4th gear
Assembly Note..... page J1-32 |
| 7. 1st gear
Assembly Note..... page J1-32 | 16. Bearing inner race
Assembly Note..... page J1-32 |
| 8. Synchronizer ring (1st)
Assembly Note..... page J1-32 | |
| 9. Clutch hub assembly (1st/2nd)
Assembly Note..... page J1-32 | |



03U0J1-069

Assembly note Bearing inner race

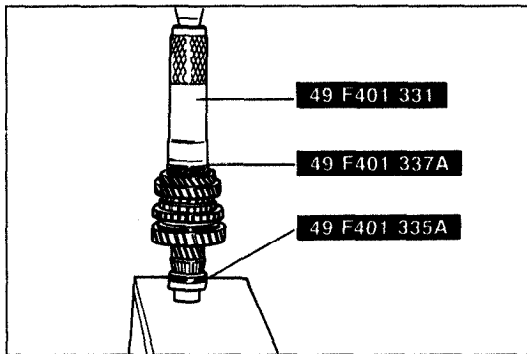
1. Install the new bearing inner race with the **SST**.



03U0J1-070

1st gear, synchronizer ring (1st) and clutch hub assembly (1st/2nd)

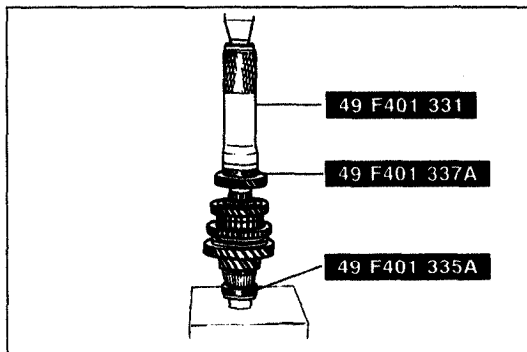
1. Install the 1st gear, synchronizer ring (1st) and clutch hub assembly (1st/2nd) with the **SST**.



03U0J1-071

Synchronizer ring (2nd), 2nd gear, and secondary 3rd gear

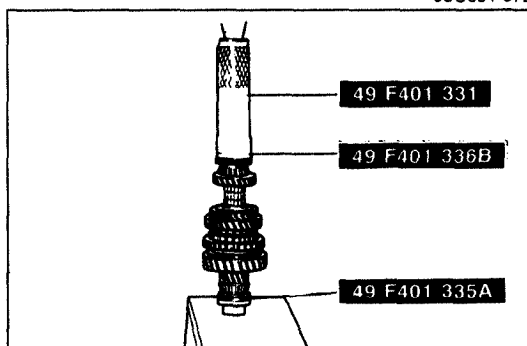
1. Install the synchronizer ring (2nd), 2nd gear, and secondary 3rd gear with the **SST**.



03U0J1-072

Secondary 4th gear

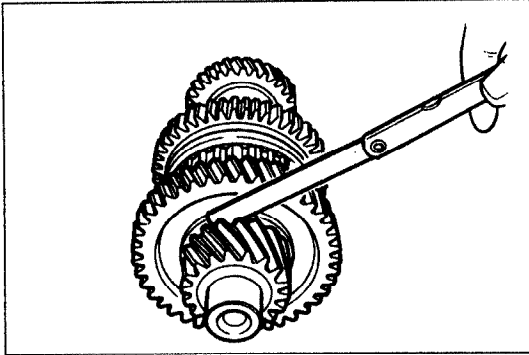
1. Install the secondary 4th gear with the **SST**.



03U0J1-073

Bearing inner race (4th gear)

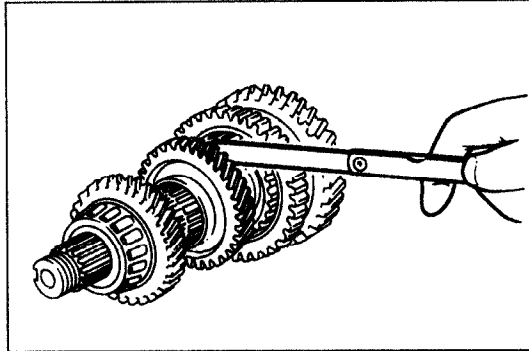
1. Install the new bearing inner race with the **SST**.



03U0J1-074

2. Measure the clearance between 1st gear and the differential drive gear.

Clearance: 0.05—0.28mm (0.002—0.011 in)
Maximum: 0.33mm (0.013 in)



03U0J1-075

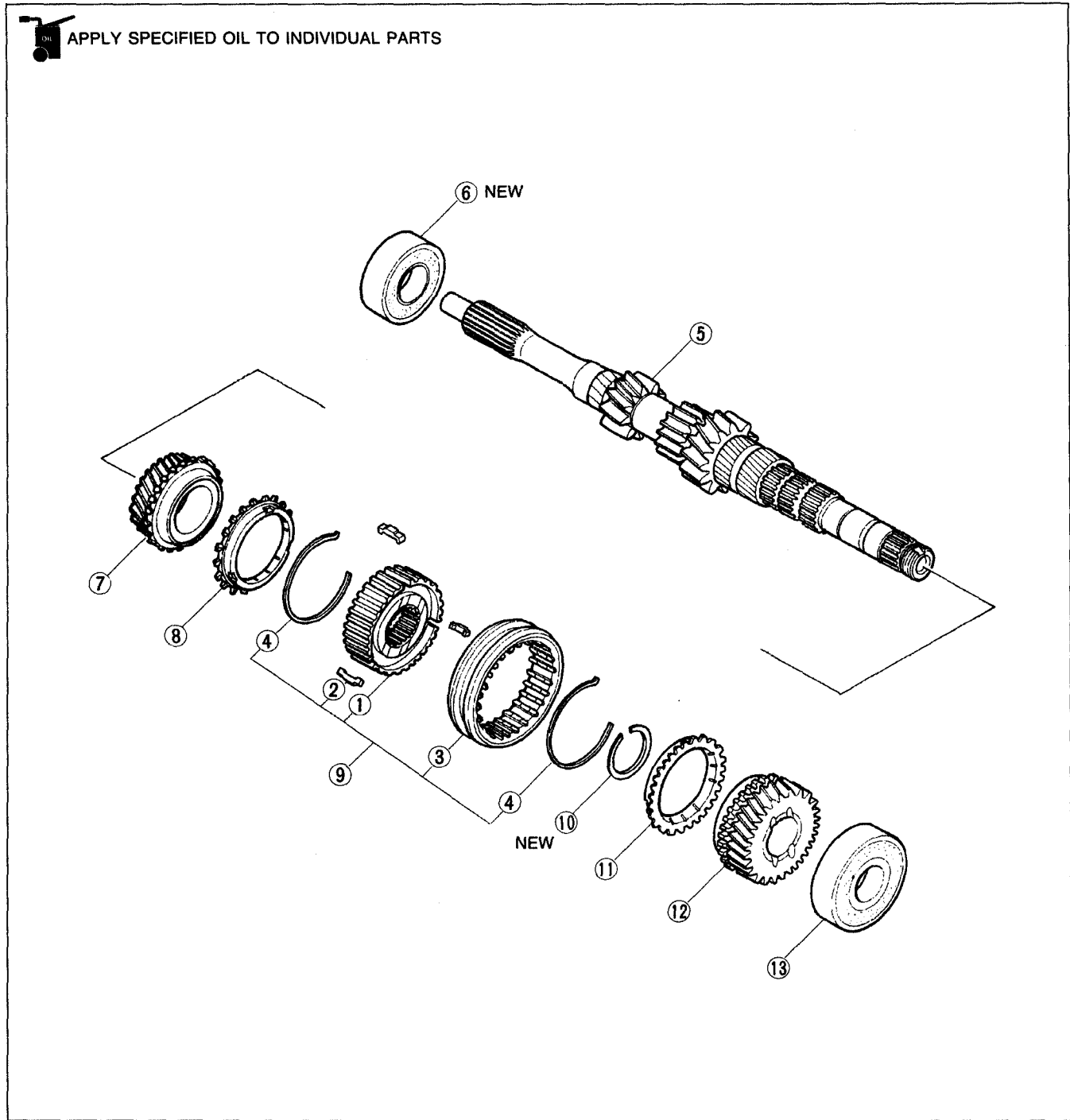
3. Measure the clearance between 2nd gear and the secondary 3rd gear.

Clearance: 0.18—0.51mm (0.007—0.020 in)
Maximum: 0.56mm (0.022 in)

4. If not as specified, reassemble the secondary shaft assembly.

Primary Shaft Assembly

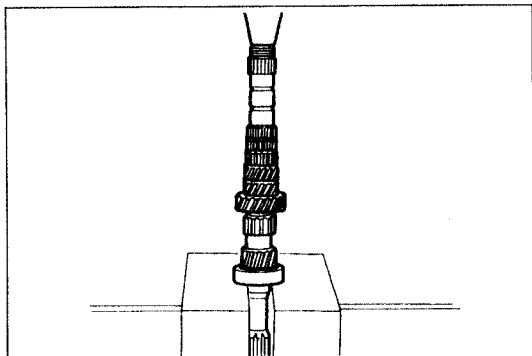
1. Assemble in the order shown in the figure, referring to **Assembly Note**.



23U0J1-007

- 1. Clutch hub
- 2. Synchronizer key
- 3. Clutch hub sleeve
- 4. Synchronizer spring
- 5. Primary shaft
- 6. Bearing
Assembly Note..... page J1-35
- 7. 3rd gear
Assembly Note..... page J1-35
- 8. Synchronizer ring (3rd)
Assembly Note..... page J1-35

- 9. Clutch hub assembly (3rd/4th)
Assembly Note..... page J1-35
- 10. Retaining ring
- 11. Synchronizer ring (4th)
Assembly Note..... page J1-35
- 12. 4th gear
Assembly Note..... page J1-35
- 13. Bearing
Assembly Note..... page J1-35

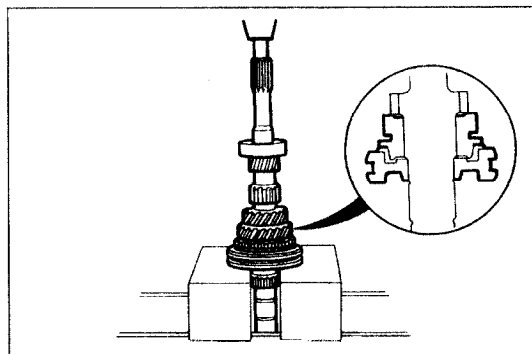


03U0J1-077

Assembly note

Bearing

1. Install the bearing with a press.



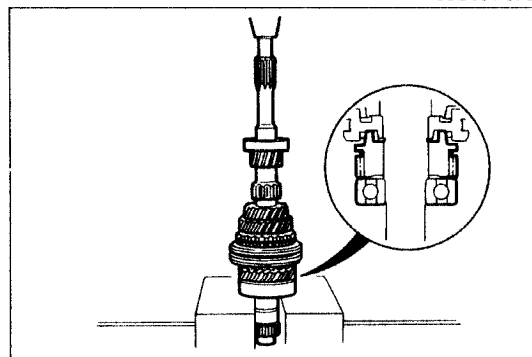
03U0J1-078

3rd gear, synchronizer ring (3rd), and clutch hub assembly (3rd/4th)

Caution

- Apply transaxle oil to the bore of 3rd gear.

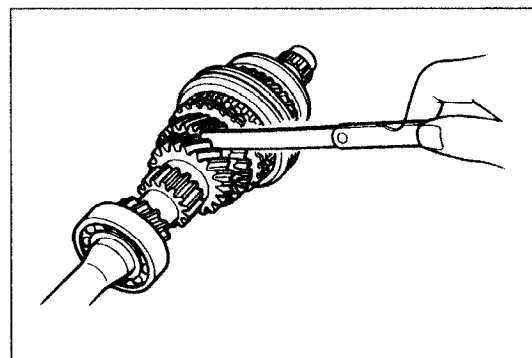
1. Turn the primary shaft over and install the 3rd gear, synchronizer ring (3rd), and clutch hub assembly (3rd/4th) with a press.



03U0J1-079

Synchronizer ring (4th), 4th gear, and bearing

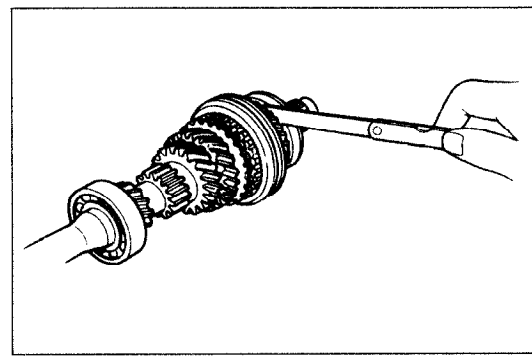
1. Install the retaining ring.
2. Install the synchronizer ring (4th), 4th gear, and ball bearing with a press.



03U0J1-080

3. Measure the clearance between 3rd gear and 2nd gear.

Clearance: 0.06—0.21mm (0.002—0.008 in)
Maximum: 0.26mm (0.010 in)



03U0J1-081

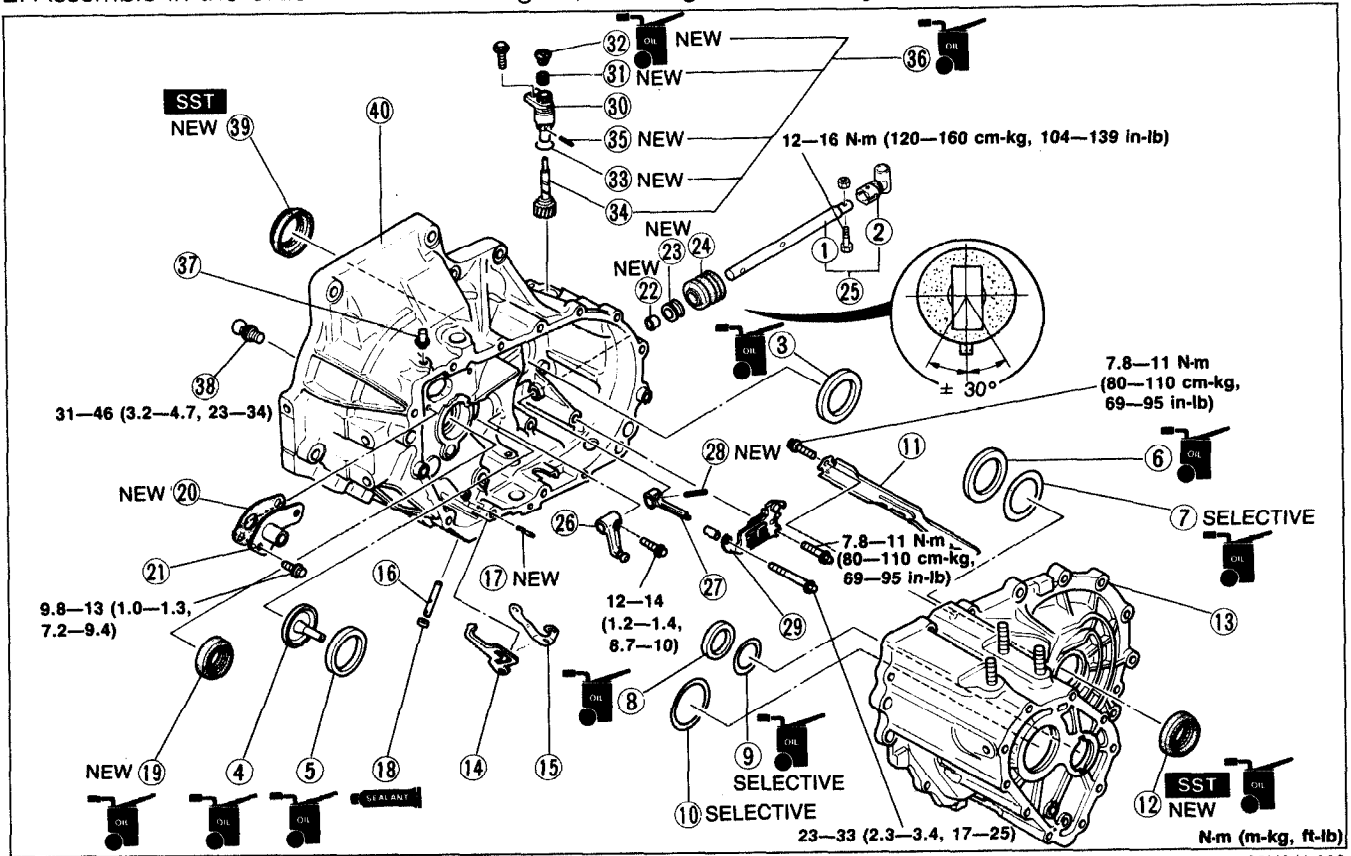
4. Measure the clearance between 4th gear and the ball bearing.

Clearance: 0.21—0.61mm (0.008—0.024 in)
Maximum: 0.66mm (0.026 in)

5. If not as specified, reassemble the primary shaft assembly.

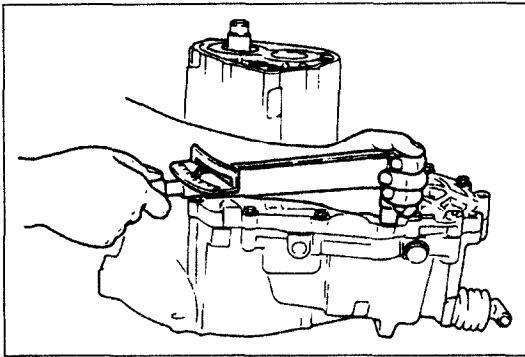
Clutch Housing and Transaxle Case Components

1. Select the adjust shim(s), referring to **Shim selection**.
2. Assemble in the order shown in the figure, referring to **Assembly Note**.



23U0J1-008

- | | | |
|-------------------------------|-----------------------------------|-----------------------------|
| 1. Change rod | 11. Oil passage | 29. Guide plate assembly |
| 2. Joint | 12. Oil seal (Differential) | 30. Gear case |
| 3. Bearing outer race | Assembly Note | 31. Oil seal |
| 4. Funnel | page J1-41 | (Speedometer gear case) |
| Assembly Note | 13. Transaxle case | Assembly Note |
| page J1-42 | 14. Reverse lever | page J1-41 |
| 5. Bearing outer race | 15. Lever set spring | 32. Packing |
| Assembly Note | 16. Reverse lever shaft | 33. O-ring |
| page J1-42 | 17. Roll pin | 34. Drive gear |
| 6. Bearing outer race | 18. Blind plug | 35. Roll pin |
| (Differential) | 19. Oil seal (Primary shaft gear) | (Speedometer driven gear |
| Assembly Note | Assembly Note | assembly) |
| page J1-41 | page J1-42 | Assembly Note |
| 7. Adjust shim (Differential) | 20. Gasket | page J1-41 |
| Assembly Note | 21. Bleeder cover | 36. Speedometer driven gear |
| page J1-41 | 22. Bushing | assembly |
| 8. Bearing outer race | 23. Oil seal (Change rod) | 37. Bleeder |
| (Secondary shaft gear) | Assembly Note | 38. Pivot |
| Assembly Note | page J1-42 | 39. Oil seal (Differential) |
| page J1-41 | 24. Boot | Assembly Note |
| 9. Adjust shim | Assembly Note | page J1-41 |
| (Secondary shaft gear) | page J1-42 | 40. Clutch housing |
| Assembly Note | 25. Change rod | |
| page J1-41 | Assembly Note | |
| 10. Adjust shim | page J1-42 | |
| (Primary shaft gear) | 26. Change arm | |
| Assembly Note | 27. Selector | |
| page J1-42 | 28. Roll pin | |



03U0J1-083

Shim selection

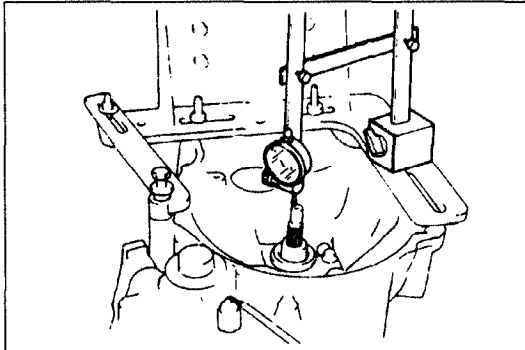
Adjust the bearing preload and select the shim(s) as follows.

Primary shaft assembly

1. Set the primary shaft assembly into the clutch housing.
2. Install the transaxle case to the clutch housing and tighten the bolts to the specified torque.

Tightening torque:

19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



03U0J1-084

3. Mount a dial indicator to the transaxle hanger and measure the primary shaft thrust clearance.

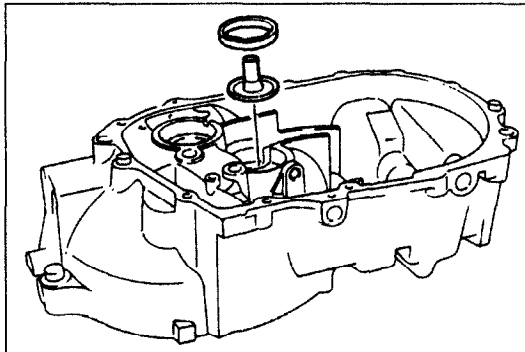
Clearance: 0.005—0.100mm (0.0002—0.0039 in)

4. Select the closest shim on the thin side from the table.

Adjustment shim thickness:

mm (in)

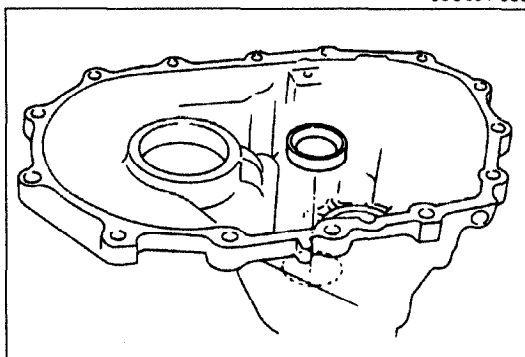
0.1 (0.004)	0.2 (0.008)	0.3 (0.012)	0.4 (0.016)
0.5 (0.020)	0.6 (0.024)		



03U0J1-085

Secondary shaft bearing preload

1. Install the funnel and bearing outer race into the clutch housing.
2. Set the secondary shaft into the clutch housing.



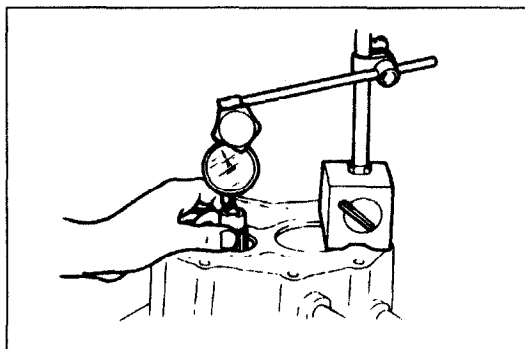
03U0J1-086

3. Install the secondary shaft bearing outer race into the transaxle case.

4. Install the transaxle case to the clutch housing and tighten the bolts to the specified torque.

Tightening torque:

19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



13U0J1-004

5. Mount a dial indicator to the transaxle case and measure the secondary shaft end play.

6. Select the shim as follows.

- (a) Add 0.03mm (0.0012 in) to the thrust clearance.
- (b) Add 0.08mm (0.0031 in) to the thrust clearance.
- (c) Select the thickest shim in the range from (a) to (b) from the table.

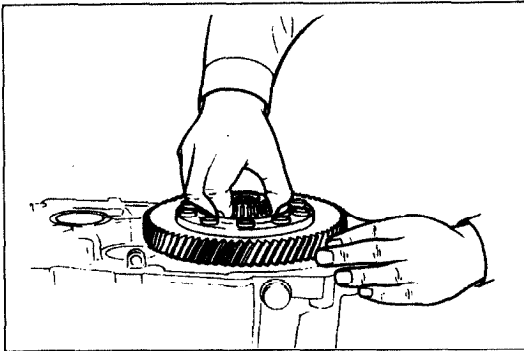
Example: 0.22mm (0.009 in)
 0.22mm (0.009 in) + 0.03mm (0.001 in)
 = 0.25mm (0.010 in)
 0.22mm (0.009 in) + 0.08mm (0.003 in)
 = 0.30mm (0.012 in)
Range: 0.25mm (0.010 in)—0.30mm (0.012 in)
Select the 0.30mm (0.012 in).

Adjustment shim thickness:

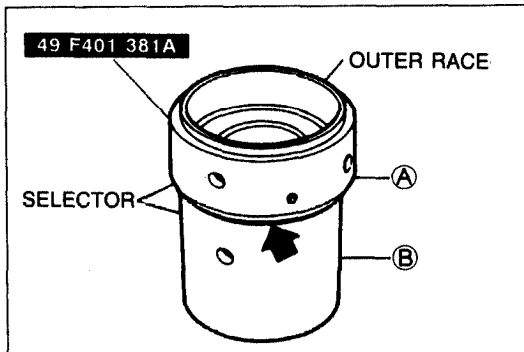
mm (in)

0.15 (0.006)	0.20 (0.008)	0.25 (0.010)	0.30 (0.012)
0.35 (0.014)	0.40 (0.016)	0.45 (0.018)	0.50 (0.020)

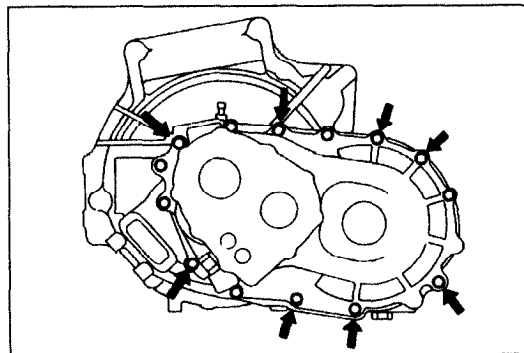
93G0J1-524



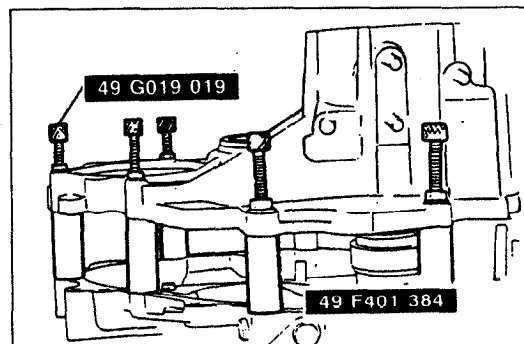
03U0J1-089



03U0J1-090



03U0J1-091



03U0J1-092

Differential

1. Install the bearing outer race into the clutch housing.
2. Set the differential assembly into the clutch housing.

Note

- Turn A and B until the gap shown in the figure is eliminated.

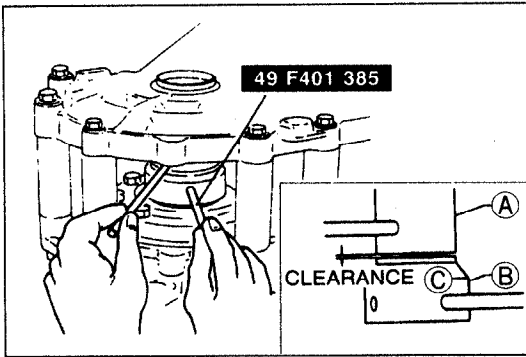
3. Install the transaxle case side bearing outer race to the **SST** (selector).

4. Set the **SST** (collars) in the positions shown in the figure.

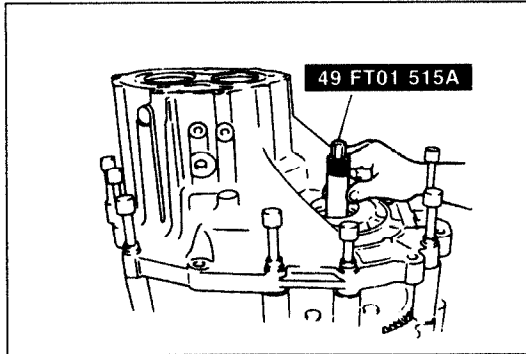
5. Tighten the **SST** (bolts) to the specified torque.

Tightening torque:

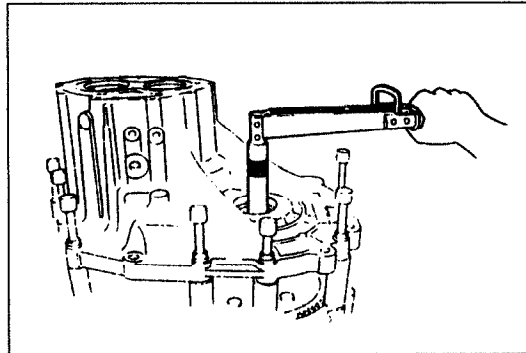
19—26 Nm (1.9—2.6 m·kg, 14—19 ft·lb)



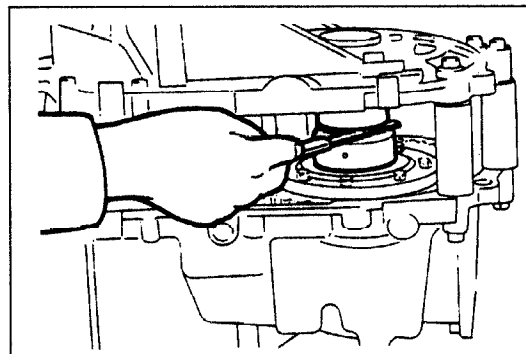
03U0J1-093



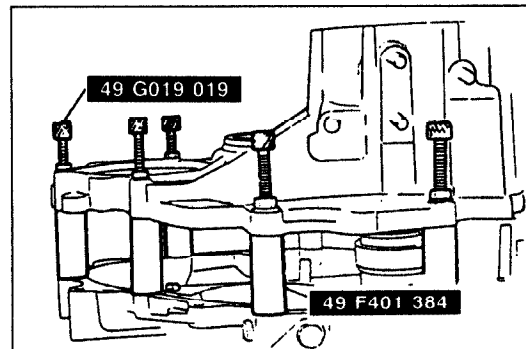
03U0J1-094



03U0J1-095



03U0J1-096



03U0J1-097

Note

- Turn the bars until the SST (selector) can no longer be moved.

- To seat the bearings, mount the bars on parts (A) and (B) of the selector, and turn the selector so the gap is widened.
- Turn in the reverse direction until the gap is eliminated.

- Install the SST to the differential pinion gear through the transaxle case.

- Turn the SST with a torque wrench. Adjust the SST (selector) with the bars until the specified preload is obtained.

Preload:

0.03—0.74 N·m (0.3—7.6 cm·kg, 0.26—6.60 in·lb)

- Remove the SST.

- Measure the clearance around the entire circumference of the SST (selector).
- Select the proper adjust shim(s) to be used for the differential by referring to the table and selecting the shim which is nearest (on the thick side) to the largest measured clearance in the selector.

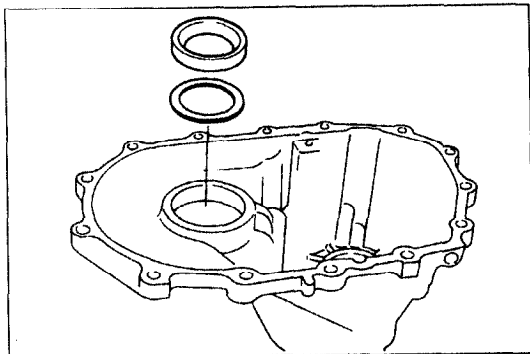
Adjust shim thickness:

mm (in)

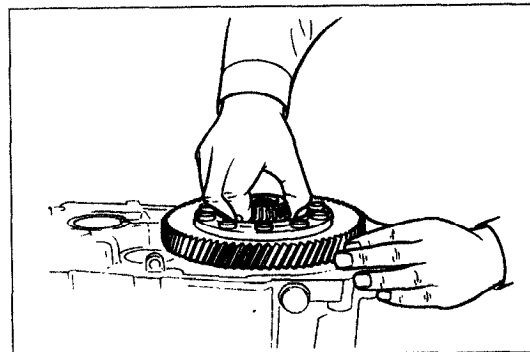
0.20 (0.008)	0.25 (0.010)	0.30 (0.012)	0.35 (0.014)
0.40 (0.016)	0.45 (0.018)	0.50 (0.020)	0.55 (0.022)

- Remove the SST (bolts).
- Remove the transaxle case and the SST (collars).

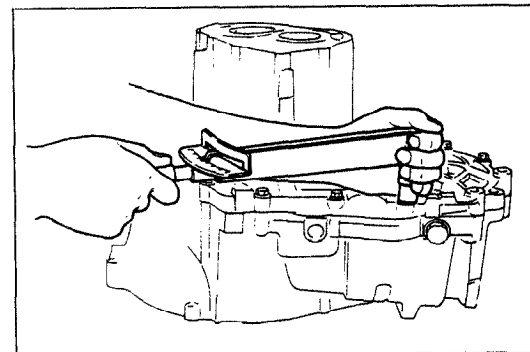
15. Remove the bearing outer race from the **SST** (selector).
16. Install the selected shim(s) and bearing outer race to the transaxle case.



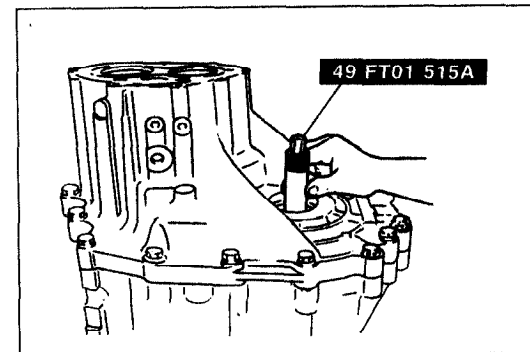
03U0J1-098



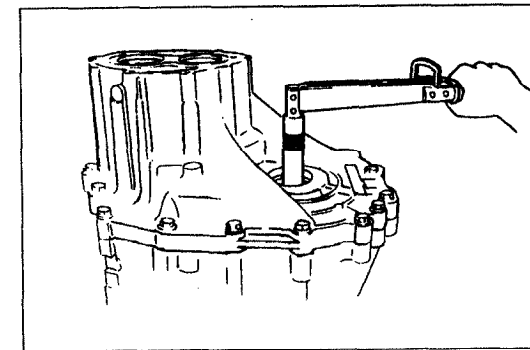
03U0J1-099



03U0J1-100



03U0J1-101



03U0J1-102

Bearing preload (Differential)

Measure the preload as follows.

1. Set the differential assembly into the clutch housing.

2. Install the transaxle case onto the clutch housing.

Tightening torque:

19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

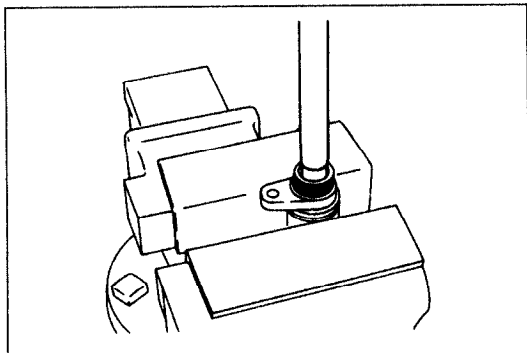
3. Install the **SST** to the differential side gear through the transaxle case.

4. Measure the bearing preload.

Preload:

0.03—0.74 N·m (0.3—7.6 cm·kg, 0.26—6.60 in·lb)

5. If not as specified, readjust the bearing preload.
6. Remove the **SST**.
7. Remove the transaxle case and differential assembly.

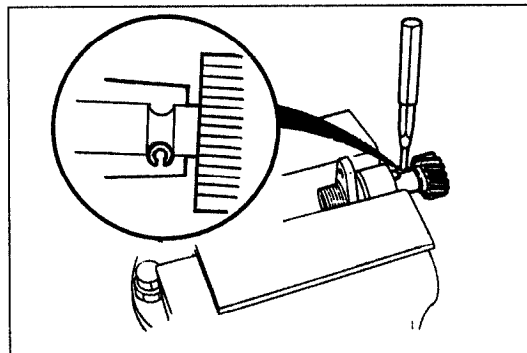


23U0J1-009

Assembly note**Oil seal (Speedometer gear case)**

1. Install the new oil seal with a suitable pipe.

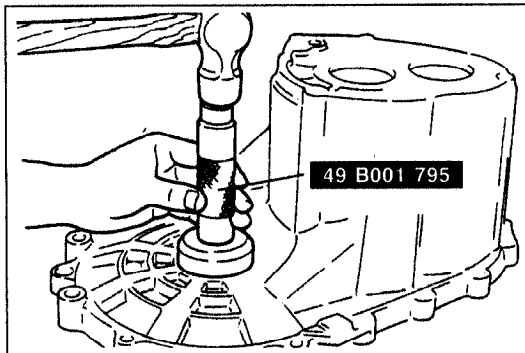
Pipe diameter: 15mm (0.591 in)



03U0J1-104

Roll pin (Speedometer driven gear assembly)

1. Install the new roll pin as shown in the figure.

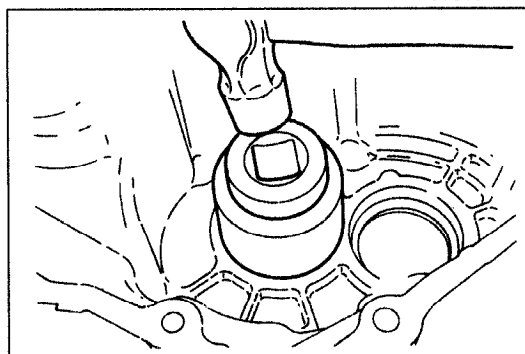


03U0J1-105

Oil seal (Differential)**Caution**

- Apply transaxle oil to the outer circumference of the oil seal.

1. Install the new oil seal with the **SST**.

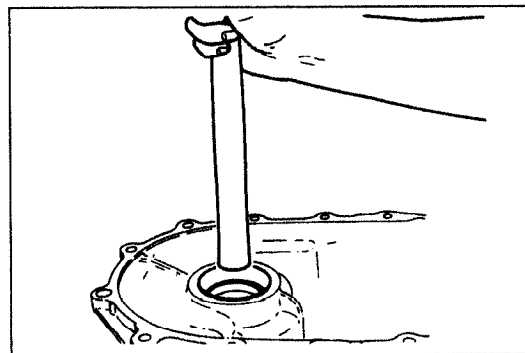


03U0J1-106

Adjust shim and bearing outer race (Secondary shaft gear)**Caution**

- Use adjust shim(s) selected during bearing preload adjustment.
- Apply transaxle oil to the bearing outer race.

1. Install the adjust shim(s) and the bearing outer race with a suitable pipe.

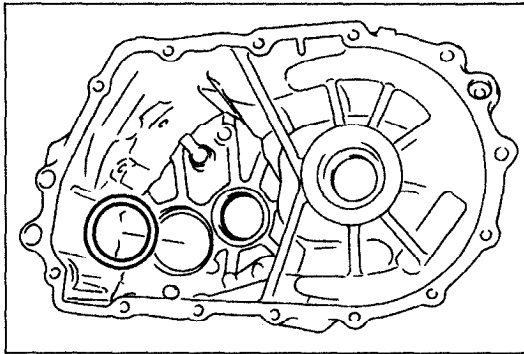


03U0J1-107

Adjust shim and bearing outer race (Differential)**Caution**

- Use adjust shim(s) selected during bearing preload adjustment.
- Apply transaxle oil to the bearing outer race.

1. Install the adjust shim(s) and the bearing outer race with a suitable pipe.



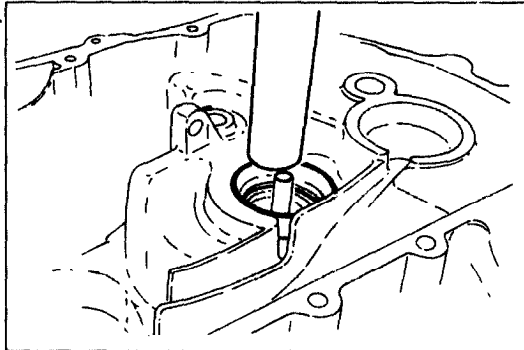
03U0J1-108

Adjust shim (Primary shaft gear)

Caution

- Use adjust shim(s) selected during bearing preload adjustment.

1. Apply transaxle oil to the adjust shim(s) and install it.



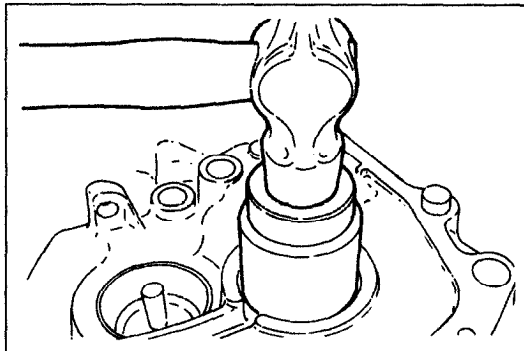
23U0J1-010

Funnel and bearing outer race

Caution

- Apply transaxle oil to the bearing outer race.

1. Install the funnel and the bearing outer race.



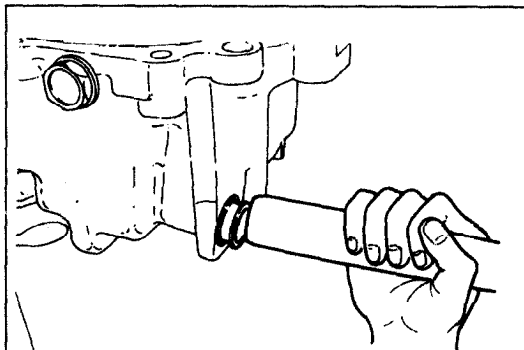
03U0J1-110

Oil seal (Primary shaft gear)

Caution

- Apply transaxle oil to outer circumference of the oil seal.

1. Install the new oil seal with a suitable pipe.



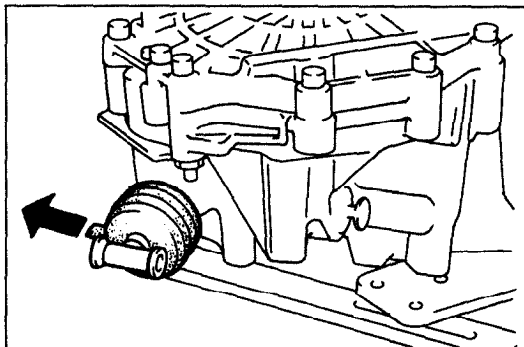
03U0J1-111

Oil seal (Change rod)

Caution

- Apply transaxle oil to the oil seal lip.

1. Install the oil seal.



03U0J1-112

Boot and change rod assembly

Caution

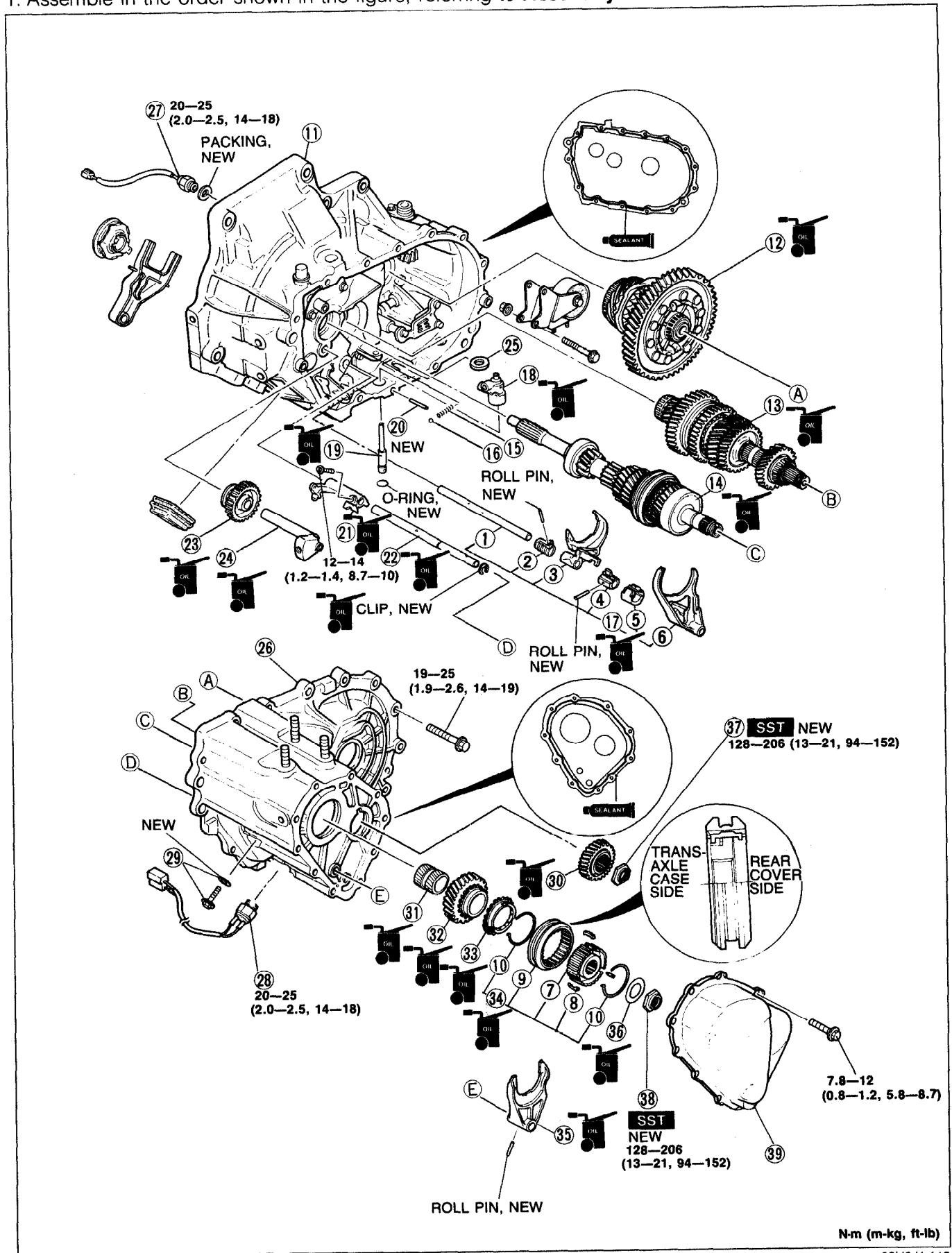
- Install the boot with the air bleed downward as shown in the figure.

1. Slide the boot onto the change rod assembly.
2. Install the change rod assembly into the clutch housing.

MEMO

5th/Reverse Gear and Housing Parts

1. Assemble in the order shown in the figure, referring to **Assembly Note**.

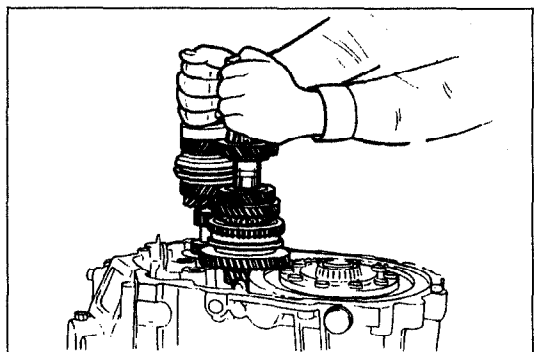


N-m (m-kg, ft-lb)

03U0J1-113

- 1. Control rod
- 2. Control end
- 3. 1st/2nd shift fork
- 4. Control lever
- 5. Interlock sleeve
- 6. 3rd/4th shift fork
- 7. Clutch hub
- 8. Synchronizer key
- 9. Clutch hub sleeve
- 10. Synchronizer spring
- 11. Clutch housing
- 12. Differential assembly
- 13. Secondary shaft gear assembly
 Assembly Note..... page J1-45
- 14. Primary shaft gear assembly
 Assembly Note..... page J1-45
- 15. Spring
- 16. Steel ball
- 17. Shift fork and shift rod assembly
 Assembly Note..... page J1-45
- 18. Crank lever assembly
 Assembly Note..... page J1-46
- 19. Crank lever shaft
 Assembly Note..... page J1-46
- 20. Pin
- 21. 5th shift rod end
 Assembly Note..... page J1-46
- 22. 5th shift rod
 Assembly Note..... page J1-46
- 23. Reverse idler gear
 Assembly Note..... page J1-46
- 24. Reverse idler shaft
 Assembly Note..... page J1-46
- 25. Magnet
- 26. Transaxle case assembly
 Assembly Note..... page J1-47
- 27. Neutral switch
- 28. Back-up light switch
- 29. Lock bolt and washer
- 30. Secondary 5th gear
- 31. Gear sleeve
- 32. 5th gear
- 33. Synchronizer ring (5th)
- 34. Clutch hub assembly (5th)
 Assembly Note..... page J1-47
- 35. 5th shift fork
 Assembly Note..... page J1-47
- 36. Stop plate
- 37. Locknut (Secondary shaft)
 Assembly Note..... page J1-47
- 38. Locknut (Primary shaft)
 Assembly Note..... page J1-47
- 39. Rear cover

13U0J1-005

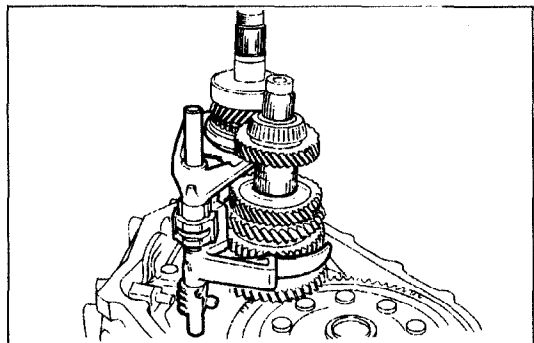


03U0J1-115

Assembly note

Primary shaft gear assembly and secondary shaft gear assembly

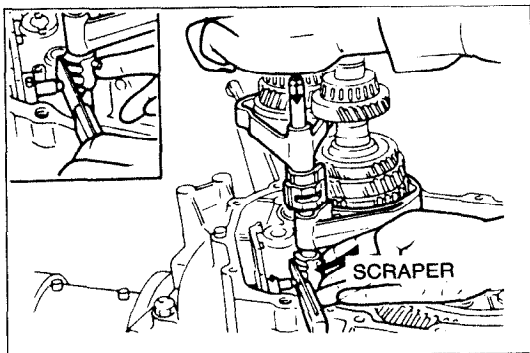
- 1. Install the primary shaft gear assembly and the secondary shaft gear assembly together.



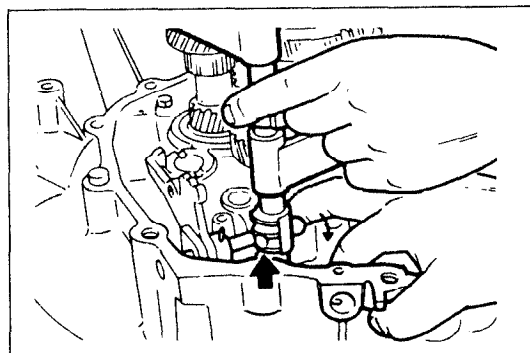
03U0J2-088

Shift fork and shift rod assembly

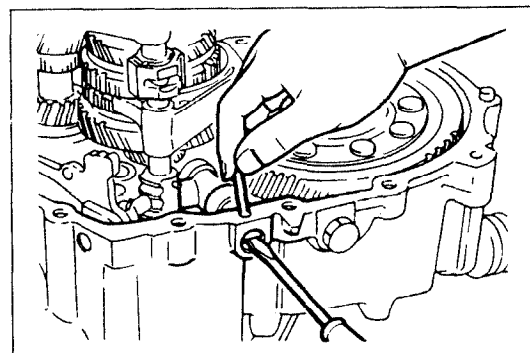
- 1. Shift to 2nd gear and position the shift fork and shift rod assembly as shown.



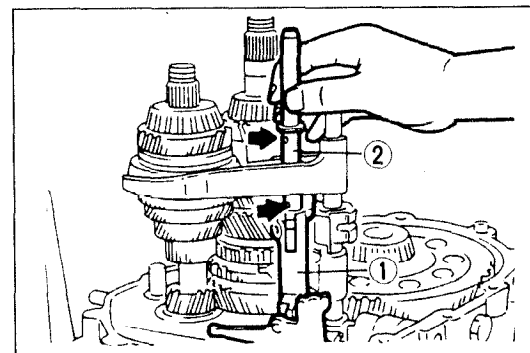
03U0J2-089



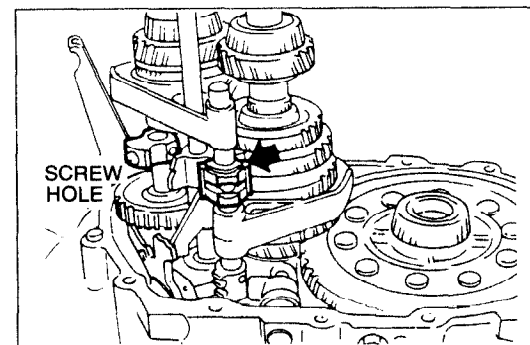
03U0J2-090



03U0J2-091



03U0J1-116



03U0J2-093

2. Insert the spring seat and spring into the reverse lever shaft, install the steel ball, and place a scraper so that it contacts the steel ball.
3. With the edge of the control end against the scraper, when the control end is pushed in the direction of the arrow in the figure so that the ball goes into the shaft, the rod will at the same time line up with the shift rod coupling hole in the clutch housing.
4. Set each clutch hub sleeve to the neutral position, and tap the shift rod from above so that the steel ball goes into the center groove (of the 3 grooves in the control end).
5. Pull the ball part of the control end forward so that the steel ball goes into the detent in the groove.

Crank lever assembly and crank lever shaft

Note

- Use a new O-ring for the crank lever shaft.

1. Fit the crank lever between the change arm and the control end, and connect the crank lever shaft to the crank lever.
2. Align the pin holes of the crank lever shaft and the clutch housing, and insert the new pin.

5th shift rod end and 5th shift rod

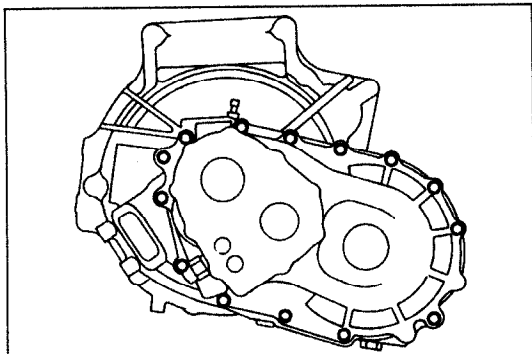
Note

- The mark (indicated by the arrow in the figure) and the shift rod end mounting bolt hole must be in the same direction.

1. Install the shift rod end (1) and the shift rod (2), and tighten the gate mounting bolt.

Reverse idler gear and reverse idler shaft

1. Install the reverse idler gear and the reverse idler shaft.
2. Attach the magnet to the clutch housing.
3. Align the end of the interlock sleeve with the control lever (indicated by the arrow), and, at the same time, face the reverse idler shaft screw hole in the direction shown in the figure.



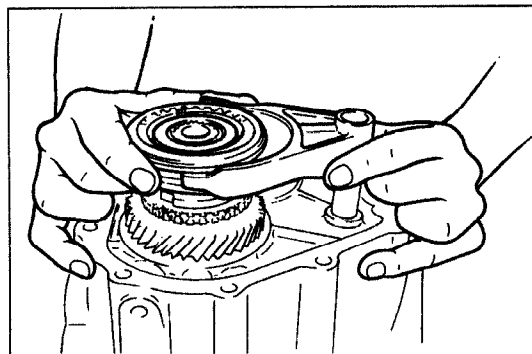
23U0J1-011

Transaxle case assembly

1. Apply a thin coat of sealant to the contact surfaces of the clutch housing and transaxle case, tighten the transaxle case installation bolts to the specified torque.

Tightening torque:

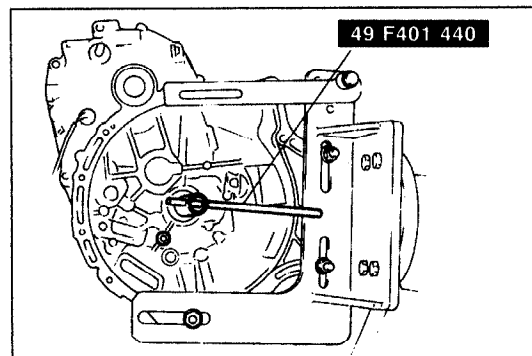
19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



03U0J1-117

Clutch hub assembly (5th) and 5th shift fork

1. Install the clutch hub assembly (5th) and the 5th shift fork together.



03U0J1-145

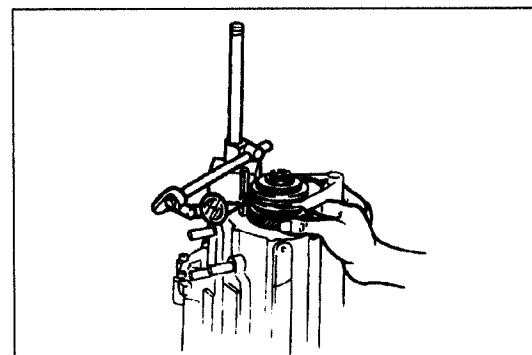
Locknut

1. Shift to 1st gear.
2. Lock the primary shaft with the **SST**.
3. Tighten new locknuts on the primary and secondary shafts.

Tightening torque:

128—206 N·m (13.0—21 m·kg, 94—152 ft·lb)

4. Stake the locknuts.



03U0J1-118

5. Measure the 5th gear thrust clearance with a dial indicator.

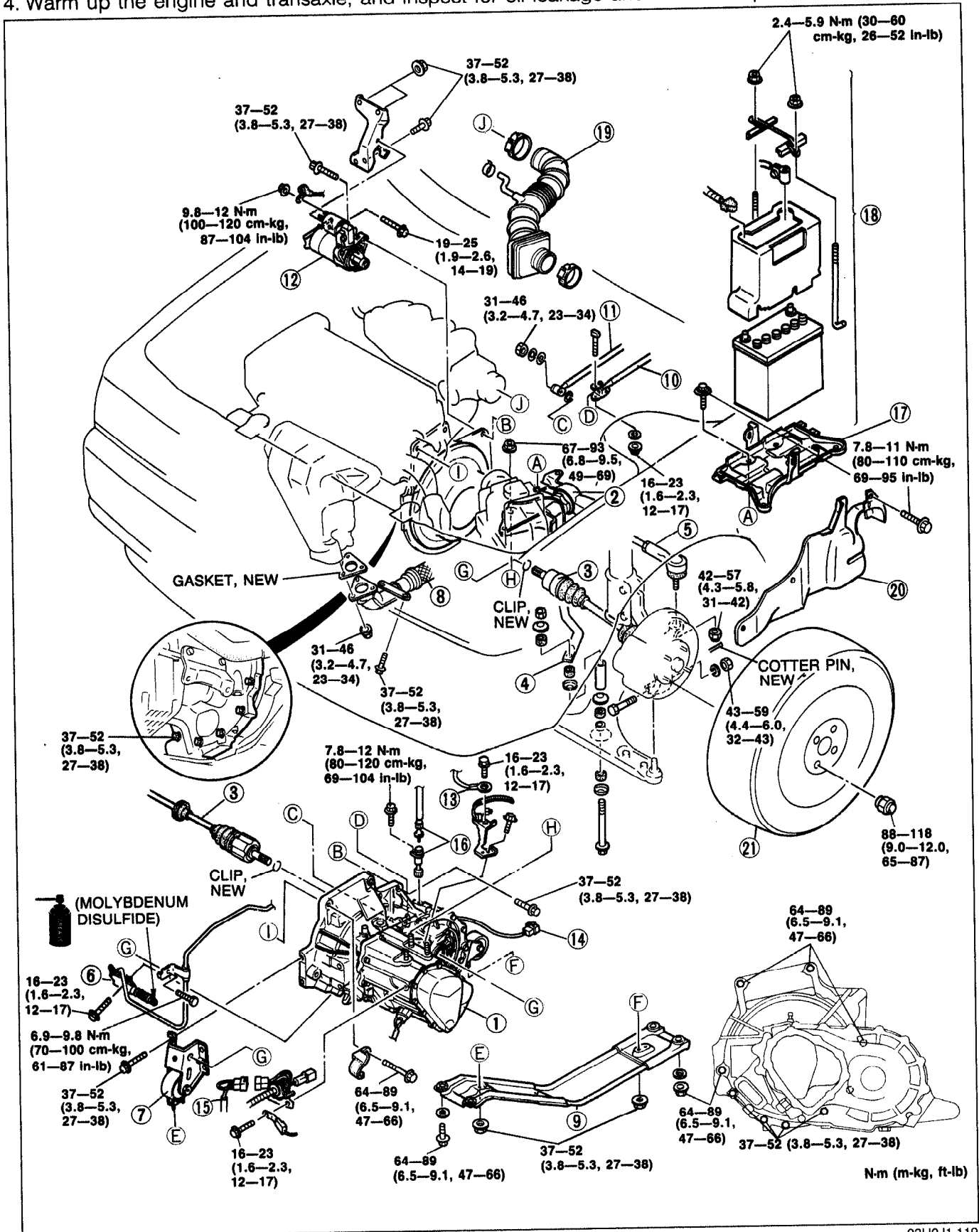
Clearance: 0.06—0.26mm (0.0024—0.0102 in)

Maximum: 0.31mm (0.0122 in)

6. If not as specified, reassemble the transaxle.

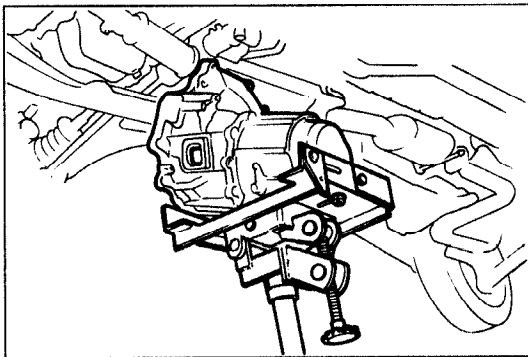
INSTALLATION

1. Raise the vehicle and support it with safety stands.
2. Install in the order shown in the figure, referring to **Installation Note**.
3. Add the specified amount of the specified transaxle oil. (Refer to page J1-7.)
4. Warm up the engine and transaxle, and inspect for oil leakage and transaxle operation.



1. Transaxle Installation Note page J1-49	11. Extension bar Installation Note page J1-51
2. Engine mount No.4	12. Starter
3. Driveshaft Installation Note page J1-50	13. Ground Installation Note page J1-51
4. Stabilizer (BP SOHC) Installation Note page J1-50	14. Neutral switch connector
5. Tie-rod end Installation Note page J1-50	15. Back-up light switch connector
6. Clutch release cylinder	16. Speedometer cable Installation Note page J1-51
7. Engine mount No.2	17. Battery carrier
8. Exhaust pipe	18. Battery
9. Engine mounting member Installation Note page J1-50	19. Air hose and resonance chamber
10. Control rod Installation Note page J1-51	20. Splash shield
	21. Wheel and tire

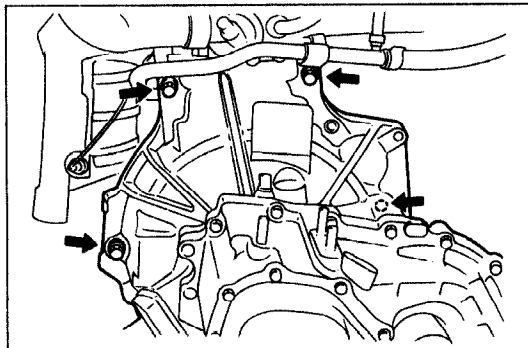
03U0J1-120



03U0J1-121

**Installation Note
Transaxle**

1. Set the transaxle on a jack and lift it into place.

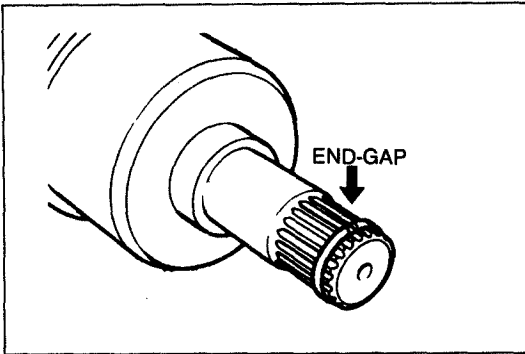


03U0J1-122

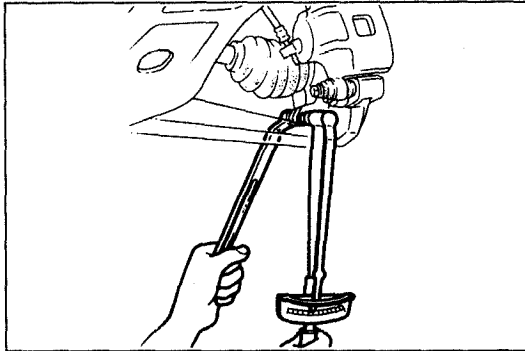
2. Install the transaxle bolts.

Tightening torque:
64—89 N·m (6.5—9.1 m·kg, 47—66 ft·lb)

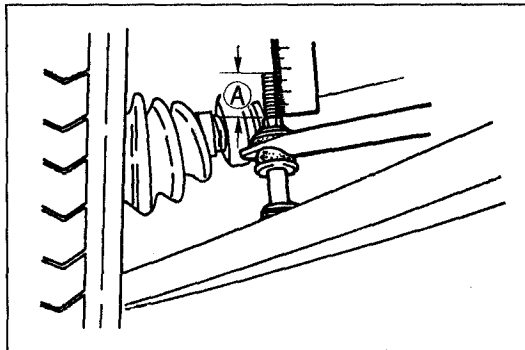
3. Loosely tighten engine mount No.4 bolts.



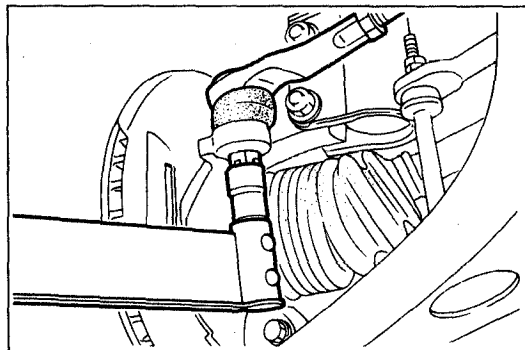
03U0J1-123



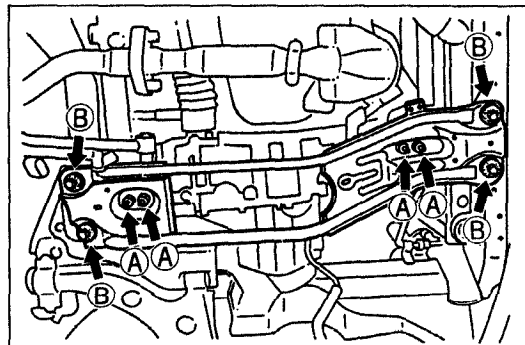
03U0J1-124



03U0J1-125



03U0J1-126



03U0J1-127

Driveshaft

Caution

- Verify that the oil seal is not damaged.
- Do not damage the oil seal

1. Insert the clip with the end-gap at the top of the groove.
2. Apply transaxle oil around the oil seal lip. Install the driveshaft.
3. Verify that the driveshaft is correctly seated by pulling on the shaft.
4. Connect the lower arm to the knuckle and tighten the clinch bolt.

Tightening torque:

43—59 N·m (4.4—6.0 m·kg, 32—43 ft·lb)

Stabilizer (BP SOHC)

1. Tighten the nut until the specified amount of thread is exposed at the end of the bolt.

Dimension A: 17—19mm (0.67—0.75 in)

Tie-rod end

1. Install the locknut.

Tightening torque:

42—57 N·m (4.3—5.8 m·kg, 31—42 ft·lb)

2. Secure the locknut with a new cotter pin.

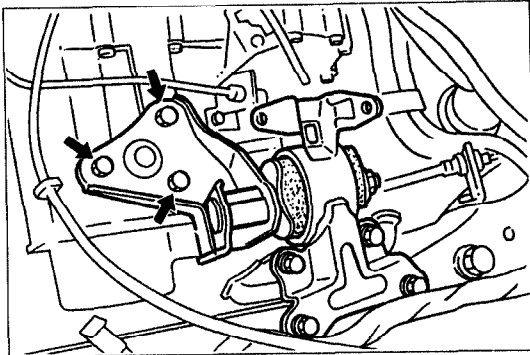
Engine mounting member

1. Install the bolts and nuts as shown.

Tightening torque

(A) : 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

(B) : 64—89 N·m (6.5—9.1 m·kg, 47—66 ft·lb)



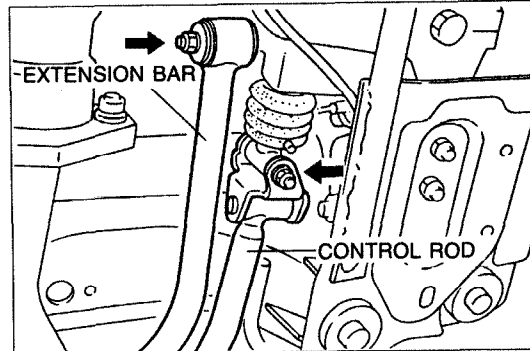
03U0J1-128

2. Tighten engine mount No.4 nuts.

Tightening torque:

67—93 N·m (6.8—9.5 m·kg, 49—69 ft·lb)

3. Remove the **SST** (Engine support).



03U0J1-129

Control rod and extension bar

1. Install the extension bar to the transaxle.

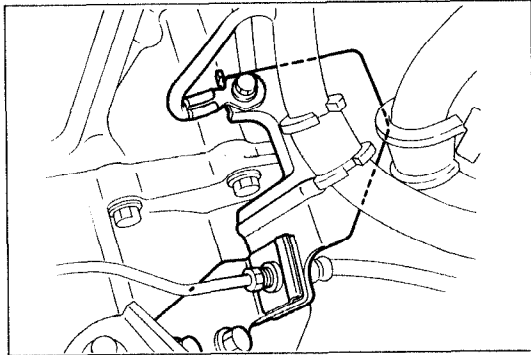
Tightening torque:

31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

2. Install the change control rod to the transaxle.

Tightening torque:

16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



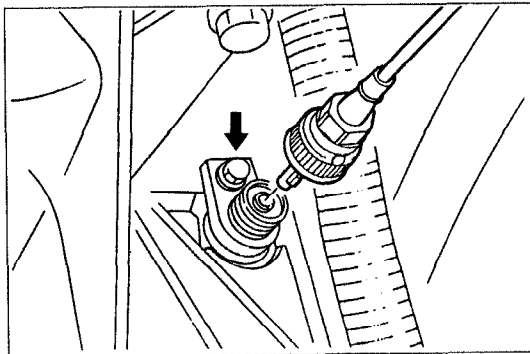
03U0J1-130

Ground

1. Connect the ground to the clutch pipe bracket.

Tightening torque:

16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



03U0J1-131

Speedometer cable

1. Add the specified oil through the speedometer gear case mounting. (Refer to page J1-7.)
2. Install the speedometer driven gear.

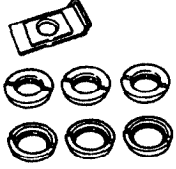
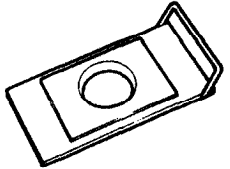
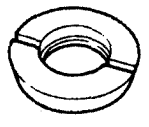
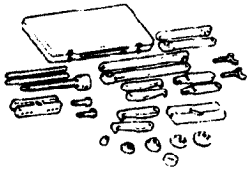
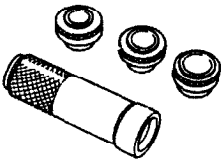
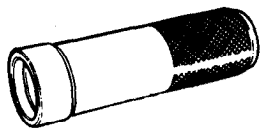

Tightening torque:

7.8—12 N·m (80—120 cm·kg, 69—104 in·lb)

3. Connect the speedometer cable to the speedometer driven gear.

DIFFERENTIAL

PREPARATION SST

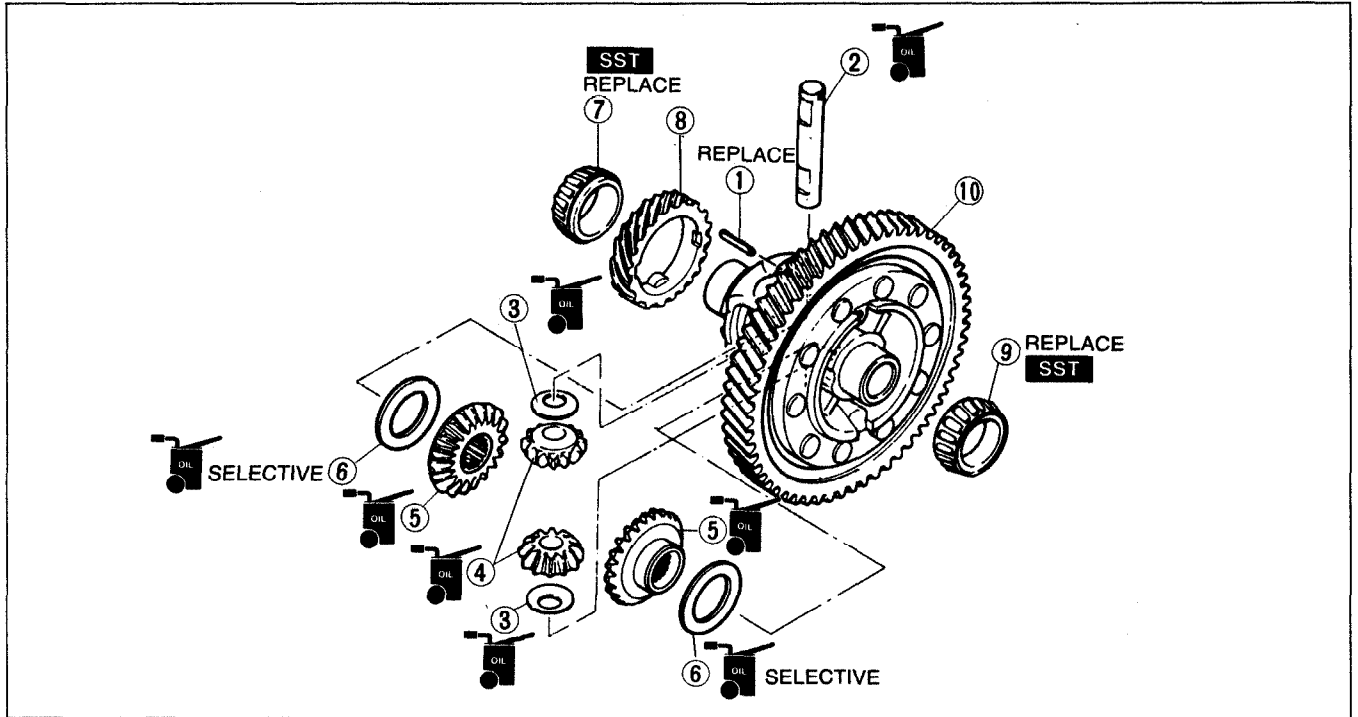
<p>49 B017 1A0</p> <p>Remover set, bearing</p> 	<p>For removal of bearing</p>	<p>49 F401 366A</p> <p>Plate (Part of 49 B017 1A0)</p> 	<p>For removal of bearing</p>
<p>49 B092 371</p> <p>Attachment E (Part of 49 B017 1A0)</p> 	<p>For removal of bearing</p>	<p>49 0839 425C</p> <p>Puller set, bearing</p> 	<p>For removal of bearing</p>
<p>49 F401 330B</p> <p>Installer set, bearing</p> 	<p>For installation of bearing</p>	<p>49 F401 331</p> <p>Body (Part of 49 F401 330B)</p> 	<p>For installation of bearing</p>
<p>49 F401 337A</p> <p>Attachment C (Part of 49 F401 330B)</p> 	<p>For installation of bearing</p>	<p>03U0J1-132</p>	

DISASSEMBLY / INSPECTION / ASSEMBLY

Caution

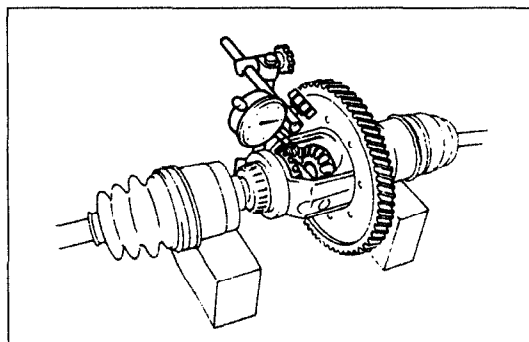
- Do not remove the inner race if not necessary.

1. Before disassembly, inspect the backlash of side gear and pinion gear, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
3. Inspect all parts and repair or replace as necessary.
4. Assemble in the reverse order of disassembly, referring to **Assembly Note**.
5. Measure the backlash after assembly, referring to **Backlash of Side Gear and Pinion Gear**.



13U0J1-007

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Roll pin
Assembly Note..... page J1-55 2. Pinion shaft 3. Thrust washer 4. Pinion gear
Inspect for wear and cracks
Preinspection page J1-53
Inspection of backlash..... page J1-55 5. Side gear
Inspect for wear and cracks
Preinspection page J1-53
Inspection of backlash..... page J1-55 6. Thrust washer | <ol style="list-style-type: none"> 7. Side bearing inner race
Disassembly Note page J1-54
Inspection..... page J1-54
Assembly Note..... page J1-55 8. Speedometer drive gear
Assembly Note..... page J1-55 9. Side bearing inner race
Disassembly Note page J1-54
Inspection..... page J1-54
Assembly Note..... page J1-55 10. Ring gear and ring case
Inspection..... page J1-54 |
|--|---|



03U0J1-134

Preinspection

Backlash of side gear and pinion gear

Measure the backlash by the following procedure.

1. Install the left and right driveshafts in the differential assembly.
2. Support the driveshafts on V-blocks as shown in the figure.
3. Measure the backlash of both pinion gears.

Backlash: 0—0.1mm (0—0.004 in)

- If the backlash exceeds specification, adjust by selecting and installing thrust washers between the case and the side gears.

Caution

- Use thrust washers with the same thickness on each side.

Thrust washer thickness:

mm (in)

2.0 (0.079)	2.1 (0.083)	2.2 (0.087)
-------------	-------------	-------------

23U0J1-012

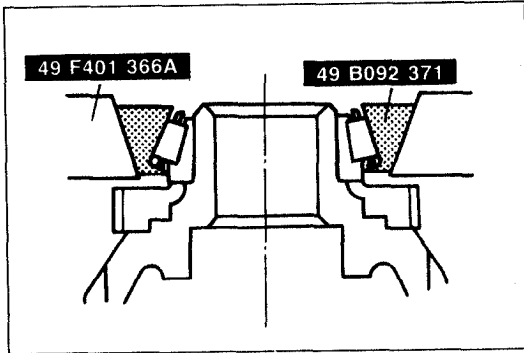
Disassembly Note

Side bearing inner race (Side opposite ring gear)

Caution

- Hold the gear case with one hand so that it does not fall.

- Remove the bearing inner race with the **SST**.



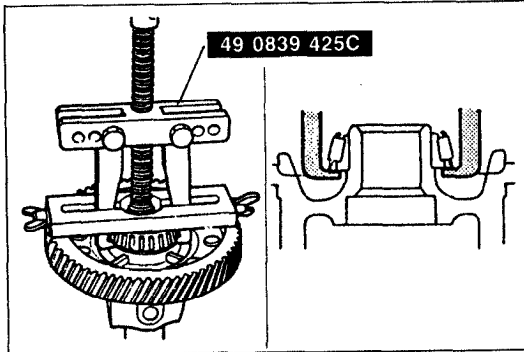
03U0J2-103

Side bearing inner race (Ring gear side)

Note

- Use pads in the vise.

- Remove the bearing inner race with the **SST**.



03U0J2-104

Inspection

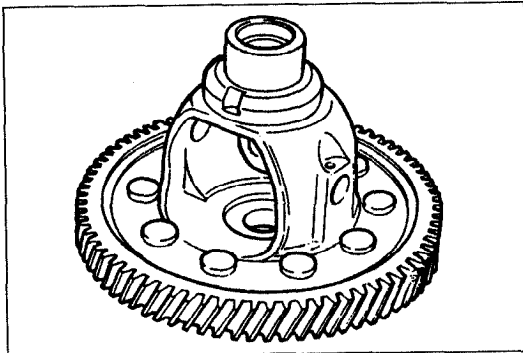
Inspect all parts and repair or replace as necessary.

Ring gear and ring case

Note

- If the gear case is replaced, adjust the bearing preload.

- Inspect the ring gear for wear and cracks.



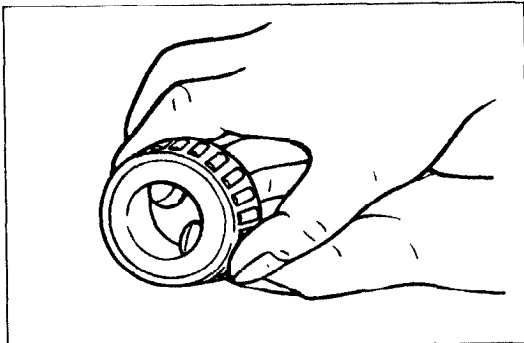
03U0J1-136

Bearing inner race

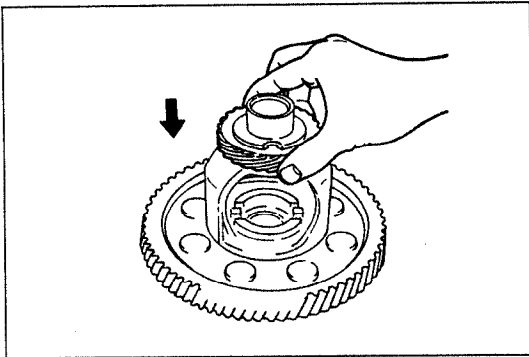
Note

- When replacing the bearing inner race, replace the bearing outer race and inner race as a set.
- If the bearing is replaced, adjust the bearing preload.

- Inspect for wear and rough rotation.



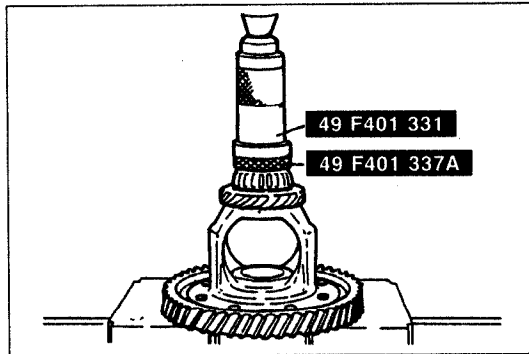
03U0J1-137



03U0J1-138

Assembly Note Speedometer drive gear

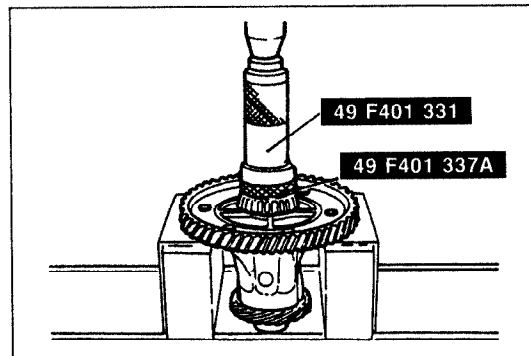
1. Install the speedometer drive gear as shown in the figure.



03U0J1-139

Side bearing inner race (Side opposite ring gear)

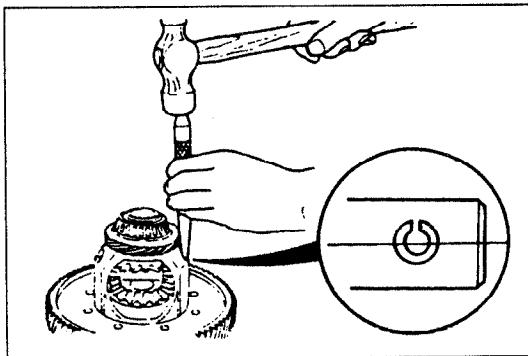
1. Install the speedometer drive gear.
2. Install the new side bearing inner race with the **SST**.



03U0J2-106

Side bearing inner race (Ring gear side)

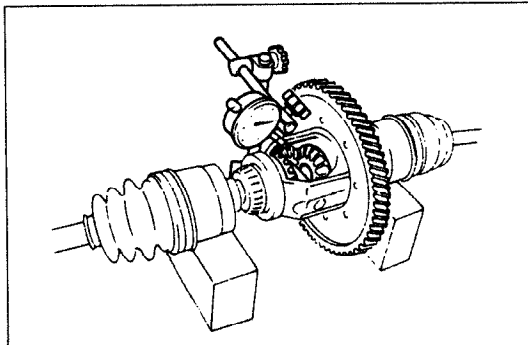
1. Install the new bearing inner race with the **SST**.



03U0J1-140

Roll pin

1. Install the new roll pin as shown in the figure to hold the pinion shaft.



03U0J1-141

Backlash of Side Gear and Pinion Gear

Measure the backlash by the following procedure.

1. Install the driveshafts in the differential assembly.
2. Support the driveshafts on V-blocks as shown in the figure.
3. Measure the backlash of both pinion gears.

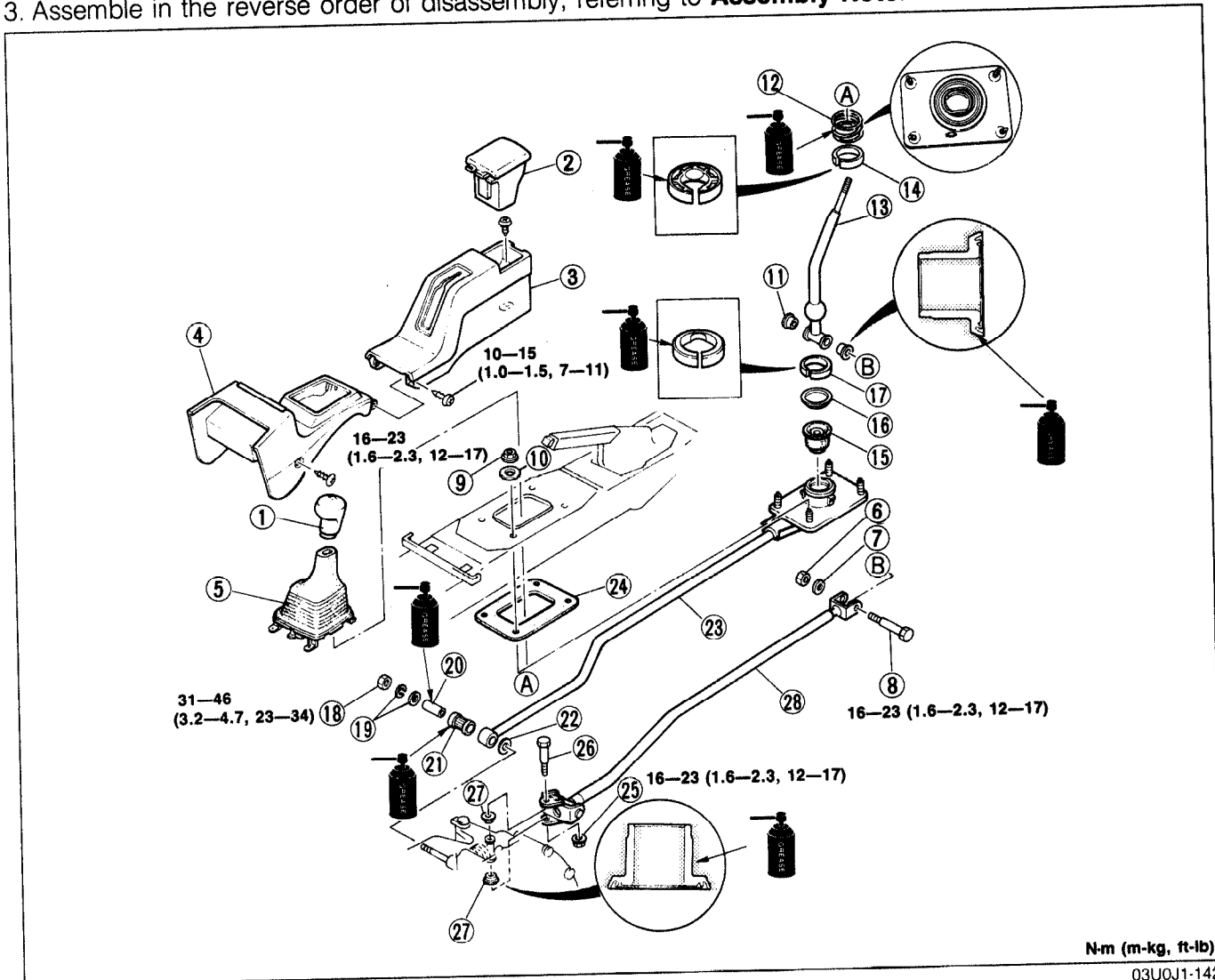
Backlash: 0—0.1mm (0—0.004 in)

4. If not as specified, select the proper thrust washers.
(Refer to preinspection, page J1-53.)

SHIFT MECHANISM

OVERHAUL

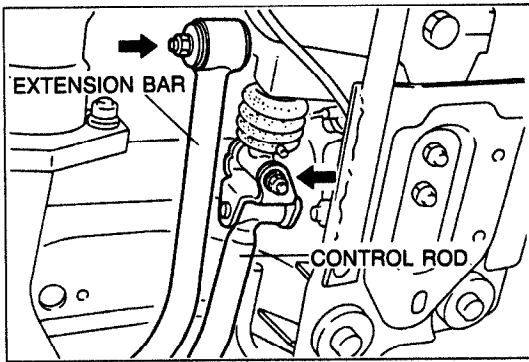
1. Disassemble in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



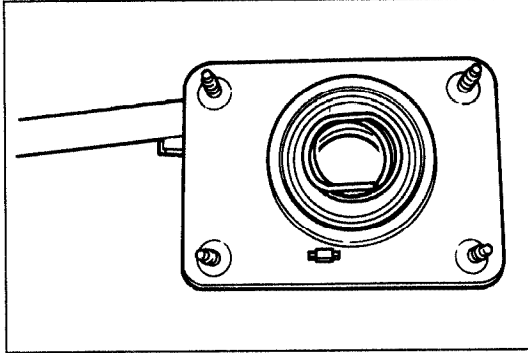
N-m (m-kg, ft-lb)

03U0J1-142

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Shift lever knob 2. Rear ashtray 3. Rear console 4. Front console 5. Boot 6. Nut 7. Washer 8. Bolt 9. Nut 10. Washer 11. Bushing 12. Spring
Inspect for damage and weakness
Assembly Note..... page J1-57 13. Shift lever 14. Ball seat (upper)
Inspect for wear and damage | <ol style="list-style-type: none"> 16. Holder 17. Ball seat (lower) 18. Nut 19. Washer 20. Pipe 21. Bushing
Inspect for wear and damage 22. Washer 23. Extension bar
Assembly Note..... page J1-57 24. Insulator
Inspect for damage and cracks 25. Nut 26. Bolt 27. Bushing
Inspect for wear and damage 28. Change control rod
Inspect for bending |
|---|---|



03U0J1-143



03U0J1-144

Assembly Note**Extension bar**

1. Connect the extension bar onto the transaxle, then mount it to the floor.

Tightening torque:**16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)****Spring**

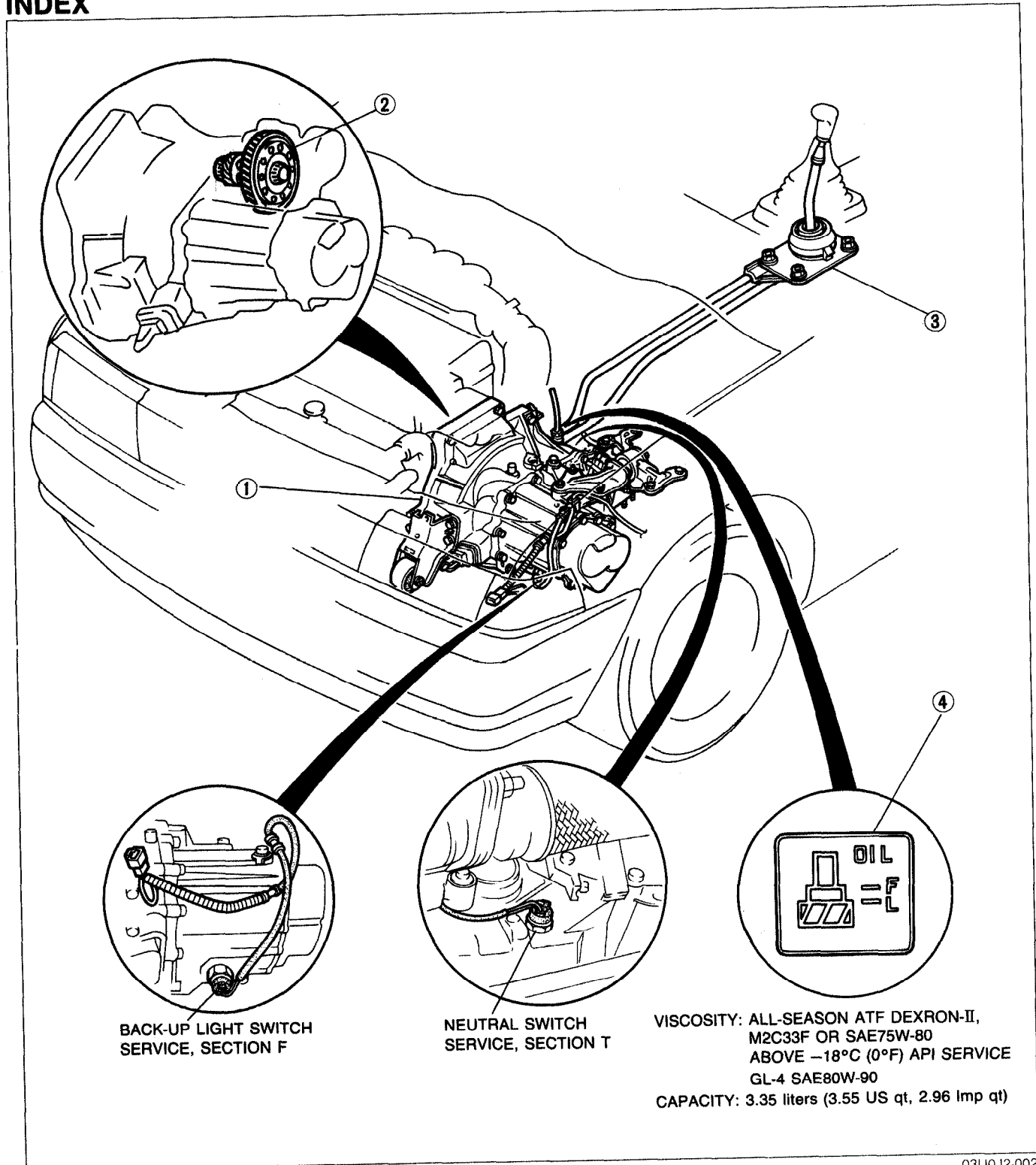
1. Verify that the hooked part of the spring is properly seated in the bracket groove.

MANUAL TRANSAXLE (G5M-R)

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POWER FLOW	J2- 5
TROUBLESHOOTING GUIDE	J2- 6
TRANSAXLE OIL	J2- 7
INSPECTION.....	J2- 7
REPLACEMENT.....	J2- 7
TRANSAXLE	J2- 8
PREPARATION.....	J2- 8
REMOVAL	J2-10
DISASSEMBLY	J2-12
INSPECTION.....	J2-22
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03U0J2-001

INDEX



03U0J2-002

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Removal.....	page J2-10
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Disassembly / Inspection /	
Assembly.....	page J2-44
3. Shift mechanism	
Overhaul.....	page J2-46
4. Transaxle oil	
Inspection.....	page J2- 7
Replacement.....	page J2- 7

OUTLINE

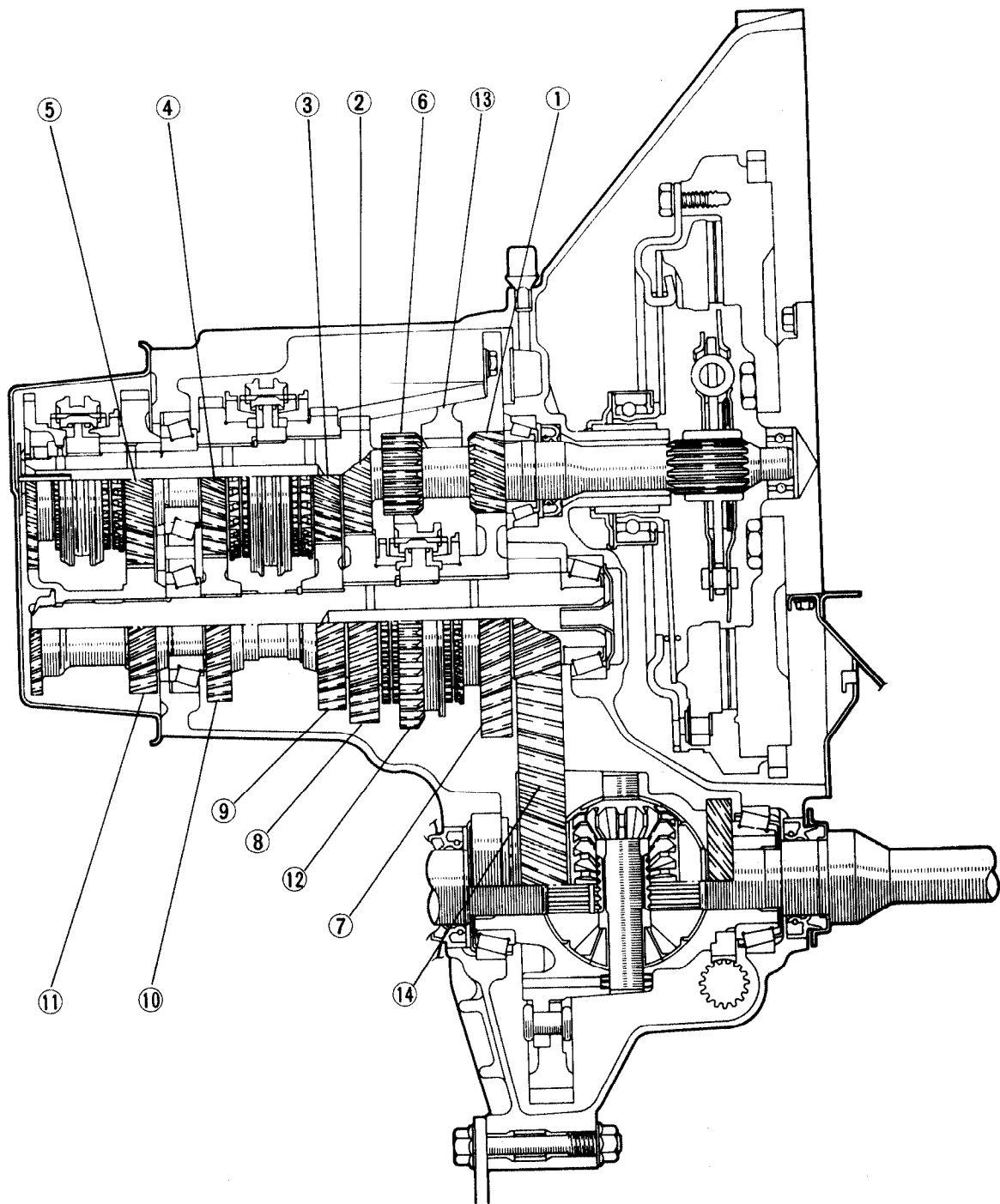
SPECIFICATIONS

Item		Engine/Transaxle	BP DOHC
			G5M-R
Transaxle control			Floor shift
Synchronmesh system			Forward: Synchronmesh Reverse: Selective sliding and synchronmesh
Gear ratio	1st		3.307
	2nd		1.833
	3rd		1.310
	4th		1.030
	5th		0.795
	Reverse		3.166
Final gear ratio			4.105
Oil	Viscosity	All-season	ATF Dexron®II, M2C33F or SAE75W-80
		Above -18°C (0°F)	API service GL-4 SAE80W-90
	Capacity	liters (US qt, Imp qt)	3.35 (3.55, 2.96)

J2

23U0J2-001

STRUCTURAL VIEW



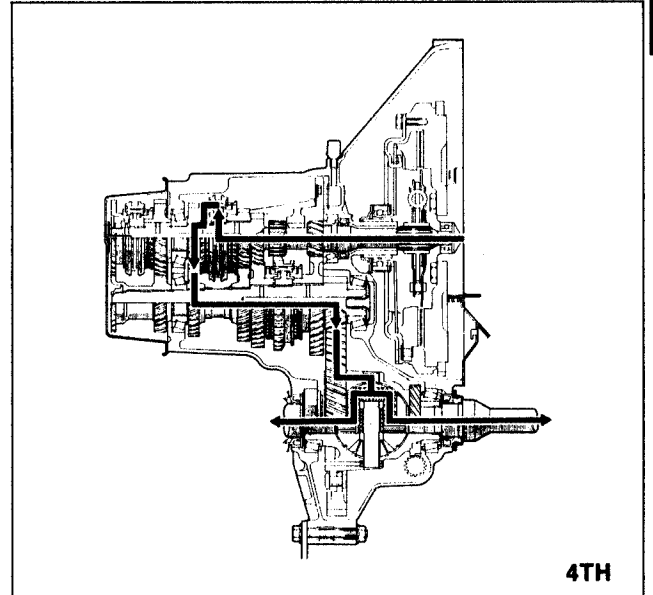
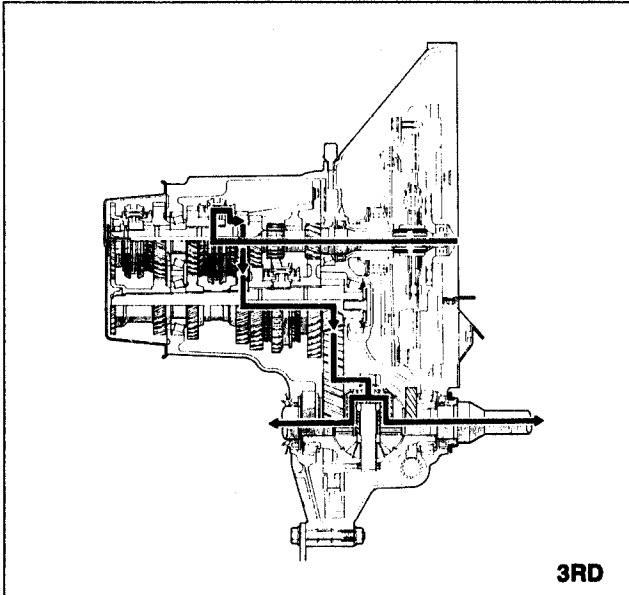
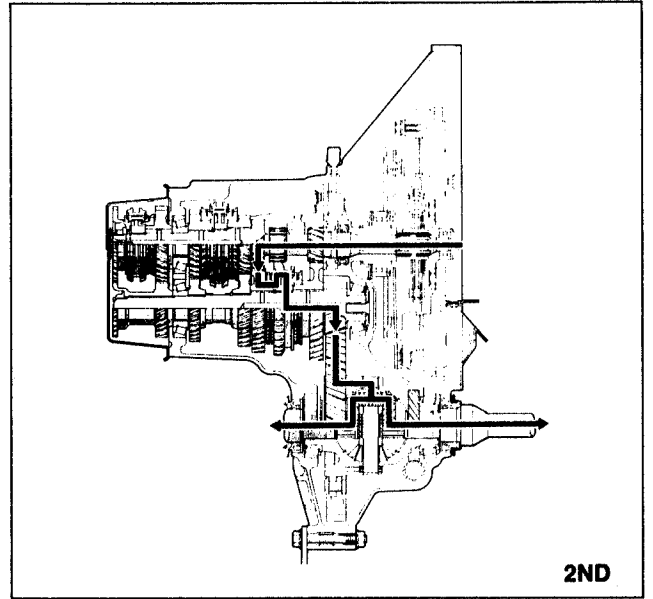
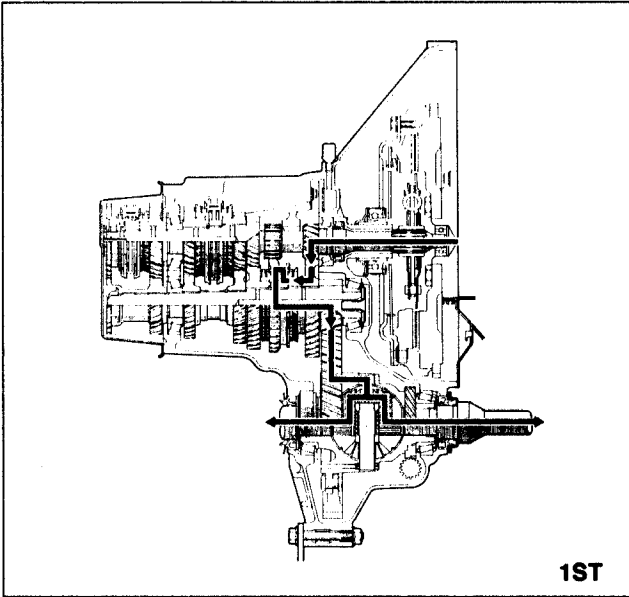
03U0J2-004

- 1. Primary 1st gear
- 2. Primary 2nd gear
- 3. Primary 3rd gear
- 4. Primary 4th gear
- 5. Primary 5th gear

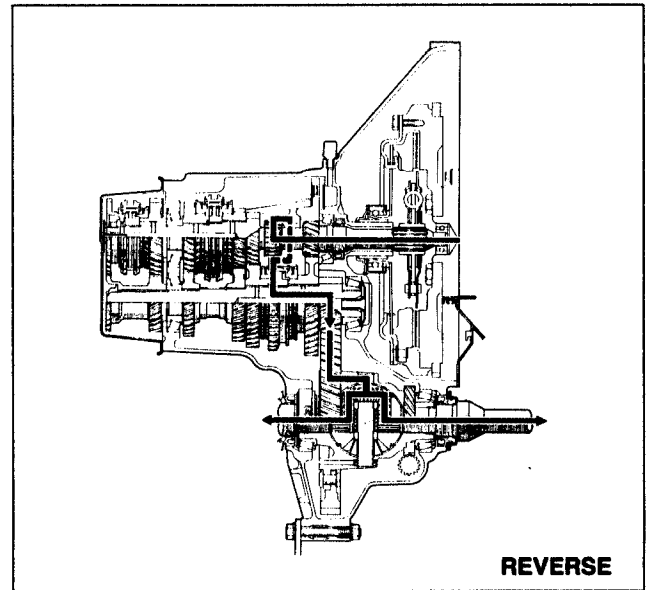
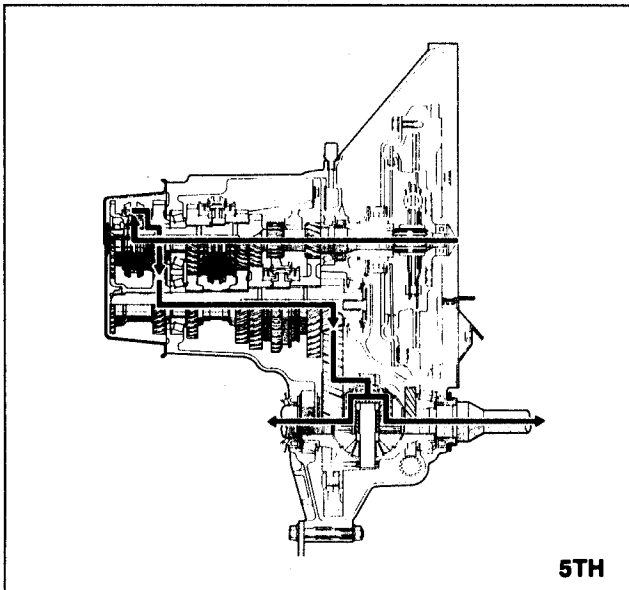
- 6. Primary reverse gear
- 7. Secondary 1st gear
- 8. Secondary 2nd gear
- 9. Secondary 3rd gear
- 10. Secondary 4th gear

- 11. Secondary 5th gear
- 12. Secondary reverse gear
- 13. Reverse idler gear
- 14. Differential

POWER FLOW



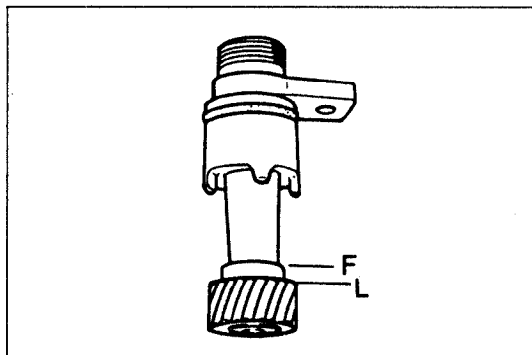
J2



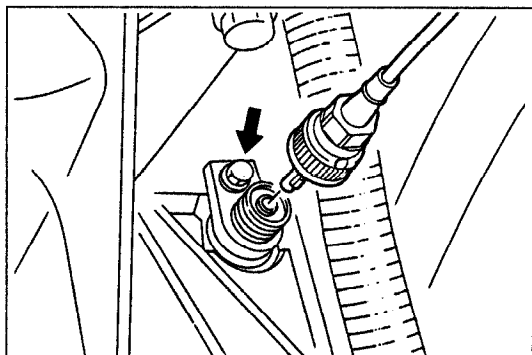
TROUBLESHOOTING GUIDE

Problem	Possible cause	Remedy	Page
Shift lever won't shift smoothly or is hard to shift	Seized shift lever ball	Replace	J2-46
	Seized change control rod joint	Replace	J2-46
	Bent change control rod	Replace	J2-46
Too much play in shift lever	Worn change control rod bushing	Replace	J2-46
	Weak shift lever ball spring	Replace	J2-46
	Worn shift lever ball bushing	Replace	J2-46
Difficult to shift	Bent change control rod	Replace	J2-46
	No grease in transaxle control	Lubricate with grease	J2-46
	Insufficient oil	Add oil	J2- 7
	Deterioration of oil quality	Replace with oil of specified quality	J2- 7
	Wear or play of shift fork or shift rod	Replace	J2-13
	Worn synchronizer ring	Replace	J2-18
	Worn synchronizer cone of gear	Replace	J2-18
	Bad contact of synchronizer ring and cone of gear	Replace	J2-18
	Excessive longitudinal play of gears	Replace	J2-18
	Worn bearing	Replace	J2-18
	Worn synchronizer key spring	Replace	J2-18
	Excessive primary shaft gear bearing preload	Adjust	J2-32
	Improperly adjusted change guide plate	Adjust	J2-15
Won't stay in gear	Bent change control rod	Replace	J2-46
	Worn change control rod bushing	Replace	J2-46
	Weak shift lever ball spring	Replace	J2-46
	Improperly installed extension bar	Tighten	J2-46
	Worn shift fork	Replace	J2-18
	Worn clutch hub	Replace	J2-18
	Worn clutch hub sleeve	Replace	J2-18
	Worn gear sliding part of both shaft gears	Replace	J2-18
	Worn gear sliding part of each gear	Replace	J2-18
	Worn steel sliding groove of control end	Replace	J2-13
	Weak spring pressing against steel ball	Replace	J2-13
	Excessive thrust clearance	Replace	J2-18
	Worn bearing	Replace	J2-18
	Improperly installed engine mount	Tighten	J2-41
Abnormal noise	Insufficient oil	Add oil	J2- 7
	Deterioration of oil quality	Replace	J2- 7
	Worn bearing	Adjust or replace	J2-18
	Worn sliding surfaces of gears or shafts	Replace	J2-18
	Excessive gear backlash	Replace	J2-18
	Damaged gear teeth	Replace with oil of specified quality	J2-18
	Foreign material in gears	Replace	J2-18
	Damaged differential gear or excessive backlash	Adjust or replace	J2-44

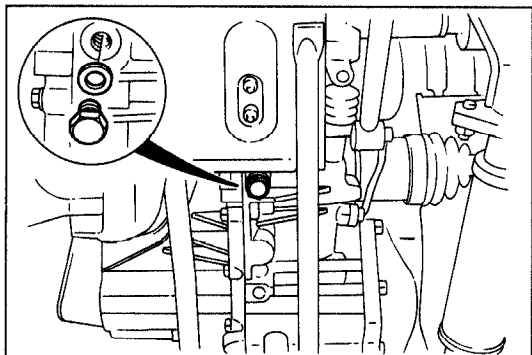
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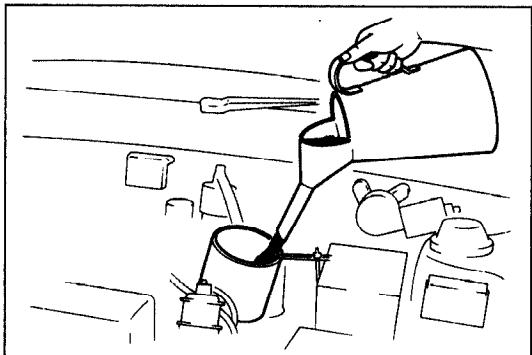
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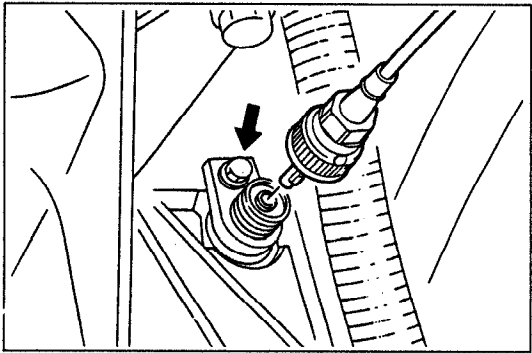
03U0J2-008



03U0J2-009



23U0J2-002



03U0J2-011

TRANSAXLE OIL

INSPECTION

Note

- Park the vehicle on level ground.

1. Disconnect the speedometer cable and remove the speedometer driven gear.
2. Verify that the oil level is between F and L.

3. Install the speedometer driven gear.

Tightening torque:

7.8—12 N·m (80—120 cm·kg, 69—104 in·lb)

4. Connect the speedometer cable.

J2

REPLACEMENT

1. Disconnect the speedometer cable and remove the speedometer driven gear.
2. Remove the drain plug and washer. Drain the oil into a suitable container.
3. Install a new washer and the drain plug.

Tightening torque:

39—59 N·m (4.0—6.0 m·kg, 29—43 ft·lb)

4. Add the necessary amount of the specified oil through the speedometer gear case hole.

Specified oil

Viscosity: All-season ATF Dexron® II, M2C33F or SAE75W-80


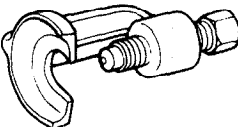
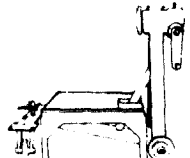
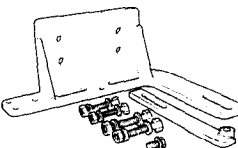
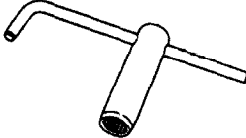
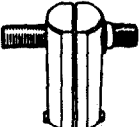

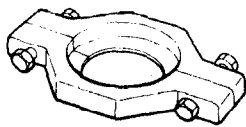
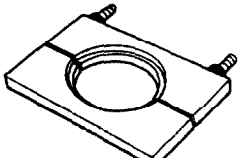
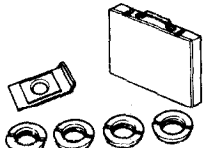
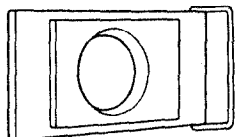

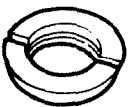
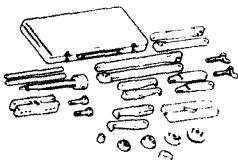
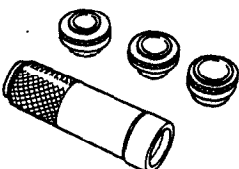
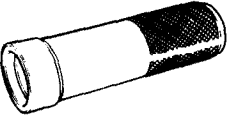
Above -18°C (0°F) API service GL-4 SAE 80W-90



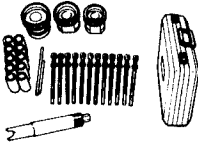



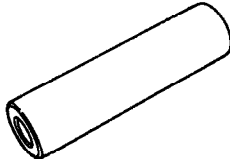

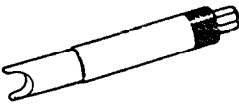
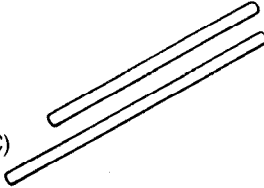
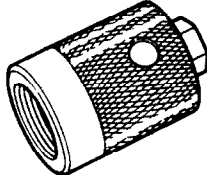
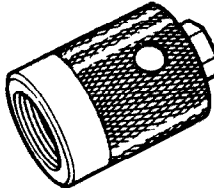
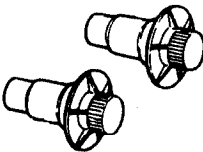
Capacity: 3.35 liters (3.55 US qt, 2.96 Imp qt)

5. Verify the oil level.
6. Install the speedometer driven gear and connect the speedometer cable.

TRANSAXLE

PREPARATION SST

<p>49 G017 5A0 Support, engine</p> 	<p>For support of engine</p>	<p>49 0118 850C Puller, ball joint</p> 	<p>For removal of tie-rod end</p>
<p>49 0107 680A Engine stand</p> 	<p>For disassembly and assembly of transaxle</p>	<p>49 G019 0A0 Hanger transaxle</p> 	<p>For disassembly and assembly of transaxle</p>
<p>49 G030 440 Holder, primary shaft</p> 	<p>For holding primary shaft</p>	<p>49 FT01 361 Remover, bearing</p> 	<p>For removal of bearing outer race</p>
<p>49 B001 795 Installer, oil seal</p> 	<p>For installation of oil seal</p>	<p>49 0636 145 Puller, fan pulley boss</p> 	<p>For removal of bearing inner race</p>
<p>49 G030 370 Removing plate</p> 	<p>For removal of secondary 3rd gear and 2nd gear</p>	<p>49 G017 1A0 Remover set, bearing</p> 	<p>For removal of bearing</p>
<p>49 F401 366A Plate (Part of 49 G017 1A0)</p> 	<p>For removal of bearing inner race</p>	<p>49 B092 373 Attachment G (Part of 49 G017 1A0)</p> 	<p>For removal of bearing inner race</p>
<p>49 B092 374 Attachment H (Part of 49 G017 1A0)</p> 	<p>For removal of bearing inner race</p>	<p>49 0839 425C Puller set, bearing</p> 	<p>For removal of bearing inner race</p>
<p>49 F401 330B Installer set, bearing</p> 	<p>For installation of bearing</p>	<p>49 F401 331 Body (Part of 49 F401 330B)</p> 	<p>For installation of bearing inner race</p>

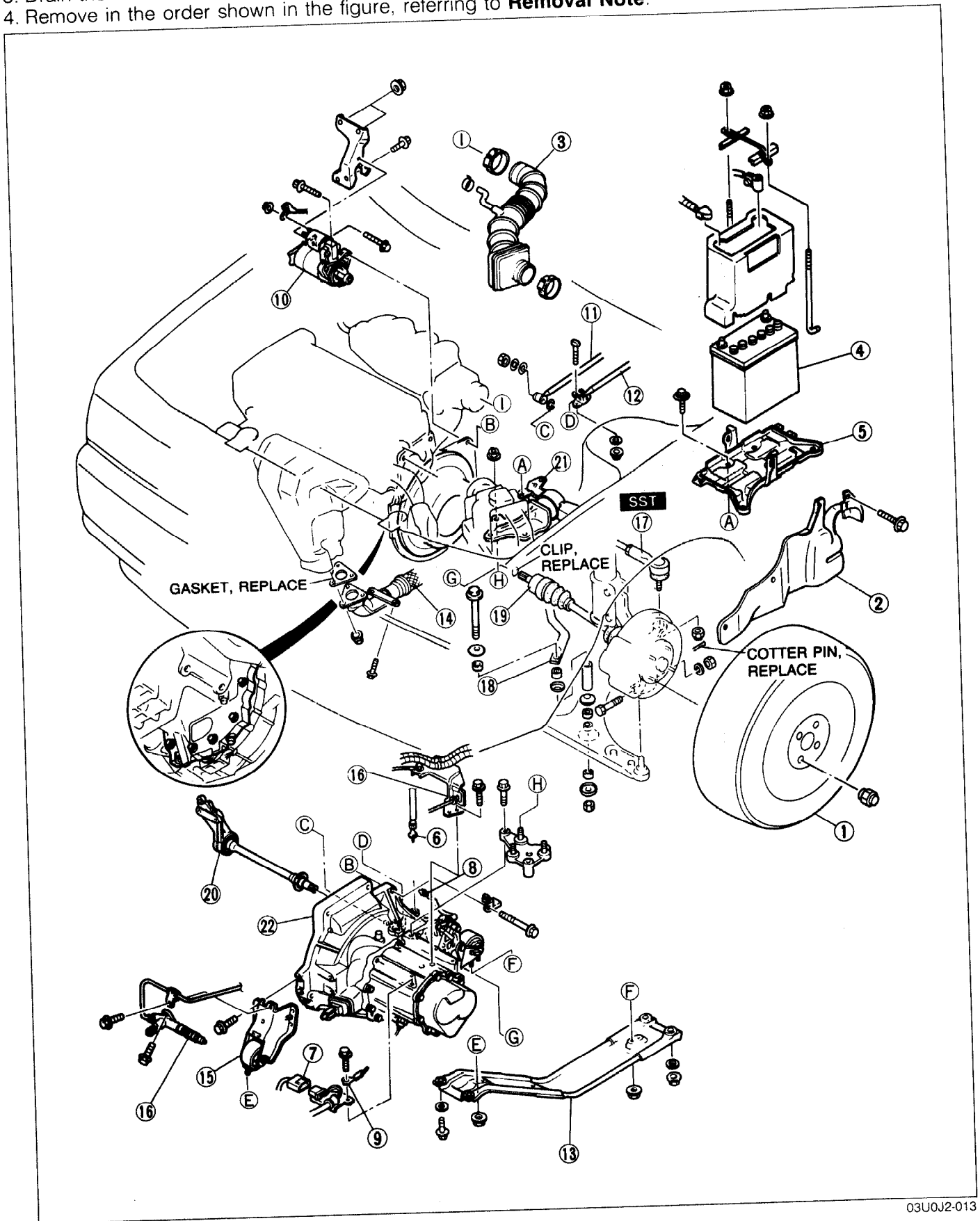
<p>49 F401 335A Attachment A (Part of 49 F401 330B)</p> 	<p>For installation of bearing inner race</p>	<p>49 F401 336B Attachment B (Part of 49 F401 330B)</p> 	<p>For installation of bearing inner race</p>
<p>49 G030 380C Shim selector set</p> 	<p>For adjustment of bearing preload</p>	<p>49 G030 381 Selector for $\phi 68$ (Part of 49 G030 380C)</p> 	<p>For adjustment of bearing preload</p>
<p>49 G030 382A Selector $\phi 58$ (Part of 49 G030 380C)</p> 	<p>For adjustment of bearing preload</p>	<p>49 F401 382A Selector (Bearing size $\phi 52$) (Part of 49 G030 380C)</p> 	<p>For adjustment of bearing preload</p>
<p>49 F401 384 Collar (Part of 49 G030 380C)</p> 	<p>For adjustment of bearing preload</p>	<p>49 G019 021 Bolt set (Part of 49 G030 380C)</p> 	<p>For adjustment of bearing preload</p>
<p>49 FT01 515A Adapter, preload (Part of 49 G030 380C)</p> 	<p>For adjustment of bearing preload</p>	<p>49 F401 385 Bar (Part of 49 G030 380C)</p> 	<p>For adjustment of bearing preload</p>
<p>49 B017 102 Adapter, preload</p> 	<p>For adjustment of bearing preload</p>	<p>49 G017 202 Adapter, preload</p> 	<p>For adjustment of bearing preload</p>
<p>49 G030 455 Holder, diff. side gear</p> 	<p>For holding side gear</p>	<p style="text-align: right;">03U0J2-012</p>	

J2

03U0J2-012

REMOVAL

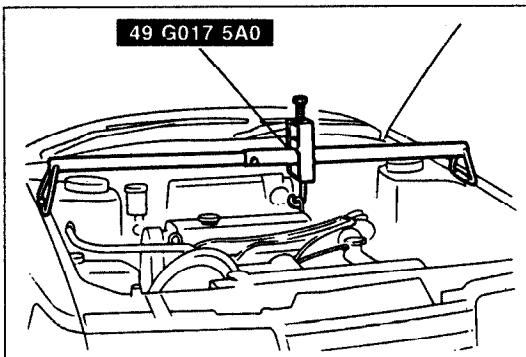
1. Disconnect the negative battery cable.
2. Raise the vehicle and support it with safety stands.
3. Drain the transaxle oil into a suitable container.
4. Remove in the order shown in the figure, referring to **Removal Note**.



- 1. Wheel and tire
- 2. Splash shield
- 3. Air hose and resonance chamber
- 4. Battery
- 5. Battery carrier
- 6. Speedometer cable
- 7. Back-up light switch connector
- 8. Neutral switch connector
- 9. Ground
- 10. Starter
- 11. Extension bar
- 12. Control rod
- 13. Engine mount member
Removal Note page J2-11

- 14. Exhaust pipe
- 15. Engine mount No.2
- 16. Clutch release cylinder
Removal Note page J2-11
- 17. Tie-rod end
Removal Note page J2-11
- 18. Stabilizer
- 19. Driveshaft
Removal Note page J2-12
- 20. Joint shaft
- 21. Engine mount No.4
- 22. Transaxle
Removal Note page J2-12

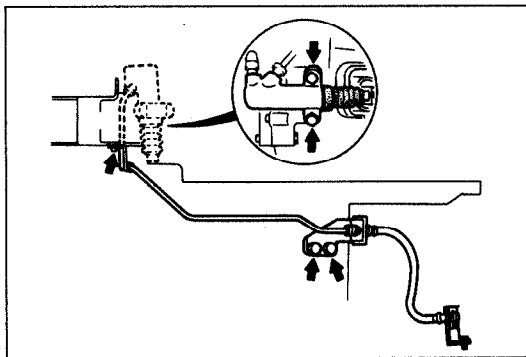
03U0J2-014



03U0J2-015

Removal Note
Engine mount member

- 1. Suspend the engine with the **SST** and remove the engine mount member.



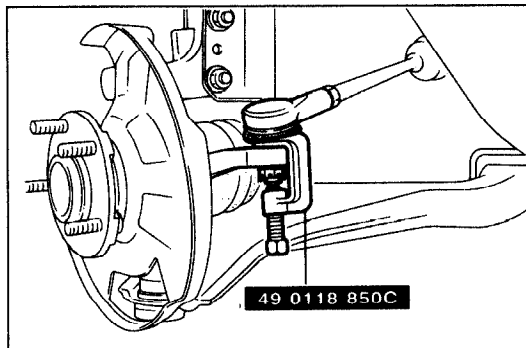
03U0J2-016

Clutch release cylinder

Caution

- Do not damage the clutch pipe.

- 1. Remove the bolts shown.
- 2. Lay aside the clutch release cylinder and the clutch pipe.



03U0J2-017

Tie-rod end

- 1. Remove the cotter pin.

Caution

- Do not damage the dust boot.

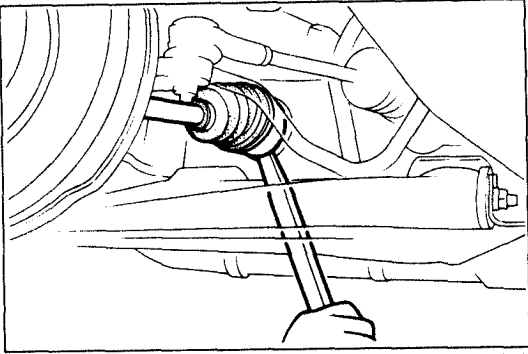
- 2. Loosen the nut and disconnect the tie-rod end with the **SST**.

Driveshaft

Caution

- Do not shock the tripod joint when removing the driveshaft.

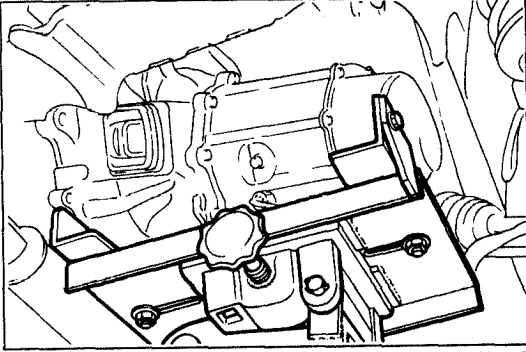
1. Separate the driveshaft from the transaxle by prying with a bar inserted between the outer ring and the transaxle.
2. Suspend the driveshaft with a rope.



03U0J2-018

Transaxle

1. Lean the engine toward the transaxle.
2. Support the transaxle with a jack.
3. Remove the transaxle mounting bolts.
4. Remove the transaxle.



03U0J2-019

DISASSEMBLY

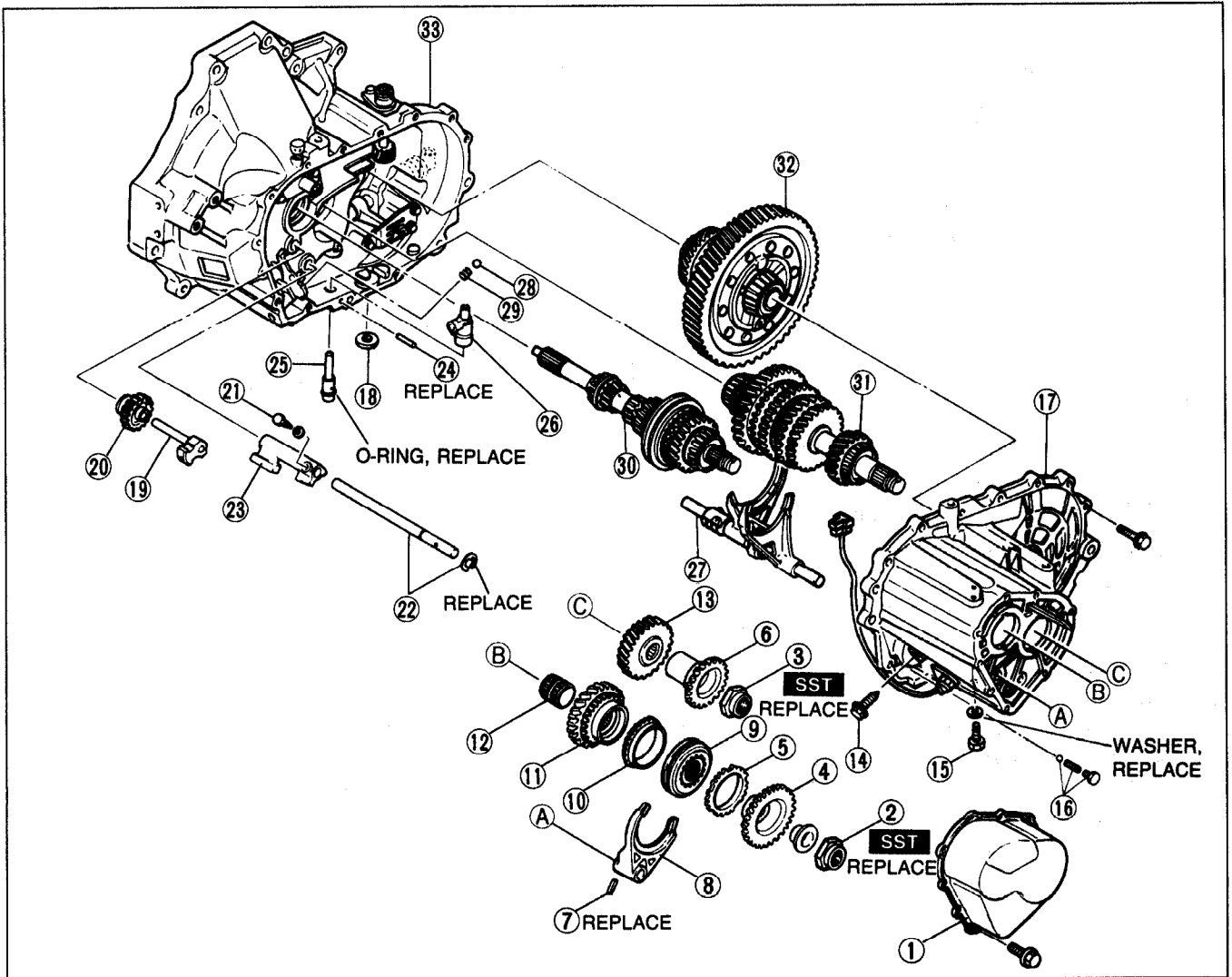
Precaution

1. Clean the transaxle exterior thoroughly with a steam cleaner or cleaning solvent before disassembly.
2. Clean the removed parts (except sealed bearings) and all sealing surfaces with cleaning solvent, and dry with compressed air. Clean out all holes and passages with compressed air, and verify that there are no obstructions.
3. Wear eye protection when using compressed air to clean components.

03U0J2-020

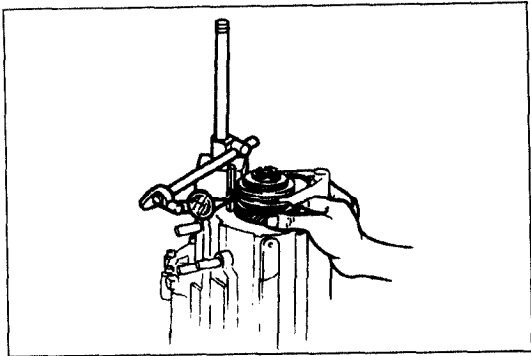
5th/Reverse Gear and Housing Parts

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



03U0J2-021

- | | |
|---|--|
| <p>1. Rear cover</p> <p>2. Locknut (Primary shaft)
Disassembly Note..... page J2-14</p> <p>3. Locknut (Secondary shaft)
Disassembly Note..... page J2-14</p> <p>4. Primary reverse synchronizer gear
Inspection..... page J2-22</p> <p>5. Synchronizer ring (Reverse)
Inspection..... page J2-22</p> <p>6. Secondary reverse synchronizer gear
Inspection..... page J2-22</p> <p>7. Roll pin</p> <p>8. 5th/Reverse shift fork</p> <p>9. Clutch hub assembly (5th/Reverse)
Inspection..... page J2-22</p> <p>10. Synchronizer ring (5th)
Inspection..... page J2-22</p> <p>11. 5th gear
Inspection..... page J2-22</p> <p>12. Gear sleeve</p> <p>13. Secondary 5th gear
Inspection..... page J2-22</p> | <p>14. Lock bolt</p> <p>15. Guide bolt</p> <p>16. Lock bolt, ball, and spring</p> <p>17. Transaxle case assembly</p> <p>18. Magnet</p> <p>19. Reverse idler shaft</p> <p>20. Reverse idler gear</p> <p>21. Lock bolt</p> <p>22. 5th/Reverse shift rod and clip</p> <p>23. 5th/Reverse shift rod end</p> <p>24. Pin</p> <p>25. Crank lever shaft</p> <p>26. Crank lever assembly</p> <p>27. Shift fork and shift rod assembly
Disassembly Note..... page J2-14</p> <p>28. Steel ball</p> <p>29. Spring</p> <p>30. Primary shaft gear assembly</p> <p>31. Secondary shaft gear assembly</p> <p>32. Differential assembly</p> <p>33. Clutch housing</p> |
|---|--|



13U0J2-012

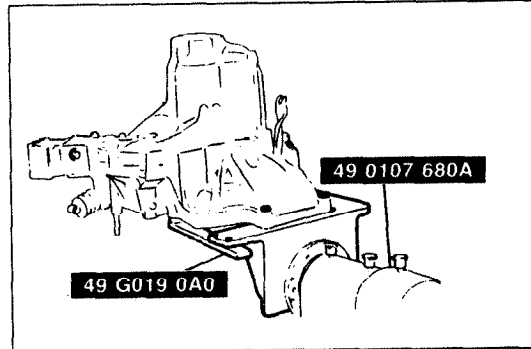
Preinspection 5th gear thrust clearance

1. Measure the 5th gear thrust clearance with a dial indicator.

Clearance: 0.10—0.22mm (0.0039—0.0087 in)

Maximum: 0.27mm (0.0106 in)

2. If the clearance exceeds the maximum, check the contact surfaces of 5th gear and the clutch hub. Replace worn or damaged parts.

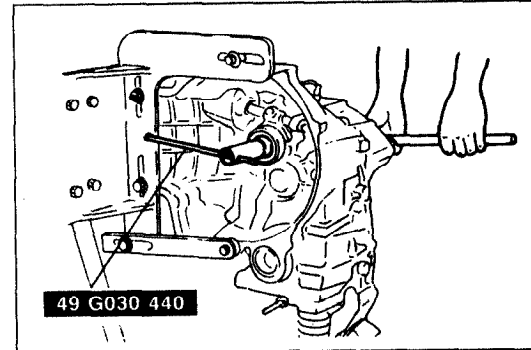


03U0J2-022

Disassembly note

Locknut

1. Mount the transaxle on the **SST**.



03U0J2-023

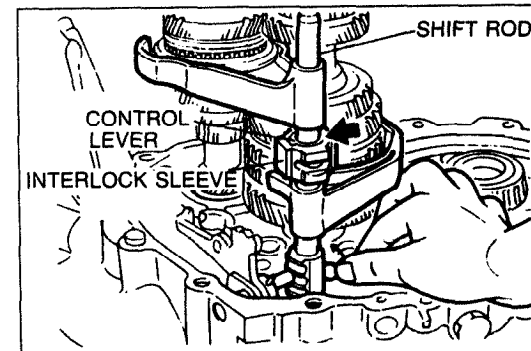
2. Lock the primary shaft with the **SST**.

3. Shift to 1st or 2nd gear to lock the rotation of the primary shaft.

Caution

- Do not reuse the removed locknut.

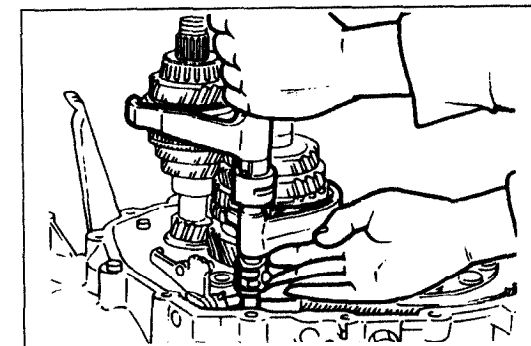
4. Uncrimp the tabs of the locknuts.
5. Remove the locknuts from the primary and secondary shafts.



03U0J2-024

Shift fork and shift rod assembly

1. Align the ends of the interlock sleeve and of the control lever (arrow). Turn the shift rod counterclockwise.
2. While holding the 1st-2nd shift fork with one hand and the 3rd-4th shift fork with the other, raise them both at the same time and shift each of the clutch hub sleeves.



76U07A-227

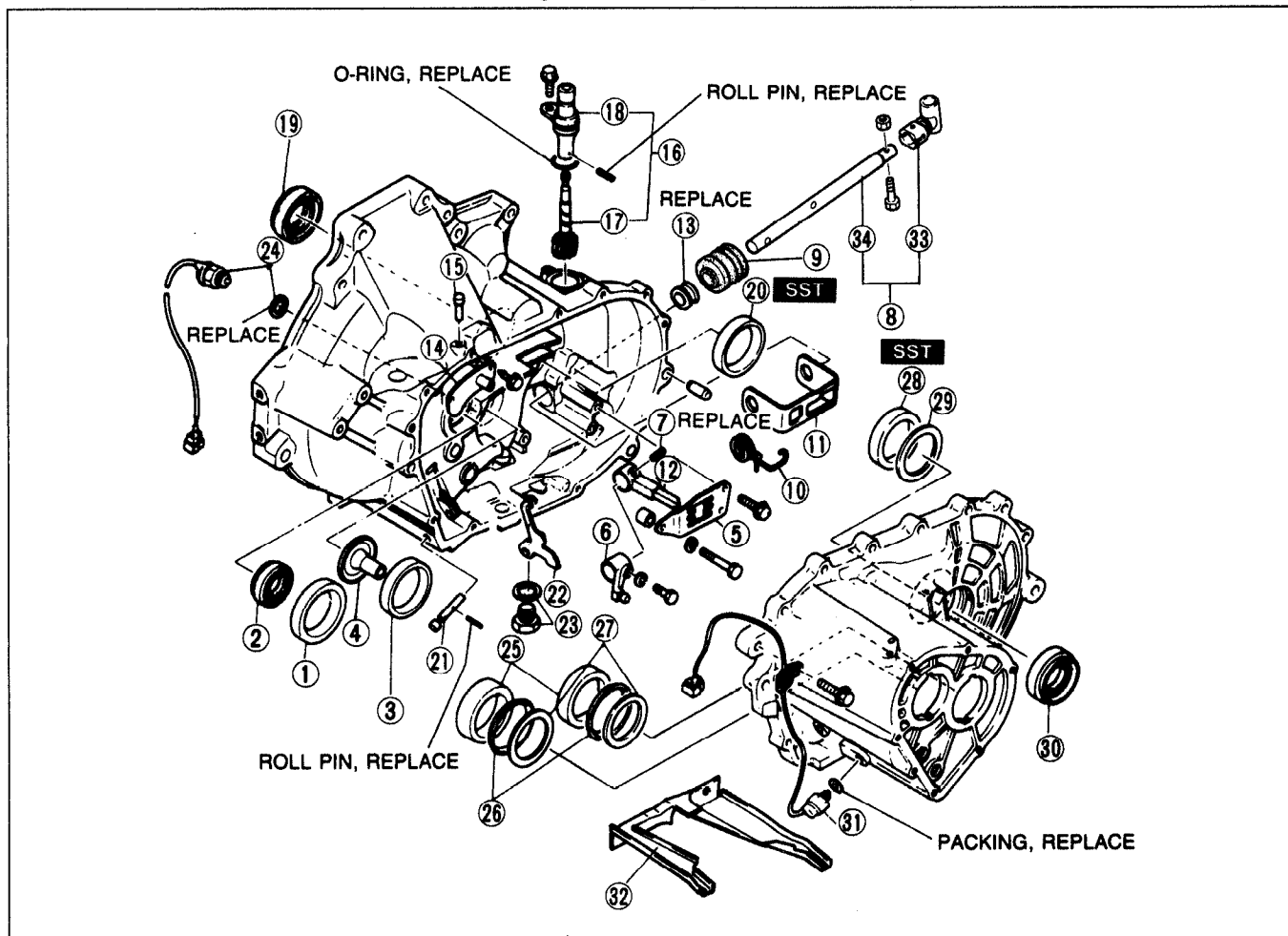
3. Lift the control end and remove the steel ball, and, at the same time, remove the shift rod from the clutch housing.
4. Separate the shift rod and shift fork assembly from each of the clutch hub sleeves.

Clutch Housing and Transaxle Case Components

Caution

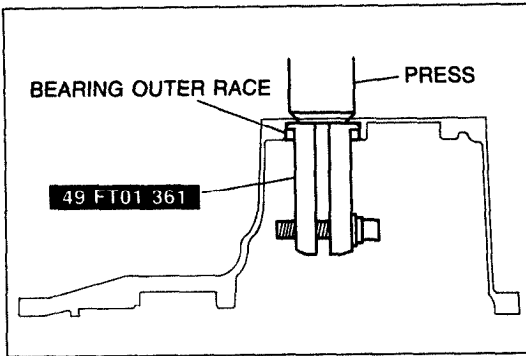
- Do not remove an oil seal if not necessary.

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



23U0J2-003

- | | |
|---|---|
| <p>1. Bearing outer race (Primary shaft)</p> <p>2. Oil seal</p> <p>3. Bearing outer race (Secondary shaft)
Disassembly Note page J2-16</p> <p>4. Funnel</p> <p>5. Guide plate</p> <p>6. Change arm</p> <p>7. Roll pin
Disassembly Note page J2-16</p> <p>8. Change rod assembly</p> <p>9. Boot</p> <p>10. Spring</p> <p>11. Reverse gate</p> <p>12. Selector</p> <p>13. Oil seal</p> <p>14. Bleeder cover</p> <p>15. Bleeder</p> <p>16. Speedometer driven gear assembly
Inspection..... page J2-24</p> <p>17. Driven gear</p> <p>18. Gear case</p> | <p>19. Oil seal (differential)
Replacement (On-vehicle)..... page J2-16</p> <p>20. Bearing outer race (differential)
Disassembly Note page J2-16</p> <p>21. Reverse lever shaft</p> <p>22. Reverse lever</p> <p>23. Drain plug and washer</p> <p>24. Neutral switch and gasket</p> <p>25. Bearing outer race (transaxle case)
Disassembly Note page J2-16</p> <p>26. Diaphragm spring</p> <p>27. Adjust shim</p> <p>28. Bearing outer race (differential)
Disassembly Note page J2-16</p> <p>29. Adjust shim(s)</p> <p>30. Oil seal (differential)
Replacement (On-vehicle)..... page J2-16</p> <p>31. Back-up light switch</p> <p>32. Oil passage</p> <p>33. Joint</p> <p>34. Change rod</p> |
|---|---|



23U0J2-004

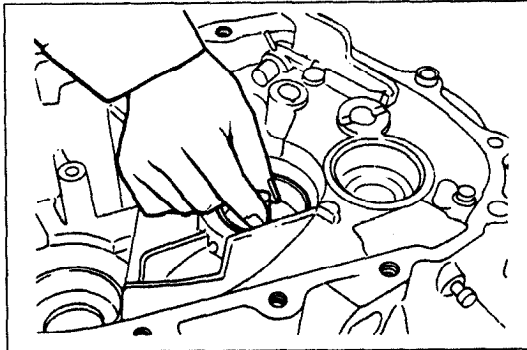
Disassembly note

Bearing outer race (transaxle case)

Note

- Since removing the bearing outer race is difficult, use the SST.

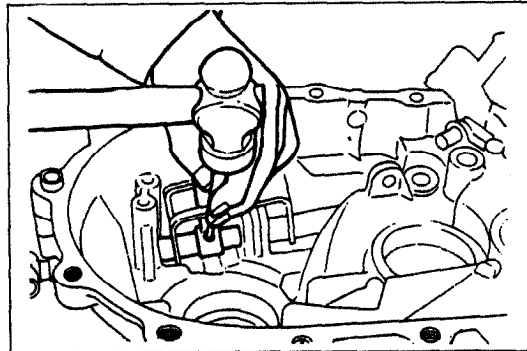
1. Remove the bearing outer race.



86U07A-042

Bearing outer race (secondary shaft)

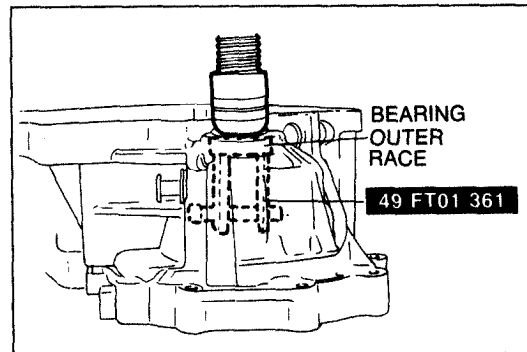
1. Remove the bearing outer race by lifting out the funnel and race together.



76G07A-020

Roll pin

1. Align the groove for removal of the clutch housing pin with the position of the roll pin, then tap the pin out using a pin punch.



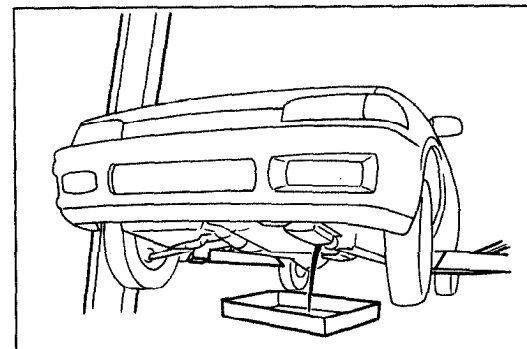
03U0J2-027

Bearing outer race (differential)

Caution

- Hold the SST with one hand so that it does not fall.

1. Remove the bearing outer race with a press.

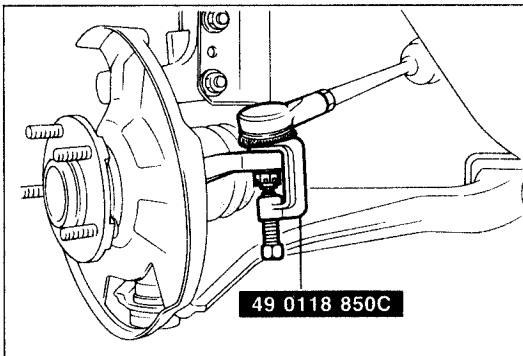


23U0J2-005

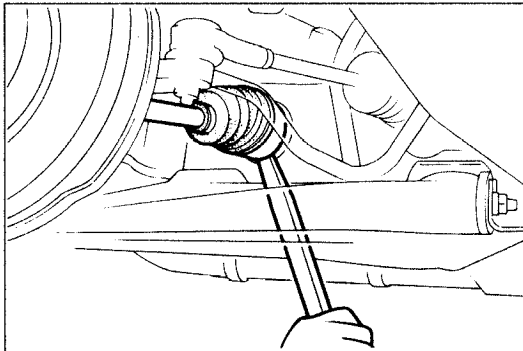
Oil seal (differential) Replacement (On-vehicle)

Jack up the vehicle and support it with safety stands. Drain the transaxle oil. Next, use the following procedure to replace the driveshaft oil seal:

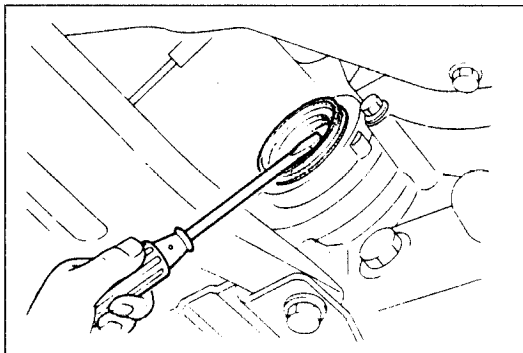
1. Remove the front wheel.
2. Remove the splash shield.
3. Separate the front stabilizer from the lower arm.



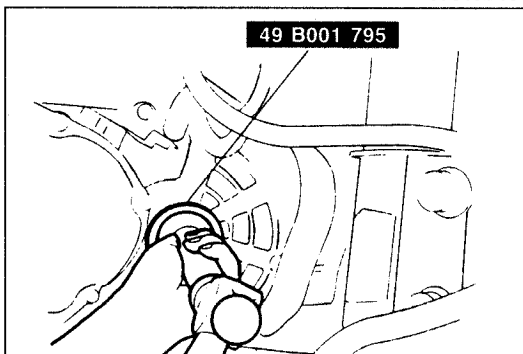
03U0J2-029



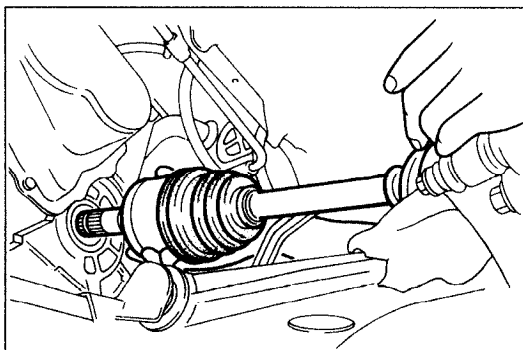
03U0J2-030



03U0J2-031



03U0J2-121



03U0J2-032

Caution

- Do not damage the dust boots.

4. Remove the clinch bolt and pull the lower arm downward. Separate the knuckle from the lower arm ball joint.
5. Loosen the nut and disconnect the tie-rod end with the **SST**.

Caution

- Do not subject the tripod joint to shock when removing the driveshaft.

6. Disconnect the driveshaft from the transaxle by prying with a bar between the outer ring and the transaxle.
7. Suspend the driveshaft with a rope.

8. Remove the oil seal with a screwdriver.

Note

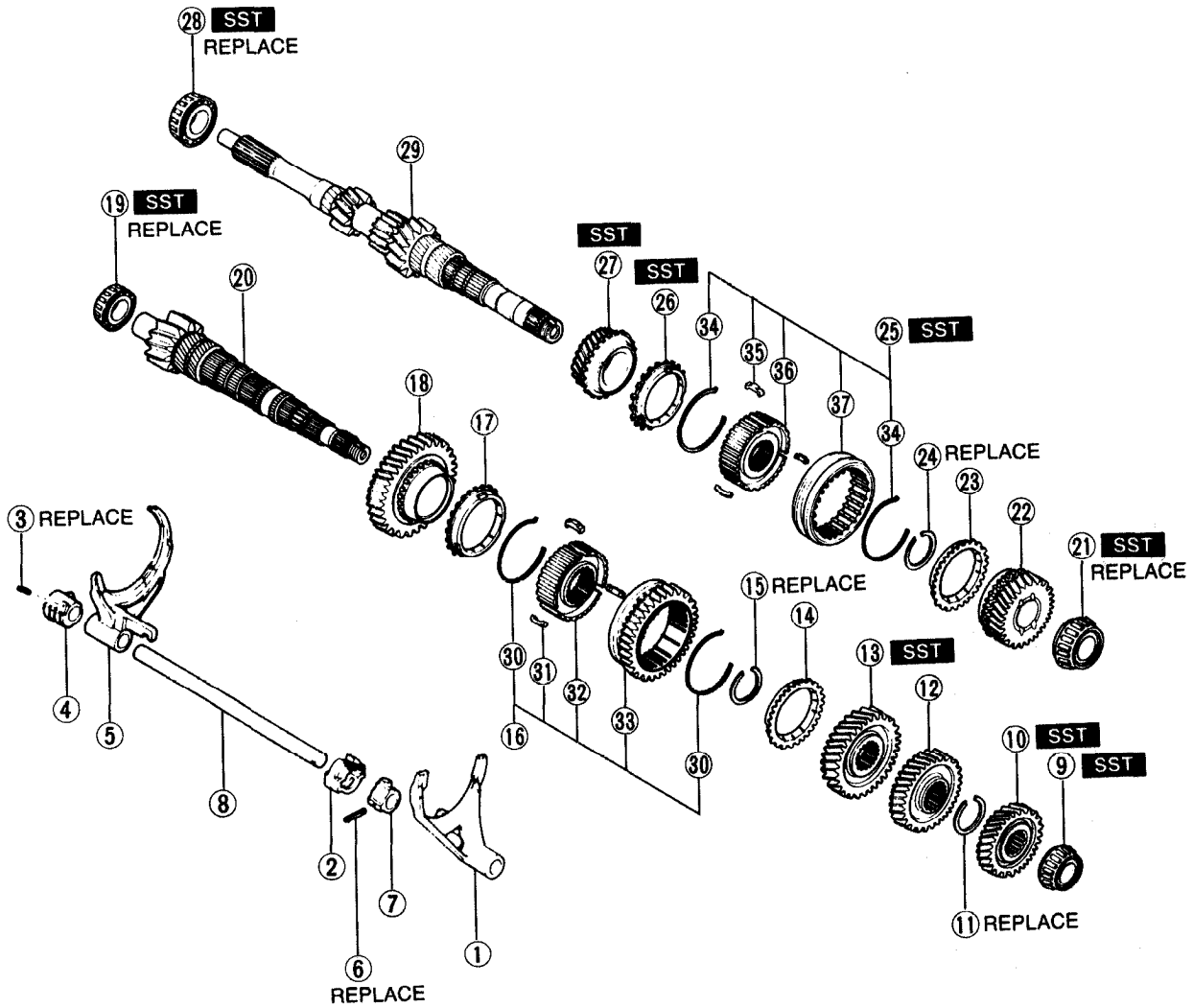
- Tap in until the oil seal installer contacts the case.
- Coat the oil seal lip with transaxle oil.

9. Tap the new oil seal into the transaxle case with the **SST**.

10. Replace the driveshaft end clip with a new one. Insert the driveshaft with the end-gap of the clip facing upward.

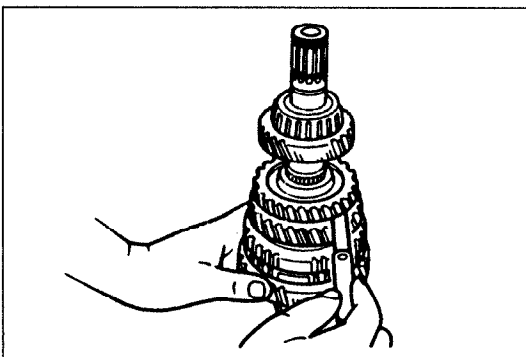
Primary Shaft Assembly and Secondary Shaft Assembly

1. Measure the thrust clearance of all gears before disassembly, referring to **Pre-inspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



1. 3rd/4th shift fork	
2. Interlock sleeve	
3. Roll pin	
4. Control end	
5. 1st/2nd shift fork	
6. Roll pin	
7. Control lever	
8. Control rod	
9. Bearing inner race	
Disassembly Note.....	page J2-20
Inspection.....	page J2-23
10. Secondary 4th gear	
Disassembly Note.....	page J2-20
Inspection.....	page J2-22
11. Retaining ring	
12. Secondary 3rd gear	
Pre-inspection.....	page J2-20
Disassembly Note.....	page J2-20
Inspection.....	page J2-22
13. 2nd gear	
Disassembly Note.....	page J2-20
Inspection.....	page J2-22
14. Synchronizer ring (2nd)	
Inspection.....	page J2-22
15. Retaining ring	
16. Clutch hub assembly (1st/2nd)	
Inspection.....	page J2-22
17. Synchronizer ring (1st)	
Inspection.....	page J2-22
18. 1st gear	
Pre-inspection.....	page J2-19
Disassembly Note.....	page J2-20
Inspection.....	page J2-22
19. Bearing inner race	
Disassembly Note.....	page J2-21
20. Secondary shaft	
Inspection.....	page J2-23
21. Bearing inner race	
Pre-inspection.....	page J2-20
Disassembly Note.....	page J2-21
22. 4th gear	
Inspection.....	page J2-22
23. Synchronizer ring (4th)	
Inspection.....	page J2-22
24. Retaining ring	
25. Clutch hub assembly (3rd/4th)	
Disassembly Note.....	page J2-21
Inspection.....	page J2-22
26. Synchronizer ring (3rd)	
Disassembly Note.....	page J2-21
Inspection.....	page J2-22
27. 3rd gear	
Pre-inspection.....	page J2-20
Disassembly Note.....	page J2-21
Inspection.....	page J2-22
28. Bearing inner race	
Disassembly Note.....	page J2-21
29. Primary shaft	
Inspection.....	page J2-23
30. Synchronizer spring	
31. Synchronizer key	
32. Clutch hub	
33. Clutch hub sleeve (reverse gear)	
34. Synchronizer spring	
35. Synchronizer key	
36. Clutch hub	
37. Clutch hub sleeve	

03U0J2-034

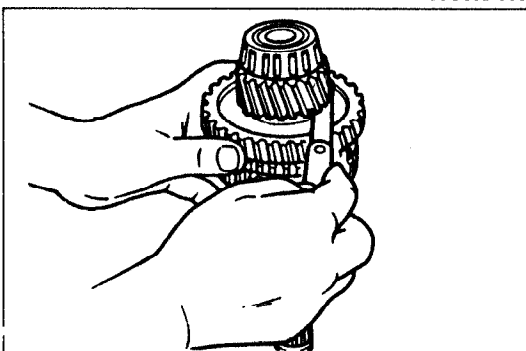


03U0J2-035

**Pre-inspection
Thrust clearance**

1. Measure the clearance between the 2nd gear and secondary 3rd gear.

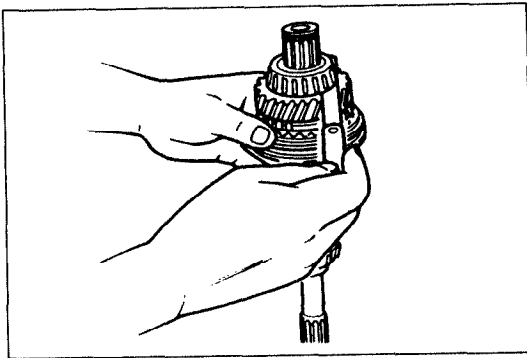
Clearance: 0.175—0.455mm (0.0069—0.0179 in)
Maximum : 0.505mm (0.0199 in)



03U0J2-036

2. Measure the clearance between the 1st gear and differential drive gear.

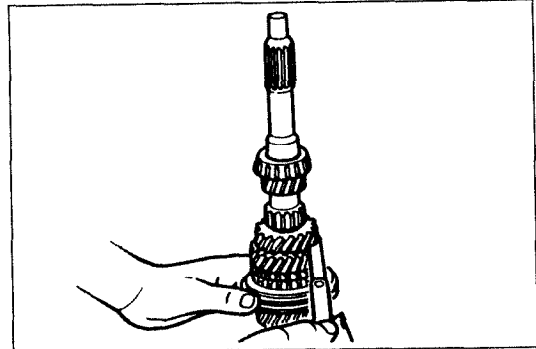
Clearance: 0.05—0.28mm (0.002—0.011 in)
Maximum : 0.33mm (0.0130 in)



13U0J2-004

3. Measure the clearance between the 4th gear and bearing inner race.

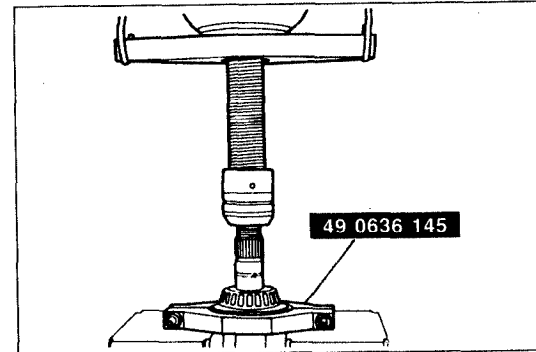
Clearance: 0.165—0.365mm (0.0065—0.0144 in)
Maximum: 0.415mm (0.0163 in)



03U0J2-038

4. Measure the clearance between the 3rd gear and 2nd gear.

Clearance: 0.05—0.20mm (0.002—0.008 in)
Maximum: 0.25mm (0.010 in)



03U0J2-039

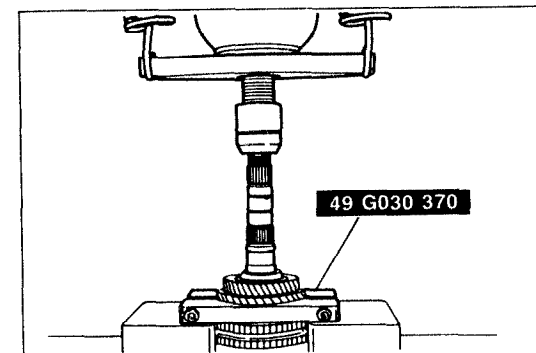
Disassembly note

Bearing inner race and secondary 4th gear

Caution

- Hold the shaft with one hand so that it does not fall.

1. Remove the bearing inner race and secondary 4th gear with the **SST**.



03U0J2-040

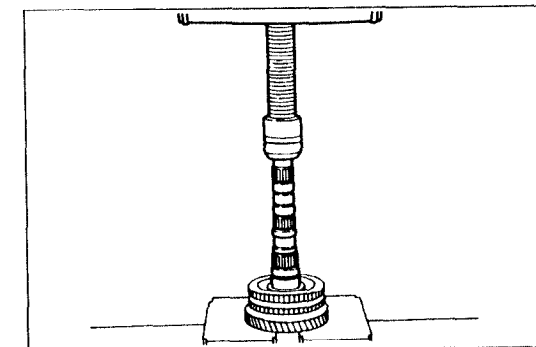
Secondary 3rd gear and 2nd gear

1. Remove the retaining ring.
2. Shift the gears to 1st gear.

Caution

- Hold the shaft with one hand so that it does not fall.

3. Remove the secondary 3rd gear and 2nd gear with the **SST**.



03U0J2-041

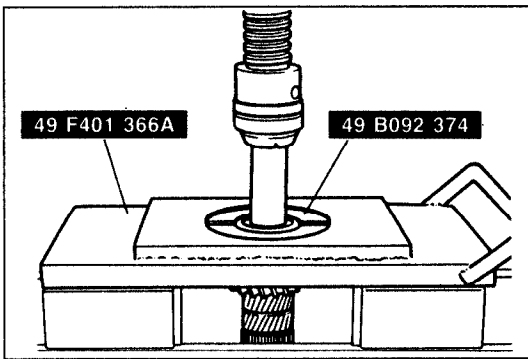
Clutch hub assembly (1st/2nd), synchronizer ring (1st), and 1st gear

1. Remove the retaining ring.

Caution

- Hold the shaft with one hand so that it does not fall.

2. Remove the clutch hub assembly (1st/2nd), synchronizer ring (1st), and 1st gear with a press.



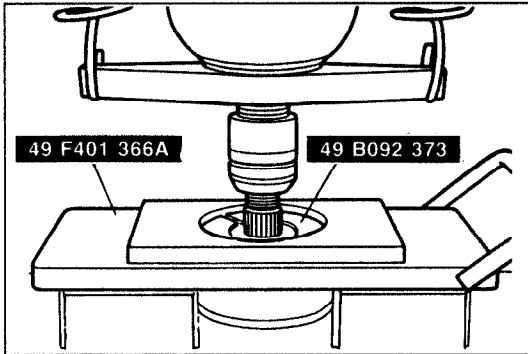
03U0J2-042

Bearing inner race (secondary shaft end)

Caution

- Hold the shaft with one hand so that it does not fall.

1. Remove the bearing inner race with the **SST**.



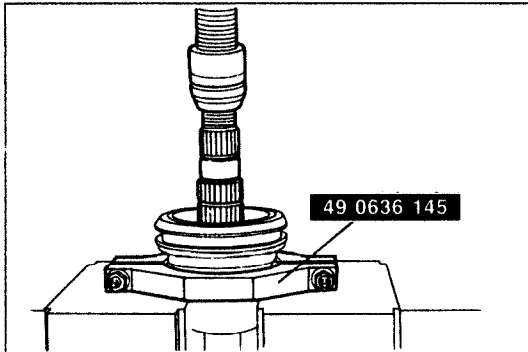
03U0J2-043

Bearing inner race (4th gear end)

Caution

- Hold the shaft with one hand so that it does not fall.

1. Remove the bearing inner race with the **SST**.



03U0J2-044

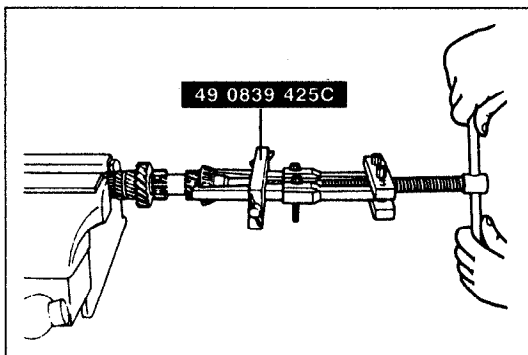
Clutch hub assembly (3rd/4th), synchronizer ring (3rd) and 3rd gear

1. Remove the retaining ring.

Caution

- Hold the shaft with one hand so that it does not fall.

2. Remove the clutch hub assembly (3rd/4th) synchronizer ring (3rd) and 3rd gear with the **SST**.



03U0J2-045

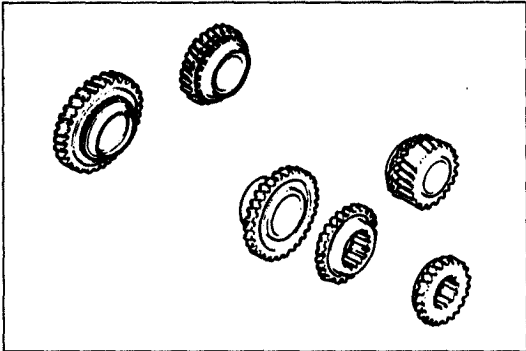
Bearing inner race (primary shaft end)

1. Remove the bearing inner race with the **SST**.

INSPECTION

Inspect all parts and repair or replace as necessary.

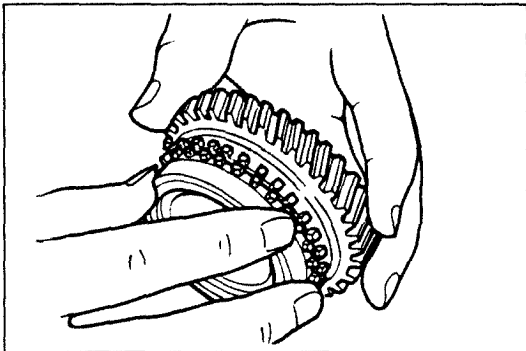
05U0JX-023



03U0J2-046

Gears

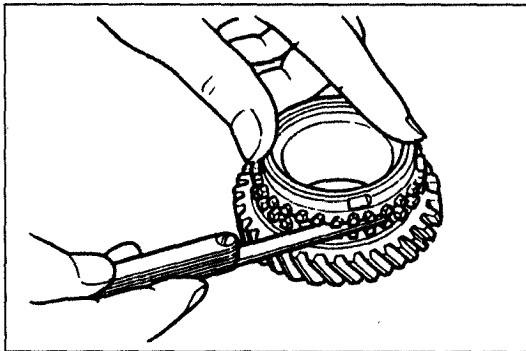
1. Inspect synchronizer cones for wear.
2. Inspect individual gear teeth for damage, wear, and cracks.
3. Inspect synchronizer ring matching teeth for damage and wear.



03U0J2-112

Synchronizer ring

1. Inspect individual synchronizer ring teeth for damage, wear, and cracks.
2. Inspect taper surface for wear and cracks.



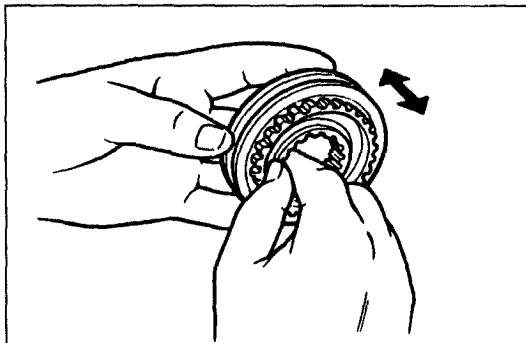
13U0J2-005

Note

- **Set the synchronizer ring squarely in the gear; then measure around the circumference.**

3. Measure the clearance between the synchronizer ring and flank surface of the gear.

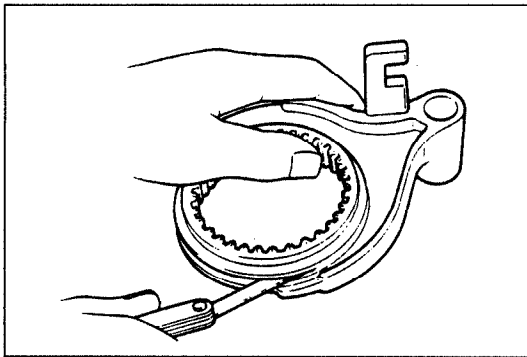
Standard clearance: 1.5mm (0.059 in)
Minimum: 0.8mm (0.032 in)



9MU0JX-059

Clutch hub assembly

1. Inspect the clutch hub sleeve and hub operation.
2. Inspect the individual gear teeth for damage, wear, and cracks.
3. Inspect the synchronizer key for damage, wear, and cracks.



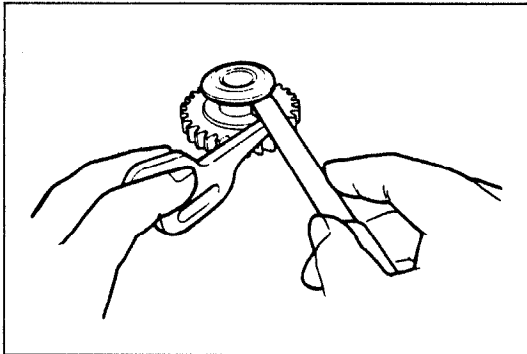
13U0J2-006

4. Measure the clearance between hub sleeve and shift fork.

Clearance

mm (in)

	Standard	Maximum
1st/2nd	0.08—0.228 (0.003—0.009)	0.728 (0.029)
3rd/4th	0.10—0.500 (0.004—0.020)	1.000 (0.039)
5th/Rev.	0.15—0.458 (0.059—0.018)	0.958 (0.038)



03U0J2-114

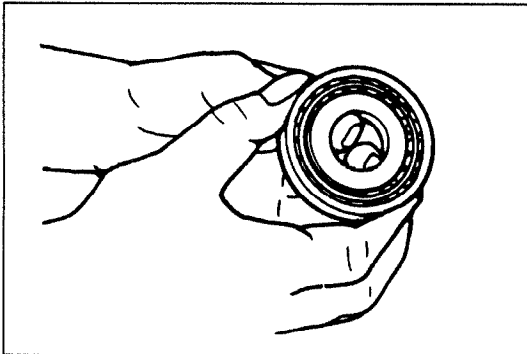
Reverse idler gear and reverse lever

1. Inspect gear teeth for damage, wear, and cracks.
2. Measure the clearance between the reverse idler gear bushing and the reverse lever.

Standard clearance:

0.10—0.32mm (0.004—0.013 in)

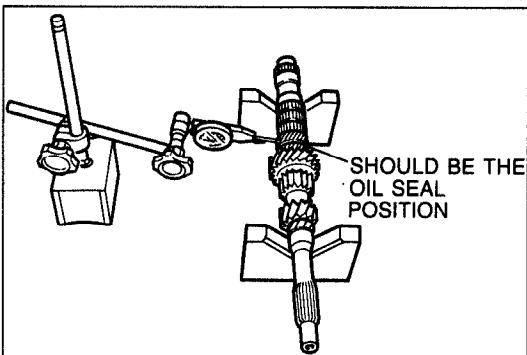
Maximum: 0.5mm (0.020 in)



03U0J2-115

Bearing

1. Inspect for damage and rough rotation.

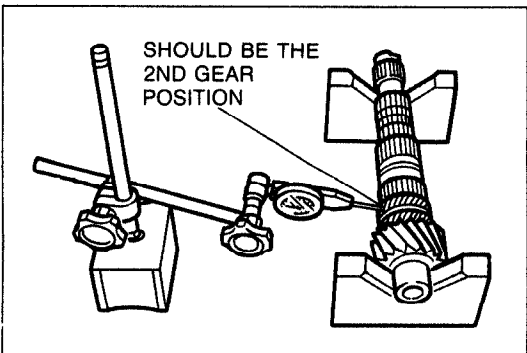


03U0J2-047

Primary Shaft and Secondary Shaft

1. Inspect the gear contact surface for damage and wear.
2. Inspect the splines for damage and wear.
3. Inspect the gear teeth for damage, wear, and cracks.
4. Inspect the oil passage for clogging.
5. Inspect the shaft gears' runout.

Primary shaft gear runout: 0.05mm (0.002 in)



03U0J2-048

Secondary shaft gear runout: 0.015mm (0.0006 in)

Note

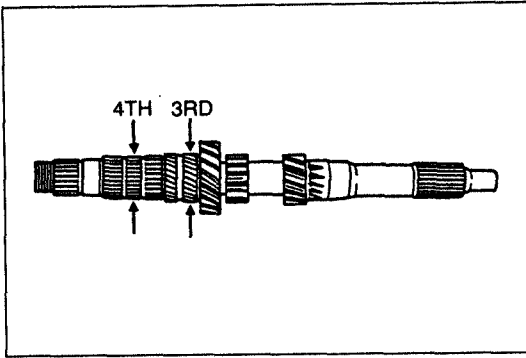
- If the shaft gear is replaced, adjust the bearing preload. (Refer to page J2-32.)

6. Oil clearance between shaft gears and gears.

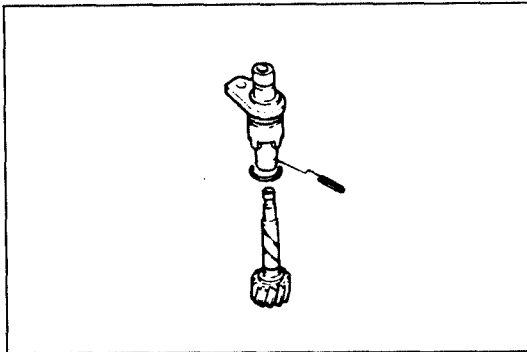
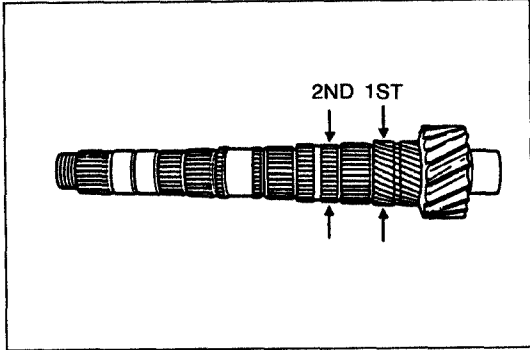
Oil Clearance

mm (in)

	Shaft (Outer dia.)	Gear (Inner dia.)	Sleeve (Outer dia.)	Oil clearance
1st	39.445—39.470 (1.553—1.554)	39.500—39.525 (1.555—1.556)	—	0.03—0.08 (0.001—0.003)
2nd	34.945—34.970 (1.376—1.377)	35.000—35.025 (1.378—1.379)	—	
3rd	35.945—35.970 (1.415—1.416)	36.000—36.025 (1.417—1.418)	—	
4th	30.945—30.970 (1.218—1.219)	31.000—31.025 (1.220—1.221)	—	
5th	—	34.000—34.025 (1.339—1.340)	33.945—33.970 (1.336—1.337)	



23U0J2-015



03U0J2-049

Speedometer Driven Gear Assembly

1. Inspect the teeth for damage and wear.
2. Inspect the O-ring for damage and wear.

MEMO

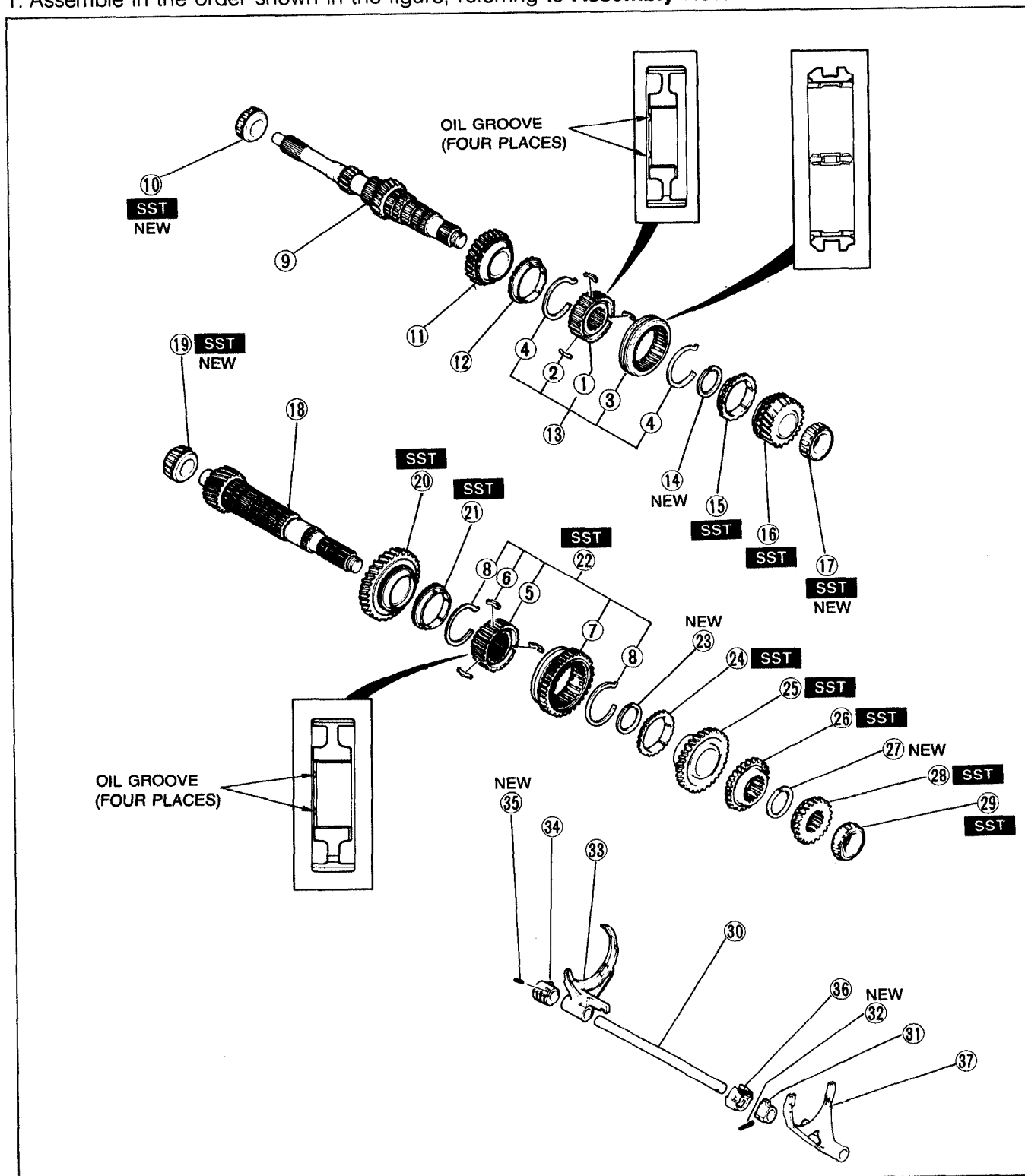
ASSEMBLY

Precaution

1. All O-rings and gaskets must be replaced with the new ones included in the overhaul kit.
2. The bearing outer race and bearing inner race must be replaced as a unit.
3. Before assembly, make sure all parts are completely clean.
4. Assemble the parts within 10 minutes after applying sealant. Allow all sealant to cure at least 30 minutes after assembly before filling the transaxle with transaxle oil.

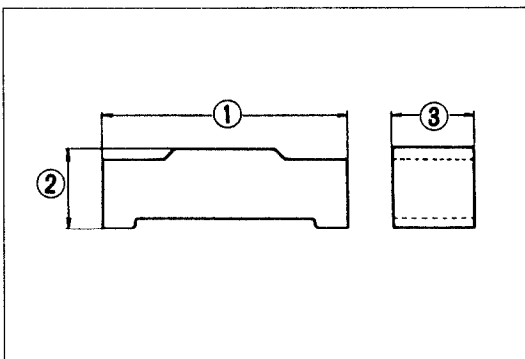
Primary Shaft Assembly and Secondary Shaft Assembly

1. Assemble in the order shown in the figure, referring to **Assembly Note**.



1. Clutch hub Assembly Note..... page J2-27	20. 1st gear Assembly Note..... page J2-29
2. Synchronizer key	21. Synchronizer ring (1st) Assembly Note..... page J2-29
3. Clutch hub sleeve	22. Clutch hub assembly (1st/2nd) Assembly Note..... page J2-29
4. Synchronizer spring	23. Retaining ring
5. Clutch hub Assembly Note..... page J2-27	24. Synchronizer ring (2nd) Assembly Note..... page J2-29
6. Synchronizer key	25. 2nd gear Assembly Note..... page J2-29
7. Clutch hub sleeve (reverse gear)	26. Secondary 3rd gear Assembly Note..... page J2-29
8. Synchronizer spring	27. Retaining ring
9. Primary shaft	28. Secondary 4th gear Assembly Note..... page J2-30
10. Bearing inner race Assembly Note..... page J2-28	29. Bearing inner race Assembly Note..... page J2-30
11. 3rd gear Assembly Note..... page J2-28	30. Control rod
12. Synchronizer ring (3rd) Assembly Note..... page J2-28	31. Control lever
13. Clutch hub assembly (3rd/4th) Assembly Note..... page J2-28	32. Roll pin
14. Retaining ring	33. 1st/2nd shift fork
15. Synchronizer ring (4th) Assembly Note..... page J2-28	34. Control end
16. 4th gear Assembly Note..... page J2-28	35. Roll pin
17. Bearing inner race Assembly Note..... page J2-28	36. Interlock sleeve Assembly Note..... page J2-30
18. Secondary shaft	37. 3rd/4th shift fork
19. Bearing inner race Assembly Note..... page J2-29	

03U0J2 051



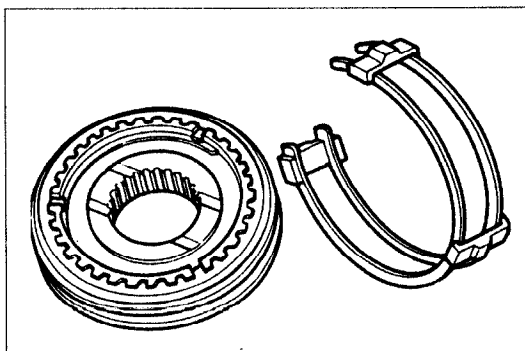
03U0J2-117

Assembly note
Clutch hub

Note

- Synchronizer key dimensions are as follows.

	mm (in)		
	(1)	(2)	(3)
1st/2nd	19 (0.7480)	4.25 (0.1673)	5.00 (0.1969)
3rd/4th 5th/Rev.	17 (0.6693)	4.25 (0.1673)	5.00 (0.1969)

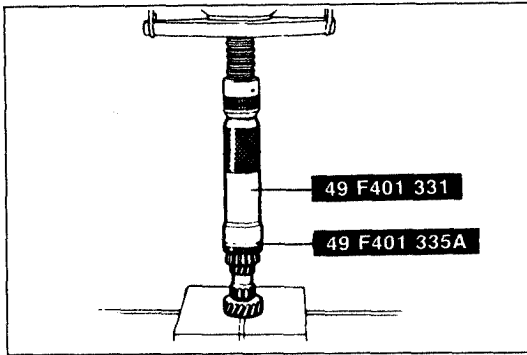


03U0J2-052

1. Install the synchronizer key springs in the clutch hub with the hooks in the grooves to hold the three synchronizer keys in place.

Bearing inner race (primary shaft end)

1. Install the new bearing inner race with the **SST**.

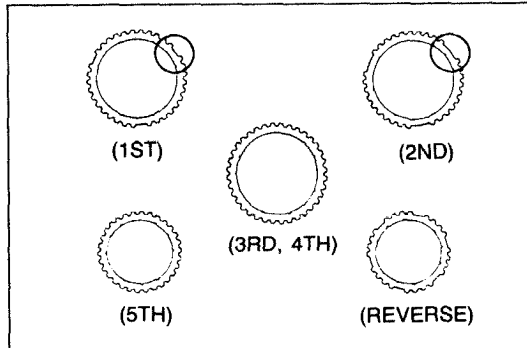


23U0J2-006

3rd gear, synchronizer ring (3rd) and clutch hub assembly (3rd/4th)

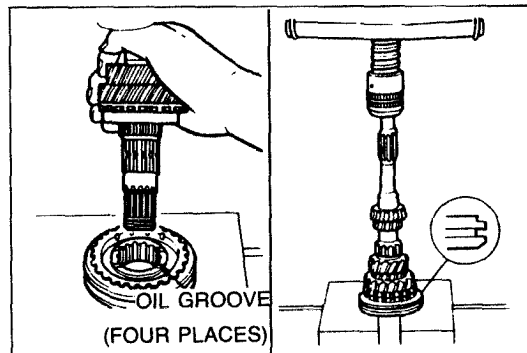
Note

- The size of the 1st, 2nd, 3rd, and 4th synchronizer rings are the same. Be careful when installing them. The 2nd ring has the larger cut-out as shown in the illustration.
- Align the synchronizer ring groove and clutch housing hub key when installing.



03U0J2-054

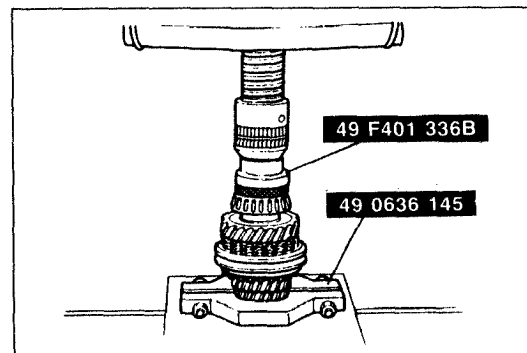
1. Install the 3rd gear, synchronizer ring (3rd), and clutch hub assembly (3rd/4th) with the **SST**.



23U0J2-007

Synchronizer ring (4th), 4th gear and bearing inner race

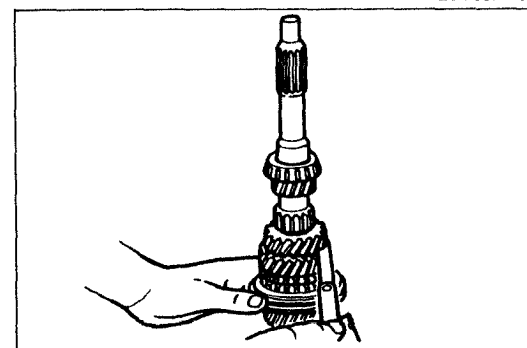
1. Install the synchronizer ring (4th), 4th gear, and bearing inner race with the **SST**.



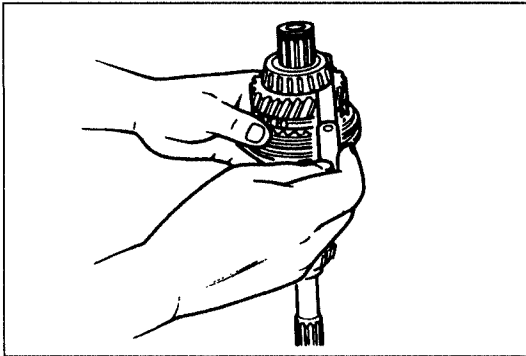
23U0J2-008

2. Measure the clearance between the 3rd gear and 2nd gear.

Clearance: 0.05—0.20mm (0.002—0.008 in)
Maximum : 0.25mm (0.010 in)



03U0J2-057

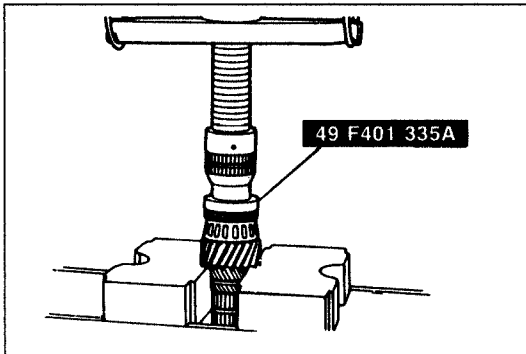


13U0J2-008

3. Measure the clearance between the 4th gear and bearing inner race.

Clearance: 0.165—0.365mm (0.0065—0.0144 in)
Maximum: 0.415mm (0.0163 in)

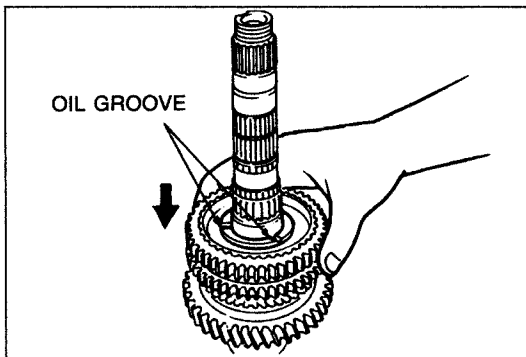
4. If not as specified, reassemble the primary shaft assembly.



23U0J2-009

Bearing inner race (secondary shaft end)

1. Install the new bearing inner race with the **SST**.



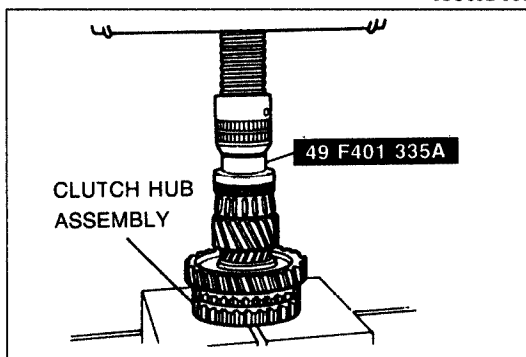
03U0J2-060

1st gear, synchronizer ring (1st) and clutch hub assembly (1st/2nd)

Note

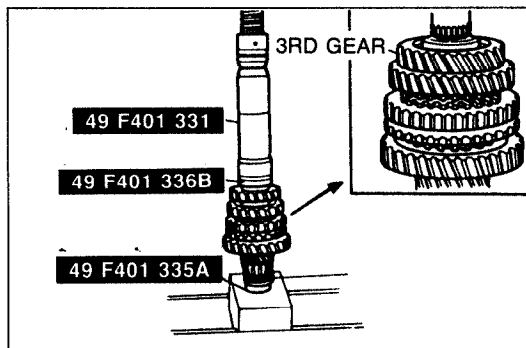
- **Align the synchronizer ring, groove and clutch housing hub key when installing.**

1. Assemble the 1st gear, synchronizer ring (1st), and clutch hub assembly (1st/2nd), as shown in the figure.



23U0J2-010

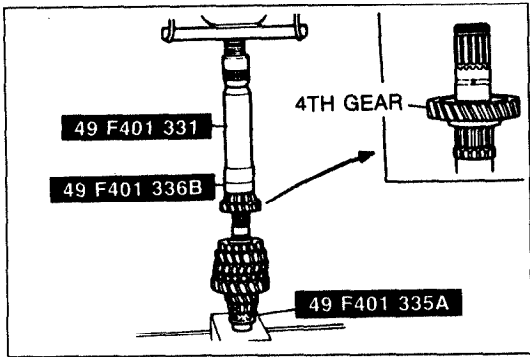
2. Press the clutch hub assembly (1st/2nd) on with the **SST**.



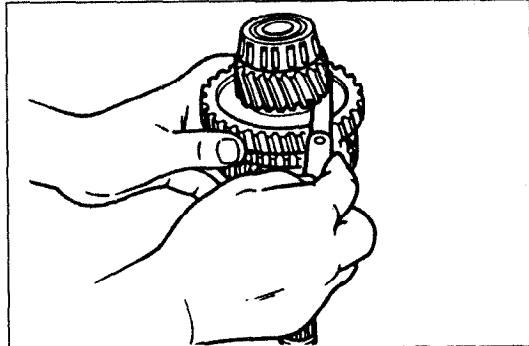
23U0J2-011

Synchronizer ring (2nd), 2nd gear and secondary 3rd gear

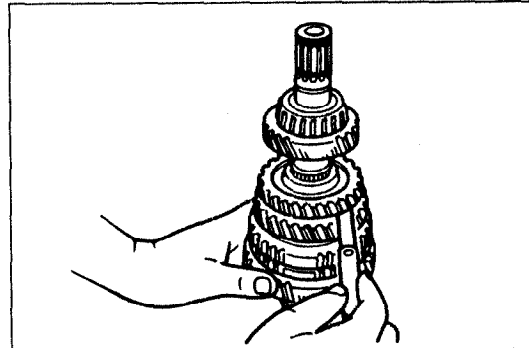
1. Install the synchronizer ring (2nd) and 2nd gear.
2. Install the secondary 3rd gear with the **SST**.



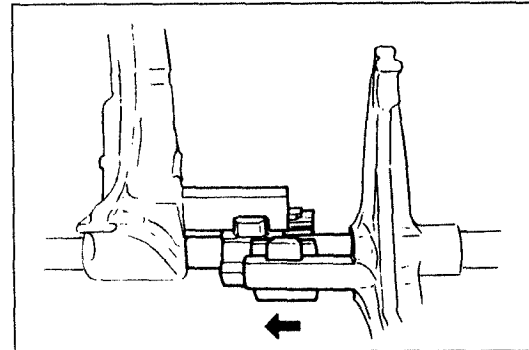
03U0J2-063



03U0J2-064



03U0J2-065



03U0J2-066

Secondary 4th gear and bearing inner race

1. Install the secondary 4th gear and new bearing inner race.

2. Measure the clearance between the 1st gear and differential drive gear.

Clearance: 0.05—0.28mm (0.002—0.011 in)
Maximum: 0.33mm (0.0130 in)

3. Measure the clearance between the 2nd gear and secondary 3rd gear.

Clearance: 0.175—0.455mm (0.0069—0.0179 in)
Maximum: 0.505mm (0.0199 in)

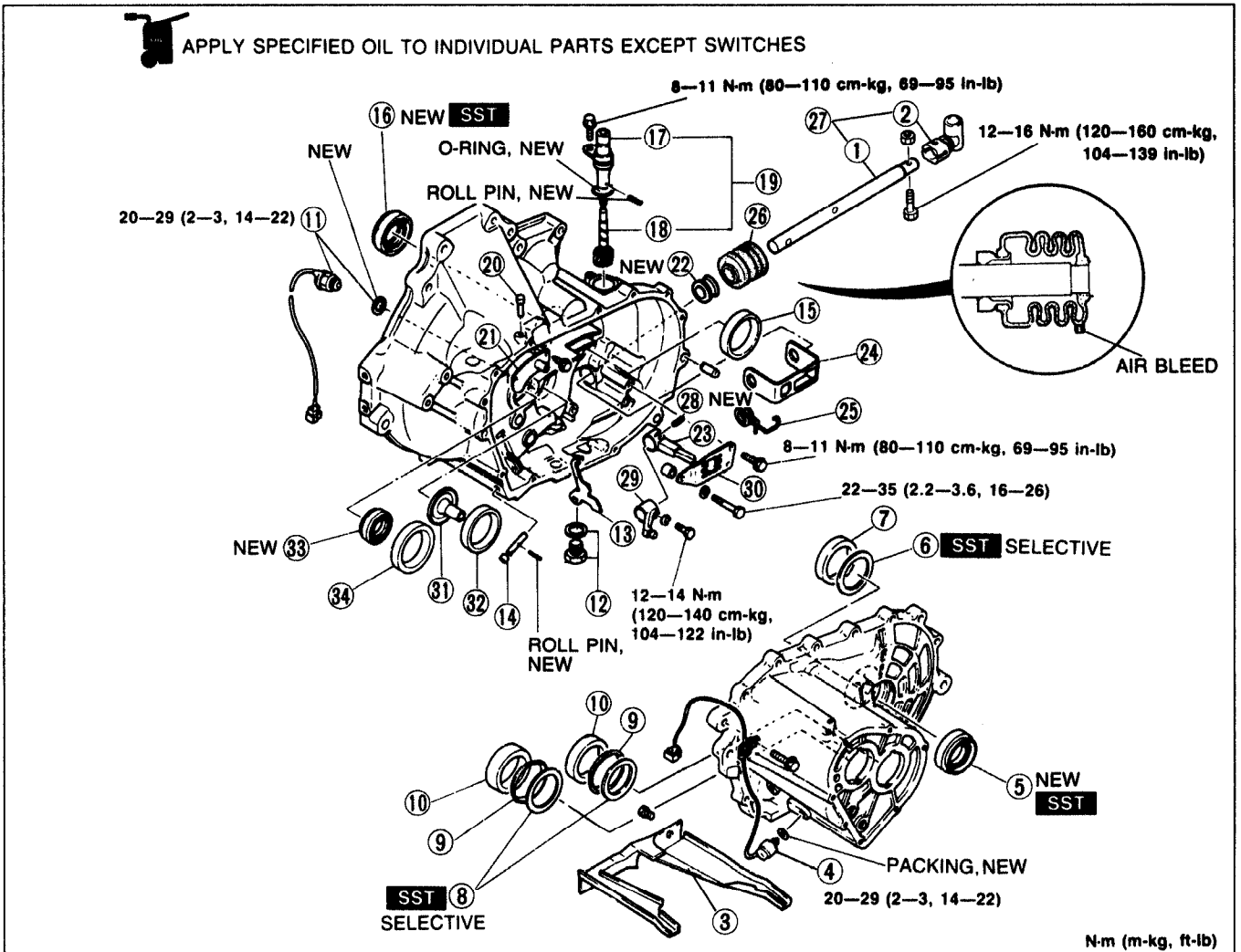
4. If not as specified, reassemble the secondary shaft as ssembly.

Interlock sleeve

1. Install both shift forks and the interlock sleeve, as in the figure.

Clutch Housing and Transaxle Case Components

1. Select the adjust shim(s), referring to **Bearing Preload Adjustment**.
2. Assemble in the order shown in the figure, referring to **Assembly Note**.
3. Verify that the bearing preload is satisfied after assembly, referring to **Bearing Preload**.



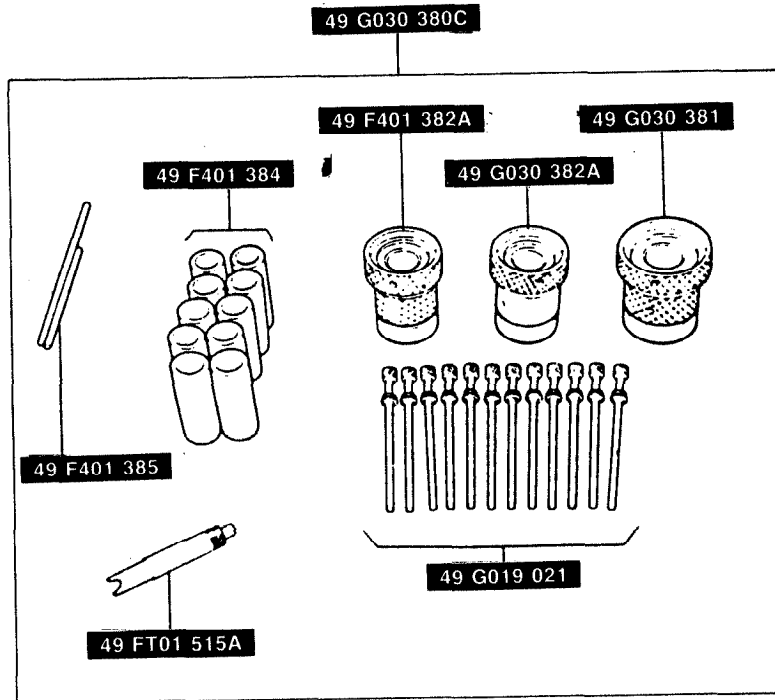
23U0J2-012

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Change rod 2. Joint 3. Oil passage 4. Back-up light switch 5. Oil seal
Assembly Note..... page J2-35 6. Adjust shim(s)
Bearing preload adjustment page J2-32
Bearing preload page J2-36 7. Bearing outer race 8. Adjust shims
Bearing preload adjustment page J2-32
Bearing preload page J2-36 9. Diaphragm springs
Assembly Note..... page J2-35 10. Bearing outer races 11. Neutral switch and gasket 12. Drain plug and washer 13. Reverse lever 14. Reverse lever shaft 15. Bearing outer race | <ol style="list-style-type: none"> 16. Oil seal
Assembly Note..... page J2-35 17. Gear case 18. Driven gear 19. Speedometer driven gear assembly 20. Bleeder 21. Bleeder cover assembly 22. Oil seal 23. Selector 24. Reverse gate 25. Spring 26. Boot
Assembly Note..... page J2-35 27. Change rod assembly 28. Roll pin 29. Change arm 30. Guide plate 31. Funnel 32. Bearing outer race 33. Oil seal 34. Bearing outer race |
|---|---|

Bearing preload adjustment

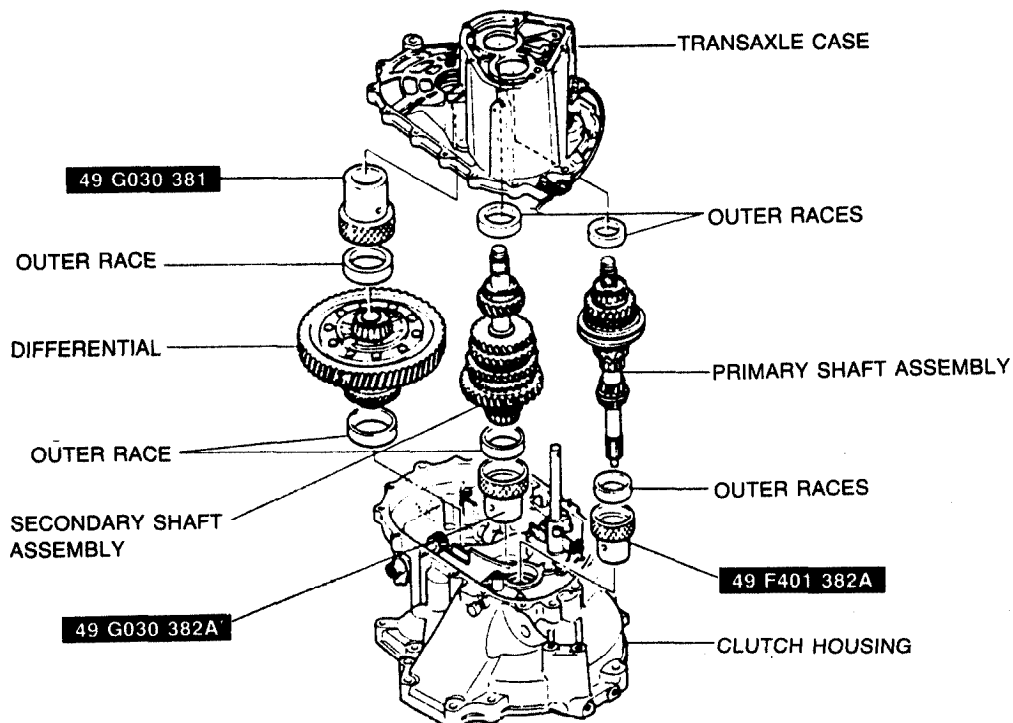
Adjust the bearing preload by selecting adjust shim(s).

SST

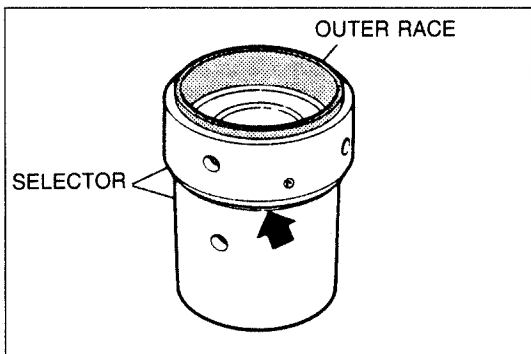


03U0J2-068

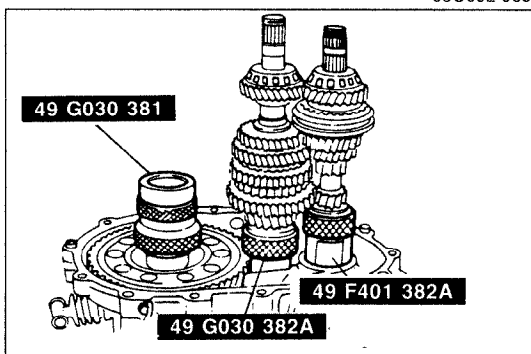
SST USAGE



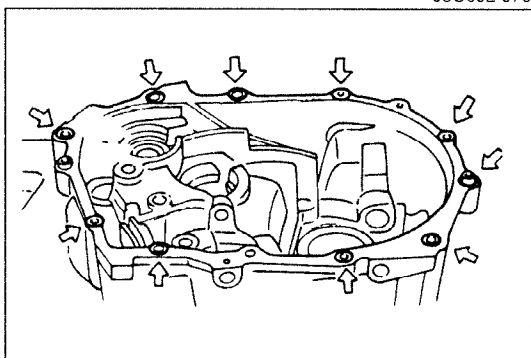
83U07A-033



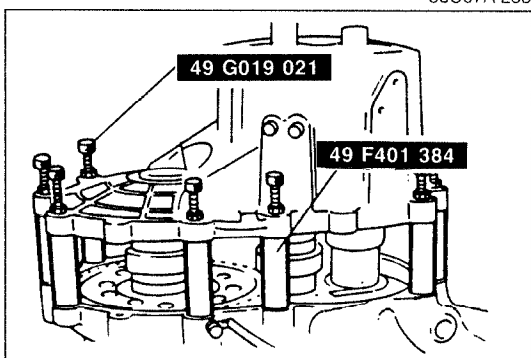
03U0J2-069



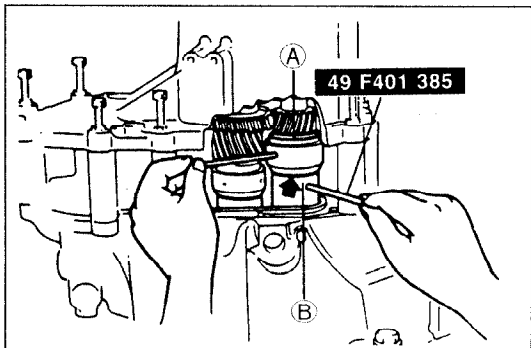
03U0J2-070



86U07A-253



03U0J2-071



03U0J2-072

1. Install the primary and secondary shaft bearing outer races into the transaxle case (diaphragm springs and shims removed).
2. Mount the clutch housing onto the transaxle hanger, and set the differential bearing outer race into the clutch housing. Position a piece of pipe against the outer race and tap in with a hammer until it contacts the clutch housing.
3. Set the outer races into the **SST** (selector) as shown in the figure.

Note

- Turn the selector to eliminate the gap indicated by the arrow in the figure.

4. Set the differential assembly into the clutch housing; then set the bearing outer race and the **SST** (selector) on the differential. Set the assembled selectors for the primary and secondary shaft in the clutch housing. Mount the shaft gear assemblies as shown in the figure.

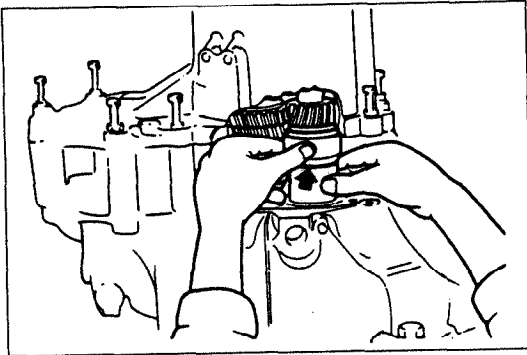
5. Set the **SST** (collars) in the positions shown in the figure.

6. Install the transaxle case and tighten the **SST** (bolts) to the specified torque.

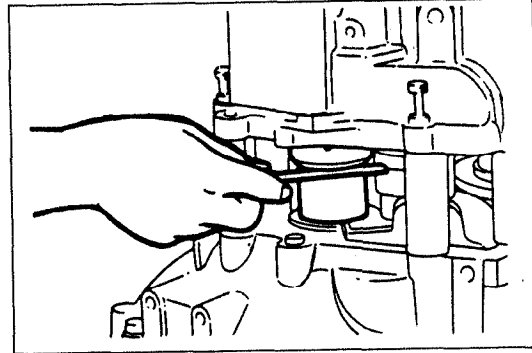
Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

7. To seat the bearings, mount the **SST** (bars) on parts (A) and (B) of the selector, and turn the selector so the gaps are widened. Then turn the **SST** in the reverse direction until the gaps are eliminated.



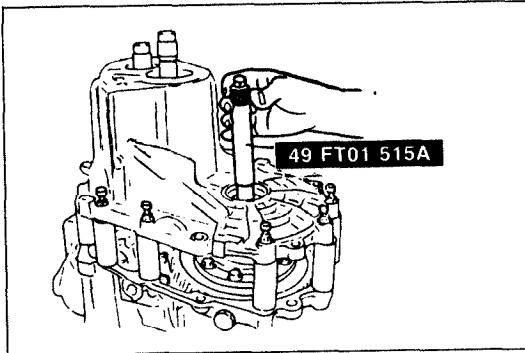
03U0J2-073



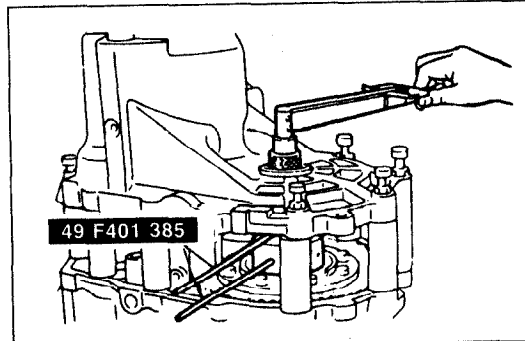
13U0J2-010

Thickness (Shaft gears)	mm (in)
0.20 (0.008)	0.50 (0.020)
0.25 (0.010)	0.55 (0.022)
0.30 (0.012)	0.60 (0.024)
0.35 (0.014)	0.65 (0.026)
0.40 (0.016)	0.70 (0.028)
0.45 (0.018)	

13U0J2-011



03U0J2-076



03U0J2-077

Note

- Check that each shaft turns smoothly.

8. Manually expand the selector until it no longer turns by hand.

Caution

- Measure the gap around the entire circumference of the selector.

9. Use a feeler gauge and measure the gap in the selector.

10. Take the maximum reading and determine the shim to be used as follows:

Note

- Use a maximum of two shims.

< **Primary shaft adjust shim** >

- Subtract the diaphragm spring thickness (0.70mm, 0.0276 in) from the gap determined in Step 9.
- Select the closest thinner shim from the table.

Example

$$1.22\text{mm (0.0480 in)} - 0.70\text{mm (0.0276 in)} = 0.52\text{mm (0.0205 in)}$$

Shim: 0.50mm (0.020 in)

< **Secondary shaft adjust shim** >

- Subtract the diaphragm spring thickness (0.70mm, 0.0276 in) from the gap determined in Step 9.
- Select the closest thicker shim from the table.

Example

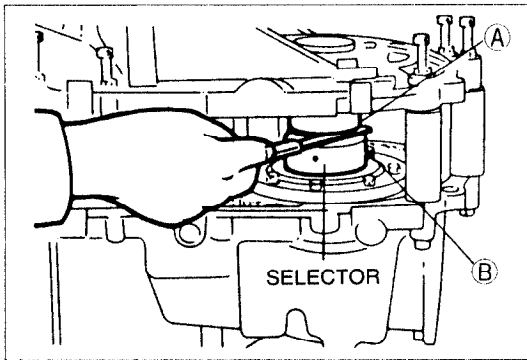
$$1.22\text{mm (0.0480 in)} - 0.70\text{mm (0.0276 in)} = 0.52\text{mm (0.0205 in)}$$

Shim: 0.55mm (0.022 in)

11. Install the **SST**.

12. Adjust the selector with the **SST** until the specified preload is obtained.

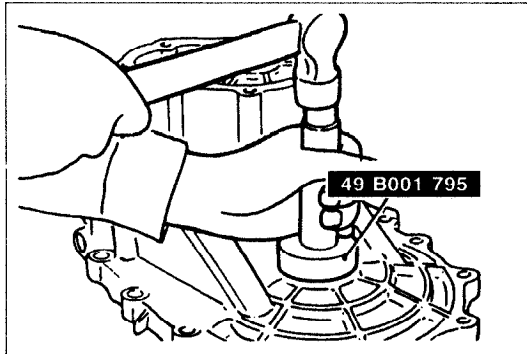
Preload: 0.5 N·m (5 cm·kg, 4.3 in·lb)



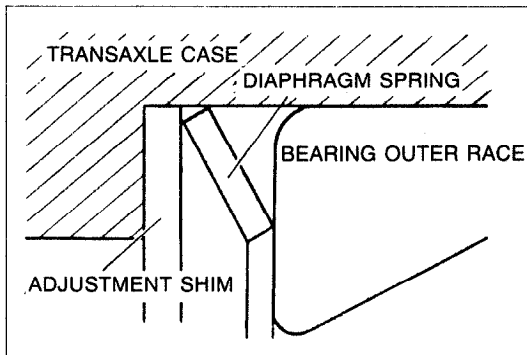
03U0J2-078

Thickness	mm (in)
0.10 (0.004)	0.70 (0.028)
0.20 (0.008)	0.75 (0.030)
0.25 (0.010)	0.80 (0.031)
0.30 (0.012)	0.85 (0.033)
0.35 (0.014)	0.90 (0.035)
0.40 (0.016)	0.95 (0.037)
0.45 (0.018)	1.00 (0.039)
0.50 (0.020)	1.05 (0.041)
0.55 (0.022)	1.10 (0.043)
0.60 (0.024)	1.15 (0.045)
0.65 (0.026)	1.20 (0.047)

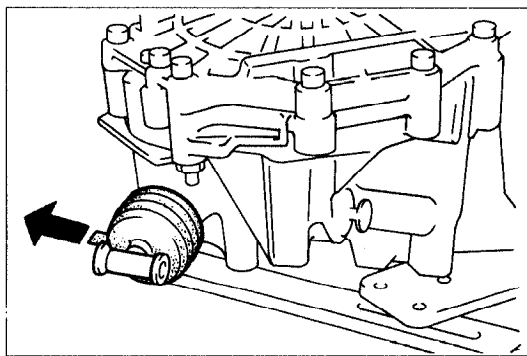
03U0J2-079



03U0J2-080



03U0J2-081



03U0J2-082

Caution

- Measure the gap around the entire circumference of the selector

13. Use a feeler gauge to measure the gap in the selector for the differential.
14. Add **0.15mm (0.0059 in)** to the measured clearance and select the combination of shims closest in value to that measurement.

Note

- Use a maximum of two shims.

See the table below for available shim sizes.

Example: 0.32mm (0.013 in)

0.32mm (0.013 in) + 0.15mm (0.006 in) = 0.47mm (0.019 in).

So the nearest shim (on the thick side) to 0.47mm (0.019 in) is 0.50mm (0.020 in).

15. Remove the **SST** and the transaxle case.
16. Remove the selectors, the primary shaft assembly and the differential.
17. Remove the bearing outer races.

Assembly note

Oil seals

1. Apply transaxle oil to outer periphery.
2. Install the new oil seals with the **SST**.

Diaphragm spring

1. Install the diaphragm spring as shown in the figure.

Boot

1. Install the boot with the drain hole facing downward.

Bearing preload

Verify the shaft gears and the differential bearing preload.

Note

- Verify that the correct adjust shims were selected.
- If the bearing preload is not within specification, adjust again.

1. Set the primary shaft gear and the differential into the clutch housing.
2. Install the transaxle case, and tighten to the specified torque.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

3. Connect the **SST** and install it through the driveshaft hole.
4. Hook a spring scale to the attachment and measure the preload.

Preload:

1.4—2.0 N·m (14—20 cm·kg, 12—17 in·lb)

5. Remove the **SST**.
6. With the transaxle facing in the direction shown in the figure, install the **SST** to the primary shaft gear.
7. Measure the preload.

Preload:

0.1—0.25 N·m (1.0—2.5 cm·kg, 0.87—2.18 in·lb)

8. Remove the **SST**, transaxle case, primary shaft gear and differential.
9. Install the secondary shaft gear and transaxle case then tighten to the specified torque.

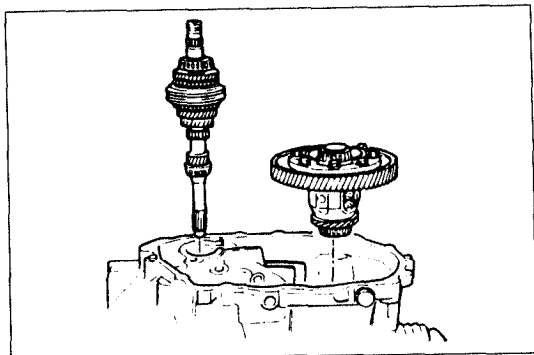
Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

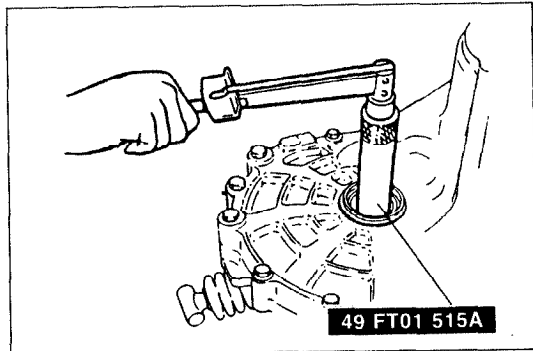
10. Measure the secondary shaft preload with the **SST**.

Preload:

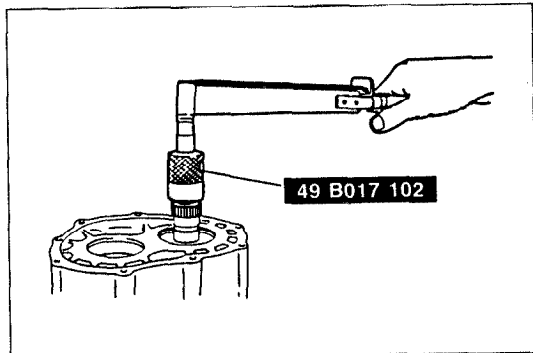
0.2—0.4 N·m (2.0—4.0 cm·kg, 1.7—3.5 in·lb)



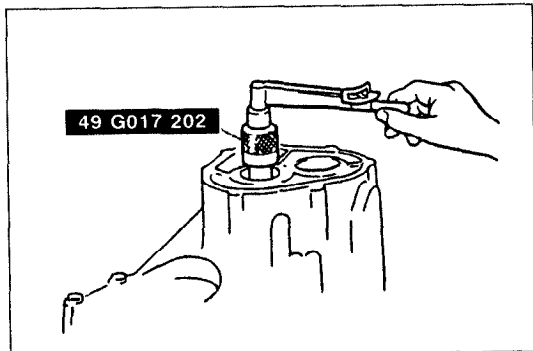
03U0J2-083



03U0J2-120



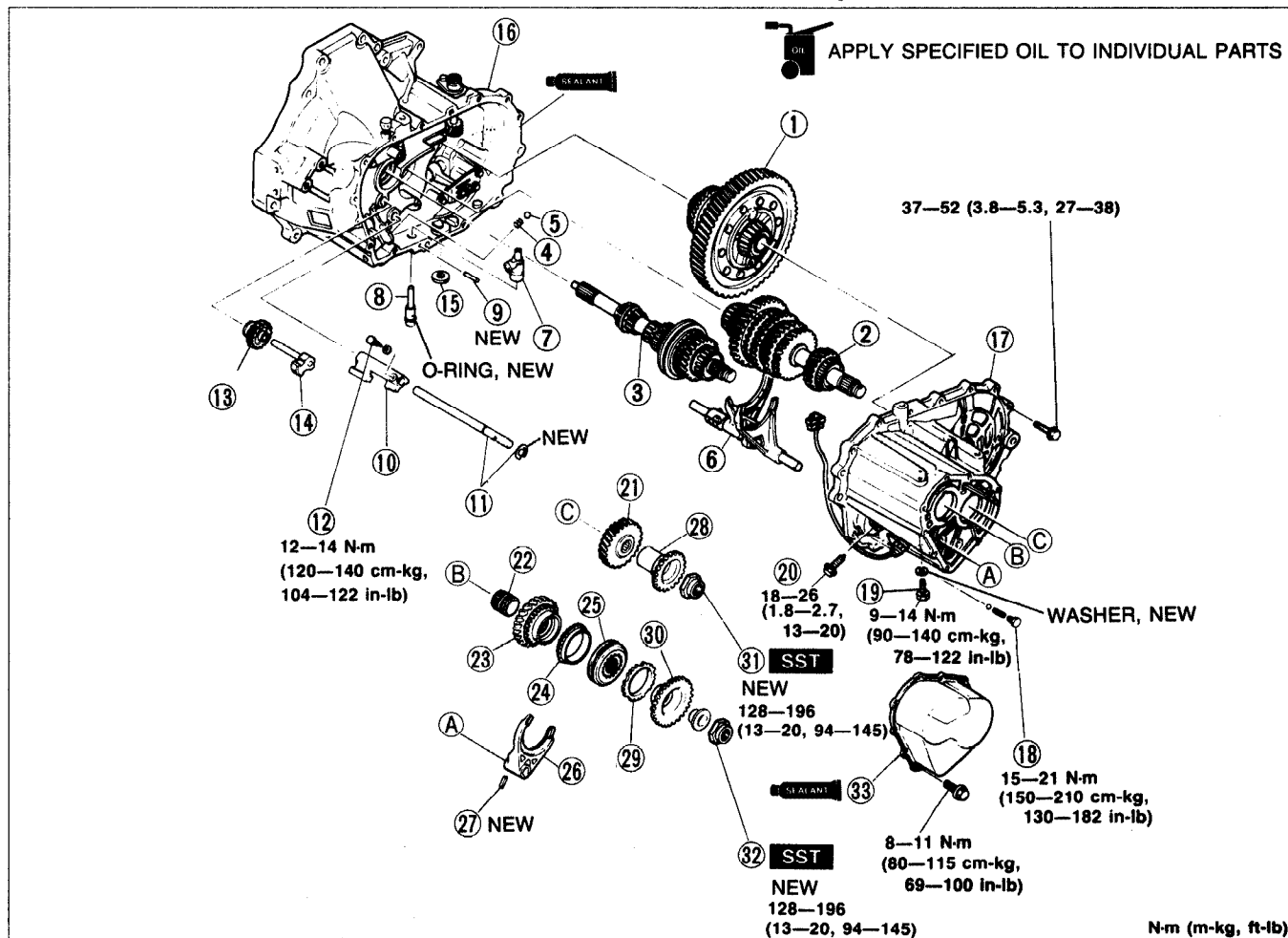
03U0J2-084



03U0J2-085

5th/Reverse Gear and Housing Parts

1. Assemble in the order shown in the figure, referring to **Assembly Note**.



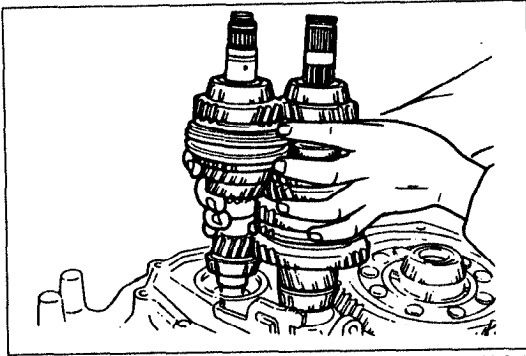
03U0J2-086

- | | |
|--------------------------------------|---|
| 1. Differential assembly | 16. Clutch housing |
| 2. Secondary shaft gear assembly | Assembly Note..... page J2-39 |
| Assembly Note..... page J2-38 | 17. Transaxle case assembly |
| 3. Primary shaft gear assembly | Assembly Note..... page J2-39 |
| Assembly Note..... page J2-38 | 18. Lock bolt, ball and spring |
| 4. Spring | 19. Guide bolt |
| 5. Steel ball | 20. Lock bolt |
| 6. Shift fork and shift rod assembly | 21. Secondary 5th gear |
| Assembly Note..... page J2-38 | Assembly Note..... page J2-39 |
| 7. Crank lever assembly | 22. Gear sleeve |
| Assembly Note..... page J2-38 | 23. 5th gear |
| 8. Crank lever shaft | 24. Synchronizer ring (5th) |
| Assembly Note..... page J2-38 | 25. Clutch hub assembly (5th/Reverse) |
| 9. Pin | Assembly Note..... page J2-39 |
| 10. 5th/Reverse shift rod end | 26. 5th/Reverse shift fork |
| Assembly Note..... page J2-39 | Assembly Note..... page J2-39 |
| 11. 5th/Reverse shift rod and clip | 27. Roll pin |
| Assembly Note..... page J2-39 | 28. Secondary reverse synchronizer gear |
| 12. Lock bolt | 29. Synchronizer ring (Reverse) |
| 13. Reverse idler gear | 30. Primary reverse synchronizer gear |
| Assembly Note..... page J2-39 | 31. Locknut |
| 14. Reverse idler shaft | Assembly Note..... page J2-40 |
| Assembly Note..... page J2-39 | 32. Locknut |
| 15. Magnet | Assembly Note..... page J2-40 |
| | 33. Rear cover |

Assembly note

Primary shaft gear assembly and secondary shaft gear assembly

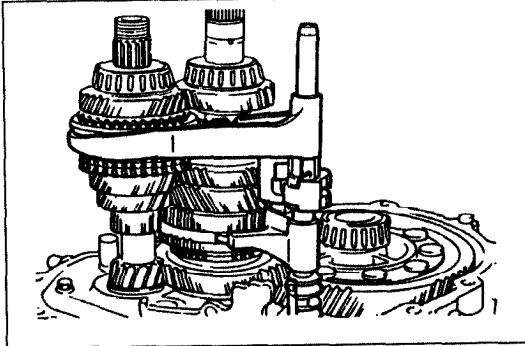
1. Install the primary shaft gear assembly and the secondary shaft gear assembly together.



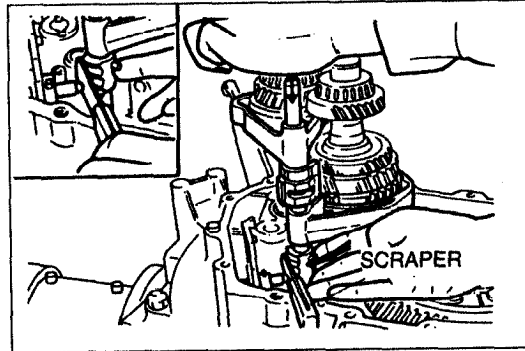
03U0J2-087

Shift fork and shift rod assembly

1. Shift to 2nd gear and position the shift fork and shift rod assembly as shown.

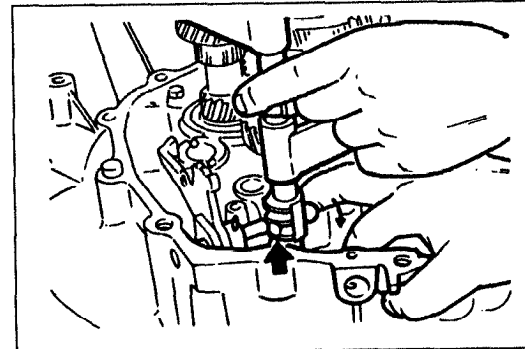


03U0J2-088



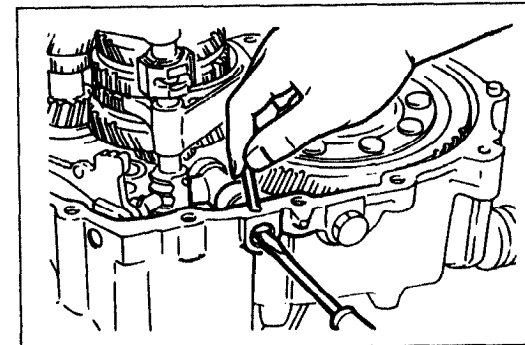
03U0J2-089

2. Insert the spring seat and spring into the reverse lever shaft, install the steel ball, and place a scraper so that it contacts the steel ball.
3. With the edge of the control end against the scraper, when the control end is pushed in the direction of the arrow in the figure so that the ball goes into the shaft, at the same time the rod will line up with the shift rod coupling hole in the clutch housing.



03U0J2-090

4. Set each clutch hub sleeve to the neutral position, and tap the shift rod from above so that the steel ball goes into the center groove (of the 3 grooves in the control end).
5. Pull the ball part of the control end forward so that the steel ball goes into the detent in the groove.



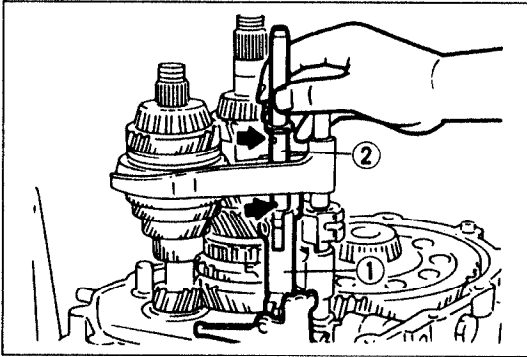
03U0J2-091

Crank lever assembly and crank lever shaft

Note

- Use a new O-ring for the crank lever shaft.

1. Fit the crank lever between the change arm and the control end, and connect the crank lever shaft to the crank lever.
2. Align the pin holes of the crank lever shaft and the clutch housing, and insert the new pin.



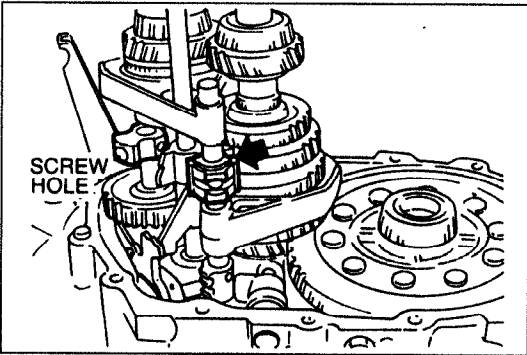
03U0J2-092

5th/Reverse shift rod end, 5th/Reverse shift rod and clip

Note

- The mark (indicated by the arrow in the figure) and the shift rod end mounting bolt hole must be in the same direction.

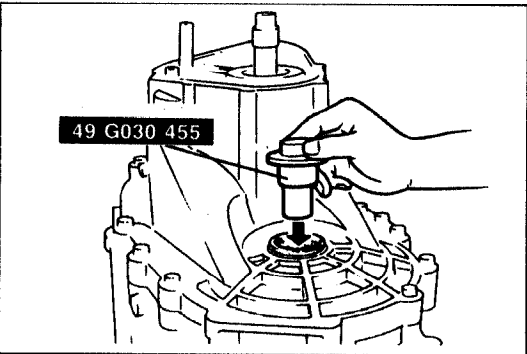
1. Install the shift rod end ① and the shift rod ②, and tighten the gate mounting bolt.



03U0J2-093

Reverse idler gear and reverse idler shaft

1. Install the reverse idler gear and the reverse idler shaft.
2. Attach the magnet to the clutch housing.
3. Align the end of the interlock sleeve with the control lever (indicated by the arrow), and, at the same time, face the reverse idler shaft screw hole in the direction shown in the figure.



03U0J2-094

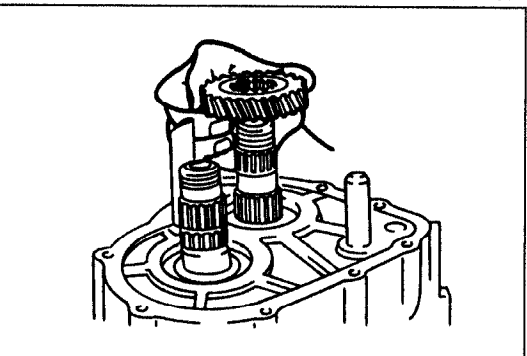
Clutch housing and transaxle case assembly

1. Apply a thin coat of sealant to the contact surfaces of the clutch housing and transaxle case, tighten the transaxle case installation bolts to the specified torque.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

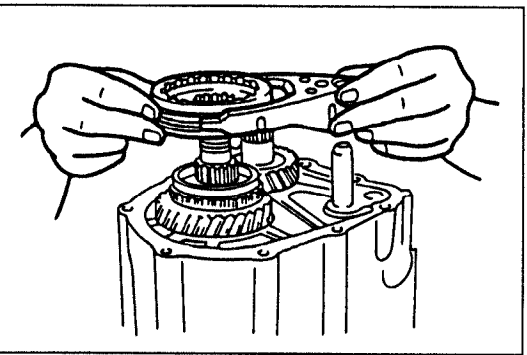
2. Insert the **SST** through driveshaft hole.



03U0J2-095

Secondary 5th gear

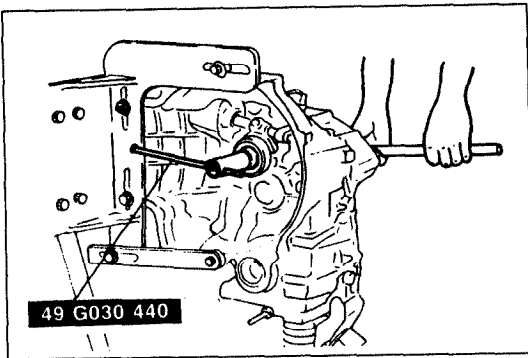
1. Install the secondary 5th gear as shown.



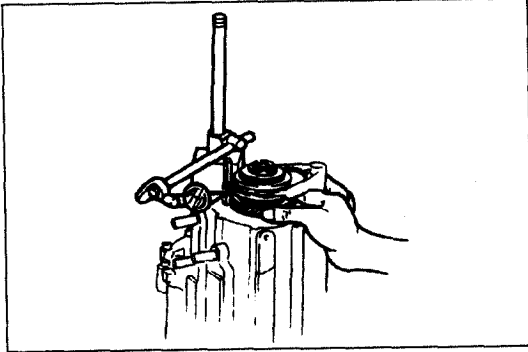
03U0J2-096

Clutch hub assembly (5th/Reverse) and 5th/Reverse shift fork

1. Install the clutch hub assembly (5th/Reverse) and the 5th/Reverse shift fork together.



03U0J2-097



23U0J2-013

Locknut

1. Shift to 1st gear.
2. Lock the primary shaft with the **SST**.
3. Tighten new locknuts on the primary and secondary shafts.

Tightening torque:

128—196 N·m (13.0—20.0 m·kg, 94—145 ft·lb)

4. Stake the locknuts.

5. Measure the 5th gear thrust clearance with a dial indicator.

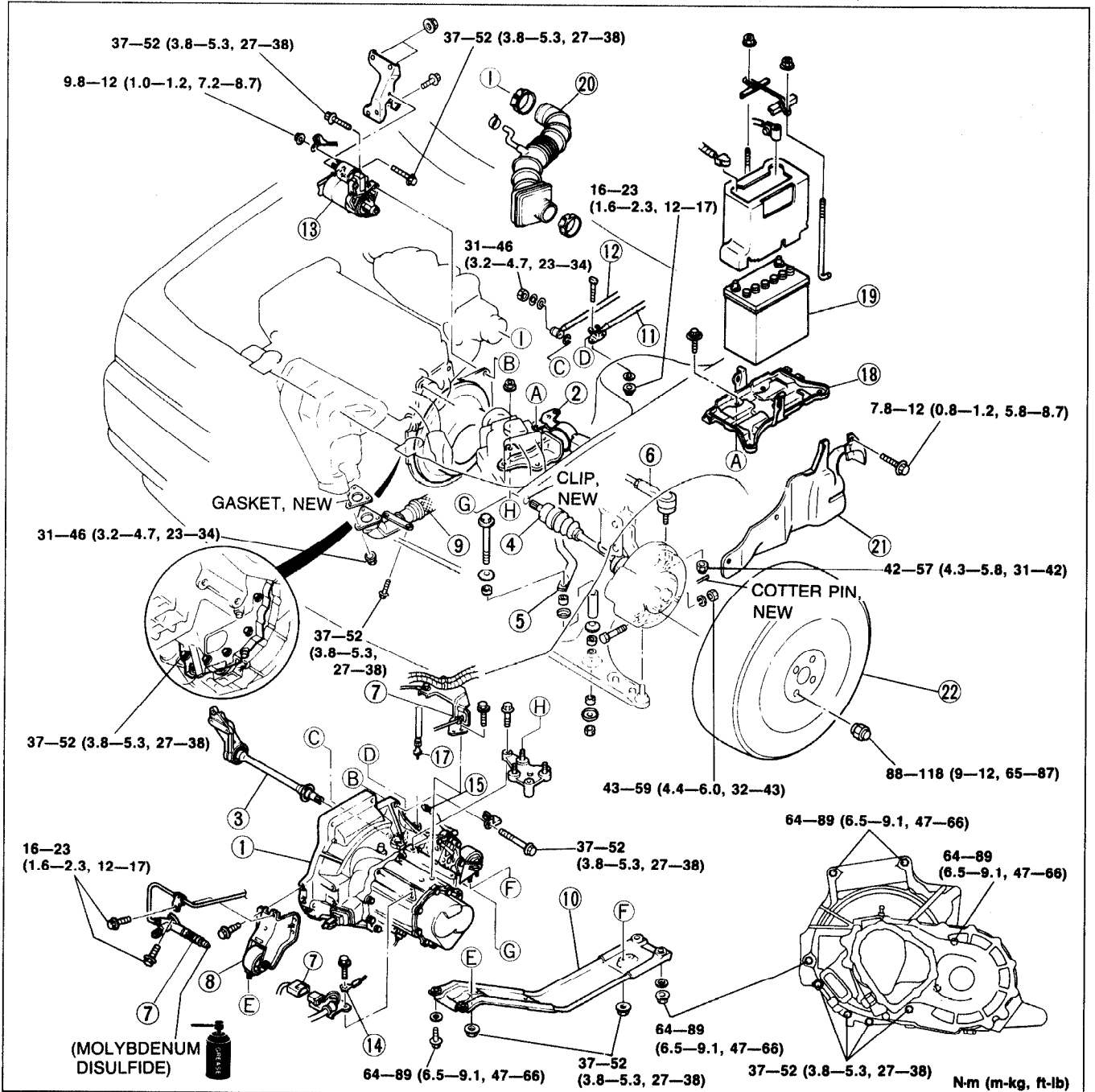
Clearance: 0.10—0.22mm (0.0039—0.0087 in)

Maximum: 0.27mm (0.011 in)

6. If not as specified, reassemble the transaxle.

INSTALLATION

1. Raise the vehicle and support it with safety stands.
2. Install in the order shown in the figure, referring to **Installation Note**.
3. Fill the transaxle with the specified amount of the specified transaxle oil after installation.
4. Warm up the engine and transaxle, and inspect for oil leakage and transaxle operation.



03U0J2-098

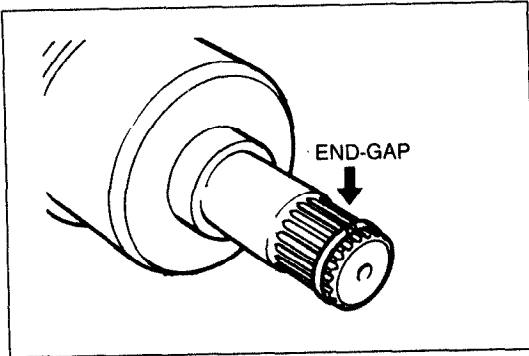
- | | | |
|----------------------|----------------------------|------------------------------------|
| 1. Transaxle | 6. Tie-rod end | 15. Neutral switch connector |
| 2. Engine mount No.4 | 7. Clutch release cylinder | 16. Back-up light switch connector |
| 3. Joint shaft | 8. Engine mount No.2 | 17. Speedometer cable |
| 4. Driveshaft | 9. Exhaust pipe | 18. Battery carrier |
| Installation Note | 10. Engine mount member | 19. Battery |
| page J2-42 | 11. Control rod | 20. Air hose and resonance chamber |
| 5. Stabilizer | 12. Extension bar | 21. Splash shield |
| Installation Note | 13. Starter | 22. Wheel and tire |
| page J2-42 | 14. Ground | |

Installation Note Driveshaft

Caution

- Do not damage the new oil seal.

1. Install the driveshaft with the end-gap of the new clip facing upward.

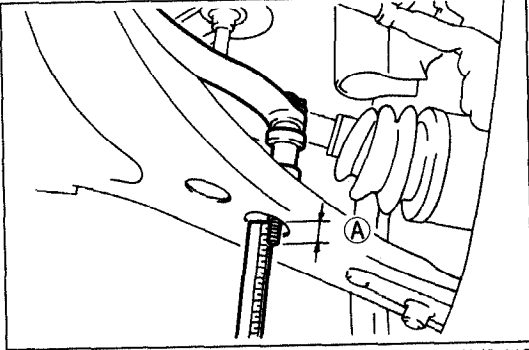


03U0J2-099

Stabilizer

1. Tighten the nut until the specified amount of thread is exposed at the end of the bolt.

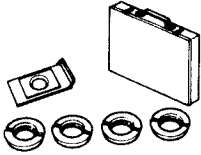
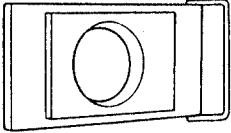

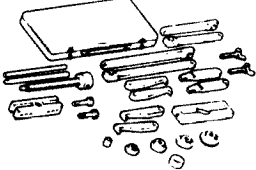

Dimension (A): 17—19mm (0.67—0.75 in)



03U0J2-118

DIFFERENTIAL

PREPARATION
SST

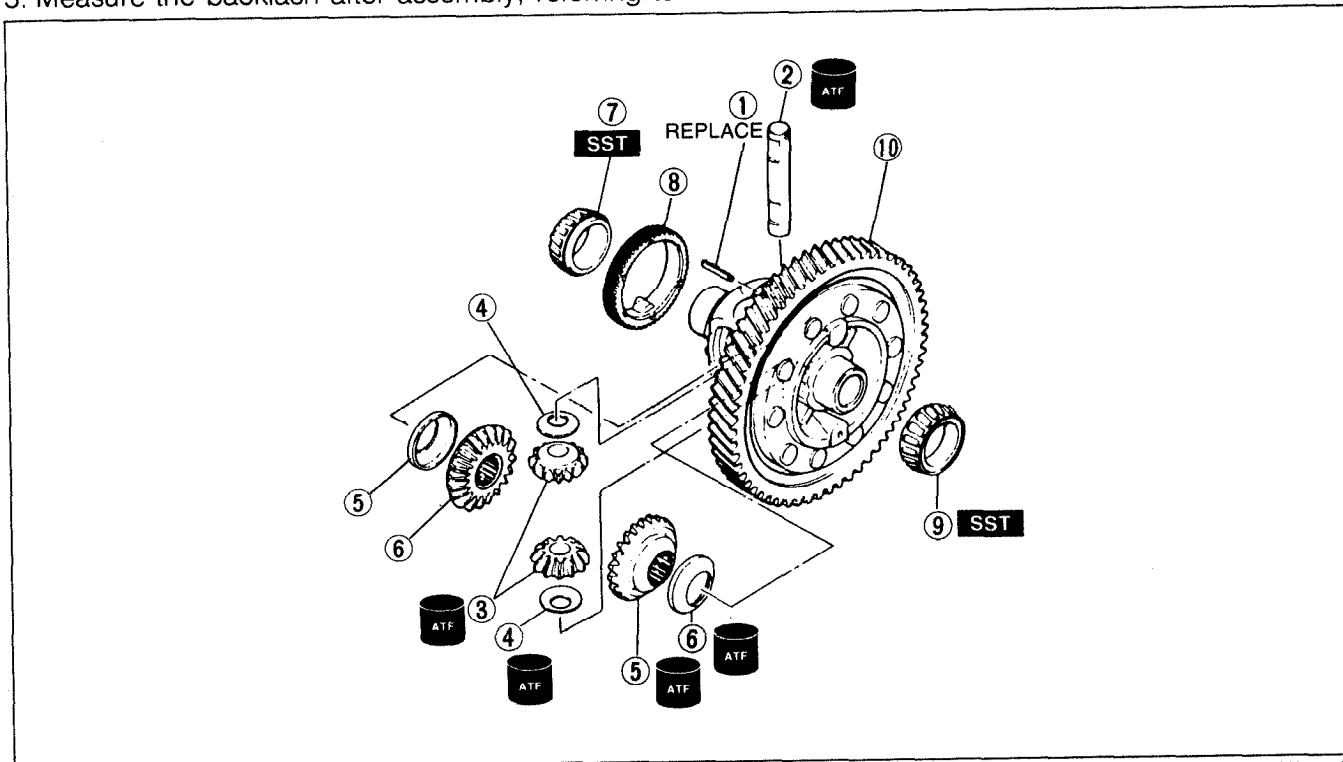
<p>49 G017 1A0 Bearing remover set</p> 	<p>For removal of bearing</p>	<p>49 F401 366A Plate (Part of 49 G017 1A0)</p> 	<p>For removal of side bearing inner race</p>
<p>49 B092 375 Attachment J (Part of 49 G017 1A0)</p> 	<p>For removal of side bearing inner race</p>	<p>49 0839 425C Puller set, bearing</p> 	<p>For removal of side bearing inner race</p>
<p>49 G030 338 Attachment E</p> 	<p>For installation of side bearing inner race</p>	<p style="text-align: right;">23U0J2-014</p>	

DISASSEMBLY / INSPECTION / ASSEMBLY

Caution

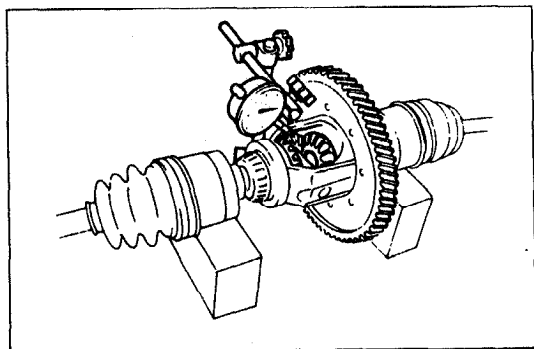
- Do not remove inner race if not necessary.

1. Before disassembly, inspect the backlash of side gear and pinion gear, referring to **Pre-inspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
3. Inspect all parts and repair or replace as necessary.
4. Assemble in the reverse order of disassembly, referring to **Assembly Note**.
5. Measure the backlash after assembly, referring to **Backlash of Side Gear and Pinion Gear**.



03U0J2-101

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Roll pin 2. Pinion shaft 3. Pinion gear
Inspect for wear and cracks
Pre-inspection page J2-44
Inspection of backlash..... page J2-45 4. Thrust washer 5. Side gear
Inspect for wear and cracks
Pre-inspection page J2-44
Inspection of backlash..... page J2-45 6. Thrust washer | <ol style="list-style-type: none"> 7. Side bearing inner race
Inspect for wear and rough rotation
Disassembly Note page J2-45
Assembly Note..... page J2-45 8. Speedometer drive gear 9. Side bearing inner race
Inspect for wear and rough rotation
Disassembly Note page J2-45
Assembly Note..... page J2-45 10. Ring gear and gear case assembly
Inspect ring gear for wear or damage |
|--|--|



23U0J2-016

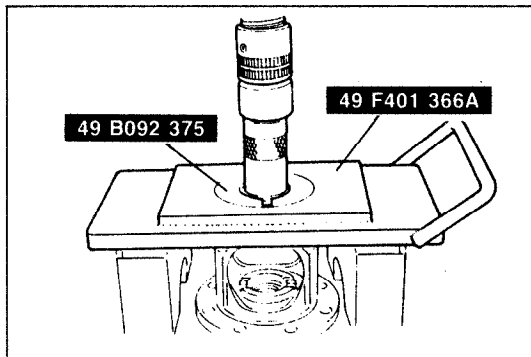
Pre-inspection

Backlash of side gear and pinion gear

Measure the backlash by the following procedure.

1. Install the left and right driveshafts in the differential assembly.
2. Support the driveshafts on V-blocks as shown in the figure.
3. Measure the backlash of both pinion gears.

Backlash: 0—0.1mm (0—0.004 in)

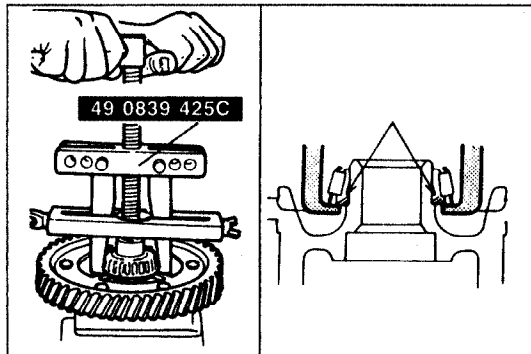


03U0J2-103

Disassembly Note**Side bearing inner race (side opposite ring gear)****Caution**

- Hold the gear case with one hand so that it does not fall.

1. Remove the bearing inner race with the **SST**.

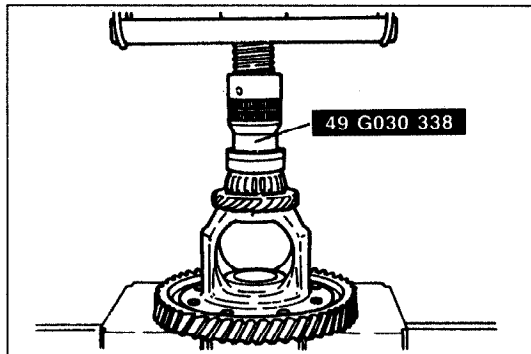


03U0J2-104

Side bearing inner race (ring gear side)**Caution**

- Use pads in the vise to prevent damaging the differential assembly.

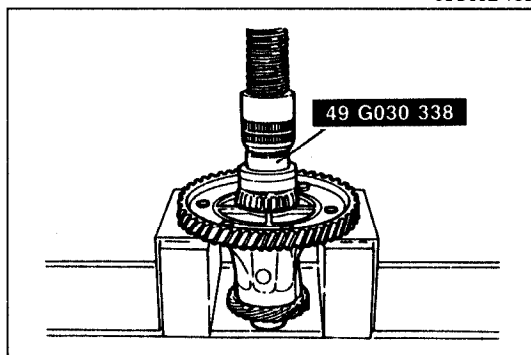
1. Remove the bearing inner race with the **SST**.



03U0J2-105

Assembly Note**Side bearing inner race (Side opposite ring gear)**

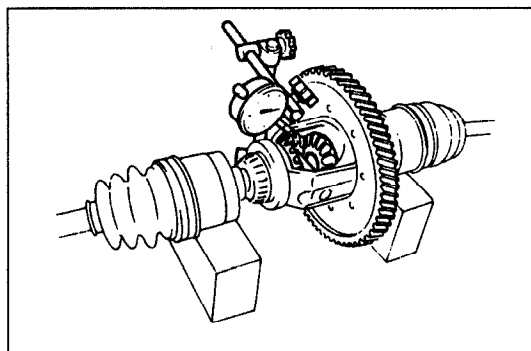
1. Install the speedometer drive gear.
2. Install the new side bearing inner race with the **SST**.



03U0J2-106

Side bearing inner race (ring gear side)

1. Install the new bearing inner race with the **SST**.



03U0J2-107

Backlash of Side Gear and Pinion Gear

Measure the backlash by the following procedure.

1. Install the left and right driveshafts in the differential assembly.
2. Support the driveshafts on V-blocks as shown in the figure.
3. Measure the backlash of both pinion gears.

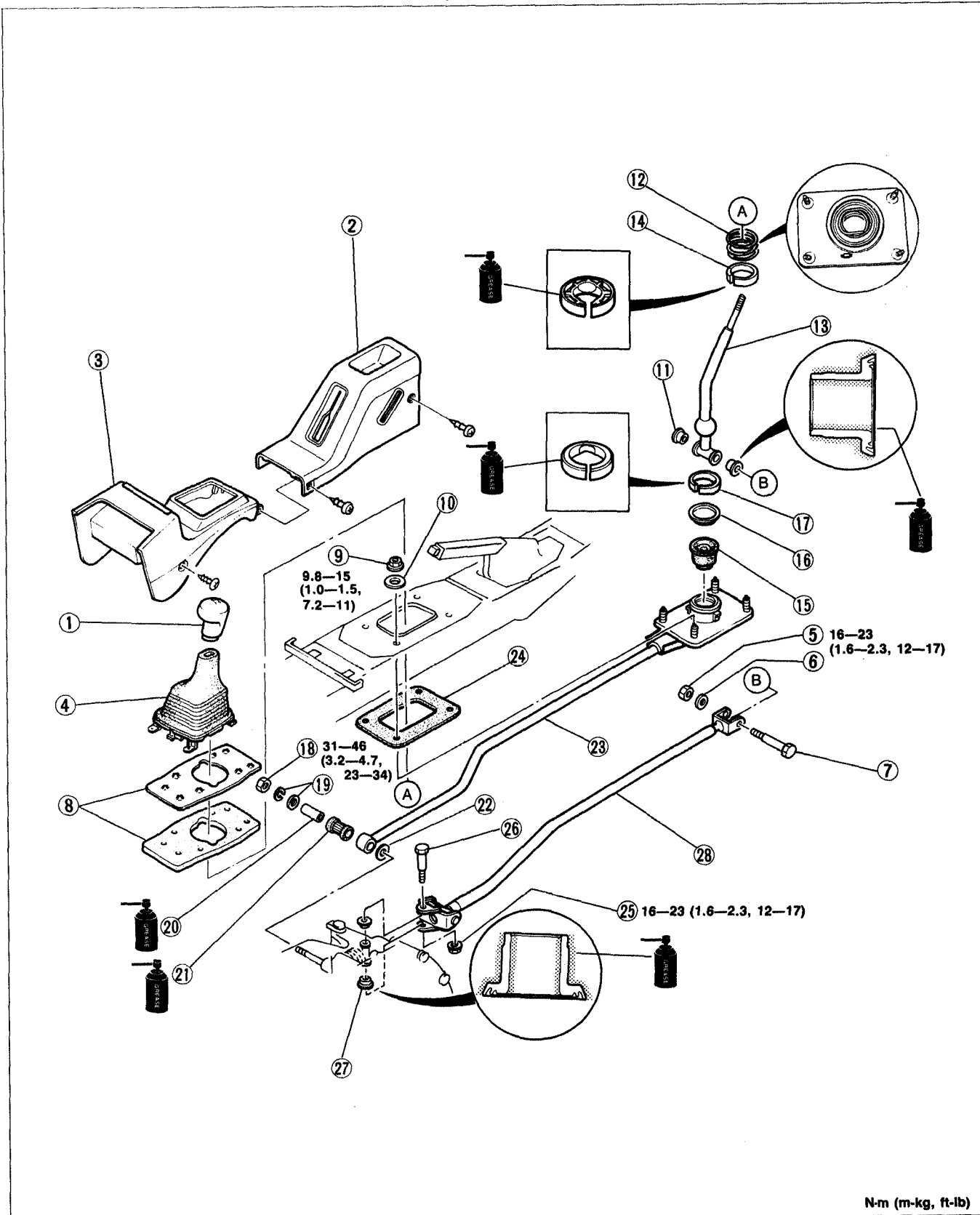
Backlash: 0—0.1mm (0—0.004 in)

4. If not as specified, replace the differential assembly.

SHIFT MECHANISM

OVERHAUL

1. Disassemble in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.

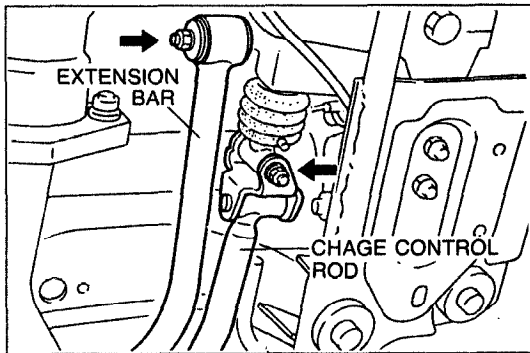


N-m (m-kg, ft-lb)

03U0J2-108

- | | |
|--------------------------------|--------------------------------|
| 1. Change lever knob | 16. Holder |
| 2. Rear console | 17. Ball seat (lower) |
| 3. Front console | 18. Nut |
| 4. Boot | 19. Washer |
| 5. Nut | 20. Pipe |
| 6. Washer | 21. Bushing |
| 7. Bolt | Inspect for wear or damage |
| 8. Cover | 22. Washer |
| 9. Nut | 23. Extension bar |
| 10. Washer | Assembly note page J2-47 |
| 11. Bushing | 24. Insulator |
| 12. Spring | Inspect for damage and cracks |
| Inspect for damage and weaked | 25. Nut |
| Assembly note page J2-47 | 26. Bolt |
| 13. Change lever | 27. Bushing |
| 14. Ball seat (Upper) | Inspect for wear and damage |
| 15. Boot | 28. Change control rod |
| Inspect for wear or damage | Inspect for bending |

03U0J2-109

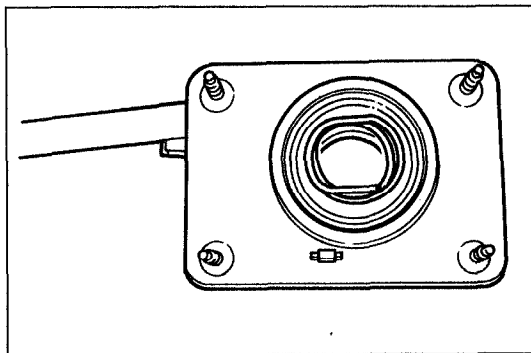


03U0J2-110

Assembly Note Extension bar

1. Connect the extension bar to the transaxle, and then mount it to the floor.

Tightening torque:
16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



03U0J2-111

Spring

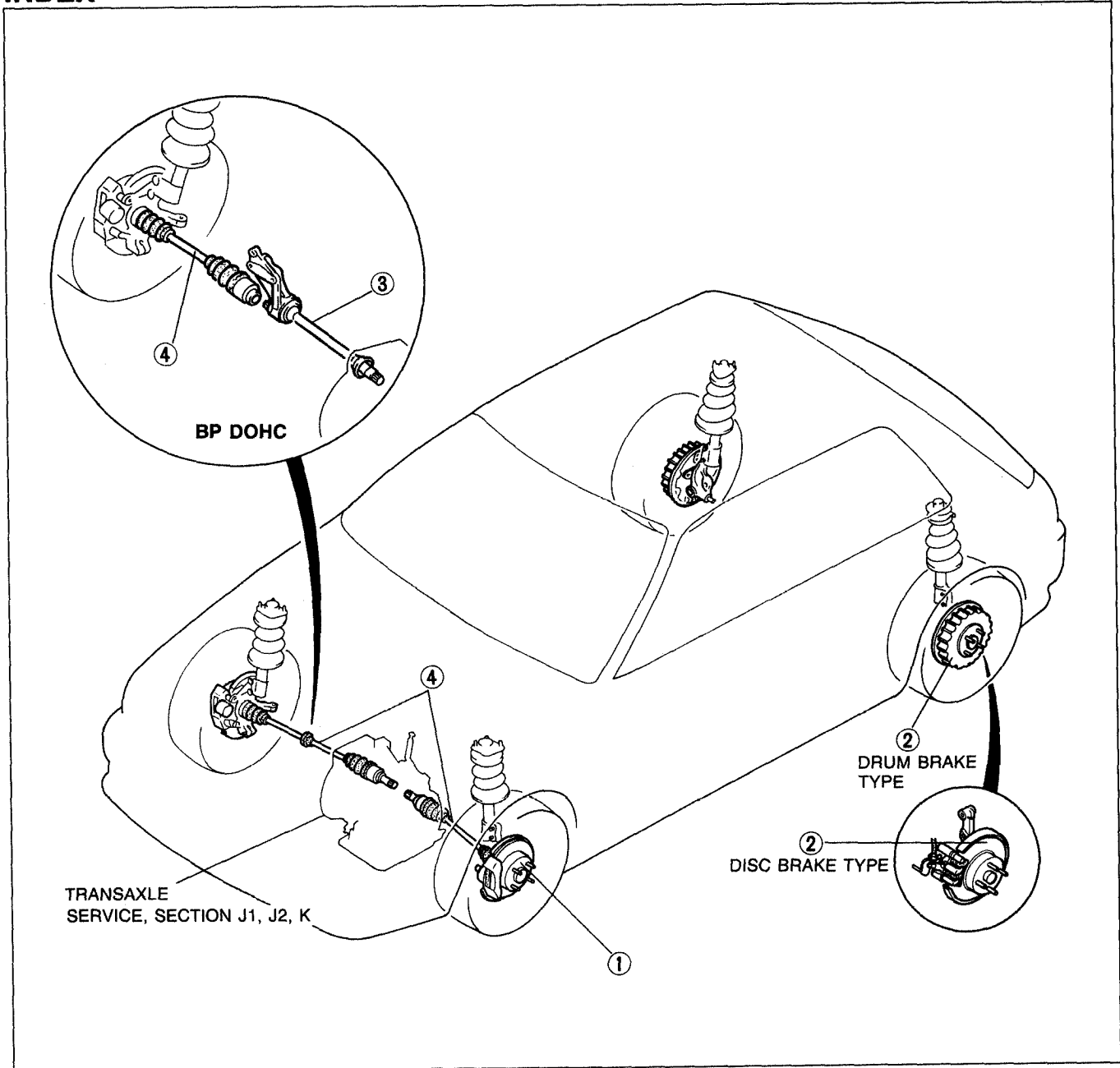
1. Verify that the hooked part of the spring is properly seated in the bracket groove.

FRONT AND REAR AXLES

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Overhaul	page M-25

OUTLINE

SPECIFICATIONS

Item	Engine/Transaxle	B6 SOHC		BP SOHC		BP DOHC	
		MTX	ATX	MTX	ATX	MTX	ATX
Front axle							
Bearing play axial direction	mm (in)	0.05 (0.002)					
Rear axle							
Bearing play axial direction	mm (in)	0.05 (0.002)					
Drive shaft							
Joint type	Inside	Tripod joint					
	Outside	Ball joint					
Length of shaft	mm (in)	Right side	919.3 (36.19)	918.7 (36.17)	630.7 (24.83)		
		Left side	637.8 (25.11)	640.2 (25.20)	621.2 (24.46)	637.1 (25.08)	
Shaft diameter	mm (in)	Right side	21.5 (0.85)	23.0 (0.91)			
		Left side	21.5 (0.85)	23.0 (0.91)			

23U0MX-003

TRUBLESHOOTING GUIDE

FRONT AXLE

Problem	Possible Cause	Action	Page
Steering wheel vibration	Worn or damaged wheel bearing Excessive wheel bearing play	Replace Tighten or replace	M- 7 M- 5, 7
Steering wheel pulls or one-sided braking	Worn or damaged wheel bearing Excessive wheel bearing play	Replace Tighten or replace	M- 7 M- 5, 7
Excessive steering wheel play	Excessive wheel bearing play	Tighten or replace	M- 5, 7
Abnormal noise	Bent drive shaft or joint shaft Worn or damaged wheel bearing Worn drive shaft or joint shaft splines Insufficient grease in joint or on splines of drive shaft Insufficient grease in joint or splines of joint shaft Worn drive shaft tripod joint	Replace Replace Replace Replenish or replace Add or replace Replace	M-18, 22 M- 7 M-18, 22 M-22, 25 M-18 M-25
Grease leakage from boot	Damaged or broken boot Faulty boot band Excessive grease	Replace Replace Repair	M-25 M-25 M-25

23U0MX-004

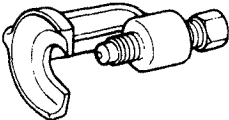
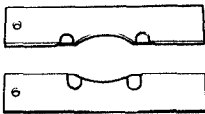
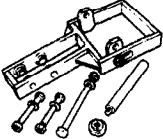
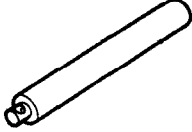
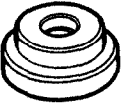

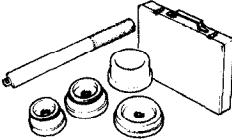
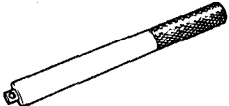


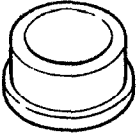
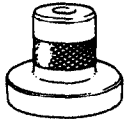
REAR AXLE

Problem	Possible Cause	Action	Page
Steering wheel vibration	Worn or damaged wheel bearing Excessive wheel bearing play	Replace Tighten or replace	M-11, 14 M-11, 14
Steering wheel pulls or one-sided braking	Worn or damaged wheel bearing Excessive wheel bearing play	Replace Tighten or replace	M-11, 14 M-11, 14
Excessive steering wheel play	Excessive wheel bearing play	Tighten or replace	M-11, 14
Abnormal noise	Worn or damaged wheel bearing	Replace	M-11, 14

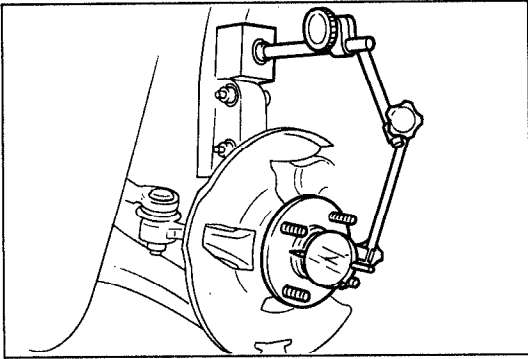
23U0MX-005

FRONT AXLE

PREPARATION SST

<p>49 0118 850C Puller, ball joint</p> 	<p>For removal of tie rod end</p>	<p>49 F026 103 Removing plate</p> 	<p>For disassembly of wheel bearing</p>
<p>49 B026 1A0 Puller, wheel hub</p> 	<p>For disassembly and assembly of wheel hub</p>	<p>49 G033 102 Handle (Part of 49 B026 1A0)</p> 	<p>For removal of front wheel hub</p>
<p>49 G030 727 Attachment A (Part of 49 B026 1A0)</p> 	<p>For removal of front wheel hub</p>	<p>49 G033 107 Installer, dust cover</p> 	<p>For installation of dust cover</p>
<p>49 F027 0A1 Installer set, bearing</p> 	<p>For installation of bearing</p>	<p>49 F027 003 Handle (Part of 49 F027 0A1)</p> 	<p>For removal and installation of wheel bearing</p>
<p>49 F027 005 Attachment 62 (Part of 49 F027 0A1)</p> 	<p>For removal of wheel bearing</p>	<p>49 F027 007 Attachment 72 (Part of 49 F027 0A1)</p> 	<p>For installation of wheel bearing</p>
<p>49 F027 009 Attachment 68 & 77 (Part of 49 F027 0A1)</p> 	<p>For installation of dust cover</p>	<p>49 V001 795 Installer, oil seal</p> 	<p>For installation of oil seal</p>

23U0MX-036



03U0MX-007

WHEEL HUB, STEERING KNUCKLE

Preinspection

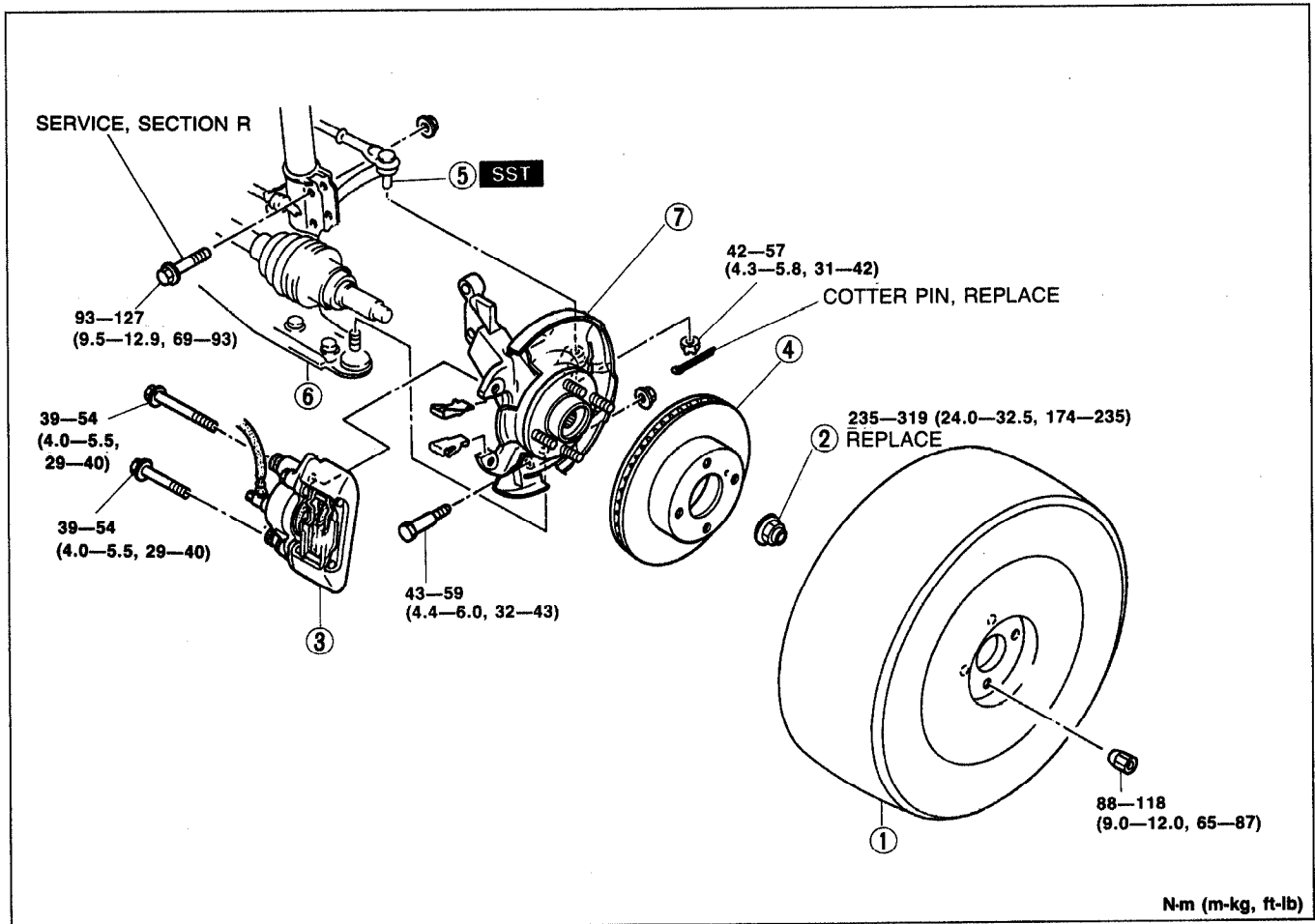
Wheel bearing play

1. Remove the wheel and tire.
2. Remove the brake caliper assembly and disc plate.
3. Position a dial indicator against the wheel hub. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.
4. If the bearing play exceeds specification, check and adjust the locknut torque or replace the wheel bearing if necessary.

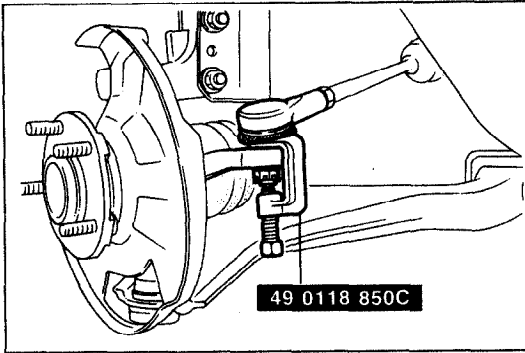
Maximum wheel bearing play: 0.05mm (0.002 in)

Removal / Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.
4. After installation, check the front wheel alignment. (Refer to Section R.)



- | | |
|---|-----------|
| 1. Wheel and tire | |
| 2. Locknut | |
| Installation Note | page M- 6 |
| 3. Brake caliper assembly | |
| Service | Section P |
| 4. Disc plate | |
| Inspection | Section P |
| 5. Tie rod end | |
| Removal Note | page M- 6 |
| Installation Note | page M- 6 |
| 6. Lower ball joint | |
| 7. Knuckle, wheel hub, and dust cover | |
| Inspect wheel hub for cracks and damage | |
| Inspect knuckle spindle for cracks and damage | |
| Inspect dust cover for damage and distortion | |
| Disassembly / Inspection / | |
| Assembly | page M- 7 |

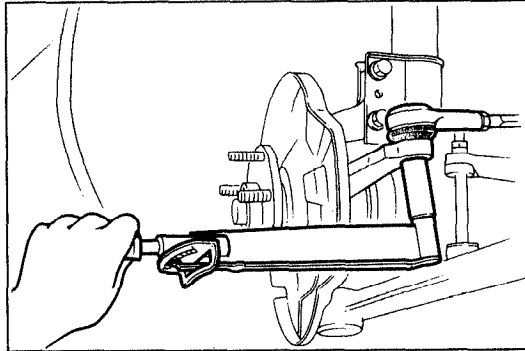


23U0MX-037

Removal note
Tie rod end**Caution**

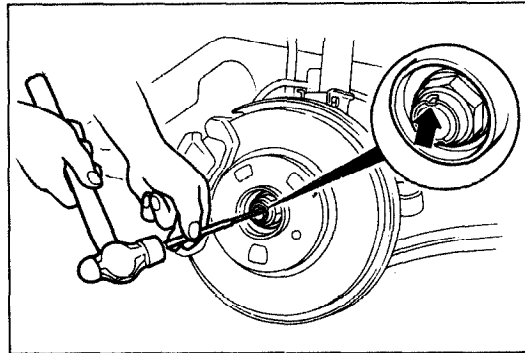
- Do not damage the dust boot.

1. Loosen the nut and disconnect the tie-rod end with the **SST**.

**Installation note**
Tie rod end**Caution**

- Do not damage the dust boot.

1. Install the nut and secure it with the new cotter pin.

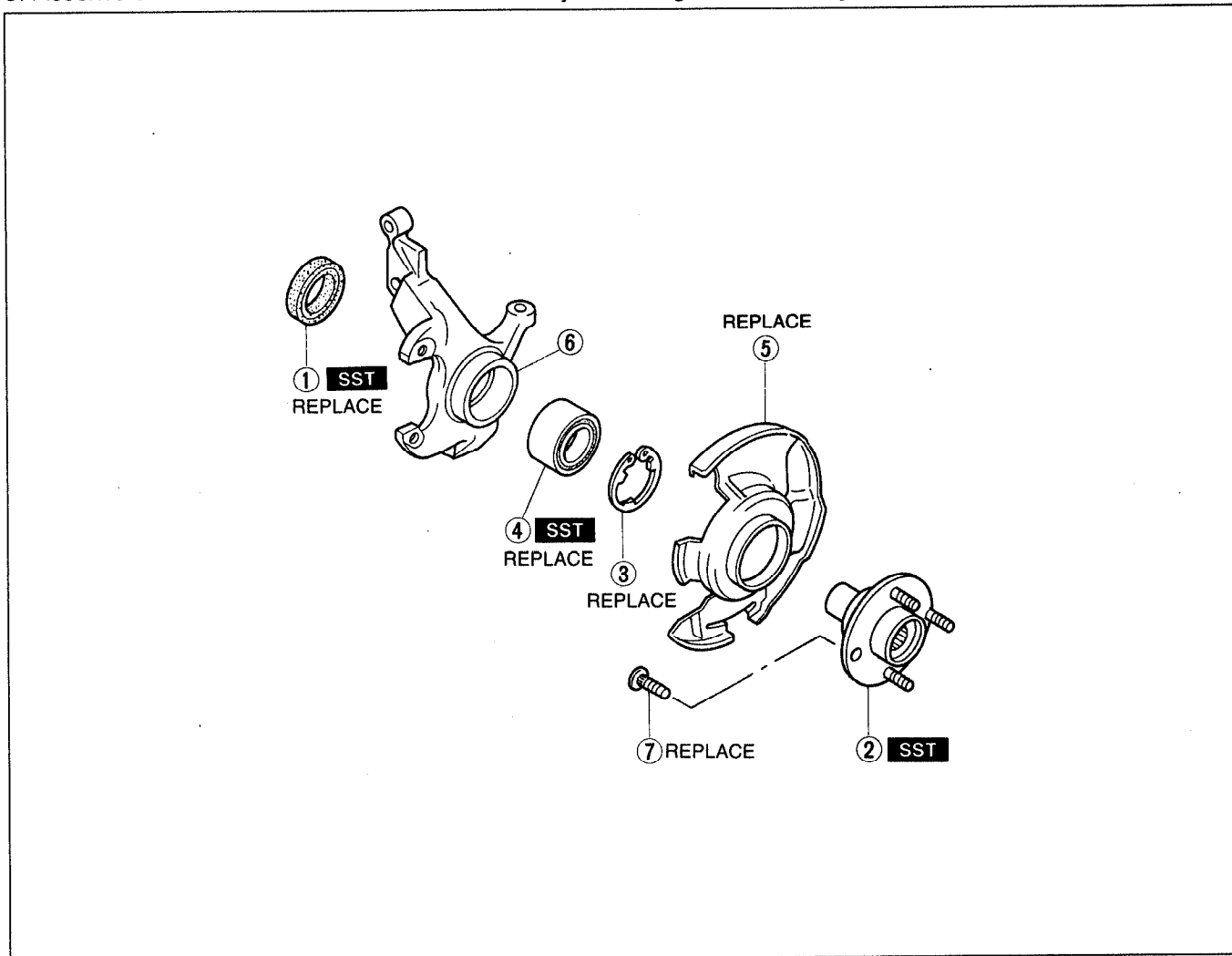
Tightening torque:**42—57 N·m (4.3—5.8 m·kg, 31—42 ft·lb)****Locknut**

1. Install a new locknut and stake it, as shown.

Tightening torque:**235—319 N·m (24.0—32.5 m·kg, 174—235 ft·lb)**

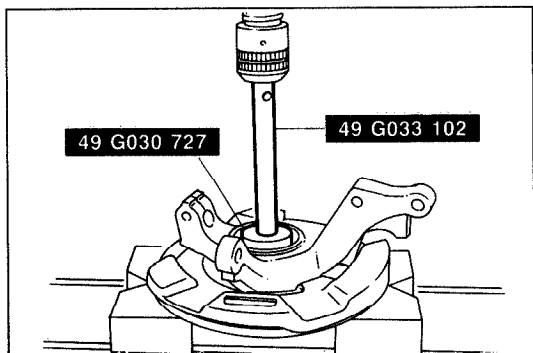
Disassembly / Inspection / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



23U0MX-007

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Oil seal
Assembly Note page M-10 2. Wheel hub assembly
Disassembly Note..... page M- 7
Assembly Note page M- 9 3. Retaining ring
Disassembly Note..... page M- 8
Assembly Note page M- 9 | <ol style="list-style-type: none"> 5. Dust cover
Disassembly Note..... page M- 8
Assembly Note page M- 9 6. Knuckle 7. Hub bolt
Disassembly Note..... page M- 8
Assembly Note page M- 9 |
|---|--|

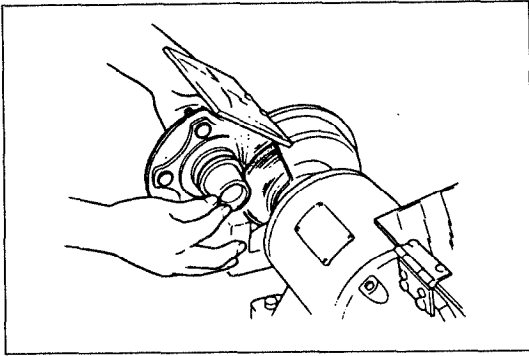


23U0MX-008

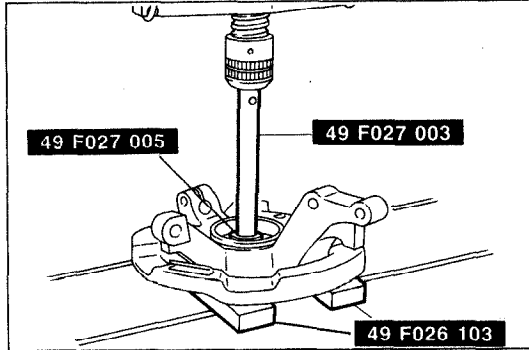
**Disassembly note
Wheel hub assembly**

1. Remove the wheel hub assembly with the **SST**.

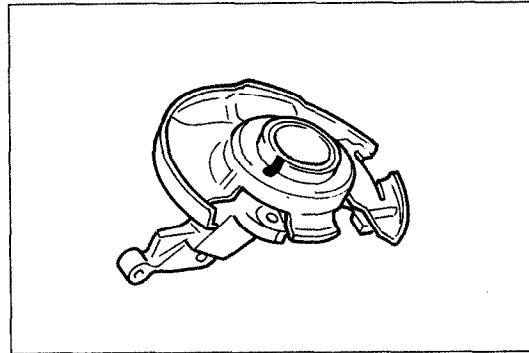
M



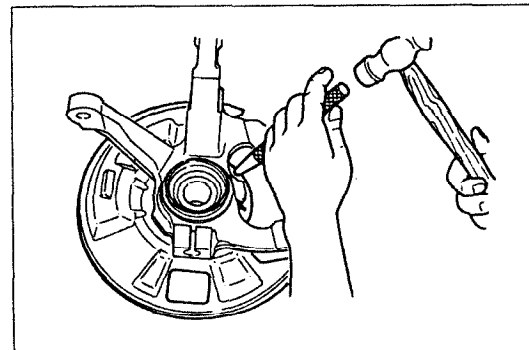
03U0MX-012



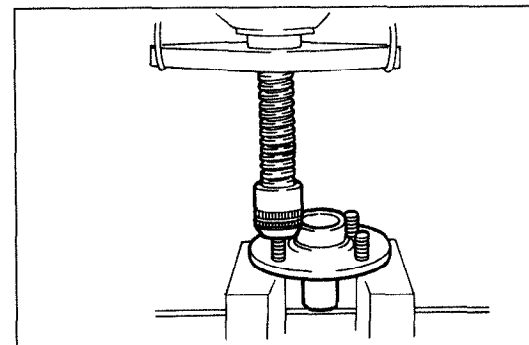
23U0MX-009



03U0MX-055



9MU0MX-014



03U0MX-013

Note

- If the bearing inner race remains on the front wheel hub assembly, use a grinder to grind a section of the bearing inner race until only approx. 0.5mm (0.020 in) remains. Then remove it with a chisel.

Wheel bearing

1. Remove the wheel bearing with the SST.

Caution

- Do not reuse the wheel bearing.

Dust cover

Caution

- Do not remove the dust cover if not necessary.
- Do not reuse the dust cover if removed.

1. Mark the dust cover and knuckle for proper reassembly.

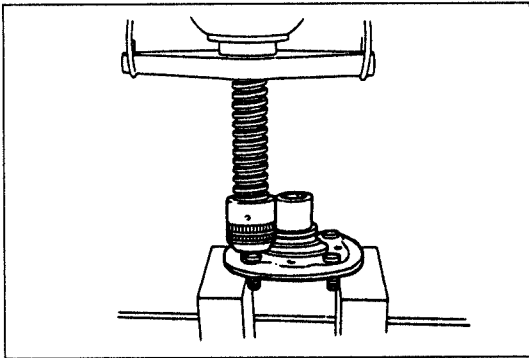
2. Remove the dust cover with a chisel.

Hub bolt

Caution

- Do not remove the hub bolts if not necessary.
- Do not reuse the hub bolts if removed.

1. Remove the hub bolts with a press.

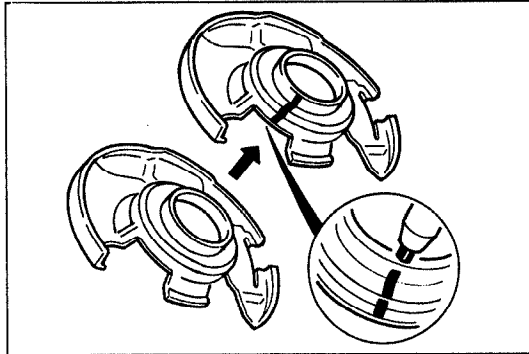


9MU0MX-620

Assembly note

Hub bolt

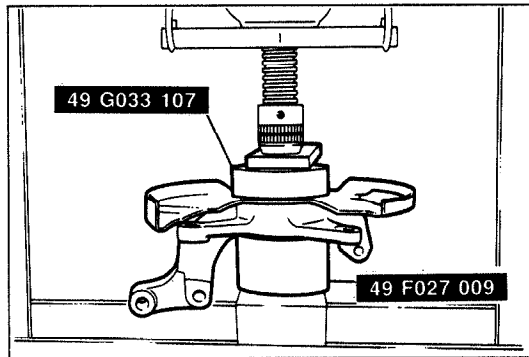
1. Press in new hub bolts.



9MU0MX-621

Dust cover

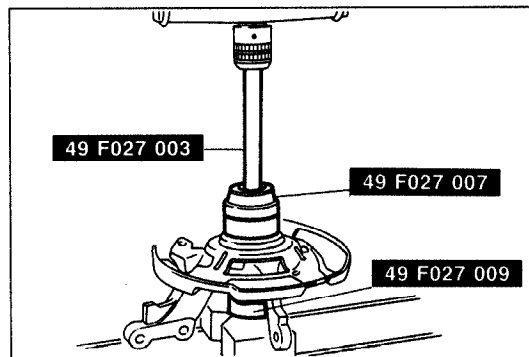
1. Mark the new dust cover as the one removed.



9MU0MX-622

2. Align the marks of the new dust cover and the knuckle.
3. Install the new dust cover with the **SST**.

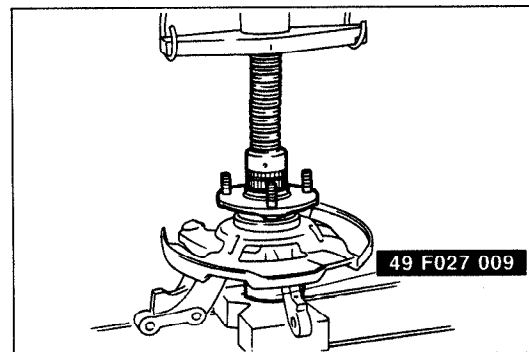
M



9MU0MX-623

Wheel bearing

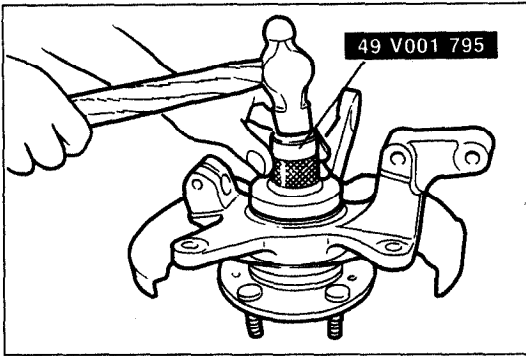
1. Install the new wheel bearing with the **SST**.



23U0MX-010

Wheel hub assembly

1. Install the wheel hub assembly with the **SST**.




03U0MX-014

Oil seal**Caution**

- Use a new oil seal, and apply grease to the lip of the seal.
- Install the oil seal flush with the knuckle.

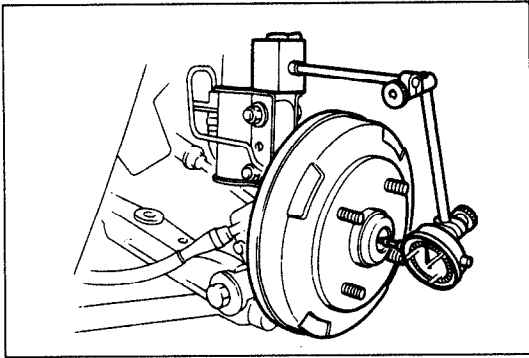
1. Install the new oil seal with the **SST**.

REAR AXLE**PREPARATION****SST**

49 0259 770B Wrench, flare nut		For removal and installation of brake pipe
-----------------------------------	---	--

23U0MX-011

REAR AXLE



23U0MX-012

DRUM BRAKE TYPE

Preinspection

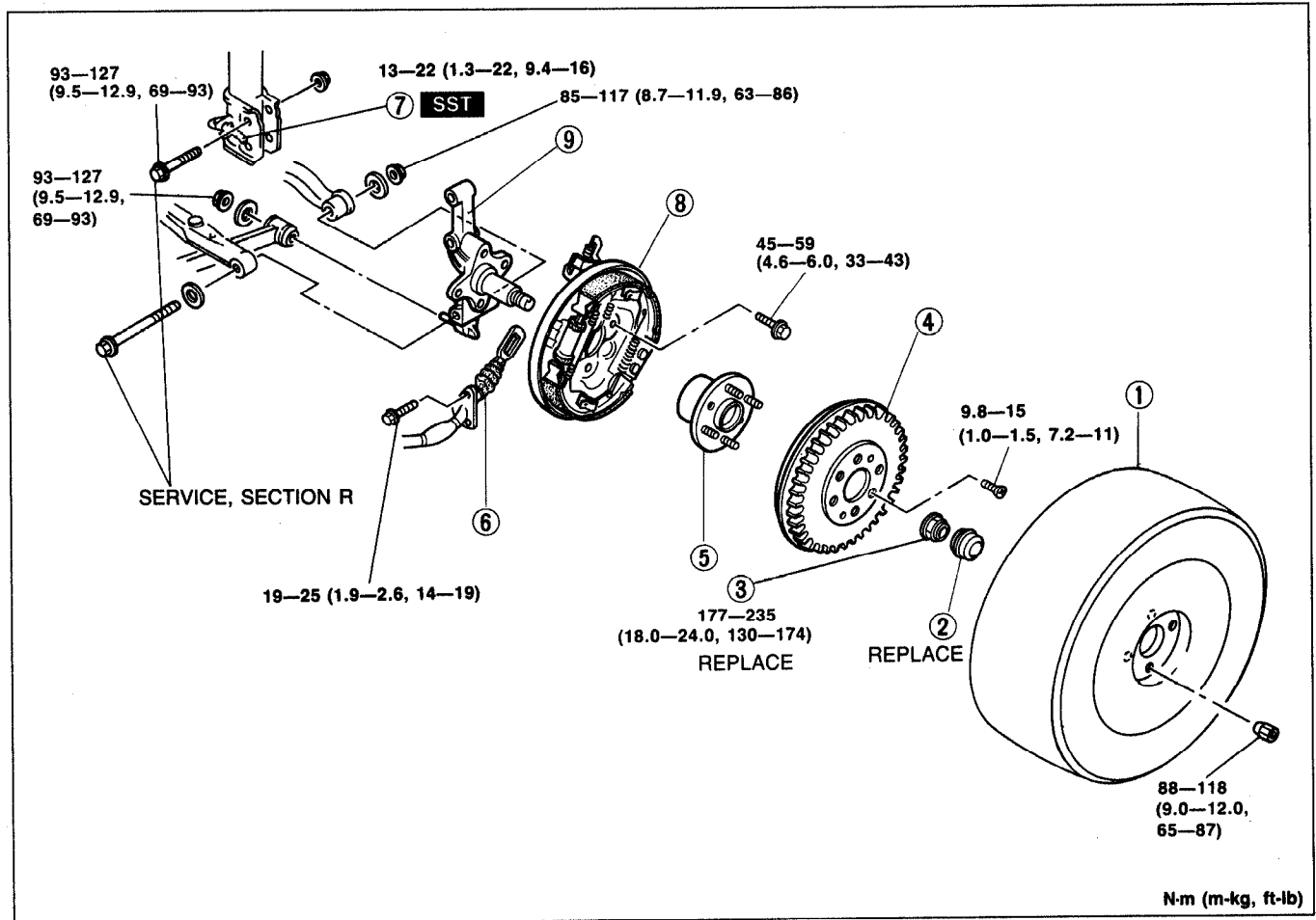
Wheel bearing play

1. Remove the wheel and tire.
2. Position a dial indicator against the brake drum. Push and pull the rear brake assembly by hand in the axial direction and measure the wheel bearing play.
3. If the bearing play exceeds specification, check and adjust the locknut torque or replace the wheel bearing if necessary.

Maximum wheel bearing play: 0.05mm (0.002 in)

Removal / Inspection / Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.
4. After installation, bleed the brake system, adjust the parking brake lever stroke (Refer to Section P.) and check the rear wheel alignment (Refer to Section R.)



23U0MX-013

- | | |
|--|-----------------------------------|
| 1. Wheel and tire | 6. Parking brake cable |
| 2. Hub cap | Service Section P |
| 3. Locknut | 7. Brake pipe |
| Installation Note page M-12 | Removal Note page M-12 |
| 4. Brake drum | Installation Note page M-12 |
| 5. Hub bearing assembly | 8. Rear brake assembly |
| Inspect for cracks and damage | Service Section P |
| Disassembly / Assembly page M-13 | 9. Rear spindle |
| | Inspect for cracks and damage |

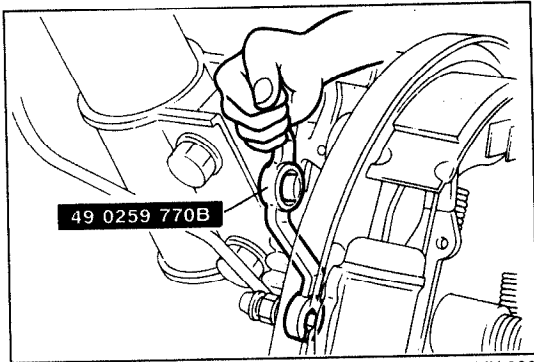
Removal note

Brake pipe

Caution

- After disconnecting the brake pipe, plug it to avoid fluid leakage.

1. Disconnect the brake pipe with the **SST**.



9MU0MX-020

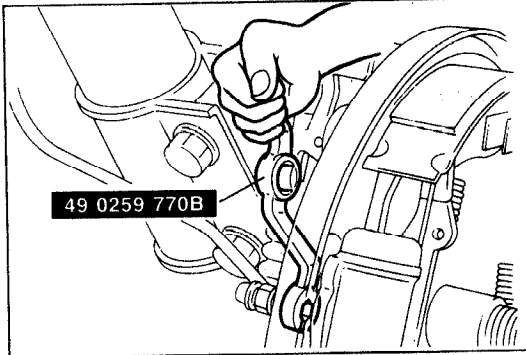
Installation note

Brake pipe

1. Tighten the brake pipe with the **SST**.

Tightening torque:

13—22 N·m (1.3—2.2 m·kg, 9.4—16 ft·lb)



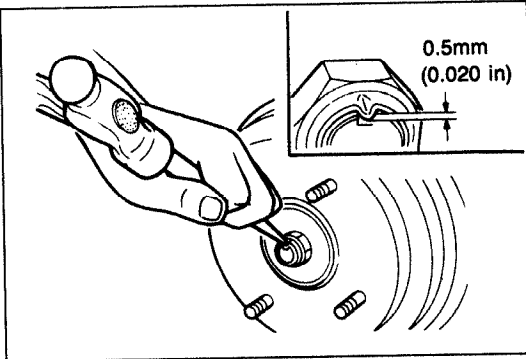
03U0MX-018

Locknut

1. Install a new locknut and stake it, as shown.

Tightening torque:

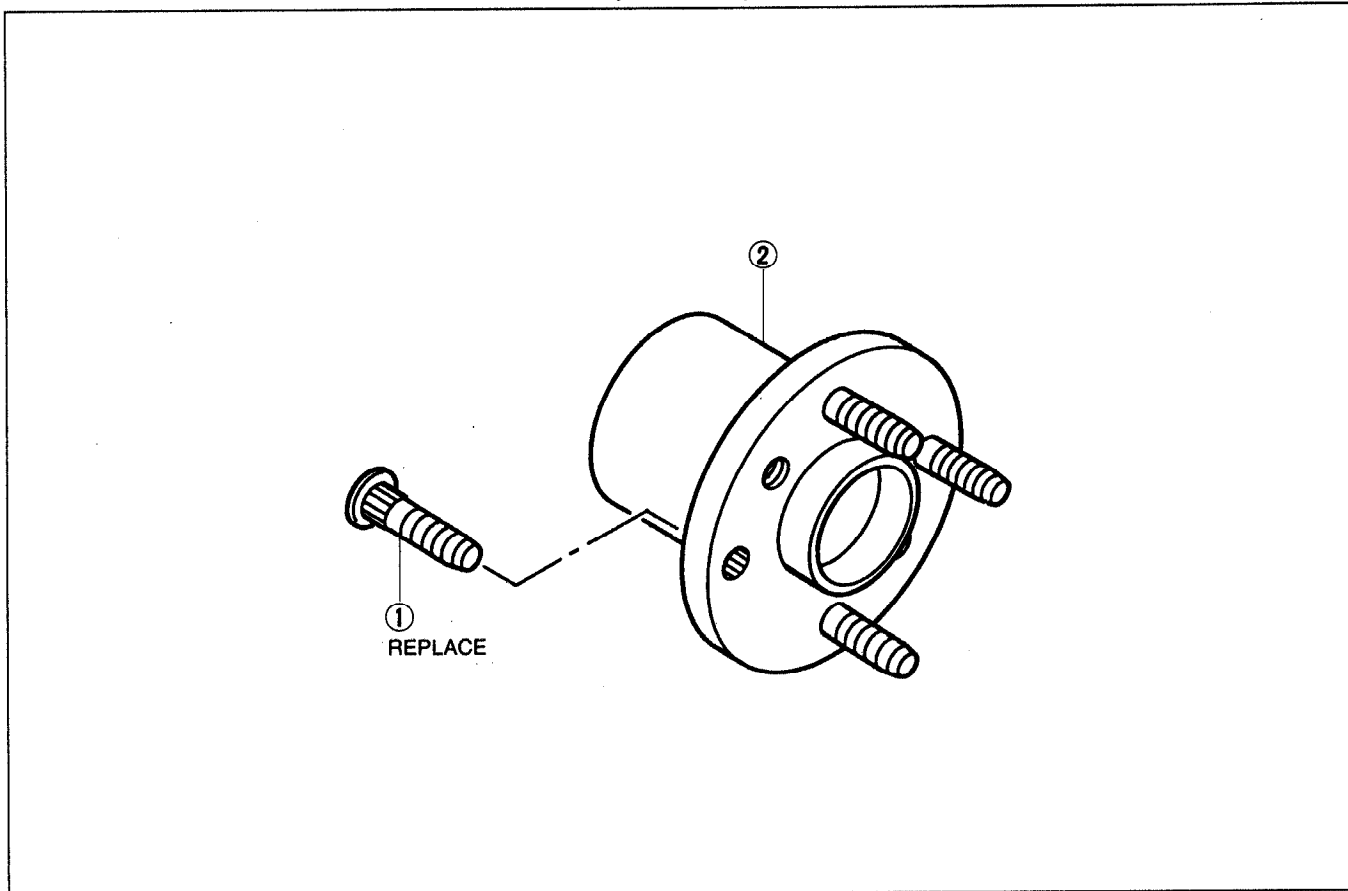
177—235 N·m (18—24 m·kg, 130—174 ft·lb)



03U0MX-019

Disassembly / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.

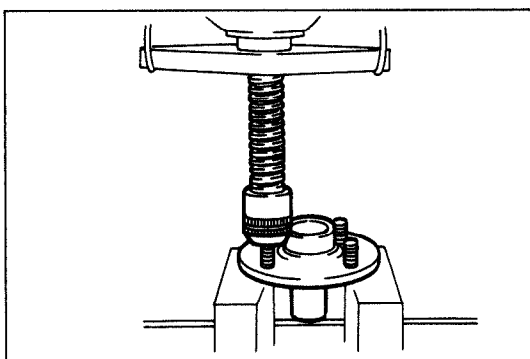


23U0MX-014

1. Hub bolt

Disassembly note page M-13
 Assembly note page M-13

2. Hub bearing assembly



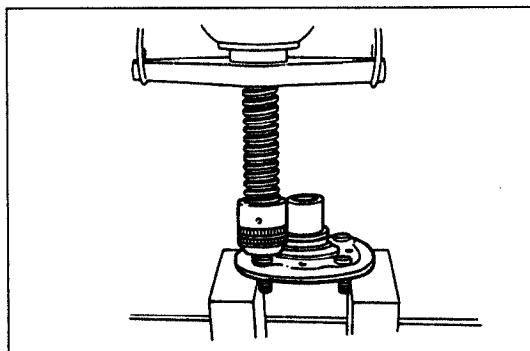
03U0MX-021

**Disassembly note
 Hub bolt**

Caution

- Do not remove the hub bolts if not necessary.
- Do not reuse the hub bolts if removed.

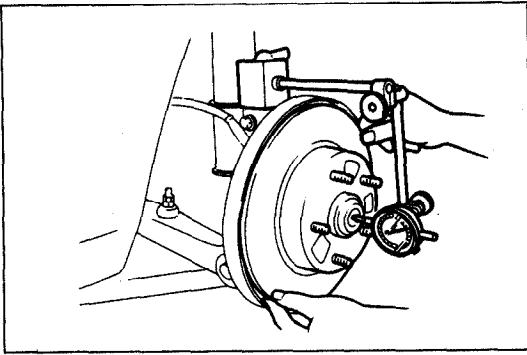
1. Remove the hub bolts with a press.



9MU0MX-620

**Assembly note
 Hub bolt**

1. Press in new hub bolts.



23U0MX-015

DISC BRAKE TYPE

Preinspection

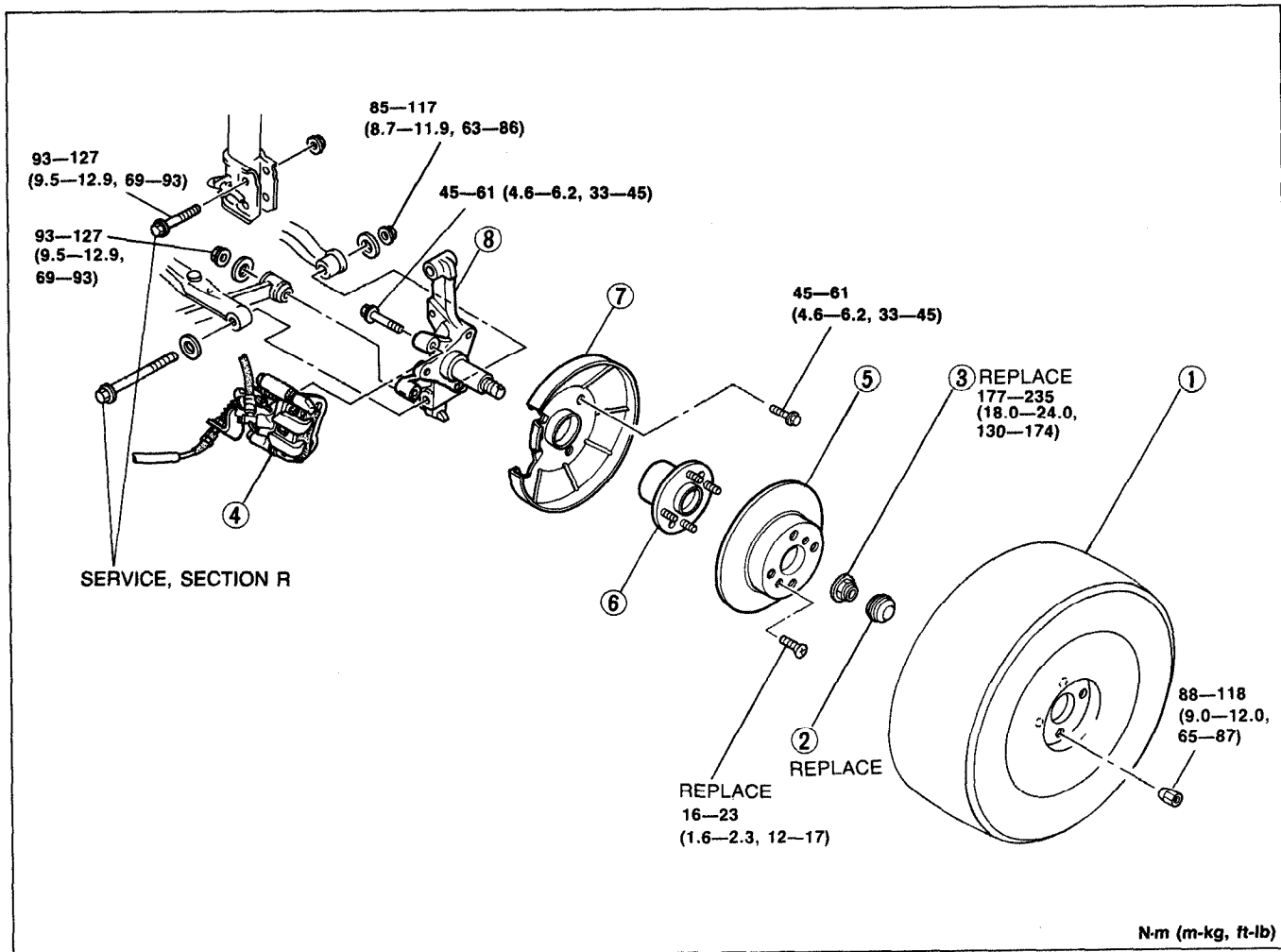
Wheel bearing play

1. Remove the wheel and tire.
2. Remove the brake caliper assembly.
3. Position a dial indicator against the wheel hub. Push and pull the wheel hub by hand in the axial direction and measure the wheel bearing play.
4. If the bearing play exceeds specification, check and adjust the locknut torque or replace the wheel bearing if necessary.

Maximum wheel bearing play: 0.05mm (0.002 in)

Removal / Inspection / Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal, referring to **Installation Note**.
4. After installation, check the rear wheel alignment (Refer to Section R.)



1. Wheel and tire

2. Hub cap

3. Locknut

Installation Note page M-15

4. Brake caliper assembly

Service Section P

5. Disc plate

Inspection Section P

6. Hub bearing assembly

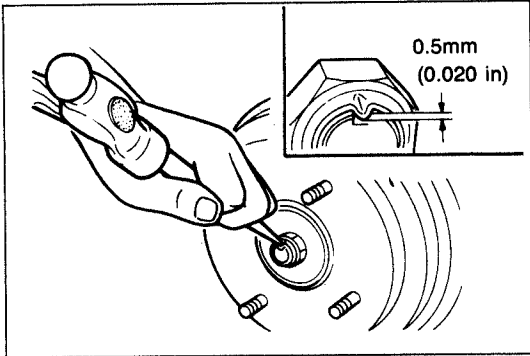
Inspect for cracks and damage

Disassembly / Assembly page M-15

7. Dust cover

8. Rear spindle

Inspect for cracks and damage



03U0MX-024

Installation note

Locknut

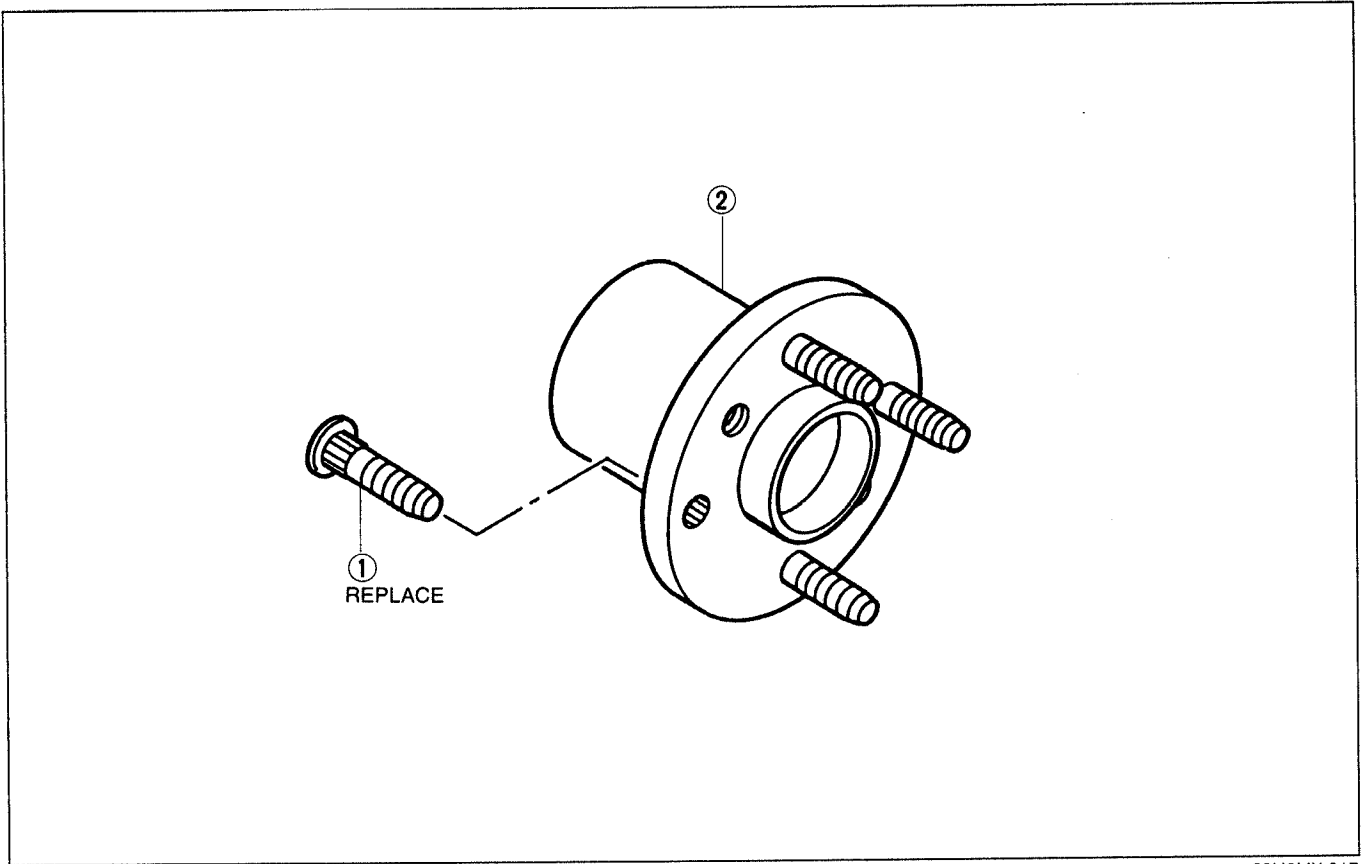
1. Install a new locknut and stake it, as shown.

Tightening torque:

177—235 Nm (18—24 m-kG, 130—174 ft-lb)

Disassembly / Assembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



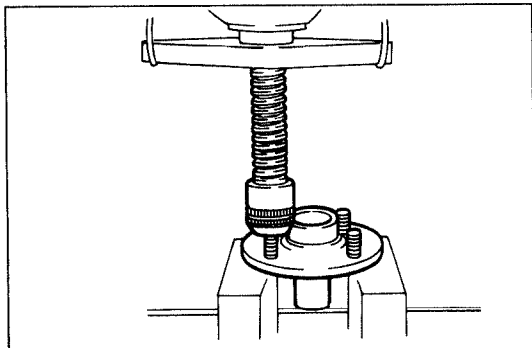
23U0MX-017

1. Hub bolt

Disassembly note page M-15

Assembly note page M-16

2. Hub bearing assembly



03U0MX-026

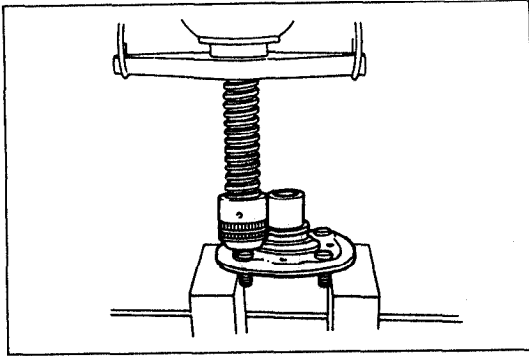
Disassembly note

Hub bolt

Caution

- Do not remove the hub bolts if not necessary.
- Do not reuse the hub bolts if removed.

1. Remove the hub bolts with a press.



9MU0MX-620

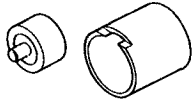
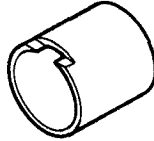
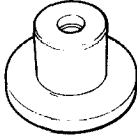

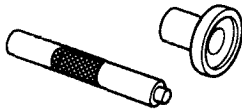

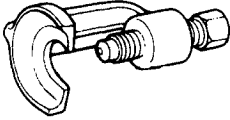
Assembly note**Hub bolt**

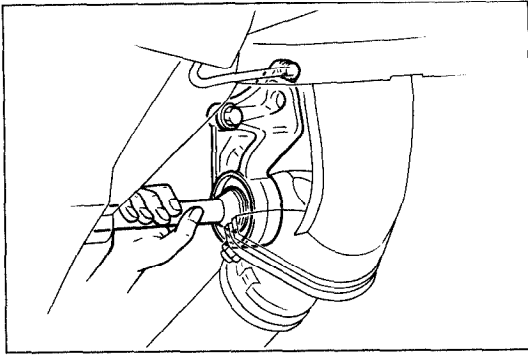
1. Press in new hub bolts.

DRIVE SHAFT

PREPARATION

SST

<p>49 H034 2A0</p> <p>Lower arm bushing puller & installer</p> 	<p>For support of bracket</p>	<p>49 H034 201</p> <p>Support block (Part of 49 H034 2A0)</p> 	<p>For support of bracket</p>
<p>49 F026 102</p> <p>Installer, bearing</p> 	<p>For removal of bearing and left dust seal</p>	<p>49 G030 795</p> <p>Installer, oil seal</p> 	<p>For installation of right dust seal and bearing</p>
<p>49 M005 795</p> <p>Installer set, oil seal</p> 	<p>For installation of left dust seal</p>	<p>49 M005 796</p> <p>Body (Part of 49 M005 795)</p> 	<p>For installation of left dust seal</p>
<p>49 0118 850C</p> <p>Puller, ball joint</p> 	<p>For removal of tie rod end</p>	<p>23UOMX-018</p>	



23U0MX-019

JOINT SHAFT (BP DOHC)

Preinspection

Joint shaft

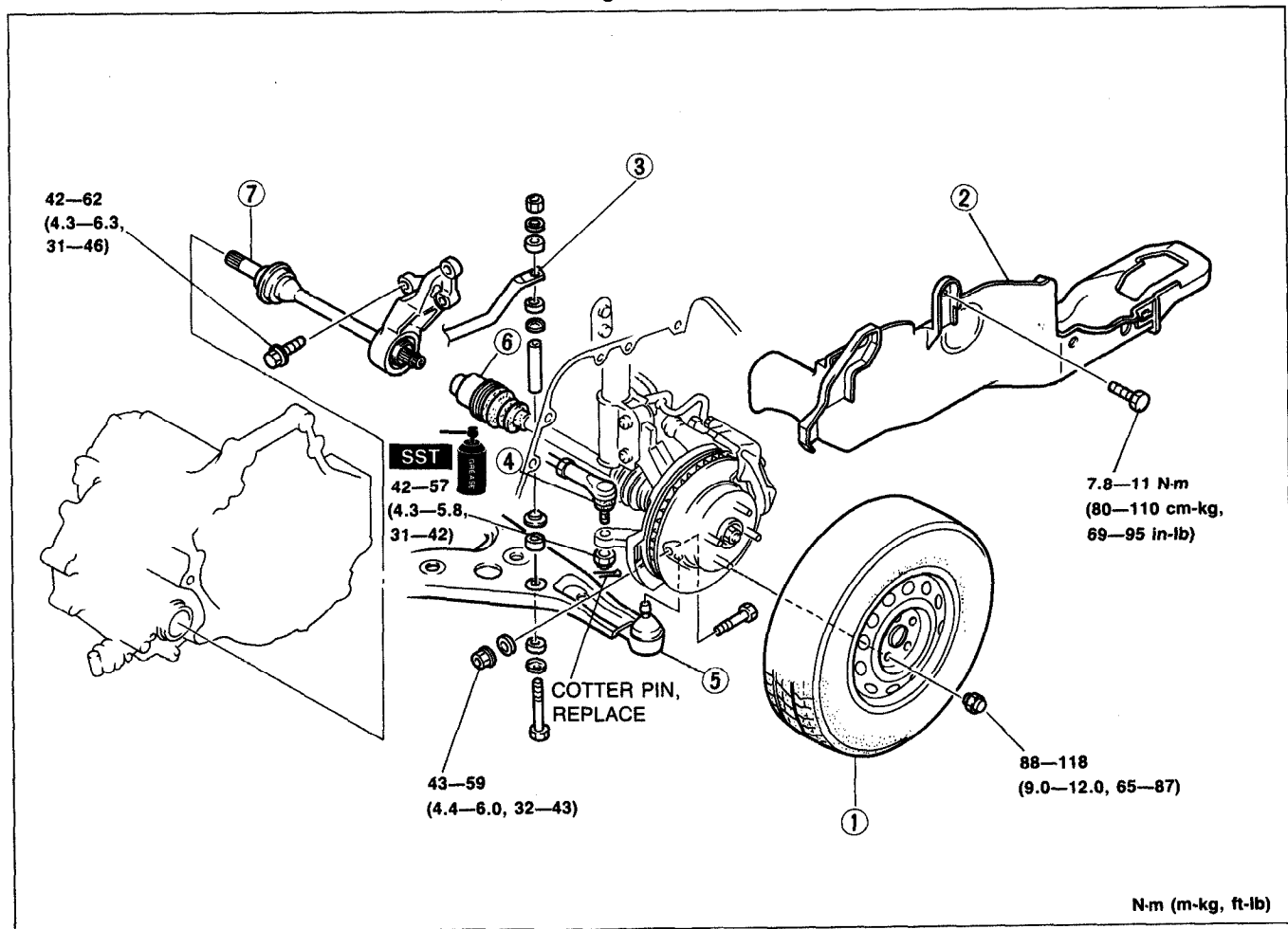
1. Verify that the joint shaft is not twisted or cracked. Replace it if necessary.
2. Turn the joint shaft by hand and verify that the bearing rotates smoothly and freely. Replace it if necessary.

Removal / Installation

Note

- Drain the transaxle oil before removal.

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



N-m (m-kg, ft-lb)

23U0MX-020

1. Wheel and tire

2. Splash shield

3. Stabilizer (BP SOHC, BP DOHC)

Installation Note page M-19

4. Tie rod end

Removal Note page M-19

Installation Note page M-19

5. Lower ball joint

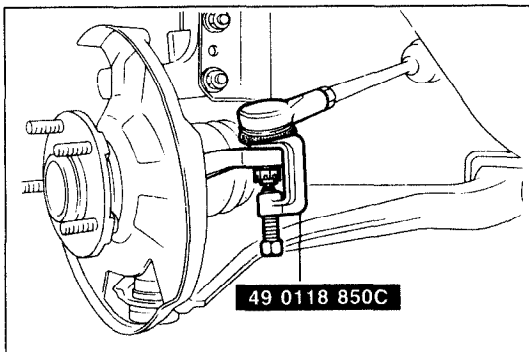
6. Right drive shaft and axle

7. Joint shaft

Removal Note page M-19

Installation Note page M-19

Overhaul page M-20



23U0MX-039

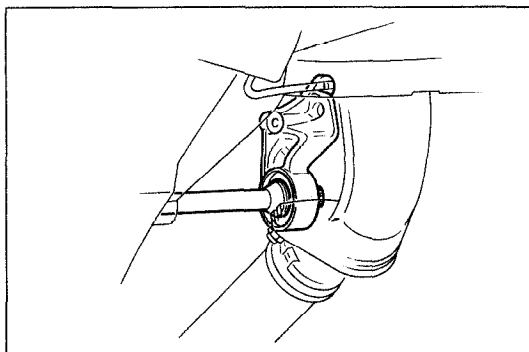
Removal note

Tie rod end

Caution

- Do not damage the dust boot.

1. Loosen the nut and disconnect the tie rod end with the **SST**.



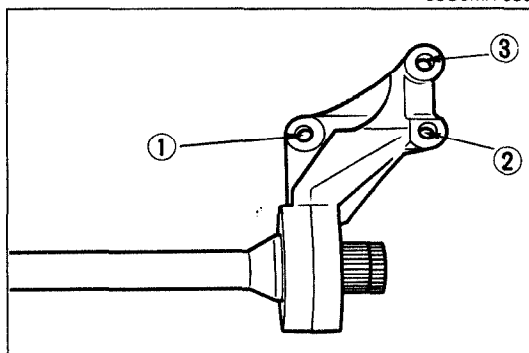
03U0MX-030

Joint shaft

Caution

- Do not damage the oil seal.

1. Remove the joint shaft.



03U0MX-031

Installation note

Joint shaft

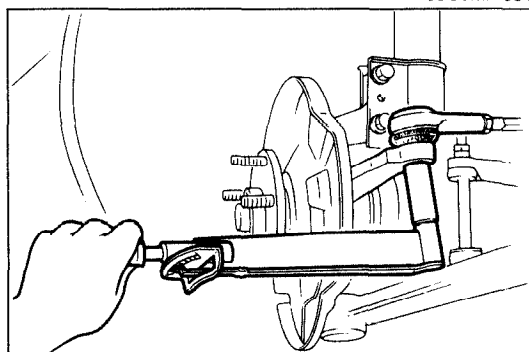
Caution

- Do not damage the oil seal.

1. Install the joint shaft.
2. Tighten the bolts in the order shown.

Tightening torque:

42—62 N·m (4.3—6.3 m·kg, 31—46 ft·lb)



23U0MX-040

Tie rod end

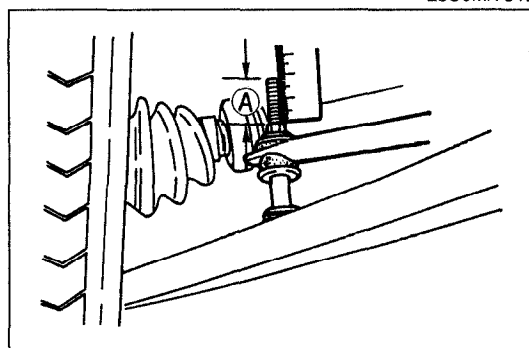
Caution

- Do not damage the dust boot.

1. Install the nut and secure it with the new cotter pin.

Tightening torque:

42—57 N·m (4.3—5.8 m·kg, 31—42 ft·lb)



03U0MX-032

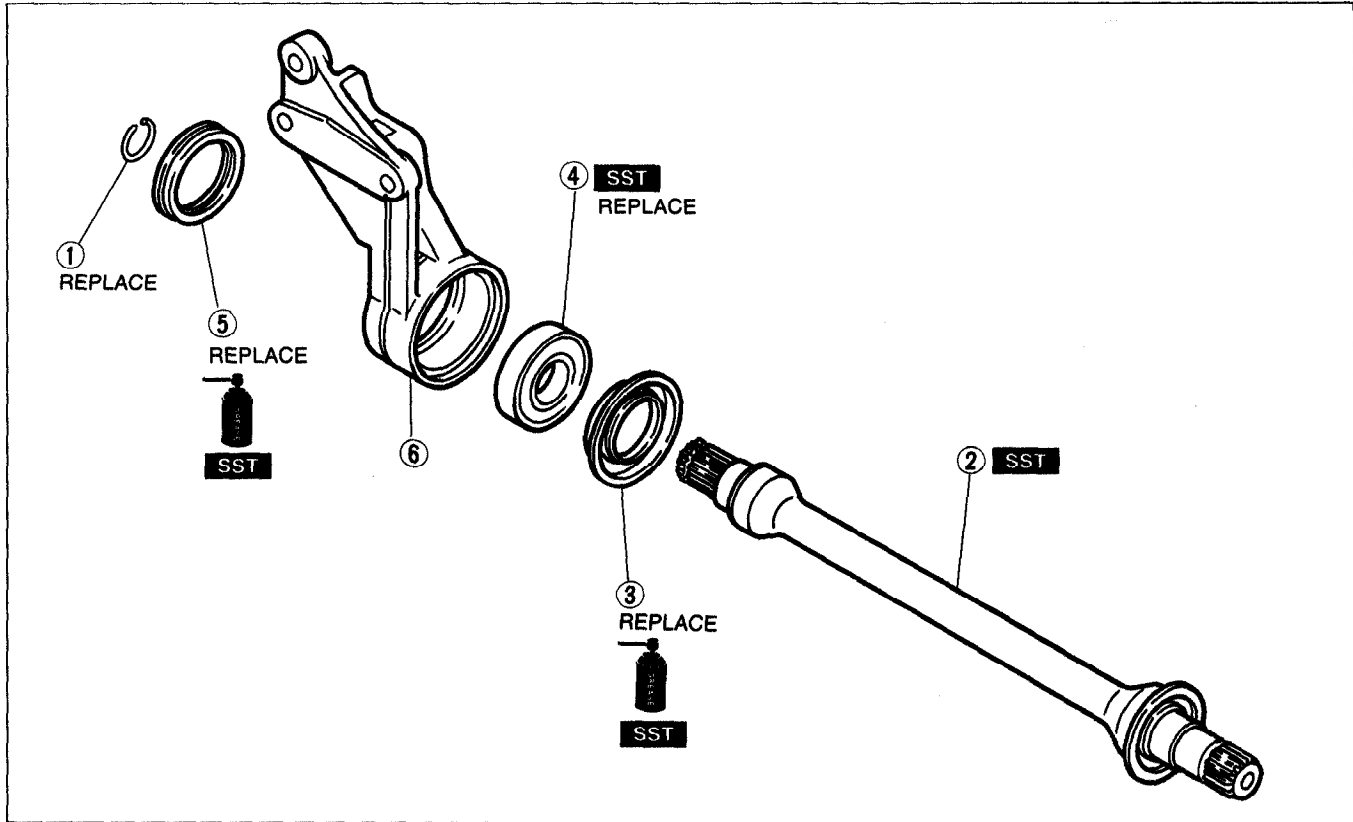
Stabilizer

1. Install the stabilizer bolt.

Dimension A: 17—19mm (0.67—0.75 in)

Overhaul

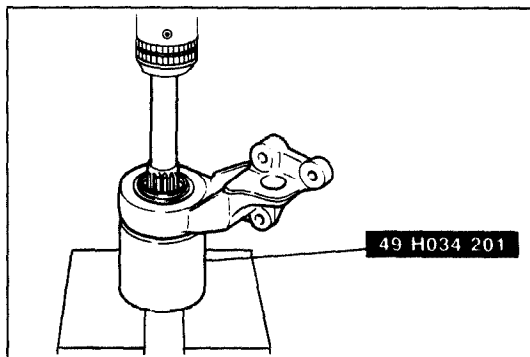
1. Disassemble in the order shown in the figure, referring to **Disassembly Procedure**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Procedure**.



23U0MX-021

1. Clip
2. Joint shaft
Inspect splines for damage and wear
3. Left dust seal

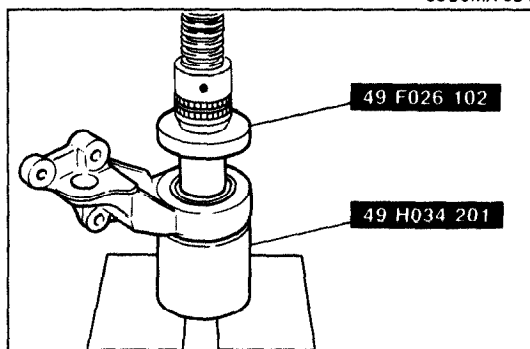
4. Bearing
5. Right dust seal
6. Bracket



03U0MX-034

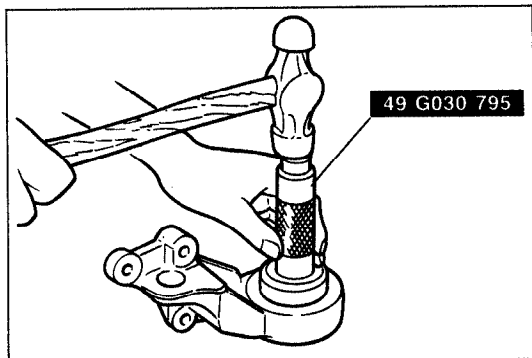
Disassembly procedure

1. Remove the clip.
2. Remove the joint shaft with the **SST**.

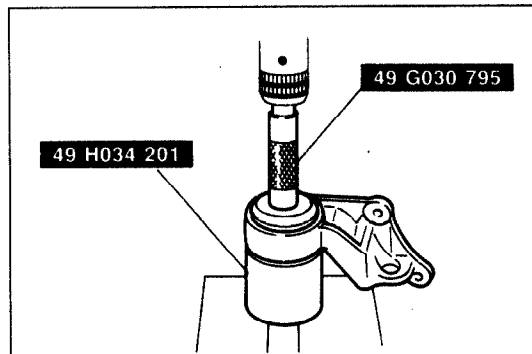


23U0MX-022

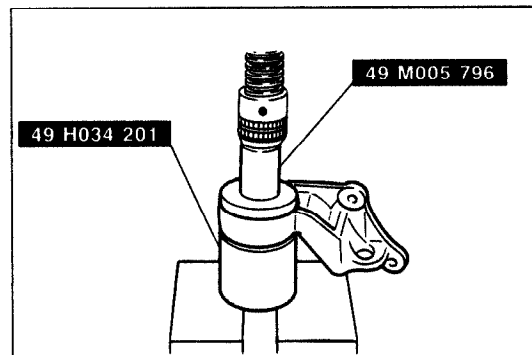
3. Remove the left dust seal and bearing with the **SST**.
4. Remove the right dust seal.



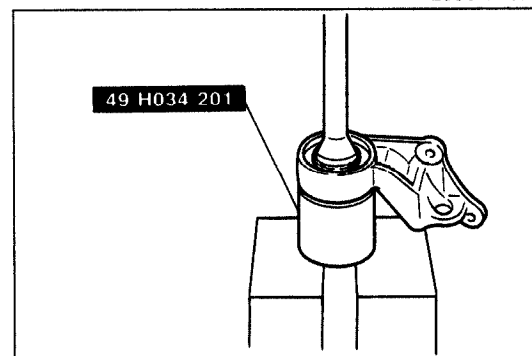
23U0MX-023



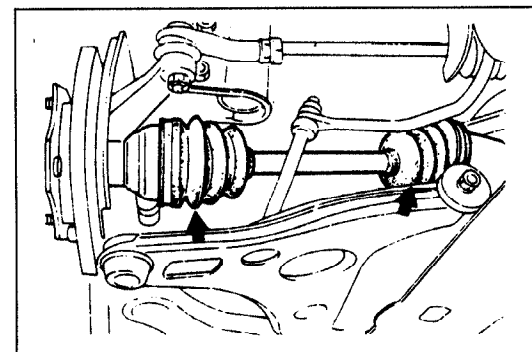
03U0MX-037



23U0MX-024



03U0MX-039



23U0MX-025

Assembly procedure

1. Install the new Right dust seal with the **SST**.
2. Install the new bearing with the **SST**.
3. Install the new Left dust seal with the **SST**.
4. Install the joint shaft with the **SST**.
5. Install the new clip.

DRIVE SHAFT (TRIPOD JOINT)

Preinspection

Drive shaft

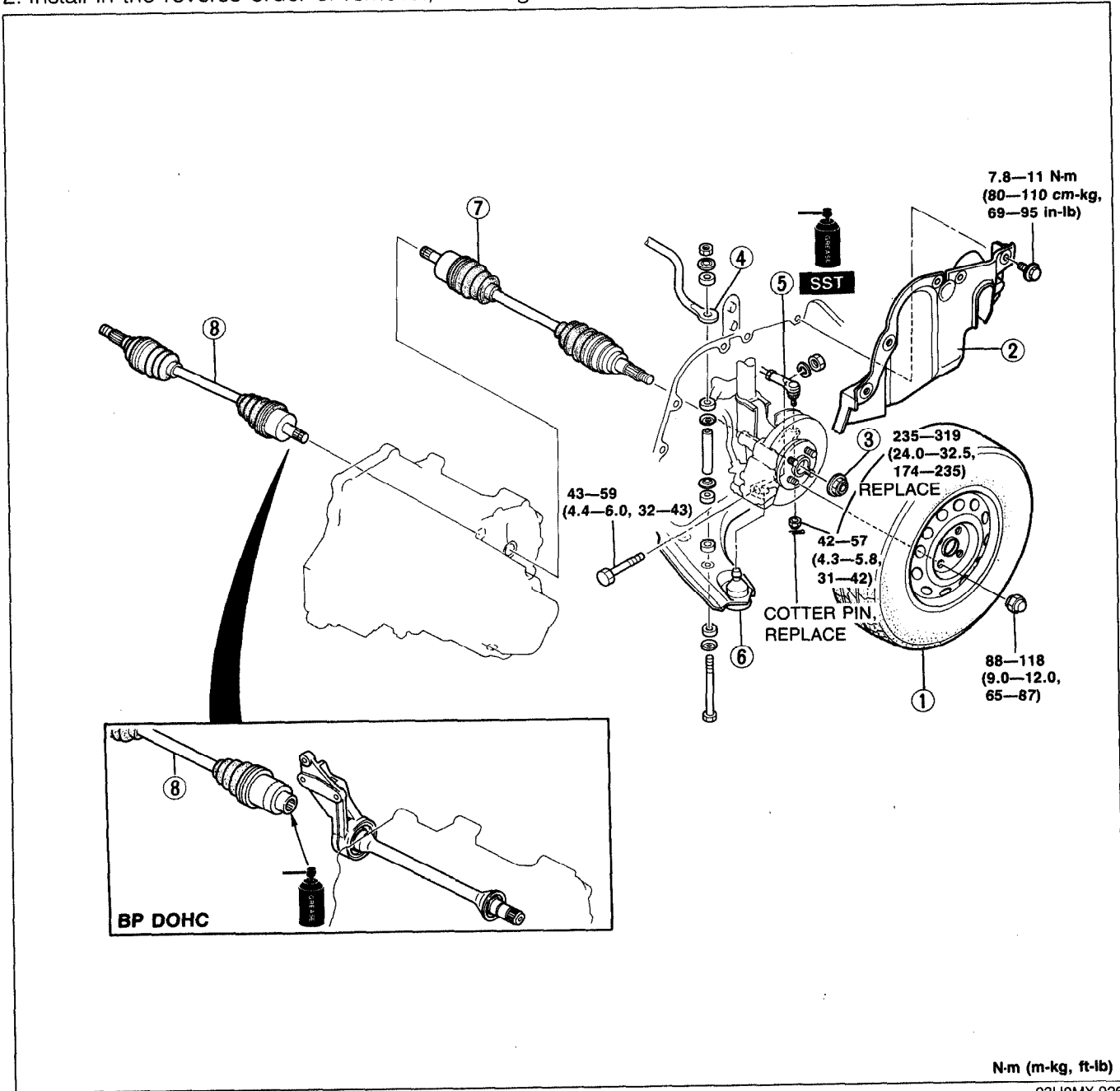
1. Check the dust boot on the drive shaft for cracks, damage, leaking grease, and a loose boot band.
2. Check the drive shaft for bending, cracks, and wear of joints or splines.
3. Repair or replace the drive shaft if necessary.

Removal / Installation

Note

- Drain the transaxle oil before removal.

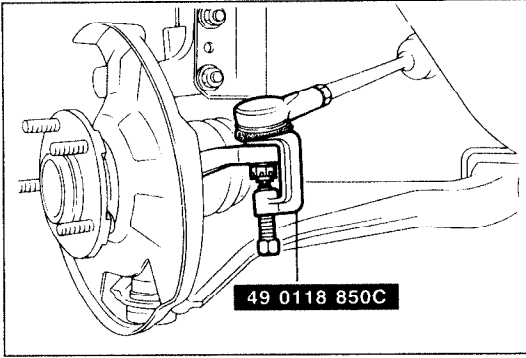
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



N-m (m-kg, ft-lb)

23U0MX-026

- | | | |
|-------------------------|-------------------------|-----------|
| 1. Wheel and tire | 6. Lower ball joint | |
| 2. Splash shield | 7. Drive shaft (Left) | |
| 3. Locknut | Removal Note | page M-23 |
| Installation Note | Installation Note | page M-23 |
| 4. Stabilizer | Overhaul | page M-25 |
| Installation Note | 8. Drive shaft (Right) | |
| page M-24 | Removal Note | page M-23 |
| 5. Tie rod end | Installation Note | page M-23 |
| Removal Note | Overhaul | page M-25 |
| page M-23 | | |
| Installation Note | | |
| page M-23 | | |



23U0MX-041

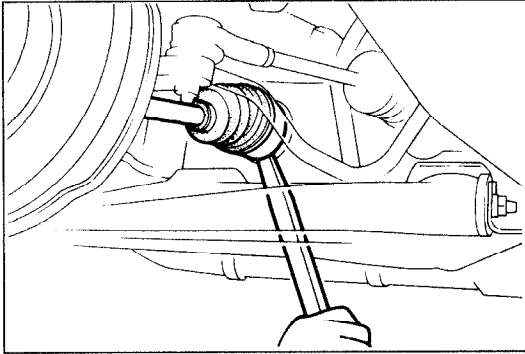
Removal note

Tie rod end

Caution

- Do not damage the dust boot.

1. Loosen the nut and disconnect the tie rod end with the **SST**.



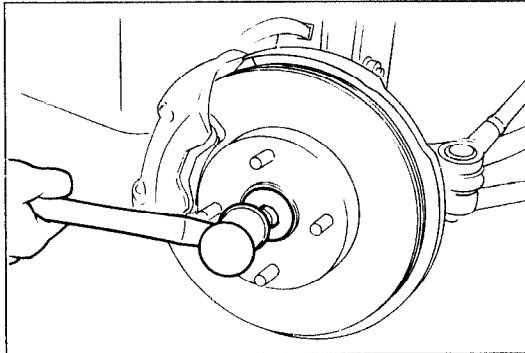
23U0MX-027

Drive shaft

Caution

- Do not damage the dust cover or oil seal.

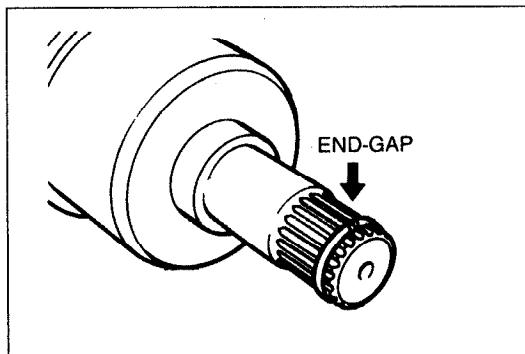
1. Remove the drive shaft from the transaxle with a pry bar.



23U0MX-028

Note

- If the drive shaft is stuck in the front wheel hub, install a miscellaneous nut until it is flush with the end of the shaft. Tap the nut with a copper hammer to remove the drive shaft.



23U0MX-029

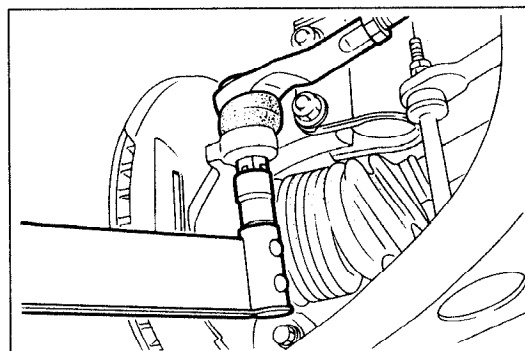
Installation note

Drive shaft

Caution

- Do not damage the dust cover or oil seal.

1. Install the drive shaft with the end-gap of clip facing upward.



23U0MX-042

Tie rod end

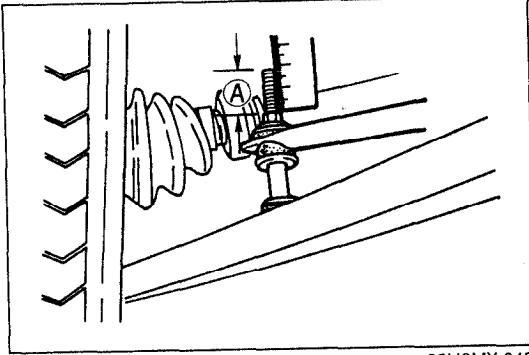
Caution

- Do not damage the dust boot.

1. Install the nut and secure it with the new cotter pin.

Tightening torque:

42—57 N·m (4.3—5.8 m·kg, 31—42 ft·lb)

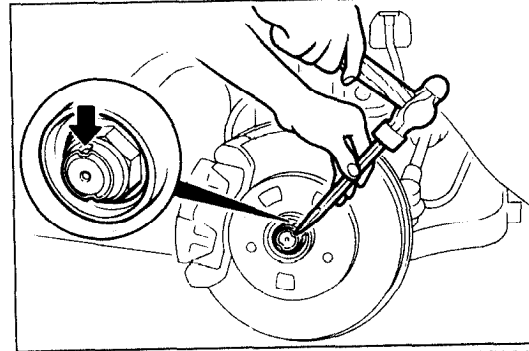


03U0MX-045

Stabilizer

1. Install the stabilizer bolt.

Dimension A: 17—19mm (0.67—0.75 in)



03U0MX-046

Locknut

1. Install a new locknut and stake it, as shown.

Tightening torque:

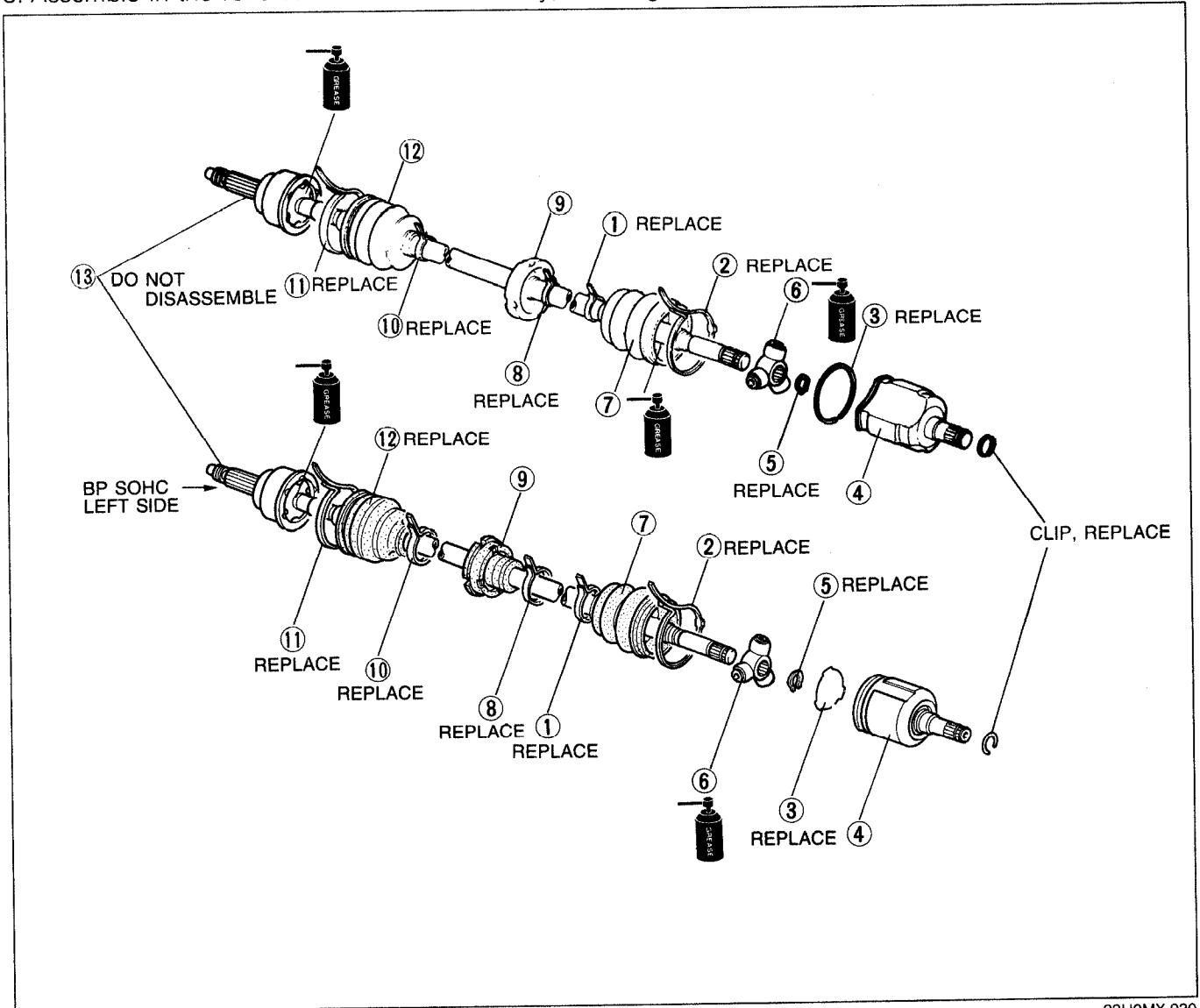
235—319 N·m (24.0—32.5 m·kg, 174—235 ft·lb)

Overhaul

Caution

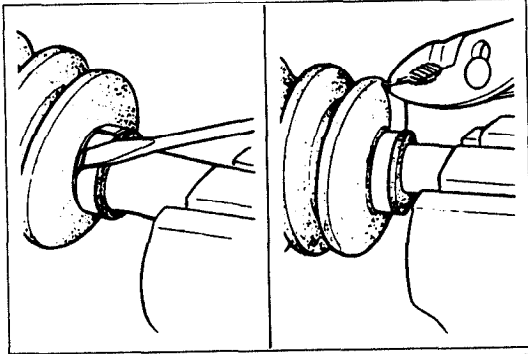
- Do not remove the U-shaped bearing outer races from the outer ring. (BP SOHC Left drive shaft)
- Secure the joint in a vise with protective material (such as copper plates) on the vise jaws.
- Be careful that dust or other foreign material does not enter the joint while the work is being performed.
- Do not disassemble the wheel-side ball joint.
- Do not wash the joint unless it is being disassembled.

1. Disassemble in the order shown in the figure, referring to **Disassembly Procedure**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Procedure**.



23U0MX-030

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Boot band 2. Boot band 3. Clip 4. Outer ring
Inspect inside bore for wear, corrosion, and scoring 5. Snap ring 6. Tripod joint 7. Boot | <ol style="list-style-type: none"> 8. Band 9. Dynamic damper 10. Boot band 11. Boot band 12. Boot 13. Shaft and ball joint assembly
Inspect splines for damage and wear
Inspect wheel-side joint for excessive play and rough rotation |
|---|--|

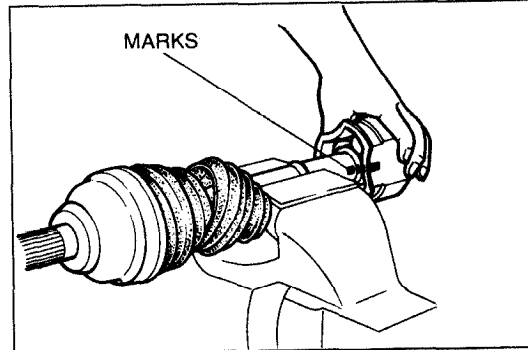


03U0MX-048

Disassembly procedure

1. Pry up the locking clips of the transaxle-side boot bands with a screwdriver.
2. Remove the bands with pliers.
3. Slide the boot along the shaft to expose the joint.

4. Mark the outer ring and the shaft for proper reassembly.
5. Remove the stopper ring.



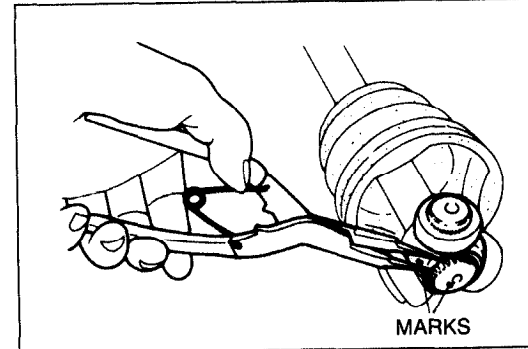
03U0MX-049

6. Mark the shaft and tripod joint for proper reassembly.
7. Remove the snap ring with snap-ring pliers.

Caution

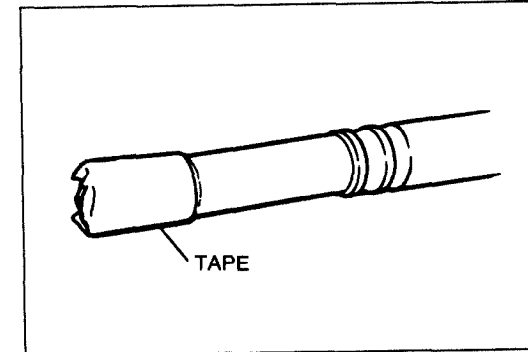
- Do not damage the bearing.

8. Remove the tripod joint from the shaft with a bar and a hammer.



03U0MX-050

9. Wrap the splines of the shaft with tape to prevent damaging the boot. Remove the boot.

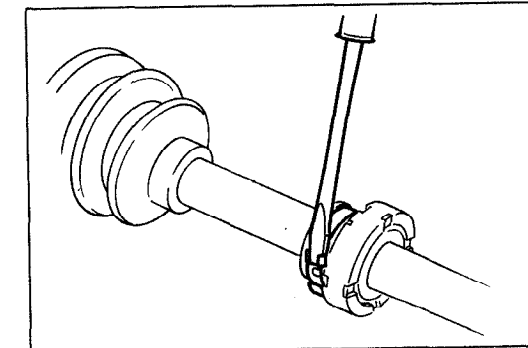


03U0MX-051

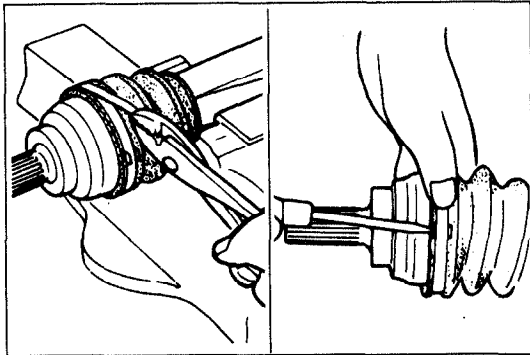
Caution

- Do not remove the dynamic damper if not necessary.

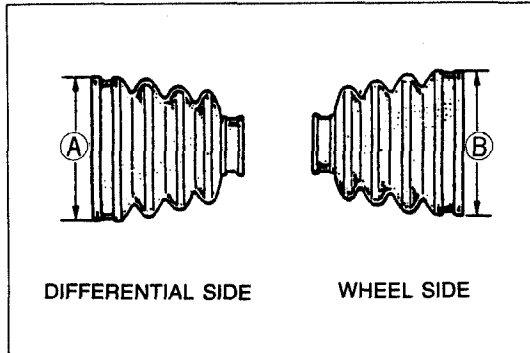
10. Pry up the locking clip of the band with a screwdriver.
11. Remove the band with pliers. Remove the dynamic damper.



03U0MX-052



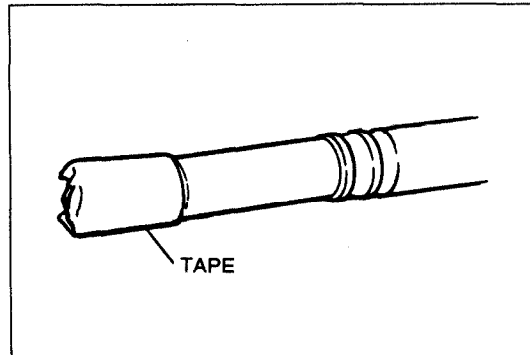
03U0MX-053



DIFFERENTIAL SIDE

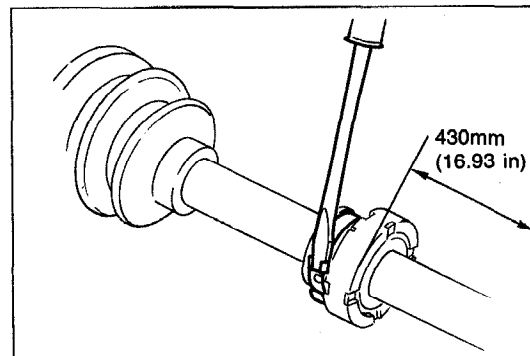
WHEEL SIDE

23U0MX-031

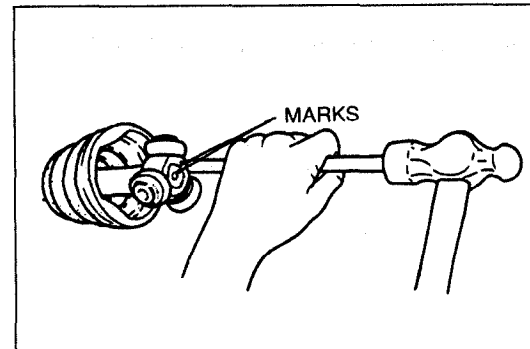


TAPE

03U0MX-057



23U0MX-032



MARKS

23U0MX-033

Caution

- Do not remove the wheel side boot if not necessary.

12. Pry up the locking clips of the wheel-side boot bands with a screwdriver.
13. Remove both bands with pliers. Remove the boot.

Assembly procedure

Caution

- The wheel-side and transaxle-side boots are different.

mm (in)

	B6 SOHC		BP SOHC		BP DOHC	
	Right side	Left side	Right side	Left side	Right side	Left side
Ⓐ	85.9 (3.38)	86.0 (3.39)	92.0 (3.62)	89.9 (3.54)	90.2 (3.55)	
Ⓑ	80.8 (3.18)		89.0 (3.50)	85.2 (3.35)	94.1 (3.70)	

1. Wrap the splines of the transaxle-side shaft, and install the wheel-side boot.

Caution

- Always use new bands.
- The bands should be mounted in the direction opposite the forward revolving direction of the drive shaft.

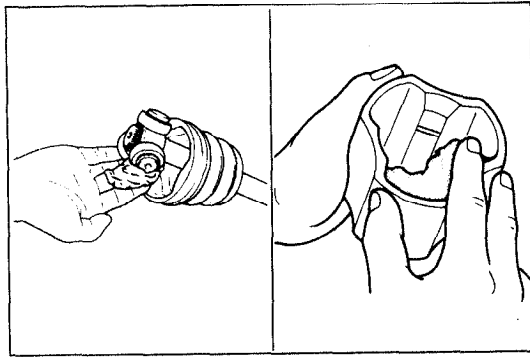
2. Install the dynamic damper and new band.
3. Fold the band back by pulling on the end of it with pliers.
4. Lock the end of the band by bending the locking clip.

5. Install the wheel-side boot.

Caution

- Do not damage the bearing.

6. Align the marks and install the tripod joint with a bar and a hammer.
7. Install the new snap ring with snap-ring pliers.



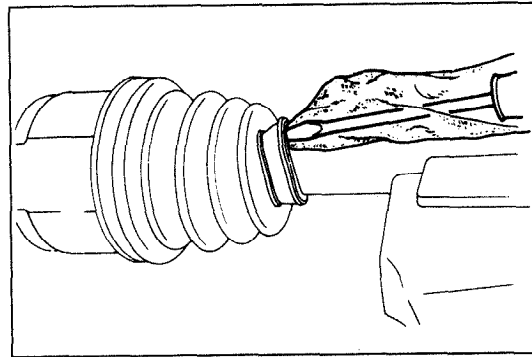
03U0MX-060

8. Apply the specified grease included in the kit to the tripod joint, outer ring, and boot.
9. If the wheel-side boot was removed, fill with the specified grease included in the kit.

Specified grease

g(oz)

	B6 SOHC		BP SOHC		BP DOHC	
	Right side	Left side	Right side	Left side	Right side	Left side
DIFFERENTIAL SIDE	125 (4.41) YELLOW		220 (7.77) LIGHT YELLOW	140 (4.94) YELLOW	145 (5.12) YELLOW	
WHEEL SIDE	70 (2.47) BLACK		140 (4.94) BLACK		90 (3.18) BLACK	

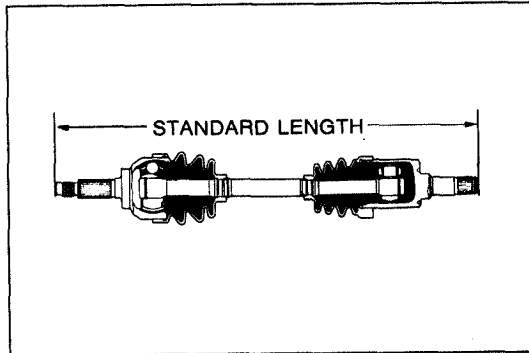


03U0MX-061

Caution

- Be sure the boots are not dented or twisted.
- Carefully lift up the small end of the boots to release any trapped air.

10. Install the boots.



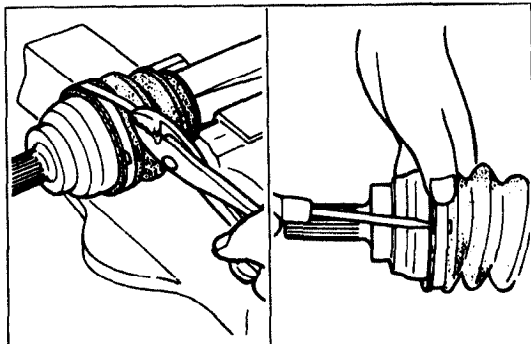
23U0MX-034

11. Measure the length of the drive shaft.

Standard length:

mm (in)

	B6 SOHC		BP SOHC		BP DOHC	
	MTX	ATX	MTX	ATX	MTX	ATX
Right side	919.3 (36.19)		918.7 (36.17)		630.7 (24.83)	
Left side	637.8 (25.11)		640.2 (25.20)		621.2 (24.46)	637.1 (25.08)



23U0MX-035

12. Fold the new bands back by pulling on the ends with pliers.
13. Lock the ends of the bands by bending the locking clips.

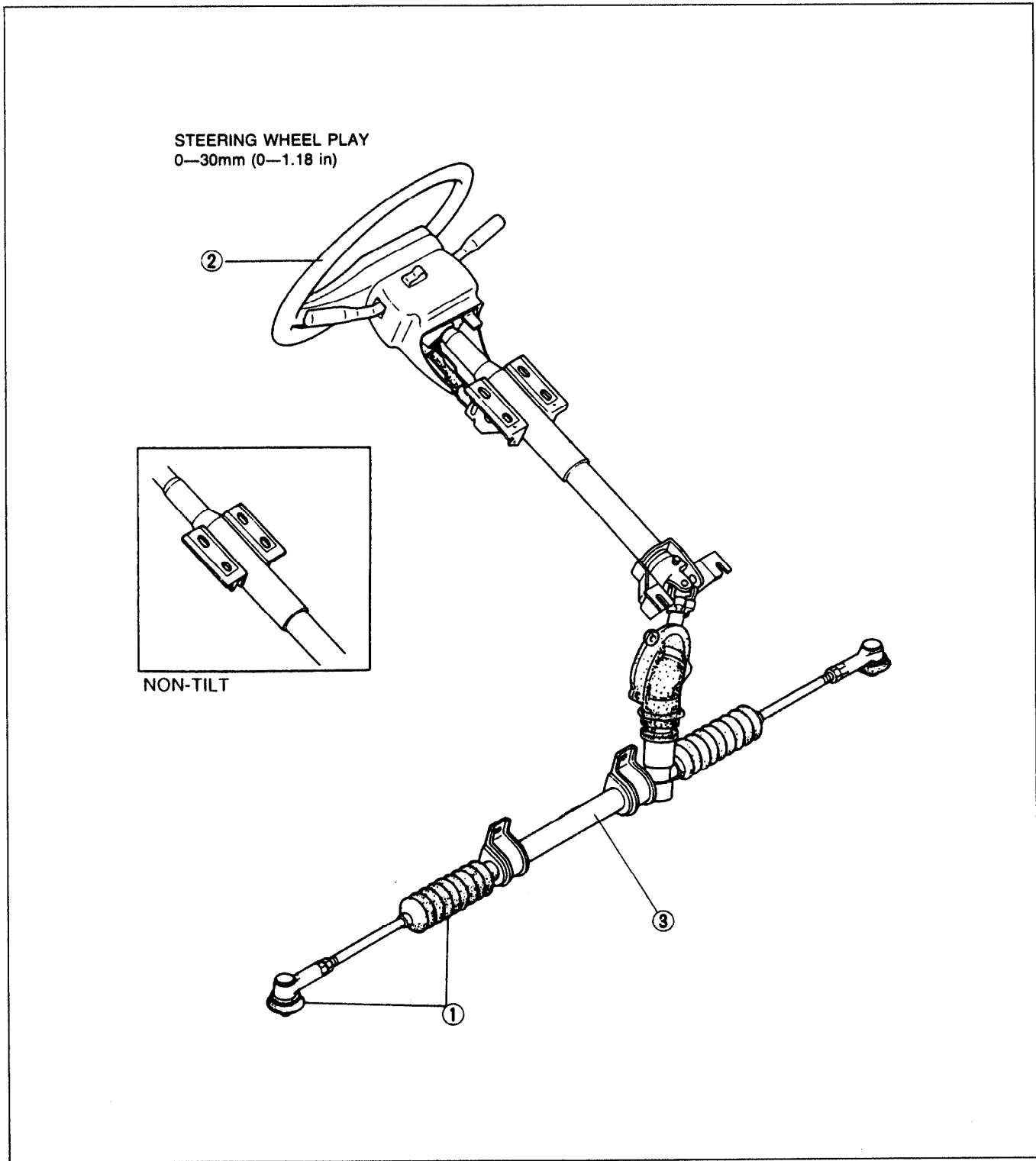
STEERING SYSTEM

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STEERING (ESPS)	N- 3
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PREPARATION	N- 4
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23U0NX-001

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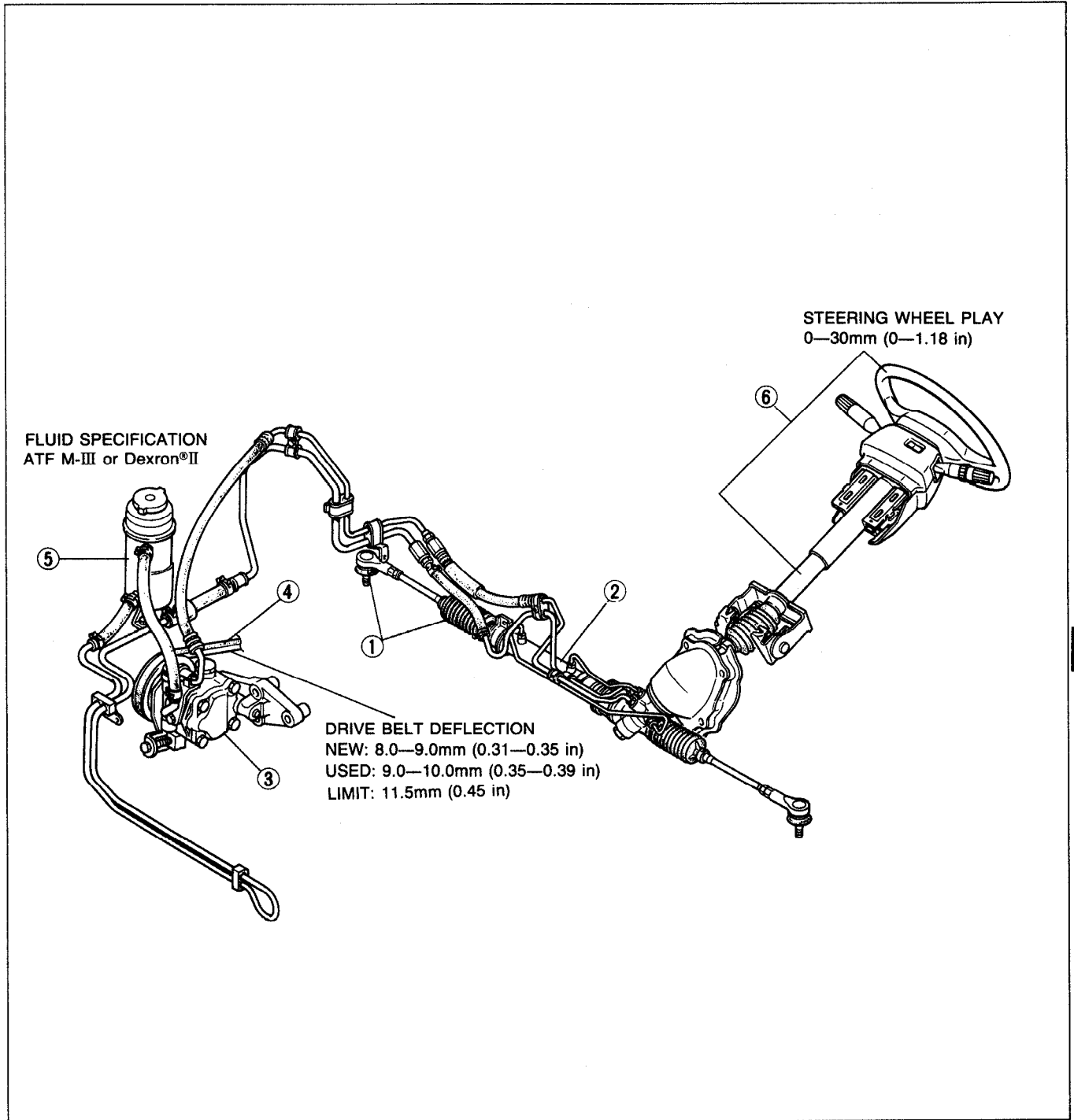
MANUAL STEERING



23U0NX-002

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2. Steering wheel and column		Disassembly.....	page N-15
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ENGINE SPEED SENSING POWER STEERING (ESPS)



N

23U0NX-003

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2. Steering gear and linkage			
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Disassembly / Inspection.....	page N-31		
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3. Power steering oil pump			
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Assembly.....	page N-38		
4. Drive belt			
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5. Power steering fluid			
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6. Steering wheel and column			
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OUTLINE

SPECIFICATIONS

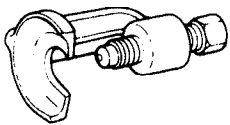
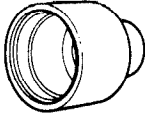
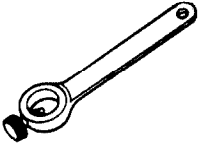

Item		Type	Manual steering	Power steering
Steering wheel	Outer diameter	mm (in)	370 (14.6)	
	Lock-to-lock	turns	4.3	3.0
Steering shaft and joint	Shaft		Collapsible	
	Joint		2-cross joint	
Steering gear	Power assist		—	Engine speed sensing
	Gear		Rack-and-pinion	
	Gear ratio		∞ (infinite)	
	Rack stroke	mm (in)	140 (5.51)	
	Power steering fluid		—	ATF Dexron®II or M-III
	Fluid capacity	liter (US qt, Imp qt)	—	0.8 (0.85, 0.70)

23U0NX-004

MANUAL STEERING

PREPARATION

SST

<p>49 0118 850C</p> <p>Puller, ball joint</p> 	<p>For removal of tie rod end</p>	<p>49 1243 785</p> <p>Installer, dust boot</p> 	<p>For installation of dust boot</p>
<p>49 0180 510B</p> <p>Attachment, steering worm bearing preload measuring</p> 	<p>For measurement of pinion preload</p>	<p>49 F032 308</p> <p>Installer</p> 	<p>For installation of oil seal</p>

93G0NX-004

TROUBLESHOOTING GUIDE

Problem	Possible cause	Action	Page/Section
Steering feels heavy (Vehicle jacked up)	Poor lubrication, foreign material in mechanism, stuck or damage of steering ball joint	Lubricate or replace	N- 6
	Improper steering gear preload	Replace gear	—
	Damaged steering gear	Replace	N-13
	Malfunction of steering shaft joint	Replace	N-10
	Malfunction of steering gear	Replace	N-13
	Cracked or worn steering gear mounting rubber Malfunction of suspension	Replace —	N- 6 Section R
Steering wheel pulls to one side	Damaged steering linkage	Replace	N-13
	Damaged wheel or tire	—	Section Q
	Malfunction of braking system	—	Section P
	Malfunction of suspension	—	Section R
General instability while driving	Worn or damaged steering joints	Replace	N- 6
	Improper steering gear preload	Adjust	—
	Damaged steering linkage	Replace	N-13
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Steering feels unstable	Malfunction of steering gear	Replace	N-13
	Malfunction of steering joints	Replace	N- 6
	Malfunction of steering linkage	Replace	N-13
Excessive steering wheel play	Worn steering gear	Replace	N-13
	Worn or damaged steering joints	Replace	N- 6
	Loose steering gear mounting bolts	Replace	N-13
Poor steering wheel return	Stuck or damaged steering joints	Replace	N- 6
	Improper steering gear preload	Replace gear	—
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Shimmy (Steering wheel vibrates left/right)	Damaged steering linkage	Replace	N-13
	Loose steering gear mounting bolts	Tighten	N-13
	Stuck or damaged steering joints	Replace	N- 6
	Damaged or worn front wheel bearing	Replace	Section M
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Abnormal noise from steering system	Loose steering gear mounting bolts	Tighten	N-13
	Malfunction of steering gear	Replace	N-13
	Obstruction near steering column	Replace	—
	Loose steering linkage	Tighten	N-13
	Worn steering joints	Replace	N- 6

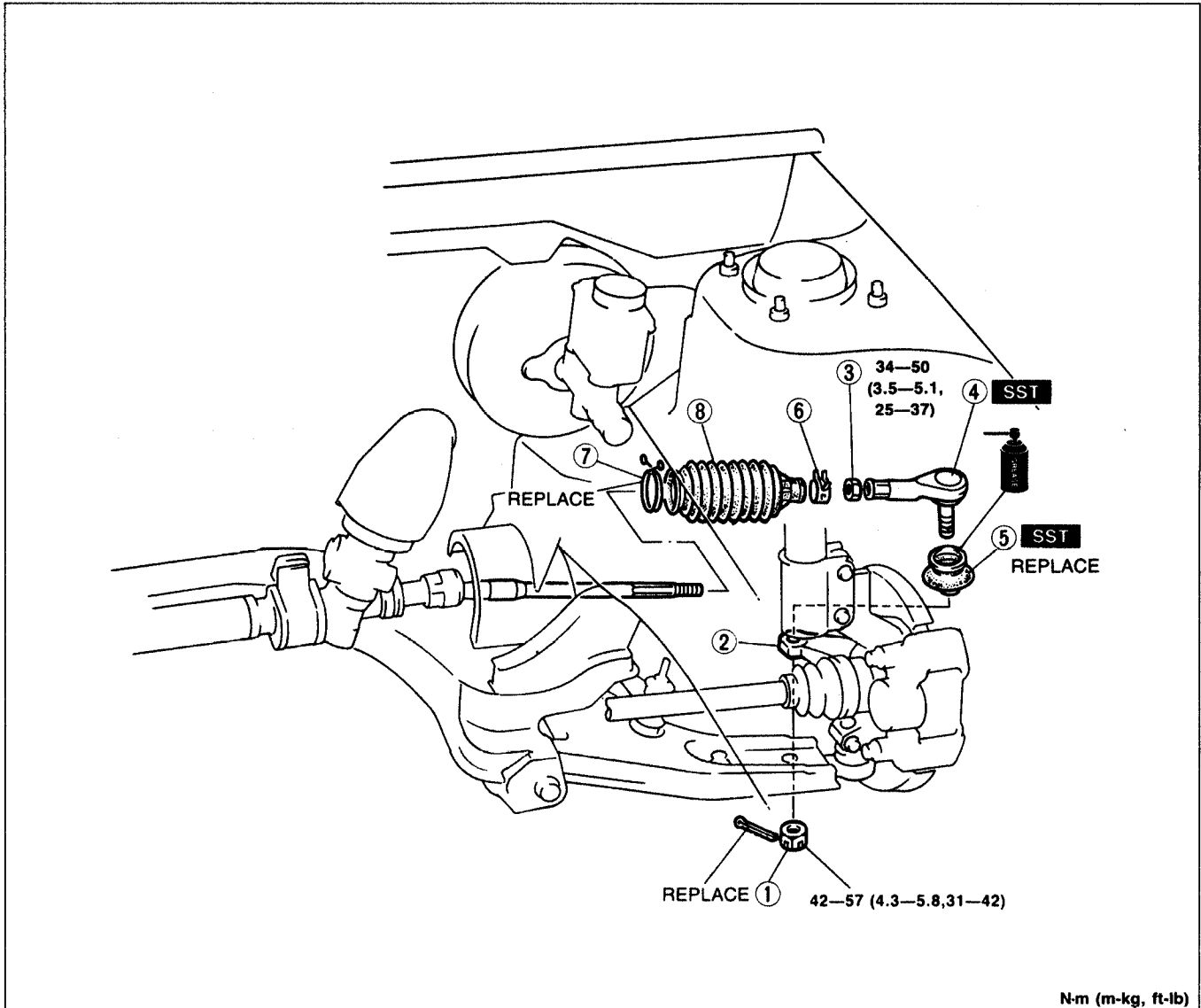
23U0NX-005

N

BOOT

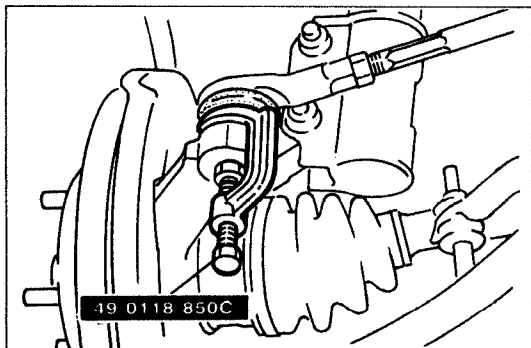
Removal / Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



23U0NX-006

- | | |
|---------------------------------|-----------------------------------|
| 1. Cotter pin, nut | 5. Tie rod end boot |
| 2. Tie rod end/Steering knuckle | Removal Note page N- 7 |
| Removal Note Below | Installation Note page N- 7 |
| 3. Locknut | 6. Boot clip |
| Removal Note page N- 7 | 7. Boot wire |
| 4. Tie rod end | 8. Rack boot |



Removal note

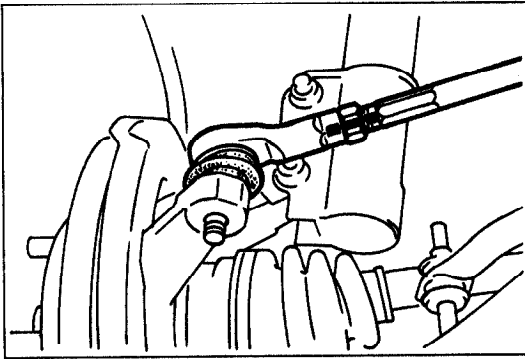
Tie rod end/Steering knuckle

1. Pull out the cotter pin, and loosen the nuts until the nut contacts with the hole stud face.

Caution

- Leave the nuts temporarily tight not to damage the screw thread.

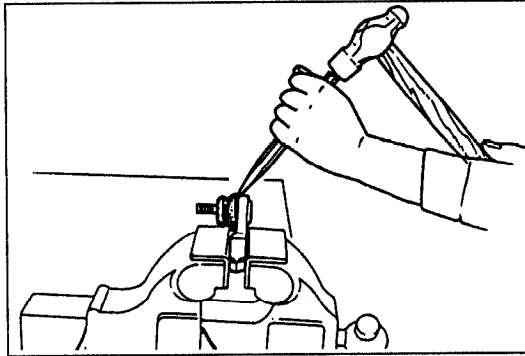
2. Remove the tie rod from the knuckle arm with the **SST**.



23U0NX-050

Locknut

1. Mark the tie rod end, the locknut, and the tie rod.



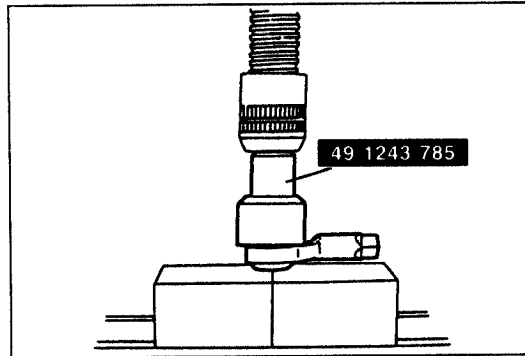
23U0NX-008

Tie rod end boot

1. Secure the tie rod end in a vise.
2. Place a chisel against the dust boot and hold it at the angle shown.
3. Remove the boot.

Caution

- Do not scar the part where the tie rod attaches to the dust boot.



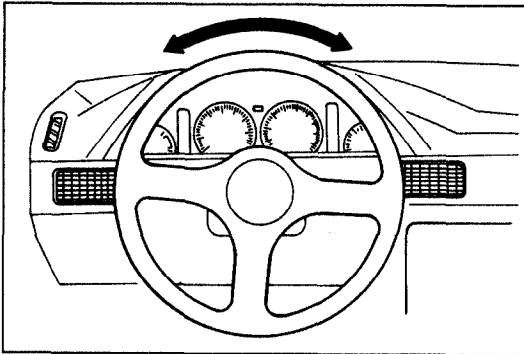
23U0NX-009

Installation note

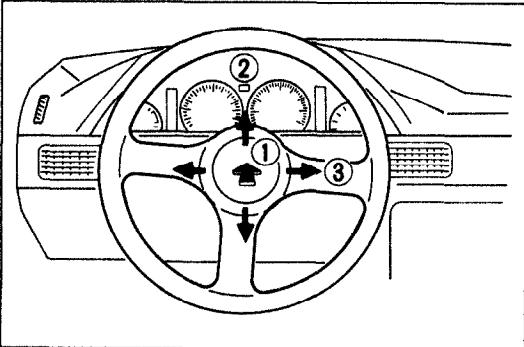
Tie rod end boot

1. Wipe the grease on the ball joint.
2. Put a small amount of rubber grease into the new dust boot.
3. Install the dust boot onto the tie rod end with the **SST** and a press.
4. Wipe away any grease expelled from the dust boot.

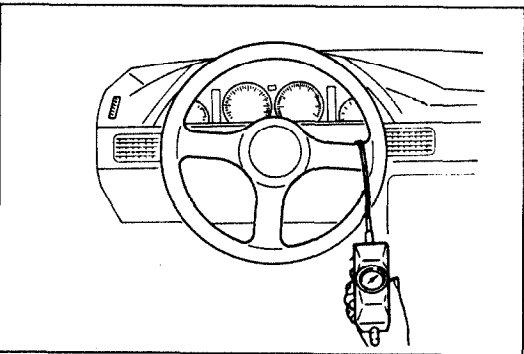
N



03U0NX-012



03U0NX-013



23U0NX-010

STEERING WHEEL AND COLUMN

On-vehicle Inspection

Steering wheel play

With the wheels in the straight-ahead position, gently turn the steering wheel to the left and right to determine if play is within specification.

Play: 0—30mm (0—1.18 in)

Note

- If play exceeds specification, either the steering joints are worn or the backlash of the steering gear is excessive.

Looseness of steering wheel and column

Move the steering wheel in directions ①, ②, and ③ to check for column bearing wear, steering shaft joint play, steering wheel looseness, and column looseness.

Steering wheel effort

1. With the vehicle on a hard level surface, move the steering wheel to put the wheels in the straight-ahead position.
2. Attach a pull scale to the outer of the steering wheel, and then starting with the wheels in the straight-ahead position, check the steering effort required to turn the steering wheel to the left and to the right.
3. If the measured effort exceeds specification, check the following: rotation-starting torque of the pinion, rotation torque of each ball joint, and seizure of each joint.

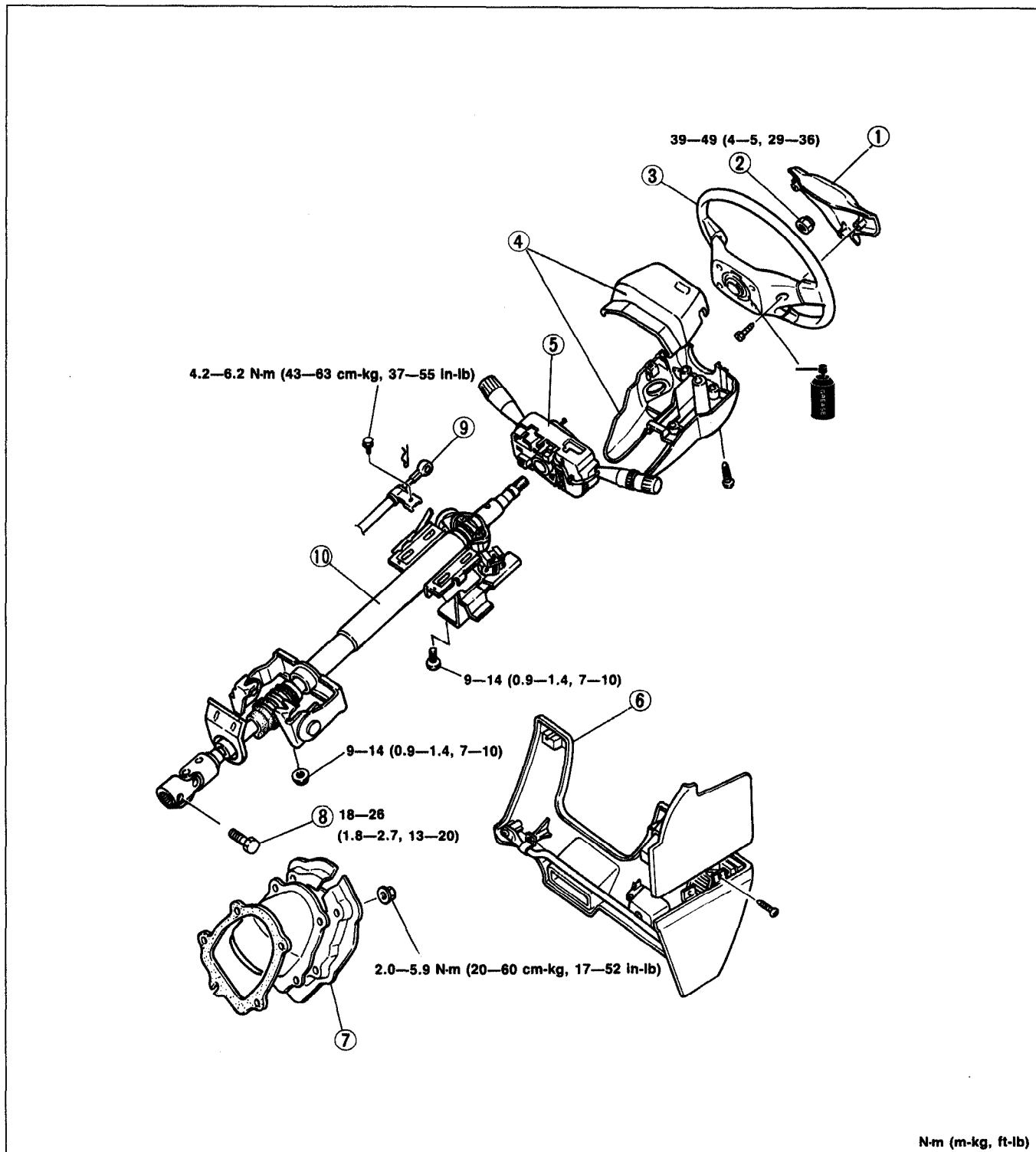
Steering wheel effort: 108 N (11 kg, 24.2 lb) or less

Note

- Measure after turning the steering wheel to the left and right 5 times or more.

Removal / Installation

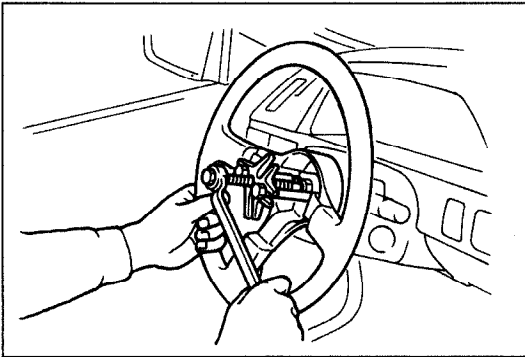
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal.



N-m (m-kg, ft-lb)

23U0NX-011

- | | |
|------------------------------|--|
| 1. Horn cap | 6. Undercover |
| 2. Locknut | 7. Dust cover |
| 3. Steering wheel | 8. Fixing bolt (Intermediate shaft/Pinion shaft) |
| Removal Note page N-10 | 9. Interlock cable (ATX only) |
| 4. Column cover | 10. Steering shaft assembly |
| 5. Combination switch | Disassembly / Assembly page N-10 |
| Operation Section T | Inspection page N-11 |



03U0NX-016

Removal note Steering wheel

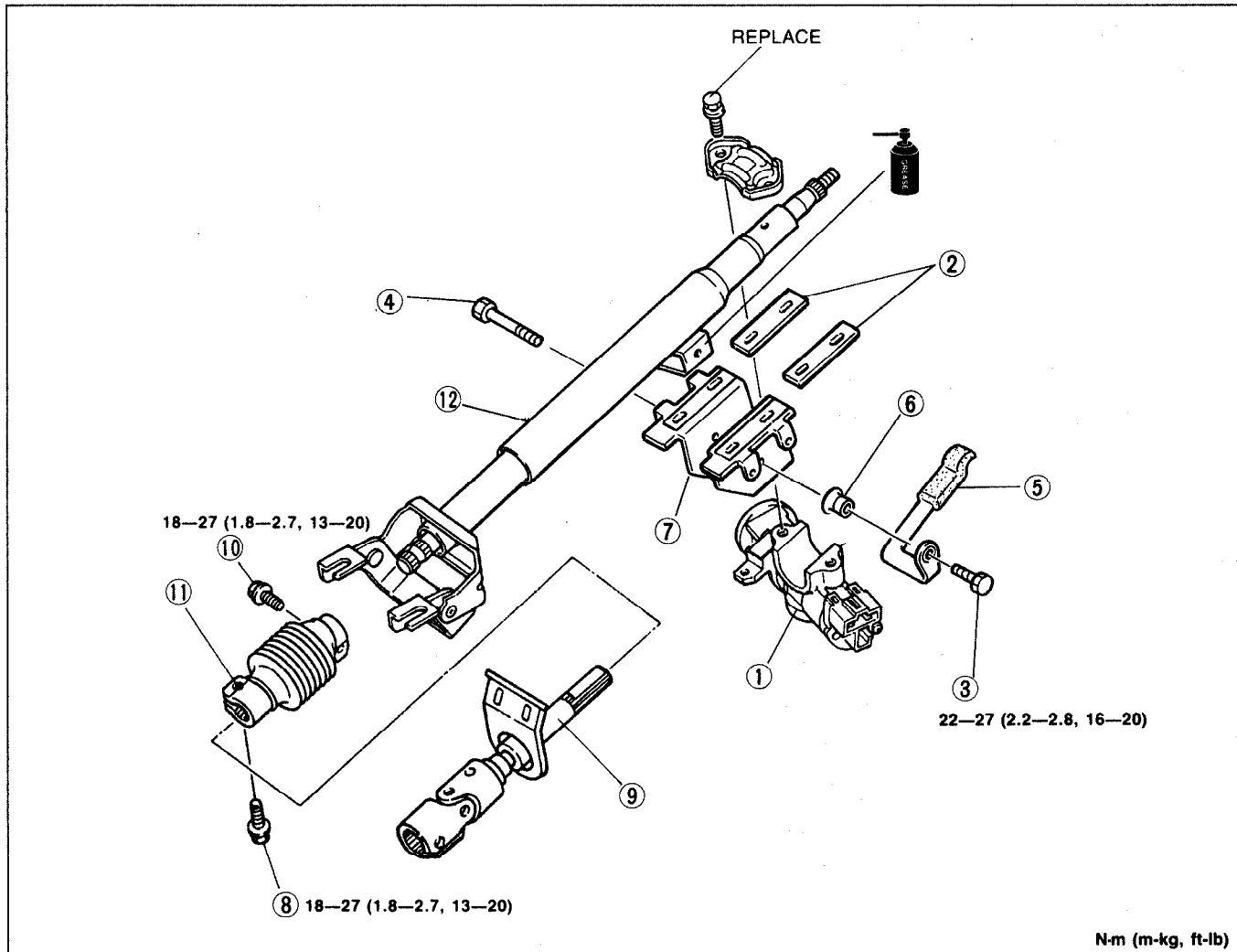
Remove the steering wheel with a suitable puller.

Caution

- Do not try to remove the steering wheel by hitting the shaft with a hammer. The column will collapse.

Disassembly / Assembly

1. Reassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



1. Steering lock assembly

- Disassembly Note page N-11
 Inspection page N-12
 Assembly Note page N-12

2. Coating plate

3. Bolt

4. Adjusting bolt

5. Adjusting lever

6. Adjusting nut

7. Tilt lever bracket

8. Fixing bolt (Universal joint/Intermediate shaft)

9. Intermediate shaft

- Inspection page N-11

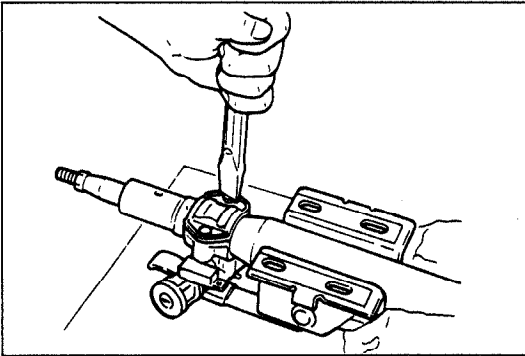
10. Fixing bolt (Steering shaft/Universal joint)

11. Universal joint

- Inspection page N-11

12. Steering shaft assembly

- Inspection page N-11



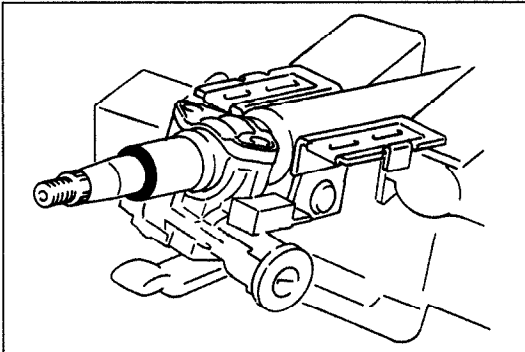
13U0NX-032

Disassembly note
Steering lock assembly

Use a chisel to make a groove in the head of the steering lock mounting bolts. Remove the bolts with a screwdriver; then remove the steering lock assembly.

Caution

- **Secure the shaft in a vise protected with brass pads or cloth.**



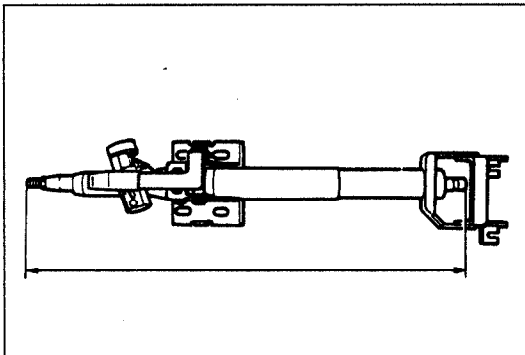
13U0NX-010

Inspection

Check for the following and replace the assembly if necessary.

Steering shaft assembly

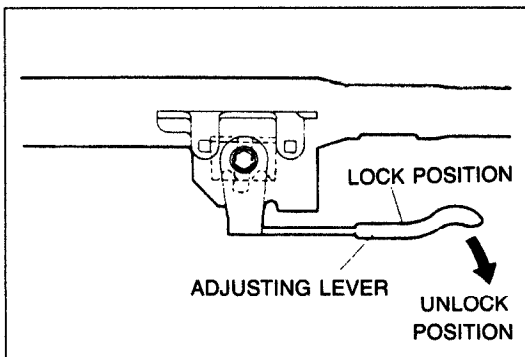
1. Column bushing wear.



23U0NX-051

2. Steering shaft length.

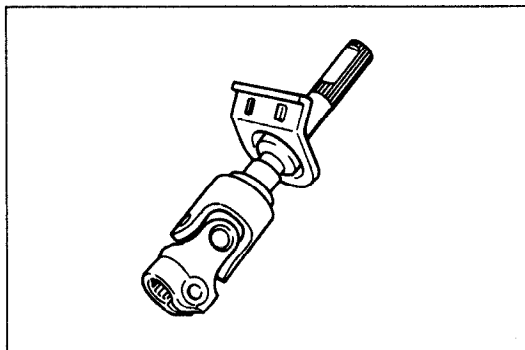
Specified length: 558.3—560.3mm (21.98—22.06 in)



19G0NX-029

3. Tilt operation.

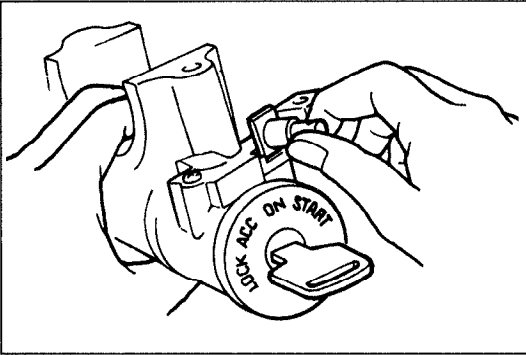
- (1) Verify that the adjusting lever moves smoothly from unlock position to lock position.
- (2) Verify that the steering shaft is fixed firmly when the adjusting lever is locked.



23U0NX-013

Intermediate shaft, Universal joint

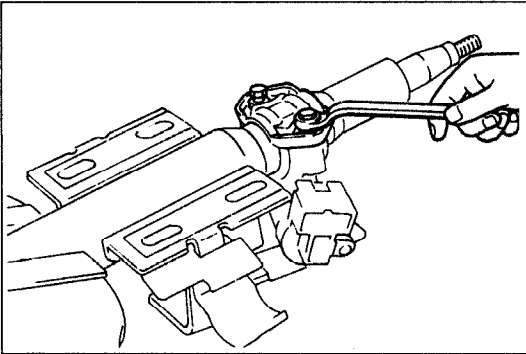
Universal joint looseness, abnormal noise, or sticking.



13U0NX-033

Steering lock assembly (ATX)

Verify that the cable connector does not move when the key is in the LOCK position and that it moves freely with the key in other positions.



13U0NX-034

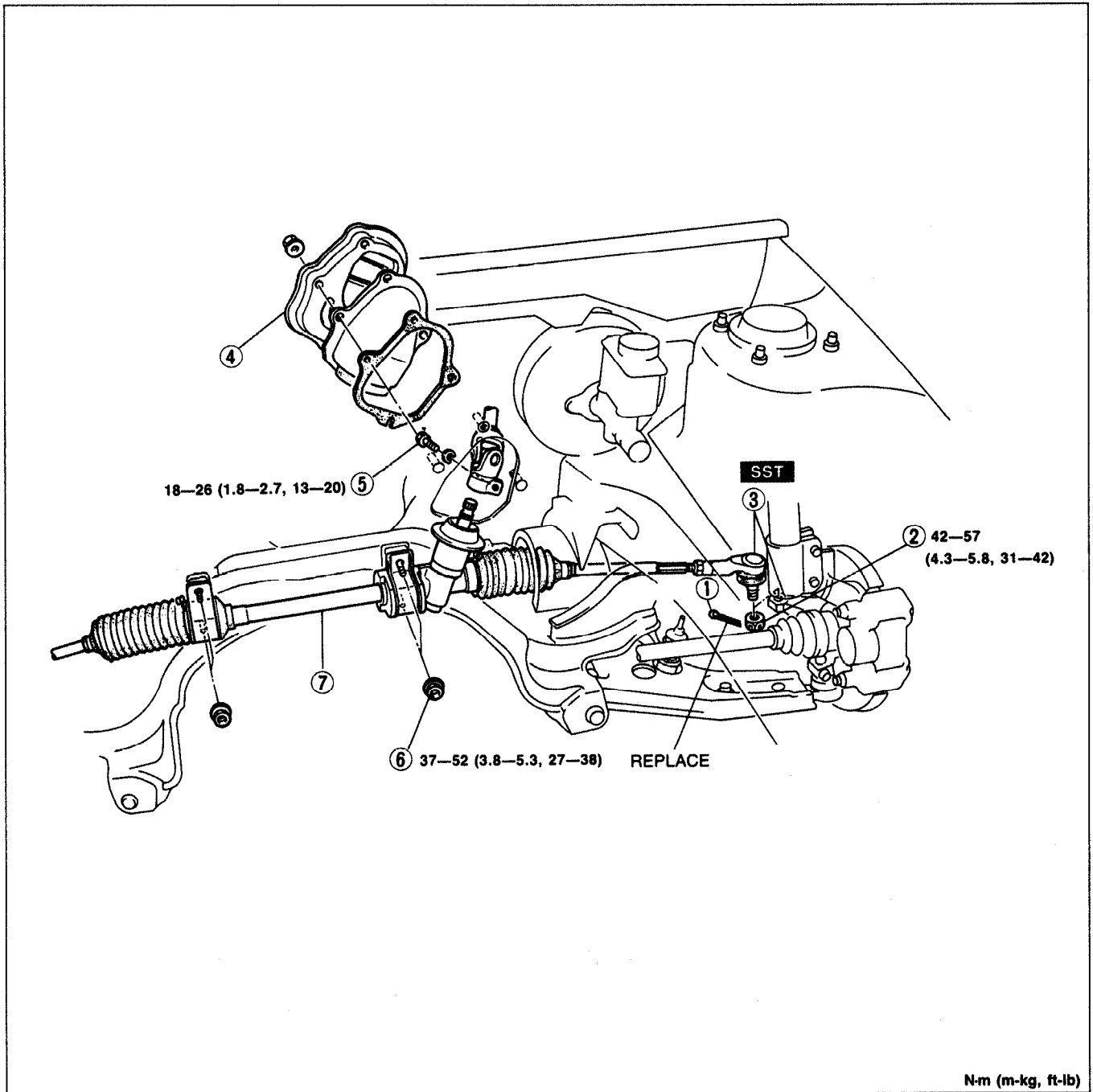
Assembly note**Steering lock assembly**

Install the steering lock assembly on the jacket. Install new steering lock mounting bolts, and tighten them until the heads break off.

STEERING GEAR AND LINKAGE

Removal / Installation

1. Loosen the wheel lug nuts.
2. Jack up the front of the vehicle and support it with safety stands.
3. Remove the wheels.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. Adjust the toe-in (Refer to Section R).

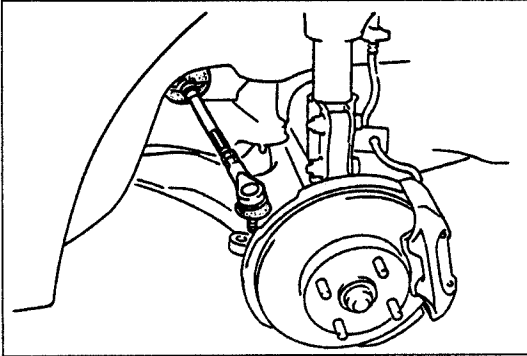


N-m (m-kg, ft-lb)

23U0NX-014

- 1. Cotter pin
- 2. Nut
- 3. Steering knuckle
Removal Note page N- 7
- 4. Set plate
- 5. Fixing bolt (Intermediate shaft/Pinion shaft)
Installation Note..... page N-14

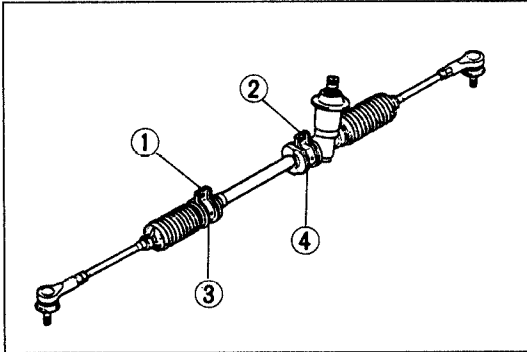
- 6. Nut
Installation Note..... page N-14
- 7. Steering gear and linkage
Removal Note page N-14



13U0NX-035

Removal note**Steering gear and linkage**

Remove the steering gear from the right side of the vehicle.



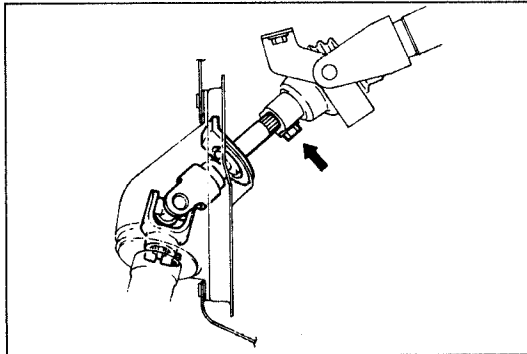
23U0NX-015

Installation note**Nut**

Install the steering gear mounting nuts in the order shown in the figure.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)



23U0NX-016

Fixing bolt (Intermediate shaft, Pinion shaft)

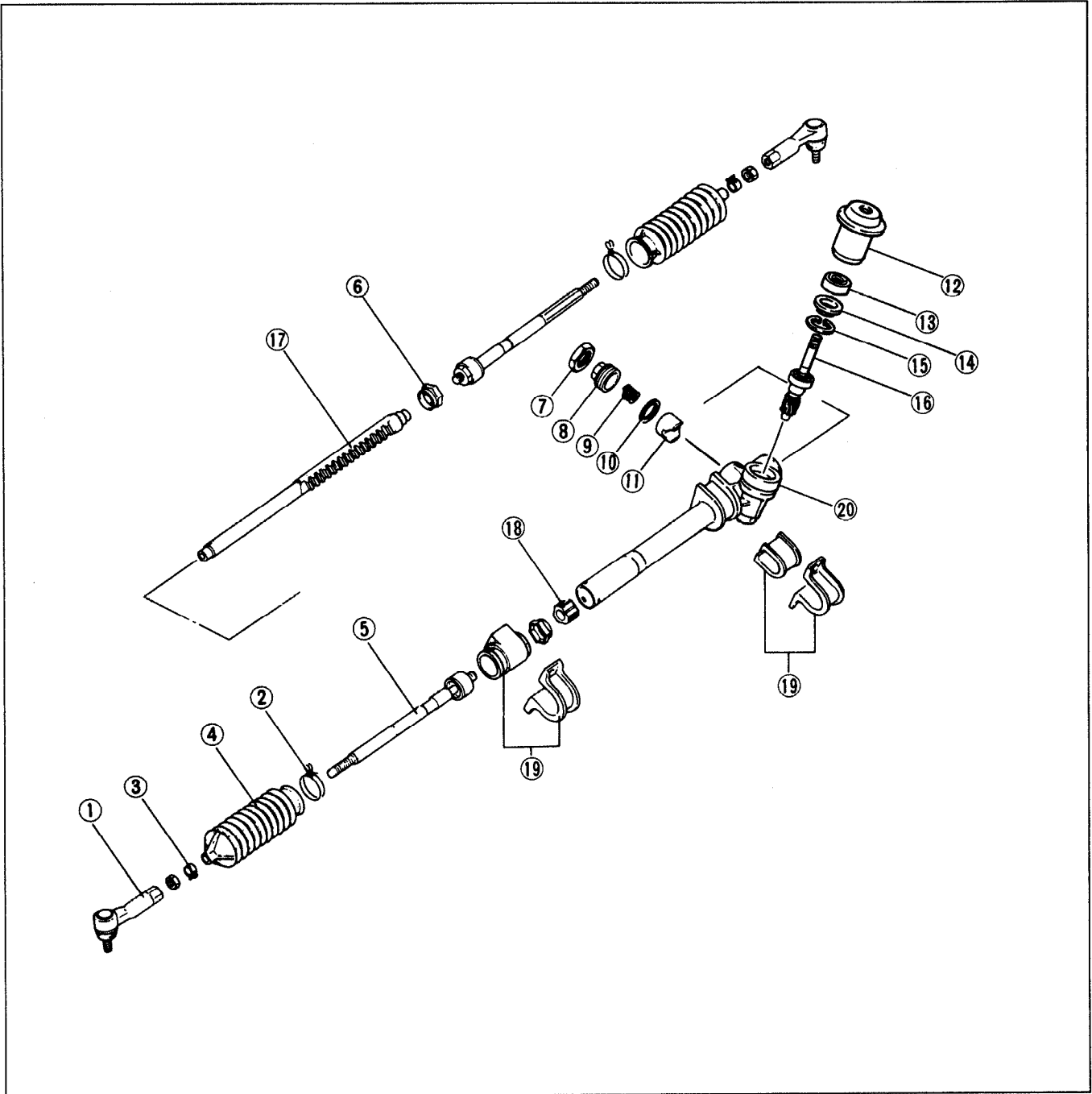
1. Remove the intermediate shaft and pinion shaft bolts, and move the intermediate shaft upward.
2. Connect the intermediate shaft and the pinion shaft. Tighten the bolts, to the specified torques.

Tightening torque:

18—26 N·m (1.8—2.7 m·kg, 13—20 ft·lb)

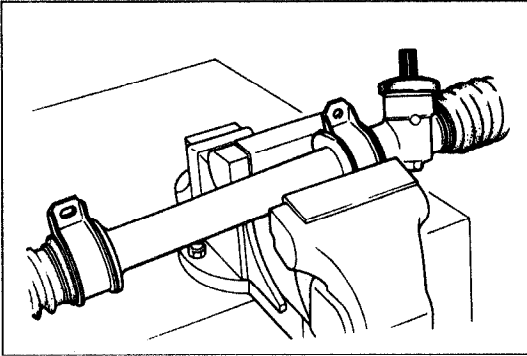
Disassembly

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



23U0NX-017

- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Tie rod end
Disassembly Note page N-16 2. Boot wire 3. Boot clip 4. Boot 5. Tie rod
Disassembly Note page N-16 6. Washer 7. Locknut 8. Adjusting cover 9. Spring 10. Pressure pad plate 11. Pressure pad | <ul style="list-style-type: none"> 12. Pinion protector
Disassembly note page N-16 13. Oil seal 14. Snap ring cap 15. Snap ring 16. Pinion
Disassembly Note page N-17 17. Rack
Disassembly Note page N-17 18. Bushing 19. Mounting bracket and rubber
Disassembly Note page N-17 20. Gear housing |
|---|--|



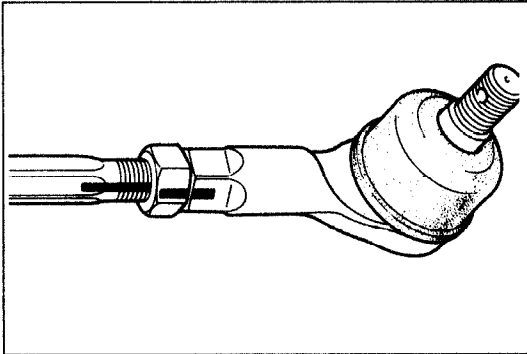
93G0NX-007

Disassembly note
Steering gear and linkage

1. Secure the mounting part of the removed gear and linkage in a vise.

Caution

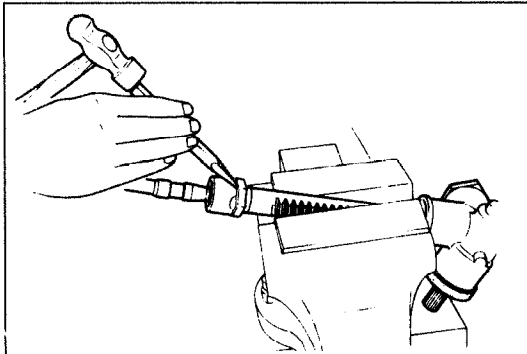
- **Be sure to insert a soft, protective material between the part and the jaws of the vise.**



23U0NX-018

Tie rod end

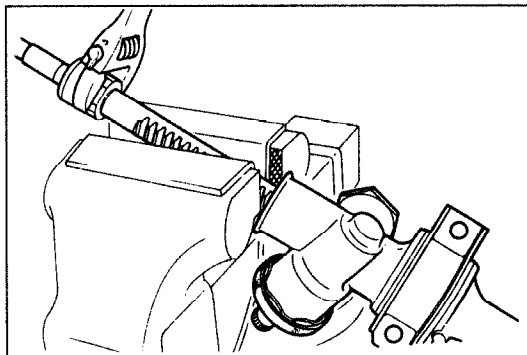
1. Make a matching mark on the tie rod threads for proper reassembly.



23U0NX-019

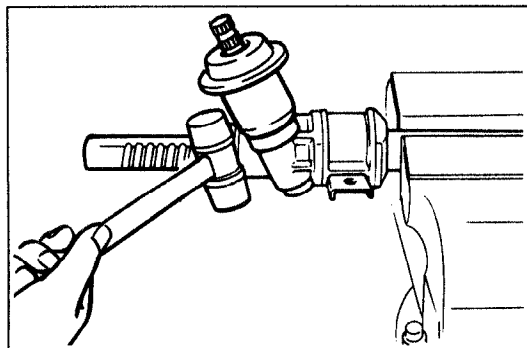
Tie rod

1. Uncrimp the locking washer.



63U10X-089

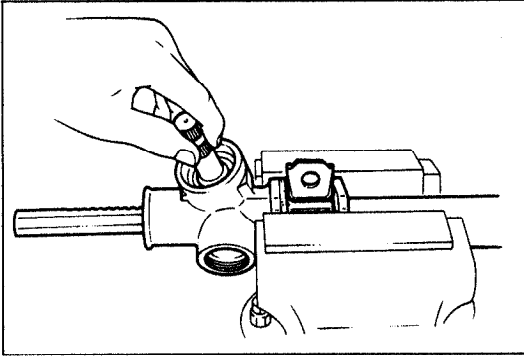
2. After wrapping the rack in a rag and securing it in a vise, remove the tie rod from the rack.



93G0NX-067

Pinion protector

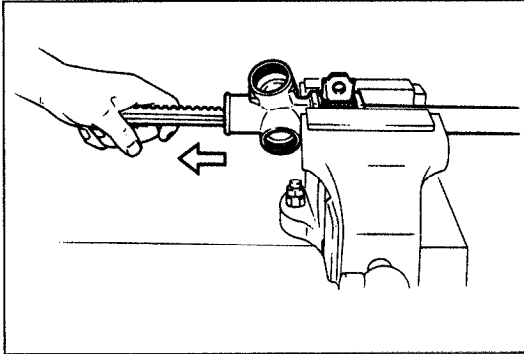
1. Hit the rim of pinion protector with a plastic hammer gently from under to remove it.



93G0NX-009

Pinion

1. Gently grasp the serrated part of the pinion, and pull it out.



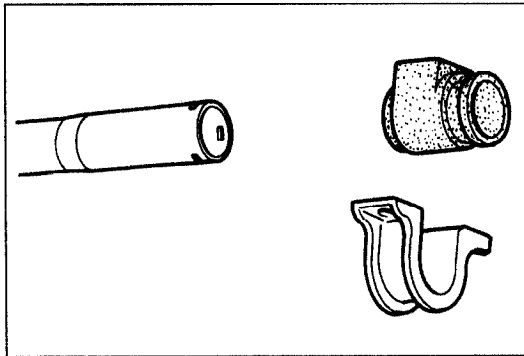
63U10X-093

Rack

1. Remove the rack by taking it out in the direction indicated by the arrow.

Caution

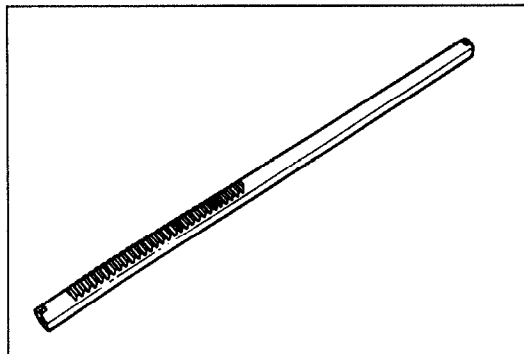
- If the rack is taken out in the opposite direction, the inside surface of the rack bushing might be damaged by the edge of the rack gear.



23U0NX-052

Mounting bracket and rubber

1. Remove the mounting bracket and rubber from the housing.

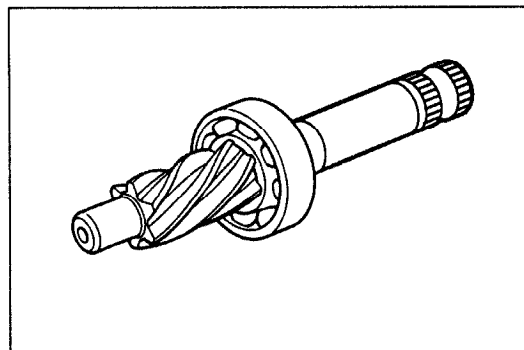


13U0KX-013

Inspection

Check the following points, replace the part if a problem is found.

1. Cracking, damage, or deterioration of boots
2. Cracking, worn teeth, or damage to rack and pinion
3. Looseness, abnormal noise, or poor bearing operation inside the gear housing

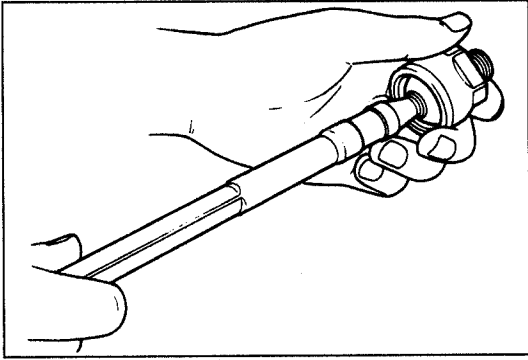


93G0NX-011

4. Worn rack bushing inside the gear housing. Wear, normal noise, or rough movement of the bearing on the pinion shaft.

Caution

- If replacement is necessary, replace the entire gear housing assembly.
- Abnormal noise or rough movement of the bearing.
- If replacement is necessary, replace the entire pinion and bearing assembly.

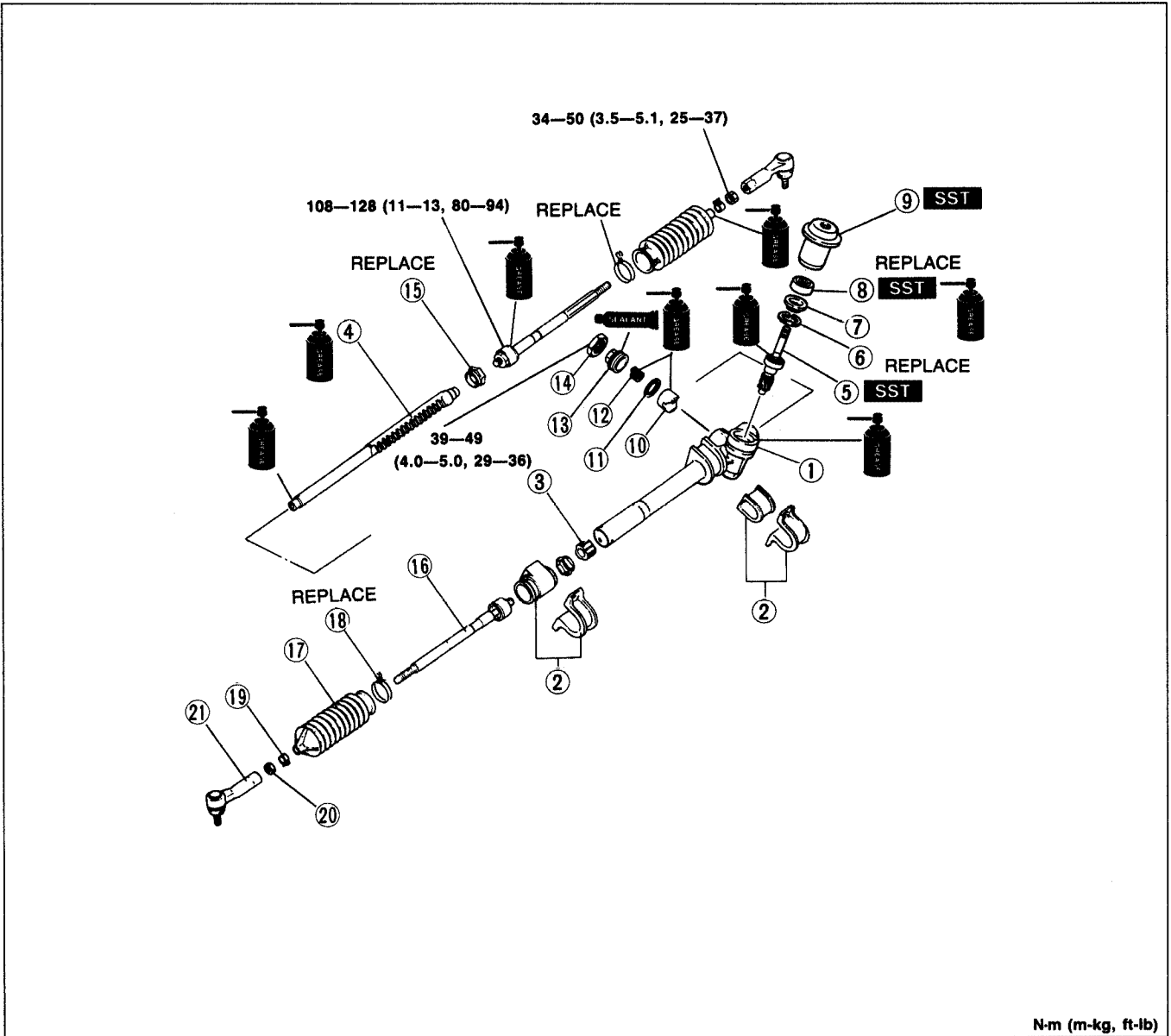


23U0NX-020

5. Wear of sliding surface of pressure pad which contacts rack
6. Cracking or deformation of gear housing
7. Looseness or lack of smoothness in tie rod ball-joint operation
8. Bent tie rod or tie rod ends
9. Damage to tie rod or tie rod end

Assembly

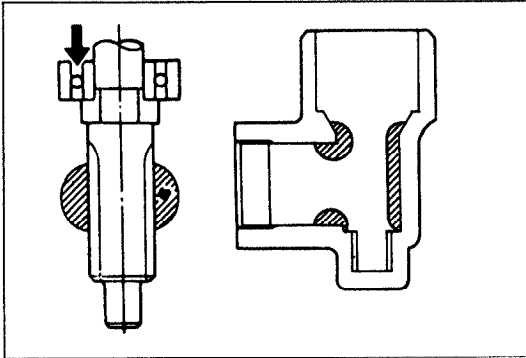
Assemble in the order shown in the figure, referring to **Assembly Note**.



N-m (m-kg, ft-lb)

23U0NX-021

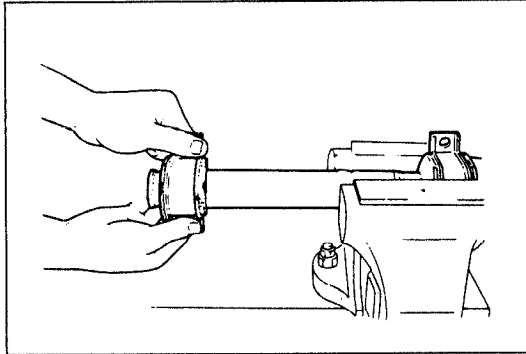
- | | |
|---|--|
| <p>1. Gear housing
Assembly Note..... page N-20</p> <p>2. Mounting bracket and rubber
Assembly Note..... page N-20</p> <p>3. Bushing</p> <p>4. Rack
Assembly Note..... page N-20</p> <p>5. Pinion gear
Assembly Note..... page N-20</p> <p>6. Snap ring
Assembly Note..... page N-20</p> <p>7. Snap ring cap</p> <p>8. Oil seal
Assembly Note..... page N-20</p> <p>9. Pinion protector
Assembly Note..... page N-21</p> <p>10. Pressure pad
Assembly Note..... page N-21</p> | <p>11. Pressure pad plate</p> <p>12. Spring</p> <p>13. Adjusting cover
Assembly Note..... page N-21</p> <p>14. Locknut
Assembly Note..... page N-21</p> <p>15. Washer
Assembly Note..... page N-22</p> <p>16. Tie rod
Assembly Note..... page N-21</p> <p>17. Boot
Assembly Note..... page N-22</p> <p>18. Boot wire</p> <p>19. Boot clip</p> <p>20. Locknut</p> <p>21. Tie rod end
Assembly Note..... page N-22</p> |
|---|--|



93G0NX-013

Assembly note**Pinion gear and gear housing**

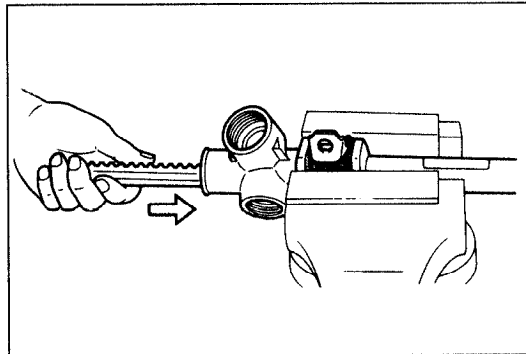
1. Fill or coat with grease.
Before assembly, coat (of fill) the following parts with grease (lithium base, NLGI No.2).
 - (1) Pinion bearing and teeth
 - (2) Inside the gear housing



23U0NX-053

Mounting bracket and rubber

1. Push the mounting rubber on until it just contacts the end of the housing.



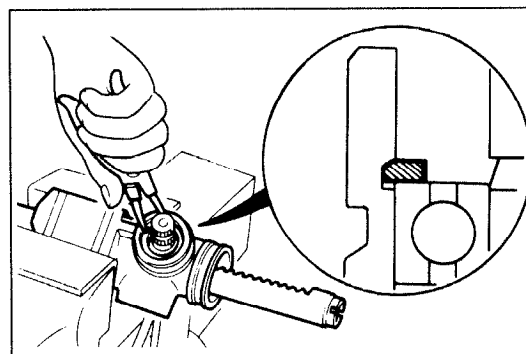
93G0NX-015

Rack

1. Carefully install the rack in the direction of the arrow.

Caution

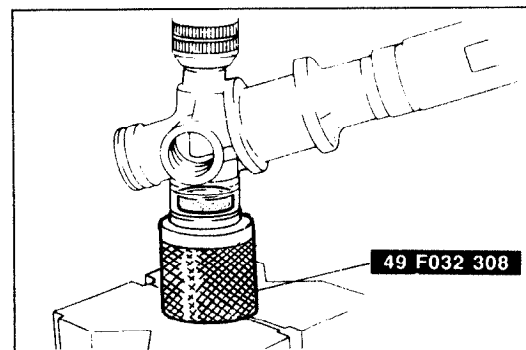
- If the rack is installed from the opposite direction, the inner surface of the rack bushing might be damaged by the edge of the rack gear.



23U0NX-022

Snap ring

1. Install the new snap ring with facing the chamfer side of the snap ring upward.



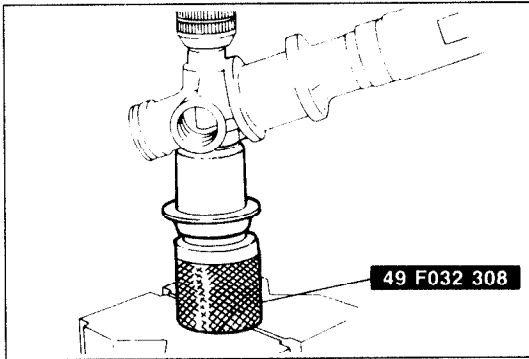
23U0NX-023

Oil seal

1. Press the new oil seal with the **SST** as shown in the figure.

Note

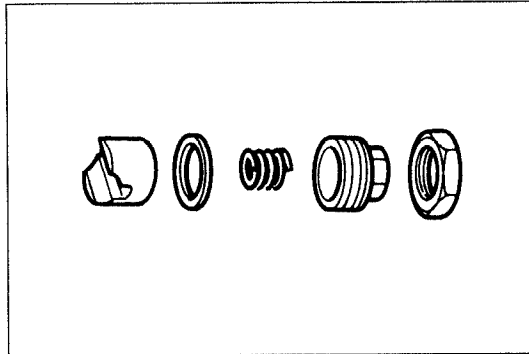
- Before installing, apply a coating of general purpose grease to the oil seal.



93G0NX-018

Pinion protector

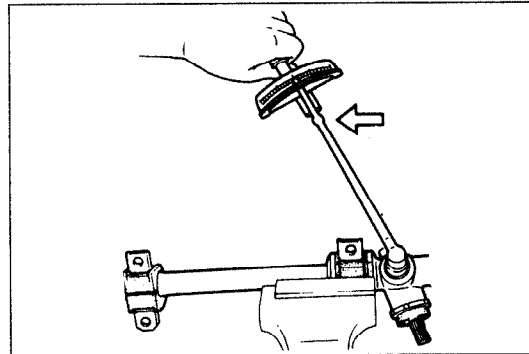
1. Press the pinion protector onto the gear housing with the **SST** as shown in the figure.



23U0NX-024

Pressure pad and adjustment cover

1. Install so that the pressure pad correctly contacts the rack.
2. Apply a coat of sealant to the threads of the adjusting cover.



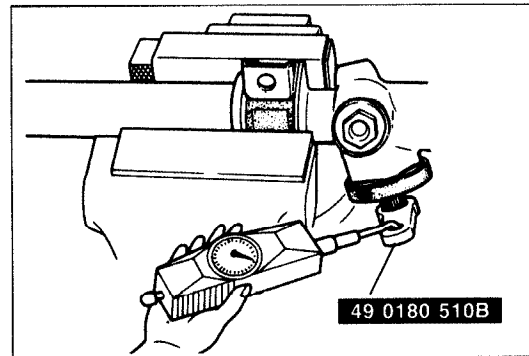
23U0NX-025

Adjusting cover and locknut

1. Apply sealant to the adjusting cover.
2. After tightening the adjusting cover to a torque of **4.4—6.4 N·m (45—65 cm·kg, 39—56 ft·lb)**, loosen it about **5°—35°** from that position. Add then tighten the locknut securely.

Locknut tightening torque:

39—49 N·m (4.0—5.0 m·kg, 29—36 ft·lb)



23U0NX-026

2. Measure the pinion torque with the **SST**.

Pinion torque: Neutral position ± 90°

0.9—1.3 N·m (9—13 cm·kg, 7.8—11.3 in·lb)

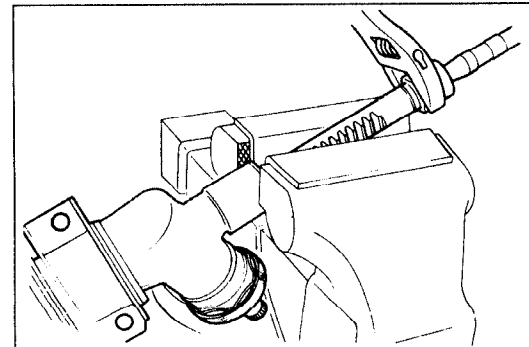
[Pull scale reading: 900—1,300 g, 31.8—45.9 oz]

Any other position

1.5 N·m or less (15 cm·kg, 13 in·lb or less)

[Pull scale reading:

1,500 g or less (52.95 oz or less)]



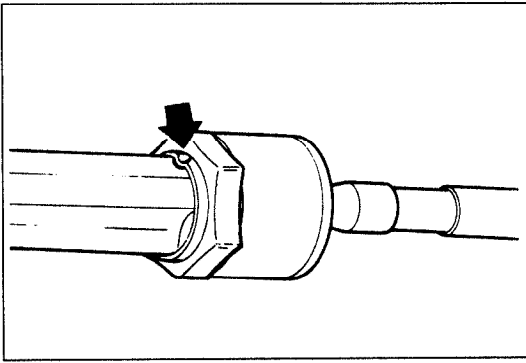
23U0NX-027

Tie rod

1. Attach new washers to the left and right tie rods, and then screw them onto the rack.
2. Using a wrench, tighten the left and right tie rod to the specified torque.

Tightening torque:

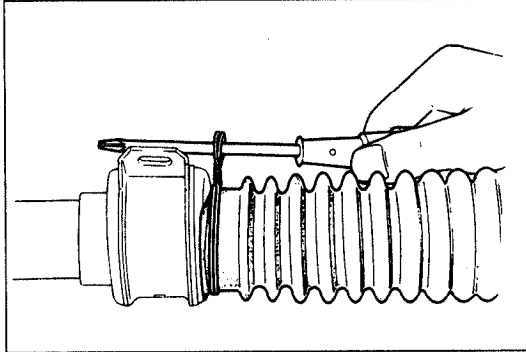
108—128 N·m (11—13 m·kg, 80—94 ft·lb)



93G0NX-071

Washer

1. Align the washer with the rack groove, and then crimp the washer.



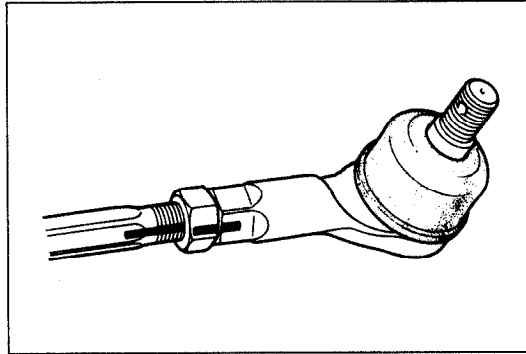
23U0NX-029

Boot

1. Install the boot and then wrap a new wire two times around it and twist it 4 or 4.5 times.

Caution

- Be sure that the boot is not twisted or dented.




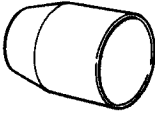


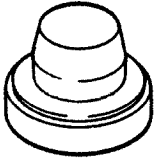
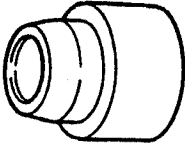
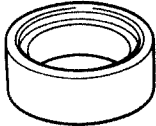
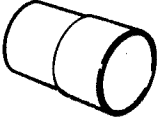

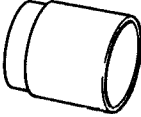
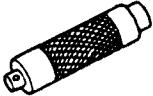

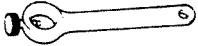

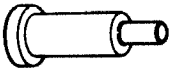
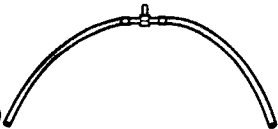
23U0NX-030



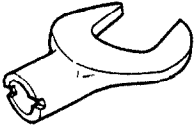

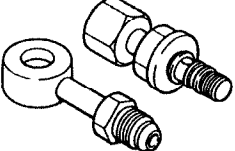
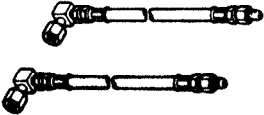
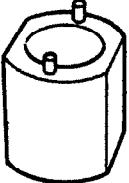

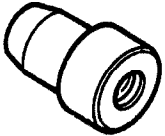
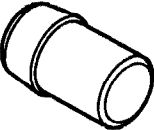
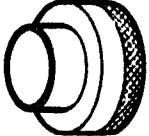
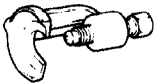
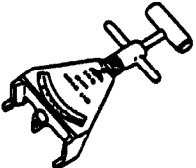
Tie rod end

1. Install the tie rod ends and align them with the marks made before disassembly.

ENGINE SPEED SENSING POWER STEERING

PREPARATION
SST

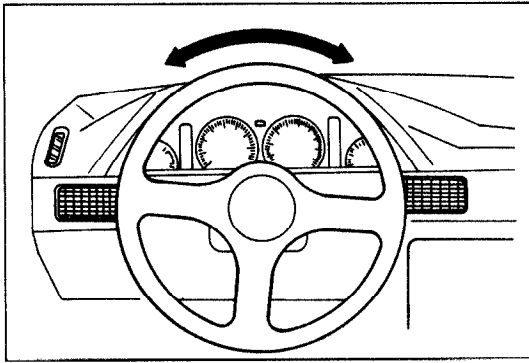
49 B032 306 Wrench, plug		For removal and installation of plug	49 B032 312 Protector, slipper seal		For installation of seal ring
49 B032 314 Slipper seal former		For form of seal ring	49 F032 303 Handle		For removal of oil seal
49 B032 315 Installer, oil seal		For installation of oil seal	49 B032 309 Installer body, pinion seal		For installation of oil seal
49 B032 316 Support block, plug		For removal of oil seal & bearing	49 B032 310 Protector, pinion seal		For installation of oil seal
49 B032 317 Remover, bearing & oil seal		For removal of oil seal & bearing	49 B032 311 Protector, slipper seal		For installation of pinion shaft
49 G030 797 Handle		For installation of pinion seal	49 B032 320 Wrench		For removal and installation of adjustment cover locknut
49 0180 510B Attachment, preload		For measurement of pinion torque	49 B032 321 Adapter		For hermetic inspection
49 B032 305 Holder, power steering pump		For installation of oil pump	49 G032 317 Hose (Part of 49 B032 3A1)		For hermetic inspection

<p>49 1232 670A</p> <p>Gauge set, power steering</p> 	<p>For measurement of fluid pressure</p>	<p>49 1232 673</p> <p>Valve body (Part of 49 1232 670A)</p> 	<p>For measurement of fluid pressure</p>
<p>49 H032 301</p> <p>Wrench</p> 	<p>For removal of tie-rod</p>	<p>49 1232 672</p> <p>Gauge (Part of 49 1232 670A)</p> 	<p>For measurement of fluid pressure</p>
<p>49 B032 304</p> <p>Adapter</p> 	<p>For measurement of fluid pressure</p>	<p>49 H002 671</p> <p>Adapter</p> 	<p>For measurement of fluid pressure</p>
<p>49 B032 307</p> <p>Wrench, outer box</p> 	<p>For removal and installation of outer box</p>	<p>49 B032 313</p> <p>Protector, outer box</p> 	<p>For installation of outer box</p>
<p>49 B032 308</p> <p>Remover body, rod seal</p> 	<p>For removal of oil seal</p>	<p>49 B032 318</p> <p>Guide, rod seal</p> 	<p>For installation of inner guide & oil seal</p>
<p>49 B032 319</p> <p>Protector body, rod seal</p> 	<p>For installation of inner guide & oil seal</p>	<p>49 0118 850C</p> <p>Puller, ball joint</p> 	<p>For removal of tie rods end</p>
<p>49 9200 020</p> <p>Tension gauge, V-ribbed belt</p> 	<p>For measurement of drive belt tension</p>	<p style="text-align: right;">23U0NX-031</p>	

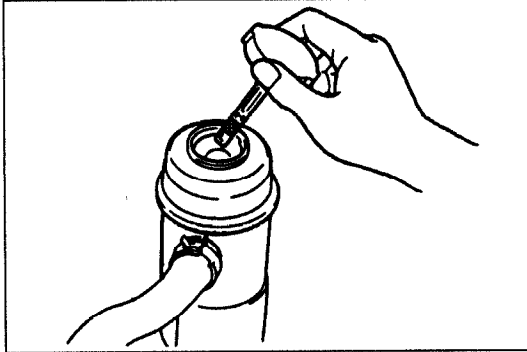
TROUBLESHOOTING GUIDE

Problem	Possible cause	Action	Page
Steering feels heavy	Poor lubrication, foreign material in mechanism, stuck or abnormal wear of steering ball joint	Lubricate or replace	N- 6
	Improper steering pinion preload	Adjust	—
	Damaged steering gear	Repair or replace	N-30, 31
	Malfunction of steering shaft joint	Replace	N-10
	Malfunction of steering gear	Replace gear assembly	—
	Leakage of fluid	Repair or replace	N-27
	Low fluid level or air in system	Add fluid or bleed air	N-26, 27
	Malfunction of P/S oil pump	Replace	N-37
	Damaged or loose P/S oil pump drive belt	Adjust or replace	N-41
	Clogged lines	Repair or replace	—
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
	Steering wheel pulls to one side	Damaged steering linkage	Replace
Damaged wheel or tire		—	Section Q
Malfunction of braking system		—	Section P
Malfunction of suspension		—	Section R
General instability	Worn or damaged steering ball joint	Replace	N- 6
	Improper steering pinion preload	Adjust	—
	Damaged steering linkage	Replace	N-13
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Steering feels unstable	Loose P/S oil pump drive belt	Adjust or replace	N-41
	Malfunction of steering gear	Repair or replace	N-30, 31
	Malfunction of steering ball joint	Replace	N- 6
	Malfunction of steering linkage	Replace	N-13
Excessive steering wheel play	Worn steering gear	Replace gear assembly	—
	Worn or damaged steering ball joint	Replace	N- 6
	Loose steering gear mounting bolts	Tighten	—
Steering wheel doesn't return properly	Stuck or damaged steering ball joint	Replace	N- 6
	Improper steering pinion preload	Replace gear assembly	—
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Shimmy (Steering wheel vibrates left/right)	Damaged steering linkage	Replace	N-13
	Loose steering gear mounting bolts	Tighten	—
	Stuck or damaged steering ball joint	Replace	N- 6
	Damaged or worn front wheel bearing	Replace	Section M
	Damaged wheel or tire	—	Section Q
	Malfunction of suspension	—	Section R
Abnormal noise from steering system	Loose steering gear mounting bolts	Tighten	—
	Malfunction of steering gear	Replace gear assembly	—
	Obstruction near steering column	Repair	—
	Loose steering linkage	Tighten	N-13
	Worn or damaged steering ball joint	Replace	N- 6
	Loose or damaged P/S oil pump drive belt	Adjust or replace	N-41
	Loose P/S oil pump bracket	Tighten	N-38
	Loose P/S oil pump mounting bolts	Tighten	N-37
	Air in system	Bleed air	N-26
	Malfunction of P/S oil pump	Replace	N-38

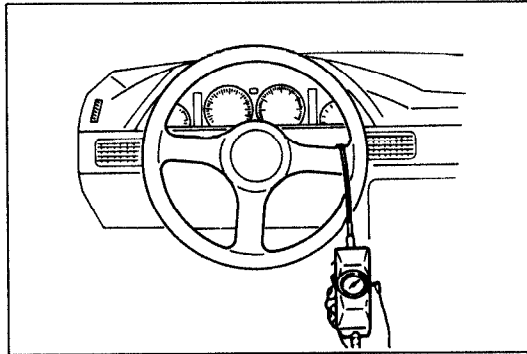
23U0NX-032



23U0NX-033



03U0NX-031



03U0NX-032

AIR BLEEDING

Caution

- Do not start the engine.
- Jack up the front of the vehicle.

1. Check the fluid level. (Refer to page N-27.)
2. Turn the steering wheel fully to the left and right several times with the engine not running.
3. Recheck the fluid level. If the level has lowered, add fluid.
4. Repeat steps 2 and 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. Check that the fluid is not foamy and that the fluid level has not dropped.
8. Add fluid if necessary and repeat steps 6 and 7.

STEERING WHEEL AND COLUMN

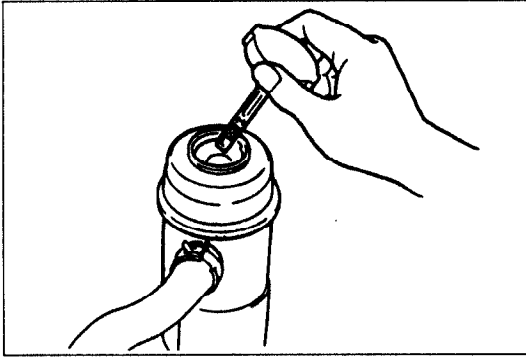
Inspection (On-vehicle)

Steering wheel effort

1. With the vehicle on a hard, level surface, put the wheels in the straight-ahead position.
2. Start the engine and warm the power steering fluid to **50—60°C (122—140°F)** by turning the steering: wheel fully left and right several times.
3. With the engine running at idle speed, attach a pull scale to the outermost point of the steering wheel spoke. Then, starting with the wheels in the straight-ahead position, check the steering effort required to turn the steering wheel to the left and to the right.
4. If the measured effort exceeds specification, check the following: fluid level, air in system, fluid leakage at hose or connections, function of P/S oil pump and gearbox, and tire pressures.

Steering wheel effort: 29 N (3.0 kg, 6.6 lb) or less

03U0NX-033



03U0NX-034

POWER STEERING FLUID**On-vehicle Inspection**
Inspection of fluid level**Caution**

- **Add only the specified power steering fluid.**

1. Verify that the fluid level is between the H and L marks.
2. Add or remove fluid if not within specification.

Inspection of fluid leakage

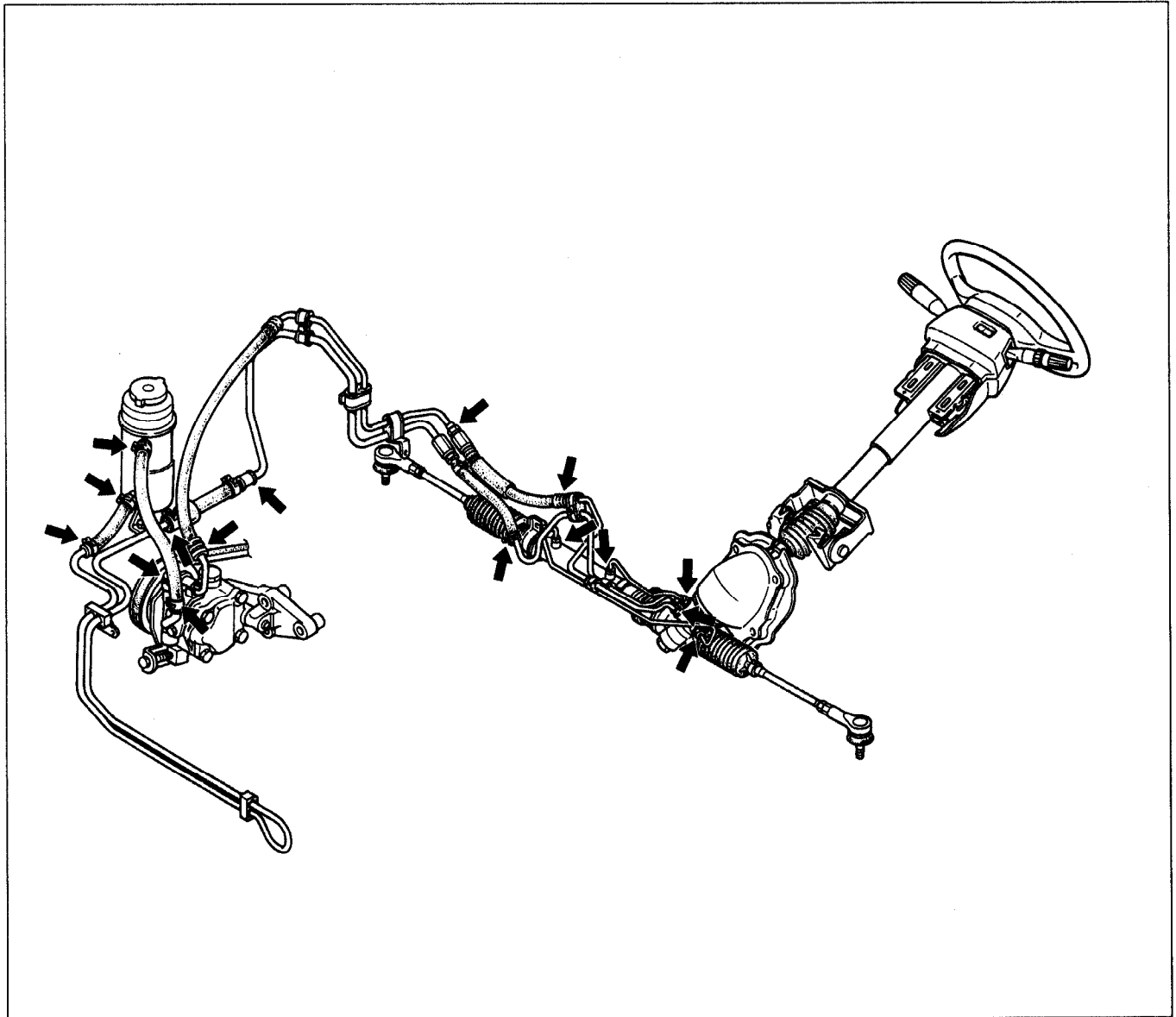
Start the engine. Turn the steering wheel fully left and right to apply fluid pressure; then check for fluid leakage.

Caution

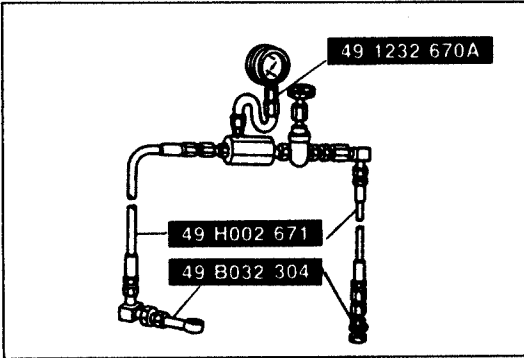
- **To prevent damage, do not keep the steering wheel in the fully turned position for more than 15 seconds.**

Note

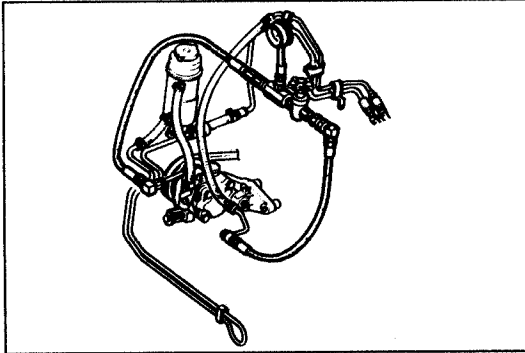
- **The points where fluid leakage may occur are indicated by the arrows in the figure.**



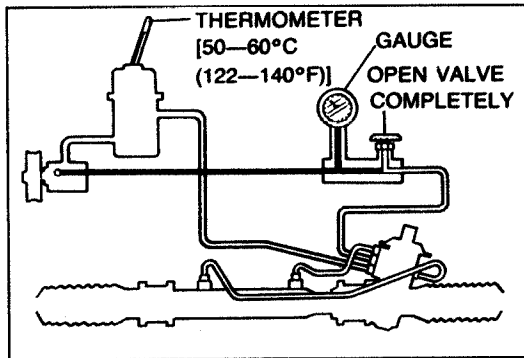
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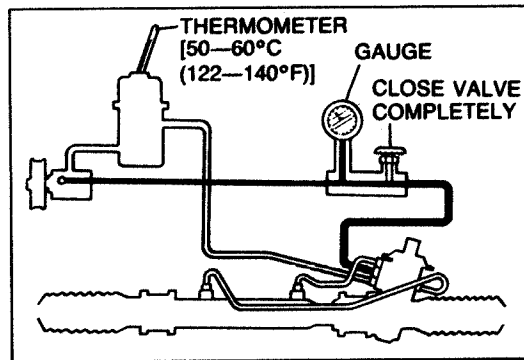
03U0NX-036



23U0NX-034



23U0NX-035



23U0NX-036

Inspection of fluid pressure

1. Assemble the SST as shown in the figure.

Tightening torque:

39—49 N·m (4.0—5.0 m·kg, 29—36 ft·lb)

2. Disconnect the pressure hose on the oil pump side, and attach the SST.

Note

- Before disconnecting the hose, make marks at the connections for proper reinstallation.

3. Bleed the air from the system. (Refer to page N-26.)
4. Open the gauge valve fully. Start the engine and turn the steering wheel fully left and right to raise the fluid temperature to 50—60°C (122—140°F).

5. Close the gauge valve completely. Increase the engine speed to 1,000—1,500 rpm and measure the fluid pressure generated by the oil pump. If the pressure is below specification, replace the oil pump assembly.

Oil pump fluid pressure:

7,358 kPa (75 kg/cm², 1,067 psi)

Caution

- If the valve is left closed for more than 15 seconds, the fluid temperature will increase excessively and adversely affect the oil pump.

6. Open the gauge valve fully again and increase the engine speed to 1,000—1,500 rpm.

7. Turn the steering wheel fully to the left and right and measure the fluid pressure generated by the gear housing. If the pressure is below specification, replace the gear housing assembly.

Gear housing fluid pressure:

7,358 kPa (75 kg/cm², 1,067 psi)

Caution

- If the steering wheel is kept in the fully turned position for more than 15 seconds, the fluid temperature will rise excessively.

8. Remove the gauge set. Install and tighten the pressure hose to the specified torque.

Tightening torque:**16—24 N·m (1.6—2.4 m·kg, 12—17 ft·lb)**

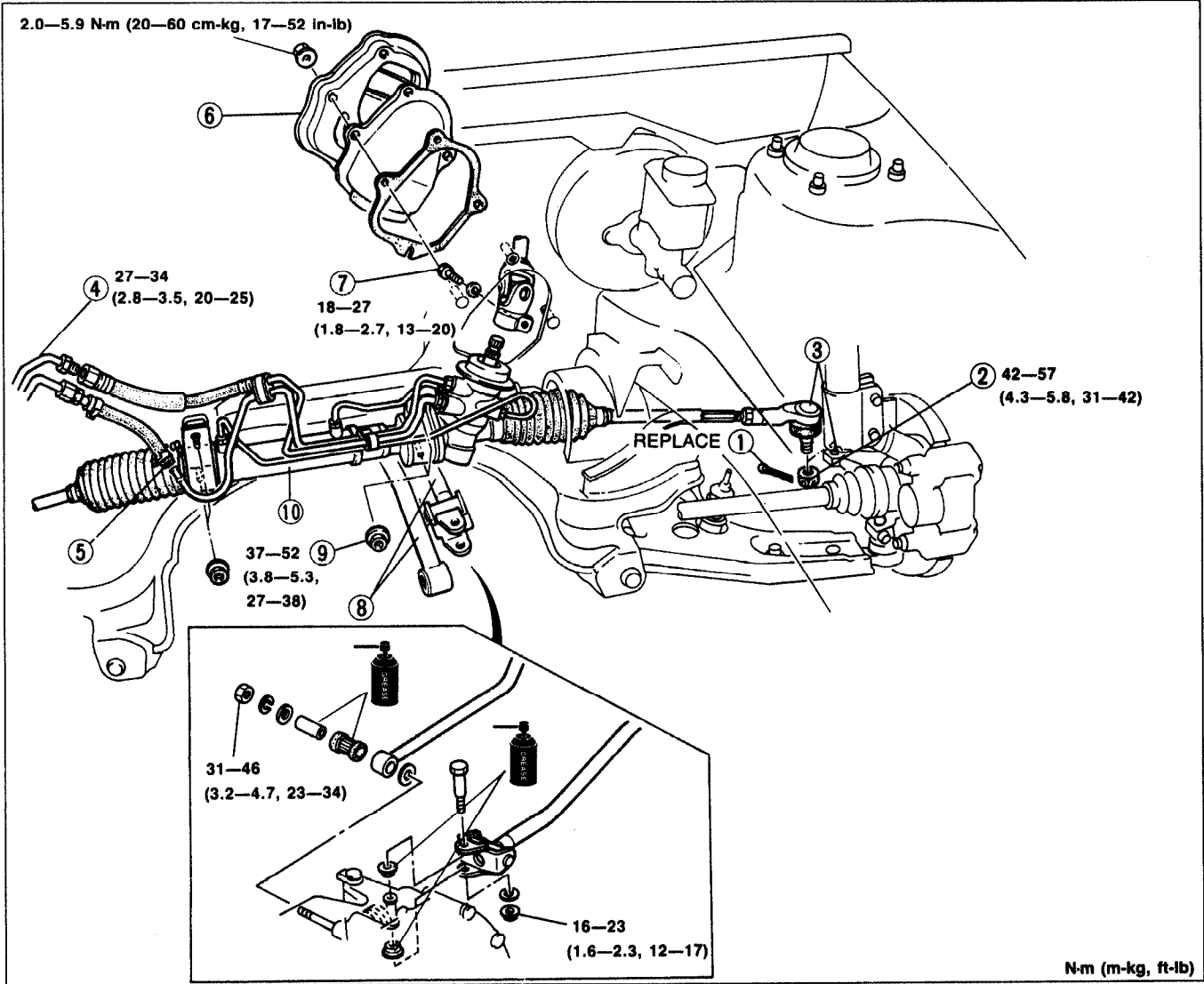
9. Bleed the air from the system. (Refer to page N-26.)

23U0NX-037

STEERING GEAR AND LINKAGE

Removal / Installation

1. Loosen the wheel lug nuts.
2. Jack up the front of the vehicle and support it with safety stands.
3. Remove the wheels.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. After installation, bleed air from the steering system and adjust the toe-in if necessary. (Refer to Section R.)



23U0NX-038

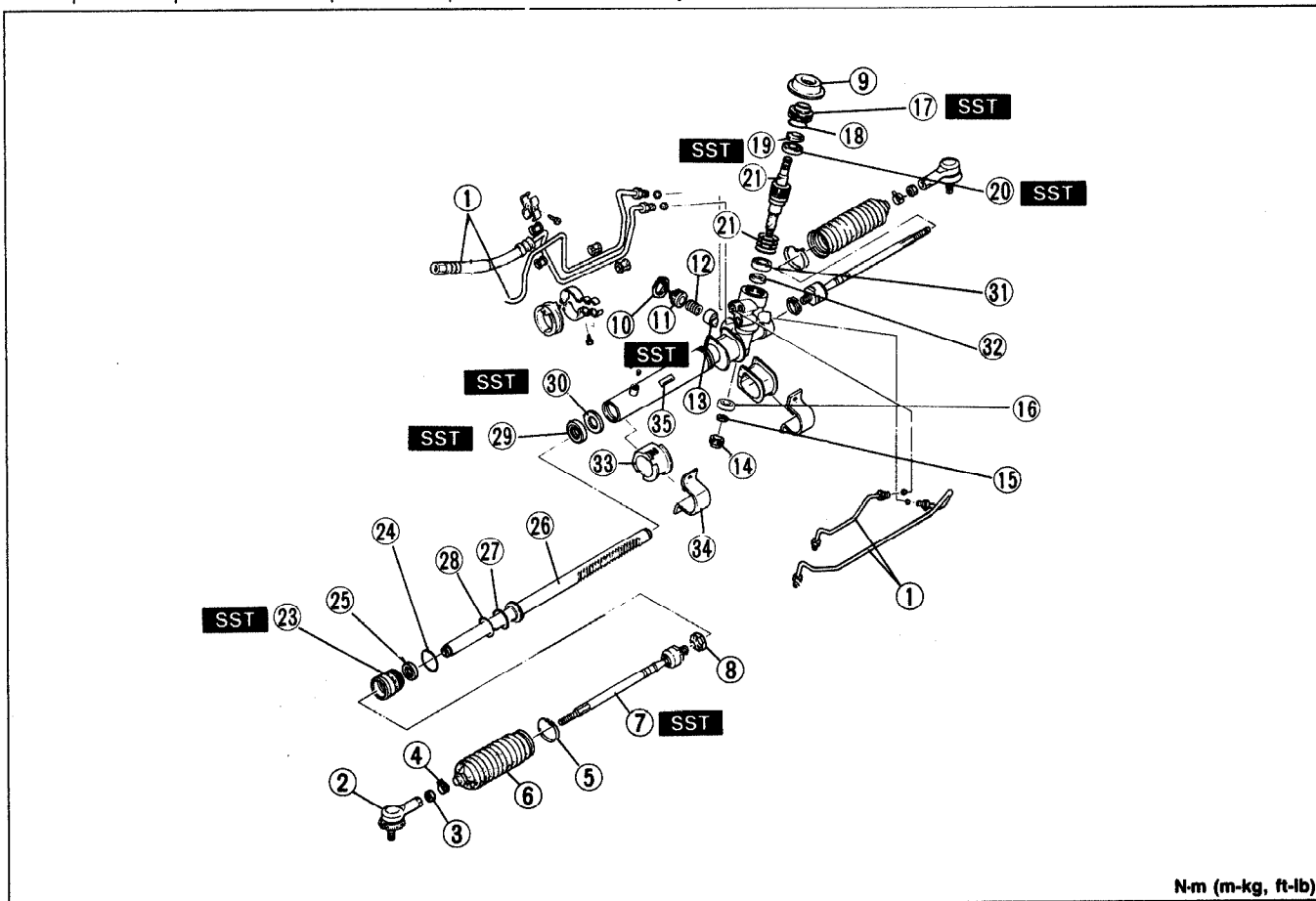
Note

- Use a container or rags to collect the power steering fluid when disconnecting the pressure pipe and return hose.
- Lower the steering brackets and steering gear and linkage as an assembly; then separate the steering gear and linkage.

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Cotter pin 2. Nut 3. Tie rod end/Steering knuckle
Removal note page N- 6 4. Pressure pipe 5. Return hose 6. Set plate 7. Fixing bolt (intermediate shaft/pinion shaft)
Installation note page N-14 | <ol style="list-style-type: none"> 8. Extension bar/Control rod (MTX) 9. Nut (Steering gear mounting bolt)
Installation note page N-14 10. Steering gear and linkage
Removal note page N-14
Disassembly / Inspection page N-31
Assembly page N-34 |
|---|--|

Disassembly / Inspection

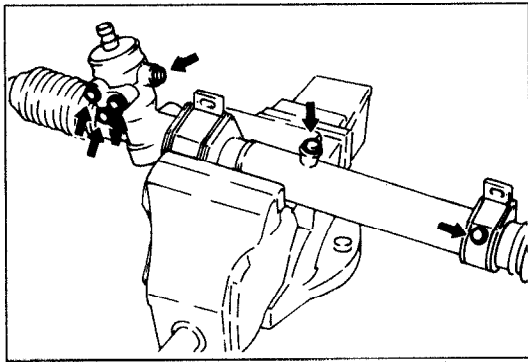
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.



N-m (m-kg, ft-lb)

23UONX-039

- | | |
|--|--|
| <p>1. Oil pipe
Disassembly Note page N-32</p> <p>2. Tie rod end</p> <p>3. Locknut</p> <p>4. Boot clip</p> <p>5. Boot wire</p> <p>6. Boot</p> <p>7. Tie rod
Disassembly Note page N-32
Inspection for damage
Inspect operation of ball joint</p> <p>8. Washer</p> <p>9. Cover</p> <p>10. Locknut
Disassembly Note page N-32</p> <p>11. Adjusting cover</p> <p>12. Spring</p> <p>13. Pressure pad</p> <p>14. Housing cover
Disassembly Note page N-32</p> <p>15. Locknut</p> <p>16. Bearing</p> <p>17. Plug
Disassembly Note page N-32
Inspection..... page N-33</p> <p>18. O-ring</p> | <p>19. Oil seal
Disassembly Note page N-33</p> <p>20. Bearing
Disassembly Note page N-33</p> <p>21. Pinion shaft assembly
Inspect for damage and wear</p> <p>22. Seal ring</p> <p>23. Outer box assembly
Disassembly note..... page N-33</p> <p>24. O-ring</p> <p>25. U-gasket</p> <p>26. Steering rack
Inspection..... page N-33</p> <p>27. Seal ring</p> <p>28. O-ring</p> <p>29. Oil seal
Disassembly Note page N-33</p> <p>30. Inner guide
Disassembly Note page N-33</p> <p>31. Bearing</p> <p>32. Oil seal</p> <p>33. Mounting rubber</p> <p>34. Mounting bracket</p> <p>35. Gear housing
Inspect for damage and crack</p> |
|--|--|

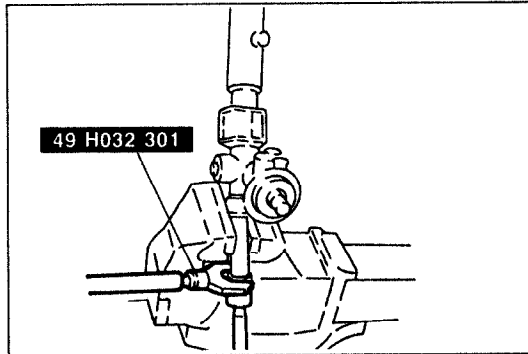


93G0NX-026

Disassembly note Oil pipe

Caution

- After disconnecting the pipes, use a plug or adhesive type tape to seal each port to prevent the entry of foreign materials.



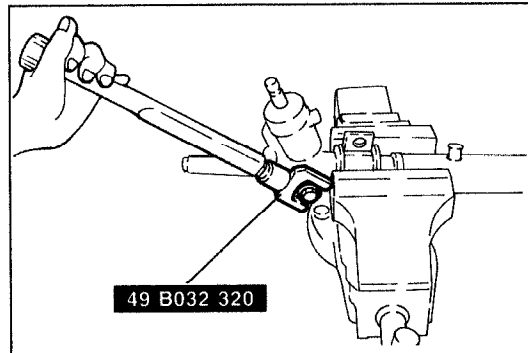
23U0NX-054

Tie rod

1. Use the **SST** to remove the tie rod.

Caution

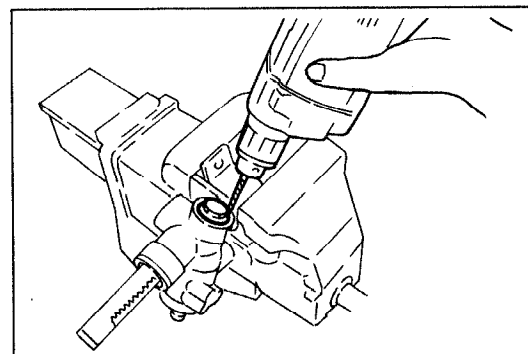
- To avoid scratching the rack, secure the rack in a vise protected with brass pads or cloth.



93G0NX-028

Locknut

1. Use the **SST** to remove the locknut.



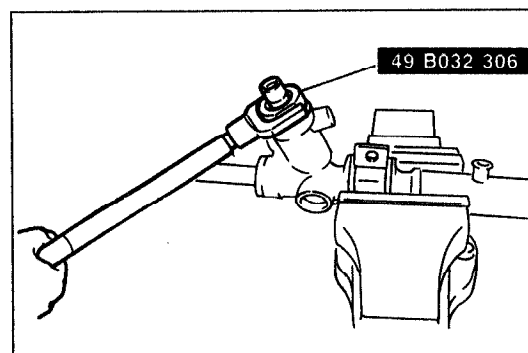
93G0NX-029

Housing cover

1. Use a drill ($\phi 1.5\text{mm}$ (0.06 in)) to make a recessed area (approx. 1.5mm (0.06 in)) at the punch-crimped part of the threaded part.

Caution

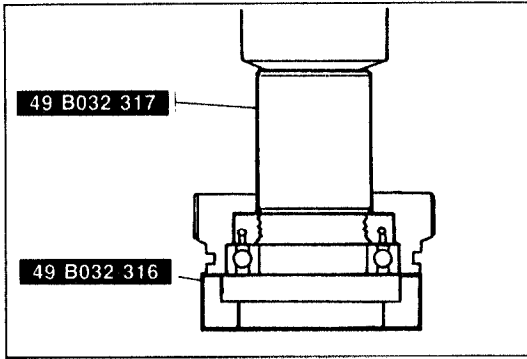
- If the drill diameter and/or the depth of the recess are excessive, the threads will be too loose when the plug is reused.



93G0NX-030

Plug

1. Use the **SST** to remove the plug.



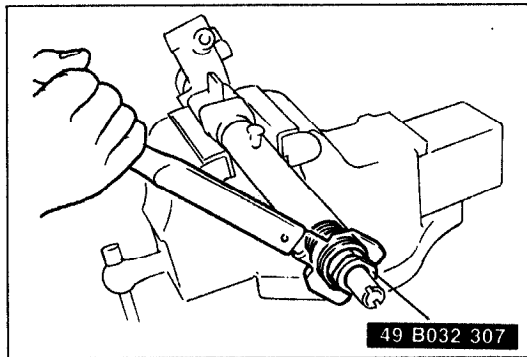
93G0NX-031

Oil seal and bearing

1. Use the **SST** to remove the bearing and the oil seal from the plug.

Caution

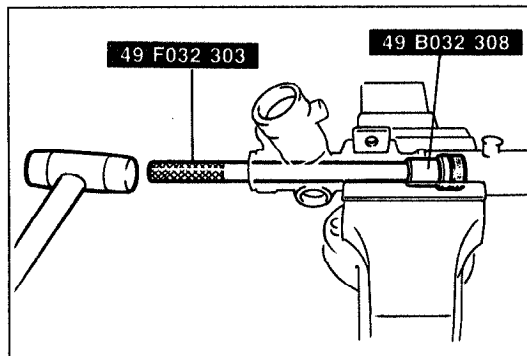
- The oil seal can not be reused.



93G0NX-032

Outer box assembly

1. Use the **SST** to remove the outer box.



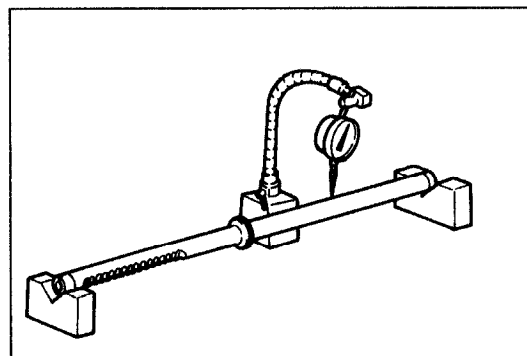
93G0NX-033

Oil seal and inner guide

1. Use the **SST** to remove the oil seal and inner guide toward the cylinder side.

Caution

- The oil seal can not be reused.



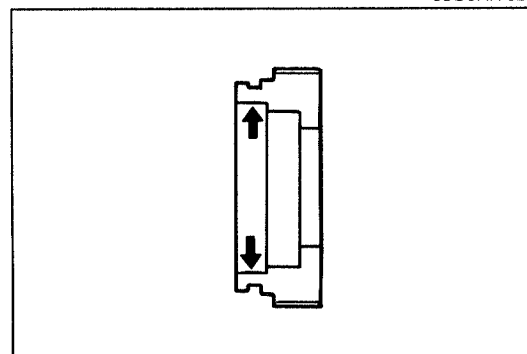
03U0NX-822

Inspection

Steering rack

1. Check the rack for cracking or other damage or for abnormal wear of the teeth; replace it if necessary.
2. Check the seal ring installation part of the rack for abnormal wear or damage; replace it if necessary.
3. Use V blocks to support both ends of the large-diameter part of the rack; check for excessive bending; replace it if necessary.

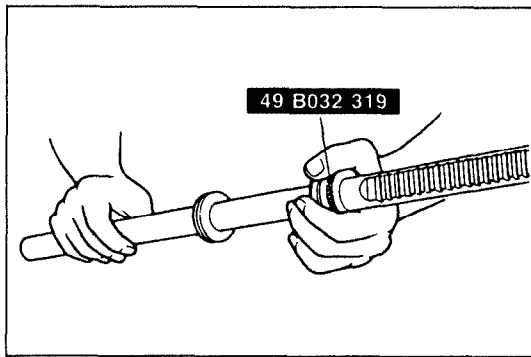
Bending limit: 0.15mm (0.006 in) (near rack center)



93G0NX-036

Plug

1. Check for scratches or other damage at the oil seal installation inner diameter; replace it if necessary.



23U0NX-055

Assembly

1. Mounting bracket and mounting rubber (gear housing side)

- (1) Install the mounting bracket and mounting rubber (gear housing side) to the gear box.

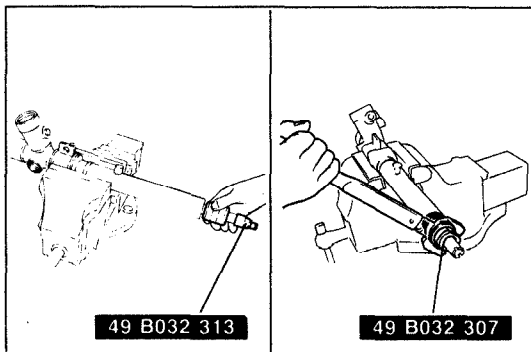
2. Steering rack

- (1) Install a new O-ring and new seal ring to the rack's piston.
- (2) After installing the seal ring, seat it properly at the piston circumference.
- (3) Install the oil seal and inner guide to the **SST**.
- (4) Using the **SST**, place the oil seal and inner guide at the edge of the steering rack's pinion.
- (5) After mounting the steering rack to the gear box, use a press to install the oil seal and inner guide to the correct position.

Caution

- When pressing in, do not apply a load pressure of more than 29,430 kPa (300 kg/cm², 4,266 psi), because to do so will damage the oil seal and inner guide.
- Apply grease to the seal ring, O-ring oil seal and inner guide.

23U0NX-056



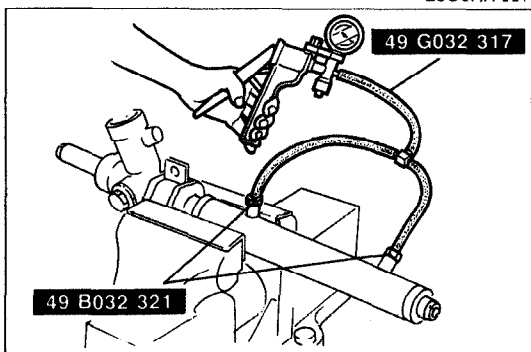
23U0NX-057

3. Outer box assembly

- (1) Install a new U-gasket and O-ring to the outer box.
- (2) After installing the **SST** to the rack, install the outer box, and use the **SST** to tighten.

Tightening torque:

39—49 N·m (4—5 m·kg, 29—36 ft·lb)



23U0NX-058

4. Cylinder air-tightness check

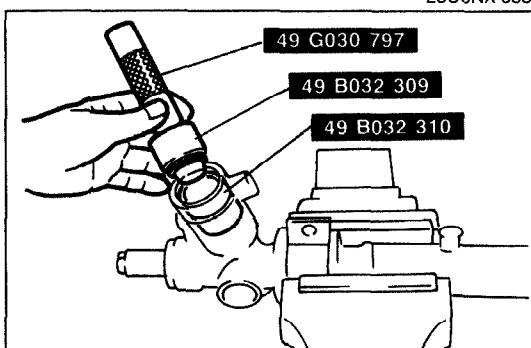
- (1) Install the **SST** to the cylinder part of the gear housing.
- (2) Using a vacuum pump, apply a vacuum of 400 mmHg and check to be sure that the vacuum is maintained for 30 seconds.
- (3) If there is any leakage, replace the oil seal.

5. Oil seal

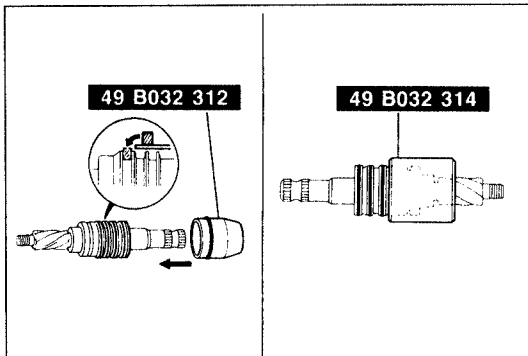
- (1) Use the **SST** to install a new oil seal to the gear housing.

Note

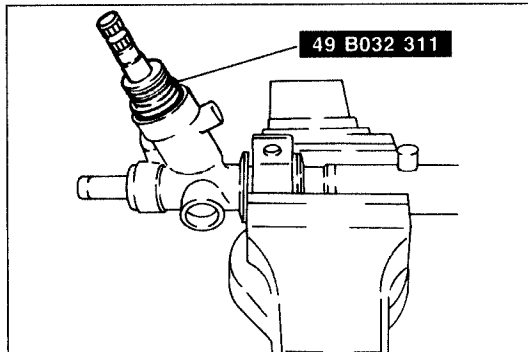
- Apply grease to the oil seal.



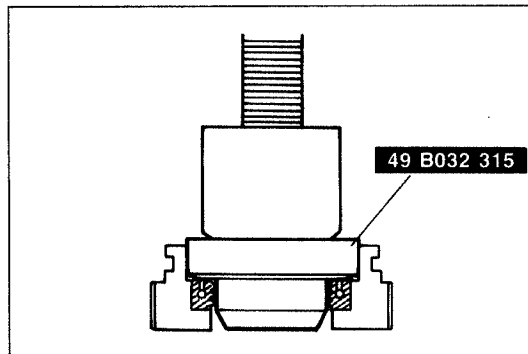
23U0NX-059



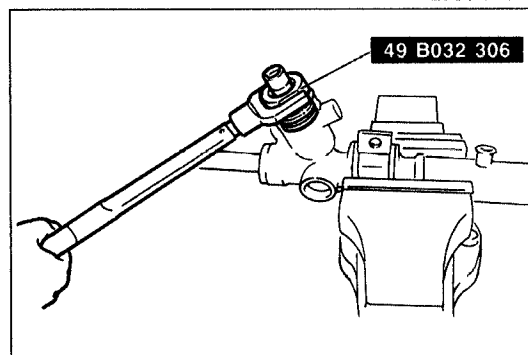
23U0NX-060



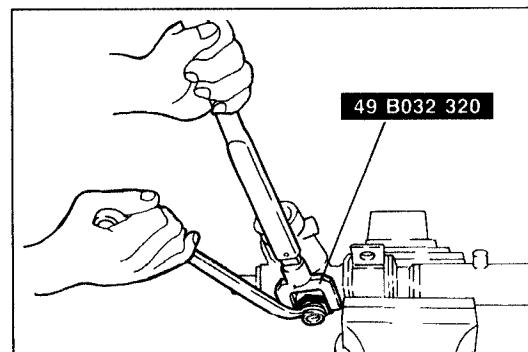
23U0NX-061



23U0NX-040



23U0NX-041



23U0NX-062

6. Pinion shaft assembly

- (1) Use the **SST** to install new seal rings to the valve part of the pinion shaft.
- (2) After installing them, use the **SST** to seat it properly.
- (3) Install the bearing to the pinion shaft.

Caution

- Apply grease to the bearing.

- (4) Use the **SST** to install the pinion shaft assembly to the gear housing.
- (5) Install the locknut.

Tightening torque:

39—49 N·m (4—5 m·kg, 29—36 ft·lb)

- (6) Install the bearing, the housing cover and stake it.

Tightening torque:

39—49 N·m (4—5 m·kg, 29—36 ft·lb)

Caution

- Apply sealant to the housing cover.
- Apply grease to the bearing.

7. Plug, Bearing, Oil seal, O-ring

- (1) Use the **SST** to press in a new oil seal.
- (2) Press in by placing the flat plate against the bearing.

Caution

- Apply grease to the oil seal and bearing.

- (3) Install the new O-ring.

Caution

- Apply grease to the O-ring.

- (4) Use the **SST** to tighten the plug to the gear housing.

Tightening torque:

29—39 N·m (3—4 m·kg, 22—29 ft·lb)

- (5) Install the cover.

8. Pressure pad, spring

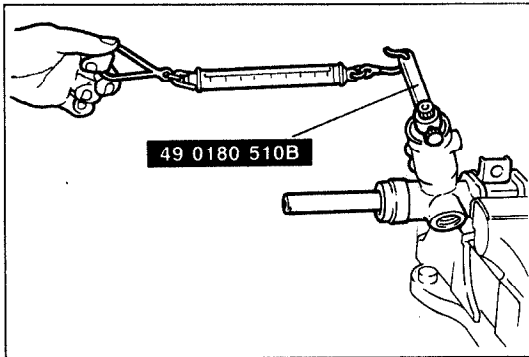
- (1) Install the pressure pad and spring.

9. Adjusting cover

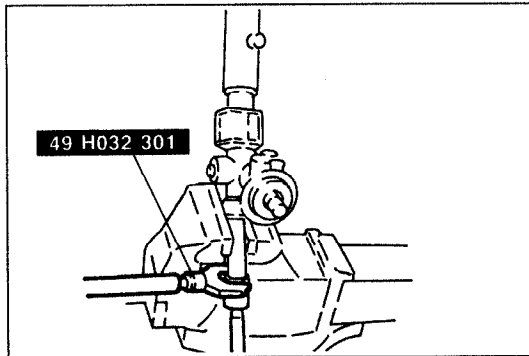
- (1) Apply sealant to the adjusting cover and temporarily tighten it to a torque of **11 N·m (110 cm·kg, 95 in·lb)**.
- (2) Move the rack back and forth **approx. 3 times** and loosen the adjusting cover.
- (3) Retighten the adjusting cover to the specified torque and then loosen it **0—40°**.

Tightening torque:

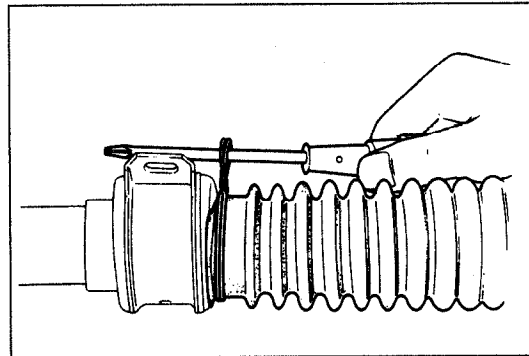
4.4—5.4 N·m (45—55 cm·kg, 39—48 in·lb)



23U0NX-042



23U0NX-063



23U0NX-064

- (4) Tighten the locknut with the **SST**.
- (5) Measure the pinion starting torque with the **SST** and a pull scale.

Starting torque

At $\pm 90^\circ$ from the straight-ahead position:

1.0—1.3 N·m (10—14 cm·kg, 8.7—12 in·lb)

(Pull scale reading: 1.0—1.4 kg [35.3—49.4 oz])

At other position:

1.6 N·m (17 cm·kg, 14.7 in·lb) max.

(Pull scale reading: 1.7 kg [3.7 lb] max.)

- (6) If not as specified, repeat Steps (3) to (5).

10. Tie rod

- (1) Install the new washers to the tie rods.
- (2) Install the tie rods with the **SST**.

Tightening torque:

59—78 N·m (6—8 m·kg, 43—58 ft·lb)

- (3) Band the washers.

Note

- Install the tie rod (with air bled out) at the rack housing side.

11. Boot

- (1) Install the boot, boot wire and boot clip.

12. Tie rod end

- (1) Install the locknut and the tie rod end.

13. Oil pipe

- (1) Install the oil pipes.

Tightening torque

Cylinder pipe: 20—29 N·m

(2—3 m·kg, 14—22 ft·lb)

Pressure and return pipe:

29—39 N·m (3—4 m·kg, 22—29 ft·lb)

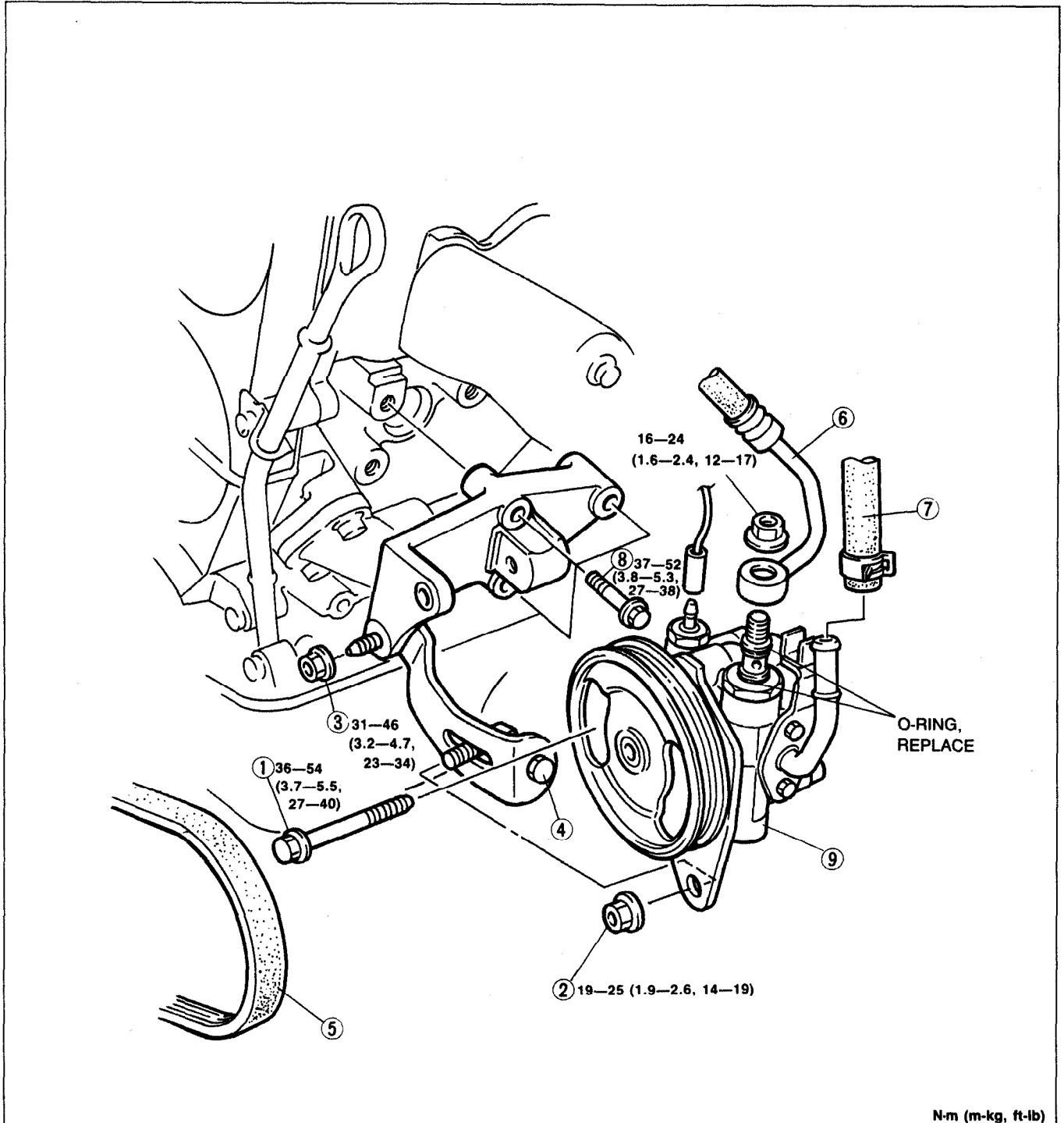
14. Mounting bracket and mounting rubber (tube side)

- (1) Install the mounting rubber and the bracket (tube side) to the gear housing.

POWER STEERING OIL PUMP

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



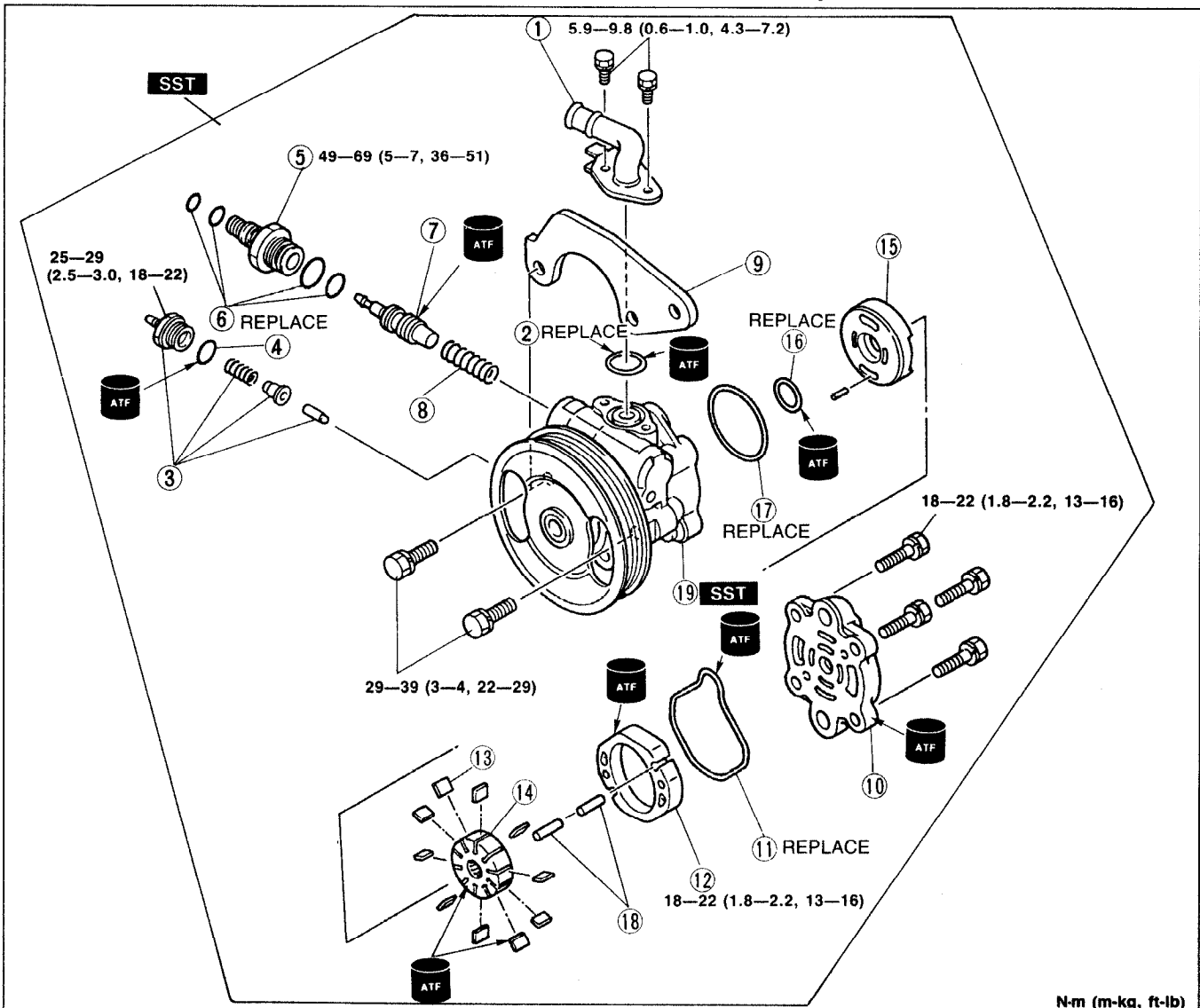
N-m (m-kg, ft-lb)
23U0NX-043

- | | |
|-------------------|--------------------------|
| 1. Bolt | 6. Pressure hose |
| 2. Nut | 7. Return hose |
| 3. Nut | 8. Bolts |
| 4. Adjusting bolt | 9. P/S oil pump assembly |
| 5. Drive belt | |

Replacement page N-42
 Adjustment page N-42
 Inspection page N-41

Disassembly / Inspection / Assembly

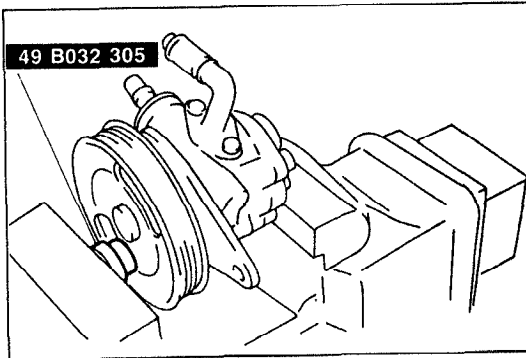
1. The following procedures show replacement of the O-rings. If a problem is found in other parts, replace the oil pump assembly.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
3. Inspect all parts and replace as necessary.
4. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



N-m (m-kg, ft-lb)

23U0NX-044

- | | |
|-----------------------------|------------------------------|
| 1. Suction pipe | 12. Cam ring |
| 2. O-ring | Assembly Note..... page N-39 |
| 3. Pressure-switch assembly | Inspection..... page N-40 |
| 4. O-ring | 13. Vane |
| 5. Connector | Assembly Note..... page N-39 |
| 6. O-ring | Inspection..... page N-40 |
| 7. Control valve | 14. Rotor |
| Inspection..... page N-40 | Assembly Note..... page N-39 |
| 8. Spring | Inspection..... page N-40 |
| Inspection..... page N-40 | 15. Side plate |
| 9. Bracket | Inspection..... page N-40 |
| 10. Pump body (rear) | 16. O-ring |
| Inspection..... page N-39 | 17. O-ring |
| 11. O-ring | 18. Pin |
| | 19. Pump body (front) |
| | Inspection..... page N-39 |

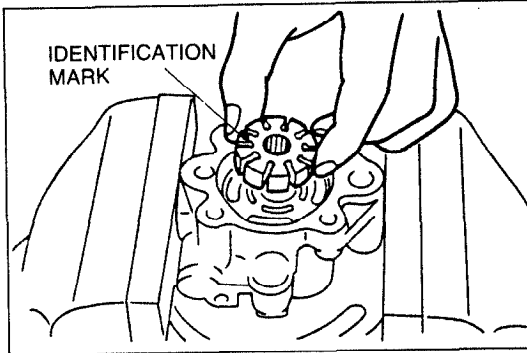


93G0NX-052

Disassembly note Oil pump

Note

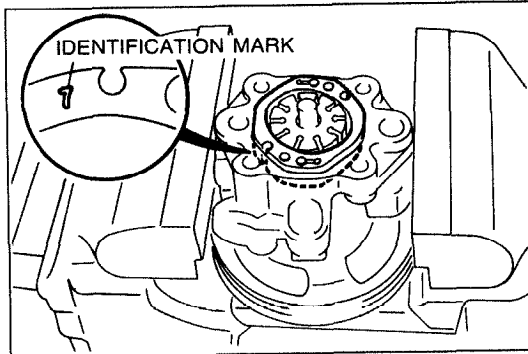
- As shown in the figure, when securing the oil pump in a vise, be sure to use the SST so that force is not applied to the pulley or shaft.



93G0NX-056

Assembly note Rotor

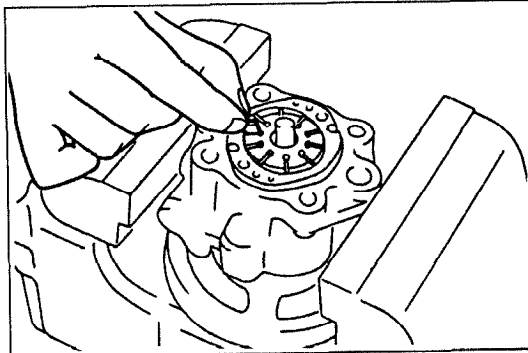
1. Install the rotor to the shaft with the rotor's identification mark facing upward.



93G0NX-057

Cam ring

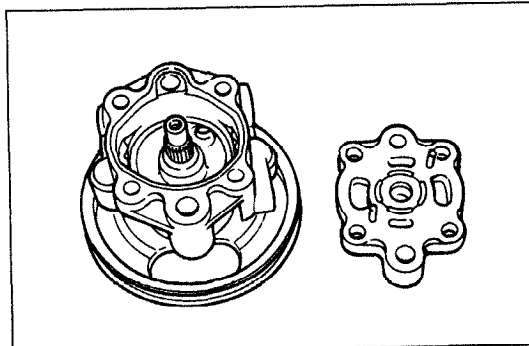
1. Install the cam ring so that its identification mark is facing downward.



03U0NX-829

Vane

1. Install the vanes (10 pieces) to the rotor, with the R part of the vanes facing outward.



93G0NX-053

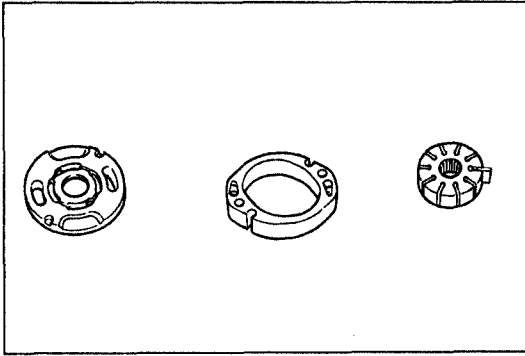
Inspection

Note

- Replace the pump assembly if necessary.

Pump body

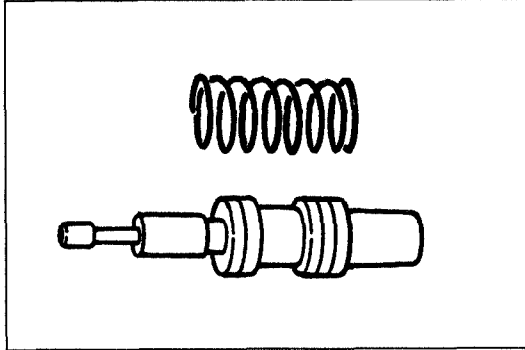
1. Check the front and rear pump bodies for cracking or other damage and for abnormal wear of the moving surface of the rotor.



93G0NX-054

Cam ring, rotor, vanes, side plate

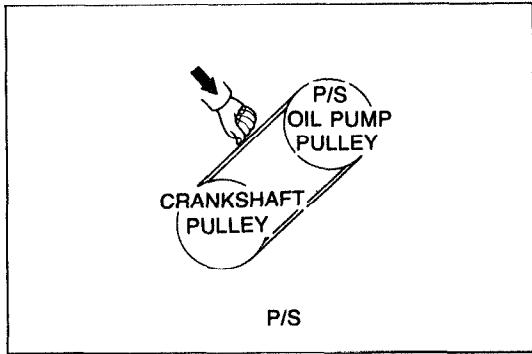
1. Check the moving surface of the cam ring's vanes for abnormal wear.
2. Check the moving surface of the side plate and the pump bodies for abnormal wear.
3. Check the moving surface of the vane cam ring for abnormal wear.
4. Check the clearance of the rotor and vanes.



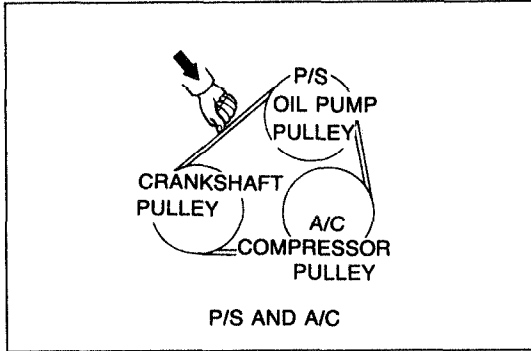
93G0NX-055

Control valve and spring

1. Check the control valve for cracking and other damage, for clogging, and for abnormal wear of the moving part.
2. Check the spring for damage.



23U0NX-045



23U0NX-046

DRIVE BELT

Inspection

1. Check the drive belts for wear, cracks, and fraying. Replace as necessary.
2. Verify that the drive belts are correctly mounted on the pulleys.
3. Check the drive belt deflection by applying moderate pressure (**98 N, 10 kg, 22 lb**) midway between the pulleys.

Note

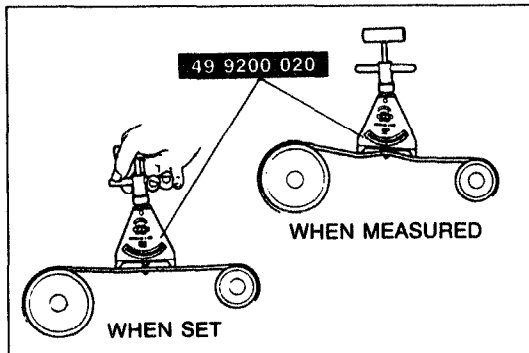
- Measure the belt deflection between the specified pulleys.
- A belt is considered "New" if it has been used on a running engine for less than five minutes. Set the deflection specification below accordingly.
- Check the belt deflection when the engine is cold, or at least 30 minutes after the engine has stopped.

Deflection

mm (in)		
New	Used	Limit
8—9.0 (0.31—0.35)	9.0—10.0 (0.35—0.39)	11.5 (0.45)

4. If the deflection is not within specification, adjust it.

23U0NX-047



23U0NX-048

Drive belt tension check

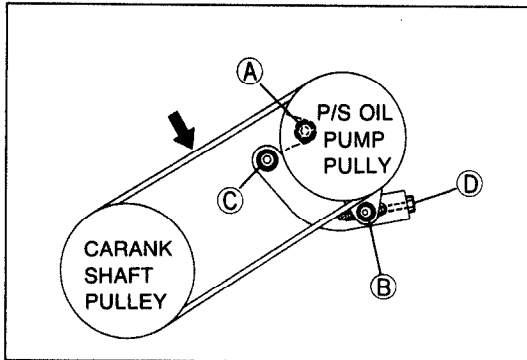
Note

- Belt tension can be checked in place of belt deflection.
- Belt tension can be measured between any two pulleys.

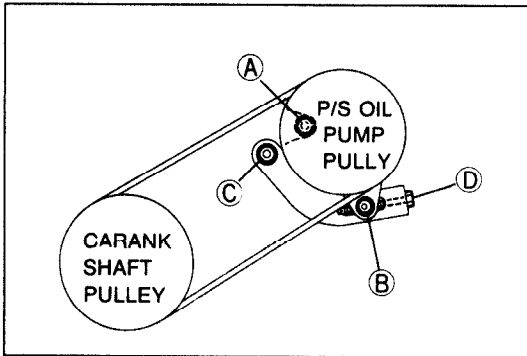
Using the **SST** check the belt tension.

Tension

N (kg, lb)		
New	Used	Limit
491—589 (50—60, 110—132)	422—491 (43—50, 95—110)	245 (25, 55)



13U0NX-028

**Adjustment**

1. Loosen bolt (A), nut (B), and locknut (C). Turn adjusting bolt (D) to adjust the belt to the specified tension.
2. Tighten locknut (C), bolt (A), and nut (B) to the specified torques.

Tightening torque

Bolt (A): 36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)

Nut (B): 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

Locknut (C):

31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

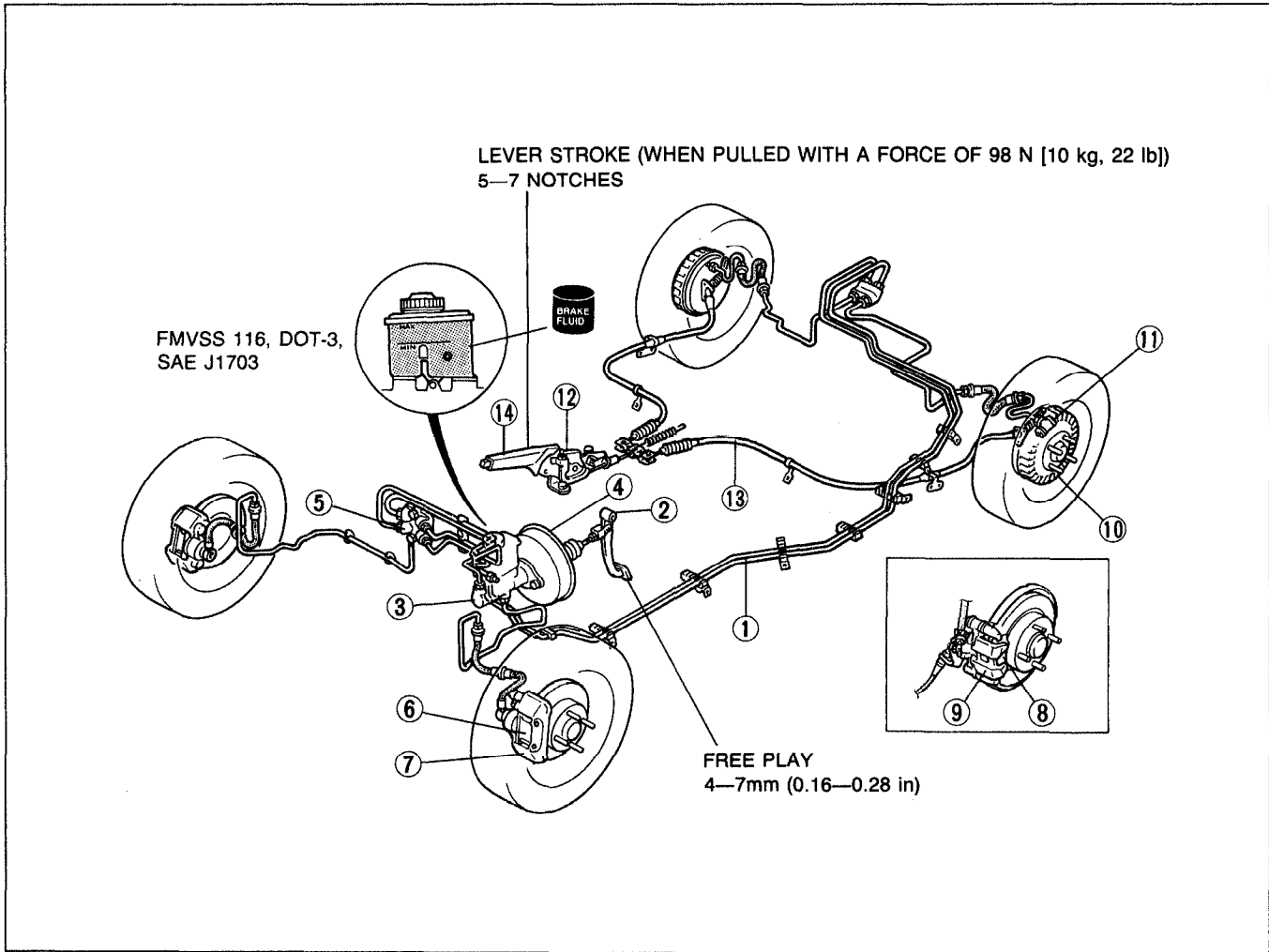
Replacement

1. Loosen bolt (A), nut (C), and locknut (B).
2. Turn adjusting bolt (D) to release the belt tension.
3. Remove the belt.
4. Install a new drive belt and adjust the tension and deflection. (Refer to above for adjustment.)

BRAKING SYSTEM

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23U0PX-008

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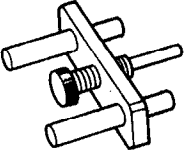
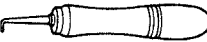
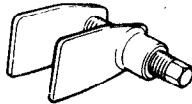
OUTLINE

SPECIFICATIONS

Item		Specifications
Brake pedal	Type	Suspended
	Pedal lever ratio	4.1
	Max. stroke	mm (in) 140 (5.51)
Master cylinder	Type	Tandem (with level sensor)
	Cylinder inner diameter	mm (in) 22.22 (0.875)
Front disc brake	Type	Ventilated disc (integral)
	Cylinder bore	mm (in) 53.97 (2.12)
	Pad dimensions (area × thickness) mm ² (in ²) × mm (in)	13-in wheel: 3,800 (5.89) × 10 (0.39) 14-in wheel: 4,300 (6.66) × 10 (0.39)
	Disc plate dimensions (outer diameter × thickness)	mm (in) 13-in wheel: 235 × 22 (9.25 × 0.87) 14-in wheel: 257 × 22 (10.12 × 0.87)
Rear disc brake	Type	Solid disc (mounting support)
	Cylinder bore	mm (in) 30.2 (1.19)
	Pad dimensions (area × thickness) mm ² (in ²) × mm (in)	2,600 × 8.0 (4.03 × 0.31)
	Disc plate dimensions (outer diameter × thickness)	mm (in) 251 × 9 (9.88 × 0.35)
Rear drum brake	Type	Leading-trailing
	Wheel cylinder inner diameter	mm (in) 17.46 (0.687)
	Lining dimensions (width × length × thickness)	mm (in) 35 × 192.0 × 4.5 (1.38 × 7.56 × 0.18)
	Drum inner diameter	mm (in) 200 (7.9)
	Shoe clearance adjustment	Automatic adjuster
Power brake unit	Type	Vacuum multiplier
	Diameter	mm (in) Ⓐ : 214 (8.43), Ⓑ : 239 (9.41)
Braking force control device	Type	Dual proportioning valve
Brake fluid		FMVSS 116: DOT-3, SAE: J1703
Parking brake	Type	Mechanical two rear wheel control
	Operation system	Center lever

Ⓐ With BP 5MTX, B6, Ⓑ With BP 4EATX

CONVENTIONAL BRAKE SYSTEM**PREPARATION
SST**

49 0259 770B Wrench, flare nut 	For removal of brake pipe	49 F043 001 Adjust gauge 	For adjustment of piston-to-push rod clearance
49 0208 701A Air-out tool, boot 	For removal of piston seal	49 0221 600C Expand tool, disc brake 	For installation of brake pads (Front disc brake)

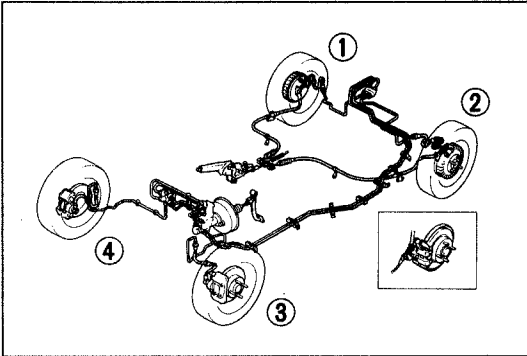
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TROUBLESHOOTING GUIDE

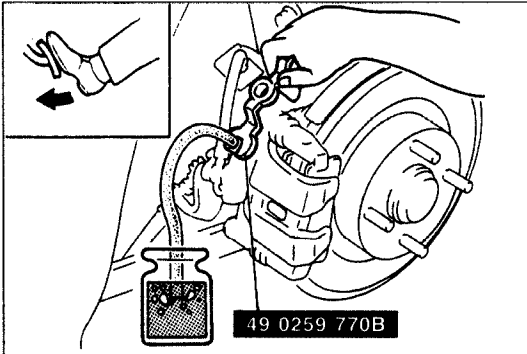
Problem	Possible cause	Remedy	Page
Poor braking	Leakage of brake fluid	Repair	P- 7
	Air in system	Bleed air	P- 6
	Worn pad or lining	Replace	P-18,23,28
	Brake fluid, grease, oil, or water on pad or lining	Clean or replace	P-18,23,28
	Hardening of pad or lining surface or poor contact	Grind or replace	P-18,23,28
	Malfunction of disc brake piston	Replace	P-19,24
	Malfunction of master cylinder or wheel cylinder	Repair or replace	P-10,21,26, 28,30
	Malfunction of power brake unit	Repair or replace	P-16
	Malfunction of check valve (vacuum hose)	Replace	P-15
	Damaged vacuum hose	Replace	—
Deterioration of flexible hose	Replace	—	
Malfunction of dual proportioning valve	Replace	P-17	
Brakes pull to one side	Worn pad or lining	Replace	P-18,23,28
	Brake fluid, grease, oil, or water on pad or lining	Clean or replace	—
	Hardening of pad or lining surface or poor contact	Grind or replace	—
	Abnormal wear or distortion of disc, drum, pad, or lining	Repair or replace	P-18,23,28
	Malfunction of automatic adjuster	Repair or replace	—
	Looseness of backing plate / dust cover mounting bolts	Tighten	Section M
	Malfunction of wheel cylinder	Repair or replace	P-21,26,30
	Improperly adjusted wheel alignment	Adjust	Section R
Unequal tire air pressures	Adjust	Section Q	
Brakes do not release	No brake pedal play	Adjust	P- 9
	Improperly adjusted push rod clearance	Adjust	P-11
	Clogged master cylinder return port	Clean	—
	Weak brake pad or shoe return spring	Replace	—
	Wheel cylinder not returning properly	Clean or replace	—
	Malfunction of piston seal of disc brake	Replace	P-19,24
	Excessive runout of disc plate	Replace	P-20,25
Pedal goes too far (too much pedal stroke)	Improperly adjusted pedal play	Adjust	P- 9
	Worn pad or lining	Replace	P-18,23,28
	Air in system	Bleed air	P- 6
Abnormal noise or vibration during braking	Worn pad or lining	Replace	P-18,23,28
	Deteriorated pad or lining	Grind or replace	—
	Brakes do not release	Repair	—
	Foreign material or scratches on disc plate or drum contact surface	Clean	—
	Looseness of backing plate / dust cover or caliper mounting bolts	Tighten	Section M, P-19,24
	Damaged disc or drum contact surface	Replace	—
	Poor contact of pad or lining	Repair or replace	P-18,23,28
	Insufficient grease on sliding parts	Grease	—
Steering wheel pulls to one side	Dragging brake	Repair	—
	Malfunction of steering system	—	Section N
	Damaged or unbalanced wheel(s)	—	Section Q
	Incorrect tire pressure	—	Section Q
	Malfunction of suspension	—	Section R

P

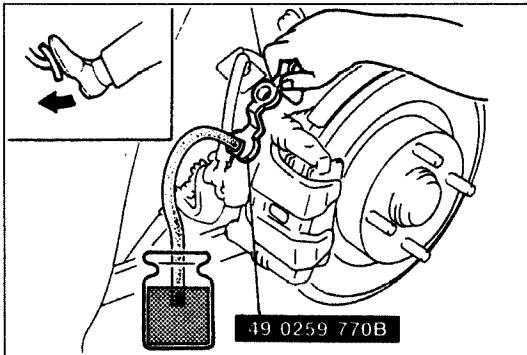
03UOPX-005



03U0PX-006



03U0PX-007



03U0PX-008

AIR BLEEDING

1. Jack up the vehicle and support it with safety stands.

Caution

- The brake fluid reservoir must be 3/4 full during air bleeding.

2. Remove the bleeder cap and attach a vinyl hose to the bleeder plug.

3. Place the other end of the vinyl tube in a clear container.

4. One person should depress the brake pedal a few times, and then hold it in the depressed position.

5. A second person should loosen the bleeder screw, drain out the fluid, and retighten the screw with the **SST**.

Caution

- The two persons should stay in voice contact with each other.
- Be sure the pedal remains depressed until the air bleed screw is tightened.

6. Repeat steps 4 and 5 until no air bubbles are seen.

7. Check for correct brake operation.

8. Verify that there is no fluid leakage. Clean away any spilled fluid with rags.

9. After bleeding the air, add brake fluid to the reservoir up to the specified level.

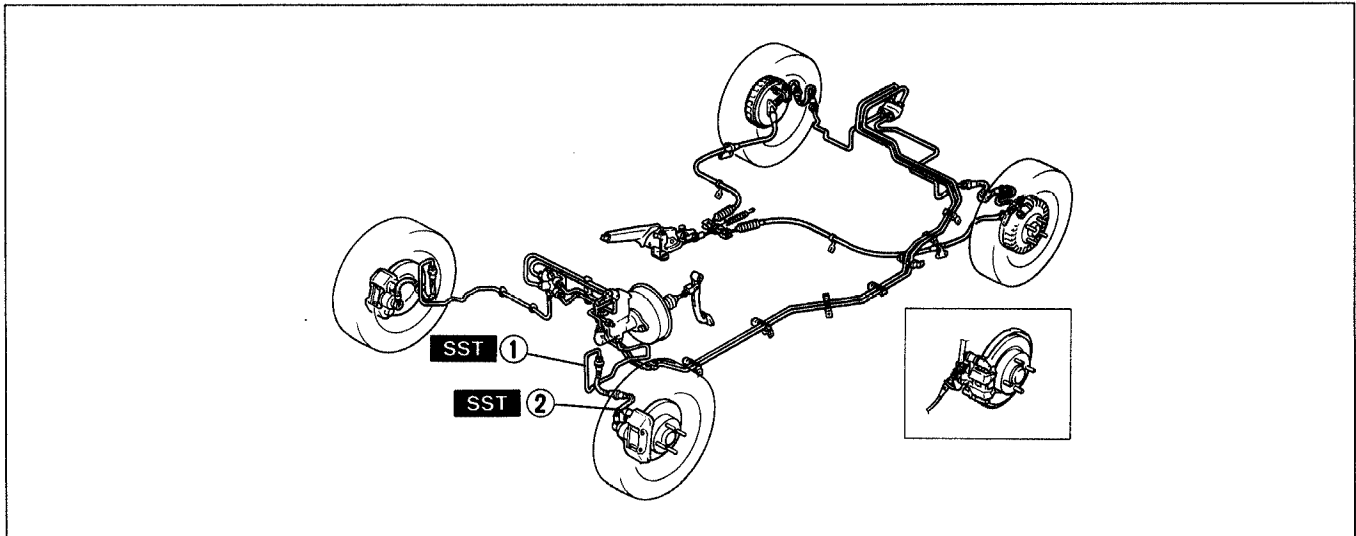
Tightening torque:

5.9—8.8 Nm (0.6—0.9 m-kg, 4.3—6.5 ft-lb)

Note

- Air bleeding must be done from the bleeder screw farthest from the disassembled parts to the nearest.

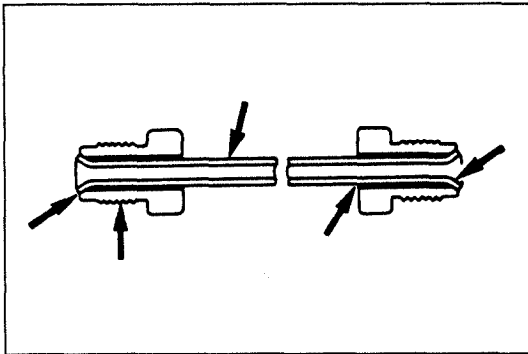
BRAKE HYDRAULIC LINE



03U0PX-009

1. Brake pipe
 Inspection / Removal /
 Installation..... page P-7

2. Flexible hose
 Inspection / Removal /
 Installation..... page P-7

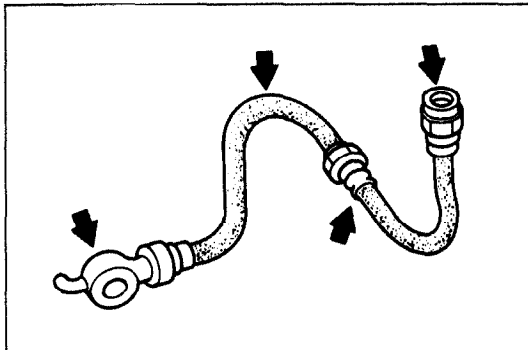


03U0PX-010

Inspection, on-vehicle

Brake pipe

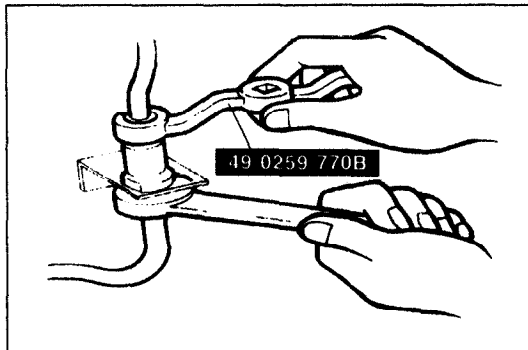
Check for cracks, damage, and corrosion of the brake pipe. Replace the pipe or flare nut(s) if necessary.



03U0PX-011

Flexible hose

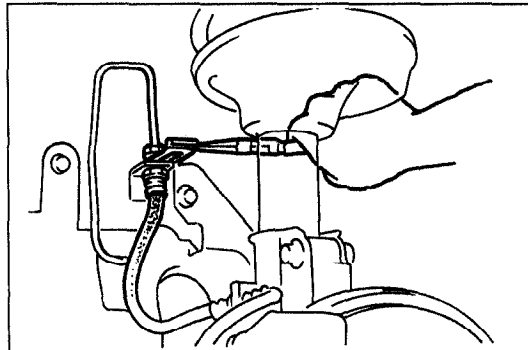
Check for scars, cracks, and swelling of flexible hose. Replace the hose if necessary.



03U0PX-012

Removal

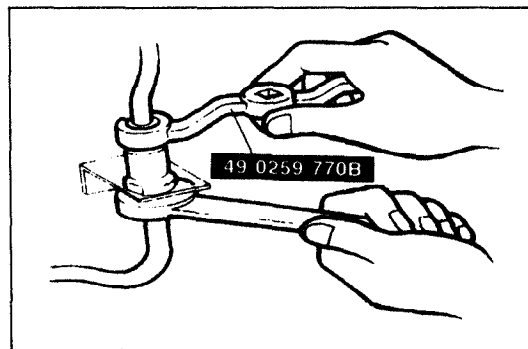
1. Remove the brake pipe with the **SST**.
2. Disconnect the clip and remove the flexible hose from the bracket.



03U0PX-013

Installation

1. Fix the flexible hose in the bracket and connect the clip to it.



23U0PX-009

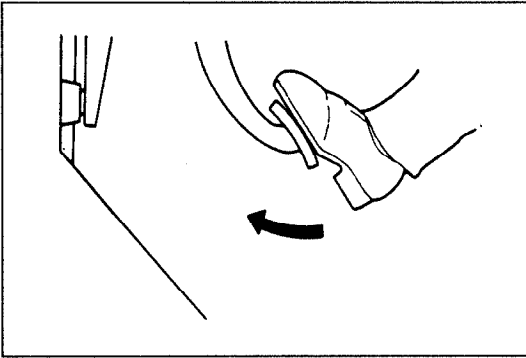
2. Connect the flexible hose to the brake pipe and tighten the flare nut with the **SST**.

Caution

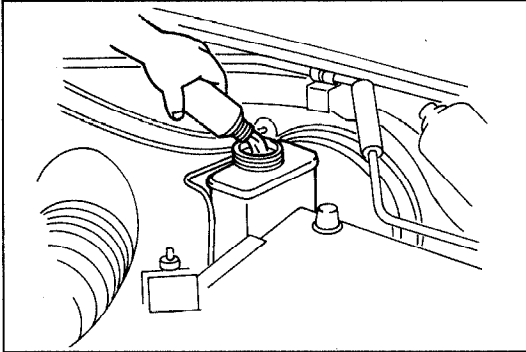
- Verify that the hose is not twisted.
- Verify that the hose does not contact other parts when the vehicle bounces or when the steering wheel is turned fully right or left.

Tightening torque:

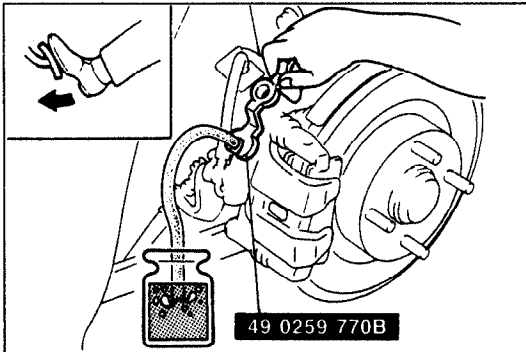
13—22 N·m (1.3—2.2 m·kg, 9.4—16 ft·lb)



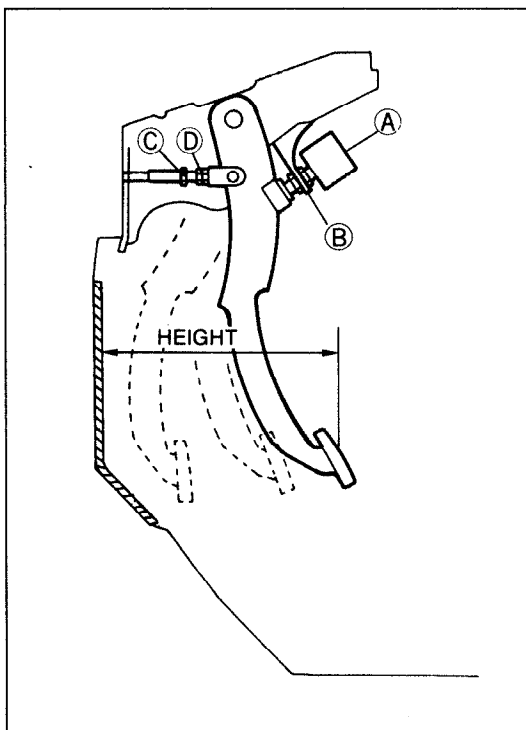
03U0PX-015



03U0PX-016



03U0PX-017



23U0PX-010

BRAKE FLUID**Inspection****Leakage inspection**

Depress the brake pedal several times, and inspect for leakage of the brake line system.

Brake Fluid Level**Leakage check**

Verify that the fluid level in the reservoir is between the MAX and MIN lines on the reservoir.
Add fluid if it is below MAX.

Replacement

1. Follow the procedure outlined in Air Bleeding.
(Refer to page P-6).
2. Continue bleeding and replacing the brake fluid until only clean fluid is expelled.
3. Fill the reservoir to the MAX level.

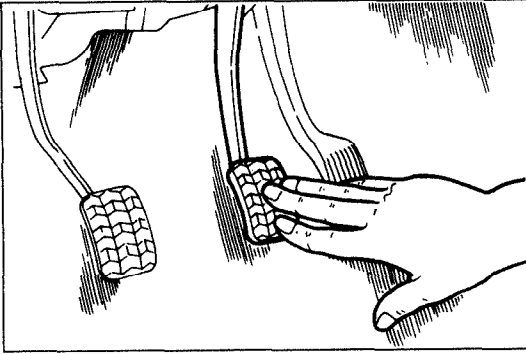
BRAKE PEDAL**Inspection, On-vehicle****Brake pedal height
Inspection**

Verify that the distance from the center on the pedal pad to the floor mat is as specified.

Specification: 193—196mm (7.60—7.72 in)

Adjustment

1. Disconnect the stoplight switch connector.
2. Loosen locknuts (B) and turn switch (A) until it does not contact the pedal.
3. Loosen locknuts (D) and turn rod (C) to adjust the height of the brake pedal.
4. Tighten the stoplight switch until it contacts the pedal; then turn it an additional 1/2 turn. Tighten locknuts (B) and (D).
5. Connect the stoplight switch connector.
6. Verify operation of the stoplights.

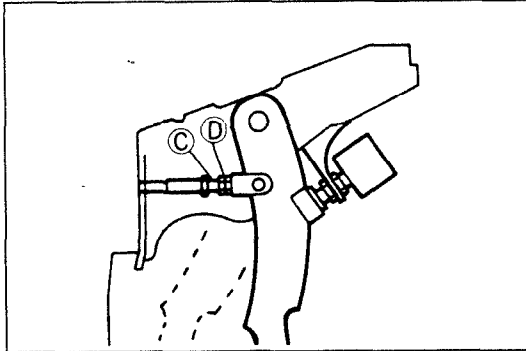


03U0PX-019

Pedal Play Inspection

1. Depress the pedal a few times to eliminate the vacuum in the system.
2. Gently depress the pedal by hand and check the free play (until resistance is felt).

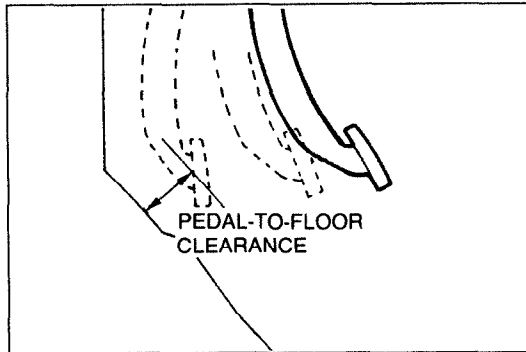
Pedal play: 4—7mm (0.16—0.28 in)



03U0PX-020

Adjustment

1. Loosen locknut (D) and turn rod (C) to adjust the free play.
2. Verify the pedal height and the stoplight operation.



03U0PX-021

Pedal-To-Floor Clearance Inspection

Verify that the distance from the floor panel to the center of the pedal pad is as specified when the pedal is depressed with a force of **589 N (60 kg, 132 lb)**.

P

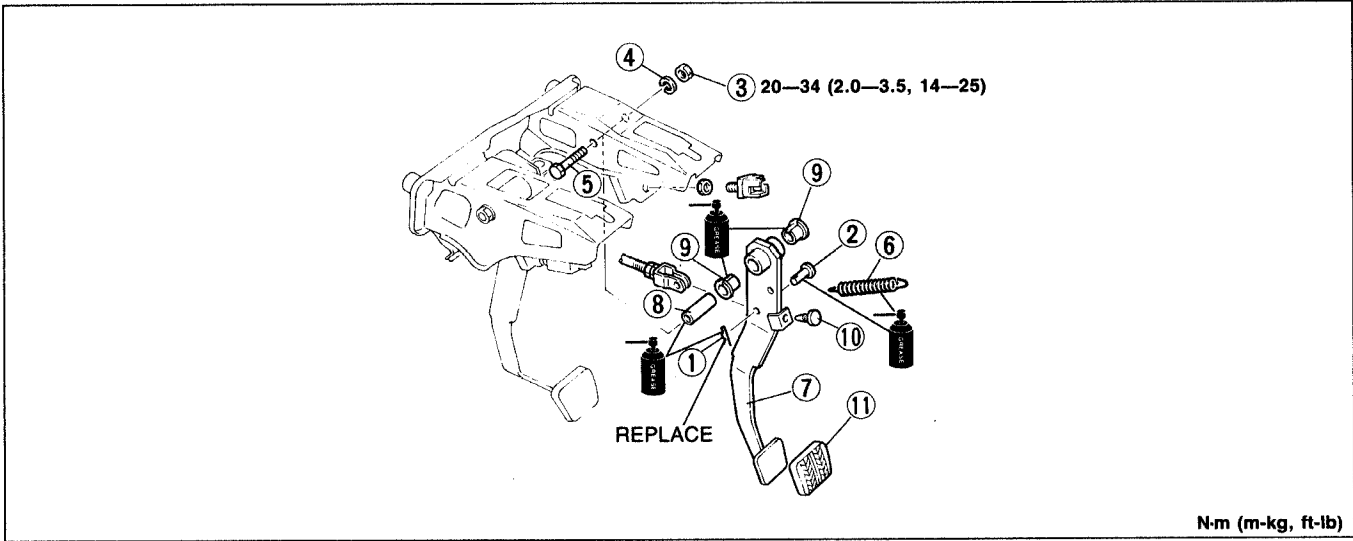
Pedal-to-floor clearance: 70mm (2.76 in) min.

If the distance is less than specified, check for the following problems:

1. Air in brake system
2. Malfunction of automatic adjuster (Rear drum brakes)
3. Worn shoes or pads

Removal / Inspection / Installation

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.
4. After installation, check and adjust the pedal height and free play if necessary.



N-m (m-kg, ft-lb)

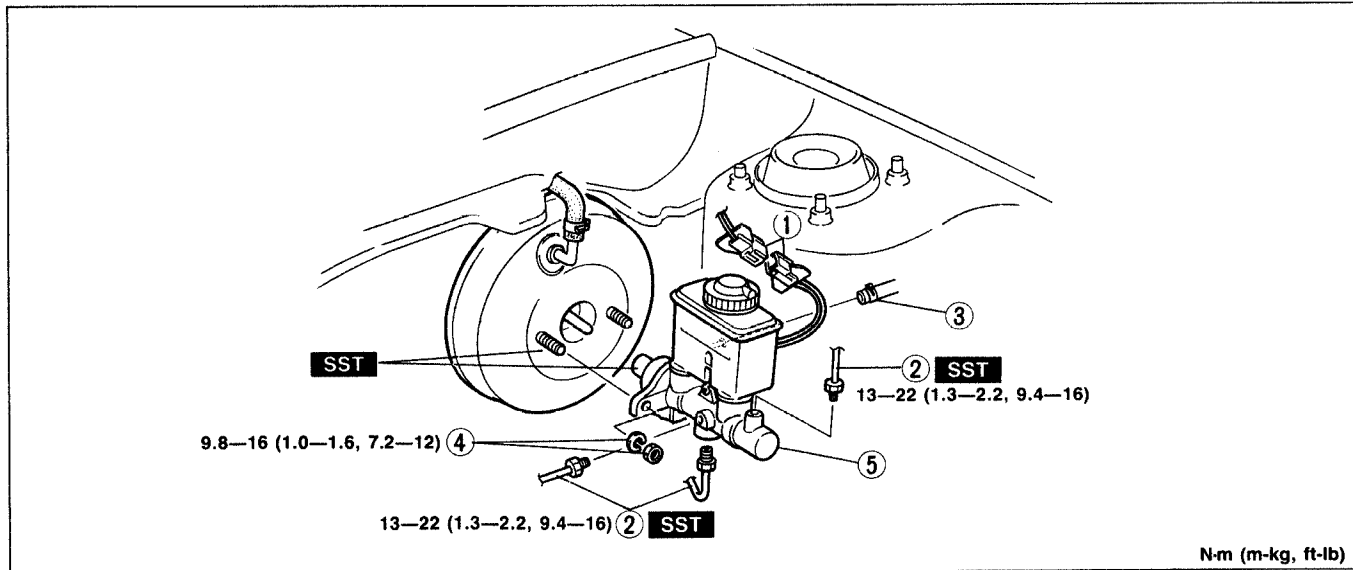
23U0PX-011

- | | | |
|----------------|--------------------------------|------------------|
| 1. Cotter pin | 6. Return spring | 9. Bushing |
| 2. Clevis pin | Inspect for wear and damage | Inspect for wear |
| 3. Nut | 7. Pedal | 10. Bushing |
| 4. Lock washer | Inspect for bending and damage | Inspect for wear |
| 5. Bolt | 8. Pedal pipe | 11. Pad |
| | | Inspect for wear |

MASTER CYLINDER

Removal / Installation

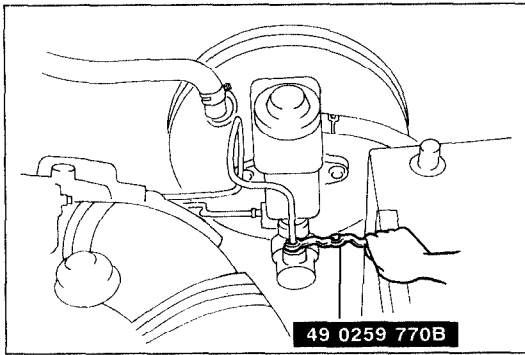
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.
3. After installation, add brake fluid, bleed air, and check for fluid leakage.



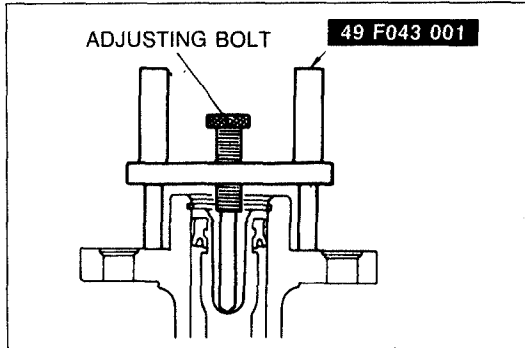
N-m (m-kg, ft-lb)

23U0PX-012

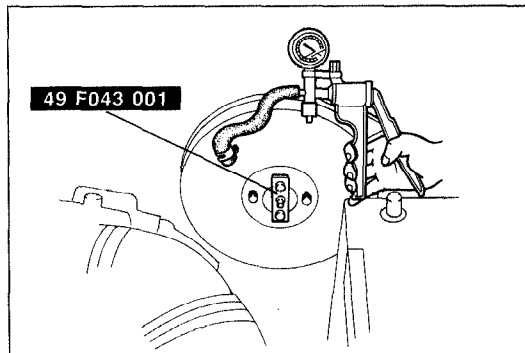
- | | |
|----------------------------------|----------------------------------|
| 1. Connector | 4. Nut and washer |
| 2. Brake pipe | 5. Master cylinder |
| Removal Note..... page P-11 | Installation Note..... page P-11 |
| Installation Note..... page P-11 | Disassembly / Assembly / |
| 3. Hose (MTX) | Inspection..... page P-12 |



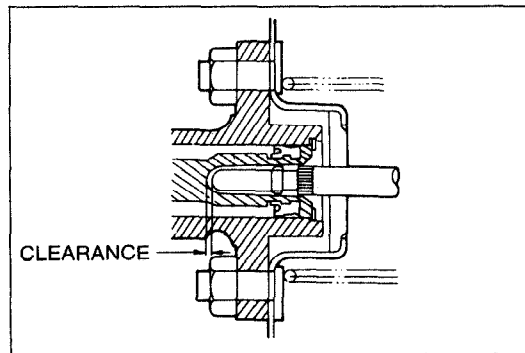
03U0PX-024



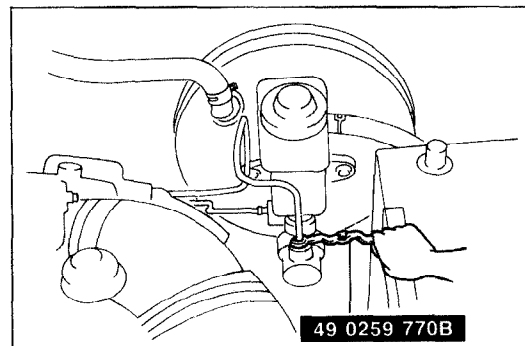
03U0PX-025



03U0PX-026



23U0PX-002



03U0PX-028

Removal note

Brake pipe

Disconnect the brake pipe from the master cylinder with the SST.

Caution

- Do not allow the brake fluid to get on painted surfaces. If it does, wipe it off immediately.

Installation note

Master cylinder

Piston to push rod clearance

Before installing the master cylinder, check the clearance between the piston of the master cylinder and the push rod of the power brake unit as follows.

1. Place the **SST** atop top of the master cylinder. Turn the adjusting bolt until it bottoms in the push rod hole in the piston.
2. Apply **500 mmHg (19.7 in-Hg)** vacuum to the power brake unit with a vacuum pump.
3. Invert the adjustment gauge used in Step 1 and place it on the power brake unit.
4. Measure the clearance between the end of the gauge and the push rod of the power brake unit. If it is not **0mm (0 in)**, loosen the push rod locknut and turn the push rod to make the adjustment.

Note

- By making the above adjustment, the clearance between the push rod and piston (after installation of the brake master cylinder and the power brake unit) will be as shown in the table below.

	Push rod-to-piston clearance
When vacuum applied to unit is 0 mmHg (0 inHg)	0.4—0.6mm (0.016—0.024 in)
When vacuum applied to unit is approx. 500 mmHg (19.7 inHg)	0.1—0.4mm (0.004—0.016 in)

Brake pipe

1. Tighten the brake pipe flare nut with the **SST**.

Tightening torque:

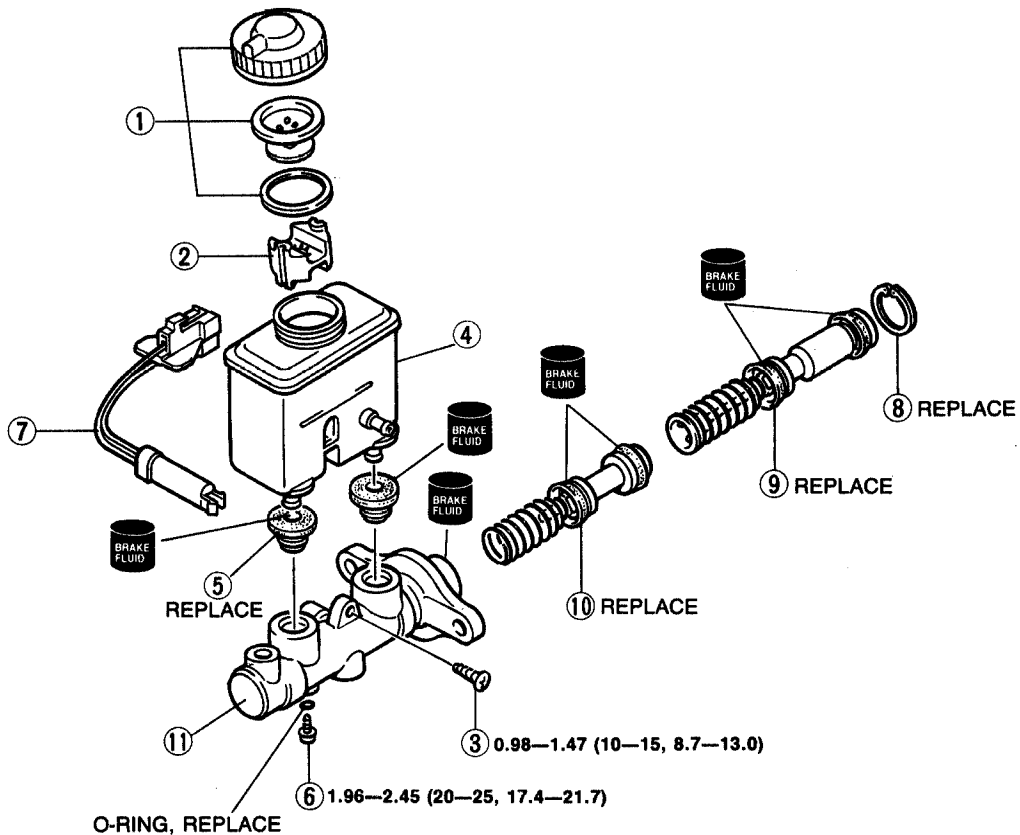
13—22 N·m (1.3—2.2 m·kg, 9.4—16 ft·lb)

Disassembly / Assembly / Inspection

1. After removing the brake fluid, disassemble in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly.

Caution

- **Secure the master cylinder flange in a vise when necessary.**
- **Replace the piston assembly, if necessary.**
- **Do not let foreign material enter the cylinder, and do not scratch the inside of the cylinder or the outer surface of the piston.**



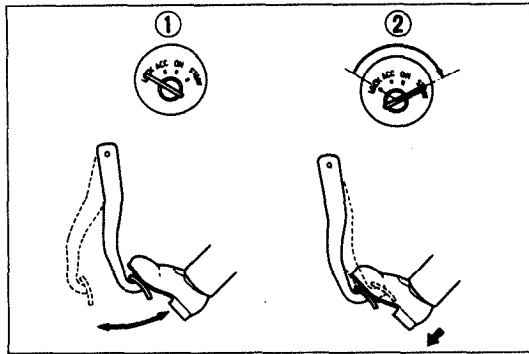
N-m (cm-kg, in-lb)

23U0PX-013

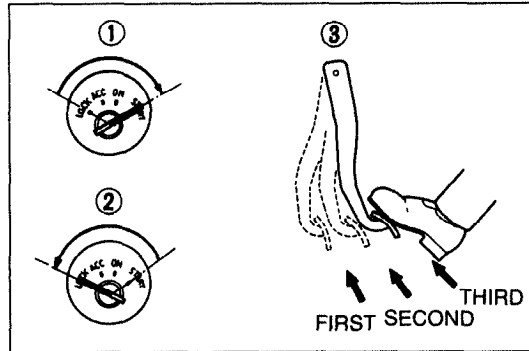
1. Reservoir cap assembly
2. Float
3. Screw
4. Reservoir

5. Bushing
6. Stopper screw
7. Fluid level sensor
8. Snap ring

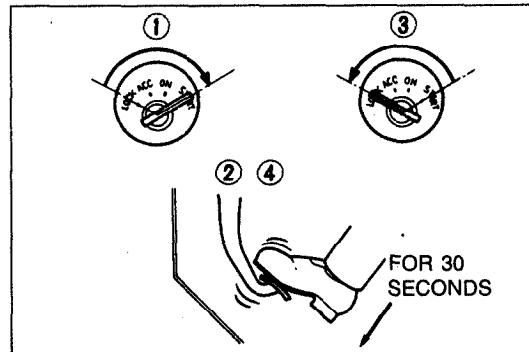
9. Primary piston assembly
10. Secondary piston assembly
11. Master cylinder body



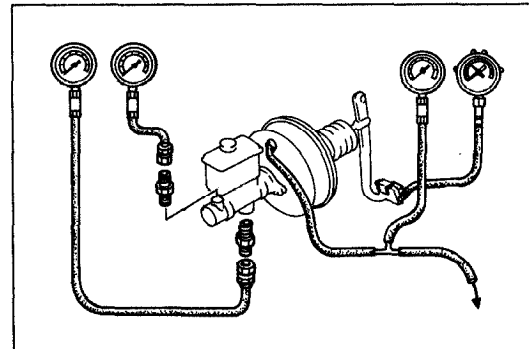
13U0PX-006



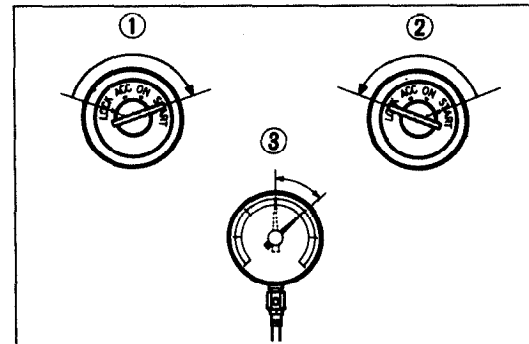
03U0PX-032



03U0PX-033



03U0PX-034



03U0PX-035

POWER BRAKE UNIT

**Quick Inspection, On-vehicle
Power brake unit function check
(Simple method)**

Step 1

1. With the engine stopped, depress the pedal a few times.
2. With the pedal depressed, start the engine.
3. If immediately after the engine starts the pedal moves down slightly, the unit is operating.

Step 2

1. Start the engine.
2. Stop the engine after it has run for **1 or 2 minutes**.
3. Depress the pedal with the usual force.
4. If the first pedal stroke is long and becomes shorter with subsequent strokes, the unit is operating.
5. If a problem is found, inspect for damage of the check valve or vacuum hose and examine the installation. Repair if necessary, and inspect it once again.

Step 3

1. Start the engine.
2. Depress the pedal with the usual force.
3. Stop the engine with the pedal held depressed.
4. Hold the pedal down for **about 30 seconds**.
5. If the pedal height does not change, the unit is operating.
6. If there is a problem, check for damage to the check valve or vacuum hose, and check the connection. Repair if necessary and check once again.

If the nature of the problem is still not clear after the 3 steps above, follow the more detailed check described in "Method-using tester," below.

(Method-using tester)

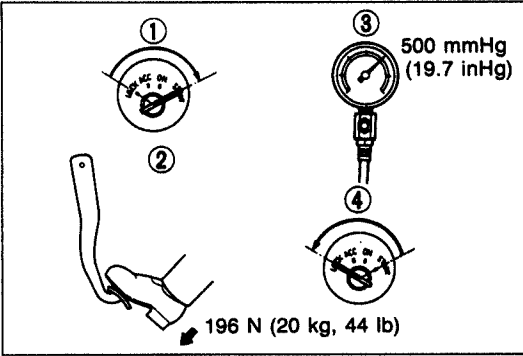
Connect a pressure gauge, vacuum gauge, and pedal depression force gauge as shown in the figure. After bleeding the air from the pressure gauge, conduct the test as described in the 3 steps below.

Note

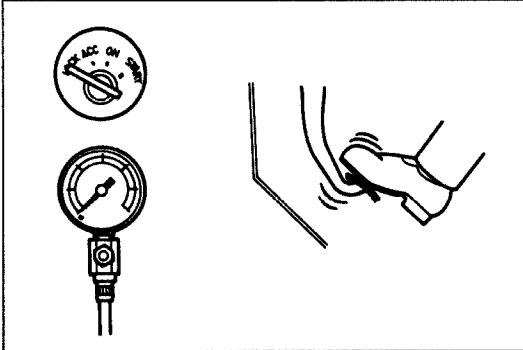
- Use commercially available gauges and pedal depression force gauge.

**a) Checking for vacuum loss
Unloaded condition**

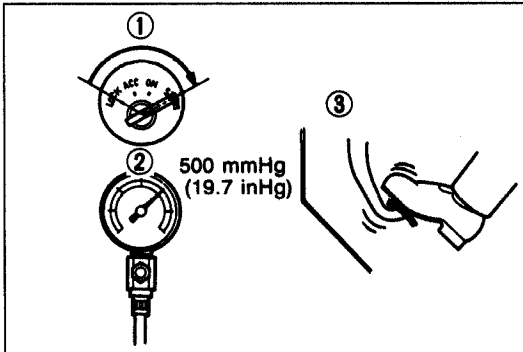
1. Start the engine.
2. Stop the engine when the vacuum gauge reading reaches **500 mmHg (19.7 inHg)**.
3. Observe the vacuum gauge for **15 seconds**. If the gauge shows **475—500 mmHg (18.7—19.7 inHg)**, the unit is operating.



03UOPX-036



03UOPX-037



03UOPX-038

Loaded condition

1. Start the engine.
2. Depress the brake pedal with a force of **196 N (20 kg, 44 lb)**.
3. With the brake pedal depressed, stop the engine when the vacuum gauge reading reaches **500 mmHg (19.7 inHg)**.
4. Observe the vacuum gauge for **15 seconds**. If the gauge shows **475—500 mmHg (18.7—19.7 inHg)**, the unit is operating.

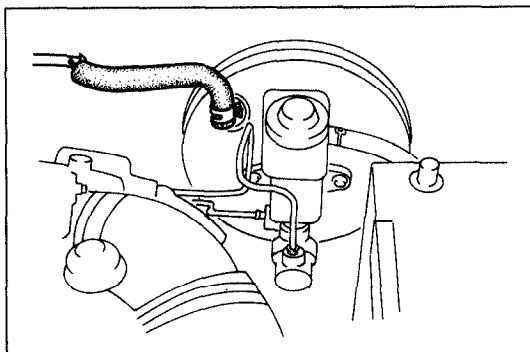
b) Checking for hydraulic pressure

1. If with the engine stopped (vacuum **0 mmHg**) the fluid pressure is within specification, the unit is operating.

Pedal force	Fluid pressure
196 N (20 kg, 44 lb)	1,177 kPa (12 kg/cm ² , 171 psi) min

2. Start the engine. Depress the brake pedal when the vacuum reaches **500 mmHg (19.7 inHg)**. If the fluid pressure is within specification, the unit is operating.

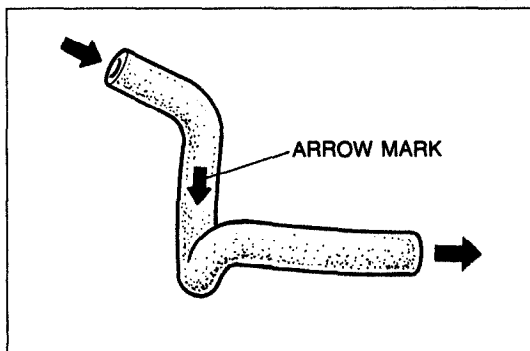
Pedal force	Fluid pressure
196 N (20 kg, 44 lb)	7,063 kPa (72 kg/cm ² , 1,024 psi)



03U0PX-039

Check valve Inspection

1. Disconnect the vacuum hose (with internal check valve) from the engine side.



23U0PX-014

2. Apply suction and pressure to the hose from the engine side. Verify that air flows only toward the engine.

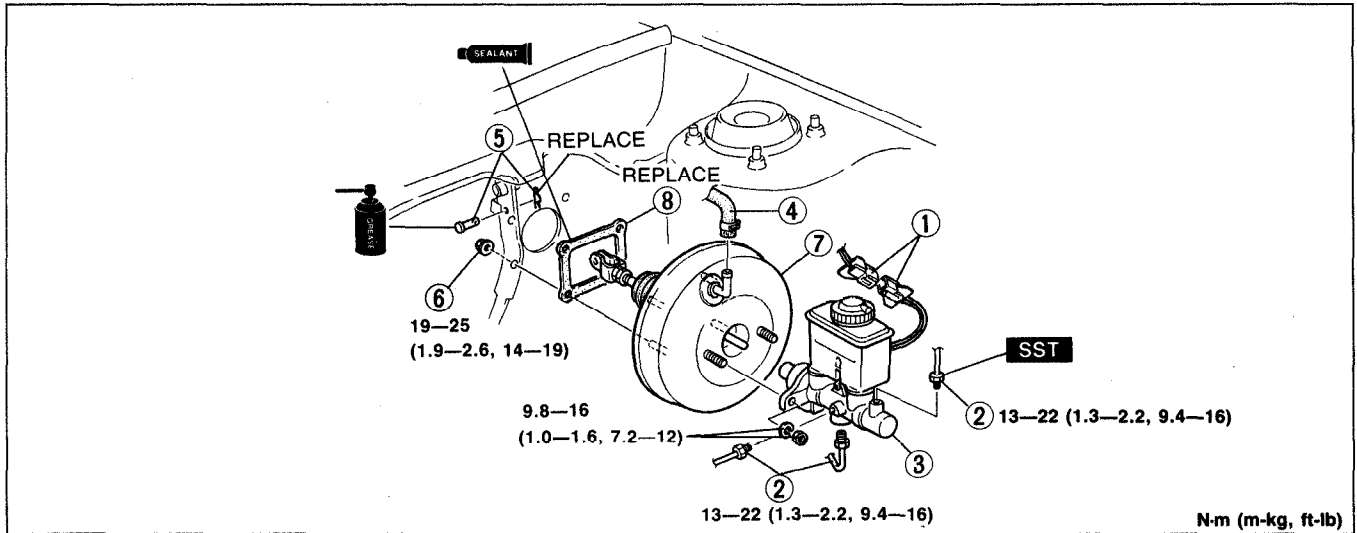
Caution

- If the check valve is bad, replace the hose with the valve.

3. Install the vacuum hose with the arrow facing the engine.

Removal / Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



23U0PX-003

- | | | |
|---------------------------|------------------------------|---------------------|
| 1. Connector | 3. Master cylinder | 6. Nut |
| 2. Brake pipe | Installation Note | 7. Power brake unit |
| Removal Note .. page P-11 | page P-11 | 8. Gasket |
| Installation Note | | |
| page P-11 | 4. Vacuum hose | |
| | 5. Cotter pin and clevis pin | |

Caution

Take the following steps after installation:

- Add fluid and bleed the air. (Refer to page P-6.)
- Check all parts for fluid leakage. (Refer to page P-8.)
- Adjust and check the brake pedal. (Refer to page P-8.)
- Make an on-vehicle check of the unit. (Refer to page P-13.)

13U0PX-007

DUAL PROPORTIONING VALVE

Inspection

1. Connect two pressure gauges (9,810 kPa [100 kg/cm², 1,422 psi]) to the brake pipes with adapters as shown in the figure.

Adapter and flare nut tightening torque:
13-22 N-m (1.3-2.2 m-kg, 9.4-16 ft-lb)

Note

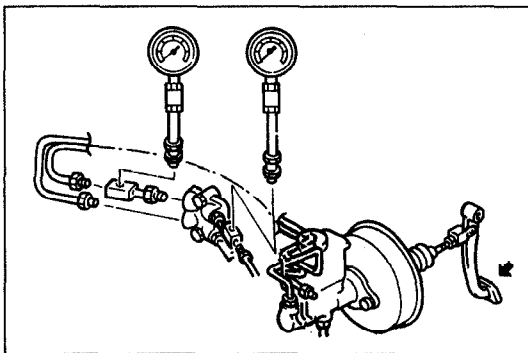
- Disconnect and connect the brake pipes with SST.

2. Bleed the air from the brake system. (Refer to page P-6.)
3. Depress the brake pedal until the master cylinder pressure equals A; then record rear brake pressure A'.
4. Depress the brake pedal again, apply additional pressure until the pressure equals B; then record pressure B'.

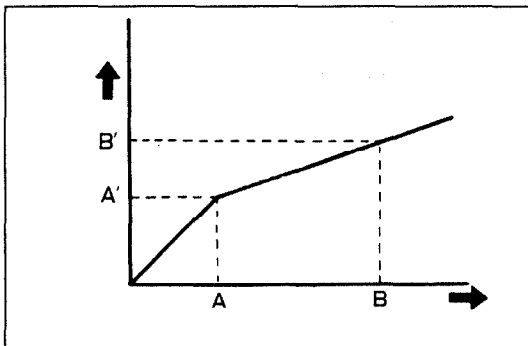
Fluid pressure

kPa (kg/cm², psi)

	A	A'	B	B'
Rear drum brake	2,453 (25, 356)	2,256-2,649 (23-27, 327-384)	5,886 (60, 853)	2,845-3,434 (29-35, 412-498)
Rear disc brake	2,453 (25, 356)	2,256-2,649 (23-27, 327-384)	5,886 (60, 853)	3,188-3,777 (32.5-38.5, 462-547)



03U0PX-043



23U0PX-004

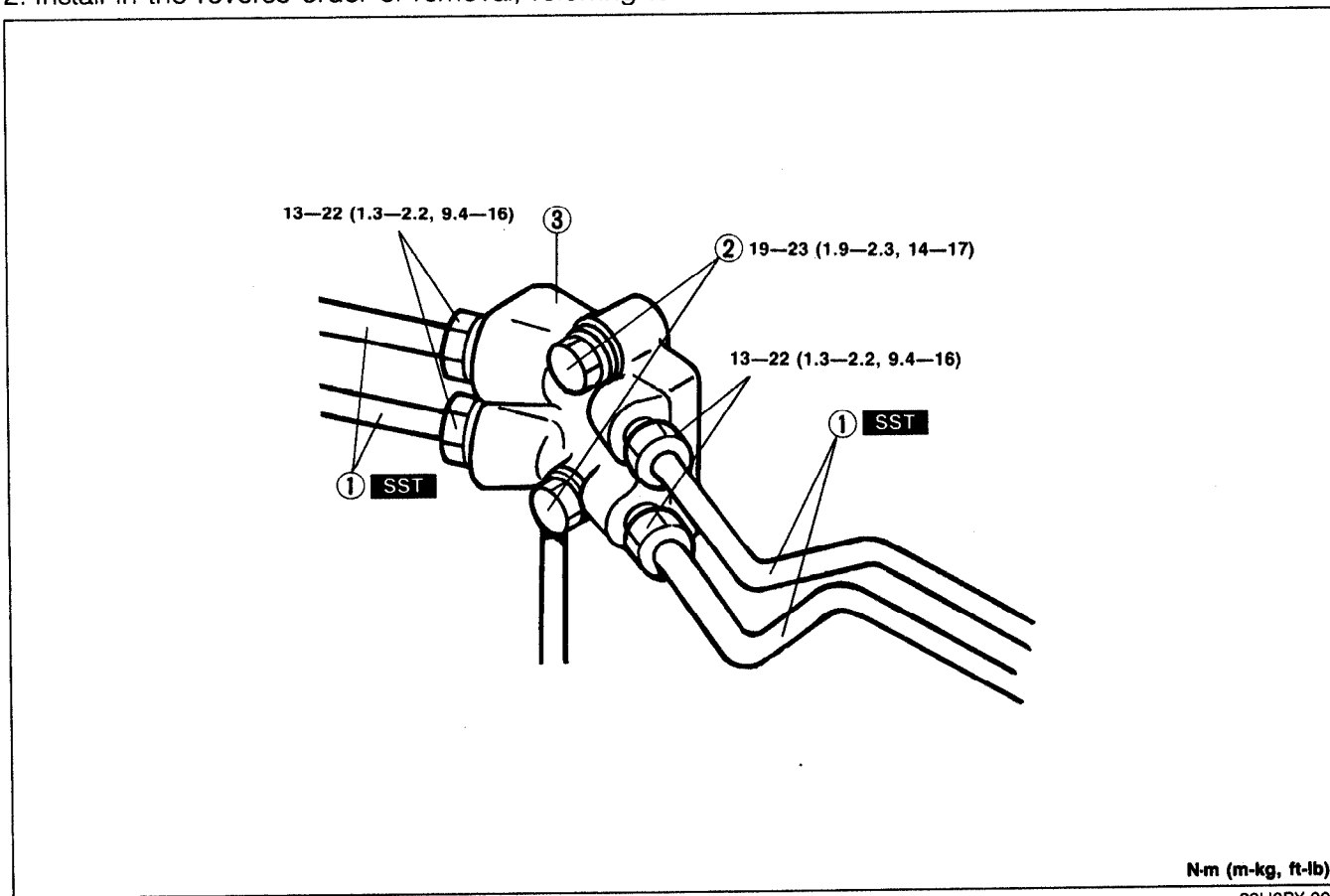
Caution

- Do not attempt to adjust the dual proportioning valve.
- After the inspection, bleed the air from the brake system and check for fluid leakage.
- If the measurements are not within specification, replace the valve assembly.

03U0PX-045

Replacement

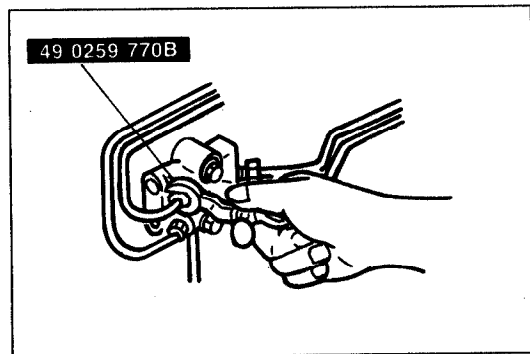
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



N-m (m-kg, ft-lb)

23U0PX-005

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Brake pipe
Removal / Installation Note Below | <ol style="list-style-type: none"> 2. Bolt 3. Dual proportioning valve |
|---|--|

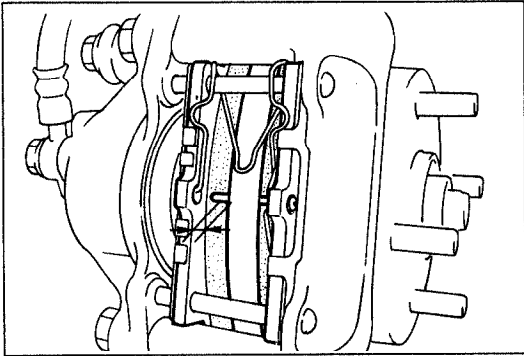


03U0PX-047

Removal / Installation note

Brake pipe

Loosen and tighten the brake pipes with the **SST**.



13U0PX-010

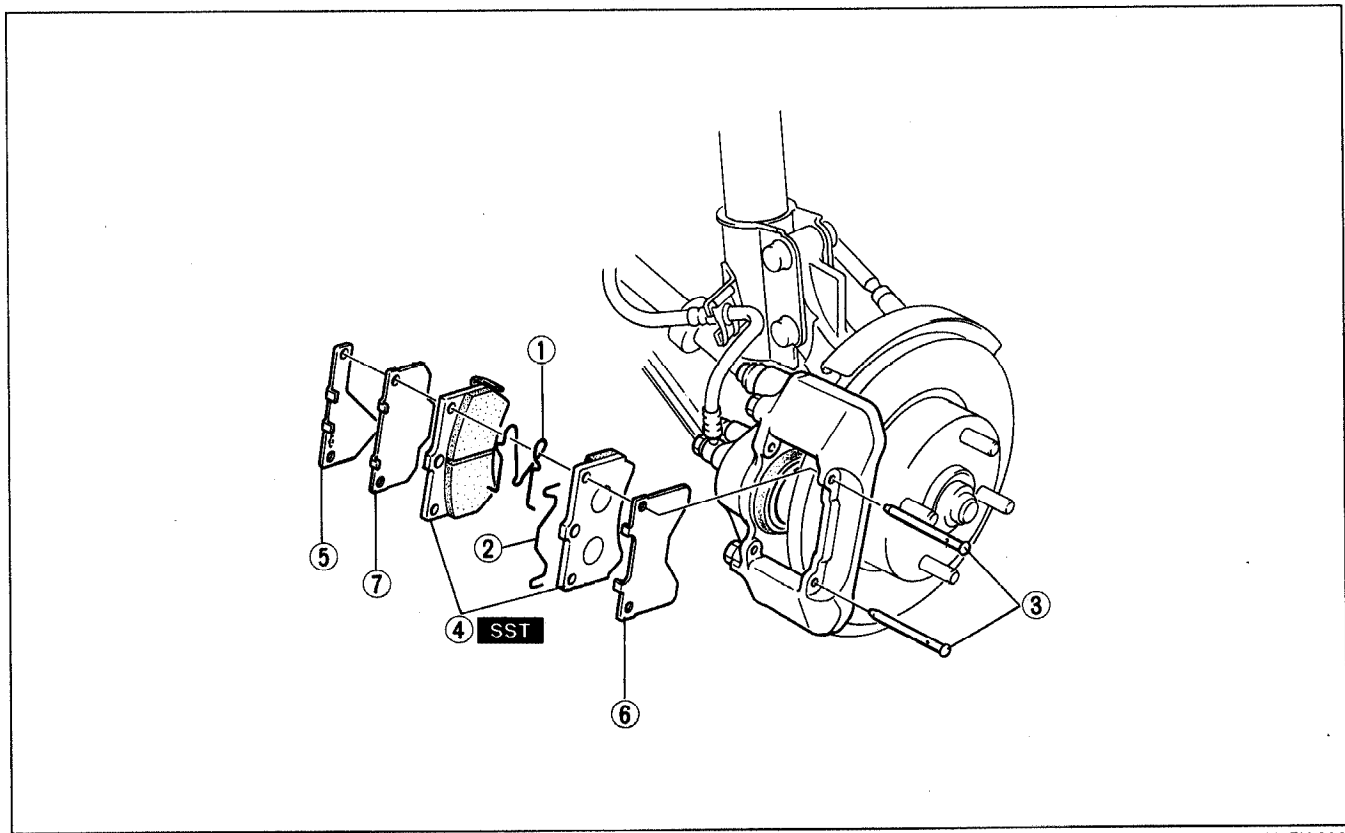
FRONT BRAKE (DISC)
Quick Inspection, On-vehicle
Disc pad

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Verify the remaining thickness of the pads.

Thickness: 2.0mm (0.08 in) min.

Replacement
Disc pad

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal, referring to **Installation Note**.

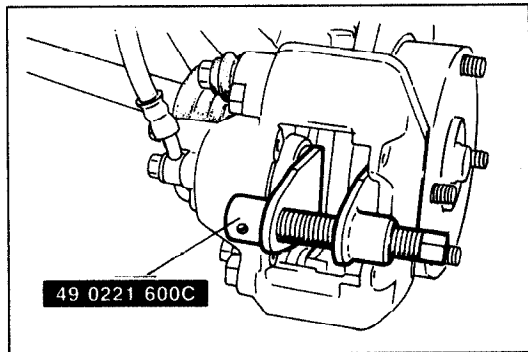


23U0PX-006

1. M-spring
2. W-pin
3. Pad pin

4. Disc pad
 Installation Note..... Below
 Inspection..... page P-20

5. Anti-squeak shim
6. Outer shim
7. Inner shim



49 0221 600C

13U0PX-012

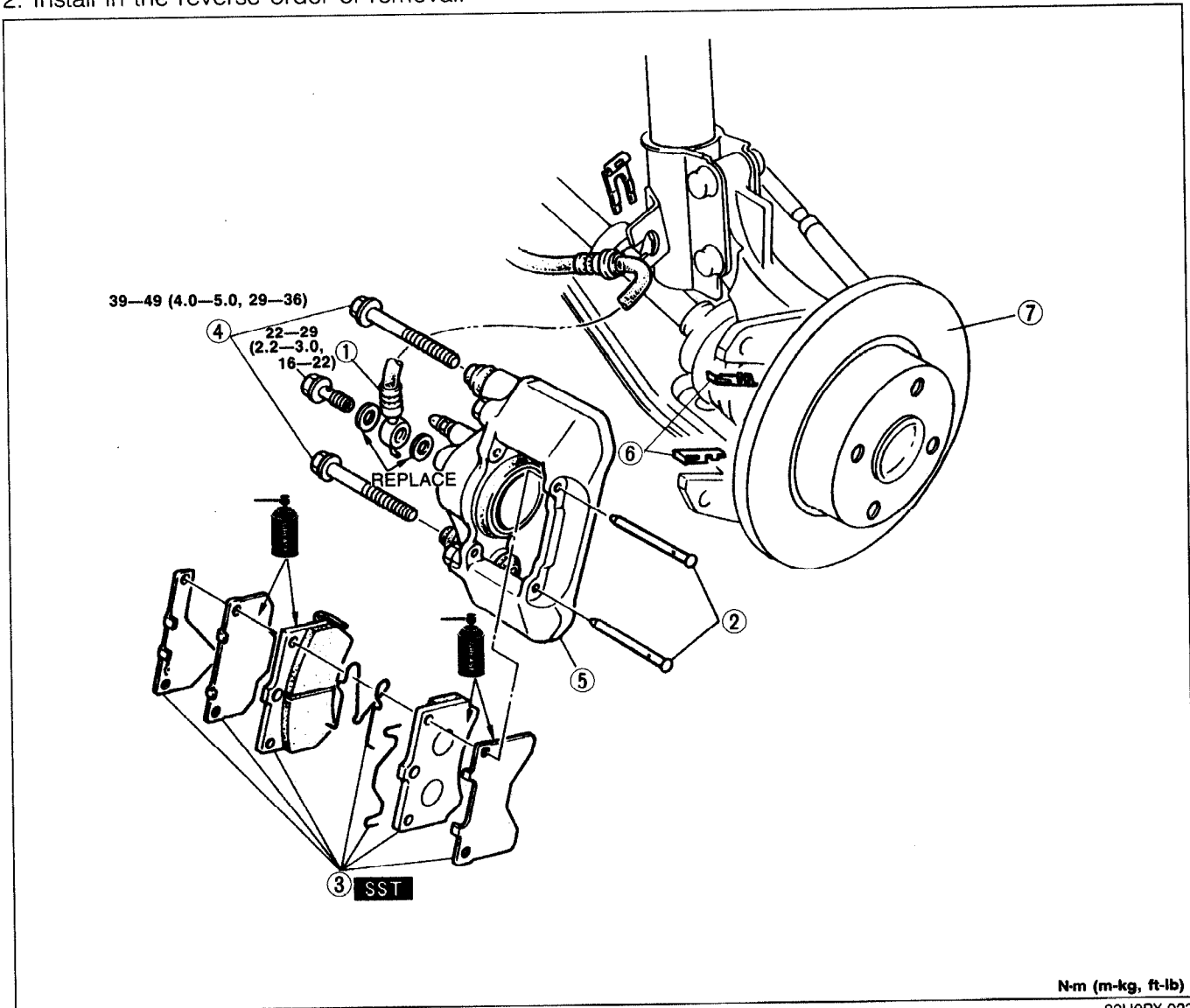
Installation note
Disc pad

When installing the disc pads, push the piston fully inward with the **SST** and an old pad.

Removal / Installation

Caliper

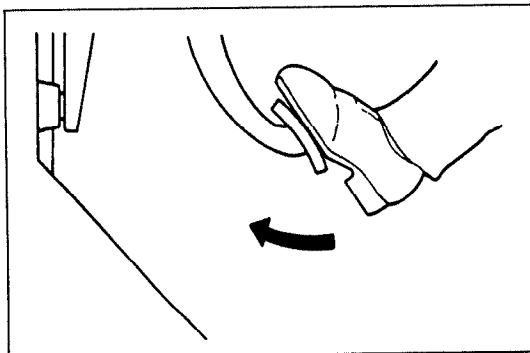
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



N-m (m-kg, ft-lb)

23U0PX-023

- | | |
|----------------------------|----------------------------|
| 1. Flexible hose | 5. Caliper |
| 2. Pad pin | Disassembly / Inspection / |
| 3. Disc pad assembly | Assembly page P-21 |
| Inspection page P-20 | 6. Guide plate |
| 4. Bolt | 7. Disc plate |
| | Inspection page P-20 |

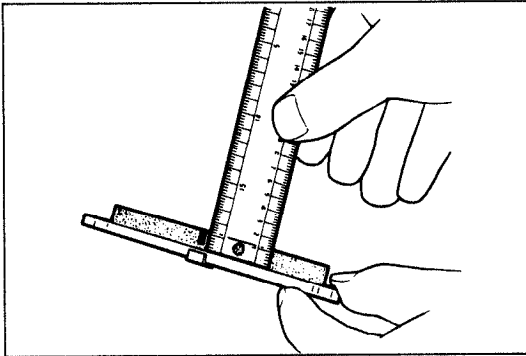


03U0PX-052

Caution

Take the following steps after installation:

- Add fluid and bleed the air. (Refer to page P-6.)
- Check for fluid leakage. (Refer to page P-8.)
- Depress the brake pedal a few times and check that the rear brakes do not drag while rotating the wheel.



23U0PX-015

Inspection

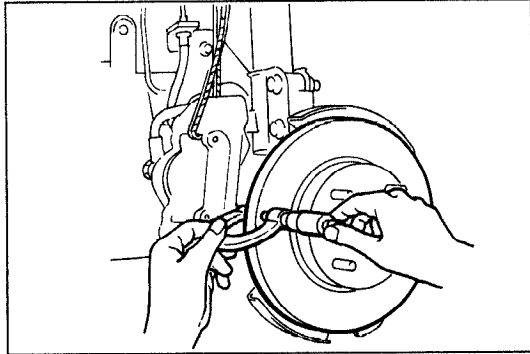
Check for the following and repair or replace parts as necessary.

Disc pad assembly

1. Check for oil or grease on the facing, abnormal wear or cracks, and deterioration or damage from heat.
2. Measure the thickness of the lining.

Specified thickness: 10mm (0.39 in)
Minimum : 2.0mm (0.08 in)

3. Check visually for damage or wear of the guide plate.



03U0PX-054

Disc plate

1. Measure the thickness of the disc plate.

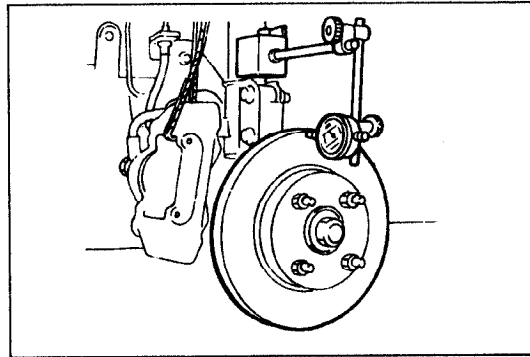
Standard: 22mm (0.87 in)
Minimum: 20mm (0.79 in)

2. Measure the runout at the outer edge of the contact surface of the disc pad.

Runout: 0.1mm (0.004 in) max.

Caution

- There must be no wheel bearing looseness.
- The measurement location is the outer edge of the disc plate surface.

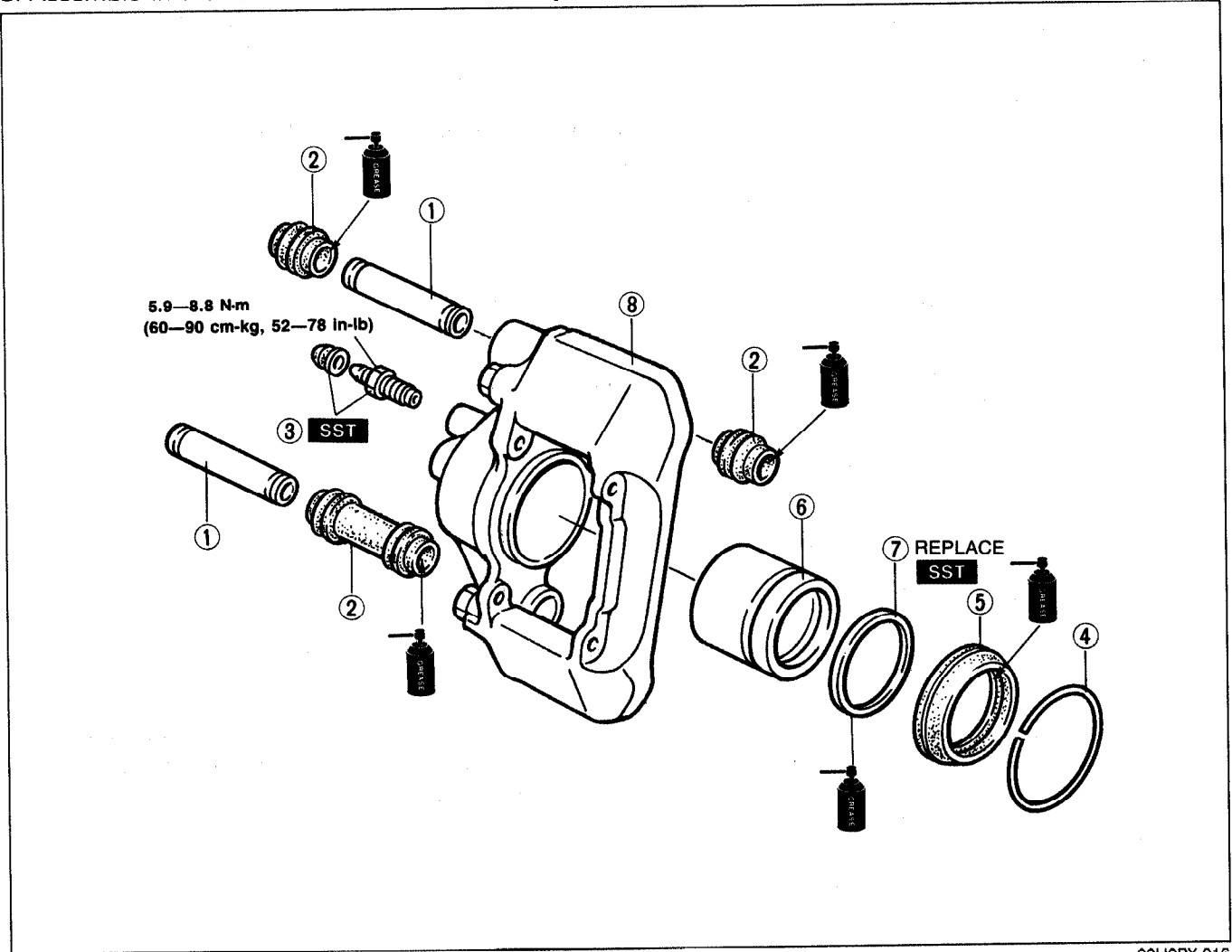


03U0PX-055

CALIPER

Disassembly / Inspection / Assembly

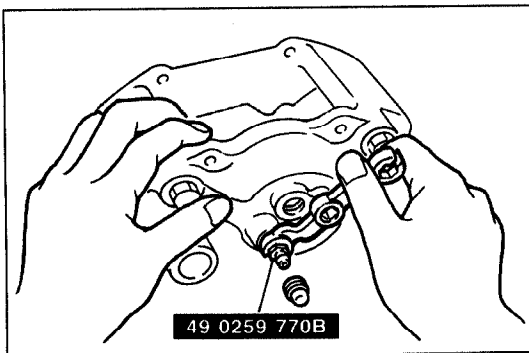
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly.



23U0PX-016

1. Sleeve pin
2. Boot
3. Rubber cap and bleeder screw Below
4. Retaining ring
5. Dust seal
6. Piston
Disassembly Note..... page P-22
Inspect for damage, wear and rust

7. Piston seal
Disassembly Note..... page P-22
8. Caliper body
Inspect for damage, wear and rust

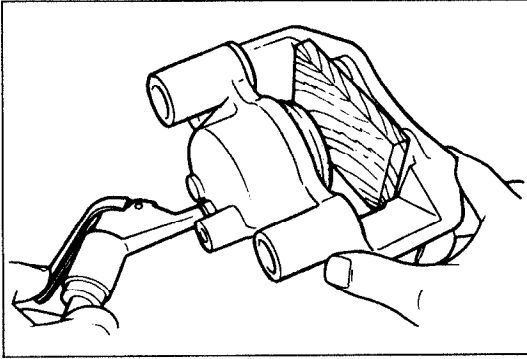


Disassembly note

Rubber cap and bleeder screw

Remove the rubber cap and remove the bleeder screw from the brake caliper with the **SST**.

03U0PX-057



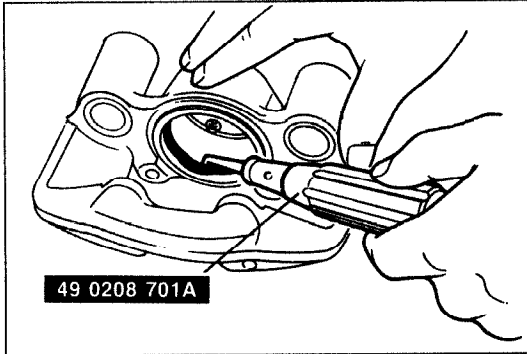
13U0PX-023

Piston

Place a piece of wood in the caliper; then blow compressed air through the hole to force the piston out of the caliper.

Caution

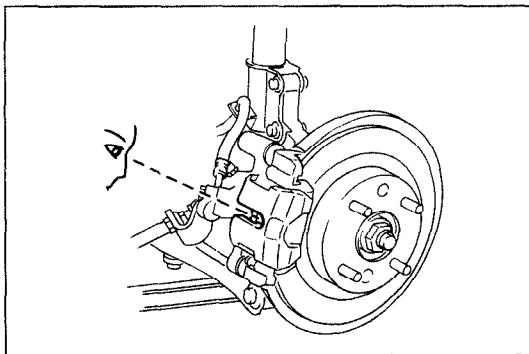
- **Blow the compressed air slowly to prevent the piston from suddenly popping out.**



03U0PX-058

Piston seal

Remove the piston seal from the brake caliper with the **SST**.



13U0PX-014

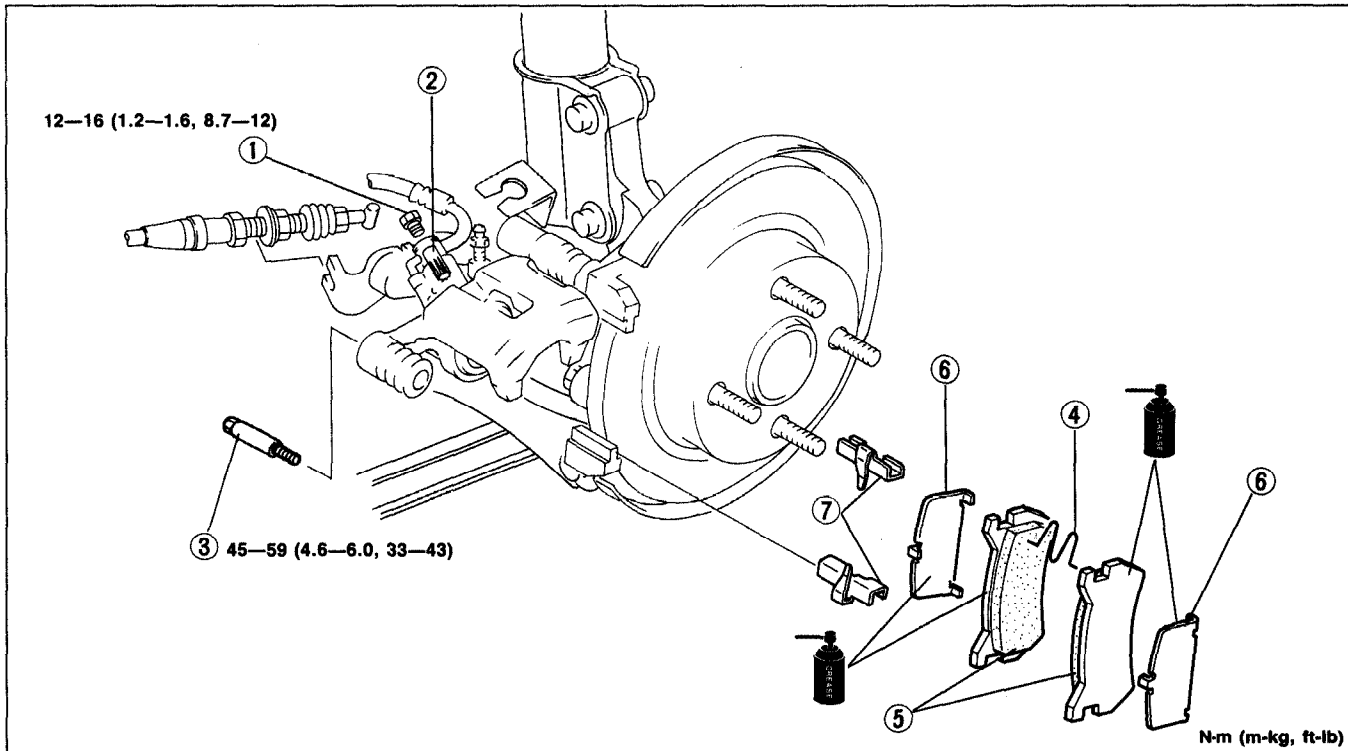
**REAR BRAKE (DISC)
Quick Inspection, On-vehicle
Disc pad**

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Verify that the remaining thickness of the pads.

Thickness: 1.0mm (0.04 in) min.

**Replacement
Disc pad**

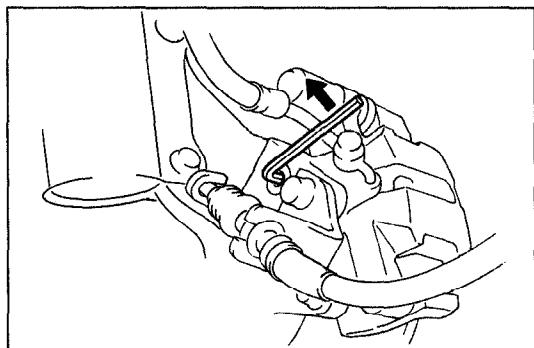
1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



23U0PX-017

1. Screw plug
2. Manual adjustment gear
Removal Note Below
Installation Note page P-24
3. Lock bolt

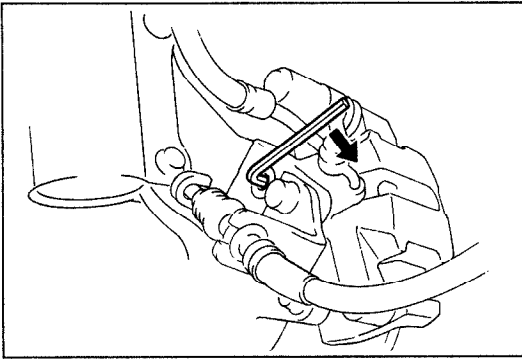
4. M-spring
5. Disc pad assembly
Inspection page P-25
6. Shim
7. Guide plate



03U0PX-062

**Removal note
Manual adjustment gear**

Turn the manual adjustment gear counterclockwise with an Allen wrench to pull the brake caliper piston inward. (Turn until it stops)



13U0PX-024

Installation note

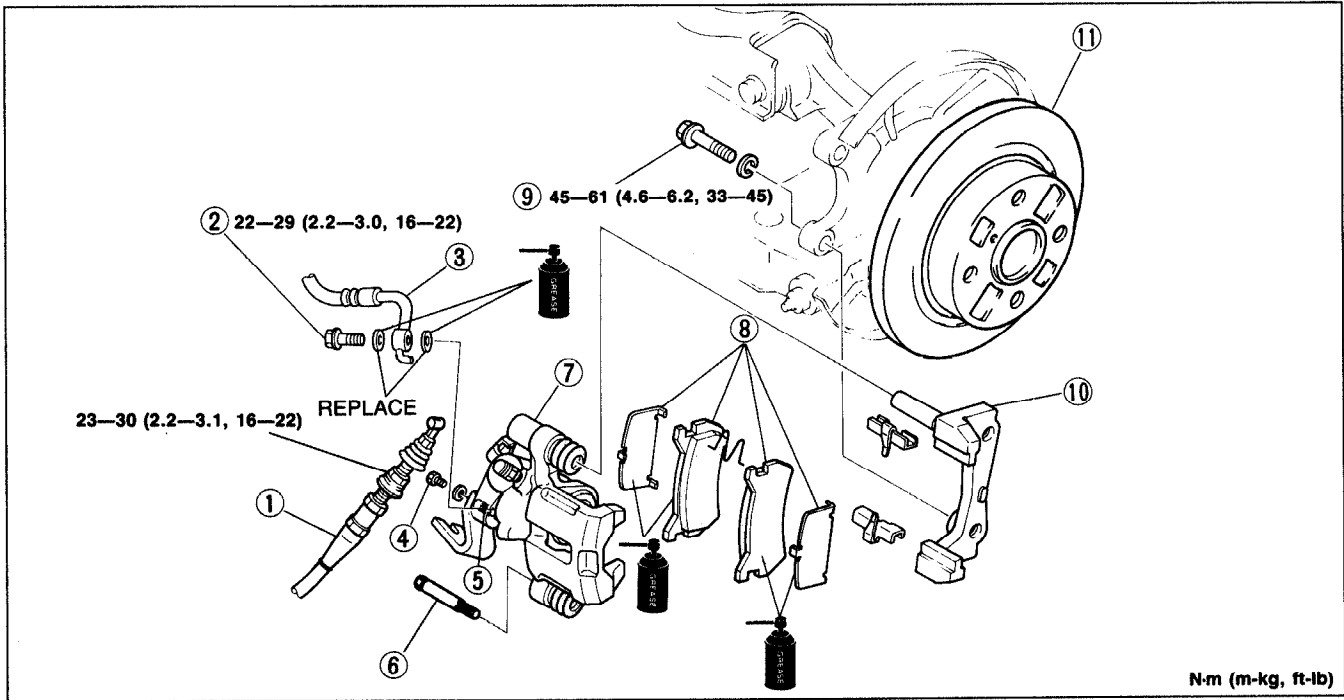
Manual adjustment gear

1. Turn the manual adjustment gear clockwise until the brake pads just touch the disc plate.
2. Return the manual adjustment gear 1/3-turn.

Removal / Installation

Caliper

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.
5. Tighten all nuts and bolts to the specified torques, referring to the figure.

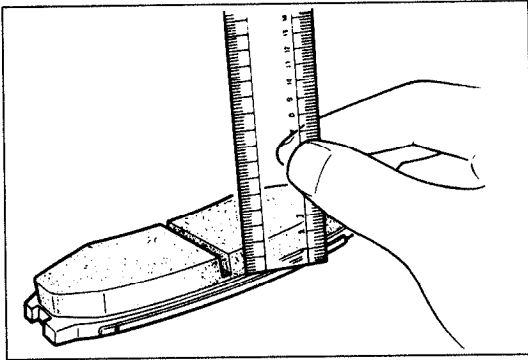


23U0PX-007

<p>1. Parking cable Removal / Inspection / Installation..... page P-32</p> <p>2. Connecting bolt</p> <p>3. Brake hose</p> <p>4. Screw plug</p> <p>5. Manual adjustment gear Removal Note..... page P-23 Installation Note..... page P-24</p> <p>6. Lock bolt</p>	<p>7. Caliper Disassembly / Inspection / Assembly..... page P-26</p> <p>8. Disc pad assembly Replacement..... page P-23 Inspection..... page P-25</p> <p>9. Bolt</p> <p>10. Mounting support</p> <p>11. Disc plate Inspection..... page P-25</p>
--	--

After installation:

- (1) Add brake fluid and bleed air. (Refer to page P-6.)
- (2) Adjust the parking brake lever stroke. (Refer to page P-31.)
- (3) Depress the brake pedal a few times and check that the rear brakes do not drag excessively while rotating the wheel by hand.



23U0PX-024

Inspection

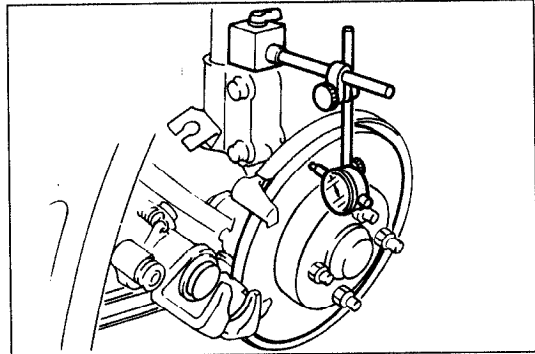
Check for the following and repair or replace parts as necessary.

Disc pad assembly

1. Oil or grease on facing
2. Abnormal wear or cracks
3. Deterioration or damage by heat
4. Remaining lining thickness

Specified thickness: 8.0mm (0.31 in)

Minimum: 1.0mm (0.04 in)



03U0PX-066

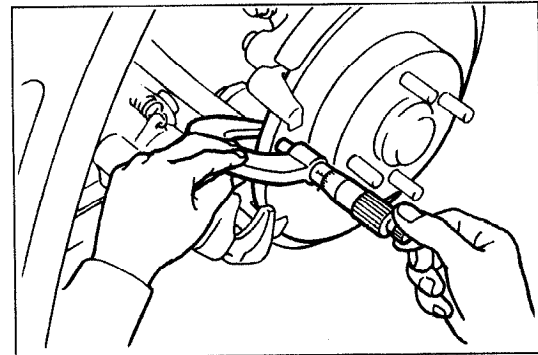
Disc plate

1. Runout

Runout: 0.1mm (0.004 in) max.

Caution

- There must be no wheel bearing looseness.
- The measurement location is the outer edge of the disc pad contact surface.



03U0PX-067

2. Wear or damage

Thickness

Standard: 9.0mm (0.35 in)

Minimum: 7.0mm (0.28 in)

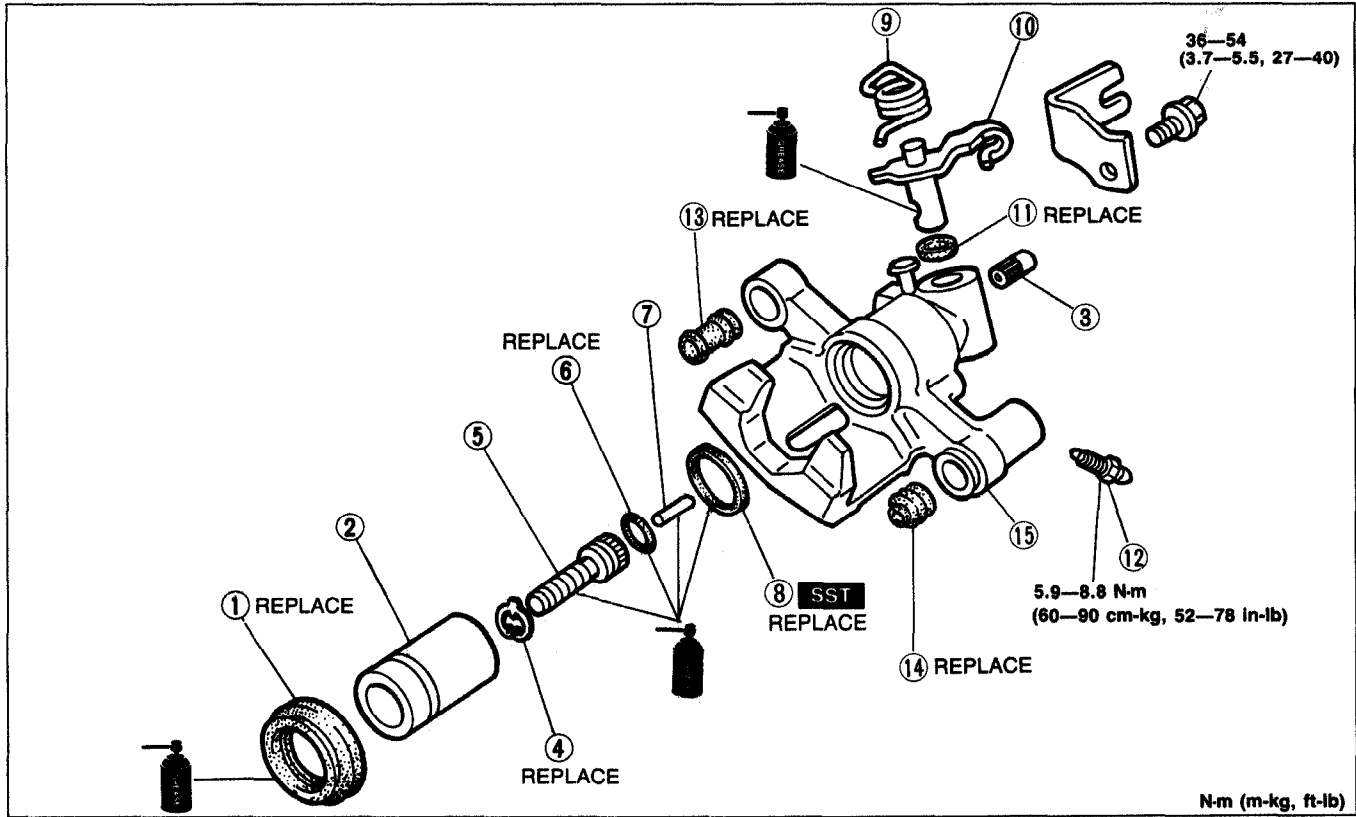
CALIPER

Disassembly / Inspection / Assembly

Caution

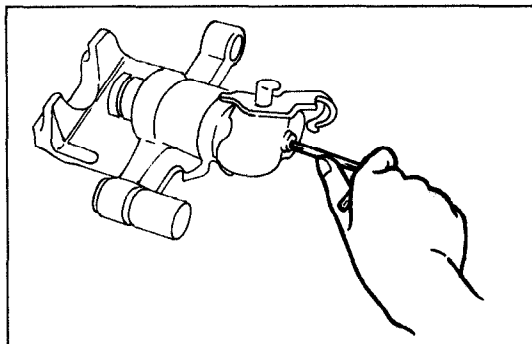
- Replace the caliper assembly if a problem is found.

1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



N-m (m-kg, ft-lb)
23U0PX-018

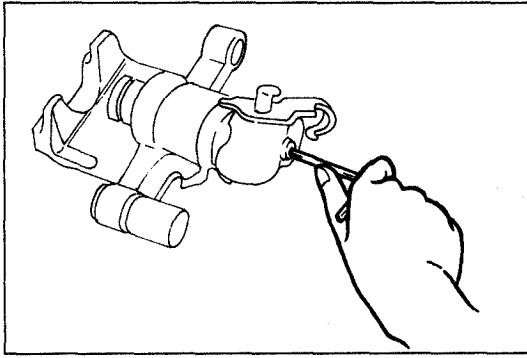
- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Dust seal
Inspect for damage and poor sealing 2. Piston
Disassembly Note..... Below
Assembly Note..... page P-27
Inspect for wear and rust 3. Manual adjustment gear 4. Snap ring 5. Adjusting bolt 6. O-ring 7. Connecting link | <ol style="list-style-type: none"> 8. Piston seal
Disassembly Note..... page P-22 9. Spring 10. Operating lever 11. Boot 12. Rubber cup and bleeder screw 13. Boot 14. Boot 15. Caliper body
Inspect for damage and cracks |
|---|--|



Disassembly note

Piston

1. Turn the adjustment gear clockwise with an Allen wrench to remove the piston from the adjustment gear. (Turn the adjustment gear until it becomes easy to turn.)

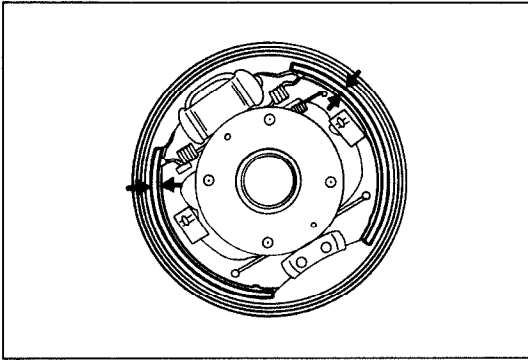


03U0PX-071

Assembly note

Piston

Insert the piston into the caliper and turn the adjustment gear counterclockwise with an Allen wrench to pull the piston inward. (Turn until it stops.)



13U0PX-017

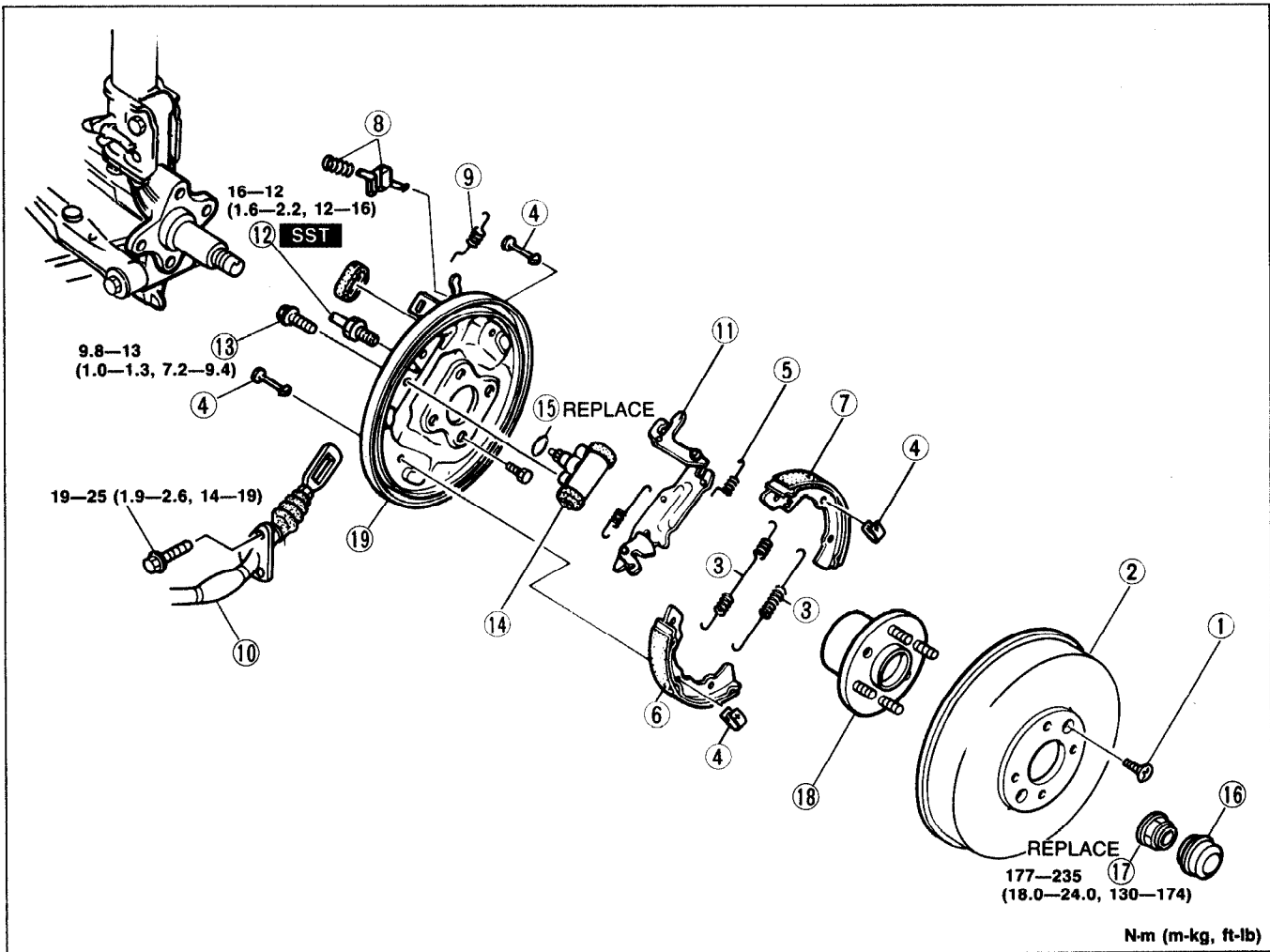
REAR BRAKE (DRUM)
Quick Inspection, On-vehicle

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove the brake drum. (See below)
4. Verify the remaining thickness of the lining.

Thickness: 1.0mm (0.04 in) min.

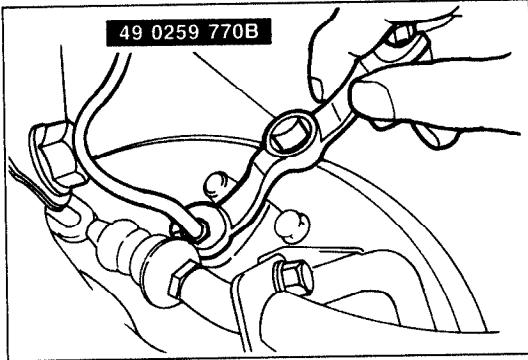
Removal / Inspection / Installation

1. Remove the lining in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.



23U0PX-019

- | | | |
|------------------------------|-------------------------------|----------------------------|
| 1. Screw | 7. Brake shoe (trailing side) | 13. Bolt |
| 2. Brake drum | Inspection Above | 14. Wheel cylinder |
| Inspection page P-29 | 8. Stopper spring and clip | Disassembly / Inspection / |
| Installation Note | 9. Return spring | Assembly page P-30 |
| page P-29 | 10. Parking brake cable | 15. Wheel cylinder gasket |
| 3. Return spring | 11. Operating lever assembly | 16. Hub cap |
| 4. Hold pin and spring | 12. Brake pipe | 17. Locknut |
| 5. Anti-rattle spring | Removal Note.. page P-29 | 18. Wheel hub |
| 6. Brake shoe (leading side) | | 19. Backing plate |
| Inspection Above | | |



03U0PX-075

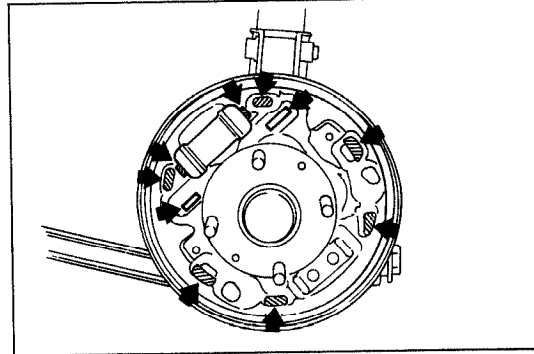
Removal note

Brake pipe

Disconnect or connect the brake pipe from/to the wheel cylinder with the **SST**.

Tightening torque:

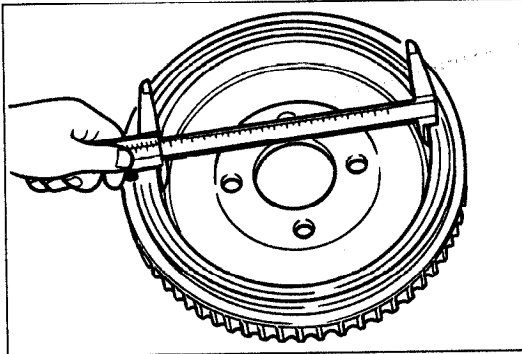
16—22 N·m (1.6—2.2 m·kg, 12—16 ft·lb)



03U0PX-076

Grease points

- (1) Piston of wheel cylinder
- (2) Anchor sliding parts
- (3) Projection of backing plate
- (4) Adjusting screw
- (5) Adjusting sleeve contact surfaces



23U0PX-025

Inspection

Check for the following and repair or replace parts as necessary.

Brake drum

1. Drum inner diameter

Standard diameter: 200mm (7.90 in)

Diameter limit : 201mm (7.91 in)

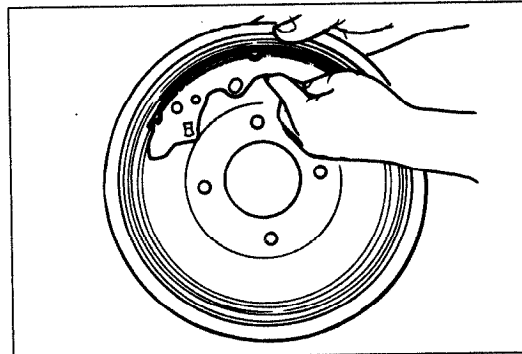
Caution

- **When repairing or replacing the drum, check the contact with the shoe.**

2. Scratches, uneven or abnormal wear inside drum

Note

- **Repair if the problem is minor.**

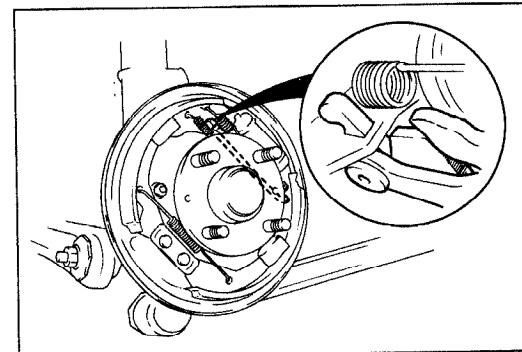


03U0PX-078

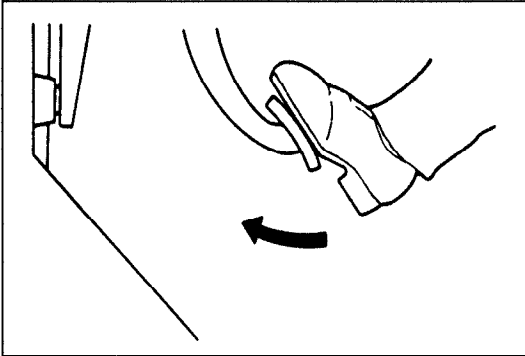
Installation note

Brake drum

Before installing the brake drum, depress the brake pedal to verify operation of the automatic adjuster.



13U0PX-019



23U0PX-020

Caution

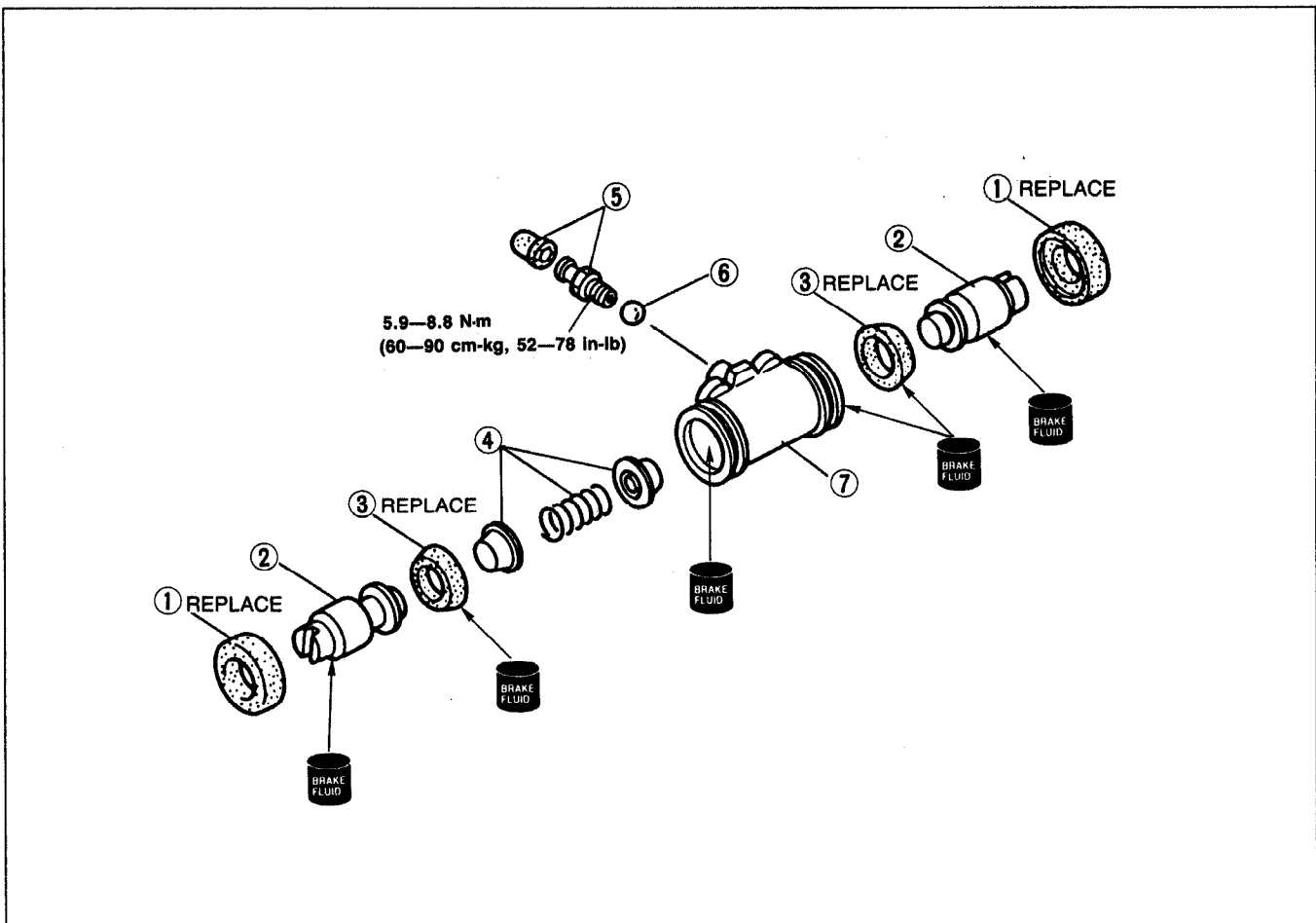
Take the following steps after installation:

- Add fluid and bleed the air. (Refer to page P-6.)
- Check for fluid leakage. (Refer to page P-8.)
- Depress the brake pedal a few times and check that the rear brakes do not drag while rotating the wheel.
- Check the parking brake lever stroke. (Refer to page P-31.)

WHEEL CYLINDER**Disassembly / Inspection / Assembly****Caution**

- If a problem is found in the wheel cylinder or the piston, replace the wheel cylinder as an assembly.

1. Disassemble the wheel cylinder in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly.



23U0PX-021

1. Dust boot
2. Piston
Inspect for corrosion and damage
3. Piston cup
4. Spring and caps

5. Rubber cup and bleeder screw
6. Steel ball
7. Wheel cylinder body
Inspect for corrosion and damage

PARKING BRAKE SYSTEM

TROUBLESHOOTING GUIDE

Problem	Possible cause	Remedy	Page
Brakes do not release	Improper return of parking brake cable or improper adjustment	Repair or adjust	P-32
Parking brake does not hold well	Excessive lever stroke Brake cable stuck or damaged Brake fluid or oil on pad or lining Hardening of pad / lining surface or poor contact	Adjust Repair or replace Clean or replace Grind or replace	P-31 P-32 — P-23,28

03U0PX-080

PARKING BRAKE SHOE

Removal / Inspection / Installation

Disc brake

Removal and Installation (Refer to page P-23)

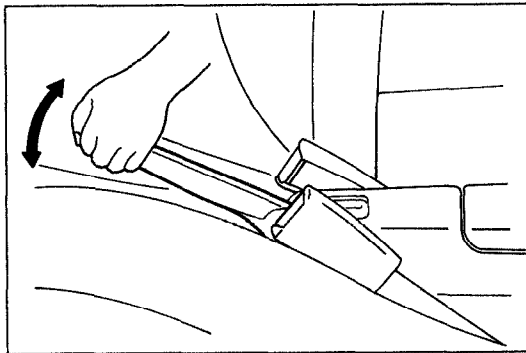
Inspection (Refer to page P-25)

Drum brake

Removal and Installation (Refer to page P-28)

Inspection (Refer to page P-29)

03U0PX-081



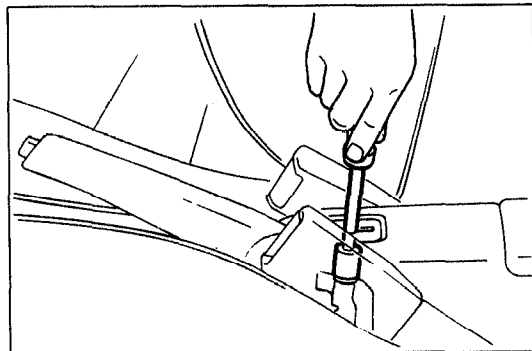
13U0PX-020

PARKING BRAKE (LEVER TYPE)

Inspection

Check that the stroke is within specification when the parking brake lever is pulled with a force of **98 N (10 kg, 22 lb)**.

Stroke: 5—7 notches



03U0PX-083

Adjustment

1. Before adjustment, start the engine and depress the brake pedal several times while the vehicle is moving in reverse.
2. Stop the engine.
3. Remove the screw and the parking brake lever cover.
4. Remove the adjusting nut clip and turn the adjusting nut at the front of the parking cable.
5. After adjustment, check the following points:
 - (1) Turn the ignition switch ON, pull the parking brake lever one notch, and check that the parking brake warning lamp illuminates.
 - (2) Verify that the rear brakes do not drag.

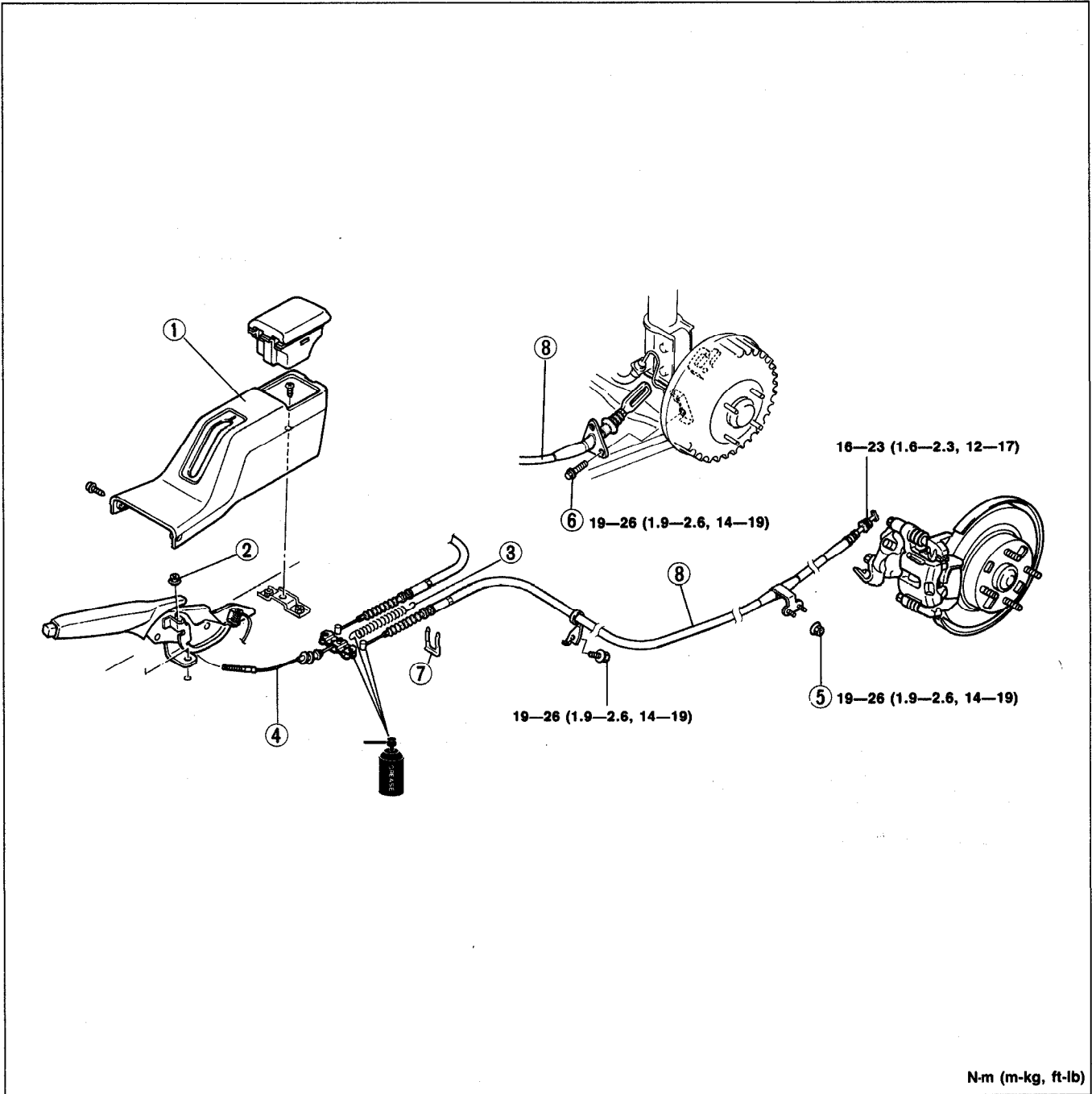
PARKING BRAKE CABLE

Removal / Inspection / Installation

Caution

- Adjust the parking brake lever stroke.
- Depress the brake pedal a few times and check that the rear brakes do not drag while rotating the wheels.

1. Remove the cable in the order shown in the figure.
2. Visually check each part, and replace it if necessary.
3. Install in the reverse order of removal.



1. Rear console
Removal / Installation
..... Section S
2. Adjusting nut

3. Return spring
4. Front parking cable
5. Nut (Disc brake type)
6. Bolt (Drum brake type)

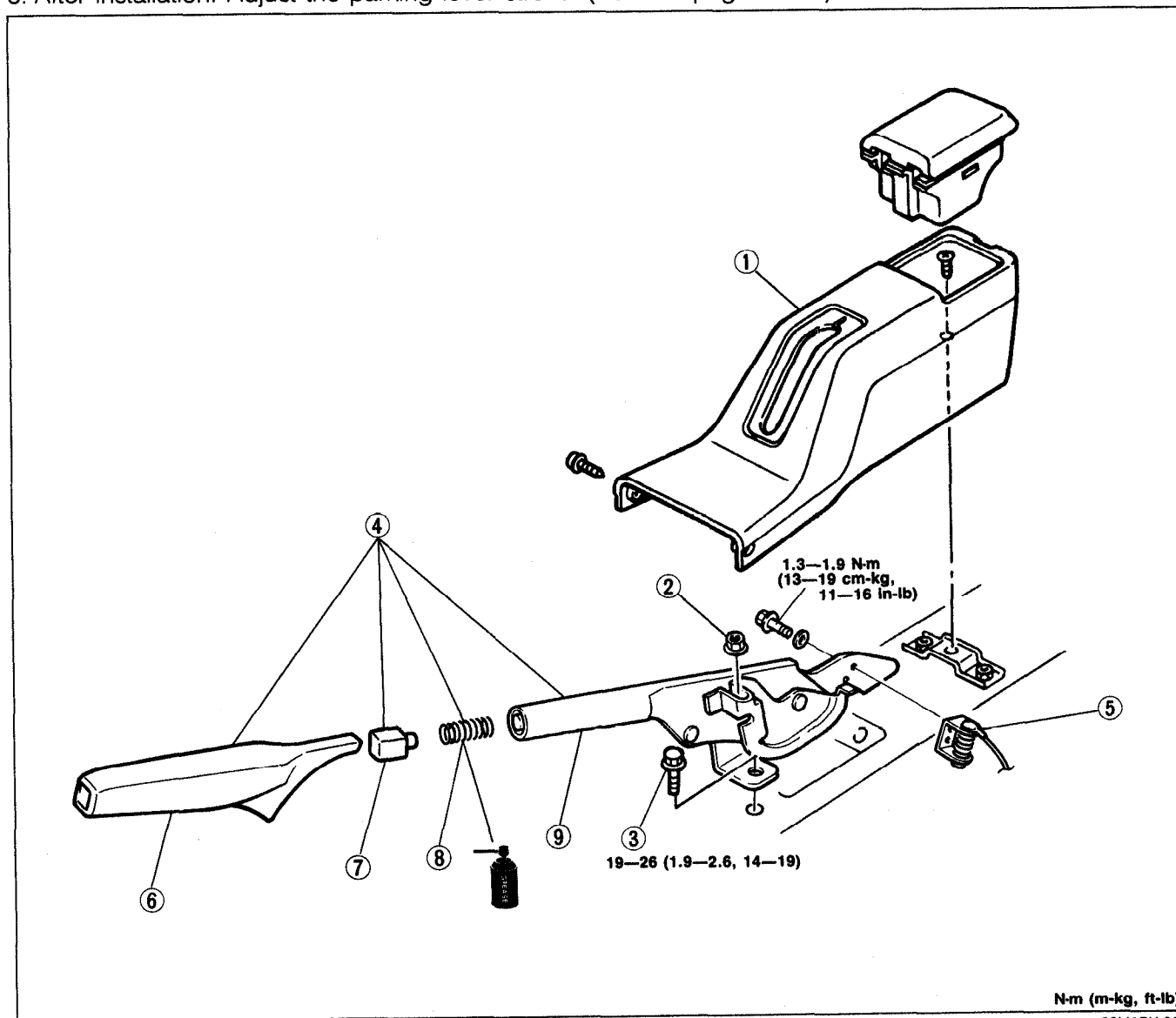
7. Clip
8. Rear parking cable
Inspect for damage and wear

PARKING BRAKE LEVER
Removal / Inspection / Installation

Caution

- Install the parking brake switch so that it contacts the parking brake lever when the lever is fully released.
- Turn the ignition switch ON, and check that the parking brake warning lamp illuminates with the lever pulled one notch.

1. Block the wheels firmly.
2. Release the parking brake.
3. Remove in the order shown in the figure.
4. Inspect all components and parts. Replace parts if necessary.
5. Install in the reverse order of removal.
6. After installation: Adjust the parking lever stroke. (Refer to page P-31.)



- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Rear console
Removal / Installation..... Section S 2. Adjusting nut 3. Bolt 4. Parking brake lever assembly
Inspect for damage and wear | <ol style="list-style-type: none"> 5. Parking brake switch 6. Parking brake cap 7. Release button 8. Parking lever spring 9. Parking brake lever |
|---|---|

WHEELS AND TIRES

OUTLINE	Q- 2
SPECIFICATIONS.....	Q- 2
TROUBLESHOOTING GUIDE	Q- 2
WHEELS AND TIRES	Q- 3
SPECIAL NOTES ABOUT WHEELS AND TIRES	Q- 3
NOTES REGARDING TIRE REPLACEMENT.	Q- 3
INSPECTION / ADJUSTMENT.....	Q- 3
REMOVAL / INSTALLATION	Q- 6
TIRE ROTATION	Q- 6
WHEEL BALANCE ADJUSTMENT	Q- 6

13U0QX-001

OUTLINE

SPECIFICATIONS

Item		Type	Standard			Temporary spare
Wheels	Size		13x5-J	14x5 1/2-JJ	14x4T	
	Offset	mm (in)	45 (1.77)			
	Pitch circle diameter	mm (in)	100 (3.94)			
	Material		Steel or aluminum alloy		Steel	
Tires	Size		P155/80R13 79S	P175/70R13 82S	P185/60R14 82H	T115/70D14
	Air pressure	kPa (kgf/cm ² , psi)	216 (2.2, 32)			415 (4.2, 60)

23U0QX-001

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Remedy	Page
Excessive or irregular tire wear	Refer to page Q-5 for details		
Premature tire wear	Incorrect tire pressure	Adjust	Q-3
Tire squeal	Incorrect tire pressure Tire deterioration	Adjust Replace	Q-3 —
Road noise or body vibration	Insufficient tire pressure Unbalanced wheel(s) Deformed wheel(s) or tire(s) Irregular tire wear	Adjust Adjust Repair or replace Replace	Q-3 Q-6 — Q-5
“Shake” occurs (Steering wheel vibrates up/down)	Excessive tire and wheel runout Loose lug nuts Unbalanced wheel(s) Cracked or worn engine mount rubber Cracked or worn transaxle mount rubber	Replace Tighten Adjust Replace Replace	— Q-4 Q-6 Sections B1, B2 Sections J1, J2
“Shimmy” occurs (Steering wheel vibrates left/right)	Excessive tire and wheel runout Loose lug nuts Unbalanced wheel(s) Irregular tire wear Insufficient tire pressure Damaged or worn front wheel bearing Malfunction of steering system Malfunction of suspension	Replace Tighten Adjust — Adjust Replace — —	— Q-4 Q-6 Q-5 Q-3 Section M Section N Section R
Steering wheel pulls to one side	Incorrect tire pressure Excessive or irregular tire wear Malfunction of steering system Malfunction of braking system Malfunction of suspension	Adjust — — — —	Q-3 Q-5 Section N Section P Section R
General driving instability	Unequal tire pressures Deformed wheel(s) or tire(s) Loose lug nuts Malfunction of steering system Malfunction of suspension	Adjust Repair or replace Tighten — —	Q-3 — Q-4 Section N Section R
Uneven (one-sided) braking	Unequal tire pressures Malfunction of braking system	Adjust —	Q-3 Section P
Heavy handling	Insufficient tire pressures Malfunction of steering system Malfunction of suspension	Adjust — —	Q-3 Section N Section R
Steering wheel doesn't return properly	Insufficient tire pressures Malfunction of steering system Malfunction of suspension	Adjust — —	Q-3 Section N Section R

23U0QX-002

WHEELS AND TIRES

SPECIAL NOTES ABOUT WHEELS AND TIRES

1. Do not use wheels or tires other than the specified types.
2. Aluminum wheels are easily scratched. When washing them, use a soft cloth, never a wire brush. If the vehicle is steam cleaned, do not allow boiling water to contact the wheels.
3. If alkaline compounds (such as saltwater or road salts) get on aluminum wheels, wash them as soon as possible to prevent damage. Use only a neutral detergent.

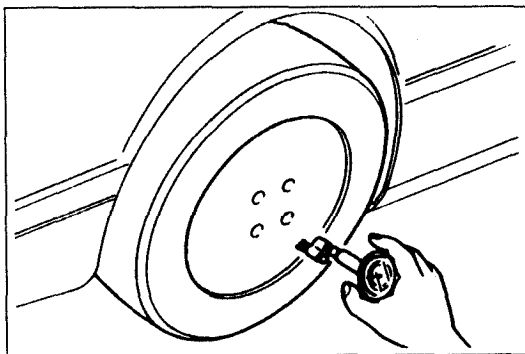
9MU0QX-004

NOTES REGARDING TIRE REPLACEMENT

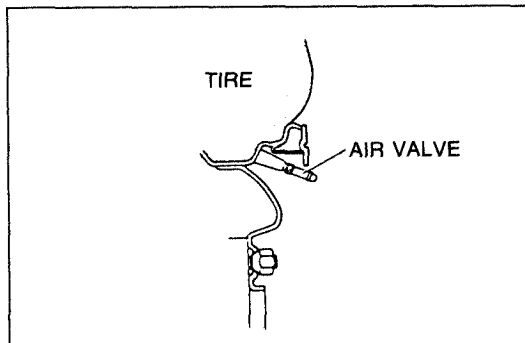
Note the following points when tires are to be removed from or mounted onto the wheels.

1. Be careful not to damage the tire bead, the rim bead, or the edge of the rim.
2. Use a wire brush, sandpaper, or cloth to clean and remove all rust and dirt from the rim edge and the rim bead.
3. When cleaning aluminum wheels, use a soft cloth, never a wire brush or sandpaper.
4. Remove any pebbles, glass, nails, and other foreign items embedded in the tire tread.
5. Be sure the air valve is installed correctly.
6. Apply a soapy solution to the tire bead and the edge of the rim.
7. After mounting a tire onto a wheel, inflate the tire to 250—300 kPa (2.55—3.06 kg/cm², 35.55—42.66 psi). Check to be sure that the bead is seated correctly onto the rim and that there are no air leaks. Then reduce the pressure to the specified level.
8. If a tire iron is used to change a tire on an aluminum wheel, be sure to use a piece of rubber between the iron lever and the wheel to avoid damage to the wheel. Work should be done on a rubber mat, not on a hard or rough surface.

03U0QX-004



23U0QX-003



13U0QX-008

INSPECTION / ADJUSTMENT

Air Pressure

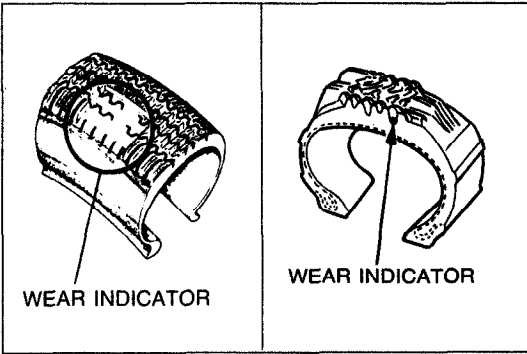
Air pressure

Check the air pressure of all tires, including the spare tire, with an air pressure gauge. If necessary, adjust the air pressure.

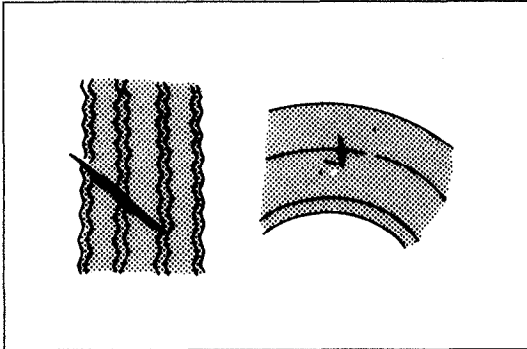
Tire Size	Air Pressure kPa (kg/cm ² , psi)	
	Front Tires	Rear Tires
P155/80R13 79S P175/70R13 82S P185/60R14 82H	216 (2.2, 32)	216 (2.2, 32)
T115/70D14	415 (4.2, 60)	

Air Leakage

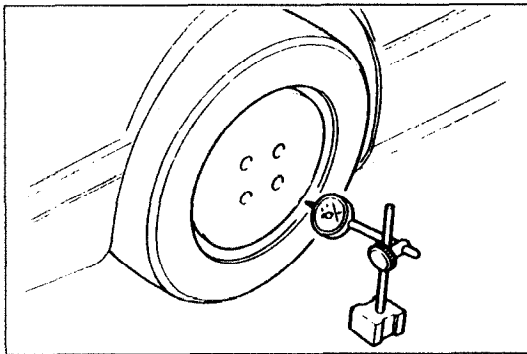
Verify that there is no air leakage from the air valve.



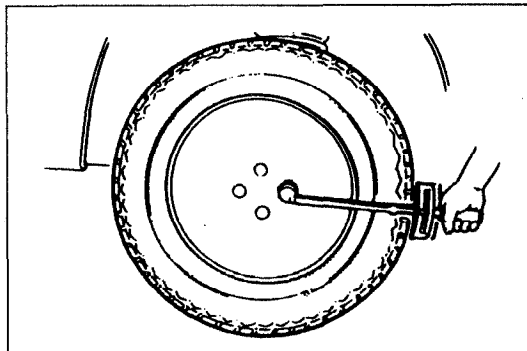
13U0QX-009



13U0QX-010



23U0QX-004



13U0QX-012

Tire Wear

1. Check the remaining tread.

Remaining tread

Standard tires: 1.6mm (0.063 in) min.

Snow tires: 50% of tread

2. The tire should be replaced if the wear indicators are exposed.

Inspection (Tire and Wheel)

The wheel or tire should be replaced if any crack, damage, deformation or other problem is found.

Wheel and Tire Runout

1. Jack up the vehicle and place it on safety stands.
2. Set the probe of a dial indicator against the wheel, and measure the runout through one full revolution.

Runout:

Horizontal	Aluminum wheel: 2.0 (0.079), Steel wheel: 2.5 (0.098)
Vertical	1.5 (0.059)

3. Replace the wheel if necessary.

Caution

- **Adjust wheel balance after replacement of a wheel or tire.**

Lug Nut

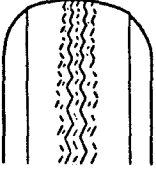
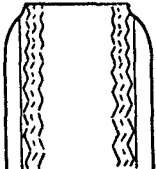
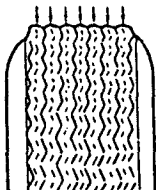
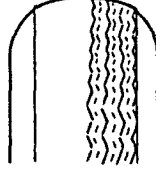
1. Verify that the lug nuts are tightened to the specified torque.

Tightening torque:

88—118 N·m (9—12 m·kg, 65—87 ft·lb)

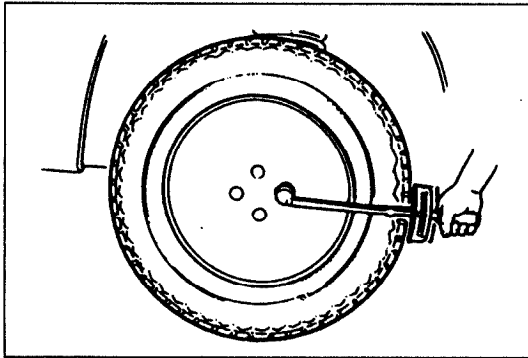
Irregular Tire Wear

Abnormal tire wear patterns, such as shown in the illustration, may occur. Refer to the chart for the possible causes and remedies.

Wear condition	Possible cause	Remedy
<p>SHOULDER WEAR</p> 	<ul style="list-style-type: none"> • Underinflation (both sides worn) • Hard cornering • Lack of rotation 	<ul style="list-style-type: none"> • Measure and adjust pressure • Reduce speed • Rotate tires
<p>CENTER WEAR</p> 	<ul style="list-style-type: none"> • Overinflation • Lack of rotation 	<ul style="list-style-type: none"> • Measure and adjust pressure • Rotate tires
<p>FEATHERED EDGE</p> 	<ul style="list-style-type: none"> • Incorrect toe adjustment 	<ul style="list-style-type: none"> • Adjust toe-in
<p>UNEVEN WEAR</p> 	<ul style="list-style-type: none"> • Incorrect camber or caster • Malfunctioning suspension • Unbalanced wheel • Out-of-round brake drum or disc • Lack of rotation 	<ul style="list-style-type: none"> • Repair or replace axle or suspension parts • Repair or replace suspension • Balance or replace • Correct or replace • Rotate tires

Q

03U0QX-011



13U0QX-005

REMOVAL / INSTALLATION

1. The wheel-to-hub contact surfaces must be clean.
2. Tighten the lug nuts to the specified torque.

Tightening torque:

88—118 N·m (9—12 m·kg, 65—87 ft·lb)

Caution

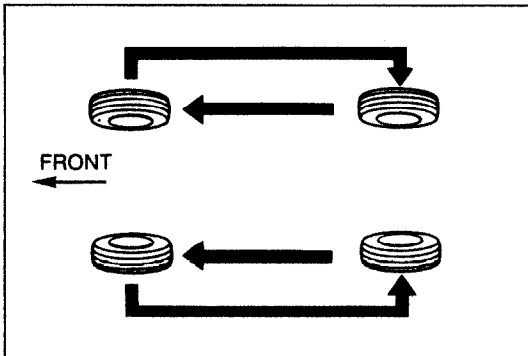
- When reinstalling a wheel, retighten the lug nuts to the specified torque after about 1,000 km (620 miles) driving.

TIRE ROTATION

To prolong tire life and assure uniform tire wear, rotate the tires from every 3,000 km (1,860 miles) to every 6,000 km (3,720 miles).

Caution

- Do not include "TEMPORARY USE ONLY" spare tire in rotation.
- Use the best tires on the front axle.
- After rotating the tires, adjust each tire to the specified air pressure. (Refer to page Q-3.)



13U0QX-006

WHEEL BALANCE ADJUSTMENT

If a wheel becomes unbalanced or if a tire is replaced or repaired, the wheel must be rebalanced to within specification.

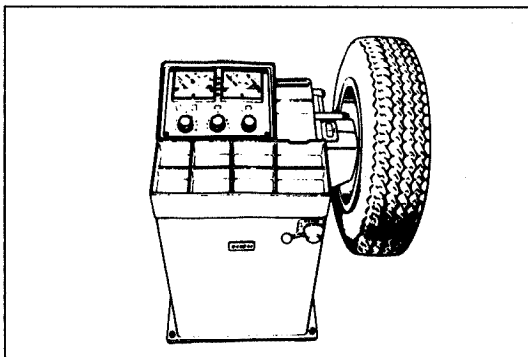
Maximum unbalance (at rim edge)

13 inch wheel: 11 g (0.39 oz)

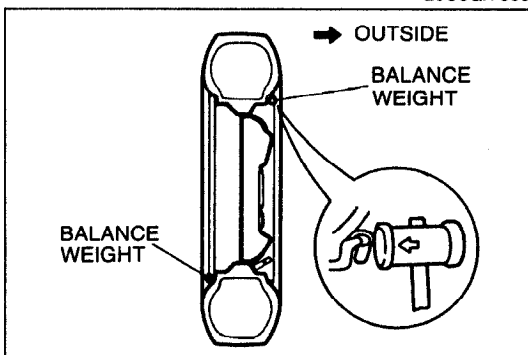
14 inch wheel: 10 g (0.35 oz)

Caution

- Do not use more than two balance weights on the inner or outer side of the wheel.
- If the total weight exceeds 100g (3.5 oz) per side, rebalance after moving the tire around on the rim.
- Attach the balance weights tightly on the wheel.
- Select suitable balance weights for steel or aluminum alloy wheels.
- Do not use an on-car balancer on automatic trans-axle models; it may cause transaxle damage.



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SUSPENSION

INDEX	R- 2
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INDEX

FRONT SUSPENSION

FRONT WHEEL ALIGNMENT

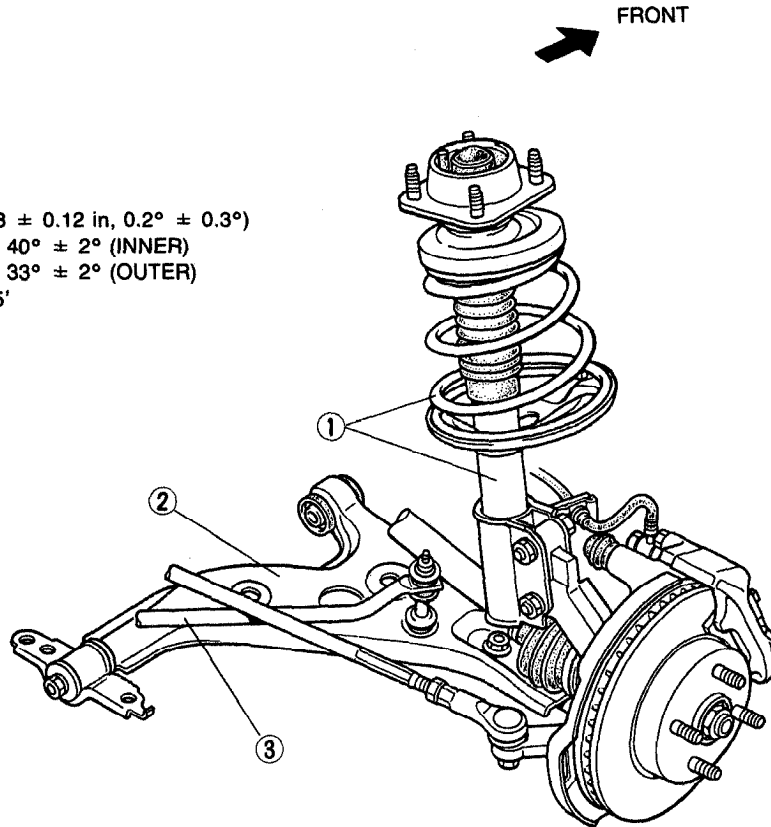
TOTAL TOE-IN: $2 \pm 3\text{mm}$ ($0.08 \pm 0.12\text{ in}$, $0.2^\circ \pm 0.3^\circ$)

MAXIMUM STEERING ANGLE: $40^\circ \pm 2^\circ$ (INNER)
 $33^\circ \pm 2^\circ$ (OUTER)

CAMBER ANGLE: $-0^\circ 05' \pm 45'$

CASTER ANGLE: $1^\circ 55' \pm 55'$

KINGPIN ANGLE: $12^\circ 25'$



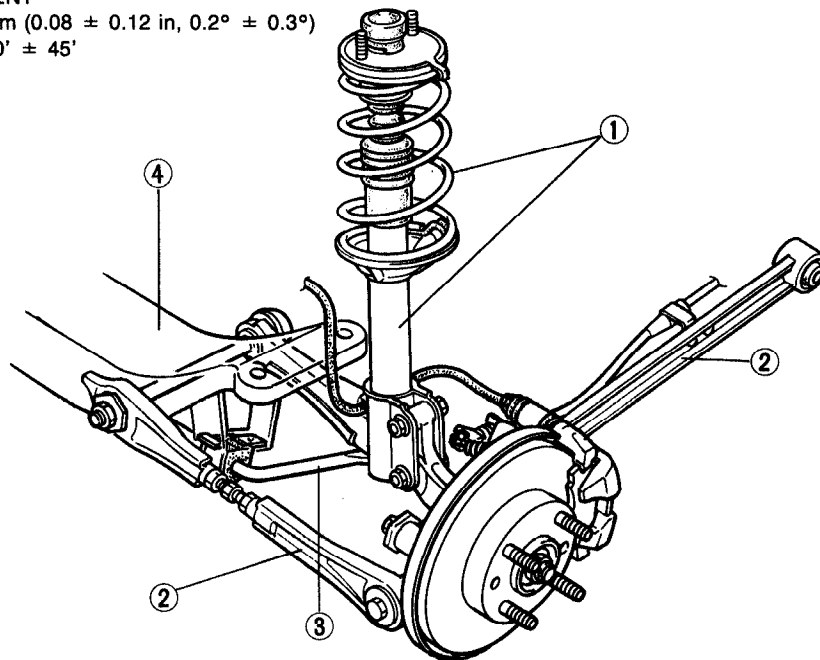
23U0RX-002

- 1. Front shock absorber and spring
 - Removal / Installation..... page R-11
 - Disassembly / Inspection..... page R-12
 - Inspection..... page R-13
 - Assembly..... page R-14
- 2. Front lower arm
 - Removal / Inspection /
Installation..... page R-16
 - Inspection..... page R-17

- 3. Front stabilizer
 - Removal / Inspection /
Installation..... page R-18

REAR SUSPENSION

REAR WHEEL ALIGNMENT
 TOTAL TOE-IN: $2 \pm 3\text{mm}$ ($0.08 \pm 0.12\text{ in}$, $0.2^\circ \pm 0.3^\circ$)
 CAMBER ANGLE: $-0^\circ 20' \pm 45'$



23UORX-003

- | | |
|--|--|
| <p>1. Rear shock absorber and spring
 Removal / Installation..... page R-21
 Disassembly / Inspection..... page R-22
 Inspection..... page R-23
 Assembly..... page R-24</p> <p>2. Lateral link and trailing link
 Removal / Inspection /
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 Removal / Inspection /
 Installation..... page R-27</p> <p>4. Rear crossmember
 Removal / Installation..... page R-29</p> |
|--|--|

OUTLINE

SPECIFICATIONS

Item				Specification
Suspension type				Strut
Shock absorber				Double-acting, oil-filled
Coil spring	Type	Front		Taper wound
		Rear		Straight wound
	Dimension		See coil spring specification below	
Stabilizer	Type			Torsion bar
	Diameter mm (in)	BP SOHC	Front	19.1 (0.75) (Hollow type)
			Rear	20.0 (0.79) (Hollow type)
		BP DOHC	Front	22.0 (0.87) (Solid type)
			Rear	21.0 (0.83) (Solid type)
		B6 SOHC	Front	—
			Rear	20.0 (0.79) (Hollow type)
Wheel alignment (*1Unladen)	Front	Maximum steering angle	Inner	40° ± 2°
			Outer	33° ± 2°
		Total toe-in	mm (in)	2 ± 3 (0.08 ± 0.12)
			degree	0.2° ± 0.3°
		Camber angle		-0°05' ± 45'
		Caster angle		1°55' ± 55'
	Kingpin angle		12°25'	
	Rear	Total toe-in	mm (in)	2 ± 3 (0.08 ± 0.12)
			degree	0.2° ± 0.3°
Camber angle		-0°20' ± 45'		

23U0RX-004

*1 Fuel tank full; radiator coolant and engine oil at specified levels; and spare tire, jack, and tools in designated positions.

Coil Spring Specifications (See next page for coil spring applications)

Item	Wire diameter mm (in)	Coil center diameter mm (in)	Free length mm (in)	Coil number	Identification mark color		
					M*1	A*2	
Front	A	13.1 (0.52)	133.5–159.5 (5.26–6.28)	294.5 (11.59)	3.22	Light green	Yellow
	B	13.3 (0.52)	133.7–159.9 (5.26–6.30)	300.5 (11.83)	3.43	Purple	
	C	13.4 (0.53)	132.6–158.6 (5.22–6.24)	301.5 (11.87)	3.49	Light blue	
	D	13.7 (0.54)	132.9–158.9 (5.23–6.26)	302.0 (11.89)	3.52	Pink	White
	E	13.6 (0.54)	132.8–158.8 (5.23–6.25)	301.5 (11.87)	3.56	Orange	Blue
Rear	F	11.0 (0.43)	129.0 (5.08)	335.0 (13.19)	3.83	Pink	—
	G	11.2 (0.44)	128.8 (5.07)	334.0 (13.15)	3.94	Brown	—
	H	11.3 (0.44)	128.7 (5.07)	333.5 (13.13)	3.90	Blue	—
	I	11.5 (0.45)	128.5 (5.06)	333.0 (13.11)	4.02	Gray	—
	J	11.6 (0.46)	128.4 (5.06)	332.5 (13.09)	4.00	Orange	—

23U0RX-005

*1 Main identification mark color: Indicated on second coil from bottom.

*2 Auxiliary identification mark color: Indicated on third coil from bottom.

Coil Spring Applications

Model	Engine	Transaxle	Sun roof	Front		Rear	
				USA	Canada	USA	Canada
PROTEGÉ	BP SOHC	5MTX	—	B	A	I	H
		4EATX	—	C	B	H	H
	BP DOHC	5MTX	—	C	—	I	—
			○	E	—	J	I
		4EATX	—	E	—	I	—
			○	D	—	J	—
HATCHBACK	B6 SOHC	5MTX	—	A	A	G	G
		4EATX	—	B	B	G	F
	BP SOHC	5MTX	—	—	B	—	G
		4EATX	—	—	B	—	G

5MTX Manual transaxle (5-speed)

4EATX..... Electronically controlled automatic transaxle (4-speed)

23U0RX-006

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Action	Page
Body "rolls"	Weak stabilizer Worn or deteriorated stabilizer bushing Worn or deteriorated lower arm bushing Malfunction of shock absorber	Replace Replace Replace Replace	R-18, 27 R-18, 27 R-16 R-11, 21
Poor riding comfort	Weak coil spring Malfunction of shock absorber	Replace Replace	R-12, 22 R-11, 21
Body leans	Weak coil spring Worn or deteriorated stabilizer bushing Worn or deteriorated lower arm bushing	Replace Replace Replace	R-12, 22 R-18, 27 R-16
Abnormal noise from suspension system	Poor lubrication or wear of lower arm ball joint Looseness of peripheral connections Malfunction of shock absorber Worn or deteriorated stabilizer bushing Worn or deteriorated lower arm bushing	Lubricate or replace Tighten Replace Replace Replace	R-16 — R-11, 21 R-18, 27 R-16
General driving instability	Weak coil spring Malfunction of shock absorber Worn or deteriorated lower arm bushing Worn or deteriorated stabilizer bushing Improperly adjusted wheel alignment Damaged lower arm ball joint Malfunction of steering system Damaged or unbalanced wheel(s)	Replace Replace Replace Replace Adjust Replace — —	R-12, 22 R-11, 21 R-16 R-18, 27 R- 7 R-16 Section N Section Q
Heavy steering	Poor lubrication or wear of lower arm ball joint Improperly adjusted wheel alignment Malfunction of steering system Damaged or unbalanced wheel(s)	Lubricate or replace Adjust — —	R-16 R- 7 Section N Section Q
Steering wheel pulls to one side	Weak coil spring Worn or deteriorated stabilizer bushing Worn or deteriorated lower arm bushing Damaged lower arm ball joint Improperly adjusted wheel alignment Malfunction of steering system Malfunction of braking system Damaged or unbalanced wheel(s)	Replace Replace Replace Replace Adjust — — —	R-12, 22 R-18, 27 R-16 R-16 R- 7 Section N Section P Section Q
"Shimmy" occurs (Steering wheel vibrates left/right)	Damaged lower arm ball joint Malfunction of shock absorber Loose shock absorber mounting Worn or deteriorated lower arm bushing Worn or deteriorated stabilizer bushing Improperly adjusted wheel alignment Damaged or worn wheel bearing Malfunction of steering system Damaged or unbalanced wheel(s)	Replace Replace Tighten Replace Replace Adjust Replace — —	R-16 R-11, 21 R-11, 21 R-16 R-18, 27 R- 7 Section M Section N Section Q
Steering wheel doesn't return properly	Stuck or damaged lower arm ball joint Improperly adjusted wheel alignment Malfunction of steering system Damaged or unbalanced wheel(s)	Replace Adjust — —	R-16 R- 7 Section N Section Q

23U0RX-007

WHEEL ALIGNMENT

PRE-INSPECTION

1. Check the tire inflations and set to the recommended pressure, if necessary.
2. Inspect the front wheel bearing play; replace the bearing if necessary.
3. Inspect the wheel and tire runout.
4. Inspect the ball joints and steering linkage for any excessive looseness.
5. The vehicle must be on level ground and have no luggage or passenger load.
6. The difference in height between the left and right sides from the center of the wheel to the fender brim must not exceed **10mm (0.39 in)**.
7. Shake the vehicle to check operation of the shock absorbers.

03U0RX-007

FRONT WHEEL ALIGNMENT

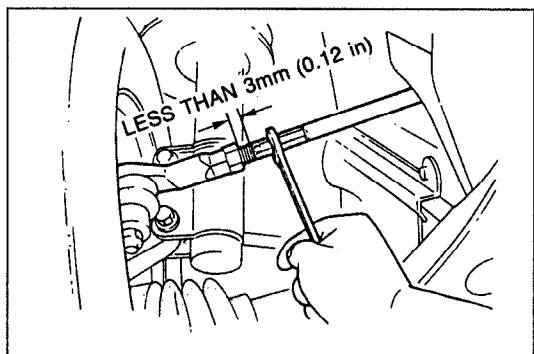
Specifications

Item			Specifications		
Wheel alignment (* ¹ Unladen)	Front	Maximum steering angle	Inner	$40^{\circ} \pm 2^{\circ}$	
			Outer	$33^{\circ} \pm 2^{\circ}$	
		Total toe-in	mm (in)	$2 \pm 3 (0.08 \pm 0.12)$	
			degree	$0.2^{\circ} \pm 0.3^{\circ}$	
		Camber angle			$-0^{\circ}05' \pm 45'$
		Caster angle			$1^{\circ}55' \pm 55'$
Kingpin angle			$12^{\circ}25'$		

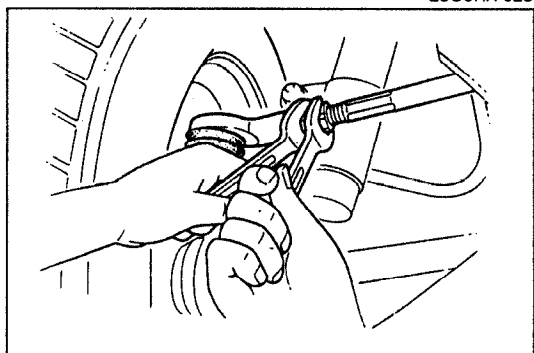
*¹ Fuel tank full; radiator coolant and engine oil at specified level; and spare tire, jack, and tools in designated positions.

23U0RX-008

R



23U0RX-023



23U0RX-024

Adjustments

Maximum steering angle

1. Loosen the left and right tie rod locknuts, then turn the tie rods equally.

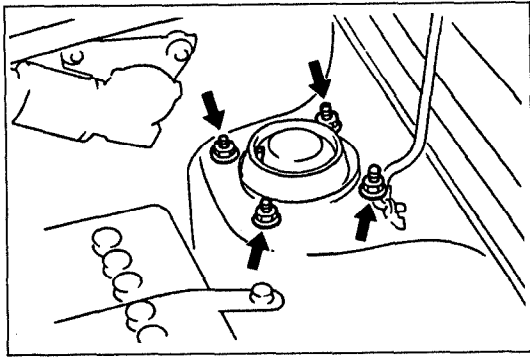
Maximum left/right difference: 3mm (0.12 in)

2. Tighten the tie rod locknuts.

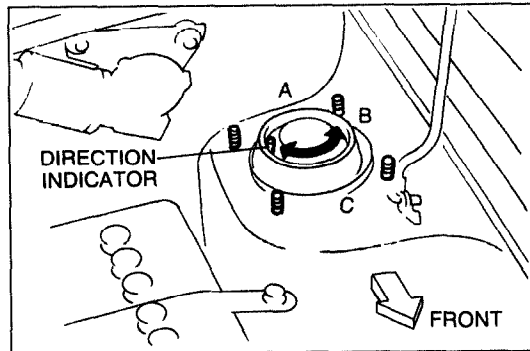
Tightening torque:

34—50 N·m (3.5—5.1 m·kg, 25—37 ft·lb)

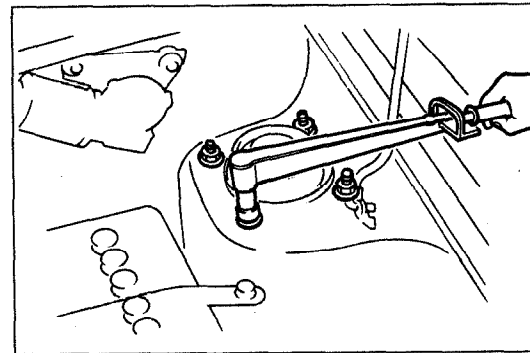
3. Adjust the toe-in after adjusting the steering angle.
4. Inspect and adjust the toe-in after adjusting the turning angle.



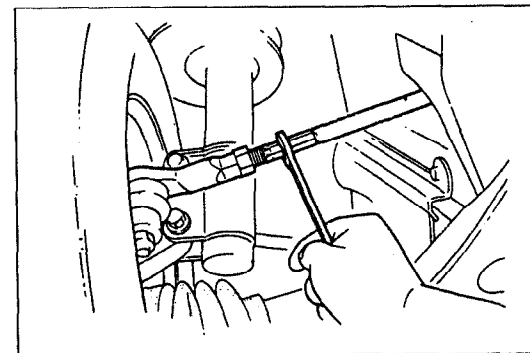
13U0RX-009



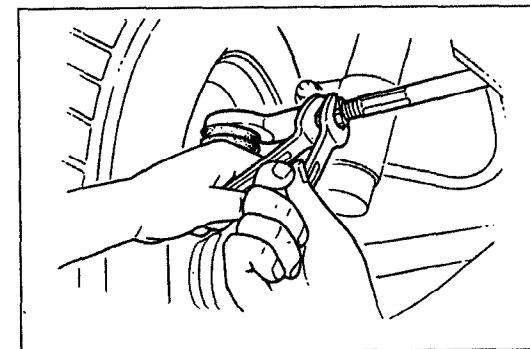
13U0RX-010



03U0RX-012



23U0RX-025



23U0RX-026

Camber and Caster

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the mounting block nuts.

3. Push the mounting block downward, and turn it to the desired position.

Direction indicator position	Difference from standard position	
	Camber angle	Caster angle
A	+14'	+14'
B	+29'	0°
C	+14'	-14'

4. Install and tighten the mounting nuts to the specified torque.

Tightening torque:

29—40 N·m (3.0—4.1 m·kg, 22—30 ft·lb)

Total toe-in

1. Loosen the left and right tie rod locknuts, then turn the tie rods equally.

Caution

- The left and right tie rods are both right threaded, so, to increase the toe-in, turn the right tie rod toward the front of the vehicle and the left tie rod equally toward the rear.
- One turn of the tie rod (both sides) changes the toe-in by about 6mm (0.24 in).

2. Tighten the tie rod locknuts.

Tightening torque:

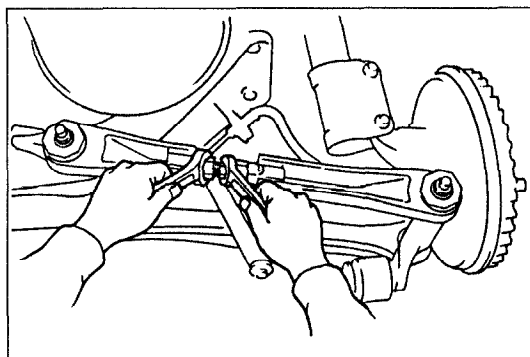
34—50 N·m (3.5—5.1 m·kg, 25—37 ft·lb)

REAR WHEEL ALIGNMENT Specifications

Item			Specifications
Wheel alignment (* ¹ Unladen)	Rear	Total toe-in	2 ± 3 (0.08 ± 0.12)
			mm (in)
			degree
		Camber angle	-0°20' ± 45'

*¹ Fuel tank full; radiator coolant and engine oil at specified level; and spare tire, jack, and tools in designated positions.

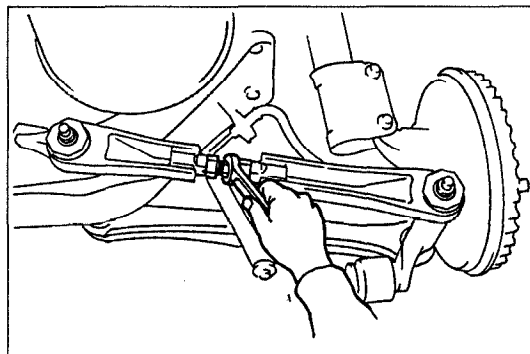
13U0RX-012



13U0RX-013

Adjustment Total toe-in

1. Loosen the lateral link locknuts.

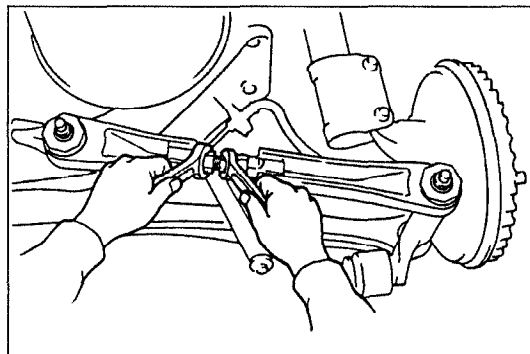


03U0RX-016

2. Turn the lateral link adjustment link to adjust.

Note

- One turn of the link changes 11.3mm (0.44 in).



03U0RX-017

3. Tighten the lateral link locknuts to the specified torque.

Tightening torque:


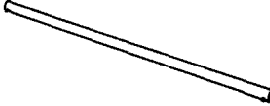
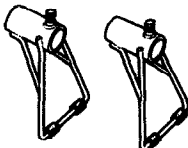
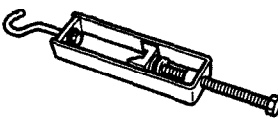
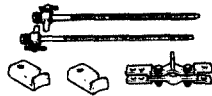



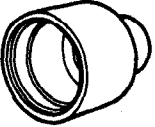
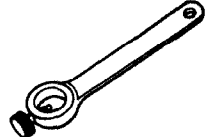
55—64 N·m (5.6—6.5 m·kg, 41—47 ft·lb)

R

FRONT SUSPENSION (STRUT)

PREPARATION

SST

<p>49 G017 5A0 Support, engine</p> 	<p>For support of engine</p>	<p>49 G017 501 Bar (Part of 49 G017 5A0)</p> 	<p>For support of engine</p>
<p>49 G017 502 Support (Part of 49 G017 5A0)</p> 	<p>For support of engine</p>	<p>49 G017 503 Hook (Part of G017 5A0)</p> 	<p>For support of engine</p>
<p>49 G034 1A0 Compressor coil spring</p> 	<p>For disassembly and assembly of coil spring</p>	<p>49 G034 101 Body (Part of 49 G034 1A0)</p> 	<p>For disassembly and assembly of coil spring</p>
<p>49 G034 102 Screw (Part of 49 G034 1A0)</p> 	<p>For disassembly and assembly of coil spring</p>	<p>49 G034 103 Arm (Part of 49 G034 1A0)</p> 	<p>For disassembly and assembly of coil spring</p>
<p>49 1243 785 Installer boot</p> 	<p>For installation of ball joint dust boot</p>	<p>49 0180 510B Attachment, steering worm bearing preload measuring</p> 	<p>For measurement of ball joint preload</p>

23U0RX-015

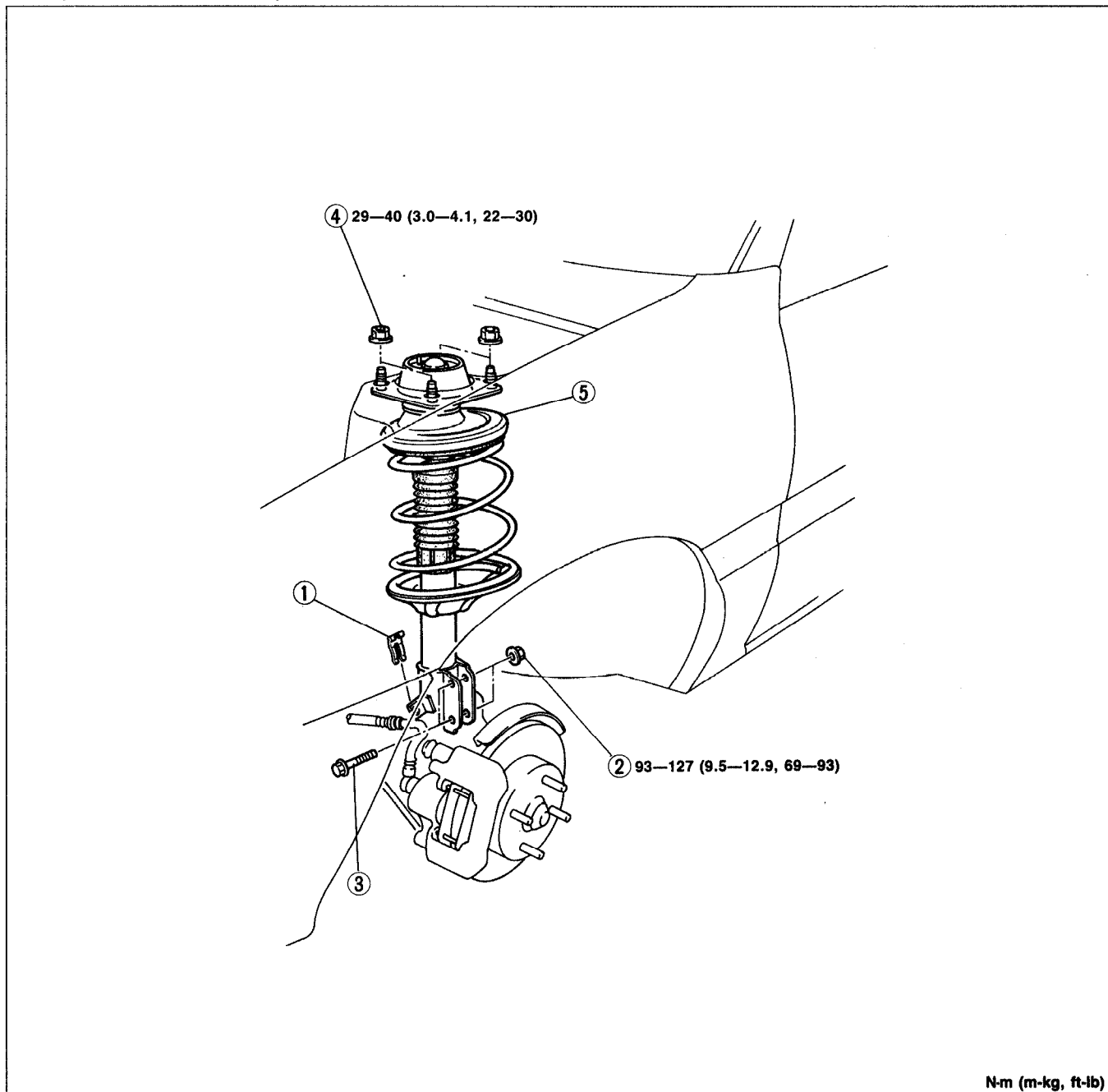
FRONT SHOCK ABSORBER AND SPRING

Removal / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal, referring to **Installation Note**.
5. After installation, measure the front wheel alignment, and adjust it if necessary.

Caution

- **Retighten the shock absorber lower bolts to the specified torque after lowering the vehicle (unladen condition).**

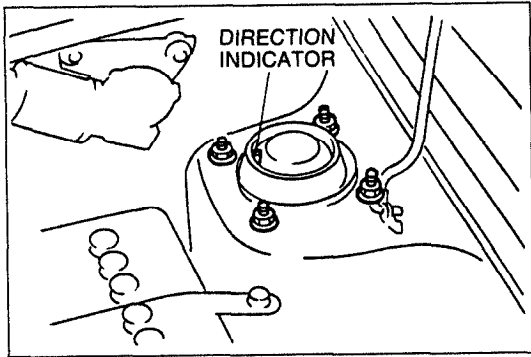


N·m (m·kg, ft·lb)

23U0RX-016

1. Clip
2. Nut
3. Bolt
4. Nut

5. Shock absorber and spring	
Disassembly	page R-12
Inspection	page R-13
Assembly	page R-14
Installation Note	page R-12



23U0RX-017

Installation note

Shock absorber and spring

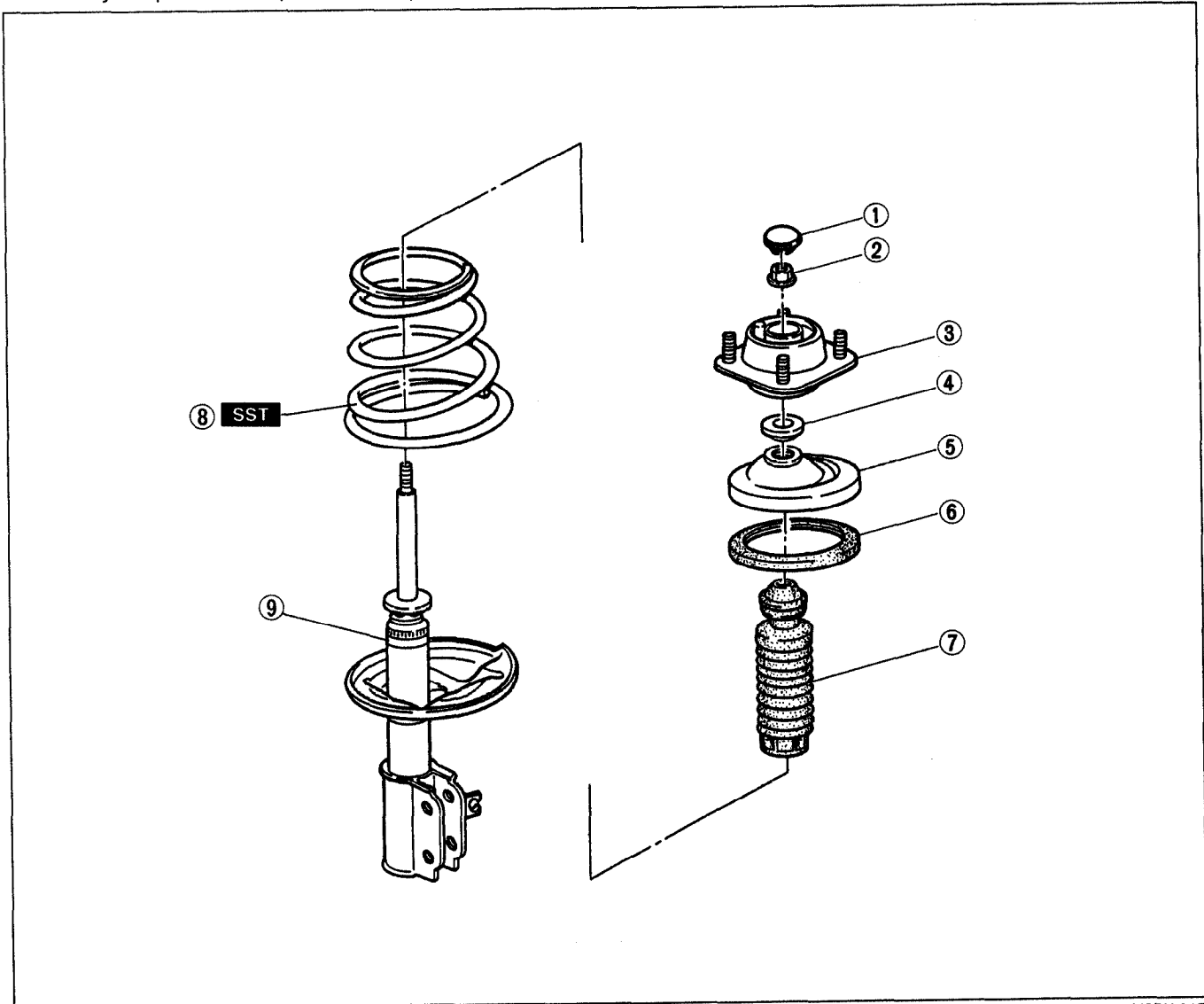
1. Face the direction indicator of the mounting block inboard, and install the shock absorber and spring.

Note

- When facing the indicator to other position, the camber and caster are changed as shown in the page R-8.

Disassembly / Inspection

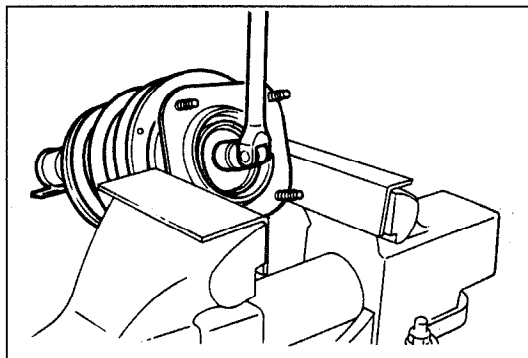
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Visually inspect each part and replace as necessary.



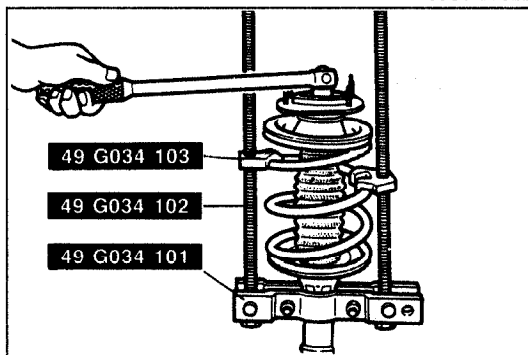
13U0RX-017

1. Cap
2. Piston rod nut
Disassembly Note page R-13
3. Mounting block
4. Thrust bearing

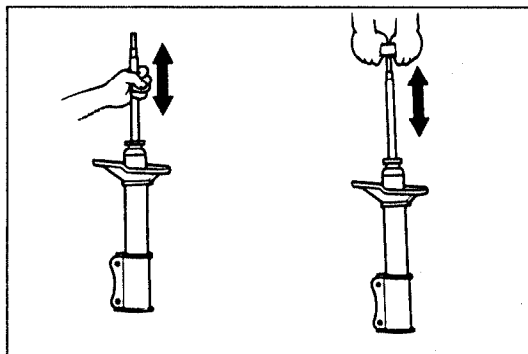
5. Upper spring seat
6. Rubber spring seat
7. Bound stopper
8. Coil spring
9. Shock absorber
Inspection page R-13



03U0RX-022



03U0RX-023



03U0RX-024

Disassembly note

Piston rod nut

1. Secure the mounting block in a vise.

Caution

- Use protective plates in the jaws of the vise.

2. Loosen the piston rod nut a few turns. **Do not remove it.**

Caution

- Do not remove the nut.

3. Compress the coil spring with the **SST**.

4. Remove the piston rod nut.

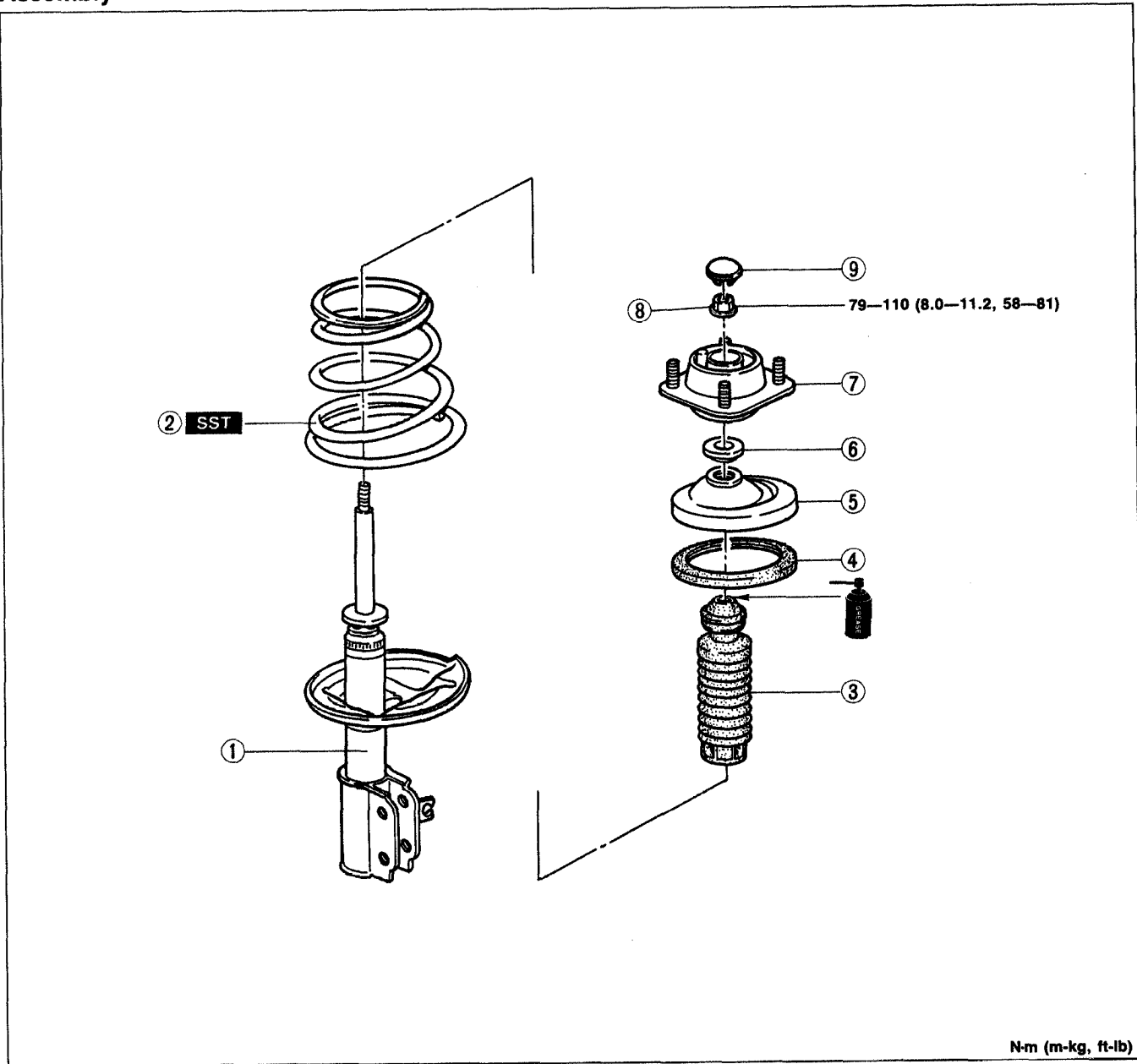
5. Remove the coil spring.

Inspection

Check for the following and replace the shock absorber if necessary.

Secure a handle to the piston rod, and compress and expand the shock piston at least three times. Verify that the operational force does not change and that there is no unusual noise.

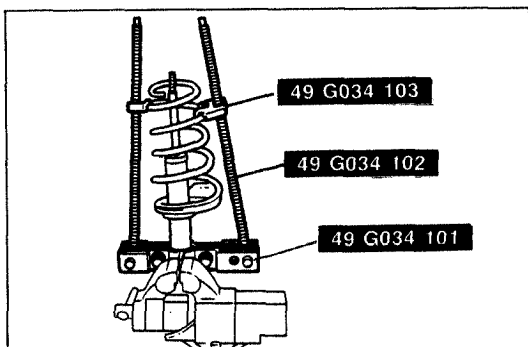
Assembly



03U0RX-025

1. Shock absorber
2. Coil spring
3. Bound stopper
4. Rubber spring seat
5. Upper spring seat

6. Thrust bearing
7. Mounting block
8. Piston rod nut
9. Cap



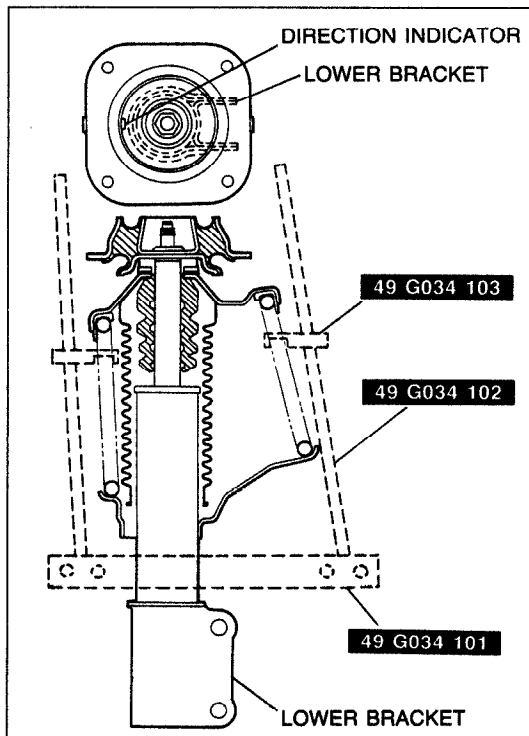
03U0RX-026

1. Secure the shock absorber in a vise.

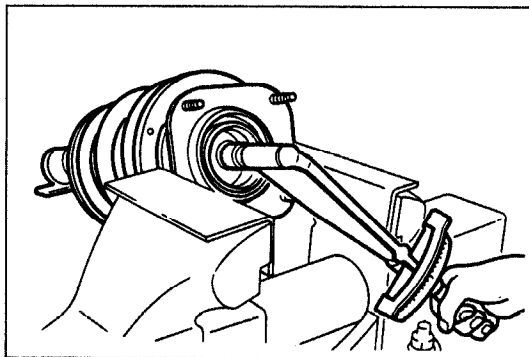
Caution

- Use protective plates in the jaws of the vise.

2. Compress the coil spring with the **SST**.
3. Install the coil spring, fitting the end of the coil into the step of the lower seat.
4. Install the bound stopper.



03U0RX-027



03U0RX-028

5. Apply the rubber lubricant to the bound stopper and the upper spring contact surfaces.
6. Install the rubber spring seat and the upper spring seat.
7. Install the thrust bearing.
8. Install the mounting block, facing the direction indicator as shown in the figure.
9. Loosely tighten the mounting block nut.
10. Carefully loosen, and remove the **SST**.

Caution

- **Verify that the coil spring is correctly seated in the upper and lower seats.**

11. Secure the mounting block in a vise.
12. Tighten the mounting block nut to the specified torque.

Tightening torque:

78—110 N·m (8.0—11.2 m·kg, 58—81 ft·lb)

13. Install the cap over the nut.

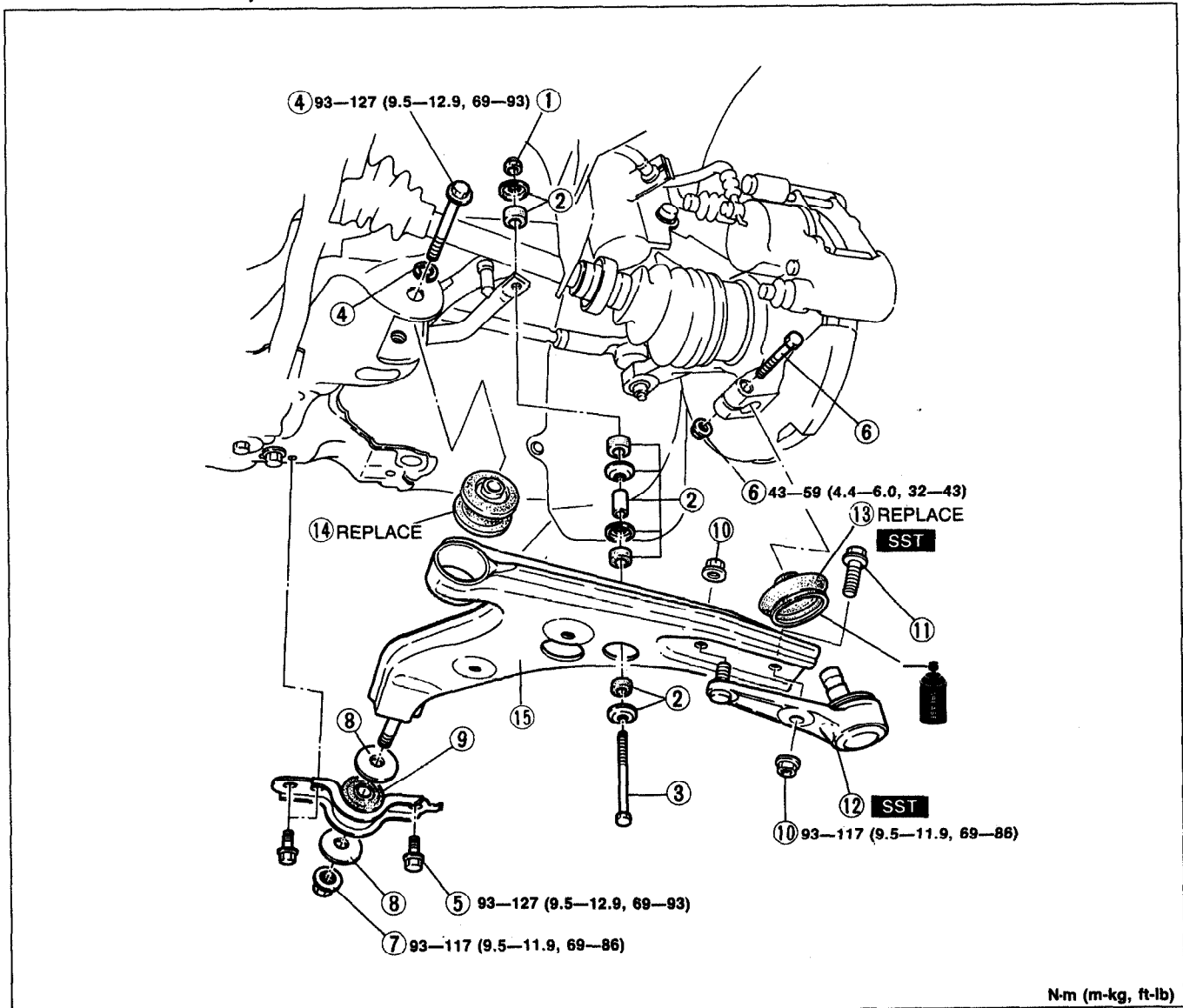
FRONT LOWER ARM

Removal / Inspection / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Visually inspect each part and replace as necessary.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. After installation, measure the front wheel alignment, and adjust it, if necessary.

Caution

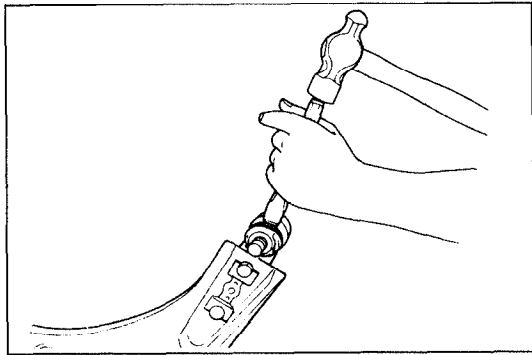
- **Retighten the lower arm bolt and nuts to the specified torque after lowering the vehicle (unladen condition).**



N-m (m-kg, ft-lb)

23UORX-009

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Stabilizer nut
Installation Note..... page R-17 2. Retainer, bushing, spacer 3. Stabilizer bolt 4. Bolt, washer 5. Bolt 6. Bolt, nut 7. Nut 8. Washer | <ol style="list-style-type: none"> 9. Lower arm bushing (Rear) 10. Nut 11. Bolt 12. Lower arm ball joint
Inspection..... page R-17 13. Ball joint dust boot
Removal / Installation Note..... page R-17 14. Lower arm bushing (Front) 15. Lower arm |
|---|---|



03U0RX-030

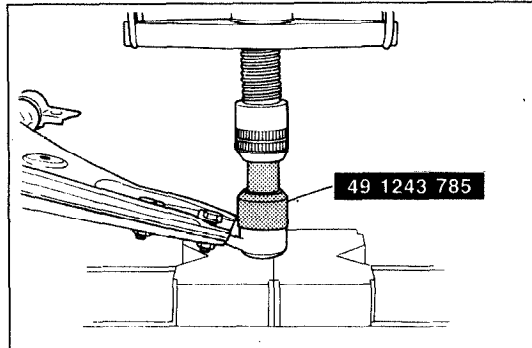
Removal note

Ball joint dust boot

1. Secure the ball joint in a vise.
2. Use a chisel to remove the dust boot from the ball joint.

Caution

- Do not damage the ball joint.

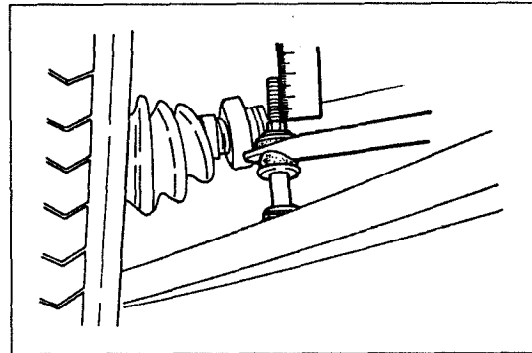


03U0RX-031

Installation note

Ball joint dust boot

1. Apply general-purpose grease to the new dust boot.
2. Install the dust boot to the ball joint, and press it on with the SST.

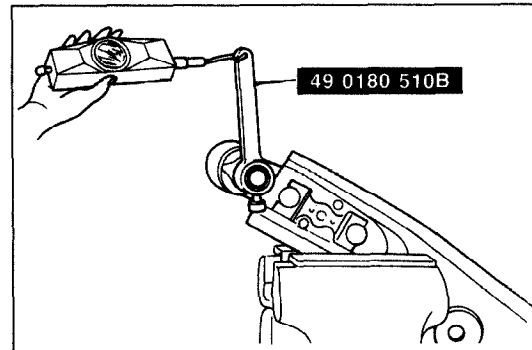


13U0RX-030

Stabilizer nut

1. Tighten the stabilizer nut so that the specified thread is exposed at the end of the bolt.

Specification: 17—19mm (0.67—0.75 in)



23U0RX-018

Inspection

Lower arm ball joint

Check the following and replace the ball joint if necessary. Attach the SST to the ball stud and measure the torque with a pull scale.

Rotation torque:

2.0—3.4 N·m (20—35 cm·kg, 17—30 in·lb)

Pull scale reading:

**20—34 N (2.0—3.5 kg, 4.4—7.7 lb)
(while ball stud is rotating)**

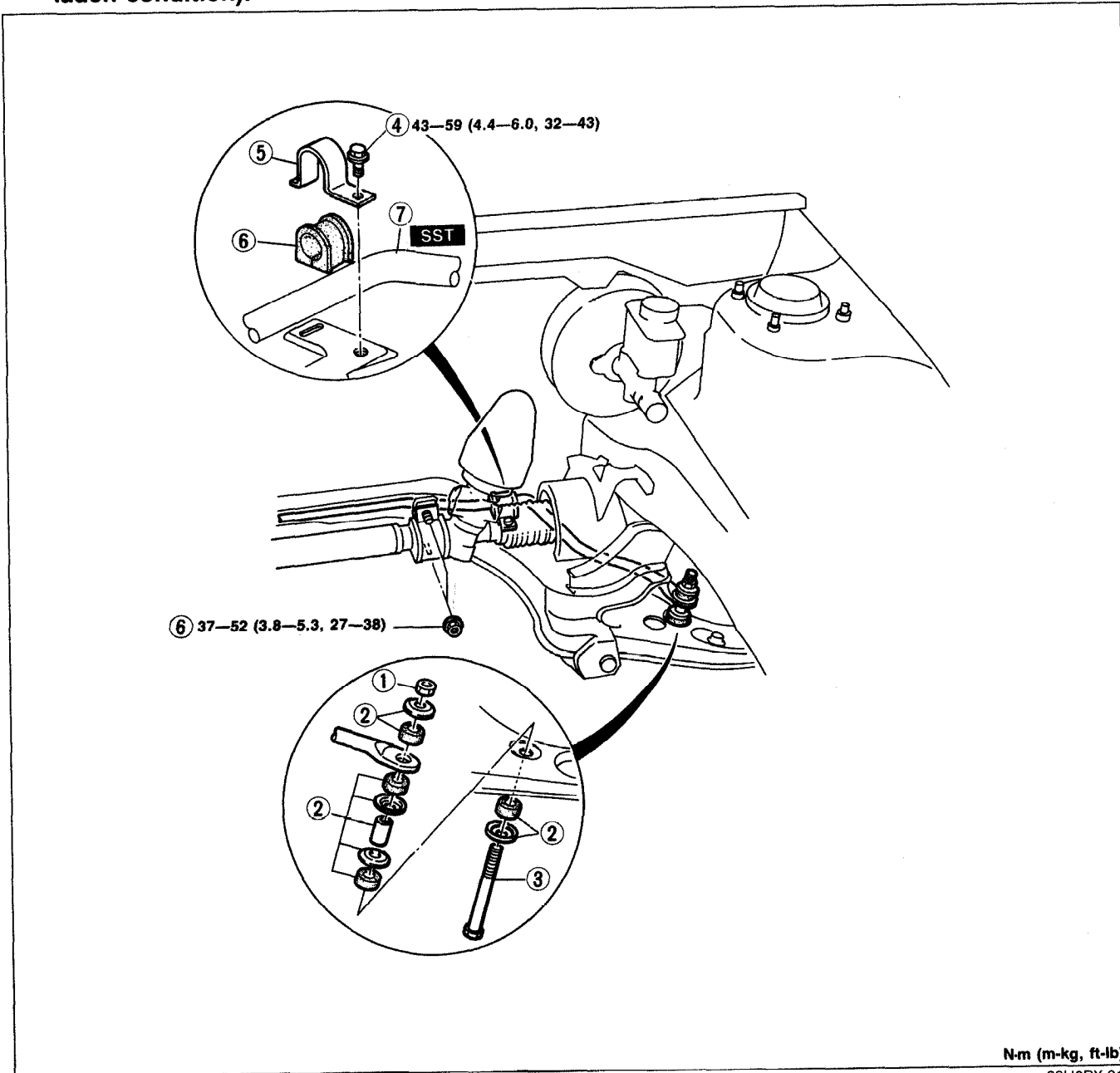
FRONT STABILIZER

Removal / Inspection / Installation

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove the undercover.
4. Remove in the order shown in the figure, referring to **Removal Note**.
5. Visually inspect each part and replace as necessary.
6. Install in the reverse order of removal, referring to **Installation Note**.

Caution

- Retighten the stabilizer bracket bolts to the specified torque after lowering the vehicle (unladen condition).

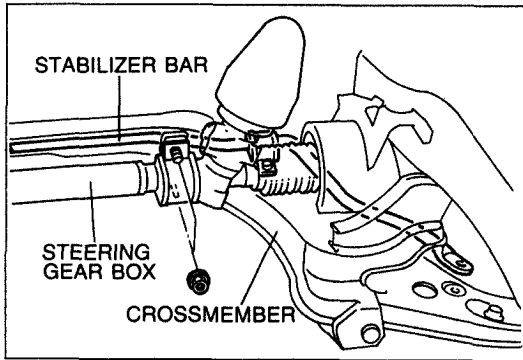


N-m (m-kg, ft-lb)

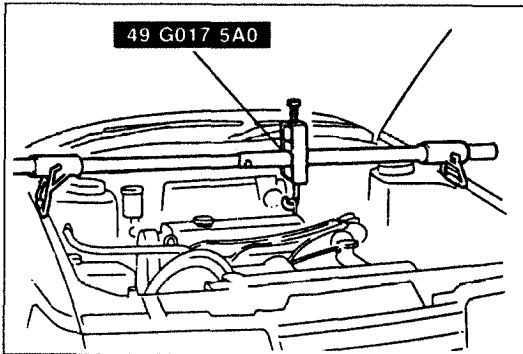
23U0RX-010

1. Stabilizer nut
Installation Note..... page R-19
2. Retainer, washer, spacer
3. Stabilizer bolt
4. Bolt

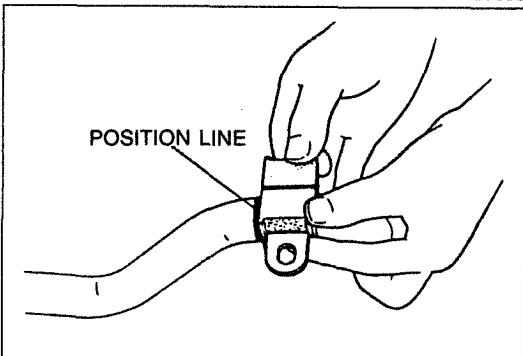
5. Stabilizer bracket
6. Stabilizer bushing
Installation Note..... page R-19
7. Stabilizer bar
Removal / Installation Note..... page R-19



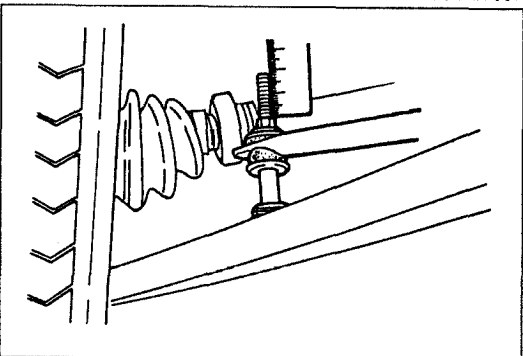
03U0RX-035



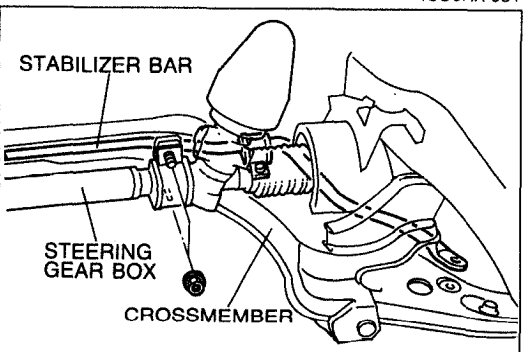
03U0RX-036



03U0RX-037



13U0RX-031



03U0RX-039

Removal note

Stabilizer bar

1. Remove the nuts of the steering gear box mounting bracket, and move the gear box forward.
2. Support the engine with the **SST**, and remove the crossmember mounting bolts.
3. Lower the crossmember slowly, and remove the stabilizer bar from the crossmember.

Installation note

Stabilizer bushing

Align the bushing with the installation position line painted on the stabilizer bar.

Stabilizer nut

1. Tighten the stabilizer nut so that the specified thread is exposed at the end of the bolt.

Specification: 17—19mm (0.67—0.75 in)

Stabilizer bar

1. Install the stabilizer bar to the crossmember.
2. Install the crossmember and tighten the mounting bolts to the specified torque.

Tightening torque:

93—127 N·m (9.5-12.9 m·kg, 69-93 ft·lb)


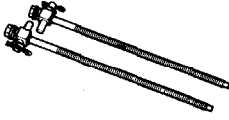
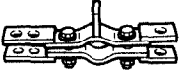

3. Tighten the nuts of the steering gear box mounting bracket to the specified torque.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

REAR SUSPENSION (STRUT)

PREPARATION SST

<p>49 G034 1A0</p> <p>Compressor coil spring</p> 	<p>For disassembly and assembly of coil spring</p>	<p>49 G034 102</p> <p>Screw (Part of 49 G034 1A0)</p> 	<p>For disassembly and assembly of coil spring</p>
<p>49 G034 101</p> <p>Body (Part of 49 G034 1A0)</p> 	<p>For disassembly and assembly of coil spring</p>	<p>49 G034 103</p> <p>Arm (Part of 49 G034 1A0)</p> 	<p>For disassembly and assembly of coil spring</p>

23U0RX-019

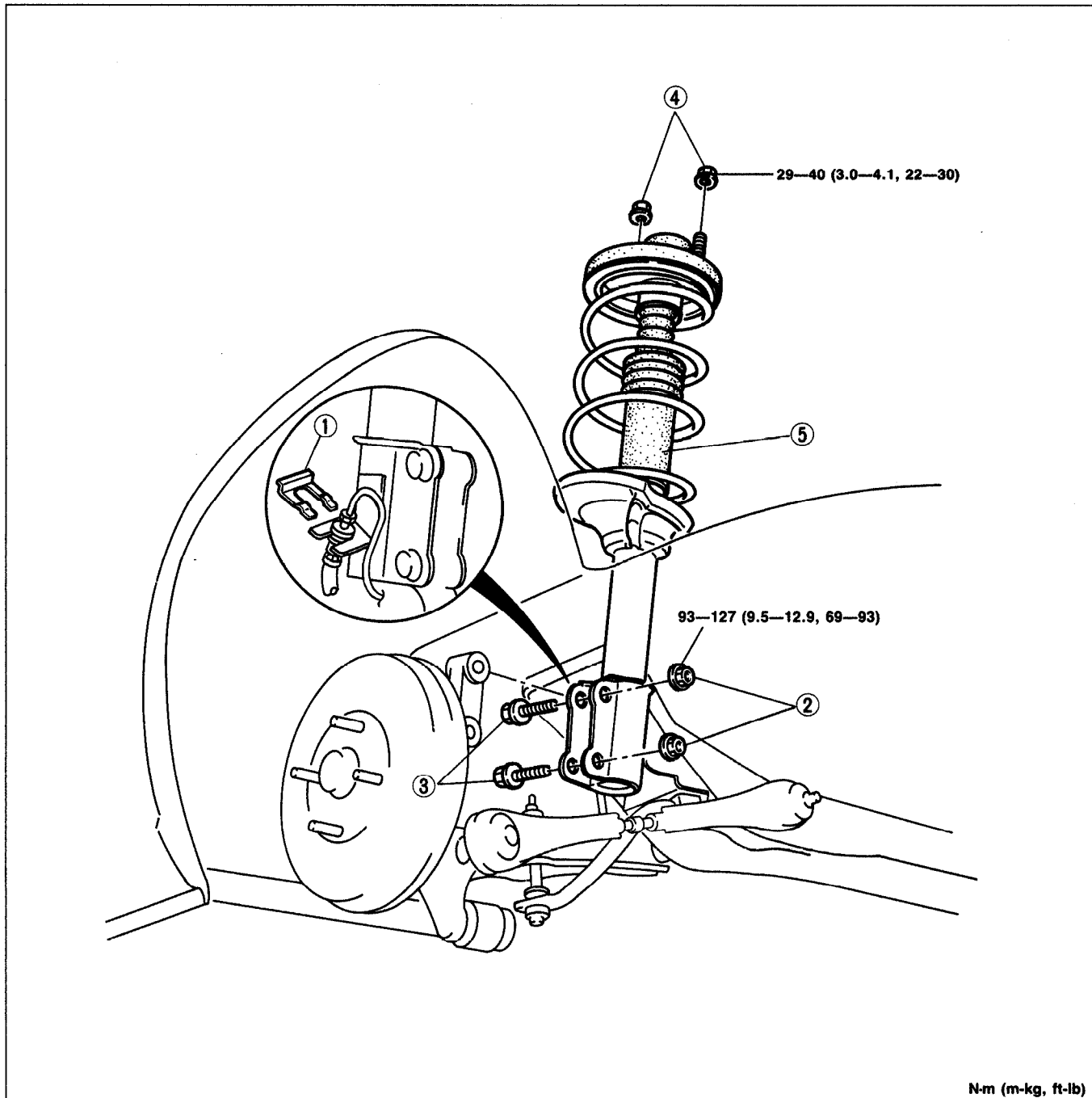
REAR SHOCK ABSORBER AND SPRING

Removal / Installation

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure.
4. Install in the reverse order of removal.
5. After installation, measure the rear wheel alignment, if necessary.

Caution

- Retighten the shock absorber lower bolts to the specified torque after lowering the vehicle (unladen condition).



N·m (m·kg, ft·lb)

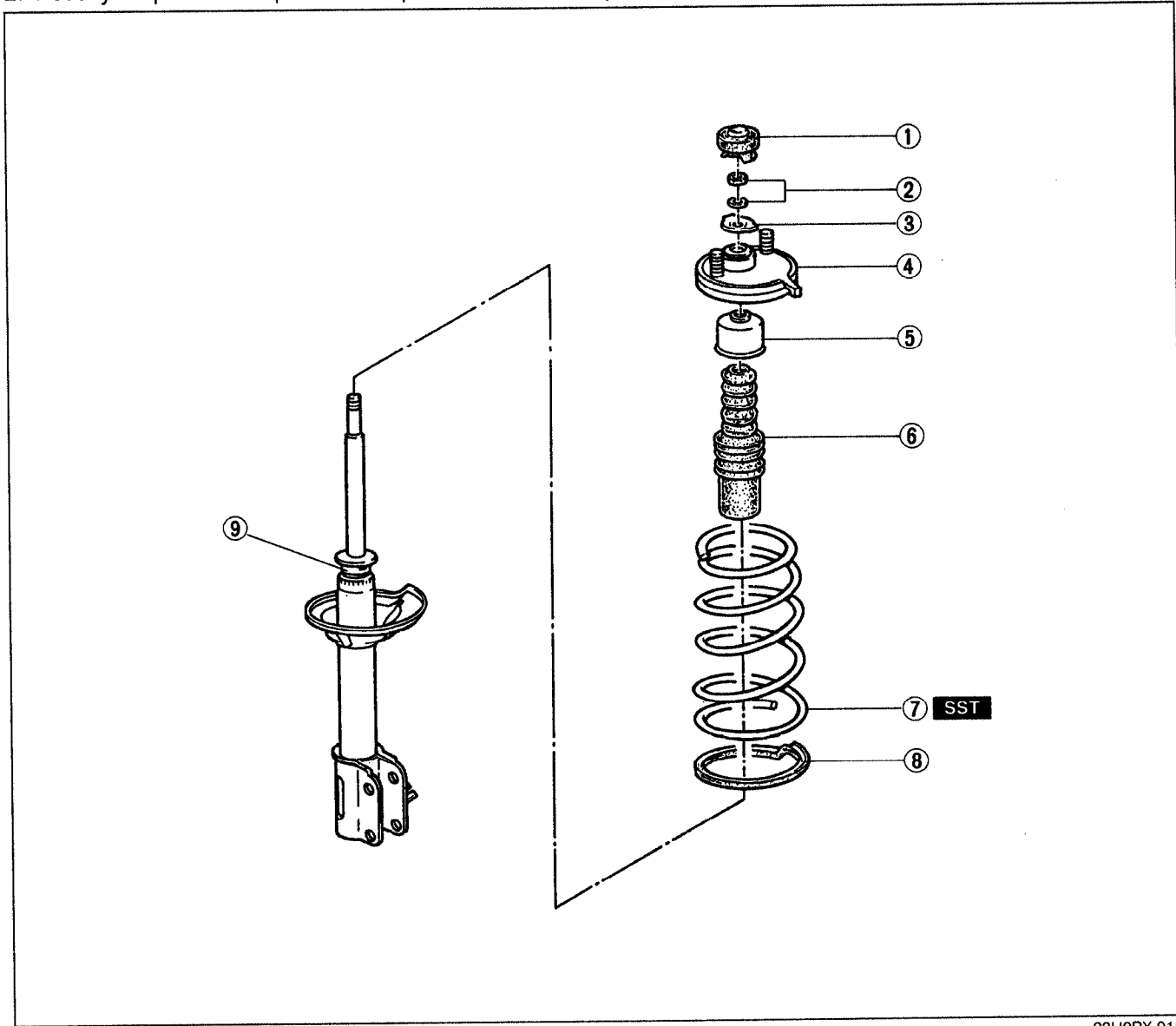
23U0RX-011

1. Clip
2. Nut
3. Bolt
4. Nut

5. Shock absorber and spring
 - Disassembly page R-22
 - Inspection page R-23
 - Assembly page R-24

Disassembly / Inspection

1. Reassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Visually inspect each part and replace as necessary.

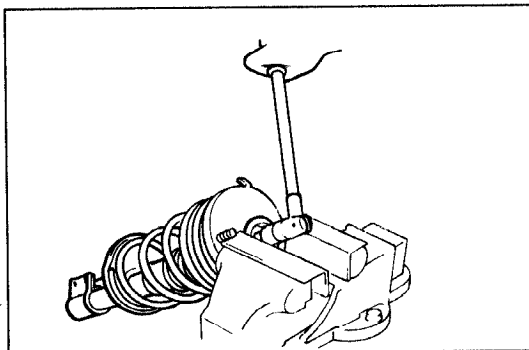


23U0RX-012

1. Cap
2. Nut and washer
Disassembly Note..... Below
3. Retainer
4. Mounting block
5. Stopper seat

6. Bound stopper
7. Coil spring
8. Lower spring seat
9. Shock absorber

Inspection..... page R-23



03U0RX-043

Disassembly note

Piston rod nut and washer

1. Secure the mounting block in a vise.

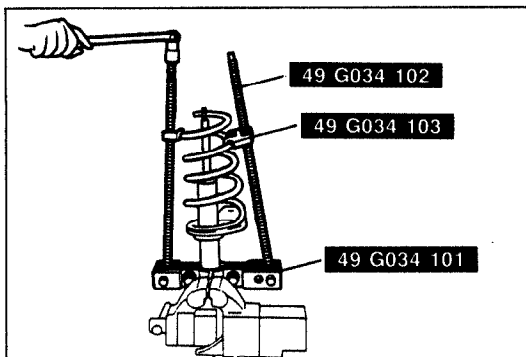
Caution

- Use protective plates in the jaws of the vise.

2. Loosen the piston rod nut a few turns. **Do not remove it.**

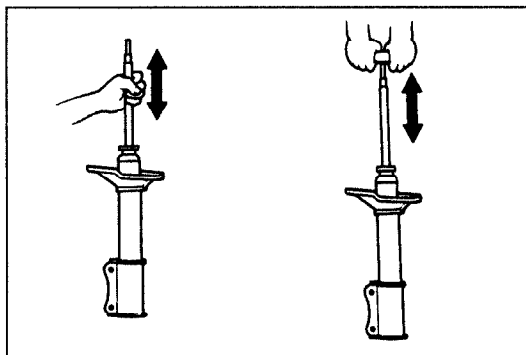
Caution

- Do not remove the nut.



03U0RX-044

3. Compress the coil spring with the **SST**.
4. Remove the piston rod nut.
5. Remove the coil spring.



03U0RX-045

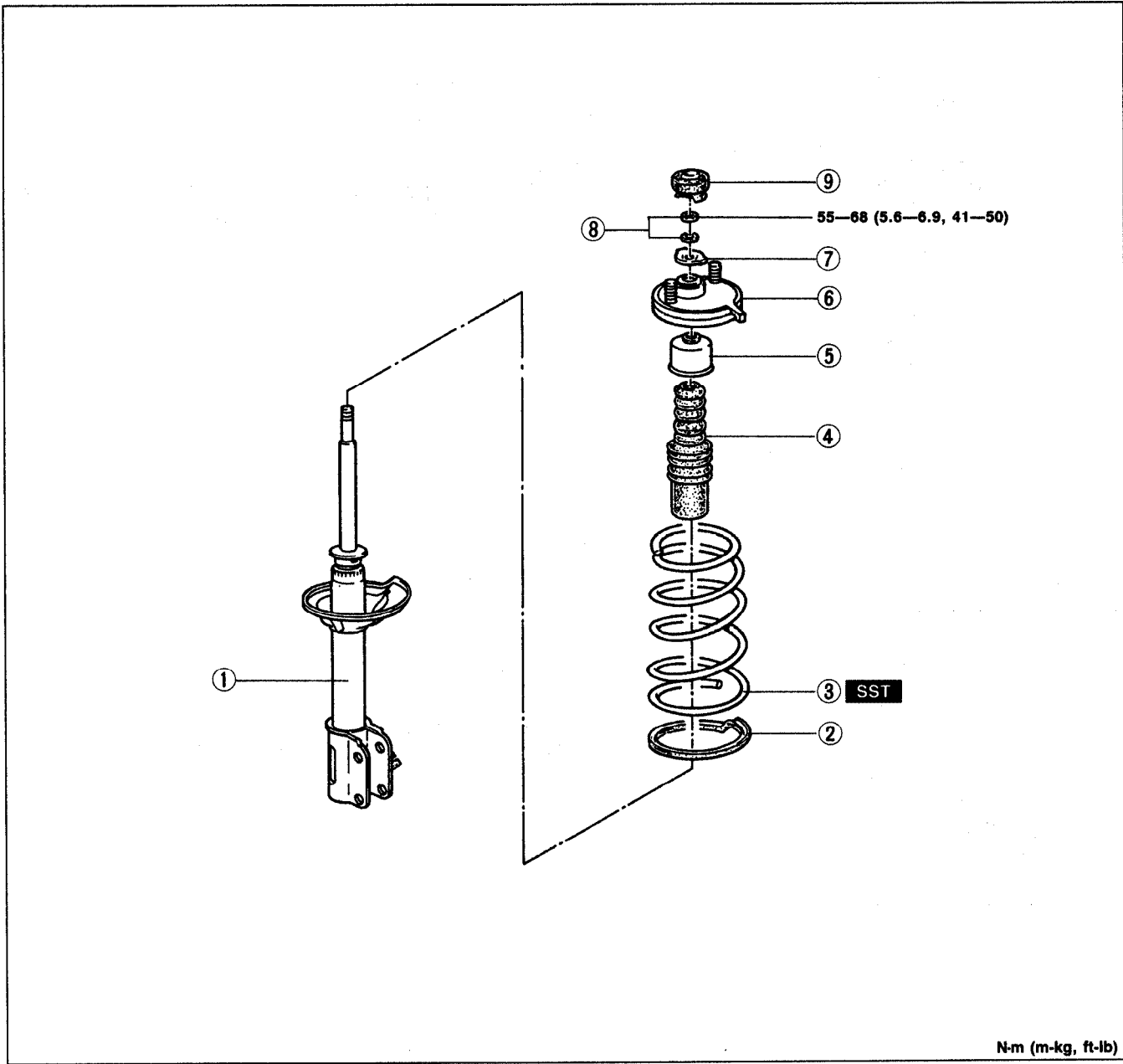
Inspection

Check for the following and replace the shock absorber, if necessary.

Rear shock absorber function inspection

Secure a handle to the piston rod, and compress and expand the shock piston at least three times. Verify that the operational force does not change and that there is no unusual noise.

Assembly

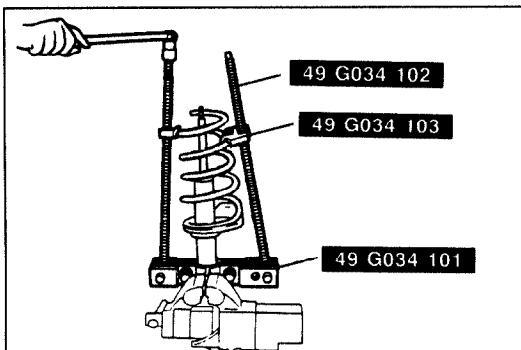


N-m (m-kg, ft-lb)

03U0RX-046

1. Shock absorber
2. Lower spring seat
3. Coil spring
4. Bound stopper
5. Stopper seat

6. Mounting block
7. Retainer
8. Nut and washer
9. Cap



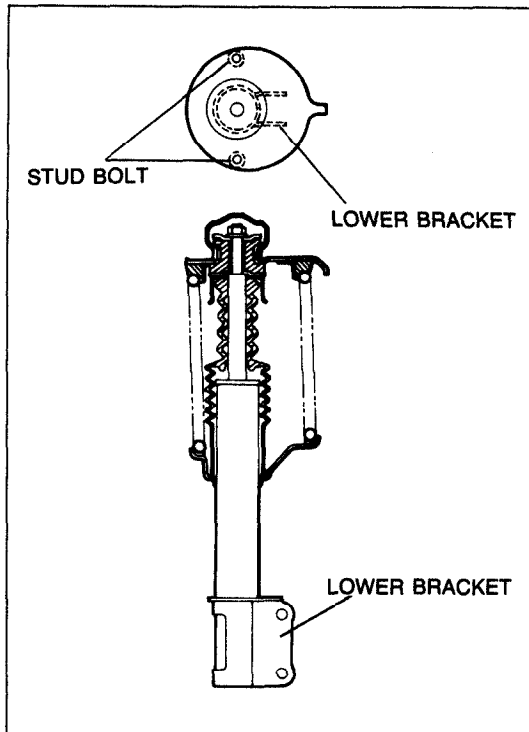
03U0RX-047

1. Secure the shock absorber in a vise.

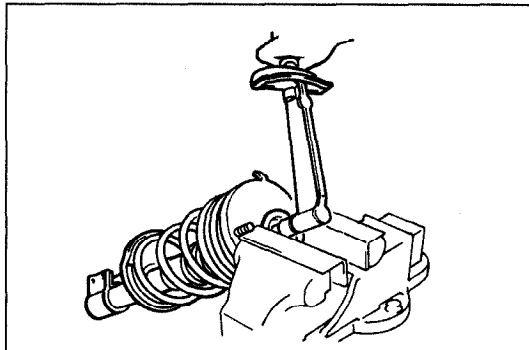
Caution

- Use protective plates in the jaws of the vise.

2. Install the lower spring seat.
3. Install the coil spring, fitting the end of the coil into the step of the lower seat.
4. Compress the coil spring with the **SST**.
5. Install the bound stopper and the stopper seat.



23U0RX-020



23U0RX-021

6. Install the mounting block, aligning the studs of the mounting block and the lower bracket of the shock absorber as shown in the figure.
7. Install the retainer.
8. Loosely tighten the piston nut.
9. Carefully loosen and remove the **SST**.

Caution

- **Verify that the coil spring is correctly seated in the mounting block and lower spring seat.**

10. Secure the mounting block in a vise.
11. Install the retainer and washer.
12. Tighten the mounting block nut to the specified torque.

Tightening torque:

55—68 N·m (5.6—6.9 m·kg, 41—50 ft·lb)

13. Install the cap over the nut.

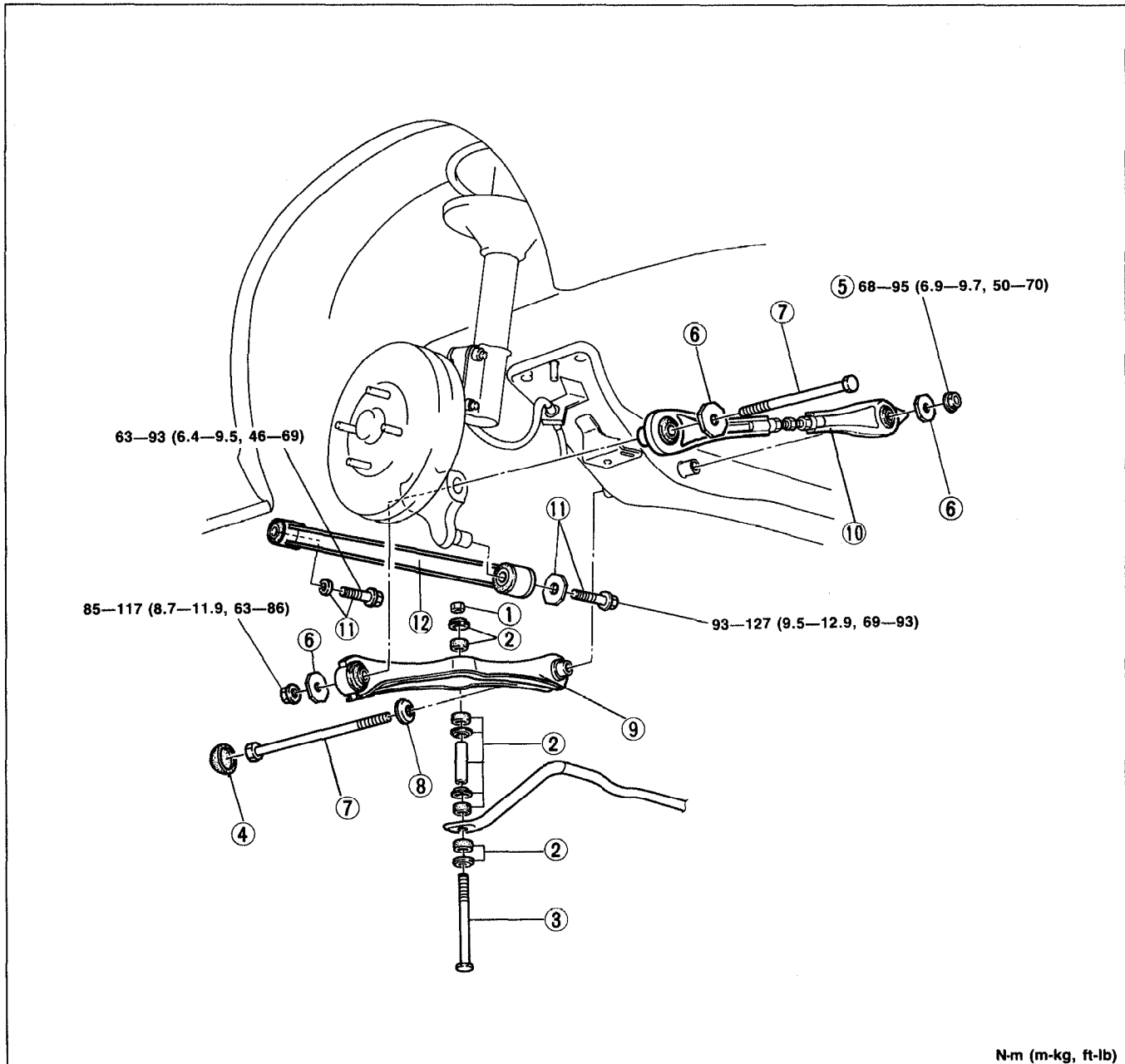
LATERAL LINK AND TRAILING LINK

Removal / Inspection / Installation

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure.
4. Visually inspect each part and replace as necessary.
5. Install in the reverse order of removal, referring to **Installation Note**.
6. After installation, measure the rear wheel alignment, and adjust it if necessary.

Caution

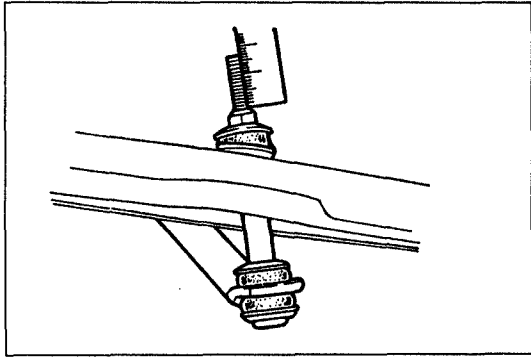
- **Retighten the lateral link and trailing link mounting bolts and nuts to the specified torque after lowering the vehicle (unladen condition).**



N-m (m-kg, ft-lb)

23U0RX-022

- | | | |
|---|-------------|-------------------------|
| 1. Stabilizer nut
Installation Note
..... page R-27 | 4. Cap | 9. Lateral link (front) |
| 2. Retainer, bushing, spacer | 5. Nut | 10. Lateral link (rear) |
| 3. Stabilizer bolt | 6. Washer | 11. Bolt, washer |
| | 7. Bolt | 12. Trailing link |
| | 8. Retainer | |



13U0RX-032

Installation note

Stabilizer nut

Tighten the stabilizer nuts so that the specified thread is exposed at the end of the bolt.

Specification: 16.2—18.2mm (0.64—0.72 in)

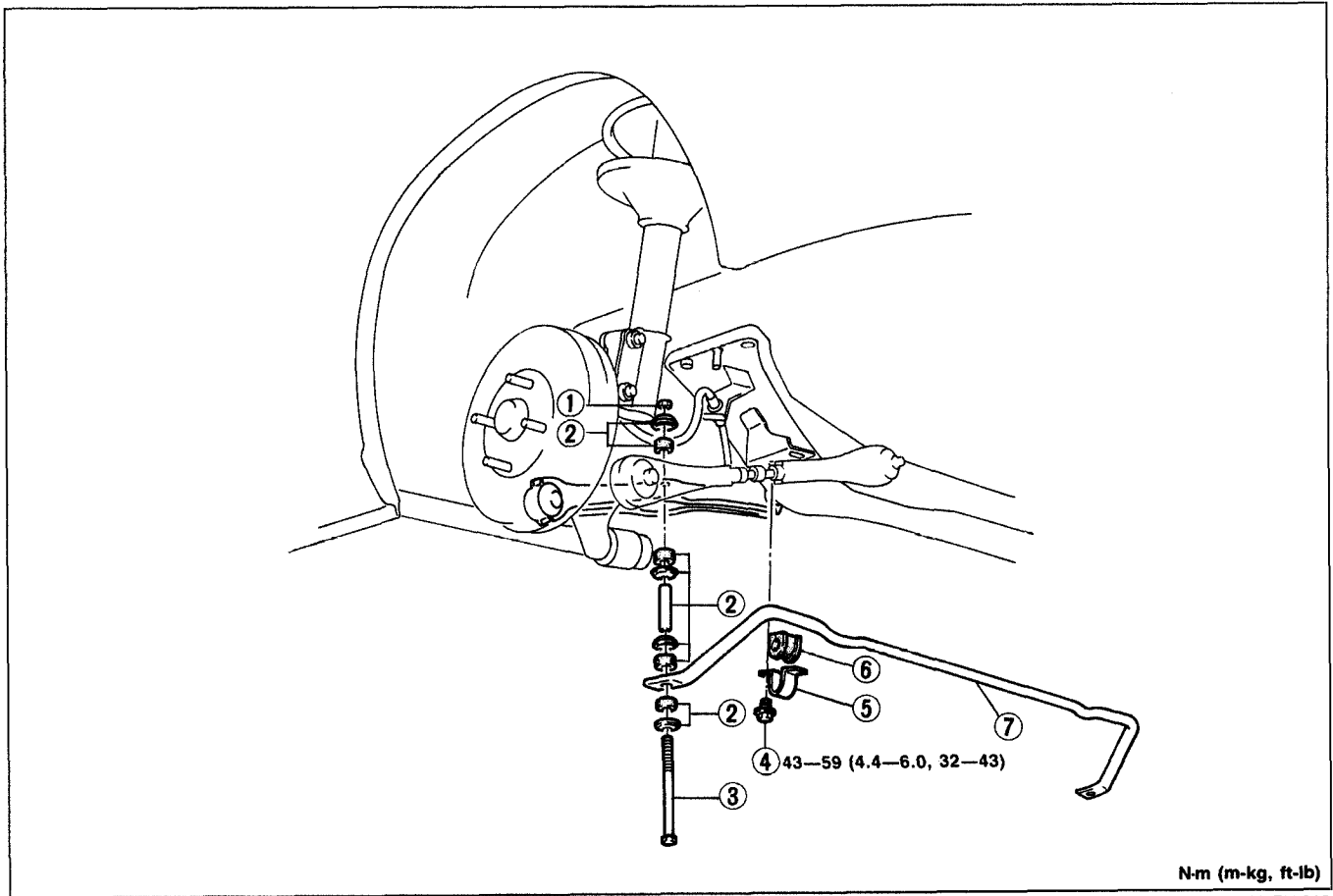
REAR STABILIZER

Removal / Inspection / Installation

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Remove in the order shown in the figure.
4. Visually inspect each part and replace as necessary.
5. Install in the reverse order of removal, referring to **Installation Note**.

Caution

- Retighten the stabilizer bracket bolts to the specified torque after lowering the vehicle (unladen condition).

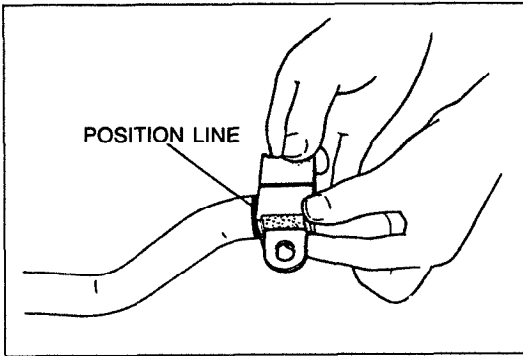


N-m (m-kg, ft-lb)

23U0RX-013

- 1. Stabilizer nut
Installation Note..... page R-28
- 2. Bushing, retainer, spacer
- 3. Stabilizer bolt
- 4. Bolt

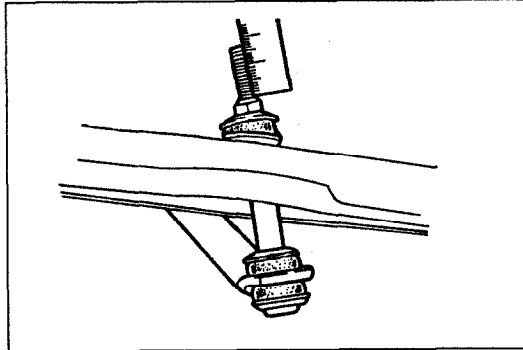
- 5. Stabilizer bracket
- 6. Stabilizer bushing
Inspect for damage and wear
Installation Note..... page R-28
- 7. Stabilizer bar



03U0RX-053

Installation note**Stabilizer bushing**

Align the bushing with the installation position line painted on the stabilizer bar.



13U0RX-033

Stabilizer nut

Tighten the stabilizer nuts so that the specified thread is exposed at the end of the bolt.

Specification: 16.2—18.2mm (0.64—0.72 in)

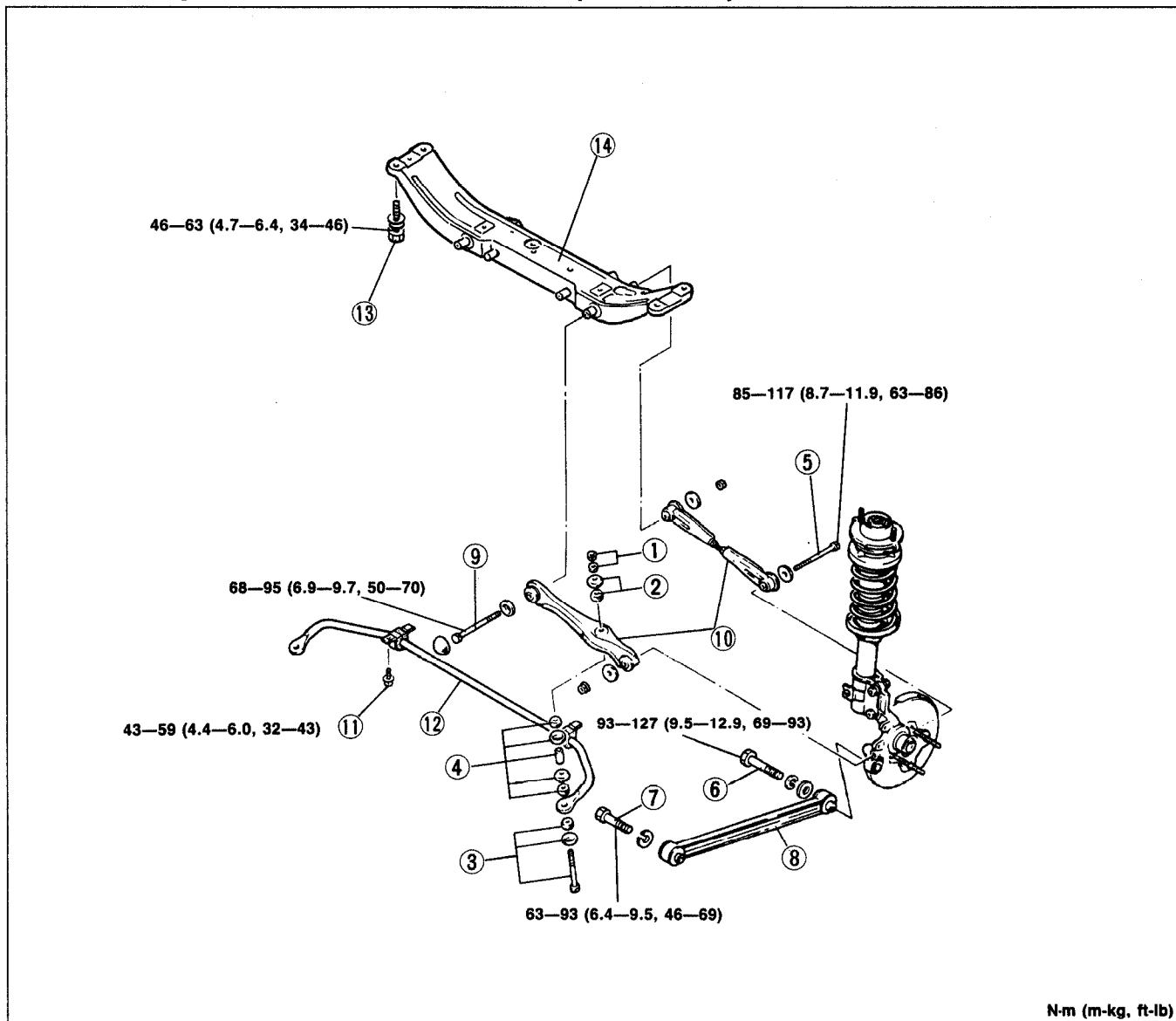
REAR CROSSMEMBER

Removal / Installation

1. Jack up the vehicle and support it with safety stands.
2. Remove the wheels and tires.
3. Remove the brake pipe holder.
4. Remove in the order shown in the figure.
5. Inspect all parts and repair or replace as necessary.
6. Install in the reverse order of removal, referring to **Installation Note**.
7. After installation, check the rear wheel alignment and adjust it if necessary.

Caution

- **Loosely tighten the lateral link and trailing link bolts and nuts when installing. Lower the vehicle and tighten all nuts and bolts to the specified torques with the vehicle unladen.**



N-m (m-kg, ft-lb)

23U0RX-014

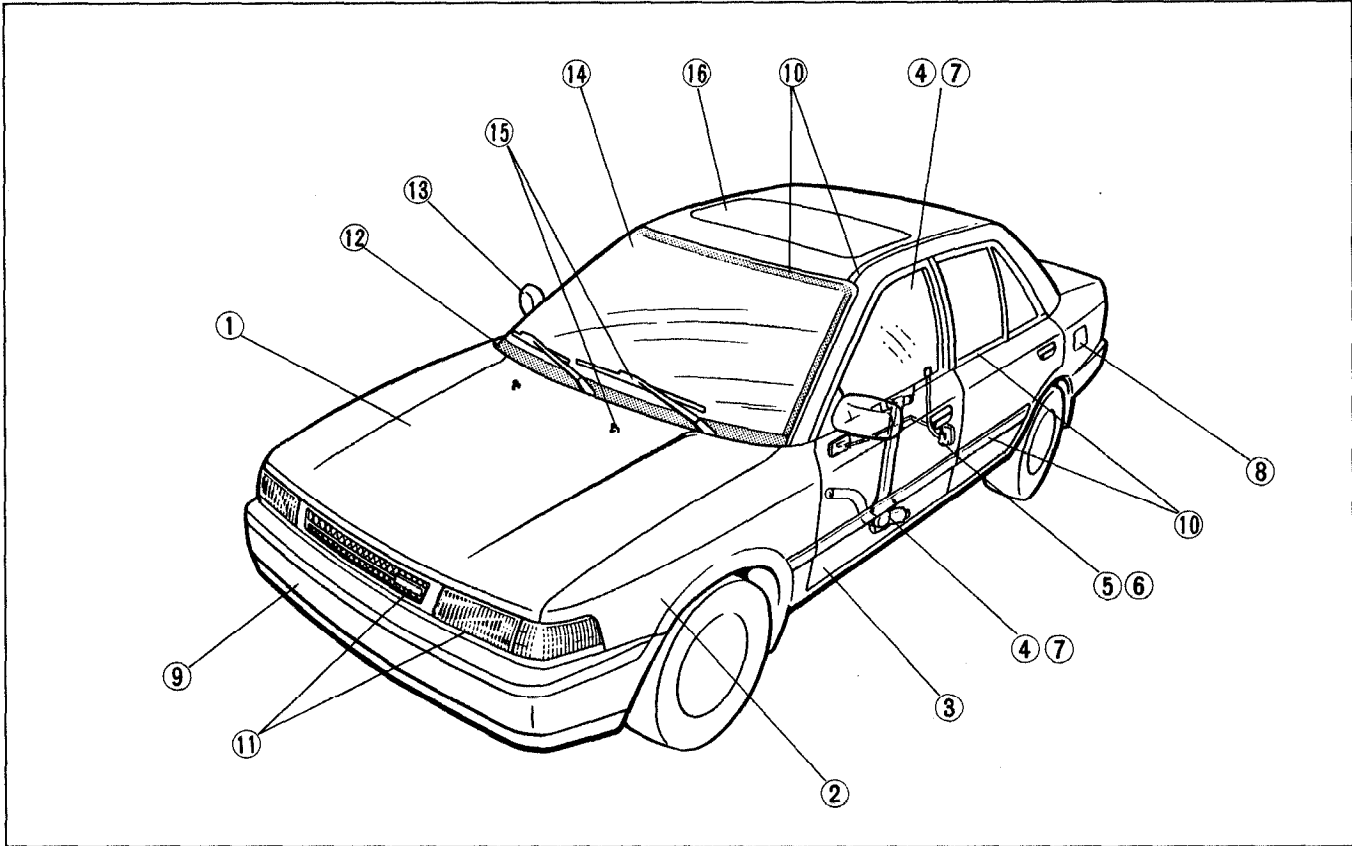
- | | |
|----------------------------------|-----------------------------------|
| 1. Nut (Stabilizer) | 8. Trailing link |
| Installation Note..... page R-28 | 9. Bolt (Lateral link) |
| 2. Bushing and retainer | 10. Lateral link (front and rear) |
| 3. Bolt, retainer and bushing | 11. Bolt |
| 4. Retainer, bushing and spacer | 12. Rear stabilizer |
| 5. Bolt (Lateral link) | 13. Bolt and washer |
| 6. Bolt (Trailing link) | 14. Rear crossmember |
| 7. Bolt (Trailing link) | |



BODY

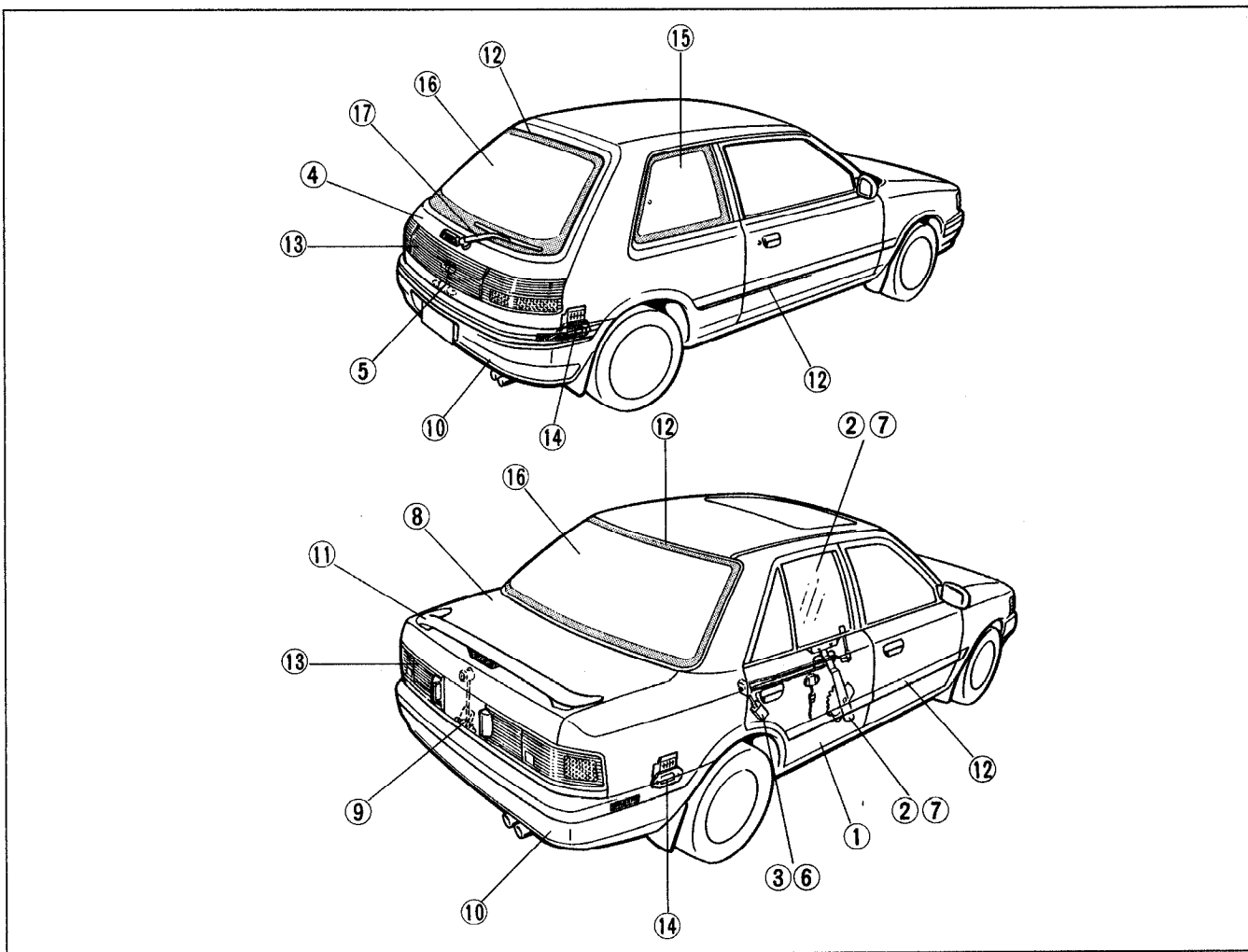
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23U0SX-039

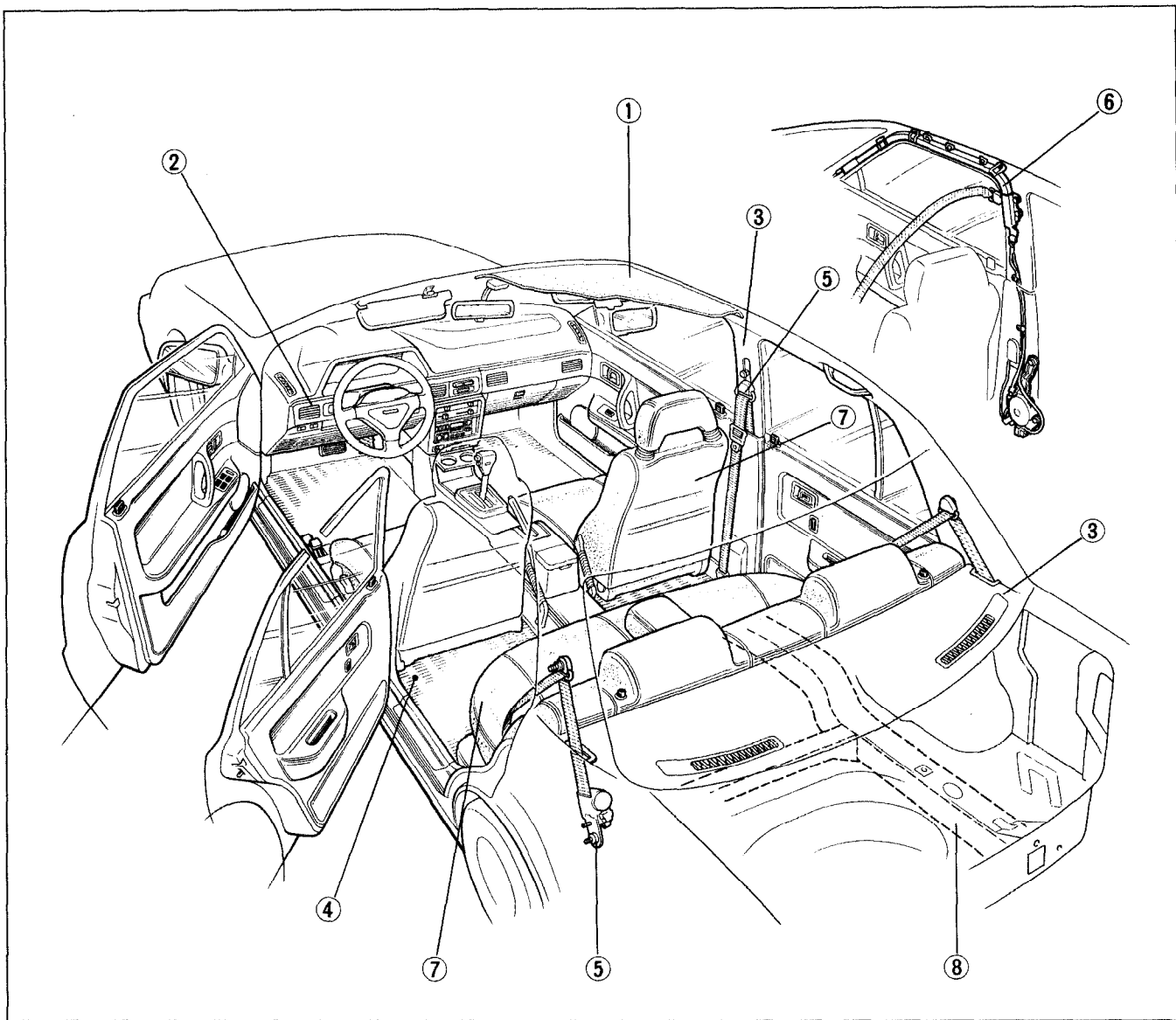
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Door lock timer and relay..... page S-26 | 15. Windshield wiper and washer
Troubleshooting guide..... page S-67
Wiper motor..... page S-70
Washer motor page S-71
Windshield wiper and
washer switch page S-71
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| 7. Power window system
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| 8. Fuel filler lid and opener
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- | | |
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 Components page S-17</p> <p>3. Rear door lock and opener
 Components page S-19</p> <p>4. Rear hatch
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 Components page S-22</p> <p>6. Power door lock system
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 Door lock switch page S-26
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 Door lock timer and relay page S-26</p> <p>7. Power window system
 Structural view page S-27
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 Main power window switch page S-31
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 Power window motor page S-32</p> <p>8. Trunk lid
 Components page S-33</p> <p>9. Trunk lid lock and opener
 Components page S-35</p> | <p>10. Rear bumper
 Components page S-40</p> <p>11. Rear spoiler
 Components page S-41</p> <p>12. Molding, protector, garnish
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|--|---|

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Components	page S- 94
3. Trim	
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4. Floor mat	
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5. Seat belt	
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Straight-line dimensions	
(Hatchback)	page S-119

HOOD

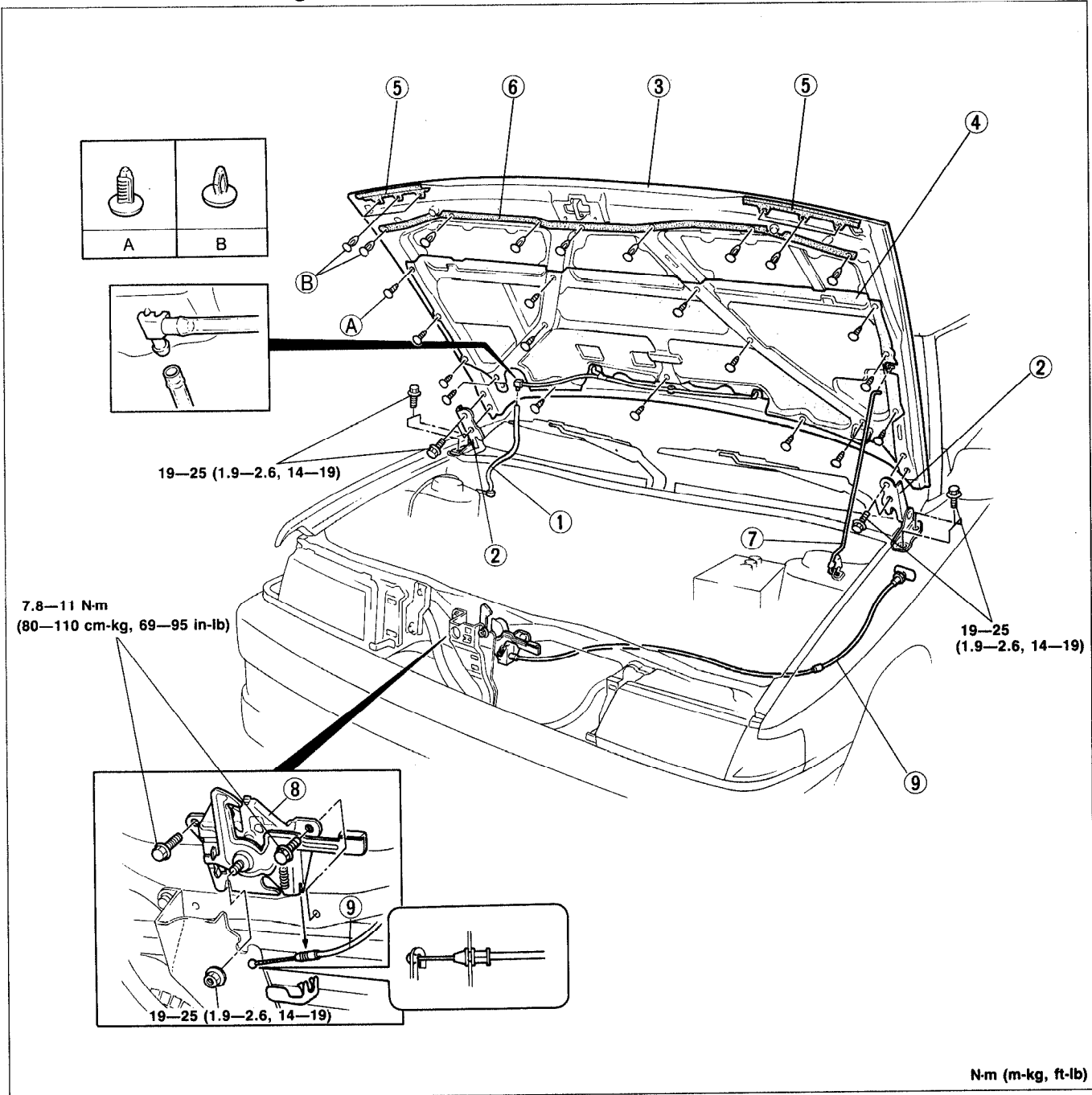
COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

Note

- Remove the radiator grille for removal of the hood lock. (Refer to page S-51.)



7.8-11 N-m
(80-110 cm-kg, 69-95 in-lb)

19-25
(1.9-2.6, 14-19)

N-m (m-kg, ft-lb)

03U0SX-005

1. Washer pipe
2. Hood hinge
3. Hood
4. Hood insulator
5. Hood deflector

Adjustment Note..... page S-6

6. Weatherstrip
7. Hood stay
8. Hood lock
9. Release wire

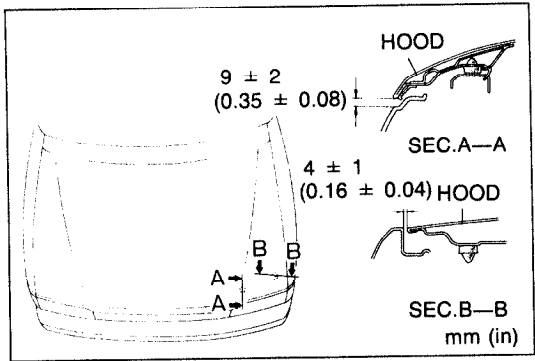
Adjustment Note..... page S-6

Adjustment Note**Hood**

Adjust the hood laterally and vertically by loosening the hood-to-hinge mounting bolts and repositioning the hood.

Tightening torque:

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



03U0SX-006

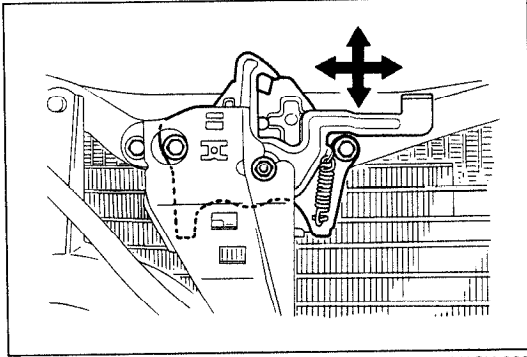
Hood lock

Adjust the hood lock after the hood has been aligned. Loosen the hood lock mounting bolts and nut and align the lock with the striker on the hood.

Tightening torque

Bolts: 7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Nut: 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



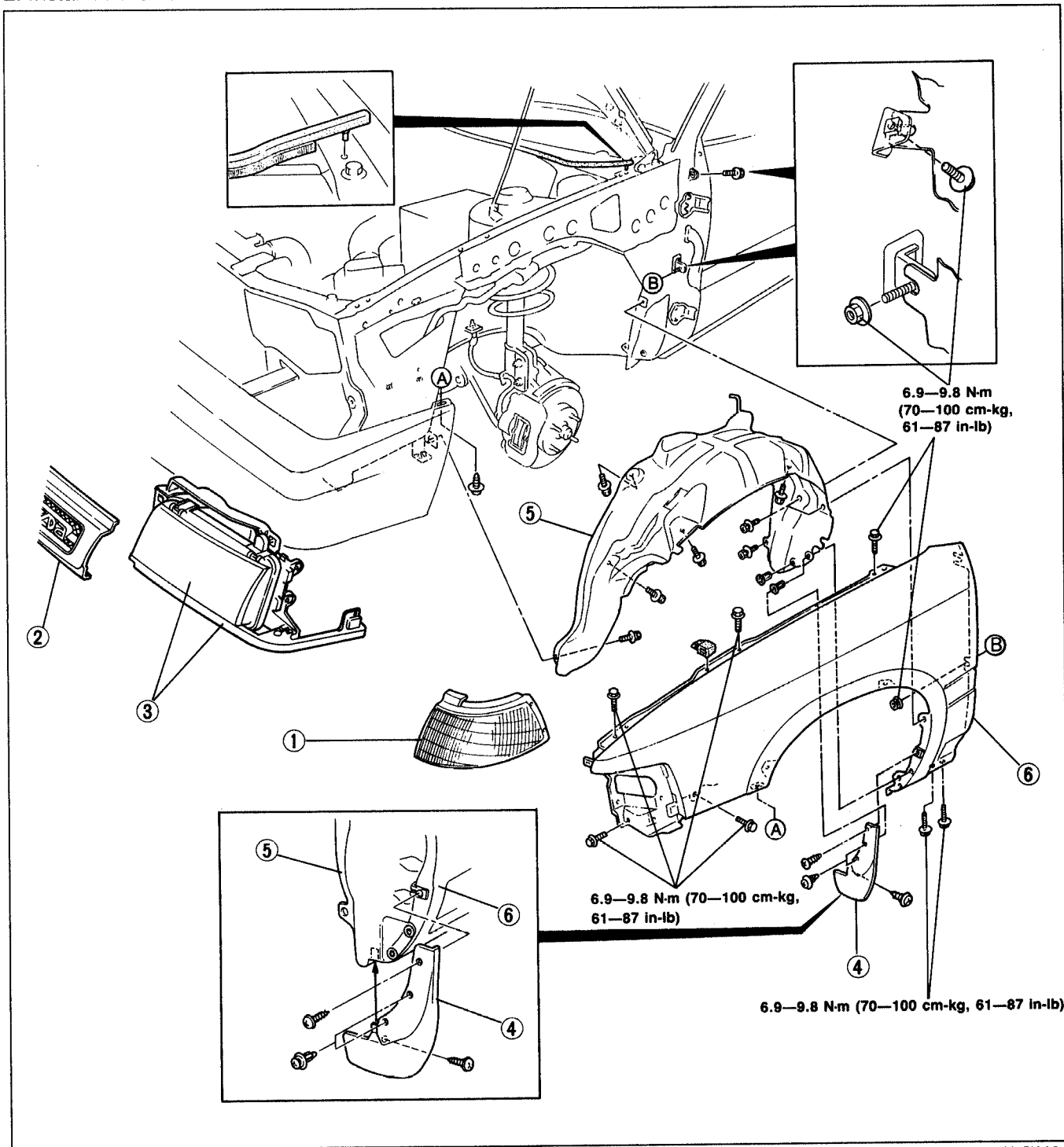
03U0SX-007

FRONT FENDER PANEL

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



1. Front combination light
Removal / Installation Section T
2. Radiator grille
Removal / Installation page S-51
3. Headlight, lower grille molding
Removal / Installation Section T

4. Front flap
5. Mud guard
6. Front fender panel

13U0SX-004

FRONT DOOR

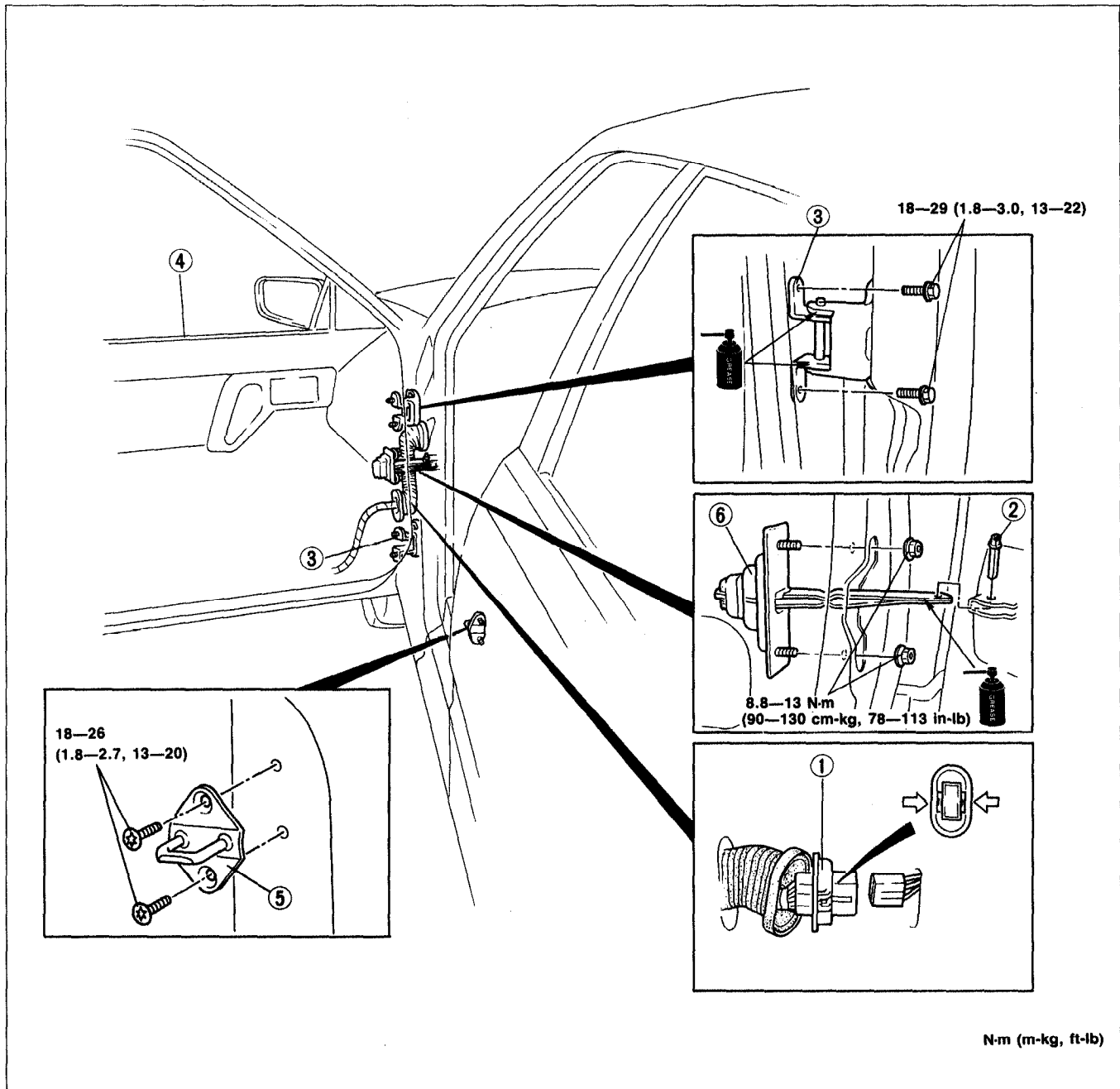
COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal

Note

- Remove the front door trim and door screen for removal of the checker.
(Refer to pages S-10, 11.)

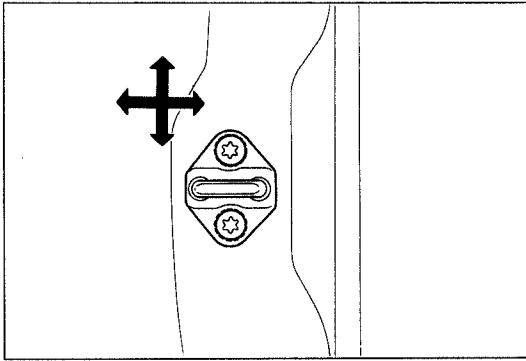


03U0SX-009

1. Harness connector
2. Checker pin
3. Hinge
4. Front door

5. Door lock striker
Adjustment Note page S-9
6. Checker

Adjustment Note page S-9



03U0SX-010

Adjustment Note
Door lock striker

1. Verify that the door can be closed easily and that there is no looseness. If there is a problem, loosen the striker mounting screws and adjust by moving the striker vertically or laterally.
2. Check the rear offset of the door to the body (or rear door). If there is a problem, adjust it by moving the door lock striker laterally.

Tightening torque:

18—26 N·m (1.8—2.7 m·kg, 13—20 ft·lb)

Note

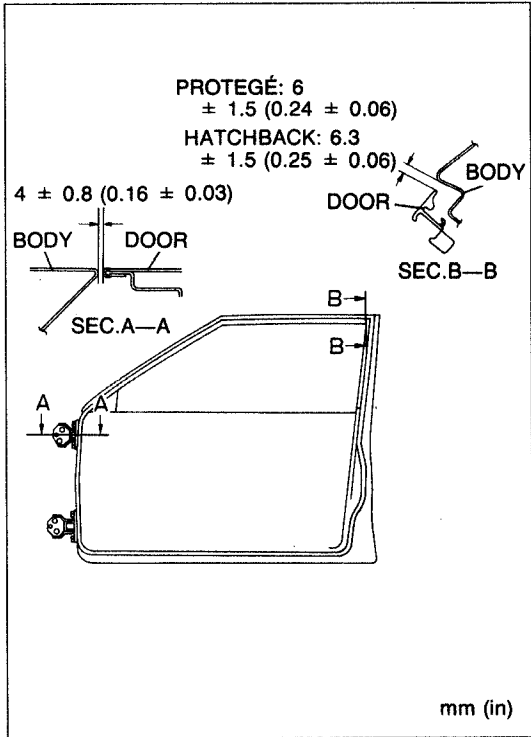
- Use a TORX drive bit for removal/installation of the door lock striker.

Front door

Loosen the hinge bolts and adjust as shown in the figure. Tighten the bolts to the specified torque.

Tightening torque:

18—29 N·m (1.8—3.0 m·kg, 13—22 ft·lb)



03U0SX-011

FRONT SIDE WINDOW REGULATOR AND GLASS

COMPONENTS

Removal / Installation

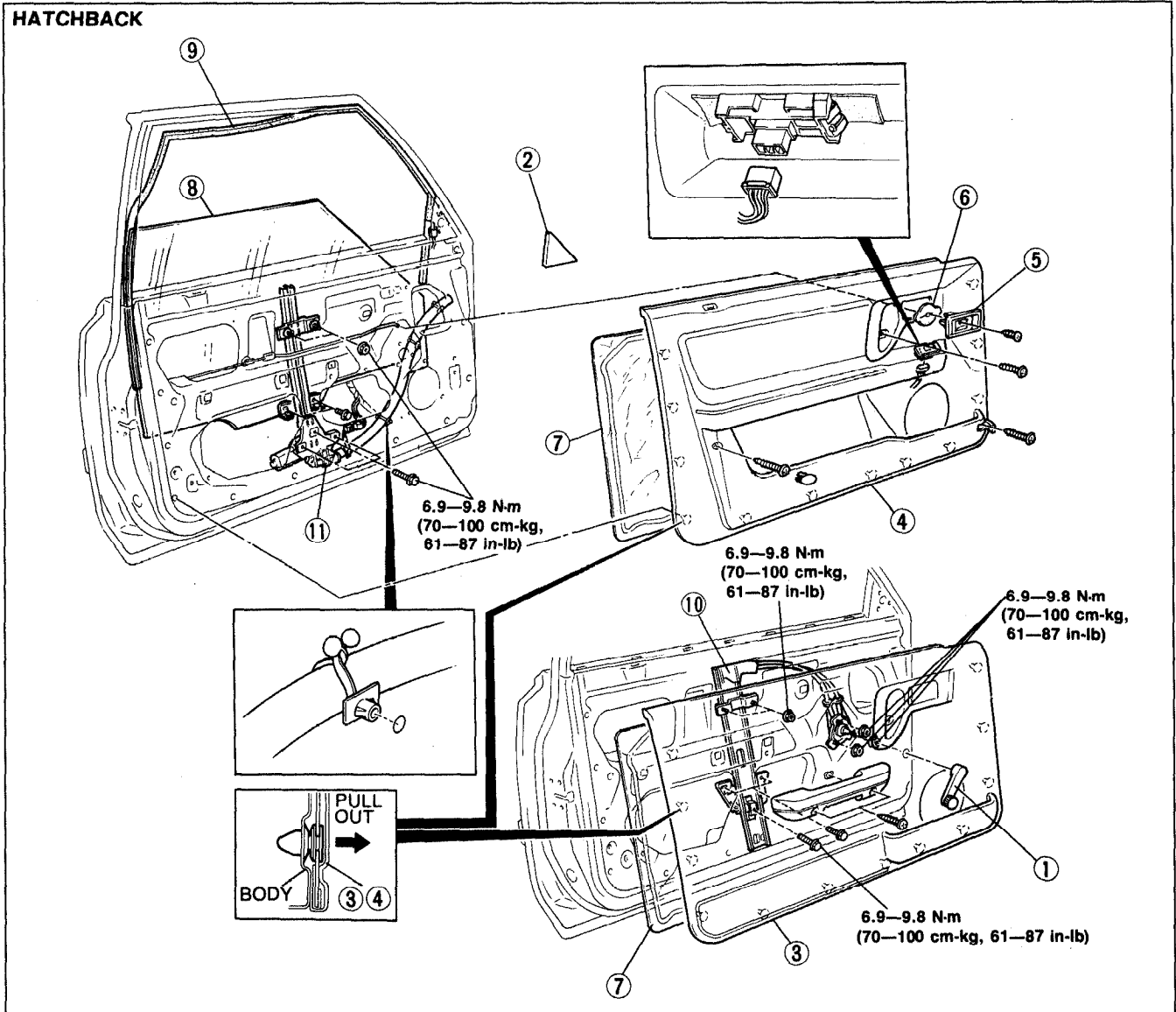
1. Raise the front door glass 110mm (4.33 in) from the fully open position.
2. Disconnect the negative battery cable.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal.

Caution

- Remove the door screen carefully so that it may be reused.

Note

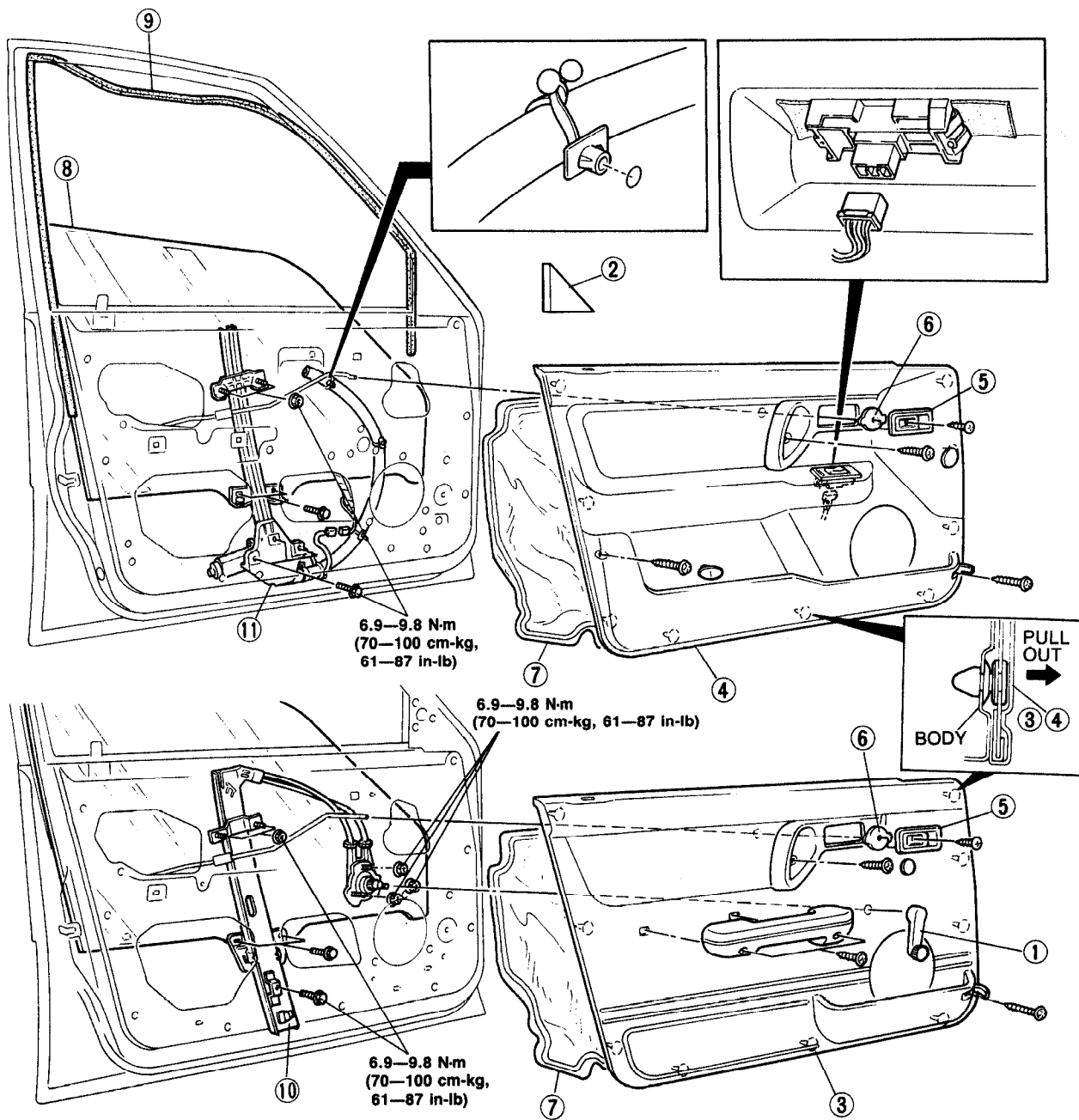
- Refer to page S-56; Removal of the door mirror for removal of the inner garnish.



23U0SX-004

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Regulator handle (Manual regulator)
Removal Note..... page S-12 2. Inner garnish 3. Front door trim (Manual window) 4. Front door trim (Power window) 5. Inner handle 6. Sealing pad | <ol style="list-style-type: none"> 7. Door screen 8. Front door glass 9. Glass run channel 10. Manual window regulator 11. Power window regulator
Inspection page S-32 |
|--|---|

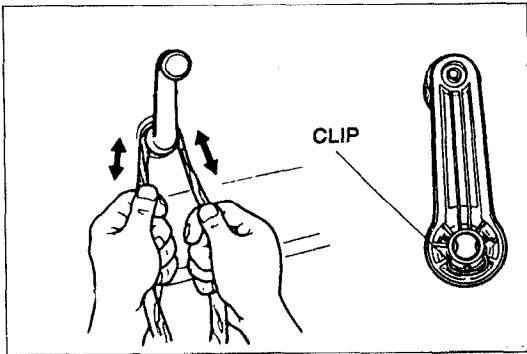
PROTEGÉ



03U0SX-013

- 1. Regulator handle (Manual regulator)
Removal Note..... page S-12
- 2. Inner garnish
- 3. Front door trim (Manual window)
- 4. Front door trim (Power window)
- 5. Inner handle
- 6. Sealing pad

- 7. Door screen
- 8. Front door glass
- 9. Glass run channel
- 10. Manual window regulator
- 11. Power window regulator
Inspection page S-32



9MU0SX-012

**Removal Note
Regulator handle**

Remove the regulator handle installation clip with a rag as shown in the figure.

FRONT DOOR LOCK AND OPENER

COMPONENTS

Removal / Installation

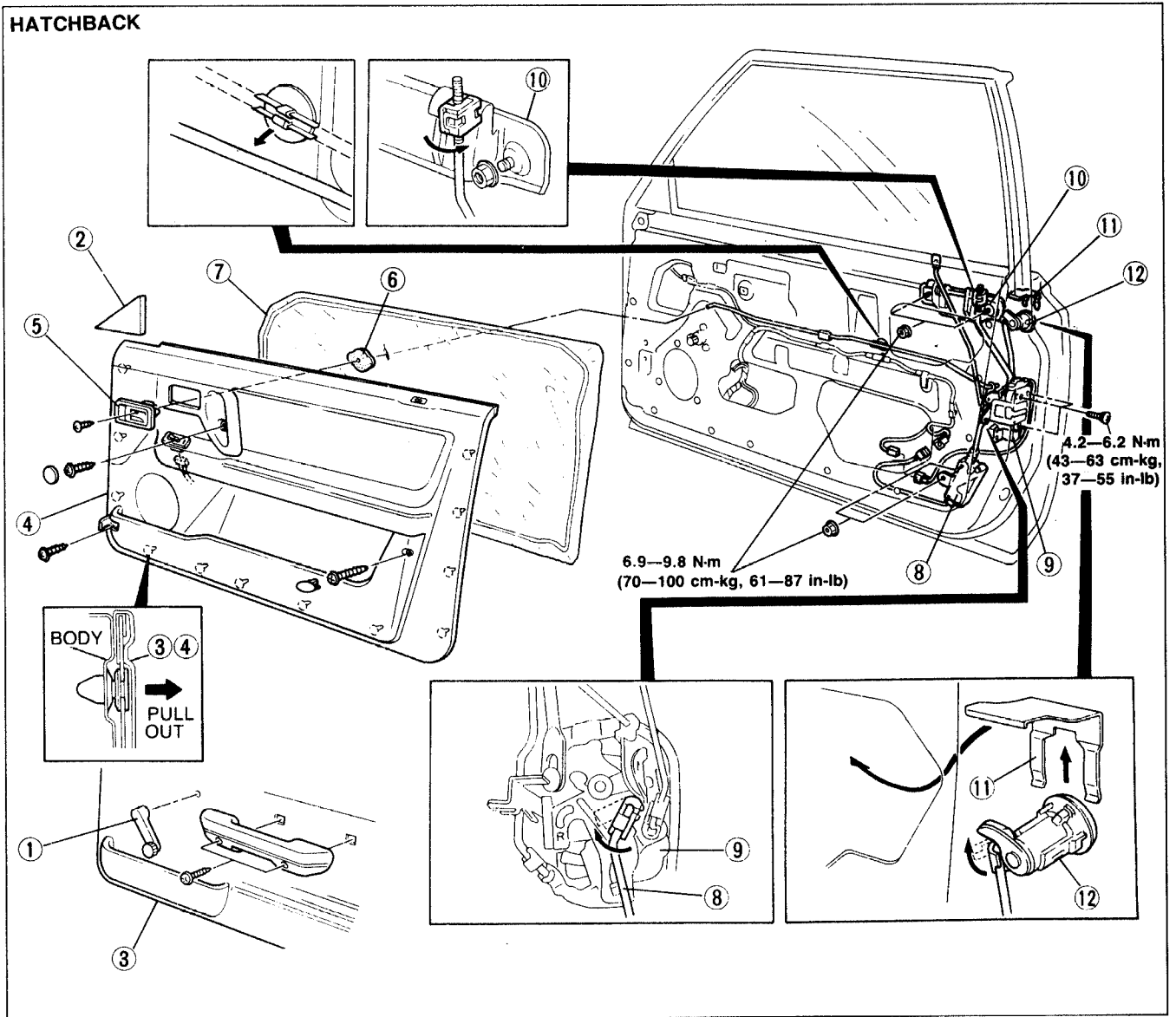
1. Raise the front door glass fully to remove the door lock assembly.
2. Disconnect the negative battery cable.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal.

Caution

- Remove the door screen carefully so that it may be reused.

Note

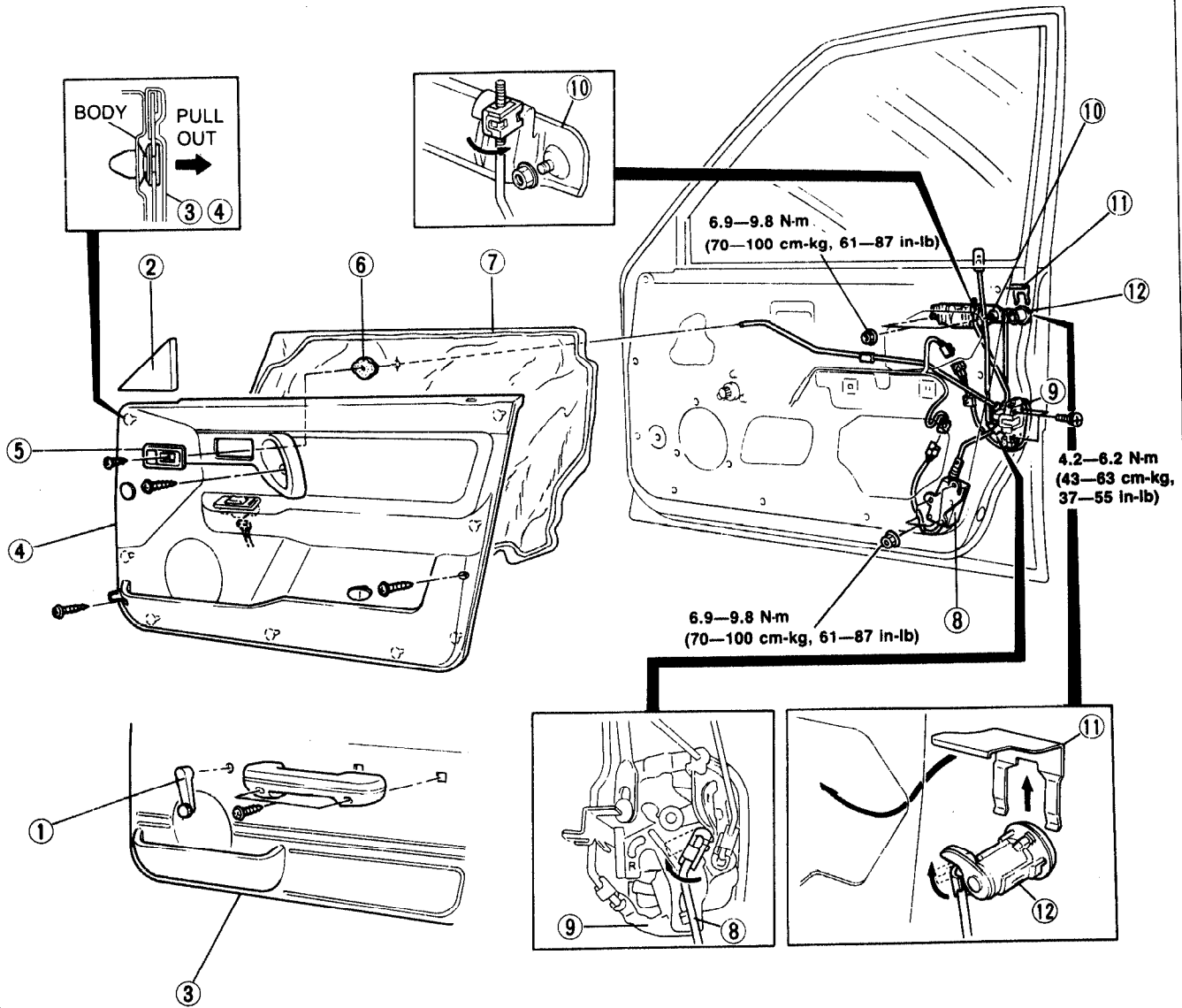
- Refer to page S-56; Removal of the door mirror for removal of the inner garnish.



23U0SX-005

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Regulator handle (Manual regulator)
Removal Note..... page S-12 2. Inner garnish 3. Front door trim (Manual window) 4. Front door trim (Power window) 5. Inner handle 6. Sealing pad | <ol style="list-style-type: none"> 7. Door screen 8. Lock control (Power door lock) 9. Front door lock assembly 10. Outer handle 11. Lock cylinder retainer 12. Lock cylinder |
|--|---|

PROTEGÉ



03U0SX-015

- 1. Regulator handle (Manual regulator)
Removal Note..... page S-12
- 2. Inner garnish
- 3. Front door trim (Manual window)
- 4. Front door trim (Power window)
- 5. Inner handle
- 6. Sealing pad

- 7. Door screen
- 8. Lock control (Power door lock)
- 9. Front door lock assembly
- 10. Outer handle
- 11. Lock cylinder retainer
- 12. Lock cylinder

REAR DOOR

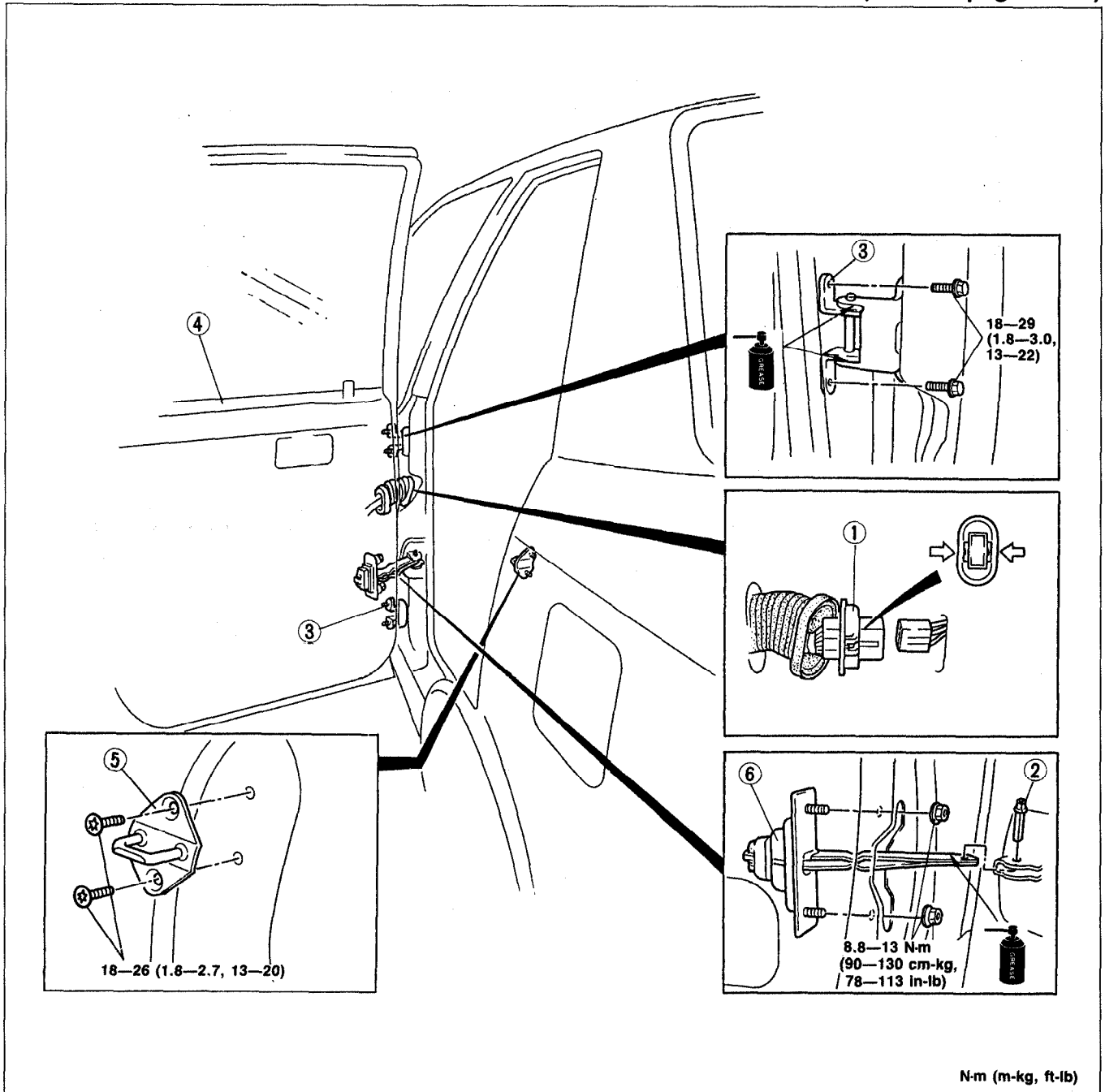
COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.

Note

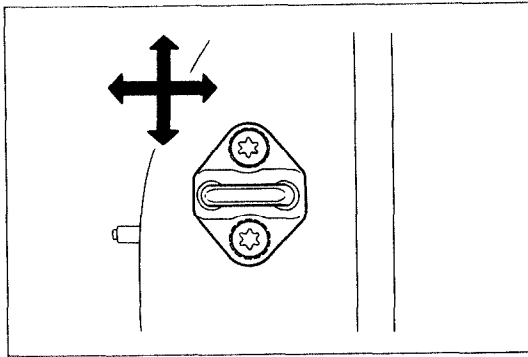
- Remove the rear door trim and door screen for removal of the checker. (Refer to page S-17.)



03U0SX-016

- 1. Harness connector
- 2. Checker pin
- 3. Hinge
- 4. Rear door
Adjustment Note..... page S-16

- 5. Door lock striker
Adjustment Note..... page S-16
- 6. Checker



03U0SX-017

Adjustment Note Door lock striker

1. Verify that the door can be closed easily and that there is no looseness. If there is a problem, loosen the striker mounting screws and adjust by moving the striker vertically or laterally.
2. Check the rear offset of the door to the body. If there is a problem, adjust it by moving the door lock striker laterally.

Tightening torque:

18—26 N·m (1.8—2.7 m·kg, 13—20 ft·lb)

Note

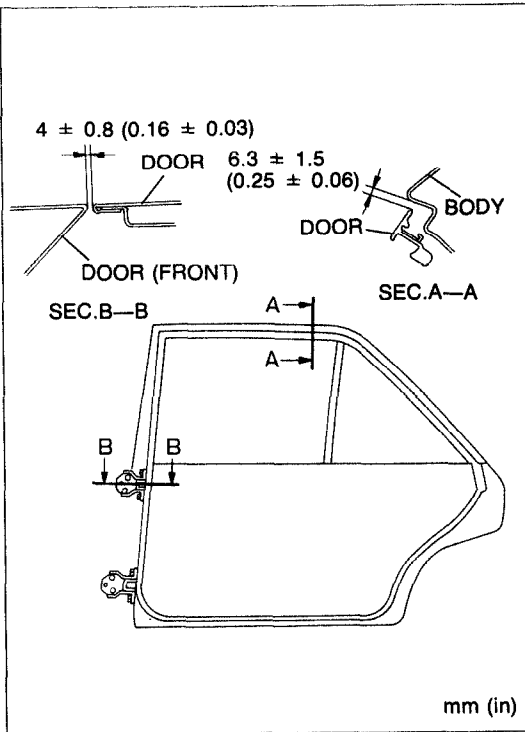
- Use a TORX drive bit for removal/installation of the door lock striker.

Rear door

Loosen the hinge bolts and adjust as shown in the figure. Tighten the bolts to the specified torque.

Tightening torque:

18—29 N·m (1.8—3.0 m·kg, 13—22 ft·lb)



03U0SX-018

REAR SIDE WINDOW REGULATOR AND GLASS

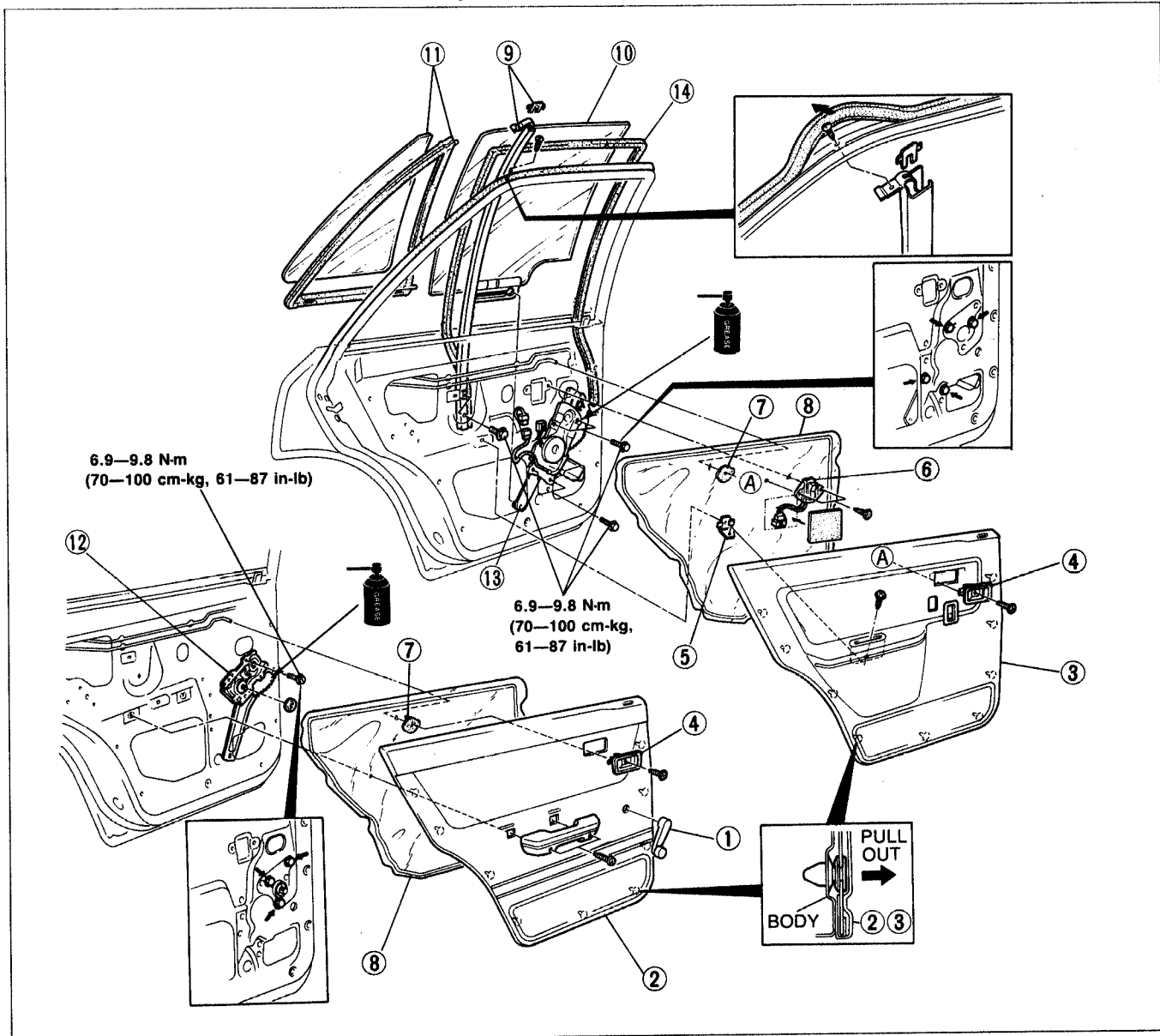
COMPONENTS

Removal / Installation

1. Open the rear door glass fully.
2. Disconnect the negative battery cable.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal, referring to **Installation Note**.

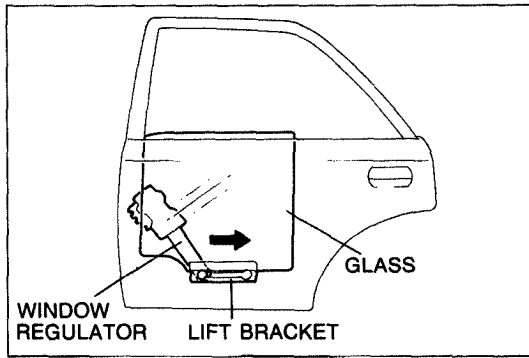
Caution

- Remove the door screen carefully so that it may be reused.

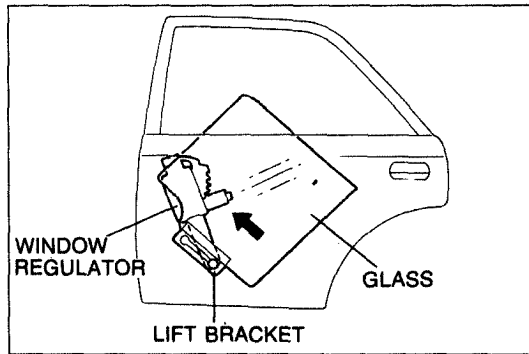


03U0SX-019

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Regulator handle (Manual window)
Removal Note..... page S-12 2. Rear door trim (Manual window) 3. Rear door trim (Power window) 4. Inner handle 5. Pull handle bracket (Power window) 6. Rear power window switch 7. Sealing pad 8. Door screen | <ol style="list-style-type: none"> 9. Center channel, channel protector 10. Rear door glass
Removal Note..... page S-18
Installation Note..... page S-18 11. Quarter window glass, weatherstrip 12. Manual window regulator 13. Power window regulator 14. Glass run channel |
|---|--|



03U0SX-020



03U0SX-021

Removal / Installation Note**Rear door glass****Manual window**

1. Remove the window regulator roller from the large hole in the lift bracket to remove the rear door glass.
2. Install in the reverse order of removal.

Power window

1. Remove the window regulator roller from the large hole in the lift bracket to remove the rear door glass.
2. Install in the reverse order of removal.

REAR DOOR LOCK AND OPENER

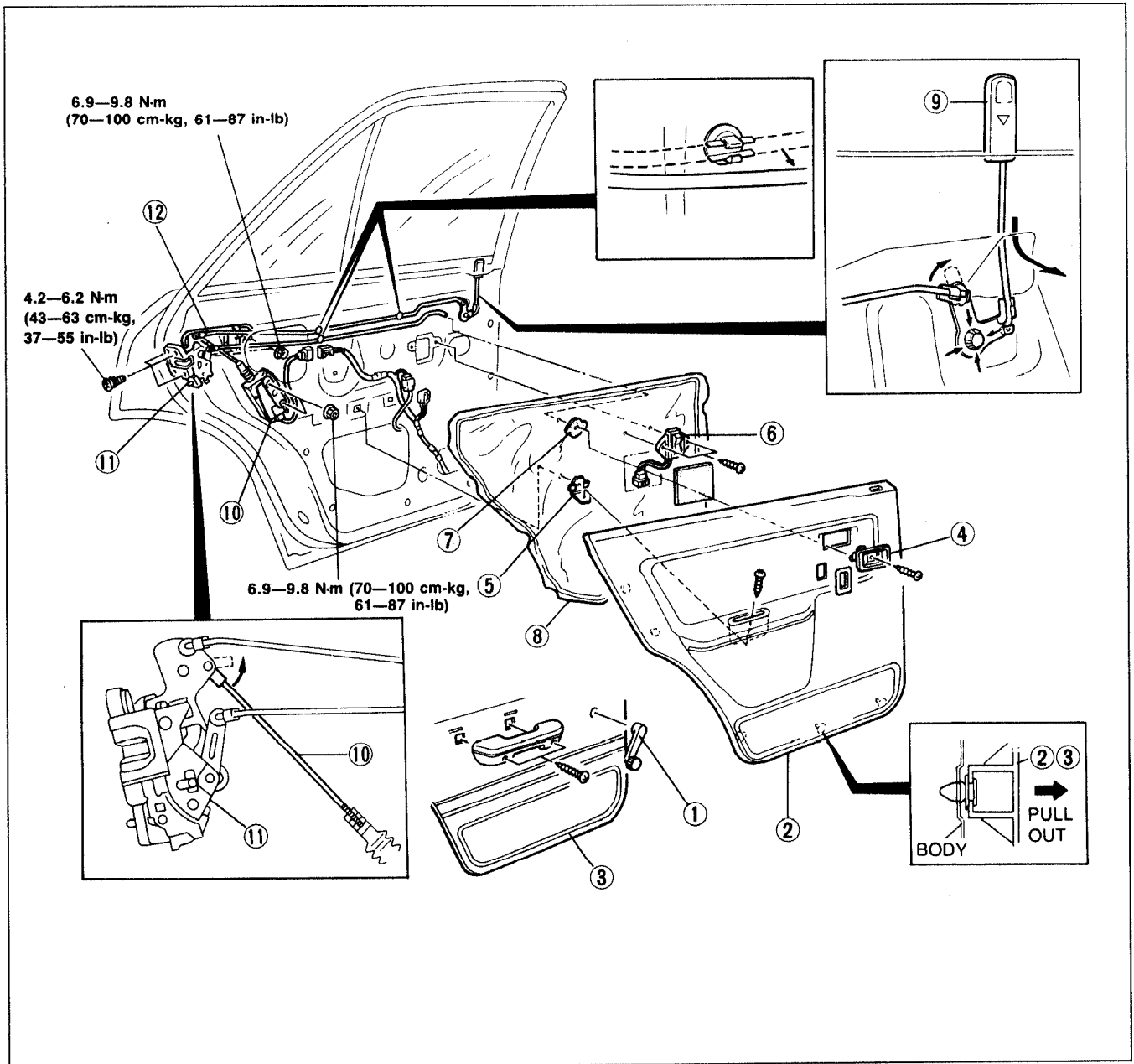
COMPONENTS

Removal / Installation

1. Raise the rear door glass fully to remove the door lock assembly.
2. Disconnect the negative battery cable.
3. Remove in the order shown in the figure, referring to **Removal Note**.
4. Install in the reverse order of removal.

Caution

- Remove the door screen carefully so that it may be reused.



23UOSX-006

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Regulator handle (Manual regulator)
Removal Note..... page S-12 2. Rear door trim (Power window) 3. Rear door trim (Manual window) 4. Inner handle 5. Pull handle bracket (power window) 6. Rear power window switch | <ol style="list-style-type: none"> 7. Sealing pad 8. Door screen 9. Lock knob assembly 10. Lock control (Power door lock) 11. Rear door lock assembly 12. Outer handle |
|--|--|

REAR HATCH

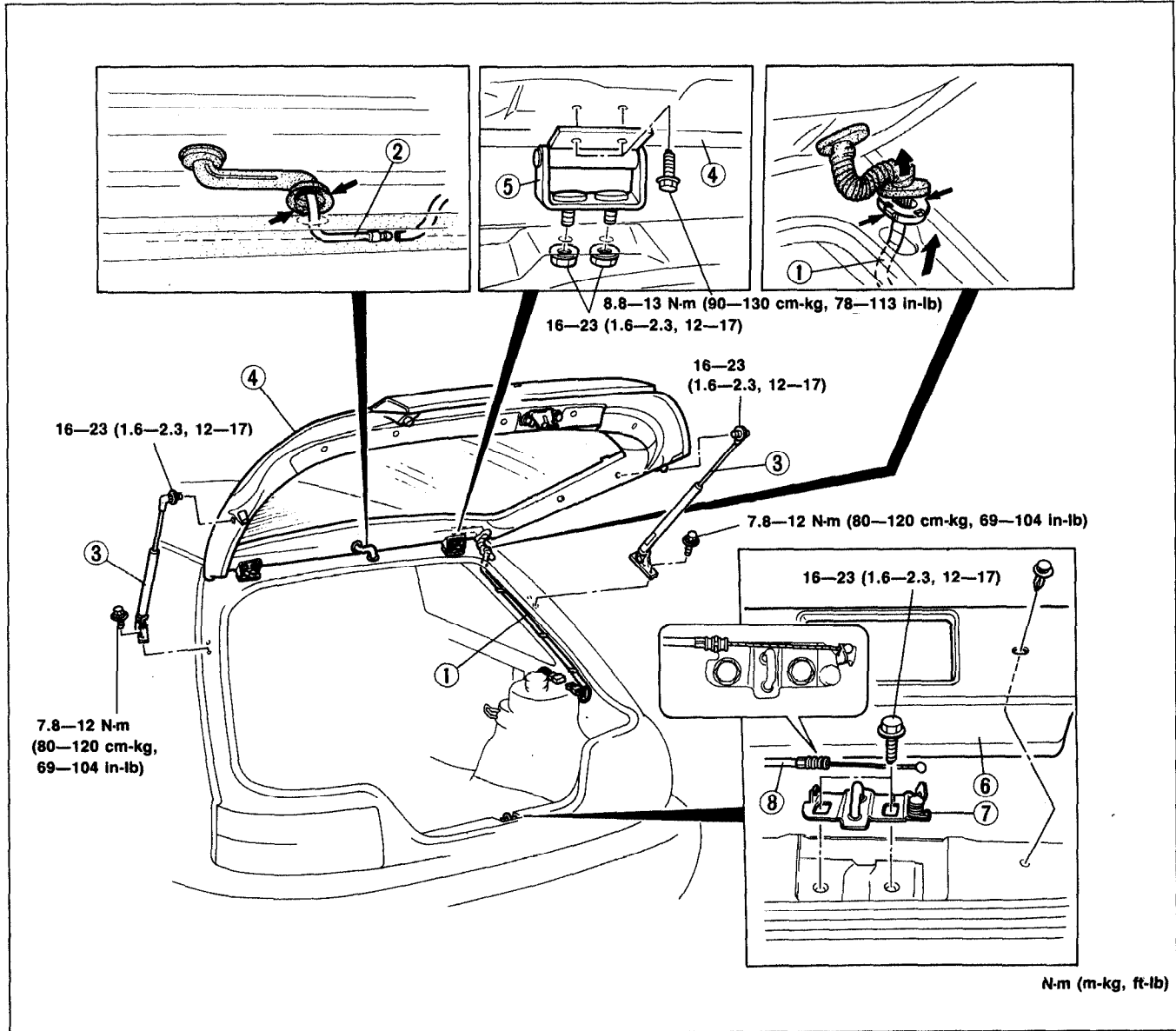
COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.

Note

- Remove the trunk end trim, trunk side cover, trunk side trim, rear header trim, rear seat belt upper anchor, and C-pillar trim for removal of rear harness No.2. (Refer to pages S-98, 101.)
- Remove the rear portion of the headliner for removal of the rear hatch hinge and washer pipe. (Refer to page S-91.)



N-m (m-kg, ft-lb)

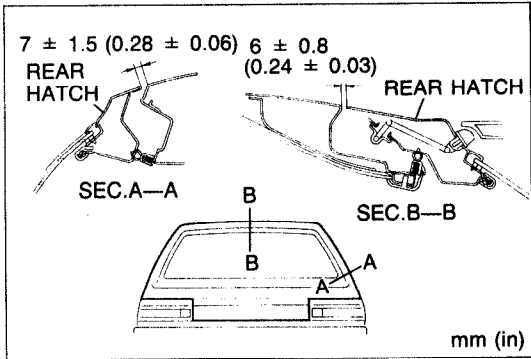
13UOSX-028

Rear hatch

1. Rear harness No.2
2. Washer pipe
3. Stay damper
4. Rear hatch
Adjustment Note..... page S-21
5. Rear hatch hinge

Rear hatch striker

6. Trunk end trim
Removal / Installation page S-98
7. Rear hatch striker
Adjustment Note..... page S-21
8. Rear hatch opener cable



03U0SX-024

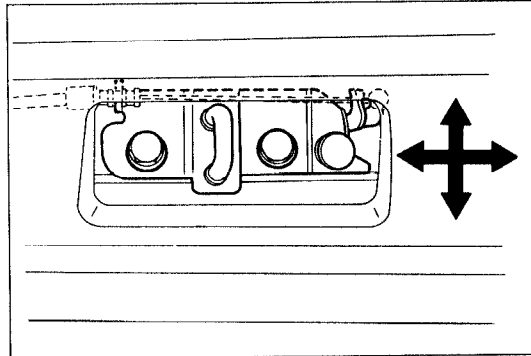
Adjustment Note

Rear hatch

Loosen the hinge bolts and adjust as shown in the figure. Tighten the bolts to the specified torque.

Tightening torque:

8.8—13 N·m (90—130 cm·kg, 78—113 in·lb)



03U0SX-025

Rear hatch striker

Verify that the rear hatch can be closed easily and that there is no looseness. If there is a problem, adjust the rear hatch striker.

- (1) Loosen the rear hatch striker installation bolts.
- (2) Close the rear hatch and align the striker with the rear hatch lock on the rear hatch.

Tightening torque:

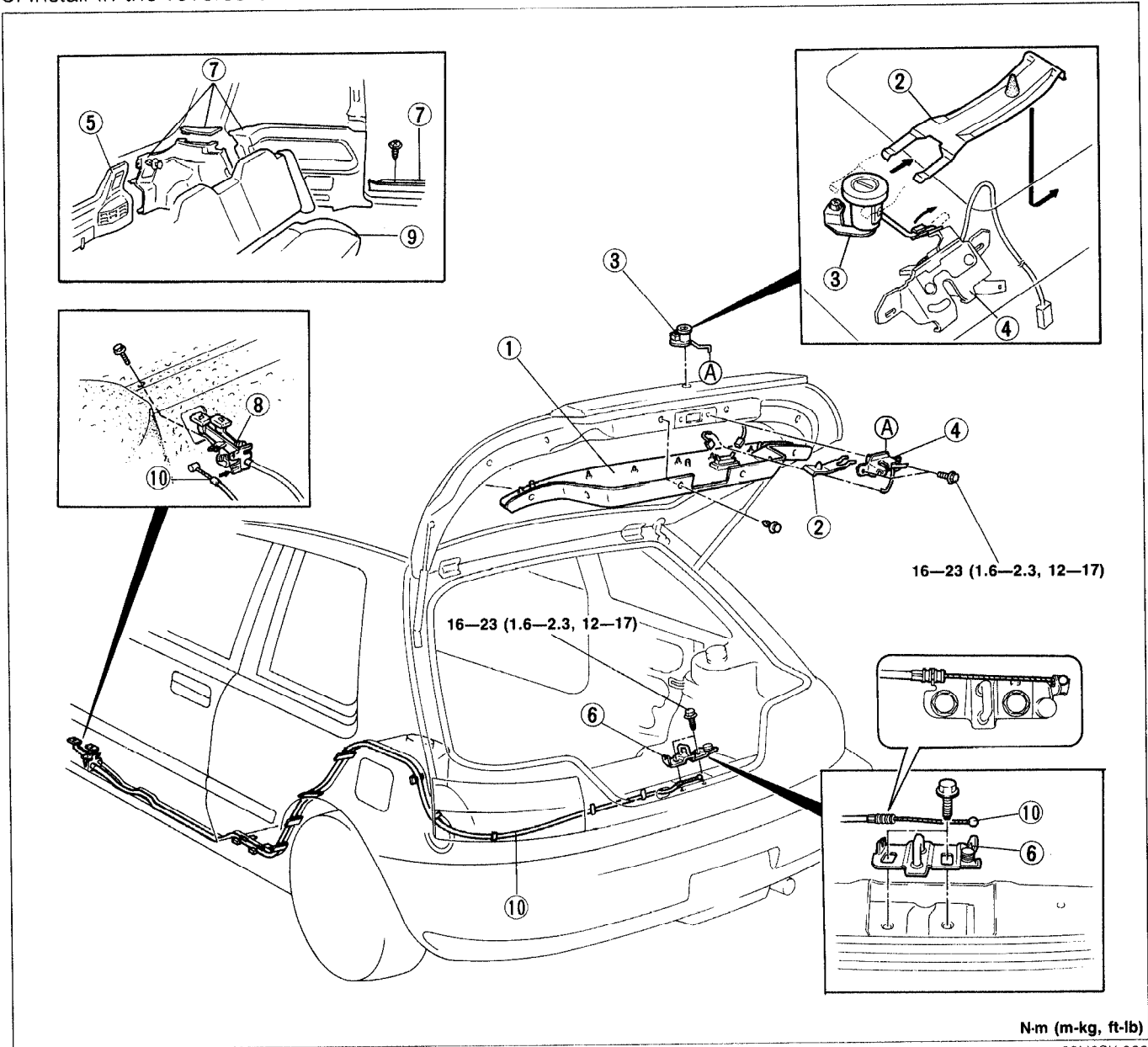
16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)

REAR HATCH LOCK AND OPENER

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



03U0SX-026

Rear hatch lock

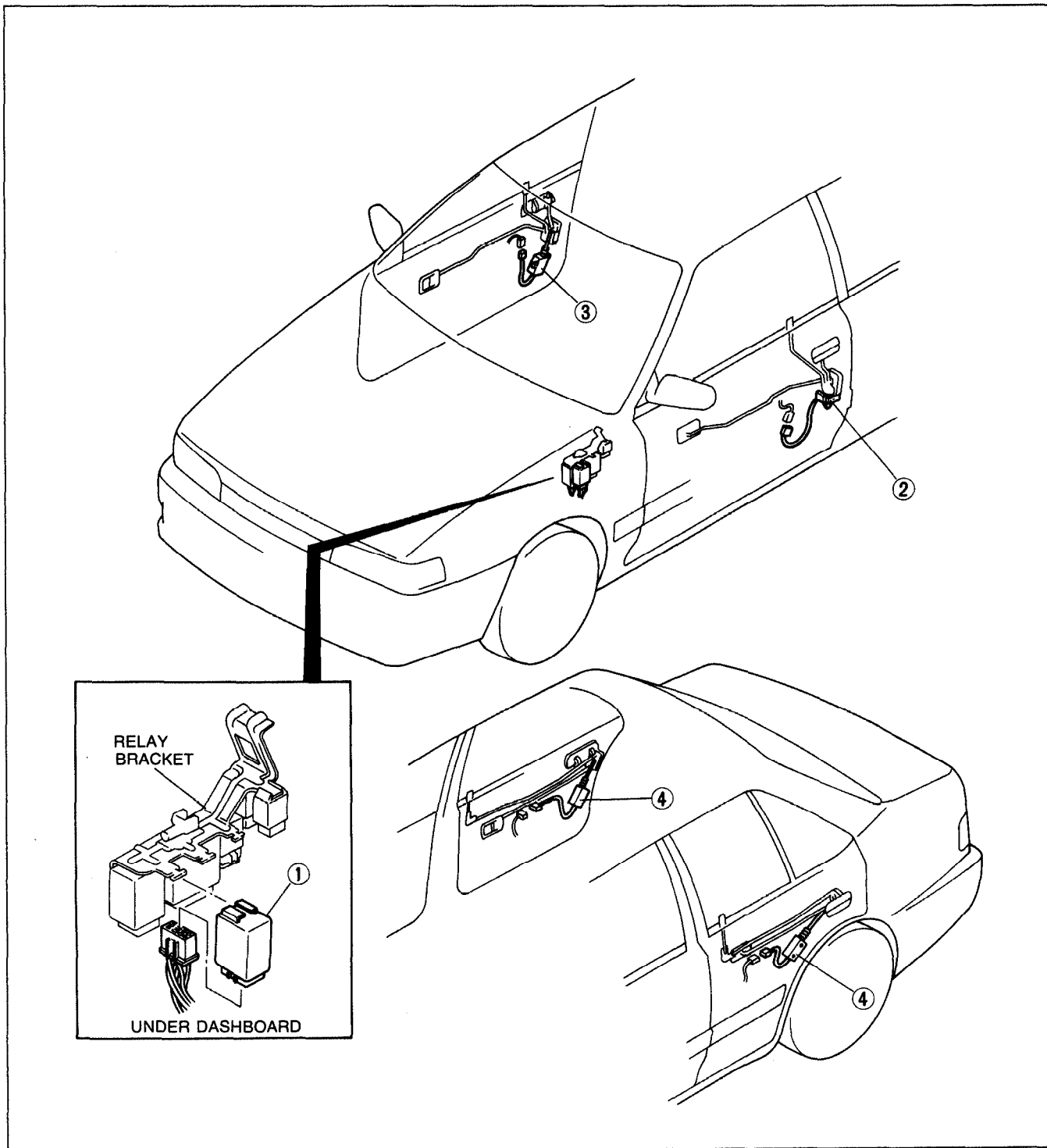
1. Rear hatch lower trim
Removal / Installation page S- 98
2. Lock cylinder retainer
3. Lock cylinder assembly
4. Rear hatch lock assembly

Rear hatch opener, opener cable

5. Trunk end trim
Removal / Installation page S- 98
6. Rear hatch striker
Adjustment Note page S- 21
7. Scuff plate, Trunk side cover, Trunk side trim,
Quarter trim (R.H. side)
Removal / Installation page S- 98
8. Opener lever
9. Rear seat cushion
Removal / Installation page S-112
10. Rear hatch opener cable

POWER DOOR LOCK SYSTEM

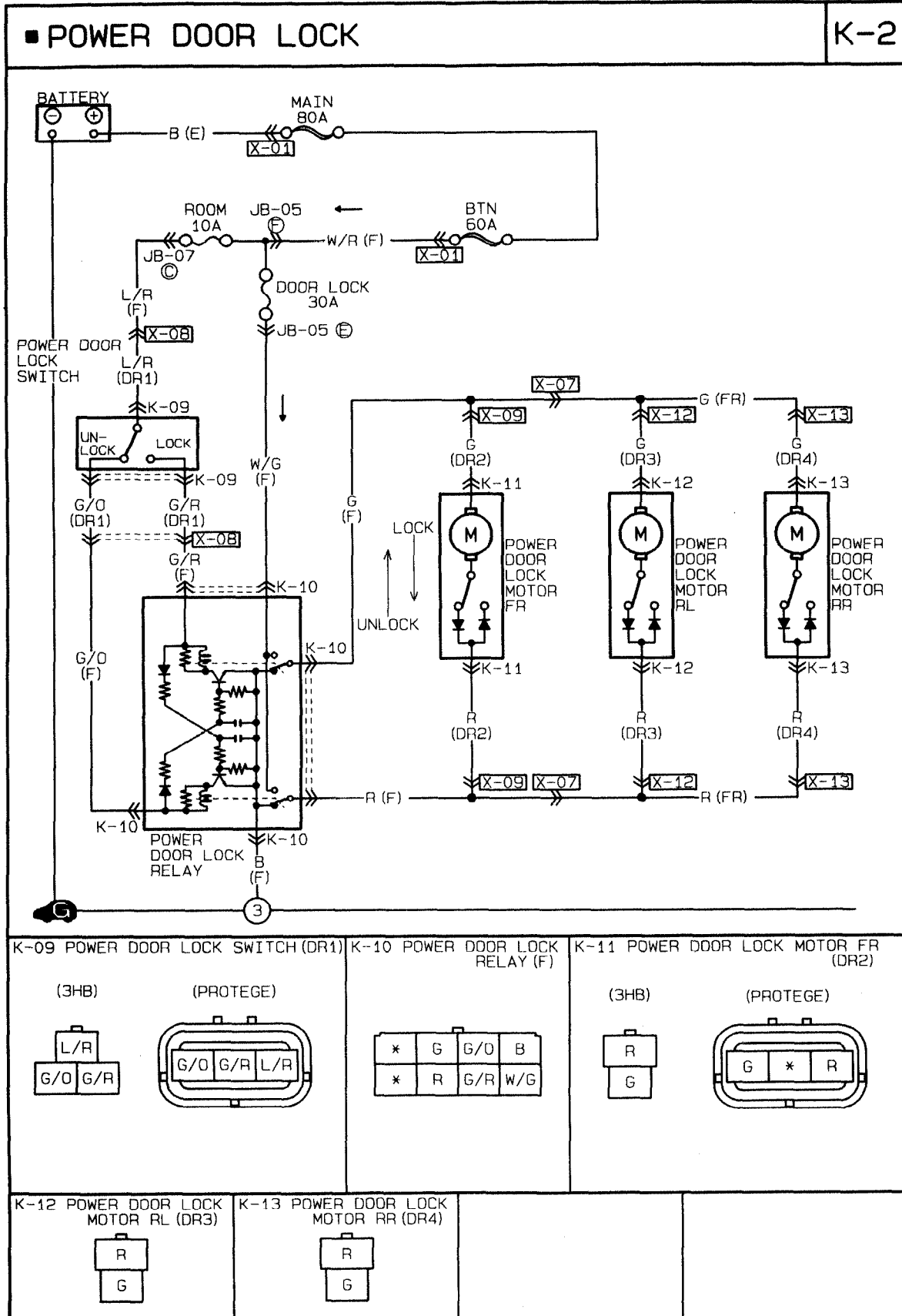
STRUCTURAL VIEW

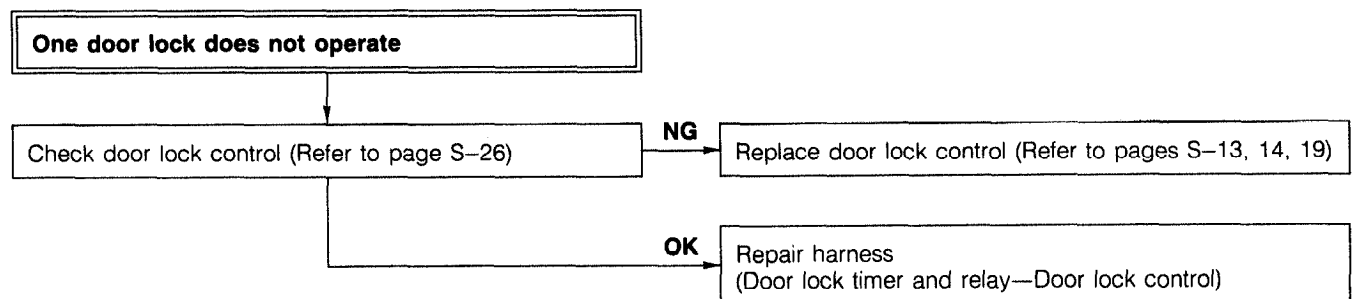
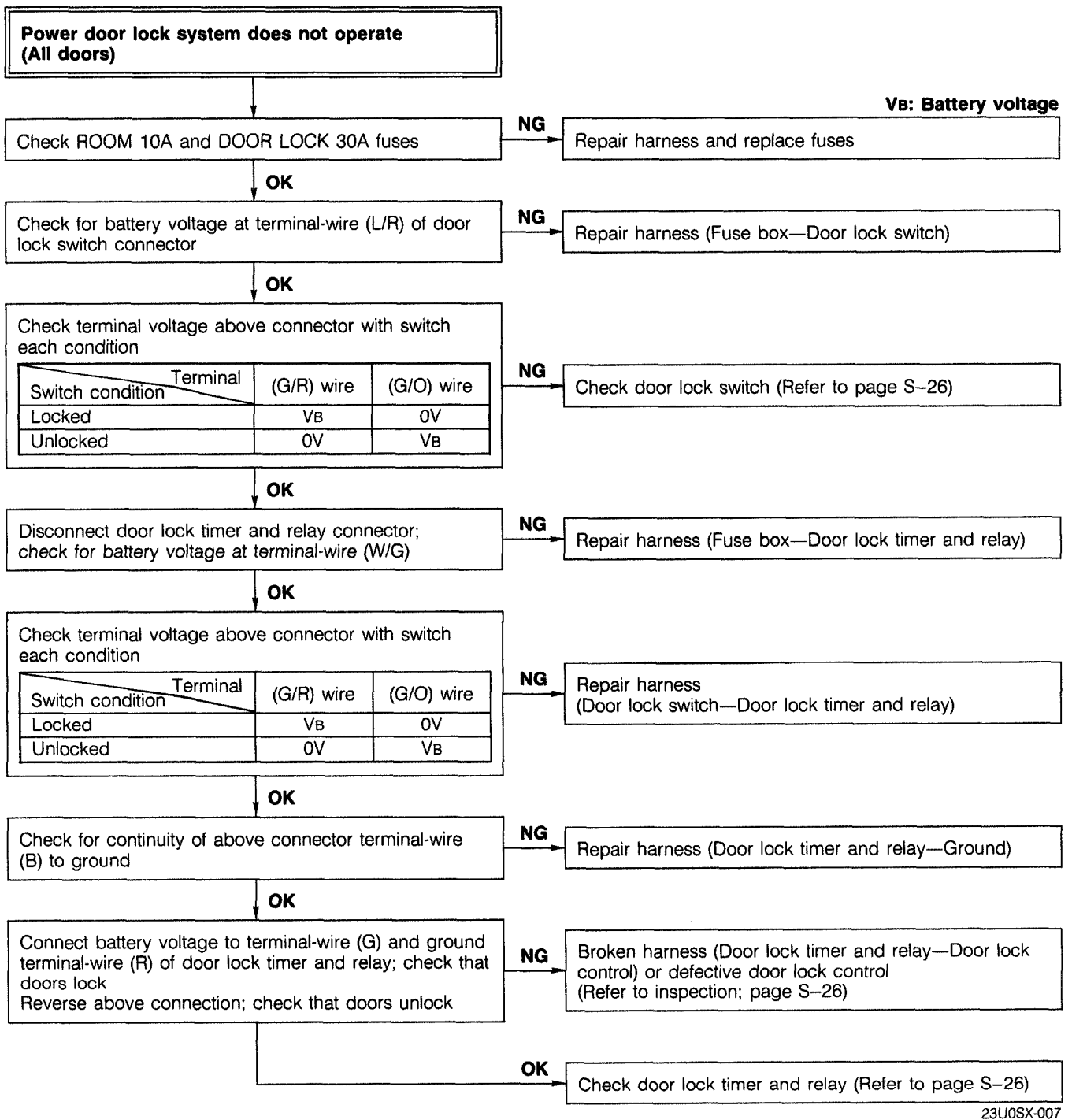


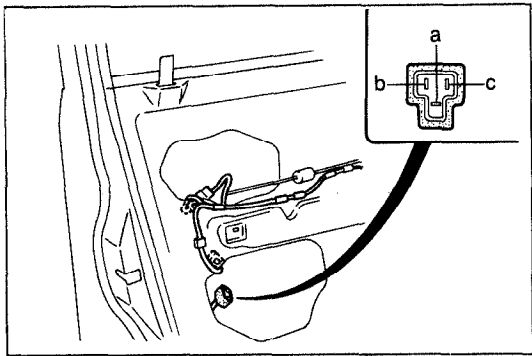
13U05X-005

1. Door lock timer and relay		3. Front door lock control	
Inspection	page S-26	Inspection	page S-26
2. Door lock switch (In door lock assembly)		Removal / Installation	
Inspection	page S-26	Hatchback	page S-13
Removal / Installation		PROTEGÉ	page S-14
Hatchback	page S-13	4. Rear door lock control	
PROTEGÉ	page S-14	Inspection	page S-26
		Removal / Installation	page S-19

TROUBLESHOOTING GUIDE
Circuit Diagram







03U0SX-031

DOOR LOCK SWITCH

Inspection

1. Disconnect the door lock switch connector.
2. Check for continuity between terminals of the switch with an ohmmeter.

Switch condition	Terminal	a	b	c
Locked		○	○	
Unlocked		○		○

○—○: Indicates continuity

3. If not as specified, replace the door lock switch.

DOOR LOCK CONTROL

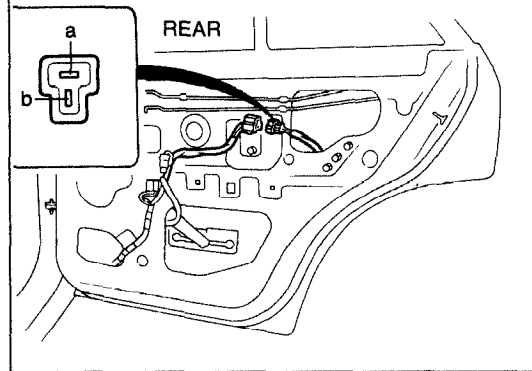
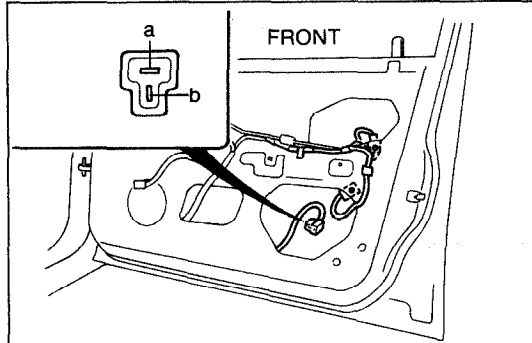
Inspection

1. Disconnect the door lock control connector.
2. Check operation of the door lock control when battery voltage is applied to the terminals.

V_B: Battery voltage

Connection		Door lock control condition
V _B	Ground	
b	a	Locked
a	b	Unlocked

3. If not as specified, replace the door lock control.



23U0SX-008

DOOR LOCK TIMER AND RELAY

Inspection

1. Check for continuity between terminals of the door lock timer and relay with an ohmmeter.

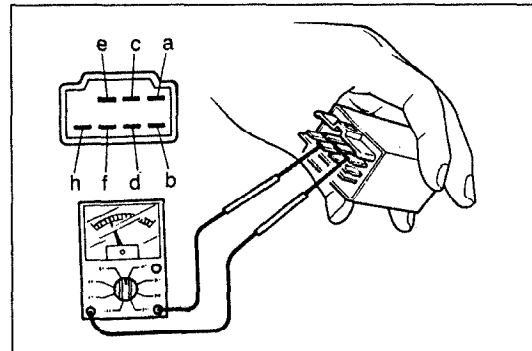
Terminals	Continuity	Terminals	Continuity	Terminals	Continuity
a—b	X	b—d	X	c—h	X
a—c	○	b—e	X	d—e	○
a—d	○	b—f	X	d—f	○
a—e	○	b—h	○	d—h	X
a—f	○	c—d	○	e—f	○
a—h	X	c—e	○	e—h	X
b—c	X	c—f	○	f—h	X

○...Yes X...No

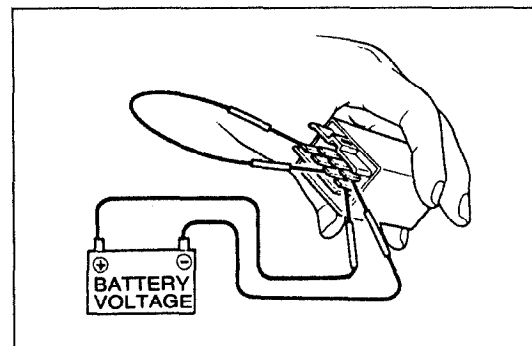
Note

- Set the tester to the × 1,000Ω range.

2. Connect battery voltage to terminal (b) and ground terminal (a). Then, short circuit between terminals (h) and (d) or (h) and (c), and check that the relay clicks.



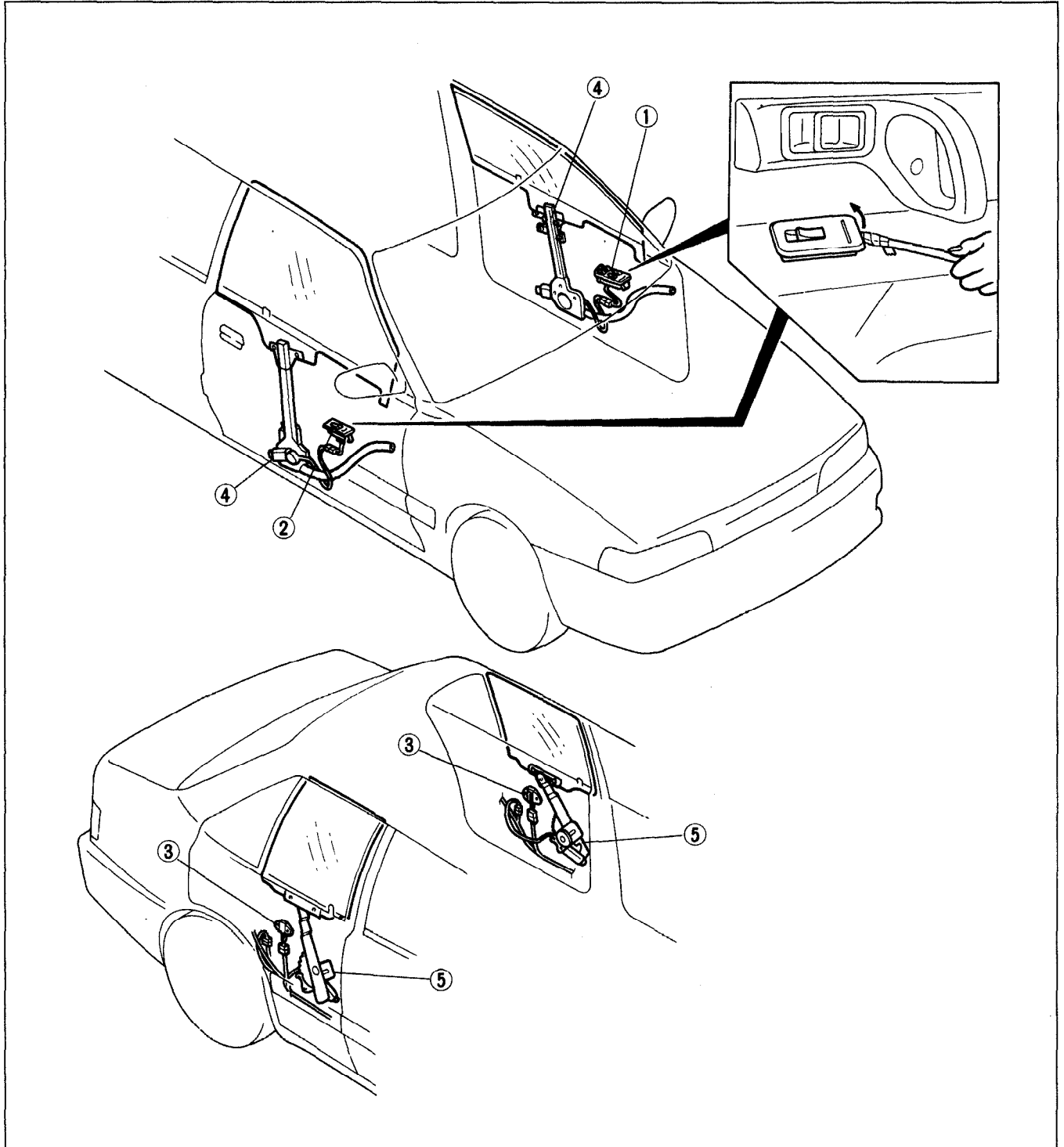
03U0SX-033



23U0SX-009

POWER WINDOW SYSTEM

STRUCTURAL VIEW

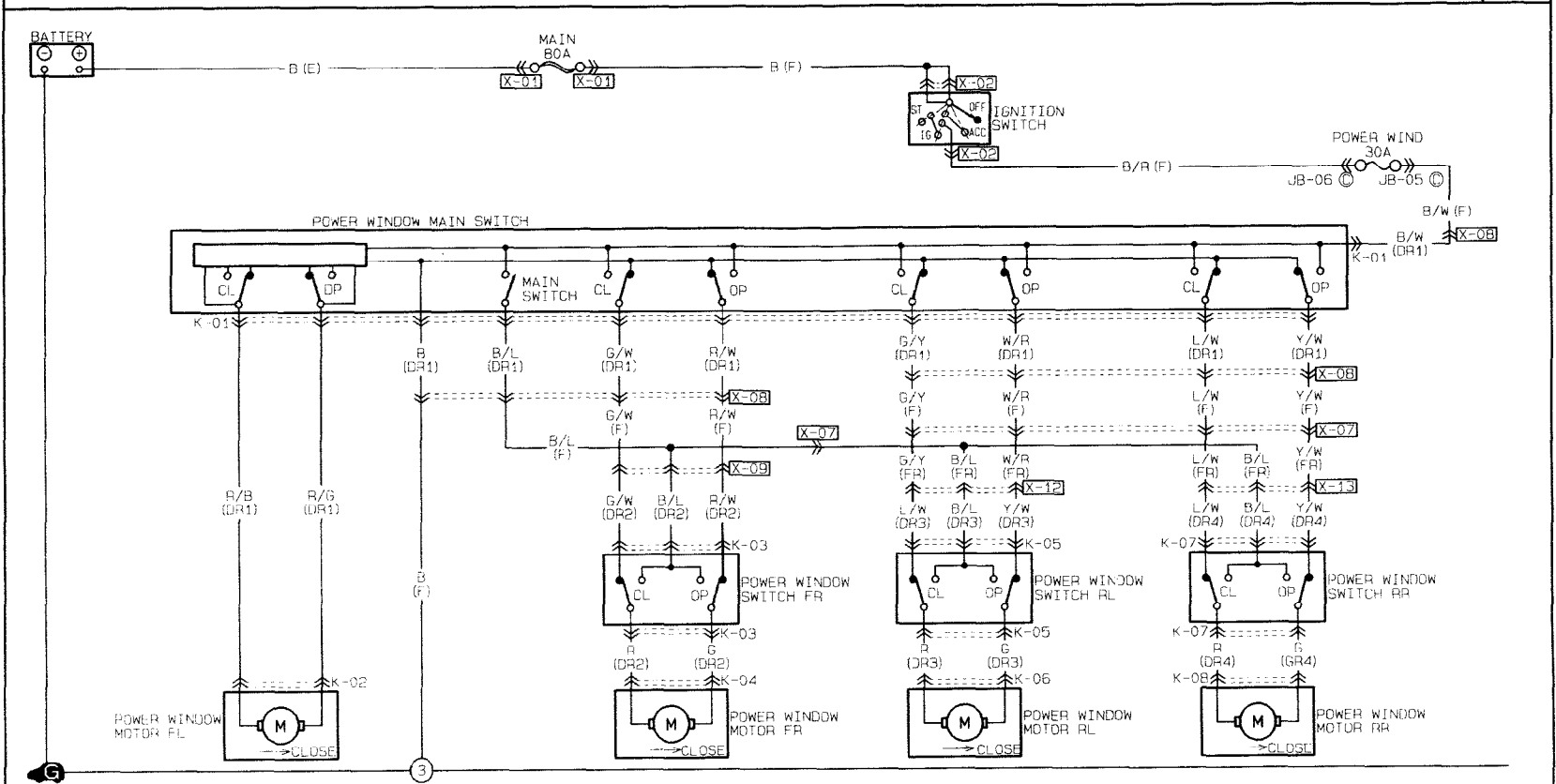


13U0SX-006

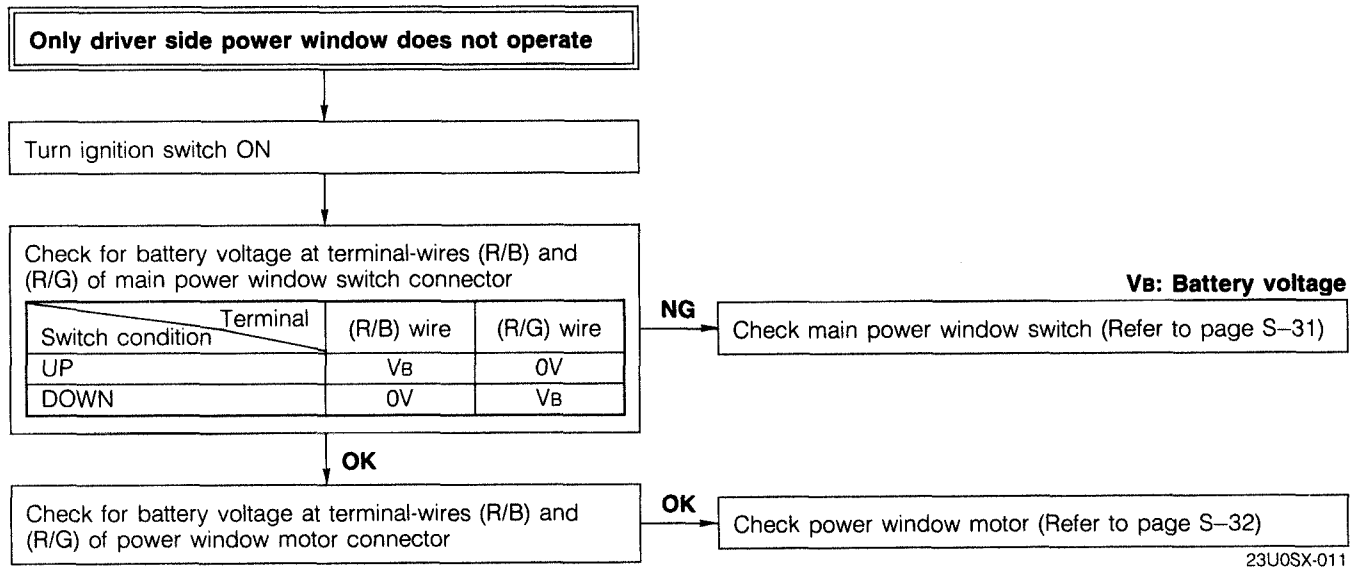
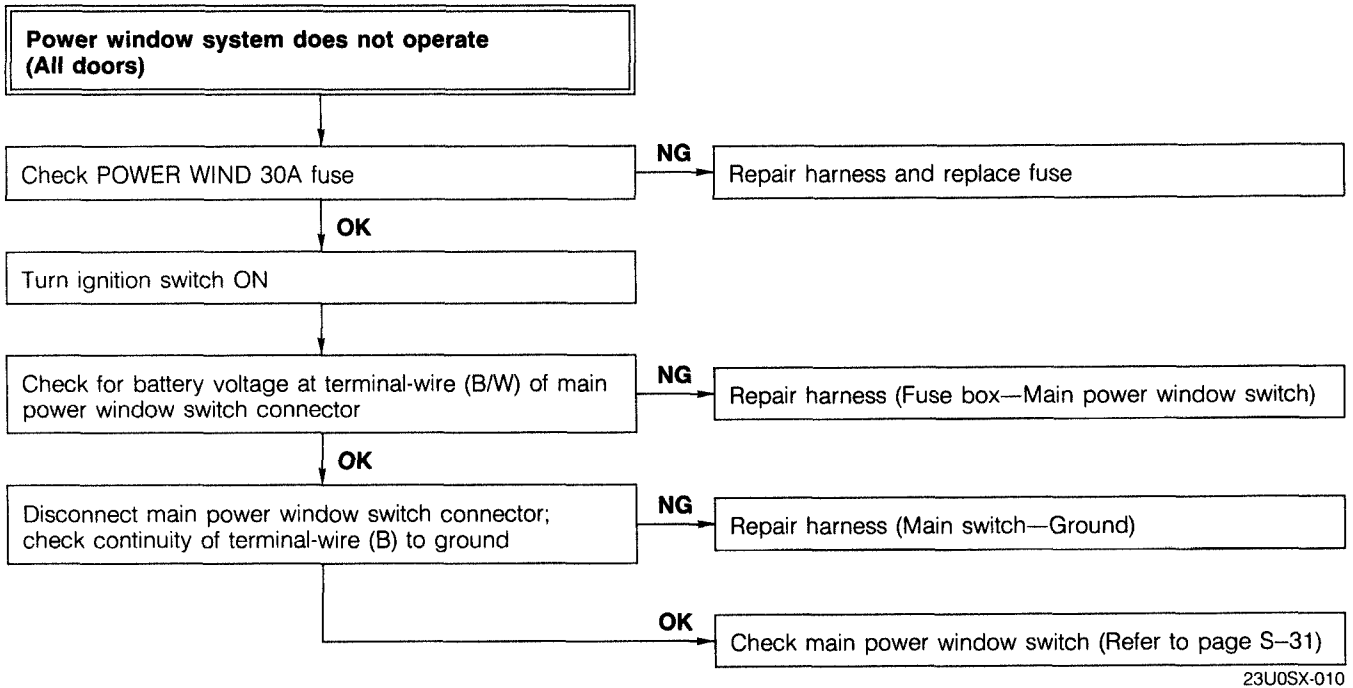
- 1. Main power window switch
Inspection page S-31
- 2. Power window sub-switch (Passenger side)
Inspection page S-32
- 3. Power window sub-switch (Rear)
Removal / Installation page S-17
Inspection page S-32

- 4. Power window regulator (Front door)
Removal / Installation
Hatchback page S-10
PROTEGÉ page S-11
Inspection page S-32
- 5. Power window regulator (Rear door)
Removal / Installation page S-17
Inspection page S-32

POWER WINDOW K-1



<p>K-01 POWER WINDOW MAIN SWITCH (DR1)</p> <p>PROTEGE</p> <table border="1"> <tr> <td>G/Y</td> <td>W/R</td> <td>Y/W</td> <td>L/W</td> <td>B/W</td> </tr> <tr> <td>R/G</td> <td>R/R</td> <td>B</td> <td>B/L</td> <td>G/W</td> </tr> </table> <p>3-B</p> <table border="1"> <tr> <td>R/G</td> <td>B</td> <td>R/W</td> </tr> <tr> <td>R/B</td> <td>B/W</td> <td>B/L</td> </tr> </table>	G/Y	W/R	Y/W	L/W	B/W	R/G	R/R	B	B/L	G/W	R/G	B	R/W	R/B	B/W	B/L	<p>K-02 POWER WINDOW MOTOR FL (DR1)</p> <table border="1"> <tr> <td>R/B</td> </tr> <tr> <td>R/G</td> </tr> </table>	R/B	R/G	<p>K-03 POWER WINDOW SWITCH FR (DR2)</p> <table border="1"> <tr> <td>R</td> <td>G/W</td> <td>R/W</td> <td>*</td> <td>G</td> <td>B/L</td> </tr> </table>	R	G/W	R/W	*	G	B/L	<p>K-04 POWER WINDOW MOTOR FR (DR2)</p> <table border="1"> <tr> <td>R</td> </tr> <tr> <td>G</td> </tr> </table>	R	G	<p>K-05 POWER WINDOW SWITCH RL (DR3)</p> <table border="1"> <tr> <td>R</td> <td>G</td> <td>L/W</td> <td>Y/W</td> <td>B/L</td> <td>*</td> </tr> </table>	R	G	L/W	Y/W	B/L	*
G/Y	W/R	Y/W	L/W	B/W																																
R/G	R/R	B	B/L	G/W																																
R/G	B	R/W																																		
R/B	B/W	B/L																																		
R/B																																				
R/G																																				
R	G/W	R/W	*	G	B/L																															
R																																				
G																																				
R	G	L/W	Y/W	B/L	*																															
<p>K-06 POWER WINDOW MOTOR RL (DR3)</p> <table border="1"> <tr> <td>R</td> </tr> <tr> <td>G</td> </tr> </table>	R	G	<p>K-07 POWER WINDOW SWITCH RR (DR4)</p> <table border="1"> <tr> <td>P</td> <td>G</td> <td>L/W</td> <td>Y/W</td> <td>B/L</td> <td>*</td> </tr> </table>	P	G	L/W	Y/W	B/L	*	<p>K-08 POWER WINDOW MOTOR RR (DR4)</p> <table border="1"> <tr> <td>R</td> </tr> <tr> <td>G</td> </tr> </table>	R	G																								
R																																				
G																																				
P	G	L/W	Y/W	B/L	*																															
R																																				
G																																				



Check for battery voltage at terminal-wires (R/B) and (R/G) of main power window switch connector

Terminal	(R/B) wire	(R/G) wire
UP	V _B	0V
DOWN	0V	V _B

V_B: Battery voltage

Power window (except driver side) cannot be operated by main switch

Turn ignition switch ON

Check for battery voltage at terminal-wires of main power window switch connector

Switch	Condition	Terminal	Voltage
Passenger side	UP	(G/W) wire	V _B
	DOWN	(R/W) wire	V _B
Rear (LH)	UP	(G/Y) wire	V _B
	DOWN	(W/R) wire	V _B
Rear (RH)	UP	(L/W) wire	V _B
	DOWN	(Y/W) wire	V _B

NG

Check main power window switch (Refer to page S-31)

V_B: Battery voltage

Note

- Use only main switch during checking operation.

OK

Check for battery voltage at terminal-wires of power window sub-switch connector while operating main switch

Switch	Condition	Terminal	Voltage
Passenger side	UP	(G/W) wire	V _B
	DOWN	(R/W) wire	V _B
Rear	UP	(L/W) wire	V _B
	DOWN	(Y/W) wire	V _B

NG

Repair harness
(Main power window switch—Power window sub-switch)

OK

Check for battery voltage at terminal-wires of power window sub-switch connector while operating main switch

Condition	Terminal	Voltage
UP	(R) wire	V _B
DOWN	(G) wire	V _B

NG

Check power window sub-switch (Refer to page S-32)

OK

Check for battery voltage at terminal wires of power window motor connector while operating main switch

Condition	Terminal	Voltage
UP	(R) wire	V _B
DOWN	(G) wire	V _B

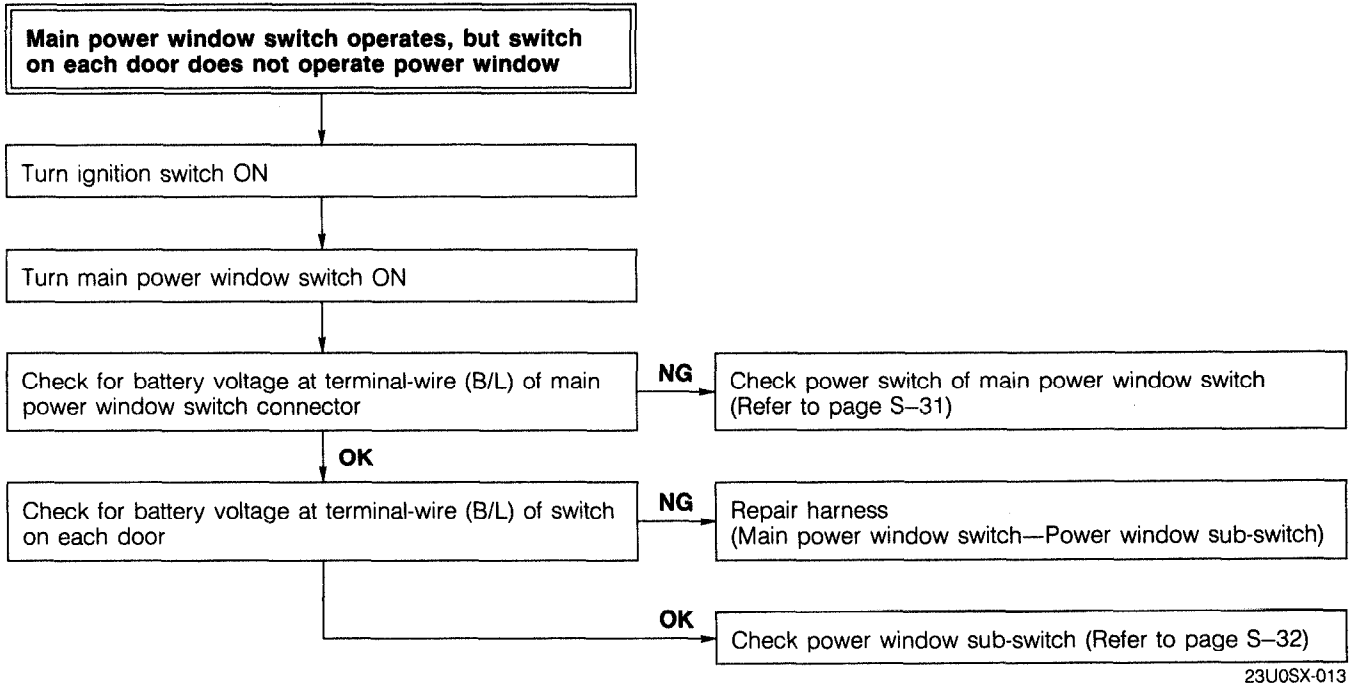
NG

Repair harness
(Power window sub-switch—Power window motor)

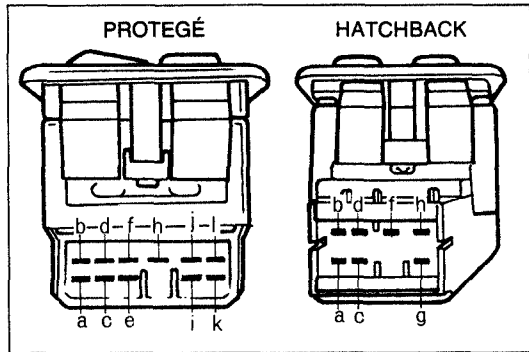
OK

Check power window motor (Refer to page S-32)

23U0SX-012



23U0SX-013



13U0SX-007

MAIN POWER WINDOW SWITCH Inspection

Check for continuity between terminals of the switch with an ohmmeter.

Power switch (ON/OFF)

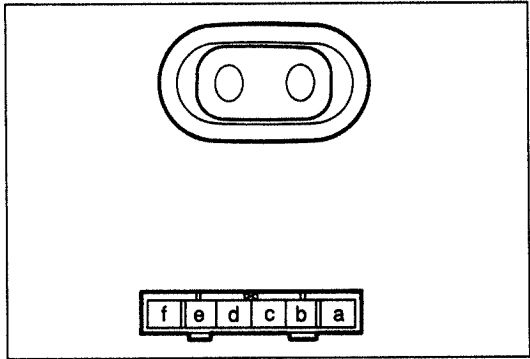
Terminal	PROTEGÉ		Hatchback	
	a	f	h	g
Switch condition ON	○—○	○—○	○—○	○—○
Switch condition OFF				

○—○: Indicates continuity

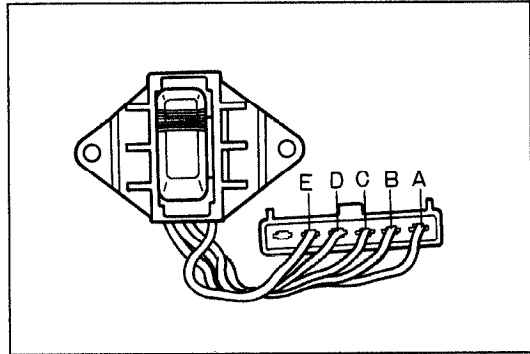
Power window switch (Up/Down)

Terminal	Switch															
	Front LH		Front RH		Rear LH		Rear RH									
	PROTEGÉ		Hatchback		PROTEGÉ		Hatchback									
Switch condition	a	b	d	h	a	h	j	l	a	c	e	h	a	h	i	k
UP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
OFF	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
DOWN	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

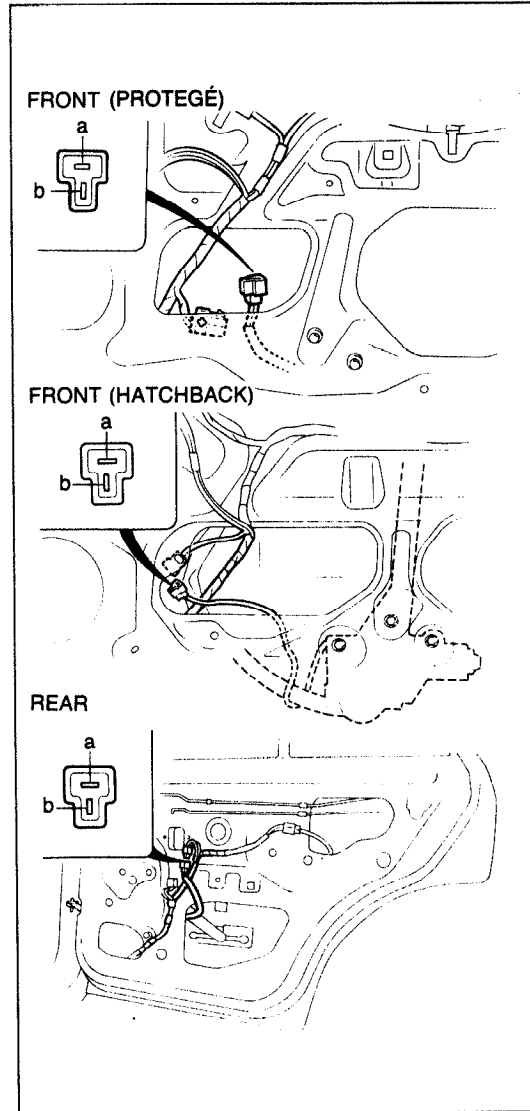
○—○: Indicates continuity



23U0SX-014



03U0SX-043



23U0SX-015

POWER WINDOW SUB-SWITCH

Inspection

Check for continuity between terminals of the switch with an ohmmeter.

Passenger side

Switch condition \ Terminal	a	b	c	d	e	f
UP	○—○	○—○	○—○	○—○		○—○
OFF		○—○	○—○	○—○	○—○	○—○
DOWN	○—○	○—○			○—○	○—○

○—○: Indicates continuity

Rear

Switch condition \ Terminal	A	B	C	D	E
UP	○—○	○—○	○—○	○—○	○—○
OFF	○—○	○—○	○—○	○—○	
DOWN	○—○	○—○	○—○	○—○	○—○

○—○: Indicates continuity

POWER WINDOW MOTOR (In power window regulator)

Inspection

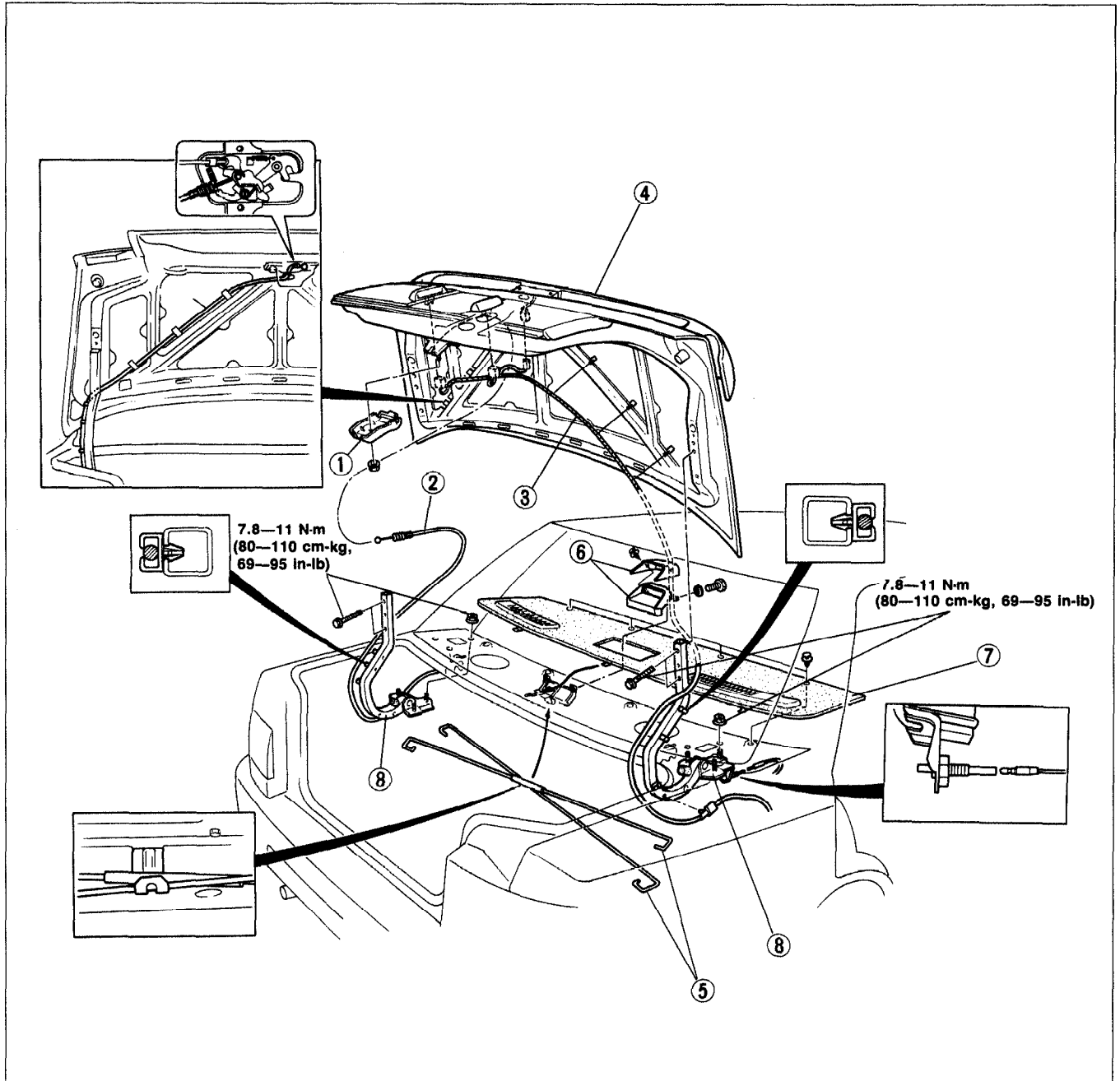
1. Disconnect the power window motor connector.
2. Connect battery voltage to terminal (a) and ground terminal (b) of the motor connector, and verify that the motor operates.
3. Reverse the above connections and check for reverse operation of the motor.

TRUNK LID

COMPONENTS

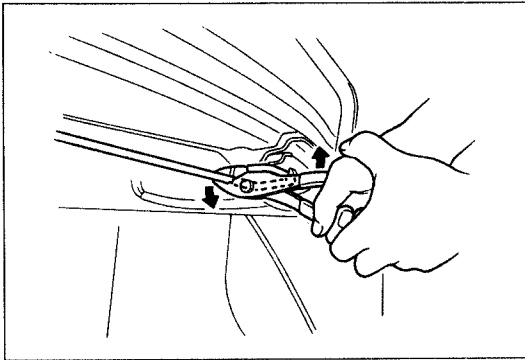
Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

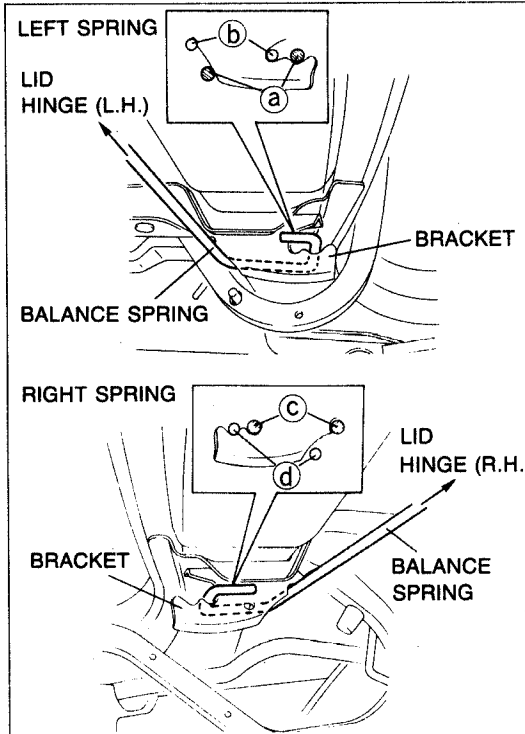


03U0SX-045

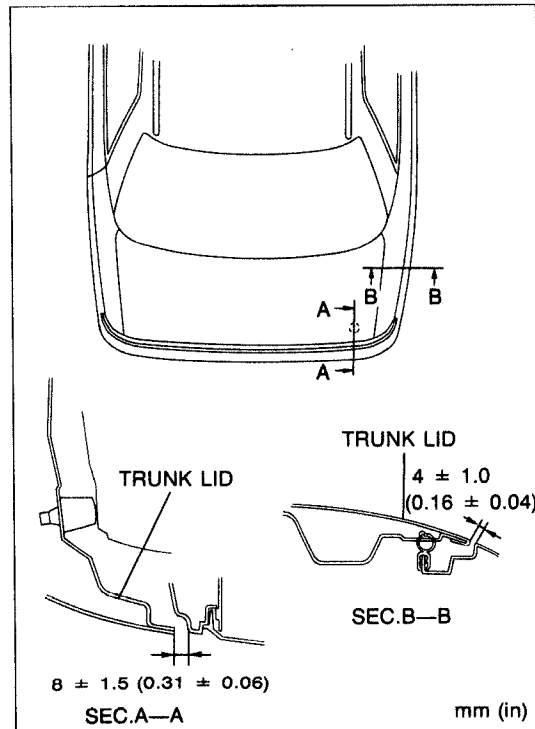
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Lid lock protector 2. Trunk opener cable 3. Rear harness 4. Trunk lid
Adjustment Note page S-34 5. Balance spring
Removal Note page S-34
Installation Note page S-34
Adjustment Note page S-34 | <ol style="list-style-type: none"> 6. High-mount stoplight (Interior mounted)
Removal / Installation Section T 7. Rear package trim
Removal / Installation page S-97 8. Lid hinge assembly |
|---|---|



03U0SX-046



03U0SX-047



03U0SX-048

Removal Note**Balance springs**

Remove the balance springs from the brackets (LH/RH) with pliers.

Warning

- Use care when moving the balance spring.

Installation Note**Balance springs**

1. Install the hook of each balance spring to the lid hinge assembly.
2. Install the balance spring at the (a) or (b) position as shown.

Warning

- Use care when moving the balance spring.

Adjustment Note**Balance spring**

Adjust the balance spring tension as described below.

- (a) Increase: Set the right spring from standard position (c) to (d).
- (b) Decrease: Set the left spring from standard position (a) to (b).

Trunk lid**Centering**

1. Loosen the hinge bolts and adjust as shown.
2. Tighten the bolts to the specified torque.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Height

1. Loosen the lid striker installation bolts as shown.
2. Tighten the bolts to the specified torque.

Tightening torque:

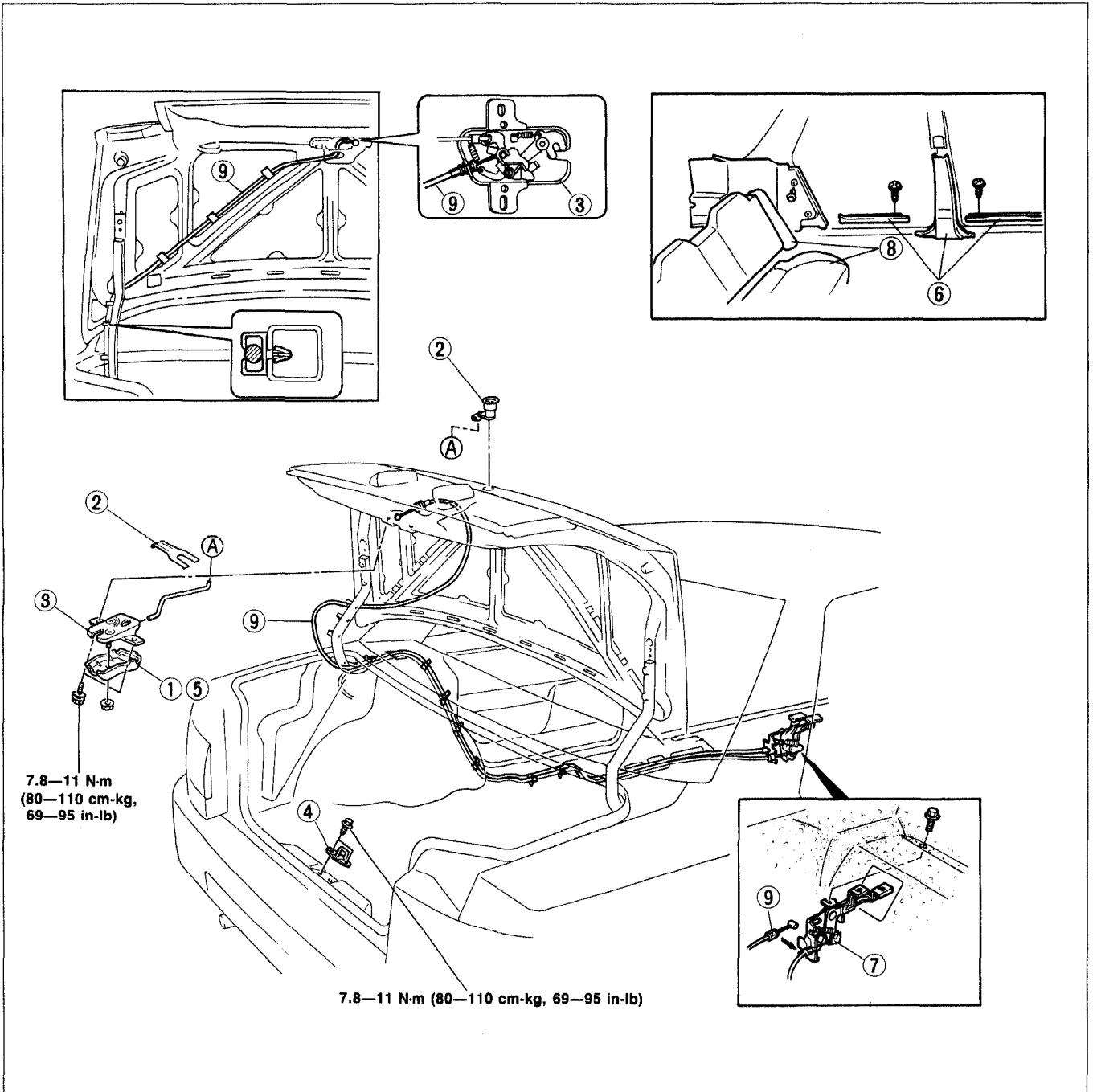
7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

TRUNK LID LOCK AND OPENER

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal.



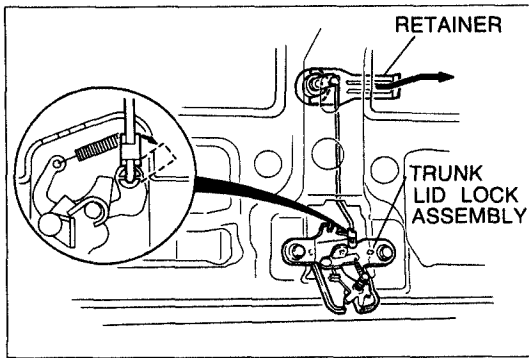
03U0SX-049

Trunk lid lock, Striker

1. Trunk lid protector
2. Trunk lid lock cylinder, Retainer
Removal Note page S- 36
3. Trunk lid lock assembly
4. Trunk lid striker

Trunk lid opener, Opener cable

5. Trunk lid protector
6. Scuff plate, B-pillar lower trim (L.H. side)
Removal / Installation page S- 97
7. Opener lever
8. Rear seat
Removal / Installation page S-111
9. Trunk lid opener cable



03U0SX-050

Removal Note**Trunk lid lock cylinder**

1. Disconnect the opening rod from the trunk lid lock assembly.
2. Remove the retainer and the trunk lid lock cylinder and opening rod.

FUEL FILLER LID AND OPENER

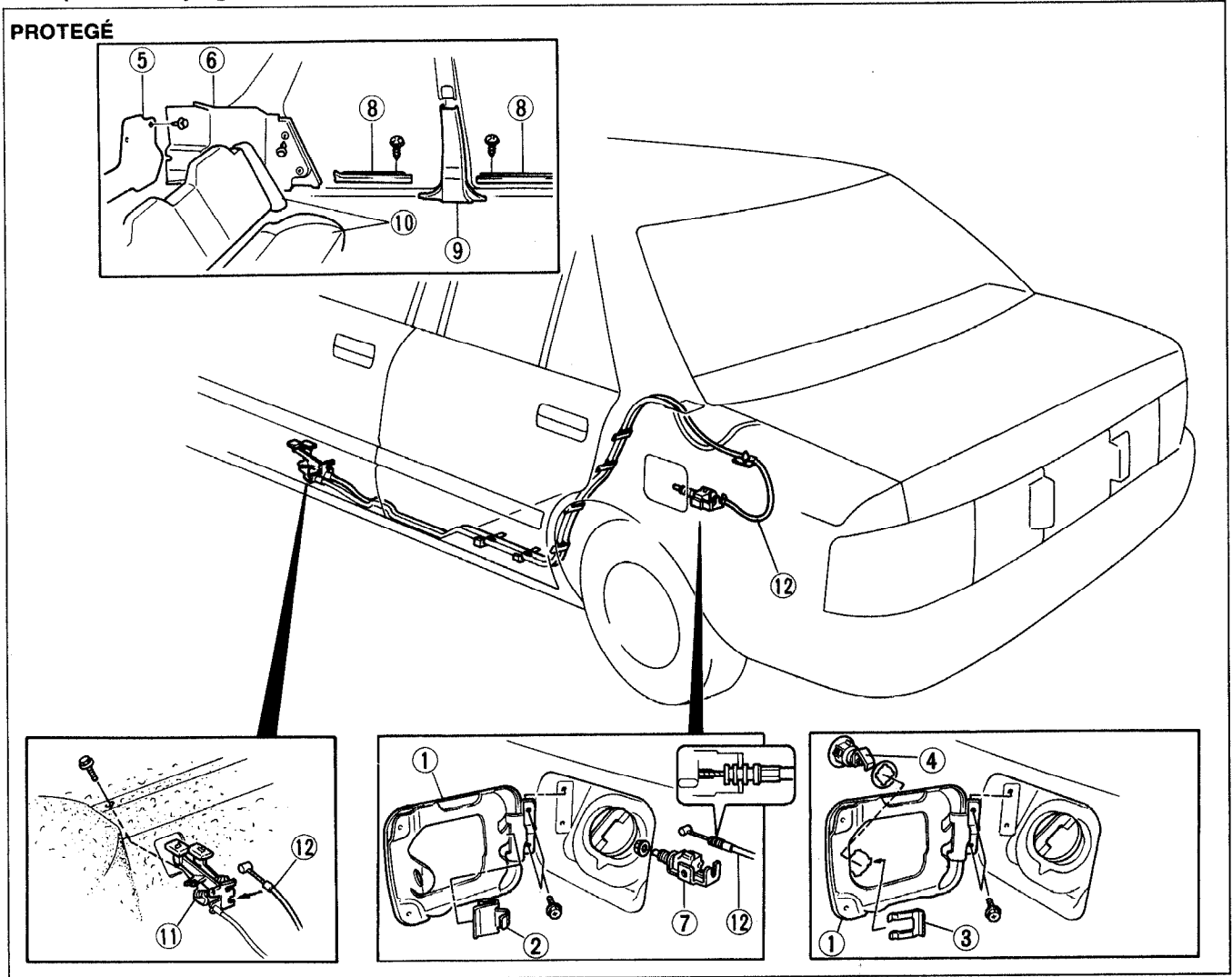
COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

Note

- Remove the rear seat belt retractor for removal of the trunk side trim (PROTEGÉ). (Refer to page S-101.)



13U0SX-008

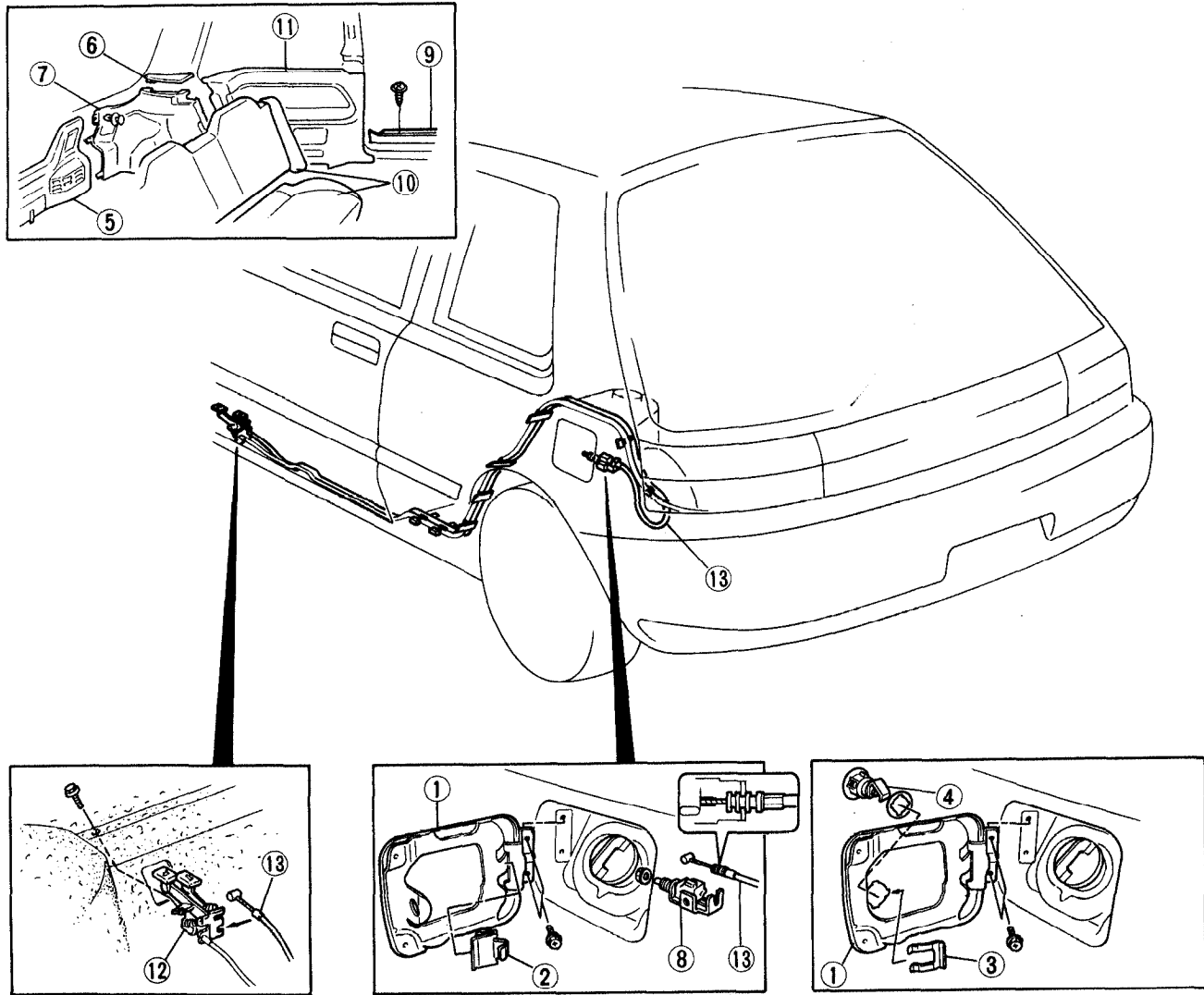
Filler lid

1. Filler lid
2. Lift spring (With opener)
3. Lock cylinder retainer (Without opener)
4. Filler lid lock (Without opener)

Filler lid opener, Opener lever, Opener cable

5. Trunk end trim
Removal / Installation page S- 97
6. Trunk side trim (L.H. side)
Removal / Installation page S- 97
7. Filler lid opener
8. Scuff plate (L.H. side)
Removal / Installation page S- 97
9. B-pillar lower trim (L.H. side)
Removal / Installation page S- 97
10. Rear seat
Removal / Installation page S-111
11. Opener lever
12. Opener cable

HATCHBACK



03U0SX-052

Filler lid

- 1. Filler lid
- 2. Lift spring (With opener)
- 3. Lock cylinder retainer (Without opener)
- 4. Filler lid lock (Without opener)

Filler lid opener, Opener lever, Opener cable

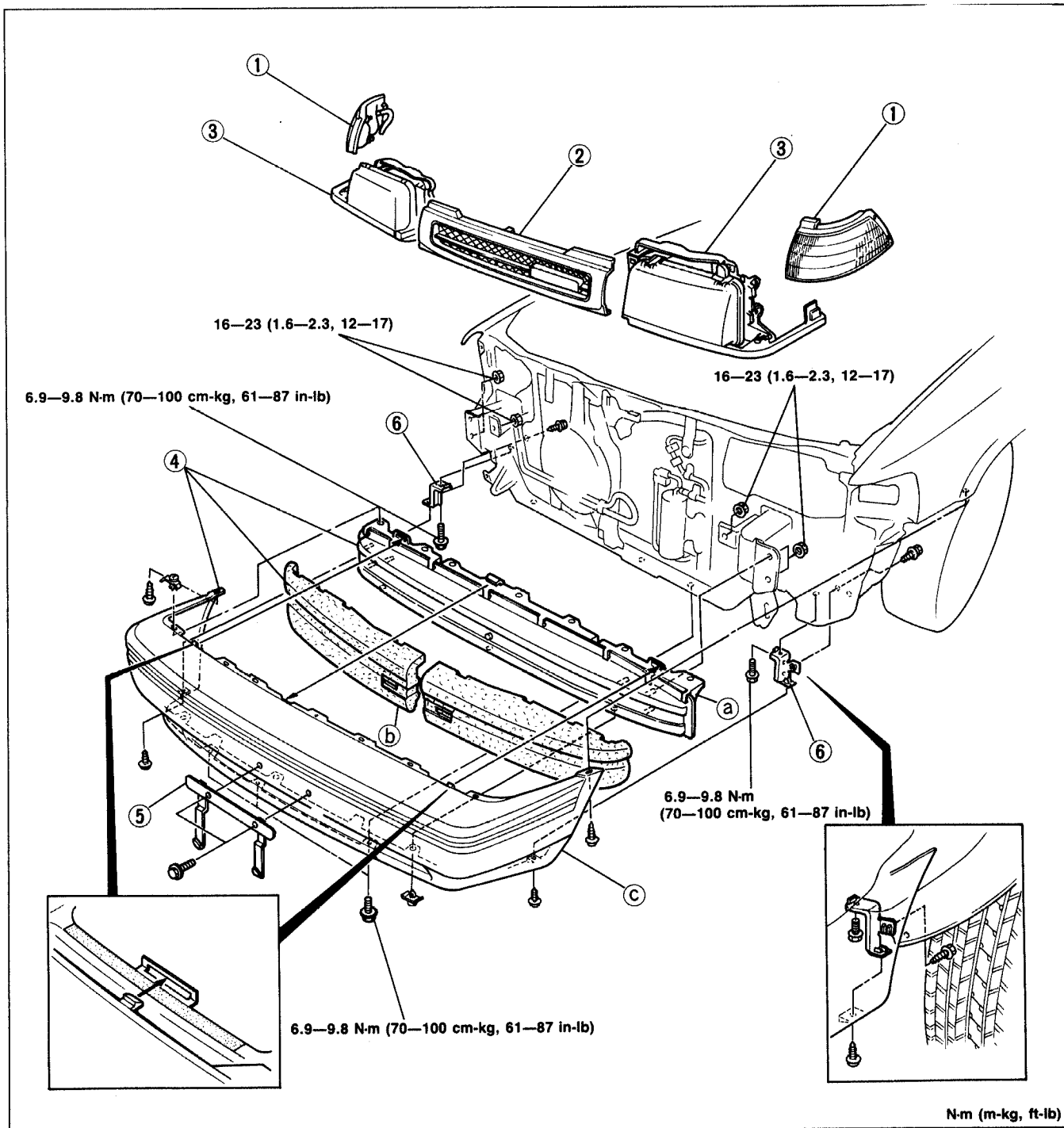
- 5. Trunk end trim
Removal / Installation page S- 98
- 6. Trunk side cover
Removal / Installation page S- 98
- 7. Trunk side trim
Removal / Installation page S- 98
- 8. Filler lid opener
- 9. Scuff plate
Removal / Installation page S- 98
- 10. Rear seat
Removal / Installation page S-112
- 11. Quarter trim
Removal / Installation page S- 98
- 12. Opener lever
- 13. Opener cable

FRONT BUMPER

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



N-m (m-kg, ft-lb)

13U0SX-009

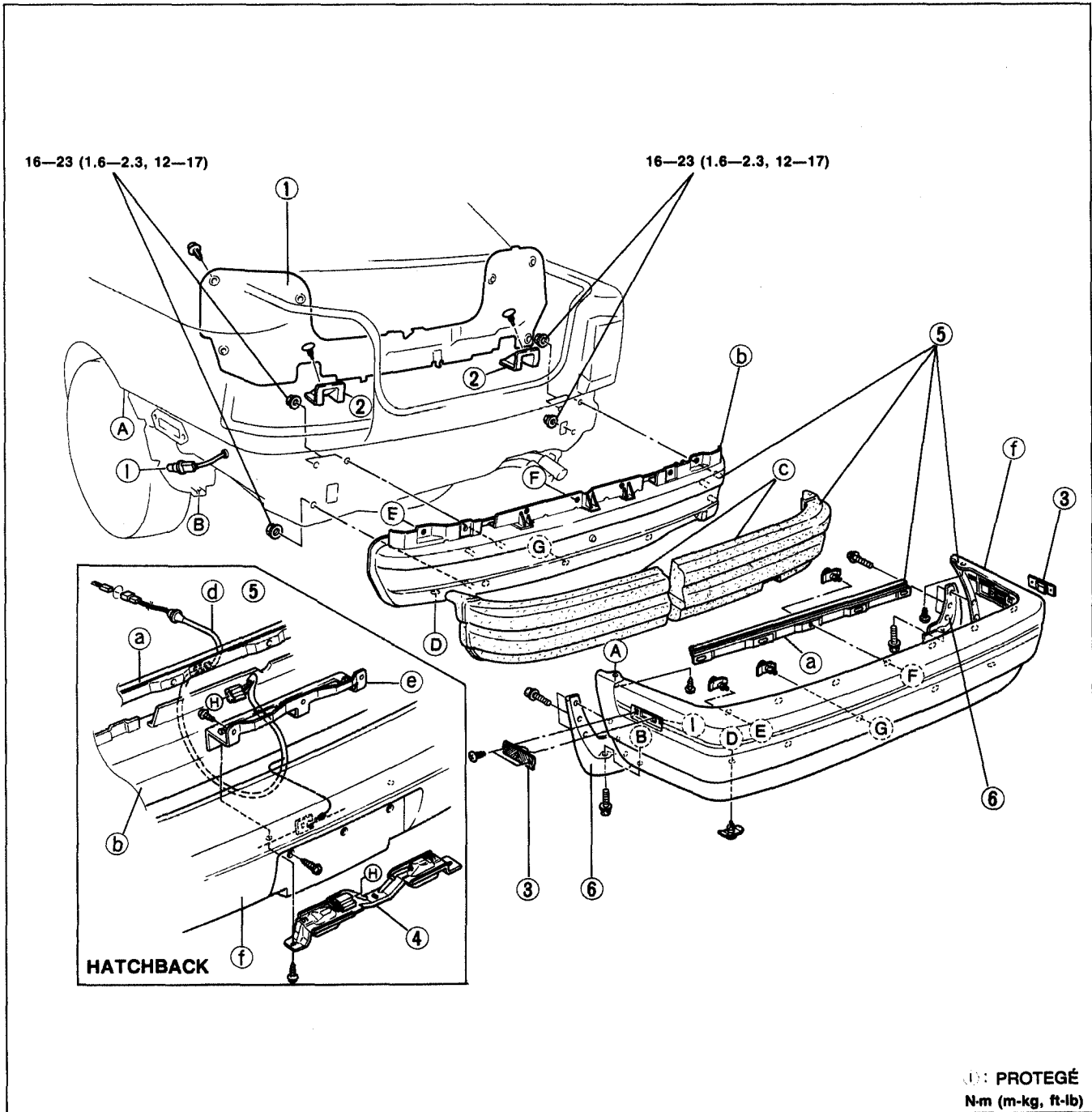
- | | | |
|---|-----------|---|
| 1. Front combination light
Removal / Installation | Section T | 4. Front bumper assembly |
| 2. Radiator grille
Removal / Installation | page S-51 | a. Front bumper reinforcement and bracket |
| 3. Headlight and lower grille molding
Removal / Installation | Section T | b. Energy absorbing foam |
| | | c. Front bumper fascia |
| | | 5. License plate holder |
| | | 6. Front bumper bracket |

REAR BUMPER

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



1. Trunk end trim
Removal / Installation pages S-97, 98
2. Bumper bracket cover (PROTEGE)
3. Rear reflector light
4. Licence plate light (Hatchback)

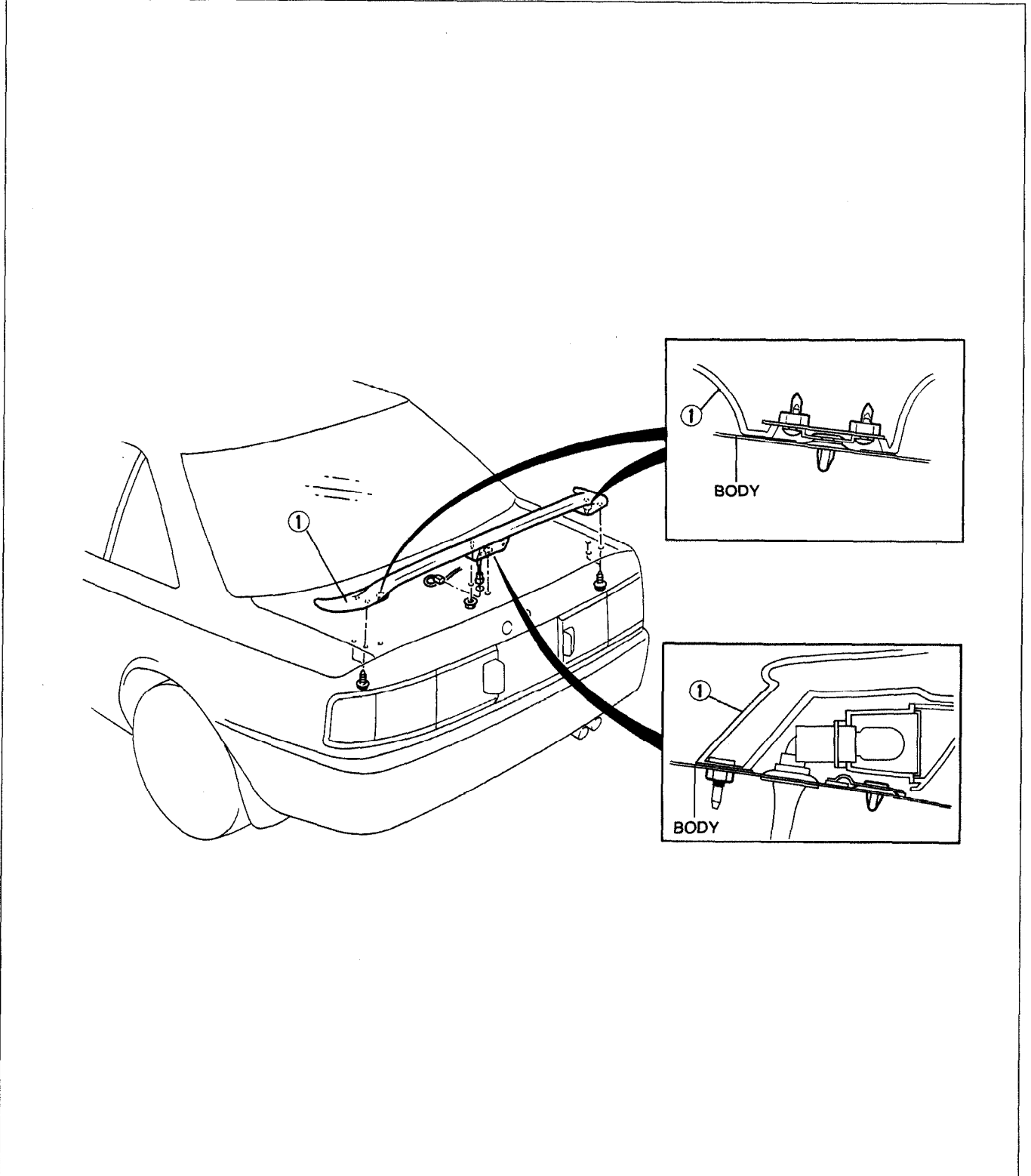
5. Rear bumper assembly
 - a. Rear bumper retainer
 - b. Rear bumper reinforcement
 - c. Energy absorbing foam
 - d. License plate light harness (Hatchback)
 - e. License plate light holder (Hatchback)
 - f. Rear bumper facia
6. Rear flap

REAR SPOILER

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



1. Rear spoiler assembly

03U0SX-055

MOLDING, PROTECTOR, GARNISH

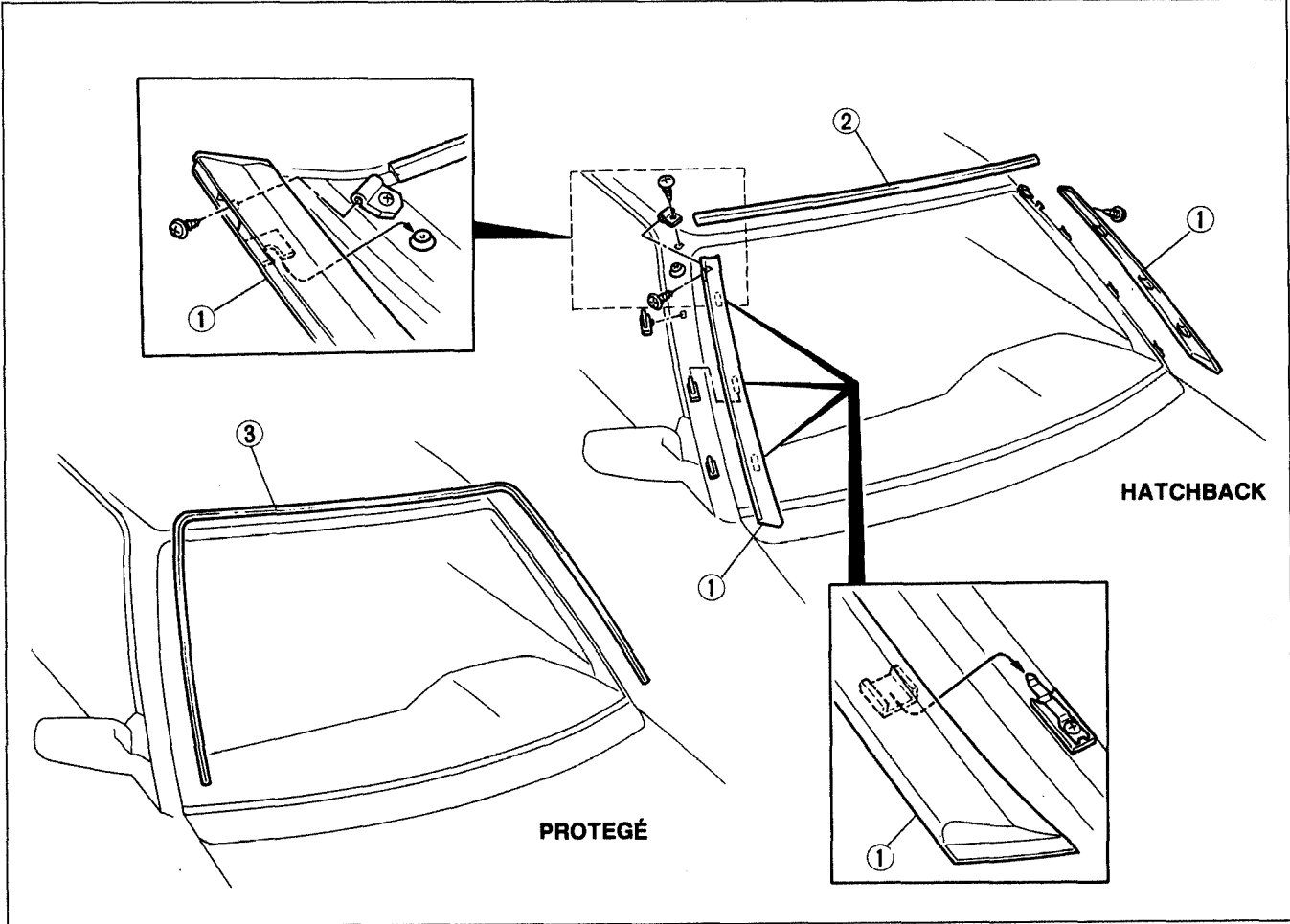
UPPER WINDSHIELD MOLDING, A-PILLAR GARNISH

Removal / Installation

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal.

Note

- Remove the wiper arm and cowl grille for removal of the upper windshield molding (PROTEGÉ). (Refer to pages S-53, 72.)
- Remove the windshield for installation of the upper windshield molding. (Refer to page S-58.)



13U0SX-011

Hatchback

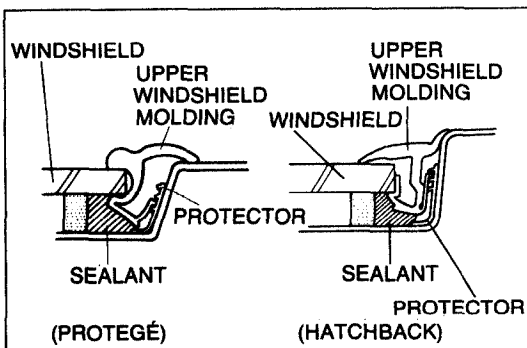
1. A-pillar garnish
2. Upper windshield molding

Removal Note..... page S-42

PROTEGÉ

3. Upper windshield molding

Removal / Installation page S-42



03U0SX-057

Removal Note

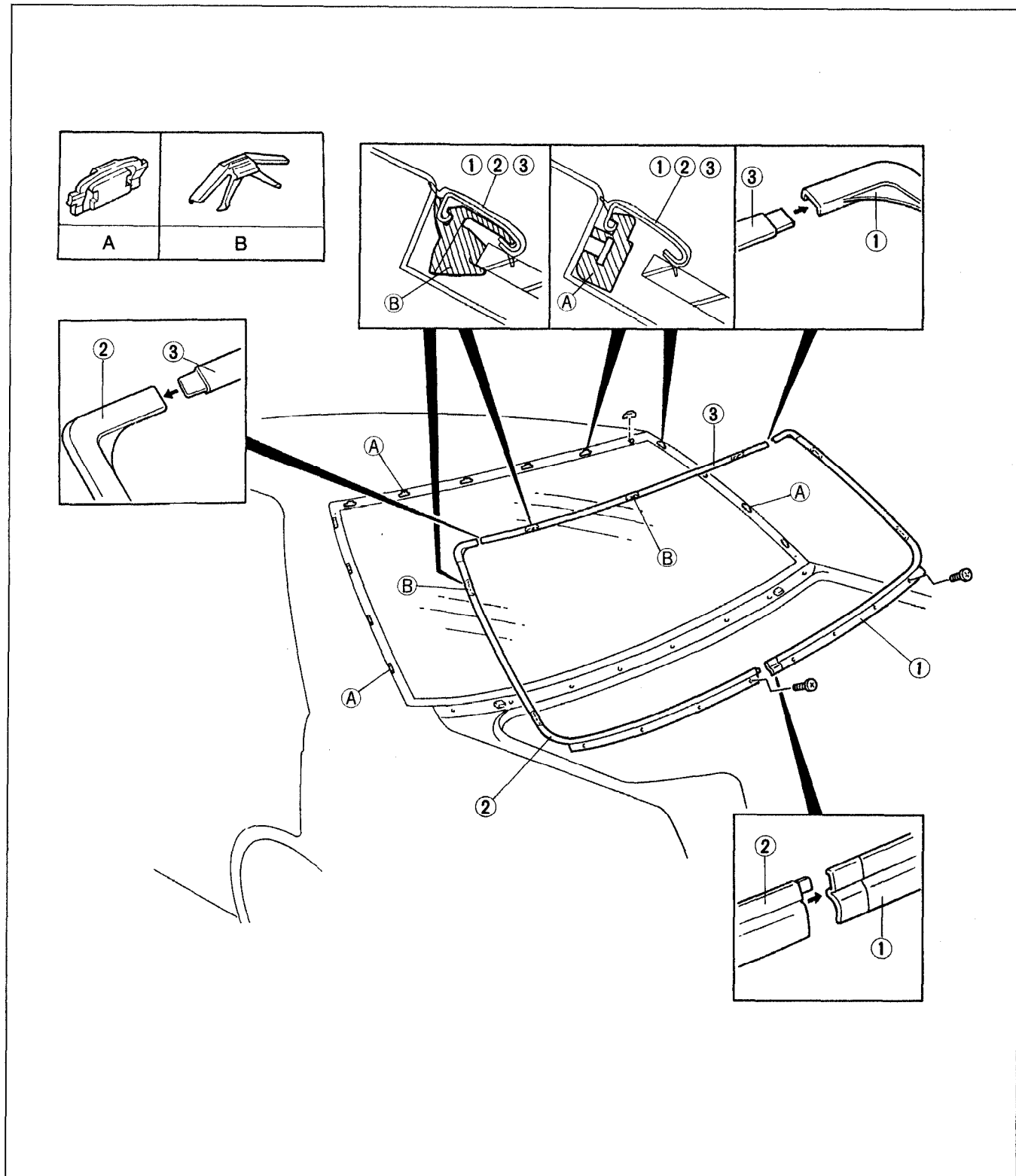
Upper windshield molding

1. The upper molding is adhered to the windshield by sealant as shown.
2. Twist the molding end to separate the molding.

REAR WINDOW MOLDING (PROTEGÉ)

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



1. R.H. rear window molding (with upper and lower joints)
2. L.H. rear window molding (with upper and lower joints)

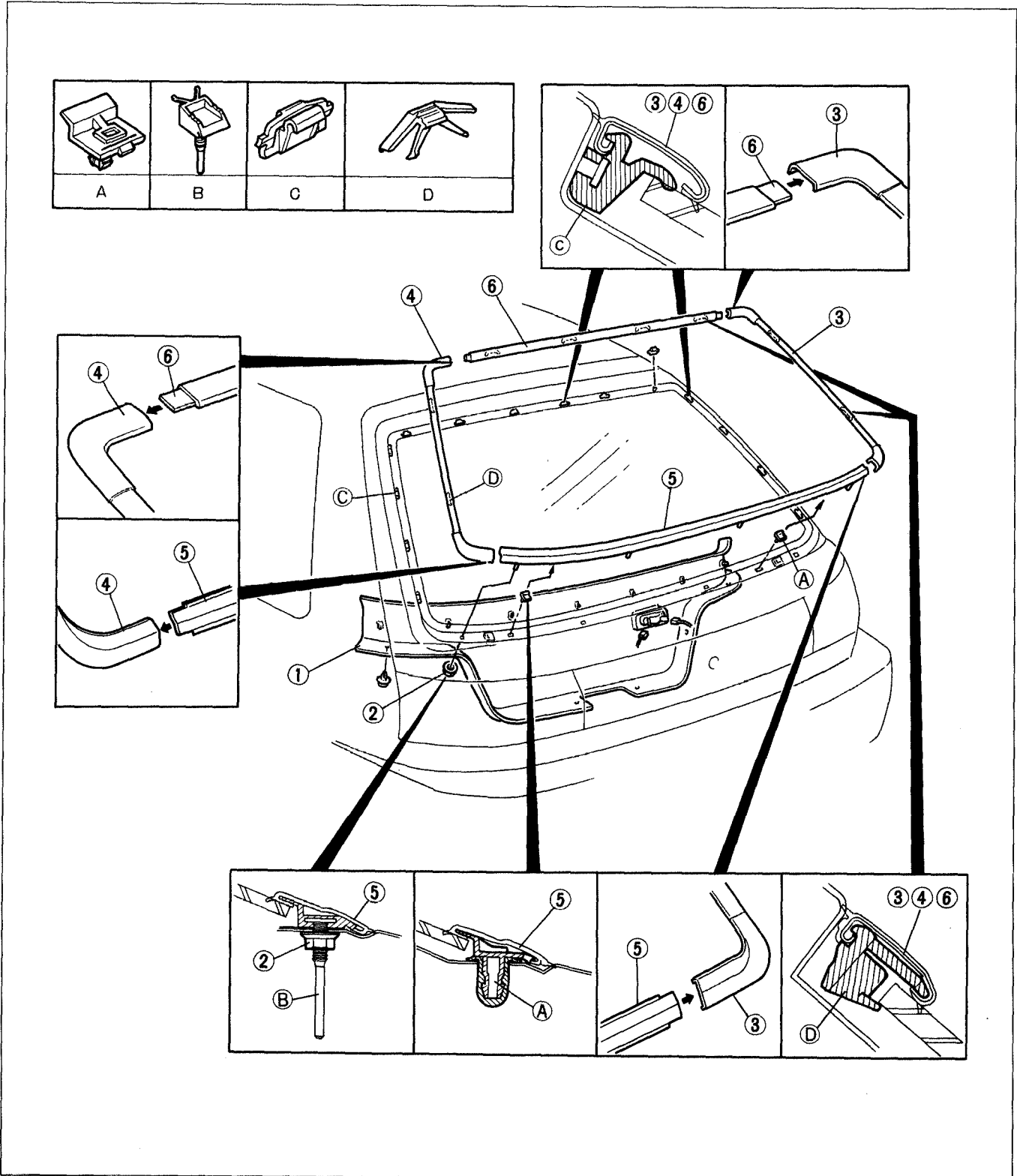
3. Upper rear window molding

13U0SX-012

REAR WINDOW MOLDING (HATCHBACK)

Removal

Remove in the order show in the figure.

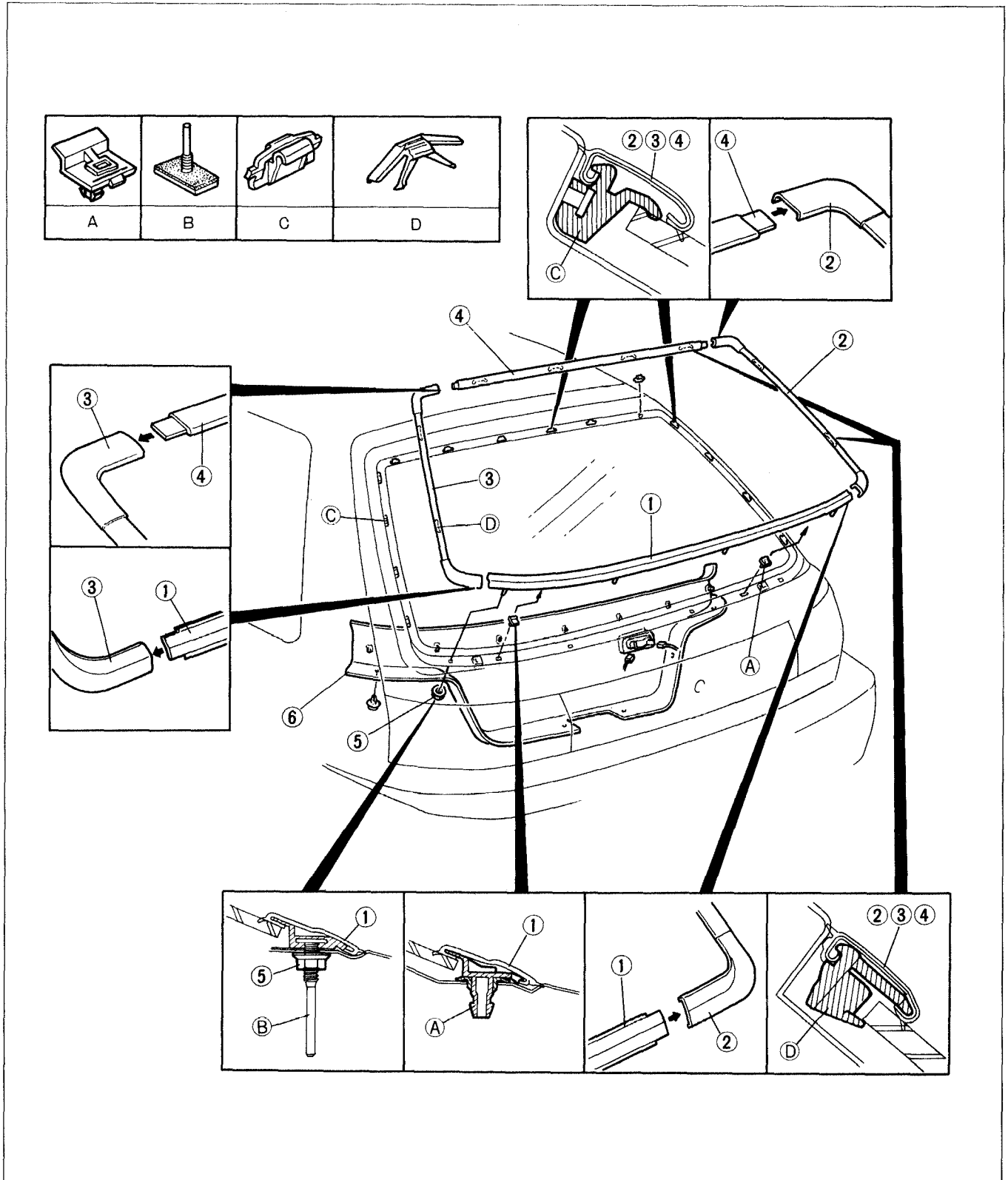


03U0SX-059

- | | |
|--|--|
| 1. Rear hatch lower trim
Removal..... page S-98 | 4. L.H. rear window molding
(with upper and lower joints) |
| 2. Lower rear window molding installation nuts | 5. Lower rear window molding |
| 3. R.H. rear window molding
(with upper and lower joints) | 6. Upper rear window molding |

Installation

Install in the order shown in the figure.



03U0SX-060

- 1. Lower rear window molding
- 2. R.H. rear window molding (with upper and lower joints)
- 3. L.H. rear window molding (with upper and lower joints)

- 4. Upper rear window molding
- 5. Lower rear window molding installation nuts
- 6. Rear hatch lower trim

Installation page S-98

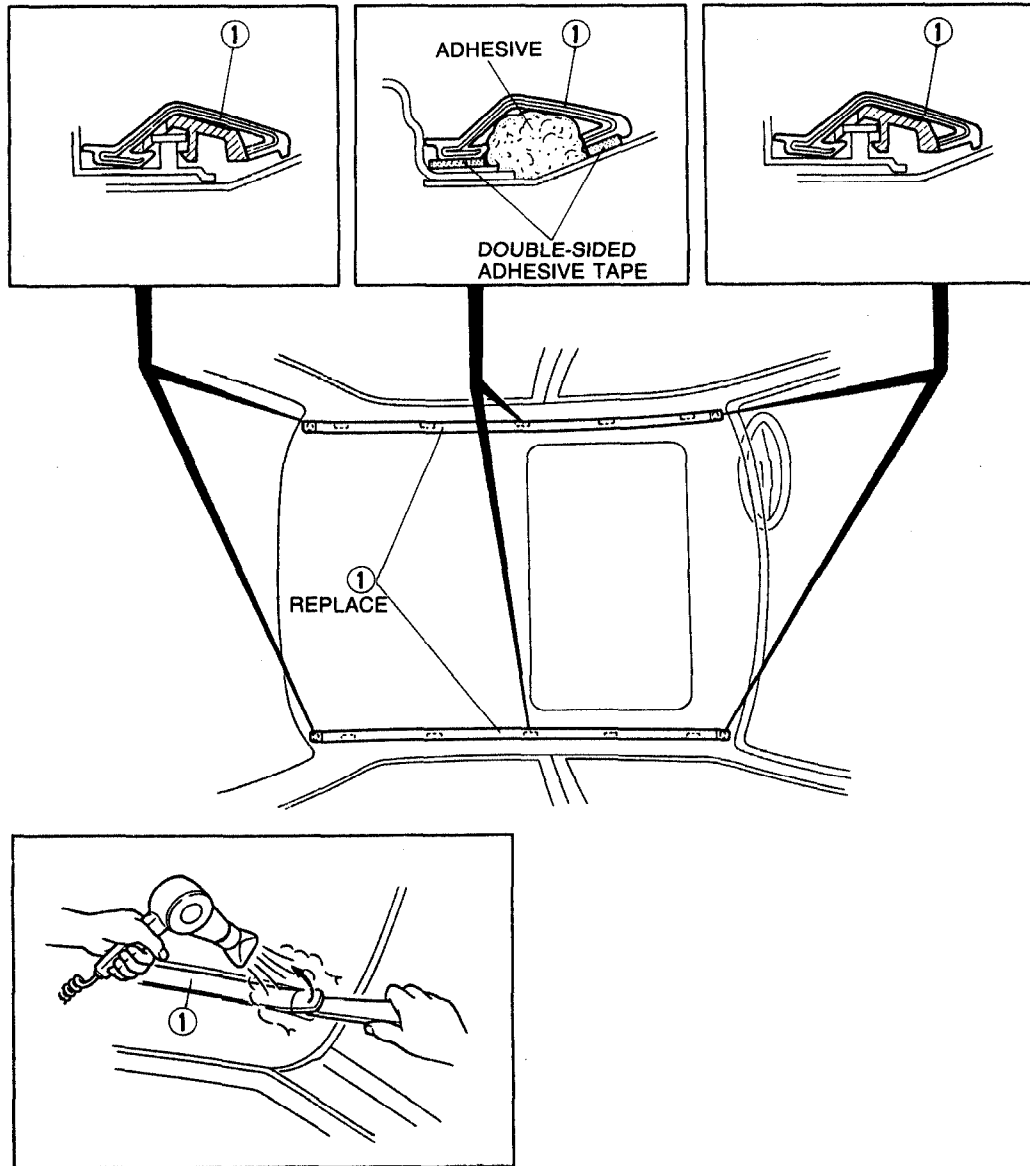
ROOF MOLDING

Removal / Installation

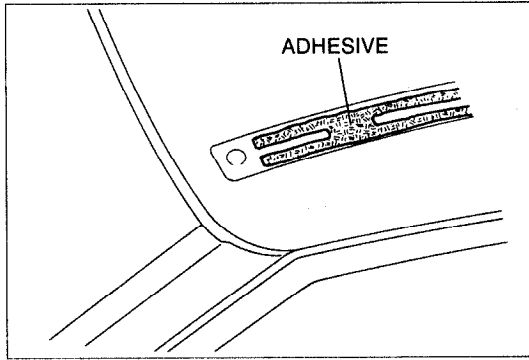
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal, referring to **Installation Note**.

Caution

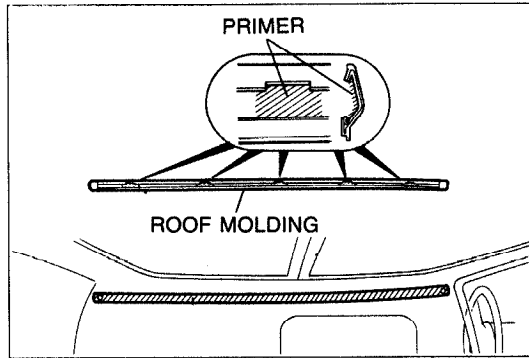
- Remove the roof molding carefully to prevent damage to the painted surface.



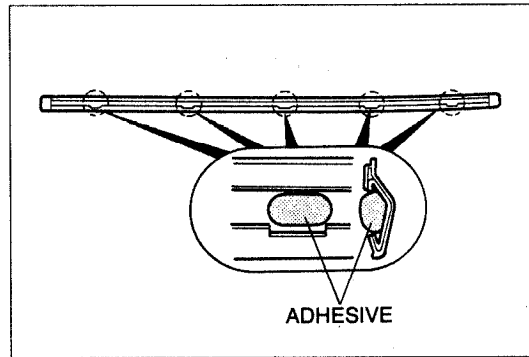
03U0SX.061



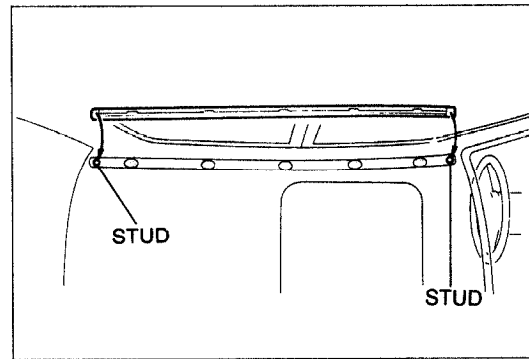
03U0SX-062



03U0SX-063



03U0SX-064



03U0SX-065

Installation Note
Roof molding

1. Remove the adhesive remaining on the body.

Note

- Remove as much adhesive as possible without damaging the painted surface.
- If the adhesive is difficult to remove, soften it with a hot air blower.

2. Remove any grease or dirt from the molding and molding adhesion surface of the body.

3. Apply primer to the molding as shown.

4. Apply the adhesive (polyurethane) to the molding as shown.

Caution

- Do not apply too much adhesive because it will ooze out when installed.

5. Peel away the molding adhesive tape protector.

6. Install the front molding clip to the body stud.

7. Align the molding on the body and attach it securely.

8. Install the rear molding clip to the body stud.

BELTLINE MOLDING

Removal / Installation

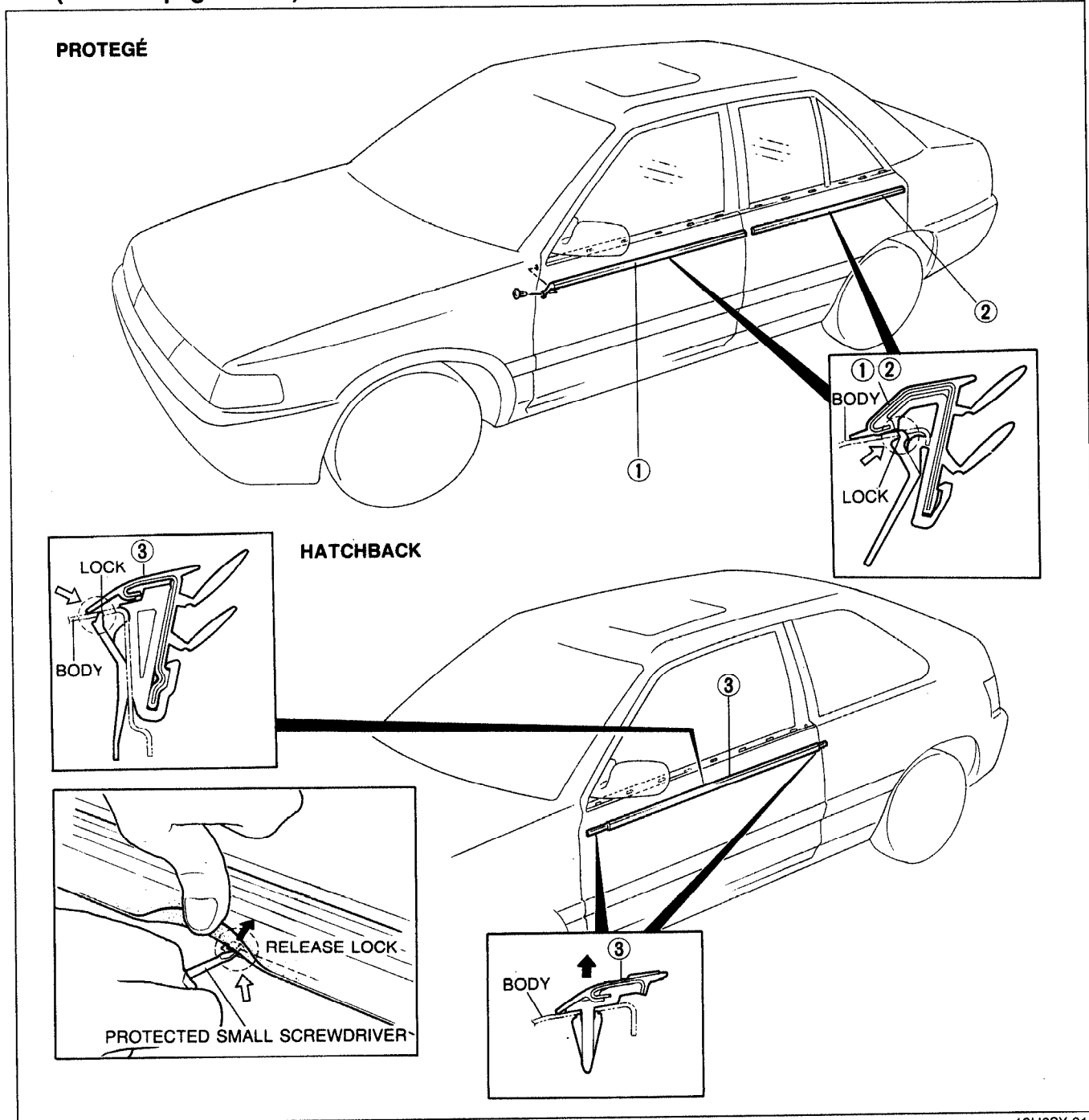
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

Caution

- Remove the beltline molding carefully to prevent damage to the painted surface.

Note

- Remove the door mirror for removal of the front beltline molding or beltline molding. (Refer to page S-56.)



13U0SX-013

PROTEGÉ

1. Front beltline molding
2. Rear beltline molding

Hatchback

3. Beltline molding

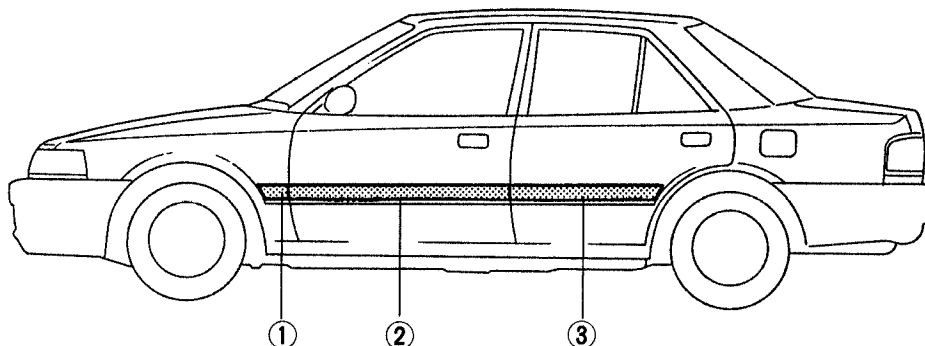
**SIDE PROTECTOR
Removal / Installation**

1. Remove in the order shown in the figure, referring to **Removal Note**.
2. Install in the reverse order of removal, referring to **Installation Note**.

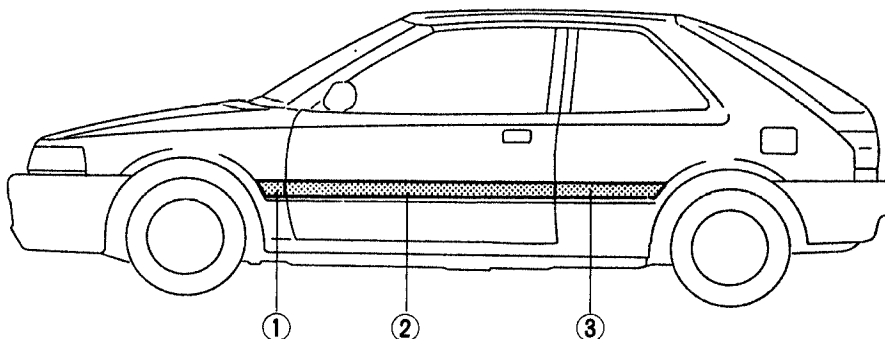
Caution

- Remove the side protector carefully to prevent damage to the painted surface.

PROTEGÉ



HATCHBACK



03U0SX-067

1. Protector No.1

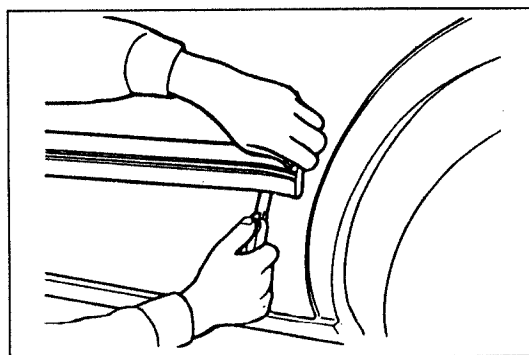
Removal Note .. page S-49
Installation Note page S-50

2. Protector No.2

Removal Note .. page S-49
Installation Note page S-50

3. Protector No.3

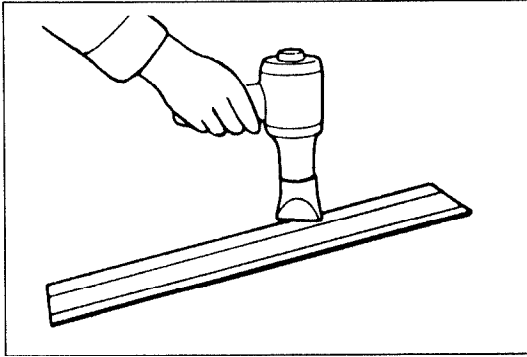
Removal Note .. page S-49
Installation Note page S-50



03U0SX-068

**Removal Note
Protector**

1. Using a screwdriver or knife, twist the protector end, being careful not to damage the painted surface, and separate the adhesive for **20—30mm (0.79—1.18 in)**.
2. Pull the separated portion to remove it.



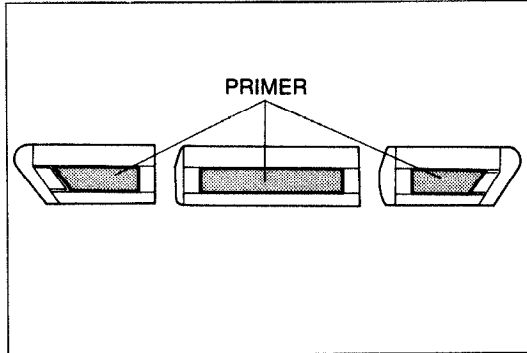
03U0SX-069

Installation Note Protector

1. Use a knife to remove the adhesive remaining on the body and protector.

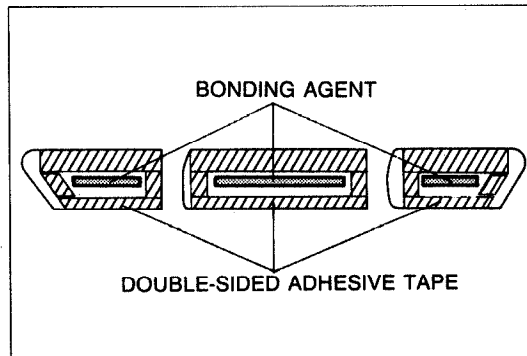
Note

- Remove as much adhesive as possible without damaging the painted surface.
- If the adhesive is difficult to remove, soften it with a hot air blower.



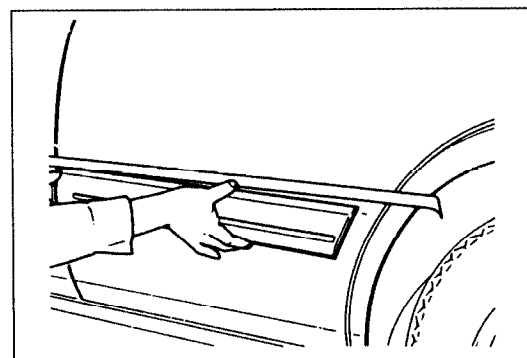
03U0SX-070

2. Remove any grease or dirt from the protector and body adhesion surface.
3. Apply primer to the protector as shown.



03U0SX-071

4. Attach double-sided adhesive tape to the protector (when re-used).
5. Apply adhesive (polyurethane) to the protector as shown.



03U0SX-072

6. Mark the installation position on the body with masking tape.
7. Align the protector on the body and attach it securely.

Note

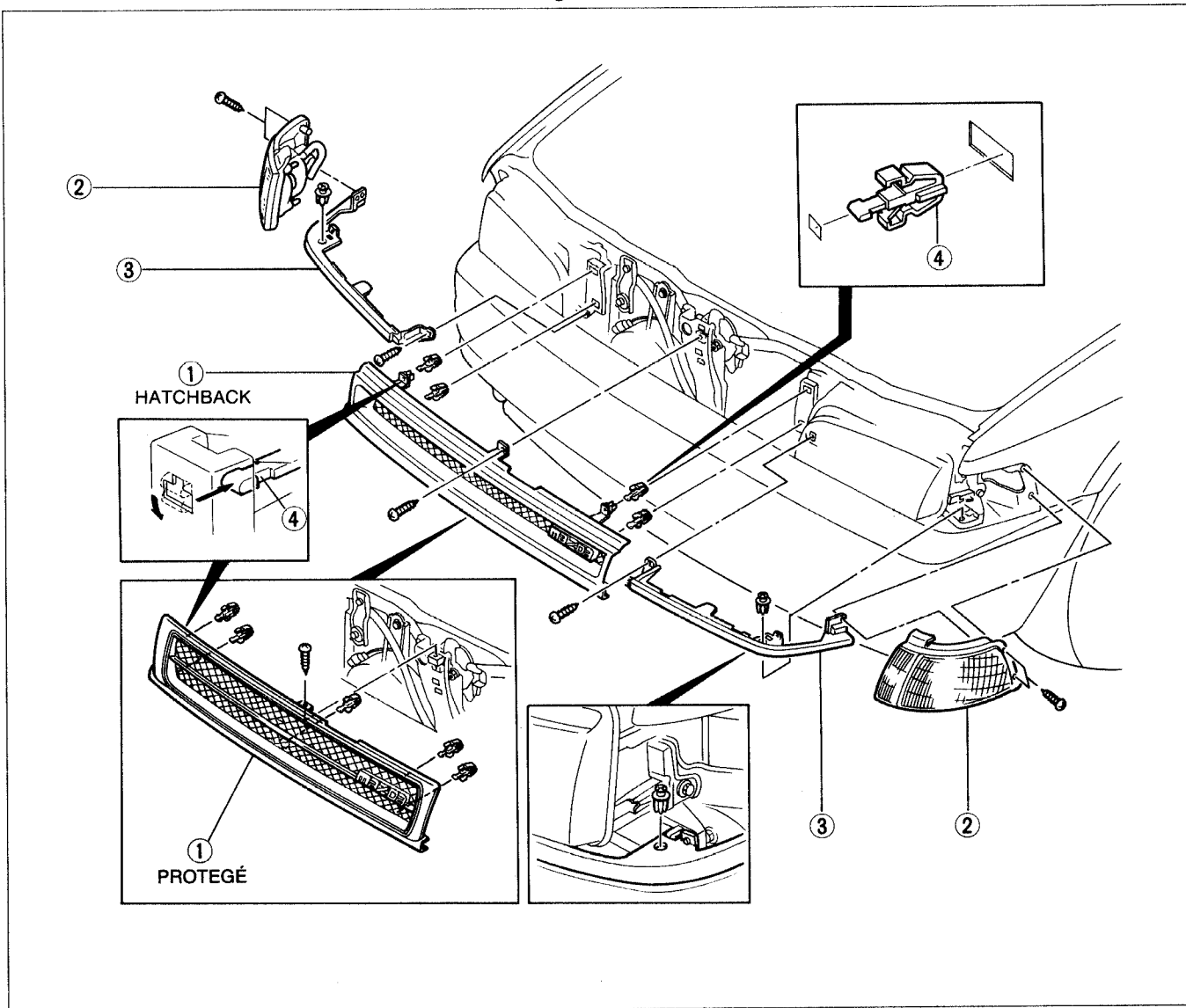
- Adhesion conditions deteriorate if air temperature is below 20°C (68°F); heating of the body is recommended.

RADIATOR GRILLE, LOWER GRILLE MOLDING

COMPONENTS

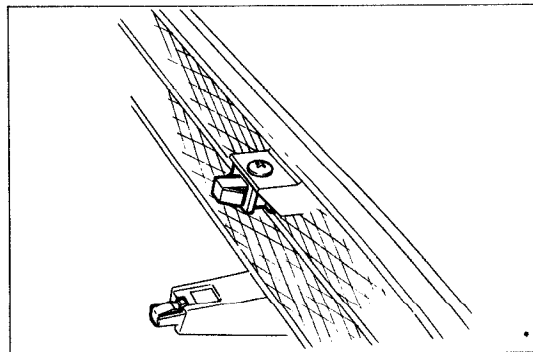
Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal, referring to **Installation Note**.



03U0SX-073

- | | |
|--|-------------------------|
| 1. Radiator grille
Installation Note page S-51 | 3. Lower grille molding |
| 2. Front combination light
Removal / Installation Section T | 4. Clip |



03U0SX-074

Installation Note
Radiator grille

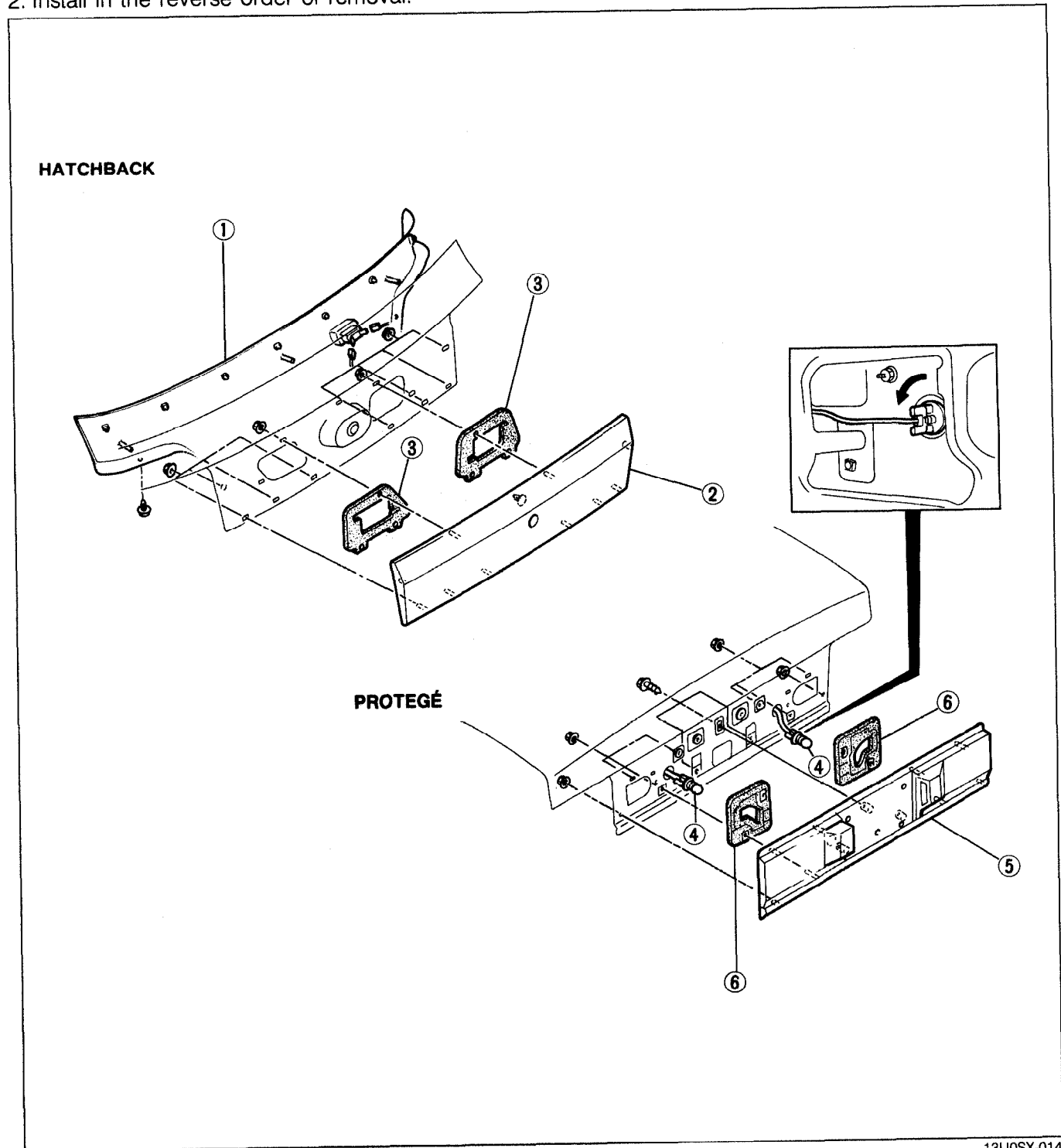
1. Insert the clips into the grille, and align them with the installation holes in the body.
2. Press the grille into the body.

REAR FINISHER

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



13U0SX-014

Hatchback

1. Rear hatch lower trim
Removal / Installation page S-98
2. Rear finisher
3. Packing

PROTEGÉ

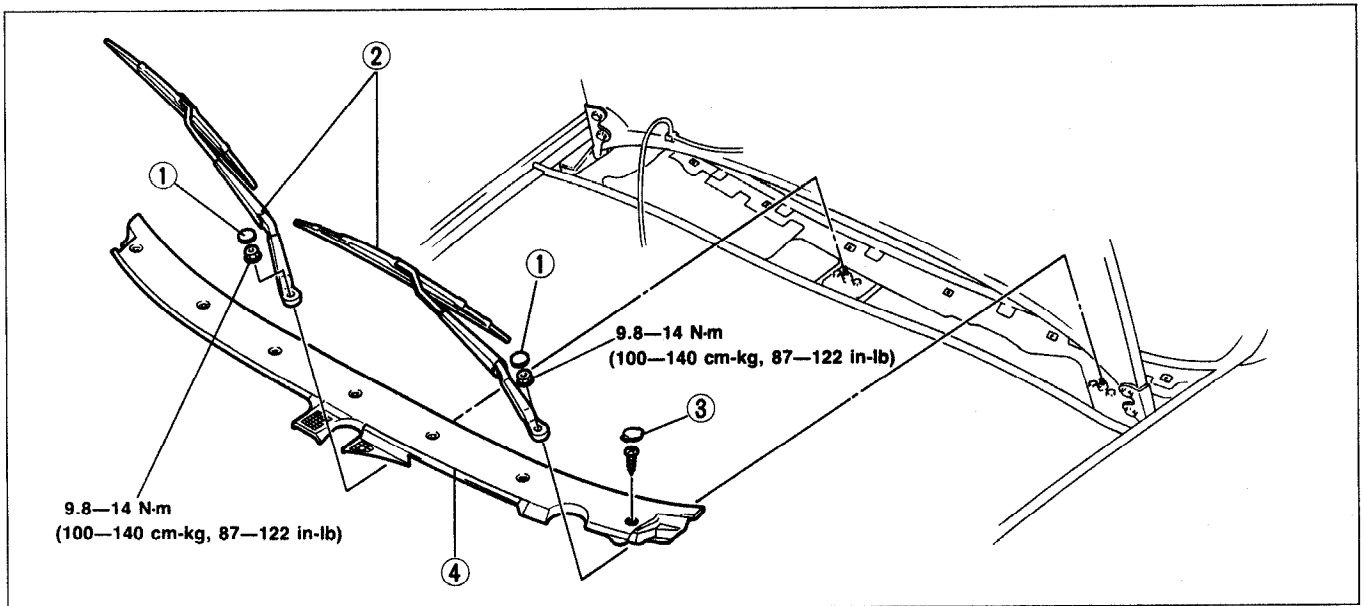
4. License plate light
5. Rear finisher
6. Packing

COWL GRILLE

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



03U0SX-076

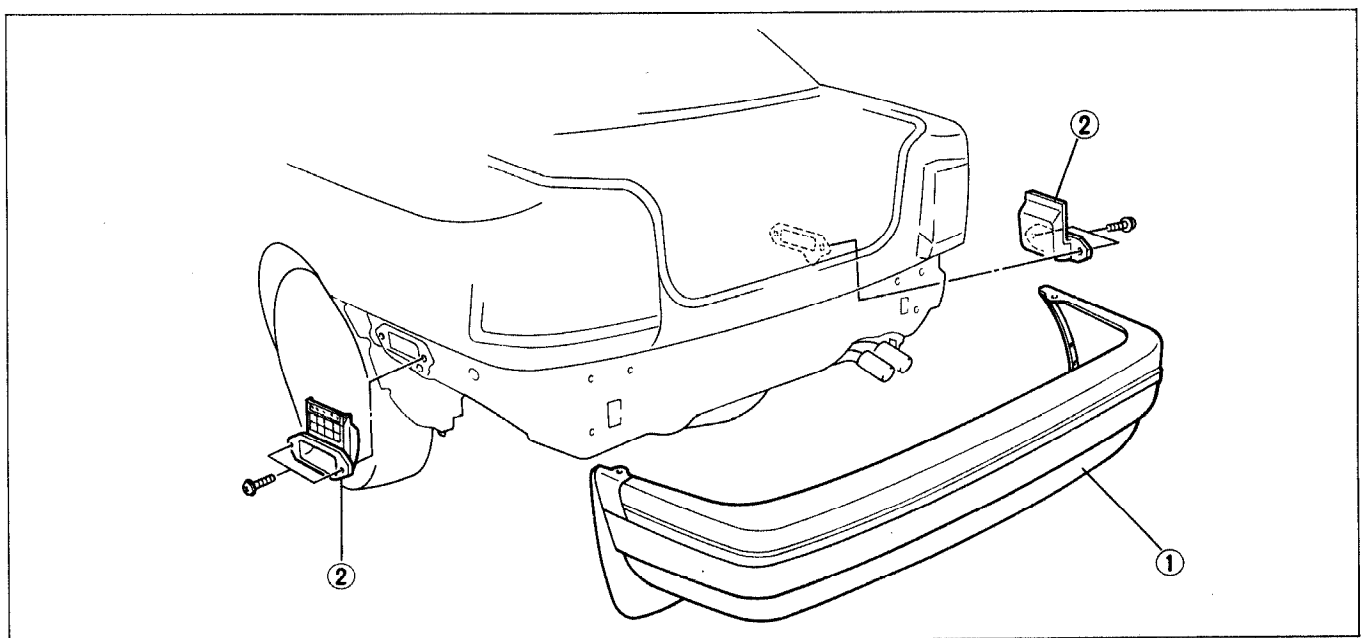
- | | |
|---------------------------------|----------------|
| 1. Wiper arm cover | 3. Cowl cap |
| 2. Wiper arm and blade | 4. Cowl grille |
| Adjustment Note page S-73 | |

EXTRACTOR CHAMBER

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



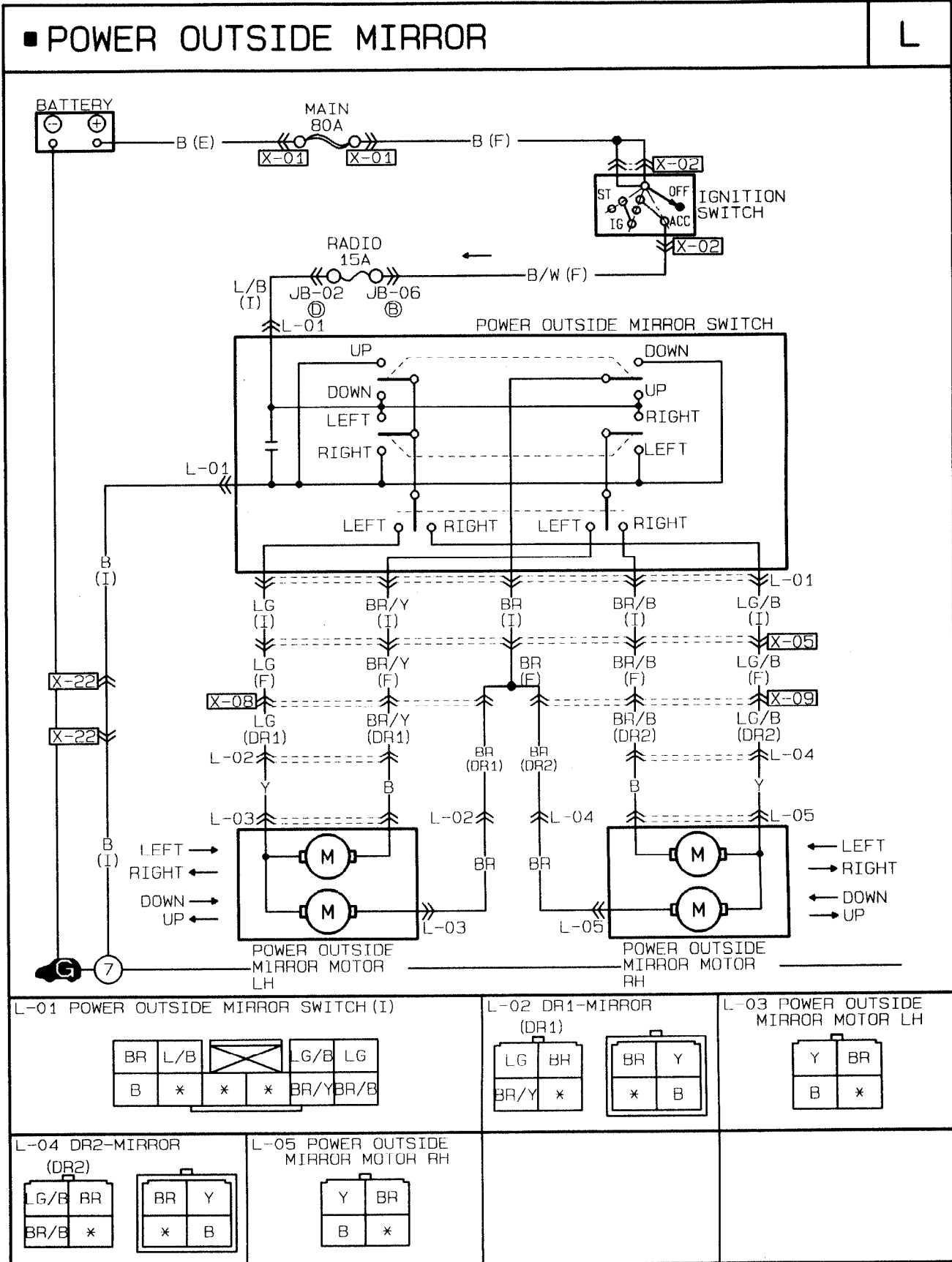
03U0SX-077

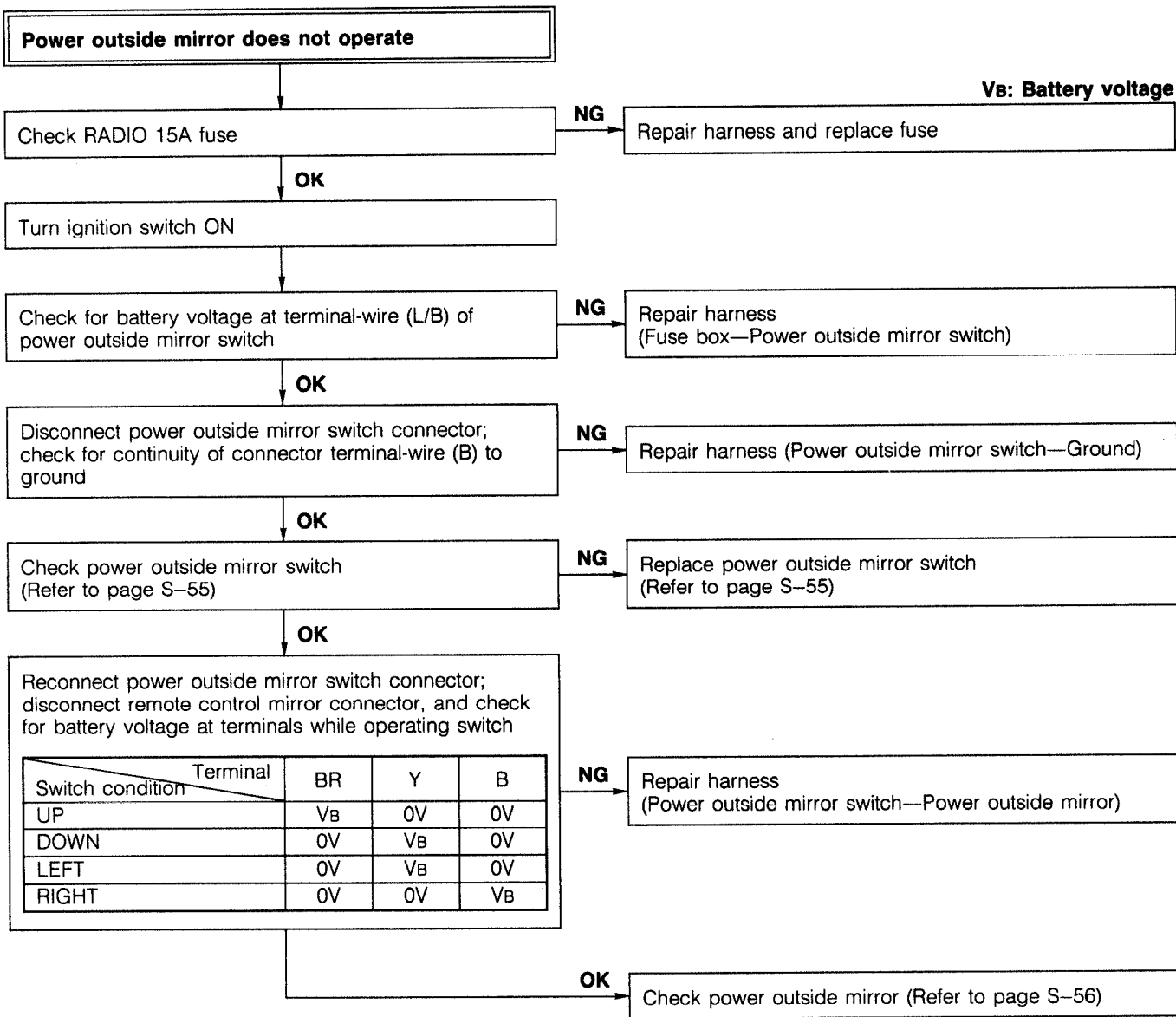
- | | |
|--|----------------------|
| 1. Rear bumper | 2. Extractor chamber |
| Removal / Installation page S-40 | |

OUTSIDE MIRROR

TROUBLESHOOTING GUIDE

Circuit Diagram

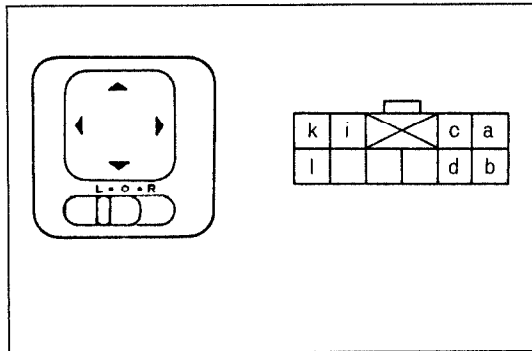




23U0SX-016

POWER OUTSIDE MIRROR SWITCH Inspection

1. Remove the power outside mirror switch. (Refer to page S-56.)
2. Check for continuity between terminals with an ohmmeter.



23U0SX-041

Switch condition \ Terminal		Terminal						
		a	b	c	d	i	k	l
Left	UP	○				○	○	○
	DOWN	○				○		○
	LEFT	○			○	○		○
	RIGHT	○			○	○		○
Right	UP			○		○	○	○
	DOWN			○		○		○
	LEFT		○	○		○		○
	RIGHT		○	○		○		○

○—○: Indicates continuity

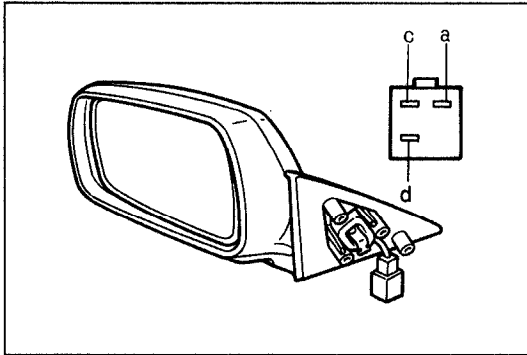
POWER OUTSIDE MIRROR

Inspection

1. Remove the power outside mirror. (Refer to page S-56.)
2. Check for continuity between terminals with an ohmmeter.

Terminal		
a	c	d
○	○	○

○—○ : Indicates continuity

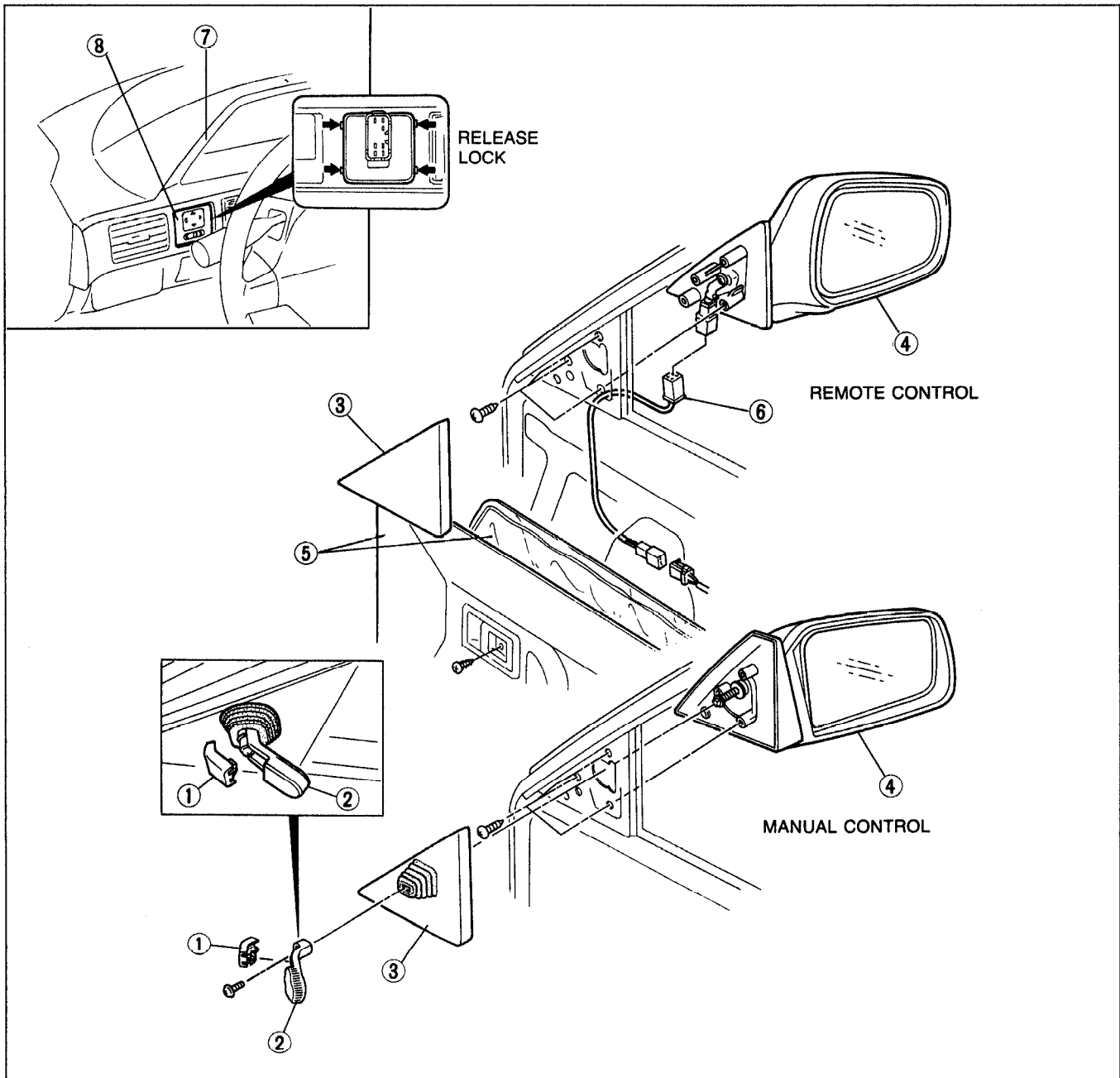


23U0SX-042

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable. (With power outside mirror.)
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.



23U0SX-043

OUTSIDE MIRROR

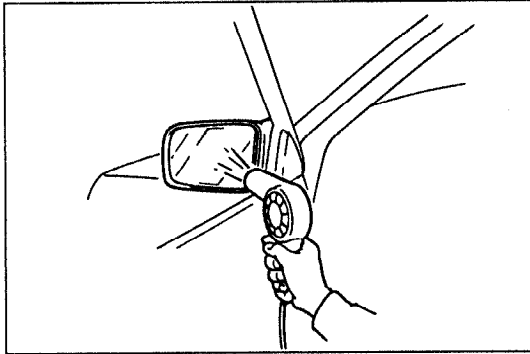
Rearview mirror

- 1. Knob cover
- 2. Knob
- 3. Inner garnish
- 4. Outside mirror
 - Inspection (Remote control) . page S-56
 - Disassembly page S-57
 - Assembly..... page S-57
- 5. Front door trim, Door screen
 - Removal / Installation pages S-10, 11
- 6. Power outside mirror harness

Power outside mirror switch

- 7. Meter hood
 - Removal / Installation page S-94
- 8. Power outside mirror switch
 - Inspection page S-55

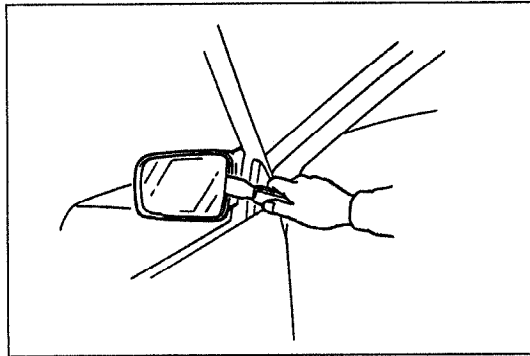
23U0SX-044



9MU0SX-061

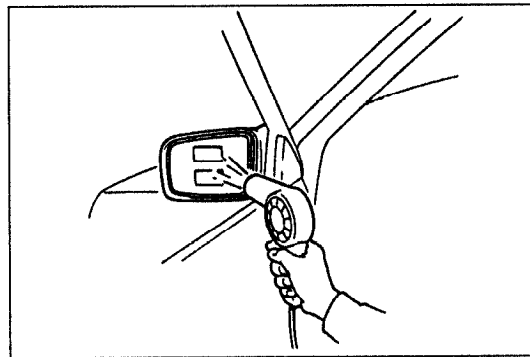
Disassembly of Door Mirror

- 1. Warm the frame and the mirror glass with a hot air blower.



03U0SX-084

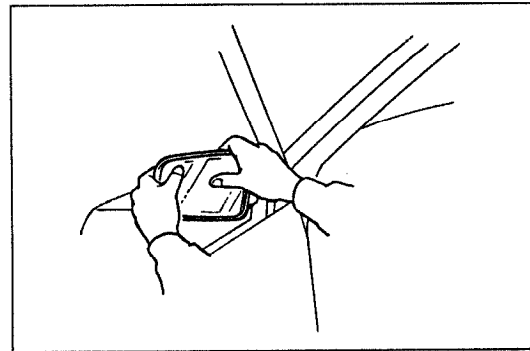
- 2. Insert a scraper between the mirror glass and the frame. Pry the mirror loose.
- 3. Remove the remaining adhesive.



23U0SX-045

Assembly of Outside Mirror

- 1. Warm the frame with a hot air blower.

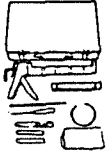


03U0SX-085

- 2. Install the glass in the frame. Gently press it in to secure it.

WINDSHIELD

PREPARATION SST

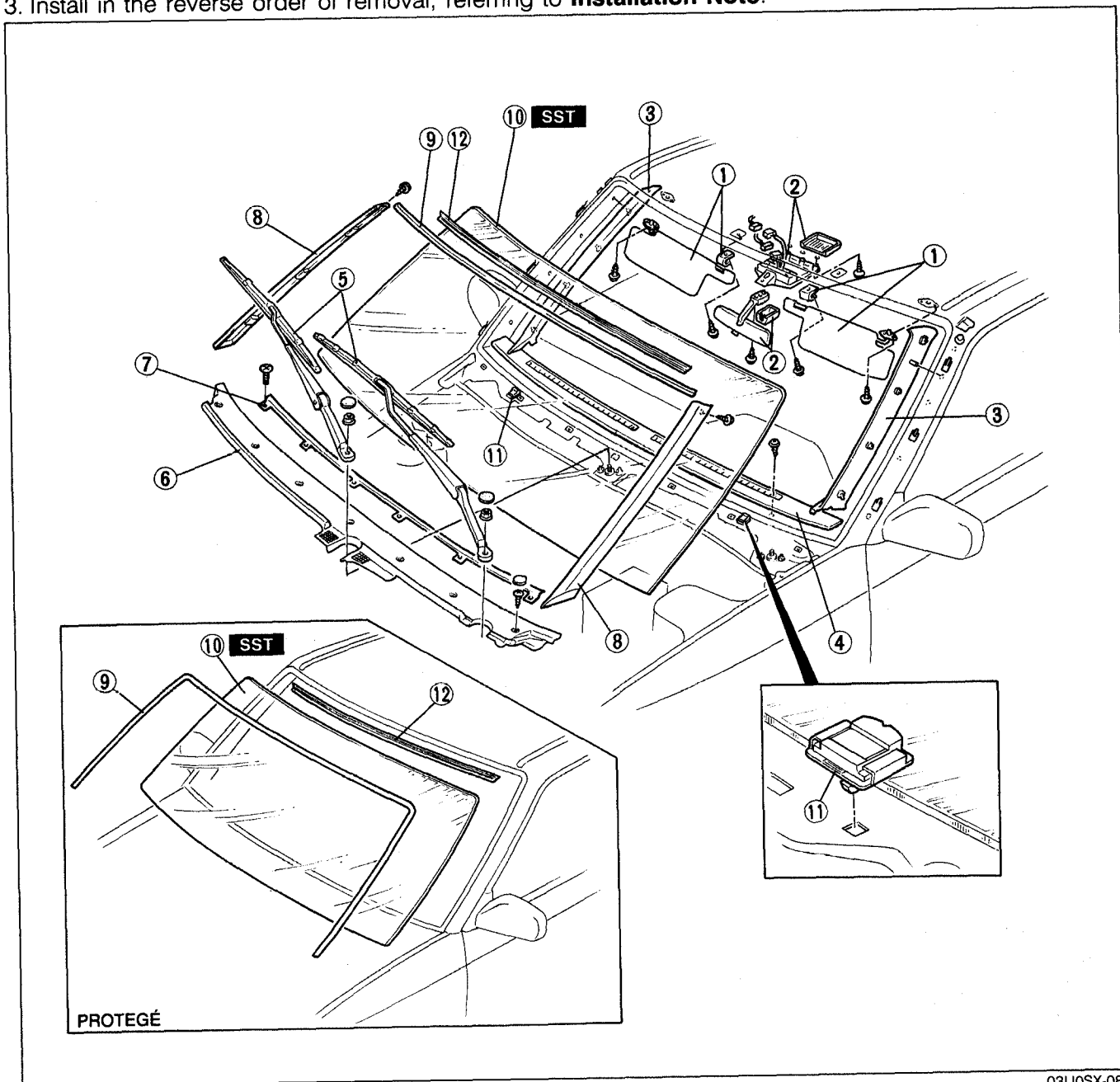
49 0305 870A		For removal and installation of windshield
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23U0SX-046

COMPONENTS

Removal / Installation

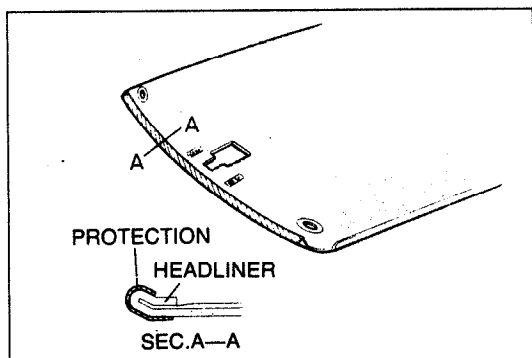
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.



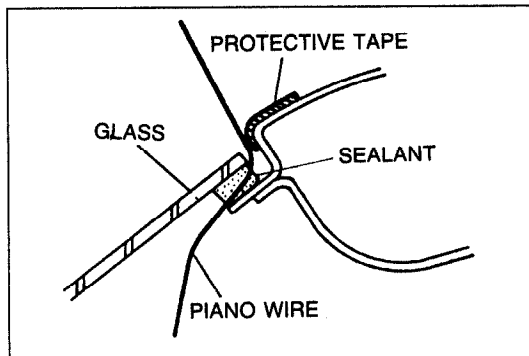
03U0SX-087

- | | |
|---|---|
| 1. Sun visor and adaptor | 7. Glass stopper |
| 2. Inside rearview mirror, overhead console
(With sliding sunroof) | 8. A-pillar garnish (Hatchback)
Removal / Installation page S-42 |
| 3. A-pillar trim
Removal / Installation pages S-97, 98 | 9. Upper windshield molding
Removal / Installation page S-42 |
| 4. Upper garnish | 10. Windshield
Removal Note page S-59
Installation Note page S-60 |
| 5. Wiper arm and blade
Removal / Installation page S-72 | 11. Spacer |
| 6. Cowl grille
Removal / Installation page S-53 | 12. Protector |

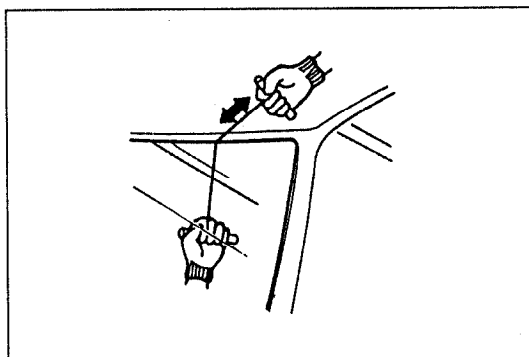
03U0SX-088



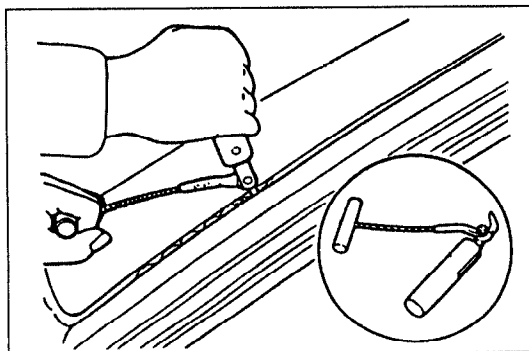
03U0SX-089



03U0SX-090



03U0SX-091



03U0SX-092

Removal Note Windshield

1. Use protective tape or cloth along the front edge of the headliner to protect it from damage.
2. Apply protective tape along the edge of the body.
3. Using an awl, make a hole through the sealant from the inside of the vehicle.
4. Pass piano wire through the hole.
5. Wind each end of the wire around a bar.
6. Working with another person, saw through the sealant around the edge of the glass. Then remove the glass.

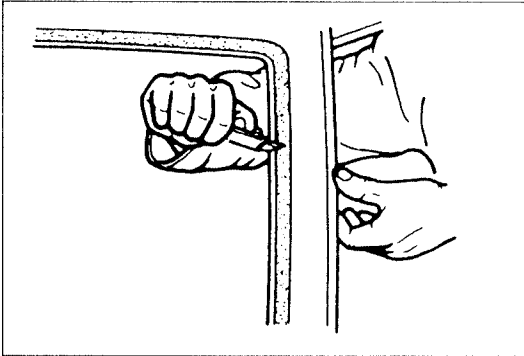
Caution

- Use a long sawing action to spread the work over the whole length of wire to prevent it from breaking.
- Be careful that the wire does not rub on the body or dash panel.

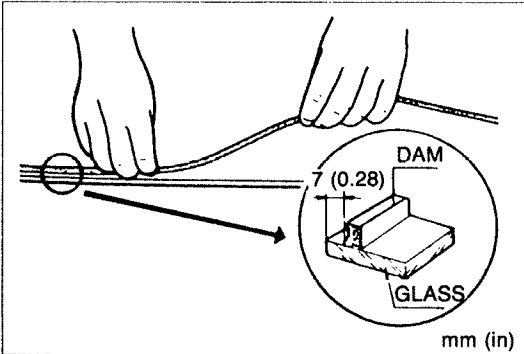
Note

- If the glass is not to be reused, a tool like that shown in the figure may be used.

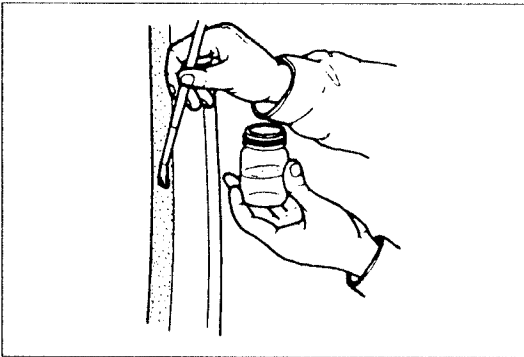
Insert the blade in the sealant, and pull on the bars.



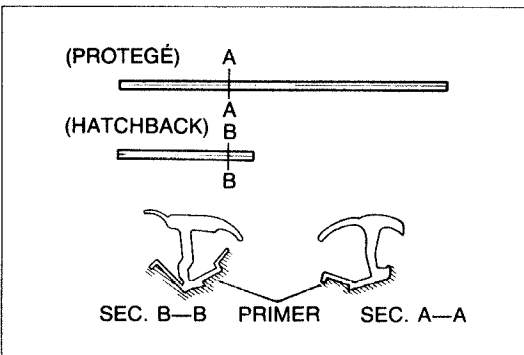
03U0SX-093



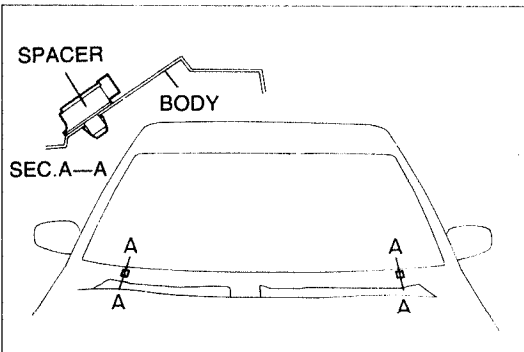
03U0SX-094



03U0SX-095



03U0SX-096



03U0SX-097

Installation Note Windshield

1. Cut away the old sealant with a razor knife so that **1 to 2mm (0.04 to 0.08 in)** of sealant remains around the circumference of the frame. If all the sealant has come off in any one place, apply primer after degreasing, and allow it to **approx. 30 minutes** to dry. Then put on new sealant to create a **2mm (0.08 in)** layer.
2. Carefully clean an area **5 cm (1.97 in)** wide around the circumference of the glass and the bond on the body.
3. Bond a new dam along the circumference of the glass **7mm (0.28 in)** from the edge.

Caution

- **Bond the dam securely and allow it to dry.**

4. Apply primer with a brush to the bonding area of the glass and the body, and allow it to dry for **approx. 30 minutes**.

Caution

- **Keep the area free of dirt and grease. Do not touch the surface. If primer gets on the hands, remove it immediately.**

5. Apply primer to the upper windshield molding as shown.

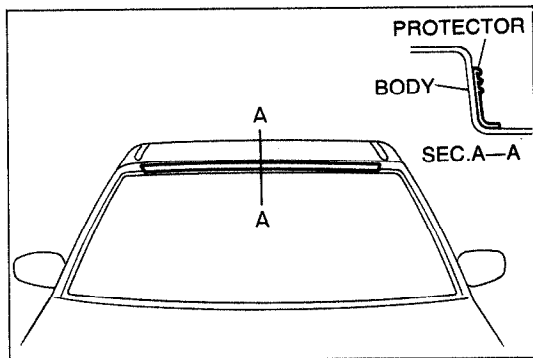
Caution

- **Keep the area free of dirt and grease. Do not touch the surface.**

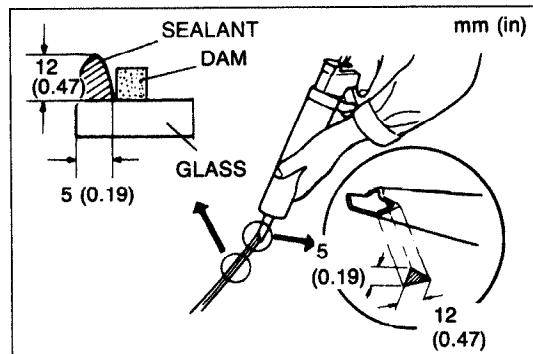
6. Install the spacers onto the body as shown.

Caution

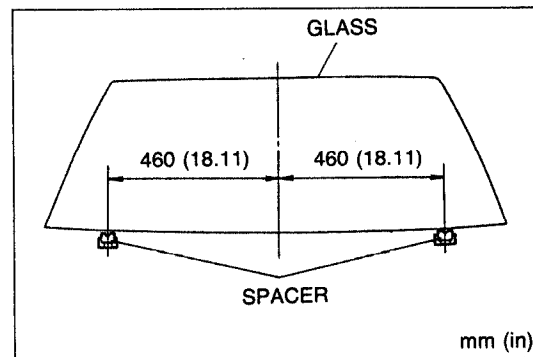
- **Damaged spacers must be replaced.**



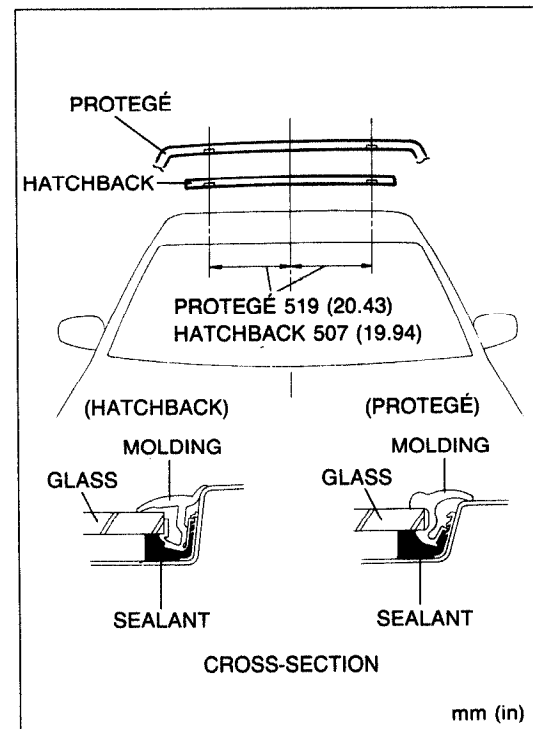
03U0SX-098



03U0SX-099



03U0SX-100



03U0SX-101

7. Align the protector on the body, and attach it securely as shown.

8. Prepare the nozzle of the sealant gun so that it has a flange that can run along the edge of the glass and a V from which the sealant can flow. Once the primer is dry, apply the sealant around the entire circumference of the glass to fill the gap between the dam and the edge of the glass with a ridge of sealant **12mm (0.47 in)** high. Keep the bead of sealant smooth and even, reshaping it where necessary with a spatula.

9. Lift the glass into place. Push it in lightly toward the vehicle to compress the sealant.

Caution

- **Open the windows to prevent the glass from being pushed out by air pressure if a door is closed.**

Hardening time of repair seal

Temperature	Surface hardening time	Time required until car can be put into service
5°C (41°F)	Approx. 1.5 hrs	12 hrs
20°C (68°F)	Approx. 1 hr	4 hrs
35°C (95°F)	Approx. 10 min	2 hrs

10. Align the upper windshield molding on the body as shown, and push the molding into place along the top.

Note

- **Install the molding before the sealant has hardened.**

11. Check for water leaks. If a leak is found, wipe the water off well and add **sealant** (B001 77 739) where needed.

QUARTER WINDOW GLASS

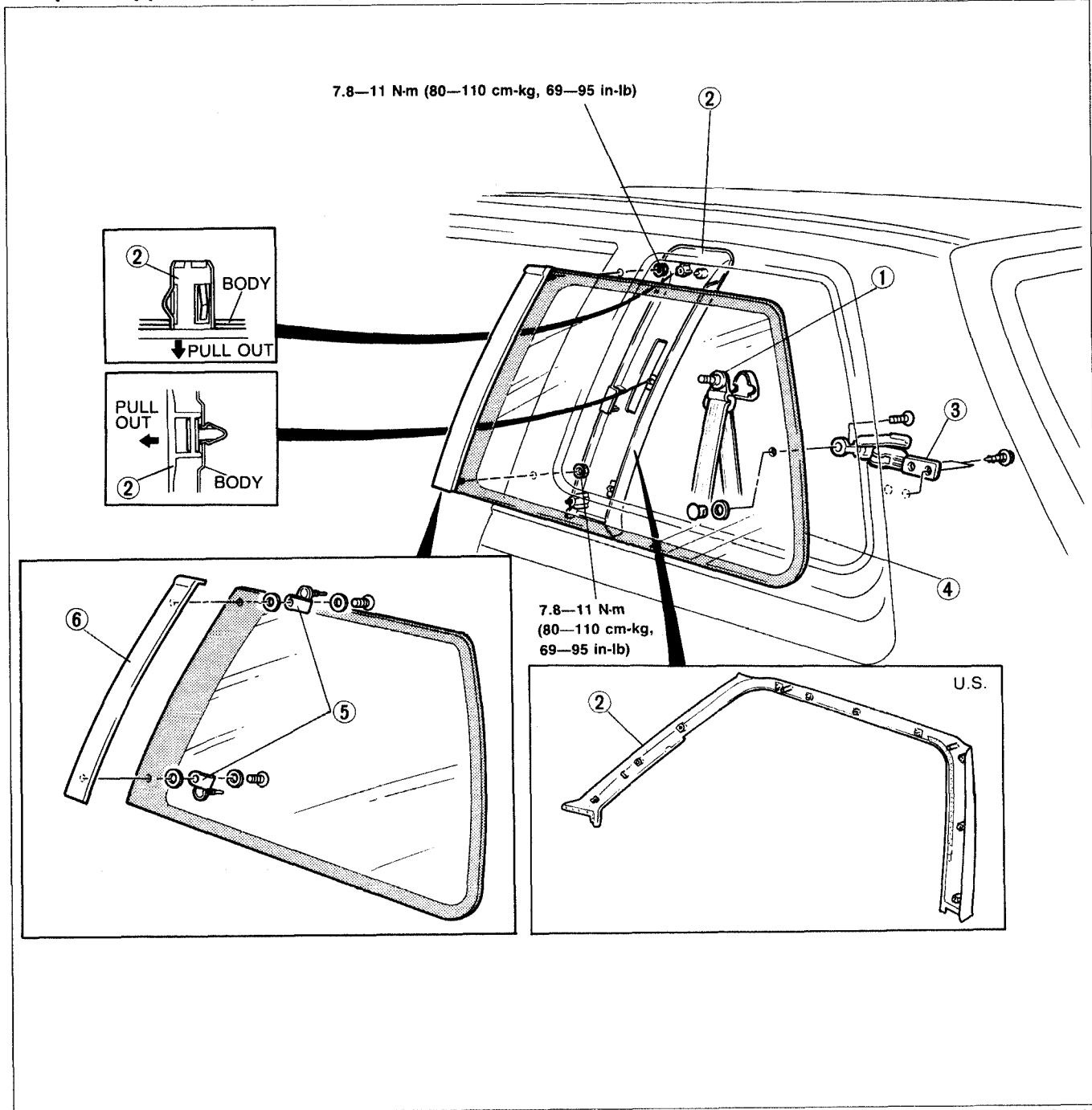
COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

Note

- Remove overlapping portion of the quarter trim for removal of the A-pillar trim (U.S.) or B-pillar upper trim (Canada).




03U0SX-103

1. Seat belt upper anchor (Canada)
Removal / Installation page S-100
2. A-pillar trim (U.S.)/B-pillar upper trim (Canada)
Removal / Installation page S- 98

3. Quarter window lock
4. Quarter window glass
5. Quarter window hinge
6. Pillar molding

REAR WINDOW GLASS

PREPARATION
SST

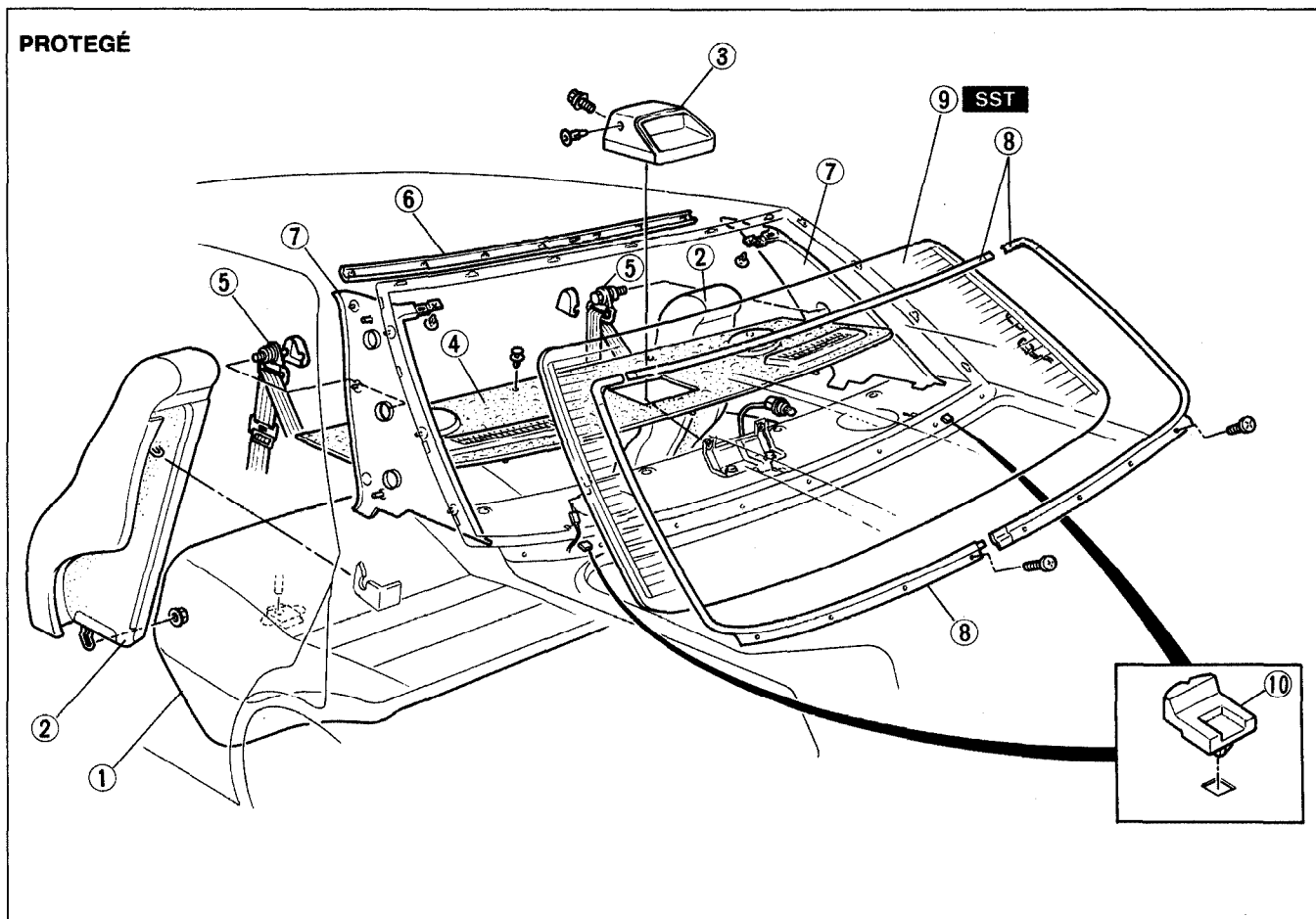
<p>49 0305 870A Tool set, window</p>		<p>For removal and installation of rear window glass</p>
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03U0SX-104

COMPONENTS

Removal / Installation

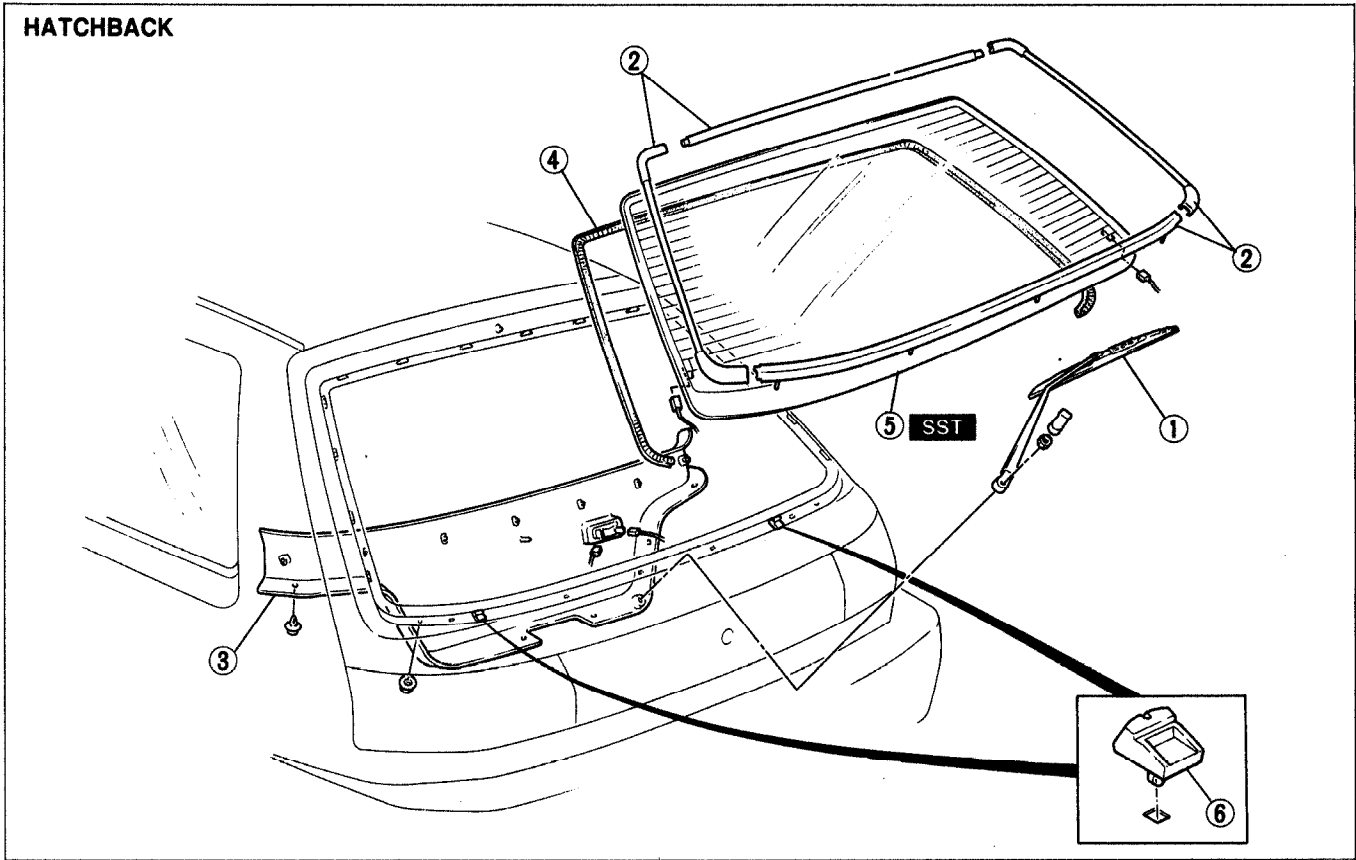
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.



03U0SX-105

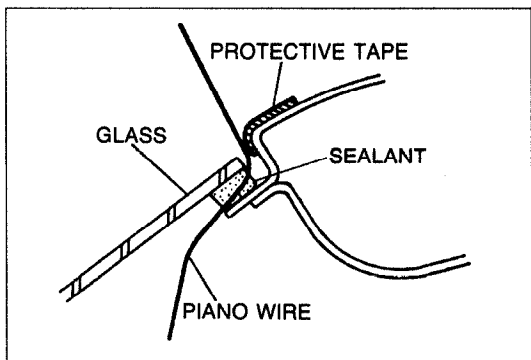
- | | |
|--|---|
| <p>1. Rear seat cushion
Removal / Installation page S-111</p> <p>2. Rear seat back/side
Removal / Installation page S-111</p> <p>3. High-mount stoplight (interior mounted)
Removal / Installation Section T</p> <p>4. Rear package trim
Removal / Installation page S- 97</p> <p>5. Rear seat belt upper anchor
Removal / Installation page S-101</p> | <p>6. Rear header trim
Removal / Installation page S- 97</p> <p>7. C-pillar trim
Removal / Installation page S- 97</p> <p>8. Rear window molding
Removal / Installation page S- 43</p> <p>9. Rear window glass
Removal Note page S- 64
Installation Note page S- 65</p> <p>10. Spacer</p> |
|--|---|

HATCHBACK

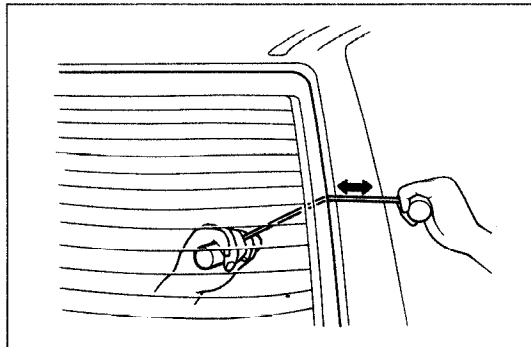


03U0SX-106

- | | |
|---|---|
| 1. Rear wiper arm and blade
Removal / Installation page S-78 | 4. Seaming welt |
| 2. Rear window molding
Removal..... page S-44
Installation..... page S-45 | 5. Rear window glass
Removal Note..... page S-64
Installation Note..... page S-65 |
| 3. Rear hatch lower trim
Removal / Installation page S-98 | 6. Spacer |



03U0SX-214



9MU0SX-139

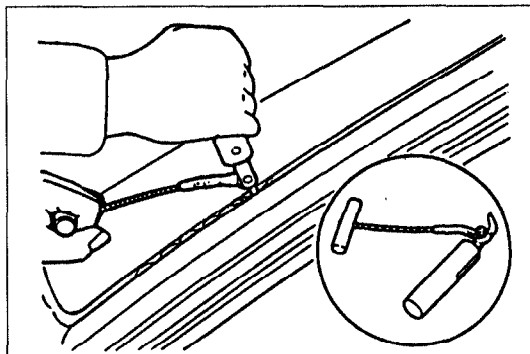
Removal Note

Rear window glass

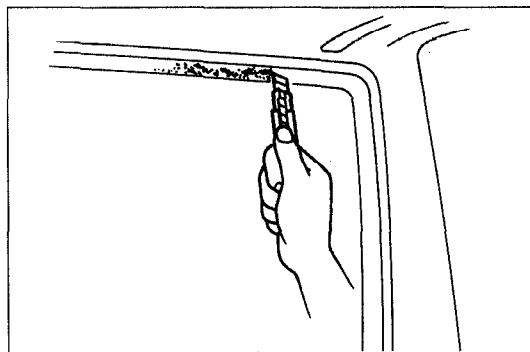
1. Apply protective tape along the edge of the body to protect it from damage.
2. Using an awl, make a hole through the sealant from the inside of the vehicle.
3. Pass piano wire through the hole.
4. Wind each end of the wire around a bar.
5. Working with another person, saw through the sealant around the edge of the glass. Then remove the glass.

Caution

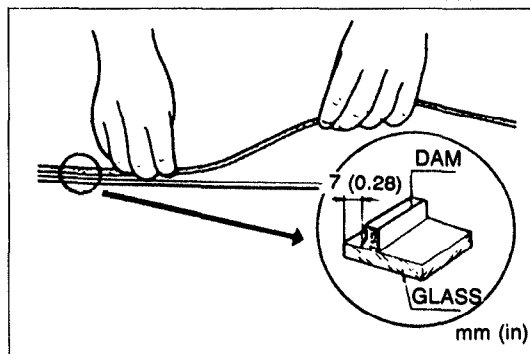
- Use a long sawing action to spread the work over the whole length of wire to prevent it from breaking.
- Be careful that the wire does not rub on the body.



9MU0SX-099



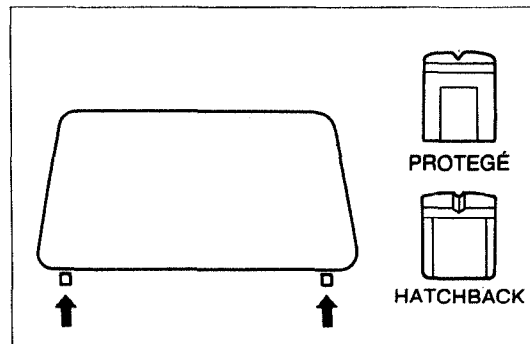
03U0SX-107



03U0SX-108



03U0SX-109



03U0SX-110

Note

- If the glass is not to be reused, a tool like that shown in the figure may be used.

Insert the blade in the sealant, and pull on the bars.

Installation Note Rear window glass

1. Cut away the old sealant with a razor knife so that **1 to 2mm (0.04 to 0.08 in)** of sealant remains around the circumference of the frame. If all the sealant has come off in any one place, apply primer after degreasing, and allow it **approx. 30 minutes** to dry. Then put on new sealant to create a **2mm (0.08 in)** layer.

2. Carefully clean an area **5 cm (1.97 in)** wide around the circumference of the glass and the bond on the body.
3. Bond a new dam along the circumference of the glass **7mm (0.28 in)** from the edge.

Caution

- Bond the dam securely and allow it to dry.

4. Apply primer with a brush to the bonding area of the glass and the body, and allow it to dry for **approx. 30 minutes**.

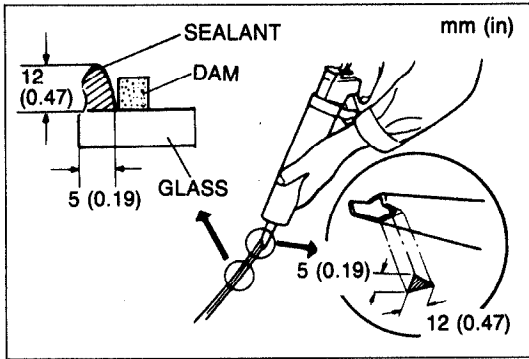
Caution

- Keep the area free of dirt and grease. Do not touch the surface. If primer gets on the hands, remove it immediately.

5. Install the spacers onto the body.

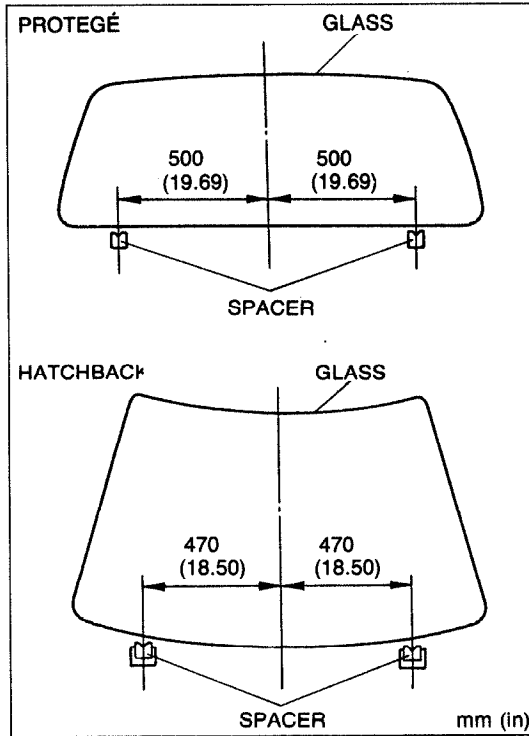
Caution

- Damaged spacers must be replaced.



03U0SX-111

- Prepare the nozzle of the sealant gun so that it has a flange that can run along the edge of the glass and a V from which the sealant can flow. Once the primer is dry, apply the sealant around the entire circumference of the glass to fill the gap between the dam and the edge of the glass with a ridge of sealant **12mm (0.47 in)** high. Keep the bead of sealant smooth and even, reshaping it where necessary with a spatula.



03U0SX-112

- Lift the glass into place. Push it in lightly toward the vehicle to compress the sealant.

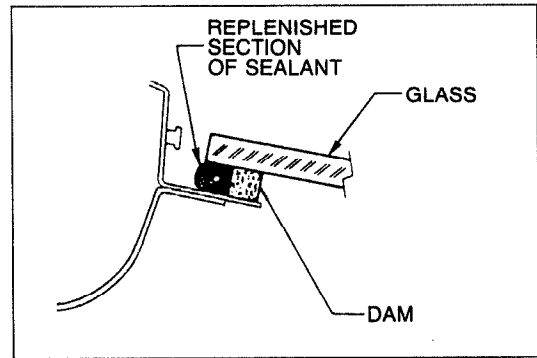
Caution

- **Open the windows to prevent the glass from being pushed out by air pressure if a door is closed.**

Hardening time of repair seal

Temperature	Surface hardening time	Time required until car can be put into service
5°C (41°F)	Approx. 1.5 hrs	12 hrs
20°C (68°F)	Approx. 1 hr	4 hrs
35°C (95°F)	Approx. 10 min	2 hrs

- Use a scraper to smooth away any sealant that oozes out. Add more sealant to any points of poor contact.



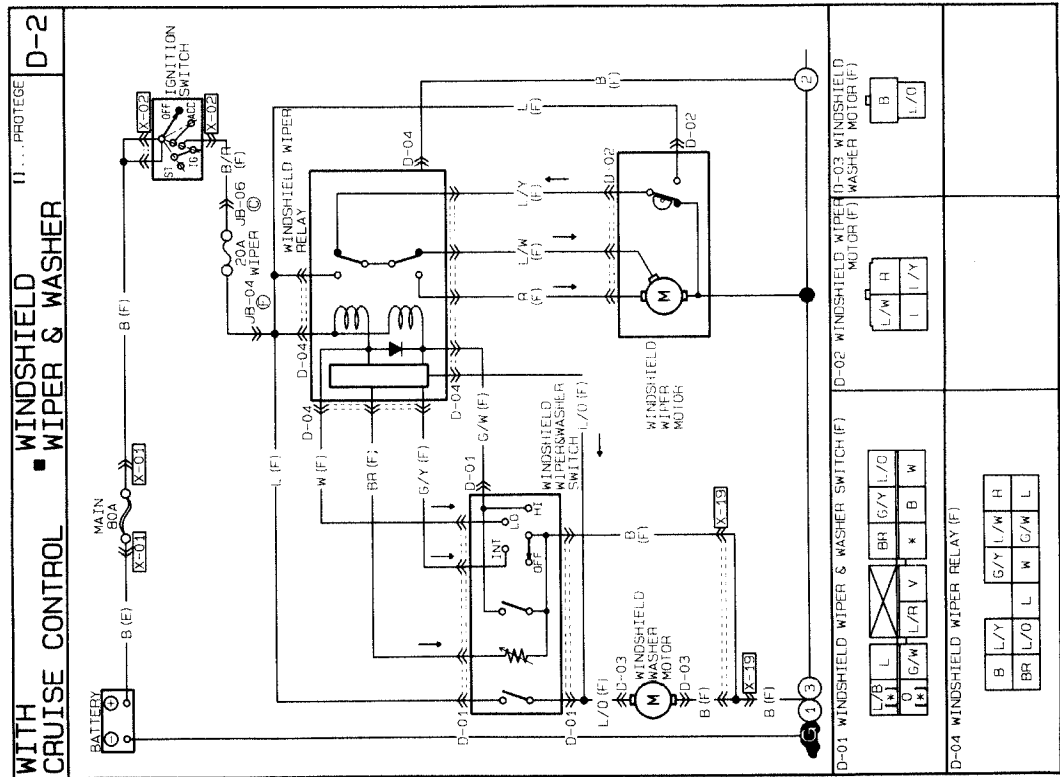
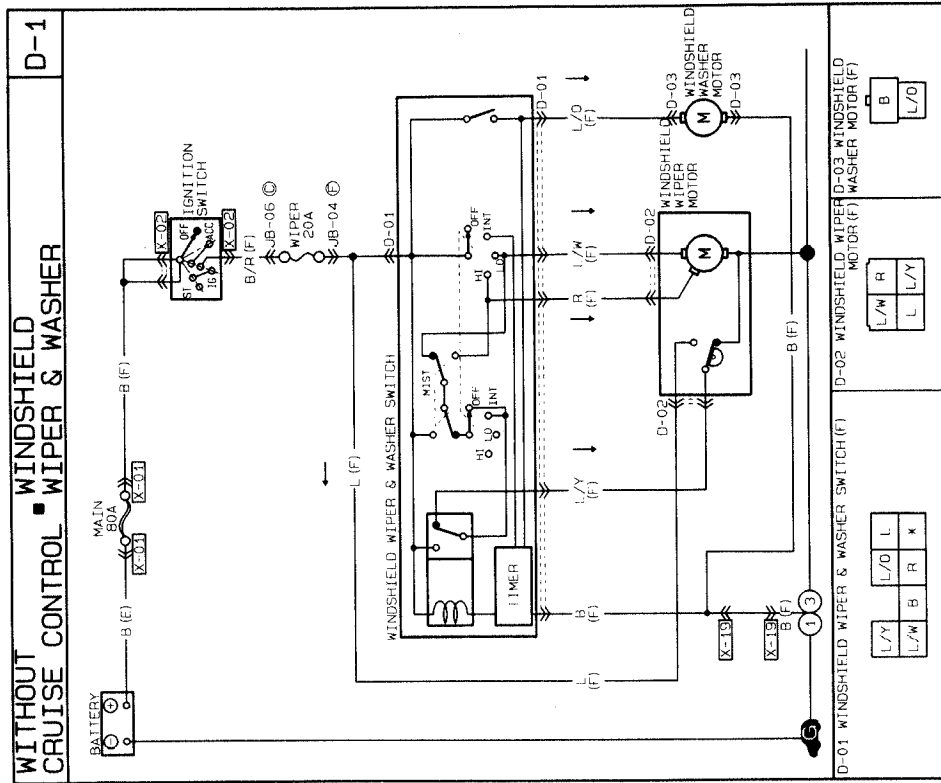
03U0SX-113

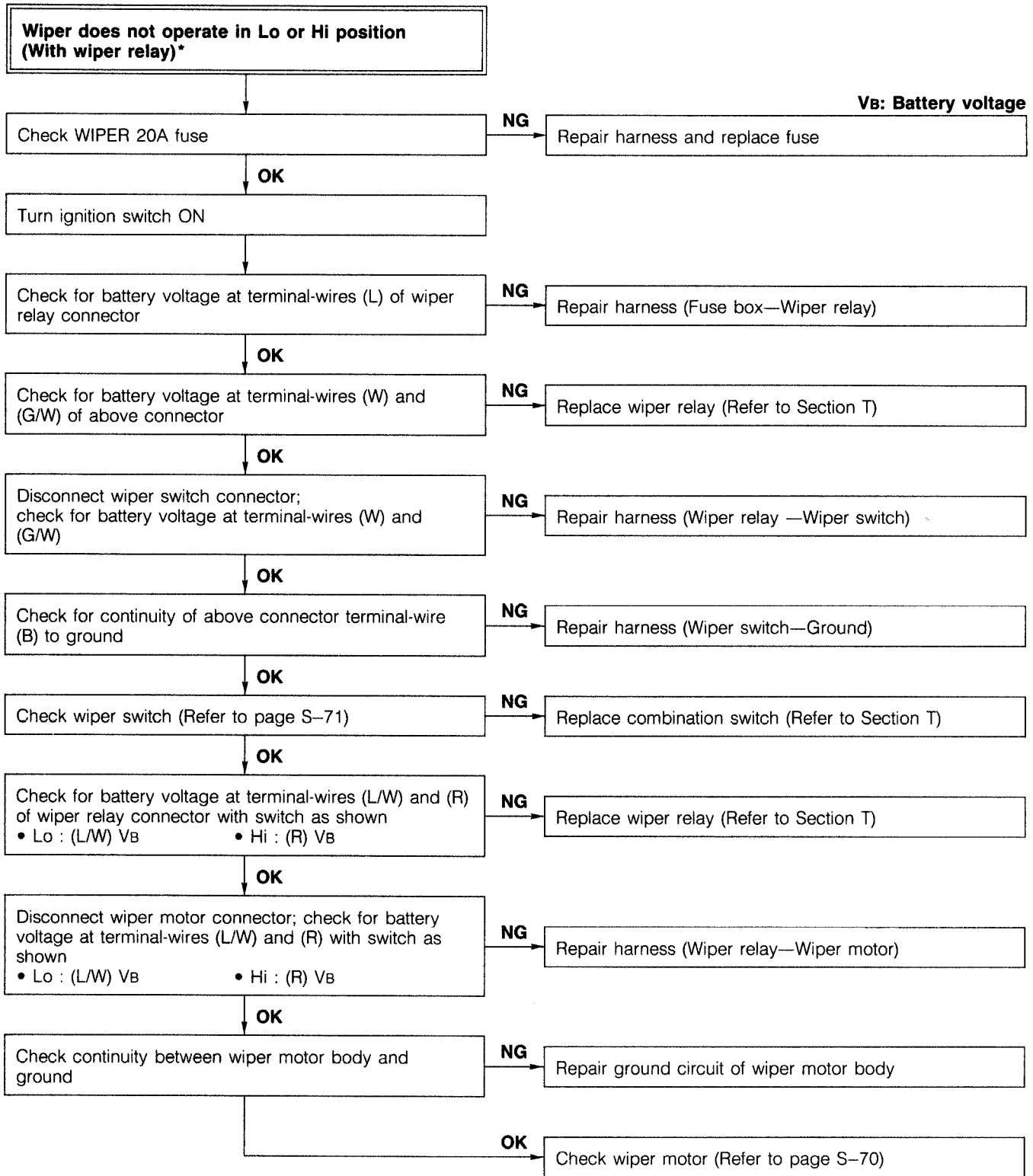
- Check for water leaks. If a leak is found, wipe the water off well and add **sealant** (B001 77 739) where needed.

WINDSHIELD WIPER AND WASHER

TROUBLESHOOTING GUIDE

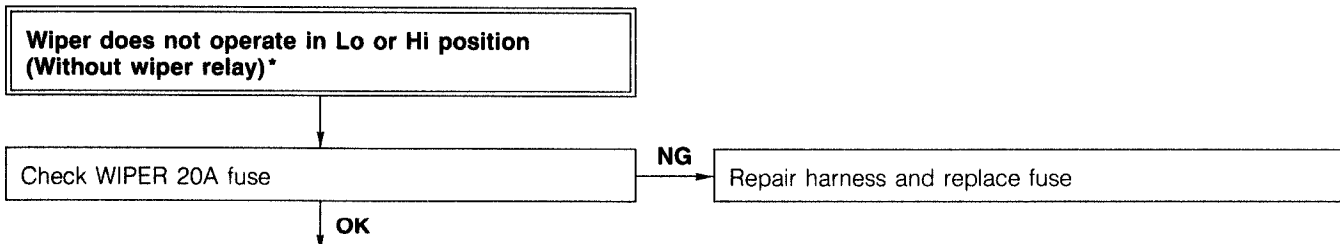
Circuit Diagram





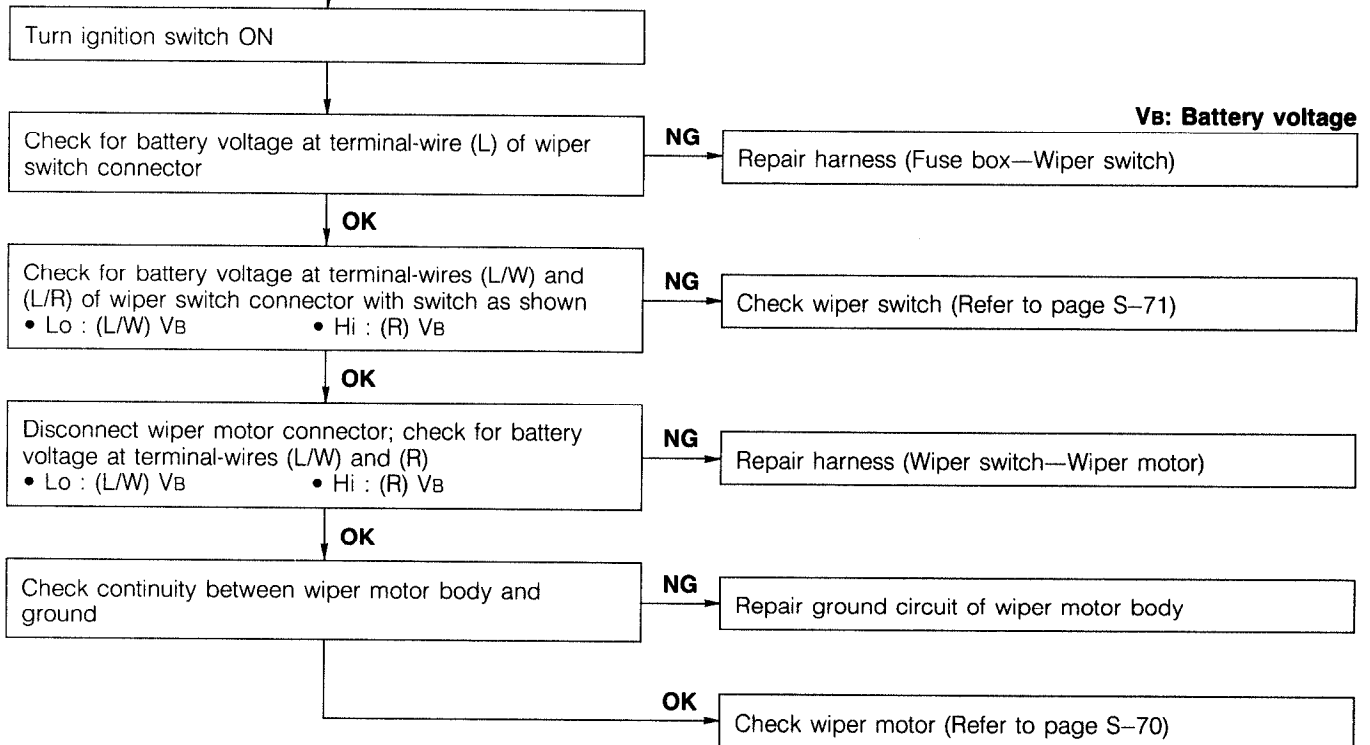
*: U.S. with/without cruise control, Canada with cruise control

23U05X-017



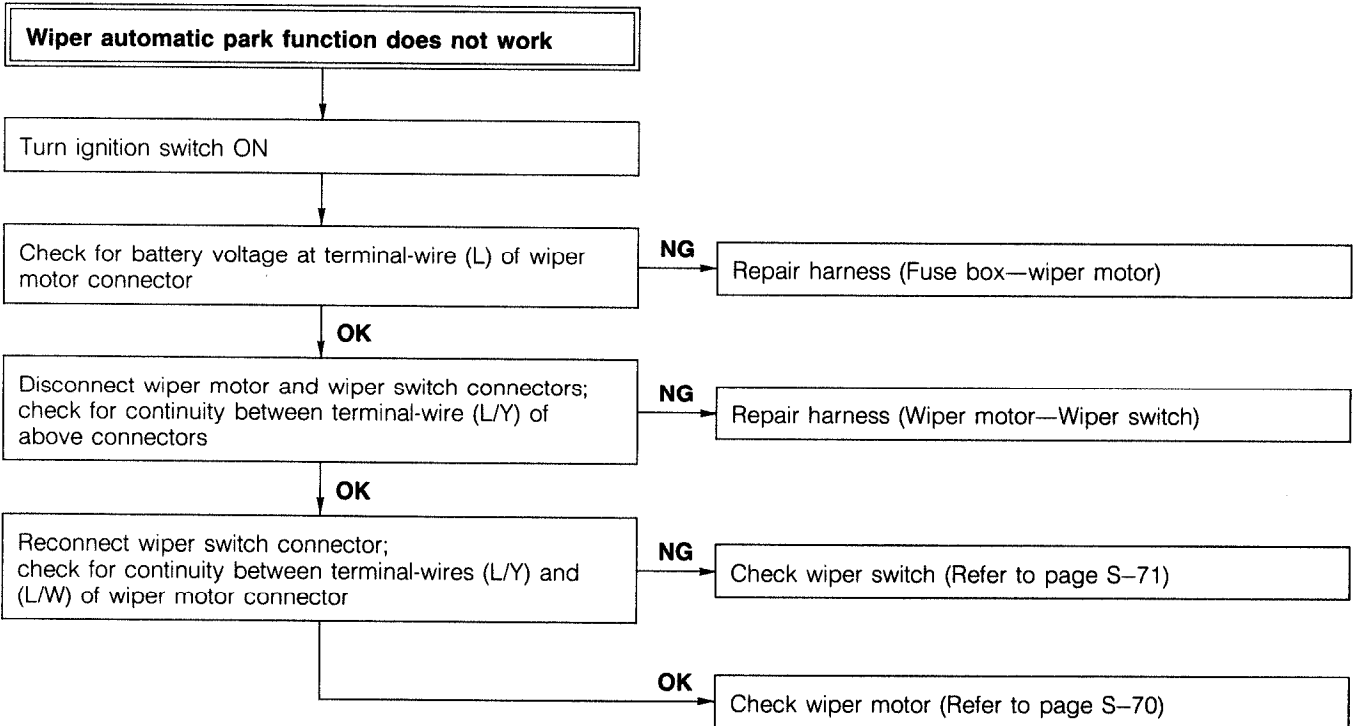
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Cont'd

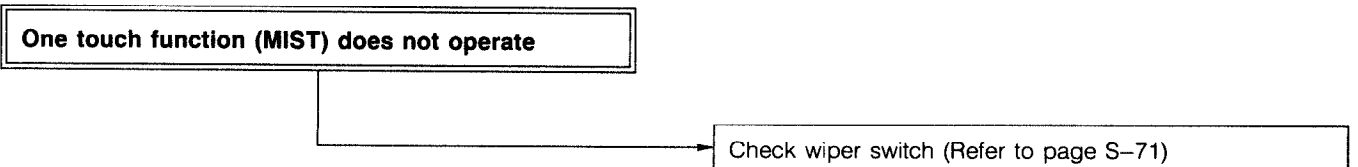


*: Canada without cruise control

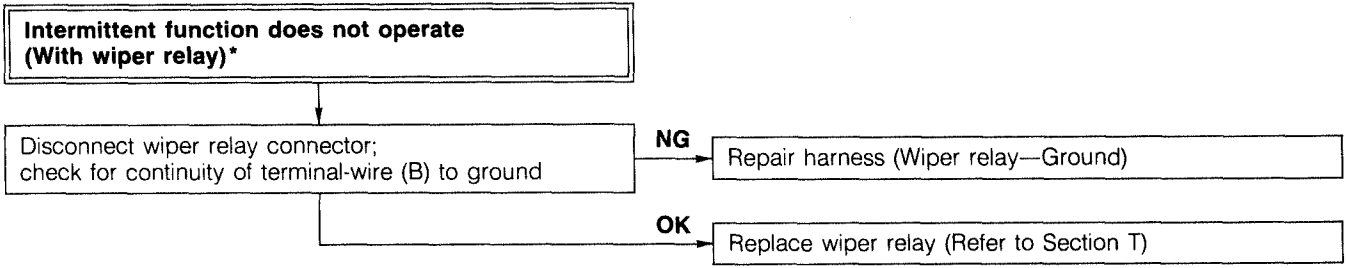
23U0SX-018



23U0SX-019

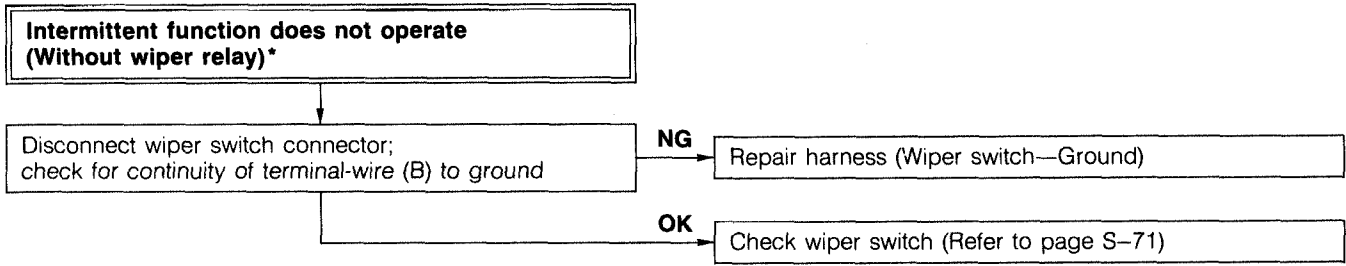


03U0SX-118



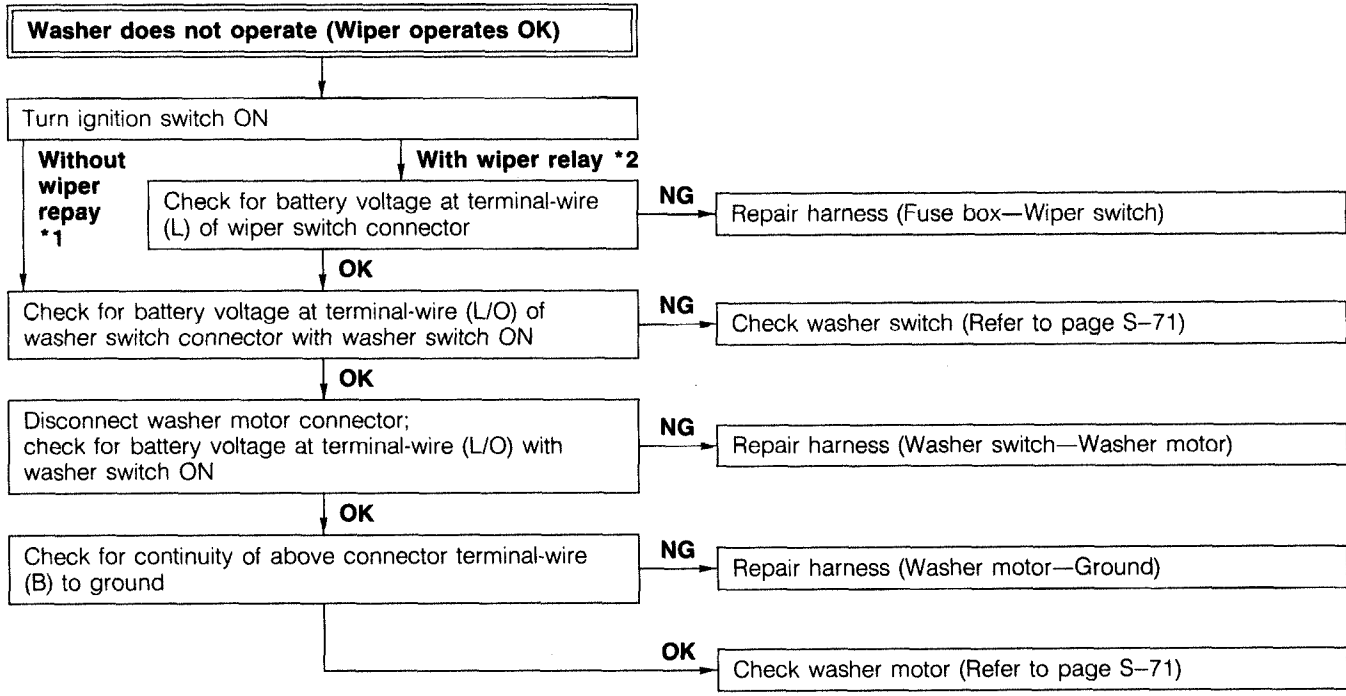
*: U.S. with/without cruise control, Canada with cruise control

03U0SX-119



*: Canada without cruise control

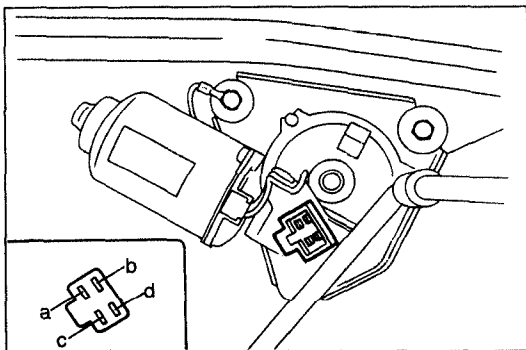
03U0SX-120



*1: Canada without cruise control

*2: U.S. with/without cruise control, Canada with cruise control

23U0SX-020



03U0SX-122

WIPER MOTOR

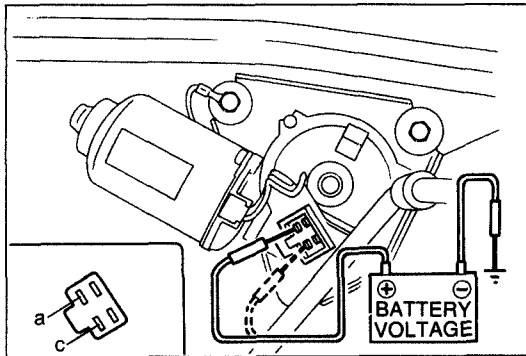
Inspection

Conductivity check

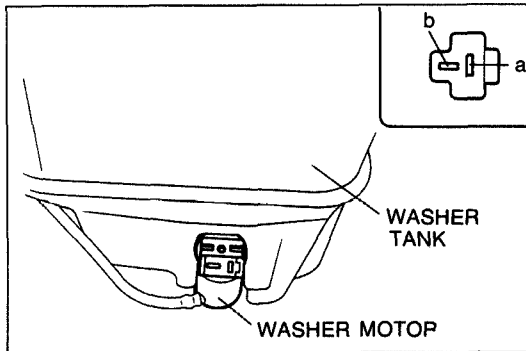
1. Disconnect the wiper motor connector.
2. Check for continuity between terminals with an ohmmeter.

Motor condition \ Terminal	a	b	c	d
In automatic park	○	○	○	
Out automatic park	○	○	○	○

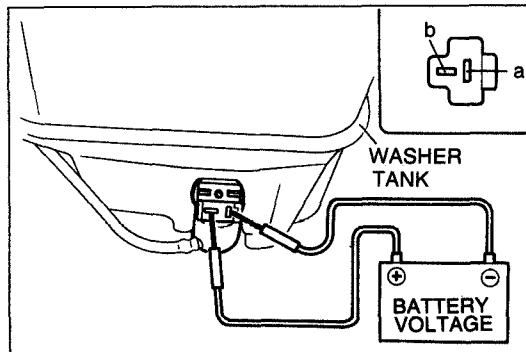
○—○: Indicates continuity



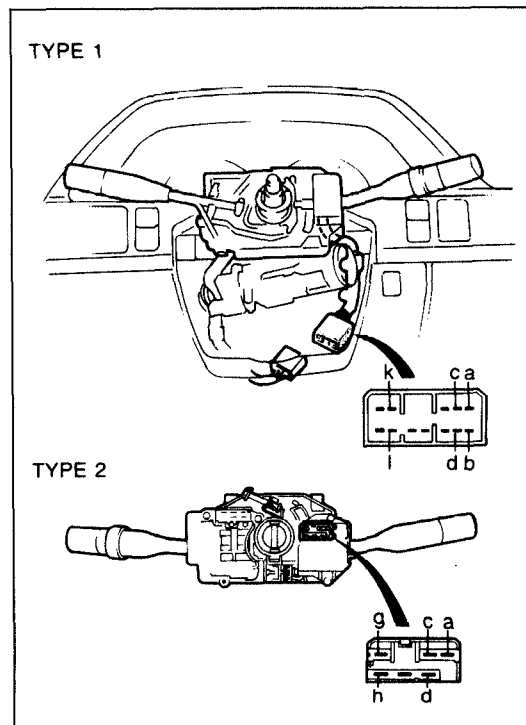
23U0SX-021



03U0SX-124



23U0SX-022



13U0SX-015

Operation check

1. Disconnect the wiper motor connector.
2. Check operation by applying battery voltage to the terminal of the motor.

Terminal	Operation speed
a	Hi
c	Lo

WASHER MOTOR

Inspection

Conductivity check

1. Disconnect the washer motor connector.
2. Check for continuity between terminals (a) and (b) with an ohmmeter.

Operation check

1. Disconnect the washer motor connector.
2. Connect battery voltage to terminal (b) and ground terminal (a).
3. Verify that the motor operates.

WINDSHIELD WIPER AND WASHER SWITCH

Inspection

1. Disconnect the windshield wiper and washer switch connector. (Refer to Removal of combination switch; Section T.)
2. Check for continuity between terminals with an ohmmeter.

Terminal		Type 1					Type 2							
		a	b	c	d	k	l	a	c	d	g	h		
Wiper switch	OFF													
	MIST					○	○			○				
	INT			○	○		○						○	○
	I (Low)			○	○		○							○
Washer switch	II (Hi)			○	○		○			○				
	ON	○						○	○					

○—○: Indicates continuity

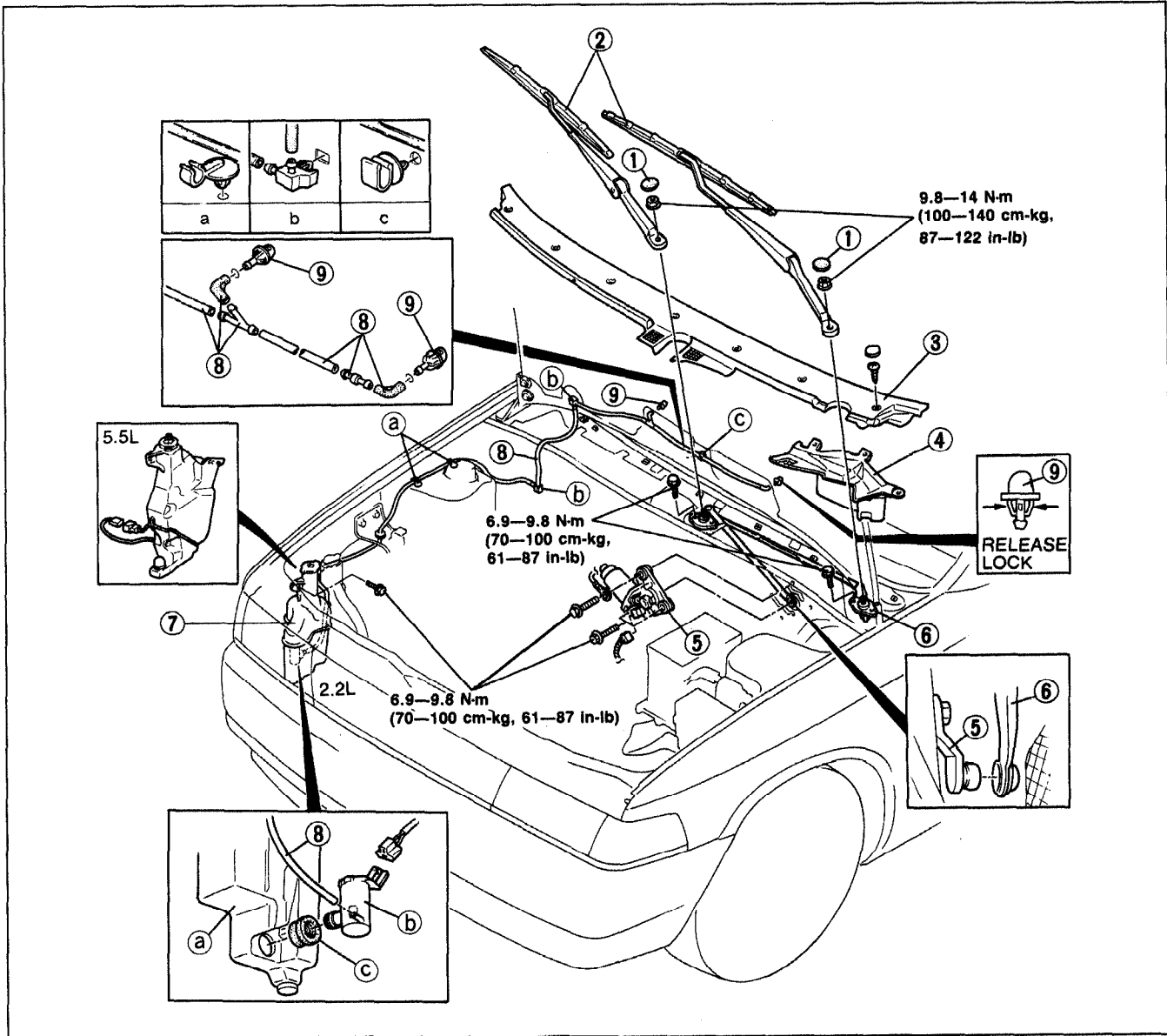
COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

Note

- Refer to Section T for removal of the windshield wiper and washer switch (in combination switch) and wiper relay.



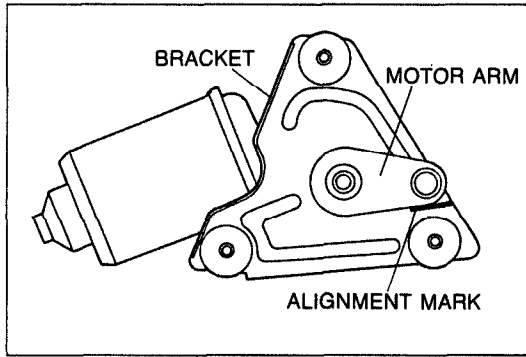
23U05X-023

Wiper

1. Wiper arm cover
2. Wiper arm and blade
Adjustment Note page S-73
3. Cowl grille
Removal / Installation page S-53
4. Baffle
5. Wiper motor and bracket
Removal Note / Installation Note page S-73
Inspection page S-70
6. Wiper link

Washer

7. Washer tank assembly
 - a. Washer tank
 - b. Washer motor
Inspection page S-71
 - c. Grommet
8. Washer pipe
9. Washer nozzle
Adjustment Note page S-73



23U0SX-024

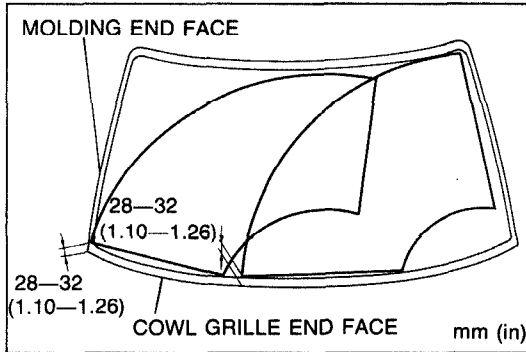
Removal Note / Installation Note

Wiper motor and bracket

1. Make an alignment mark on the bracket before removing the motor arm from the motor.
2. Align the motor arm with the mark on the bracket when installing the arm.

Tightening torque:

11—18 N·m (110—180 cm·kg, 95—156 in·lb)



03U0SX-129

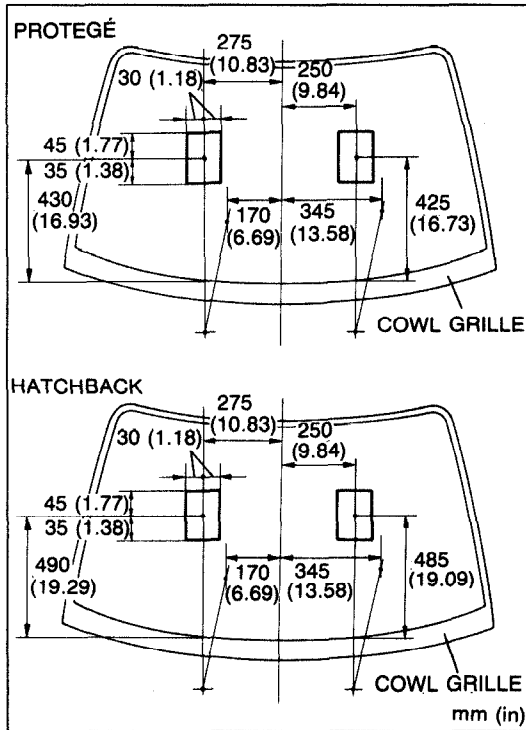
Adjustment Note

Arm height

1. Turn the wiper switch ON to operate the motor.
2. Turn the wiper switch OFF to set the automatic park position.
3. Set the arm height as shown in the figure.

Tightening torque:

9.8—14 N·m (100—140 cm·kg, 87—122 in·lb)



03U0SX-130

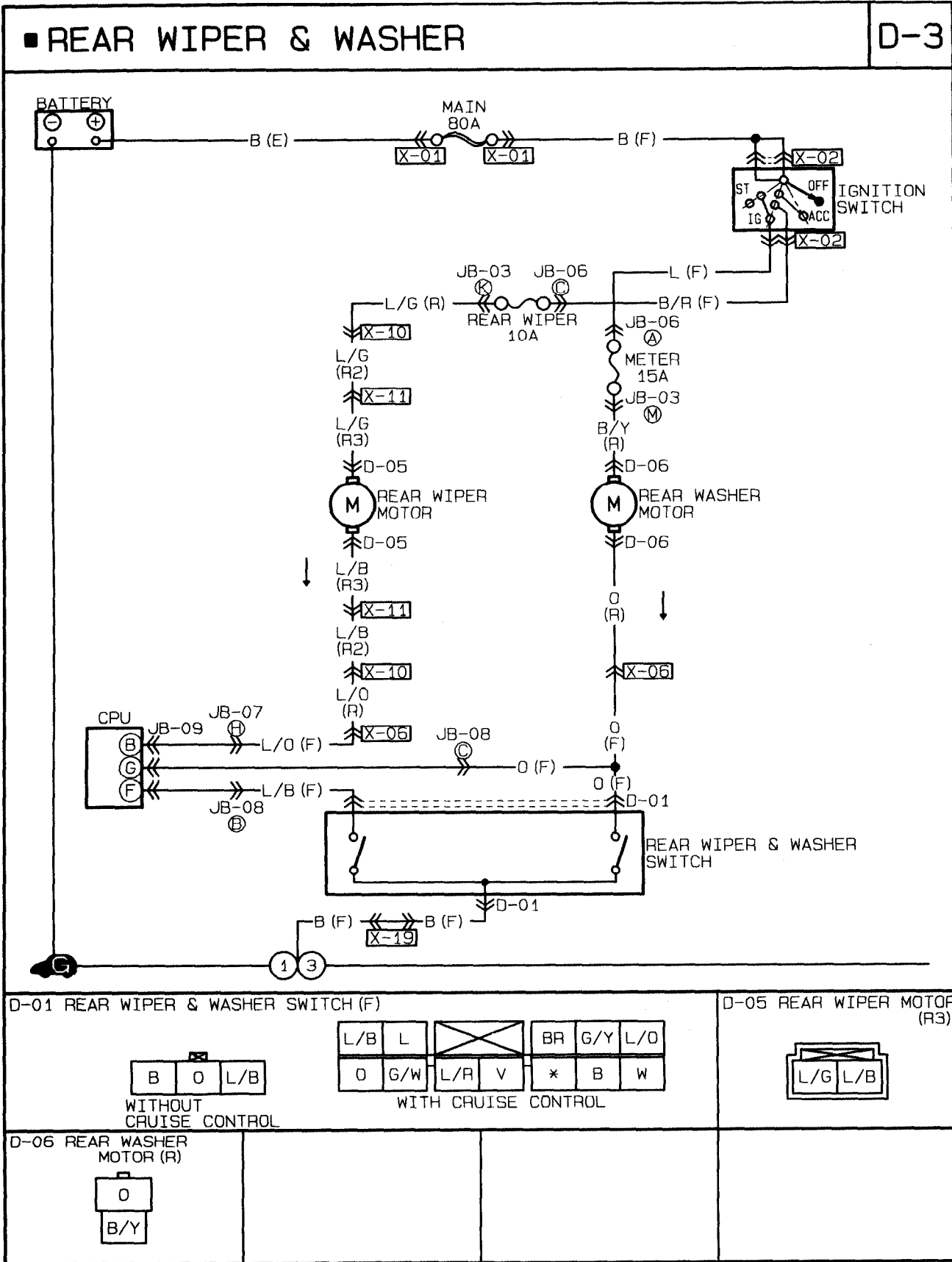
Washer nozzle

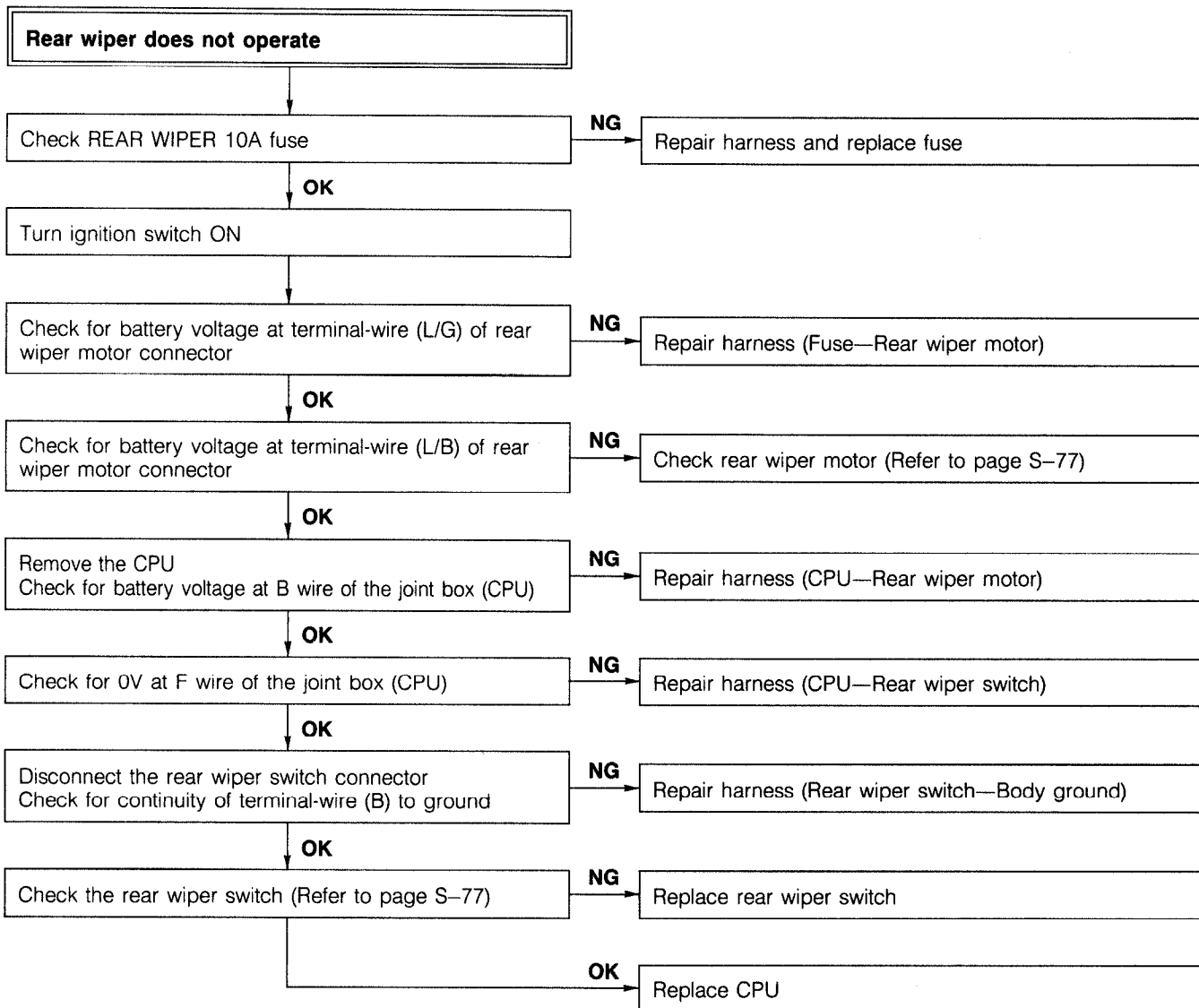
Insert a needle or similar object into the nozzle hole and move the nozzle to adjust the spray direction.

REAR WIPER AND WASHER

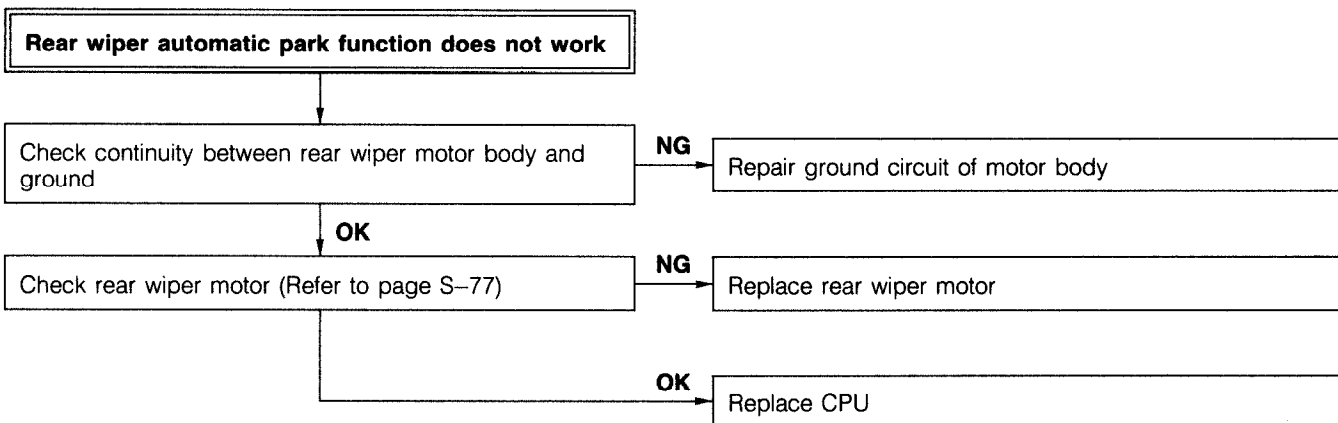
TROUBLESHOOTING GUIDE

Circuit Diagram

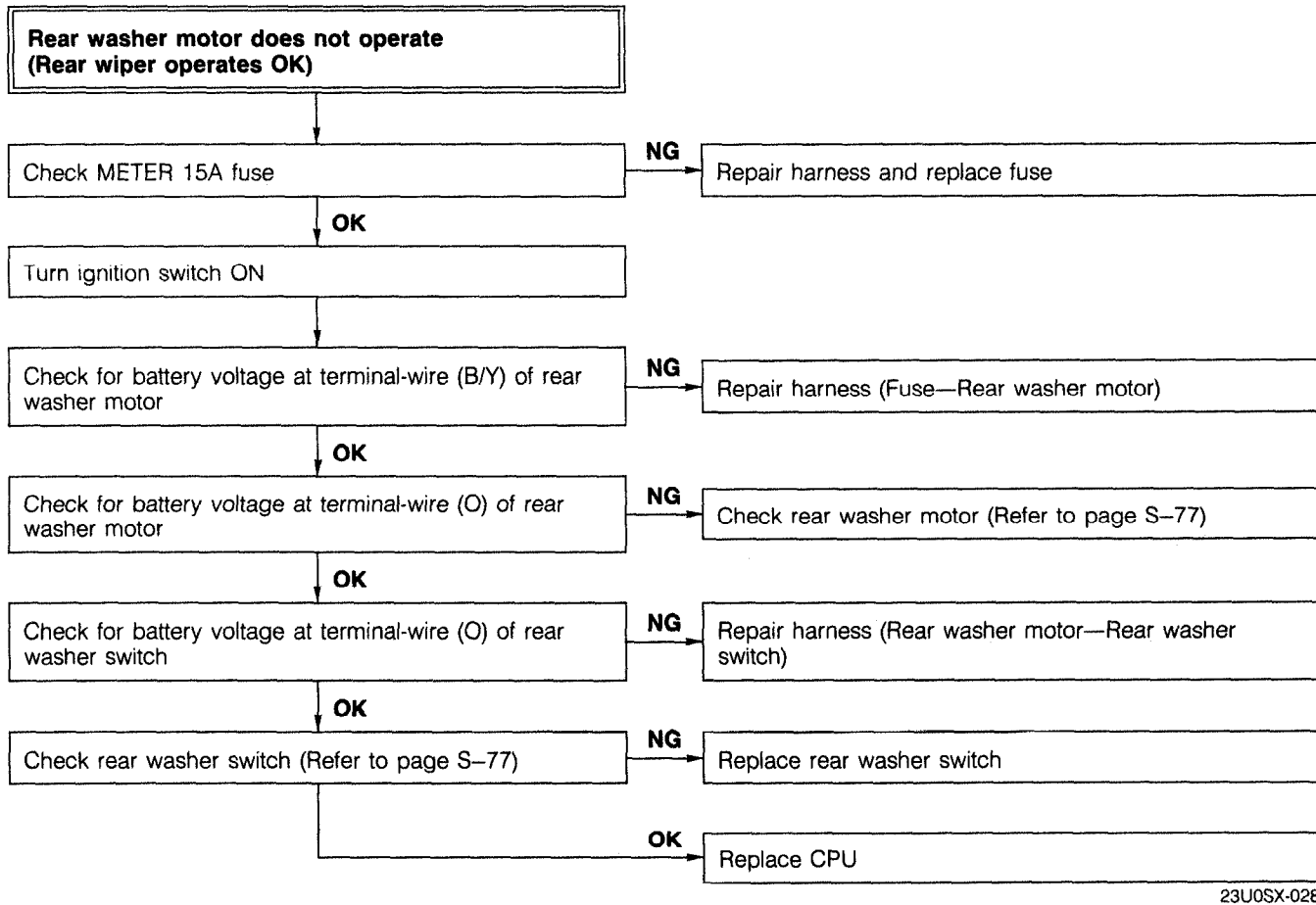
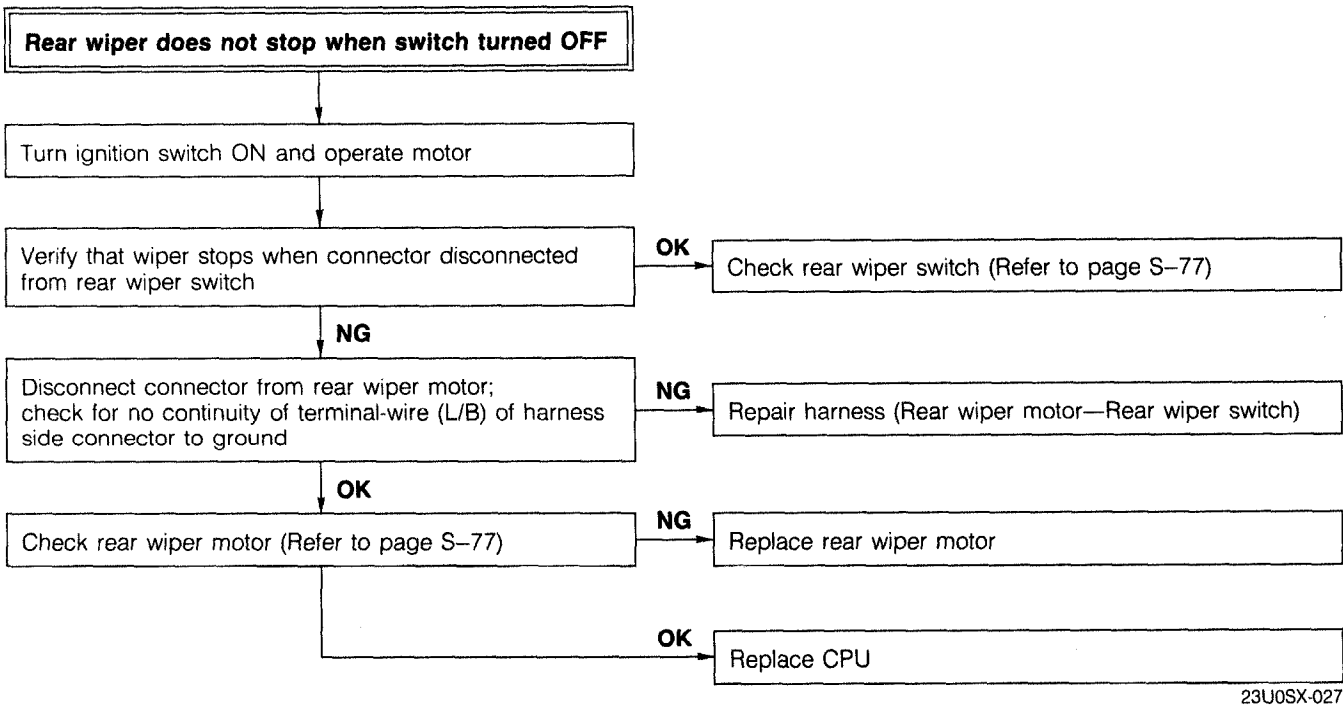


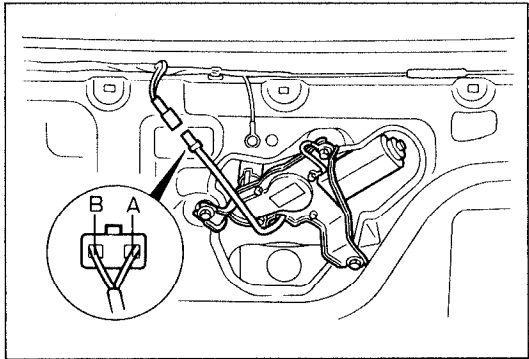


23U0SX-025



23U0SX-026





23U0SX-029

REAR WIPER MOTOR

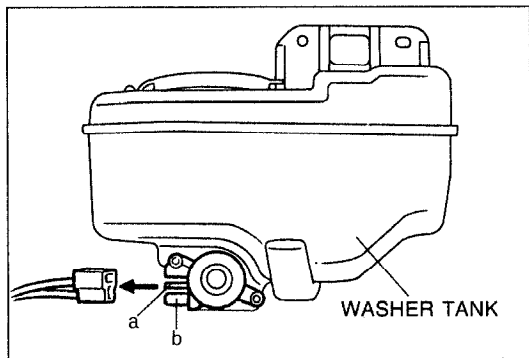
Inspection

Conductivity check

1. Disconnect the rear wiper motor connector.
2. Check for continuity between terminals (A) and (B) with an ohmmeter.

Operation check

1. Check that the motor operates continuously when battery voltage is connected to terminal (A) and a ground is connected to terminal (B) of the motor.
2. Disconnect the ground from terminal (B) and immediately connect it to the motor body. Verify that the motor shaft stops at the park position.
3. If not as specified, replace the rear wiper motor.

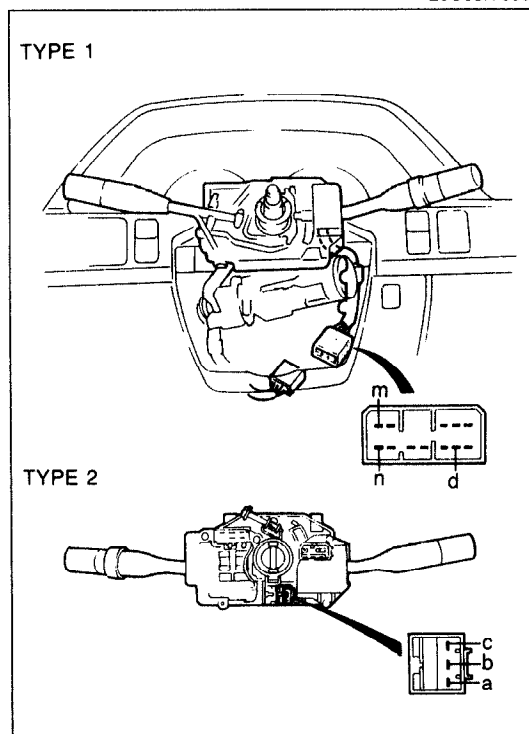


23U0SX-030

REAR WASHER MOTOR

Inspection

1. Disconnect the rear washer motor connector.
2. Check for continuity between terminals (a) and (b) of the washer motor with an ohmmeter.
3. Connect battery voltage to terminal (b) and ground terminal (a) of the washer motor. Verify that the washer motor operates.
4. If not as specified, replace the rear washer motor.



23U0SX-031

REAR WIPER AND WASHER SWITCH

Inspection

1. Disconnect the rear wiper and washer switch connector. (Refer to Removal of combination switch; Section T.)
2. Check for continuity between terminals with an ohmmeter. (Refer to; Section T.)
3. If not as specified, replace the combination switch.

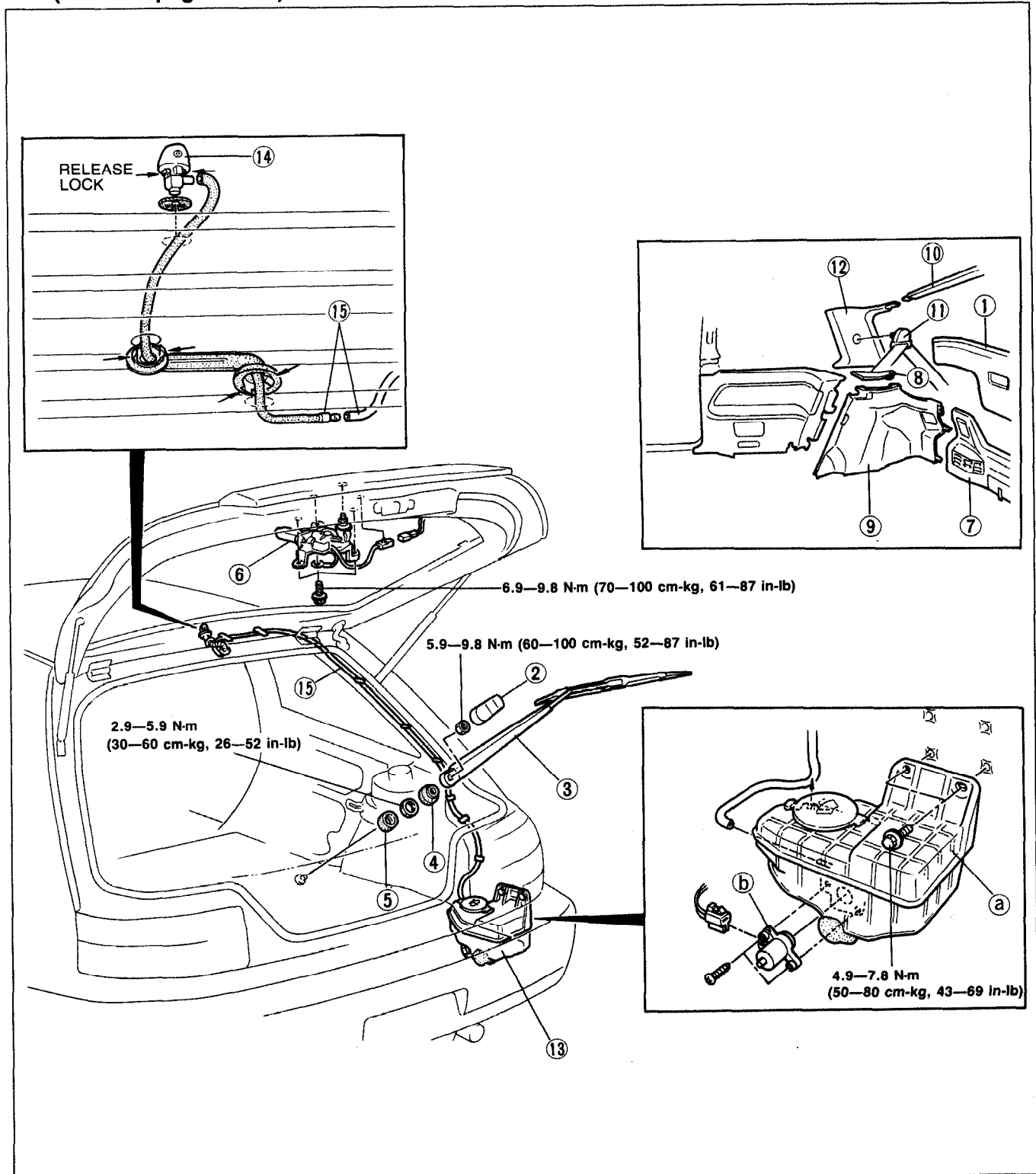
COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.

Note

- Refer to Section T for removal of the rear wiper and washer switch (in combination switch).
- Remove the rear portion of the headliner for removal of the rear washer nozzle.
(Refer to page S-91.)



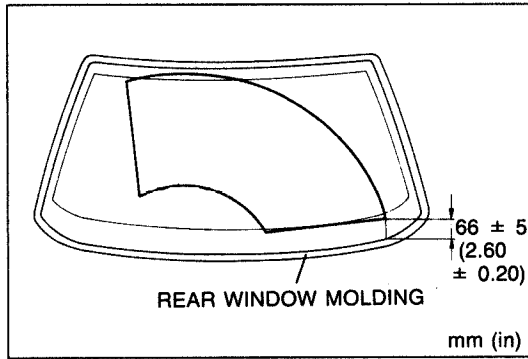
Wiper

- 1. Rear hatch lower trim
Removal / Installation page S- 98
- 2. Wiper arm cover
- 3. Rear wiper arm and blade
Adjustment Note..... page S- 79
- 4. Seal cap
- 5. Outer bushing
- 6. Rear wiper motor
Inspection page S- 77

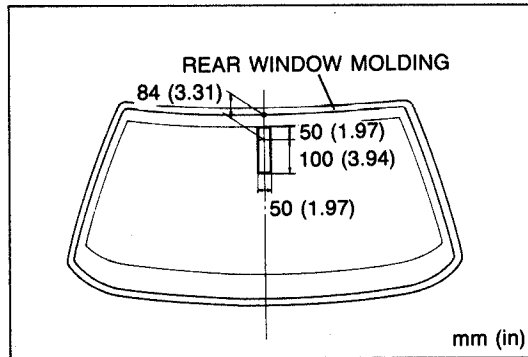
Washer

- 7. Trunk end trim
Removal / Installation page S- 98
- 8. Trunk side cover
Removal / Installation page S- 98
- 9. Trunk side trim
Removal / Installation page S- 98
- 10. Rear header trim
Removal / Installation page S- 98
- 11. Rear seat belt upper anchor
Removal / Installation page S-101
- 12. C-pillar trim
Removal / Installation page S- 98
- 13. Washer tank assembly
 - a. Washer tank
 - b. Washer motor
Inspection page S- 77
- 14. Washer nozzle
Adjustment Note..... page S- 79
- 15. Washer pipe

23U0SX-032



03U0SX-140



03U0SX-141

Adjustment Note

Arm height

- 1. Set the motor shaft to the park position by turning the rear wiper switch from ON to OFF.
- 2. Set the arm height as shown in the figure.

Tightening torque:

5.9—9.8 N·m (60—100 cm·kg, 52—87 in·lb)

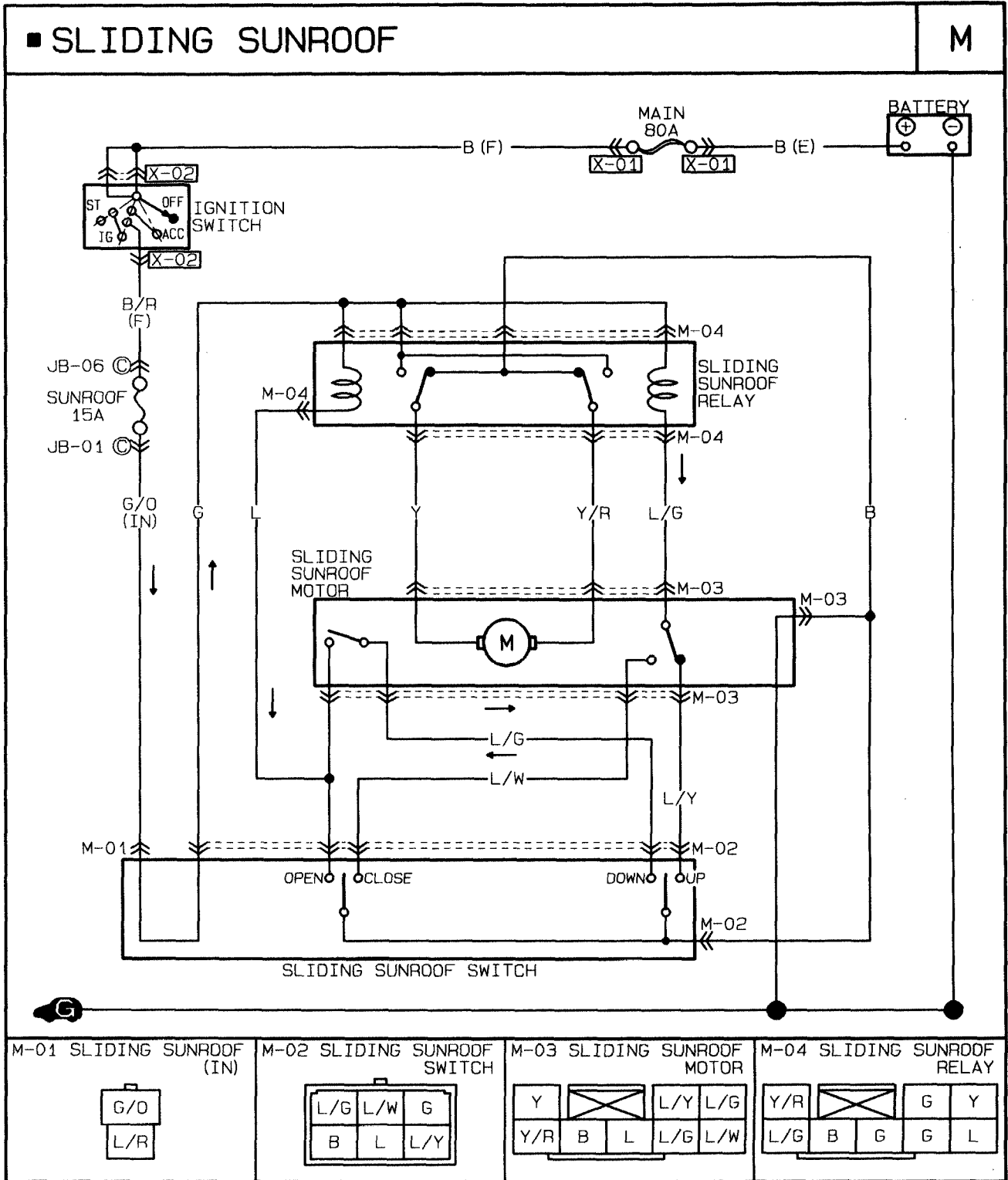
Washer nozzle

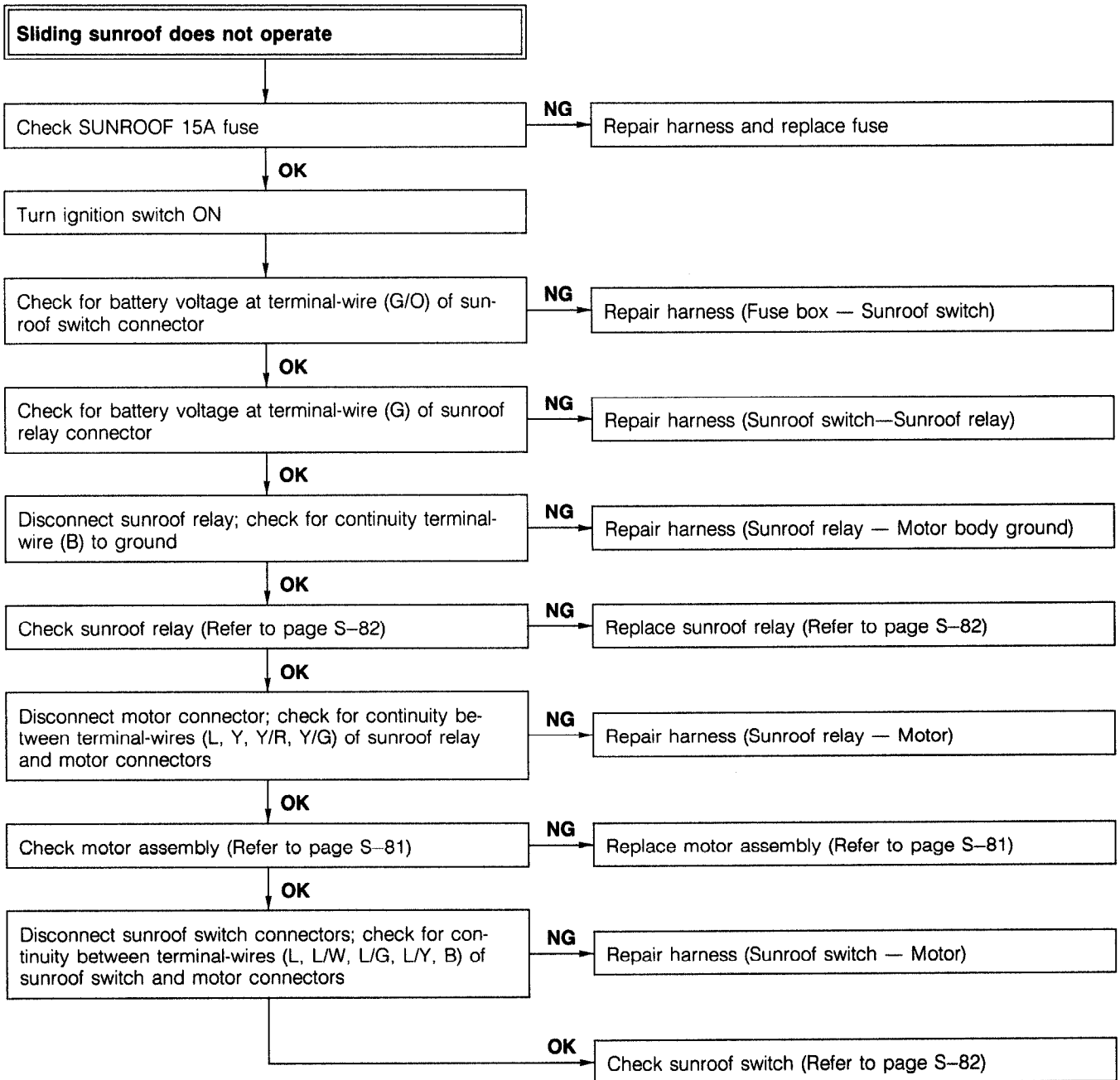
Insert a needle or similar object into the nozzle hole and move the nozzle to adjust the spray direction.

SLIDING SUNROOF

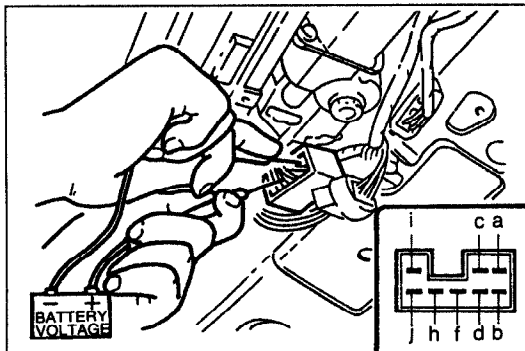
TROUBLESHOOTING GUIDE

Circuit diagram





23U0SX-033



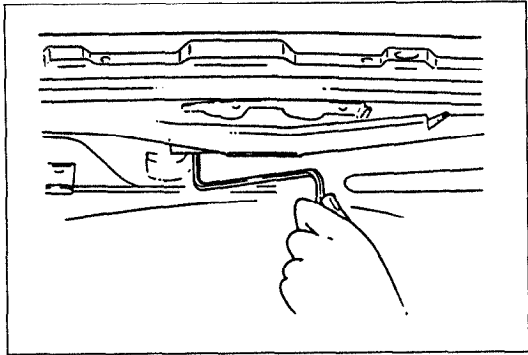
23U0SX-034

MOTOR ASSEMBLY

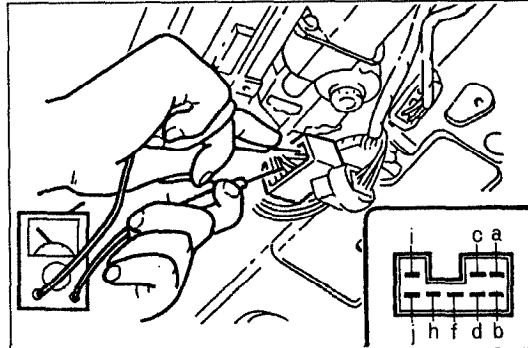
Inspection

Motor

1. Disconnect the motor connector.
2. Verify that the motor operates when battery voltage is connected to terminal (i) and a ground is connected to terminal (j).
3. Reverse the above connections and verify reverse operation of the motor.



03U0SX-145



Limit switch

Using the sunroof emergency handle (hex-head wrench) set the roof panel in the positions shown, and check for continuity between terminals of the motor assembly connector.

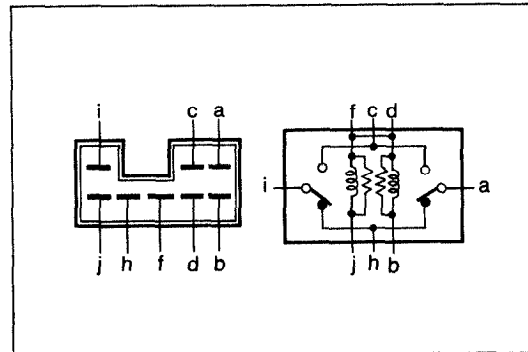
Roof panel	Limit switch Terminal	LS1		LS2		
		f	d	a	b	c
Open				○	○	
Closed				○		○
Tilted up		○	○	○		○

○—○: Indicates continuity

SUNROOF RELAY

Inspection

1. Disconnect the sunroof relay connector.
2. Check for continuity between terminals.



23U0SX-035

Terminal							
a	b	c	d	f	h	i	j
○	○		○	○	○	○	○

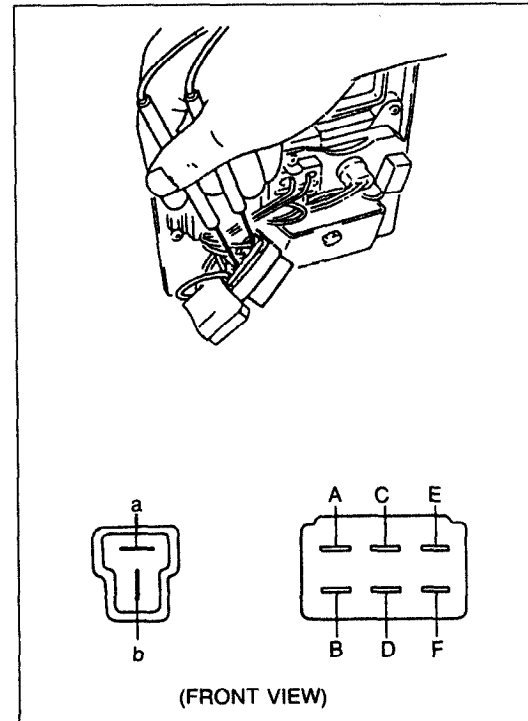
○—○: Indicates continuity

3. Check for continuity between terminals (c) and (i) when battery voltage is connected to terminal (f) and a ground is connected to terminal (j).

SUNROOF SWITCH (OVERHEAD CONSOLE)

Inspection

1. Disconnect the sunroof switch connector.
2. Check for continuity between terminals.



03U0SX-147

Switch position	Terminal	a	b	A	B	C	D	E	F
		OFF		○		○			
Slide switch	Open	○		○			○		○
	Close	○		○		○			○
Tilt switch	Up	○		○	○				○
	Down	○		○				○	○
Lamp	ON	○	○	○		⊕			○

○—○: Indicates continuity

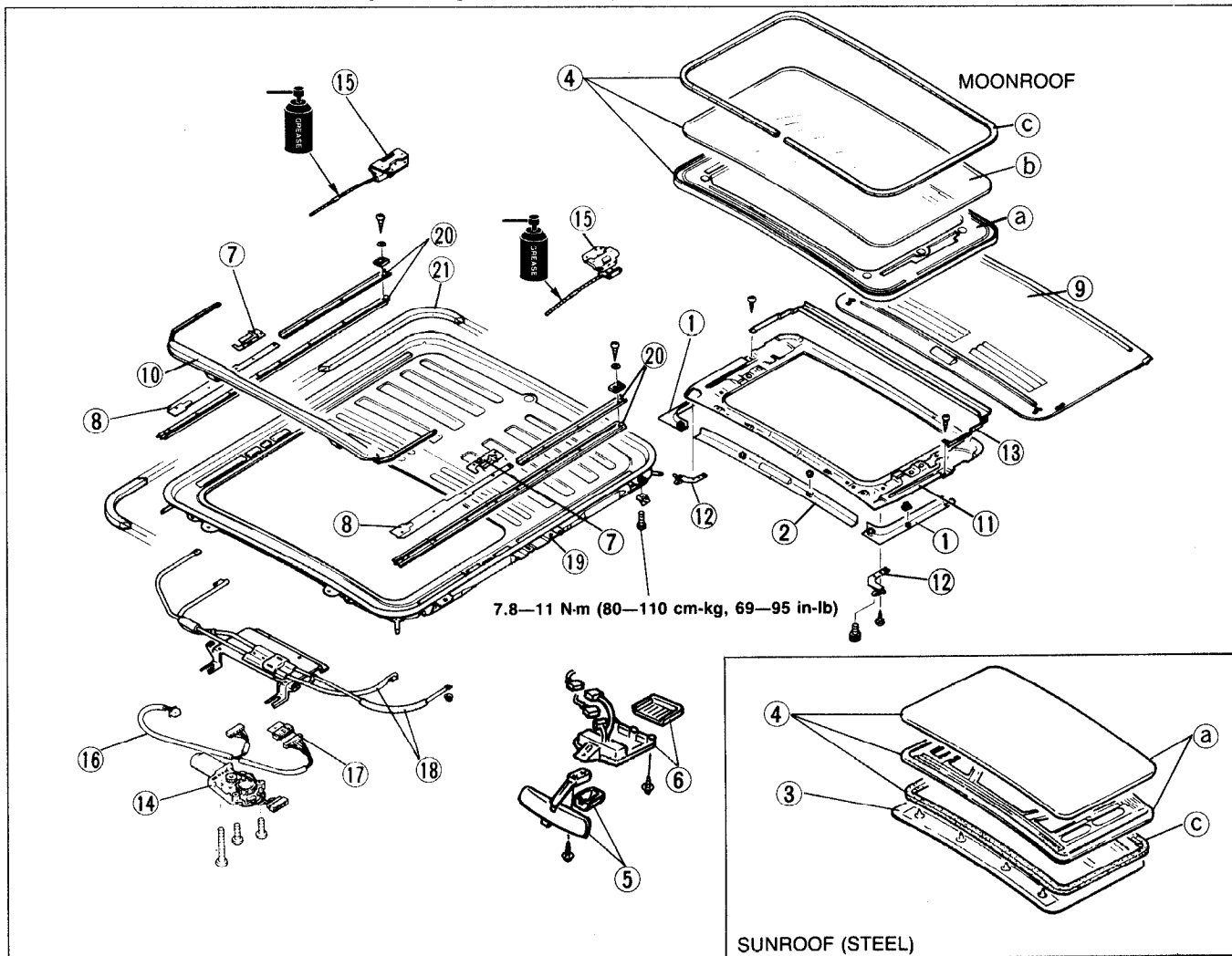
COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

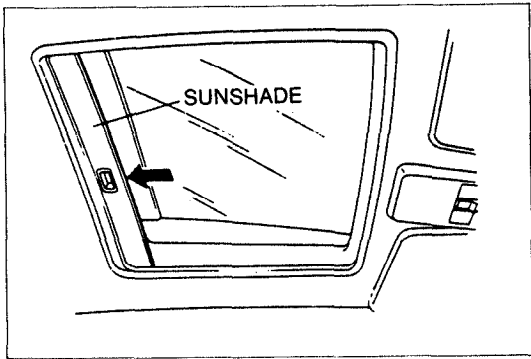
Note

- Remove the headliner for removal of the sunroof harness, sunroof relay, drive unit assembly, and sunroof frame and packing. (Refer to page S-89.)



03U0SX-148

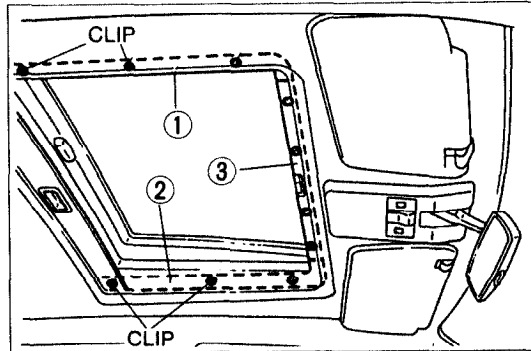
- | | | |
|--|---|--|
| 1. Decoration cover (Moonroof)
Removal Note .. page S-84 | 7. Set plate
Installation
Note page S-86 | 14. Motor assembly
Installation
Note page S-86 |
| 2. Lower panel cover (Moonroof)
Removal Note .. page S-84 | 8. Guide rail cover
Installation
Note page S-86 | 15. Rear guide assembly
Removal Note .. page S-86
Installation
Note page S-86 |
| 3. Sliding roof trim (Sunroof)
Removal Note .. page S-84 | 9. Sunshade (Moonroof)
Removal Note .. page S-84 | 16. Sliding roof harness |
| 4. Sliding panel assembly
Removal Note .. page S-84
Adjustment
Note page S-87 | 10. Deflector
Removal Note .. page S-85 | 17. Sliding roof relay
Inspection..... page S-82 |
| a. Sliding panel | 11. Lower panel
Removal Note .. page S-85 | 18. Drive unit assembly |
| b. Glass (Moonroof) | 12. Front guide | 19. Sliding roof frame |
| c. Weatherstrip | 13. Drip rail assembly | 20. Guide rail assembly |
| 5. Rearview mirror | | 21. Packing |
| 6. Overhead console
Inspection..... page S-82 | | |



03U0SX-149

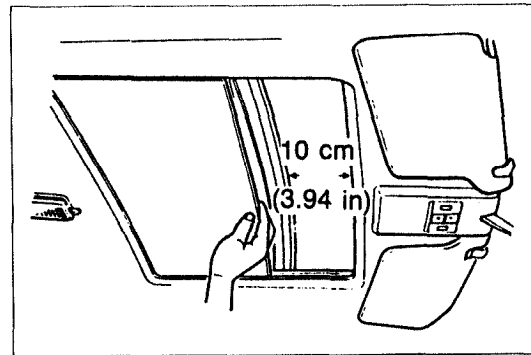
Removal Note**Decoration cover, Lower panel cover**

1. Slide the sunshade all the way to the rear.
2. Fully close the sliding panel.



03U0SX-150

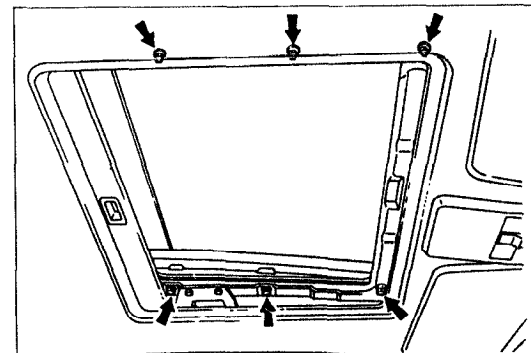
3. Remove the decoration covers and lower panel cover in the order shown.



03U0SX-151

Sliding roof trim

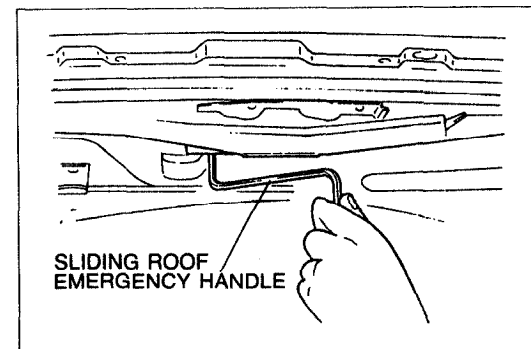
1. Open the slide panel **approx. 10 cm (4 in)**.
2. Remove the sliding roof trim.
 - (1) Pull down the front.
 - (2) Pull the trim forward.
 - (3) Remove the trim, lifting it up, and out of the vehicle.



03U0SX-152

Sliding panel assembly

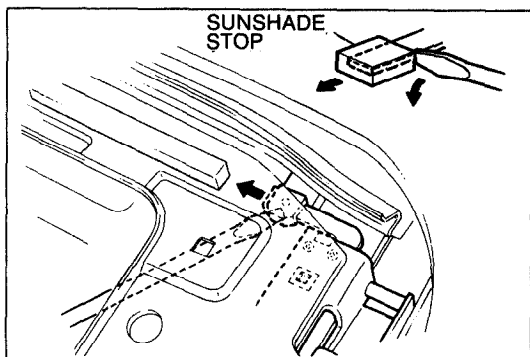
1. Close the sliding panel fully, and remove the installation nuts from the sliding panel and the lower panel.
2. Remove the sliding panel by pushing it upward from inside the vehicle.



03U0SX-153

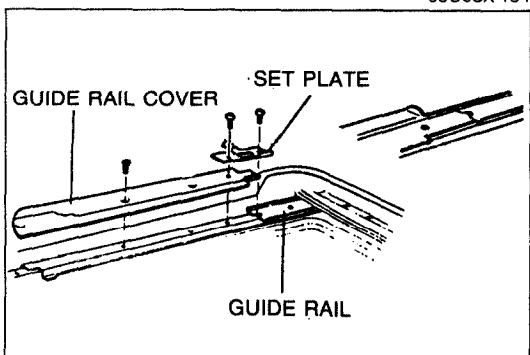
Sunshade

1. Fully close the sunshade.
2. Turn the sliding roof emergency handle and move the sunshade **5–10mm (0.19–0.39 in)** to the rear.



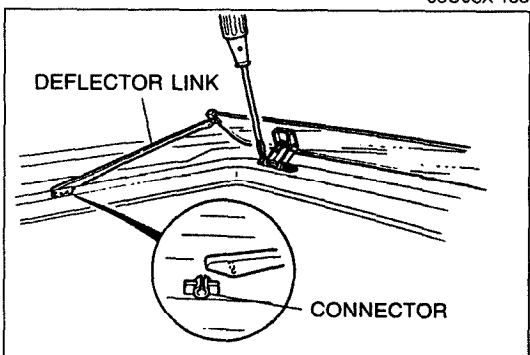
03U0SX-154

3. Release the sunshade stop at the rear of the cable holder, and move the sunshade forward.
4. Turn the handle to fully open the lower panel. (Leave the sunshade fully closed.)



03U0SX-155

5. Remove the set plate and guide rail cover.
6. Pull out the sunshade.



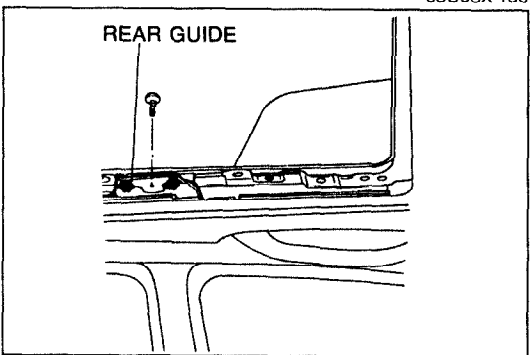
03U0SX-156

Deflector

1. Hold the deflector down slightly. Pry up the connector at the rear of the deflector link, and remove the deflector link.
2. Remove the screws and remove the deflector.

Caution

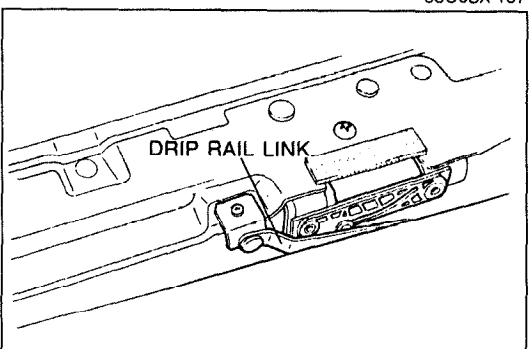
- Do not damage the deflector link or connector.



03U0SX-157

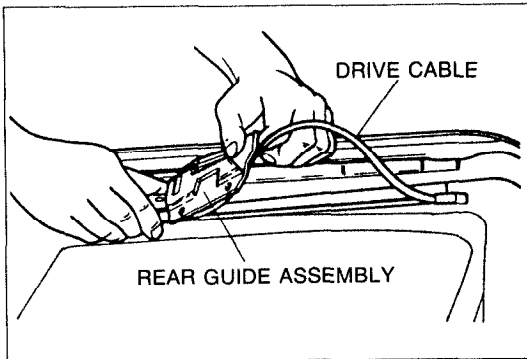
Lower panel

1. Fully close the lower panel.
2. Remove the lower panel and rear guide screw and nuts.



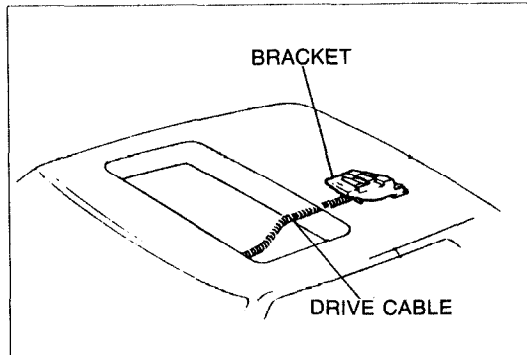
03U0SX-158

3. Remove the installation screw from the drip rail link.



03U0SX-159

Rear guide assembly
Pull out the drive cable.

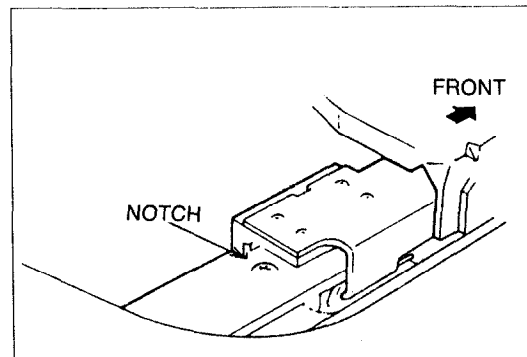


03U0SX-160

Installation Note
Rear guide assembly
1. Insert the drive cable into the tube.

Note

- Apply a liberal coat of grease to the drive cable and friction surface of the rear guide assembly.

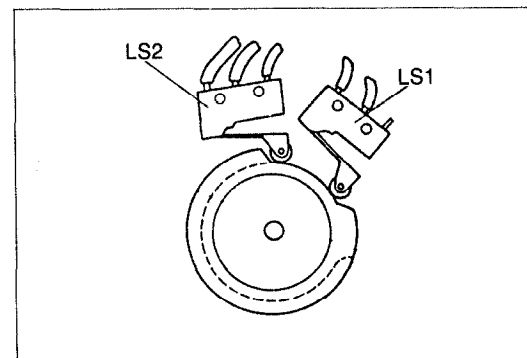


03U0SX-161

2. Adjust the left and right sides of the drive cable.

Note

- Insert the guide rail assembly into the guide rail and match the rear end of the bracket into the notch at the rear of the rail.



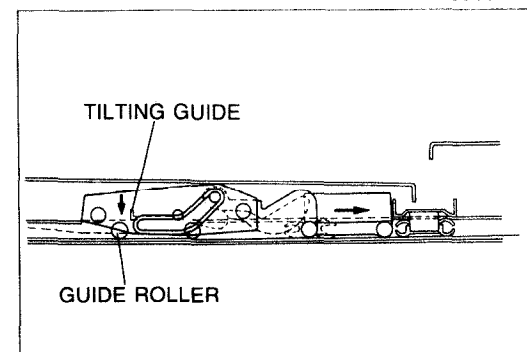
03U0SX-162

Motor assembly

Verify that the limit switches (LS1 and LS2) of the motor are as shown in the OFF position, and install the motor assembly.

Note

- Be certain of the cam position.
- Use the handle to position the cam correctly if necessary.
- There are two lengths of motor assembly installation screws, long and short. Be sure to use the correct ones.



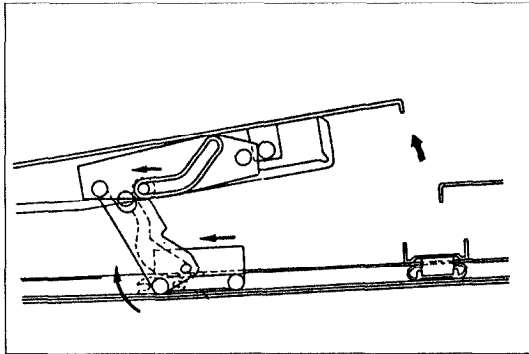
03U0SX-163

Guide rail cover, Set plate

1. Using the sliding roof emergency handle, turn the motor to fully open the lower panel.

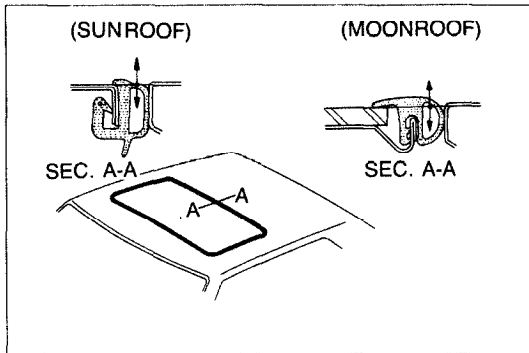
Note

- Because the roof panel and lower panel might interfere with each other when the lower panel is opened, check that the guide roller is correctly fitted into the guide rail as shown.
- Turn the motor while pushing the cable.



03U0SX-164

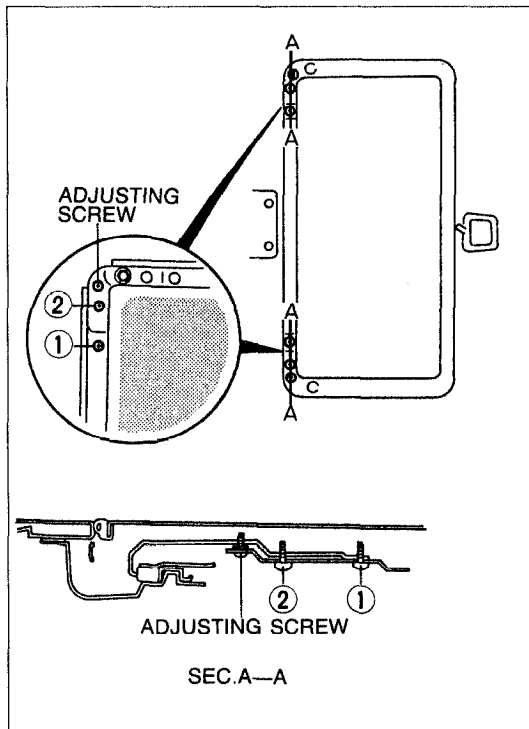
2. Install the guide rail cover and set plate.
3. Turn the motor using the emergency handle, and visually check the sliding, tilt-down and tilt-up operations.



03U0SX-165

Adjustment Note
Sliding panel assembly
Height

Adjust so that the height difference between the sliding panel and the roof panel is **1.5mm (0.06 in) max**, referring to below.



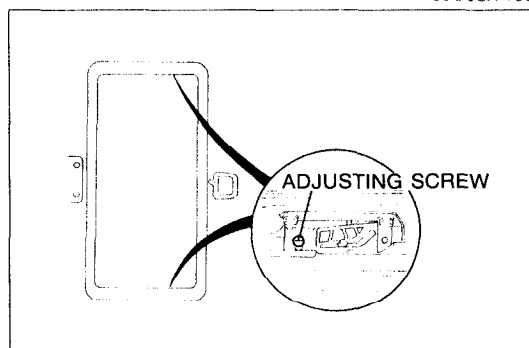
03U0SX-166

(Front portion)

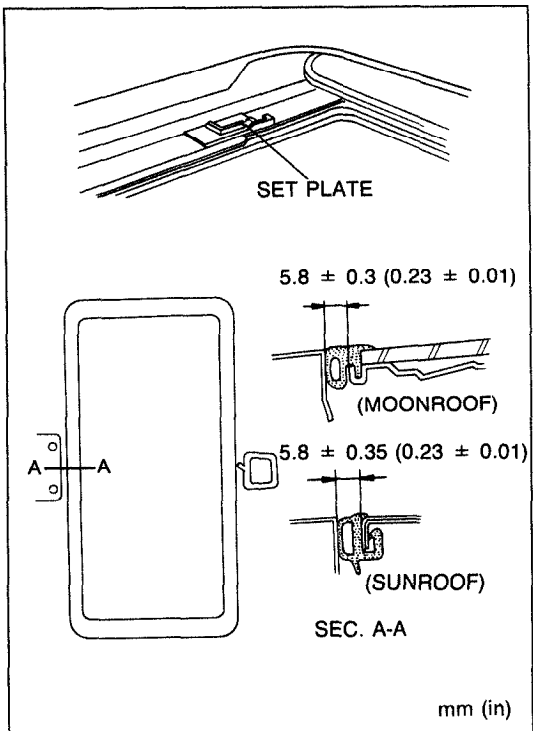
1. Loosen installation screws (1) and (2).
 If the adjustment is only about **2mm (0.08 in)** don't loosen screw (1).
2. Turn the screws to adjust.
 Turning to the right raises; to the left lowers.
3. Tighten installation screws (1) and (2).

(Rear portion)

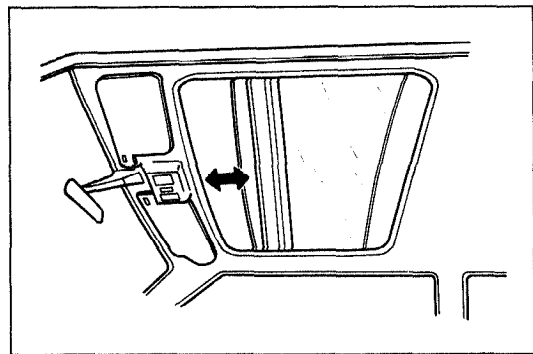
1. Loosen the adjusting screw.
2. Adjust by moving the sliding panel.
3. Tighten the adjusting screw.



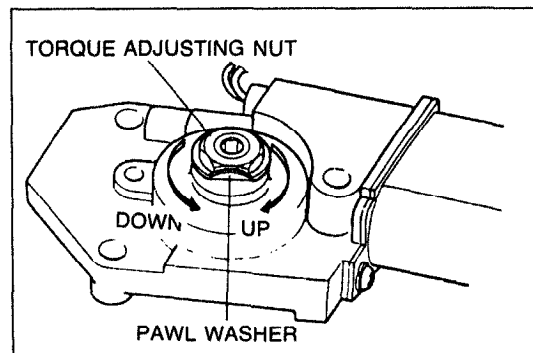
03U0SX-167



13U0SX-030



03U0SX-169



03U0SX-170

Gap

1. Verify that the sliding panel does not interfere with the roof panel when opened.
2. Open the sliding panel fully and move the set plate forward if necessary.

Caution

- If the set plate is moved too far forward, there may be a malfunction or leakage.

Moving load

1. Measure the operation time of the sliding panel.
(From fully opened to fully closed or reverse operation.)

Specified time: 4—7 sec.

2. If not as specified, adjust the torque adjusting nut on the motor.

Tightening torque:**3.9—4.9 N·m (40—50 cm·kg, 35—43 in·lb)****Caution**

- Lock the nut with the pawl washer after adjustment.

HEADLINER

COMPONENTS

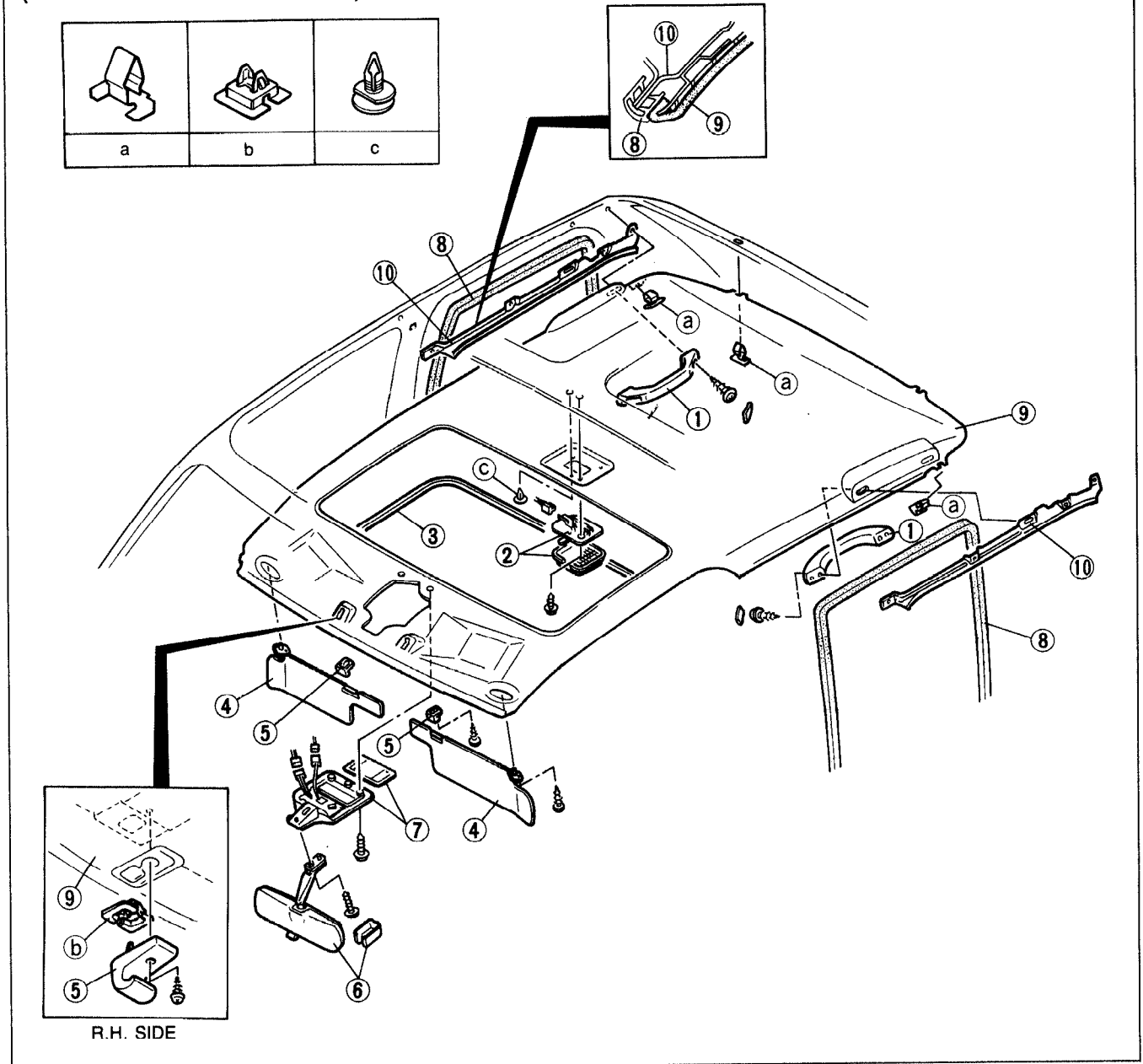
Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

Note

- Remove the surrounding trim for removal of the headliner. (Refer to pages S-97, 98.)

**PROTEGÉ
(WITH PASSIVE SHOULDER BELT)**



R.H. SIDE

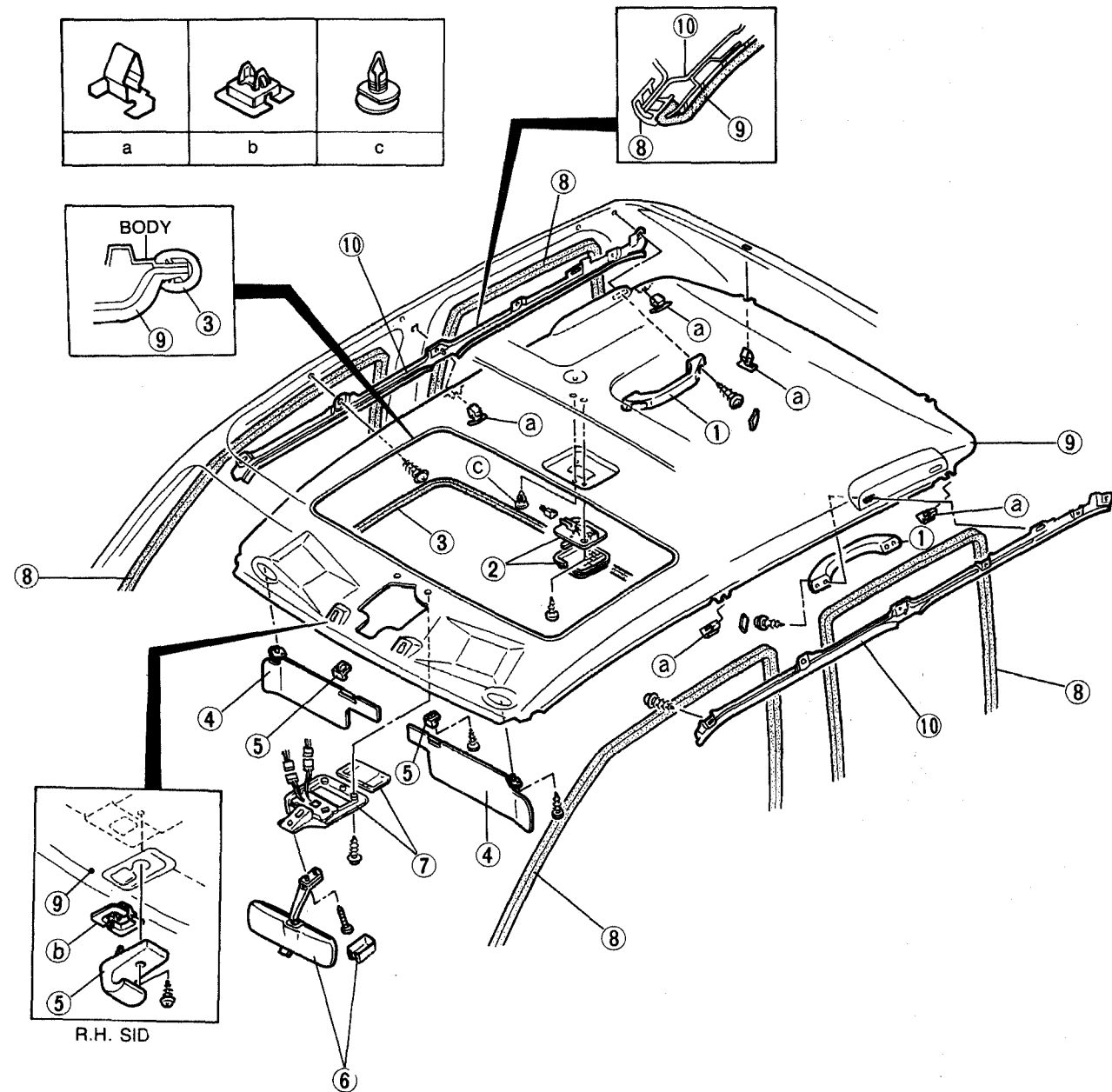
13U0SX-031

1. Assist handle
2. Interior lamp
3. Seaming welt (With sliding sunroof)
4. Sunvisor

5. Sunvisor adapter
6. Rearview mirror
7. Overhead console (With sliding sunroof)
8. Seaming welt (Pillar)

9. Headliner
Removal Note .. page S-93
Installation Note page S-93
10. Rear top bracket

**PROTEGÉ
(WITHOUT PASSIVE SHOULDER BELT)**



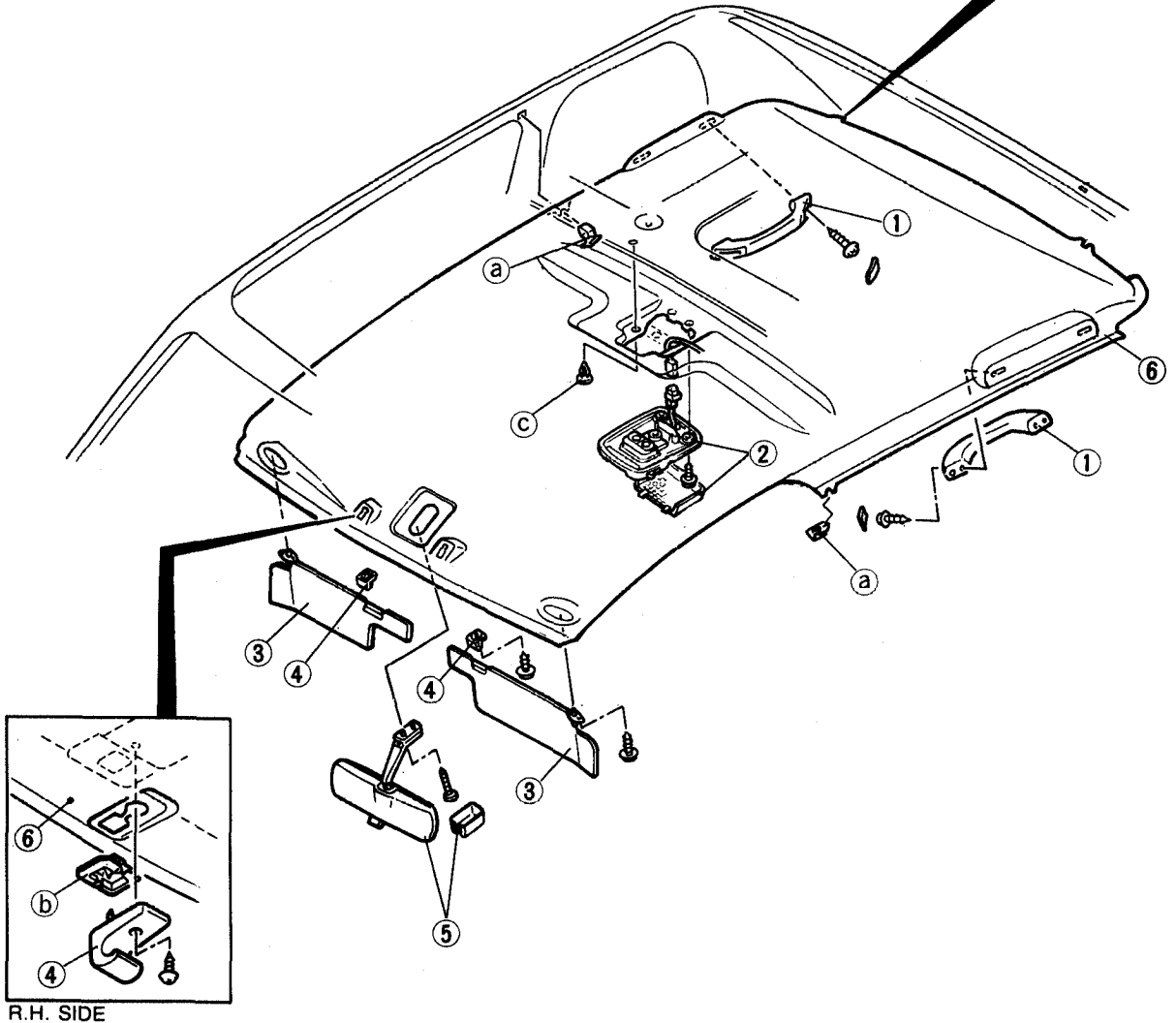
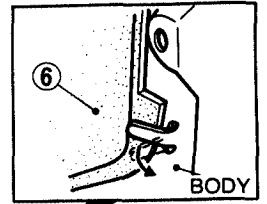
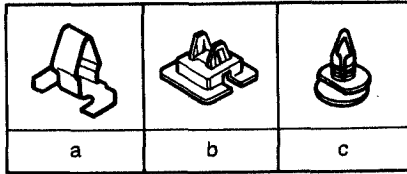
13U0SX-032

- 1. Assist handle
- 2. Interior lamp
- 3. Seaming welt (With sliding sunroof)
- 4. Sunvisor

- 5. Sunvisor adapter
- 6. Rearview mirror
- 7. Overhead console (With sliding sunroof)
- 8. Seaming welt (Pillar)

- 9. Headliner
Removal Note .. page S-93
Installation Note page S-93
- 10. Front top bracket

HATCHBACK
(WITH PASSIVE SHOULDER BELT)



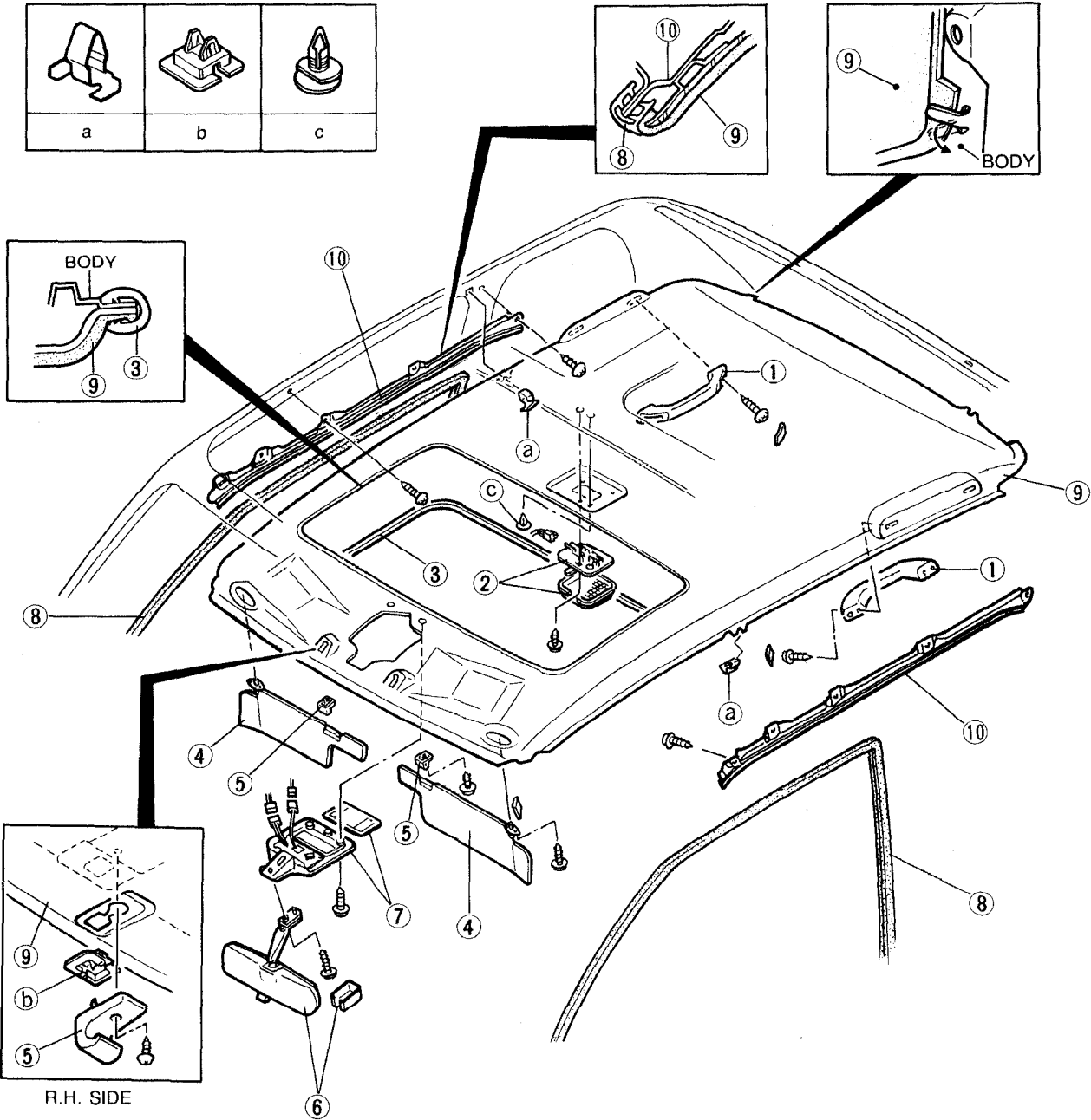
- 1. Assist handle
- 2. Interior lamp
- 3. Sunvisor
- 4. Sunvisor adapter

- 5. Rearview mirror
- 6. Headliner

Removal Note..... page S-93
Installation Note..... page S-93

13U0SX-033

**HATCHBACK
(WITHOUT PASSIVE SHOULDER BELT)**

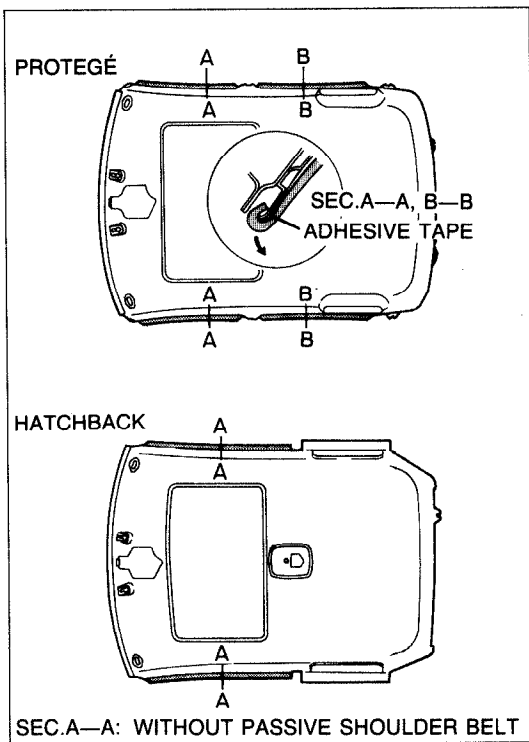


13U0SX-034

- 1. Assist handle
- 2. Interior lamp
- 3. Seaming welt (With sliding sunroof)
- 4. Sunvisor
- 5. Sunvisor adapter
- 6. Rearview mirror

- 7. Overhead console (With sliding sunroof)
- 8. Seaming welt (Pillar)
- 9. Headliner
- 10. Front top bracket

Removal Note..... page S-93
 Installation Note..... page S-93



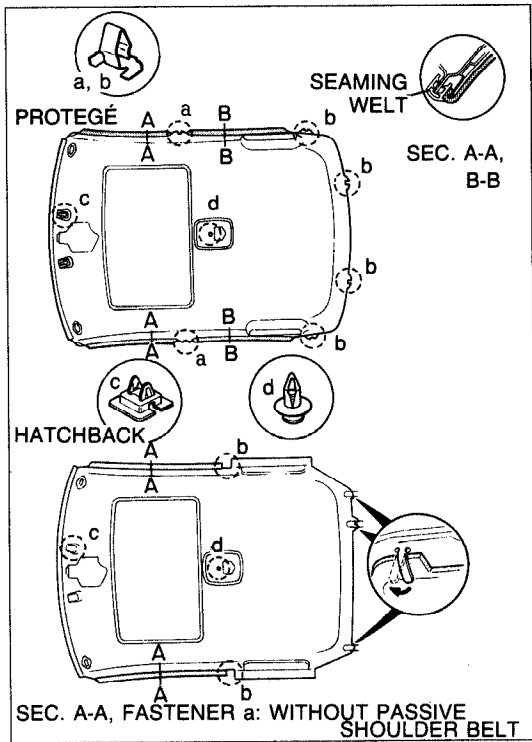
03U0SX-175

**Removal Note
Headliner**

The headliner is bonded to the front (or rear) top bracket with the double adhesive tape as shown. (Except hatchback with passive shoulder belt.)

Caution

- Peel off the bonded section of the headliner carefully to prevent damaging it.



03U0SX-176

**Installation Note
Headliner**

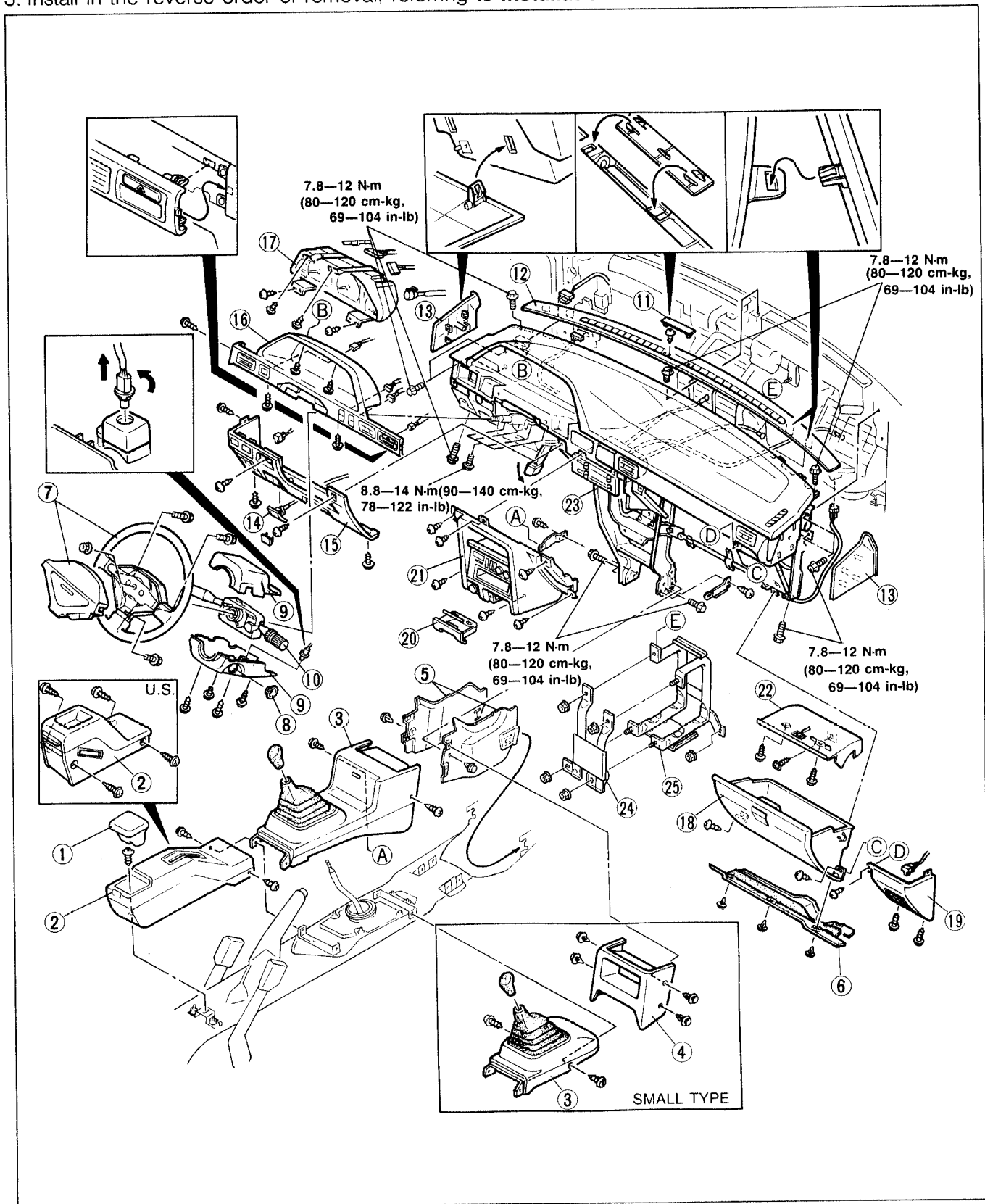
1. Install the headliner using the body brackets (hatchback) and fasteners.
2. Install the seaming welt between the front top bracket and the body to hold the headliner.

DASHBOARD

COMPONENTS

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Install in the reverse order of removal, referring to **Installation Note**.

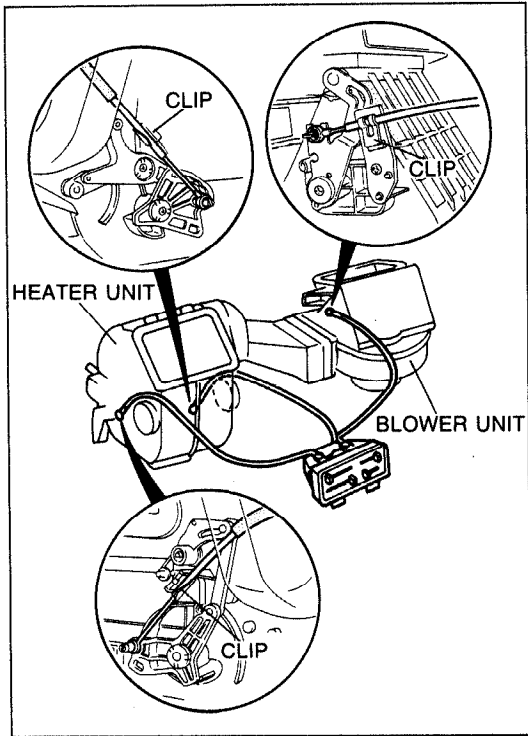


- | | | |
|--|---|---|
| 1. Rear ashtray (Without passive shoulder belt) | 10. Combination switch Removal / Installation | 18. Glove box lid |
| 2. Rear console | Section T | 19. Lower panel (R.H.) |
| 3. Front console | 11. Center upper hole cover | 20. Front ashtray |
| 4. Control box center cover (With small front console) | 12. Upper garnish | 21. Lower panel (Center) |
| 5. Side walls | 13. Side panel | 22. Glove box cover |
| 6. Undercover | 14. Hood release knob | 23. Dashboard Removal Note .. page S-95 |
| 7. Steering column Removal / Installation | 15. Lower panel (L.H.) | Installation Note page S-96 |
| Section N | 16. Meter hood | 24. Pipe frame (Lower) |
| 8. Key cylinder set ring | 17. Instrument cluster Removal / Installation | 25. Pipe frame (Upper) |
| 9. Column cover | Section T | |

13U05X-017

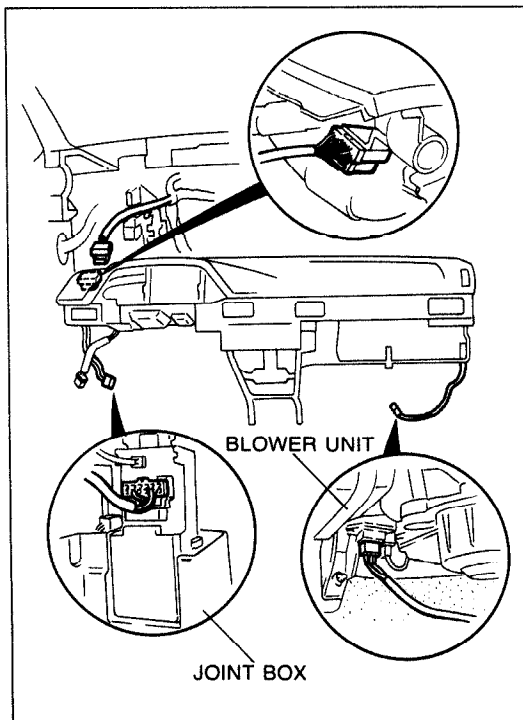
**Removal Note
Dashboard**

1. Remove the control wires of the heater unit and blower unit.

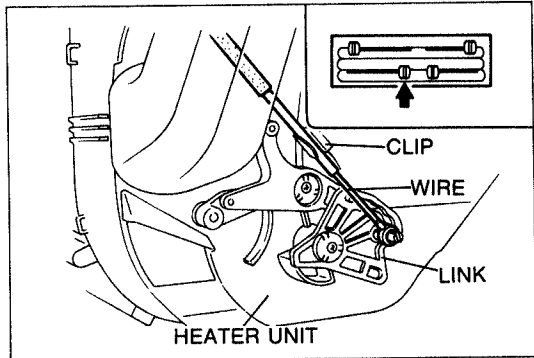


03U05X-179

2. Disconnect the necessary harness connectors.



03U05X-180



03U0SX-181

Installation Note**Dashboard**

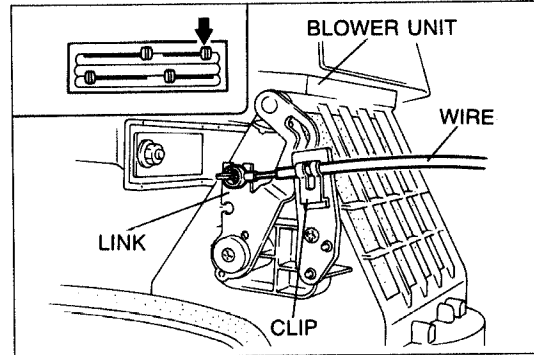
After installing the dashboard, adjust the control wires of the heater and blower units.

Mode control wire

1. Set the control lever to the position shown.
2. Set the mode control link to the extreme stop position. Install the wire loop onto the link.
3. Clamp the wire into position with the clip.

Caution

- Move the Mode lever to verify that it moves the full stroke between DEF and VENT.



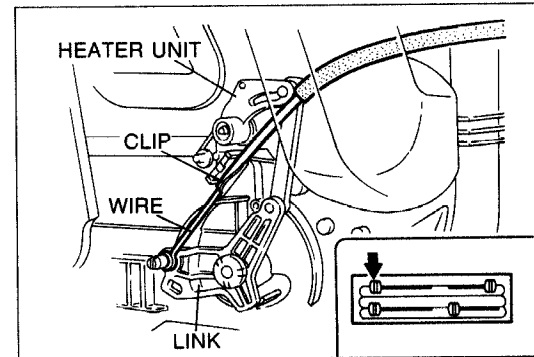
03U0SX-182

Rec-Fresh selector control wire

1. Set the control lever to the position shown.
2. Set the air-mix control link to the extreme stop position. Install the wire loop onto the link.
3. Clamp the wire into position with the clip.

Caution

- Move the Rec-Fresh lever to verify that it moves the full stroke between REC and FRESH.



03U0SX-183

Temperature control**Temperature control wire**

1. Set the control lever to the position shown.
2. Set the temperature control link to the extreme stop position. Install the wire loop onto the link.
3. Clamp the wire into position with the clip.

Caution

- Move the Temperature control lever to verify that it moves the full stroke between HOT and COLD.

TRIM

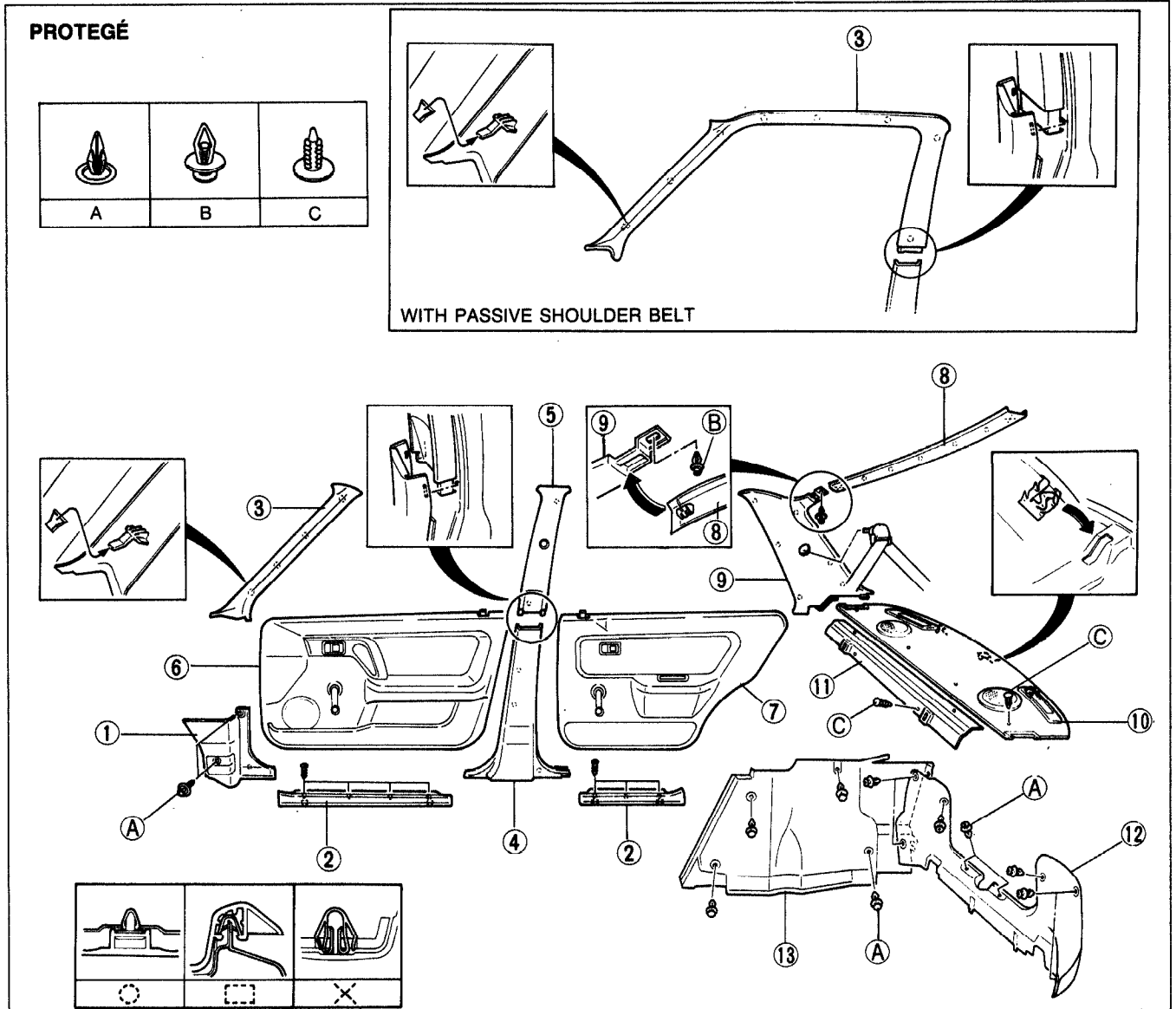
COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

Note (PROTEGÉ)

- Remove the front seat belt upper anchor for removal of the B-pillar upper trim. (Refer to page S-100.)
- Remove the rear seat side cushion (or seat back) and the rear seat belt upper anchor for removal of the C-pillar trim. (Refer to pages S-101, 111.)
- Remove the high-mount stoplight (interior mounted) for removal of the rear package trim. (Refer to Section T.)



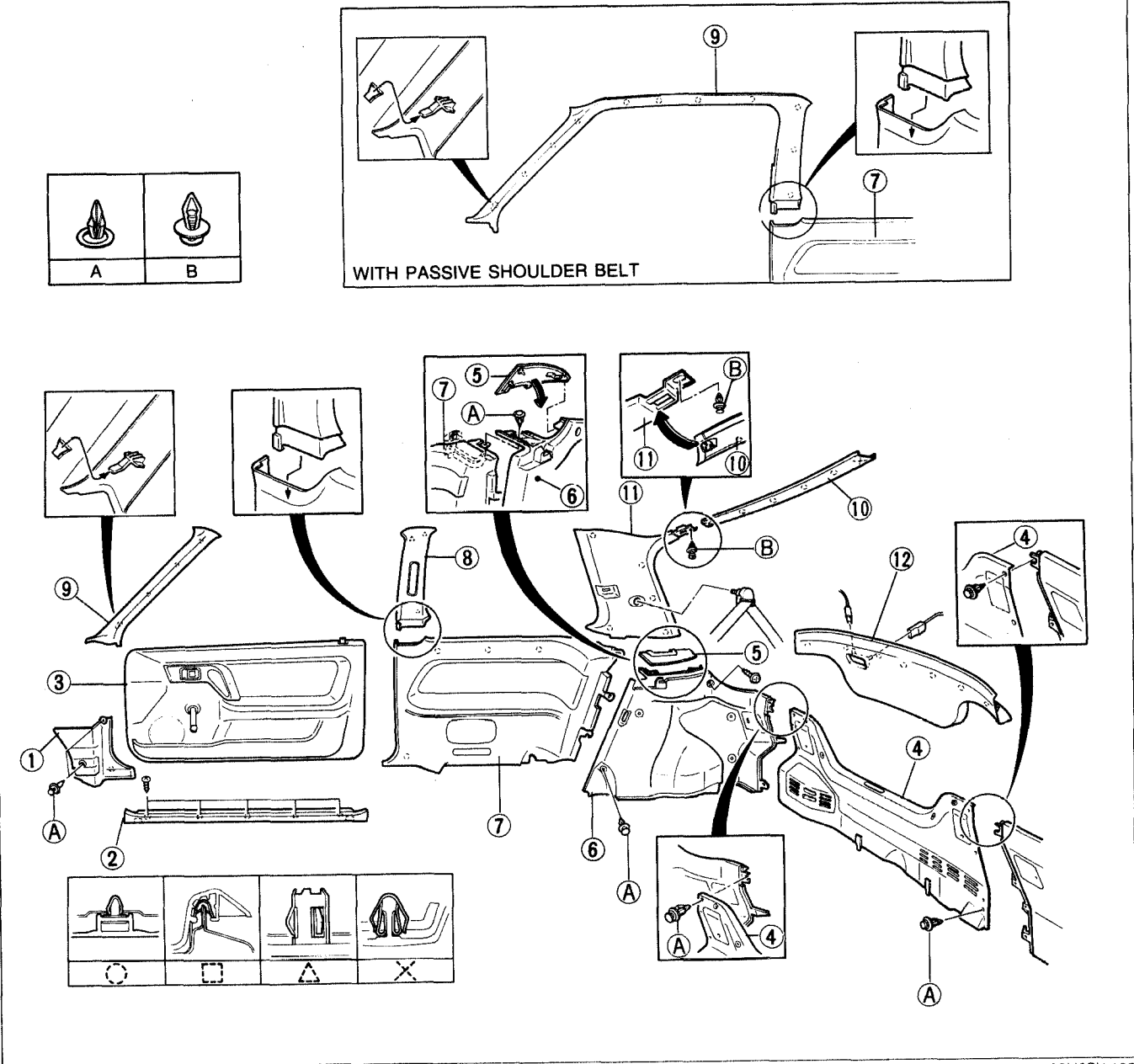
13U0SX-018

- | | | |
|---------------------------|------------------------|----------------------------|
| 1. Front side trim | 6. Front door trim | 8. Rear header trim |
| 2. Scuff plate | Removal / Installation | 9. C-pillar trim |
| 3. A-pillar trim | page S-11 | 10. Rear package trim |
| 4. B-pillar lower trim | 7. Rear door trim | 11. Rear package edge trim |
| 5. B-pillar upper trim | Removal / Installation | 12. Trunk end trim |
| (Without passive shoulder | page S-17 | 13. Trunk side trim |
| belt) | | |

Note (Hatchback)

- Remove the front seat belt upper anchor for removal of the B-pillar upper trim. (Refer to page S-100.)
- Remove the rear seat belt upper anchor and the quarter window lock for removal of the C-pillar trim. (Refer to pages S-62, 101.)
- Remove the rear seat cushion for removal of the quarter trim. (Refer to page S-112.)
- Disconnect the negative battery cable for removal of the rear hatch lower trim. (With luggage compartment lamp.)

HATCHBACK



03U0SX-185

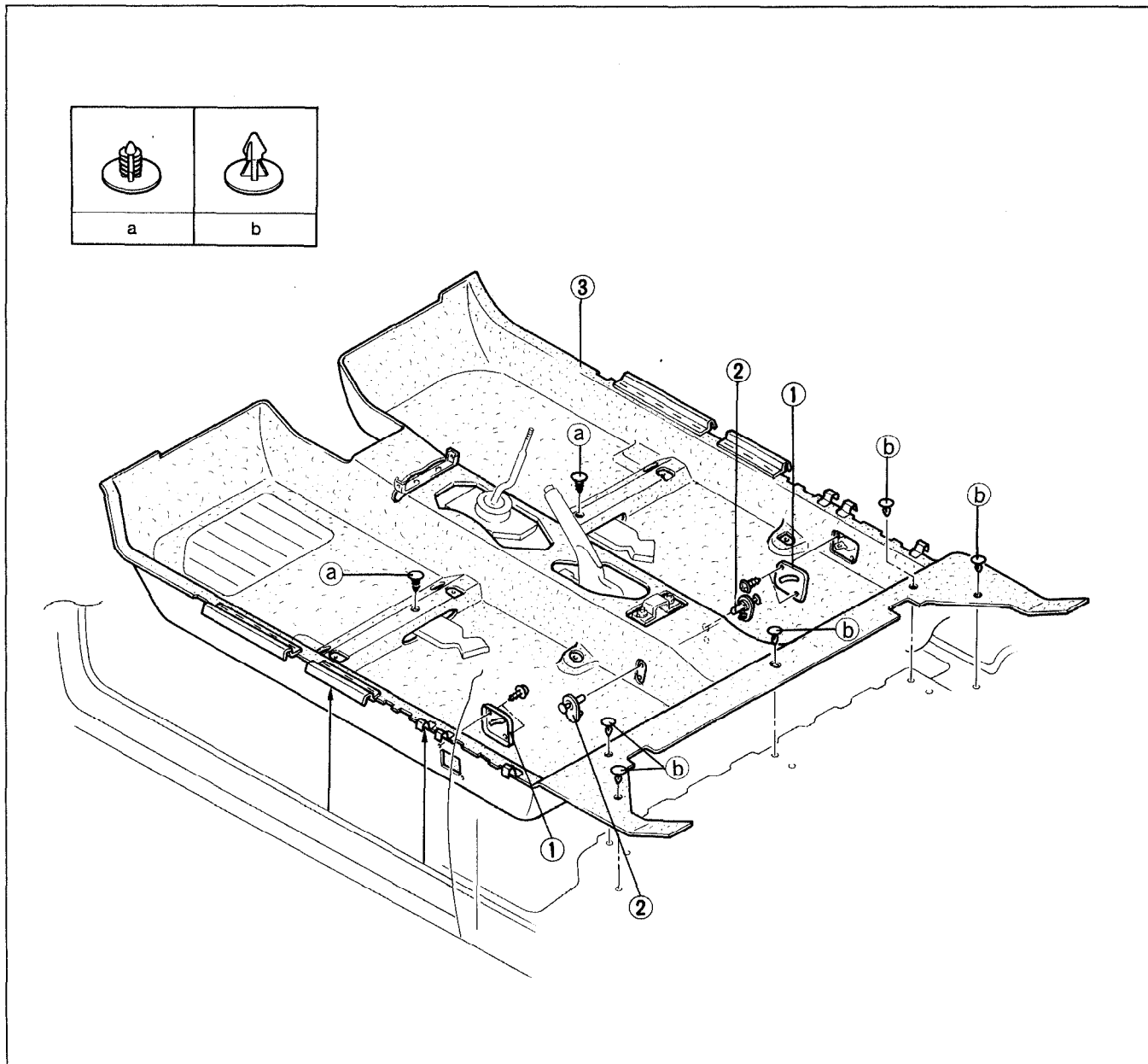
- | | |
|--|---|
| 1. Front side trim | 7. Quarter trim |
| 2. Scuff plate | 8. B-pillar upper trim
(Without passive shoulder belt) |
| 3. Front door trim
Removal / Installation page S-10 | 9. A-pillar trim |
| 4. Trunk end trim | 10. Rear header trim |
| 5. Trunk side cover | 11. C-pillar trim |
| 6. Trunk side trim | 12. Rear hatch lower trim |

FLOORMAT

COMPONENTS

Removal / Installation

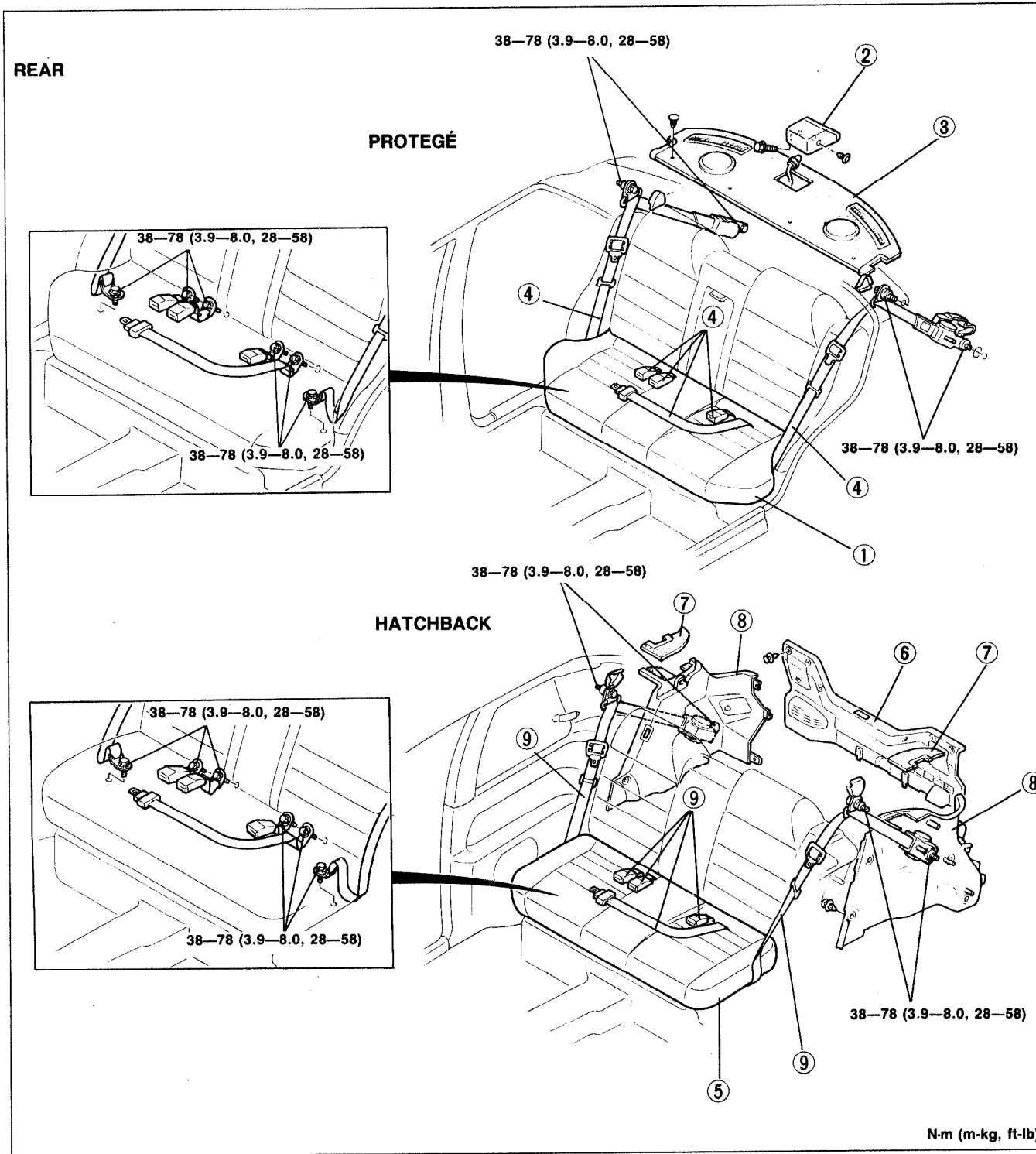
1. Disconnect the negative battery cable.
2. To remove the floormat, first remove:
 - a. Front seats and rear seat cushion. (Refer to pages S-110, 111, 112.)
 - b. Scuff plates and front side trim. (Refer to pages S-97, 98.)
 - c. B-pillar lower trim (PROTEGÉ) or quarter trim (Hatchback). (Refer to pages S-97, 98.)
 - d. Front seat belt lower anchor (hatchback with standard shoulder belt). (Refer to page S-100.)
 - e. Front seat belt buckles (standard shoulder belt models). (Refer to page S-100.)
 - f. Rear and front consoles. (Refer to page S-94.)
 - g. Passive shoulder belt retractor (passive shoulder belt models). (Refer to page S-108.)
 - h. Passive shoulder belt control unit (passive shoulder belt models). (Refer to page S-108.)
- 3 Remove the remaining parts in the order shown in the figure.
- 4 Install in the reverse order of removal.



1. Belt cover
2. Hole cover (With passive shoulder belt)

3. Floormat

13U0SX-019



N-m (m-kg, ft-lb)

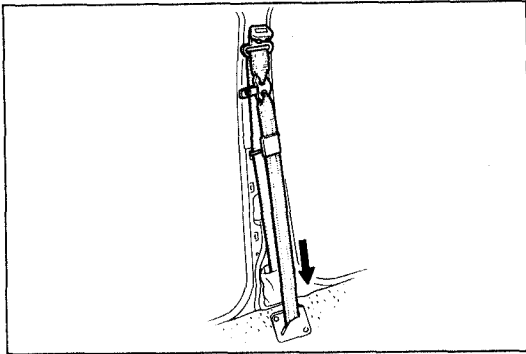
13U0SX-021

PROTEGÉ

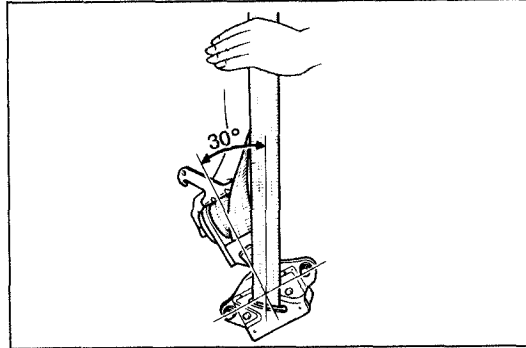
- 1. Rear seat cushion
Removal / Installation page S-111
- 2. High-mount stoplight (Interior mounted)
Removal / Installation Section T
- 3. Rear package trim
Removal / Installation page S- 97
- 4. Rear seat belt
Inspection page S-102

Hatchback

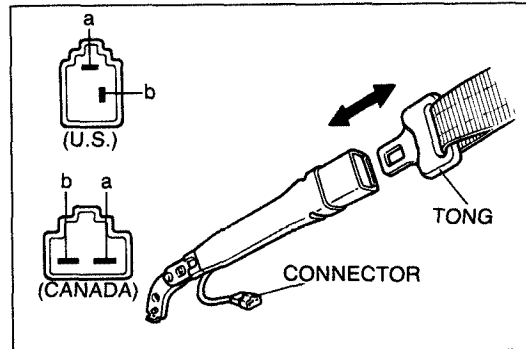
- 5. Rear seat cushion
Removal / Installation page S-112
- 6. Trunk end trim
Removal / Installation page S- 98
- 7. Trunk side cover
Removal / Installation page S- 98
- 8. Trunk side trim
Removal / Installation page S- 98
- 9. Rear seat belt
Inspection page S-102



03U0SX-189



03U0SX-190



03U0SX-191

SEAT BELT

Inspection

Emergency lock retractor

1. Verify that the belt can be pulled out smoothly and that it moves smoothly when worn.
2. Verify that the retractor locks when quickly pulling the belt.

3. Remove the retractor.
4. Hold the retractor at the same angle as when it was installed.
5. Slowly incline the retractor while pulling out the belt.
6. Verify that the retractor locks at an inclination of **approx. 30 degrees**.

Webbing

Inspect the webbing for scars, tears, and wear and for deformation of the fittings.

BUCKLE SWITCH (Driver side buckle)

Inspection

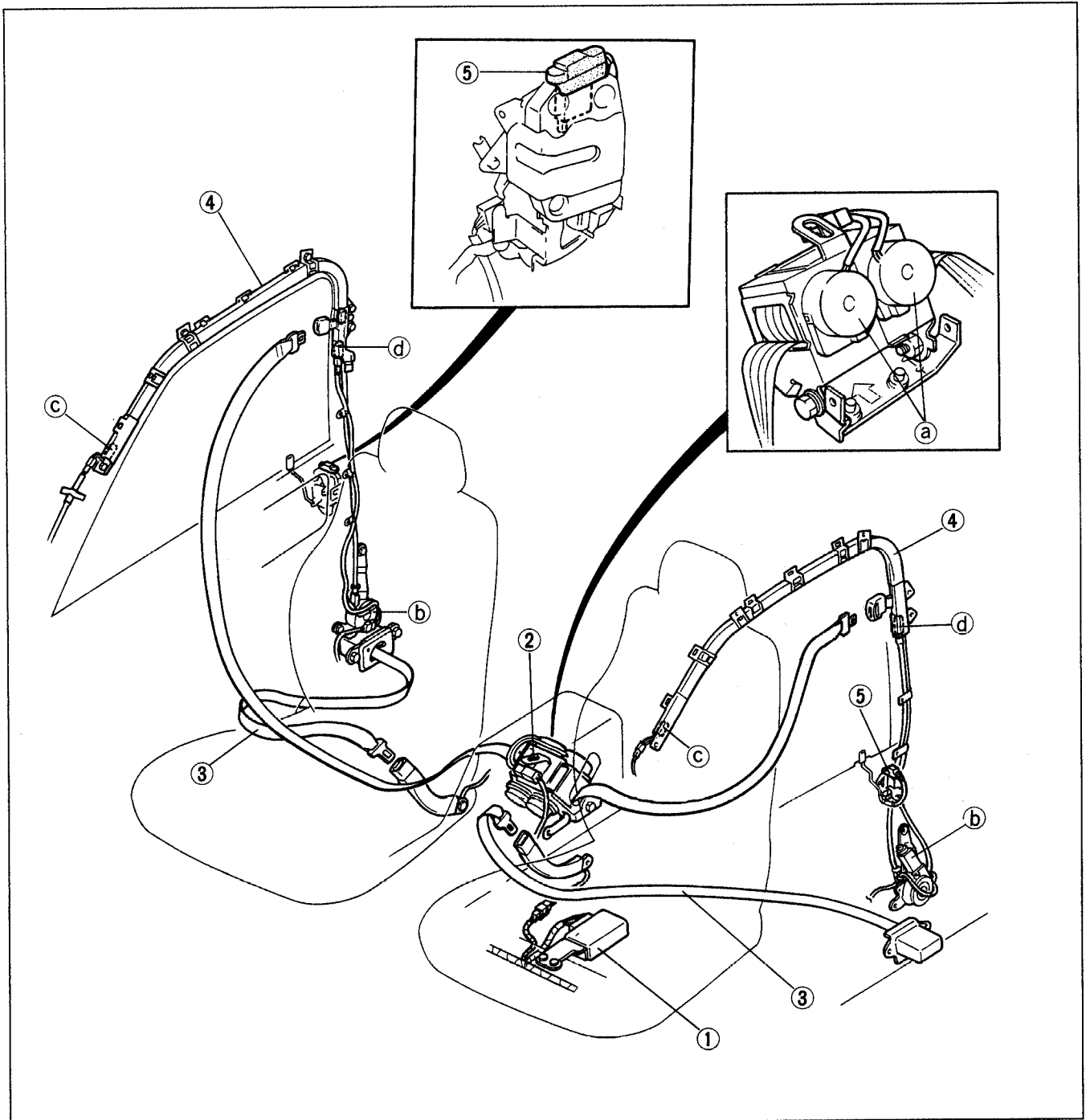
1. Disconnect the buckle switch connector.
2. Check for continuity between terminals with an ohmmeter.

Belt condition	Terminal	
	a	b
Unfastened	○—○	○—○
Fastened		

○—○: Indicates continuity

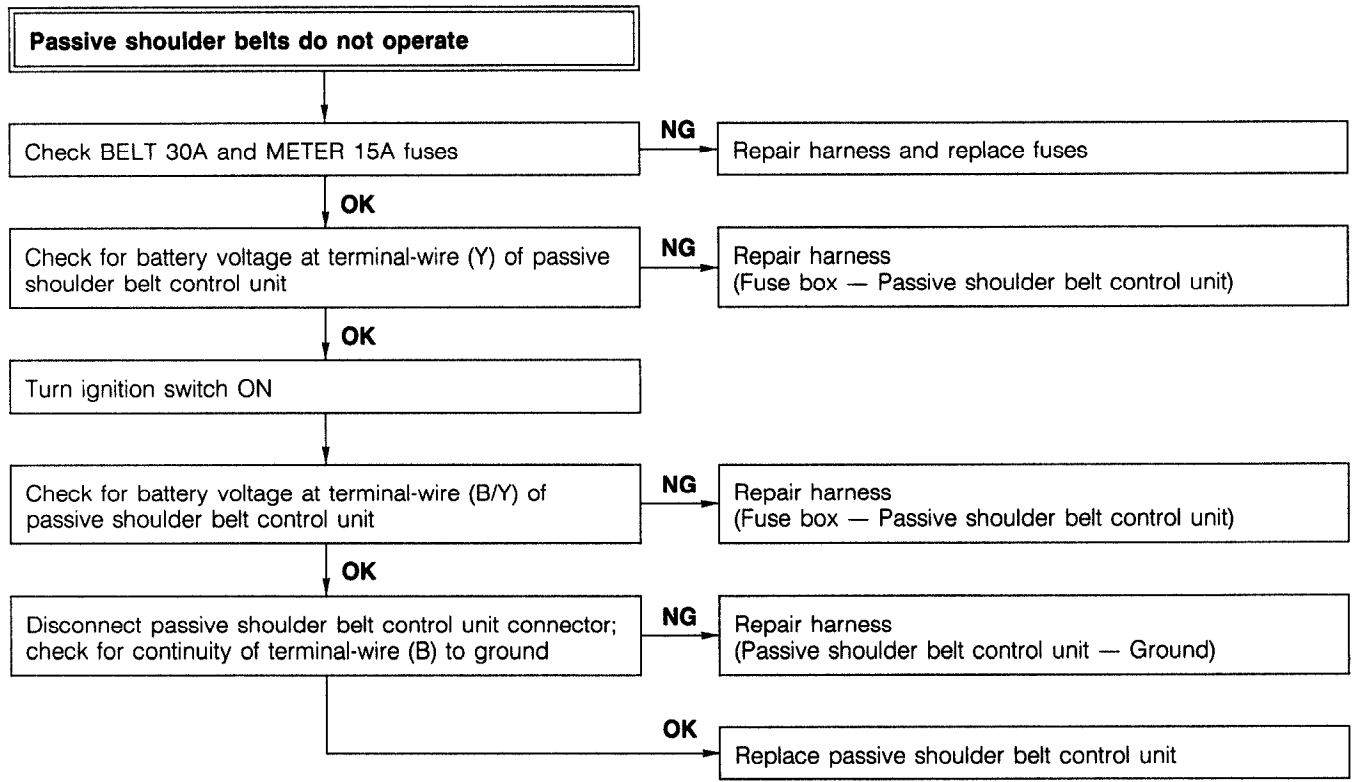
PASSIVE SHOULDER BELT SYSTEM

STRUCTURAL VIEW

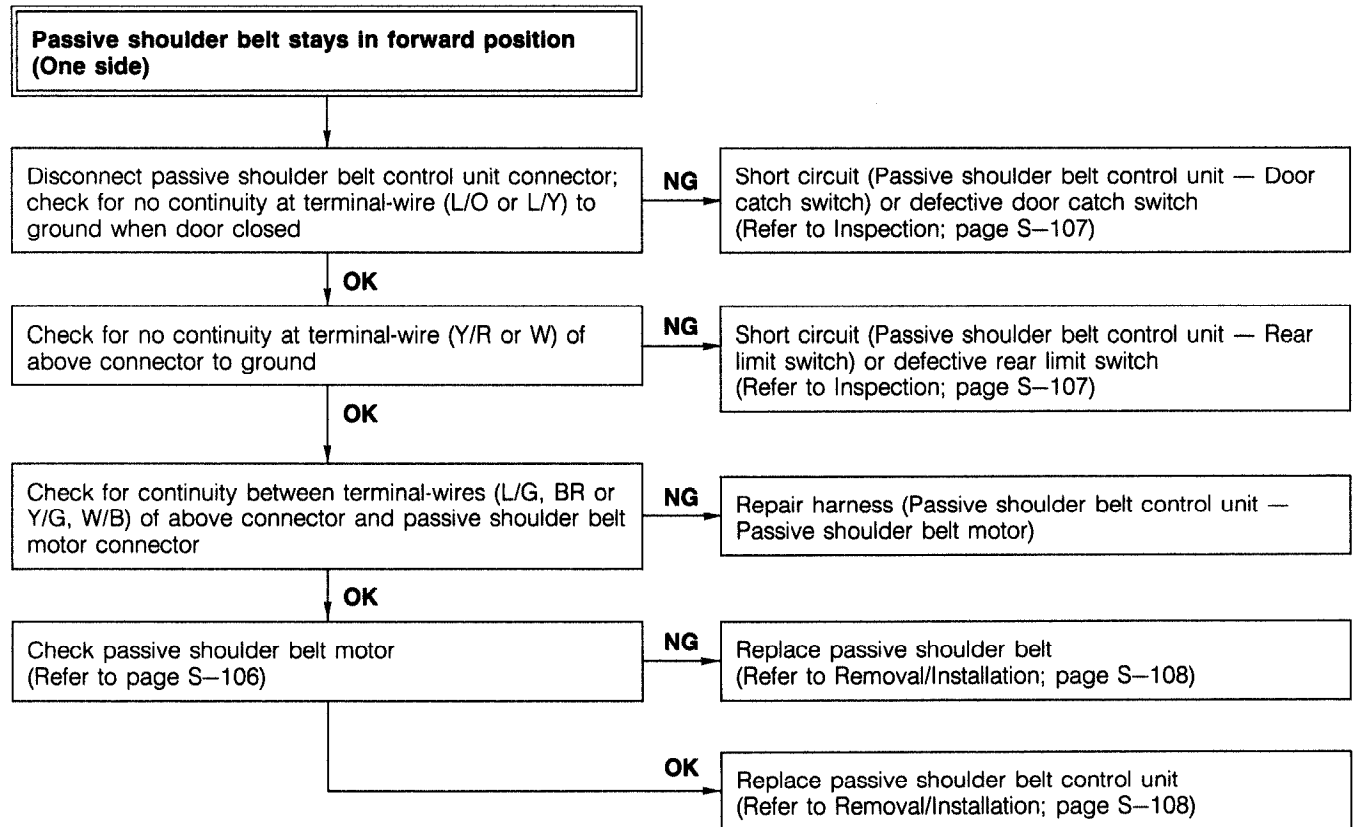


03U0SX-192

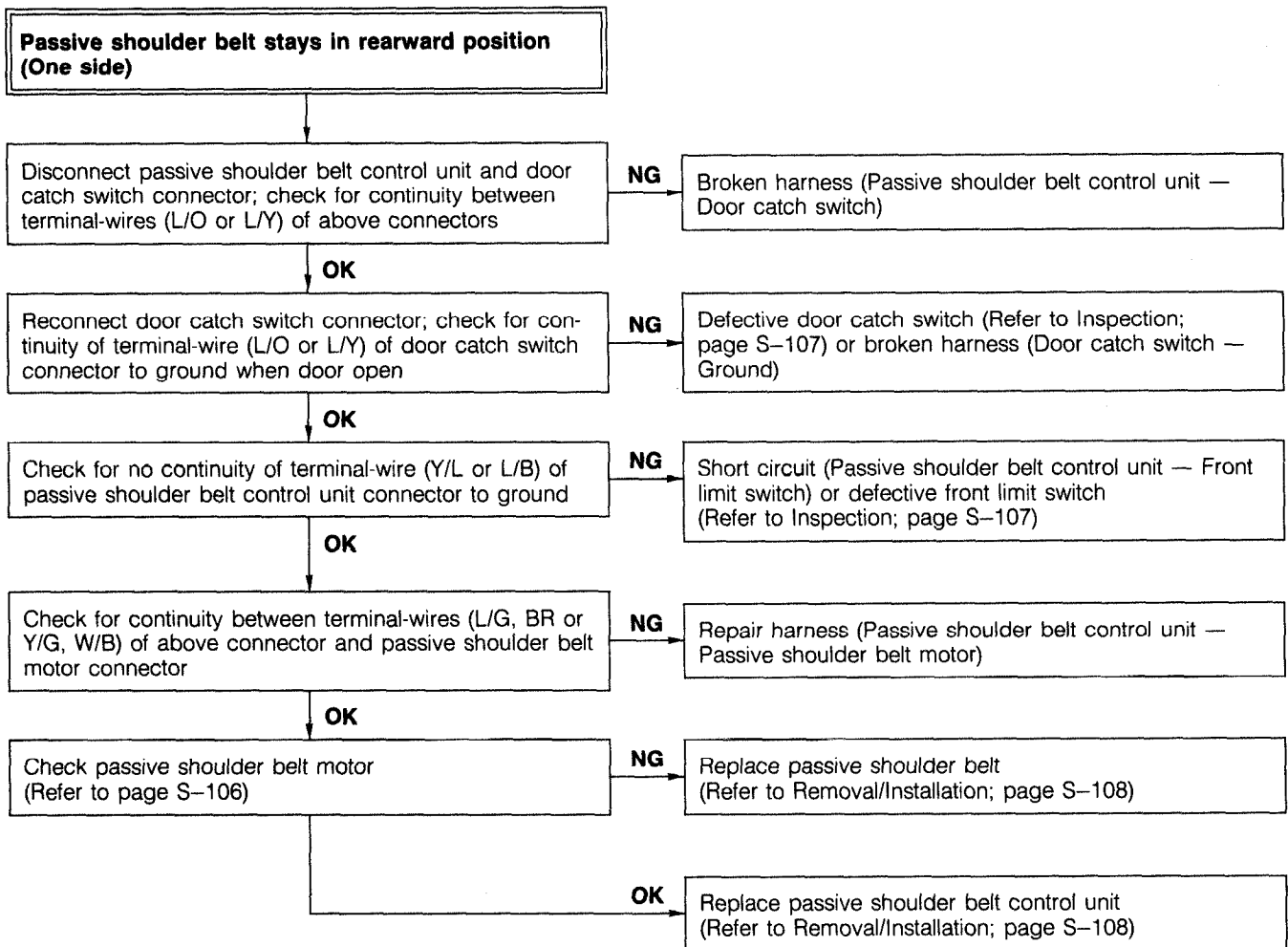
- | | |
|--|---|
| <p>1. Passive shoulder belt control unit
Removal / Installation page S-108</p> <p>2. Passive shoulder belt retractor
Removal / Installation page S-108</p> <p> a. Warning switch
 Inspection..... page S-107</p> <p>3. Lap belt
Inspection (Retractor)..... page S-102</p> | <p>4. Passive shoulder belt
Removal / Installation page S-108</p> <p> b. Passive shoulder belt motor
 Inspection..... page S-106</p> <p> c. Limit switch (Front)
 Inspection..... page S-107</p> <p> d. Limit switch (Rear)
 Inspection..... page S-107</p> <p>5. Door catch switch (In door lock assembly)
Removal / Installation pages S-13, 14
Inspection page S-107</p> |
|--|---|



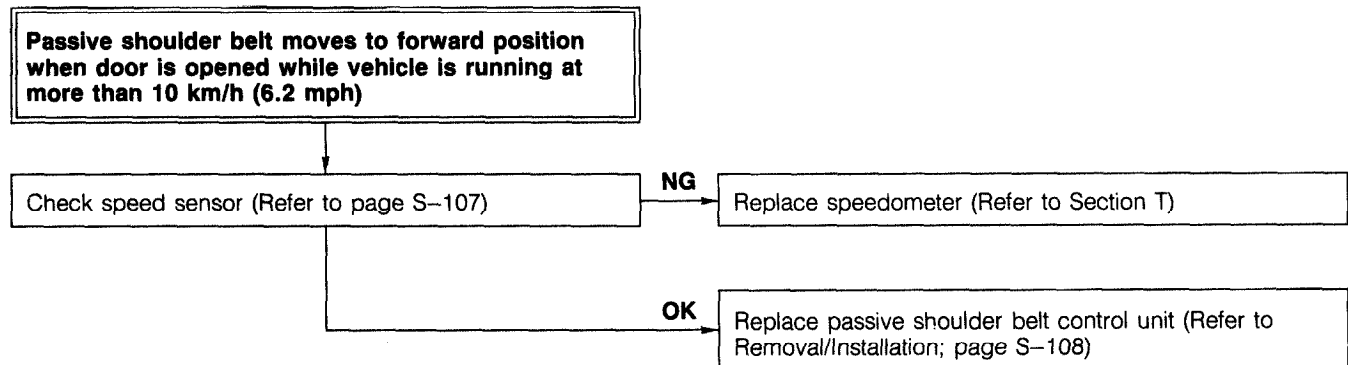
23U0SX-036



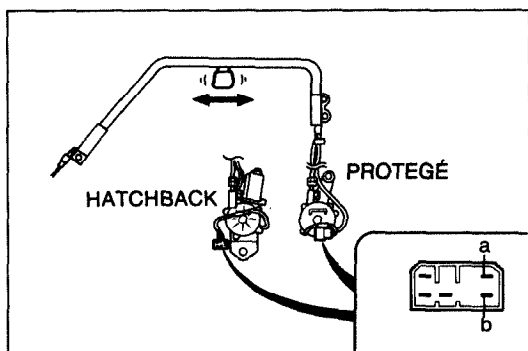
03U0SX-195



03U0SX-196



03U0SX-197



23U0SX-037

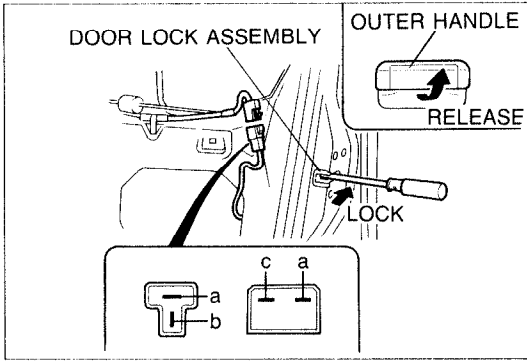
S-106

PASSIVE SHOULDER BELT MOTOR Inspection

1. Disconnect the passive shoulder belt connector.
2. Connect battery voltage to terminal (a) and ground terminal (b). Verify that the motor rotates in the forward direction (release).
3. Reverse the above connection, and check that the motor rotates in the rearward direction (lock).
4. If not as specified, replace the passive shoulder belt.

Caution

- Do not operate the motor for an extended time.



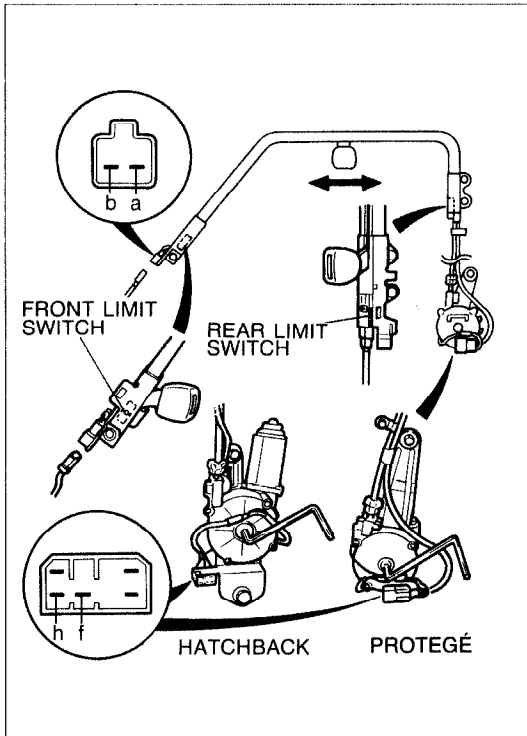
03U0SX-199

**DOOR CATCH SWITCH (in front door lock assembly)
Inspection**

1. Disconnect the door catch switch connector.
2. Check for continuity between the terminals with an ohmmeter.

Switch condition	Terminal	a	b	c
Lock				
Release		○—○	○—○	○—○

○—○: Indicates continuity



03U0SX-200

**LIMIT SWITCH (FRONT/REAR)
Inspection**

1. Disconnect the passive shoulder belt and front limit switch connectors.
2. Position the shoulder belt buckle forward and rearward as shown with the emergency handle.
3. Check for continuity between the limit switch terminals with an ohmmeter.

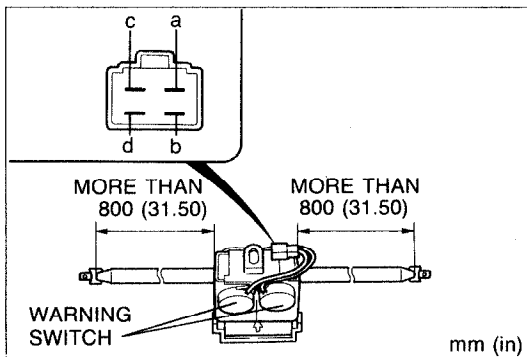
Note

- Verify that the shoulder belt buckle is fully in the front/rear lock position when checking.

Buckle position	Limit switch		Front		Rear	
	Terminal		a	b	f	h
Released (Front)			○—○			
Moving						
Locked (Rear)					○—○	

○—○: Indicates continuity

4. If not as specified, replace the passive shoulder belt.



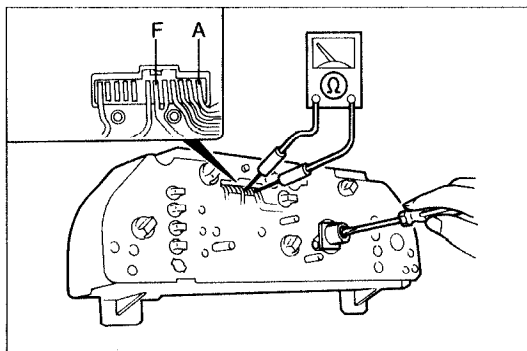
03U0SX-201

**WARNING SWITCH (in passive shoulder belt retractor)
Inspection**

1. Disconnect the warning switch connector.
2. Check for continuity between terminals when the lap belt is pulled out/released.

Lap belt condition	Switch		R.H. side		L.H. side	
	Terminal		a	b	c	d
Pulled (more than 80 cm (31.50 in))			○—○		○—○	
Released						

○—○: Indicates continuity



03U0SX-202

**SPEED SENSOR
Inspection**

1. Remove the instrument cluster. (Refer to Section T.)
2. Check for continuity between terminals A and F while rotating the speedometer cable shaft.
3. If there are not four pulses per shaft rotation, replace the speedometer. (Refer to Section T.)

COMPONENTS

Removal / Installation

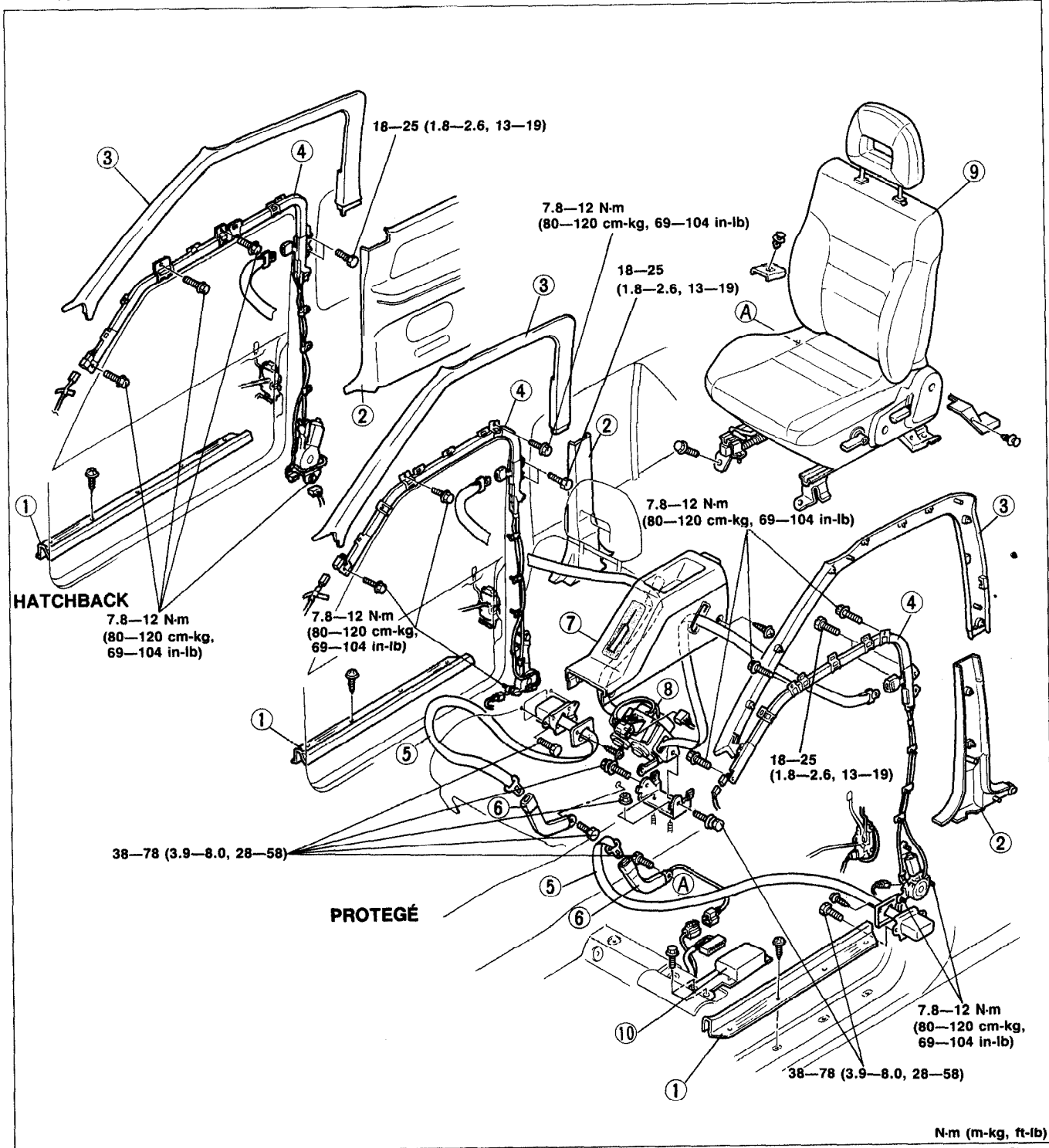
1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.

Caution

- Remove/install the passive shoulder belt carefully to prevent damaging the headliner.

Note

- Refer to page S-13 or 14; Removal of the front door lock assembly for removal of the door catch switch.



-
- 1. Scuff plate
Removal / Installation pages S- 97, 98
 - 2. B-pillar lower trim (PROTEGÉ)/
Quarter trim (Hatchback)
Removal / Installation pages S- 97, 98
 - 3. A-pillar trim
Removal / Installation pages S- 97, 98
 - 4. Passive shoulder belt
Inspection
(Motor, Limit switch) pages S-106, 107
 - 5. Lap belt
Inspection (Retractor) page S-102
 - 6. Lap belt buckle
Inspection (Buckle switch) page S-102
 - 7. Rear console
Removal / Installation page S- 94
 - 8. Passive shoulder belt retractor
Inspection (Retractor, Warning switch)
..... pages S-102, 107
 - 9. Front seat (L.H. side)
Removal / Installation page S-110
 - 10. Passive shoulder belt control unit

13U0SX-022

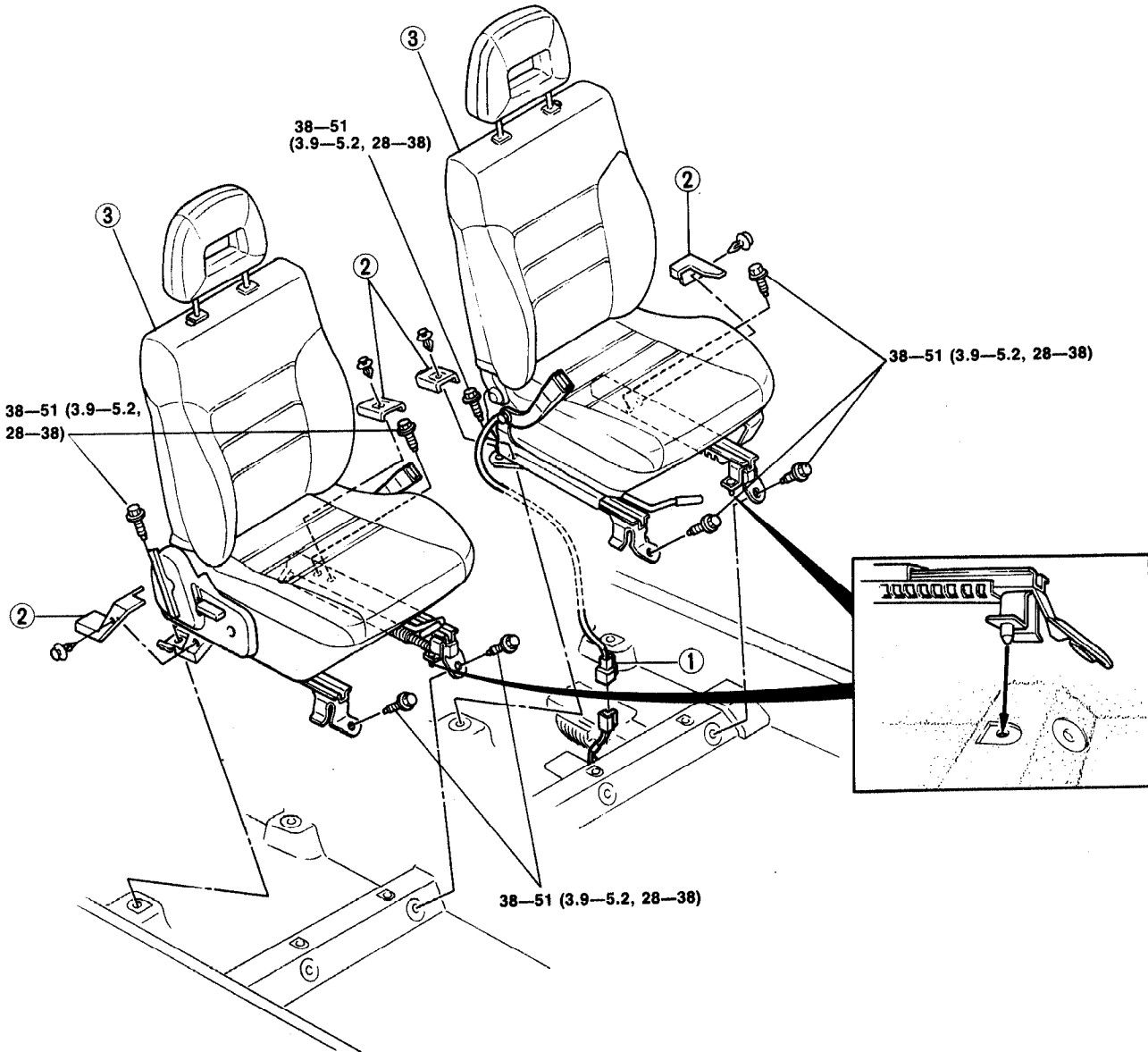
SEAT

COMPONENTS

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

FRONT



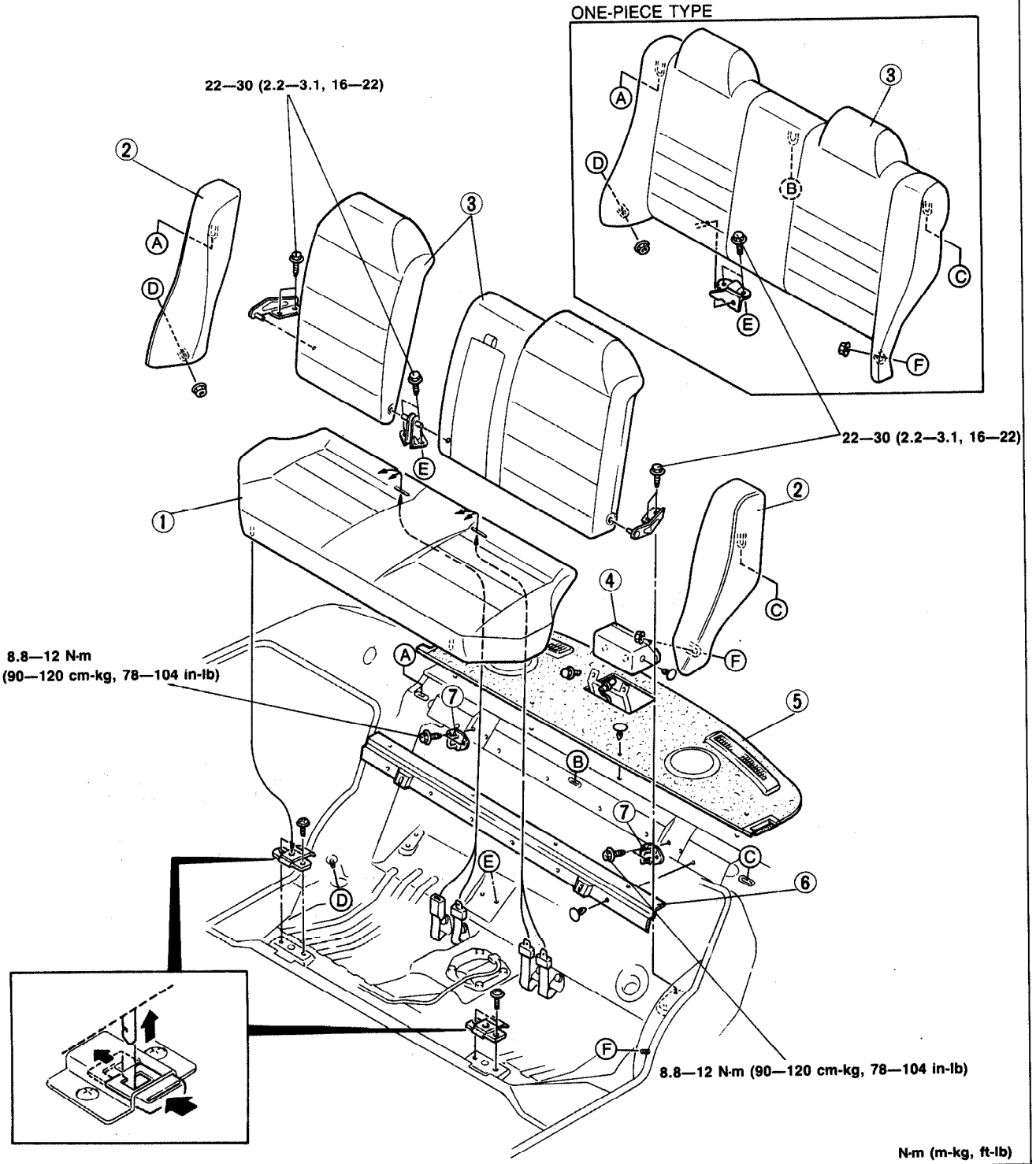
N-m (m-kg, ft-lb)

03U0SX-204

1. Buckle switch connector
(With passive shoulder belt)
2. Seat slide rear cover

3. Front seat
Disassembly / Assembly page S-113

REAR (PROTEGÉ)



Rear seat

- 1. Rear seat cushion
- 2. Rear seat side cushion
(With split-folding seatback)
- 3. Seat back

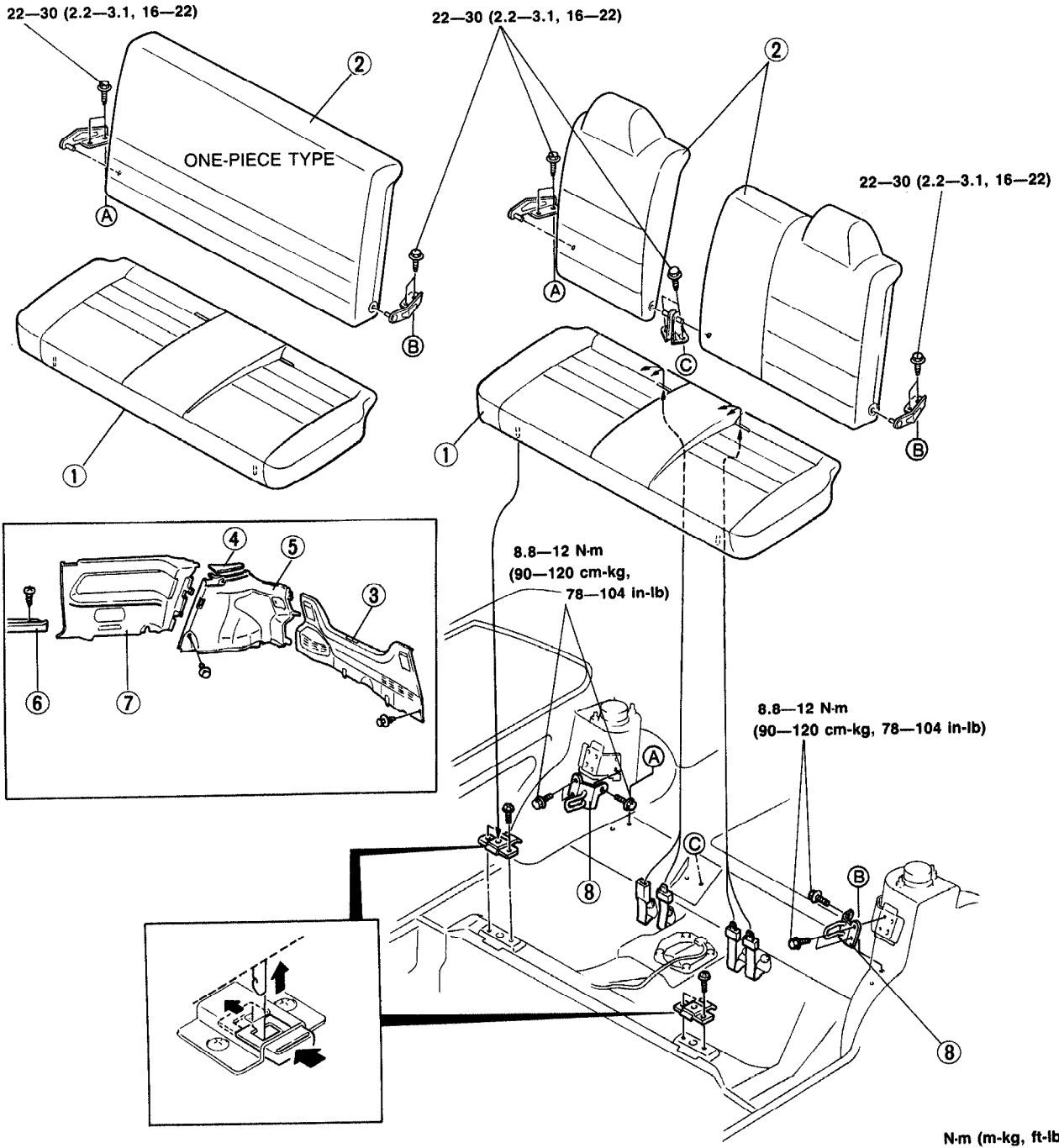
Rear seat back striker

(With split-folding seat back)

- 4. High-mount stoplight (interior mounted)
Removal / Installation Section T
- 5. Rear package trim
Removal / Installation page S-97
- 6. Rear package edge trim
Removal / Installation page S-97
- 7. Seat back striker

03UOSX-205

REAR (HATCHBACK)



N-m (m-kg, ft-lb)

03U0SX-206

Rear seat

- 1. Rear seat cushion
- 2. Seat back

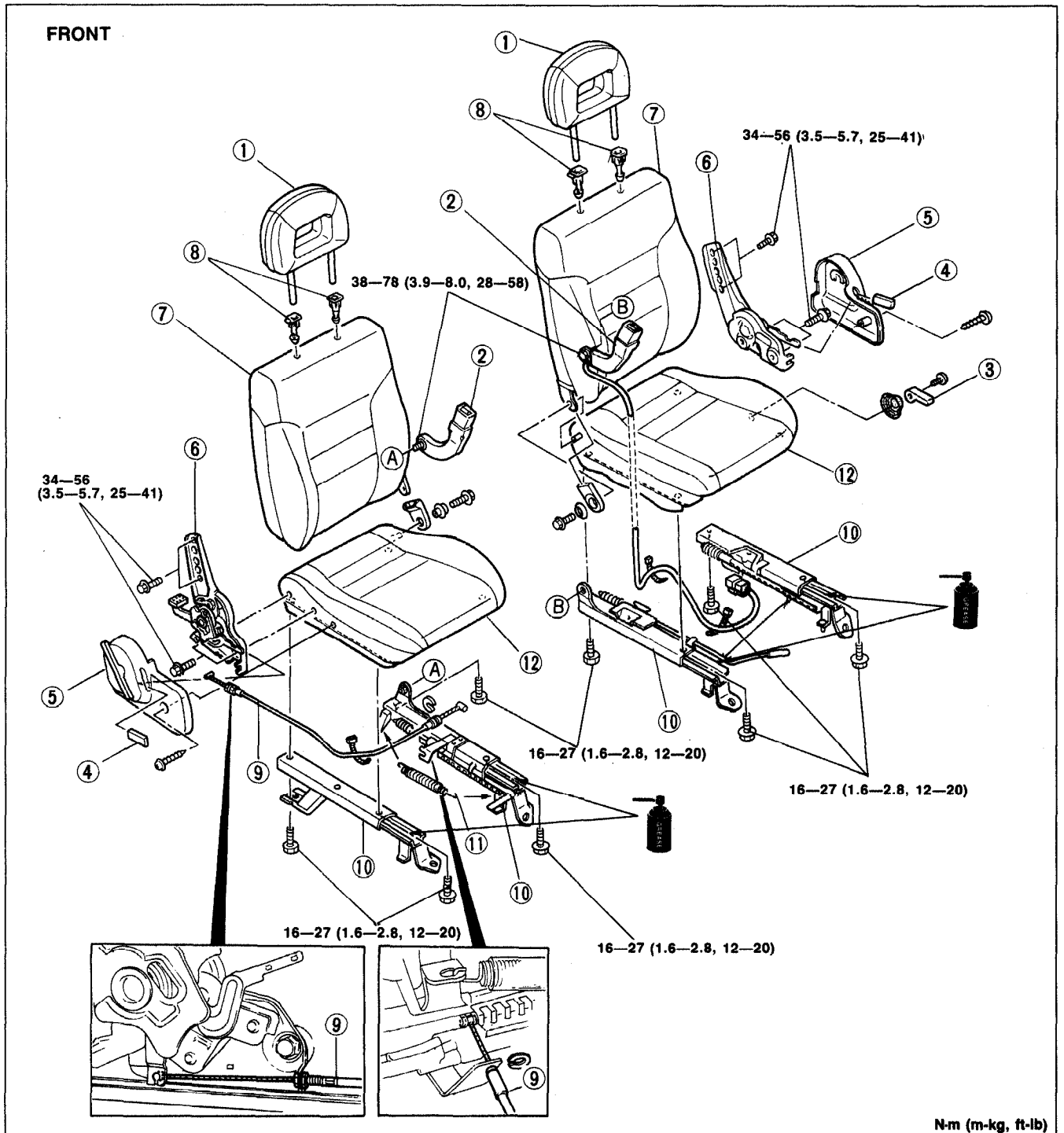
Rear seat back striker

- 3. Trunk end trim
Removal / Installation page S-98
- 4. Trunk side cover
Removal / Installation page S-98
- 5. Trunk side trim
Removal / Installation page S-98
- 6. Scuff plate
Removal / Installation page S-98
- 7. Quarter trim
Removal / Installation page S-98
- 8. Seat back striker

SEAT ASSEMBLY

Disassembly / Assembly

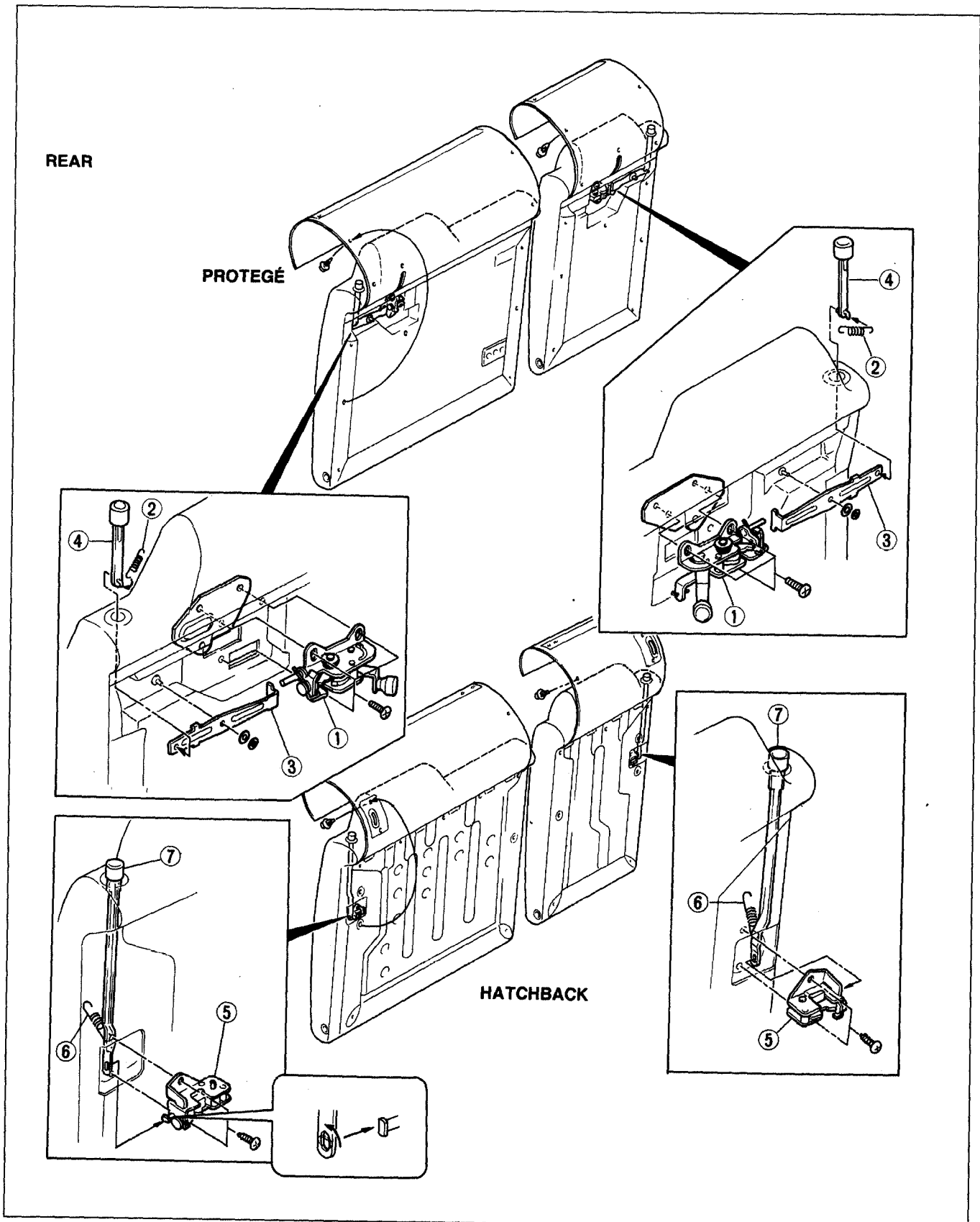
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Assemble in the reverse order of disassembly.



N-m (m-kg, ft-lb)
23U0SX-038

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Headrest (Except GT models) 2. Front seat belt buckle
(With passive shoulder belt) 3. Lift lever (With lifter) 4. Knuckle knob 5. Knuckle cover 6. Reclining Knuckle | <ol style="list-style-type: none"> 7. Seat back 8. Head restraint pole guide (Except GT models) 9. Walk-in slide wire (Hatchback) 10. Seat slide 11. Return spring (Hatchback) 12. Seat cushion |
|--|---|

Disassembly Note..... page S-115



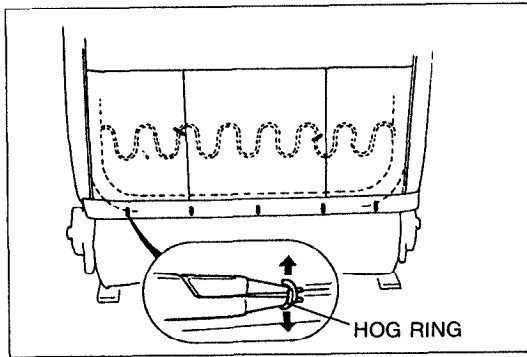
13U0SX-023

PROTEGE

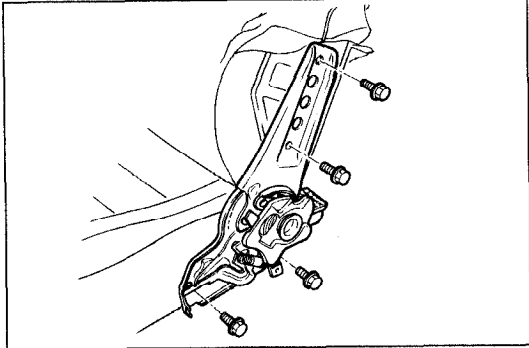
- 1. Rear seat back lock
- 2. Spring
- 3. Rear seat back rod
- 4. Rear seat back knob

Hatchback

- 5. Rear seat back catch
- 6. Spring
- 7. Rear seat back knob



03U0SX-209



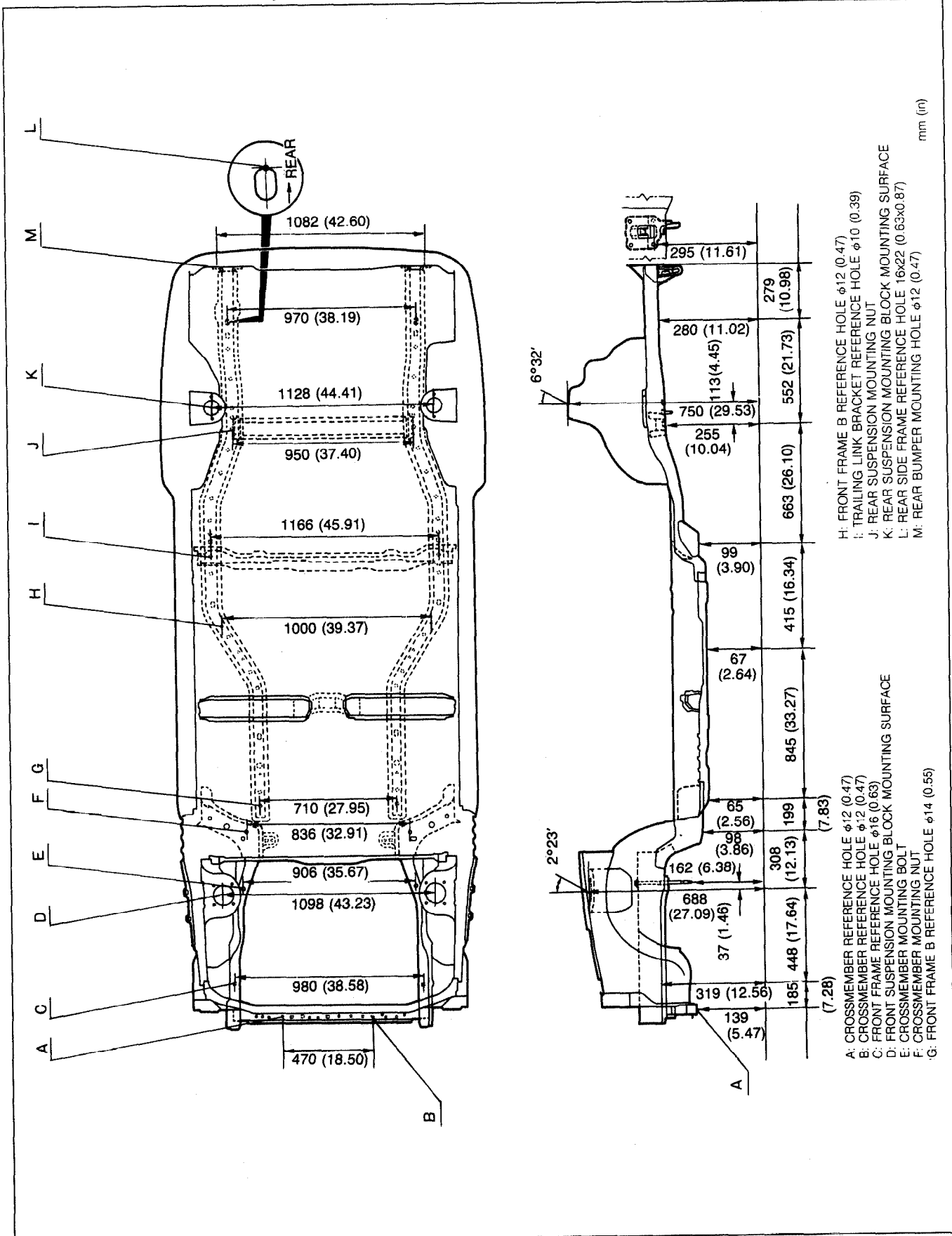
9MU0SX-174

Disassembly Note
Reclining knuckle

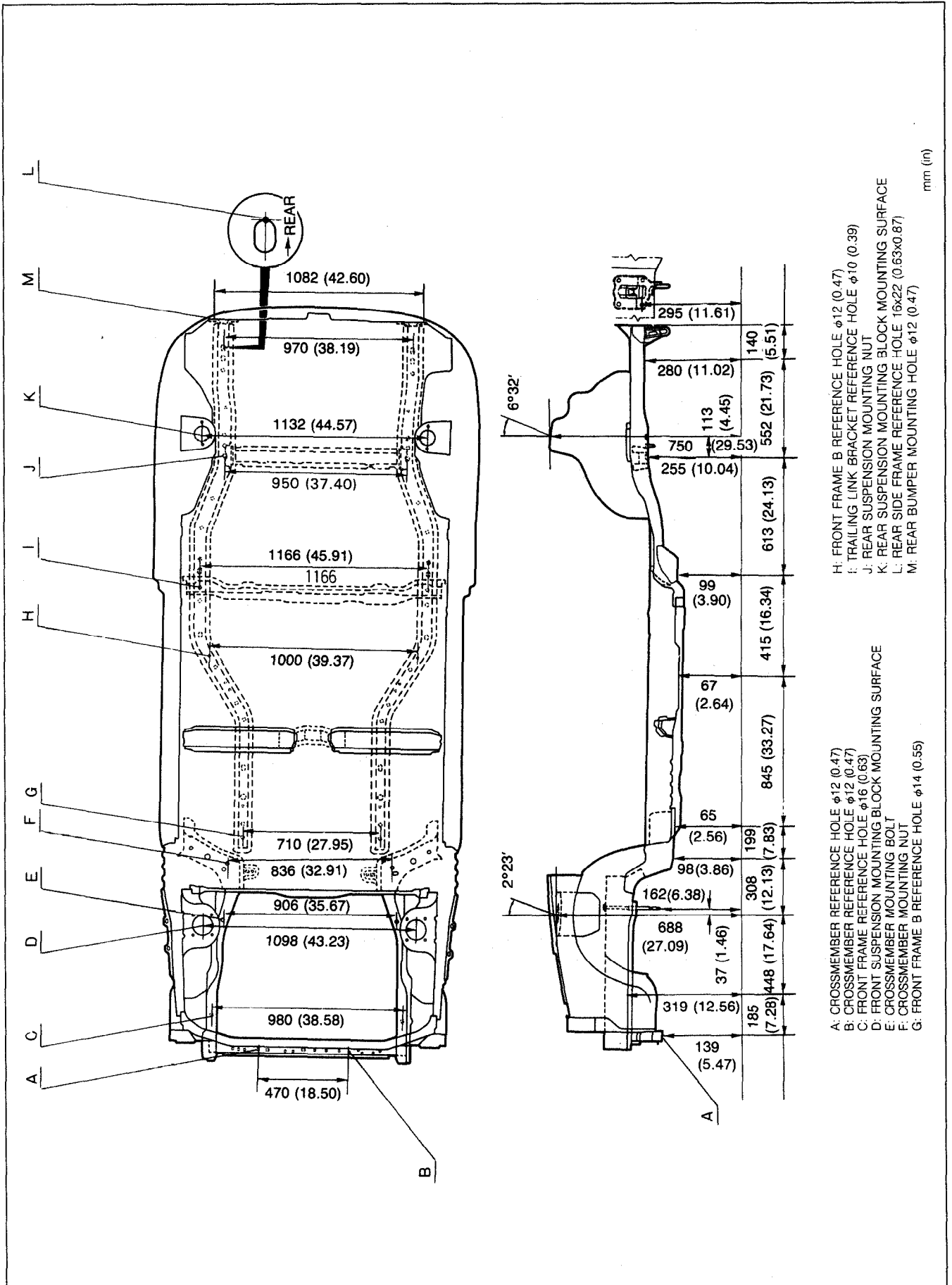
1. Remove the hog rings on the rear of the seat back.
2. Lift the seat back trim until the reclining knuckle installation bolts are accessible.
3. Remove the reclining knuckle installation bolts and remove the reclining knuckle.

UNDERBODY DIMENSIONS

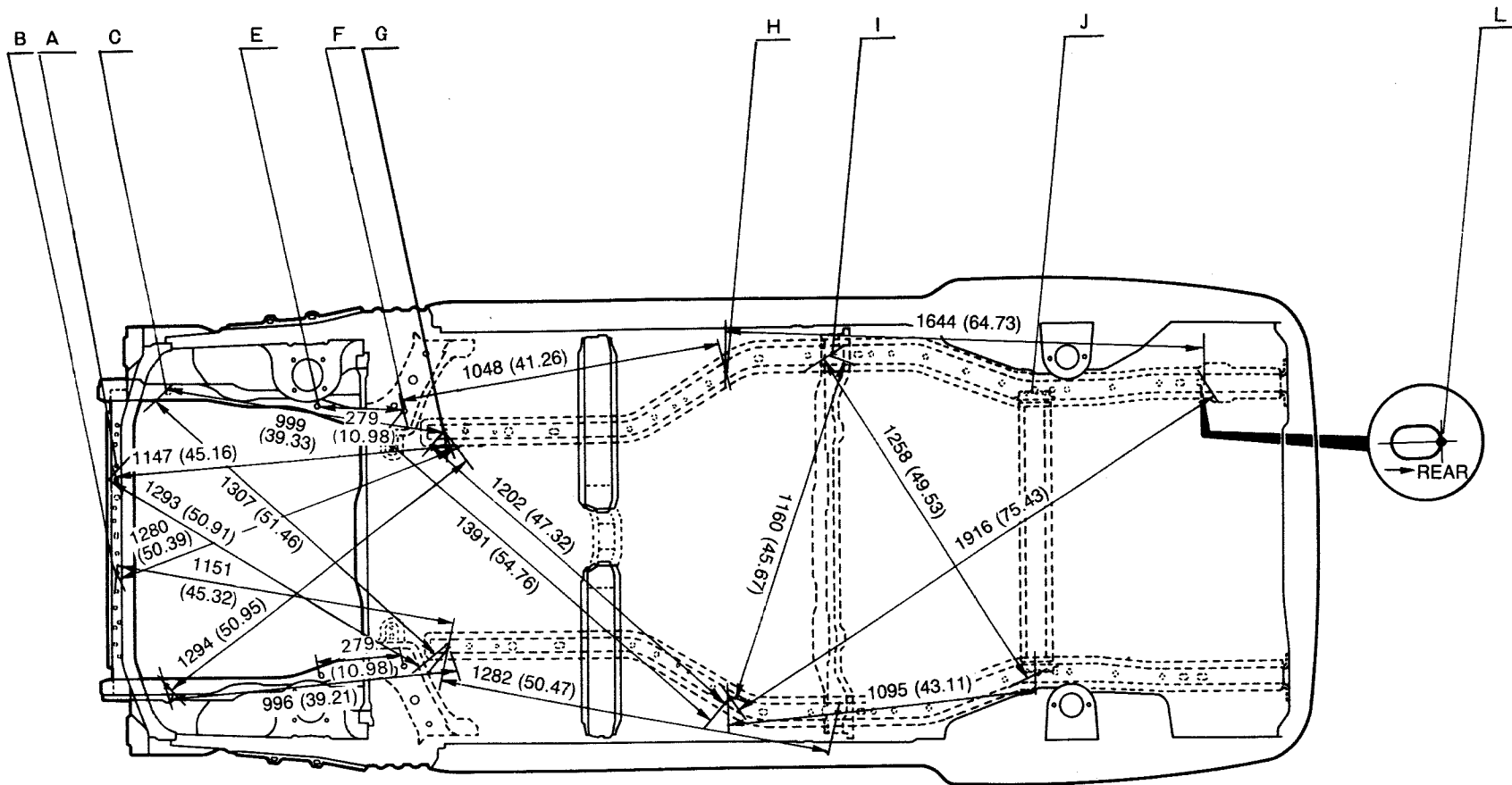
PROJECTED DIMENSIONS (PROTEGÉ)



PROJECTED DIMENSIONS (HATCHBACK)



STRAIGHT-LINE DIMENSIONS (PROTEGE)



A: CROSSMEMBER REFERENCE HOLE $\phi 12$ (0.47)
 B: CROSSMEMBER REFERENCE HOLE $\phi 12$ (0.47)
 C: FRONT FRAME REFERENCE HOLE $\phi 16$ (0.63)
 E: CROSSMEMBER MOUNTING BOLT
 F: CROSSMEMBER MOUNTING NUT

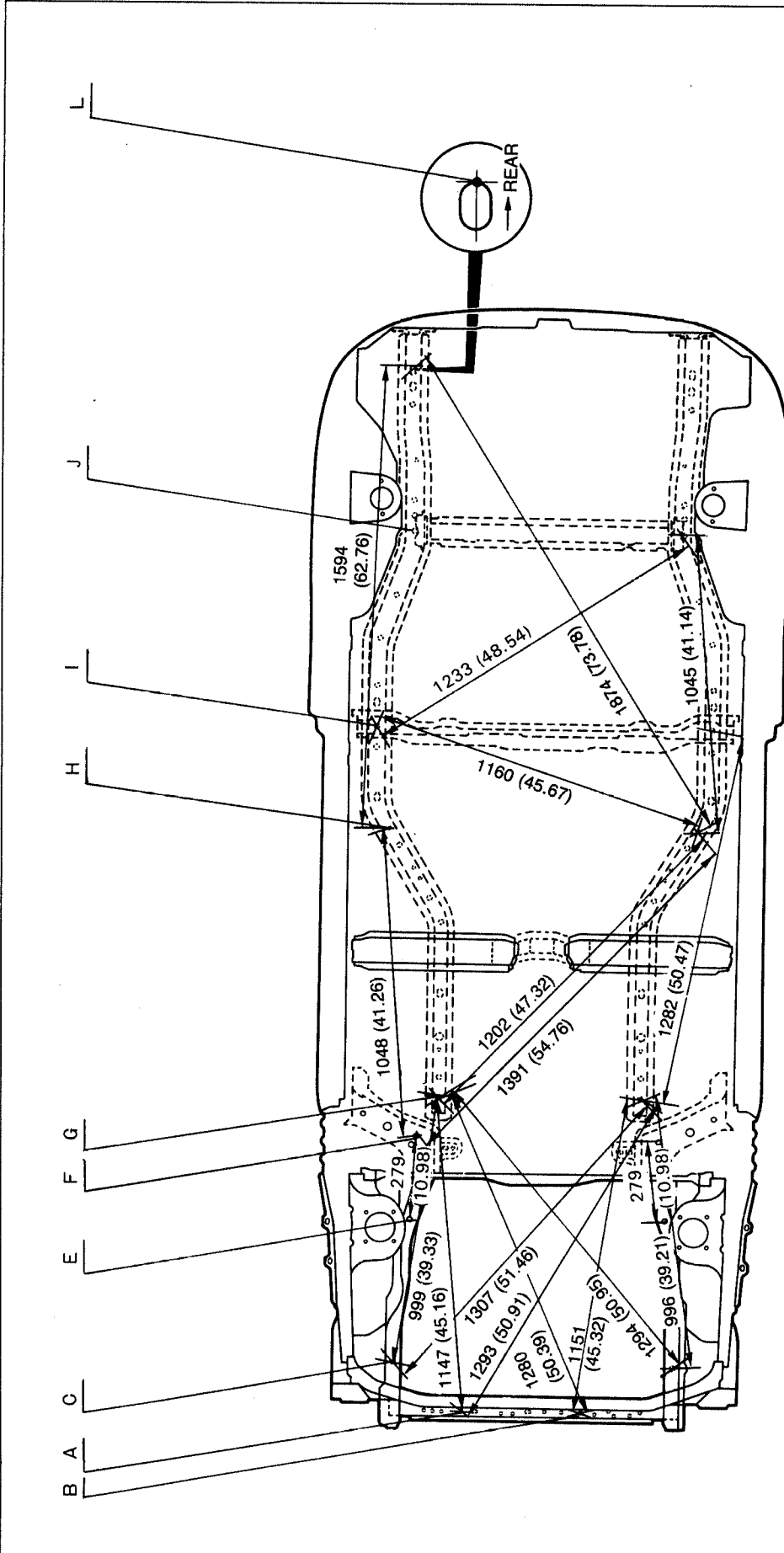
G: FRONT FRAME B REFERENCE HOLE $\phi 14$ (0.55)
 H: FRONT FRAME B REFERENCE HOLE $\phi 12$ (0.47)
 I: TRAILING LINK BRACKET REFERENCE HOLE $\phi 10$ (0.39)
 J: REAR SUSPENSION MOUNTING NUT
 L: REAR SIDE FRAME REFERENCE HOLE 16x22 (0.63x0.87)

mm (in)

UNDERBODY DIMENSIONS

S

STRAIGHT-LINE DIMENSIONS (HATCHBACK)



- G: FRONT FRAME B REFERENCE HOLE $\phi 14$ (0.55)
- H: FRONT FRAME B REFERENCE HOLE $\phi 12$ (0.47)
- I: TRAILING LINK BRACKET REFERENCE HOLE $\phi 10$ (0.39)
- J: REAR SUSPENSION MOUNTING NUT
- L: REAR SIDE FRAME REFERENCE HOLE 16x22 (0.63x0.87)

- A: CROSSMEMBER REFERENCE HOLE $\phi 12$ (0.47)
- B: CROSSMEMBER REFERENCE HOLE $\phi 12$ (0.47)
- C: FRONT FRAME REFERENCE HOLE $\phi 16$ (0.63)
- E: CROSSMEMBER MOUNTING BOLT
- F: CROSSMEMBER MOUNTING NUT

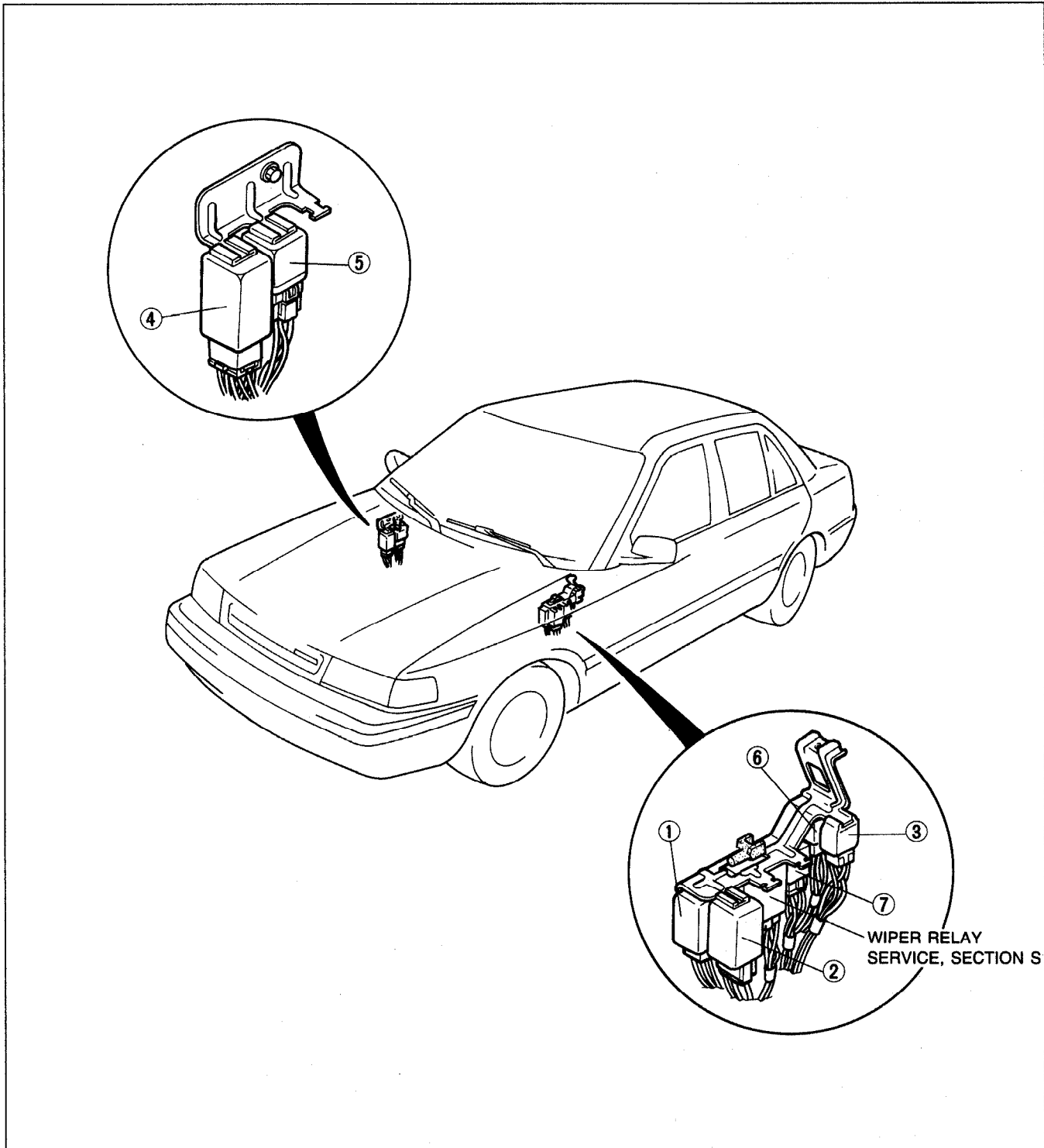
mm (in)

BODY ELECTRICAL SYSTEM

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RELAY

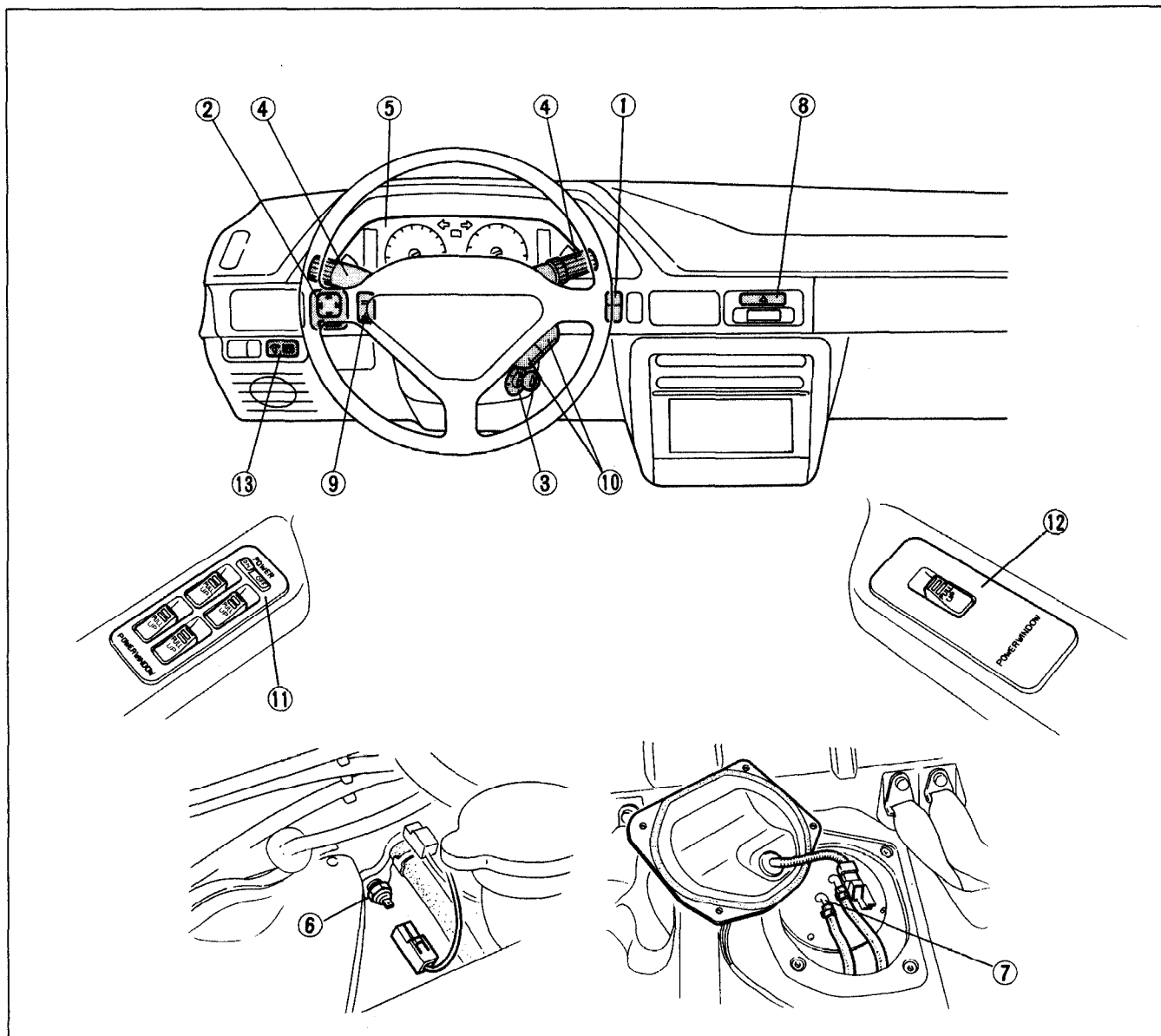


13U0TX-002

1. Flasher unit	
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2. Door lock timer unit	
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3. Horn relay	
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5. DRL relay (Canada)	
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6. TNS relay	
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7. Headlight relay	
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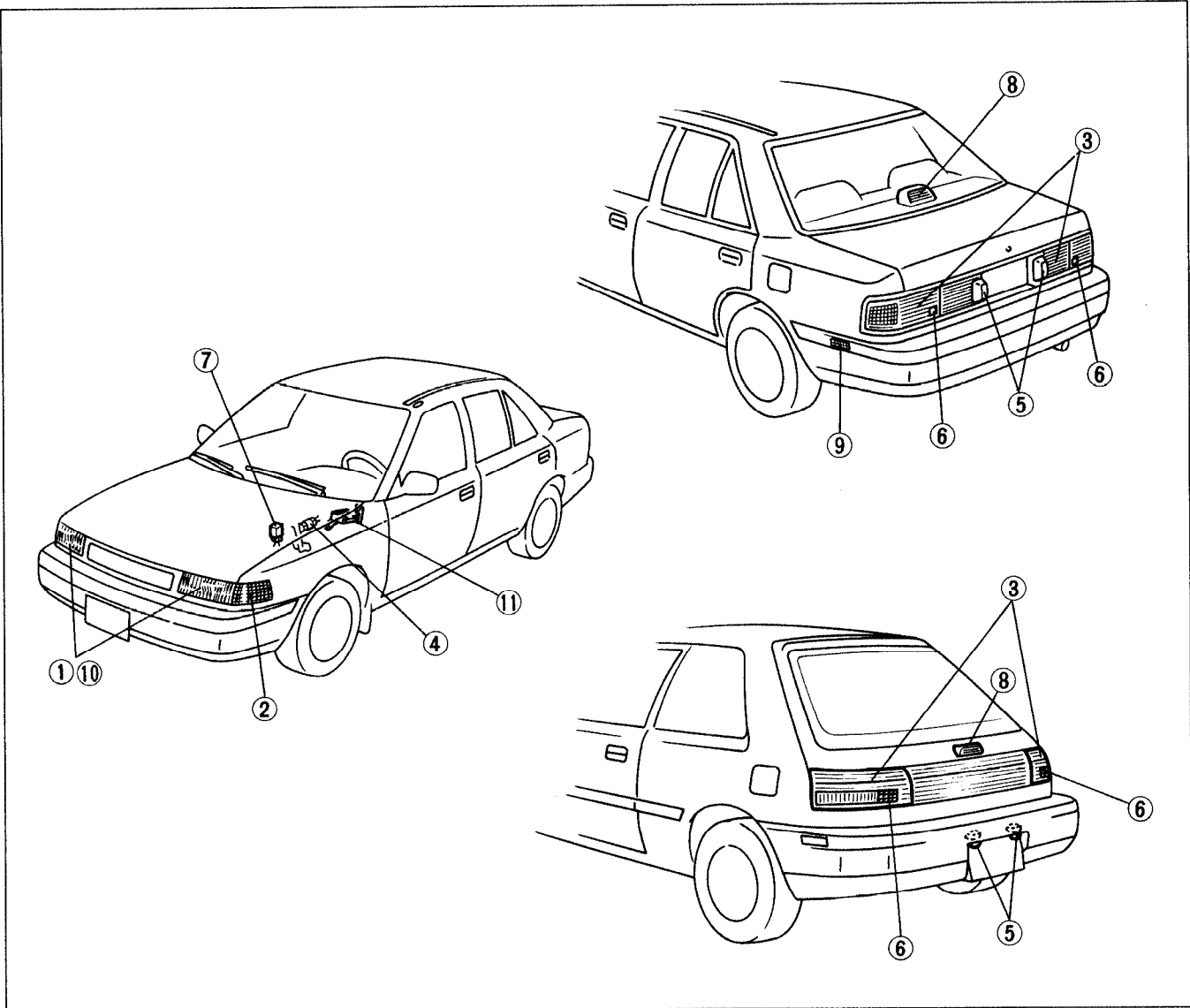
INSTRUMENT CLUSTER AND SWITCHES



23U0TX-002

- | | |
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| 1. Rear window defroster switch | |
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| 2. Remote control door mirror switch | |
| Inspection | page T-20 |
| 3. Ignition switch | |
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| 4. Combination switch | |
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| 5. Instrument cluster | |
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| 6. Water thermosensor | |
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| 7. Fuel gauge sender unit | |
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| 8. Hazard warning switch | |
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| 10. Cruise control switch | |
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| 11. Power window main switch | |
| Inspection | page T-22 |
| 12. Power window switch | |
| Inspection | page T-22 |
| 13. Panel lamp control switch | |
| Inspection | page T-22 |

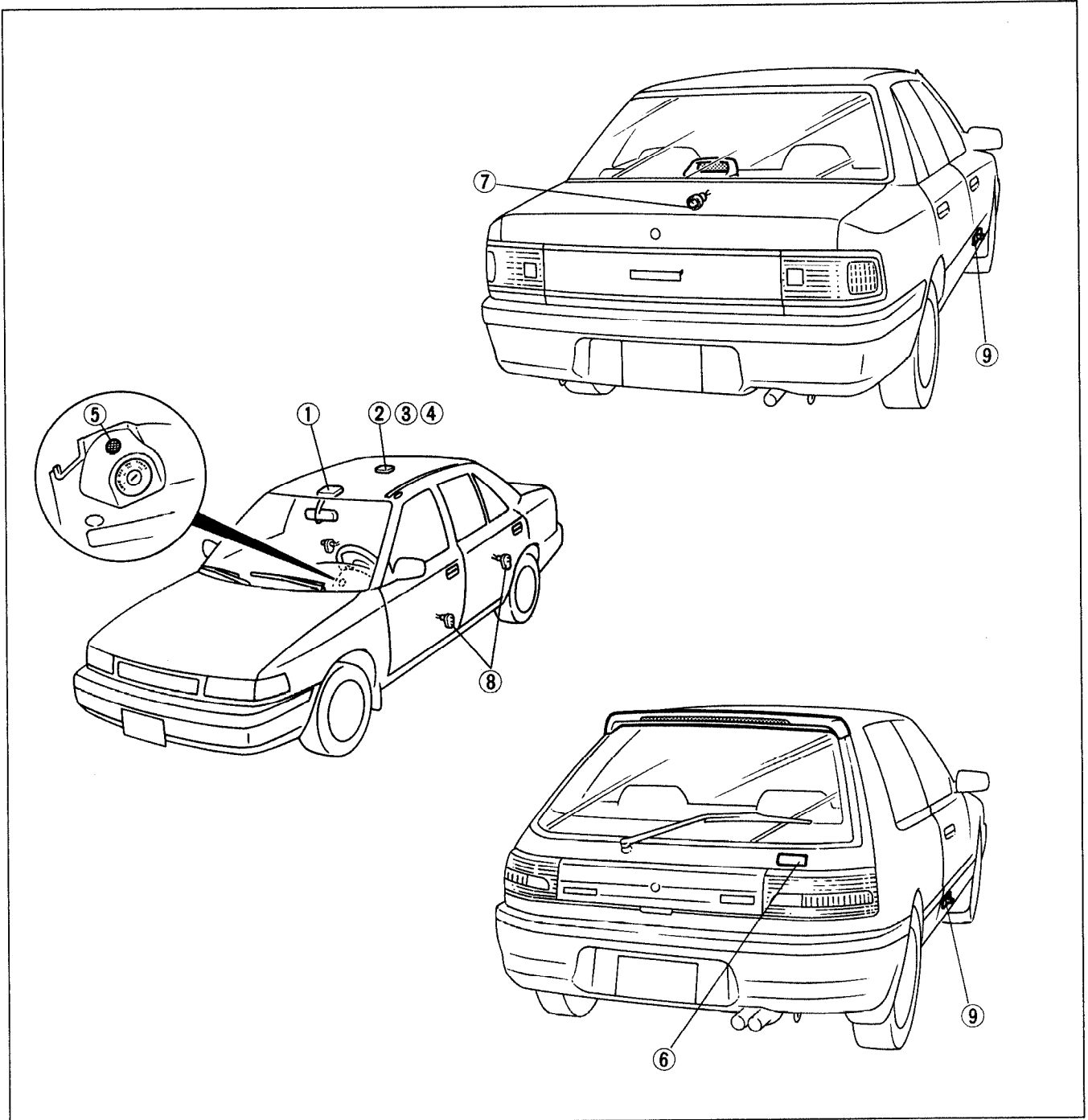
EXTERIOR LIGHTS



13U0TX-004

- | | |
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| 1. Headlight | |
| Troubleshooting | page T-30 |
| Removal / Installation | page T-41 |
| Aiming..... | page T-30 |
| 2. Front combination light | |
| Removal / Installation | page T-41 |
| (1) Turn and hazard warning light | |
| Troubleshooting | page T-34 |
| (2) Small light control system | |
| Troubleshooting | page T-37 |
| 3. Rear combination light | |
| Removal / Installation | page T-43 |
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| (1) Turn and hazard warning light | |
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| Troubleshooting | page T-37 |
| (3) Stoplight | |
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| 5. License plate light | |
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| 6. Back-up light switch | |
| Inspection | page T-47 |
| 7. Flasher unit | |
| Inspection | page T-42 |
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| Removal / Inspection / | |
| Installation | page T-45 |
| 9. Rear side marker light | |
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| Installation | page T-48 |
| 10. Daytime running light (DRL) system | |
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| 11. DRL resistor | |
| Removal / Installation | page T-46 |
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INTERIOR LAMPS

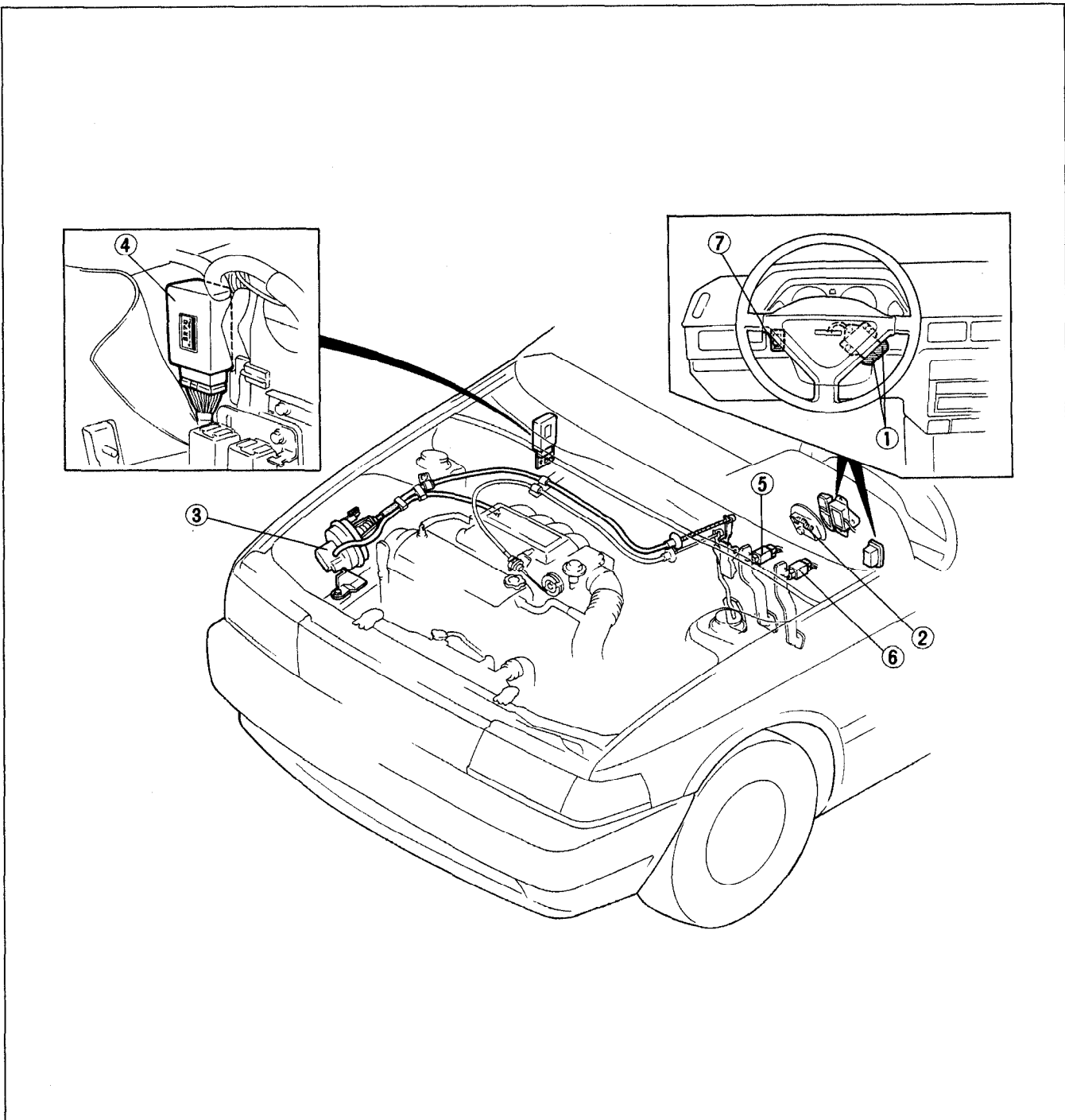


23U0TX-003

- | | |
|---|--|
| <p>1. Spot lamp (in overhead console)
Removal / Inspection /
Installation page T-52</p> <p>2. Interior and spot lamp (Without sunroof)
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Installation page T-53</p> <p>3. Interior lamp (Without sunroof)
Removal / Inspection /
Installation page T-52</p> <p>4. Interior lamp (With sunroof)
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Installation page T-54</p> <p>7. Trunk compartment lamp
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Removal / Inspection /
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|---|--|

T

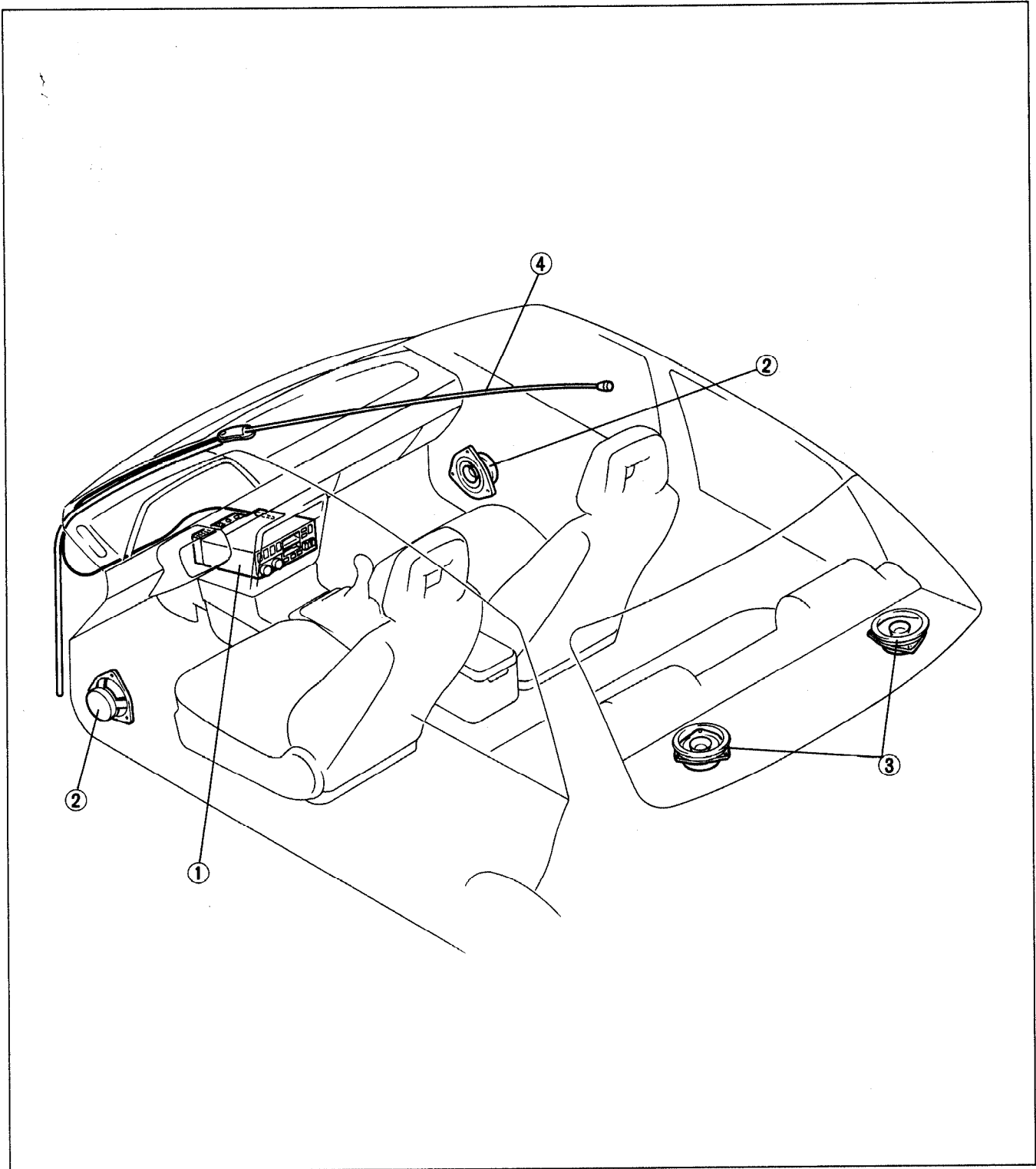
CRUISE CONTROL SYSTEM



23U0TX-004

- | | | | |
|----------------------------------|-----------|-------------------------------|----------------|
| 1. Cruise control switch | | 5. Stoplight switch | |
| Removal / Installation | page T-20 | Inspection | pages T-47, 87 |
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| 2. Speed sensor (in the meter) | | 6. Clutch switch (For MTX) | |
| Inspection | page T-72 | Adjustment..... | page T-87 |
| 3. Actuator | | 7. Cruise control main switch | |
| Inspection | page T-87 | Inspection | page T-21 |
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| Troubleshooting | page T-83 | | |
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| Self-diagnostic inspection | page T-80 | | |
| Inspection | page T-86 | | |

AUDIO



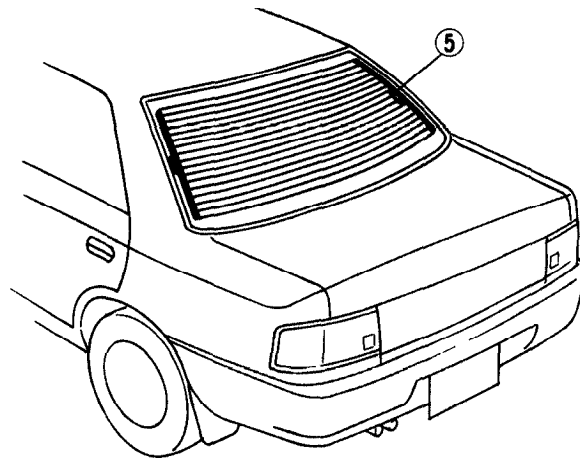
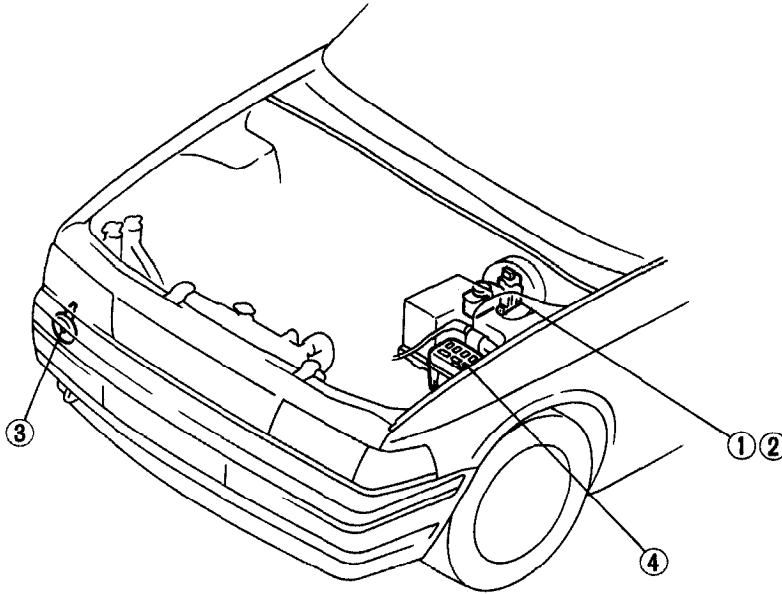
23U0TX-005

- 1. Audio component
 - Troubleshooting page T- 92
 - Removal / Installation page T- 98
- 2. Door speaker
 - Troubleshooting page T- 92
 - Removal / Installation page T- 98
 - Inspection page T- 99

- 3. Rear speaker
 - Troubleshooting page T- 92
 - Removal / Installation page T- 99
 - Inspection page T- 99
- 4. Antenna feeder
 - Troubleshooting page T- 92
 - Removal page T- 99
 - Installation page T-100
 - Inspection page T-100

T

OTHER



23U0TX-006

- 1. Joint box (including CPU)
 - Removal / Installation page T-15
 - Inspection page T-58
- 2. Circuit breaker
 - Note page T-14
- 3. Horn
 - Removal / Installation page T-88

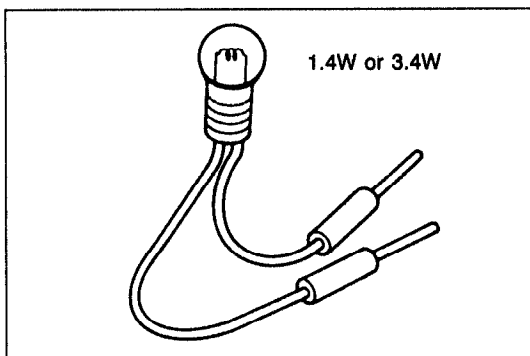
- 4. Main fuse
 - Removal / Installation page T-14
- 5. Rear window defroster (Filament)
 - Troubleshooting page T-75
 - Inspection page T-77
 - Repairing page T-77

OUTLINE

HOW TO USE THIS SECTION

Information regarding removal and installation of electrical equipment is given in **SECTION S**. Understanding will be easier if this section is used in conjunction with the **WIRING DIAGRAMS**.

9MU0TX-008



23U0TX-071

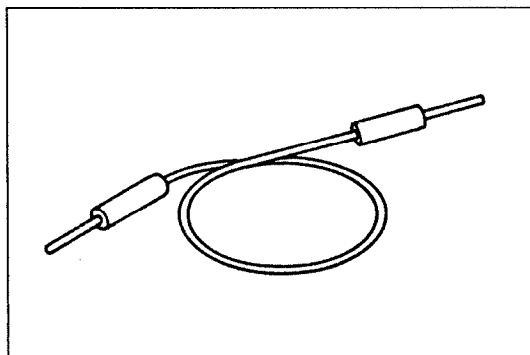
ELECTRICAL TROUBLESHOOTING TOOLS

Test Light

The test light, as shown in the figure, uses a battery voltage bulb. The two leads should be connected to probes. The test light is used for simple voltage checks and to check for open circuits.

Caution

- When checking the control unit, never use a bulb over 3.4W.



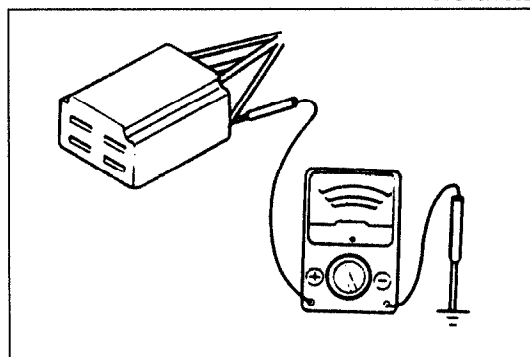
61G15X-002

Jumper Wire

The jumper wire is used for testing by short-circuiting switch terminals and for verifying the condition of ground connections.

Caution

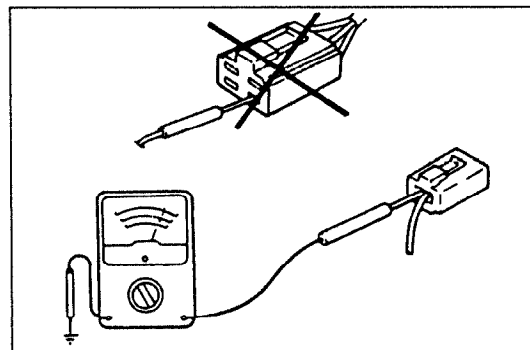
- Do not connect the jumper wire between a power source line and body ground because this may cause burning or other damage to harnesses or electronic components.



69G15X-003

Voltmeter

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



63U15X-005

Ohmmeter

The ohmmeter is used to measure the resistance between two points in a circuit, and is also used to check for continuity and diagnosis of short circuits.

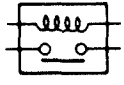

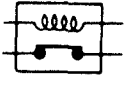
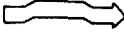



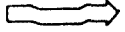
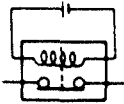
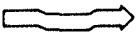
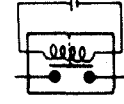


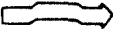


Caution

- Do not attempt to connect the ohmmeter to any circuit to which voltage is applied because this may burn or otherwise damage the ohmmeter.







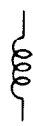

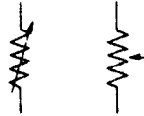


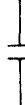

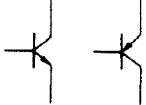



ELECTRICAL SYMBOLS

Switches and Relays

There is an NC (normally closed) and NO (normally open) indication for switches and relays which shows when no change of operation conditions has occurred.

	Relay		Switch	
	NO type relay	NC type relay	NO switch	NC switch
Not in operation (No power supply)	  STOP	  FLOW	  STOP	  FLOW
In operation (Power supply)	  FLOW	  STOP	  FLOW	  STOP

Other Electrical Symbols

		 HOLDER	 BOX	
BATTERY	BODY GROUND	FUSE		FUSIBLE LINK
				
MOTOR	COIL, SOLENOID	RESISTOR	VARIABLE RESISTOR	
				
THERMISTOR	DIODE	CONDENSER	LIGHT	
				
TRANSISTOR	SPEAKER	CIGARETTE LIGHTER	HEATER	

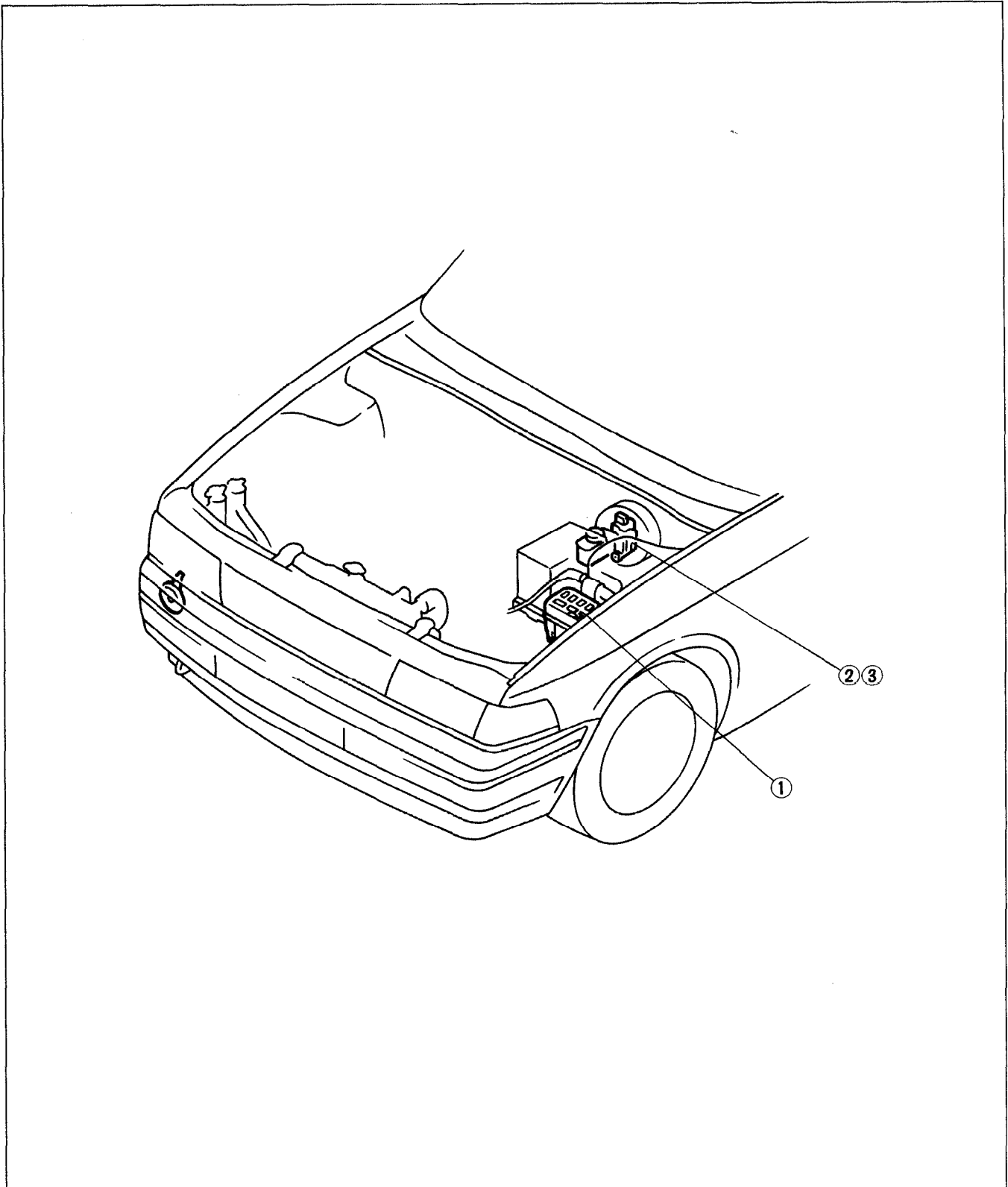
TROUBLESHOOTING GUIDE

System	Symptom	Reference page
Exterior lighting system	Headlights do not operate	T-32
	Headlights either do not operate or are dim	T-33
	Low-High beam or passing flasher does not operate	T-33
	Daytime running lights (DRL) do not operate	T-33
	Turn signal lights do not operate	T-35
	Only hazard function does not operate	T-36
	Only one side of signal operates	T-36
	TNS system (side marker, license, tail, illumination light) does not operate	T-38
	Both stoplights do not operate when brake pedal is depressed	T-40
One stoplight does not come on	T-40	
Interior lamp system	IG key illumination does not operate	T-51
Warning system	Key reminder alarm does not sound	T-58
	Light-off reminder alarm does not sound	T-59
	Seat belt alarm does not sound	T-59
	Seat belt timer does not operate	T-59
	Passive shoulder belt alarm does not sound	T-59
	IG key illumination timer does not operate	T-59
Instrument cluster	Speedometer does not operate or indication is not correct	T-65
	Tachometer does not operate	T-66
	Water temperature gauge does not operate	T-67
	Fuel gauge does not operate	T-68
Rear window defroster	Defroster does not operate	T-76
Cruise control system	Can't set or control the speed	T-84
Audio system	No sound	T-93
	Sound is partial	T-93
	Bad sound quality of radio	T-94
	Bad sound quality of tape	T-94
	Noise	T-95
	Scan or tuning does not stop	T-95

23U0TX-007

FUSE AND JOINT BOX

STRUCTURAL VIEW



13U0TX-010

- 1. Main fuse
Removal / Installation page T-14
- 2. Fuse
Removal / Installation page T-14

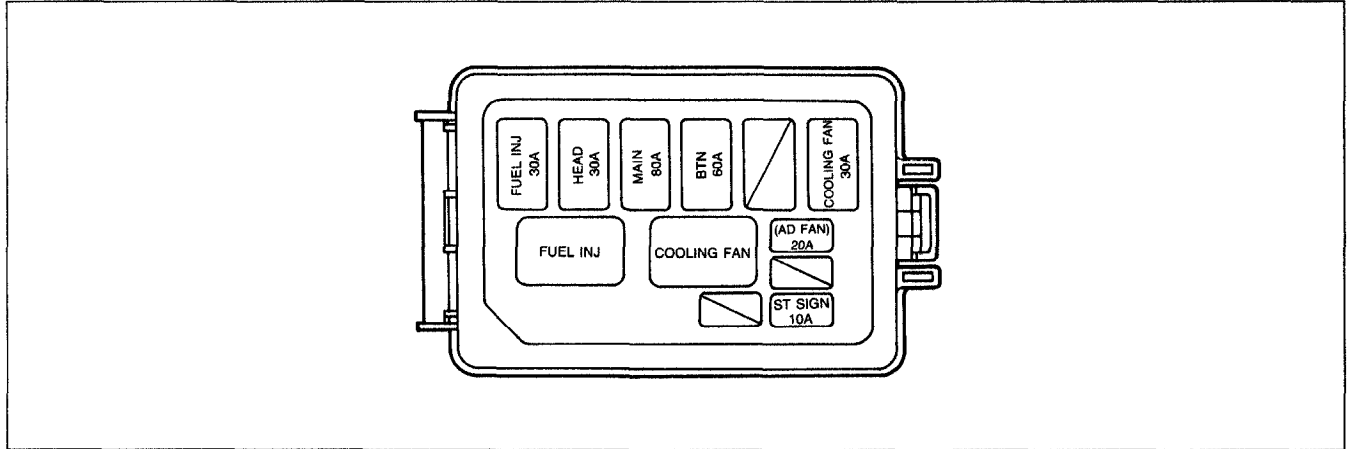
- 3. Joint box
Removal / Installation page T-15
Inspection page T-58

FUSES

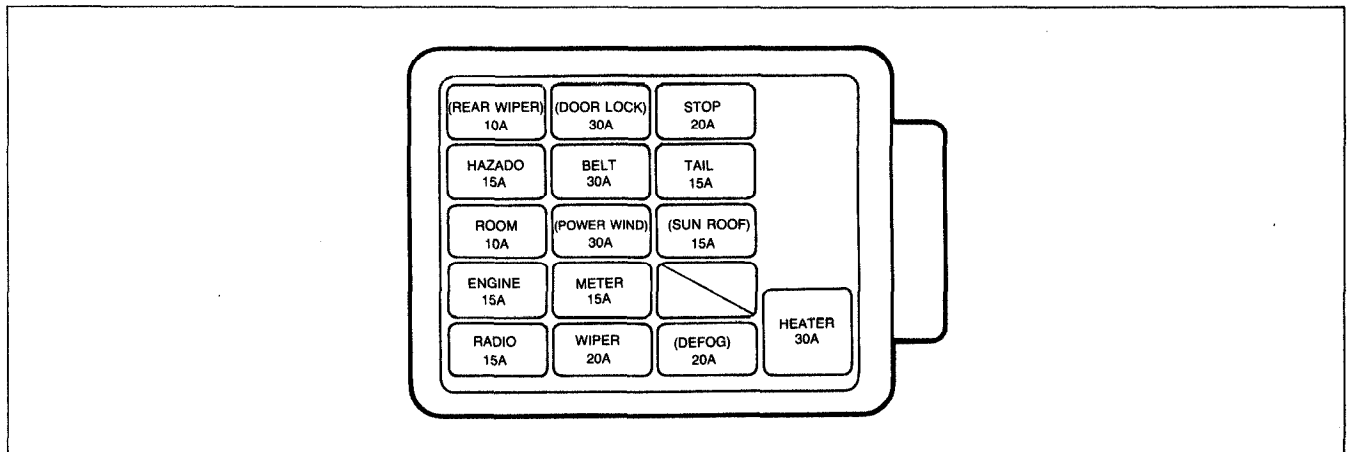
Specifications

Main fuse block

Fuse	Color	Protected circuit
FUEL INJ 30A	Pink	EGI system
HEAD 30A	Pink	Headlight
MAIN 80A	Black	Cooling fan, Power window, Sunroof, Wiper and washer, Air conditioner
BTN 60A	Green	Door lock, Charging system
AD FAN 30A	Pink	Additional cooling fan
ST SIG 10A	Red	Fuel pump
ELEC FAN 30A	Pink	Cooling fan



Fuse box



23U0TX-008

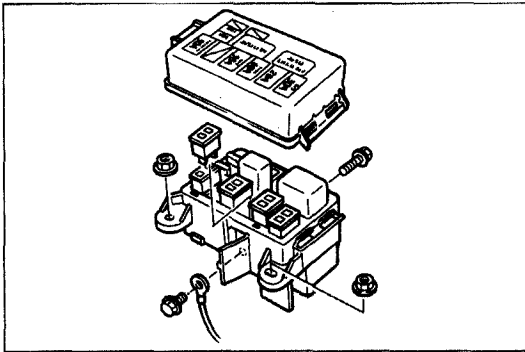
Specifications

Fuse	Color	Protected circuit
REAR WIPER 10A	Red	Rear wiper and washer
HAZARD 15A	Blue	Hazard warning
ROOM 10A	Red	Clock, Interior lamp, Cargo compartment lamp, Trunk compartment lamp
ENGINE 15A	Blue	Alternator
RADIO 15A	Blue	Audio
DOOR LOCK 30A	Green	Power door lock
BELT 30A	Green	Passive shoulder belt
POWER WINDOW 30A	Green	Power window

Specifications (Cont'd)

Fuse	Color	Protected circuit
METER 15A	Blue	Instrument panel (gauges and warning lamps), Back-up light, Turn signal, Cruise control system
WIPER 20A	Yellow	Windshield wiper and washer
STOP 20A	Yellow	Stoplight, Horn
TAIL 15A	Blue	Taillight, Side marker light, Parking light, Illumination light, License plate light
SUNROOF 15A	Blue	Sunroof
DEFOG 20A	Yellow	Rear window defroster
HEATER 30A	Light green	Blower motor

13U0TX-067

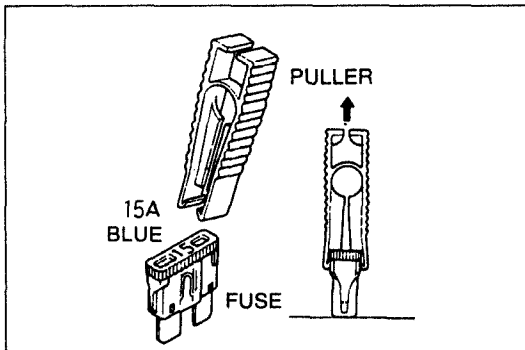


03U0TX-013

Removal / Installation

Main fuse

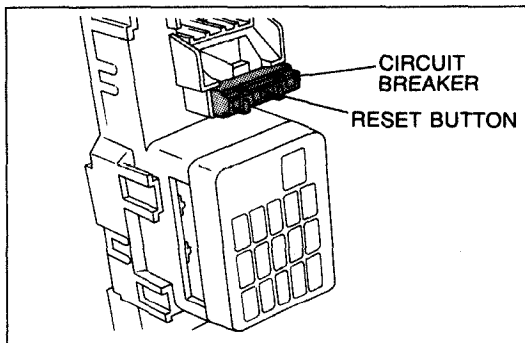
1. Remove the main fuse box mounting bolts.
2. Open the main fuse box lid and remove the bolt.
3. Remove MAIN 80A fuse.
4. Install in the reverse order of removal.



03U0TX-014

Fuse

When replacing a fuse, use the fuse puller supplied in the fuse box cover.



03U0TX-015

CIRCUIT BREAKER

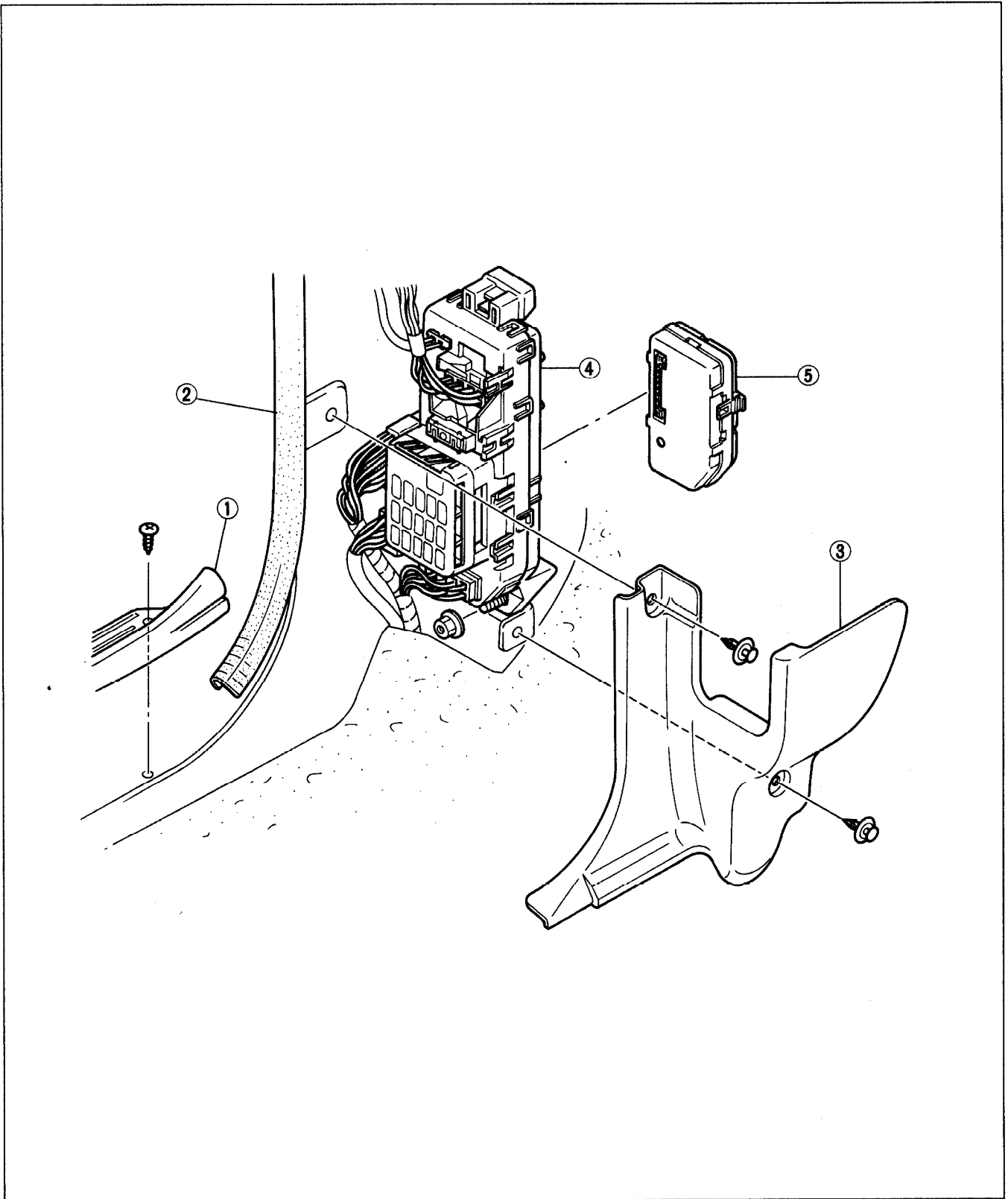
Note

- Push button to reset circuit breaker after operating diagnosis of malfunction.

JOINT BOX

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



13U0TX-011

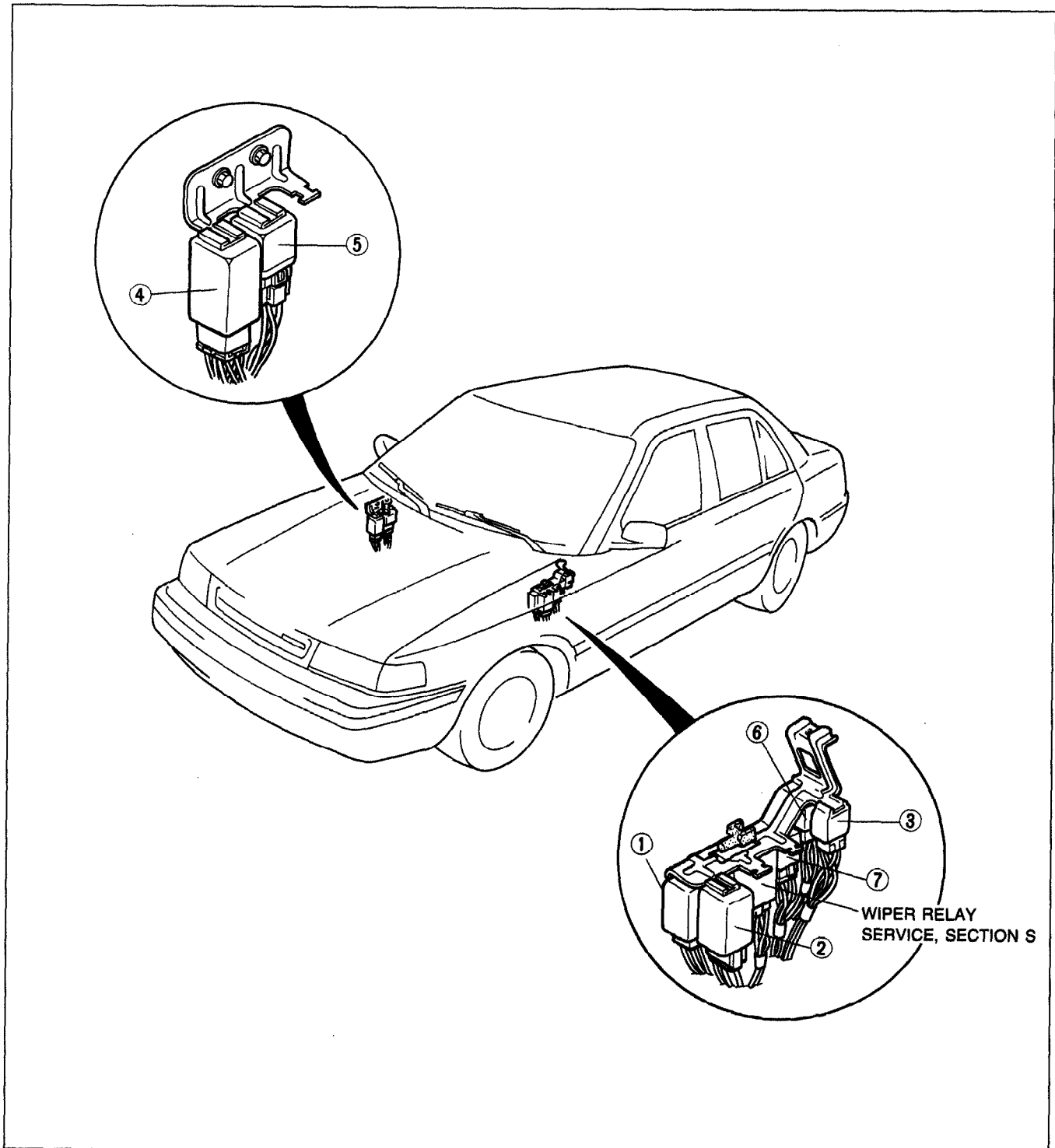
1. Scuff plate
2. Seaming welt
3. Front side trim

4. Joint box (including CPU)
5. CPU

Inspection page T-57

RELAY

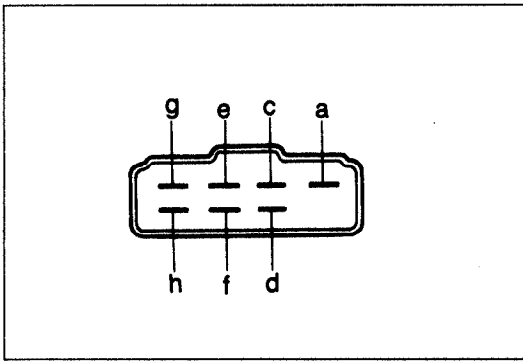
STRUCTURAL VIEW



13U0TX-012

- 1. Flasher unit
Inspection page T-17
- 2. Door lock timer unit
Inspection page T-17
- 3. Horn relay
Inspection page T-18
- 4. DRL control unit (Canada)
Troubleshooting page T-33

- 5. DRL relay (Canada)
Inspection page T-18
- 6. TNS relay
Inspection page T-18
- 7. Headlight relay
Inspection page T-18



03U0TX-018

FLASHER UNIT

Inspection

1. Check for continuity between terminals of the flasher unit.

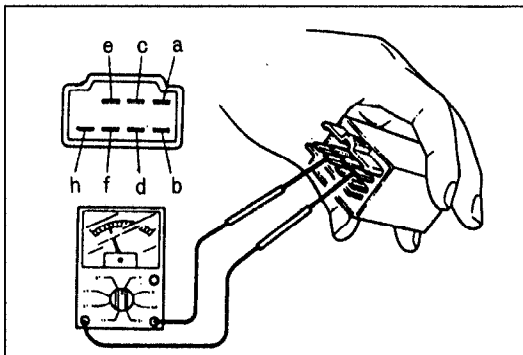
Terminal	Continuity	Terminal	Continuity	Terminal	Continuity
a-c	X	d-e	X	f-g	X
a-d	X	d-f	X	f-h	X
a-e	○	d-g	X	g-a	X
a-f	○	d-h	X	g-c	X
a-g	X	e-a	X	g-d	X
a-h	X	e-c	X	g-e	X
c-a	○	e-d	X	g-f	X
c-d	○	e-f	X	g-h	X
c-e	○	e-g	X	h-a	○
c-f	○	e-h	X	h-c	○
c-g	○	f-a	X	h-d	○
c-h	○	f-c	X	h-e	○
d-a	X	f-d	X	h-f	○
d-c	X	f-e	X	h-g	○

○: Indicates continuity X: No continuity

Note

- Set the tester to the x1,000Ω range.

2. If continuity is not as specified, replace the switch.



03U0TX-019

DOOR LOCK TIMER UNIT

Inspection

1. Check for continuity between terminals.

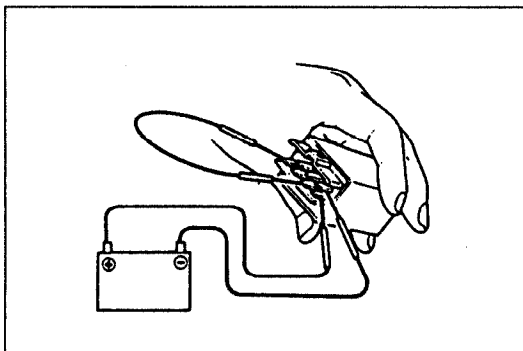
Terminals	Continuity	Terminals	Continuity	Terminals	Continuity
a-c	X	b-d	X	c-h	X
a-c	○	b-e	X	d-e	○
a-d	○	b-f	X	d-f	○
a-e	○	b-h	○	d-h	X
a-f	○	c-d	○	e-f	○
a-h	X	c-e	○	e-h	○
b-c	X	c-f	○	f-h	X

○: Continuity X: Non-continuity

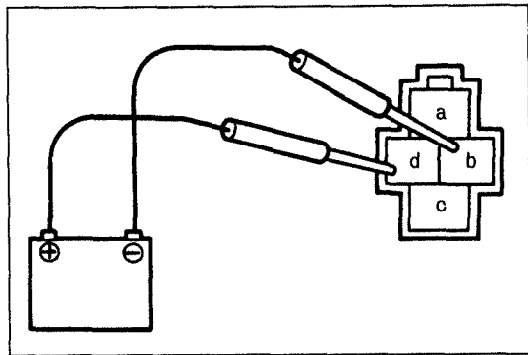
Note

- Set the tester to x10000Ω range.
- Continuity includes the state with resistance, and Non-continuity means insulated.

2. Connect the battery voltage to the "b" terminal and the ground to the "a" terminal. Then, short circuit the "h" and "d" terminals between the "h" and "c" terminals, and check that the relay clicks.



23U0TX-009

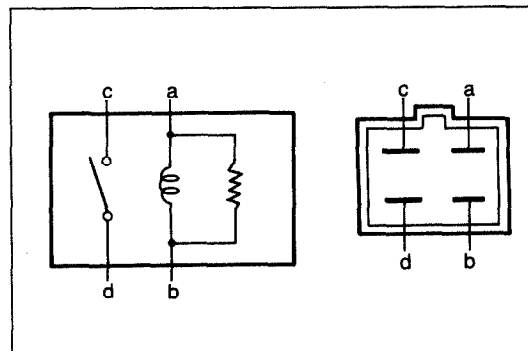


23U0TX-010

HORN RELAY

Inspection

1. Connect the battery voltage to the "d" terminal and the ground to the "b" terminal. Check for continuity between the "a" and "c" terminals.



23U0TX-011

HEADLIGHT RELAY

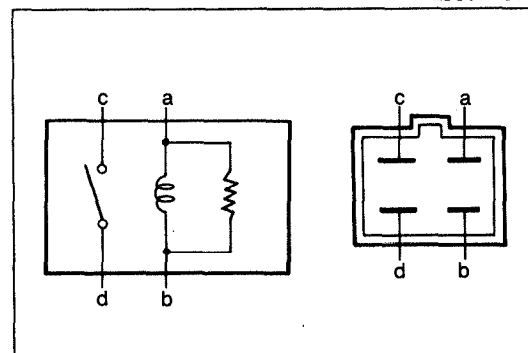
Inspection

1. Disconnect the headlight relay connector and remove the relay.
2. Check for continuity between terminals of the relay.

V_B: Battery voltage

Connecting to		a	b	c	d
V _B	Ground				
—	—	○—○			
a	b			○—○	

○—○: Indicates continuity



23U0TX-012

TNS RELAY

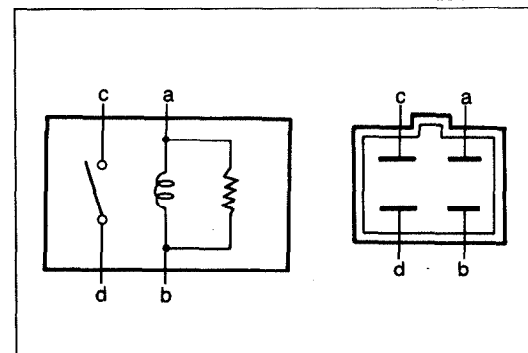
Inspection

1. Disconnect the TNS relay connector and remove the relay.
2. Check for continuity between terminals of the relay.

V_B: Battery voltage

Connecting to		a	b	c	d
V _B	Ground				
—	—	○—○			
a	b			○—○	

○—○: Indicates continuity



23U0TX-013

DRL RELAY (CANADA)

Inspection

1. Disconnect the DRL relay connector and remove the relay.
2. Check for continuity between terminals of the relay.

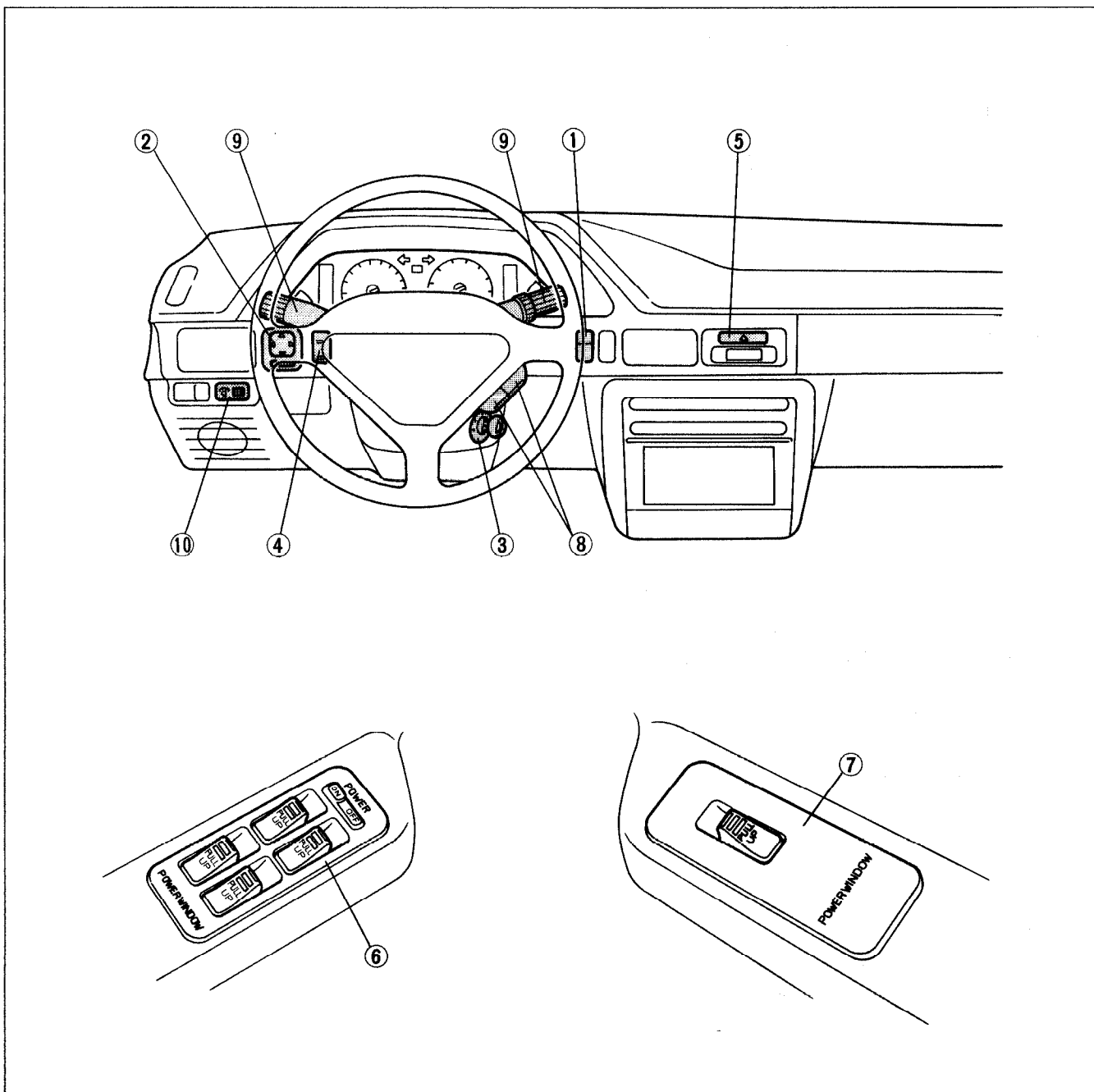
V_B: Battery voltage

Connecting to		a	b	c	d
V _B	Ground				
—	—	○—○			
a	b			○—○	

○—○: Indicates continuity

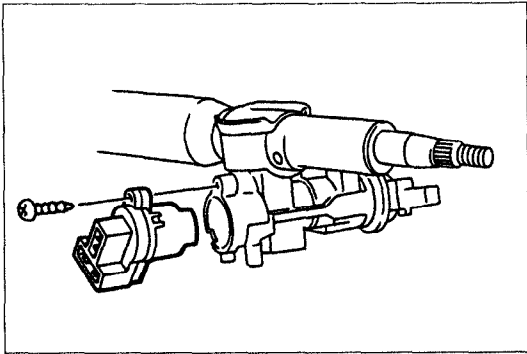
SWITCHES

STRUCTURAL VIEW



13U0TX-013

- | | |
|---|---|
| <p>1. Rear window defroster switch
 Inspection page T-21</p> <p>2. Remote control door mirror switch
 Inspection page T-20</p> <p>3. Ignition switch
 Removal / Installation page T-20
 Inspection page T-21</p> <p>4. Cruise control main switch
 Inspection page T-21</p> <p>5. Hazard warning switch
 Removal / Installation page T-20
 Inspection page T-21</p> | <p>6. Power window main switch
 Inspection page T-22</p> <p>7. Power window switch
 Inspection page T-22</p> <p>8. Cruise control switch
 Removal / Installation page T-20
 Inspection page T-21</p> <p>9. Combination switch
 Removal / Installation pages T-23, 25
 Disassembly / Assembly pages T-24, 26
 Inspection pages T-27, 28</p> <p>10. Panel lamp control switch
 Inspection page T-22</p> |
|---|---|



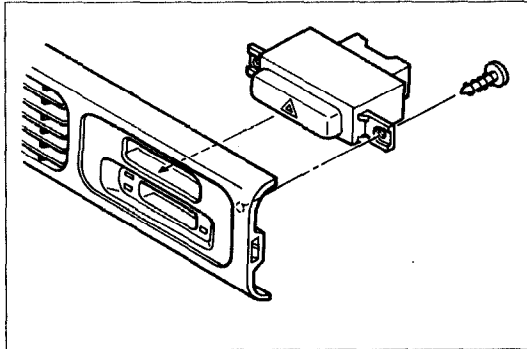
03U0TX-026

SWITCH

Removal / Installation

Ignition switch

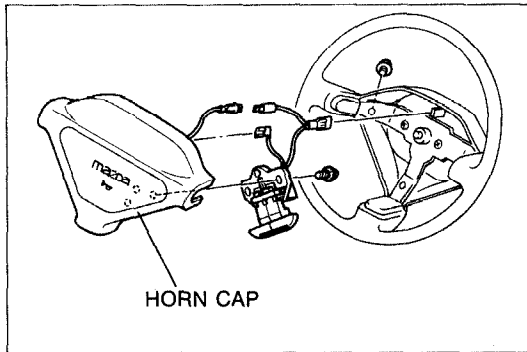
1. Remove the negative battery cable.
2. Remove the steering column cover.
3. Remove the screw and the ignition switch.
4. Install in the reverse order of removal.



03U0TX-027

Hazard warning switch

1. Remove the meter hood.
2. Remove the screws and the hazard switch.
3. Install in the reverse order of removal.

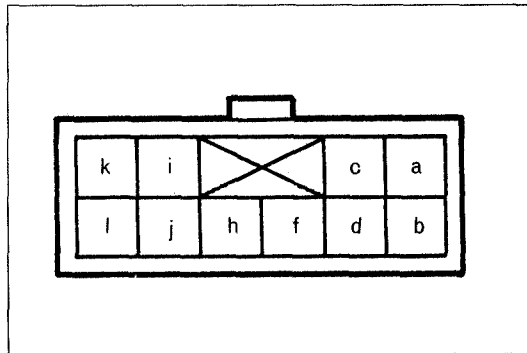


03U0TX-028

Cruise control switch

(set/coast and resume/accel switch)

1. Remove the steering wheel cap.
2. Remove the cruise control switch as shown in the figure.
3. Install in the reverse order of removal.



03U0TX-029

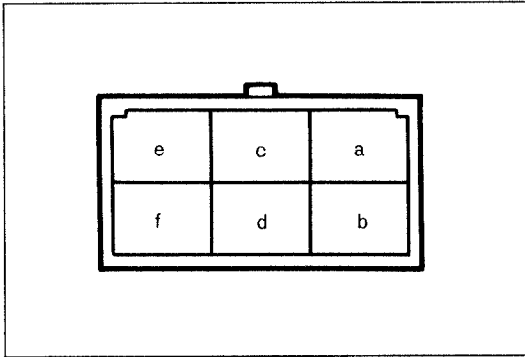
Inspection

1. Check for continuity between the terminals with an ohmmeter.

Remote control door mirror switch

CLASS	DIRECTION	a	b	c	d	i	k	l
LEFT	UP	○—○				○—○		○—○
	DOWN	○—○					○—○	
	LEFT	○—○			○—○			○—○
	RIGHT	○—○			○—○			○—○
RIGHT	UP			○—○		○—○		○—○
	DOWN			○—○			○—○	
	LEFT		○—○		○—○			○—○
	RIGHT		○—○		○—○			○—○

○—○: Indicates continuity

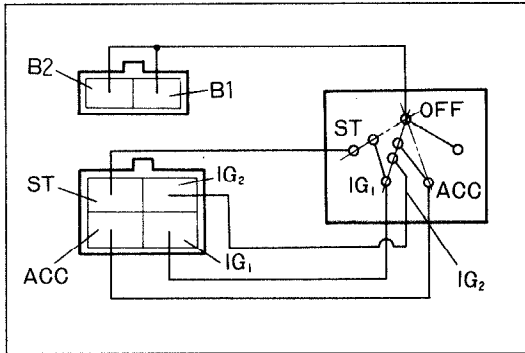


03U0TX-030

Rear window defroster switch

Position \ Terminal	a	b	c	d	e	f
OFF	○	⊗	○	○	⊗	○
ON	○	⊗	○	○	⊗	○

○—○: Indicates continuity

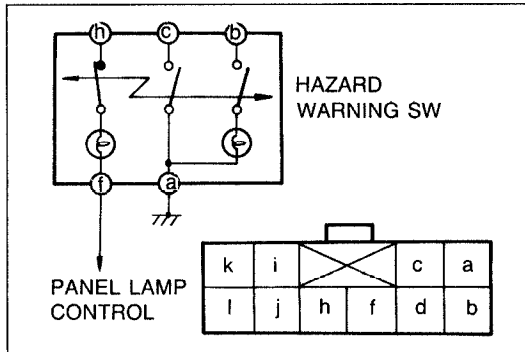


13U0TX-068

Ignition switch

Position \ Terminal	B1	B2	ACC	IG1	IG2	ST	K1	K2
ACC	○	○	○				○	○
ON	○	○	○	○	○		○	○
ST	○	○		○		○	○	○
LOCK	TURN							
	RETURN						○	○

○—○: Indicates continuity

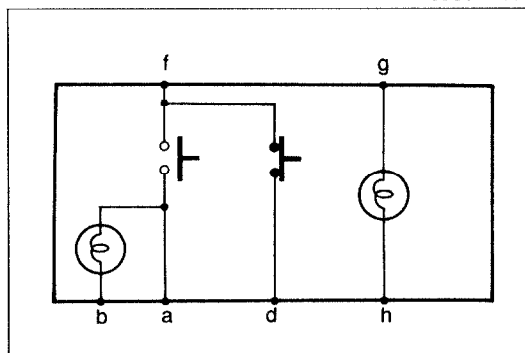


03U0TX-032

Hazard warning switch

Position \ Terminal	a	b	c	d	f	h	i	j	k	l
OFF					○	⊗	○			
ON	○	⊗	○							

○—○: Indicates continuity



13U0TX-014

Cruise control main switch

Position \ Terminal	a	b	d	f	g	h
OFF			○	○	○	⊗
ON	○	○	○	○	○	⊗

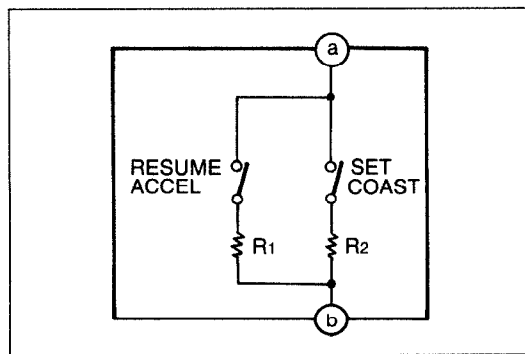
○—○: Indicates continuity

2. Measure the switch resistance with an ohmmeter.

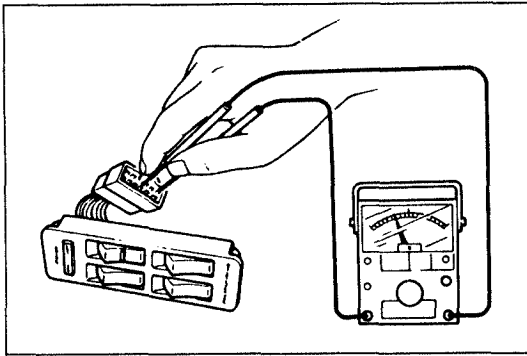
Cruise control switch

Switch	Condition	Check terminal
		a—b
RESUME/ACCEL	OFF	∞
	ON	910Ω
SET/COAST	OFF	∞
	ON	240Ω

○—○: Indicates continuity



03U0TX-034

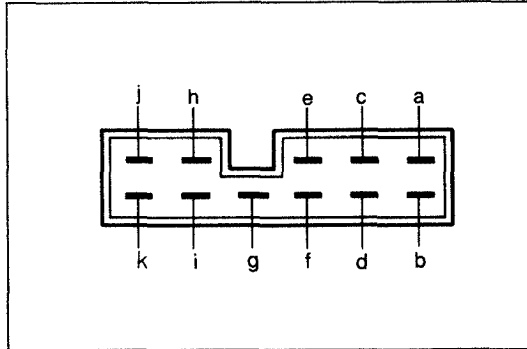


03U0TX-035

**Power window main switch
(Power switch)**

Position	Terminal	a	h
OFF			
ON		○	○

○—○: Indicates continuity

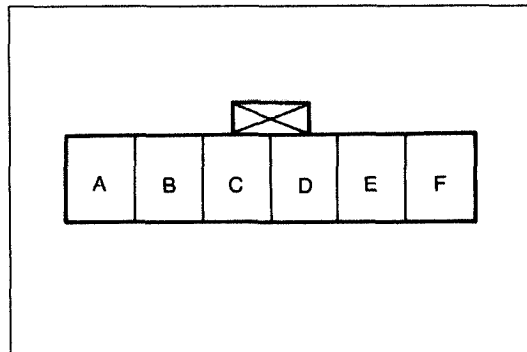


03U0TX-036

(Power window switch)

Switch	Driver side				Passenger side				Rear-right				Rear-left			
Terminal	a	h	j	l	a	h	d	b	a	h	c	e	a	h	k	i
UP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
OFF		○	○	○		○	○	○		○	○	○		○	○	○
DOWN		○	○	○		○	○	○		○	○	○		○	○	○

○—○: Indicates continuity

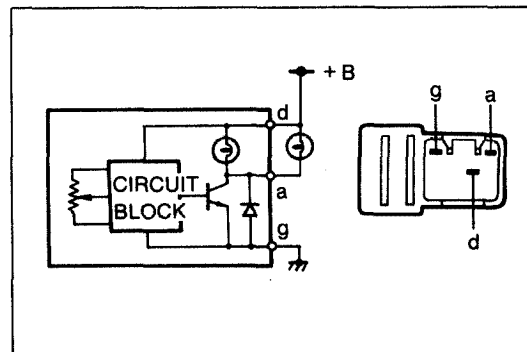


03U0TX-037

Power window switch (Each door)

Terminal	A	B	C	D	E
UP	○				○
OFF		○		○	
DOWN		○		○	

○—○: Indicates continuity



23U0TX-014

Panel lamp control switch

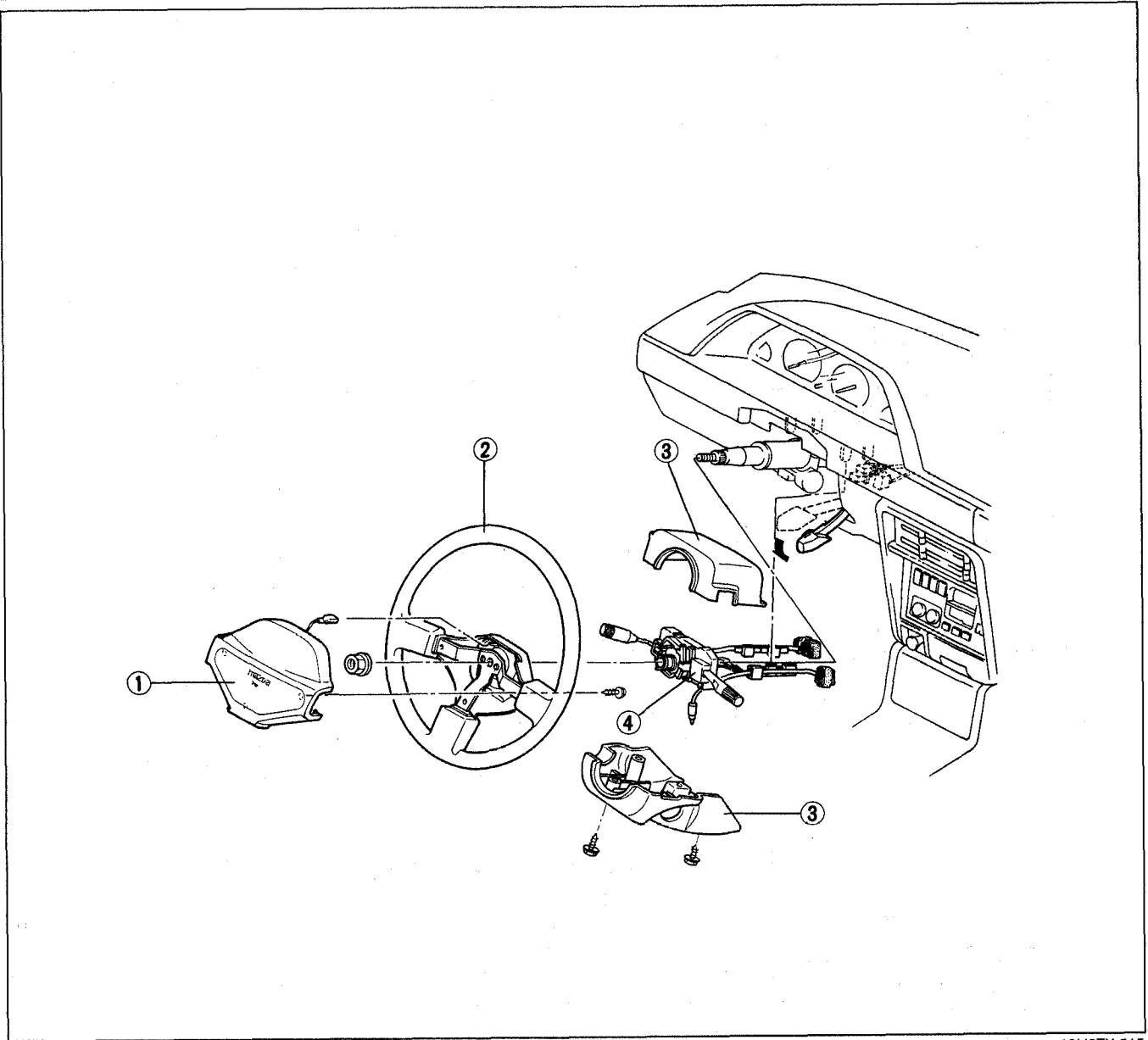
1. Remove the switch.
2. Apply battery voltage to terminal "d" and ground to terminal "g".
3. Check that the voltage at terminal "a" changes linearly when turning the switch.

Switch	Voltage
Min. position	10V
Max. position	0V

COMBINATION SWITCH

Removal / Installation (Except Canada without cruise control system)

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



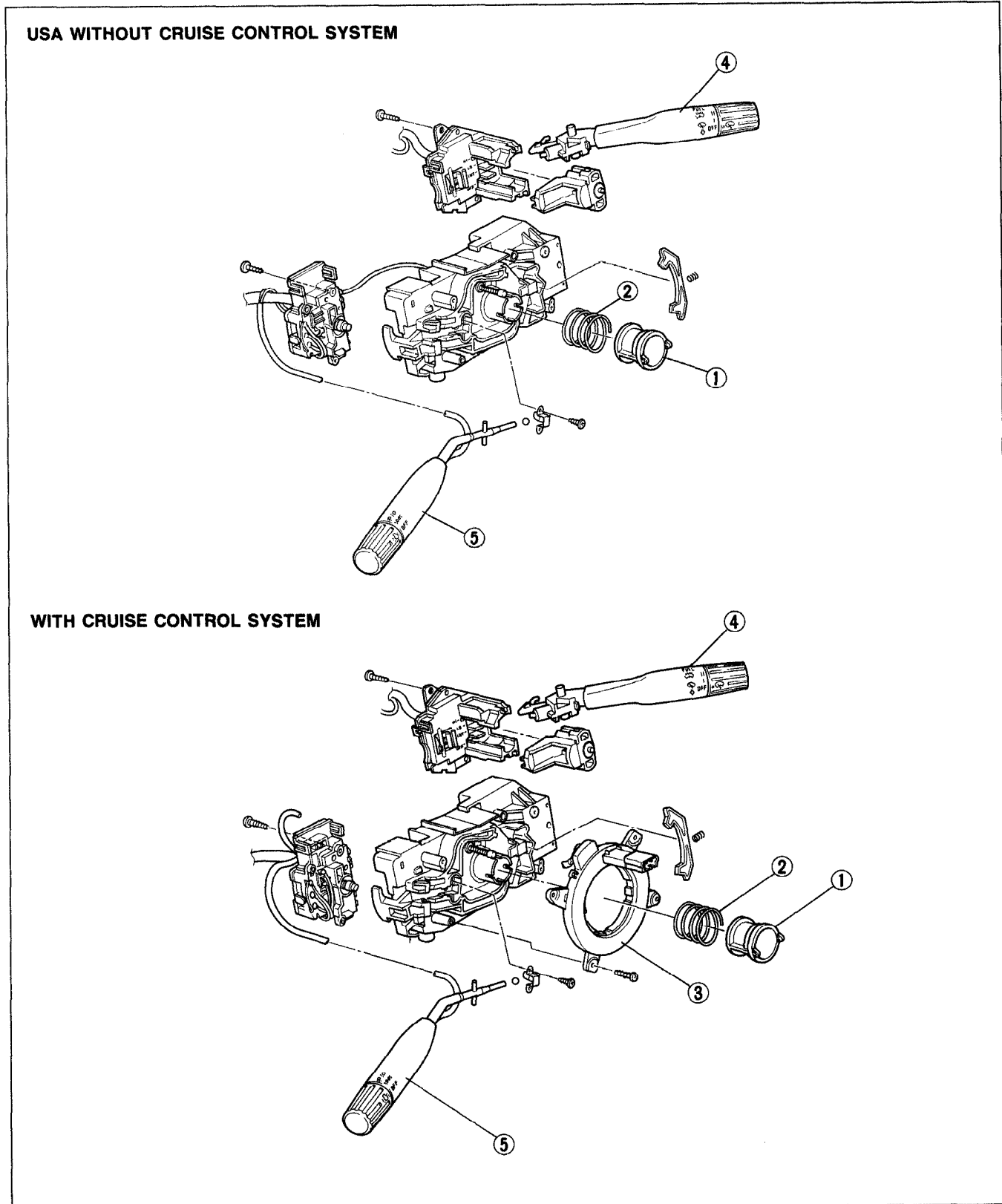
13U0TX-015

1. Horn cap
2. Steering wheel
3. Steering column cover

4. Combination switch
 Disassembly / Assembly page T-24
 Inspection page T-27

Disassembly / Assembly

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



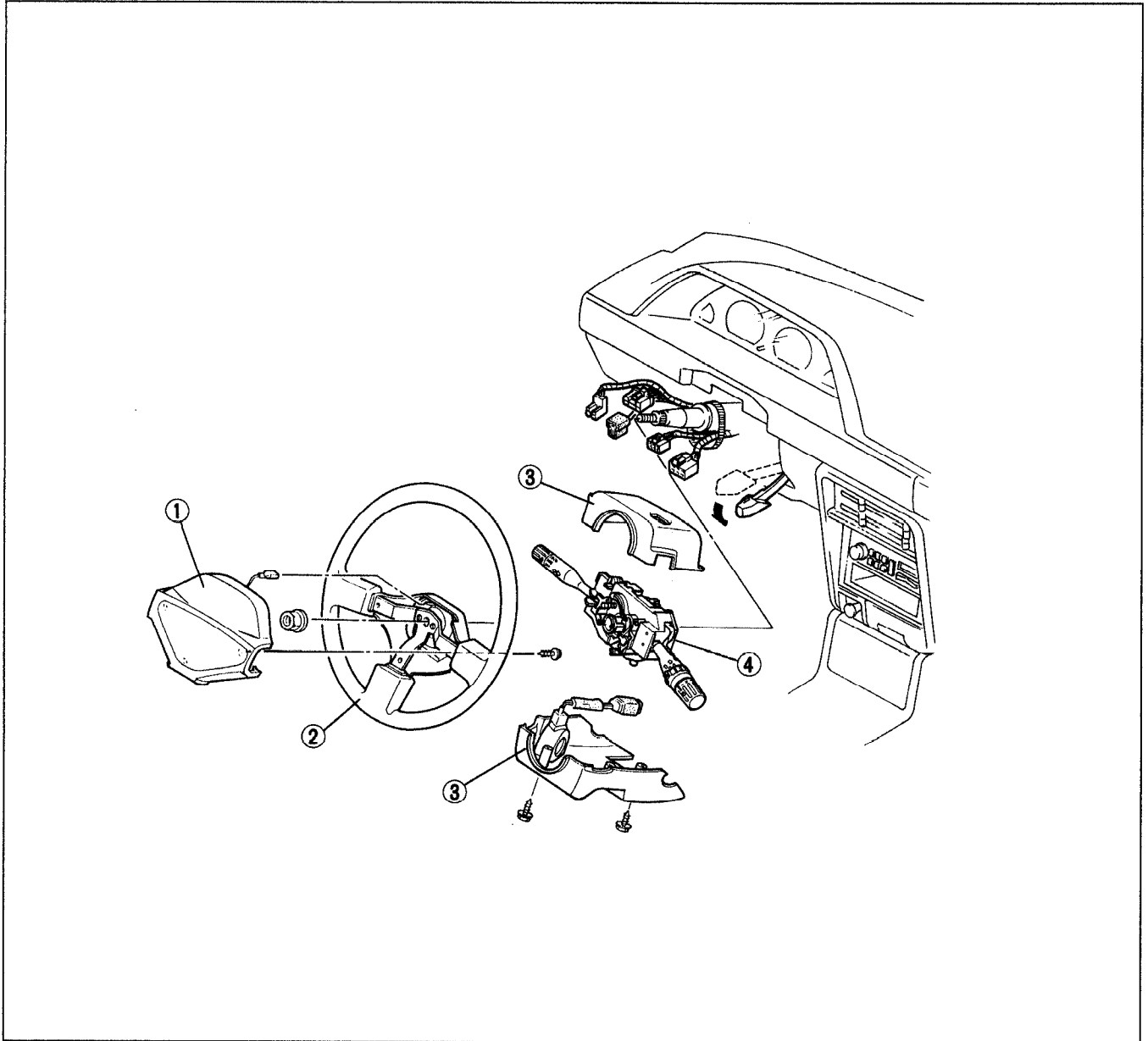
13U0TX-016

1. Cancel cam
2. Spring
3. Slip ring assembly

4. Wiper lever
5. Light unit

Removal / Installation (Canada without cruise control system)

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



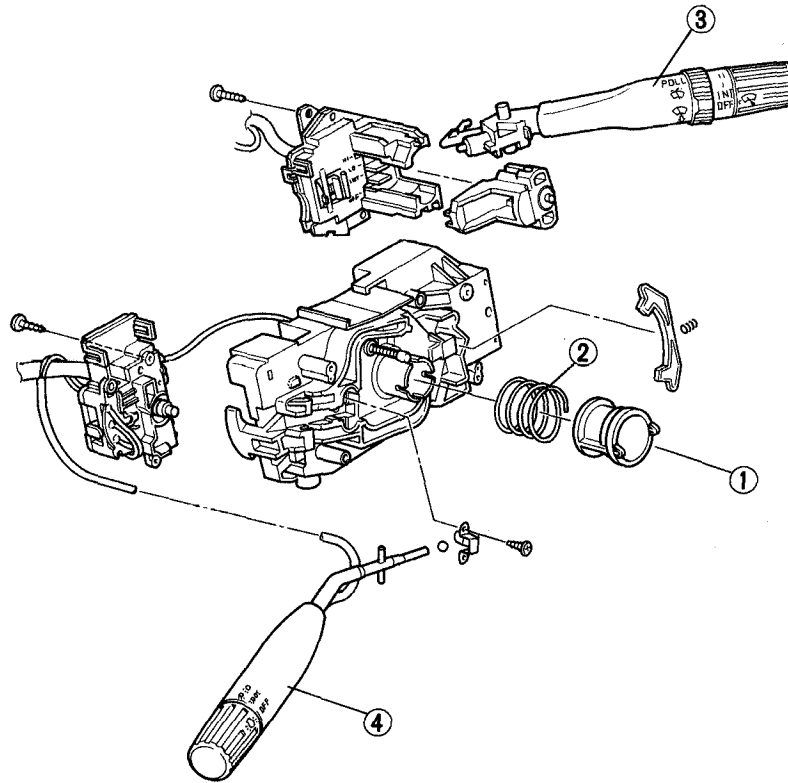
13U0TX-017

1. Horn cap
2. Steering wheel
3. Steering column cover

4. Combination switch
 - Disassembly / Assembly page T-26
 - Inspection page T-28

Disassembly / Assembly

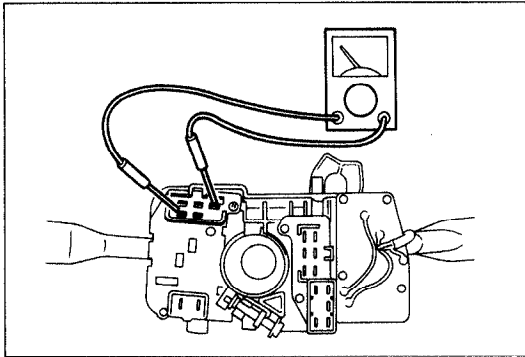
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

CANADA WITHOUT CRUISE CONTROL SYSTEM

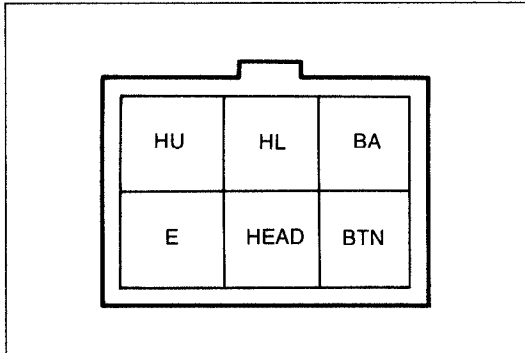
1. Cancel cam
2. Spring

3. Wiper lever
4. Light unit

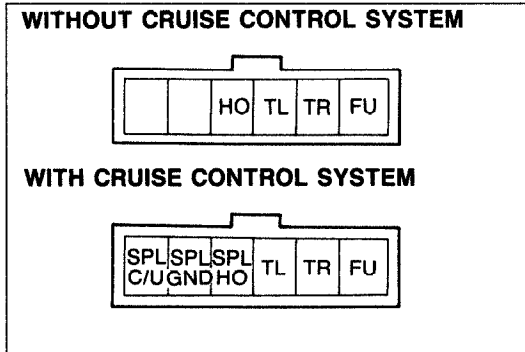
13U0TX-018



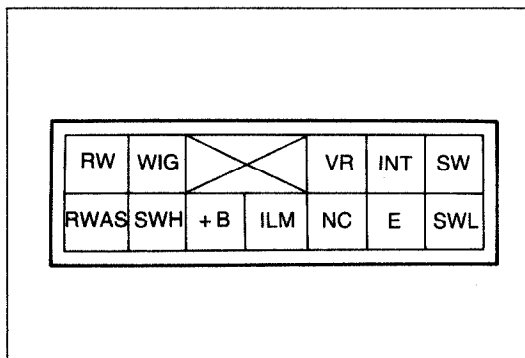
03U0TX-040



13U0TX-019



03U0TX-042



23U0TX-015

Inspection

1. Check for continuity between terminals with an ohmmeter.

**(Except Canada without cruise control system)
Light switch**

Position	Terminal	BTN	E	HEAD	BA	HU	HL
OFF							
Small		○—○					
		○—○—○					
Light ON	Lo				○—○—○		○
	Hi				○—○		
Flash-to-pass		○—○—○		○—○	○—○		

○—○: Indicates continuity

Turn signal switch

Turn	FU	TL	TR
Left	○—○		
OFF			
Right	○—○		○—○

○—○: Indicates continuity

Windshield wiper and washer switch

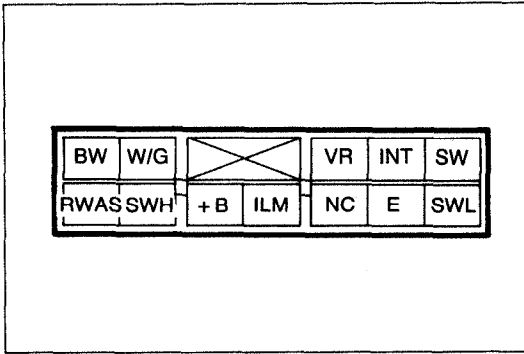
Position	Terminal	E	INT	SWL	SWH	WIG	SW
Wiper switch	OFF	One touch OFF					
		One touch ON	○—○—○				
	INT	○—○	○—○	○—○			
	I	○—○	○—○	○—○			
	II	○—○	○—○	○—○			
Washer ON						○—○	

○—○: Indicates continuity

Rear wiper switch (Without intermittent type)

Position	Terminal	RW	RWAS	E
OFF				
One touch		○—○		○—○
Wiper ON		○—○		○—○
Washer ON		○—○	○—○	○—○

○—○: Indicates continuity

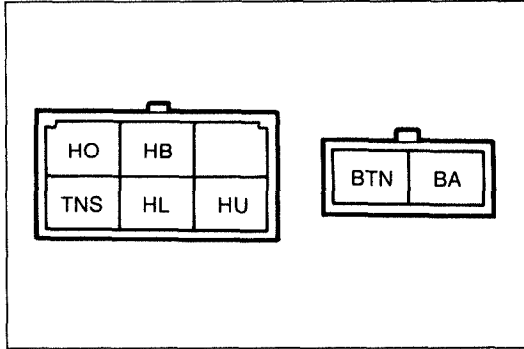


23U0TX-016

Rear wiper switch (With intermittent type)

Position	Terminal	RW	RWAS	E
OFF				
One touch		○—○		○—○
Wiper ON			○—○	○—○
Washer ON			○—○	○—○

○—○: Indicates continuity

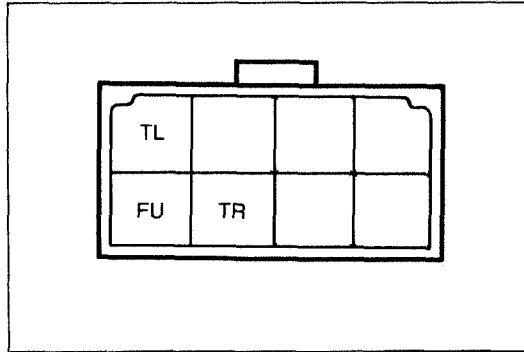


13U0TX-020

**(Canada without cruise control system)
Light switch**

Position	Terminal	BTN	TNS	HB	BA	HU	HL
OFF							
Small		○—○	○—○				
Light ON	Lo				○—○	○—○	○—○
	Hi				○—○	○—○	
Flash-to-pass		○—○	○—○	○—○	○—○		

○—○: Indicates continuity

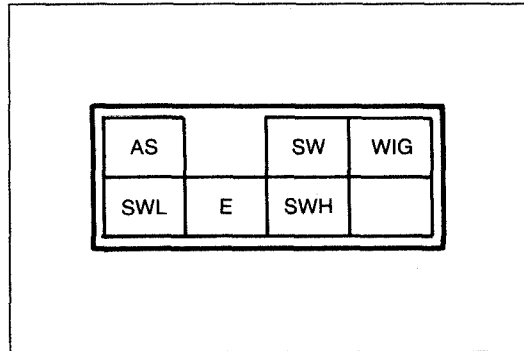


03U0TX-176

Turn signal switch

Turn	FU	TL	TR
Left	○—○	○—○	
OFF			
Right	○—○	○—○	○—○
OFF	○—○	○—○	○—○

○—○: Indicates continuity

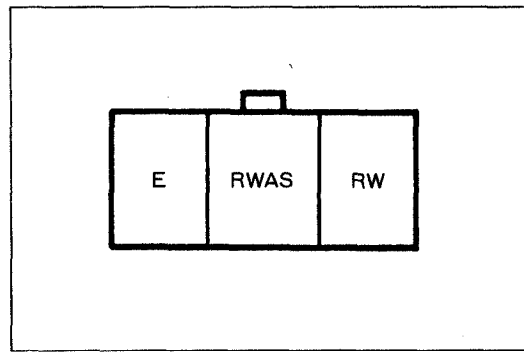


03U0TX-177

Windshield wiper and washer switch

Position	Terminal	AS	SWL	SWH	WIG	SW
Wiper switch	OFF		○—○			
	One touch OFF					
	One touch ON			○—○		
	INT		○—○			
	I (LOW)			○—○	○—○	
Washer ON	II			○—○	○—○	
					○—○	○—○

○—○: Indicates continuity



03U0TX-178

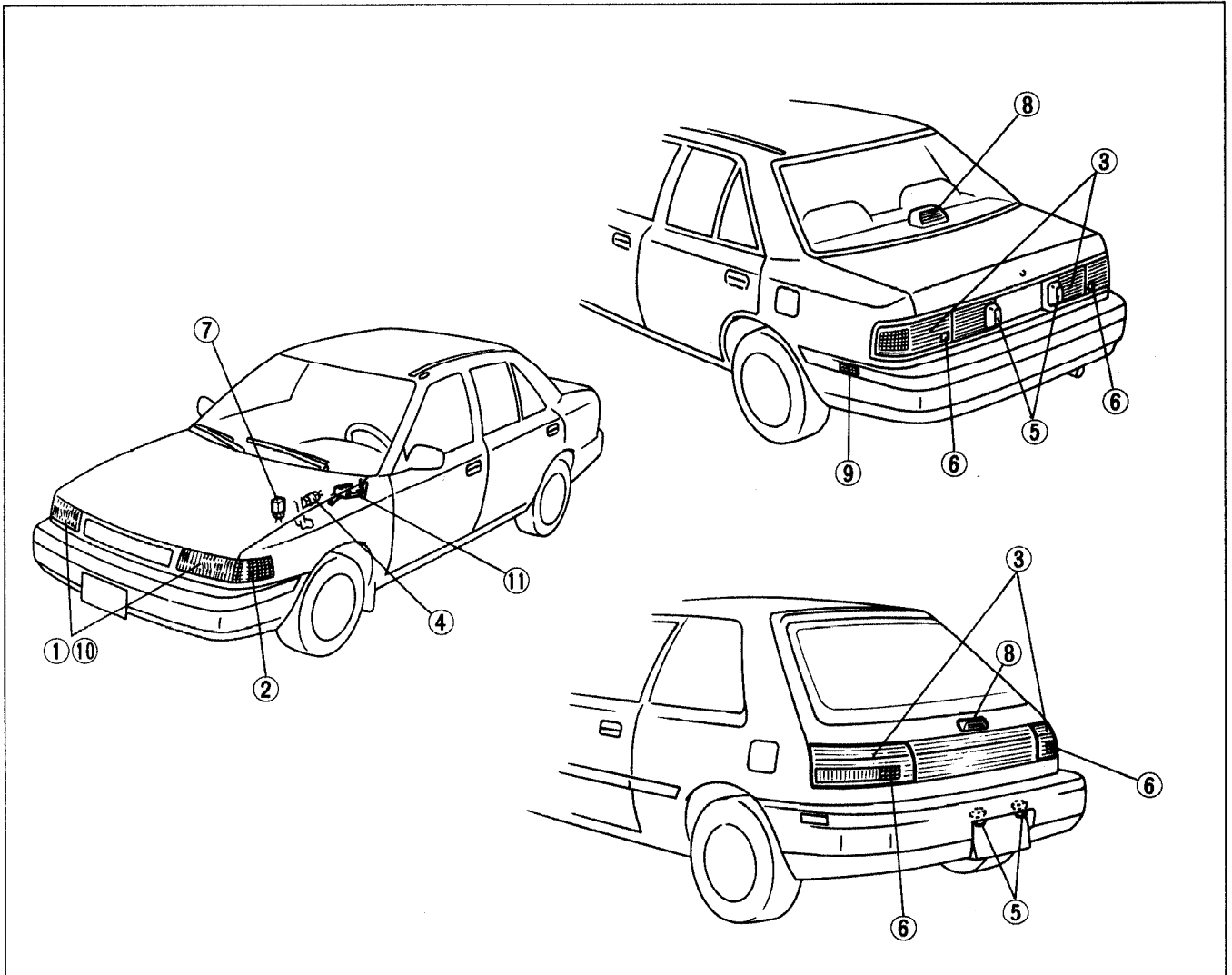
Rear wiper switch

Position	Terminal	RW	RWAS	E
OFF				
One touch		○—○	○—○	○—○
Wiper ON		○—○	○—○	○—○
Washer ON		○—○	○—○	○—○

○—○: Indicates continuity

EXTERIOR LIGHTING SYSTEM

STRUCTURAL VIEW



13U0TX-021

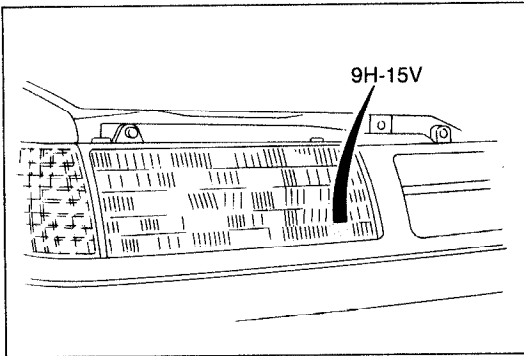
1. Headlight		5. License plate light	
Troubleshooting	page T-30	Troubleshooting	page T-37
Removal / Installation	page T-41	Removal / Inspection /	
Aiming.....	page T-30	Installation	page T-47
2. Front combination light		6. Back-up light switch	
Removal / Installation	page T-41	Inspection	page T-47
(1) Turn and hazard warning light		7. Flasher unit	
Troubleshooting	page T-34	Inspection	page T-42
(2) Small light control system		8. High-mount stoplight	
Troubleshooting	page T-37	Removal / Inspection /	
3. Rear combination light		Installation	page T-45
Removal / Installation	page T-43	9. Rear side marker light	
Disassembly / Assembly	page T-44	Removal / Installation	page T-48
(1) Turn and hazard warning light		10. Daytime running light (DRL) system	
Troubleshooting	page T-34	Troubleshooting	page T-33
(2) Parking light control system		Inspection	page T-42
Troubleshooting	page T-37	11. DRL resistor	
(3) Stoplight		Removal / Installation	page T-46
Troubleshooting	page T-39	Inspection	page T-46
4. Stoplight switch			
Inspection	page T-47		

Specifications

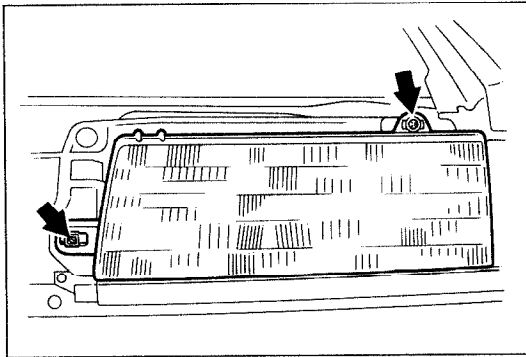
* PROTEGÉ

Item	Number	Specification (W) (Bulb trade number)
Headlight	2	65/45 (9004)
Front turn signal/Parking light	2	27/8 (1157)
Stop/Taillight	2*, 4 (3HB)	27/8 (1157)
High mount stoplight	1	18.4 (1141)
Rear turn signal light	2	27 (1156)
Back-up light	2	27 (1156)
License plate light	2	7.5 (89)*, 5 (168) [3HB]
Rear side marker light	2	3.8 (194)

13U0TX-022



03U0TX-046



9MU0TX-148

AIMING

1. Adjust the tire air pressure to specification.
2. Position the unloaded vehicle on a flat, level surface.

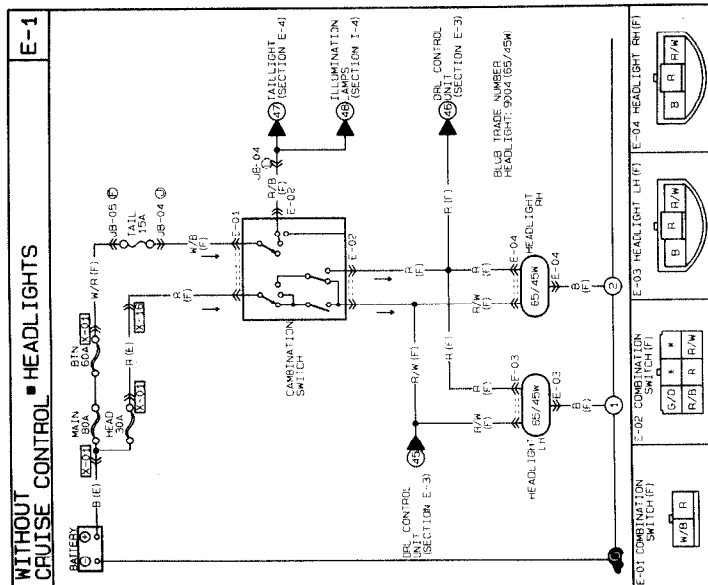
Note

- Adjust, using specification numbers 9H-15V (found on headlight lens) with a "HOPPY" brand aimer or equivalent.

3. Adjust the headlights to meet local regulations. To adjust, turn the two adjusting screws.

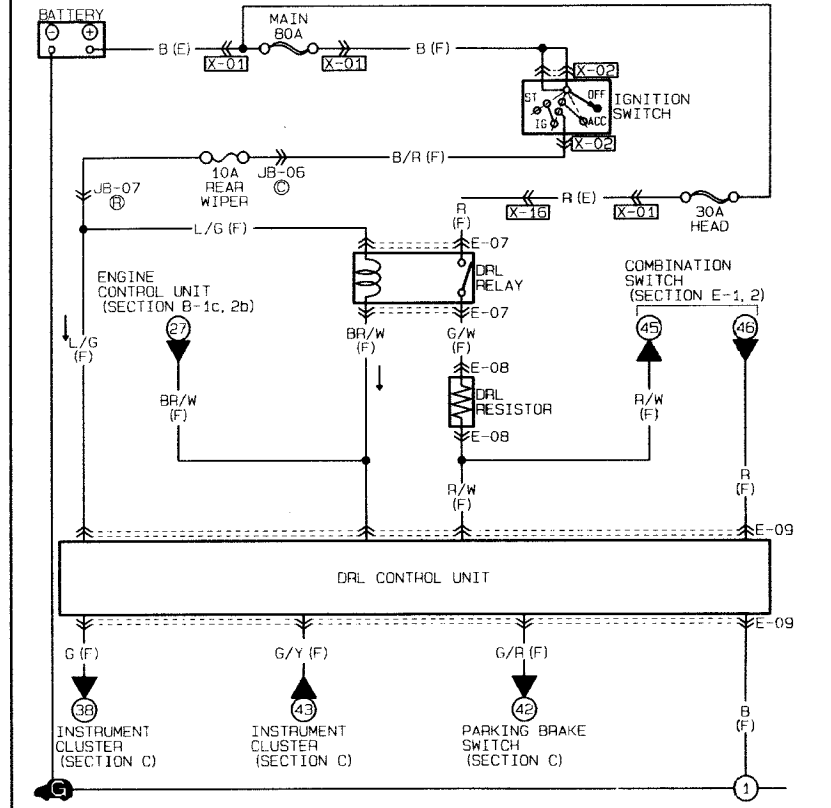
TROUBLESHOOTING

Headlight Circuit diagram



CANADA ■ DAYTIME RUNNING LIGHTS

E-3

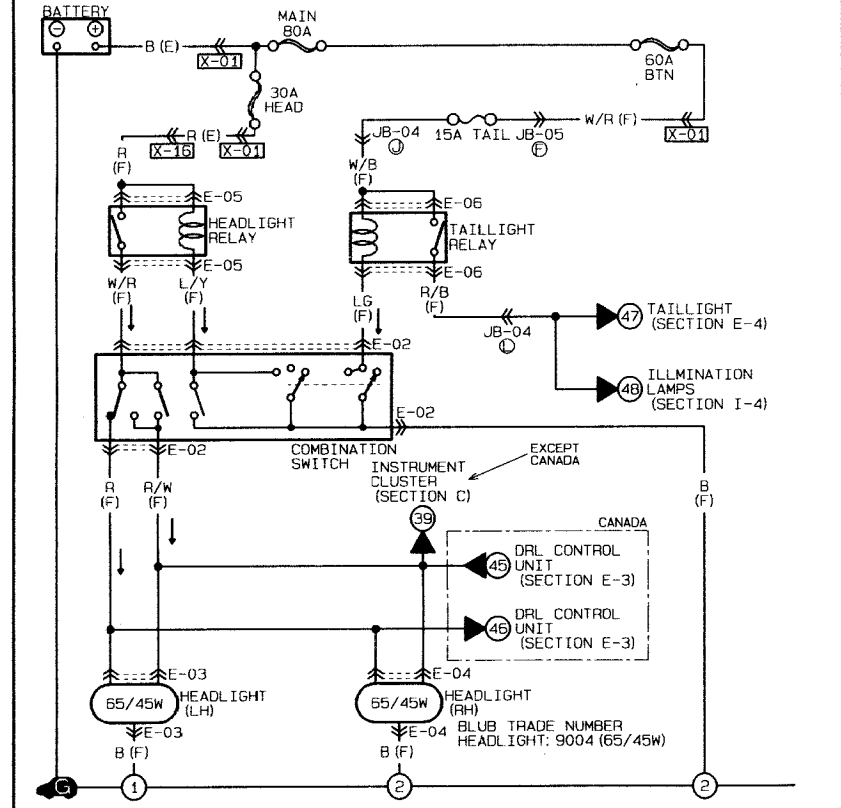


E-07 DRL RELAY (F)	E-08 DRL RESISTOR (F)	E-09 DRL CONTROL UNIT (F)

Daytime Running Light System
Circuit diagram

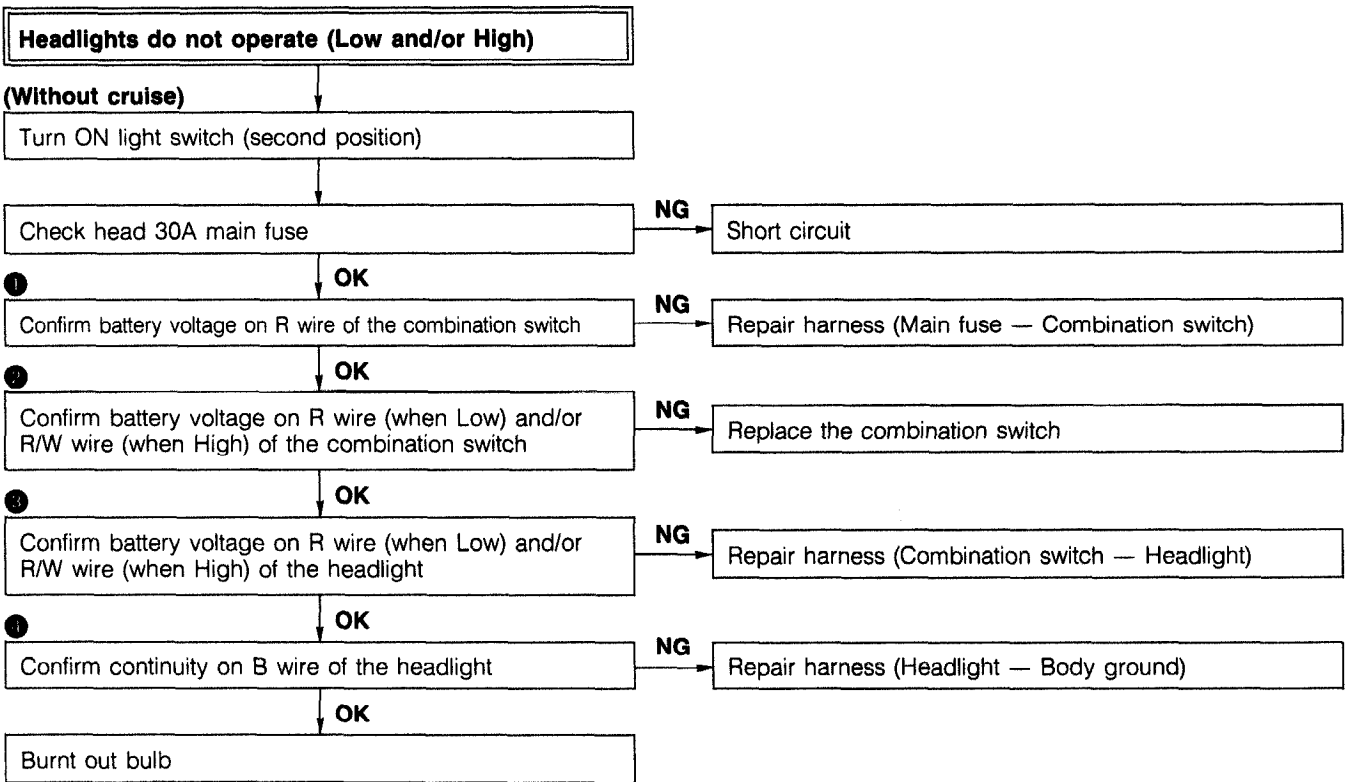
WITH CRUISE CONTROL ■ HEADLIGHTS

E-2

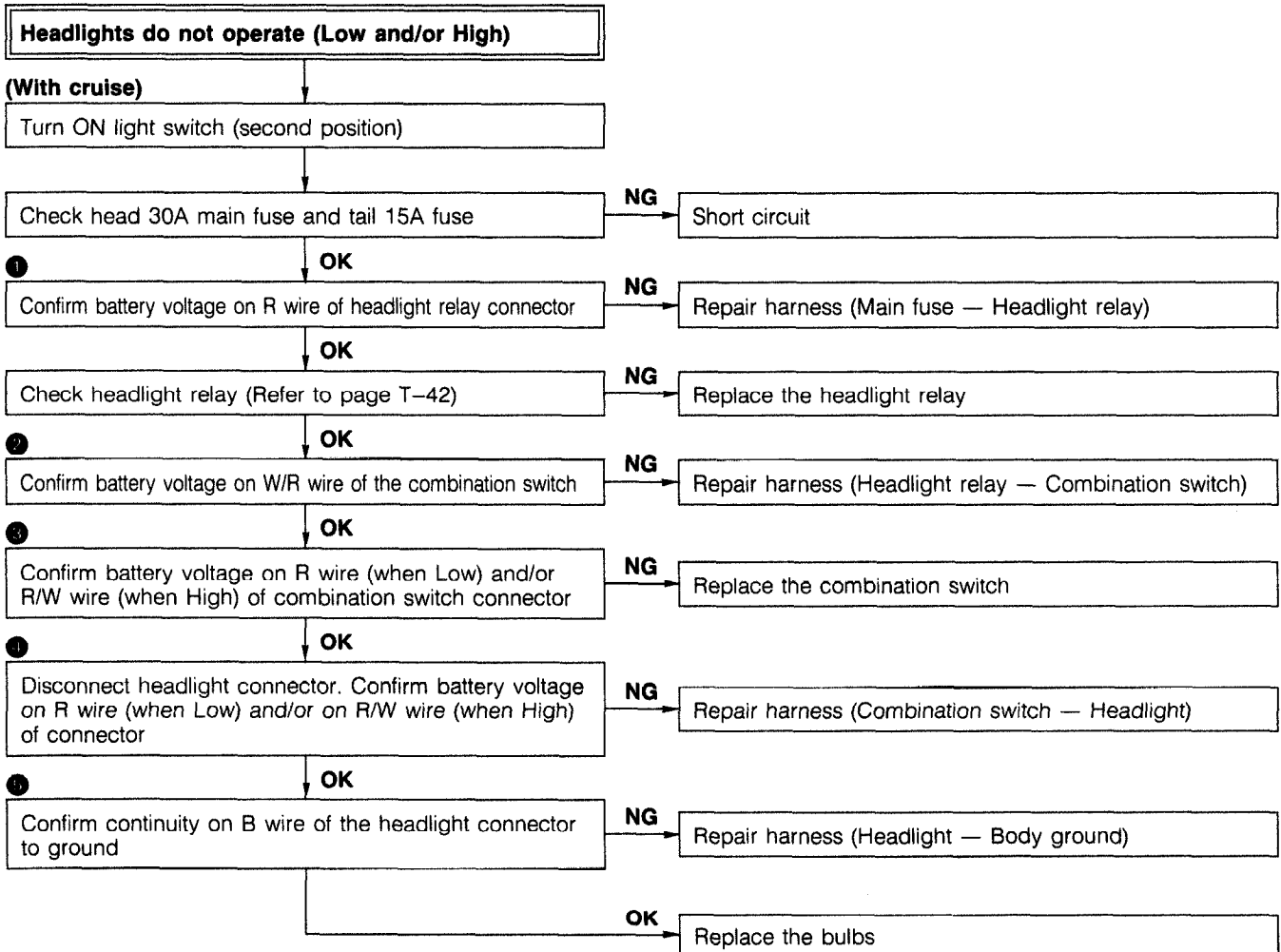


E-02 COMBINATION SWITCH (F)	E-03 HEADLIGHT LH (F)	E-04 HEADLIGHT RH (F)	E-05 HEADLIGHT RELAY (F)
E-06 TAILLIGHT RELAY (F)			

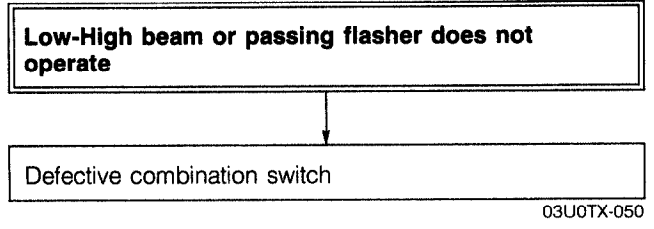
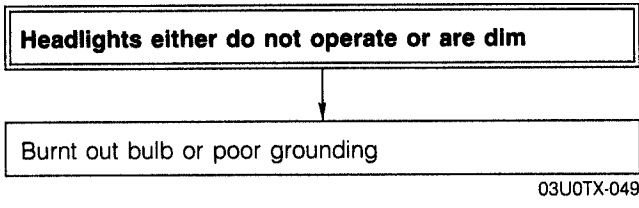
EXTERIOR LIGHTING SYSTEM



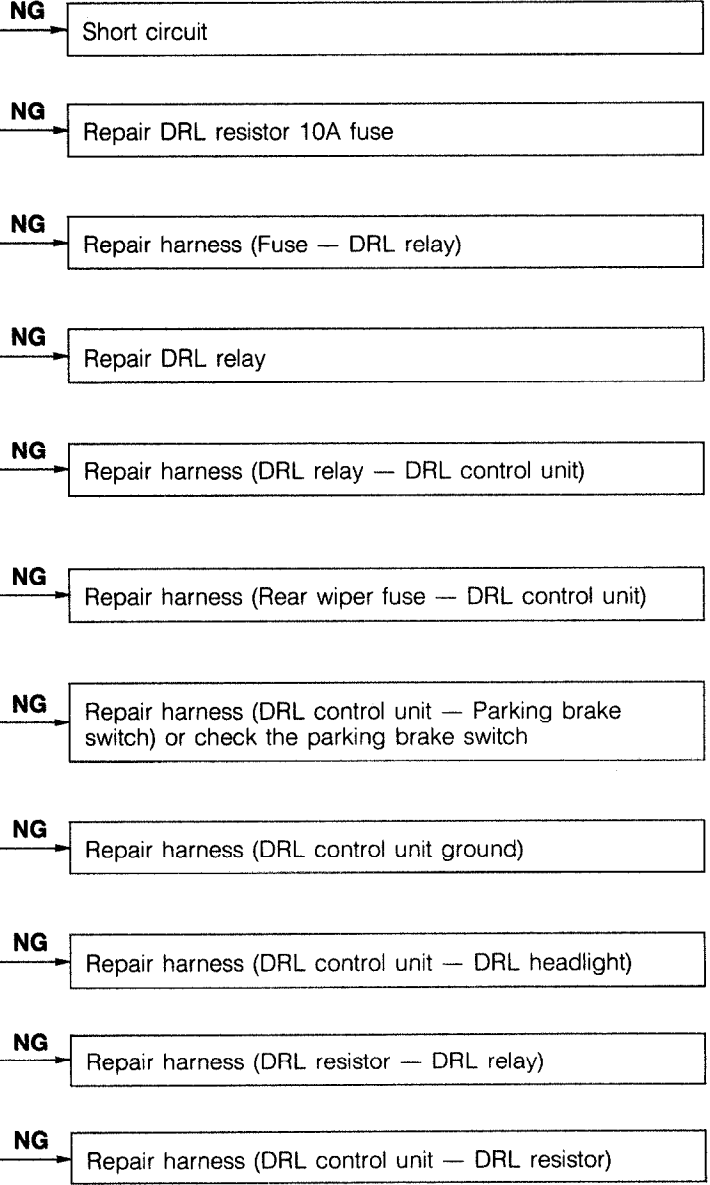
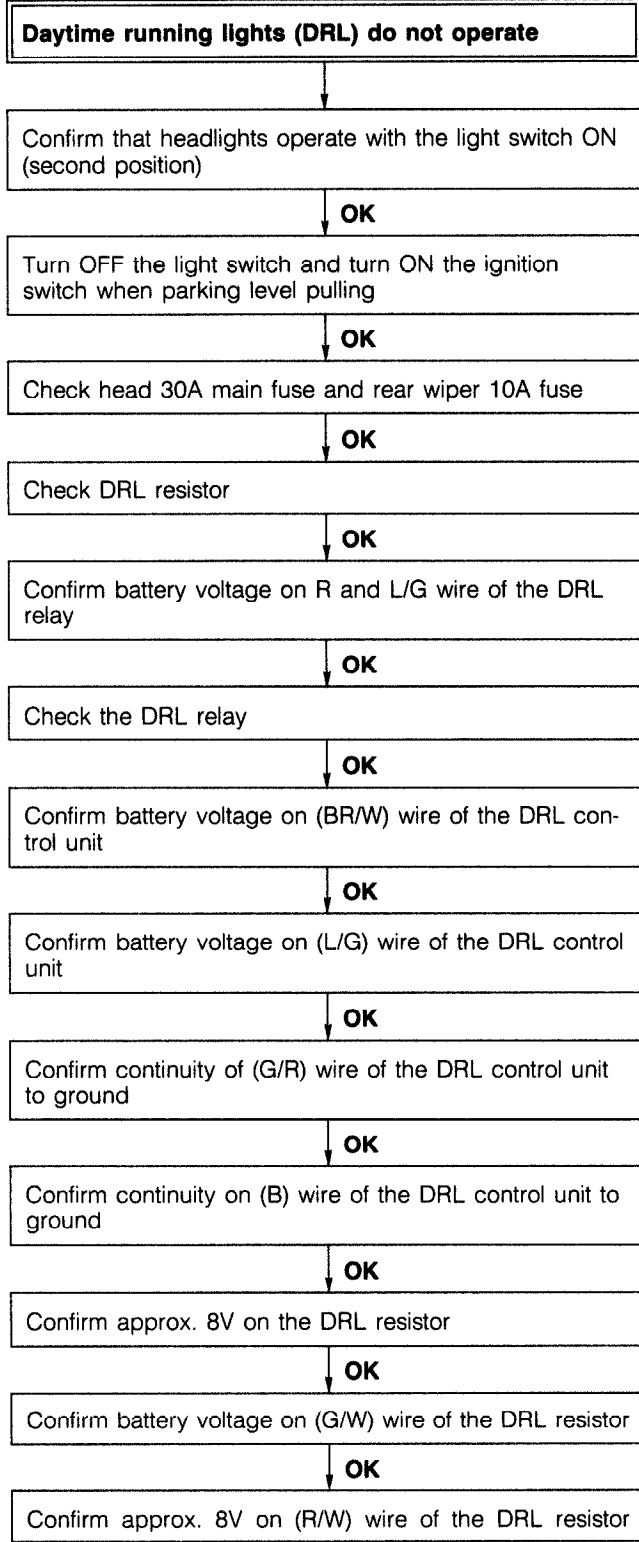
23U0TX-017



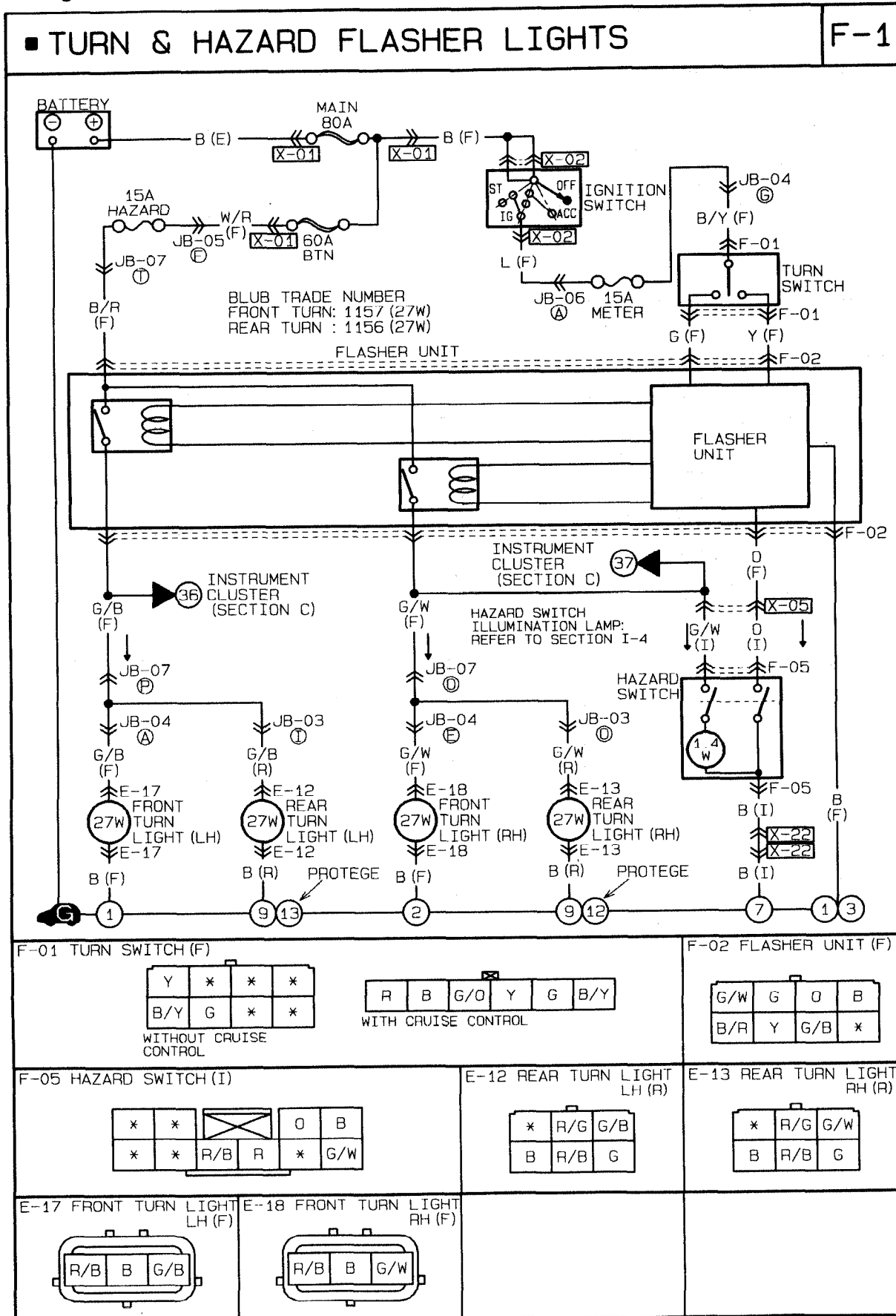
23U0TX-018

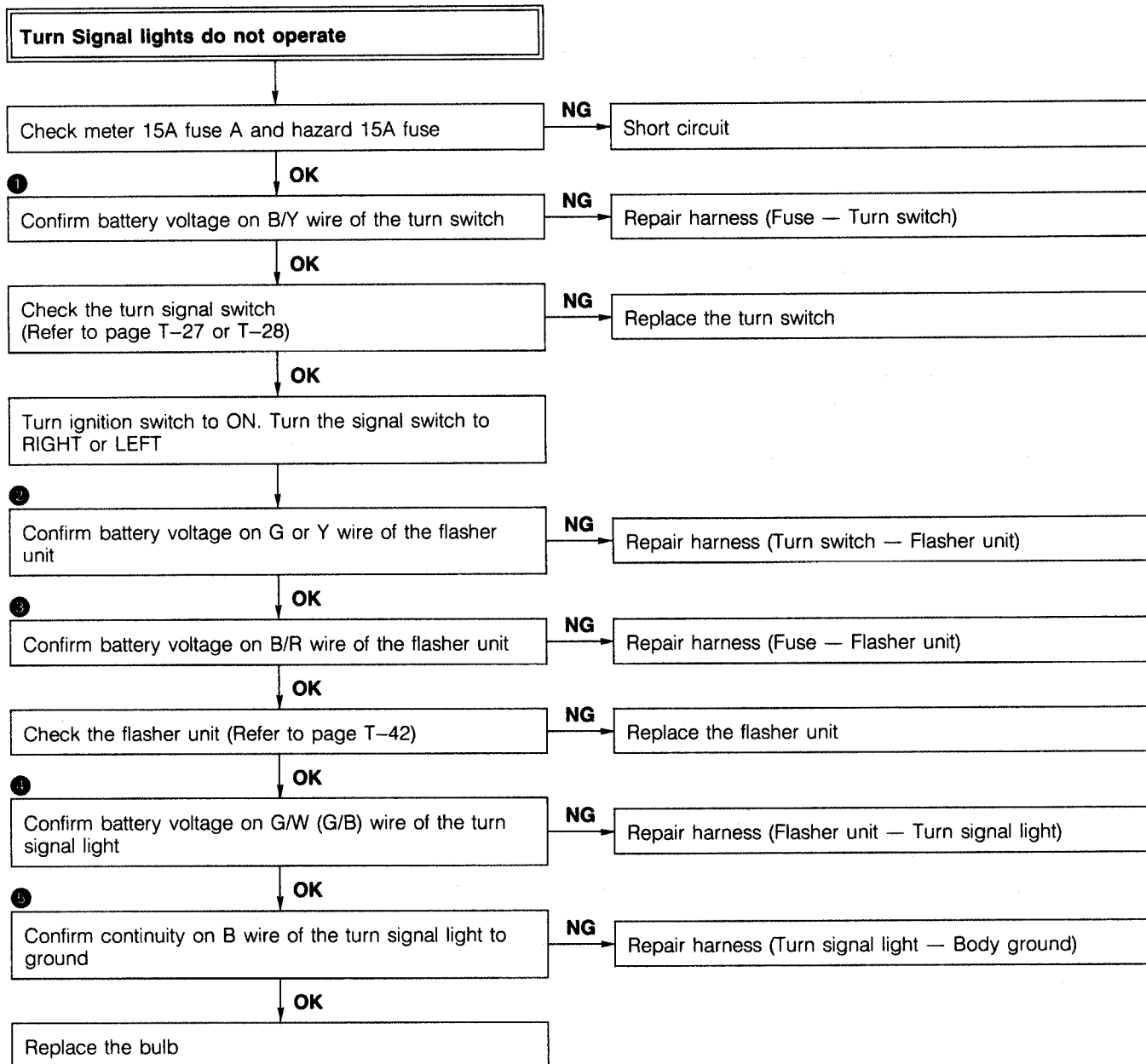


(Canada)

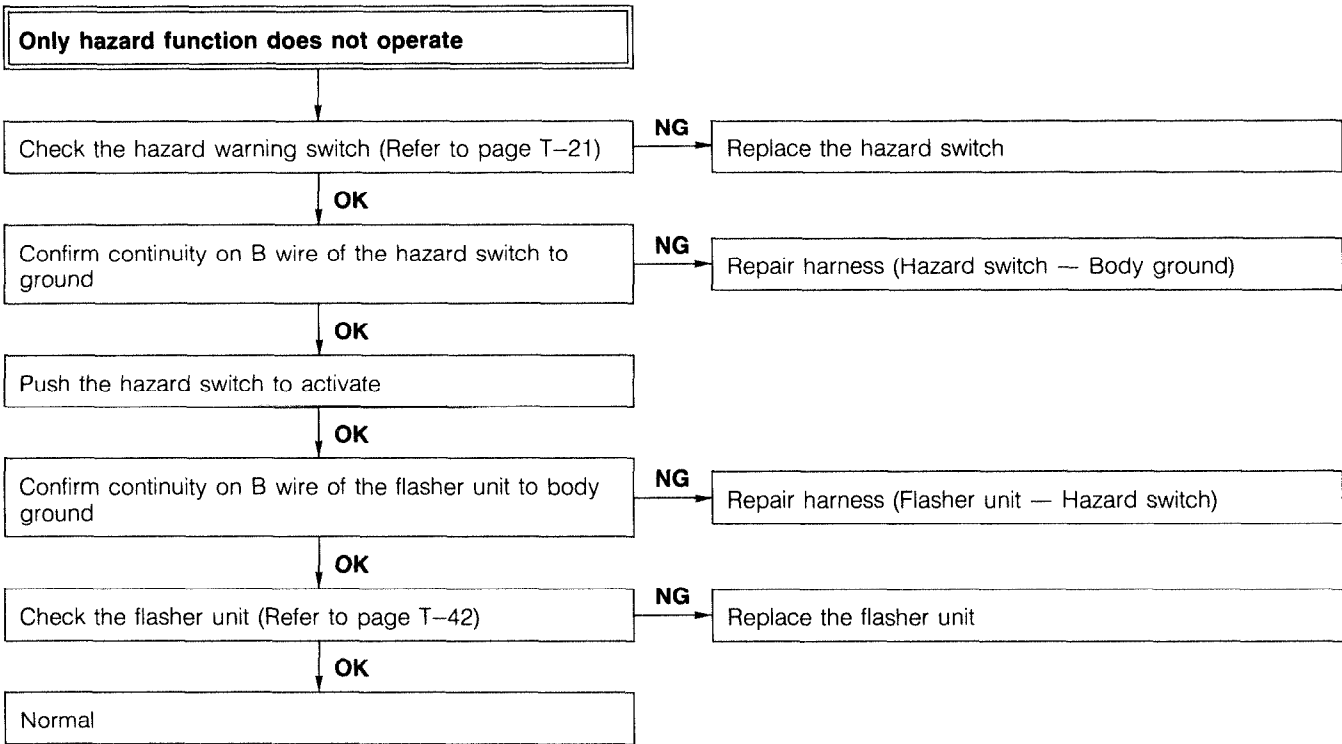


Turn and Hazard Warning Light
Circuit diagram

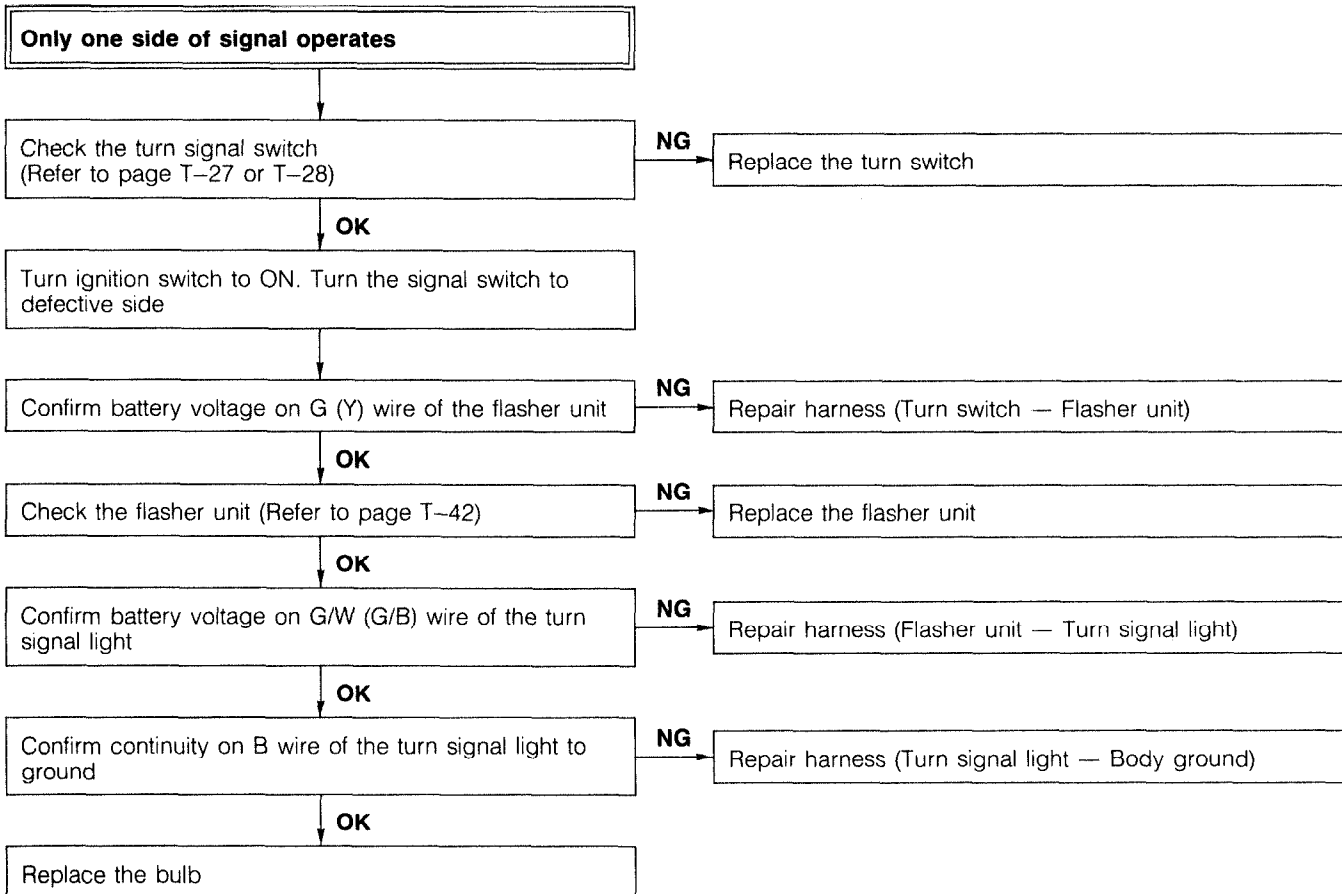




23U0TX-020



13U0TX-026



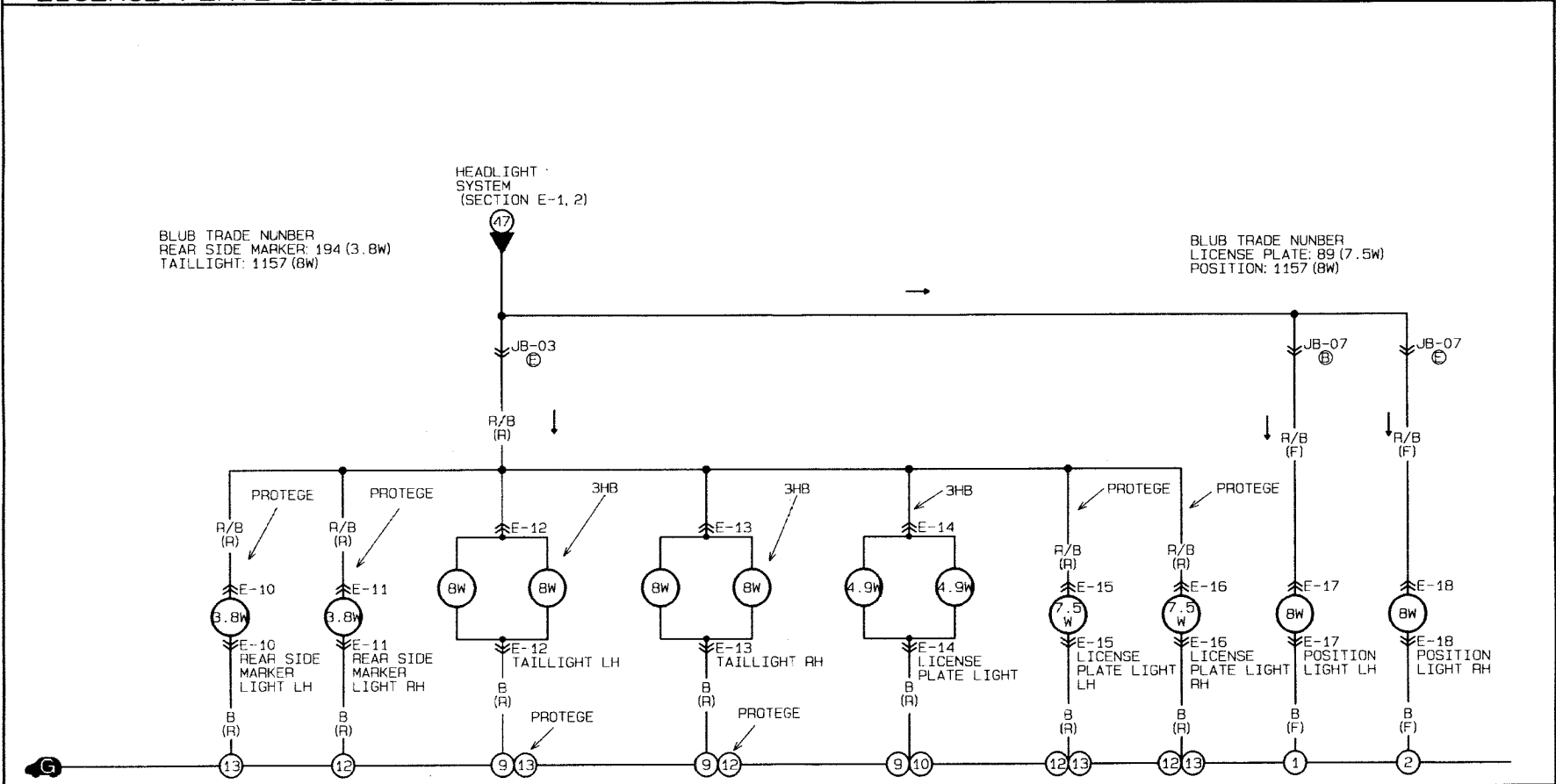
23U0TX-021

■ TAILLIGHTS ■ REAR SIDE MARKER LIGHTS ■ POSITION LIGHTS
 ■ LICENSE PLATE LIGHTS

E-4

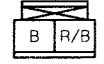
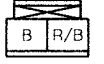
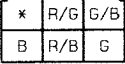
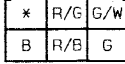
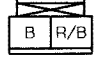
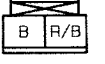
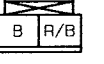
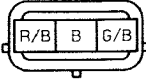
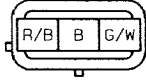
Parking Light Control System
 Circuit diagram

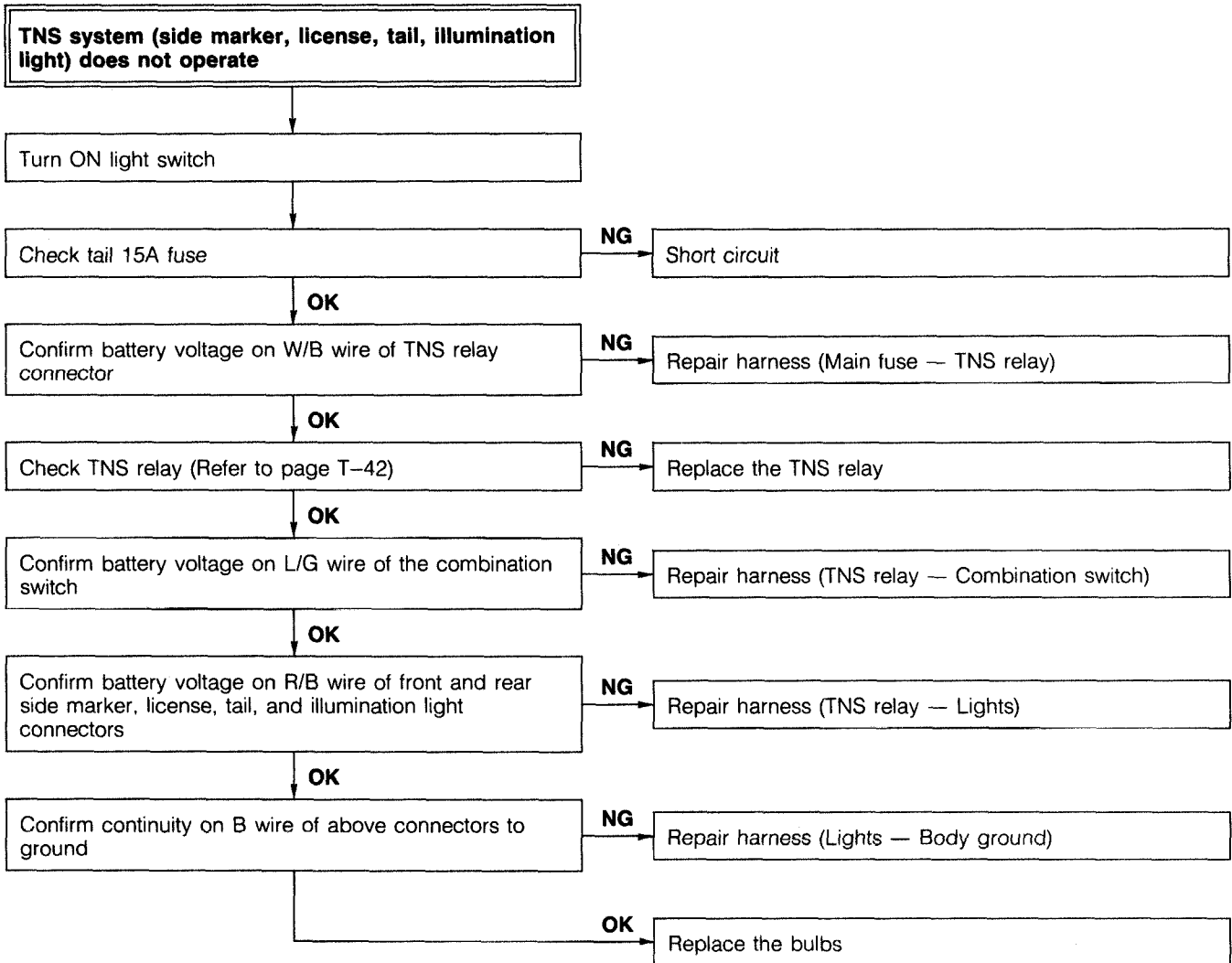
EXTERIOR LIGHTING SYSTEM



BLUB TRADE NUMBER
 REAR SIDE MARKER: 194 (3.8W)
 TAILLIGHT: 1157 (8W)

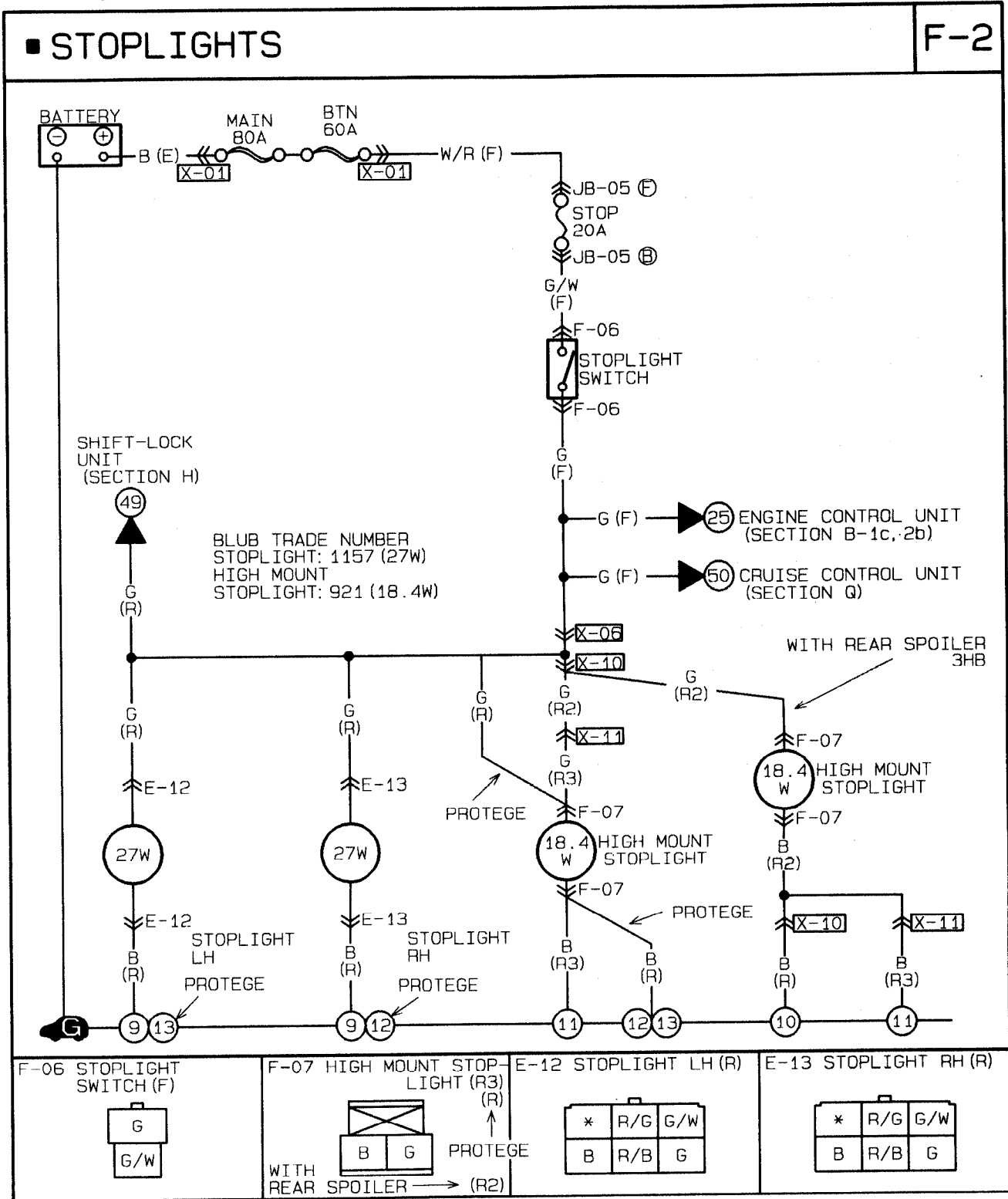
BLUB TRADE NUMBER
 LICENSE PLATE: 89 (7.5W)
 POSITION: 1157 (8W)

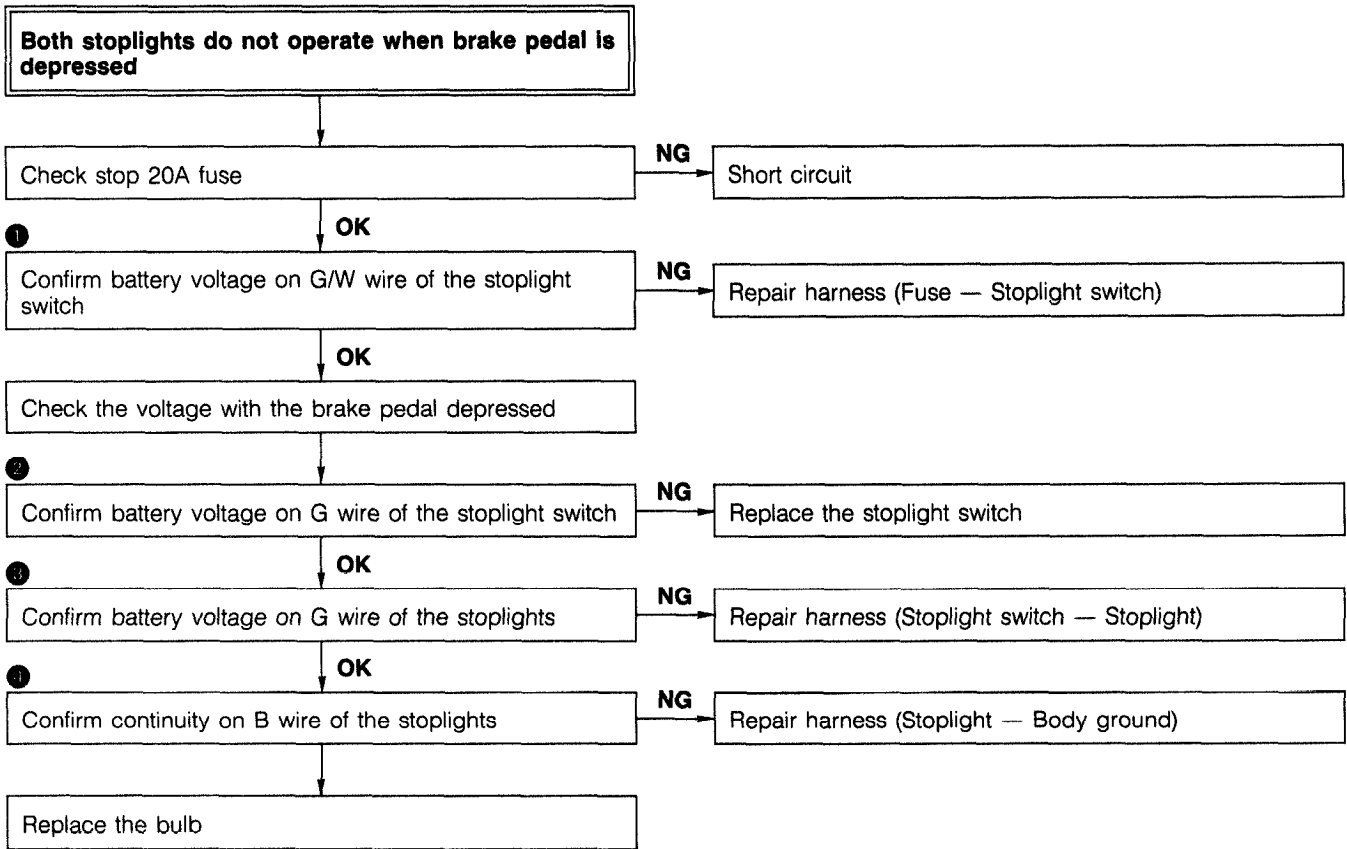
E-10 REAR SIDE MARKER LIGHT LH (R) 	E-11 REAR SIDE MARKER LIGHT RH (R) 	E-12 TAILLIGHT LH (R) 	E-13 TAILLIGHT RH (R) 	E-14 LICENSE PLATE LIGHT (R) 	E-15 LICENSE PLATE LIGHT LH (R) 	E-16 LICENSE PLATE LIGHT RH (R) 
E-17 POSITION LIGHT LH (F) 	E-18 POSITION LIGHT RH (F) 					



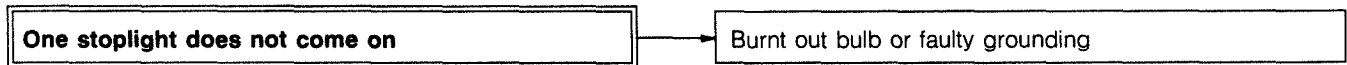
23U0TX-022

**Stoplight
Circuit diagram**





23U0TX-023

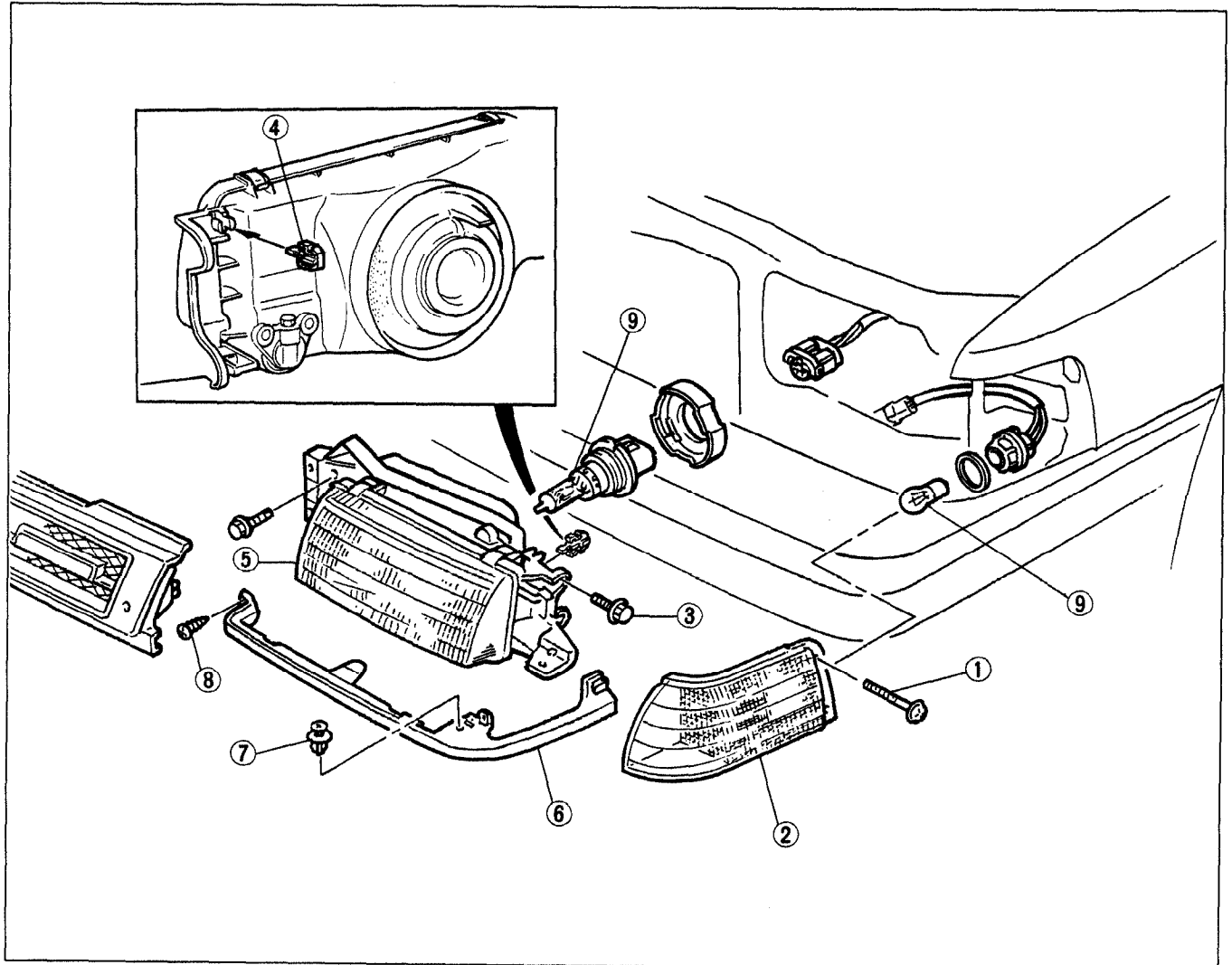


03U0TX-058

HEADLIGHT AND FRONT COMBINATION LIGHT

Removal / Installation

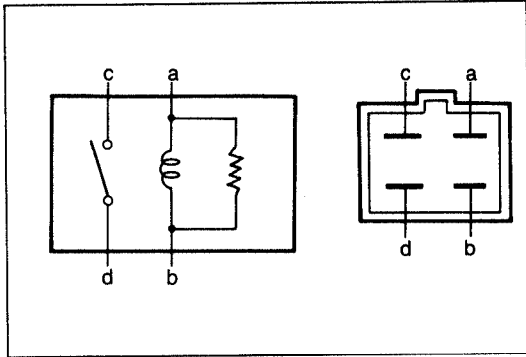
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



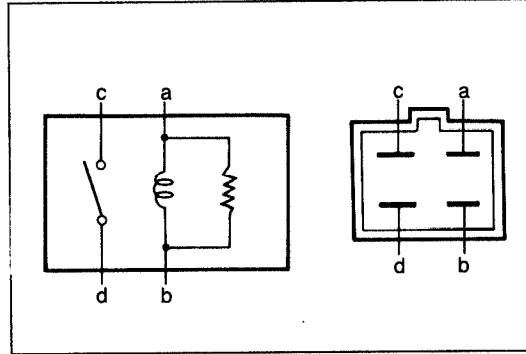
13U0TX-029

- | | |
|----------------------------|-----------|
| 1. Screw | |
| 2. Front combination light | |
| Inspection | page T-42 |
| 3. Bolt | |
| 4. Fastener | |
| 5. Headlight | |
| Inspection | page T-42 |
| Aiming | page T-30 |

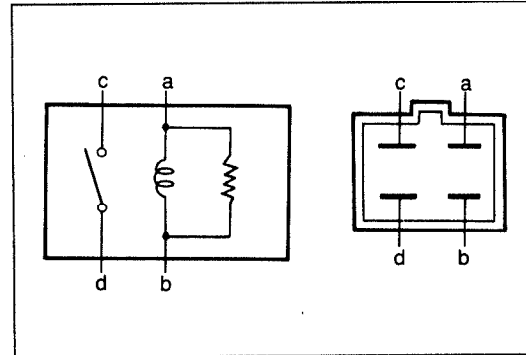
- | |
|-------------------------|
| 6. Lower grille molding |
| 7. Fastener |
| 8. Screw |
| 9. Bulb |



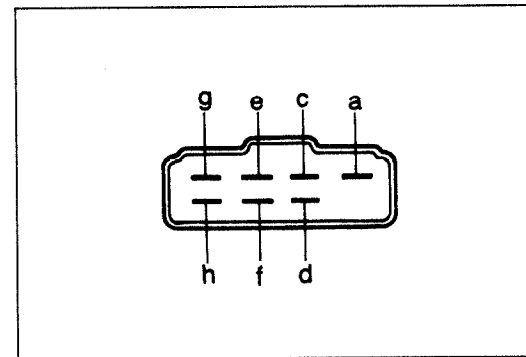
23U0TX-024



23U0TX-025



23U0TX-026



03U0TX-063

Inspection

Headlight (Headlight relay)

1. Disconnect the headlight relay connector and remove the relay.
2. Check for continuity between terminals of the relay.

V_B: Battery voltage

Connecting to		a	b	c	d
V _B	Ground				
—	—	○—○			
a	b			○—○	

○—○: Indicates continuity

Headlight (DRL relay)

1. Disconnect the DRL relay connector and remove the relay.
2. Check for continuity between terminals of the relay.

V_B: Battery voltage

Connecting to		a	b	c	d
V _B	Ground				
—	—	○—○			
a	b			○—○	

○—○: Indicates continuity

Front combination light (TNS relay)

1. Disconnect the TNS relay connector and remove the relay.
2. Check for continuity between terminals of the relay.

V_B: Battery voltage

Connecting to		a	b	c	d
V _B	Ground				
—	—	○—○			
a	b			○—○	

○—○: Indicates continuity

Front combination light (Flasher unit)

1. Check for continuity between terminals of the flasher unit.

Terminal	Continuity	Terminal	Continuity	Terminal	Continuity
a—c	X	d—e	X	f—g	X
a—d	X	d—f	X	f—h	X
a—e	○	d—g	X	g—a	X
a—f	○	d—h	X	g—c	X
a—g	X	e—a	X	g—d	X
a—h	X	e—c	X	g—e	X
c—a	○	e—d	X	g—f	X
c—d	○	e—f	X	g—h	X
c—e	○	e—g	X	h—a	○
c—f	○	e—h	X	h—c	○
c—g	○	f—a	X	h—d	○
c—h	○	f—c	X	h—e	○
d—a	X	f—d	X	h—f	○
d—c	X	f—e	X	h—g	○

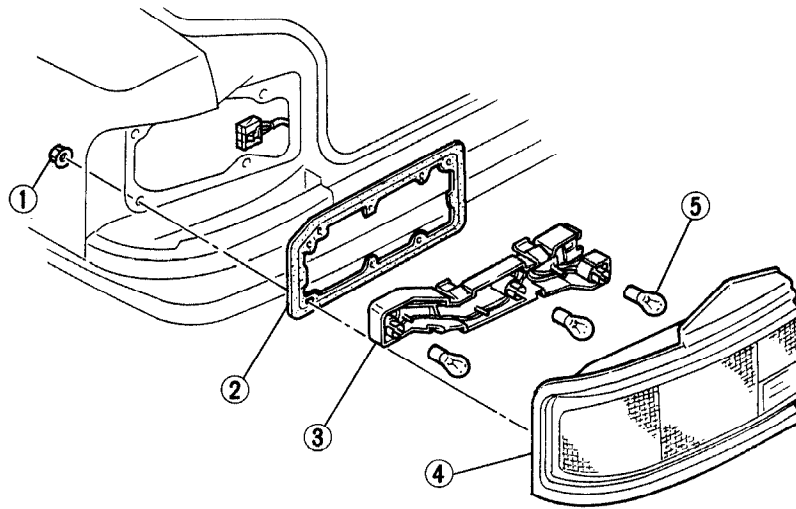
○: Indicates continuity X: No continuity

REAR COMBINATION LIGHT

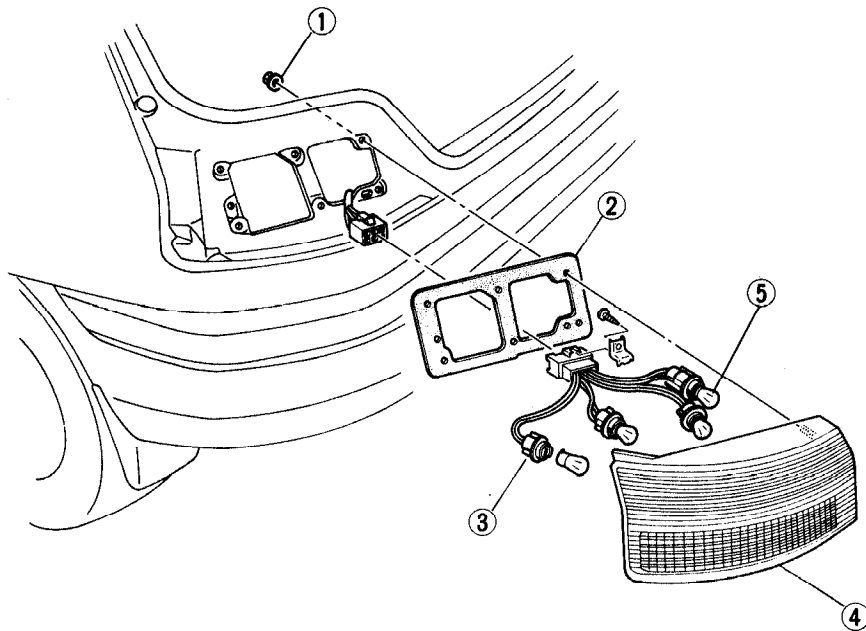
Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.

PROTEGÉ



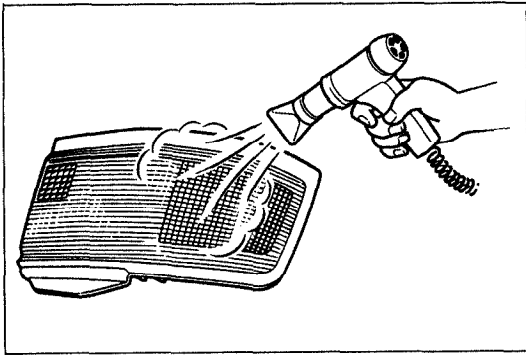
HATCHBACK



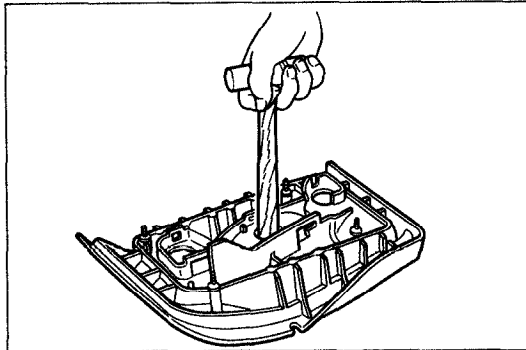
1. Nut
2. Gasket
3. Socket

4. Lens
Disassembly..... page T-44
Assembly page T-44
5. Bulb

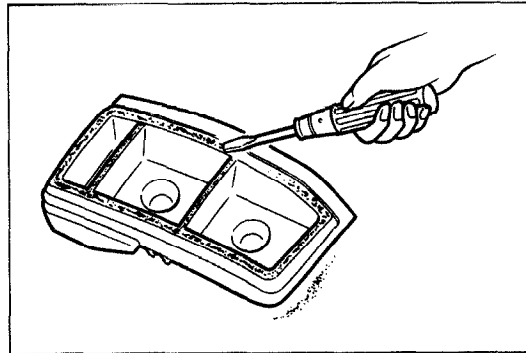
13U0TX-030



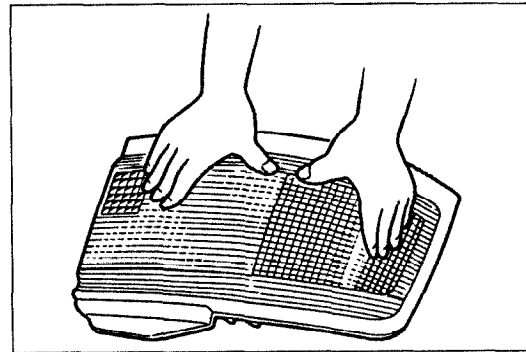
03U0TX-065



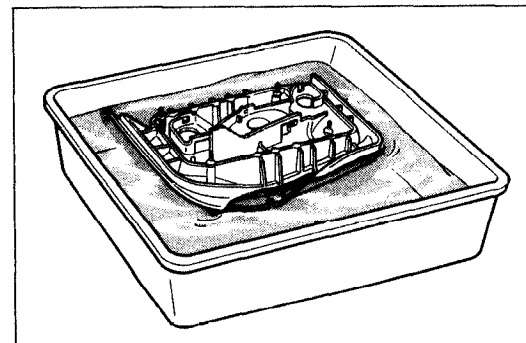
03U0TX-066



03U0TX-067



03U0TX-068



03U0TX-069

Disassembly

1. Use a hot air blower to soften the "hot melt" (bonding agent) around the lens.
2. Remove the lens from the light housing by pushing the rear of the lens with a hammer handle or round bar.

Note

- Remove the "hot melt" in the light housing when the new hot melt is used.

Assembly

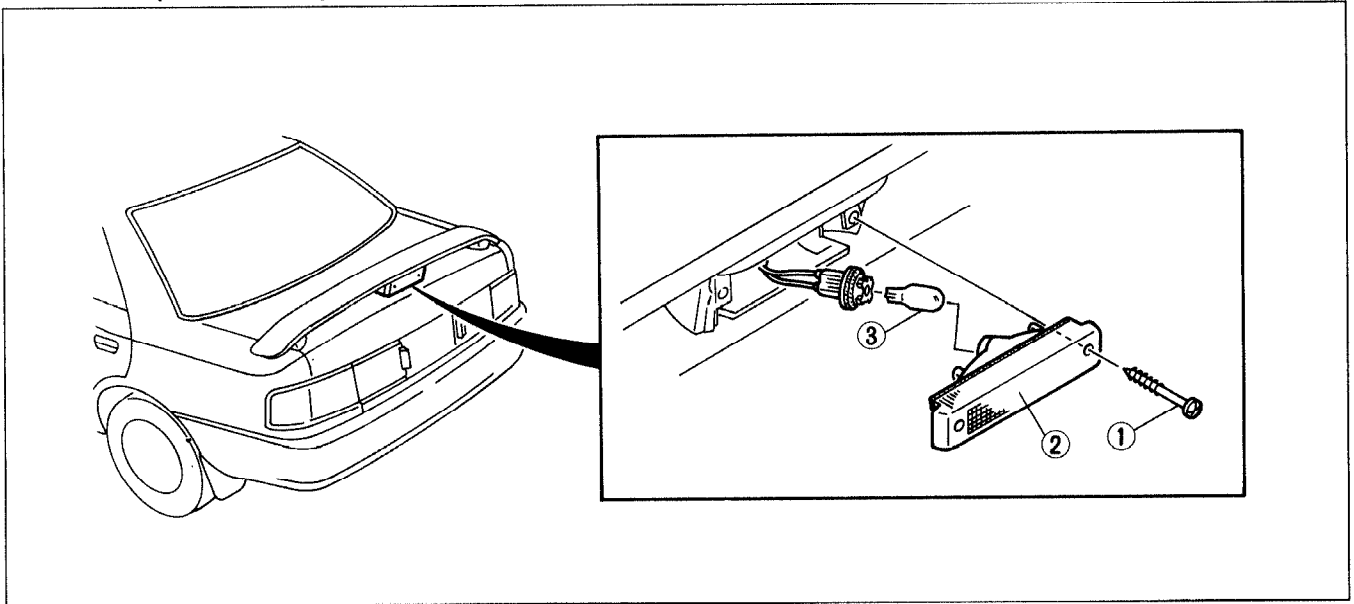
1. If the new hot melt is used, put **Uni-sealer** (8531 77 739) adhesive in the light housing groove.
2. Fit the new lens onto the light housing. Press the lens firmly so that it will adhere.
3. Immerse the combination light in water to check for leaks after about one hour.

HIGH-MOUNT STOPLIGHT

Removal / Inspection / Installation

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.

PROTEGÉ (With rear spoiler)

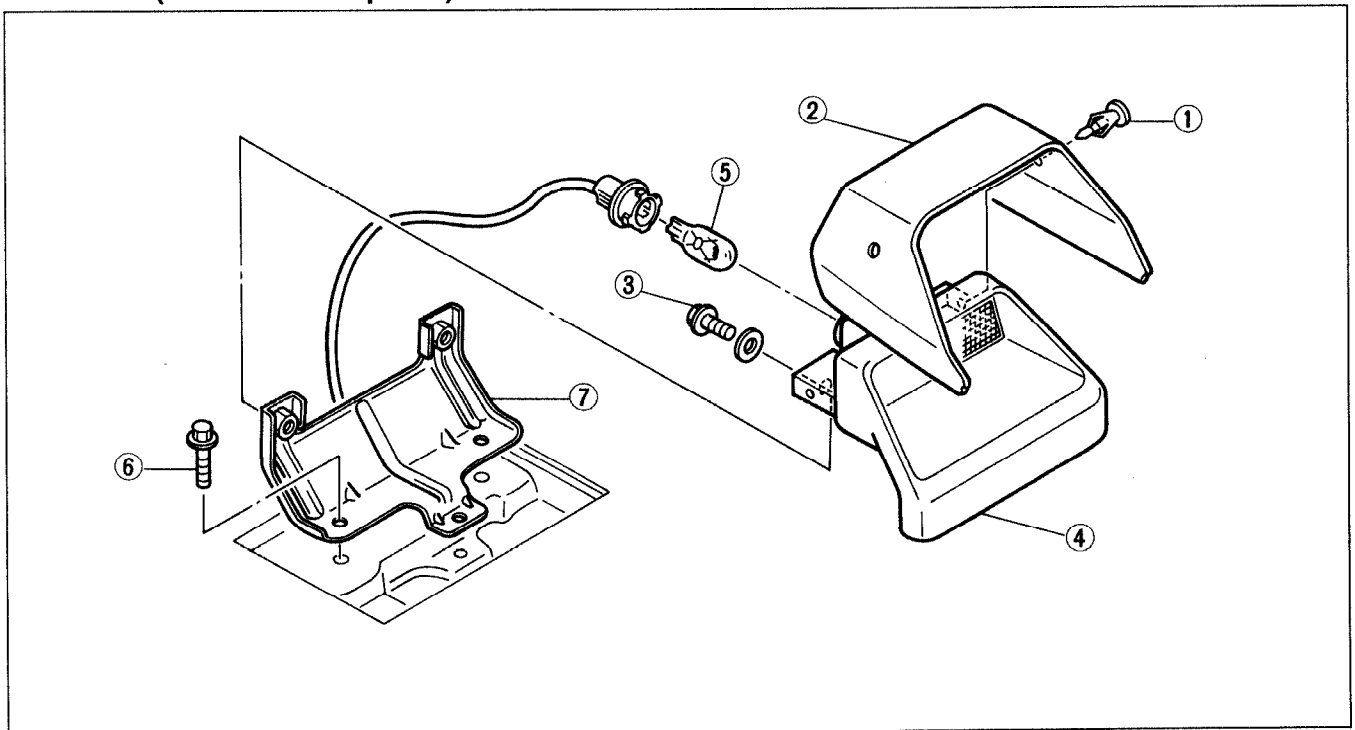


13U0TX-031

1. Screw
2. Lens

3. Bulb
Visual inspection

PROTEGÉ (Without rear spoiler)

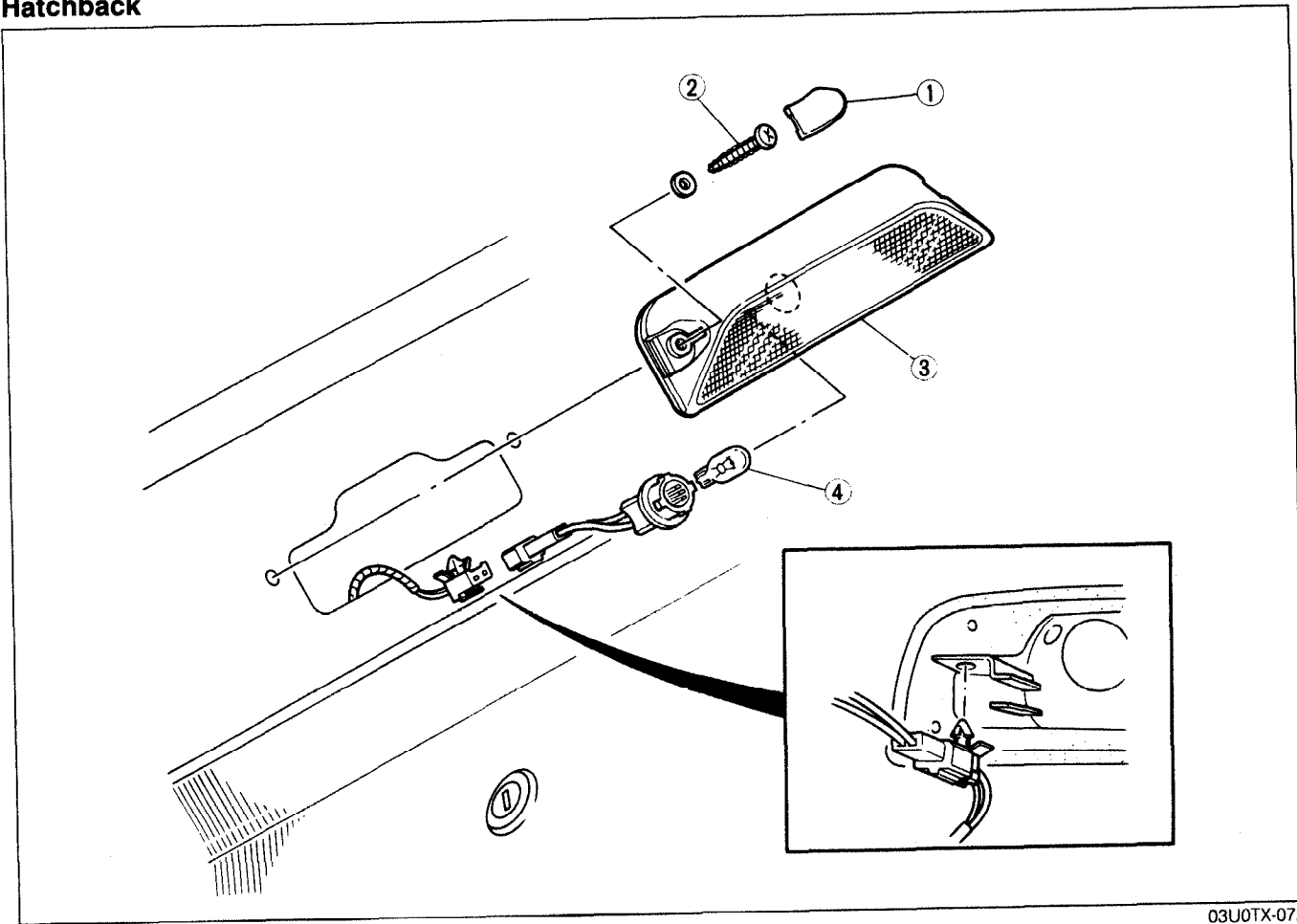


13U0TX-032

1. Fastener
2. Cover
3. Bolt
4. Lens

5. Bulb
Visual inspection
6. Bolt
7. Bracket

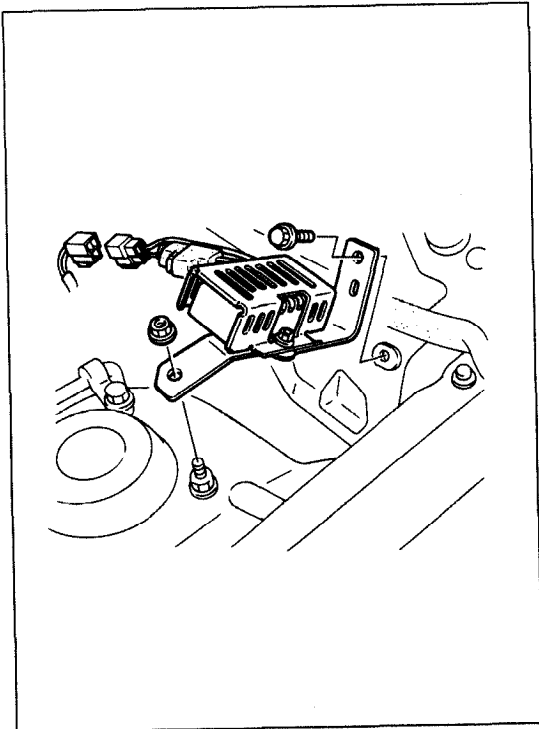
Hatchback



03U0TX-072

- 1. Cover
- 2. Screw
- 3. Lens

- 4. Bulb
Visual inspection



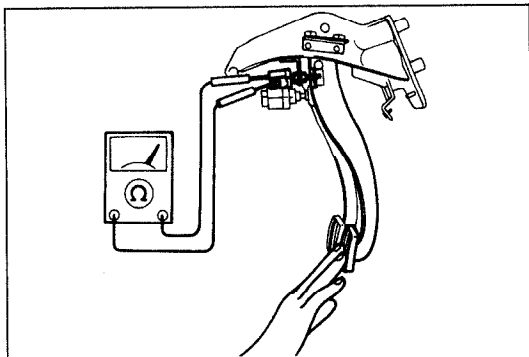
03U0TX-180

DRL RESISTOR Removal / Installation

1. Remove the nut and the bolt.
2. Remove the DRL resistor bracket.
3. Install in the reverse order of removal.

Inspection

Confirm that fuse is not burnt out.

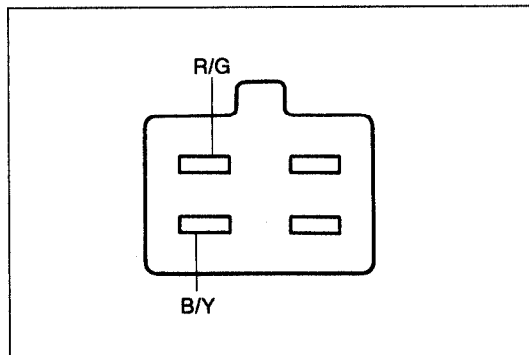


03U0TX-073

STOPLIGHT SWITCH

Inspection

1. Remove the stoplight switch connector.
2. Connect an ohmmeter between terminals of the stoplight switch.
3. Confirm continuity between the terminals when the brake pedal is depressed.



03U0TX-074

BACK-UP LIGHT SWITCH (For MTX)

Inspection

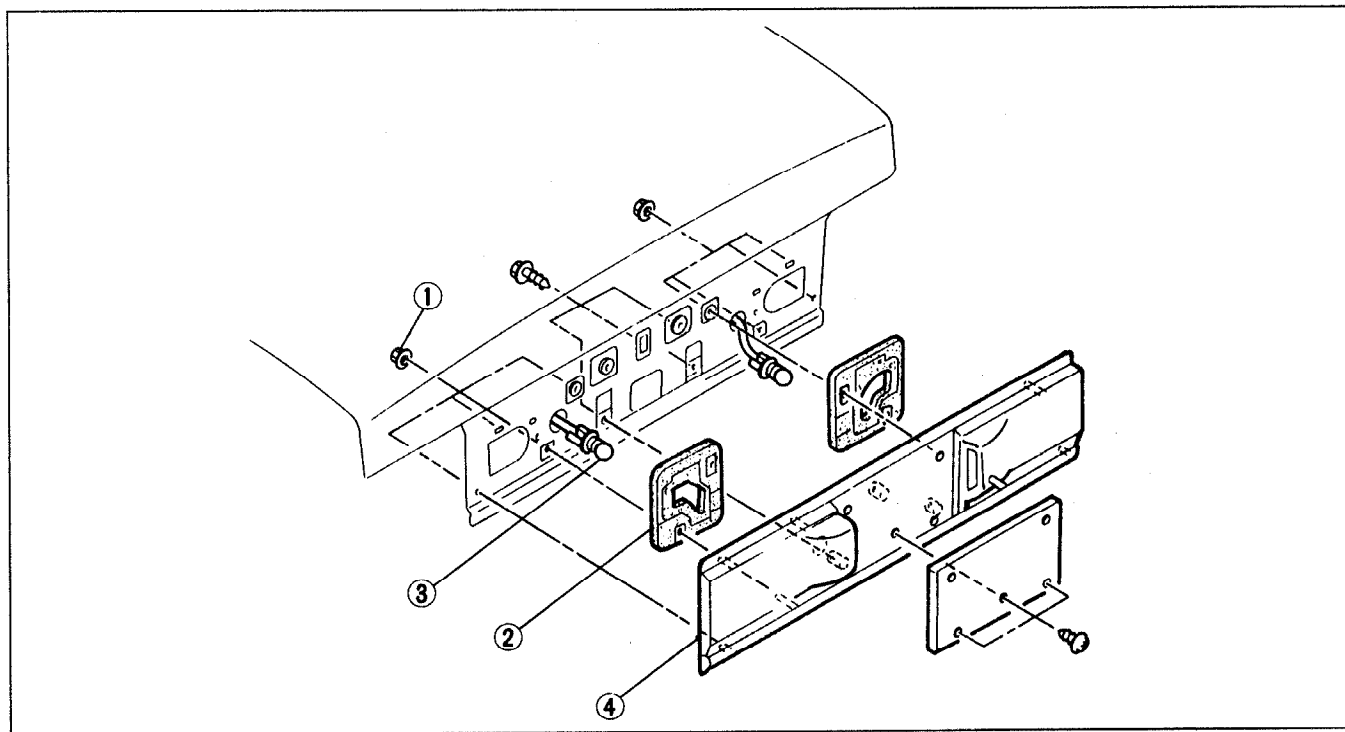
1. Remove the back-up light switch connector.
2. Shift to the reverse position.
3. Confirm continuity between the R/G and the B/Y wire of the connector.

LICENSE PLATE LIGHT

Removal / Inspection / Installation

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary
3. Install in the reverse order of removal.

PROTEGÉ

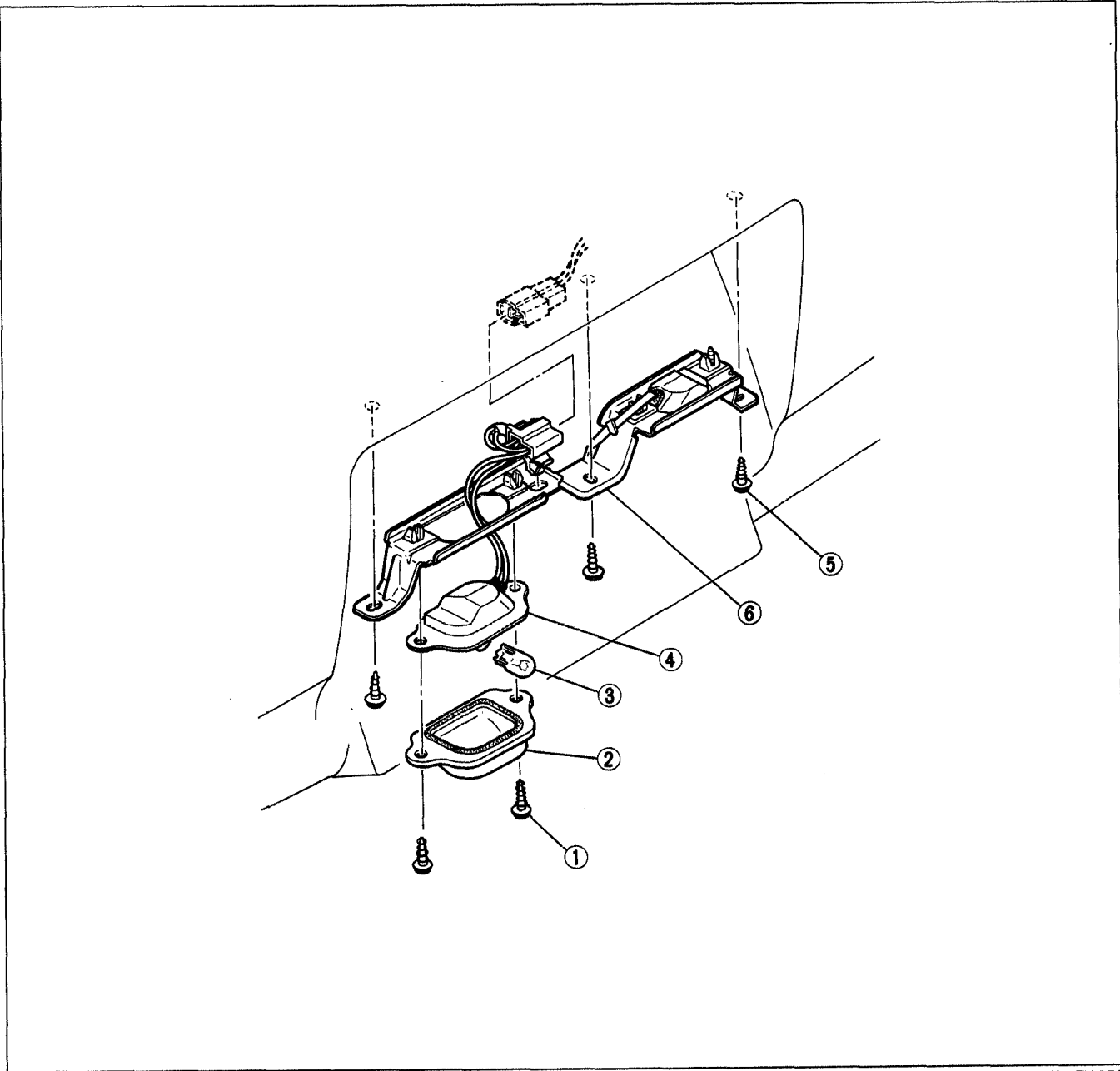


13U0TX-066

1. Nut
2. Gasket
3. Bulb

4. License plate light (Rear finisher)
Visual inspection

Hatchback

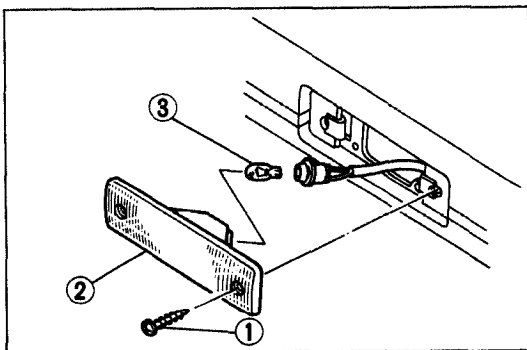


03U0TX-076

- 1. Screw
- 2. Lens
- 3. Bulb

- 4. Cover
- 5. Screw
- 6. Bracket

Visual inspection



13U0TX-033

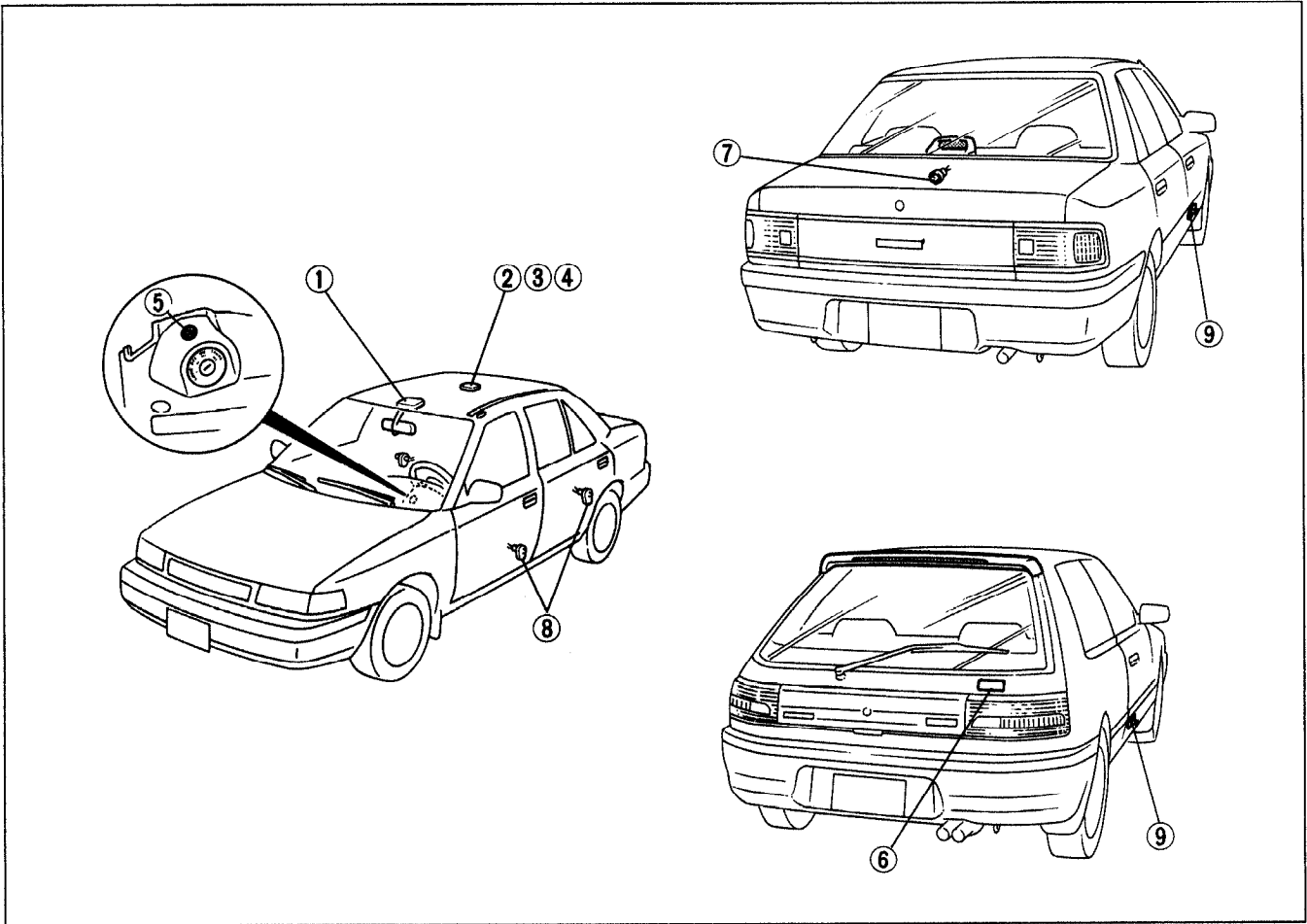
REAR SIDE MARKER LIGHT (PROTEGÉ)

Removal / Inspection / Installation

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.

INTERIOR LAMP SYSTEM

STRUCTURAL VIEW



23U0TX-027

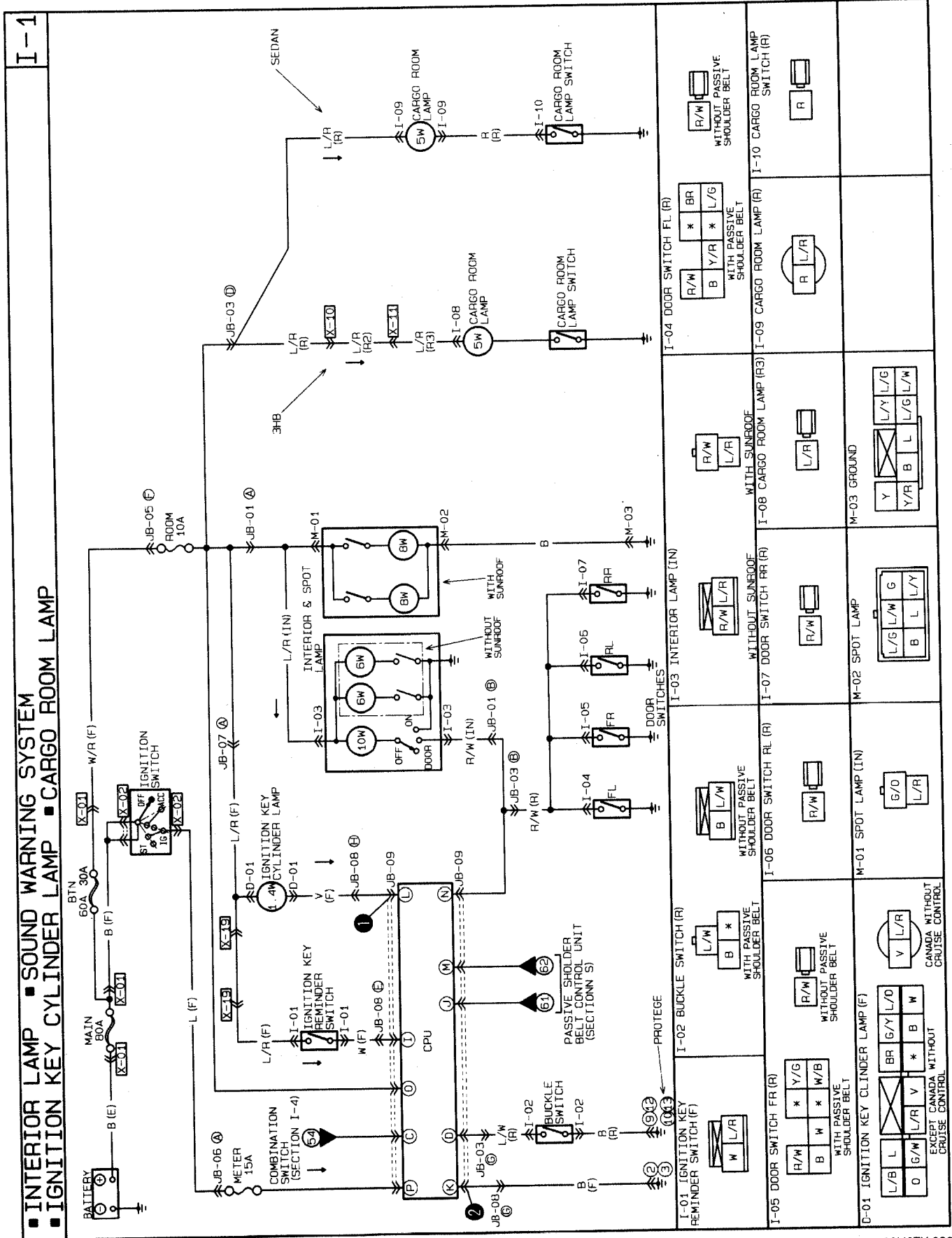
- | | |
|---|--|
| <p>1. Spot lamp (in overhead console)
Removal / Inspection /
Installation page T-52</p> <p>2. Interior and spot lamp (Without sunroof)
Removal / Inspection /
Installation page T-53</p> <p>3. Interior lamp (Without sunroof)
Removal / Inspection /
Installation page T-52</p> <p>4. Interior lamp (With sunroof)
Removal / Inspection /
Installation page T-53</p> | <p>5. IG key illumination
Troubleshooting page T-50</p> <p>6. Cargo compartment lamp
Removal / Inspection /
Installation page T-54</p> <p>7. Trunk compartment lamp
Removal / Inspection /
Installation page T-54</p> <p>8. Door switch
Inspection page T-51</p> <p>9. Courtesy lamp
Removal / Inspection /
Installation page T-54</p> |
|---|--|

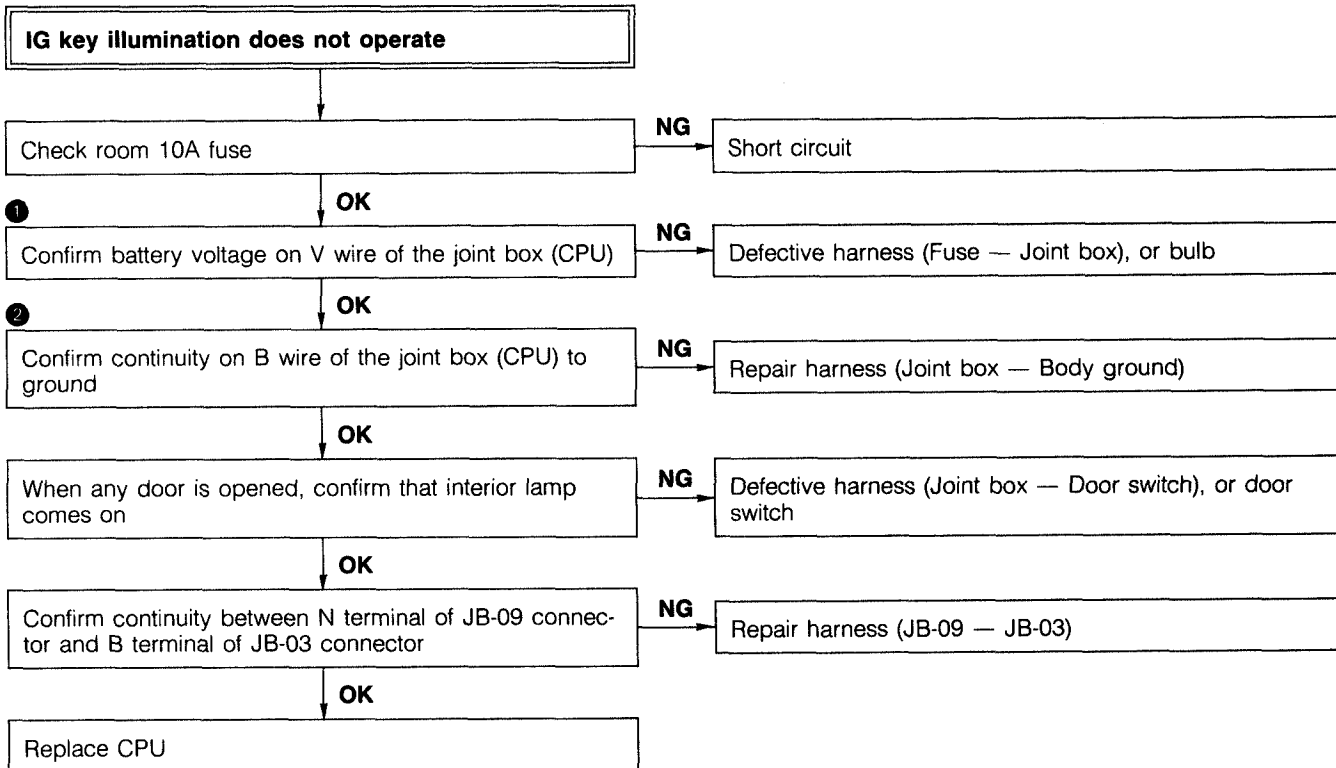
Specifications

Item	Number	Specification (W) (Bulb trade number)
Interior and spot lamp	Interior	10
	Spot	6
Interior lamp	1	10
Spot lamp (in overhead console)	2	8 (67)
Cargo compartment lamp	1	5 (168)
Trunk compartment lamp	1	5 (168)
Courtesy lamp	2	5 (168)

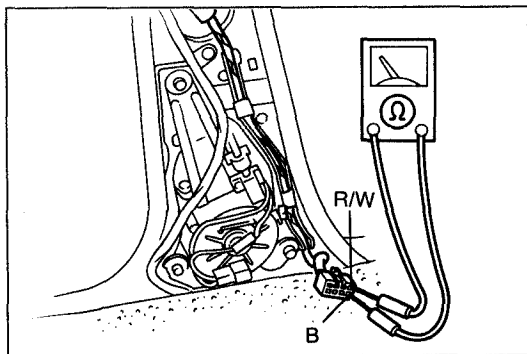
23U0TX-028

TROUBLESHOOTING
IG Key Illumination
Circuit diagram





23U0TX-029



03U0TX-181

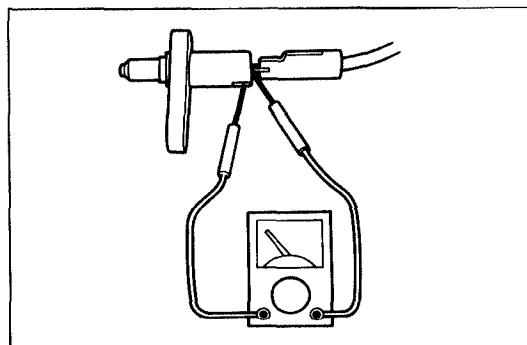
Inspection

Door switch (Front sides with passive belt)

Confirm continuity between the R/W wire and the B wire of the door switch connector (in passive motor connector).

Condition	Continuity
Push	X
Not push	○

○: Indicates continuity X: No continuity



03U0TX-082

Door switch (Others)

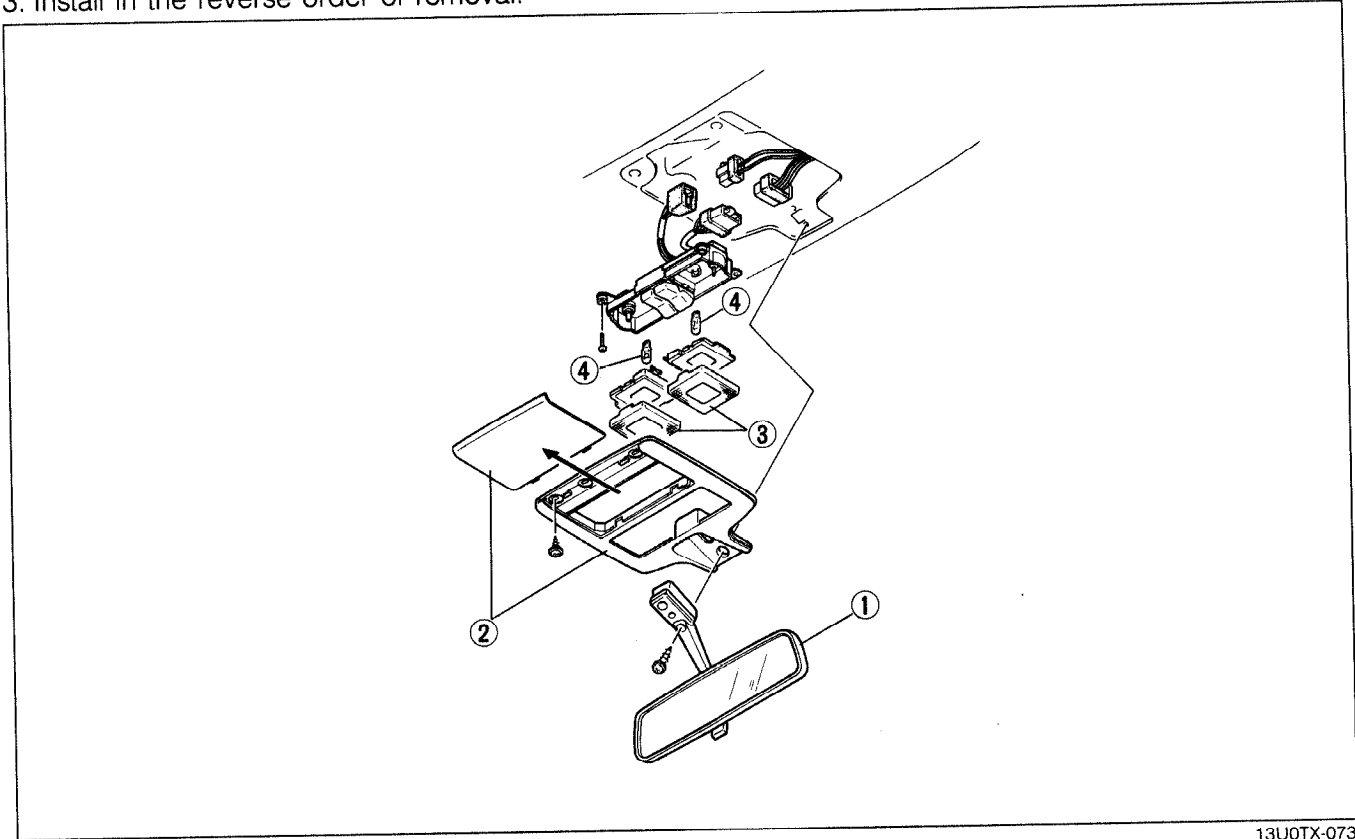
Confirm for continuity between the terminals of the door switch.

Condition	Continuity
Push	X
Not push	○

○: Indicates continuity X: No continuity

SPOT LAMP (IN OVERHEAD CONSOLE)**Removal / Inspection / Installation**

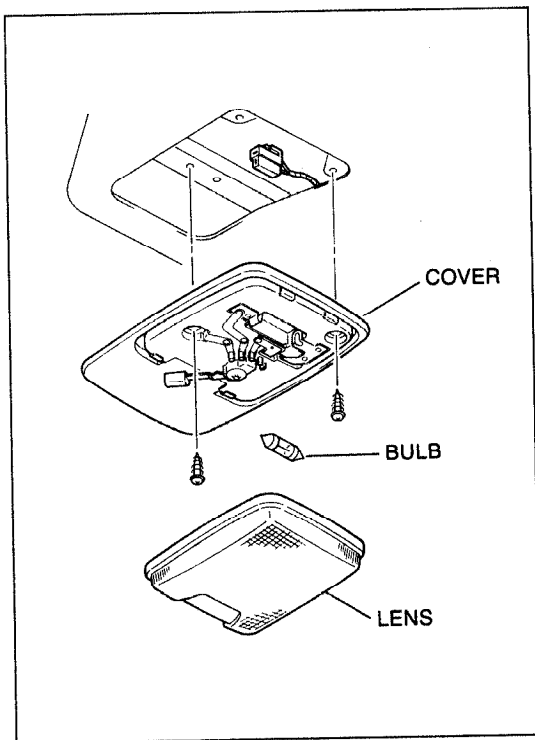
1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.



13U0TX-073

1. Rearview mirror
2. Cover

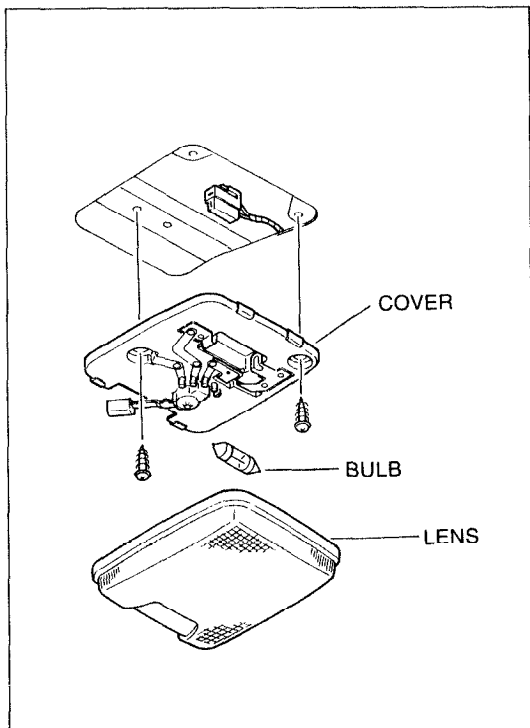
3. Lens
 4. Bulb
- Visual inspection



13U0TX-074

INTERIOR LAMP (WITHOUT SUNROOF)**Removal / Inspection / Installation**

1. Remove the lens.
2. Remove the bulb.
3. Remove the screws and cover.
4. Inspect all parts and repair or replace as necessary.
5. Install in the reverse order of removal.



13U0TX-075

INTERIOR LAMP (WITH SUNROOF)

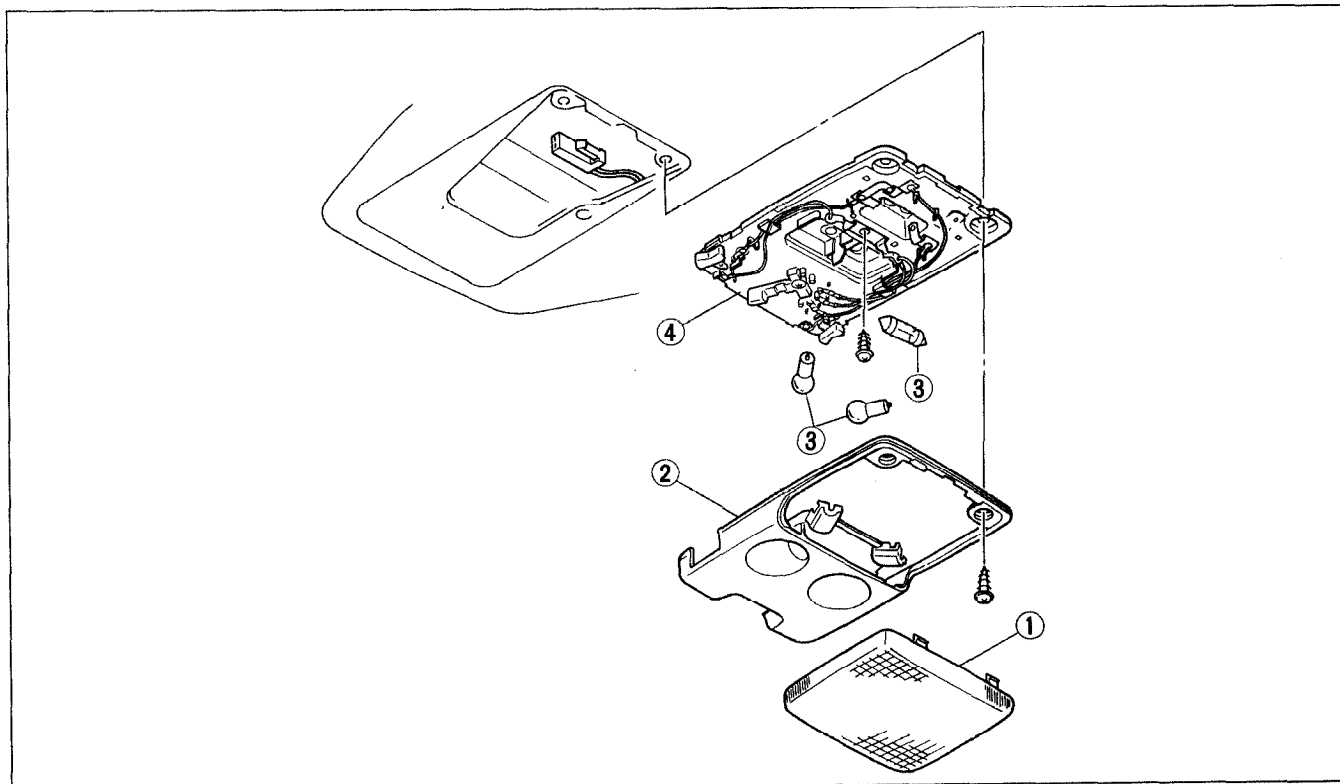
Removal / Inspection / Installation

1. Remove the lens.
2. Remove the bulb.
3. Remove the screws and the cover.
4. Inspect all parts and repair or replace as necessary.
5. Install in the reverse order of removal.

INTERIOR AND SPOT LAMP (WITHOUT SUNROOF)

Removal / Inspection / Installation

1. Remove in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Install in the reverse order of removal.



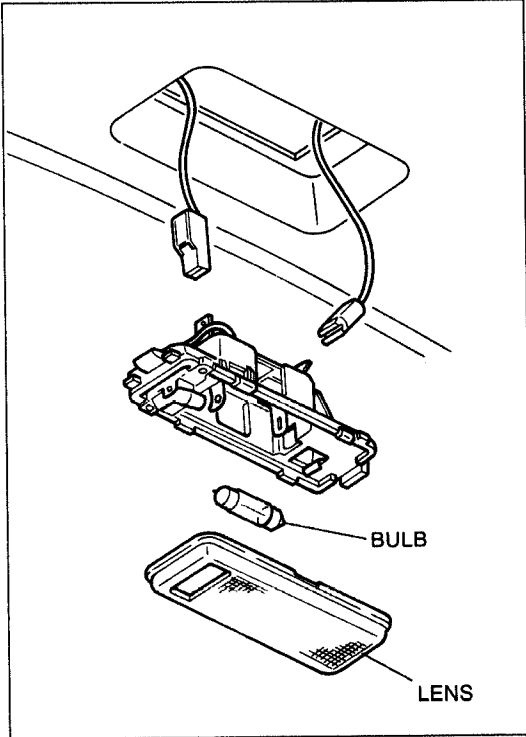
13U0TX-076

1. Lens
2. Cover

3. Bulb
- Visual inspection
4. Cover

CARGO COMPARTMENT LAMP Removal / Inspection / Installation

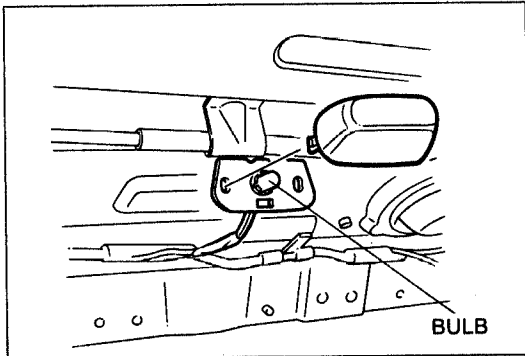
1. Remove the lens.
2. Remove the bulb.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse order of removal.



13U0TX-077

TRUNK COMPARTMENT LAMP Removal / Inspection / Installation

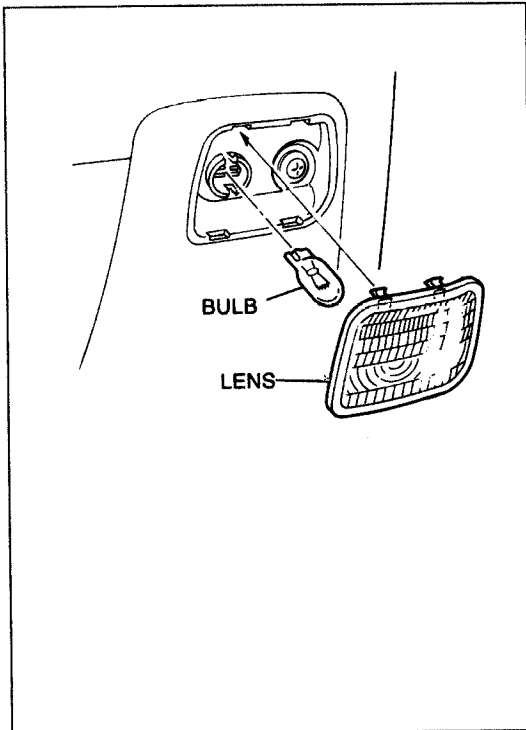
1. Remove the lens.
2. Remove the bulb.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse order of removal.



13U0TX-078

COURTESY LAMP Removal / Inspection / Installation

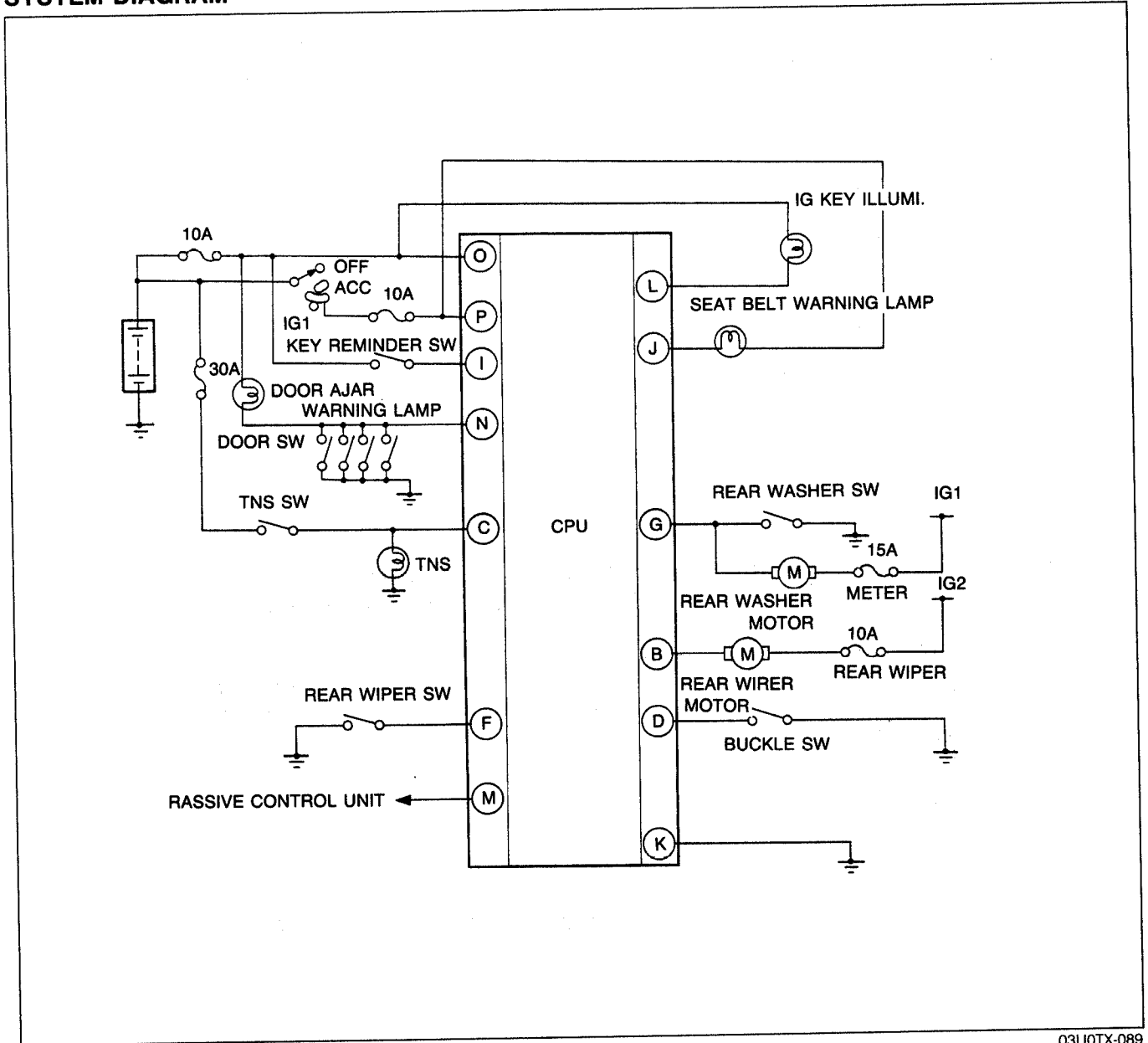
1. Remove the lens
2. Remove the bulb.
3. Inspect all parts and repair or replace as necessary.
4. Install in the reverse order of removal.



23U0TX-030

CENTRAL PROCESSING UNIT (CPU)

SYSTEM DIAGRAM

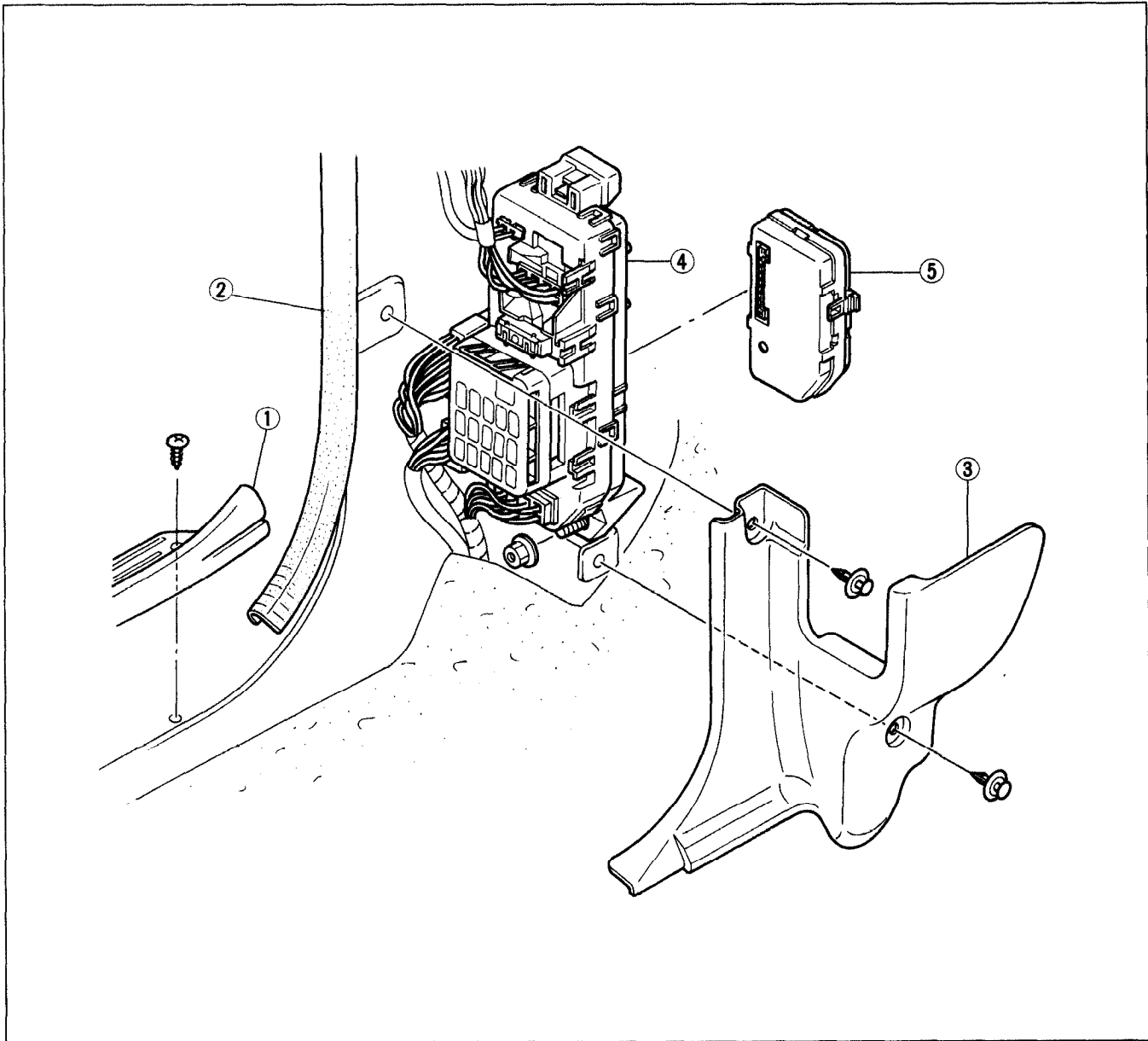


03U0TX-089

CPU

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



13U0TX-035

1. Scuff plate
2. Seaming welt
3. Front side trim

4. Joint box
5. CPU

Inspection page T-57

Inspection

1. Remove the CPU and check the voltage or continuity between terminals of joint box and a body ground.

V_B: Battery voltage

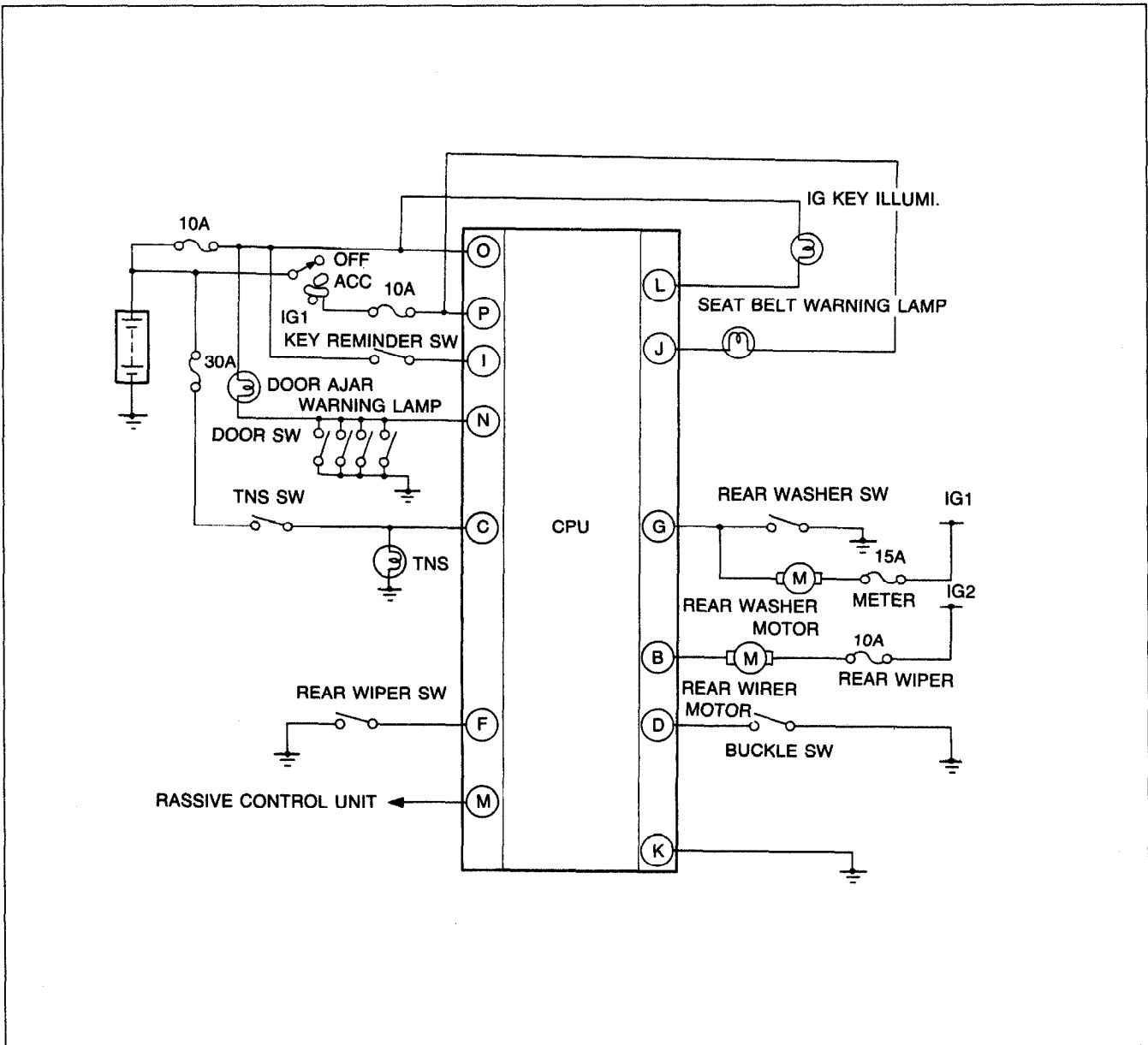
Terminal	Connected to	Test condition	Specification
A			
B	Rear wiper motor	Ignition switch	V _B
C	TNS switch	Light switch ON (first and second position)	V _B
		Light switch OFF	0V
D	Seat belt buckle switch	Seat belt buckled	0Ω
		Seat belt unbuckled	∞
E			
F	Rear wiper switch	Rear wiper switch ON	0Ω
		Rear wiper switch OFF	∞
G	Rear washer switch	Rear washer switch ON	0Ω
		Rear washer switch OFF	∞
H			
I	Key reminder switch	Key reminder switch ON	V _B
		Key reminder switch OFF	0V
J	Seat belt warning lamp	Ignition switch OFF	0V
		Ignition switch ON	V _B
K	Ground	Constant	0V
L	IG key illumination	Constant	V _B
M	Passive shoulder belt	For 5 seconds after ign. switch ON and belt unbuckled	0Ω
		Other conditions	∞
N	Door switch	All doors closed	V _B
		Any door open	0V
O	Battery	Constant	V _B
P	Ignition switch	Ignition switch ON	V _B

23U0TX-031

WARNING SYSTEM

WARNING BUZZER AND TIMER

Circuit Diagram



03U0TX-092

Inspection

Remove the CPU and check the voltage or continuity between terminals of joint box and a body ground.

Key reminder alarm does not sound.

V_B: Battery voltage

Terminal	Connected to	Test condition	Specification	To correct
I	Key reminder switch (ignition switch)	Key in cylinder Key out of cylinder	V _B 0V	Check ignition switch and wiring harness (Refer to page T-21)
P	Ignition switch	Ignition switch ON	V _B	Check ignition switch and wiring harness (Refer to page T-21)
N	Door switch	Any door open All doors closed	0V V _B	Check door switches and wiring harness (Refer to page T-51)

23U0TX-032

Light-off reminder alarm does not sound.

V_B: Battery voltage

Terminal	Connected to	Test condition	Specification	To correct
C	Headlight switch	Headlight switch ON	V _B	Check headlight switch and wiring harness (Refer to pages T-27, 28)
P	Ignition switch	Ignition switch ON	V _B	Check ignition switch and wiring harness (Refer to page T-21)
N	Door switch	Any door open All doors closed	0V V _B	Check door switches and wiring harness (Refer to page T-51)

23U0TX-033

Seat belt alarm does not sound.

V_B: Battery voltage

Terminal	Connected to	Test condition	Specification	To correct
P	Ignition switch	Ignition switch ON	V _B	Check ignition switch and wiring harness (Refer to page T-21)
D	Seat belt buckle switch	Seat belt buckled Seat belt unbuckled	0Ω ∞	Check seat belt buckle switch and wiring harness (Refer to page S-102)

23U0TX-034

Seat belt timer does not operate.

V_B: Battery voltage

Terminal	Connected to	Test condition	Specification	To correct
P	Ignition switch	Ignition switch ON	V _B	Check ignition switch and wiring harness (Refer to page T-21)

23U0TX-035

Passive shoulder belt alarm does not sound.

V_B: Battery voltage

Terminal	Connected to	Test condition	Specification	To correct
P	Ignition switch	Ignition switch	V _B	Check ignition switch and wiring harness (Refer to page T-21)
M	Passive shoulder belt control unit	For 5 seconds after ignition switch and belt unbuckled Other conditions	0Ω ∞	Check passive shoulder belt control unit and wiring harness (Refer to page S-104)

23U0TX-036

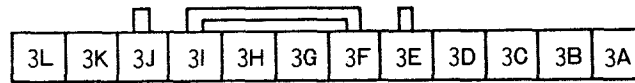
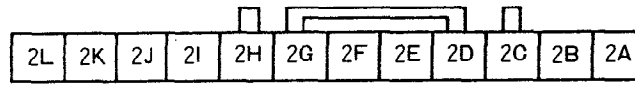
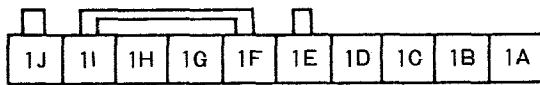
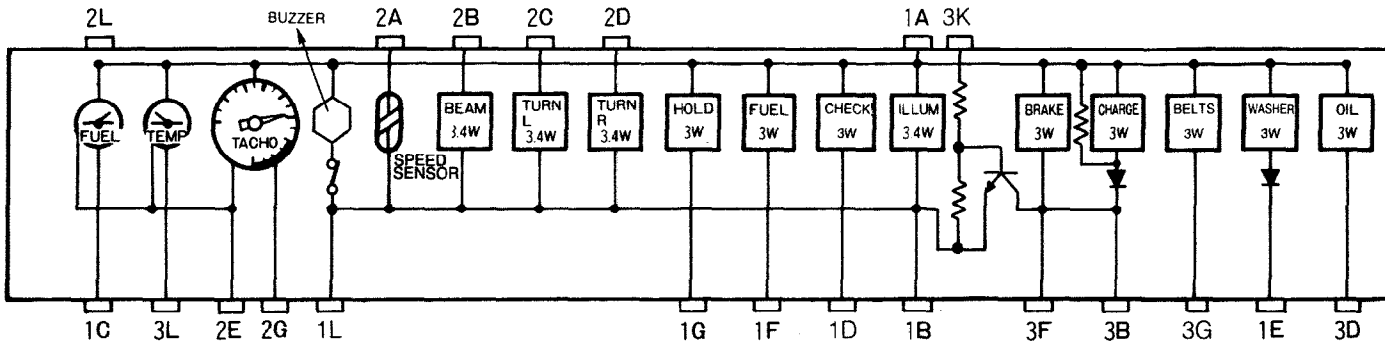
IG key illumination timer does not operate.

V_B: Battery voltage

Terminal	Connected to	Test condition	Specification	To correct
L	IG key illumination	Either door open	V _B	Check bulbs and wiring harness
N	Door switch	Any door open All doors closed	0V V _B	Check door switches and wiring harness (Refer to page T-51)

23U0TX-037

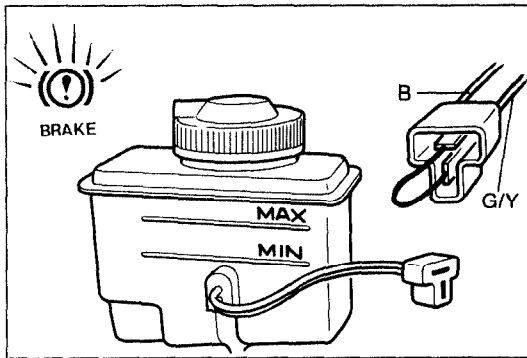
WARNING AND INDICATOR LAMP
Circuit Diagram



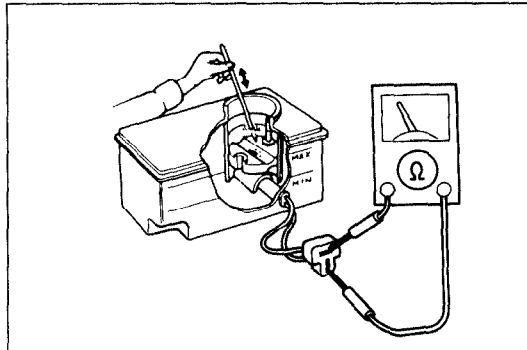
Ter- minal	Connected to
1A	Combination switch
1B	Ground
1C	Fuel tank unit
1D	EGI control unit
1E	Washer level sensor
1F	Fuel tank unit
1G	EC-AT control unit
1H	EC-AT control unit
1I	
1J	

Ter- minal	Connected to
2A	Speed sensor output
2B	Light switch (high beam)
2C	Turn switch (L)
2D	Turn switch (R)
2E	Ground
2F	Ground
2G	IG coil (igniter)
2H	
2I	
2J	
2K	
2L	IG1 battery

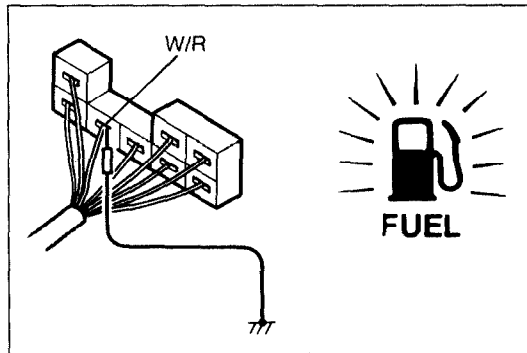
Ter- minal	Connected to
3A	
3B	Alternator
3C	
3D	Oil pressure switch
3E	
3F	Parking brake switch, Brake fluid switch
3G	Passive shoulder belt control unit
3H	
3I	
3J	
3K	IG ₂ battery
3L	Water temperature gauge unit



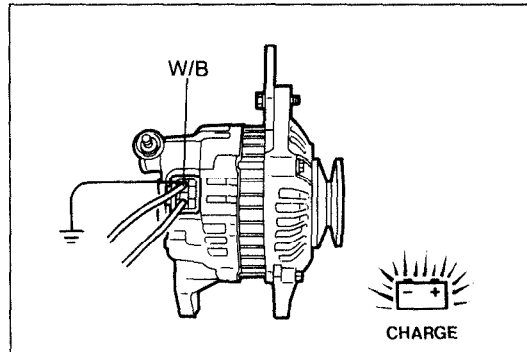
13U0TX-079



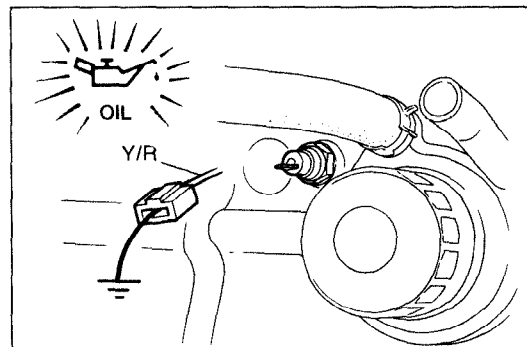
63U15X-051



13U0TX-080



13U0TX-081



13U0TX-082

Inspection

Brake system warning lamp

1. Disconnect the connector from the brake fluid level sensor.
2. Connect a jumper wire between "G/Y" and "B" terminal (body ground).
3. Start the engine and check that the BRAKE warning lamp illuminates.

Caution

- Be sure that the parking brake is fully released before checking.

4. If there is no illumination, check the fuse, bulb, and wiring harness.

Brake fluid level sensor

Connect an ohmmeter to each terminal of the brake fluid level sensor connector.

Check for continuity when the float is moved up and down. The sensor is good if there is continuity when the float is below the "MIN" mark, and if there is no continuity when the float is above the "MAX" mark. If the sensor does not pass this test, replace it.

Fuel-level warning lamp

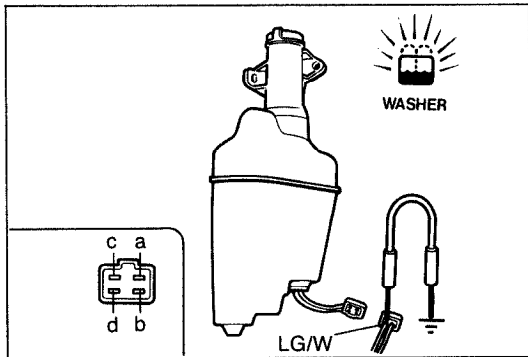
1. Disconnect the connector from the fuel tank unit.
2. Connect the connector terminal "W/R" to the body ground.
3. Start the engine and check that the FUEL warning lamp illuminates.
4. If there is no illumination, check the fuse, warning lamp, and wiring harness.

Alternator warning lamp

1. Start the engine, connect the connector terminal "W/B" to a body ground.
2. Check that the alternator warning lamp illuminates.
3. If there is no illumination, check the warning lamps, wiring harness and alternator. Replace or repair as necessary.

Engine oil pressure warning lamp

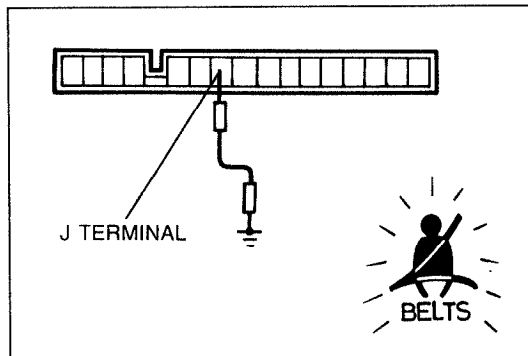
1. Disconnect the connector from the oil pressure switch.
2. Start the engine and connect the connector terminal "Y/R" to a body ground.
3. Check that the "OIL" warning lamp illuminates. If it does not, replace the sender switch or repair the wiring harness if bulb is not burnt out.



13U0TX-083

Washer fluid warning lamp

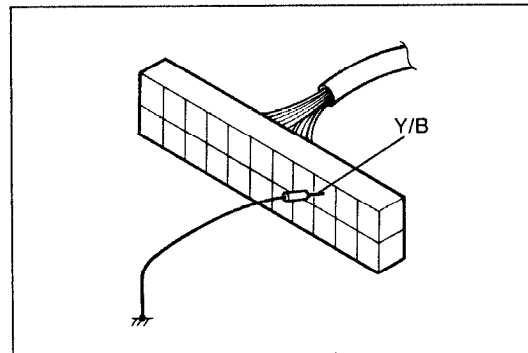
1. Disconnect the connector from the washer fluid level sensor.
2. Start the engine and with a jumper wire to connect the connector terminal "a" (LG/W) to a body ground.
3. Check that the washer fluid warning lamp illuminates. If it does not and the bulb is not burnt out, replace the fluid level sensor or repair the wiring harness.



13U0TX-084

Seat belt warning lamp

1. Remove the CPU.
2. Connect the connector J terminal (joint box side) to a body ground.
3. Turn ignition switch to ON and confirm that BELT warning lamp illuminates for about 6 seconds.
4. If there is no illumination, check the fuse, warning readout and wiring harness. Check bulb, CPU and wiring harness and switch, repair or replace as necessary.



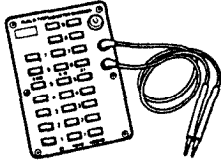
13U0TX-085

Malfunction indicator lamp

1. Connect the "Y/B" wire to a body ground.
2. Start the engine and check that the warning lamp illuminates.
3. If there is no illumination, check the meter fuse, bulb, and wiring harness between the instrument cluster and the EGI control unit.

INSTRUMENT CLUSTER

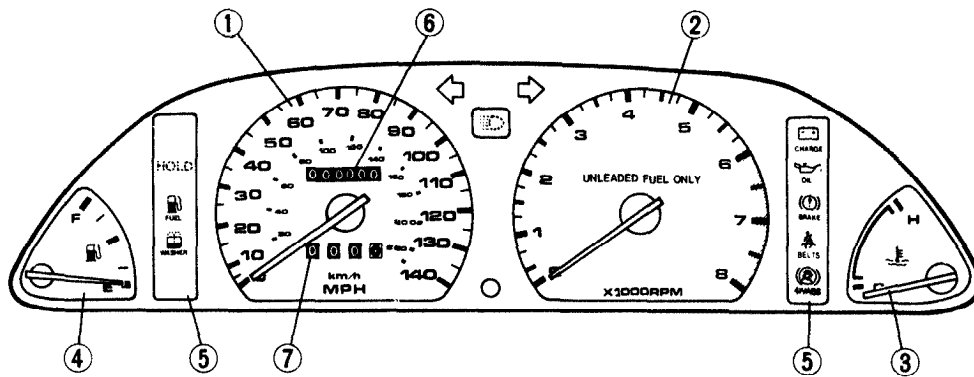
PREPARATION
SST

49 0839 285		For inspection of fuel and water temperature gauge
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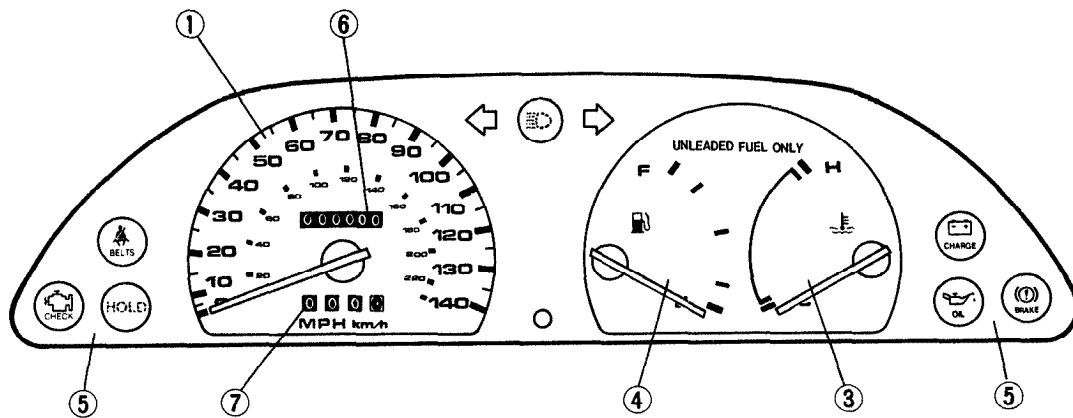
23U0TX-038

STRUCTURAL VIEW

WITH TACHOMETER (2WD)



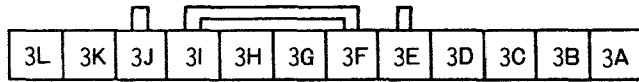
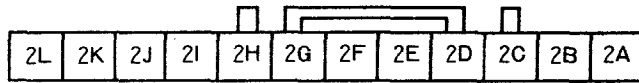
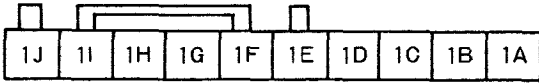
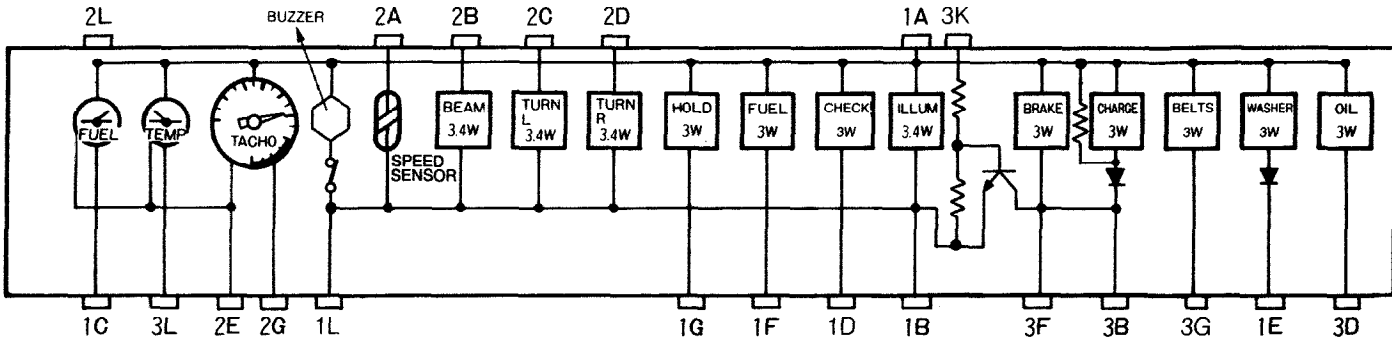
WITHOUT TACHOMETER (2WD)



23U0TX-039

- | | | | |
|----------------------------|-----------|--------------------------|-----------|
| 1. Speedometer | | 4. Fuel gauge | |
| Troubleshooting | page T-64 | Troubleshooting | page T-64 |
| Inspection | page T-71 | Inspection | page T-71 |
| 2. Tachometer | | 5. Warning and indicator | |
| Troubleshooting | page T-64 | Inspection | page T-61 |
| Inspection | page T-71 | 6. Odometer | |
| 3. Water temperature gauge | | 7. Tripmeter | |
| Troubleshooting | page T-64 | | |
| Inspection | page T-72 | | |

2WD



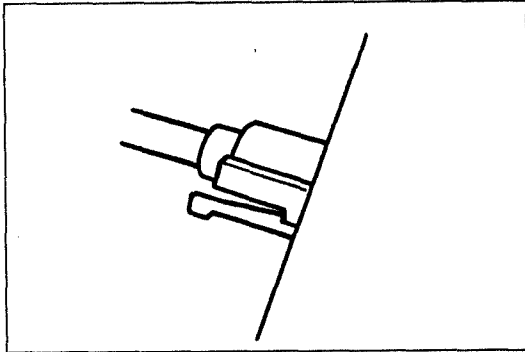
Terminal	Connected to
1A	Combination switch
1B	Ground
1C	Fuel tank unit
1D	EGI control unit
1E	Washer level sensor
1F	Fuel tank unit
1G	EC-AT control unit
1H	EC-AT control unit
1I	
1J	

Terminal	Connected to
2A	Speed sensor output
2B	Light switch (high beam)
2C	Turn switch (L)
2D	Turn switch (R)
2E	Ground
2F	Ground
2G	IG coil (igniter)
2H	
2I	
2J	
2K	
2L	IG1 battery

Terminal	Connected to
3A	
3B	Alternator
3C	
3D	Oil pressure switch
3E	
3F	Parking brake switch, Brake fluid switch
3G	Passive shoulder belt control unit
3H	
3I	
3J	
3K	IG2 battery
3L	Water temperature gauge unit

Symptom: Speedometer does not operate or indication is not correct.

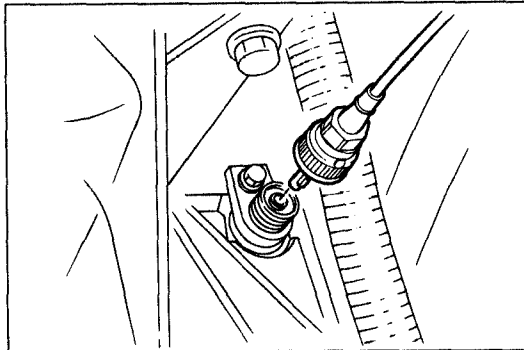
9MU0TX-066



9MU0TX-067

Step 1

Verify that the speedometer cable is connected properly. If the connections are OK, go to Step 2.



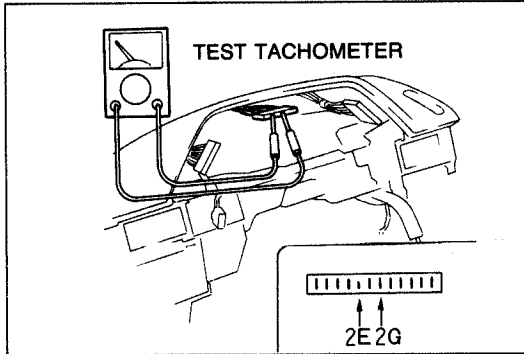
9MU0TX-068

Step 2 — Check speedometer cable

1. Disconnect the speedometer cable from the instrument cluster and transmission case.
2. Verify that the cable and gear spin easily when turned by hand.
3. If the cable or gear is stiff, replace the speedometer cable or gear.
4. If the speedometer cable and gear are OK, replace the speedometer.

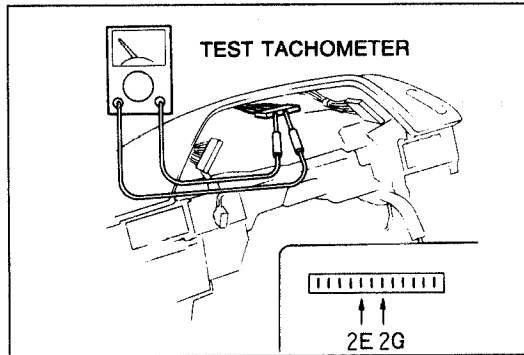
Symptom: Tachometer does not operate.

9MU0TX-069



Step 1

1. Remove the instrument cluster. (Refer to page T-69.)
2. Connect a test tachometer between terminals 2E and 2G of the harness side connector.



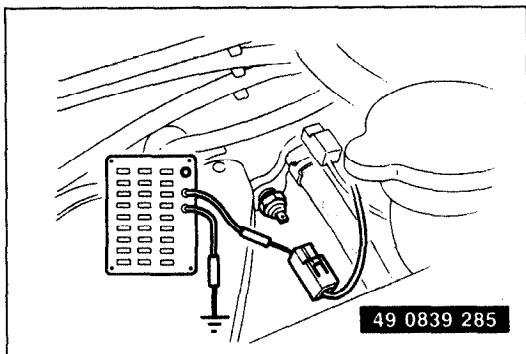
Step 2

1. Start the engine.
2. Check that the test tachometer indicates engine speed.

Indicates rpm	Action
Yes	Replace tachometer
No	Repair wiring harness (Instrument cluster — Igniter)

Symptom: Water temperature gauge does not operate.

9MU0TX-072

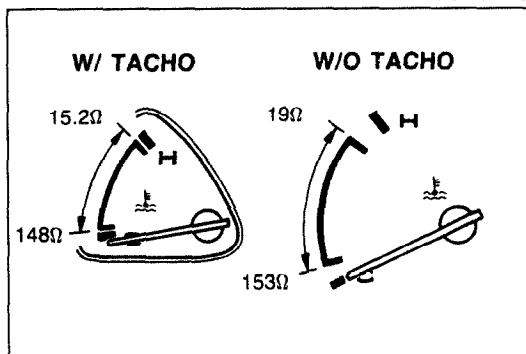


9MU0TX-073

Step 1

1. Disconnect the connector from the water thermosensor.
2. Connect the red lead of the **SST** to the connector and the black lead to a body ground.
3. Set the **SST** to the resistance values shown in the figure.
4. Turn the ignition switch ON, and check that the needle indicates the correct values.

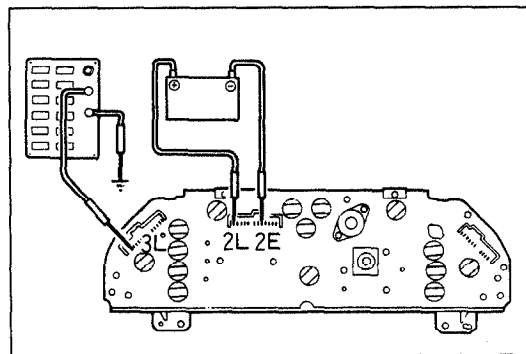
Gauge displays correct	Action
Yes	Replace water thermo sensor
No	Go to Step 2



03U0TX-110

Caution

- Continue the above checks for at least two minutes each to correctly judge the condition.
- The allowable indication error is twice the width of the needle.

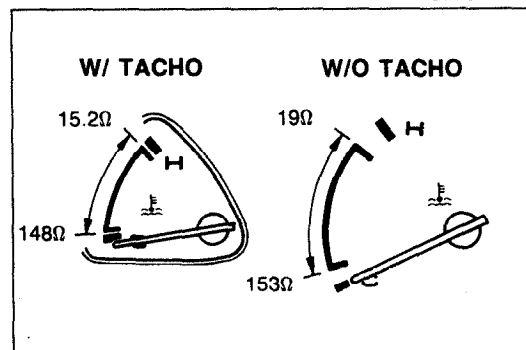


23U0TX-041

Step 2

1. Remove the instrument cluster. (Refer to page T-69.)
2. Apply battery voltage to terminal 2L and ground terminal 2E.
3. Connect the red lead of the **SST** to terminal 3L and the black lead to a negative battery terminal.

4. Set the **SST** to the resistance values shown in the figure.
5. Verify that the needle indicates the correct values.



9MU0TX-076

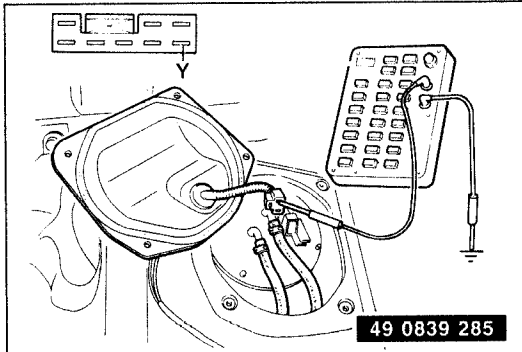
Indicates correct	Action
Yes	Repair wiring harness (Instrument cluster — Water thermosensor)
No	Replace water temperature gauge

Caution

- Continue the above checks for at least two minutes each to correctly judge the condition.
- The allowable indication error is twice the width of the needle.

Symptom: Fuel gauge does not operate.

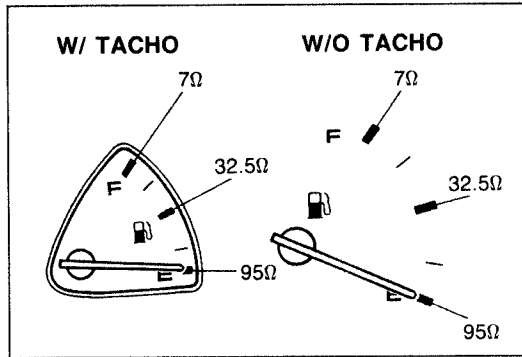
9MU0TX-077



03U0TX-186

Step 1

1. Disconnect the connector from the fuel gauge sender unit.
2. Connect the red lead of the **SST** to the terminal-wire (Y) and the black lead to a body ground.



9MU0TX-079

3. Set the **SST** to the resistance values shown in the figure.
4. Turn the ignition switch ON, and verify that the needle indicates the correct values.

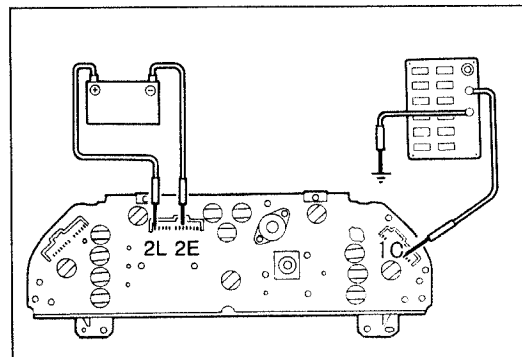
Indicates correct	Action
Yes	Replace fuel gauge sender unit (in fuel tank)
No	Go to Step 2

Caution

- Continue the above checks for at least two minutes each to correctly judge the condition.
- The allowable indication error is twice the width of the needle.

Step 2

1. Remove the instrument cluster. (Refer to page T-69.)
2. Apply battery voltage to terminal 2L and ground terminal 2E.
3. Connect the red lead of the **SST** to terminal 1C and the black lead to a negative battery terminal.



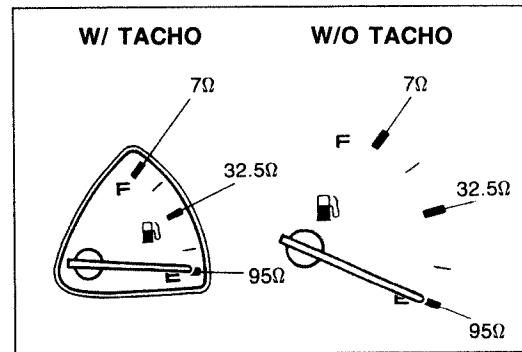
23U0TX-042

4. Set the **SST** to the resistance values shown in the figure.
5. Verify that the needle indicates the correct values.

Indicates correct	Action
Yes	Repair wiring harness (Instrument cluster — fuel gauge sender unit)
No	Replace fuel gauge sender unit

Caution

- Continue the above checks for at least two minutes each to correctly judge the condition.
- The allowable indication error is twice the width of the needle.

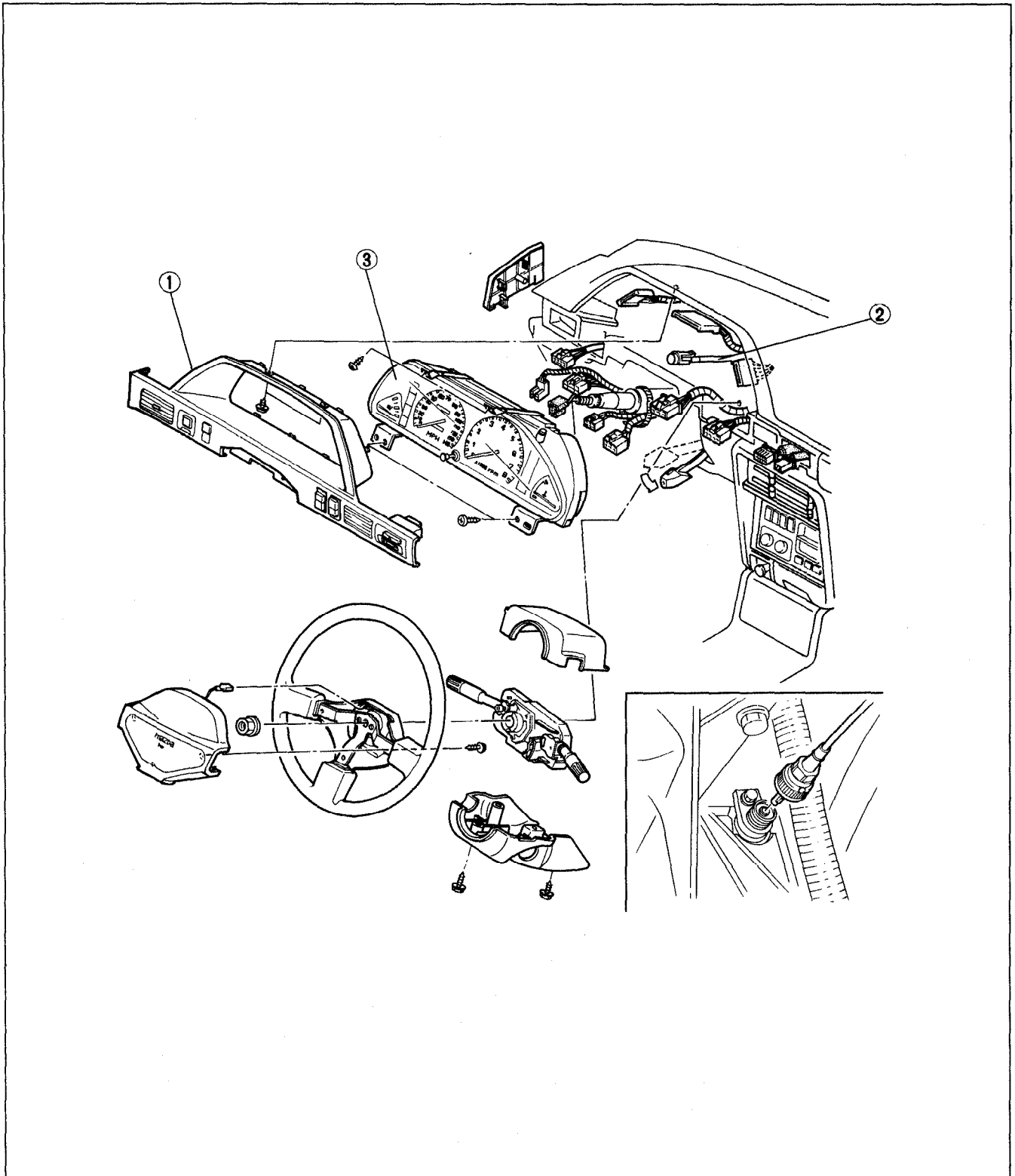


9MU0TX-081

INSTRUMENT CLUSTER AND SPEEDOMETER CABLE

Removal / Installation

1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



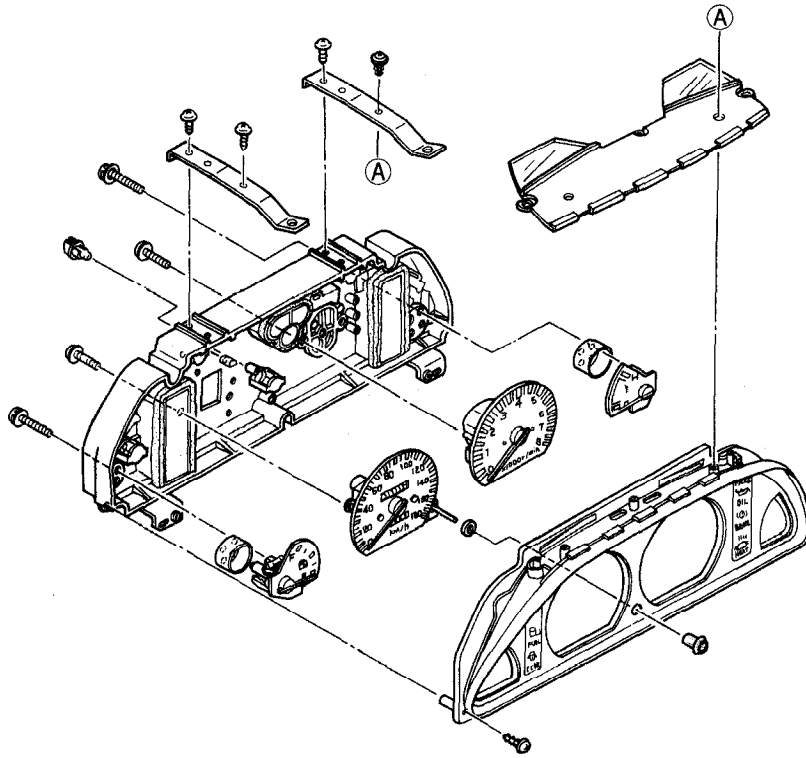
1. Meter hood
2. Speedometer cable
Inspection page T-66

3. Instrument cluster
Troubleshooting page T-64
Disassembly / Assembly page T-70
Inspection page T-71

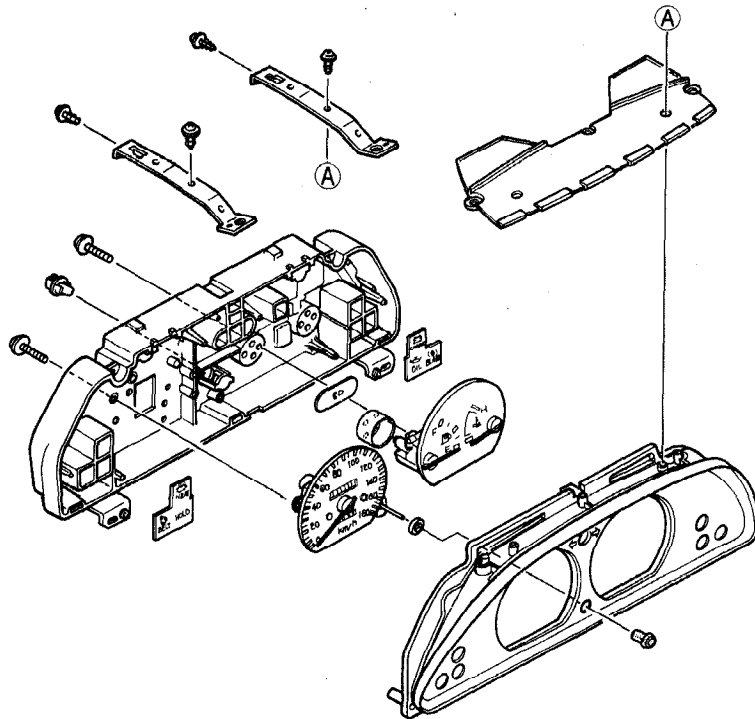
23U0TX-043

Disassembly / Assembly

WITH TACHOMETER



WITHOUT TACHOMETER



(For Canada)

Standard indication (km/h)	Allowable range (km/h)
40	40— 43
80	80— 84
120	120—126

(For USA)

Standard indication (mph)	Allowable range (mph)
30	30—32
60	60—63
90	90—95

03U0TX-114

Standard Indication (rpm)	Allowable range (rpm)
1,000	880—1,060
2,000	1,970—2,150
3,000	3,000—3,180
4,000	4,000—4,240
5,000	5,000—5,300
6,000	6,000—6,360
7,000	7,000—7,420
8,000	8,000—8,480

03U0TX-115

**Inspection
Speedometer**

1. Using a speedometer tester, check the speedometer for allowable indication error, and check the operation of the odometer. Replace if necessary.
2. Check the speedometer for fluctuation and/or abnormal noise.

Caution

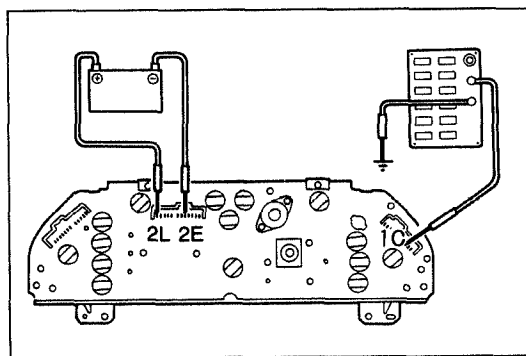
- If significant fluctuation occurs or the speedometer does not move at all, remove the speedometer cable. If it is normal, replace the speedometer assembly.
- Tire wear and improper inflation will increase speedometer error.

Tachometer

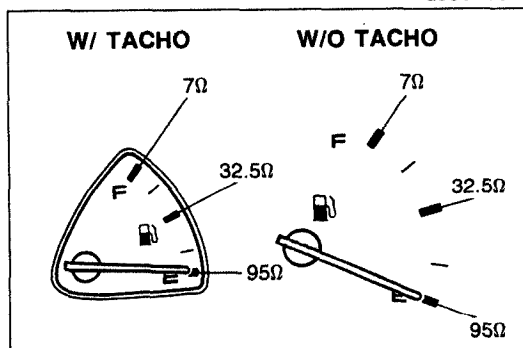
1. Connect a test tachometer to the engine, and start the engine.
2. Check the tachometer for allowable indication error. Replace if necessary.

Caution

- When removing or installing the tachometer, do not drop it or subject it to sharp shocks.



23U0TX-044



9MU0TX-087

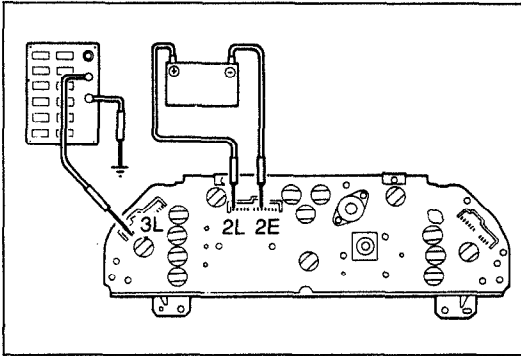
Fuel gauge

1. Remove the instrument cluster. (Refer to page T-69.)
2. Apply battery voltage to terminal 2L and ground terminal 2E.
3. Connect the red lead of the **SST** to terminal 1C and the black lead to a negative battery terminal.

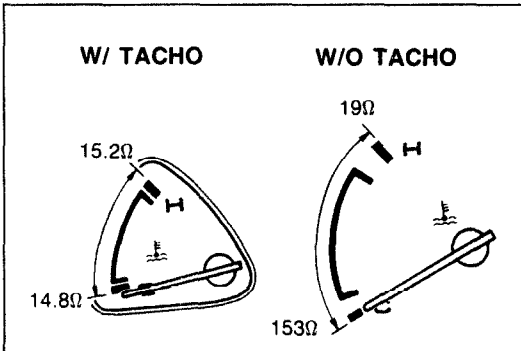
4. Set the **SST** to the resistance values shown in the figure.
5. Verify that the needle indicates the correct values.

Caution

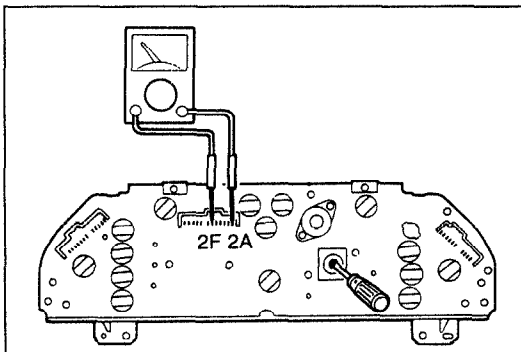
- Continue the above checks for at least two minutes each to correctly judge the condition.
- The allowable indication error is twice the width of the needle.



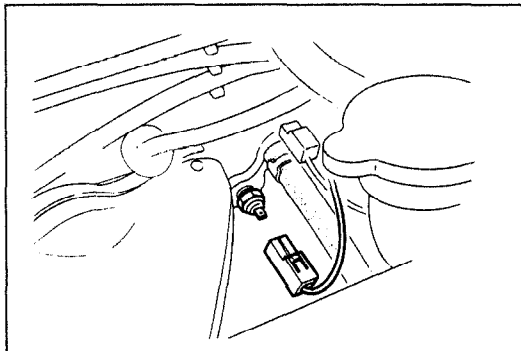
23U0TX-045



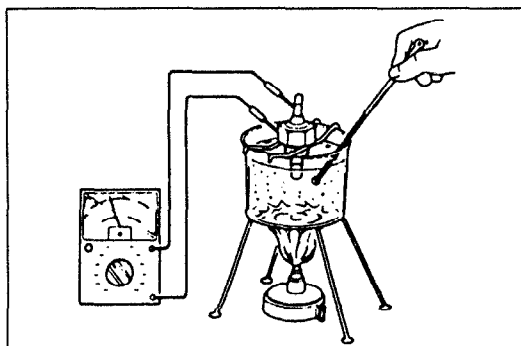
9MU0TX-089



03U0TX-118



03U0TX-119



03U0TX-120

Water temperature gauge

1. Remove the instrument cluster. (Refer to page T-69.)
2. Apply battery voltage to terminal 2L and ground terminal 2E.
3. Connect the red lead of the **SST** to terminal 3L and the black lead to a negative battery terminal.

4. Set the **SST** to the resistance values shown in the figure.
5. Turn the ignition switch ON, and verify that the needle indicates the correct values.

Caution

- Continue the above checks for at least two minutes each to correctly judge the condition.
- The allowable indication error is twice the width of the needle.

Speed sensor

1. Remove the instrument cluster.
2. Check continuity between terminals 2A and 2F while rotating the speedometer cable shaft.
3. If there are not four pulses per shaft rotation, replace the speed sensor.

WATER THERMOSENSOR

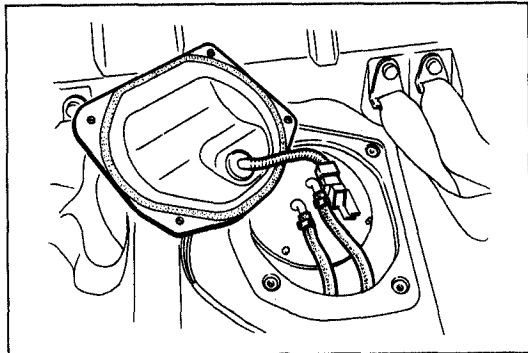
Removal / Installation

1. Remove the connector.
2. Remove the thermosensor.
3. Install in the reverse order of removal.

Inspection

1. Remove the sensor.
2. Place the sensor in water.
3. Heat the water gradually, and check the resistance of the sensor with an ohmmeter.
4. If the resistance is not as specified, replace the sensor.

Resistance: 190—260Ω at 50°C (122°F)

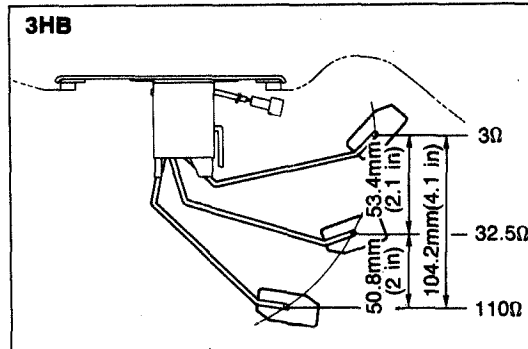


03U0TX-121

FUEL GAUGE SENDER UNIT

Removal / Installation

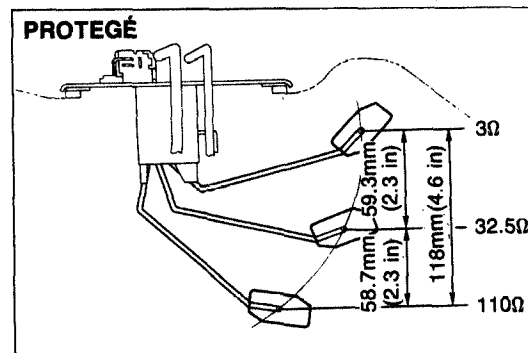
1. Remove the fuel hose from the fuel tank.
2. Remove the bolt and fuel tank.
3. Remove the fuel gauge sender unit.
4. Install in the reverse order of removal.



03U0TX-122

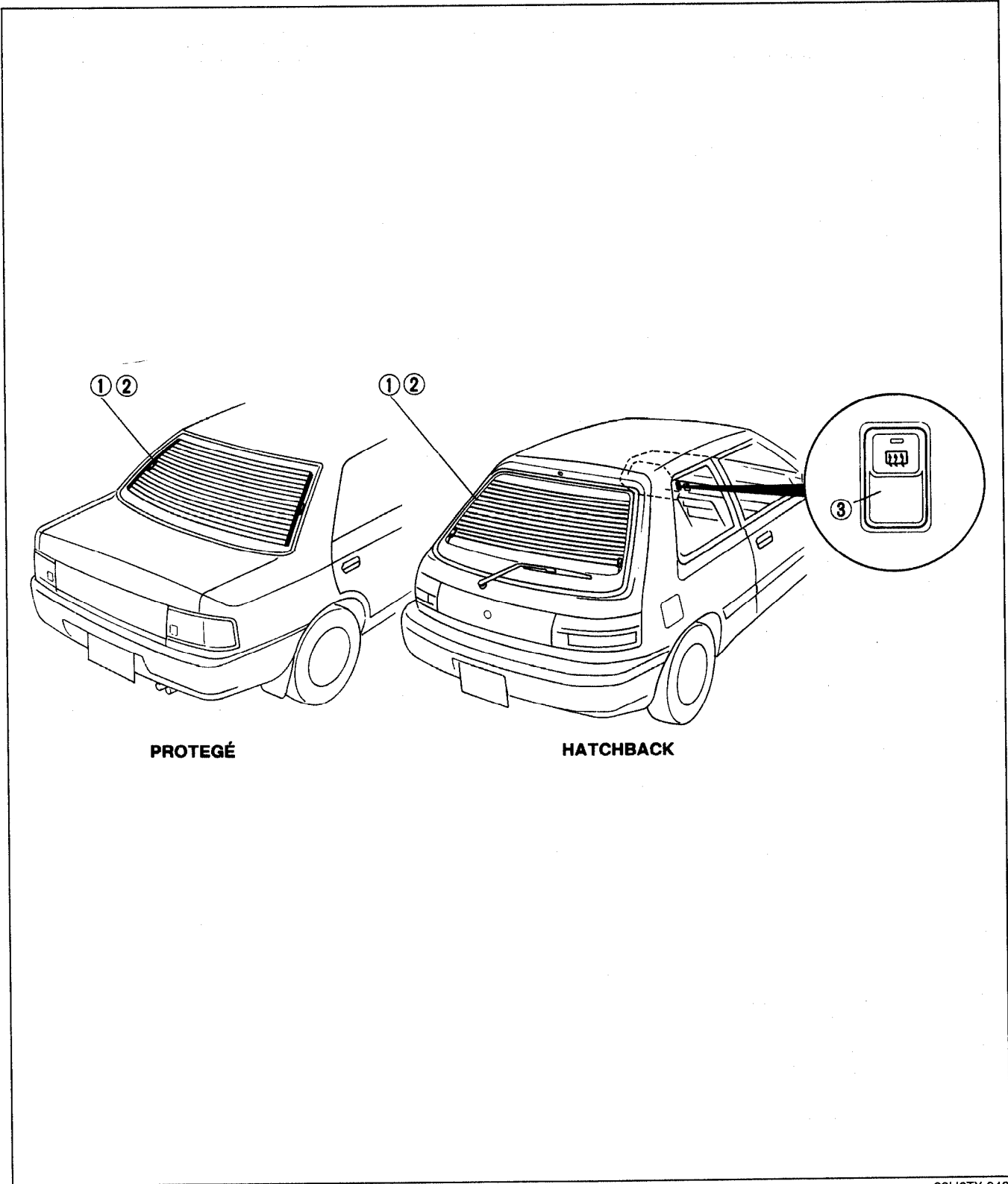
Inspection

1. Remove the fuel tank gauge unit. (Refer to Section F.)
2. Disconnect the fuel gauge sender unit connector.
3. Check resistance while slowly moving the unit arm from point F to point E.
4. If not correct, replace the fuel gauge sender unit.



REAR WINDOW DEFROSTER

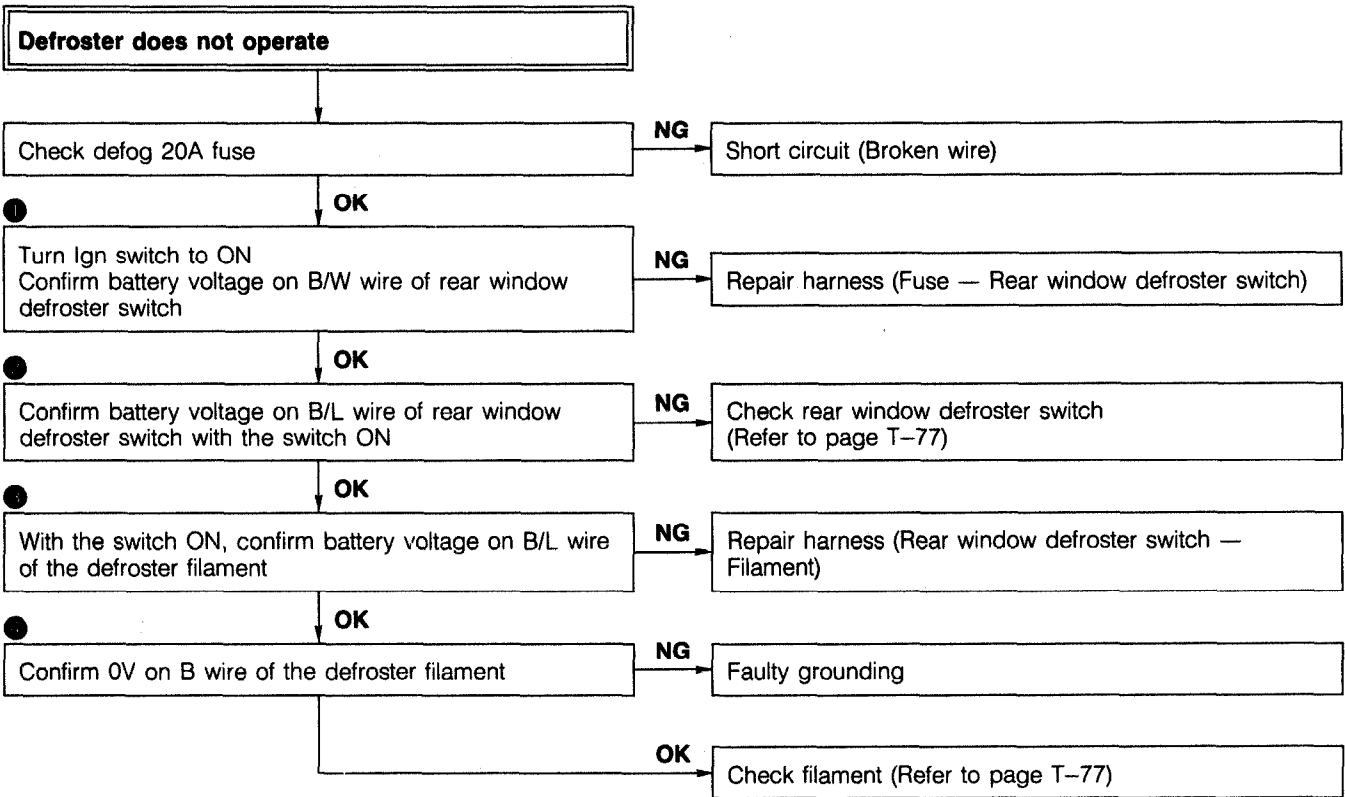
STRUCTURAL VIEW



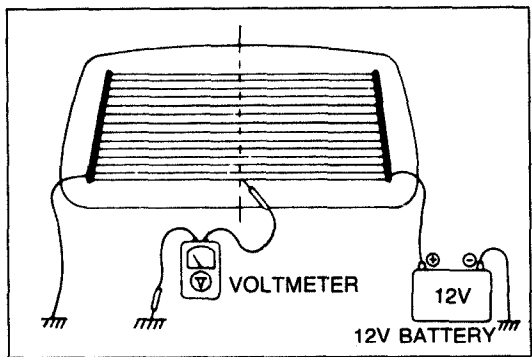
23U0TX-046

1. Rear window defroster	
Troubleshooting	page T-75
2. Filament	
Inspection	page T-77
Repairing	page T-77

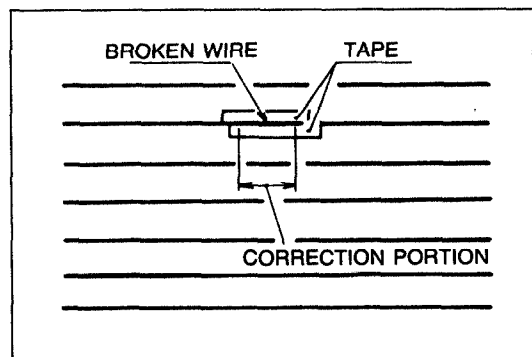
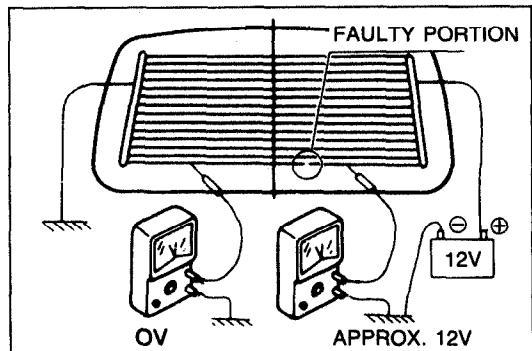
3. Rear window defroster switch	
Inspection	page T-77



23U0TX-047



03U0TX-126



03U0TX-127

FILAMENT Inspection

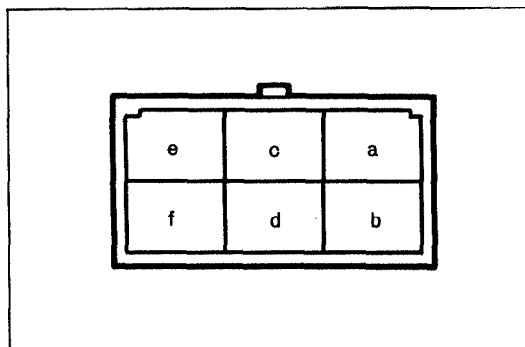
1. Turn the rear window defroster switch ON.
2. Connect the (+) terminal of the voltmeter to the center of each filament and the (-) terminal to the body. The standard voltage at the center of each filament is approximately 6V. If the meter indication is high, there is a short circuit between the center and the grounded side of the filament. If the indication is low or zero, the malfunction is between the center and positive side.

Repairing

1. Use paint thinner or ethyl alcohol to clean the damaged part of the filament.
2. Attach tape to both sides of the damaged part of the filament.
3. Using a small brush or marking pen, coat the damaged part with silver paint (part no. 2835 77 600) or equivalent.
4. Let the paint set for 24 hours at 25°C (77°F) to let it dry completely. (If a blow dryer is used to heat it to 150°C (302°F), it can be dried in about 30 minutes.)

Note

- Do not use the rear window defroster until the paint is dry.
- Do not use gasoline or similar solvents to clean the damaged part.



03U0TX-128

REAR WINDOW DEFROSTER SWITCH

Inspection

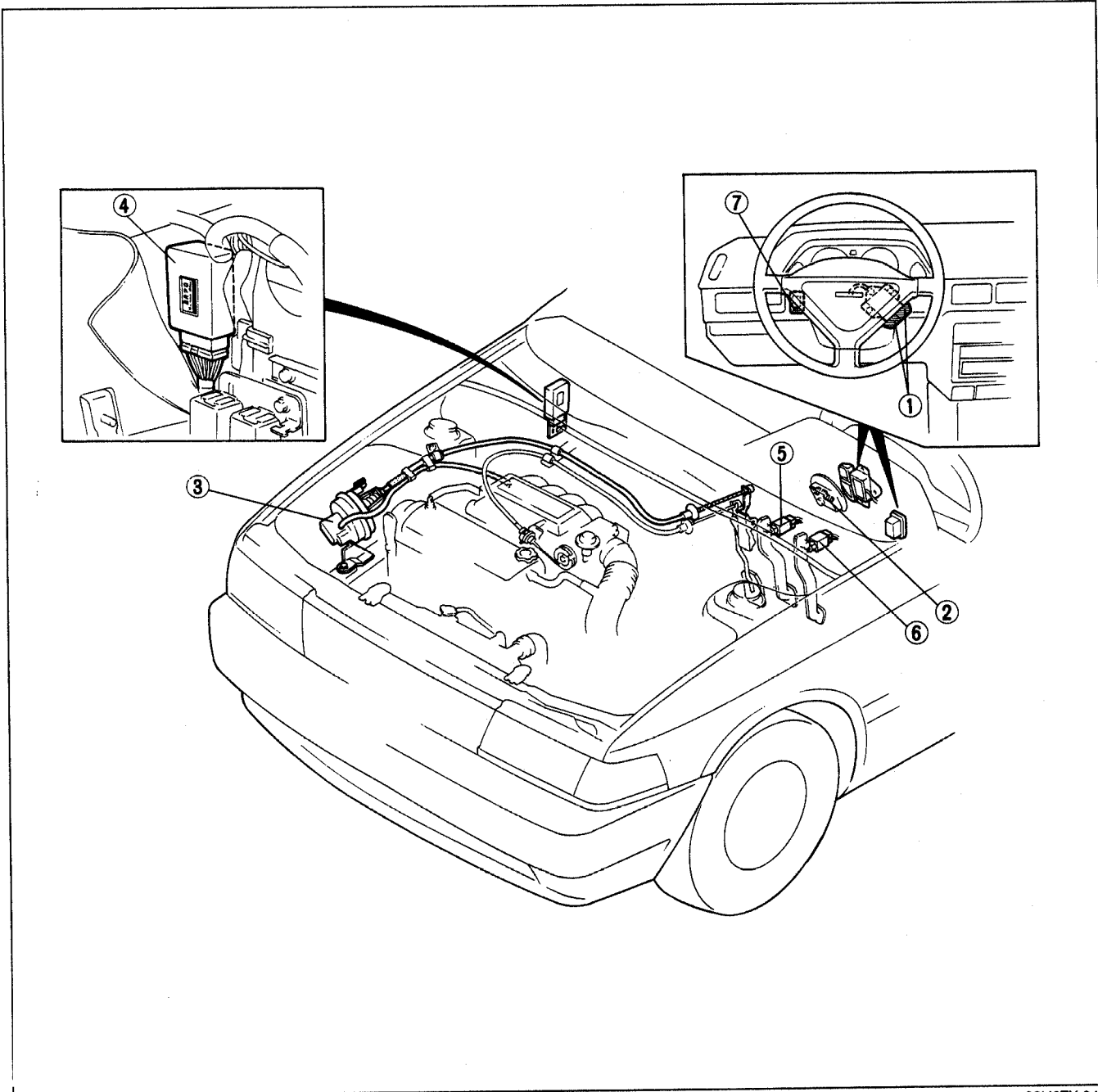
1. Check for continuity between the terminals with an ohmmeter.

Terminal	a	b	c	d	e	f
Position						
OFF	○—○	○—○	○—○	○—○	○—○	○—○
ON	○—○	○—○	○—○	○—○	○—○	○—○

○—○ : Indicates continuity

CRUISE CONTROL SYSTEM

STRUCTURAL VIEW



23U0TX-048

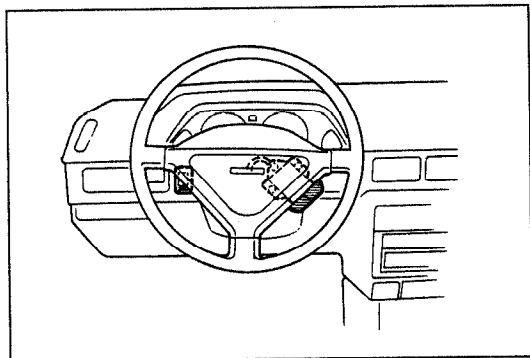
- | | |
|----------------------------------|----------------|
| 1. Cruise control switch | |
| Removal / Installation | page T-20 |
| Inspection | page T-21 |
| 2. Speed sensor (in the meter) | |
| Inspection | page T-72 |
| 3. Actuator | |
| Inspection | page T-87 |
| 4. Cruise control unit | |
| Troubleshooting | page T-83 |
| Removal / Installation | page T-85 |
| Self-diagnostic inspection | page T-80 |
| Inspection | page T-86 |
| 5. Stoplight switch | |
| Inspection | pages T-47, 87 |
| Adjustment..... | page T-87 |
| 6. Clutch switch (For MTX) | |
| Adjustment..... | page T-87 |
| 7. Cruise control main switch | |
| Inspection..... | page T-21 |

TROUBLESHOOTING GUIDE

General Note

Troubleshooting and inspection of the cruise control is done in two steps. First is the quick, self-diagnostic inspection using the built-in self-diagnostic function, cruise control switch, and test light. The other is a detailed inspection of parts using a voltmeter and an ohmmeter.

03U0TX-130



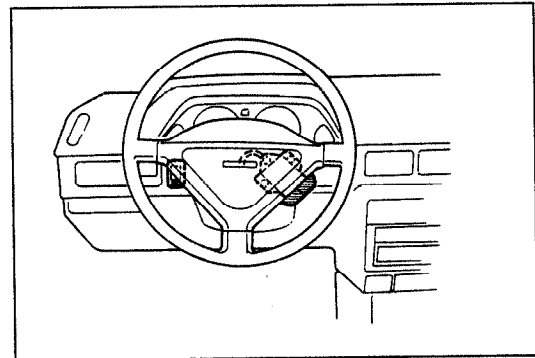
23U0TX-049

Step 1: Self-diagnostic Inspection (Self-diagnosis of malfunction)

Check for condition code(s) memorized in the cruise control unit by using the cruise control switch and test light. (Refer to page T-81.)

If no condition code exists, go to Step 2.

If a condition code(s) is indicated, go to Step 3.



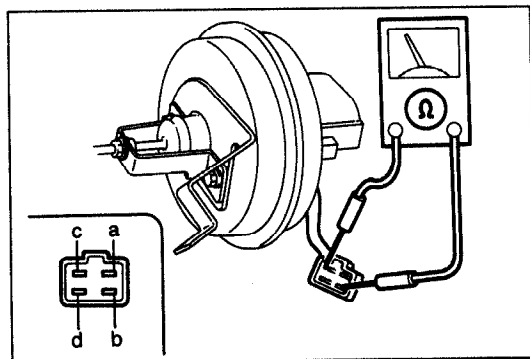
23U0TX-050

Step 2: Self-diagnostic Inspection (Quick inspection of cruise control system)

Verify operation codes by using the cruise control switch and test light. (Refer to page T-82.)

If the operation code is correctly indicated, the part under inspection is OK.

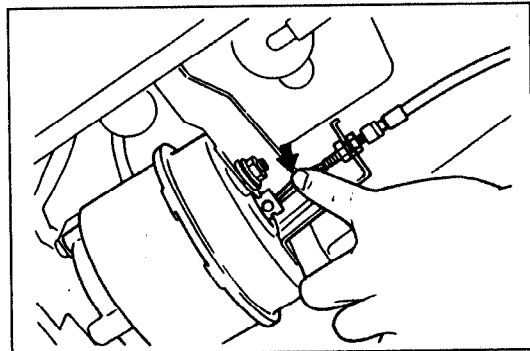
If an operation code is not indicated, go to Step 3.



23U0TX-051

Step 3: Inspection of Circuit and Parts

Check the cruise control wiring and parts with a voltmeter and an ohmmeter. (Refer to page T-86.)



03U0TX-134

Adjustment

Checking free play of actuator inner cable

Remove the clip and adjust the nut so that the actuator control cable play is as follows when the cable is pressed lightly.

Free play of actuator inner cable:
1—5mm (0.039—0.197 in)

SELF-DIAGNOSTIC INSPECTION**Self-diagnostic Function**

The Self-diagnostic function intergrated within the cruise control unit diagnoses the condition of the cruise control system.

Condition/operation codes are indicated by flashing of the test light connected to the control unit. (Refer to condition code numbers on page T-80.) This operation continues until canceled.

23U0TX-052

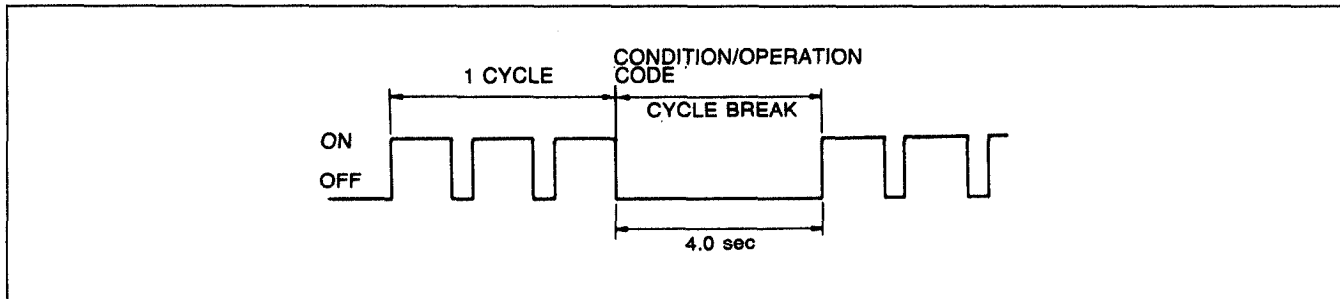
Principle of Code Cycle

Condition and operation codes are determined by flashing of the test light connected to the control unit as shown below.

03U0TX-140

1. Code cycle break

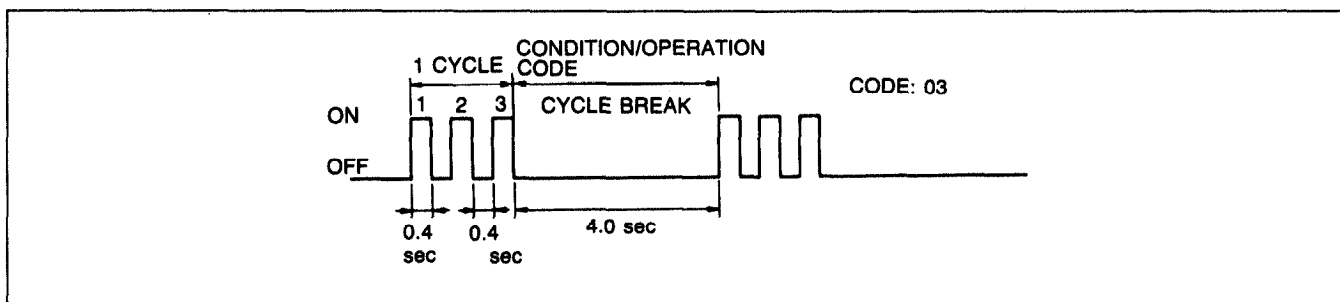
The time between condition/operation code cycles is 4.0 seconds (the time the lamp is off).



97U0TX-188

2. Second digit of condition/operation code (ones position)

The digit in the ones position of the condition/operation code represents the number of times the lamp is on 0.4 second during one cycle.

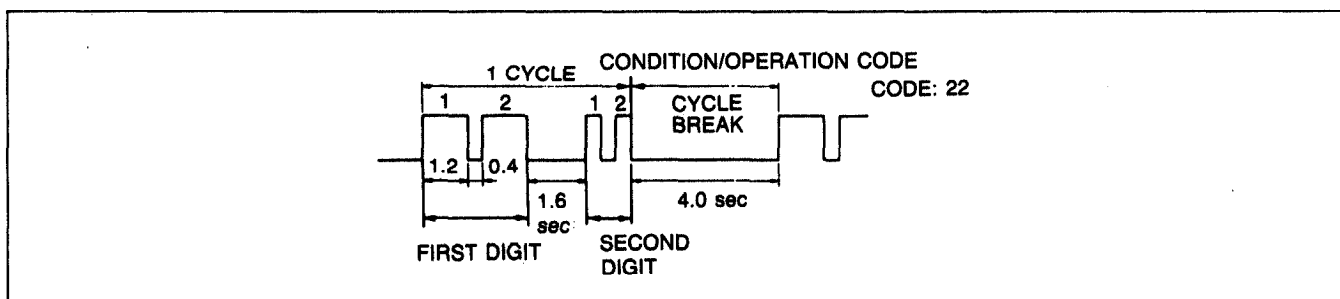


97U0TX-189

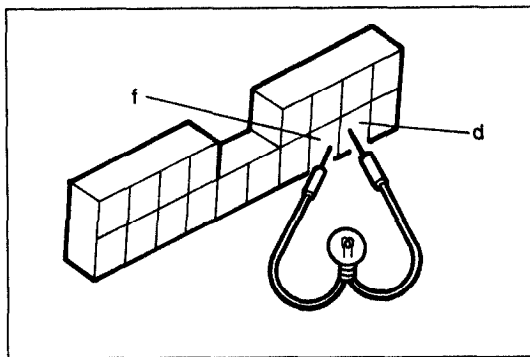
3. First digit of condition/operation code (tens position)

The digit in the tens position of the condition/operation code represents the number of times the lamp is on 1.2 seconds during one cycle.

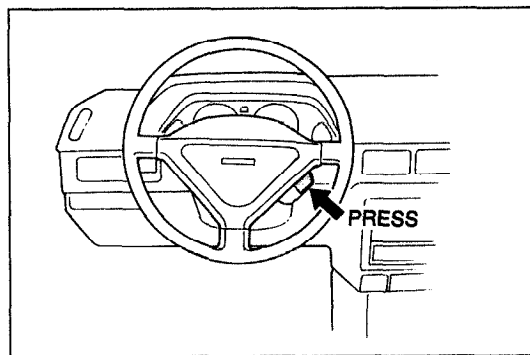
The lamp remains off for 1.6 seconds between the long and short flashes.



97U0TX-190



23U0TX-053



23U0TX-054

Inspection Procedure
Self-diagnosis of malfunction

1. Locate the cruise control connector.
2. Connect a 1.4W test light between terminals f and d, with connector attached to control unit.

Note

- There is no wire in terminal d of the connector. Push the test light through the connector and touch the corresponding pin on the control unit.

3. Turn the ignition switch to ON.
4. Turn the cruise control on by pressing the MAIN switch. (The MAIN indicator lamp will come ON.)
5. Press and hold the RESUME/ACCEL switch for more than three second.
6. The test light will illuminate for 3 seconds and go out for 2 seconds.
7. The self-diagnostic system is activated and the test light will flash if a problem is present.
8. Make note of the condition code number(s). (Refer to the chart at the bottom of the page).
9. After retrieving the code(s), drive the vehicle at more than 16 km/h (10mph), or press the MAIN switch to deactivate self-diagnosis. (The MAIN indicator lamp will go OFF.)

Note

- The cruise control system will not operate when in the self-diagnosis mode.

Condition Code Numbers
Self-diagnosis of malfunction

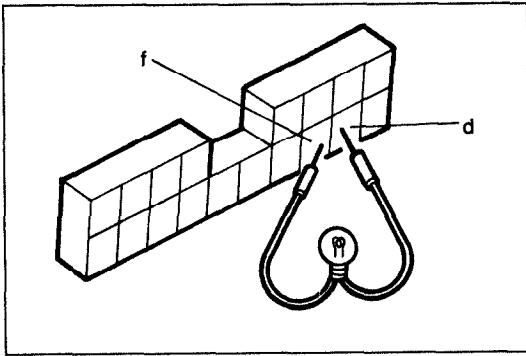
The test light will flash if a malfunction is present.

Pattern of output signal (Test light)	Code No.	Possible Cause	Action
ON OFF	01	Defective wiring (Actuator—Cruise control unit, Stoplight switch—Cruise control unit) Defective actuator Defective stoplight switch (For cruise)	Repair harness Inspect actuator (Refer to page T-87) Inspect stoplight switch (Refer to page T-87)
ON OFF	05	STOP fuse blown Defective wiring (Fuse — Cruise control unit)	Replace fuse Repair harness
ON OFF	07	Both stoplight switches (for vehicle and cruise) are ON simultaneously	Inspect stoplight switches (Refer to pages T-47 and T-87)
ON OFF	11	Defective SET/COAST, or RESUME/ACCEL switch	Inspect cruise control switch (Refer to page T-21)
ON OFF	15	Defective cruise control unit	Go to troubleshooting (Refer to page T-83)

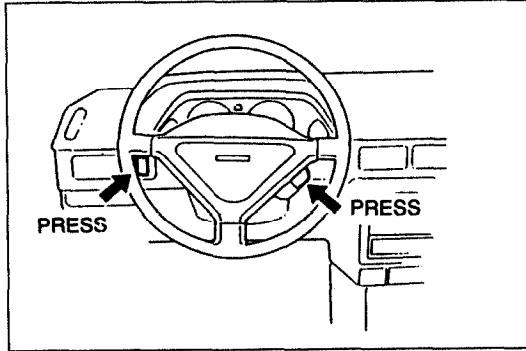
23U0TX-055

Note

- If there is more than one malfunction, the code numbers will be indicated in numerical order.



23U0TX-056



23U0TX-057

Inspection Procedure

Quick inspection of cruise control system

1. Locate the cruise control connector.
2. Connect a 1.4W test light between terminals f and d, with connector attached to control unit.

Note

- There is no wire in terminal d of the connector. Push the test light through the connector and touch the corresponding pin on the control unit.

3. Turn the ignition switch to ON.
4. Verify that the MAIN switch is OFF. (The MAIN indicator lamp is OFF.)
5. Press the RESUME/ACCEL switch and the MAIN switch simultaneously to activate the system inspection. (The MAIN indicator lamp will come ON.)
6. Operate each switch as described below and verify the operation codes.
7. Press the MAIN switch to deactivate the system inspection. (The MAIN indicator lamp will go OFF.)

Note

- The cruise control system will not operate when in the self-diagnosis mode.






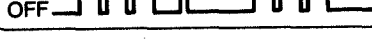




Operation Code Numbers

Inspection of cruise control system

The test light will flash if the system is operating **correctly**. If the light fails to flash, inspect the system.

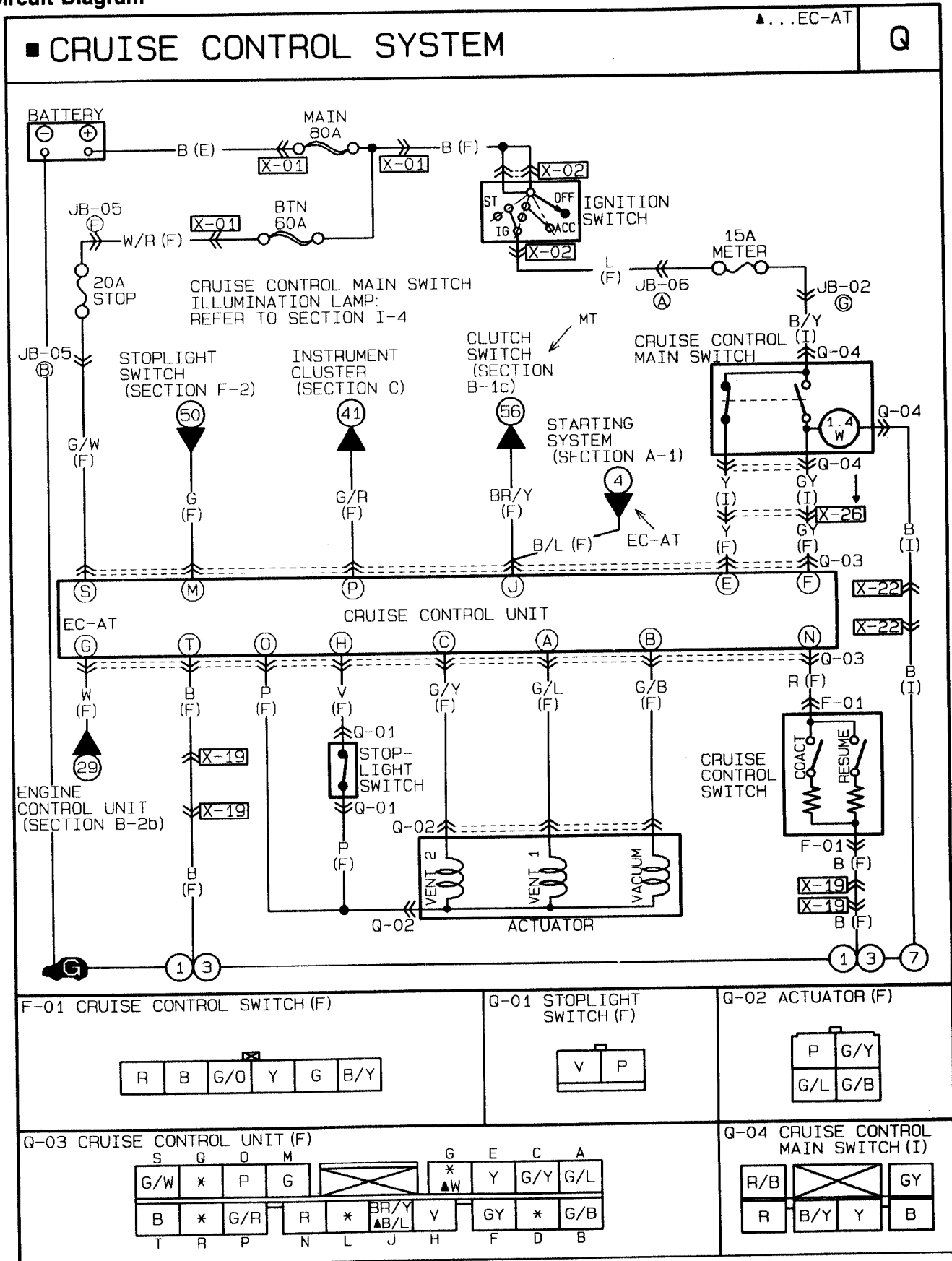
Note

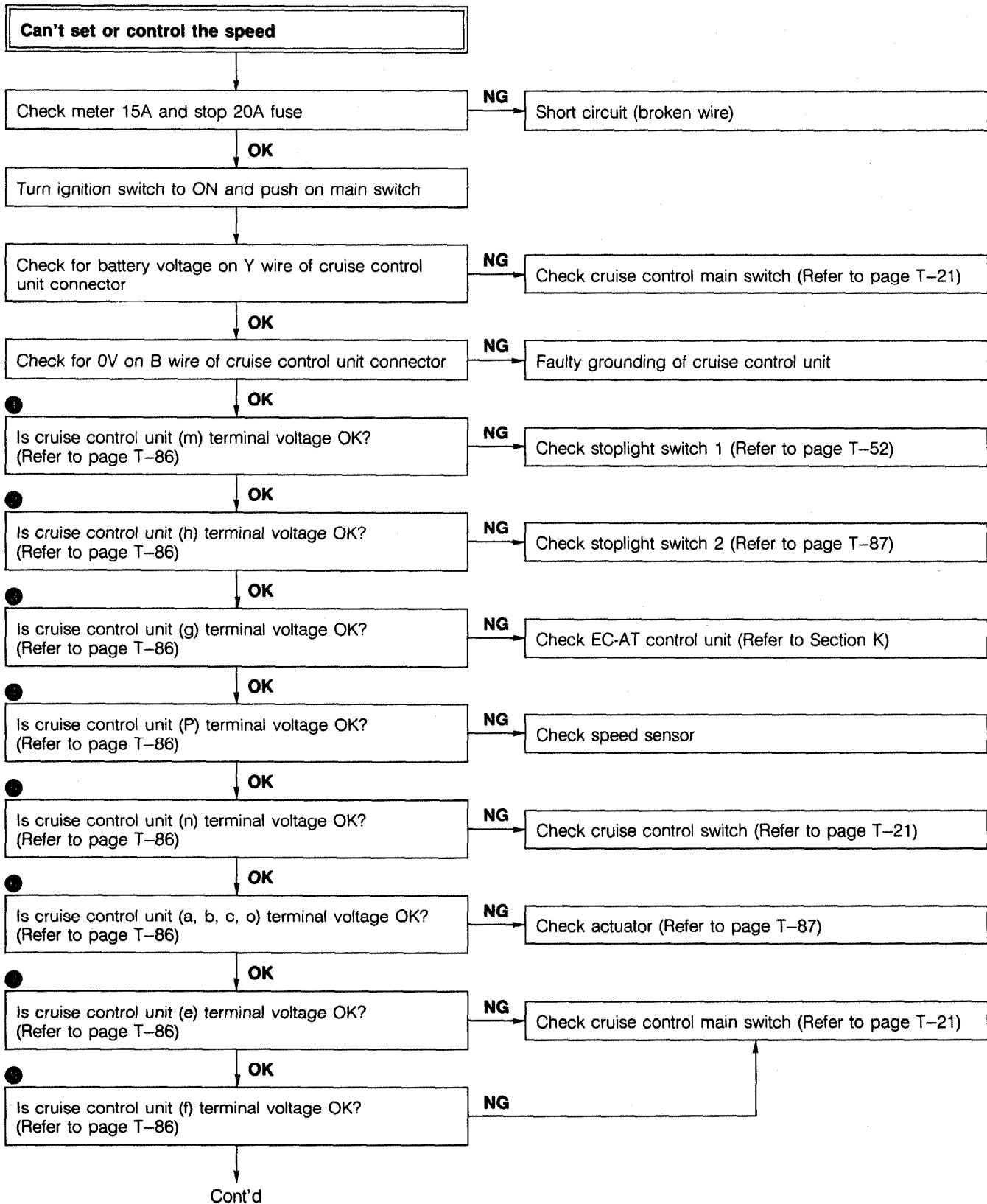
- Shift the selector lever to D or R range before operating the inspection. (For ATX)
- Shift to the gear except the neutral position. (For MTX)

Procedure	Pattern of output signal (Test light)	Code No.	Action to inspect
Press SET/COAST switch	ON  OFF 	21	Inspect cruise control switch (Refer to page T-21)
Press RESUME/ACCEL switch	ON  OFF 	22	Inspect cruise control switch (Refer to page T-21)
Depress brake pedal	ON  OFF 	31	Inspect stoplight switches (Refer to pages T-47 and T-88)
Turn ignition switch to ON and shift the selector lever to P or N range (For ATX) Depress clutch pedal (For MTX)	ON  OFF 	35	Inspect inhibitor switch (Refer to Section K) or clutch switch (Refer to Section F)
Drive vehicle above 40 km/h (25 mph)	ON  OFF 	37	Inspect speed sensor or wire harness

23U0TX-058

TROUBLESHOOTING
Circuit Diagram





Cont'd

Place vehicle on the chassis roller and start the engine and drive the vehicle at a speed of 50 km/h (31 mph) Check voltage at (a, b, c, o) terminal of cruise control unit

V_B: Battery voltage

Terminal	Condition	Voltage
a	MAIN switch ON	Approx. 9V
	SET switch ON	Approx. 0—12V
b	MAIN switch ON	Approx. 9V
	SET switch ON	Approx. 0—12V
c	MAIN switch ON	Approx. 9V
	SET switch ON	Approx. 1V
o	MAIN switch ON	Approx. 9V
	SET switch ON	V _B

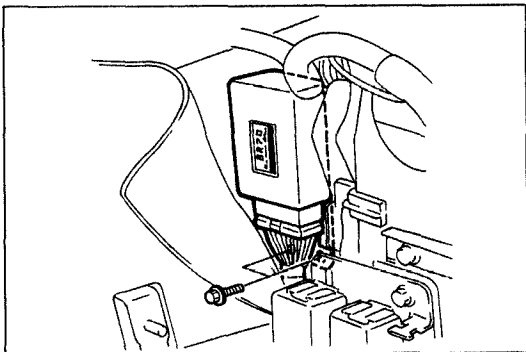
NG

Defective actuator (Refer to page T-88)

OK

Defective actuator cable or cruise control unit

23U0TX-059

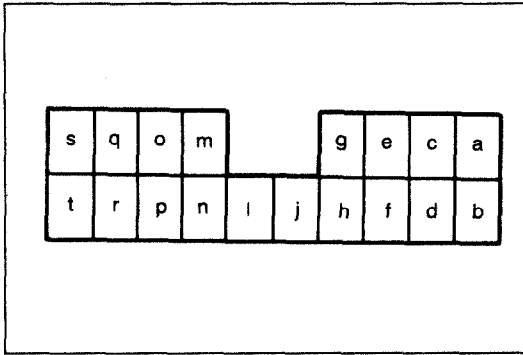


03U0TX-145

CRUISE CONTROL UNIT

Removal / Installation

1. Remove the blower unit. (Refer to Section U.)
2. Remove the bolts and the cruise control unit.



03U0TX-146

Inspection

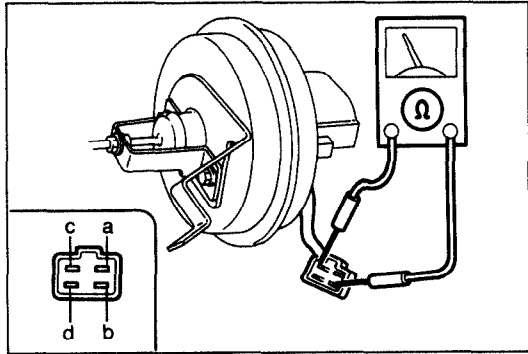
Cruise control unit

1. Connect a voltmeter between cruise control unit and ground.
2. Turn the ignition switch ON and check the terminal voltages as described below.

V_B: Battery voltage

Terminal	Connected to	Voltage	Procedure
a (Output)	Actuator	0V Approx. 9V	Ignition switch ON Main switch ON
b (Output)	Actuator	0V Approx. 9V	Ignition switch ON Main switch ON
c (Output)	Actuator	0V Approx. 9V	Ignition switch ON Main switch ON
d			
e (Input)	Cruise control main switch (N.C)	V _B	Ignition switch ON
f (Input)	Cruise control main switch (N.O)	V _B	Main switch ON
g (Input)	EC-AT control unit (only ATX)	V _B	Ignition switch ON
h (Output)	Stoplight switch 2 (N.C)	Approx. 9V	Main switch ON
j (Input) Note Disconnect EGI control unit connector	Inhibitor switch (ATX)	0V Approx. 5V	"N" or "P" range and main switch ON Other range and main switch ON
	Clutch switch (MTX)	0V Approx. 5V	Clutch pedal depressed and main switch ON Main switch ON
i (Input)	Horn relay	V _B	Horn switch OFF
m (Input)	Stoplight switch 1 (N.O)	0V V _B	Ignition switch ON Brake pedal depressed
n (Input)	Cruise control switch (Resume/accel switch)	V _B Approx. 9V	Main switch ON While pushing the resume/accel switch after main switch ON
	Cruise control switch (Set/coast switch)	V _B Approx. 5V	Main switch ON While pushing the set/coast switch after main switch ON
o (Input)	Stoplight switch 2 (N.C)	Approx. 9V 0V	Main switch ON Brake pedal depressed
p (Input) Note Disconnect EC-AT control unit connector	Speed sensor	Run out between 0—5V	While rotating the rear tire
q			
r			
s	Battery	V _B	Constant
t	Ground	0V	Constant

23U0TX-060

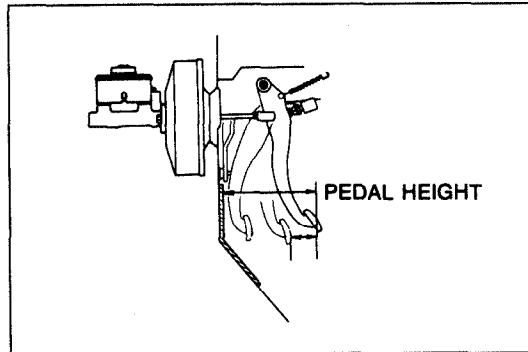


03U0TX-148

Actuator

Measure the actuator solenoid resistance using an ohmmeter.

Check terminals	Resistance
c-a	Approx. 22 to 55Ω
c-b	
c-d	



03U0TX-149

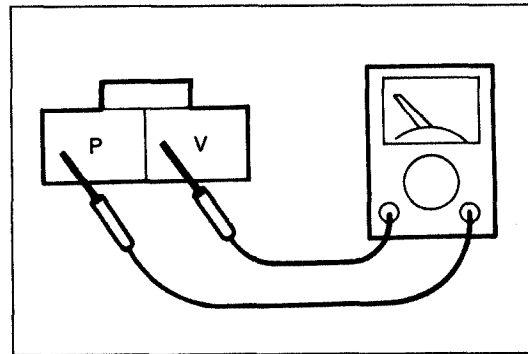
Clutch switch, Brake switch

When servicing these switches, adjust them so that the corresponding pedal height is as specified.

Pedal height (With carpet)

Clutch: 196—204mm (7.72—8.03 in)

Brake : 193—196mm (7.60—7.72 in)



03U0TX-182

Stoplight switch (For cruise)

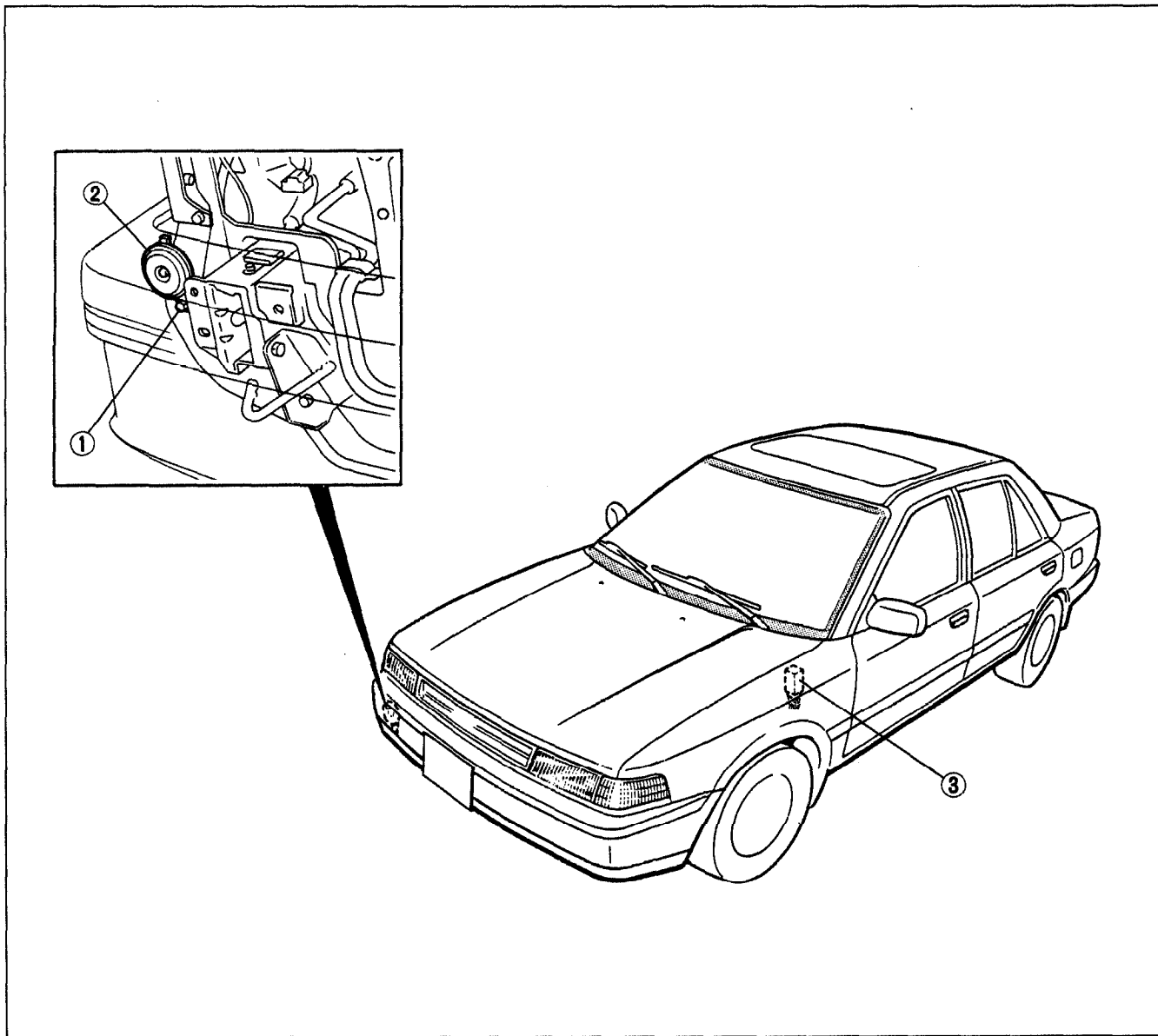
Check that there is continuity between (P) and (V) wires when the brake pedal is released.

HORN

HORN AND HORN RELAY

Removal / Installation

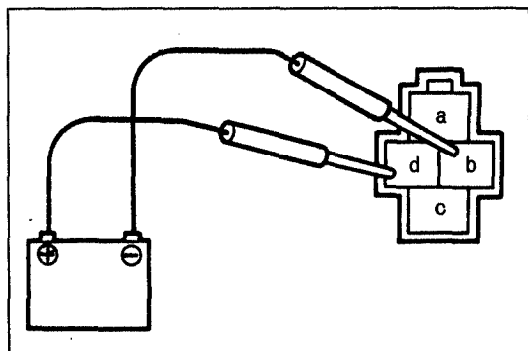
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



23U0TX-061

1. Bolt
2. Horn

3. Horn relay
Inspection page T-88



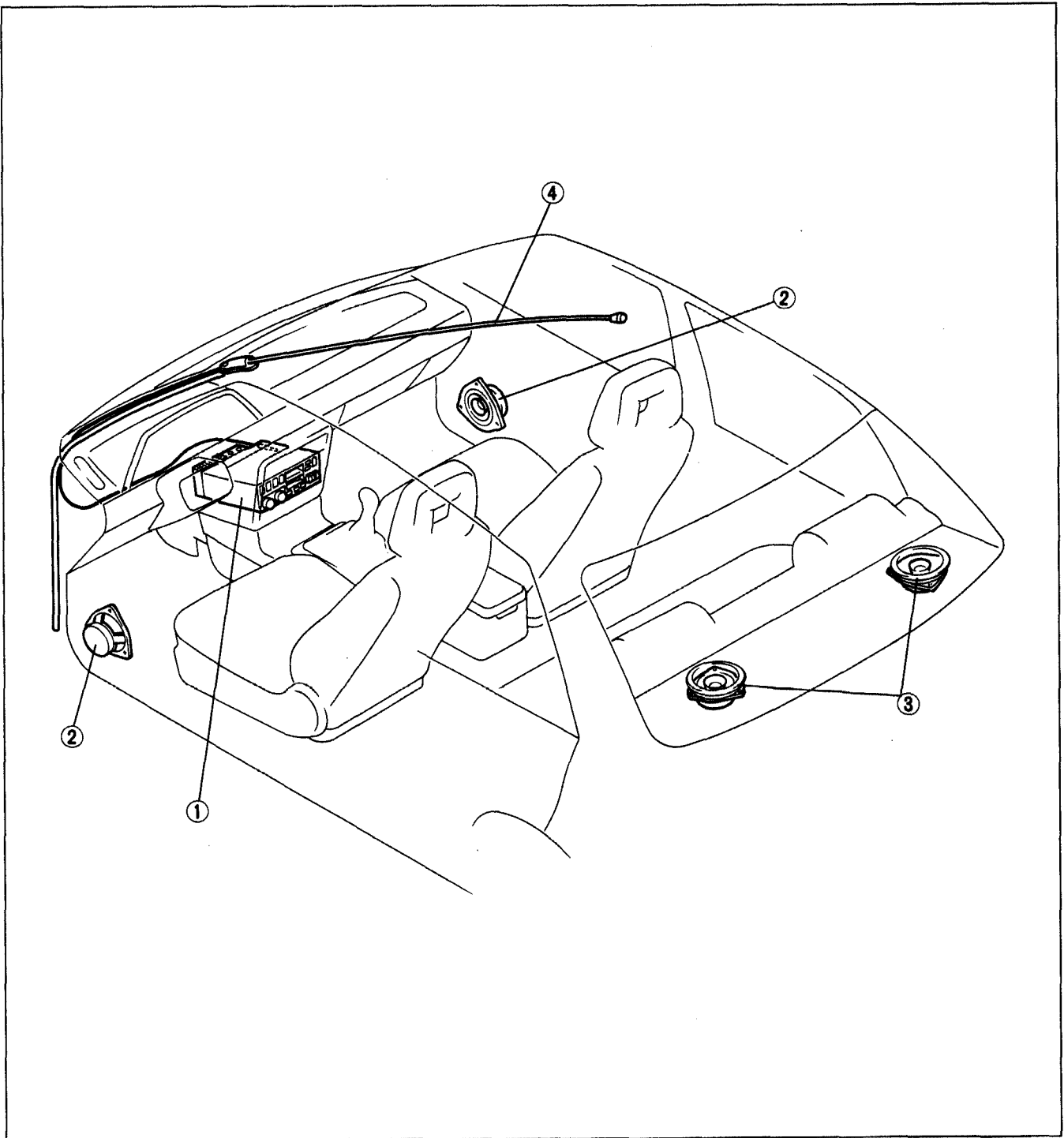
23U0TX-062

Inspection Horn relay

1. Connect the battery voltage to the "d" terminal and the ground to the "b" terminal. Check for continuity between the "a" and "c" terminals.

AUDIO

STRUCTURAL VIEW



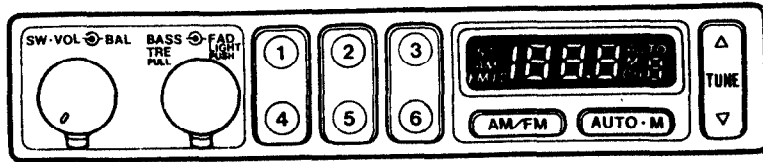
23U0TX-063

1. Audio component	
Troubleshooting	page T- 92
Removal / Installation	page T- 98
2. Door speaker	
Troubleshooting	page T- 92
Removal / Installation	page T- 98
Inspection	page T- 99

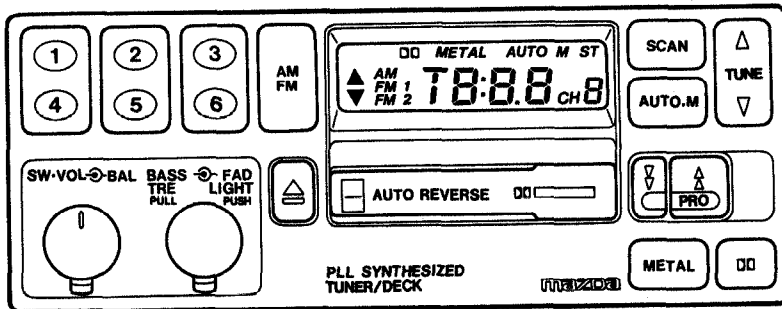
3. Rear speaker	
Troubleshooting	page T- 92
Removal / Installation	page T- 99
Inspection	page T- 99
4. Antenna feeder	
Troubleshooting	page T- 92
Removal	page T- 99
Installation	page T-100
Inspection	page T-100

OUTLINE OF AUDIO Front View

RADIO



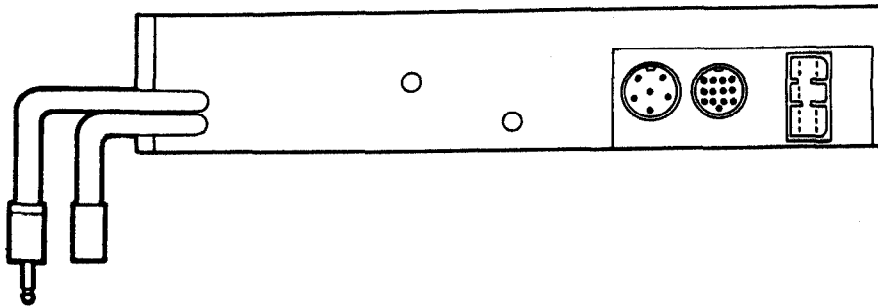
RADIO, CASSETTE TAPE PLAYER



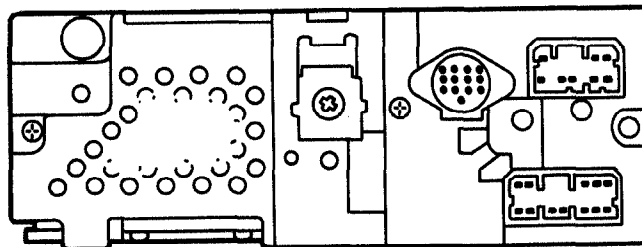
03U0TX-153

Rear View

RADIO



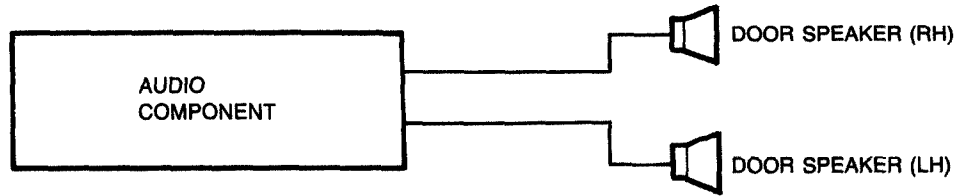
RADIO, CASSETTE TAPE PLAYER



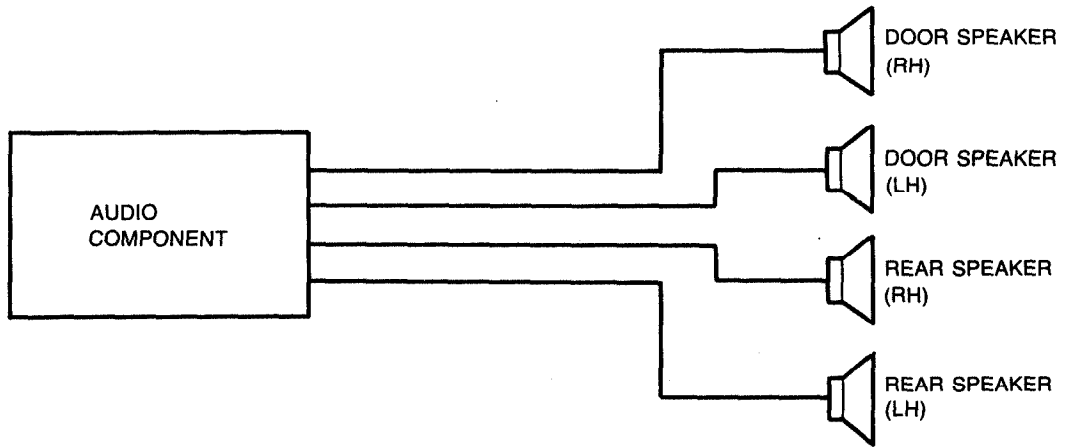
03U0TX-154

SYSTEM

RADIO

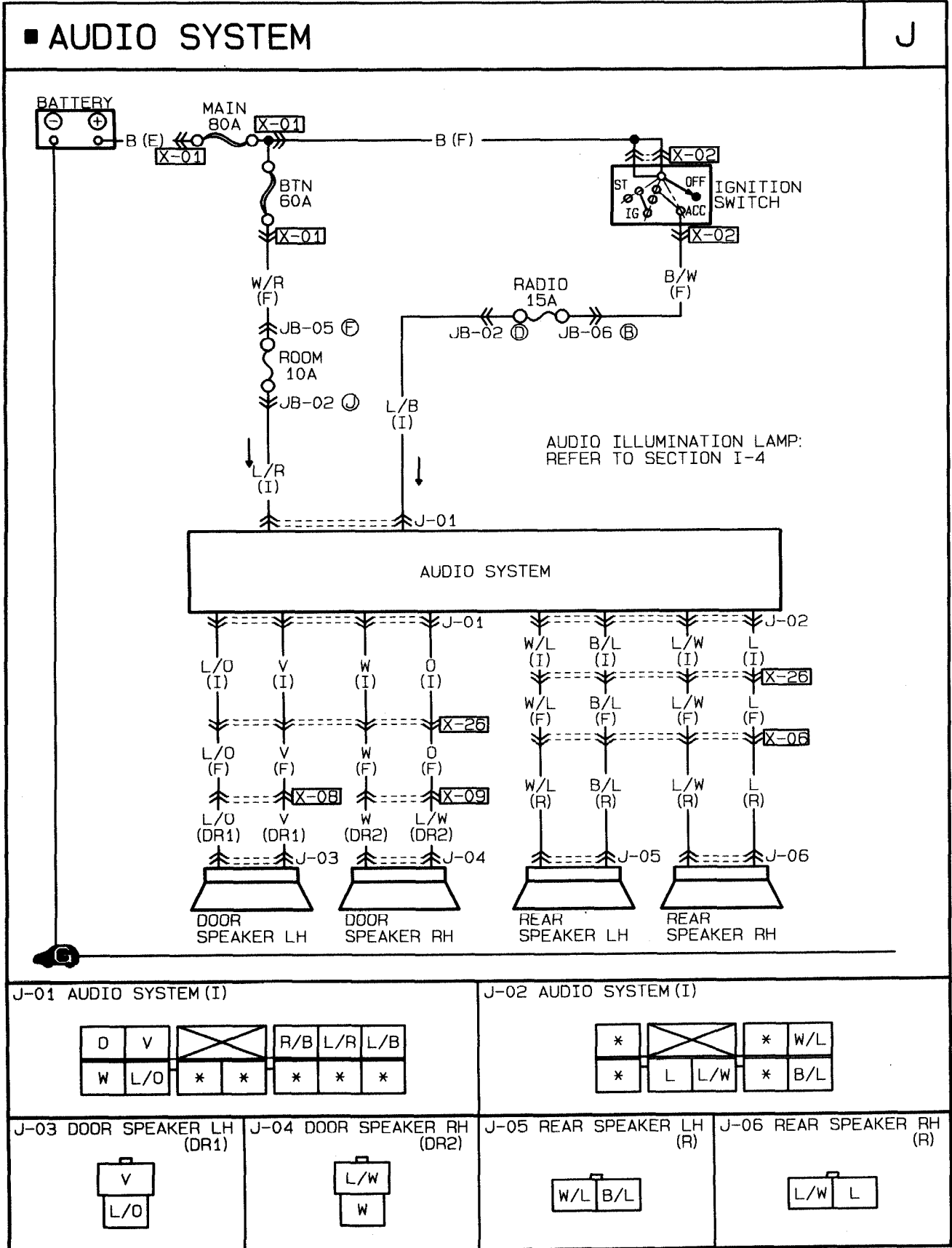


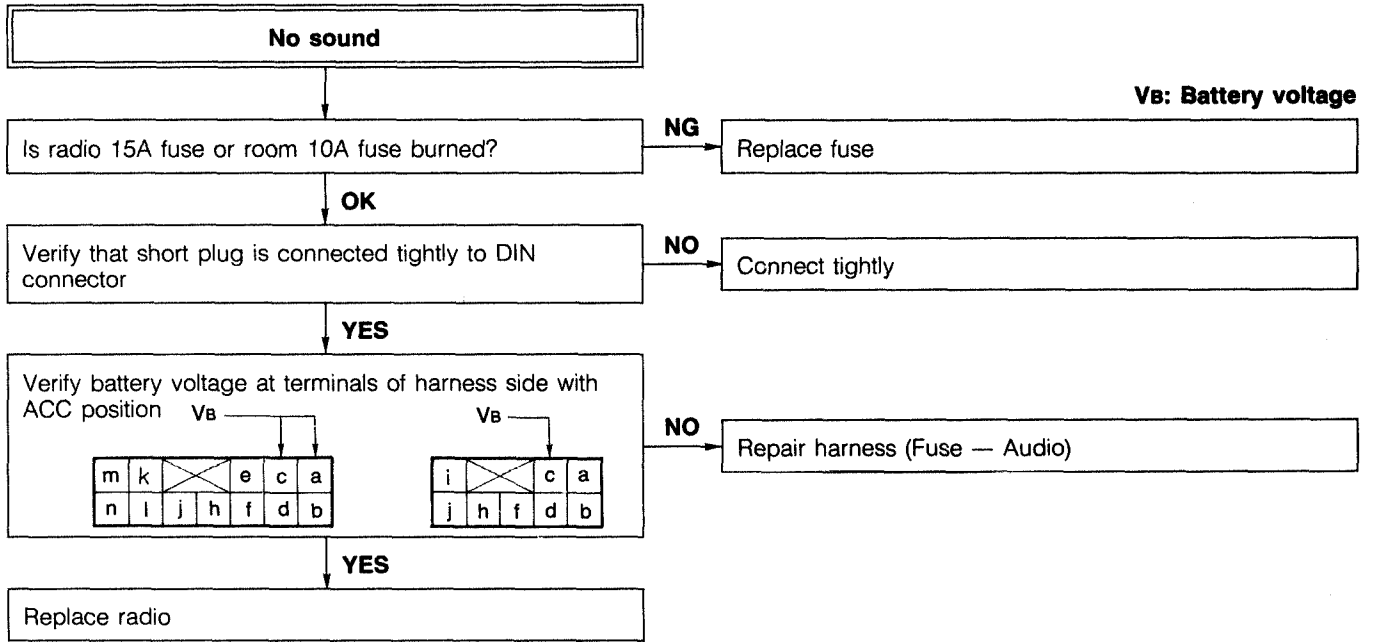
RADIO, CASSETTE TYPE PLAYER



03U0TX-155

TROUBLESHOOTING
Circuit Diagram





23U0TX-064

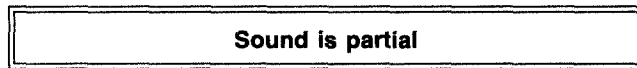
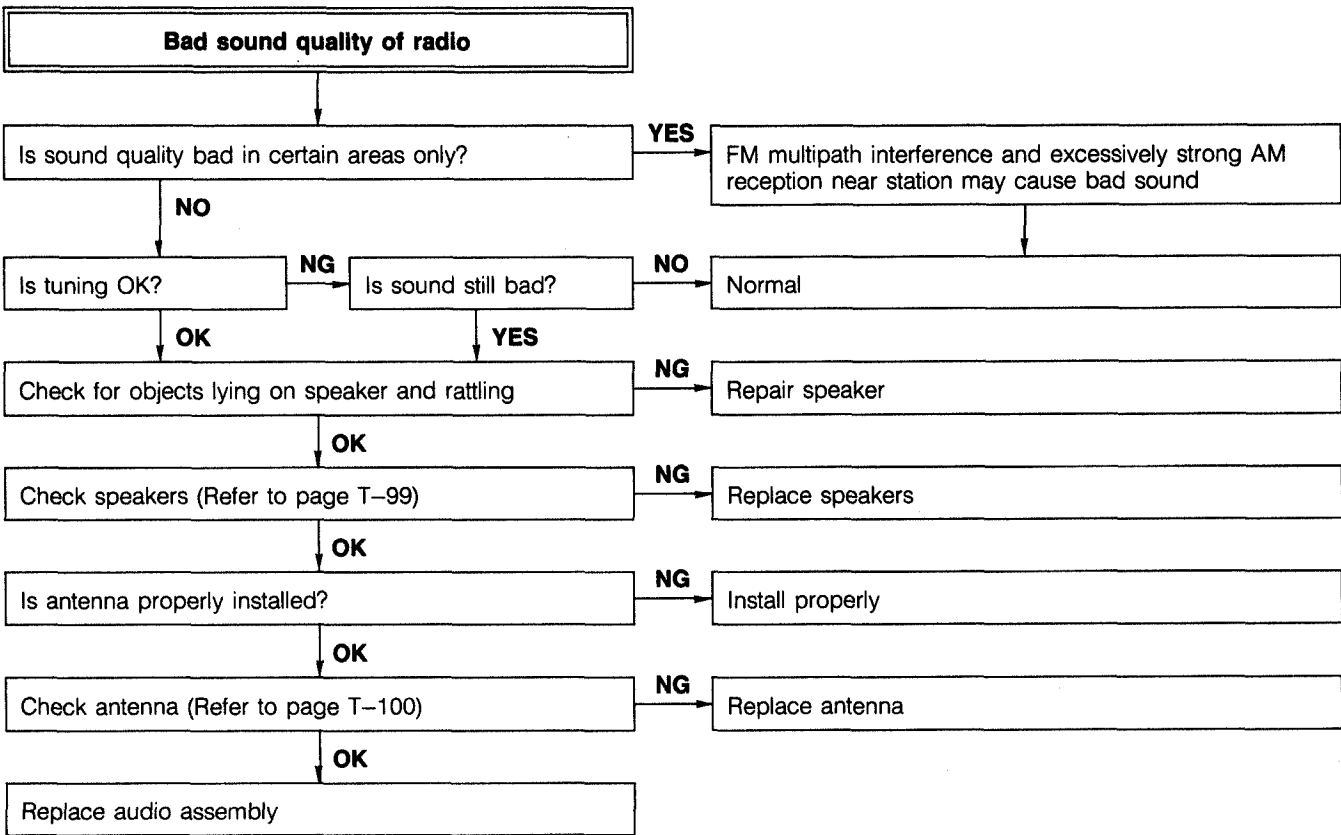


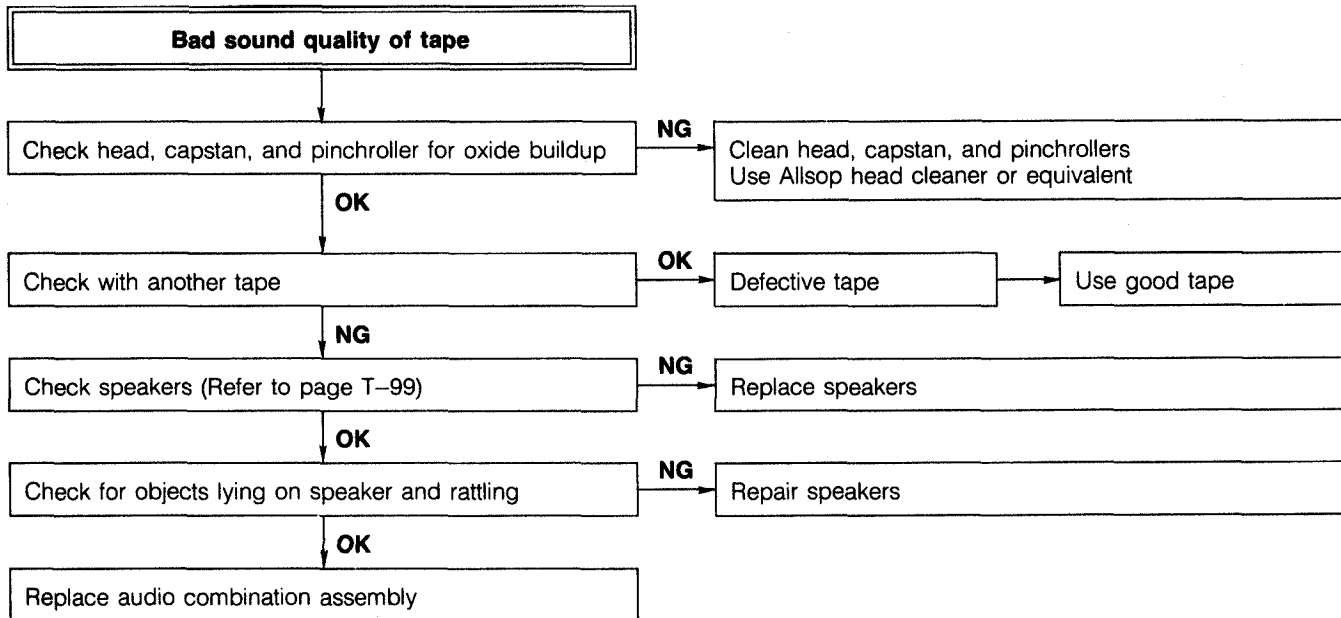
Table 1				
Speaker	Fader	Balance	Speaker operates	Judgement
Left rear	Rear	Left	Yes	Left rear speaker OK
			No	Left rear speaker circuit faulty (Go to Table 2)
Right rear	Rear	Right	Yes	Right rear speaker OK
			No	Right rear speaker circuit faulty (Go to Table 2)
Left door	Rear	Left	Yes	Left door speaker OK
			No	Left door speaker circuit faulty (Go to Table 2)
Right door	Rear	Right	Yes	Right door speaker OK
			No	Right door speaker circuit faulty (Go to Table 2)

Table 2	
No operation	Action
Any speaker	Inspect the speaker (Refer to page T-99)
All speakers	Replace the audio component

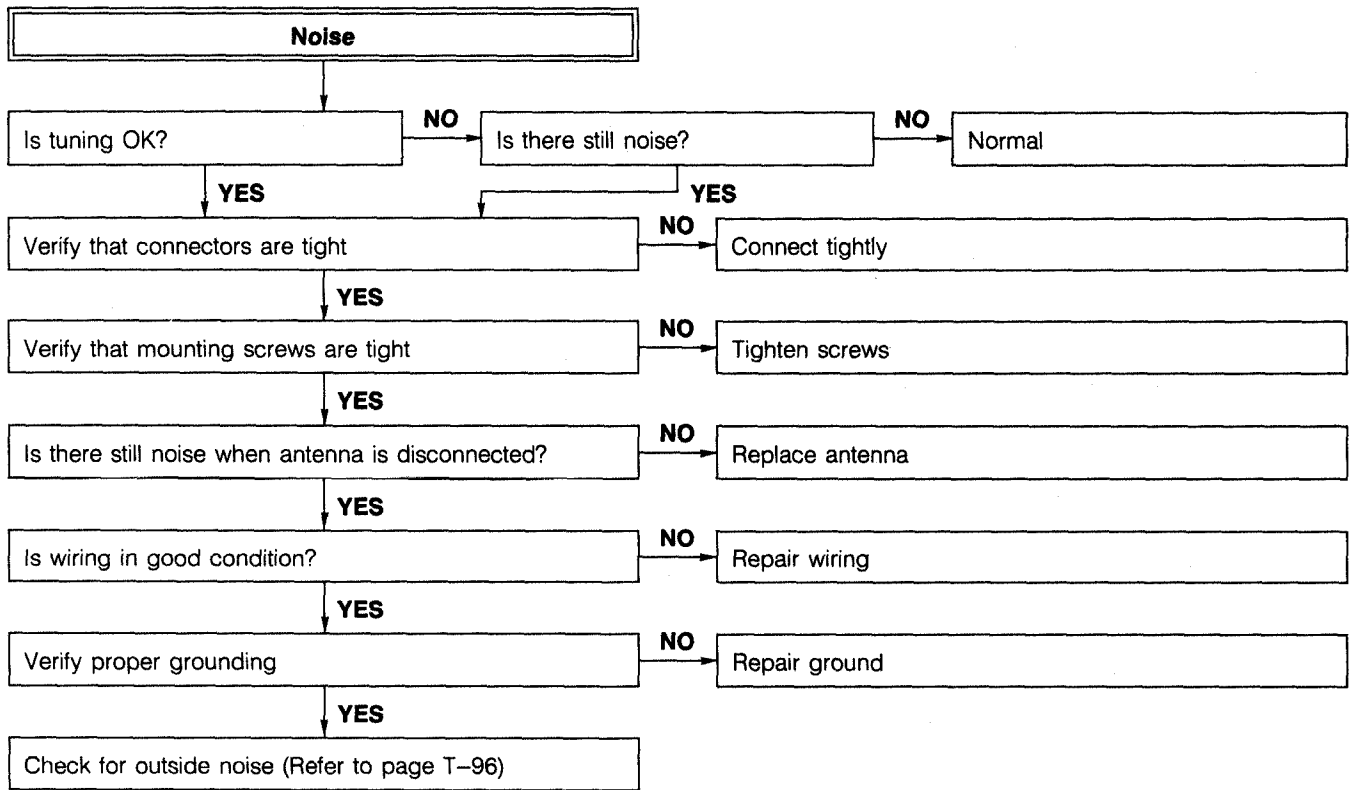
23U0TX-065



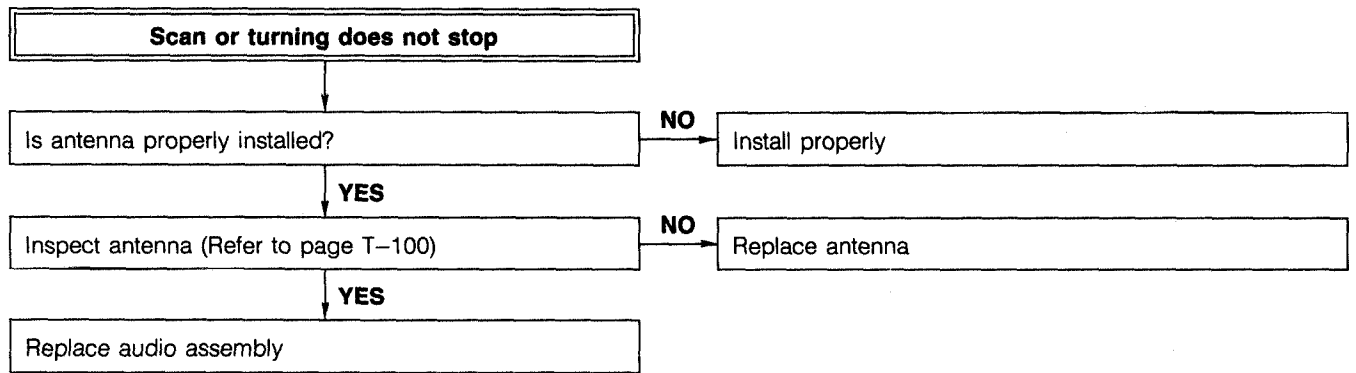
23U0TX-066



23U0TX-067



23U0TX-068



23U0TX-069

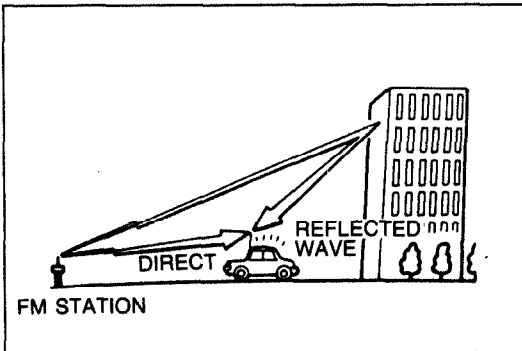
CAUSES OF NOISE

When the radio receives a signal from a station, there may be some noise interference. The cause could be

1. Defective audio system.
2. The vehicle itself inducts noise (called outside noise).
3. Noise from other cars or neon signs, for example, ambience noise.

Since ambience noise is a temporary occurrence, this section does not deal with it. For noise problems, first, the cause of the noise must be determined through the troubleshooting guide. Once it has been determined, refer to the suppression chart to find the proper procedure for eliminating the noise.

03U0TX-187

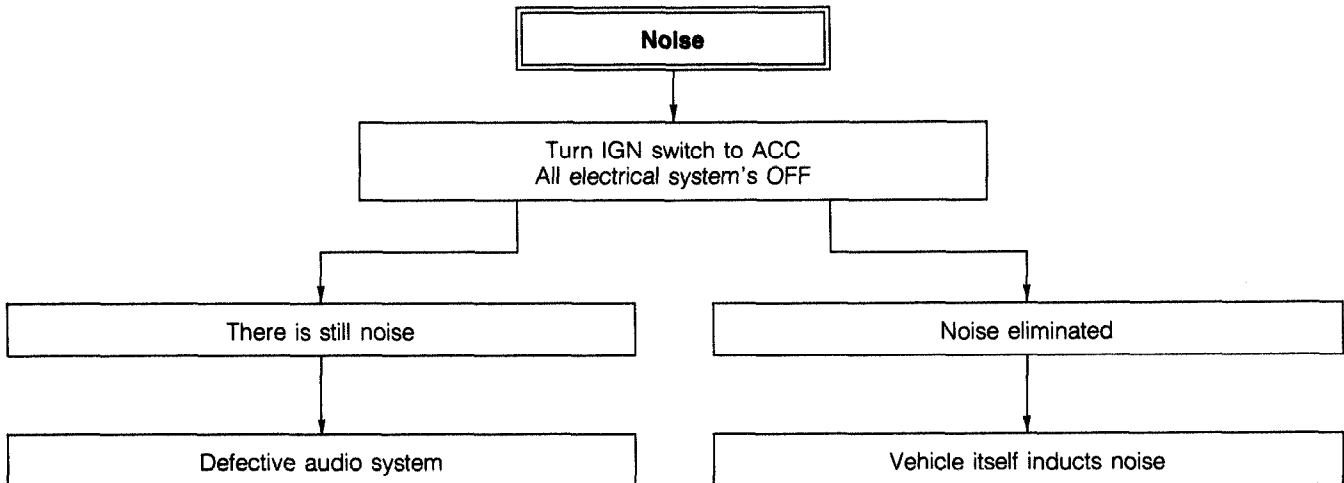


93U15X-071

FM multipath

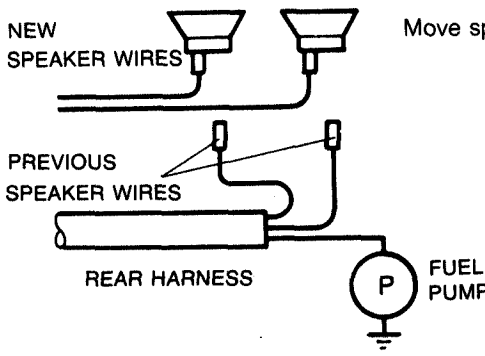
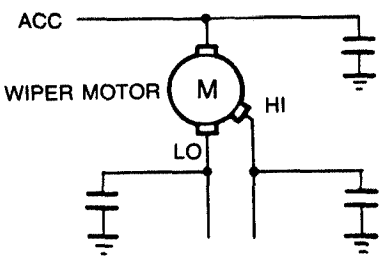
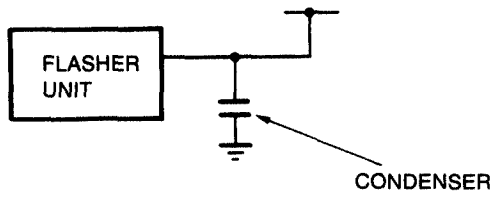
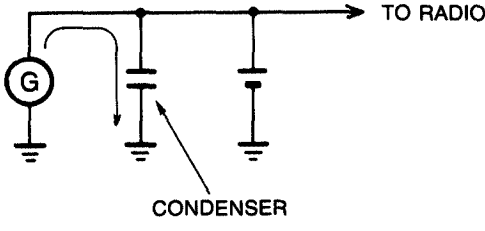
FM waves can cause a problem called multipath receiving. This happens when the radio picks up a direct wave and reflected wave at the same time. This results in a "Dead Spot" or distorted sound.

Troubleshooting



23U0TX-070

Noise Suppression Chart

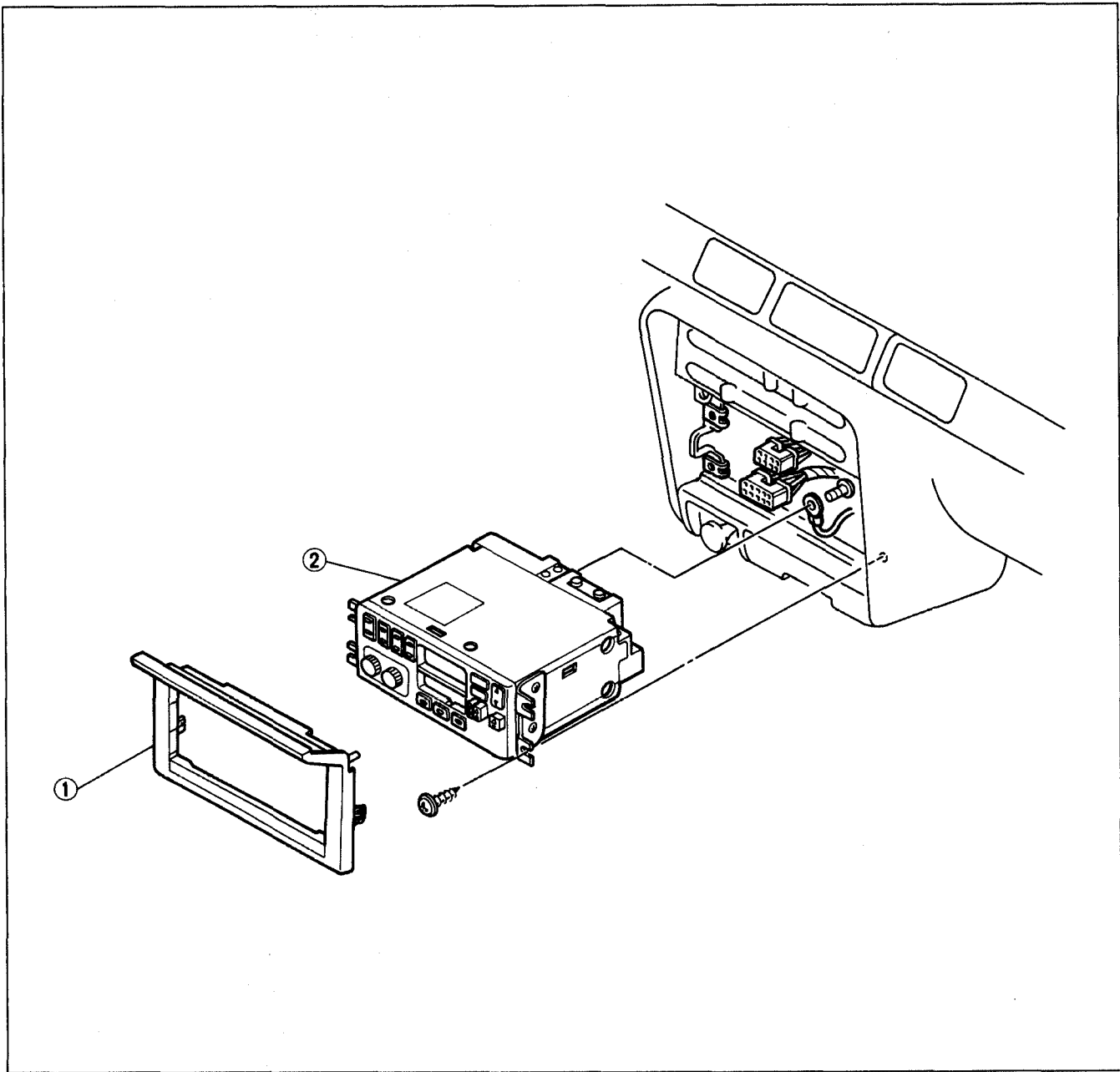
Cause	Remedy
<p>Fuel pump noise</p>	 <p>Move speaker wiring away from fuel pump wire.</p>
<p>Motor noise (Wiper, washer, power window, for example)</p>	<p>1. Check grounding. 2. Install condensers to motor circuit.</p> 
<p>Turn signal noise</p>	<p>Connect condenser (0.5 μF) to power line of filter unit.</p>  <p>Note • Condenser should be placed near flasher unit.</p>
<p>Alternator noise</p>	<p>Connect condenser (0.5 μF) near alternator.</p> 

97U0TX-151

AUDIO COMPONENT

Removal / Installation

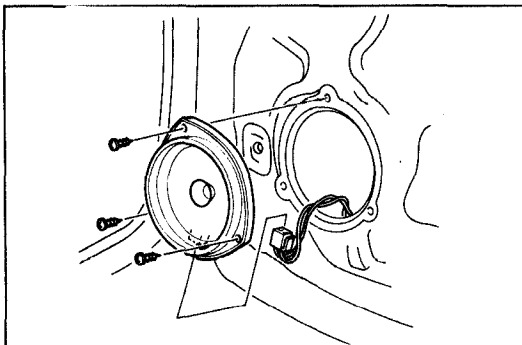
1. Remove in the order shown in the figure.
2. Install in the reverse order of removal.



03U0TX-163

1. Center panel

2. Audio component

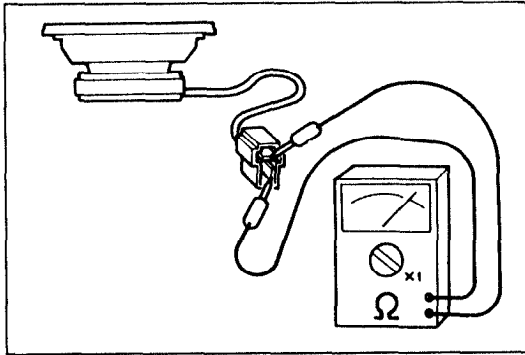


03U0TX-164

DOOR SPEAKER

Removal / Installation

1. Remove the door trim. (Refer to Section S.)
2. Remove the door screen.
3. Remove the door speaker.



97U0TX-166

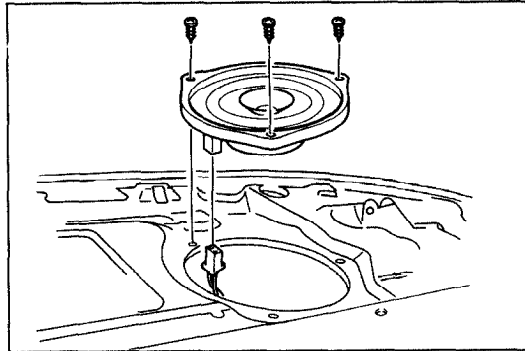
Inspection

1. Check for resistance with an ohmmeter.

Note

- Set the ohmmeter to $x1\Omega$ range.
- Resistance: approximately 4Ω

2. Confirm that clicking comes from the speaker when touching the connectors. If not, replace speaker.

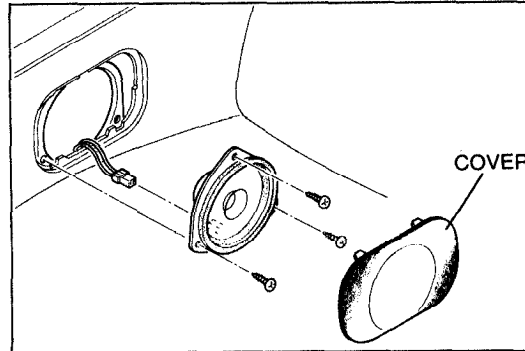


13U0TX-065

REAR SPEAKER

Removal / Installation (PROTÉGÉ)

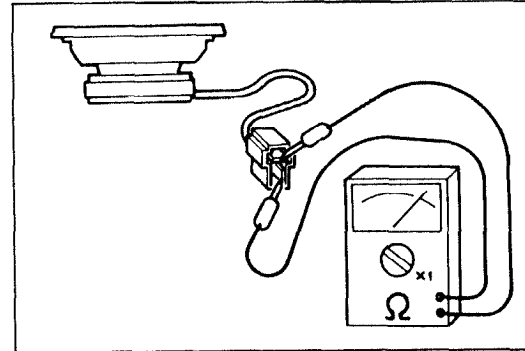
1. Remove the fasteners and the rear package trim.
2. Remove the screws and the rear speaker.



03U0TX-183

(Hatchback)

1. Remove the cover.
2. Remove the screw and the rear speaker.



03U0TX-189

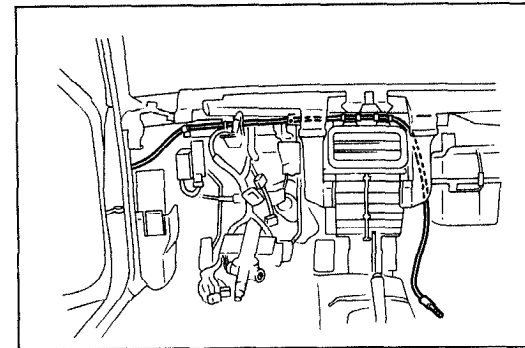
Inspection

1. Check for resistance with an ohmmeter.

Note

- Set the ohmmeter to $x1\Omega$ range.
- Resistance: approximately 4Ω

2. Confirm that a clicking comes from the speaker when touching the connectors. If not, replace the speaker.



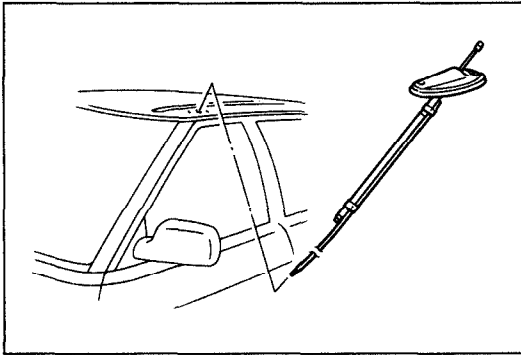
03U0TX-166

ANTENNA FEEDER

Removal

1. Remove the instrument panel. (Refer to Section S.)
2. Remove the front side trim.

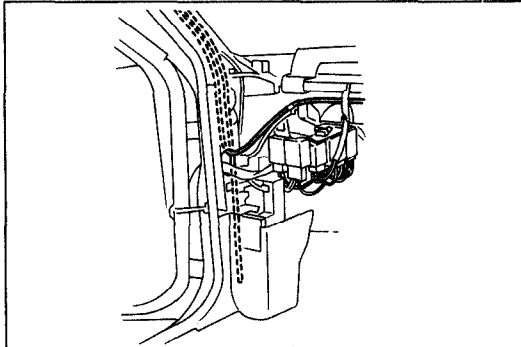
3. Remove the antenna feeder from the clip.
4. Remove the screws and antenna assembly.



03U0TX-167

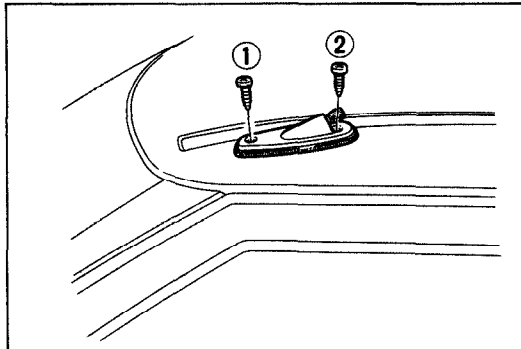
Installation

1. Extend the antenna.
2. Insert the antenna feeder and the drain pipe in the hole of the roof.



03U0TX-168

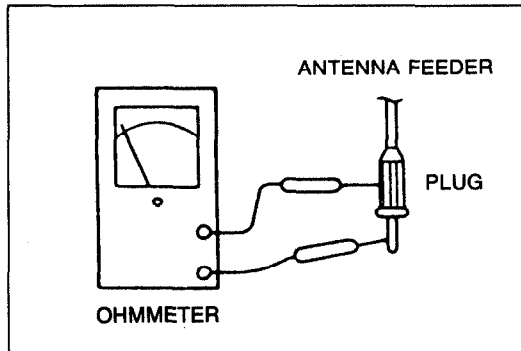
3. Install in the order shown in the figure.



03U0TX-169

Inspection

1. Check the antenna with an ohmmeter.
2. If the needle does not indicate infinite, replace the antenna.



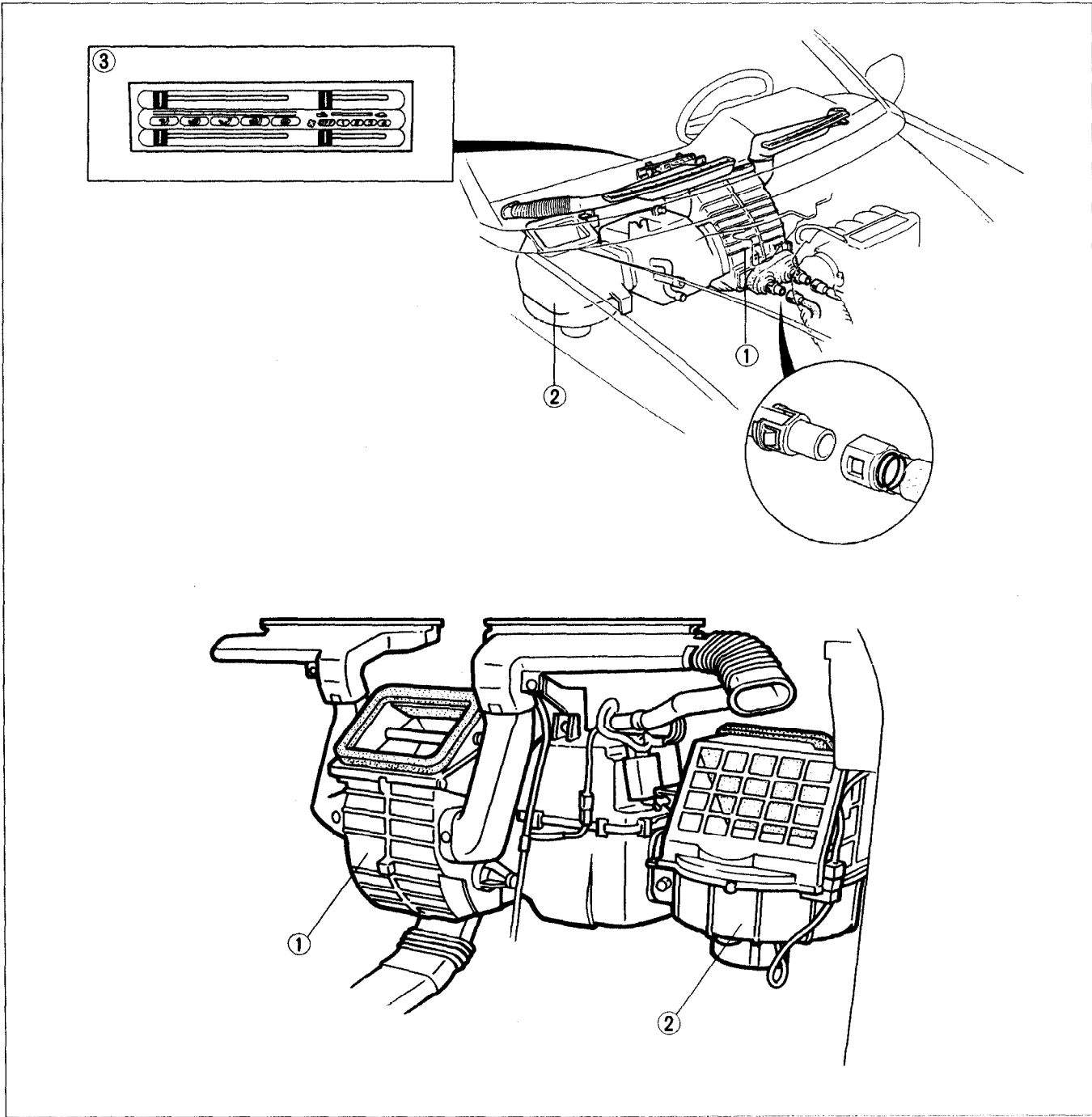
03U0TX-170

HEATER AND AIR CONDITIONER SYSTEMS

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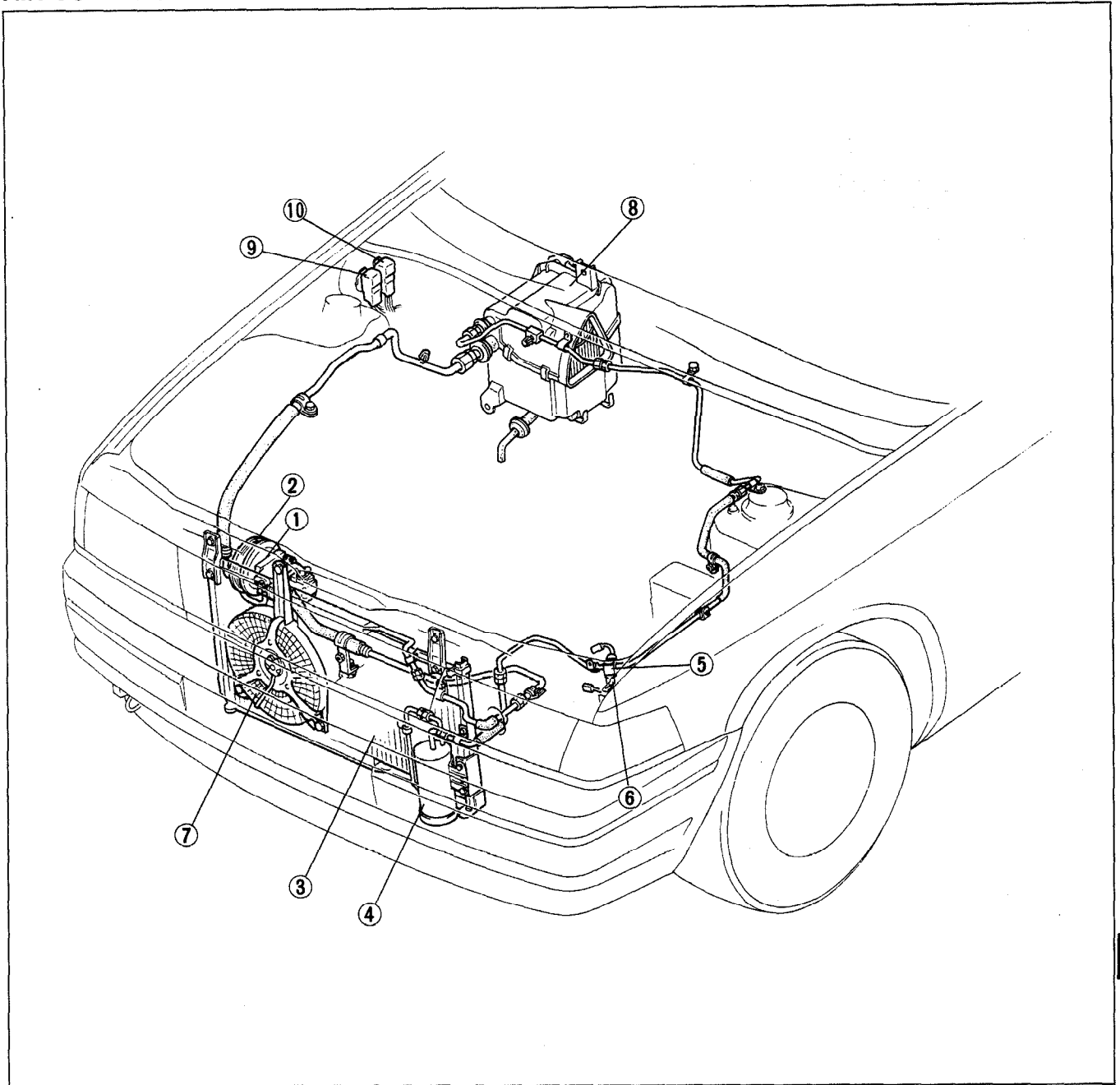
HEATER



03U0UX-002

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Disassembly / Assembly.....	page U-24	Rec-Fresh wire	
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Inspection.....	page U-25	Mode wire	
Resistor assembly (in blower unit)		Adjustment.....	page U-28
Inspection.....	page U-25	Mix wire	
		Adjustment.....	page U-28

AIR CONDITIONER

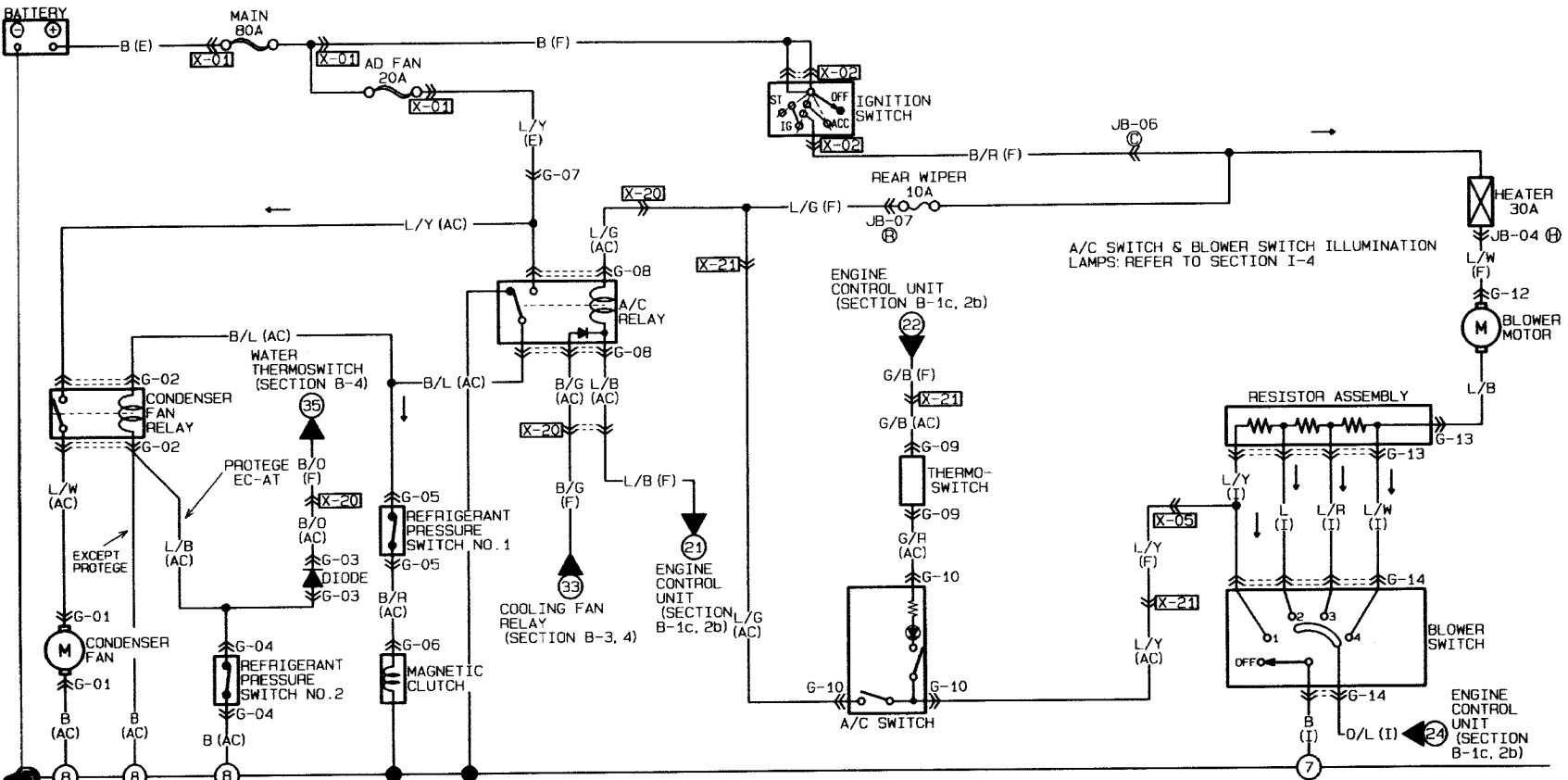


23U0UX-002

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2. Magnetic clutch		
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10. Condenser fan relay		
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U

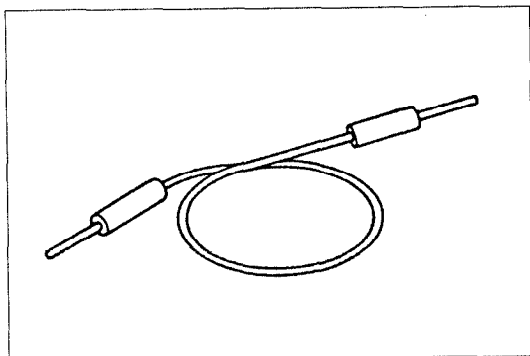
HEATER & AIR CONDITIONER



<p>G-01 CONDENSER FAN (AC)</p>	<p>G-02 CONDENSER FAN RELAY (AC)</p>	<p>G-03 DIODE (AC)</p>	<p>G-04 REFRIGERANT PRESSURE SWITCH NO.2 (AC)</p>	<p>G-05 REFRIGERANT PRESSURE SWITCH NO. 1 (AC)</p>	<p>G-06 MAGNETIC CLUTCH (AC)</p>	<p>G-07 (E) - (AC) CONNECTOR</p>
<p>G-08 A/C RELAY (AC)</p>	<p>G-09 THERMOSWITCH (AC)</p>	<p>G-10 A/C SWITCH (AC)</p>	<p>G-12 BLOWER MOTOR (F)</p>	<p>G-13 RESISTOR ASSEMBLY (I)</p>		
<p>G-14 BLOWER SWITCH (I)</p>						

Symptom	Reference page
Blower motor does not operate	U- 6
Condenser fan does not operate (Magnetic clutch operates normally)	U- 8
Magnetic clutch does not operate (Condenser fan operates normally)	U-10
Condenser fan and magnetic clutch do not operate	U-12
Insufficient cooling No cooling Intermittent cooling	U-14

03U0UX-004



9MU0UX-008

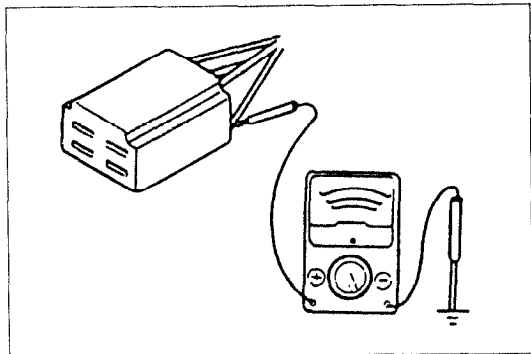
ELECTRICAL TROUBLESHOOTING TOOLS

Jumper Wire

The jumper wire is used for testing by short-circuiting switch terminals and to verify the condition of ground connections.

Caution

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

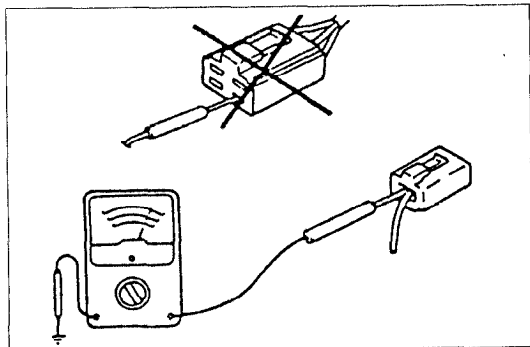


9MU0UX-009

Voltmeter

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

U



9MU0UX-010

Ohmmeter

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

Caution

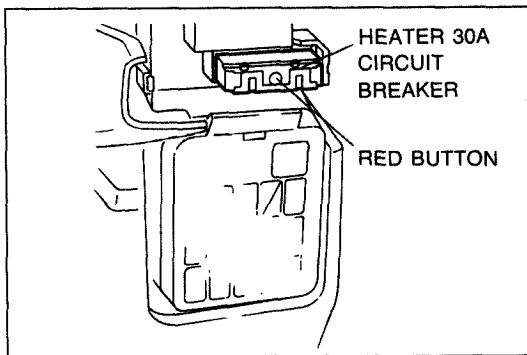
- **Never connect the ohmmeter to any circuit to which voltage is applied. Doing so may burn or otherwise damage the ohmmeter.**

Symptom: Blower motor does not operate.

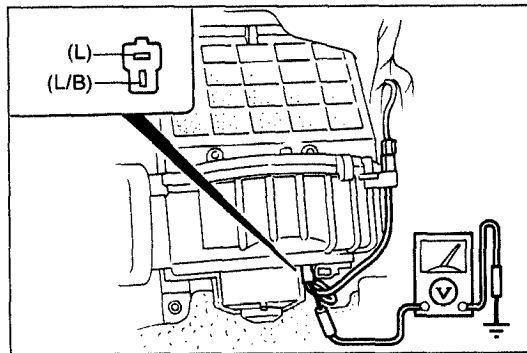
Normal operation of blower motor

Blower motor speed is controlled by the blower switch and a resistor assembly in the blower unit. When the blower switch is in the OFF position, the motor ground circuit is open and the blower motor does not operate. When the switch is in the first (Low) position, current flow from the blower motor is restricted by the three resistors in the resistor assembly, and the blower motor turns at low speed. Changing the blower switch to the second (Mid), third (High), or fourth (Super-high) positions causes the circuit resistance to decrease, and the blower motor speed to become correspondingly faster.

03U0UX-005



03U0UX-111



23U0UX-003

Step 1 Check circuit breaker

1. Check the circuit breaker.

Circuit breaker	Amperage	Location
HEATER	30A	Fuse box

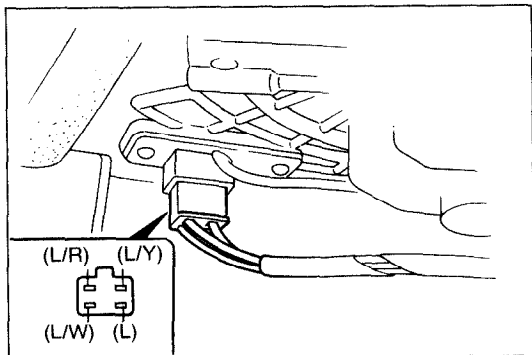
2. If the reset button is not out, go to Step 2.
3. If the reset button is out, check for a short circuit in the harness. Repair as necessary; then depress the reset button to reset the circuit breaker.

Step 2 Measure voltage at blower motor

1. Turn the ignition switch ON.
2. Turn the blower switch to the fourth position.
3. Measure the voltage at the following terminal wires of the blower motor connector.

V_B: Battery voltage

Wire	Voltage	Action
(L)	V _B	Next, check wire (L/B)
	0V	Repair wire harness (Circuit breaker—Blower motor)
(L/B)	V _B	Go to Step 3
	0V	Replace blower motor



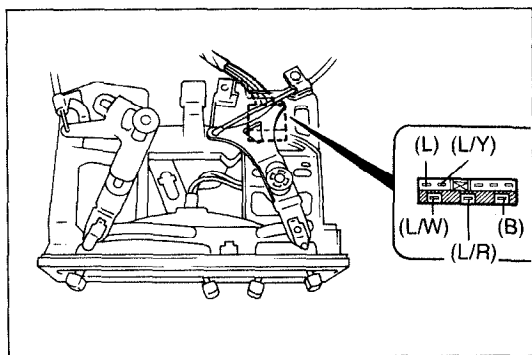
23U0UX-004

Step 3 Measure voltage at resistor assembly

1. Turn the ignition switch ON.
2. Turn the blower switch OFF and verify that the A/C switch is OFF.
3. Measure the voltage at the following terminal wires of the resistor assembly.

V_B: Battery voltage

Wire	Voltage	Action
(L/W)	V _B	Next, check wire (L/R)
	0V	Replace resistor assembly
(L/R)	V _B	Next, check wire (L)
	0V	Replace resistor assembly
(L)	V _B	Next, check wire (L/Y)
	0V	Replace resistor assembly
(L/Y)	V _B	Go to Step 4
	0V	Replace resistor assembly



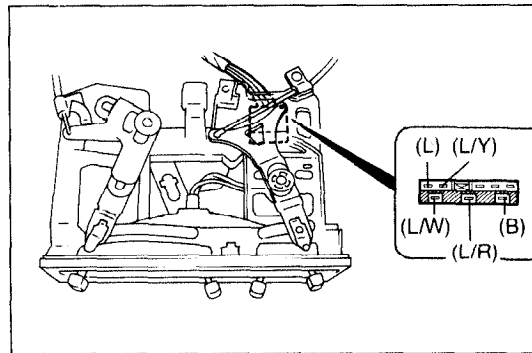
23U0UX-005

Step 4 Measure voltage at blower switch

1. Turn the ignition switch ON.
2. Turn the blower switch to the fourth position.
3. Measure the voltage at the following terminal wire of the blower switch connector.

V_B: Battery voltage

Wire	Voltage	Action
(B)	0V	Go to Step 5
	V _B	Repair wire harness (Blower switch—Body ground)



23U0UX-006

Step 5 Measure voltage at blower switch

1. Turn the ignition switch ON.
2. Turn the blower switch and A/C switch OFF.
3. Measure the voltage at the following terminal wires of the blower switch connector.

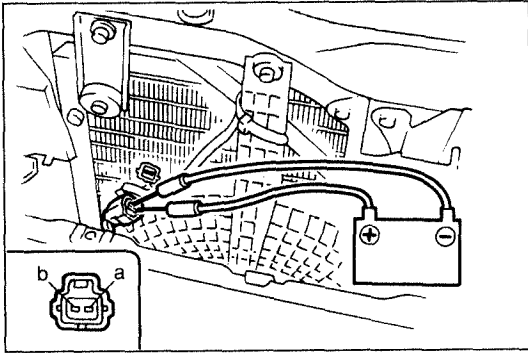
V_B: Battery voltage

Wire	Voltage	Action
(L/W)	0V	Repair wire harness (Resistor assembly—Blower switch)
	V _B	Next, check wire (L/R)
(L/R)	0V	Repair wire harness (Resistor assembly—Blower switch)
	V _B	Next, check wire (L)
(L)	0V	Repair wire harness (Resistor assembly—Blower switch)
	V _B	Next, check wire (L/Y)
(L/Y)	0V	Repair wire harness (Resistor assembly—Blower switch)
	V _B	Replace blower switch

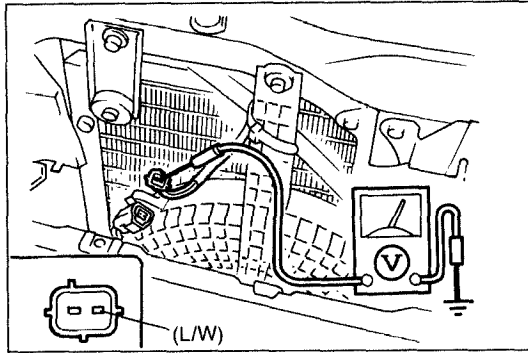


Symptom: Condenser fan does not operate. (Magnetic clutch operates normally.)

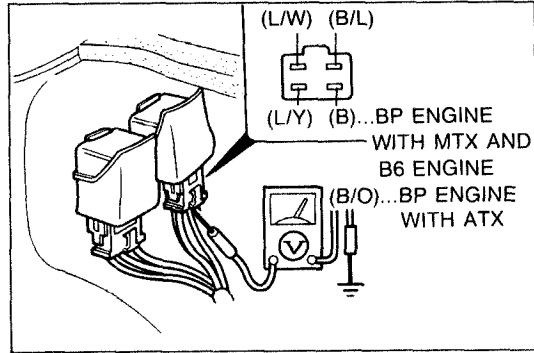
03U0UX-009



23U0UX-007



23U0UX-008



23U0UX-009

Step 1 Check condenser fan operation

1. Disconnect the condenser fan connector.
2. Apply battery voltage to terminal a and ground terminal b and verify that the condenser fan operates.
3. If the condenser fan does not operate, replace it.
4. If the condenser fan operates, go to Step 2.

Step 2 Measure voltage at condenser fan

1. Disconnect the condenser fan connector.
2. Run the engine at idle.
3. Turn the A/C and blower switches ON.
4. Measure the voltage at the following terminal wire of the condenser fan connector.

V_B: Battery voltage

Wire	Voltage	Action
(L/W)	V _B	Replace condenser fan
	0V	Go to Step 2

Step 3 Measure voltage at condenser fan relay

Measure the voltage at the following terminal wires of the condenser fan relay connector.

(BP engine with ATX)

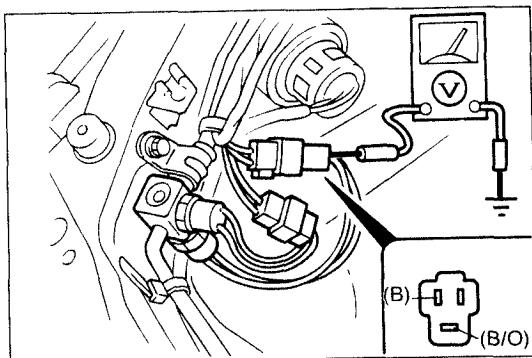
V_B: Battery voltage

Wire	Voltage	Action
(L/W)	V _B	Repair wire (L/W)
	0V	Next check wire (L/Y)
(L/Y)	V _B	Next check wire (B/L)
	0V	Repair wire (L/Y)
(B/L)	V _B	Next check wire (B/O)
	0V	Repair wire (B/L)
(B/O)	V _B	Go to Step 4
	0V	Replace condenser fan relay

(BP engine with MTX and B6 engine)

V_B: Battery voltage

Wire	Voltage	Action
(L/W)	V _B	Repair wire (L/W)
	0V	Next check wire (L/Y)
(L/Y)	V _B	Repair wire (L/Y)
	0V	Next check wire (B/L)
(B/L)	V _B	Repair wire (B/L)
	0V	Next check wire (B)
(B)	V _B	Repair wire (B)
	0V	Replace condenser fan relay



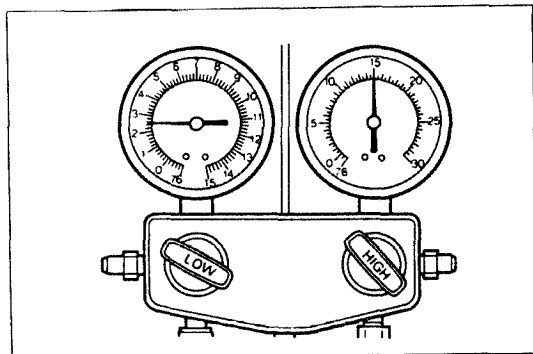
23U0UX-010

Step 4 Measure voltage at refrigerant pressure switch No.2

Measure the voltage at the following terminal wires of the refrigerant pressure switch No.2 connector.

V_B: Battery voltage

Wire	Voltage	Action
(B/O)	V _B	Next check wire (B)
	0V	Repair wire (B/O)
(B)	V _B	Repair wire (B)
	0V	Go to Step 5



03U0UX-014

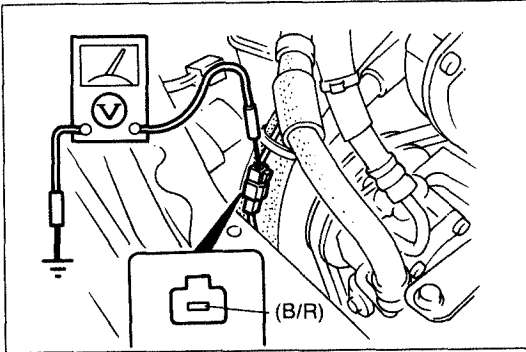
Step 5 Measure refrigerant pressure

1. Connect the A/C manifold gauge set.
2. Operate the engine at 2,000 rpm and set the air conditioner to maximum cooling.
3. Measure the high-pressure side refrigerant pressure.

Refrigerant pressure	Action
Below: 1,177 kPa (12 kg/cm ² , 171 psi)	Normal operation
Above: 1,177 kPa (12 kg/cm ² , 171 psi)	Replace refrigerant pressure switch No.2

Symptom: Magnetic clutch does not operate. (Condenser fan operates normally.)

03U0UX-015



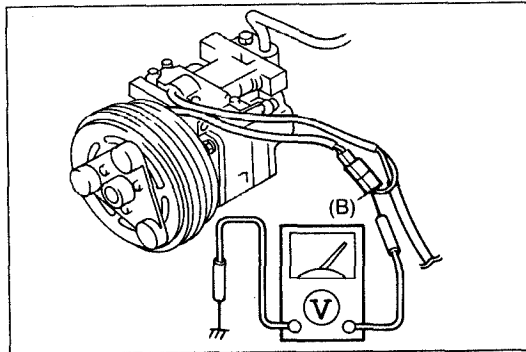
23U0UX-011

Step 1 Measure voltage at compressor connector

1. Run the engine at idle.
2. Turn A/C and the blower switches ON.
3. Measure the voltage at the following terminal wire of the compressor connector.

V_B: Battery voltage

Wire	Voltage	Action
(B/R)	V _B	Go to Step 2
	0V	Go to Step 5



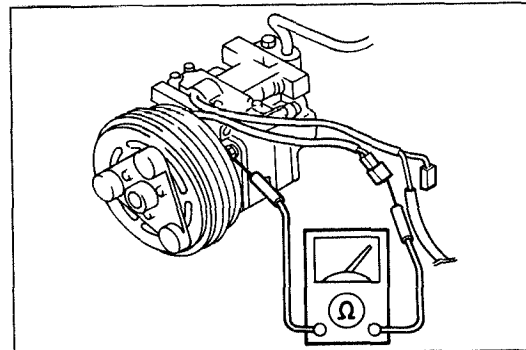
23U0UX-012

Step 2 Measure voltage at magnetic clutch connector

Measure the voltage at the following terminal wire of the magnetic clutch connector.

V_B: Battery voltage

Wire	Voltage	Action
(B)	V _B	Go to Step 3
	0V	Go to Step 4

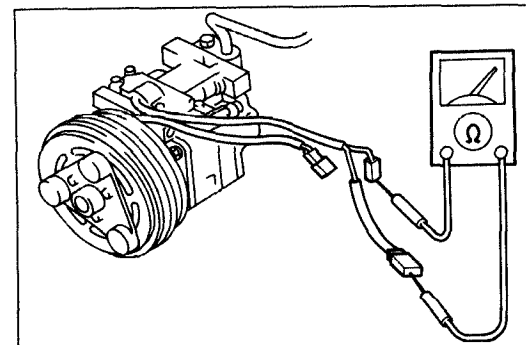


03U0UX-018

Step 3 Check magnetic clutch

1. Disconnect the magnetic clutch connector.
2. Check for continuity between the magnetic clutch and a body ground.

Continuity	Action
Yes	Adjust magnetic clutch clearance or check for compressor internal trouble
No	Check ground wire If ground wire OK, replace magnetic clutch

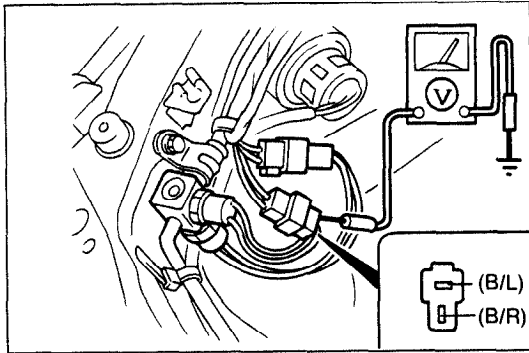


03U0UX-019

Step 4 Check thermal protector

1. Turn the air conditioner OFF for about 10 minutes.
2. After 10 minutes, check for continuity of the thermal protector.

Continuity	Action
Yes	Normal operation
No	Replace thermal protector



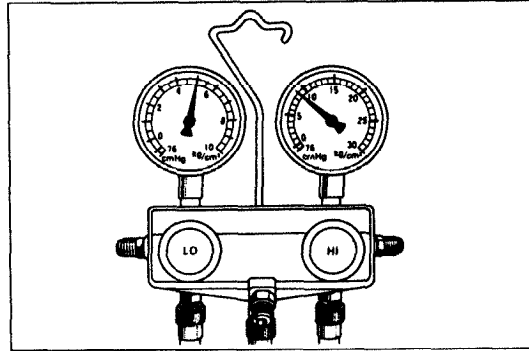
23U0UX-013

Step 5 Measure voltage at refrigerant pressure switch No.1

Measure the voltage at the following terminal wires of the refrigerant pressure switch No.1 connector.

V_B: Battery voltage

Wire	Voltage	Action
(B/R)	V _B	Repair wire (B/R)
	0V	Next check wire (B/L)
(B/L)	V _B	Go to Step 6
	0V	Repair wire (B/L)



03U0UX-021

Step 6 Measure refrigerant pressure

1. Turn the ignition switch OFF.
2. Connect the high-pressure hose of the manifold gauge to the high-pressure gauge fitting.
3. Measure the refrigerant pressure at the high-pressure side.

High-pressure side:

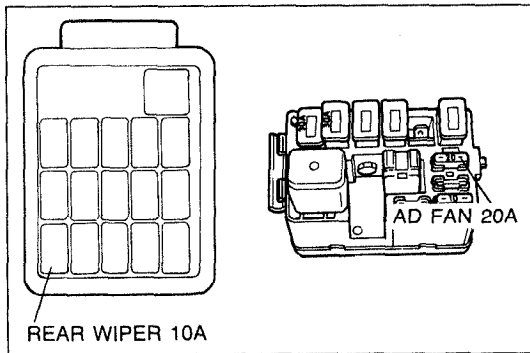
Above 451 kPa (4.6 kg/cm², 65 psi)

4. If not as specified, check the refrigerant system by referring to the troubleshooting information on page U-14.
5. If correct, replace refrigerant pressure switch No.2 with cooler pipe No.2. (Refer to page U-54.)

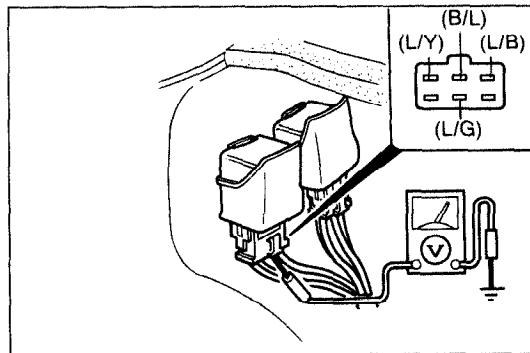
23U0UX-014

Symptom: Condenser fan and magnetic clutch do not operate.

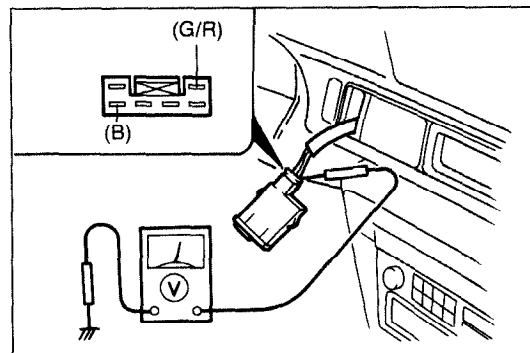
03U0UX-023



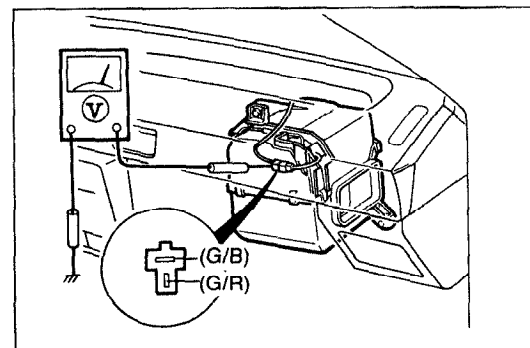
03U0UX-024



23U0UX-015



23U0UX-016



23U0UX-017

Step 1 Check fuses

1. Check the following fuses.

Fuse	Amperage	Location
AD FAN	20A	In main fuse box
REAR WIPER	10A	In fuse box

2. If the fuse is burned, check for a short-circuit in the wiring harness before replacing it.
3. If the fuses are OK, go to Step 2.

Step 2 Measure voltage at A/C relay connector

1. Run the engine at idle.
2. Turn the A/C and blower switches ON.
3. Measure the voltage at the following terminal wires of the A/C relay connector.

V_B: Battery voltage

Wire	Voltage	Action
(L/G)	V _B	Next check wire (L/Y)
	0V	Repair wire (L/G)
(L/Y)	V _B	Next check wire (B/L)
	0V	Repair wire (L/Y)
(B/L)	V _B	Repair wire (B/L)
	0V	Next check wire (L/B)
(L/B)	V _B	Go to Step 3
	0V	Replace A/C relay

Step 3 Measure voltage at A/C switch

Measure the voltage at the following terminal wires of the A/C switch connectors.

V_B: Battery voltage

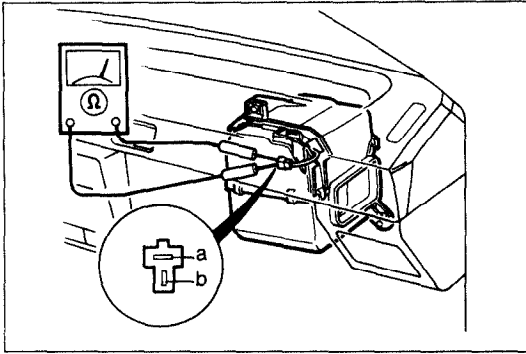
Wire	Voltage	Action
(B)	V _B	Repair wire (B)
	0V	Next check wire (G/R)
(G/R)	V _B	Replace A/C switch
	0V	Go to Step 4

Step 4 Measure voltage at thermoswitch

Measure the voltage at the terminal wires of the thermoswitch connector.

V_B: Battery voltage

Wire	Voltage	Action
(G/R)	V _B	Repair wire (G/R)
	0V	Next check wire (G/B)
(G/B)	V _B	Go to Step 5
	0V	Check ECU operation Refer to Section F



03U0UX-028

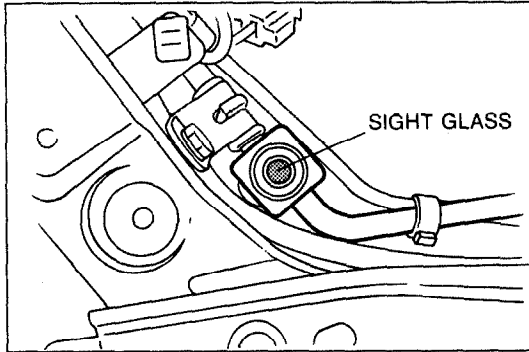
Step 5 Check thermostat

1. Turn OFF the A/C switch and set the blower switch to the fourth position to operate the blower fan for a few minutes.
2. After a few minutes, turn OFF the blower switch and stop the engine.
3. Disconnect the thermostat connector and check for continuity of the thermostat.

Terminals	Continuity	Action
a - b	Yes	Normal operation
	No	Replace thermostat

**Symptom: Insufficient cooling.
No cooling.
Intermittent cooling.**

03U0UX-110



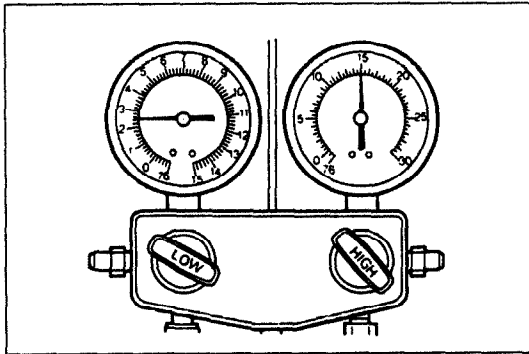
05U0UX-020

Step 1 Checking refrigerant charge

1. Run the engine at a fast idle.
2. Operate the air conditioner at maximum cooling for a few minutes.
3. Observe the sight glass to determine the amount of refrigerant and the related action as shown below.

Item	Symptom	Amount of refrigerant	Action
1	Bubbles present in sight glass	Insufficient refrigerant	Check refrigerant pressure; go to Step 2
2	No bubbles present in sight glass	Too much or proper amount of refrigerant	Turn air conditioner OFF, and watch bubbles (Refer to Items 3 and 4)
3	Immediately after air conditioner turned OFF, refrigerant in sight glass stays clear	Too much refrigerant	Check refrigerant pressure; go to Step 2
4	When air conditioner turned OFF, refrigerant foams, and then sight glass becomes clear	Proper amount of refrigerant	Refrigerant amount normal

9MU0UX-073



23U0UX-056

Step 2 Checking refrigerant pressure

1. Connect the A/C manifold gauge set.
2. Operate the engine at 2,000 rpm and set the air conditioner to maximum cooling.
3. Measure the low- and high-pressure sides. (Refer to page U-37.)

Normal pressure

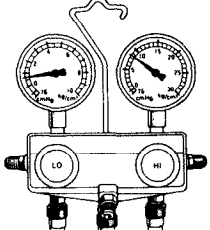
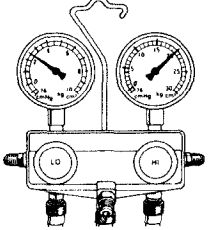
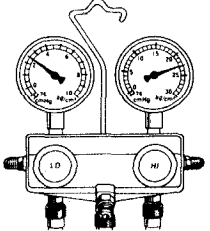
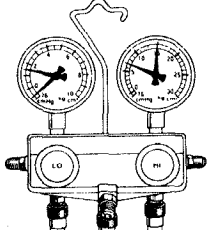
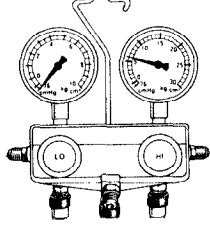
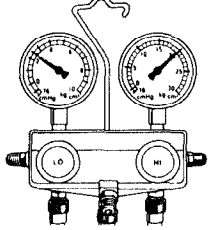
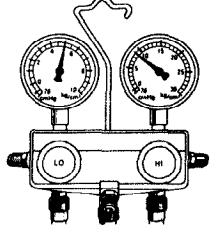
Low-pressure side:

147—294 kPa (1.5—3.0 kg/cm², 21—43 psi)

High-pressure side:

1,177—1,619 kPa (12.0—16.5 kg/cm², 171—235 psi)

4. If the pressures are not as specified, refer to the chart on the next page and check the system.

Measured pressure	Possible cause	Action
	Low-side: Below 78.5 kPa (0.8 kg/cm ² , 11.4 psi) High-side: 785–883 kPa (8–9 kg/cm ² , 114–128 psi)	Insufficient refrigerant Case 1 (Refer to page U–16)
	Low-side: Above 245 kPa (2.5 kg/cm ² , 35.6 psi) High-side: Above 1,962 kPa (20 kg/cm ² , 284 psi)	Excessive refrigerant or insuffi- cient condenser cooling Case 2 (Refer to page U–17)
	Low-side: Above 245 kPa (2.5 kg/cm ² , 35.6 psi) High-side: Above 2,256 kPa (23 kg/cm ² , 327 psi)	Air in system Case 3 (Refer to page U–17)
	Low-side: 50 cmHg (2.0 inHg) of Vacuum—147 kPa (1.5 kg/cm ² , 21.3 psi) High-side: 687—1,472 kPa (7—15 kg/cm ² , 100—213 psi)	Moisture in system Case 4 (Refer to page U–18)
	Low-side: 76 cmHg (3.0 inHg) of Vacuum High-side: Below 589 kPa (6 kg/cm ² , 85 psi)	No refrigerant circulation Case 5 (Refer to page U–18)
	Low-side: Above 245 kPa (2.5 kg/cm ² , 35.6 psi) High-side: 1,864—1,962 kPa (19—20 kg/cm ² , 270—284 psi)	Expansion valve stuck open Case 6 (Refer to page U–19)
	Low-side: 392—589 kPa (4—6 kg/cm ² , 57—85 psi) High-side: 687—981 kPa (7—10 kg/cm ² , 100—142 psi)	Faulty compressor Case 7 (Refer to page U–19)

Case 1: Insufficient refrigerant**Measured pressure**

Low-pressure side: Less than 78.5 kPa (0.8 kg/cm², 11.4 psi)

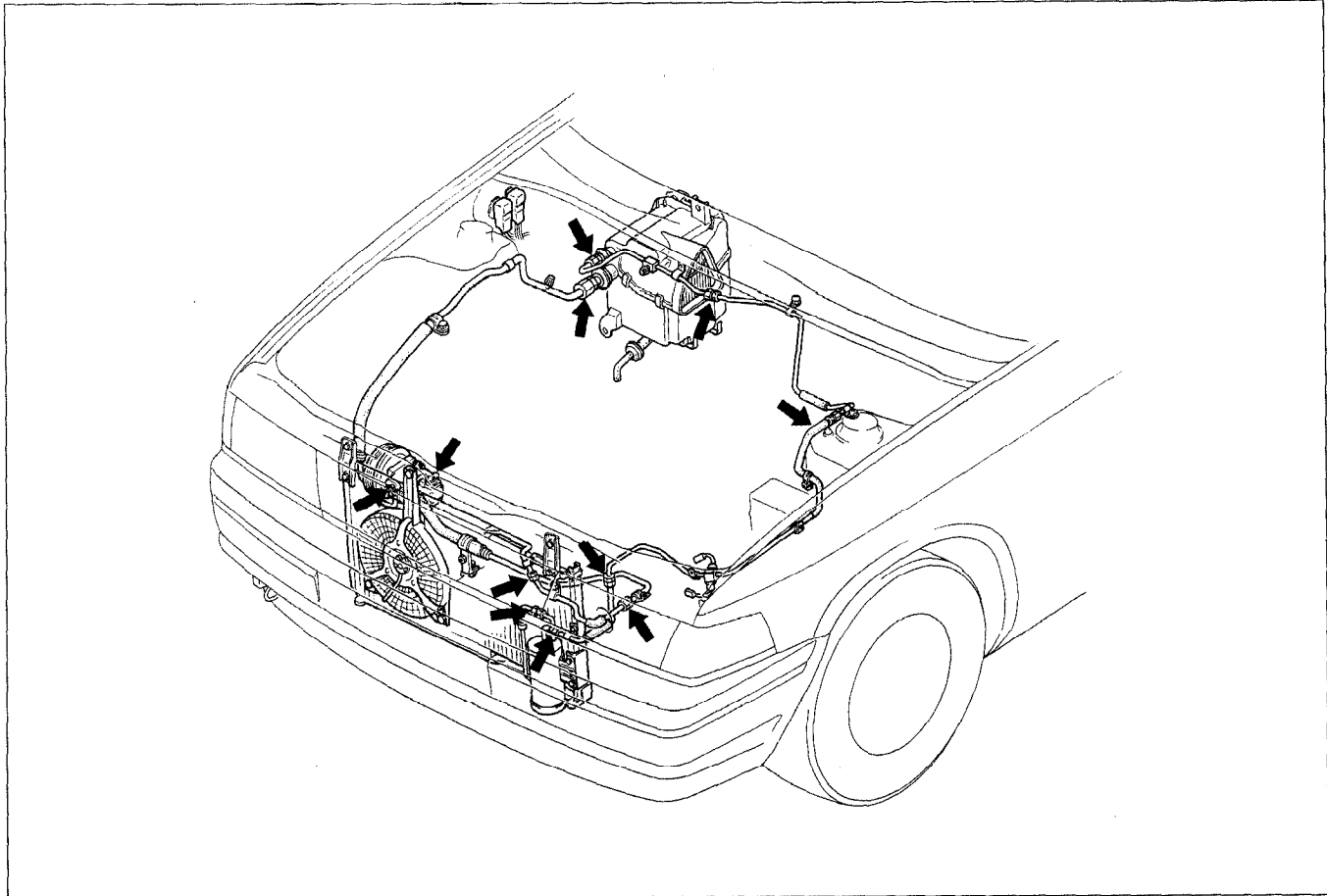
High-pressure side: 785—883 kPa (8—9 kg/cm², 114—128 psi)

Condition

- Outlet air from vents not cold.
- Bubbles seen in sight glass.

Step 1

1. Check for oil stains on the pipes, hoses and other parts. (Refer to illustration below.)
2. If oil staining is found at the connection of pipes or hoses, replace the O-ring; then, evacuate, charge, and test the system.
3. If oil staining is not found, go to Step 2.



05U0UX-023

Step 2

1. Check for leakage from the following connections with a gas leak tester.
 - Inlet and outlet of condenser.
 - Inlet and outlet of receiver/drier.
 - Inlet and outlet of compressor.
 - Sight glass.
 - Inlet and outlet of cooling unit.
2. If leakage is evident, go to Step 3.
3. If leakage cannot be found, evacuate, charge, and test the system. (System OK, but refrigerant leaked gradually over time.)

Step 3

1. Check tightening torque of the connection where leak was detected.
2. If the connection is loose, tighten the connection to the specified torque; then evacuate, charge, and test the system.
3. If the connection is properly tightened, replace the O-ring; then evacuate, charge, and test the system.

Case 2: Excessive refrigerant or insufficient condenser cooling

Measured pressure

Low-pressure side: Above 245 kPa (2.5 kg/cm², 35.6 psi)

High-pressure side: Above 1,962 kPa (20 kg/cm², 284 psi)

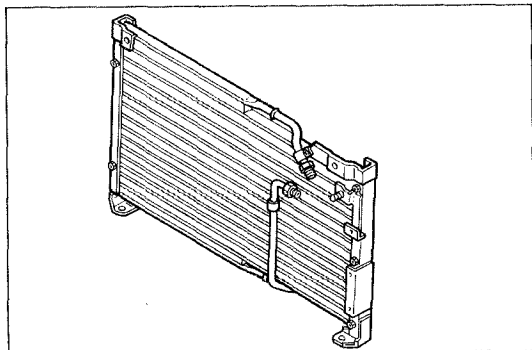
Condition

Insufficient cooling

Note

- If the condenser fan does not operate when the air conditioner is operating, see “Condenser fan does not operate”; page U-8, before proceeding.

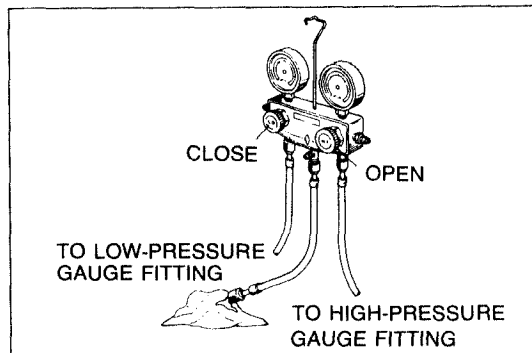
03U0UX-031



03U0UX-113

Step 1

1. Check the condenser for bent fins or damage. Repair or replace as necessary.
2. If the condenser is OK, go to Step 2.



13U0UX-005

Step 2

1. Discharge the excess refrigerant. (Refer to page U-32.)

Warning

- Always wear gloves and eye protection when discharging the refrigerant.

2. Verify that the refrigerant pressure is normal.

Case 3: Air in system

Measured pressure

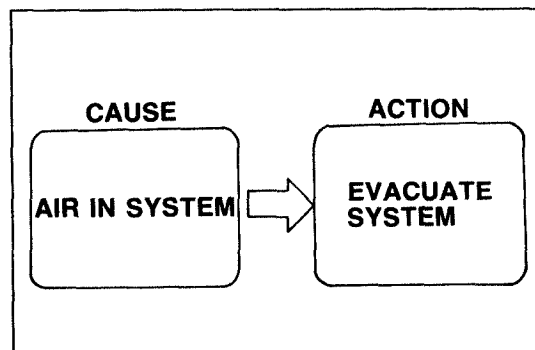
Low-pressure: Above 245 kPa (2.5 kg/cm², 35.6 psi)

High-pressure: Above 2,256 kPa (23 kg/cm², 327 psi)

Condition

Insufficient cooling

9MU0UX-086



23U0UX-057

Step 1

Discharge the refrigeration system. (Refer to page U-32.)

Step 2

Evacuate the system to remove all air from it. (Refer to page U-33.)

Step 3

Charge the system with refrigerant. (Refer to page U-33.)

Step 4

After charging, measure the refrigerant pressure. (Refer to page U-37.)

Step 5

If the low- and high-pressure sides are still too high, replace the receiver/drier.

Case 4 Moisture in system

Measured pressure

Low-pressure: 50 cmHg (2.0 inHg) [Vacuum]

High-pressure: 687—1,472 kPa (7—15 kg/cm², 100—213 psi)

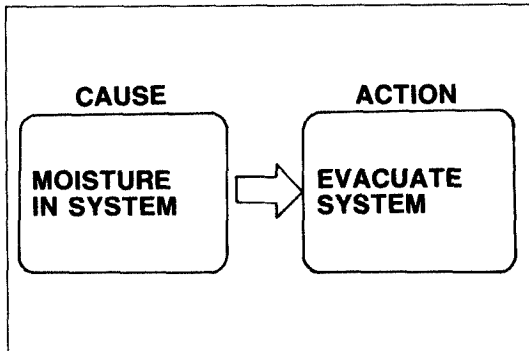
Condition

Intermittent cooling

(Moisture in refrigeration system freezes in expansion valve and causes temporary blocking.)

After time, ice melts and condition returns to normal.)

9MU0UX-088



23U0UX-058

Step 1

Discharge the refrigeration system. (Refer to page U-32.)

Step 2

Evacuate the system to remove all air and moisture from it. (Refer to page U-32.)

Step 3

Charge the system with refrigerant. (Refer to page U-33.)

Step 4

After charging, measure the refrigerant pressure. (Refer to page U-37.)

Step 5

If the low- and high-pressure sides are still too high, replace the receiver/drier.

Case 5 No refrigerant circulation

Measurement pressure

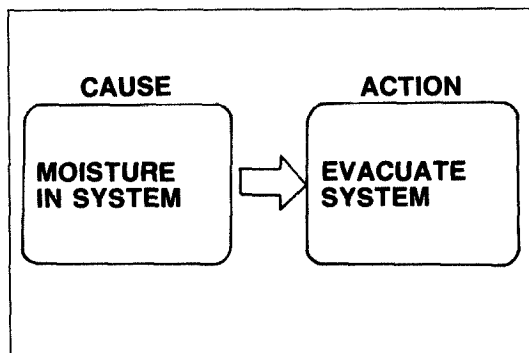
Low-pressure: 76 cmHg (3.0 inHg) [Vacuum]

High-pressure: Below 589 kPa (6 kg/cm², 85 psi)

Condition

Refrigerant flow obstructed by moisture or dirt, causing freezing or blockage of expansion valve

9MU0UX-090



05U0UX-028

Step 1

Turn the air conditioner OFF for about 10 minutes. Turn the air conditioner ON to determine whether the blockage is due to moisture or dirt.

a) If caused by moisture

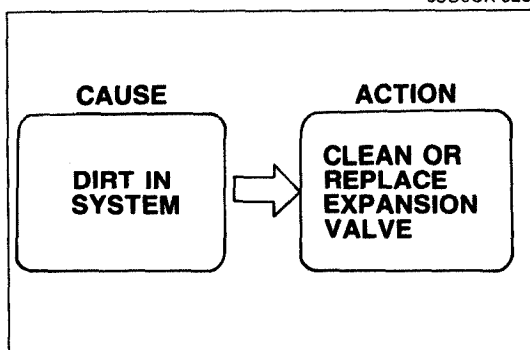
System will operate normally after being OFF for 10 minutes. (Ice melts and relieves blockage.) Refer to "Moisture in system".

b) If caused by dirt

System remains abnormal after being OFF 10 minutes. Go to Step 2.

Step 2

1. Remove the expansion valve. (Refer to page U-39.)
2. Blow out the dirt with compressed air.
3. If unable to remove the dirt, replace the expansion valve.
4. Evacuate, charge, and test the system.



23U0UX-059

Case 6 Expansion valve stuck open

Measured pressure

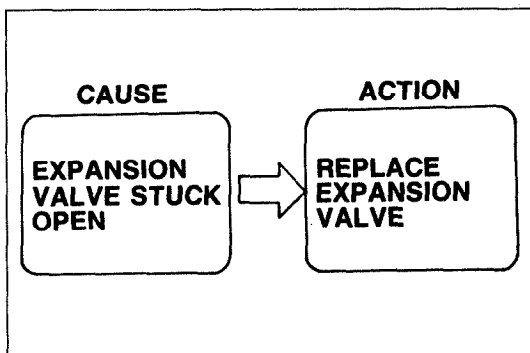
Low-pressure: Above 245 kPa (2.5 kg/cm², 35.6 psi)

High-pressure: 1,864—1,962 kPa (19—20 kg/cm², 270—284 psi)

Condition

Insufficient cooling

9MU0UX-093



23U0UX-018

1. Check whether there is frost or heavy dew on the suction pipe (between cooling unit and compressor).
2. If neither is found, refer to "Excessive refrigerant or insufficient condenser cooling"; page U-17.
3. If either is found, replace the expansion valve. (Refer to page U-39.)

Case 7 Faulty compressor

Measured pressure

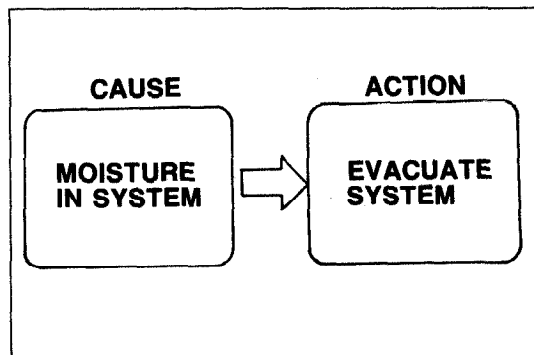
Low-pressure: 392—589 kPa (4—6 kg/cm², 57—85 psi)

High-pressure: 687—981 kPa (7—10 kg/cm², 100—142 psi)

Condition

No cooling

9MU0UX-095

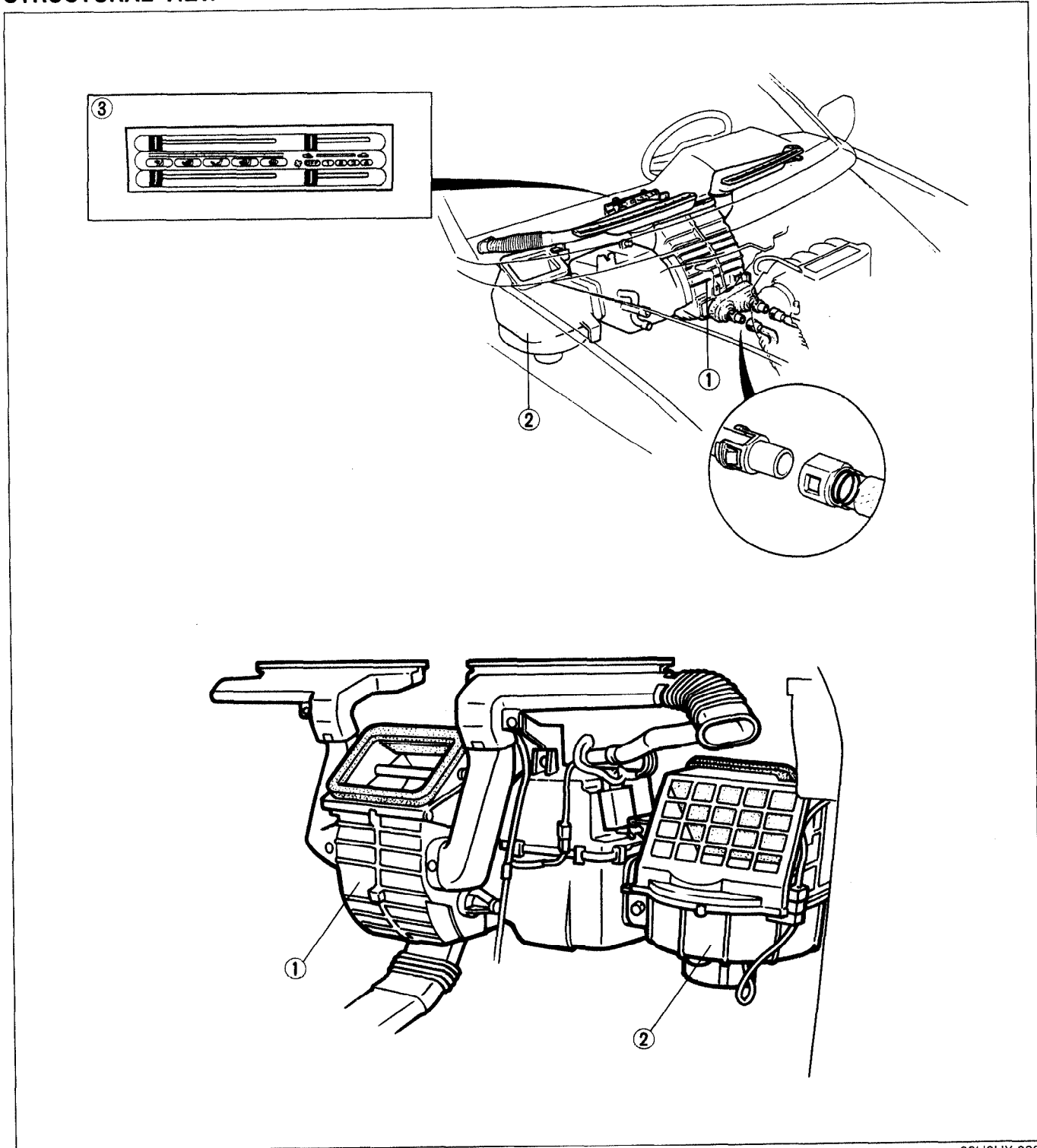


03U0UX-037

1. Run the engine at a fast idle.
2. Verify that the magnetic clutch is ON when the A/C switch and blower switch are ON.
3. If the magnetic clutch remains OFF, refer to "Magnetic clutch does not operate"; page U-10.

HEATER

STRUCTURAL VIEW



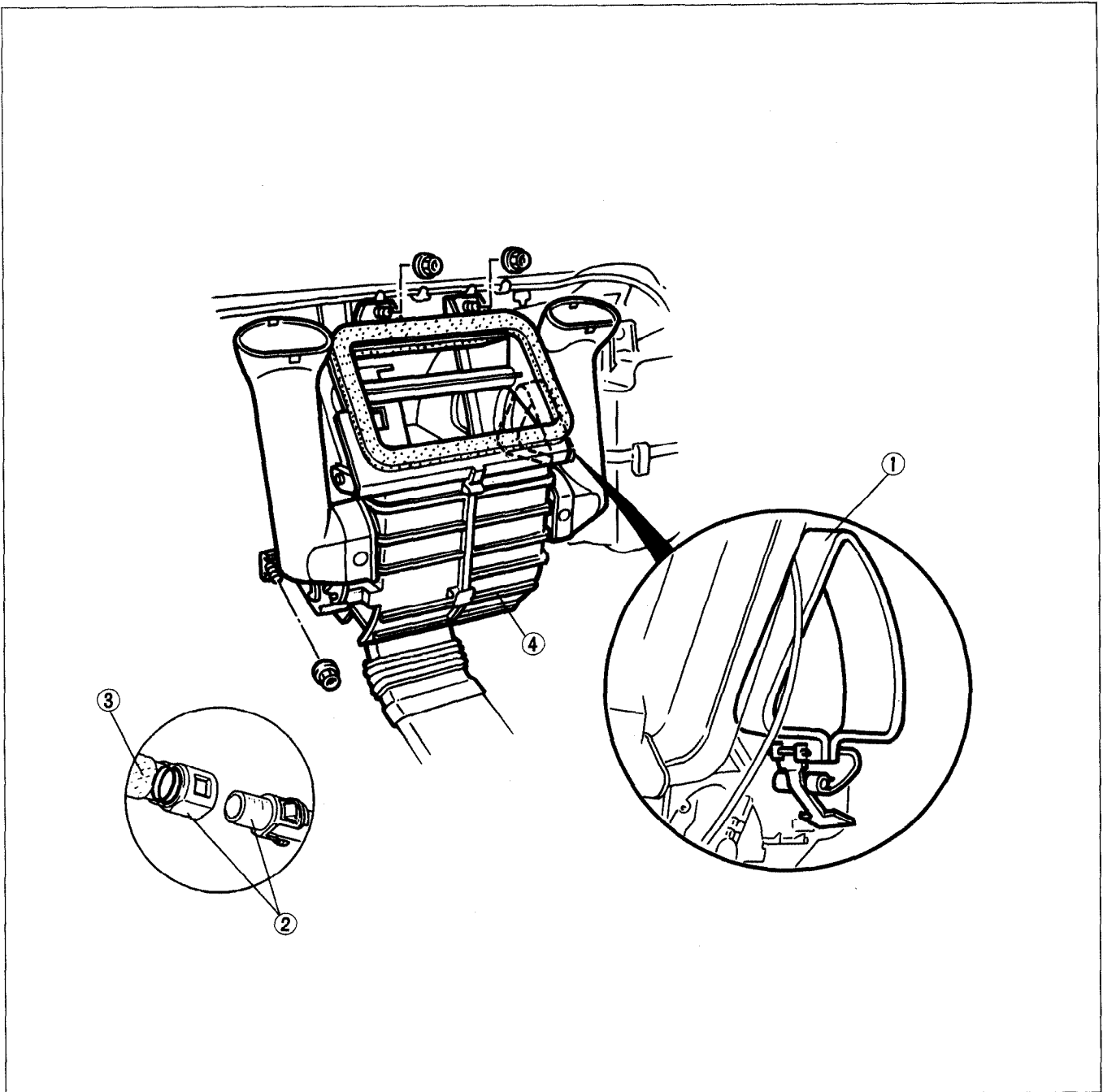
03U0UX-038

- 1. Heater unit
 - Removal / Installation..... page U-21
 - Disassembly / Assembly..... page U-22
- 2. Blower unit
 - Removal / Installation..... page U-23
 - Disassembly / Assembly..... page U-24
 - Inspection..... page U-25

- 3. Heater control unit
 - Removal / Installation..... page U-26
 - Disassembly / Assembly..... page U-27
 - Inspection..... page U-28
 - Adjustment page U-28

HEATER UNIT**Removal / Installation**

1. Drain the engine coolant.
2. Remove the dashboard. (Refer to Section S.)
3. Remove as shown in the figure.
4. Install in the reverse order of removal.



03U0UX-039

Note

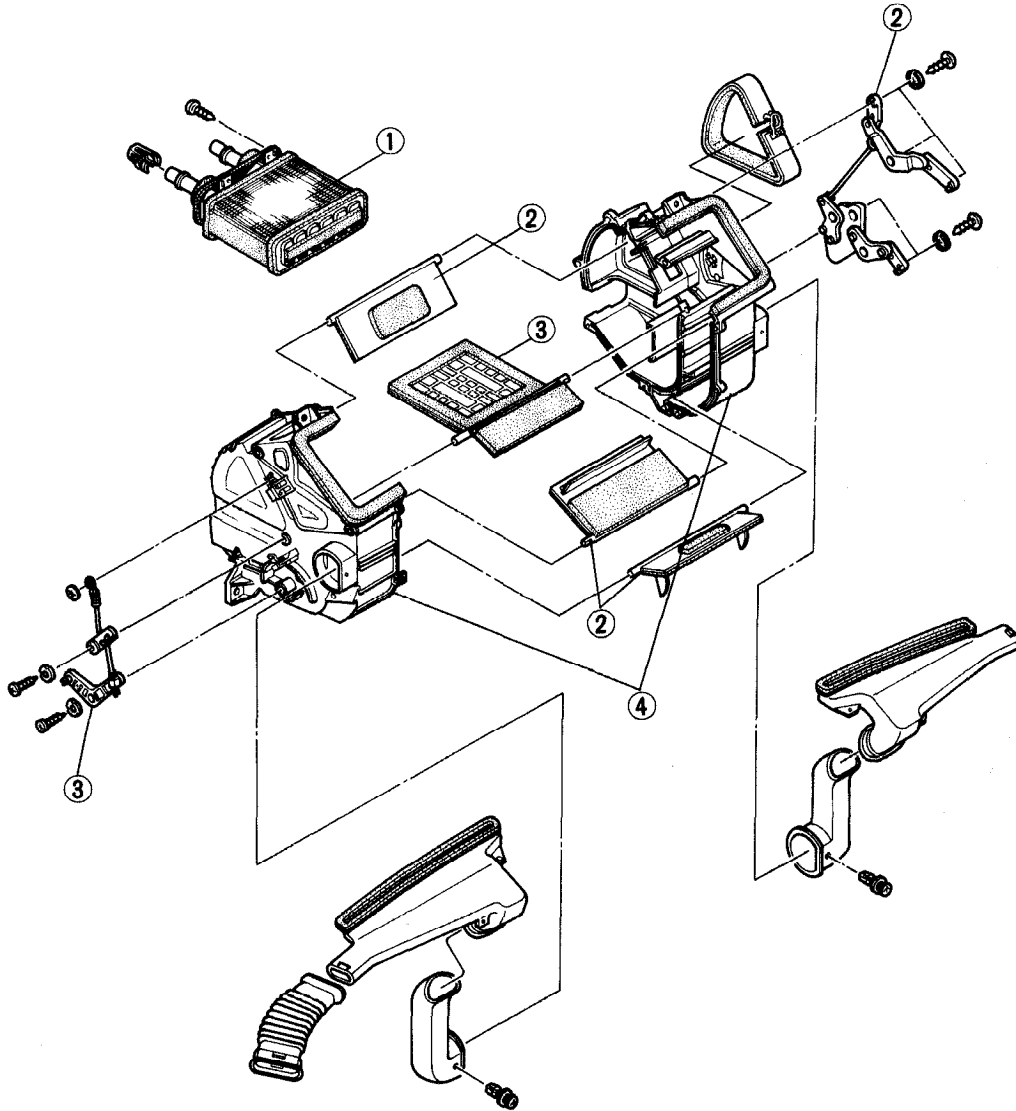
- When disconnecting the heater hose from the heater core, unlock the hose connector at the heater core side.
- When installing the heater hose on the heater core, verify that the hose connector is securely locked.
- Release the clamp, and remove the seal plate together with the heater unit.

1. Seal plate
2. Hose connector

3. Heater hose
4. Heater unit

Disassembly / Assembly

1. Disassemble in the order shown in the figure.
2. Check for the following and repair or replace the heater core as necessary.
 - ① Cracks, damage, and water leakage.
 - ② Bent fins.
 - ③ Distorted and bent inlet.
3. Assemble in the reverse order of disassembly.



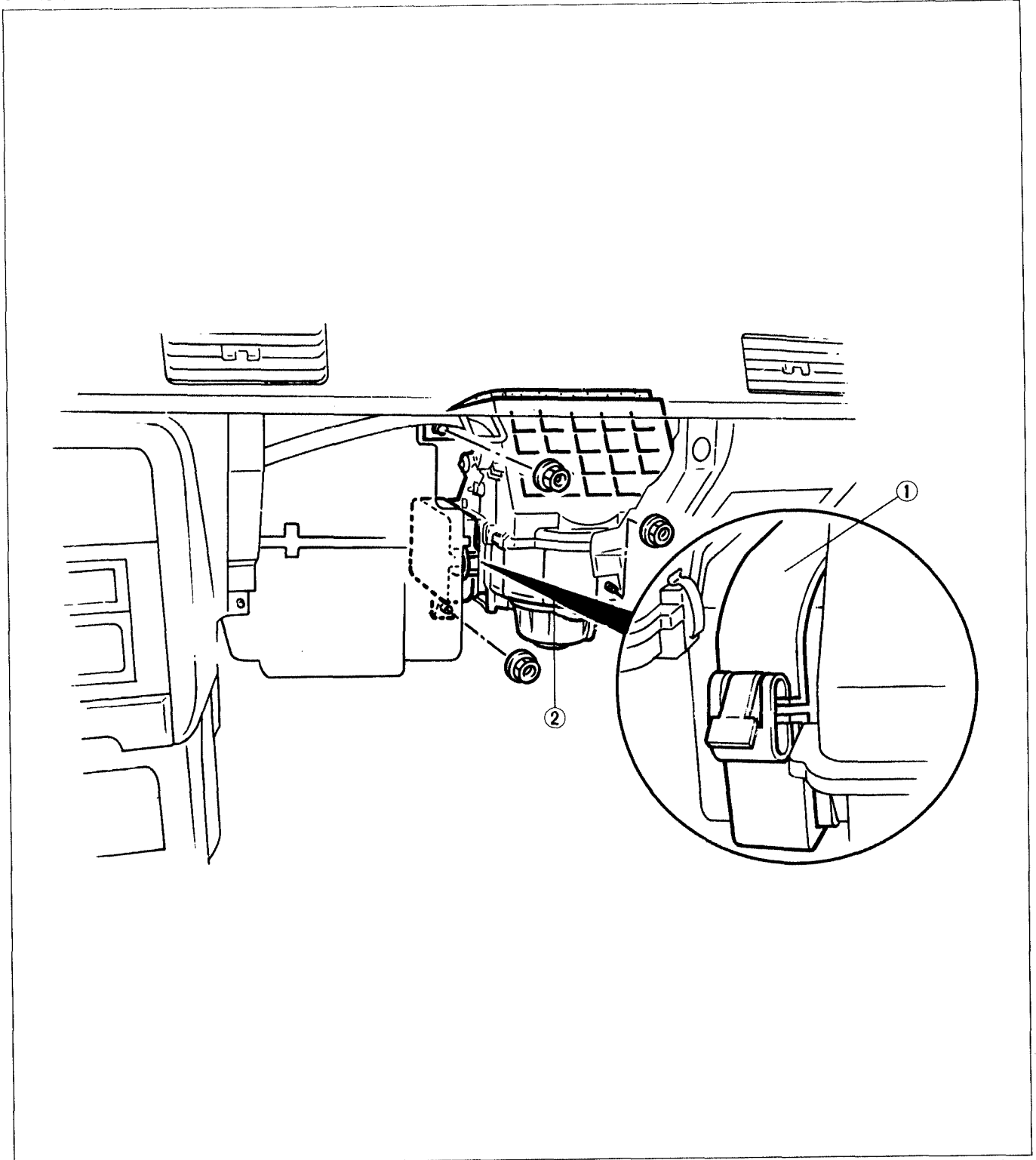
03U0UX-040

1. Heater core
2. Mode door assembly

3. Mix door assembly
4. Heater unit case

BLOWER UNIT**Removal / Installation**

1. Remove the glove box. (Refer to Section S.)
2. Remove as shown in the figure.
3. Install in the reverse order of removal.



03U0UX-041

Note

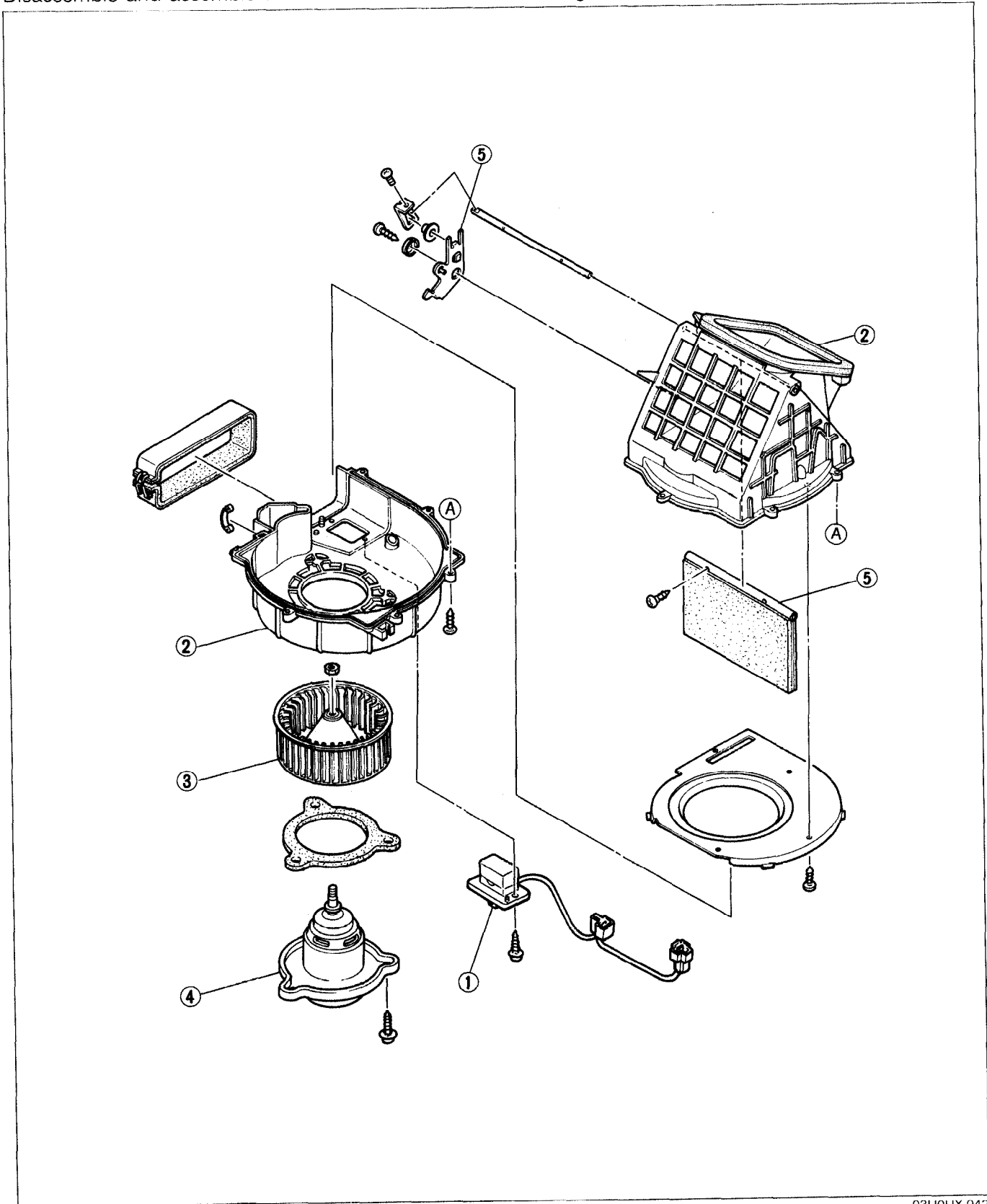
- Release the clamp, and remove the seal plate together with the blower unit.

1. Seal plate

2. Blower unit case

Disassembly / Assembly

Disassemble and assemble the blower unit as shown in the figure.

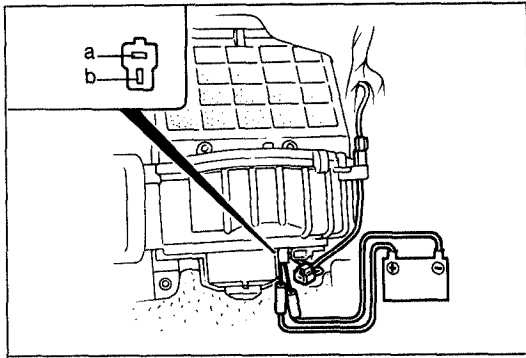


03U0UX-042

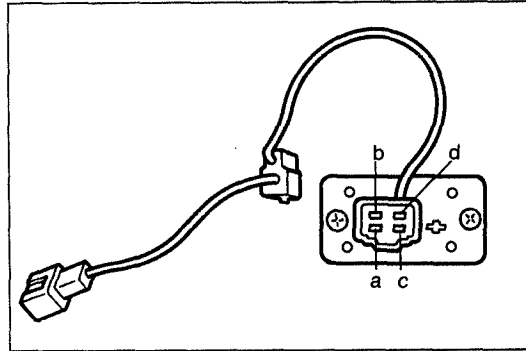
- 1. Resistor assembly
Inspection page U-25
- 2. Blower unit case

- 3. Blower fan
- 4. Blower motor
Inspection page U-25

- 5. Rec-Fresh door assembly



23U0UX-019



23U0UX-020

Inspection

Blower motor

1. Remove the glove box. (Refer to Section S.)
2. Disconnect the blower motor connectors.
3. Verify that the blower motor runs when connecting battery voltage to terminal a and grounding terminal b.
4. If not as specified, replace the blower motor.

Resistor assembly

1. Remove the glove box. (Refer to Section S.)
2. Disconnect the resistor assembly connectors.
3. Check continuity between terminals.

Terminals			
a	b	c	d
○	○		
○		○	
○			○

○—○: Indicates continuity

4. If not as specified, replace the resistor assembly.

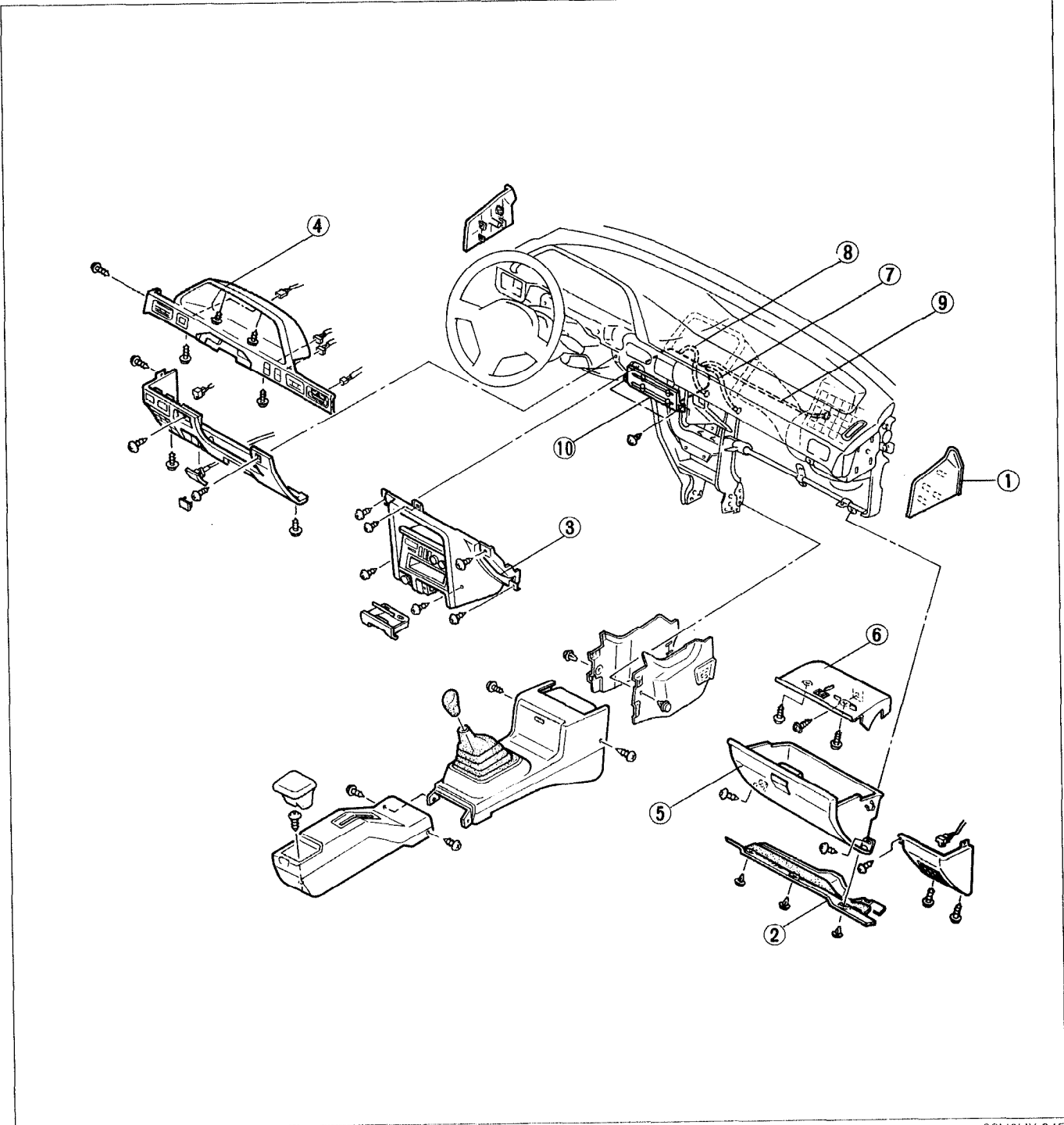
HEATER CONTROL UNIT

Removal / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure.
3. Install in the reverse order of removal.

Note

- After installing the Mix, Mode, and Rec-Fresh wires, verify that each lever moves its full stroke.

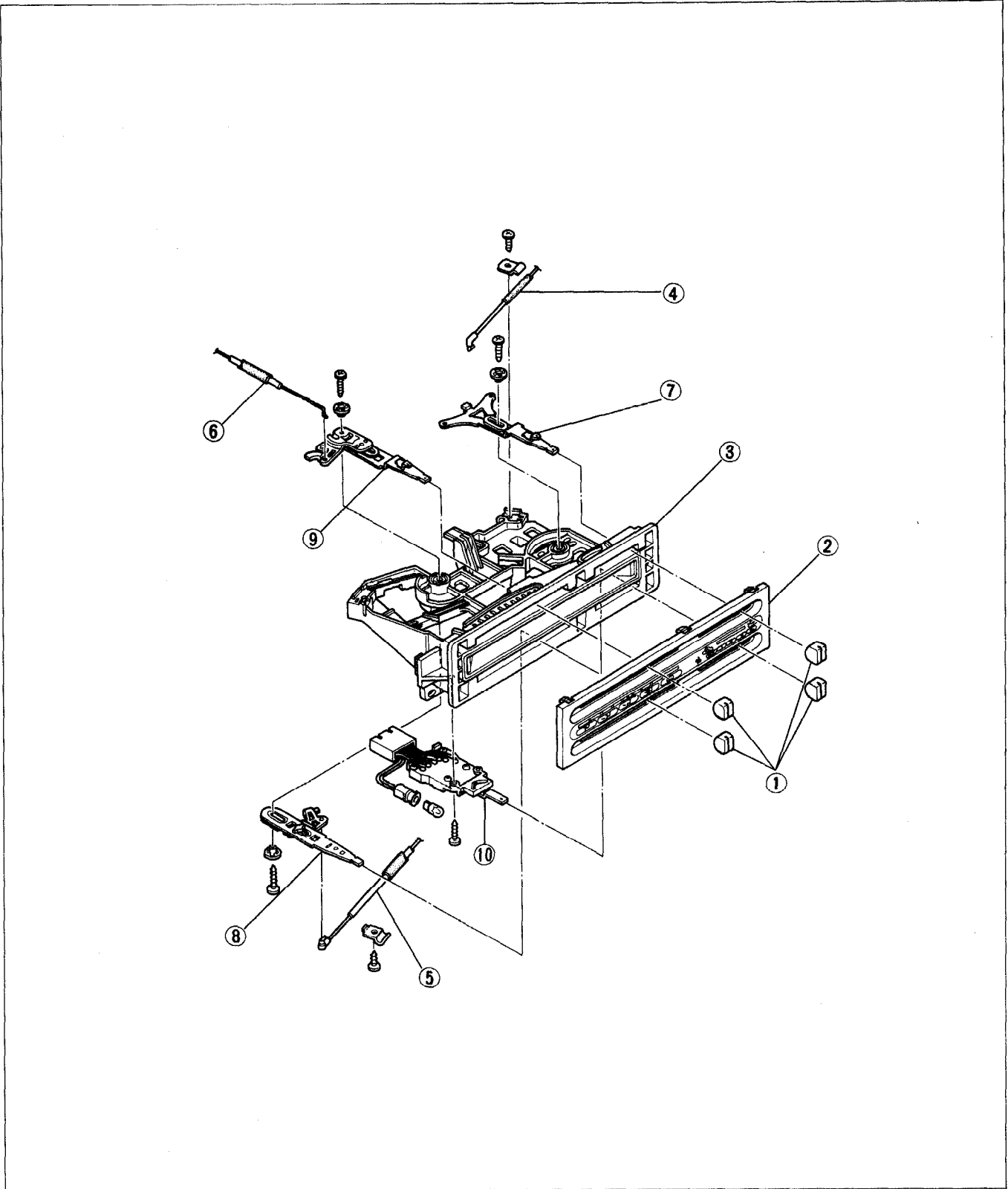


03U0UX-045

- | | | |
|-------------------------|--------------------|-----------------------------|
| 1. Side panel | 5. Glove box | 8. Mix wire |
| 2. Lower panel (R.H.) | 6. Glove box cover | 9. Rec-Fresh wire |
| 3. Lower panel (Center) | 7. Mode wire | 10. Heater control assembly |
| 4. Meter hood | | |

Disassembly / Assembly

Disassemble and assemble the heater control unit as shown in the figure.



03U0UX-046

- | | | |
|---------------------------|---------------------------|----------------------------|
| 1. Knob | 5. Mode wire | 7. Rec-Fresh lever |
| 2. Switch panel | Adjustment..... page U-28 | 8. Mode lever |
| 3. Switch body | 6. Mix wire | 9. Mix lever |
| 4. Rec-Fresh wire | Adjustment..... page U-28 | 10. Blower switch |
| Adjustment..... page U-28 | | Inspection page U-28 |

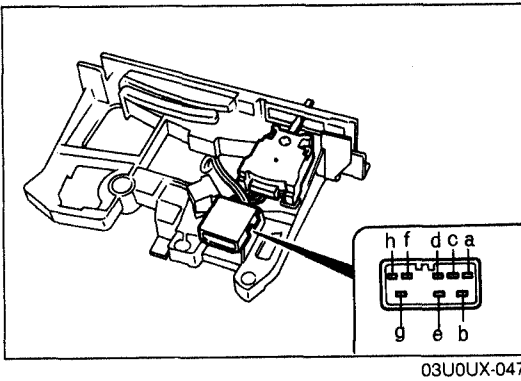
Inspection Blower switch

1. Check continuity between terminals of the blower switch.

SWITCH	Terminals							
	a	b	c	d	e	f	g	h
OFF	○		○					
1	○	○	○			○		
2	○	○	○	○				○
3	○	○	○	○	○			
4	○	○	○	○			○	

○—○: Indicates continuity

2. If not as specified, replace the blower switch.

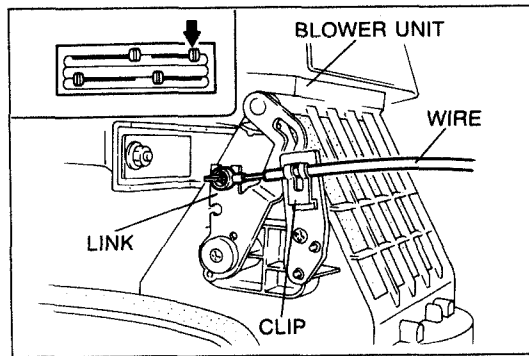


03U0UX-047

Adjustment

Rec-fresh wire

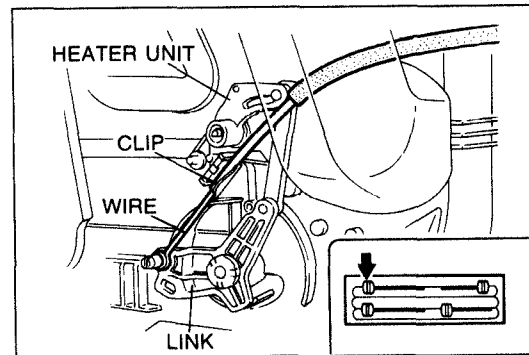
1. Set the Rec-Fresh lever to fresh position.
2. Connect the Rec-Fresh wire to the Rec-Fresh door.
3. Set the door to fresh position and clamp the wire into place.
4. Verify that the Rec-Fresh lever moves its full stroke.



03U0UX-048

Mix wire

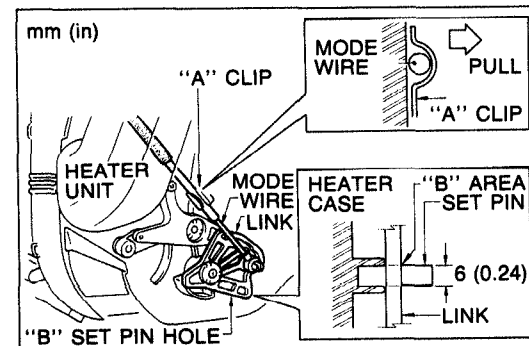
1. Set the Mix lever to cold position.
2. Connect the Mix wire to the Mix door.
3. Set the door to cold position and clamp the wire into place.
4. Verify that the Mix lever moves its full stroke.



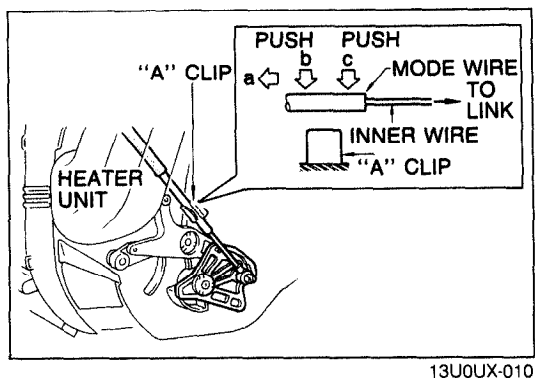
03U0UX-050

Mode wire

1. Set the mode lever at defrost position.
2. Remove the mode wire from clip A.
3. Align the set pin hole at B of the link with the matching hole of the heater unit. If a pin (0.24 in in diameter) is available, insert it to fix the link to the correct position.



13U0UX-009



4. Verify that the mode lever is in the defrost position.
5. Set the mode wire to clip A as shown. Keep natural tension of the mode wire. (It is all right if the mode wire is slightly pulled to the direction a) Push areas b and c simultaneously when setting the wire to the clip.

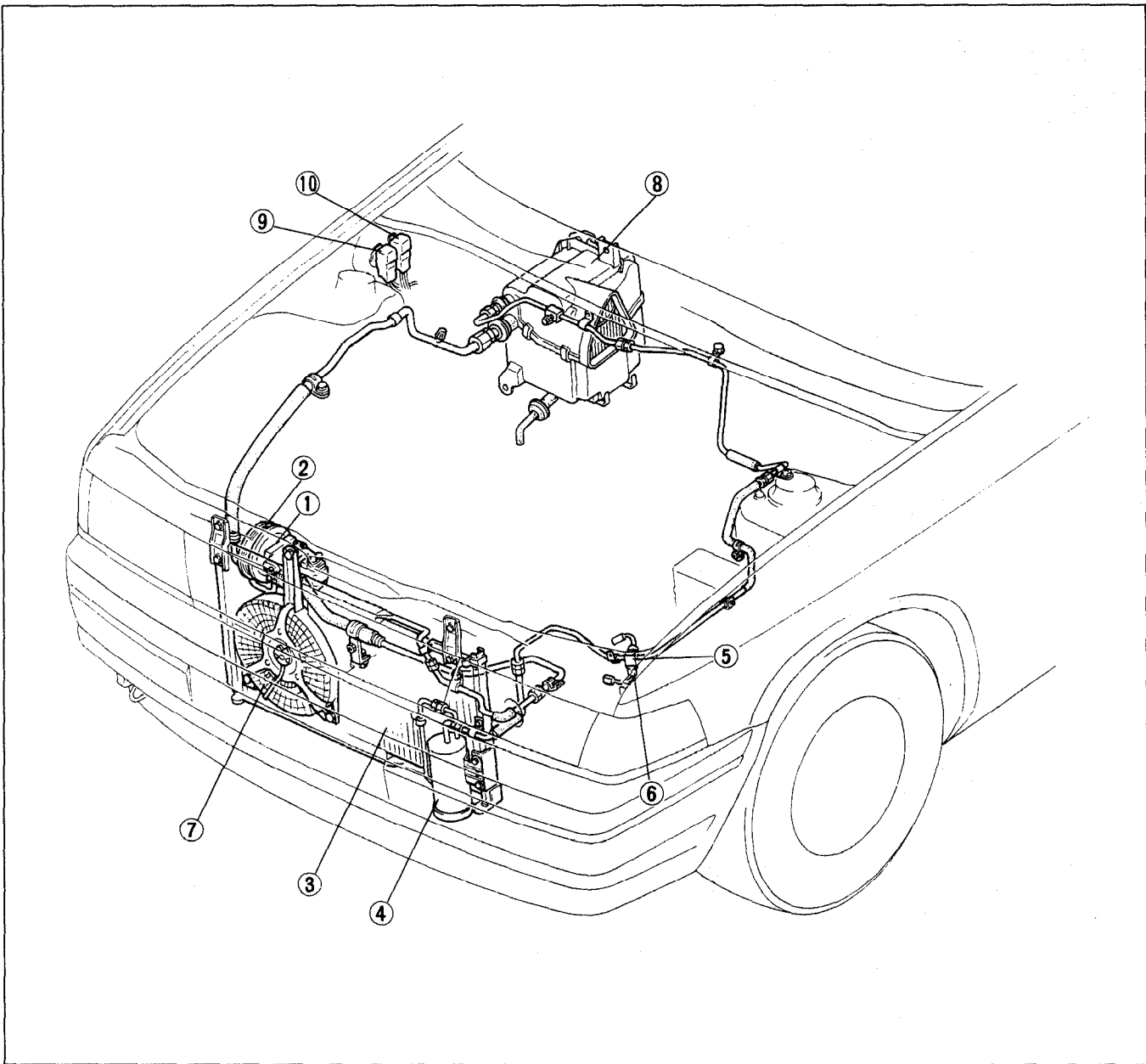
Note

- **Do not push the inner wire of the mode wire when setting, if pushed, it may result in deformation of the wire and prevent the correct setting.**

6. Check the function of the mode lever. If the result is not good, pull the mode wire 2mm (0.08 in) in direction a.
7. Confirm the function of the mode lever.
8. Remove the set pin.

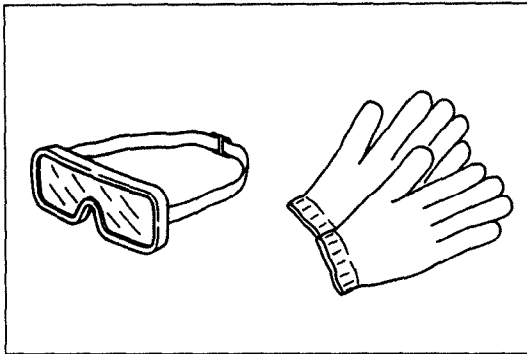
AIR CONDITIONER

STRUCTURAL VIEW

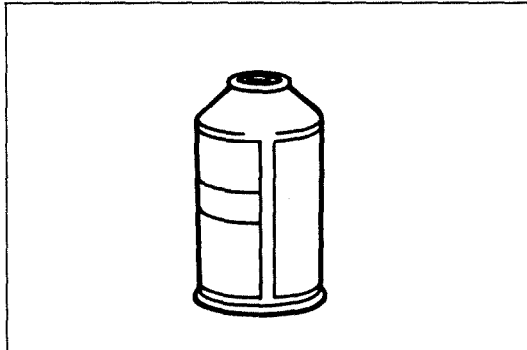


23U0UX-021

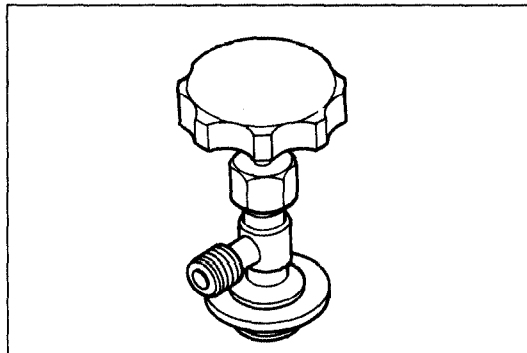
- | | |
|-------------------------------------|-----------|
| 1. Compressor | |
| Removal / Installation..... | page U-41 |
| Disassembly / Assembly..... | page U-43 |
| Adjustment..... | page U-50 |
| 2. Magnetic clutch | |
| Disassembly / Assembly..... | page U-51 |
| Inspection..... | page U-51 |
| Adjustment..... | page U-51 |
| 3. Condenser | |
| Removal / Installation..... | page U-53 |
| Inspection..... | page U-53 |
| 4. Receiver/Drier | |
| Removal / Installation..... | page U-52 |
| 5. Refrigerant pressure switch No.1 | |
| Inspection..... | page U-55 |
| 6. Refrigerant pressure switch No.2 | |
| Inspection..... | page U-55 |
| 7. Condenser fan | |
| Removal / Installation..... | page U-57 |
| Inspection..... | page U-57 |
| 8. Cooling unit | |
| Removal / Installation..... | page U-38 |
| Disassembly / Assembly..... | page U-39 |
| Replacement..... | page U-39 |
| On-vehicle inspection..... | page U-40 |
| Inspection..... | page U-40 |
| 9. A/C relay | |
| Inspection..... | page U-56 |
| 10. Condenser fan relay | |
| Inspection..... | page U-56 |



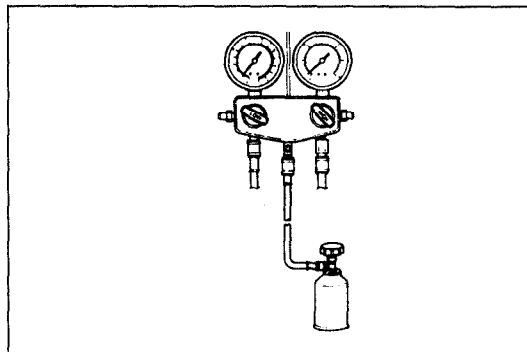
9MU0UX-125



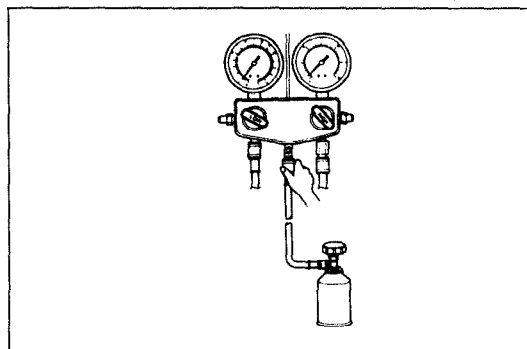
13U0UX-025



03U0UX-114



9MU0UX-128



13U0UX-012

REFRIGERANT SYSTEM

Safety Precaution

1. R-12 liquid refrigerant is highly volatile. A drop of it on the skin could result in localized frostbite. When handling the refrigerant, be sure to wear gloves.
2. If the refrigerant splashes into the eyes, wash them with clean water immediately. Always wear goggles or glasses to protect the eyes.
3. The R-12 container is a highly pressurized vessel. Never subject it to high heat, and be sure that the temperature where it is stored is below **52°C (125.6°F)**.
4. A halide leak detector is often used to check the system for refrigerant leakage. R-12, upon coming into contact with the flame, produces phosgene, a toxic gas. Always provide adequate ventilation.

Refrigerant System Service Basics Refrigerant container service valve

1. Turn the handle fully counterclockwise before connecting the valve to the refrigerant container.
2. Turn the outlet valve counterclockwise until it reaches its highest position.
3. Turn the outlet valve fully clockwise by hand. Connect the center hose to the valve fitting.
4. Turn the handle clockwise to puncture the sealed can.
5. Turn the handle fully counterclockwise to fill the center hose. Do not open the high- or low-pressure manual valves.
6. Loosen the hose nut connected to the center fitting of the manifold gauge. Allow air to escape. Then retighten the nut.

Manifold gauge set/Stop valve installation

Caution

- Connect all charging hoses via stop valves to avoid venting the refrigerant remaining in the hoses into the atmosphere.
- Do not disconnect the stop valve from the charging hose when there is refrigerant remaining in the hose.

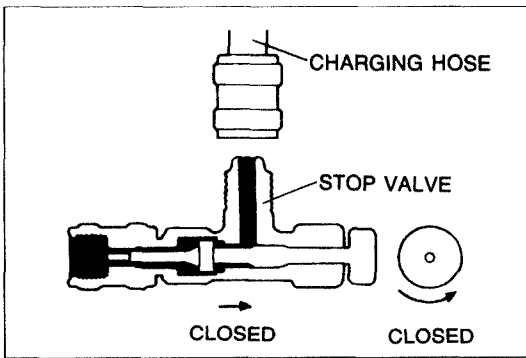
1. Turn the knob counterclockwise to close the stop valve.
2. Install the stop valve to the end of the charging hose of the manifold gauge set.

Caution

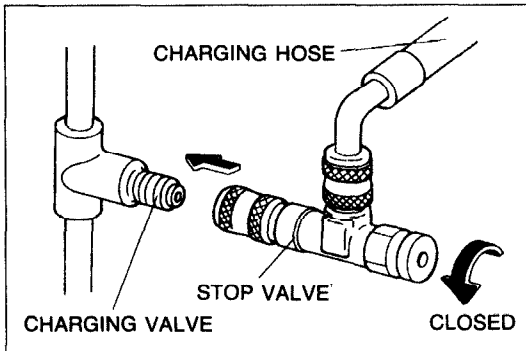
- Verify that high-and low-pressure side valves of the manifold gauge set are fully closed before connecting the charging hose and stop valve to the refrigerant system service valve.

3. Connect high-and low-pressure side charging hoses and stop valves to the refrigerant system service valves.

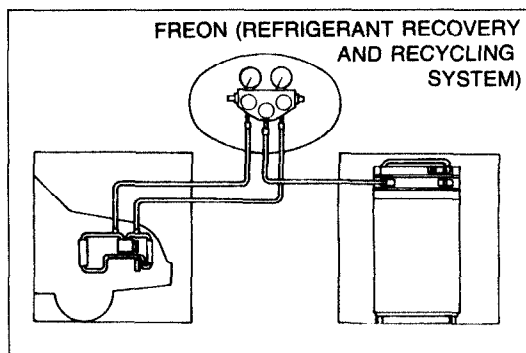
23U0UX-062



23U0UX-060



23U0UX-061



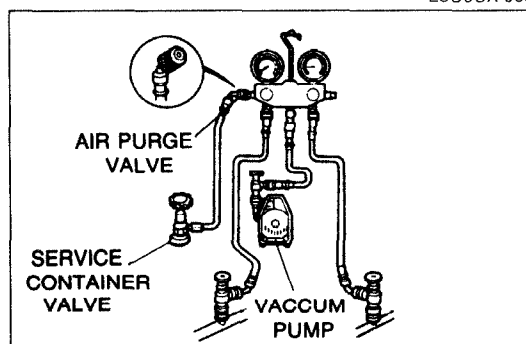
23U0UX-063

Refrigerant recovery operation.

Remove the refrigerant from the refrigerant system by using a freon (refrigerant) recovery and recycling system.

Caution

- Never vent the refrigerant into the atmosphere.
- When using a freon recovery and recycling system, follow the operation instructions provided by the equipment manufacturer.



23U0UX-064

Evacuation/Airtightness test

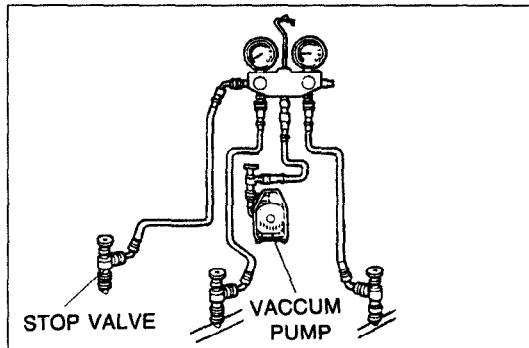
1. Connect the manifold gauge set and stop valves to the refrigerant system service valves.
2. Connect the center hose of the manifold gauge set to the vacuum pump inlet.
3. Prepare as follows according to the charging method.
Charging from service container.
Connect the charging hose and service container valve to the manifold gauge set air purge valve.

Caution

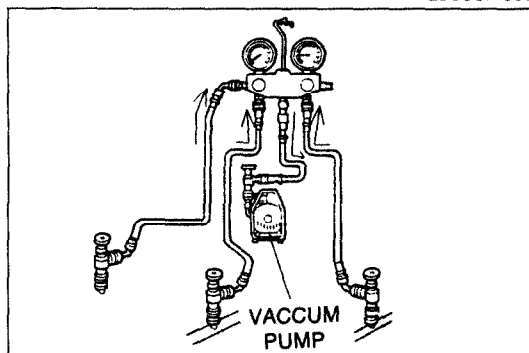
- Connect the charging hose to the air purge valve via its tap pin side.
- Do not disconnect the charging hose or the service container valve until the charging operation is completed.
- Do not open the service container valve when not used.

Charging from freon recovery and recycling system.
Connect the charging hose and stop valve to the manifold gauge set air purge valve.

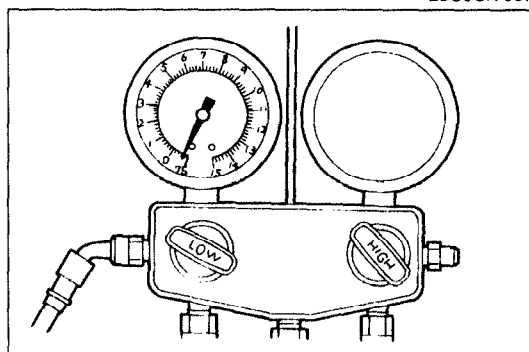
23U0UX-065



23U0UX-066



23U0UX-067



23U0UX-068

Caution

- Connect the charging hose to the air purge valve via its tap pin side.
- Do not disconnect the charging hose or stop valve until the charging operation is completed.
- Do not open the stop valve when not used.

4. Start the vacuum pump and open the high- and low-pressure side valves of the manifold gauge set.

5. Start the pump and let it operate for 15 minutes.

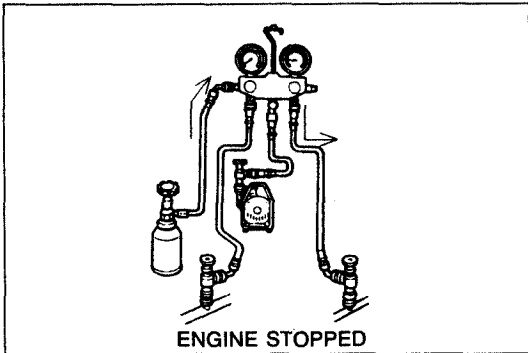
6. Check high- and low-pressure side gauge readings. When both of them are at 750 mmHg or more, close the manifold gauge set valves.

7. Stop the vacuum pump and wait for about 5 minutes.

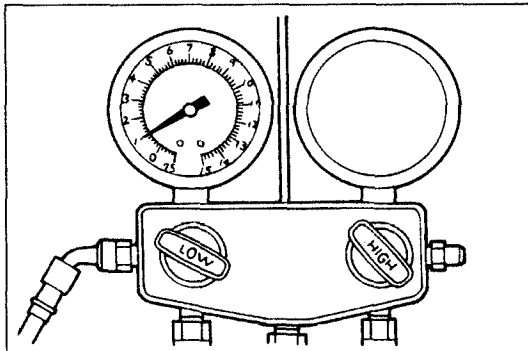
8. Verify that the low-pressure side gauge reading does not change.

9. If the reading changes, retighten the piping connections and repeat the evacuation operation.

10. If not changed, check for leaks (see below) and charge the system.



23U0UX-069



23U0UX-070

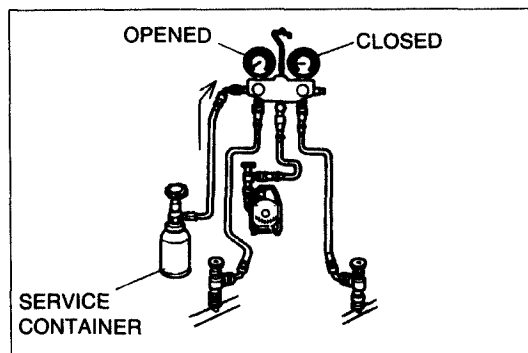
Leak test

1. Carry out the system evacuation and airtightness test as described above.
2. Prepare as follows according to charging method.
Charging from service container.
Connect the refrigerant service container to the service container valve (which is connected to the manifold gauge set air purge valve) and open the service container.
Charging from freon recovery and recycling system.
Connect the charging valve of the system to the stop valve (which is connected to the manifold gauge air purge valve).
3. Open the high-pressure side valve of the manifold gauge set. Charge the system until the low-pressure side gauge indicates 98.1 kPa. (1 kg/cm², 14.22 psi).
4. Close the high pressure side valve.
5. Check for leaks at the system piping joints by using a gas leak tester.
6. If leaks are found, check the O-rings and tightening torques at the joints. Replace or retighten as necessary.
7. If no leaks are found, fully charge the system.

Caution

- Carry out the leak test in a well-ventilated but still air area because it is affected by moving air.

23U0UX-071



23U0UX-072

Initial charging from service container

1. Carry out the system evacuation, airtightness test, and leak test.
2. Open the high-pressure side valve of the manifold gauge set and charge the system as specified.

Charging amount: Approx. 400 g (14.12 oz)

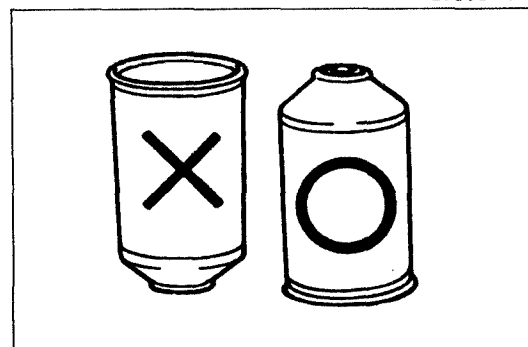
3. Close the high pressure side valve.
4. Start the engine and actuate the A/C compressor.

Caution

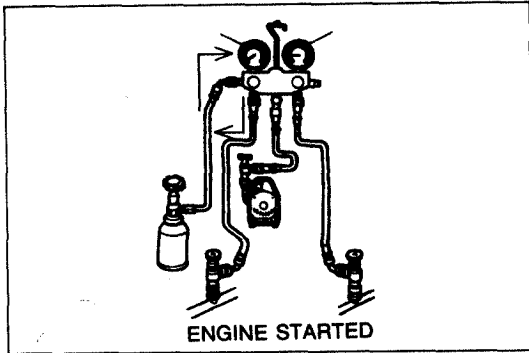
- Do not turn the service container upside down while charging when the engine is running.
- Do not open the high-pressure side valve while the engine is running.

5. Open the low-pressure side valve of the manifold gauge set and charge the system to specification.

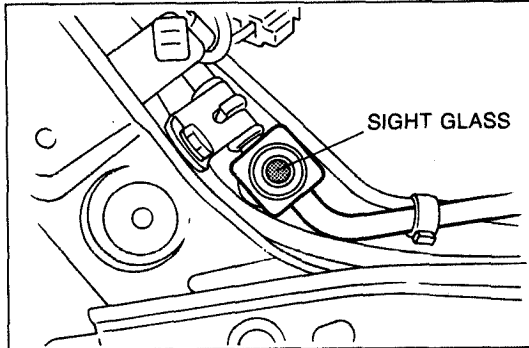
Specified total refrigerant amount: 800 g (28.24 oz)



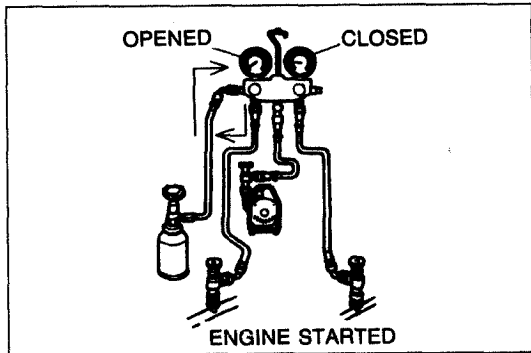
23U0UX-073



23U0UX-074



23U0UX-075



23U0UX-076

6. Close the low-pressure side valve.
7. Stop the engine.
8. Close the stop valves and the service container valve.

Caution

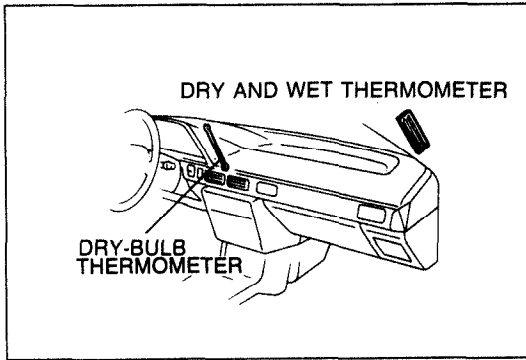
- Do not disconnect the stop valves or the service container valve from the charging hoses when there is refrigerant remaining in the hoses.

Refilling

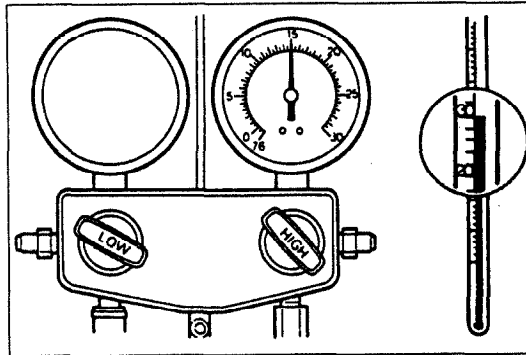
Caution

- Do not overcharge the system.
- Note the sight glass during refilling the refrigerant. Stop charging when no bubbles are observed in the glass. (Refer to page U-40).
- Care must be taken when the ambient temperature is low. The bubbles may not be present even if the refrigerant amount is insufficient.

1. Connect the manifold gauge set to the refrigerant system charging valve. (Refer to page U-32).
2. Start the engine.
3. Open the low-pressure side valve of the manifold gauge set and charge the system as necessary.
4. Note the sight glass, and when no bubbles can be seen, close the low-pressure side valve.
5. Stop the engine.
6. Close the stop valve and service container valve. Disconnect the stop valves quickly.



13U0UX-014



05U0UX-050

Performance test

After finishing repairs, conduct a performance test of the air conditioning system as follows.

1. Connect the manifold gauge set. (Refer to page U-32.)
2. Start the engine and keep the engine speed at **1,500 rpm**.
3. Operate the air conditioner at maximum cooling.
4. Open all windows and doors.
5. Place a dry-bulb thermometer in the center ventilator outlet.
6. Place a dry and wet thermometer close to the blower inlet.
7. Wait until the air conditioner outlet temperature stabilizes.

Stabilized condition

Blower inlet temperature: 25—35°C (77—95°F)

High-pressure side:

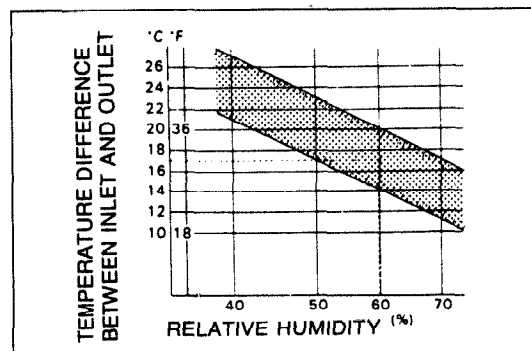
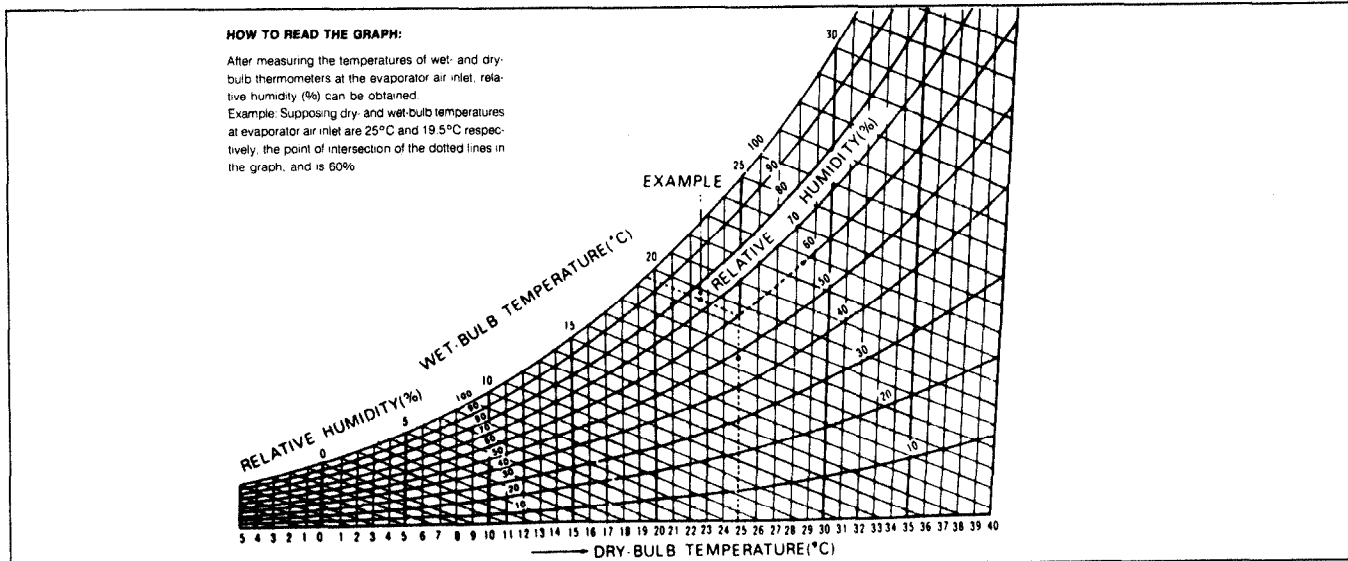
1,177—1,619 kPa (12.0—16.5 kg/cm², 171—235 psi)

Note

- If the high-pressure side becomes too high, pour cool water on the condenser. If it is too low, cover the front of the condenser.

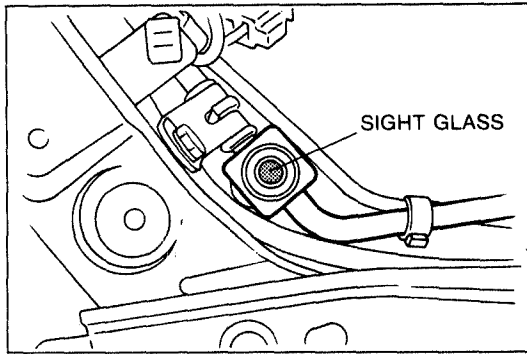
8. After the air conditioner stabilizes, read the dry and wet thermometer at the air inlet.
9. Calculate the relative humidity from the chart below by comparing the wet- and dry-bulb readings.

05U0UX-051



96U16X-103

10. Read the dry thermometer at the air outlet, and calculate the difference between the inlet dry-bulb and outlet dry-bulb temperatures.
11. Verify that the intersection of the relative humidity and temperature difference is in the shaded zone.



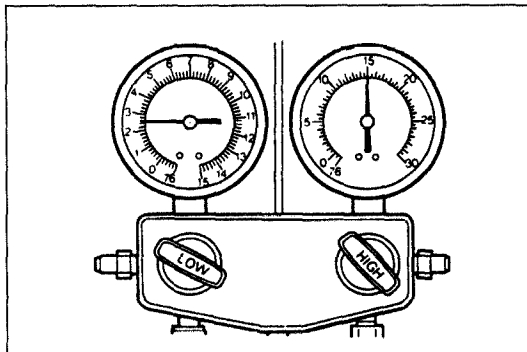
9MU0UX-139

Checking refrigerant charge

1. Run the engine at a fast idle.
2. Operate the air conditioner at maximum cooling for a few minutes.
3. Determine the amount of refrigerant as shown below by observing the sight glass.

Item	Symptom	Amount of refrigerant	Action
1	Bubbles present in sight glass	Insufficient refrigerant	Check refrigerant pressure
2	No bubbles present in sight glass	Too much or proper amount of refrigerant	Turn air conditioner OFF, and watch bubbles (Refer to Items 3 and 4)
3	Immediately after air conditioner turned OFF, refrigerant in sight glass stays clear	Too much refrigerant	Check refrigerant pressure
4	When air conditioner turned OFF, refrigerant foams, and then sight glass becomes clear	Proper amount of refrigerant	Refrigerant amount normal

9MU0UX-140



13U0UX-015

Checking refrigerant pressure

1. Connect the manifold gauge set. (Refer to page U-32.)
2. Operate the engine at 2,000 rpm and set the air conditioner to maximum cooling.
3. Measure the low- and high-pressure sides.

Normal pressure

**Low-pressure side: 147—294 kPa
(1.5—3.0 kg/cm², 21—43 psi)**

**High-pressure side: 1,177—1,619 kPa
(12.0—16.5 kg/cm², 171—235 psi)**

COOLING UNIT**Removal / Installation**

1. Discharge the refrigeration system. (Refer to page U-32.)
2. Remove the glove box, glove box cover, undercover, and instrument panel stay. (Refer to Section S.)
3. Remove the cooling unit as shown in the figure.

Note

- Immediately plug all open fittings to keep moisture out of system.

4. Install the cooling unit in the reverse order of removal.

Note

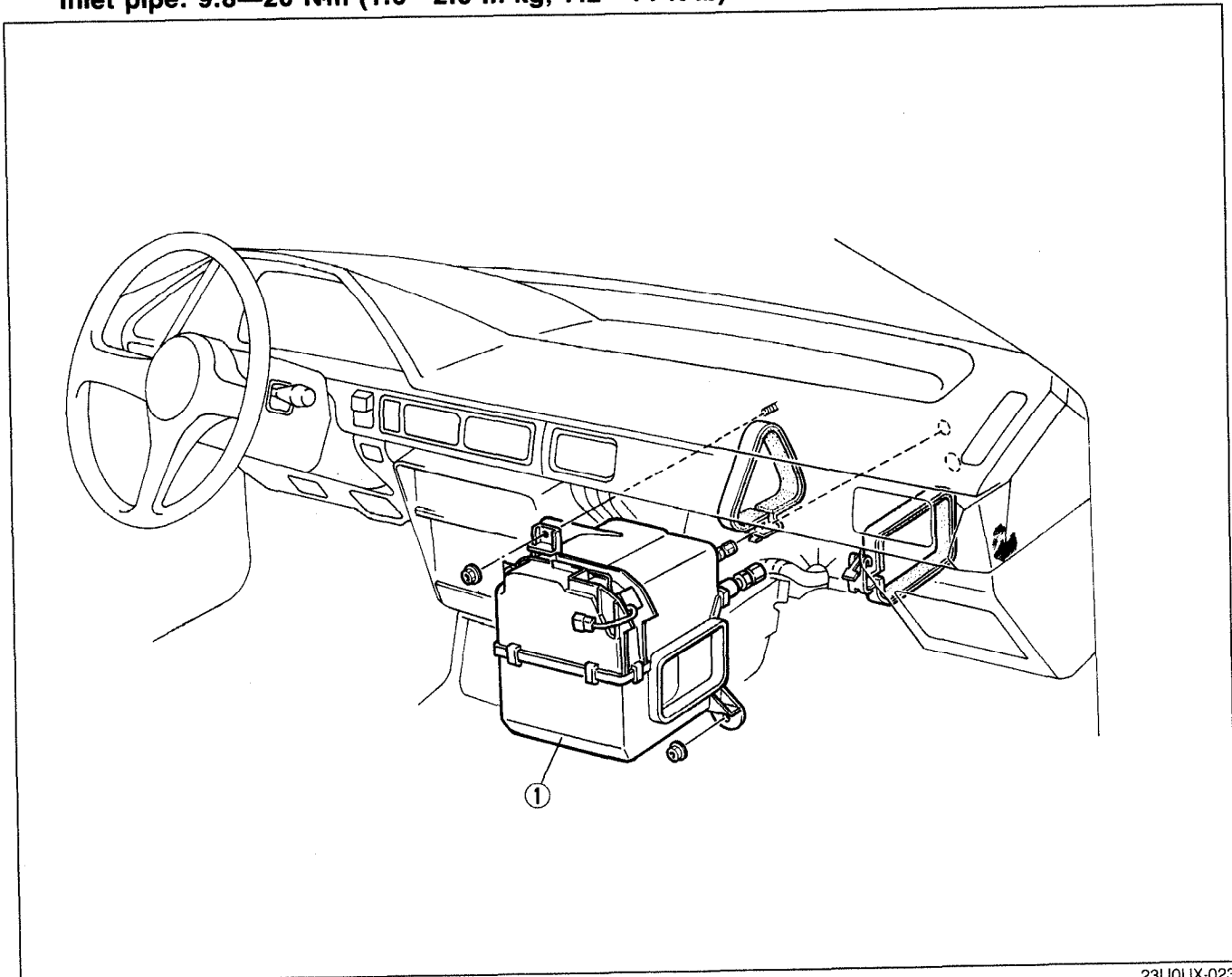
- Position the cooling unit so that its connections match those of the heater unit and blower unit.
- Apply clean compressor oil to the O-rings before connecting the fittings.
- Do not apply compressor oil to the fitting nuts.
- When installing a new cooling unit, add compressor oil through the high-pressure pipe port of the compressor.

Compressor oil: 50 cc (3.05 cu in)

Tightening torque

Outlet pipe: 20—29 N·m (2.0—3.0 m·kg, 14—22 ft·lb)

Inlet pipe: 9.8—20 N·m (1.0—2.0 m·kg, 7.2—14 ft·lb)

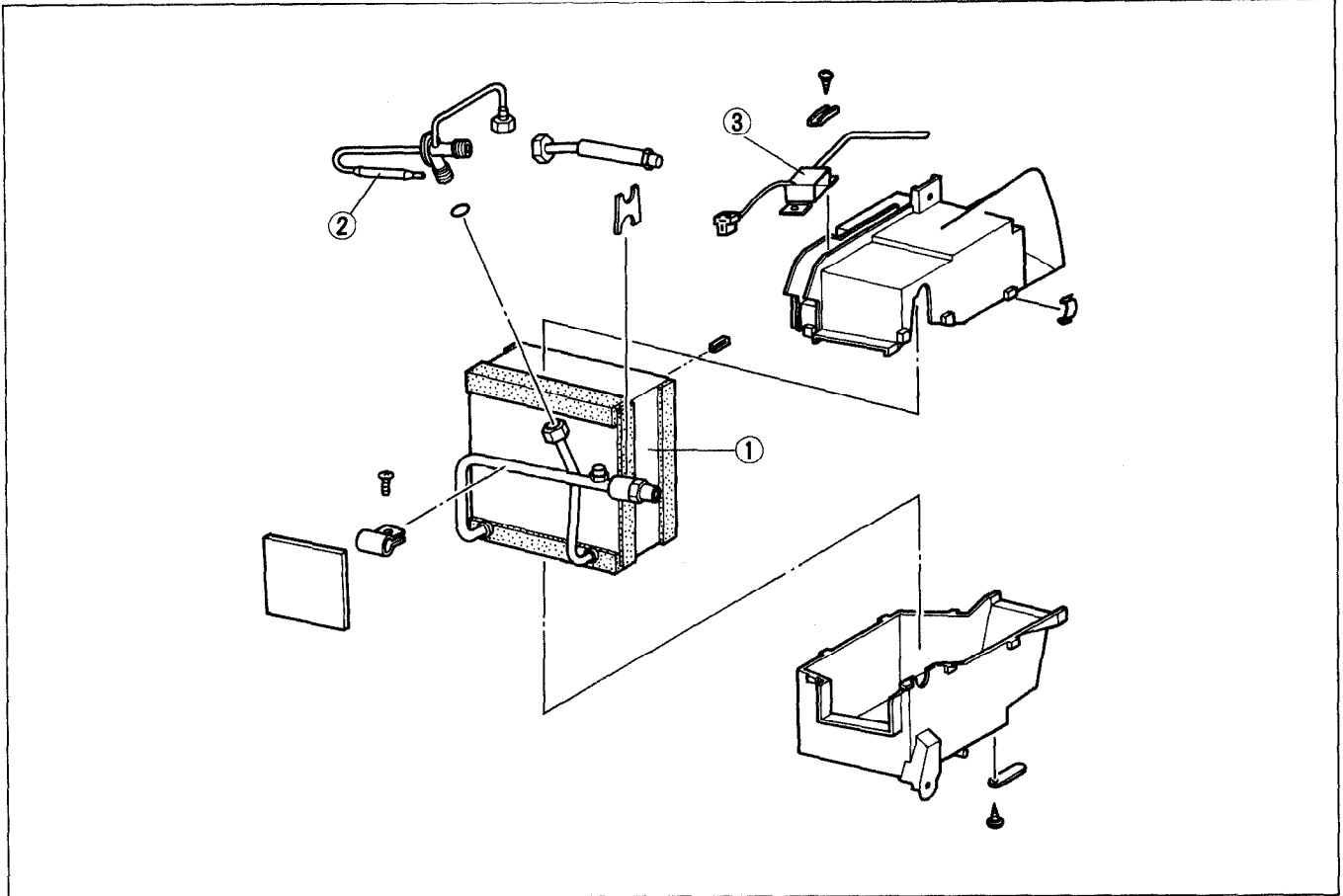


23U0UX-023

1. Cooling unit
Disassembly / Assembly..... page U-39

Disassembly / Assembly

Disassemble and assemble as shown in the figure.



03U0UX-061

1. Evaporator

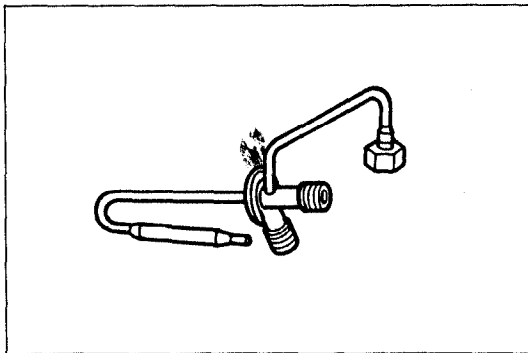
2. Expansion valve

3. Thermoswitch

Replacement Expansion valve

Note

- Before replacement of the expansion valve, carefully check the refrigeration system, referring to the troubleshooting information on page U-14.



23U0UX-024

1. Remove the cooling unit. (Refer to page U-38.)
2. Disassemble the cooling unit. Remove the evaporator and expansion valve as an assembly.
3. Disconnect the inlet and outlet pipes.
4. Remove the capillary tube from the outlet pipe and remove the expansion valve.
5. Install in the reverse order of removal, noting the following.

Note

- Apply clean compressor oil to the O-rings before connecting the fittings.

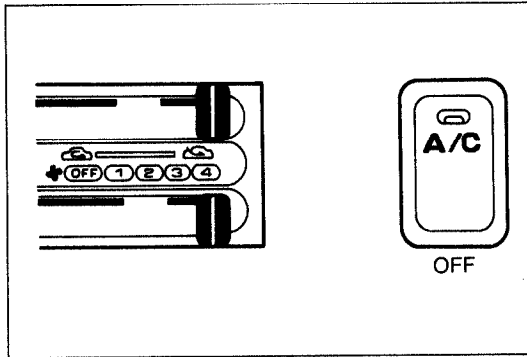
Tightening torque

Inlet pipe:

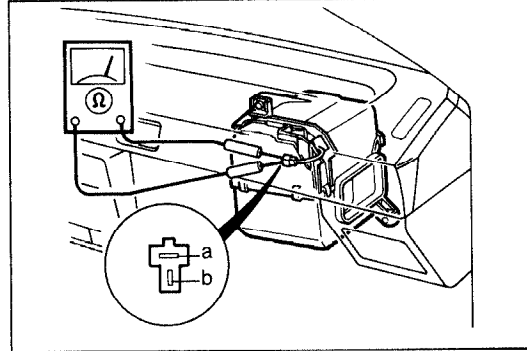
12–15 N·m (1.2–1.5 m·kg, 8.7–11 ft·lb)

Outlet pipe:

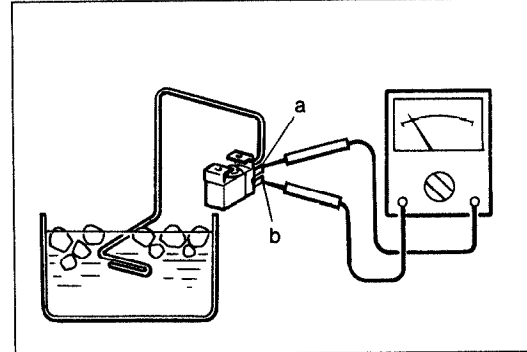
29–34 N·m (3.0–3.5 m·kg, 22–25 ft·lb)



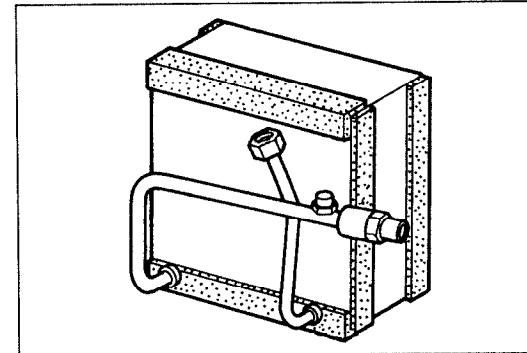
03U0UX-063



03U0UX-064



03U0UX-065



03U0UX-066

On-vehicle Inspection

Thermoswitch

1. Remove the glove box.
2. Run the engine at idle.
3. Turn OFF the A/C switch and set the blower switch to the highest position to operate the blower fan for a few minutes.

4. After a few minutes, turn OFF the blower switch and stop the engine.
5. Disconnect the thermoswitch connector and check for continuity between terminals of the switch.

Terminals	Continuity
a — b	Yes

6. If not as specified, replace the thermoswitch.

Note

- The thermoswitch contacts will be open if the evaporator temperature is below $0.4 \pm 0.7^{\circ}\text{C}$ ($32.7 \pm 1.3^{\circ}\text{F}$).

Inspection

Thermoswitch

1. Immerse the sensing bulb in a container of ice water.
2. Check continuity between terminals of the switch as specified.

Terminals	Temperature	Continuity
a — b	Above 5°C	Yes
	Below 0°C	No

3. If not as specified, replace the thermoswitch.

Evaporator

1. Check the evaporator fins for blockage. If the fins are clogged, clean them with compressed air.

Caution

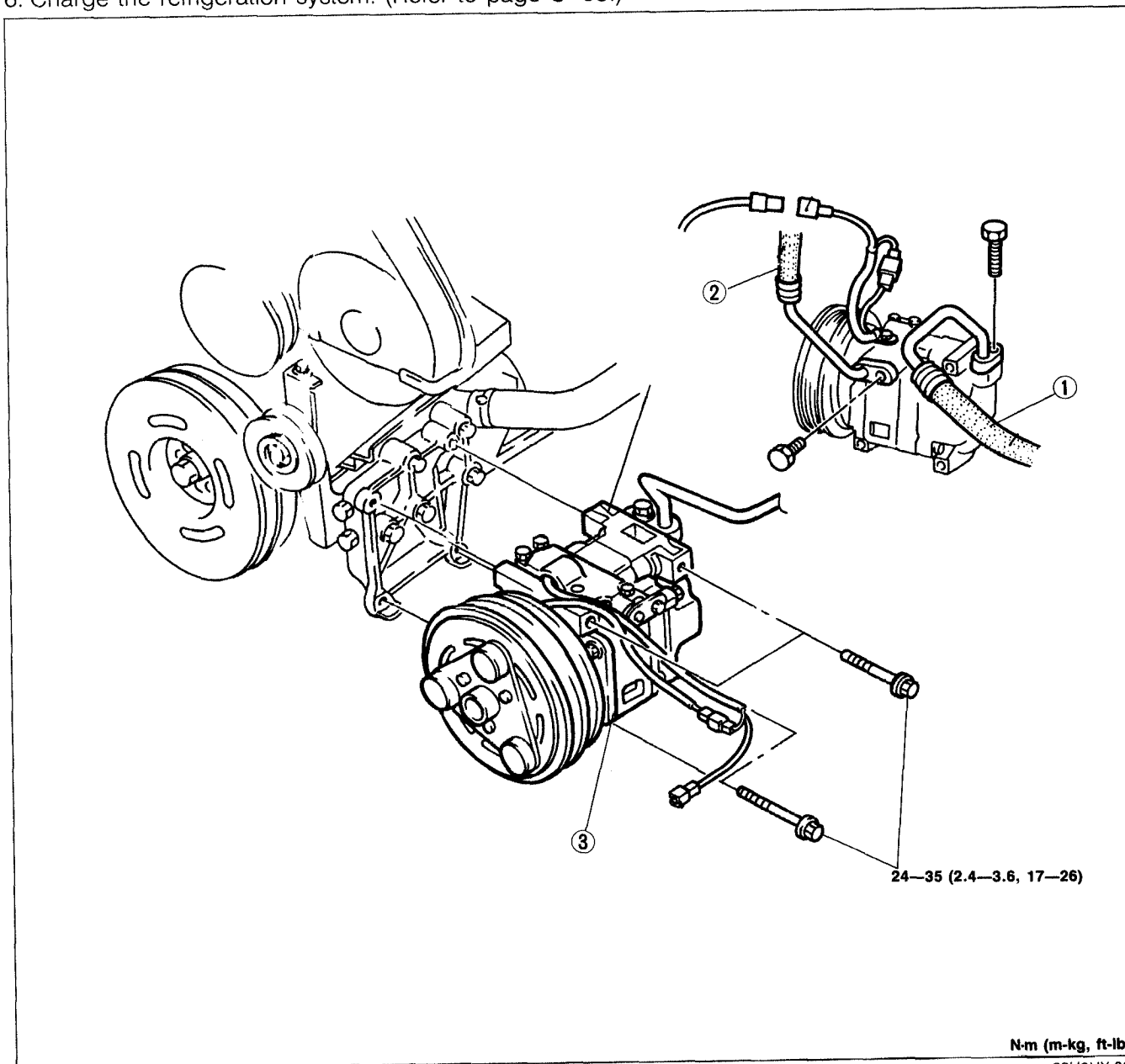
- Never use water to clean the evaporator.

2. Check the fittings for cracks and other damage. Replace the evaporator if necessary.

COMPRESSOR

Removal / Installation

1. Discharge the refrigeration system. (Refer to page U-32.)
2. Remove the undercover.
3. Remove the compressor as shown in the figure, referring to **Removal Note**.
4. Install the compressor in the reverse order of removal, referring to **Installation Note**.
5. Install the undercover.
6. Charge the refrigeration system. (Refer to page U-33.)



N-m (m-kG, ft-lb)

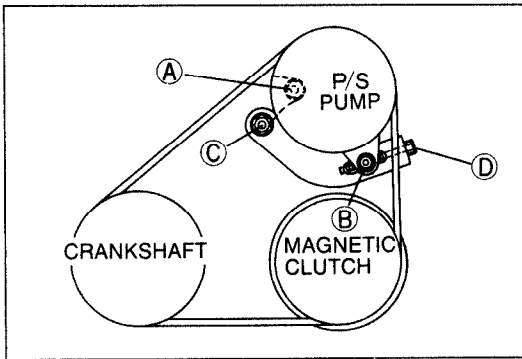
23U0UX-025

1. Suction hose
2. Discharge hose

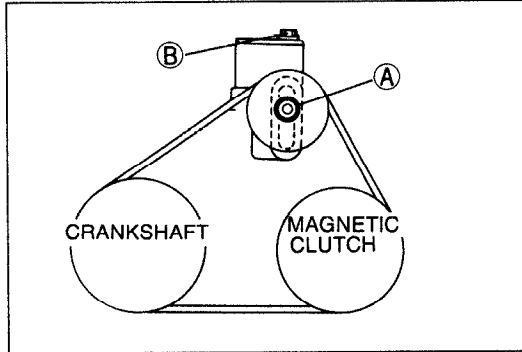
3. Compressor

Note

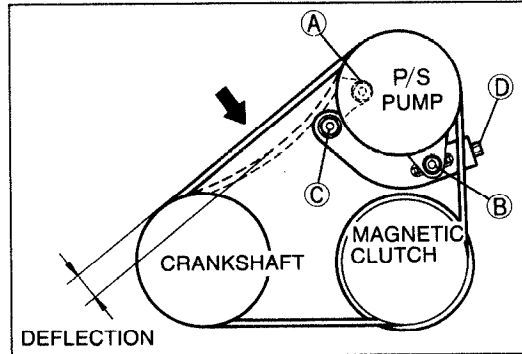
- Immediately plug any open fittings to keep moisture out of the system.
- Apply new compressor oil to the O-rings before connecting the fittings.
- Do not apply compressor oil to the fittings.
- Tightening torque



03U0UX-068



03U0UX-069



23U0UX-026

Removal note

Drive belt

Remove the drive belt as follows.

Vehicle with power steering.

- 1) Loosen bolt A.
- 2) Loosen nut C.
- 3) Loosen nut B.
- 4) Loosen bolt D.
- 5) Remove the drive belt.

Vehicle without power steering

- 1) Loosen nut A.
- 2) Loosen bolt B.
- 3) Remove the drive belt.

Installation note

Vehicle with power steering

Drive belt

Adjust the deflection of the drive belt as follows.

Vehicle with power steering

- 1) Loosen bolt A and nuts B and C.
- 2) Turn adjusting bolt B and adjust the deflection of the drive belt to within specification.

Belt	Deflection: When applying moderate pressure 98 N (10 kg, 22 lb)
New	8–9mm (0.31–0.35 in)
Used	9–10mm (0.35–0.39 in)

- 3) Tighten bolt A and nuts B and C.

Tightening torque

Bolt A: 36–54 N·m (3.7–5.5 m·kg, 27–40 ft·lb)

Nut B: 19–25 N·m (1.9–2.6 m·kg, 14–19 ft·lb)

Nut C: 32–46 N·m (3.2–4.7 m·kg, 24–34 ft·lb)

Vehicle without power steering

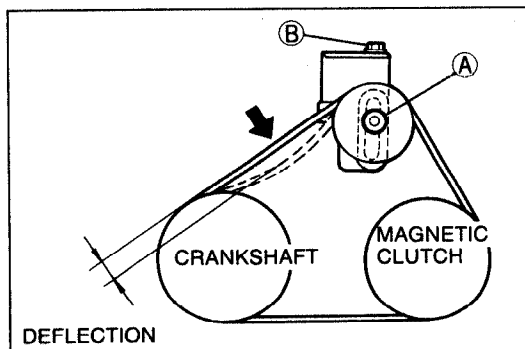
- 1) Loosen nut A.
- 2) Turn adjusting bolt B and adjust the deflection of the drive belt to within specification.

Belt	Deflection: When applying moderate pressure 98 N (10 kg, 22 lb)
New	8–9mm (0.31–0.35 in)
Used	9–10mm (0.35–0.39 in)

- 3) Tighten nut A.

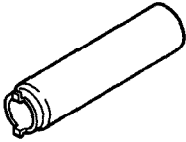
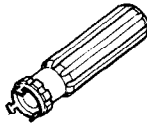
Tightening torque

Nut A: 31–34 N·m (3.2–3.5 m·kg, 23–25 ft·lb)



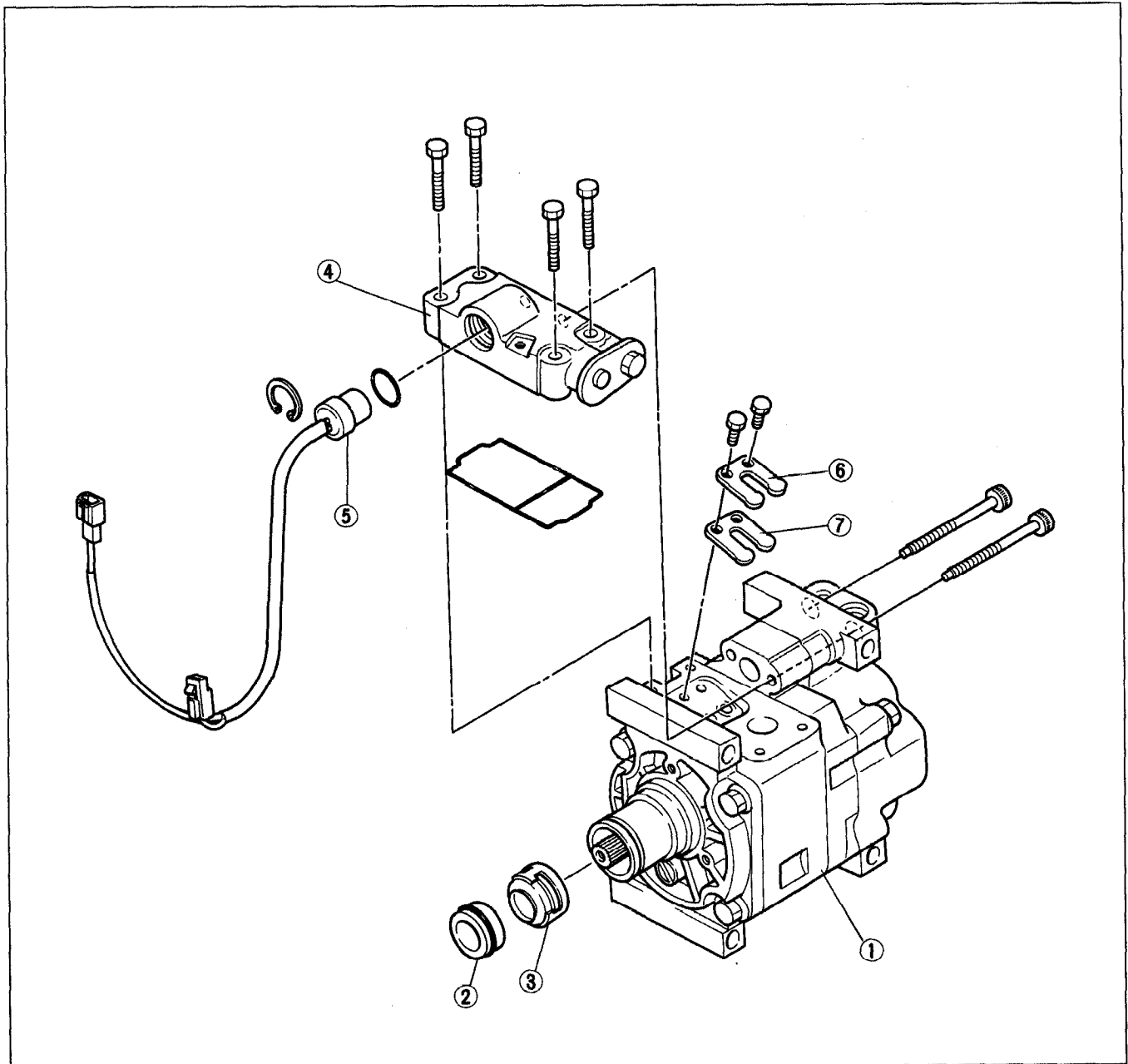
13U0UX-027

**Disassembly / Assembly
Preparation
SST**

49 B061 005 Replacer, seal plate		For replacement of shaft seal plate	0000-41-0809-06 Remover & installer, seal		For replacement of shaft seal
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03U0UX-072

Structural view

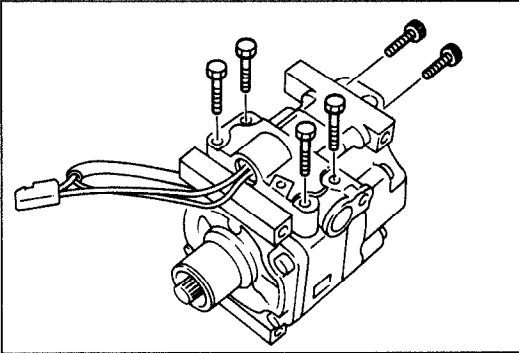


03U0UX-073

- 1. Compressor body
- 2. Shaft seal plate
- 3. Shaft seal

- 4. Discharge valve body
- 5. Thermal protector

- 6. Discharge valve plate
- 7. Discharge valve

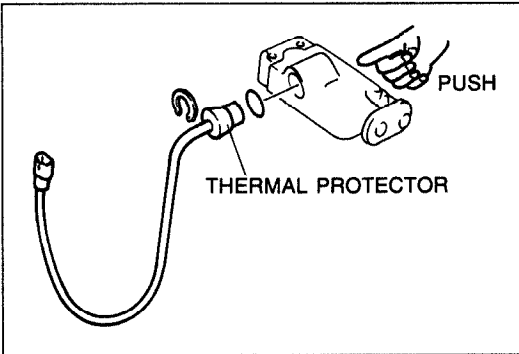


23U0UX-027

Thermal Protector Replacement

1. Removal of discharge valve body

Remove the bolts and carefully remove the discharge valve body.



23U0UX-028

2. Removal of snap ring and thermal protector

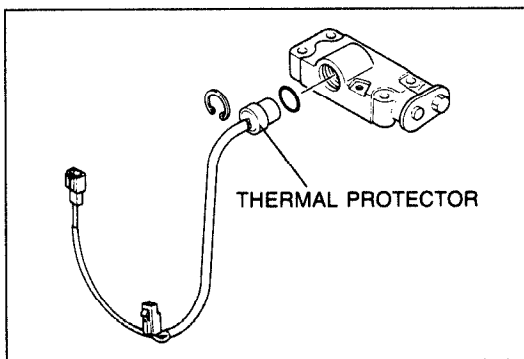
Note

- When removing the thermal protector, do not pull the harness wires but push the protector out from its back side.

3. Installation of thermal protector

- 1) Check that the O-ring groove is free from foreign matter. Apply compressor oil to the O-ring and properly fit it in the groove.
- 2) Before installing the thermal protector, check it for continuity.

23U0UX-029



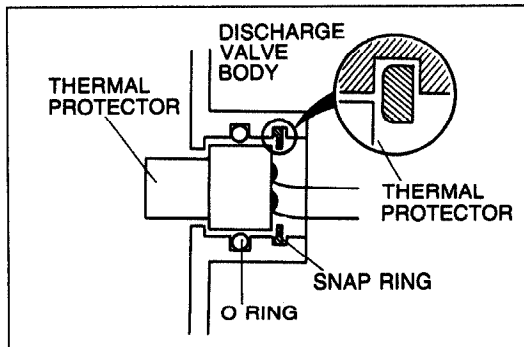
23U0UX-030

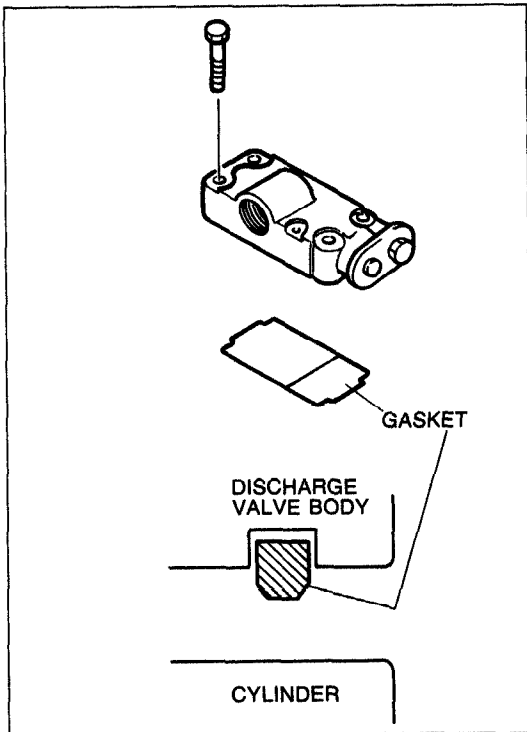
- 3) Install the snap ring so that its chamfered edge side faces the thermal protector (the non-chamfered side faces outward) as shown left.

Make sure the snap ring is seated securely in its groove.

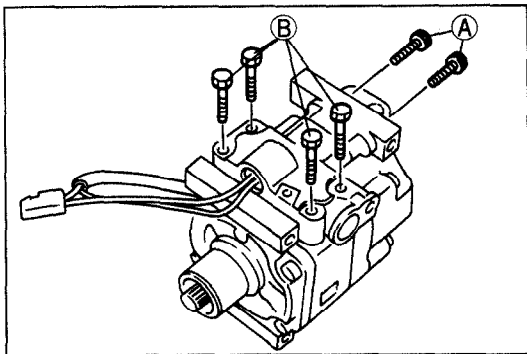
Note

- Install the thermal protector so that its two lead wire outlet sections are horizontal as shown left.





23U0UX-031



23U0UX-032

4. Installation of discharge valve body

- 1) Replace the O-ring and gasket with new ones.
Apply compressor oil to the new O-ring and gasket and properly assemble them.

Note

- Fit the gasket as shown left while checking that its top side faces upward.

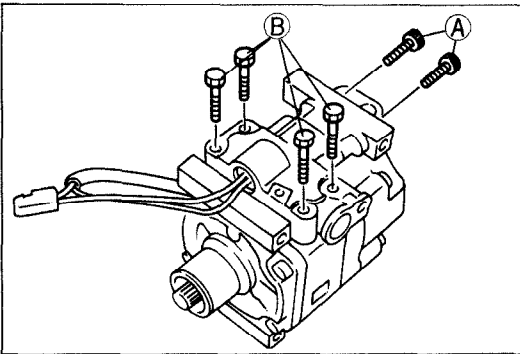
- 2) Carefully install the discharge valve body on the compressor and finger tighten the six M6 bolts.

Note

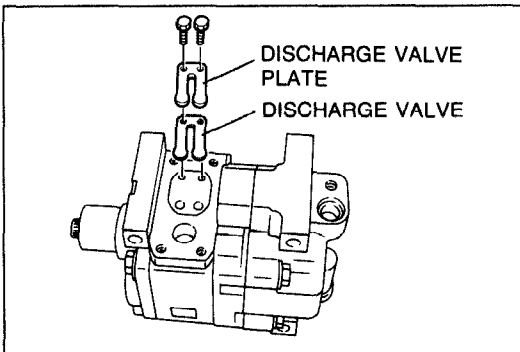
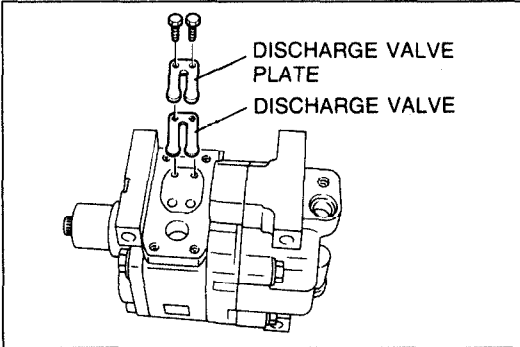
Bolt torquing sequence

- Torque the two socket head bolts (A) to the specification.
- Torque the four bolts (B) in a diagonal manner to the specification.

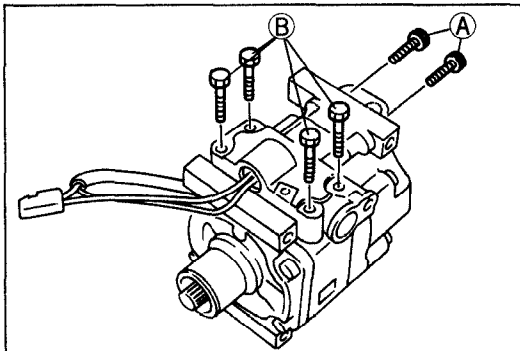
Tightening torque: 9.8 N-m (100 cm-kg, 87 in-lb)



23U0UX-033



23U0UX-034



23U0UX-035

Discharge Valve Replacement

1. Removal of discharge valve

Carefully remove the discharge valve body.

Remove the bolts, then remove the discharge valve plate and discharge valve.

Note

- Do not allow the removed bolts to drop into the suction port.

2. Installation of discharge valve

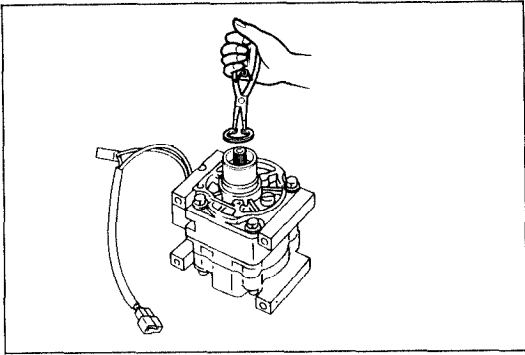
Install the discharge valve and the discharge valve plate.

Install the bolts and tighten them to the specified torque.

Tightening torque: 2.94 N·m (30 cm·kg, 26 in·lb)

Note

- The machined cylinder surface and the rear plate must be clean and free from foreign material.
- Do not use the removed O-ring and gasket again.
- Check that the installed discharge valve is properly seated and aligned.
- Install the discharge valve body with the new O-ring and gasket referring to the instruction for the thermal protector replacement.
- Make sure that the suction and discharge ports are plugged with the caps.



23U0UX-036

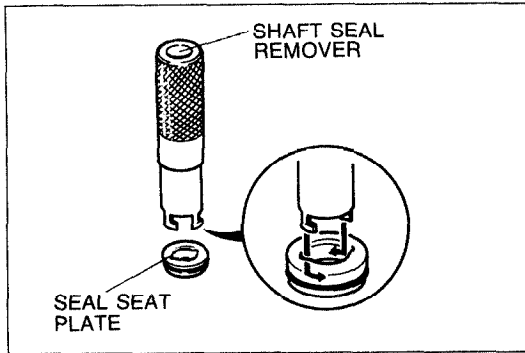
Shaft Seal Replacement

1. Remove the armature plate.

Note

- Removal of the clutch pulley and coil is not necessary.

2. Remove the felt seal and snap ring.



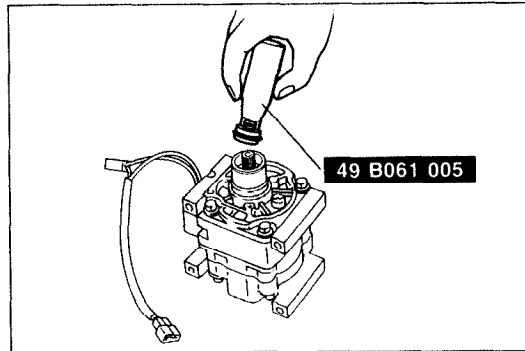
23U0UX-037

3. Remove the shim(s).

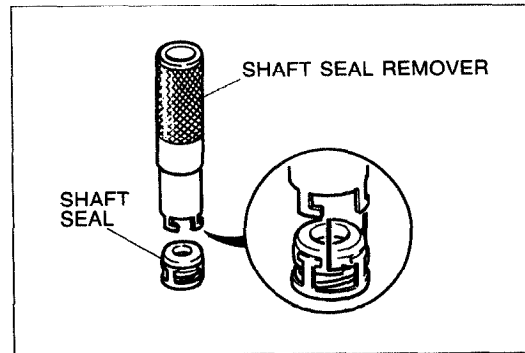
4. Insert the **SST** into the compressor aligning the cutout of the **SST** with the groove of the seal plate.

5. Rotate the **SST** counterclockwise to make sure that the cutout is engaged with the seal plate.

6. Pull out the seal plate.



49 B061 005

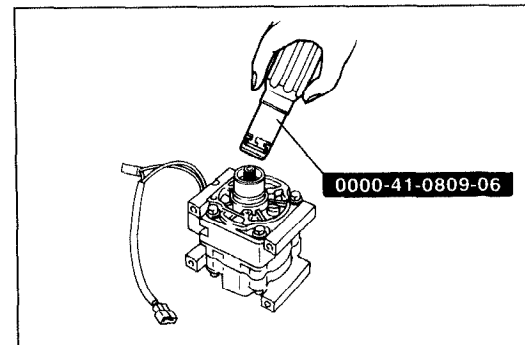


23U0UX-038

7. Insert the **SST** into the compressor aligning the cutout of the **SST** with the metal pawl of the shaft seal.

8. Rotate the **SST** counterclockwise to make sure that the cut-off is engaged with the metal pawl.

9. Pull out the shaft seal.



0000-41-0809-06

10. Lay down the compressor and clean the shaft seal contacting face of the compressor with cleaning solvent.

Caution

- **Keep the cleaning solvent and dirt out of the compressor.**
- **Do not use any cloth for cleaning. Clean only by rinsing with the solvent.**
- **Do not spill the refrigerant oil from the compressor. Refill the same amount of the oil if the oil is spilled out.**

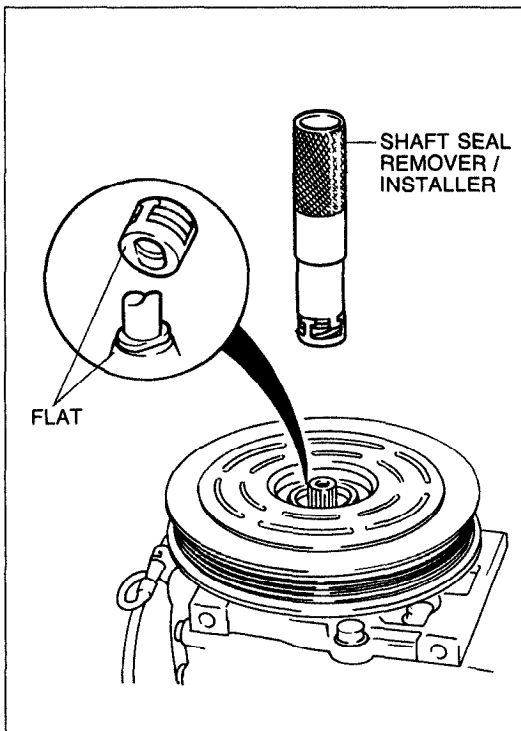
23U0UX-039

11. Clean the new shaft seal thoroughly with cleaning solvent.
12. Lubricate the shaft seal with refrigerant oil (SUNISO 5GS or equivalent) and install it on the **SST**.

Note

- **Use only clean refrigerant oil.**
- **Do not touch the sealing surfaces of the shaft seal after lubricated.**

23U0UX-040



23U0UX-041

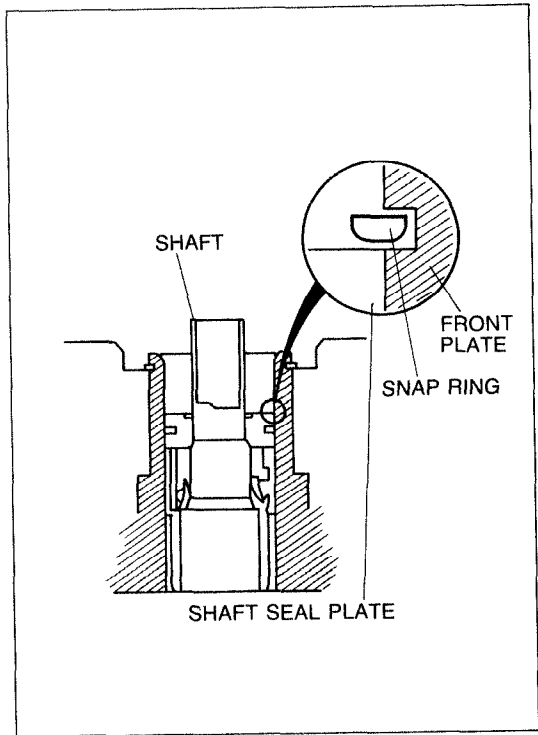
13. Liberally lubricate the compressor shaft with refrigerant oil.
14. Install the shaft seal onto the compressor shaft aligning the seal case flats with the shaft flats.

15. Clean the seal plate with cleaning solvent.
Lubricate the seal plate with refrigerant oil (SUNISO 5GS or equivalent).

Note

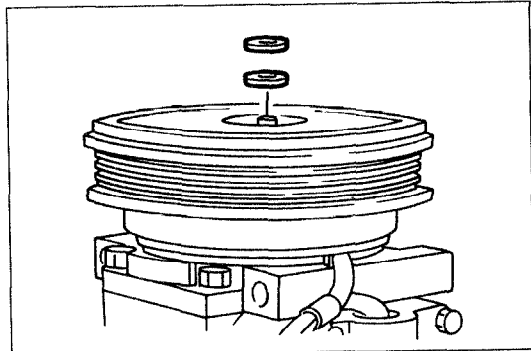
- Use only clean refrigerant oil.
- Do not touch the sealing surface of the seal plate after lubricated.

23U0UX-042



23U0UX-043

16. First, slide the seal plate into the compressor by hand as far as possible.
17. Press the seal plate with grip side of the **SST**.
18. Install the snap ring with its chamfered edge inside.
19. Press the snap ring with the grip side of the **SST**, then install the felt seal.
20. Make sure the snap ring is seated correctly in its groove.
21. Install the shim(s).
22. Install the armature plate.
Measure the clearance between the pulley and armature plate all the way around.
If the clearance is not as specified, add or remove the shim as required.

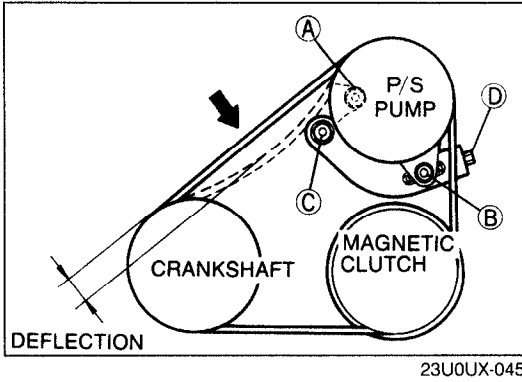


23U0UX-044

Clearance: 0.4—0.5mm (0.016—0.020 in)

Shim

Part number	Thickness mm (in)
B455 61 L15	0.2 (0.008)
B456 61 L15	0.5 (0.020)



Adjustment

Drive belt

Vehicle with power steering

1. Loosen bolt A and nuts B and C.
2. Turn adjusting bolt B and adjust the deflection of the drive belt to within specification.

Belt	Deflection: When applying moderate pressure 98 N (10 kg, 22 lb)
New	8—9mm (0.31—0.35 in)
Used	9—10mm (0.35—0.39 in)

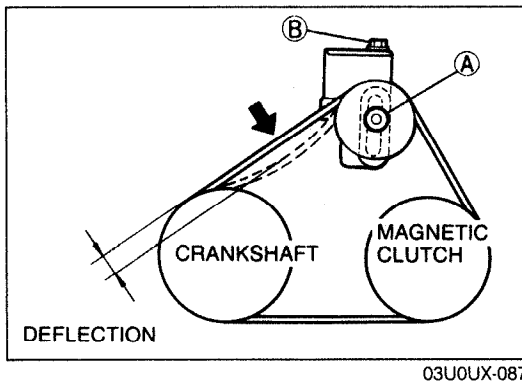
3. Tighten bolt A and nuts B and C.

Tightening torque

Bolt A: 36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)

Nut B: 38—51 N·m (3.8—5.3 m·kg, 28—38 ft·lb)

Nut C: 32—46 N·m (3.2—4.7 m·kg, 24—34 ft·lb)



Vehicle without power steering

1. Loosen nut A.
2. Turn adjusting bolt B and adjust the deflection of the drive belt to within specification.

Belt	Deflection: When applying moderate pressure 98 N (10 kg, 22 lb)
New	8—9mm (0.31—0.35 in)
Used	9—10mm (0.35—0.39 in)

3. Tighten nut A.

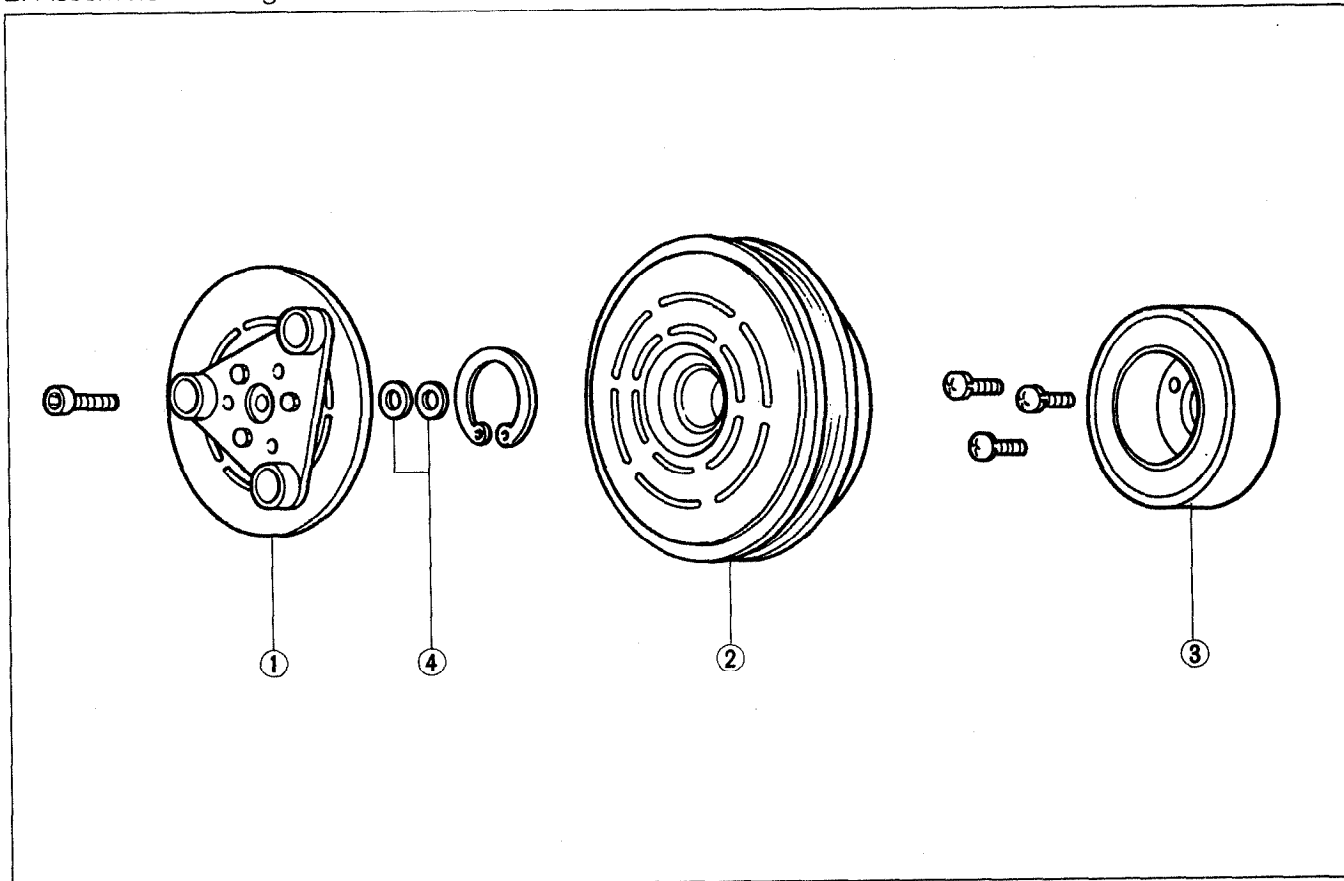
Tightening torque:

32—34 N·m (3.2—3.5 m·kg, 24—25 ft·lb)

MAGNETIC CLUTCH

Disassembly / Assembly

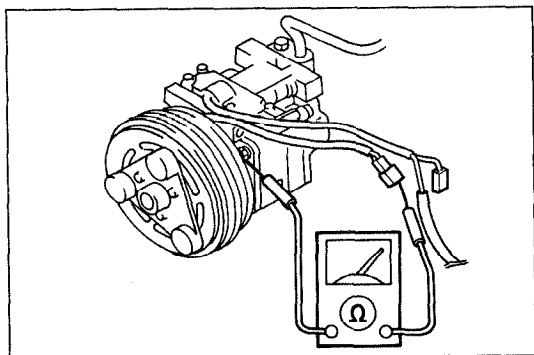
1. Disassemble the magnetic clutch as shown in the figure.
2. Assemble the magnetic clutch in the reverse order of removal.



03U0UX-089

1. Pressure plate
2. Rotor pulley

3. Stator
4. Shim



03U0UX-090

Inspection
Stator

1. Verify continuity between the stator terminals.

Note

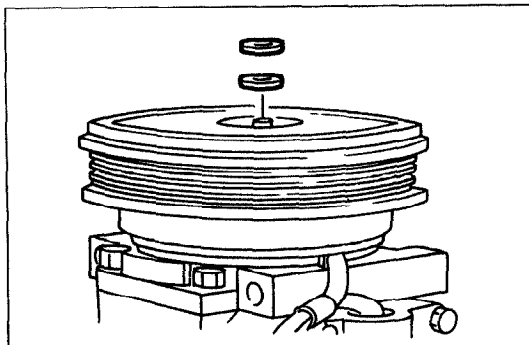
- Set the ohmmeter to $\times 1,000$ range.

2. If there is no continuity, replace the stator.

Adjustment
Magnetic clutch clearance

Adjust the clearance between the pressure plate and the rotor pulley by selecting and installing the proper shim(s).

Clearance: 0.4—0.5mm (0.016—0.020 in)



03U0UX-091

Part number	Thickness mm (in)
B455 61 L15	0.2 (0.008)
B456 61 L15	0.5 (0.020)

RECEIVER/DRIER**Removal / Installation**

1. Discharge the refrigeration system. (Refer to page U-32.)
2. Remove the radiator grille. (Refer to Section S.)
3. Remove the receiver/drier as shown in the figure.

Note

- Immediately plug the open fittings to keep moisture out of the system.

4. Install the receiver/drier in the reverse order of removal.

Note

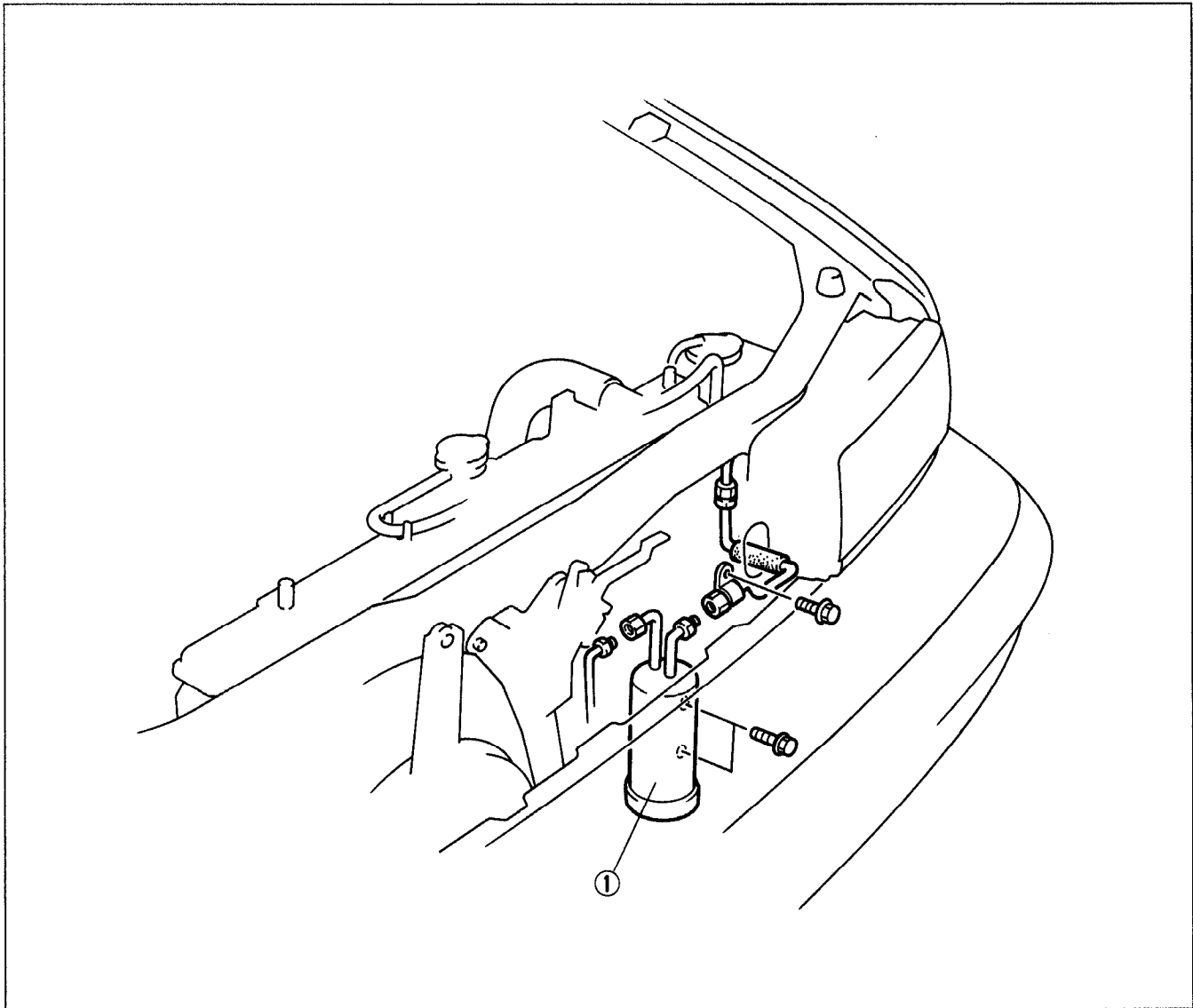
- Apply clean compressor oil to the O-rings before connecting the fittings.
- Do not apply compressor oil to the fitting nuts.
- When installing a new receiver/drier, add compressor oil through the high-pressure pipe port of the compressor.

Compressor oil: 10 cc (0.61 cu in)

Tightening torque

Receiver/drier inlet: 9.8—20 N·m (1.0—2.0 m·kg, 7.2—14 ft·lb)

Receiver/drier outlet: 15—25 N·m (1.5—2.5 m·kg, 11—18 ft·lb)



23U0UX-046

1. Receiver/drier

CONDENSER

Removal / Installation

1. Discharge the refrigeration system. (Refer to page U-32.)
2. Remove the radiator grille. (Refer to Section S.)
3. Remove the receiver/drier. (Refer to page U-52.)
4. Remove the condenser as shown in the figure.

Note

- Insert a protector such as cardboard between the condenser and the radiator.
- Immediately plug the open fittings to keep moisture out of the system.

5. Install the condenser in the reverse order of removal.

Note

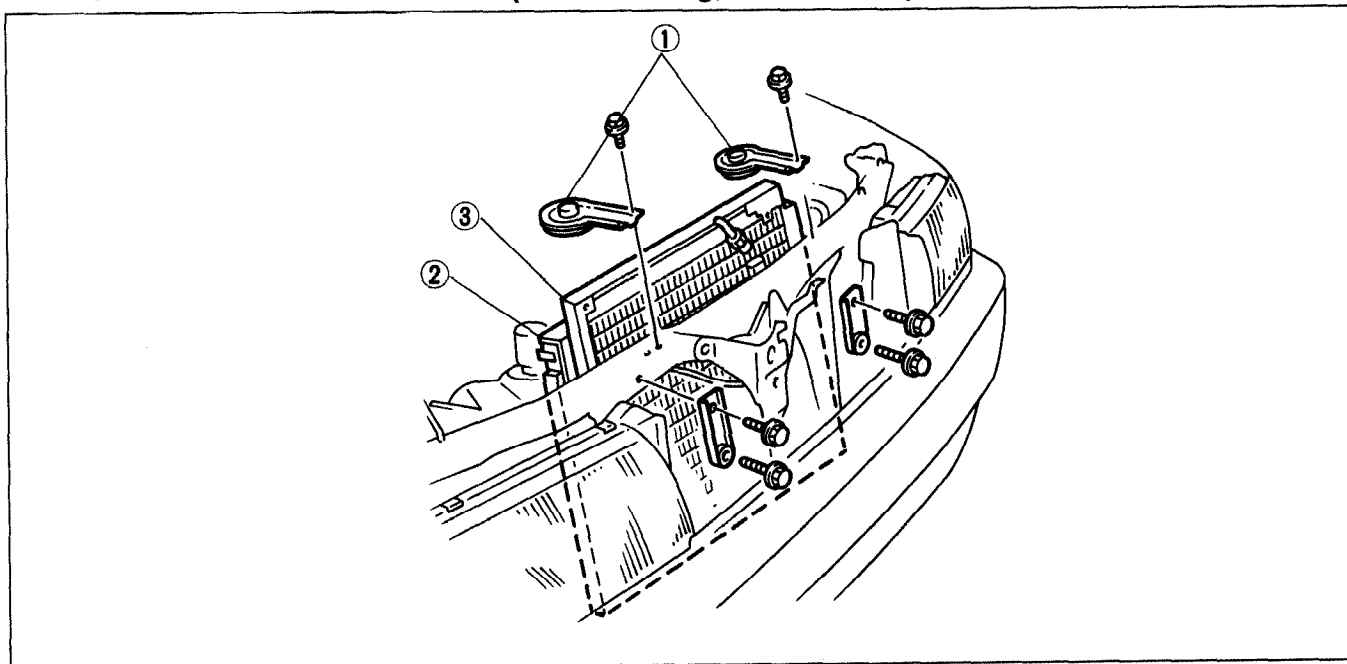
- Apply clean compressor oil to the O-rings before connecting the fittings.
- Do not apply compressor oil to the fitting nuts.
- Remove the protector before installing the radiator brackets.
- When installing a new condenser, add compressor oil through the high-pressure pipe port of the compressor.

Compressor oil: 30 cc (1.83 cu in)

Tightening torque

Condenser inlet: 15—25 N·m (1.5—2.5 m·kg, 11—18 ft·lb)

Condenser outlet: 9.8—20 N·m (1.0—2.0 m·kg, 7.2—14 ft·lb)

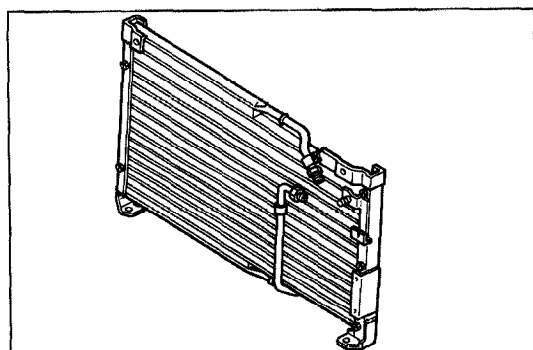


23U0UX-047

1. Radiator bracket

2. Radiator

3. Condenser



03U0UX-094

Inspection

Check for the following and repair or replace the condenser as necessary.

1. Cracks, damage, or refrigerant leakage.
2. Bent fins.
3. Distorted or damaged condenser inlet or outlet.

REFRIGERANT LINES

On-vehicle Inspection

Check for leakage at connections. (Refer to page U-32.)

Repair or replace as necessary.

Replacement

1. Discharge the refrigeration system. (Refer to page U-32.)
2. Replace the faulty pipe or hose.

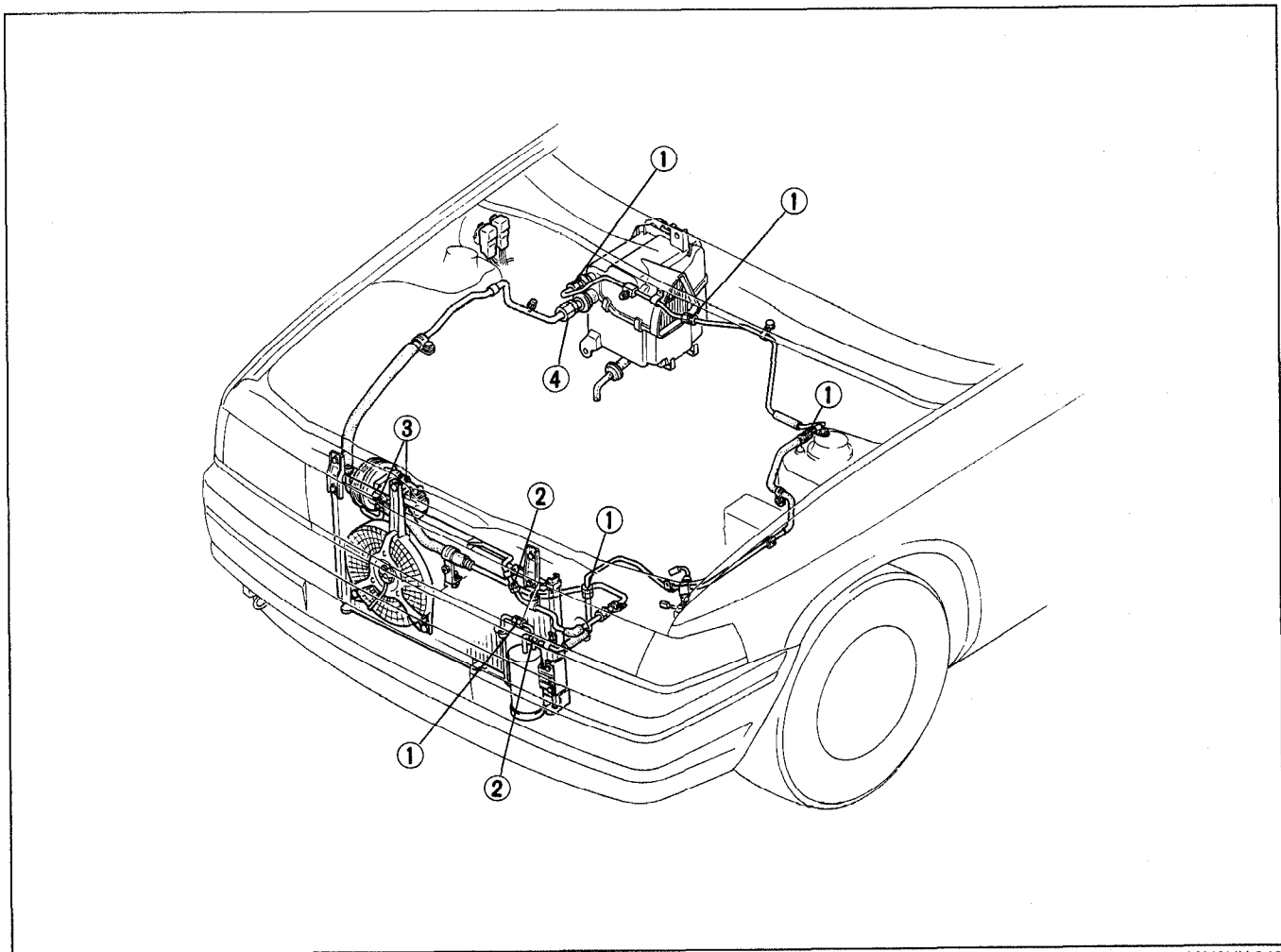
Note

- Immediately plug the open fittings to keep moisture out of the system.
- Apply clean compressor oil to the O-rings before connecting the fittings.
- Do not apply compressor oil to the fitting nuts.

Tightening torque (fittings):

Location	Tightening torque
①	9.8—20 N·m (1.0—2.0 m·kg, 7.2—14 ft·lb)
②	15—25 N·m (1.5—2.5 m·kg, 11—18 ft·lb)
③	9.8—16 N·m (1.0—1.6 m·kg, 7.2—12 ft·lb)
④	20—29 N·m (2.0—3.0 m·kg, 15—21 ft·lb)

3. Evacuate, charge, and test the refrigeration system.

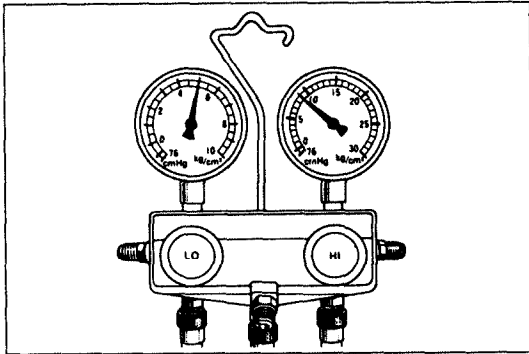


23U0UX-048

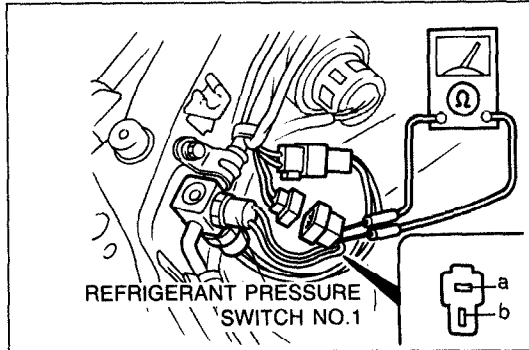
1. High-pressure hose
2. Low-pressure hose
3. Cooler pipe No.1

4. Cooler pipe No.2
5. Cooler pipe No.3

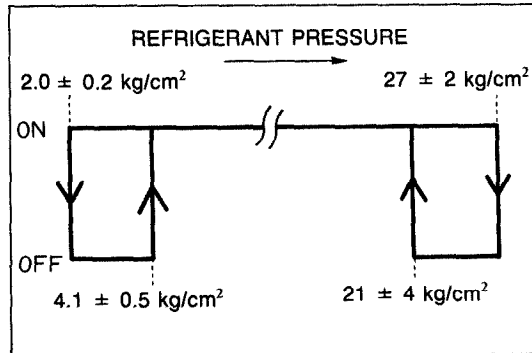
6. Cooler pipe No.4
7. Cooler pipe No.5



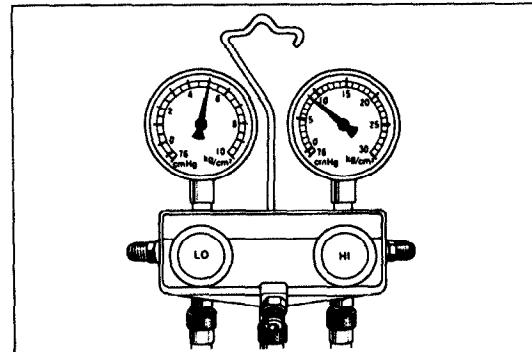
03U0UX-096



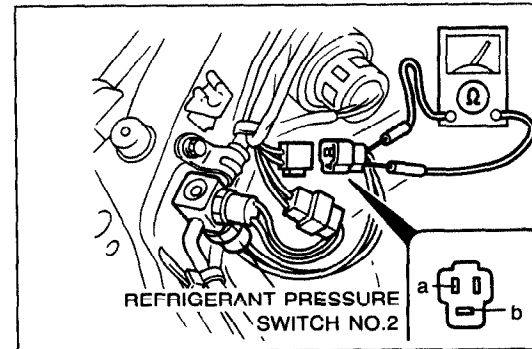
23U0UX-049



13U0UX-028



03U0UX-099



23U0UX-050

REFRIGERANT PRESSURE SWITCH No.1

Inspection

1. Turn the ignition switch OFF.
2. Connect the manifold gauge set and measure the high-pressure side refrigerant pressure.

High-pressure side:

Above 451 kPa (4.6 kg/cm², 65 psi)

3. If not as specified, check the refrigerant system, referring to the troubleshooting information on page U-14.
4. If correct, go to the next step.
5. Disconnect the refrigerant pressure switch No.1 connector.
6. Check for continuity of the switch.

Terminals	Continuity
a - b	Yes

7. If not as specified, replace the switch together with cooler pipe No.2. (Refer to page U-54.)

Note

- If problems occur in the refrigeration system, causing abnormally high (above 2,649 ± 196 kPa [27 ± 2 kg/cm², 384 ± 28 psi]) or low (below 196 ± 20 kPa [2.0 ± 0.2 kg/cm², 28 ± 2.8 psi]) pressures, refrigerant pressure switch No.1 cuts power to the magnetic clutch to protect the mechanical components. If the pressure recovers to within normal operating range (below 2,060 ± 392 kPa [21 ± 4 kg/cm², 299 ± 57 psi] or above 402 ± 49 kPa [4.1 ± 0.5 kg/cm², 58 ± 7 psi]), the power is again restored.

REFRIGERANT PRESSURE SWITCH No.2 (BP ENGINE WITH ATX)

Inspection

1. Turn the ignition switch OFF.
2. Connect the manifold gauge set and measure the high-pressure side refrigerant pressure.

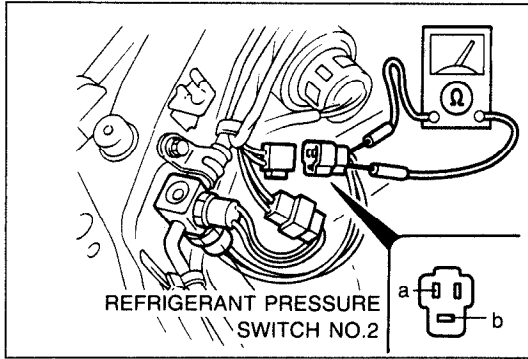
High-pressure side:

below 1,177 kPa (12 kg/cm², 171 psi)

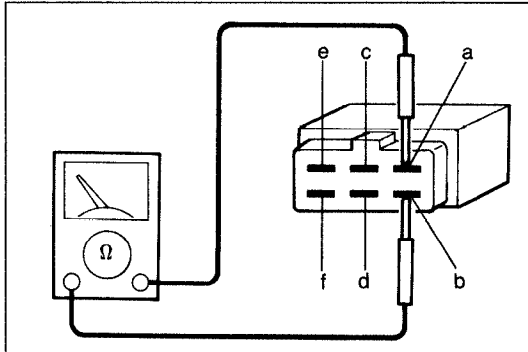
3. Disconnect the refrigerant pressure switch No.2 connector.
4. Check continuity of the switch.

Terminals	Continuity
a - b	No

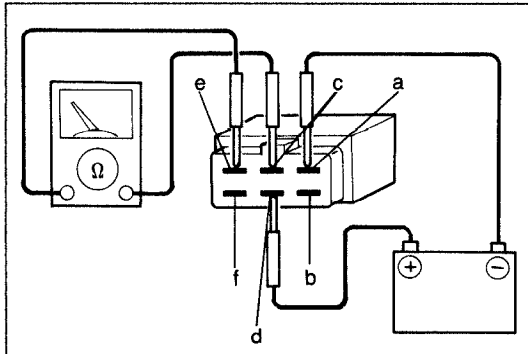
5. If not as specified, replace the switch together with cooler pipe No.2. (Refer to page U-54.)
6. If correct, go to next step.



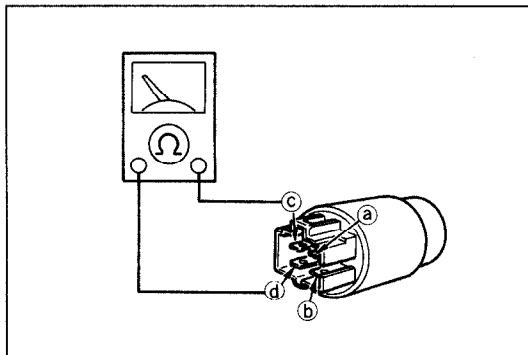
23U0UX-051



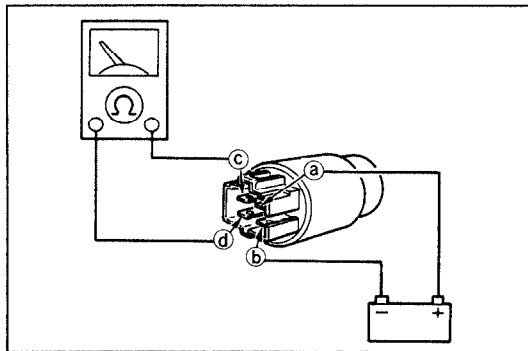
03U0UX-102



23U0UX-052



03U0UX-104



23U0UX-053

Caution

- While testing refrigerant pressure switch No.2, carefully note the high-pressure side refrigerant pressure. If the pressure increases above 1,766 kPa (18 kg/cm², 256 psi), stop the testing.

7. Disconnect the condenser fan connector.
8. Run the engine at 2,000 rpm, and operate the air conditioner at maximum cooling position.
9. Check that the refrigerant pressure switch turns on when the high-pressure side refrigerant pressure increases above **1,570 ± 98 kPa (16 ± 1 kg/cm², 228 ± 14 psi)**.
10. If not as specified, replace the switch together with cooler pipe No.2. (Refer to page U-54.)

A/C RELAY

Inspection

1. Disconnect the A/C relay connector.
2. Check continuity between terminals of the switch.

Terminals		Continuity
Tester probe: +	Tester probe: -	
a	b	Yes
a	d	Yes
b	a	No
c	e	No
d	a	No
e	c	Yes

3. If not as specified, replace the relay.
4. If correct, go to the next step.
5. Apply battery voltage to terminal d and ground terminal a.
6. Check for continuity between terminals a and d.

Terminals	Continuity
a - d	Yes

7. If not as specified, replace the relay.

CONDENSER FAN RELAY

Inspection

1. Disconnect the condenser fan relay connector.
2. Check continuity between terminals of the relay.

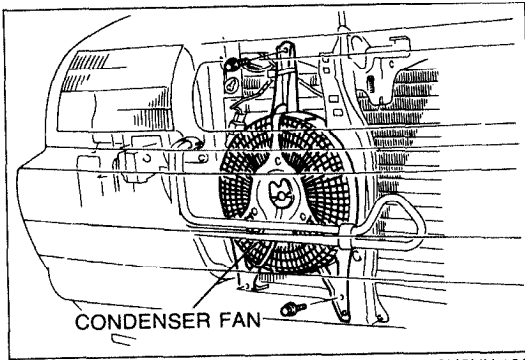
Terminals	Continuity
a - b	Yes
c - d	No

3. If not as specified, replace the relay.
4. If correct, go to the next step.

5. Apply battery voltage to terminal a and ground terminal b.
6. Check for continuity between terminals c and d.

Terminals	Continuity
c - d	Yes

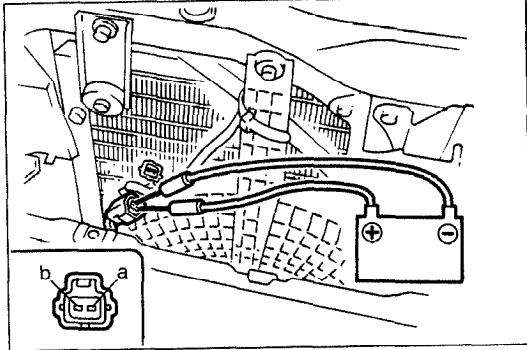
7. If not as specified, replace the relay.



03U0UX-106

CONDENSER FAN Removal / Installation

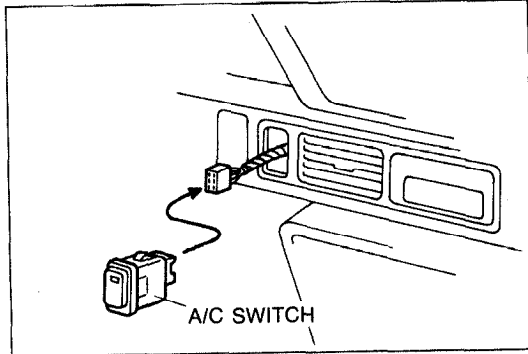
1. Remove the radiator grille. (Refer to Section S.)
2. Disconnect the condenser fan connector.
3. Remove the bolts and remove the condenser fan.
4. Install in the reverse order of removal.



23U0UX-054

Inspection

1. Disconnect the condenser fan connector.
2. Apply battery voltage to terminal a and ground terminal b, and verify that the condenser fan operates.
3. If not as specified, replace the condenser fan.



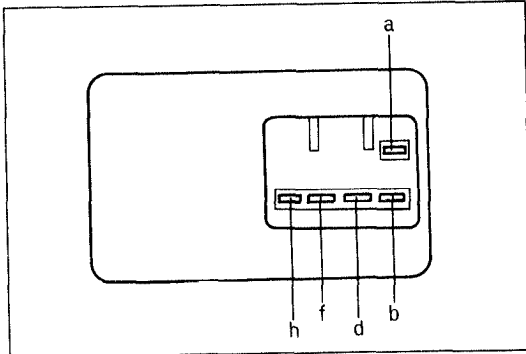
23U0UX-055

A/C SWITCH Inspection

1. Remove the A/C switch and check continuity between terminals.

Switch	Terminals				
	a	b	d	f	h
OFF		○	—	—	○
ON	○	○	○	○	
	○	◀	▶	○	

- : Indicates continuity
- ◀○: Indicates diode



03U0UX-109

2. If not as specified, replace the A/C switch.

TECHNICAL DATA

MEASUREMENTS..... TD- 2
ENGINE (B6 AND BP SOHC) TD- 2
ENGINE (BP DOHC)..... TD- 5
LUBRICATION SYSTEM..... TD- 8
COOLING SYSTEM..... TD- 8
FUEL AND EMISSION CONTROL
SYSTEMS..... TD- 9
ENGINE ELECTRICAL SYSTEM TD-10
CLUTCH..... TD-11
MANUAL TRANSAXLE (F5M-R) TD-12
MANUAL TRANSAXLE (G5M-R)..... TD-13
AUTOMATIC TRANSAXLE TD-14
FRONT AND REAR AXLES..... TD-17
STEERING SYSTEM TD-17
BRAKING SYSTEM..... TD-18
WHEELS AND TIRES..... TD-19
SUSPENSION TD-19
BODY ELECTRICAL SYSTEM..... TD-20
HEATER AND AIR CONDITIONER
SYSTEMS..... TD-21
STANDARD BOLT AND NUT TIGHTENING
TORQUE TD-21

23UTDX-001

MEASUREMENTS

Item	Body	PROTEGÉ	Hatchback
Overall length	mm (in)	4,355 (171.5)	4,155 (163.6)
Overall width	mm (in)	1,675 (65.9)	1,670 (65.7)
Overall height	mm (in)	1,375 (54.1)	1,380 (54.3)
Wheel base	mm (in)	2,500 (98.4)	2,450 (96.5)
Front tread	mm (in)	1,430 (56.3)	
Rear tread	mm (in)	1,435 (56.5)	

B1. ENGINE (B6 AND BP SOHC)

Item		Engine	B6 SOHC	BP SOHC	
Type		Gasoline, 4-cycle			
Cylinder arrangement and number		In-line 4-cylinder			
Combustion chamber		Multispherical	Pentroof		
Valve system		OHC, belt-driven	OHC, belt-driven 16 valves		
Bore x Stroke		mm (in)	78.0 x 83.6 (3.07 x 3.29)	83.0 x 85.0 (3.27 x 3.35)	
Total piston displacement		cc (cu in)	1,597 (97.4)	1,839 (112.2)	
Compression ratio			9.3	8.9	
Compression pressure kPa (kg/cm ² , psi)-rpm		Standard	1,236 (12.6, 179)-300	1,197 (12.2, 173)-300	
		Minimum	863 (8.8, 125)-300	834 (8.5, 121)-300	
		Maximum difference between each cylinders	196 (2.0, 28)		
Valve timing		IN	Open BTDC	14°	2°
			Close ABDC	50°	
		EX	Open BBDC	52°	55°
			Close ATDC	12°	8°
Valve clearance mm (in) (Warm engine)		Valve side	IN	0 Maintenance-free	
			EX	0 Maintenance-free	
		Cam side	IN	0 Maintenance-free	
			EX	0 Maintenance-free	
Cylinder head					
Height		mm (in)	107.4—107.6 (4.228—4.236)		
Distortion		mm (in)	0.15 (0.006) max.	0.10 (0.004) max.	
Grinding		mm (in)	0.20 (0.008) max.	0.10 (0.004) max.	
Valve and valve guide					
Valve head diameter		mm (in)	IN	37.9—38.1 (1.492—1.500)	29.9—30.1 (1.177—1.185)
			EX	31.9—32.1 (1.256—1.264)	24.85—25.15 (0.978—0.990)
Valve head margin thickness		mm (in)	IN	0.8 (0.031)	0.9 (0.035)
			EX	1.1 (0.043)	1.0 (0.039)
Valve face angle			IN	45°	
			EX	45°	
Valve length		IN	Standard	103.77 (4.085)	101.77 (4.007)
			Minimum	103.27 (4.066)	101.27 (3.987)
		EX	Standard	102.67 (4.042)	102.97 (4.054)
			Minimum	102.17 (4.022)	102.47 (4.034)
Valve stem diameter		mm (in)	IN	6.970—6.985 (0.2744—0.2750)	5.970—5.985 (0.2350—0.2356)
			EX	6.965—6.980 (0.2742—0.2748)	5.965—5.980 (0.2348—0.2354)
Guide inner diameter		mm (in)	7.01—7.03 (0.2760—0.2768)	6.01—6.03 (0.2366—0.2374)	
Valve stem-to-guide clearance		mm (in)	IN	0.025—0.060 (0.0010—0.0024)	
			EX	0.030—0.065 (0.0011—0.0026)	
			Maximum	0.20 (0.008)	
Guide projection (Height "A")		mm (in)	IN	13.2—13.8 (0.520—0.543)	18.3—18.9 (0.720—0.744)
			EX	13.2—13.8 (0.520—0.543)	16.8—17.4 (0.661—0.685)

Item		Engine	B6 SOHC	BP SOHC			
Valve seat							
Seat angle		IN	45°				
		EX	45°				
Seat contact width		mm (in)	IN	1.1—1.7 (0.043—0.067)	0.8—1.4 (0.031—0.055)		
		EX	1.1—1.7 (0.043—0.067)	0.8—1.4 (0.031—0.055)			
Seat sinking		mm (in)	IN	Standard	39 (1.5354)	42.5 (1.673)	
				Maximum	40.5 (1.594)	44.0 (1.732)	
		EX	Standard	39 (1.5354)	41.0 (1.614)		
			Maximum	40.5 (1.594)	42.5 (1.673)		
Valve spring							
Free length		IN	Standard	mm (in)	43.66 (1.7188)	46.12 (1.8157)	
			Minimum	N (kg, lb)/mm (in)	224—253 (22.8—25.8, 50—57)/35.5 (1.398)	205—231 (20.9—23.5, 46—52)/39 (1.535)	
		EX	Standard	mm (in)	43.66 (1.7188)	43.61 (1.7169)	
			Minimum	N (kg, lb)/mm (in)	224—253 (22.8—25.8, 50—57)/35.5 (1.398)	129—147 (13.1—15.0, 29—33)/37.5 (1.476)	
Out-of-square		mm (in)	Maximum	1.52 (0.060)	IN...1.61 (0.063), EX...1.52 (0.060)		
Camshaft							
Lobe height		mm (in)	IN	Standard	36.451 (1.4351)	35.993 (1.4170)	
				Wear limit	36.251 (1.4272)	35.793 (1.4092)	
		EX	Standard	36.451 (1.4351)	36.273 (1.4281)		
			Wear limit	36.251 (1.4272)	36.073 (1.4202)		
Journal diameter		mm (in)	Front	43.440—43.460 (1.7102—1.7110)	No.1 & No.5	43.440—43.460 (1.7102—1.7110)	
				Center	43.430—43.445 (1.7098—1.7108)	No.2 & No.4	43.425—43.450 (1.7096—1.7106)
				Rear	43.440—43.460 (1.7102—1.7110)	No.3	43.410—43.435 (1.7091—1.7100)
		Out-of-round	0.05 (0.002) max.				
Camshaft bearing oil clearance		mm (in)	Front	0.055—0.095 (0.0021—0.0037)	No.1 & No.5	0.040—0.075 (0.0016—0.0030)	
				Center	0.060—0.105 (0.0023—0.0041)	No.2 & No.4	0.035—0.080 (0.0014—0.0031)
				Rear	0.055—0.095 (0.0021—0.0037)	No.3	0.050—0.095 (0.0020—0.0037)
		Maximum	0.15 (0.006)				
Camshaft runout		mm (in)	Maximum	0.01 (0.0004)	0.03 (0.0012)		
Camshaft end play		mm (in)	Standard	0.05—0.18 (0.0020—0.0071)	0.06—0.19 (0.0024—0.0075)		
			Maximum	0.2 (0.008)			
Rocker arm and rocker arm shaft							
Rocker arm inner diameter		mm (in)	18.000—18.027 (0.7087—0.7097)	IN...19.000—19.027 (0.7480—0.7491) EX...19.000—19.033 (0.7480—0.7493)			
Rocker arm shaft diameter		mm (in)	17.959—17.980 (0.7070—0.7079)	18.959—18.980 (0.7464—0.7472)			
Rocker arm to shaft clearance		mm (in)	Standard	0.020—0.068 (0.0008—0.0027)	IN...0.020—0.068 (0.0008—0.0027) EX...0.020—0.074 (0.0008—0.0029)		
			Maximum	0.10 (0.004)			
Cylinder block							
Height		mm (in)	221.5 (8.720)				
Distortion		mm (in)	0.15 (0.006) max.				
Grinding		mm (in)	0.20 (0.008) max.				
Cylinder bore diameter		mm (in)	Standard size	78.006—78.013 (3.0711—3.0714)	83.006—83.013 (3.2679—3.2682)		
			0.25 (0.010) oversize	78.256—78.263 (3.0809—3.0812)	83.256—83.263 (3.2778—3.2781)		
			0.50 (0.020) oversize	78.506—78.513 (3.0908—3.0911)	83.506—83.513 (3.2876—3.2879)		
Cylinder bore taper and out-of-round		mm (in)	0.019 (0.0007) max.				

TD

Engine		B6 SOHC	BP SOHC
Piston			
Piston diameter Measured at 90° to pin bore axis and 16.5mm (0.650 in) below oil ring groove mm (in)	Standard size	77.954—77.974 (3.0690—3.0698)	82.954—82.974 (3.2659—3.2667)
	0.25 (0.010) oversize	78.211—78.217 (3.0792—3.0794)	83.211—83.217 (3.2760—3.2763)
	0.50 (0.020) oversize	78.461—78.467 (3.0890—3.0892)	83.461—83.467 (3.2859—3.2861)
Piston-to-cylinder clearance mm (in)	Standard	0.039—0.052 (0.0015—0.0020)	
	Maximum	0.15 (0.006)	
Piston ring			
Thickness mm (in)	Top	1.47—1.49 (0.0579—0.0587)	
	Second	1.47—1.49 (0.0579—0.0587)	
End gap (Measured in cylinder) mm (in)	Top	0.15—0.30 (0.006—0.012)	
	Second	0.15—0.30 (0.006—0.012)	
	Oil (rail)	0.20—0.70 (0.008—0.028)	
	Maximum	1.0 (0.039)	
Ring groove width in piston mm (in)	Top	1.520—1.535 (0.0598—0.0604)	
	Second	1.520—1.535 (0.0598—0.0604)	
	Oil	4.02—4.04 (0.1583—0.1591)	3.02—3.04 (0.1189—0.1197)
Piston ring-to-ring groove clearance mm (in)	Top	0.030—0.065 (0.0012—0.0026)	
	Second	0.030—0.065 (0.0012—0.0026)	
	Maximum	0.15 (0.006)	
Piston pin			
Diameter	mm (in)	19.974—19.980 (0.7864—0.7866)	
Interference in connecting rod	mm (in)	0.013—0.037 (0.0005—0.0015)	
Installing pressure	N (kg, lb)	4,905—14,715 (500—1,500, 1,100—3,300)	
Connecting rod and connecting rod bearing			
Length (Center to center)	mm (in)	132.85—132.95 (5.2303—5.2342)	
Bending	mm (in)	0.075 (0.0030) max./50 (1.97)	
Small end bore	mm (in)	19.943—19.961 (0.7852—0.7859)	
Big end bore	mm (in)	48.000—48.016 (1.8898—1.8904)	
Big end width	mm (in)	21.838—21.890 (0.8598—0.8618)	
Connecting rod side clearance mm (in)	Standard	0.110—0.262 (0.0043—0.0103)	
	Maximum	0.30 (0.012)	
Crankshaft			
Crankshaft runout	mm (in)	0.04 (0.0016) max.	
Main journal diameter mm (in)	Standard size	Standard	49.938—49.956 (1.9661—1.9668)
		Minimum	49.904 (1.9647)
	0.25 (0.010) undersize	Standard	49.704—49.708 (1.9568—1.9570)
		Minimum	49.652 (1.9548)
	0.50 (0.020) undersize	Standard	49.454—49.458 (1.9470—1.9472)
		Minimum	49.402 (1.9450)
0.75 (0.030) undersize	Standard	49.204—49.208 (1.9372—1.9373)	—
	Minimum	49.152 (1.9351)	—
Main journal taper and out-of-round	mm (in)	0.05 (0.020) max.	
Crankpin diameter mm (in)	Standard size	Standard	44.940—44.956 (1.7693—1.7699)
		Minimum	44.908 (1.7680)
	0.25 (0.010) undersize	Standard	44.690—44.706 (1.7594—1.7601)
		Minimum	44.658 (1.7582)
	0.50 (0.020) undersize	Standard	44.440—44.456 (1.7496—1.7502)
		Minimum	44.408 (1.7483)
0.75 (0.030) undersize	Standard	44.190—44.206 (1.7398—1.7404)	
	Minimum	44.158 (1.7385)	
Crankpin taper and out-of-round	mm (in)	0.05 (0.020) max.	
Main bearing			
Main journal bearing oil clearance mm (in)	Standard	0.018—0.036 (0.0007—0.0014)	
	Maximum	0.10 (0.004)	
Available undersized bearing	mm (in)	0.25 (0.010), 0.50 (0.020), 0.75 (0.030)....B6 Only	

Item		Engine	B6 SOHC	BP SOHC
Crankpin bearing				
Crankpin bearing oil clearance	mm (in)	Standard	0.028—0.068 (0.0011—0.0027)	
		Maximum	0.10 (0.004)	
Available undersized bearing		mm (in)	0.25 (0.010), 0.50 (0.020), 0.75 (0.030)	
Thrust bearing				
Crankshaft end play	mm (in)	Standard	0.080—0.282 (0.0031—0.0111)	
		Maximum	0.30 (0.012)	
Bearing width	mm (in)	Standard size	2.500—2.550 (0.0984—0.1004)	
		0.25 (0.010) oversize	2.625—2.675 (0.1033—0.1053)	
		0.50 (0.020) oversize	2.750—2.800 (0.1083—0.1102)	
		0.75 (0.030) oversize	2.875—2.925 (0.1132—0.1152)	
Timing belt				
Belt deflection		mm (in)/98 N (10 kg, 22 lb)	11.0—13.0 (0.43—0.51)	

B2. ENGINE (BP DOHC)

Item		Engine	BP DOHC
Type			Gasoline, 4-cycle
Cylinder arrangement and number			In-line 4-cylinders
Combustion chamber			Pentroof
Valve system			DOHC, belt-driven 16 valves
Bore x Stroke		mm (in)	83.0 x 85.0 (3.27 x 3.35)
Total piston displacement		cc (cu in)	1,839 (112.2)
Compression ratio			9.0
Compression pressure kPa (kg/cm ² , psi)-rpm		Standard	1,256 (12.8, 182)-300
		Minimum	883 (9.0, 128)-300
		Maximum difference between each cylinder	196 (2.0, 28)
Valve timing	IN	Open BTDC	5°
		Close ABDC	48°
	EX	Open BBDC	56°
		Close ATDC	14°
Valve clearance	mm (in)	IN	0 Maintenance-free
		EX	0 Maintenance-free
Cylinder head			
Height		mm (in)	133.8—134.0 (5.268—5.276)
Distortion		mm (in)	0.10 (0.004) max.
Grinding		mm (in)	0.10 (0.004) max.
Cylinder head-to-HLA clearance	mm (in)	Standard	0.025—0.066 (0.0010—0.0026)
		Maximum	0.18 (0.0071)
Valve and valve guide			
Valve head diameter	mm (in)	IN	32.9—33.1 (1.295—1.303)
		EX	27.85—28.15 (1.096—1.108)
Valve head margin thickness	mm (in)	IN	0.9 (0.0354)
		EX	1.0 (0.0393)
Valve face angle		IN	45°
		EX	45°
Valve length	IN	Standard	101.34 (3.9898)
		Minimum	100.84 (3.9701)
	EX	Standard	101.44 (3.9937)
		Minimum	100.94 (3.9740)
Valve stem diameter	mm (in)	IN	5.970—5.985 (0.2350—0.2356)
		EX	5.965—5.980 (0.2348—0.2354)
Guide inner diameter		mm (in)	6.01—6.03 (0.2366—0.2374)
Valve stem-to-guide clearance	mm (in)	IN	0.025—0.060 (0.0010—0.0024)
		EX	0.030—0.065 (0.0012—0.0026)
		Maximum	0.20 (0.008)

TD

Item		Engine	BP DOHC
Guide projection (Height "A")	mm (in)	IN	18.3—18.9 (0.720—0.744)
		EX	18.3—18.9 (0.720—0.744)
Valve seat			
Seat angle		IN	45°
		EX	45°
Seat contact width	mm (in)	IN	0.8—1.4 (0.031—0.055)
		EX	0.8—1.4 (0.031—0.055)
Seat sinking	IN	Standard	45.0 (1.7716)
		Maximum	46.5 (1.831)
	EX	Standard	45.0 (1.7716)
		Maximum	46.5 (1.831)
Valve spring			
Free length	Standard	mm (in)	46.26 (1.821)
	Minimum	N (kg, lb)/mm (in)	224—253 (22.8—25.8, 50—57)/39.5 (1.555)
Out-of-square		mm (in)	1.62 (0.064) max.
Camshaft			
Cam height	IN	Standard	44.094 (1.7360)
		Wear limit	43.894 (1.7281)
	EX	Standard	44.600 (1.7560)
		Wear limit	44.400 (1.7480)
Journal diameter	mm (in)	Standard (No. 1—No. 5)	25.940—25.965 (1.0213—1.0222)
		Out-of-round	0.03 (0.001) max.
Camshaft bearing oil clearance	mm (in)	Standard (No. 1—No. 5)	0.035—0.081 (0.0014—0.0032)
		Maximum	0.15 (0.006)
Camshaft runout		mm (in)	0.03 (0.0012) max.
Camshaft end play	mm (in)	Standard	0.07—0.19 (0.0028—0.0075)
		Maximum	0.2 (0.008)
Cylinder block			
Height		mm (in)	221.5 (8.720)
Distortion		mm (in)	0.15 (0.006) max.
Grinding		mm (in)	0.20 (0.008) max.
Cylinder bore diameter	mm (in)	Standard size	83.006—83.013 (3.2679—3.2682)
		0.25 (0.010) oversize	83.256—83.263 (3.2778—3.2781)
		0.50 (0.020) oversize	83.506—83.513 (3.2876—3.2879)
Cylinder bore taper and out-of-round		mm (in)	0.019 (0.0007) max.
Piston			
Piston diameter Measured at 90° to pin bore axis and 16.5mm (0.650 in) below oil ring groove	mm (in)	Standard size	82.954—82.974 (3.2659—3.2667)
		0.25 (0.010) oversize	83.211—83.217 (3.2760—3.2763)
		0.50 (0.020) oversize	83.461—83.467 (3.2859—3.2861)
Piston to cylinder clearance	mm (in)	Standard	0.039—0.052 (0.0015—0.0020)
		Maximum	0.15 (0.006)
Piston ring			
Thickness	mm (in)	Top	1.47—1.49 (0.0579—0.0587)
		Second	1.47—1.49 (0.0579—0.0587)
End gap (Measured in the cylinder)	mm (in)	Top	0.15—0.30 (0.006—0.012)
		Second	0.15—0.30 (0.006—0.012)
		Oil (rail)	0.20—0.70 (0.008—0.028)
		Maximum	1.0 (0.039)
Ring groove width in piston	mm (in)	Top	1.520—1.535 (0.0598—0.0604)
		Second	1.52—1.54 (0.0598—0.0606)
		Oil	3.02—3.04 (0.1189—0.1197)

Item		Engine	BP DOHC
Piston ring-to-ring groove clearance mm (in)		Top	0.030—0.065 (0.0012—0.0026)
		Second	0.030—0.070 (0.0012—0.0028)
		Maximum	0.15 (0.006)
Piston pin			
Diameter		mm (in)	19.987—19.993 (0.7869—0.7871)
Piston-to-piston pin clearance		mm (in)	−0.005—0.013 (−0.0002—0.0005)
Connecting rod bush-to-piston pin clearance		mm (in)	0.010—0.027 (0.0004—0.0011)
Connecting rod and connecting rod bearing			
Length (Center to center)		mm (in)	132.85—132.95 (5.230—5.234)
Bending		mm (in)	0.075 (0.0030) max./50 (1.97)
Small end bore (Bush inner diameter)		mm (in)	20.003—20.014 (0.7875—0.7880)
Big end bore		mm (in)	48.000—48.016 (1.8898—1.8904)
Big end width		mm (in)	21.838—21.890 (0.8598—0.8618)
Connecting rod side clearance mm (in)		Standard	0.110—0.262 (0.0043—0.0103)
		Maximum	0.30 (0.012)
Crankshaft			
Crankshaft runout		mm (in)	0.04 (0.0016) max.
Main journal diameter mm (in)	Standard size	Standard	49.938—49.956 (1.9661—1.9668)
		Minimum	49.904 (1.9647)
	0.25 (0.010) undersize	Standard	49.704—49.708 (1.9568—1.9570)
		Minimum	49.652 (1.9548)
	0.50 (0.020) undersize	Standard	49.454—49.458 (1.9470—1.9472)
		Minimum	49.402 (1.9450)
0.75 (0.030) undersize	Standard	49.204—49.208 (1.9372—1.9373)	
	Minimum	49.152 (1.9351)	
Main journal taper and out-of-round		mm (in)	0.05 (0.020) max.
Crankpin diameter mm (in)	Standard size	Standard	44.940—44.956 (1.7693—1.7699)
		Minimum	44.908 (1.7680)
	0.25 (0.010) undersize	Standard	44.690—44.706 (1.7594—1.7601)
		Minimum	44.658 (1.7582)
	0.50 (0.020) undersize	Standard	44.440—44.456 (1.7496—1.7502)
		Minimum	44.408 (1.7483)
0.75 (0.030) undersize	Standard	44.190—44.206 (1.7398—1.7404)	
	Minimum	44.158 (1.7385)	
Crankpin taper and out-of-round		mm (in)	0.05 (0.020) max.
Main bearing			
Main journal bearing oil clearance mm (in)		Standard	0.018—0.036 (0.0007—0.0014)
		Maximum	0.10 (0.004)
Available undersized bearing		mm (in)	0.25 (0.010), 0.50 (0.020), 0.75 (0.030)
Crankpin bearing			
Crankpin bearing oil clearance mm (in)		Standard	0.028—0.068 (0.0011—0.0027)
		Maximum	0.10 (0.004)
Available undersized bearing		mm (in)	0.25 (0.010), 0.50 (0.020), 0.75 (0.030)
Thrust bearing			
Crankshaft end play mm (in)		Standard	0.080—0.282 (0.0031—0.0111)
		Maximum	0.30 (0.012)
Bearing width mm (in)	Standard size		2.500—2.550 (0.0984—0.1004)
	0.25 (0.010) oversize		2.625—2.675 (0.1033—0.1053)
	0.50 (0.020) oversize		2.750—2.800 (0.1083—0.1102)
	0.75 (0.030) oversize		2.875—2.925 (0.1132—0.1152)
Timing belt			
Belt deflection		mm (in)/98 N (10 kg, 22 lb)	9.0—11.5 (0.35—0.45)

TD

D. LUBRICATION SYSTEM

Item		Engine	B6 SOHC	BP SOHC	BP DOHC
Lubricating method			Force-fed		
Oil pump					
Type			Trochoid gear		
Relief pressure		kPa (kg/cm ² , psi)	343—441 (3.5—4.5, 50—64)		
Regulated pressure		kPa (kg/cm ² , psi)-rpm	294—392 (3.0—4.0, 43—57)-3,000		
Inner rotor tooth tip to outer rotor clearance		mm (in)	Standard	0.02—0.16 (0.0008—0.0063)	
			Maximum	0.20 (0.0078)	
Outer rotor to body clearance		mm (in)	Standard	0.09—0.18 (0.0035—0.0071)	
			Maximum	0.22 (0.0087)	
Side clearance		mm (in)	Standard	0.03—0.11 (0.0012—0.0043)	
			Maximum	0.14 (0.0055)	
Oil filter					
Type			Full-flow, paper element		
Relief pressure differential		kPa (kg/cm ² , psi)	78—118 (0.8—1.2, 11—17)		
Engine oil					
Capacity liters (US qt, Imp qt)		Total (dry engine)	3.4 (3.6, 3.0)	4.0 (4.2, 3.5)	
		Oil pan	3.0 (3.2, 2.6)	3.6 (3.8, 3.2)	
		Oil filter	0.17 (0.18, 0.15)		
Grade		API Service SG Energy Conserving II (ECII)			
Viscosity number	Above -25°C (-13°F)		SAE 10W-30		
	Below 0°C (32°F)		SAE 5W-30		

E. COOLING SYSTEM

Item		Engine/Transaxle	B6 SOHC		BP SOHC		BP DOHC	
			MTX	ATX	MTX	ATX	MTX	ATX
Cooling method			Water-cooled, forced circulation					
Water pump								
Type			Centrifugal, V-belt driven					
Impeller diameter		mm (in)	70 (2.76)			75 (2.95)		
Number of impeller blades			6					
Speed ratio			1 : 1.05					
Water seal type			Unified mechanical seal					
Thermostat								
Type			Wax, two-stage					
Opening temperature		°C (°F)	Sub: 83.5—86.5 (182—188), Main: 86.5—89.5 (188—193)					
Full-open temperature		°C (°F)	100 (212)					
Full-open lift		mm (in)	Sub: 1.5 (0.06) min., Main: 8.0 (0.31) min.					
Radiator								
Type			Corrugated fin					
Cap valve opening pressure		kPa (kg/cm ² , psi)	74—103 (0.75—1.05, 11—15)					
Cooling circuit checking pressure		kPa (kg/cm ² , psi)	103 (1.05, 15)					
Cooling fan								
Type			Electric					
Number of blades			4					
Outer diameter		mm (in)	320 (12.6)					
Capacity		W-V	80-12		160-12		80-12 160-12	
Current		A	6.6		Hi : 13.3 Low : 8.8		6.6 Hi : 13.3 Low : 8.8	
Water thermostwitch								
OFF → ON		°C (°F)	97 (207)					
Radiator thermostwitch								
OFF → ON		°C (°F)	—		105 (221)		— 105 (221)	

Engine/Transaxle		B6 SOHC		BP SOHC		BP DOHC	
		MTX	ATX	MTX	ATX	MTX	ATX
Coolant							
Capacity		liters (US qt, Imp qt)		5.0 (5.3, 4.4)	6.0 (6.3, 5.3)	5.0 (5.3, 4.4)	6.0 (6.3, 5.3)
Antifreeze solution	Coolant protection	Volume percentage %				Specific gravity at 20°C (68°F)	
		Water		Coolant			
	Above -16°C (3°F)		65	35	1.054		
	Above -26°C (-15°F)		55	45	1.066		
Above -40°C (-40°F)		45	55	1.078			

F. FUEL AND EMISSION CONTROL SYSTEMS

Item		Engine	B6 SOHC	BP SOHC	BP DOHC
Idle speed*1*2		rpm	700—800		
Ignition timing*2		BTDC	6°—8°	4°—6°	9°—11°
Fuel pump					
Maximum output pressure		kPa (kg/cm ² , psi)	441—637 (4.5—6.5, 64—92)		
Fuel filter					
Type	Low-pressure side		Nylon element (in fuel pump)		
	High-pressure side		Paper element		
Pressure regulator					
Regulating pressure		kPa (kg/cm ² , psi)	265—314 (2.7—3.2, 38—46)		
Injector					
Type		High-ohmic			
Type of drive		Electromechanical			
Resistance		Ω	12—16		
Idle speed control (ISC) valve					
Type		Rotary			
Resistance		Ω	11—13		
Purge control solenoid valve					
Resistance		Ω	23—27		
Water thermosensor					
Resistance	kΩ	-20°C (-4°F)	14.6—17.8		
		20°C (68°F)	2.21—2.69		
		40°C (104°F)	1.0—1.3		
		80°C (176°F)	0.29—0.35		
Airflow meter					
Resistance	Ω	E2↔Vs	Fully closed	20—600	
			Fully open	20—1,000	
	E2↔THAA (Intake air thermosensor)	Ω	-20°C (-4°F)	13,600—18,400	
			20°C (68°F)	2,210—2,690	
			60°C (140°F)	493—667	
	E1↔Fc	Ω	Fully closed	∞	
Fully open			0		
Fuel tank					
Capacity		liters (US gal, Imp gal)	Hatchback...50 (13.2, 11.0), PROTEGÉ...55 (14.5, 12.1)		
Air cleaner					
Element type		Oil permeated			
Fuel					
Specification		Unleaded regular (RON 91 or higher)			

*1 With parking brake applied (Canada)

*2 TEN terminal of diagnosis connector grounded

TD

G. ENGINE ELECTRICAL SYSTEM

Item	Engine/Transaxle		B6 SOHC	BP SOHC		BP DOHC		
				MTX	ATX	MTX	ATX	
Battery	Voltage	V	12					
	Type and capacity (20-hour rate)		55D23L (60AH)	55D23L (60AH)				
Dark current* ¹		mA	Max. 20.0					
Alternator	Type		A.C					
	Output	V-A	12-65					
	Regulator type		Transistorized (built-in IC regulator)					
	Regulated voltage	V	14.1—14.7					
	Brush length mm (in)	Standard		21.5 (0.846)				
		Minimum		8.0 (0.315)				
	Drive belt deflection mm (in)/98 N (10 kg, 22 lb)	New		8—9 (0.31—0.35)				
Used			9—10 (0.35—0.39)					
Starter	Type		Direct	Direct	Coaxial reduction	Direct	Coaxial reduction	
	Output	V-kW	12-0.85	12-0.95	12-1.4	12-0.95	12-1.4	
	Brush length mm (in)	Standard	17 (0.67)	17 (0.67)	17.5 (0.69)	17 (0.67)	17.5 (0.69)	
Minimum		11.5 (0.453)	11.5 (0.453)	10.0 (0.39)	11.5 (0.453)	10.0 (0.39)		
Distributor			Electronic spark advance (photo diode)					
Ignition timing (TEN terminal of diagnosis connector grounded)	BTDC		6°—8°	4°—6°	9°—11°			
Ignition coil	Resistance (at 20°C [68°F])	Primary coil winding	0.81—0.99Ω					
		Secondary coil winding	10—16 kΩ					
Spark plug	Type	NGK	BKR5E-11 BKR6E-11		BKR5E-11 BKR6E-11 BKR7E-11			
		NIPPONDENSO	K16PR-U11 K20PR-U11		K16PR-U11 K20PR-U11 K22PR-U11			
	Plug gap	mm (in)	1.0—1.1 (0.039—0.043)					
	Firing order		1—3—4—2					

*¹ Dark current is the constant flow of current while the ignition switch is OFF.
(i.e engine control unit, audio, etc.)

H. CLUTCH

Engine/Transaxle		B6 SOHC		BP SOHC	BP DOHC
		F5M-R			G5M-R
Clutch control		Hydraulic			
Clutch pedal					
Type		Suspended			
Pedal ratio		6.55			
Full stroke		mm (in)	135 (5.32)		
Height (With carpet)		mm (in)	196—204 (7.72—8.03)		
Free play		mm (in)	5.0—13.0 (0.197—0.512)		
Distance to carpet when clutch fully disengaged		mm (in)	Minimum	41.0 (1.61)	
Flywheel					
Runout limit		mm (in)	0.2 (0.008)		
Clutch disc					
Type		Single dry plate			
Runout limit		mm (in)	0.7 (0.027)		
Wear limit		mm (in)	0.3 (0.012) from rivet head		
Outer diameter		mm (in)	190 (7.48)	200 (7.87)	215 (8.46)
Inner diameter		mm (in)	130 (5.12)		150 (5.91)
Facing thickness		mm (in)	Flywheel side		
			3.5 (0.138)		
			3.5 (0.138)	3.8 (0.150)	3.8 (0.150)
Clutch cover					
Type		Diaphragm spring			
Set load		N (kg, lb)	3,630 (370, 814)	3,826 (390, 858)	3,846 (392, 862)

J1. MANUAL TRANSAXLE (F5M-R)

Item		Engine/Transaxle	B6 SOHC	BP SOHC
			F5M-R	
Transmission				
Shift lever position			Floor shift	
Gear ratio	First		3.416	
	Second		1.842	
	Third		1.290	
	Fourth		0.918	
	Fifth		0.731	
	Reverse		3.214	
Oil	Grade		API service GL-4	
	Viscosity		SAE 75W-90	
	Capacity	liters (US qt, Imp qt)	2.68 (2.83, 2.36)	
Clearance				
Clearance of lever and reverse idler gear	mm (in)	Standard	0.10—0.32 (0.004—0.013)	
		Wear limit	0.37 (0.015)	
Clearance of shift fork and clutch sleeve	Standard	1st—2nd	0.10—0.36 (0.004—0.014)	
		3rd—4th	0.20—0.50 (0.008—0.020)	
		5th—Rev.	0.40—0.75 (0.016—0.030)	
	Wear limit	1st—2nd	0.86 (0.034)	
		3rd—4th	1.00 (0.039)	
		5th—Rev.	1.25 (0.049)	
Clearance of synchronizer ring and gear	mm (in)	Standard	1.12—1.88 (0.044—0.074)	
		Wear limit	0.8 (0.032)	
Gear thrust clearance	First	Standard	0.05—0.28 (0.002—0.011)	
		Limit	0.33 (0.013)	
	Second	Standard	0.18—0.51 (0.007—0.020)	
		Limit	0.56 (0.022)	
	Third	Standard	0.06—0.21 (0.002—0.008)	
		Limit	0.26 (0.010)	
	Fourth	Standard	0.21—0.61 (0.008—0.024)	
		Limit	0.66 (0.026)	
	Fifth	Standard	0.06—0.26 (0.0024—0.0102)	
		Limit	0.31 (0.0122)	
Bearing preload adjust shim	mm (in)	Primary shaft	0.1 (0.004), 0.2 (0.008), 0.3 (0.012), 0.4 (0.016), 0.5 (0.020), 0.6 (0.024)	
		Secondary shaft	0.15 (0.006), 0.20 (0.008), 0.25 (0.010), 0.30 (0.012), 0.35 (0.014), 0.40 (0.016), 0.45 (0.018), 0.50 (0.020)	
Drive and differential				
Final gear	Type		Helical	
	Reduction ratio		4.105 : 1	3.619 : 1
Bearing preload		N·m (cm·kg, in·lb)	0.03—0.74 (0.3—7.6, 0.3—6.6)	
Bearing preload adjust shim		mm (in)	0.20 (0.008), 0.25 (0.010), 0.30 (0.012), 0.35 (0.014), 0.40 (0.016), 0.45 (0.018), 0.50 (0.020), 0.55 (0.022)	
Backlash of side gear and pinion gear		mm (in)	0—0.1 (0—0.004)	

J2. MANUAL TRANSAXLE (G5M-R)

Item		Engine/Transaxle		BP DOHC
				G5M-R
Transmission				
Shift lever position			Floor shift	
Gear ratio	First		3.307	
	Second		1.833	
	Third		1.310	
	Fourth		1.030	
	Fifth		0.795	
	Reverse		3.166	
Oil	Viscosity	All-season		ATF Dexron®II, M2C33-F or SAE 75W-80
		Above -18°C (0°F)		API service GL-4 SAE 80W-90
	Capacity	liters (US qt, Imp qt)		3.35 (3.55, 2.96)
Clearance				
Clearance of lever and reverse idler gear		mm (in)		Standard 0.1—0.32 (0.004—0.013)
				Wear limit 0.5 (0.020)
Clearance of shift fork and clutch sleeve	Standard	mm (in)		1st—2nd 0.08—0.228 (0.003—0.009)
				3rd—4th 0.1—0.5 (0.004—0.020)
				5th—Rev. 0.15—0.458 (0.059—0.018)
	Wear limit			1st—2nd 0.728 (0.029)
				3rd—4th 1.000 (0.039)
				5th—Rev. 0.958 (0.038)
Clearance of synchronizer ring and gear		mm (in)		Standard 1.5 (0.059)
				Wear limit 0.8 (0.032)
Gear thrust clearance	First	mm (in)		Standard 0.05—0.28 (0.002—0.011)
				Limit 0.33 (0.013)
	Second			Standard 0.175—0.455 (0.0069—0.0179)
				Limit 0.505 (0.0199)
	Third			Standard 0.05—0.20 (0.002—0.008)
				Limit 0.25 (0.010)
	Fourth			Standard 0.165—0.365 (0.0065—0.0144)
				Limit 0.415 (0.0163)
	Fifth			Standard 0.1—0.22 (0.0039—0.0087)
				Limit 0.27 (0.0106)
Bearing preload of primary shaft gear		Nm (cm-kg, in-lb)		0.1—0.25 (1.0—2.5, 0.87—2.18)
Bearing preload of secondary shaft gear		Nm (cm-kg, in-lb)		0.2—0.4 (2.0—4.0, 1.7—3.5)
Bearing preload adjust shim		mm (in)		0.20 (0.008), 0.30 (0.012), 0.40 (0.016), 0.50 (0.020), 0.25 (0.010), 0.35 (0.014), 0.45 (0.020), 0.55 (0.022), 0.60 (0.023), 0.65 (0.025), 0.70 (0.028)
Drive and differential				
Final gear	Type		Helical	
	Reduction ratio		4.105	
Bearing preload		N-m (cm-kg, in-lb)		1.4—2.0 (14—20, 12.2—17)
Bearing preload adjust shim		mm (in)		0.10 (0.004), 0.20 (0.008), 0.25 (0.010), 0.30 (0.012), 0.35 (0.014), 0.40 (0.016), 0.45 (0.018), 0.50 (0.020), 0.55 (0.022), 0.60 (0.024), 0.65 (0.026), 0.70 (0.028), 0.75 (0.030), 0.80 (0.031), 0.85 (0.033), 0.90 (0.035), 0.95 (0.037), 1.00 (0.039), 1.05 (0.041), 1.10 (0.043), 1.15 (0.045), 1.20 (0.047)
Backlash of side gear and pinion gear		mm (in)		0—0.1 (0—0.004)

K. AUTOMATIC TRANSAXLE

Item		Transaxle/Engine		F4A-EL		
				B6 SOHC	BP SOHC	BP DOHC
Torque converter stall torque ratio				2.2 : 1	2.1 : 1	
Gear ratio	1st		2.800			
	2nd		1.540			
	3rd		1.000			
	OD (4th)		0.700			
	Reverse		2.333			
Final gear ratio		3.736		3.476		3.736
Automatic transaxle fluid (ATF)		Type		Dexron®II or M-III		
		Capacity liters (US qt, Imp qt)		6.3 (6.7, 5.5)		
Engine stall speed	rpm	D, S, L and R ranges		2,400—2,700	2,250—2,550	2,200—2,500
Time lag	sec.	N→D range		0.5—0.6		
		N→R range		0.6—0.7		
Line pressure kPa (kg/cm ² , psi)	At idle	D, S and L ranges		451—540 (4.6—5.5, 65—78)		
		R range		736—883 (7.5—9.0, 107—128)		
	At stall	D, S and L ranges		863—1,001 (8.8—10.2, 125—145)		
		R range		1,413—1,638 (14.4—16.7, 205—237)		
Throttle pressure kPa (kg/cm ² , psi)	At idle	D range		60—129 (0.61—1.31, 9—19)		
	At stall			442—531 (4.51—5.41, 64—77)		
Oil pump	Outer and inner rotor clearance	mm (in)	Standard	0.02—0.04 (0.0078—0.0078)		
			Maximum	0.05 (0.0020)		
	Outer rotor clearance	mm (in)	Standard	0.09—0.15 (0.0354—0.0591)		
			Maximum	0.170 (0.0067)		
	Inner rotor inner diameter	mm (in)	Standard	0.04—0.115 (0.0078—0.0453)		
			Maximum	0.125 (0.0049)		
3-4 clutch	Number of drive/driven plates		4/4			
	Drive plate thickness	mm (in)	Standard	1.6 (0.063)		
			Minimum	1.4 (0.055)		
	3-4 clutch clearance		mm (in) 1.3—1.6 (0.051—0.063)			
	Snap ring size		mm (in) 1.4 (0.055), 1.6 (0.063), 1.8 (0.071), 2.0 (0.079), 2.2 (0.087), 2.4 (0.095)			
Forward clutch	Number of drive/driven plates		3/3			
	Drive plate thickness	mm (in)	Standard	1.6 (0.063)		
			Minimum	1.4 (0.055)		
	Forward clutch clearance		mm (in) 1.0—1.2 (0.039—0.047)			
	Snap ring size		mm (in) 1.8 (0.071), 1.95 (0.077), 2.1 (0.083), 2.25 (0.089), 2.4 (0.094), 2.55 (0.100), 2.7 (0.106), 2.85 (0.112)			
Coasting clutch	Number of drive/driven plates		2/2			
	Drive plate thickness	mm (in)	Standard	1.6 (0.063)		
			Minimum	1.4 (0.055)		
	Coasting clutch clearance		mm (in) 1.0—1.2 (0.039—0.047)			
	Snap ring size		mm (in) 1.6 (0.063), 1.75 (0.069), 1.9 (0.075), 2.05 (0.081), 2.2 (0.087), 2.35 (0.093), 2.5 (0.098), 2.65 (0.104)			
Reverse clutch	Number of drive/driven plates		2/2			
	Drive plate thickness	mm (in)	Standard	1.6 (0.063)		
			Minimum	1.4 (0.055)		
	Reverse clutch clearance		mm (in) 1.0—1.3 (0.039—0.051)			
	Snap ring size		mm (in) 2.0 (0.079), 2.2 (0.087), 2.4 (0.095), 2.6 (0.102), 2.8 (0.110), 3.0 (0.118)			
Low and reverse brake	Number of drive/driven plates		4/4			
	Drive plate thickness	mm (in)	Standard	1.6 (0.063)		
			Minimum	1.4 (0.055)		
	Low and reverse brake clearance		mm (in) 2.1—2.4 (0.083—0.094)			
	Snap ring size		mm (in) 2.0 (0.079), 2.2 (0.087), 2.4 (0.095), 2.6 (0.102), 2.8 (0.110), 3.0 (0.118)			

Transaxle/Engine			F4A-EL		
			B6 SOHC	BP SOHC	BP DOHC
Carrier hub	Clearance between pinion washer and planet carrier mm (in)	Maximum	0.2—0.7 (0.008—0.028)		
Sun gear drum	Bushing inner diameter mm (in)	Maximum	30.425 (1.198)		
Small sun gear	Bushing inner diameter mm (in)	Maximum	21.021 (0.828)		
Gear assembly					
Total end play		mm (in)	0.25—0.50 (0.010—0.020)		
End play adjust race		mm (in)	1.2 (0.047), 1.4 (0.055), 1.6 (0.063), 1.8 (0.071), 2.0 (0.079), 2.2 (0.087)		
Idle gear bearing preload		N-m (cm-kg, in-lb)	0.03—0.9 (0.3—9.0, 0.26—7.8)		
Preload adjust shims		mm (in)	3.80 (0.150), 3.85 (0.152), 3.90 (0.154), 3.95 (0.156), 4.00 (0.158), 4.05 (0.159), 4.10 (0.161), 4.15 (0.163), 4.20 (0.165), 4.25 (0.167), 4.30 (0.169), 4.35 (0.171), 4.40 (0.173), 4.45 (0.175), 4.50 (0.177), 4.55 (0.179), 4.60 (0.181), 4.65 (0.183), 4.70 (0.185), 4.75 (0.187)		
Output gear bearing preload		N-m (cm-kg, in-lb)	0.03—0.9 (0.3—9.0, 0.26—7.8)		
Preload adjust shims		mm (in)	0.50 (0.020), 0.55 (0.022), 0.60 (0.024), 0.65 (0.026), 0.70 (0.028), 0.75 (0.030), 0.80 (0.032), 0.85 (0.034), 0.90 (0.035), 0.95 (0.037), 1.00 (0.039), 1.05 (0.041), 1.10 (0.043), 1.15 (0.045), 1.20 (0.047), 1.25 (0.049), 1.30 (0.051), 1.35 (0.053), 1.40 (0.055), 1.45 (0.057)		
Differential					
Bearing preload		N-m (cm-kg, in-lb)	2.9—3.9 (30—40, 26—35)		
Preload adjust shims		mm (in)	0.50 (0.020), 0.55 (0.022), 0.60 (0.024), 0.65 (0.026), 0.70 (0.028), 0.75 (0.030), 0.80 (0.032), 0.85 (0.034), 0.90 (0.035), 0.95 (0.037), 1.00 (0.039), 1.05 (0.041), 1.10 (0.043), 1.15 (0.045), 1.20 (0.047), 1.25 (0.049), 1.30 (0.051), 1.35 (0.053), 1.40 (0.055), 1.45 (0.057)		
Backlash of side gear and pinion	mm (in)	Standard	0.025—0.1 (0.001—0.004)		
		Maximum	0.5 (0.020)		
Torque converter					
Bushing inner diameter	mm (in)	Standard	53.030—53.075 (2.088—2.090)		
		Maximum	53.075 (2.090)		

Spring Specification

Spring name		Outer diameter mm (in)	Free length mm (in)	No. of coil	Wire diameter mm (in)	
Upper control valve body	Throttle modulator spring	8.1 (0.319)	43.4 (1.709)	10.5	0.8 (0.031)	
	Throttle spring	5.4 (0.213)	46.2 (1.819)	29.0	0.88 (0.035)	
	Throttle assist spring	5.15 (0.203)	26.88 (1.058)	16.2	0.6 (0.024)	
Main control valve body	Pressure regulator spring	4.9 (0.193)	30.5 (1.200)	23.0	0.55 (0.022)	
	1-2 shift spring	11.5 (0.453)	34.2 (1.346)	9.5	1.0 (0.039)	
	Low reducing spring	7.9 (0.311)	34.5 (1.358)	11.0	0.8 (0.031)	
	2-3 timing spring	8.0 (0.315)	27.84 (1.096)	10.0	0.8 (0.031)	
	3-2 timing spring	8.0 (0.315)	29.98 (1.180)	10.0	0.8 (0.031)	
	3-4 shift spring	7.4 (0.291)	36.6 (1.441)	12.0	0.8 (0.031)	
Premain control valve body	Bypass spring	B6 SOHC	4.9 (0.193)	27.6 (1.087)	23.0	0.55 (0.022)
		BP SOHC	4.9 (0.193)	30.5 (1.201)	23.0	0.55 (0.022)
	BP DOHC	4.9 (0.193)	30.5 (1.201)	23.0	0.55 (0.022)	
	2-3 shift spring	7.4 (0.291)	36.6 (1.441)	12.0	0.8 (0.031)	
	Converter relief spring	8.6 (0.339)	68.4 (2.693)	27.5	1.2 (0.057)	
Lockup control spring	5.0 (0.197)	30.1 (1.185)	21.5	0.55 (0.022)		
Control valve body	Throttle relief spring	6.6 (0.260)	21.6 (0.850)	11.5	0.8 (0.031)	
Oil pump	Spring	13.0 (0.512)	53.0 (2.087)	12.0	1.2 (0.047)	

Spring name		Outer diameter mm (in)	Free length mm (in)	No. of coil	Wire diameter mm (in)	
Accumulator	2-3 accumulator small spring	BP DOHC	11.6 (0.457)	59.7 (2.350)	16.9	1.8 (0.071)
		B6 SOHC BP SOHC	10.0 (0.394)	71.8 (2.827)	24.2	1.4 (0.055)
	2-3 accumulator large spring	BP DOHC	15.0 (0.591)	71.8 (2.827)	9.8	1.2 (0.047)
		B6 SOHC BP SOHC	15.0 (0.591)	71.8 (2.827)	15.8	2.0 (0.079)
	1-2 accumulator small spring		11.2 (0.441)	84.7 (3.335)	25.5	1.5 (0.059)
	1-2 accumulator large spring	BP DOHC	—	—	—	—
		B6 SOHC BP SOHC	16.0 (0.630)	84.7 (3.335)	19.5	1.9 (0.075)
	N-D Accumulator small spring	B6 SOHC	10.8 (0.425)	101.2 (3.984)	28.2	1.2 (0.047)
		BP SOHC BP DOHC	10.8 (0.425)	101.2 (3.984)	28.2	1.2 (0.047)
	N-D Accumulator large spring	B6 SOHC	15.0 (0.591)	94.2 (3.709)	16.5	1.6 (0.063)
BP SOHC BP DOHC		15.0 (0.591)	94.2 (3.709)	16.5	1.6 (0.063)	
N-R Accumulator small spring		9.8 (0.386)	93.2 (3.669)	31.5	1.3 (0.051)	
N-R Accumulator large spring		14.0 (0.551)	106.5 (4.193)	23.0	1.7 (0.067)	
3-4 clutch	Return spring	74.4 (2.929)	40.5 (1.594)	1.0	5.0 (0.197)	
Coasting clutch	Return spring	7.3 (0.287)	20.45 (0.805)	10.0	1.0 (0.039)	
Low and reverse brake	Return spring	5.55 (0.219)	14.3 (0.563)	12.0	0.75 (0.030)	
Servo	Return spring	27.7 (1.091)	43.25 (1.703)	4.5	3.2 (0.126)	

Vehicle Speed at Shift point Table

Mode	Range	Throttle condition (Throttle sensor voltage)	Shift	Drum speed rpm			Vehicle speed km/h (mph)		
				B6 SOHC	BP SOHC	BP DOHC	B6 SOHC	BP SOHC	BP DOHC
NORMAL	D	Fully opened (4.0 volt)	D1 → D2	5,150—5,750	5,150—5,700	5,900—6,500	52—58 (32—36)	56—62 (35—38)	59—65 (37—40)
			D2 → D3	5,000—5,450	5,000—5,500	5,550—6,000	92—100 (57—62)	99—107 (61—66)	101—109 (63—68)
			D3 → OD	5,500—5,900	5,550—5,850	5,950—6,300	156—166 (97—103)	168—178 (104—110)	167—177 (104—110)
		Half throttle (1.6—2.2 volt)	D1 → D2	2,500—3,350	2,850—3,800	3,300—4,300	25—34 (16—21)	31—41 (19—25)	33—43 (20—27)
			D2 → D3	2,450—3,400	3,050—3,950	3,700—4,700	45—62 (28—38)	60—78 (37—48)	67—86 (42—53)
			D3 → OD	2,650—3,550	3,300—4,100	4,050—5,050	75—101 (47—63)	100—125 (62—78)	113—142 (70—88)
			Lock-up ON (OD)	1,850—2,500	2,100—2,650	2,300—3,000	74—100 (46—62)	91—116 (56—72)	93—120 (58—74)
		Lock-up OFF (OD)	1,850—2,200	1,950—2,550	2,300—2,700	74—88 (46—55)	85—110 (53—68)	93—108 (58—67)	
		Kickdown	OD → D3	3,500—3,750	3,550—3,750	3,850—4,100	142—152 (88—94)	153—163 (95—101)	155—165 (96—102)
			OD → D2	2,000—2,250	2,050—2,200	2,350—2,550	82—90 (51—56)	88—96 (55—60)	94—102 (58—63)
			OD → D1	1,050—1,200	950—1,100	1,300—1,450	42—48 (26—30)	42—48 (26—30)	52—58 (32—36)
			D3 → D2	2,900—3,200	2,900—3,150	3,350—3,650	82—90 (51—56)	88—96 (55—60)	94—102 (58—63)
	D3 → D1		1,500—1,700	1,400—1,600	1,850—2,050	42—48 (26—30)	42—48 (26—30)	52—58 (32—36)	
	D2 → D1	2,300—2,600	2,150—2,450	2,850—3,200	42—48 (26—30)	42—48 (26—30)	52—58 (32—36)		
	S	Fully opened (4.0 volt)	S1 → S2	5,150—5,750	5,150—5,700	5,900—6,500	52—58 (32—36)	90—107 (56—66)	59—65 (37—40)
			S2 → S3	5,000—5,450	3,050—3,950	5,550—6,000	92—100 (57—62)	60—78 (37—48)	101—109 (63—68)
			S3 → S2	2,900—3,200	2,900—3,150	3,350—3,650	82—90 (51—56)	88—96 (55—60)	94—102 (58—63)
			S2 → S1	2,300—2,600	2,150—2,450	2,850—3,200	42—48 (26—30)	42—48 (26—30)	52—58 (32—36)
		Half throttle (1.6—2.2 volt)	S1 → S2	2,500—3,350	2,850—3,800	3,300—4,300	25—34 (16—21)	31—41 (19—25)	33—43 (20—27)
			S2 → S3	2,450—3,450	3,050—3,950	4,050—5,150	45—63 (28—39)	60—78 (37—48)	74—94 (46—58)
	L	Fully opened (4.0 volt)	L1 → L2	5,150—5,750	5,150—5,700	5,900—6,500	52—58 (32—36)	56—62 (35—38)	59—65 (37—40)
			L2 → L1	2,300—2,600	2,150—2,450	2,850—3,200	42—48 (26—30)	42—48 (26—30)	52—58 (32—36)
		Half throttle (1.6—2.2 volt)	L1 → L2	2,500—3,350	2,850—3,800	3,300—4,300	25—34 (16—21)	31—41 (19—25)	33—43 (20—27)

Mode	Range	Throttle condition (Throttle sensor voltage)	Shift	Drum speed rpm			Vehicle speed km/h (mph)		
				B6 SOHC	BP SOHC	BP DOHC	B6 SOHC	BP SOHC	BP DOHC
HOLD	D	Fully opened (4.0 volt)	D1 → D2	2,700—3,250	2,500—3,050	2,700—3,300	27—33 (17—20)		
			D2 → D3	2,150—2,750	2,050—2,550	2,200—2,750	40—50 (25—31)		
			D3 → D1	300—500	300—500	450—650	9—15 (6—9)	12—18 (7—11)	
	S	Fully closed (0.5 volt)	S3 → S2	3,200—3,400	3,250—3,450	3,550—3,800	91—97 (56—60)	98—104 (61—64)	100—106 (62—66)
	L		L2 → L1	2,350—2,650	2,200—2,500	2,350—2,700	43—49 (27—30)		

M. FRONT AND REAR AXLES

Item	Engine/Transaxle	B6 SOHC		BP SOHC		BP DOHC	
		MTX	ATX	MTX	ATX	MTX	ATX
Driveshaft							
Joint type	Inside	Tripod joint					
	Outside	Ball joint					
Length of shaft	mm (in)	Right	919.3 (36.19)	918.7 (36.17)	630.7 (24.83)		
		Left	637.8 (25.11)	640.2 (25.20)	621.2 (24.46)	637.1 (25.08)	
Shaft diameter		21.5 (0.85)		23.0 (0.91)			
Front axle							
Bearing play axial direction	mm (in)	0.05 (0.002)					
Rear axle							
Bearing play axial direction	mm (in)	0.05 (0.002)					

N. STEERING SYSTEM

Item	Specifications	
Steering wheel		
Outer diameter	mm (in) 370 (14.57)	
Free play	mm (in) 0—30 (0—1.18)	
Operation force	N (kg, lb) M/S : 108 (11, 24.2) or less P/S : 29 (3.0, 6.6) or less	
Lock-to-lock	M/S : 4.3 P/S : 3.0	
Steering gear		
Type	Rack and pinion	
Steering gear ratio	Infinite (∞)	
Backlash between rack and pinion	mm (in) 0 (0)	
Pinion preload	N·m (cm·kg, in·lb) Preload measured by torque wrench	M/S : 0.9—1.3 (9—13, 7.8—11.3) P/S : 1.0—1.3 (10—14, 8.7—12)
	g (oz) Preload measured by pull scale with attachment	M/S : 900—1,300 (31.8—45.9) P/S : 1,000—1,400 (35.3—49.4)
Limit of rack housing movement	mm (in) 1.5 (0.06)	
Distance between left and right brackets	mm (in) 298.5 (11.75)	
Rack stroke	mm (in) 140 (5.51)	
Lubricant type (power steering)	ATF: M-III or Dexron®II	
Oil capacity (power steering)	liter (US qt, Imp qt) 0.8 (0.85, 0.70)	
Drive belt		
Deflection with force of 98 N (10 kg, 22 lb)	mm (in) New belt: 8—9 (0.31—0.35) Used belt: 9—10 (0.35—0.39) Limit: 11.5 (0.45)	

P. BRAKING SYSTEM

Item		Specifications	
Brake type		Front disc, Rear disc or drum	
Brake pedal			
Height	mm (in)	193—196 (7.60—7.72)	
Free play	mm (in)	4—7 (0.16—0.28)	
Reserve travel Clearance when pedal depressed at 589 N (60 kg, 132 lb)	mm (in)	70 (2.76) min	
Master cylinder			
Master cylinder	Type	Tandem	
	Bore diameter	mm (in)	22.22 (0.875)
Front disc brake			
Type		Ventilated	
Thickness of pad	mm (in)	Standard	10 (0.39)
		Minimum	2 (0.08)
Thickness of disc plate	mm (in)	Standard	22 (0.87)
		Minimum	20 (0.79)
Runout of disc plate	mm (in)	0.1 (0.004)	
Cylinder bore	mm (in)	53.97 (2.12)	
Rear brake (disc)			
Type		Solid	
Thickness of pad	mm (in)	Standard	8.0 (0.31)
		Minimum	1 (0.04)
Thickness of disc plate	mm (in)	Standard	9 (0.35)
		Minimum	7 (0.28)
Runout of disc plate	mm (in)	0.1 (0.004)	
Cylinder bore	mm (in)	30.2 (1.19)	
Rear brake (drum)			
Type		Leading & trailing	
Thickness of lining	mm (in)	Standard	4.5 (0.18)
		Minimum	1 (0.04)
Drum inside diameter	mm (in)	Standard	200 (7.90)
		Maximum	201 (7.91)
Wheel cylinder bore	mm (in)	17.46 (0.687)	
Parking brake			
Type		Mechanical two-rear-wheel control	
Parking brake lever notches When lever is pulled at 98N (10 kg, 22 lb)		5—7	
Power brake unit			
Diameter	mm (in)	(a): 214 (8.43) (b): 239 (9.41)	
Fluid pressure per treading force kPa (kg/cm ² , psi)/N (kg, lb)	(a)	More than 1,177 (12, 171)/196 (20, 44) at 0 mmHg (0 inHg) More than 7,063 (72, 1,024)/196 (20, 44) at 500 mmHg (19.7 inHg)	
	(b)	More than 1,517 (15, 213)/196 (20, 44) at 0 mmHg (0 inHg) More than 8,593 (88, 1,251)/196 (20, 44) at 500 mmHg (19.7 inHg)	
Rear wheel hydraulic control system			
Type		Dual proportioning valve	
Switching point (Master cylinder pressure)		kPa (kg/cm ² , psi)	2,453 (25, 356)

(a): BP engine with 5MTX, B6 engine

(b): BP engine with 4EATX

Q. WHEELS AND TIRES

Item		Specifications	
Wheel			
Size		Standard: 13x5-J, 14x5 1/2-JJ Temporary spare: 14x4-T	
Offset	mm (in)	45 (1.77)	
Diameter of pitch circle	mm (in)	100 (3.94)	
Tire			
Size		Standard: P155/80R13 79S, P175/70R13 82S P185/60R14 82H Temporary spare: T115/70D14	
Inflation pressure	kPa (kg/cm ² , psi)	Front	Standard: 216 (2.2, 32) Temporary spare: 415 (4.2, 60)
		Rear	Standard: 216 (2.2, 32) Temporary spare: 415 (4.2, 60)
Wheel and tire			
Runout limit	mm (in)	Horizontal	Aluminum wheel: 2.0 (0.079), Steel wheel: 2.5 (0.098)
		Vertical	1.5 (0.059)
Unbalance limit		g (oz)	13 inch wheel: 11 (0.39), 14 inch wheel: 10 (0.35)

R. SUSPENSION

Item		Specifications		
Suspension type		Strut		
Shock absorber type		Double-acting, oil-filled		
Coil spring	Type	Front	Taper wound	
		Rear	Straight wound	
	Dimension		See next page	
Stabilizer	Type		Torsion bar	
		Diameter mm (in)	BP SOHC	Front: 19.1 (0.75) Rear: 20.0 (0.79)
	BP DOHC		Front: 22.0 (0.87) Rear: 21.0 (0.83)	
		B6 SOHC	Front: — Rear: 20.0 (0.79)	
	Wheel alignment (* ¹ Unladen)		Front	Maximum steering angle
		Total toe-in		mm (in): 2 ± 3 (0.08 ± 0.12) degree: 0.2° ± 0.3°
Camber angle				-0°05' ± 45'
Caster angle		1°55' ± 55'		
Kingpin angle		12°25'		
Rear		Total toe-in	mm (in): 2 ± 3 (0.08 ± 0.12) degree: 0.2° ± 0.3°	
		Camber angle	-0°20' ± 45'	

*1 Fuel tank full; radiator coolant and engine oil at specified level; and spare tire, jack, and tools in designated positions.

Coil Spring Specifications (See page R-5 for coil spring applications)

Item	Wire diameter mm (in)	Coil center diameter mm (in)	Free length mm (in)	Coil number	Identification mark color		
					M ^{*1}	A ^{*2}	
Front	A	13.1 (0.52)	133.5—159.5 (5.26—6.28)	294.5 (11.59)	3.22	Light green	Yellow
	B	13.3 (0.52)	133.7—159.9 (5.26—6.30)	300.5 (11.83)	3.43	Purple	
	C	13.4 (0.53)	132.6—158.6 (5.22—6.24)	301.5 (11.87)	3.49	Light blue	
	D	13.7 (0.54)	132.9—158.9 (5.23—6.26)	302.0 (11.89)	3.52	Pink	White
	E	13.6 (0.54)	132.8—158.8 (5.23—6.25)	301.5 (11.87)	3.56	Orange	Blue
Rear	F	11.0 (0.43)	129.0 (5.08)	335.0 (13.19)	3.83	Pink	—
	G	11.2 (0.44)	128.8 (5.07)	334.0 (13.15)	3.94	Brown	—
	H	11.3 (0.44)	128.7 (5.07)	333.5 (13.13)	3.90	Blue	—
	I	11.5 (0.45)	128.5 (5.06)	333.0 (13.11)	4.02	Gray	—
	J	11.6 (0.46)	128.4 (5.06)	332.5 (13.09)	4.00	Orange	—

*1 Main identification mark color: Indicated on second coil from bottom.

*2 Auxiliary identification mark color: Indicated on third coil from bottom.

T. BODY ELECTRICAL SYSTEM

Item		Specification (W) (Bulb Trade number)	
Exterior lamps	Headlight	65/45 (9004)	
	Front turn signal/Parking light	27/8 (1157)	
	Stop/Taillight	27/8 (1157)	
	High mount stoplight	18.4 (1141)	
	Rear turn single light	27 (1156)	
	Back-up light	27 (1156)	
	Rear side marker light (Sedan)	3.8 (194)	
	License plate light	7.5 (89) [PROTEGÉ], 5 (168) [3HB]	
Interior lamps	Interior and spot lamp	Interior	10
		Spot	6
	Interior lamp	10	
	Spot lamp (in overhead console)	8 (67)	
	Cargo room lamp	5 (168)	
	Trunk room lamp	5 (168)	
Indicator and warning lamps	Curtesy lamp	5 (168)	
	High beam	3.4	
	Turn light	3.4	
	Brake	3	
	Hold	3 (158)	
	Charge	3 (158)	
	Oil pressure	3 (158)	
	Washer	3 (158)	
	Seat belt	3 (158)	
	Malfunction	3 (158)	
	Fuel	3 (158)	
	Illumination	3.4	
	Check	3 (158)	
Dif. lock	3 (158)		

U. HEATER AND AIR CONDITIONER SYSTEMS

Item		Specifications
Refrigerant amount	g (oz)	750—800 (26.5—28.2)
Refrigerant pressure	kPa (kg/cm ² , psi)	High: 1,177—1,619 (12.0—16.5, 171—235) Low: 147—294 (1.5—3.0, 21—43)
Compressor	Capacity	cc (cu in)
	Compressor oil amount	cc (cu in)
Magnetic clutch	Electrical load	W
Condenser fan	Electrical load	W
Receiver/Drier	Capacity	cc (cu in)

STANDARD BOLT AND NUT TIGHTENING TORQUE

Diameter mm (in)	Pitch mm (in)	4T			6T			8T		
		N-m	m-kg	ft-lb	N-m	m-kg	ft-lb	N-m	m-kg	ft-lb
6 (0.236)	1 (0.039)	4.2—6.2	0.43—0.63	3.1—4.6	6.9—9.8	0.7—1.0	5.0—7.2	7.8—11.8	0.8—1.2	5.8—8.8
8 (0.315)	1.25 (0.049)	9.8—14.7	1.0—1.5	7.2—10.8	16—23	1.6—2.3	12—17	18—26	1.8—2.7	13—20
10 (0.394)	1.25 (0.049)	20—28	2.0—2.9	14—21	31—46	3.2—4.7	23—34	36—54	3.7—5.5	27—40
12 (0.472)	1.5 (0.059)	34—50	3.5—5.1	25—37	55—80	5.6—8.2	41—59	63—93	6.4—9.5	46—69
14 (0.551)	1.5 (0.059)	—	—	—	75—103	7.7—10.5	56—76	102—137	10—14	75—101
16 (0.630)	1.5 (0.059)	—	—	—	116—157	12—16	85—116	156—211	16—22	115—156
18 (0.709)	1.5 (0.059)	—	—	—	167—225	17—23	123—166	221—299	23—31	163—221
20 (0.787)	1.5 (0.059)	—	—	—	231—314	24—32	171—231	308—417	31—43	227—307
22 (0.866)	1.5 (0.059)	—	—	—	314—423	32—43	231—312	417—564	43—58	307—416
24 (0.945)	1.5 (0.059)	—	—	—	475—546	41—56	298—403	536—726	55—74	396—536



SPECIAL TOOLS

GENERAL INFORMATION	ST- 2
ENGINE.....	ST- 3
CLUTCH AND MANUAL TRANSAXLE.....	ST- 4
AUTOMATIC TRANSAXLE.....	ST- 5
FRONT AND REAR AXLES.....	ST- 7
STEERING SYSTEM	ST- 8
BRAKING SYSTEM.....	ST- 9
FRONT AND REAR SUSPENSIONS	ST-10
HEATER AND AIR CONDITIONER SYSTEMS	ST-10
CHECKER AND OTHER EQUIPMENT.....	ST-10

23USTX-001

GENERAL INFORMATION

The letters A and B in the priority column indicate the degree of importance of each tool.

A.....Indispensable

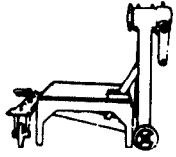
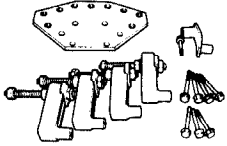
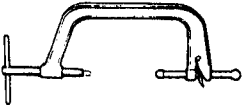
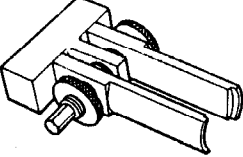
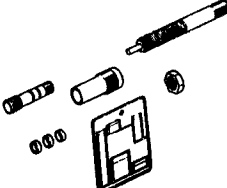

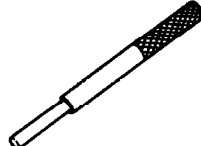

The tools ranked A in this list are indispensable for performing operations satisfactorily, easily, safely, and efficiently. It is, therefore advisable that all service shops have these tools.

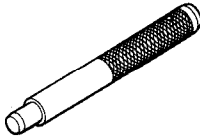
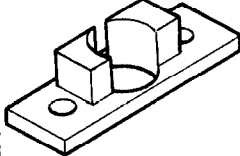
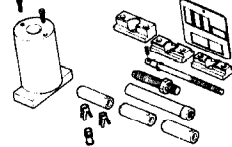
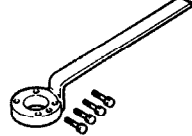
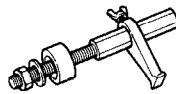
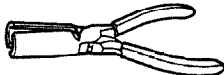

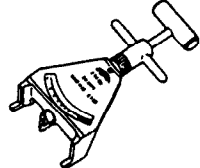
B.....Selective

The tools in this list are not as necessary as tools ranked A, but all service shops should have these tools to perform repairs more easily and more efficiently.

23USTX-002

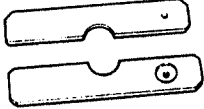
ENGINE

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0107 680A Engine stand	A	
49 L010 1A0 Hanger set, engine stand	A	
49 0636 100A Arm, valve spring lifter	A	
49 B012 0A2 Pivot, valve spring lifter	A	
49 L012 0A0 Installer set, valve seal & valve guide	A	
49 0249 010A Remover & installer, valve guide (B6 eng.)	A	
49 B012 005 Remover & installer, valve guide (BP eng.)	A	
49 0187 280 Oil pressure gauge	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0221 061A Remover & installer, piston pin (BP DOHC)	B	
49 H011 001A Support block head (Except BP DOHC)	A	
49 L011 0A0 Piston pin setting tool set (Except BP DOHC)	A	
49 D011 102 Crankshaft lock tool	A	
49 E011 1A0 Brake, ring gear	A	
49 S120 170 Remover, valve seal	A	
49 9200 145 Adapter set, radiator cap tester	A	
49 9200 020 Tension gauge, V-ribbed belt	A	

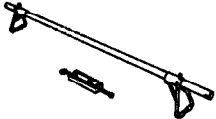
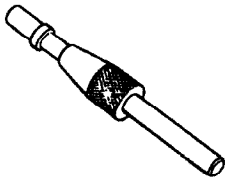

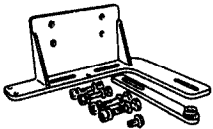
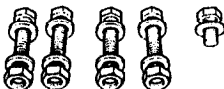
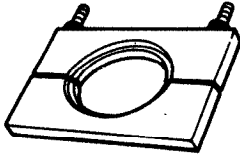
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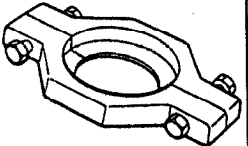
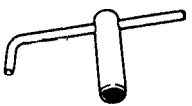
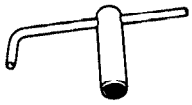
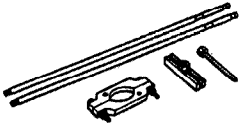
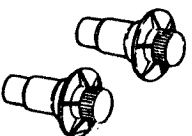

ENGINE (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 E301 144 Removing plate	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
—	—	—

CLUTCH AND MANUAL TRANSAXLE

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G017 5A0 Support, engine	A	
49 SE01 310A Clutch disc centering tool	A	
49 1285 071 Puller, bearing	A	
49 G019 0A0 Hanger, transaxle	A	
49 B017 001 Bolt set (Except BP DOHC)	A	
49 G030 370 Removing plate	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0636 145 Puller, fan pulley boss	A	
49 G030 440 Holder, primary shaft (BP DOHC)	A	
49 F401 440 Holder, primary shaft (Except BP DOHC)	A	
49 0187 520 Bearing puller, rear axle shaft (Except BP DOHC)	A	
49 G030 455 Holder, differential side gear	A	
49 0259 770B Wrench, flare nut	A	

CLUTCH AND MANUAL TRANSAXLE (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G030 380C Shim selector set (BP DOHC)	A	
49 0839 425C Puller set, bearing	A	
49 B001 795 Installer, oil seal	A	
49 G017 1A0 Remover set, bearing	A	
49 FT01 361 Remover, bearing	A	
49 D017 2A2A Shim selector set (Except BP DOHC)	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 F401 330B Installer set, bearing	A	
49 G030 338 Attachment E (BP DOHC)	A	
49 B017 102 Preload adapter (BP DOHC)	A	
49 G017 202 Preload adapter (BP DOHC)	A	
49 B017 1A0 Remover set, bearing (Except BP DOHC)	A	
49 FT01 515A Adapter, preload	A	


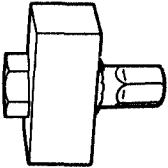
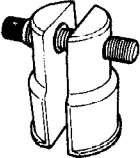

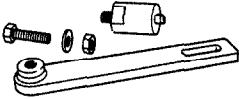
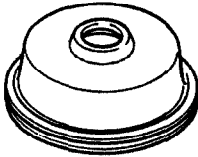
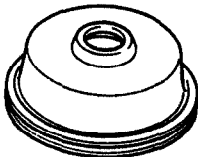

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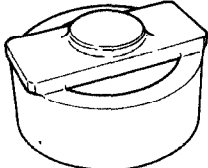
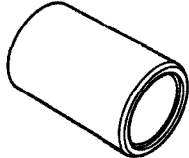
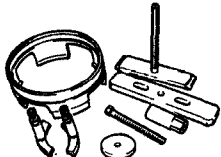
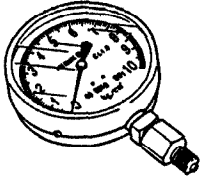
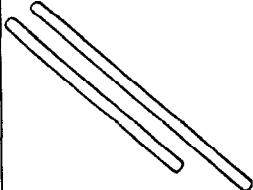
AUTOMATIC TRANSAXLE

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B019 007 Adapter, preload	A	

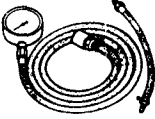

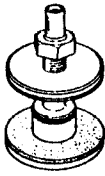
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B092 365 Remover set, bearing	A	


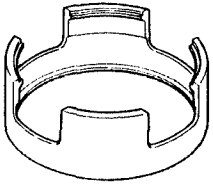

AUTOMATIC TRANSAXLE (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 D019 001 Bolt	A	
49 FT01 439 Holder, idle gear shaft	A	
49 G019 013 Remover, bearing	A	
49 FT01 384 Collar	A	
49 G019 0A2 Holder, turbine shaft	A	
49 B019 004 Adapter (B6 eng.)	A	
49 B019 005 Adapter (BP eng.)	A	
49 F401 384 Collar	A	

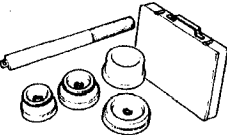
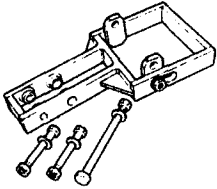
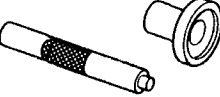
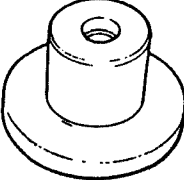
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 F401 381B Selector $\phi 60$	A	
49 G019 019 Bolt set	A	
49 G019 021 Bolt set	A	
49 G019 017 Installer, oil seal	A	
49 S120 785 Installer, dust boot	A	
49 G019 0A7A Compressor set, return spring	A	
49 B019 901 Gauge, oil pressure	A	
49 F401 385 Bar	A	

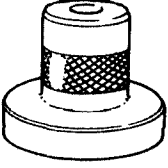
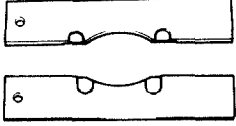
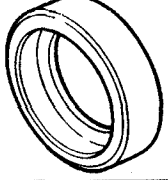
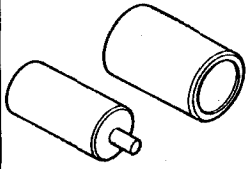
AUTOMATIC TRANSAXLE (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0378 400A Gauge set, oil pressure	A	
49 H019 002 Adapter	A	
49 B019 008 Leak checker	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G030 795 Installer, oil seal	A	
49 B019 002 Body	A	
49 0180 510B Preload measuring attachment	B	

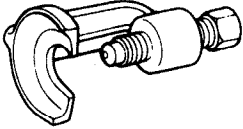
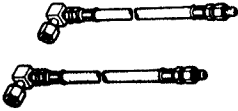
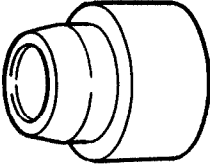
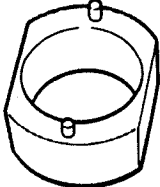
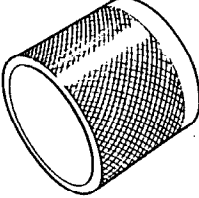
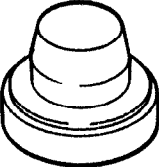
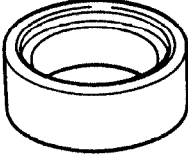

FRONT AND REAR AXLES

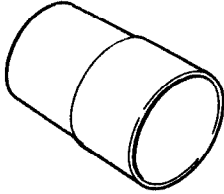
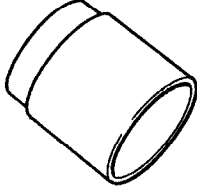
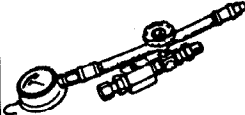
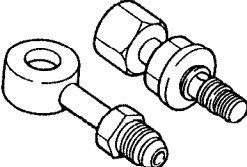
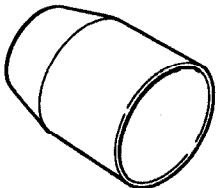

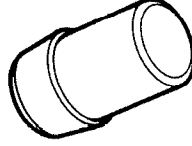
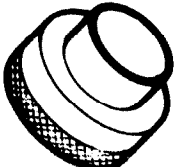
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 F027 0A1 Installer set, bearing	A	
49 B026 1A0 Puller, wheel hub	A	
49 M005 795 Installer set, oil seal	A	
49 F026 102 Installer, bearing	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 V001 795 Installer, oil seal	A	
49 F026 103 Removing plate	A	
49 G033 107 Installer, dust cover	A	
49 H034 2A0 Lower arm bushing puller & installer	A	

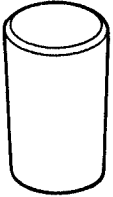
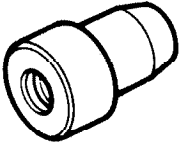

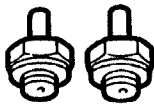

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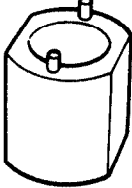
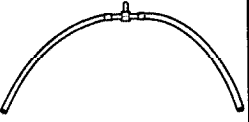
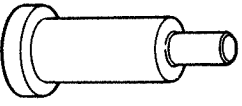
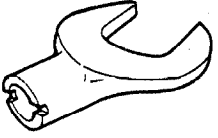
STEERING SYSTEM

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0118 850C Puller, ball joint	A	
49 H002 671 Adapter	A	
49 B032 309 Installer body, pinion seal	A	
49 B032 306 Wrench, plug	A	
49 B032 314 Slipper seal former	A	
49 B032 315 Installer, oil seal	A	
49 B032 316 Support block, plug	A	
49 B032 320 Wrench	A	

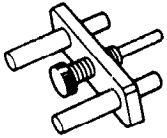
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B032 310 Protector, pinion seal	A	
49 B032 311 Protector, slipper seal	A	
49 1232 670A Gauge set, power steering	A	
49 B032 304 Adapter	A	
49 B032 312 Protector, slipper seal	A	
49 B032 313 Protector, outer box	A	
49 B032 318 Guide, rod seal	A	
49 B032 319 Protector body, rod seal	A	

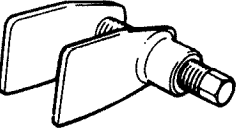
STEERING SYSTEM (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B032 317 Remover, bearing & oil seal	B	
49 B032 308 Remover body, rod seal	A	
49 F032 303 Handle	A	
49 B032 321 Adapter	A	
49 F032 308 Installer, dust seal	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B032 307 Wrench, outer box	A	
49 G032 317 Hose	A	
49 B032 305 Holder, power steering pump	A	
49 H032 301 Wrench	A	
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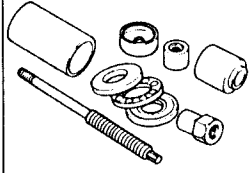
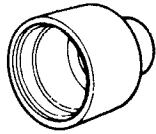
BRAKING SYSTEM

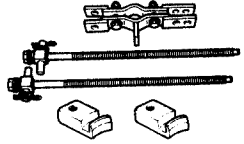
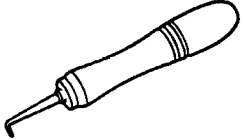
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 F043 001 Adjust gauge	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0221 600C Expand tool, disc brake	B	

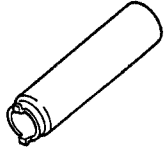
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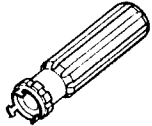
FRONT AND REAR SUSPENSIONS

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B034 2A0 Replacer set, rubber bush	A	
49 1243 785 Installer, dust boot	A	

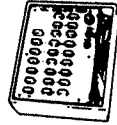
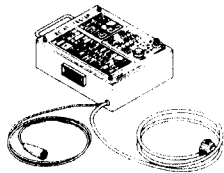
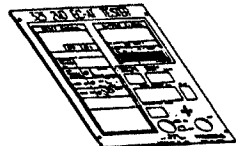
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G034 1A0 Compressor, coil spring	A	
49 0208 701A Air-out tool, boot	B	

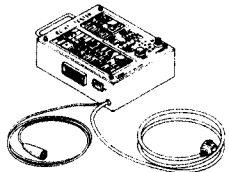
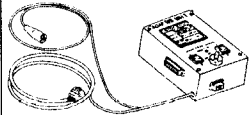

HEATER AND AIR CONDITIONER SYSTEMS

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B061 005 Replacer, seal plate	A	

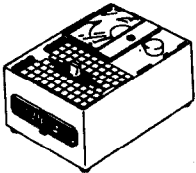
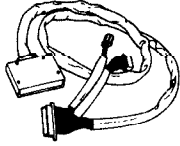
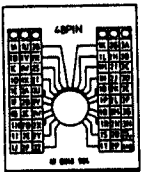
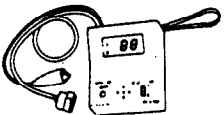
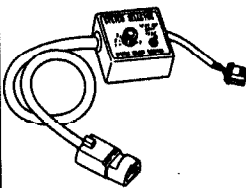
TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
0000-41-0809-06 Remover & installer, seal	A	

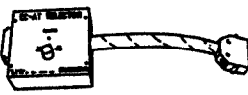
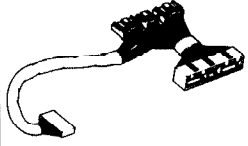
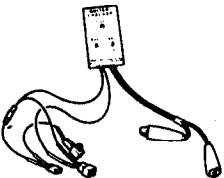
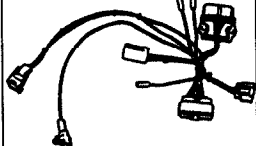
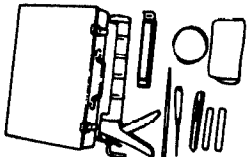
CHECKER AND OTHER EQUIPMENT

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 0839 285 Checker, fuel & thermometer	A	
49 G019 901A EC-AT tester	A	
49 B019 904 Panel (EC-AT tester)	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 G019 901 EC-AT tester	A	
49 H019 902 Adapter unit (EC-AT tester)	A	
49 B019 905 Panel (EC-AT tester)	A	

CHECKER AND OTHER EQUIPMENT (CONT'D)

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 9200 162 Monitor, engine signal	A	
49 G018 903 Adapter harness (Engine signal monitor)	A	
49 G018 904 Sheet (Engine signal monitor)	A	
49 H018 9A1 Checker, self-diagnosis	A	
49 B019 9A0 System selector	A	

TOOL NUMBER & DESCRIPTION	PRIORITY	ILLUSTRATION
49 B019 9A1 EC-AT selector (EC-AT tester)	A	
49 B019 908 Harness, adapter (EC-AT tester)	A	
49 F018 002 Igniter checker	A	
49 N018 001 Adapter harness (igniter checker)	A	
49 0305 870A Tool set, window	A	



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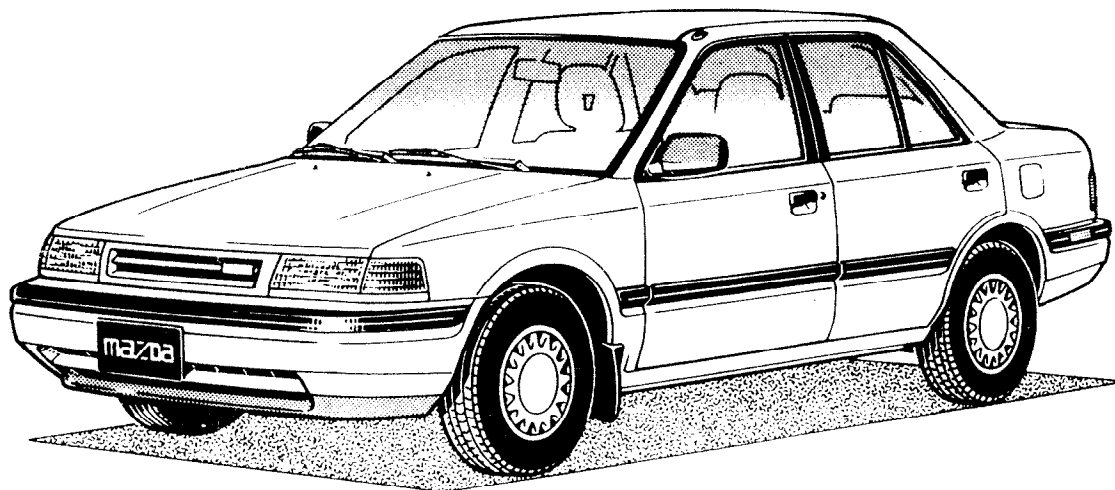
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Mazda 323 Protegé

1992
Wiring Diagram



mazda

1992 Mazda 323 Protegé Wiring Diagram

FOREWORD

This wiring diagram incorporates the wiring schematic in the basic vehicle and available optional equipment. Actual vehicle wiring may vary slightly depending upon optional equipment and/or local specifications. All information contained in this booklet is based on the information available at the time of printing. Mazda Motor Corporation reserves the right to make changes without previous notice.

Mazda Motor Corporation
HIROSHIMA, JAPAN

APPLICATION:

This manual is applicable to vehicles beginning with the Vehicle Identification Numbers(VIN) shown on the following page.

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Z

**VEHICLE IDENTIFICATION NUMBERS(VIN)
(CHASSIS NUMBER)**

4 DOOR PROTEGE

JM1 BG223*NO 400001~

JM1 BG224*NO 400001~

JM1 BG225*NO 400001~

JM1 BG226*NO 400001~

3 DOOR HATCHBACK

JM1 BG231*NO 400001~

JM1 BG232*NO 400001~

JM1 BG233*NO 400001~

JM1 BG234*NO 400001~

WIRING COLOR CODE

Color	Code	Color	Code
Blue	L	Natural	N
Black	B	Orange	O
Brown	BR	Pink	P
Dark Blue	DL	Red	R
Dark Green	DG	Purple	PU
Green	G	Tan	T
Gray	GY	White	W
Light Blue	LB	Yellow	Y
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GENERAL INFORMATION

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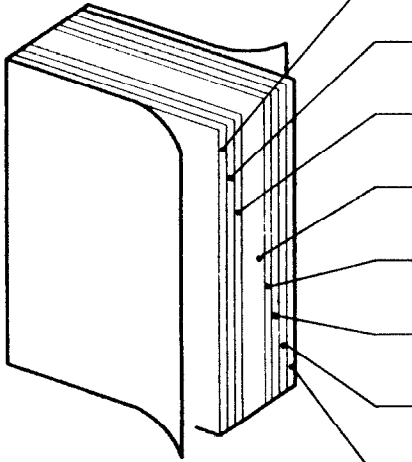
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Z-GI-2 Contents of and Using Electrical Wiring Diagrams

Contents of wiring diagrams


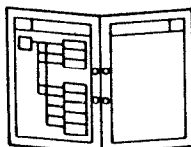
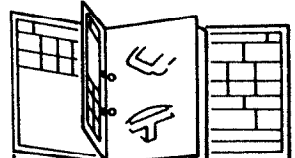
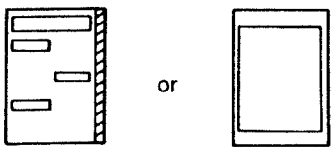
- This document is composed of the 8 groups shown below. The main components are summarized in the components location diagram at the end of the document.



GI	General information	Tells how to: use and read wiring diagrams, use test equipment, check harnesses and connectors, and locate trouble spots.
Y	Ground points	Ground routes from and to the battery.
W	Electrical wiring schematic	Shows main and other fuses for each system.
A-V	Circuit diagrams for individual systems	Shows circuit and connector diagrams, component and connector location diagrams.
X	Common connectors	Shows connectors common throughout system.
JB	Joint box diagrams	Shows internal circuits and connectors.
PL	Parts location	Shows location of major electrical parts.
PI	Index	Gives page number of circuit diagram for each component.

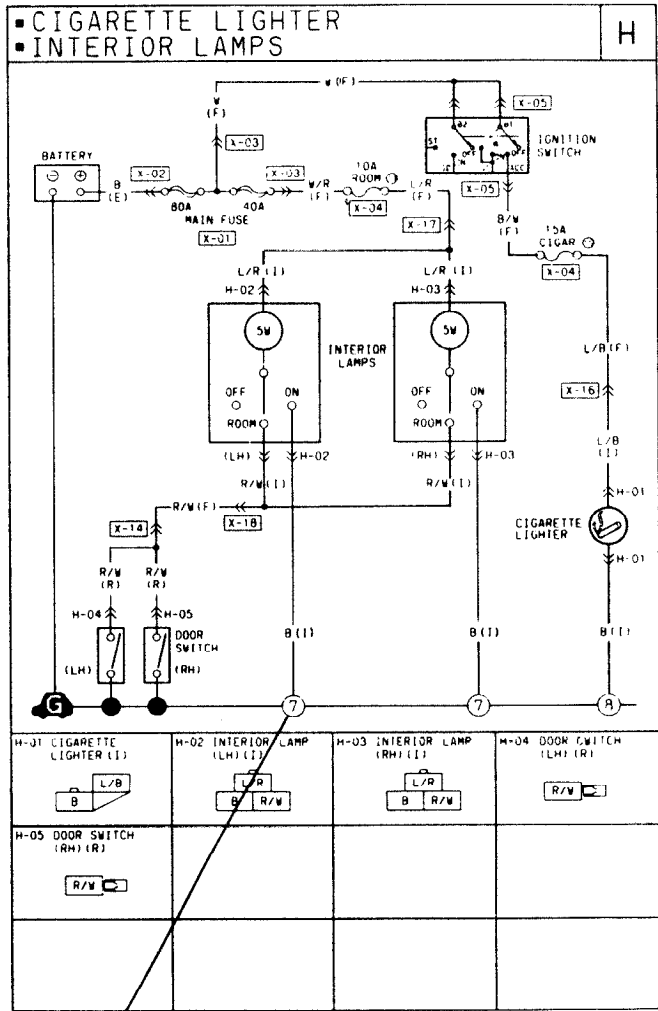
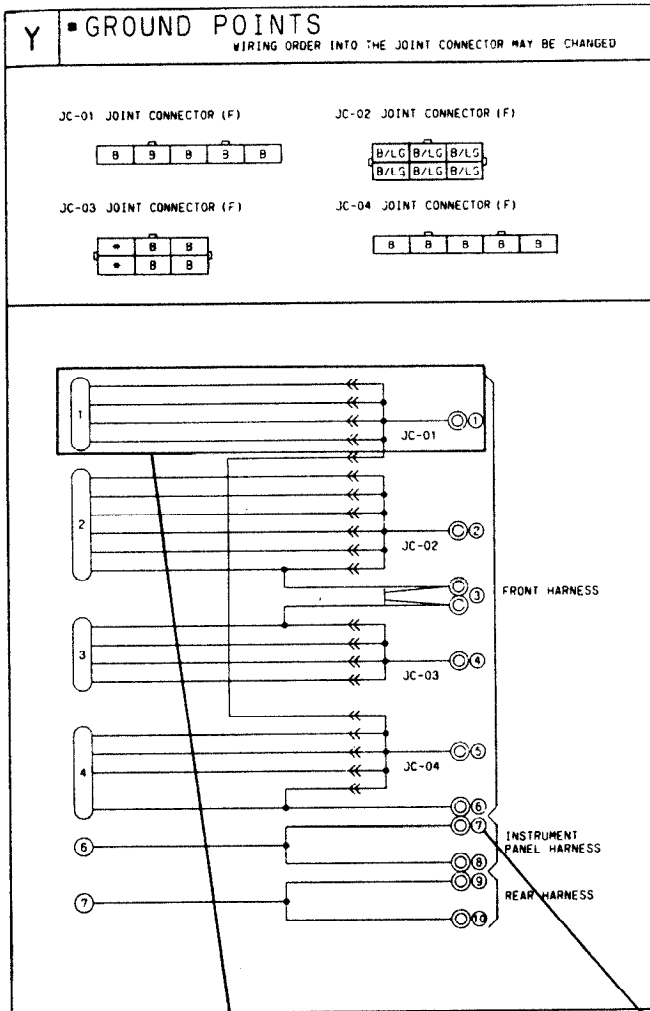
Using wiring diagrams

- The use of the wiring diagram depends on its intended application.

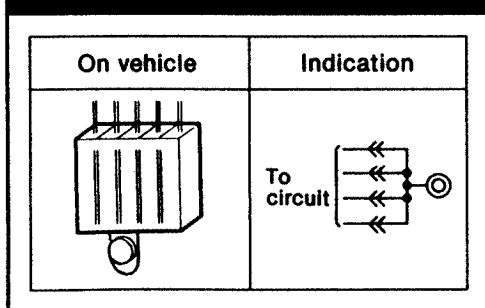
Application	Use	Application	Use
For checking circuits of individual systems	 <p>Open to page with circuit diagram and harness routing to be used and fold out common connector diagram or joint box diagram.</p>	For checking fuse connections	 <p>Open to electrical wiring schematic.</p>
For checking ground circuit of individual systems	 <p>Open to page with ground point diagram and fold out common connector diagram or joint box diagram.</p>	For locating page numbers of systems and components	<p>Parts Index System Index</p>  <p>or</p> <p>Open to parts index or system index.</p>

Ground points

- This shows ground points of the harness.



Ground indication



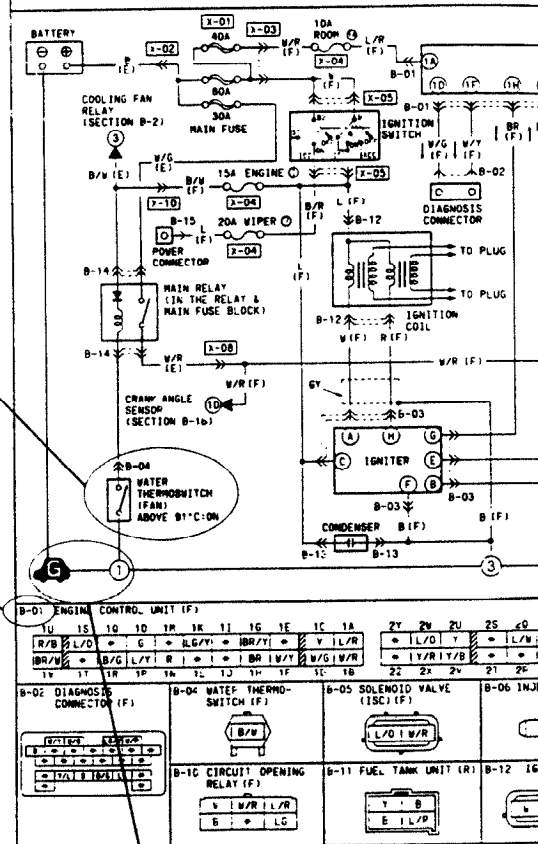
On circuit diagrams and ground points

The ground connection numbers in system circuit diagrams correspond to those in the ground point diagram.

System circuit diagram/connector diagram

- These show the circuits for each system, from the power supply to the ground. The power supply side is on the upper part of the page, the ground side on the lower part. The diagrams describe circuits with the ignition switch off.
- Below is an explanation of the various points in the diagram.

IGNITION SYSTEM ENGINE CONTROL



Indicates operating conditions for switches.

Connector code

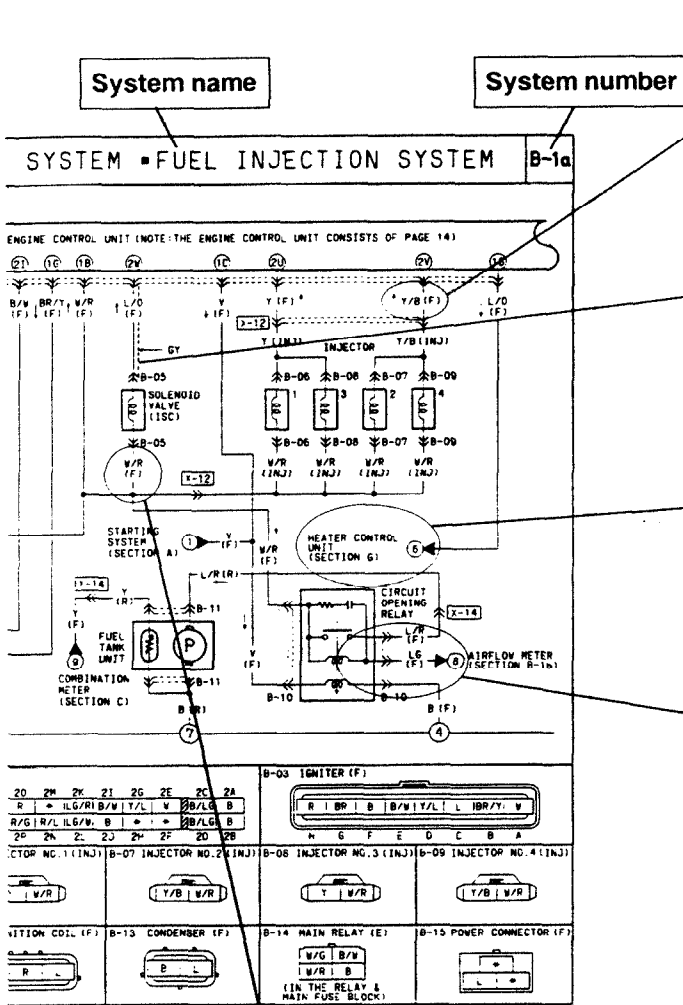
The prefix letter indicates the system in which the connector is used.

- JB: Joint box connections
- X : Common connectors
- A : Charging system/starting system connectors
- B : Engine control system connectors
- C : Gauge control system connectors
- D : Wiper system connectors
- E : Lighting system connectors
- F : Signal system connectors
- G : Air-conditioning system connectors
- H : Transmission control system connectors
- I : Interior lamp system connectors
- J : Audio/radio connectors
- K : Power window/power door lock system connectors
- L : Remote control mirror system connectors
- M : Sliding sunroof system connectors
- N : Power steering/4-wheel steering system connectors
- O : Anti-lock brake system connectors
- P : Power seat/seat heater system connectors
- Q : Auto cruise control system connectors
- R : Auto adjusting suspension system connectors
- S : Passive shoulder belt control/air bag system connectors
- T : Others
- Y : Ground connector

Ground numbers

A harness ground is represented differently than a unit ground.

Types of grounds	Symbol
<p>Harness</p>	
<p>Unit</p>	



System name

System number

Current symbol
Current flows in the direction of the arrow.

***Indicates shielded wire.**

*Shielded wire:
Prevents signal disturbances due to electrical interference.
Wire is covered by a metal meshing for grounding.

The number (e.g. 6), indicates the circuit continues to the related system diagram.

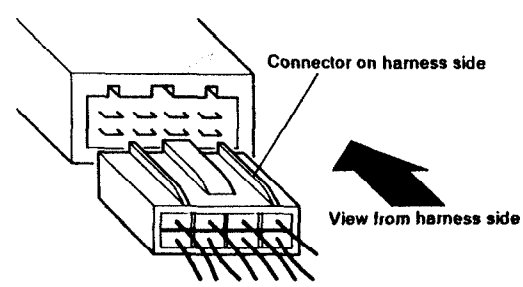
Connector symbols

● Male and female connectors are represented as follows in the circuit and connector diagrams.

	Circuit diagram symbol	Connector diagram symbol
Male		
Female		

● Like connectors are linked by broken lines between the connector symbols.
● Connector diagrams always show connectors on the harness side. The arrow indicates the view from the harness side.

(Example)

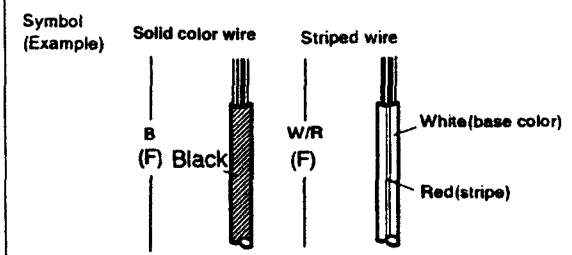


● Colors for connectors other than those that are off white are given in diagrams.
● Unused terminals are indicated by *.

Wire color code (harness symbol)

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

W/R is a white wire with a red strip
BR/Y is a brown wire with a yellow strip



● The harness symbol is given in the () following the wire color (Refer to GI-7.).

Routing diagram

- This shows where electrical components are located on the system circuit diagram by lead and connector symbols.
- Specified values are listed beside the routing diagram or on the following page.

Connector symbol

Shows the system that uses the connector.

(Example)

Connector	Symbol
Joint box	JB-04
Common connectors	X-19
System connectors	I-03

Component name

Shows the names of components in routing diagrams.

Ground symbol

Shows the ground in system diagrams.

Engine control unit terminal (unit side)

Terminal	Input	Output	Connection to	Test condition	Voltage	Remark
1K	○		Diagnose Connector	At System Selector test switch "C ₁ "	Approx. 12V	
1N	○		Throttle sensor (idle point)	All System Selector test switch "SELF-TEST"	Approx. 0V	Ignition switch ON
1O	○		Singlight switch	Accelerator pedal depressed	Approx. 12V	
1P	○		Brake pedal depressed	Brake pedal depressed	0V	
1R	○		P/S pressure switch	Ignition switch ON	Approx. 12V	
1S	○		P/S ON (at idle)	P/S ON (at idle)	0V	
1T	○		P/S OFF (at idle)	P/S OFF (at idle)	Approx. 12V	
1U	○		Fan switch	Fan operating (Engine coolant temperature over 97°C (207°F) or diagnose connector terminal TFA grounded)	Approx. 0V	
1V	○		Headlight switch	Fan not operating (idle)	Approx. 12V	
1W	○		Headlights ON (Fast parking, low beam or high beam)	Headlights ON (Fast parking, low beam or high beam)	Approx. 12V	
1X	○		Headlights OFF	Headlights OFF	Approx. 0V	
1Y	○		Neutral or clutch switch	Neutral position or clutch pedal depressed	Approx. 10V	
1Z	○		Other conditions	Other conditions	Approx. 12V	
2A	-	-	Ground (Driver)	Constant	0V	
2B	-	-	Ground (Output)	Constant	0V	
2C	-	-	Ground (CPU)	Constant	0V	
2D	-	-	Ground (Input)	Constant	0V	
2E	○		Crank angle sensor (No signal)	Ignition switch ON	Approx. 0V or 5V	
2F	○		Crank angle sensor (Signal)	Idle	Approx. 12V	
2G	○		Ignition switch ON	Ignition switch ON	Approx. 0V or 5V	
2H	○		Idle	Idle	Approx. 1.5V	
2J	○		Constant	Constant	0V	
2K	○		Airflow meter	Constant	4.5 - 5.5V	
2L	○		Accelerator pedal released	Accelerator pedal released	Approx. 5V	
2M	○		Accelerator pedal fully depressed	Accelerator pedal fully depressed	Approx. 0V	
2N	○		Ignition switch ON	Ignition switch ON	0V	
2O	○		Idle (Cold engine)	Idle (After warm up)	0 - 1V	
2P	○		Increase engine speed (After warm up)	Increase engine speed (After warm up)	0.5 - 1V	
2Q	○		Deceleration	Deceleration	0 - 0.4V	
2R	○		Airflow meter	Ignition switch ON	Approx. 3.8V	
2S	○		Idle	Idle	Approx. 3.3V	
2T	○		Airflow sensor (Intake air temperature)	At 20°C (68°F)	Approx. 2.5V	
2U	○		Water temperature	Engine coolant temperature 20°C (68°F)	Approx. 2.5V	
2V	○		After warm up	After warm up	Approx. 0.4V	

Specified values

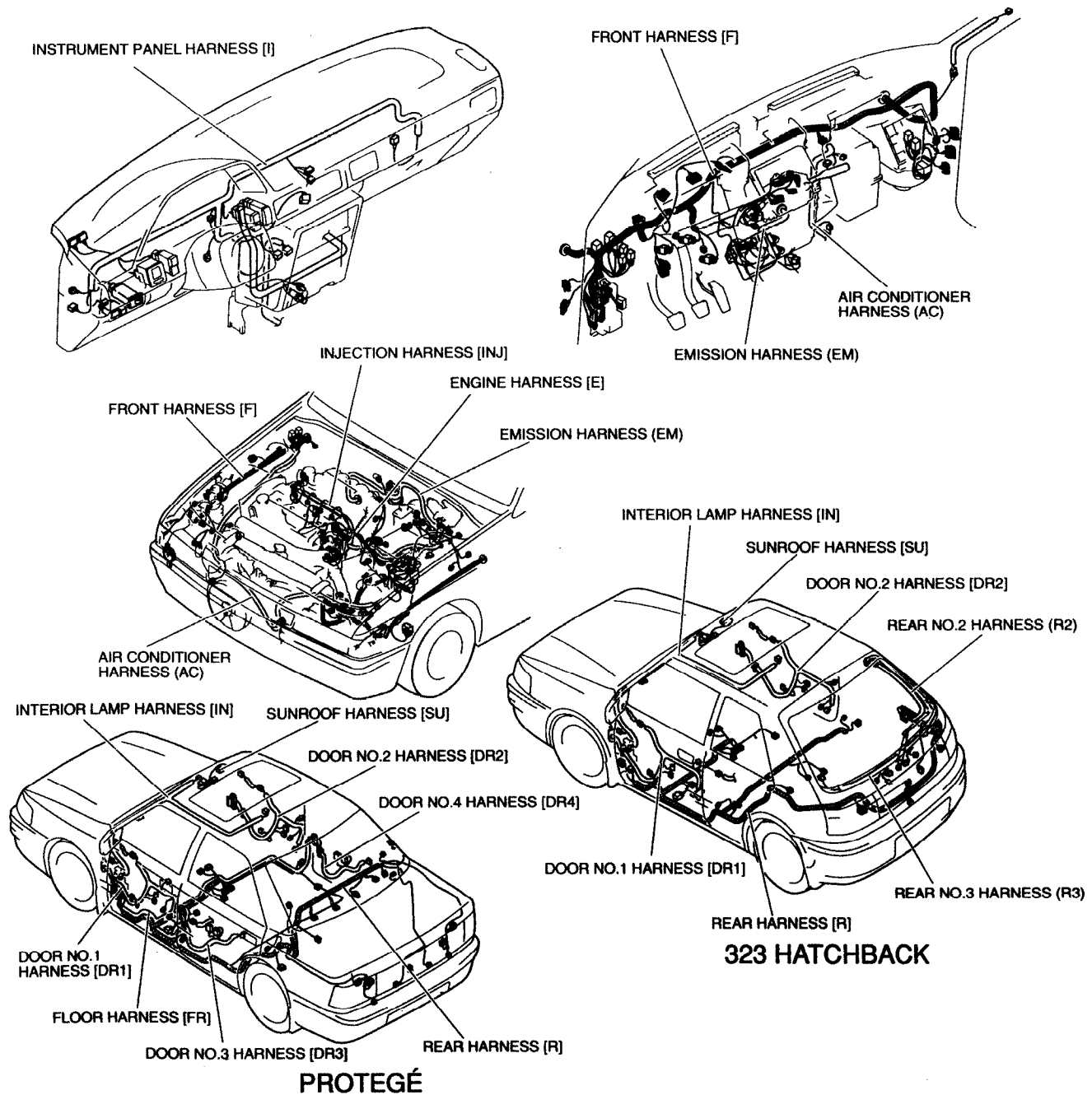
Shows values for determining whether an electrical component is good.

Reading Wiring Diagrams



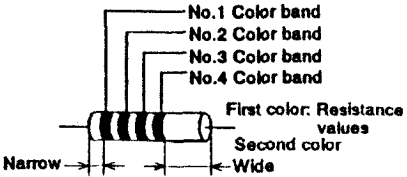
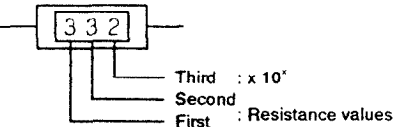
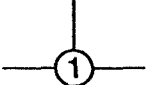


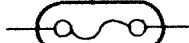
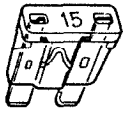
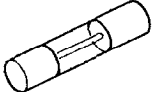

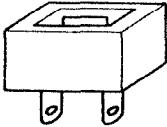
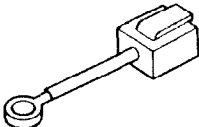
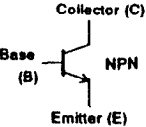
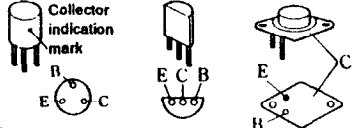

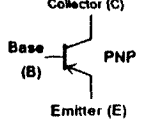



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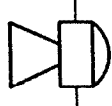
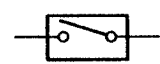

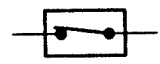
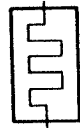

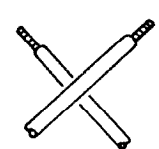
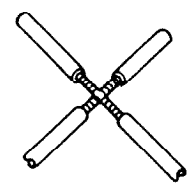
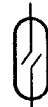

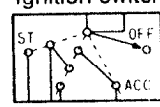
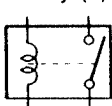
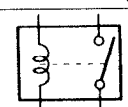
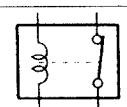
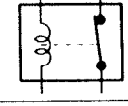
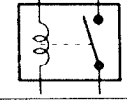
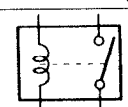
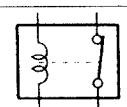
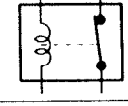
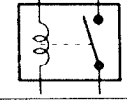
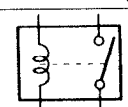
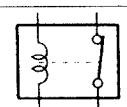
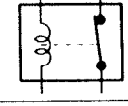
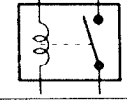
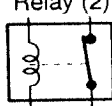
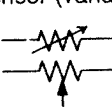
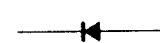
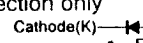
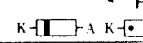

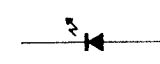

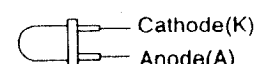
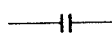

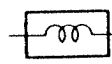

HARNESS SYMBOLS

DESCRIPTION OF HARNESS	COLOR	SYMBOL	DESCRIPTION OF HARNESS	SYMBOL
FRONT HARNESS	■	(F)	INTERIOR LAMP HARNESS	(IN)
ENGINE HARNESS	■	(E)	FLOOR HARNESS	(FR)
INSTRUMENT PANEL HARNESS	■	(I)	DOOR NO.1 HARNESS	(DR1)
REAR HARNESS	■	(R)	DOOR NO.2 HARNESS	(DR2)
REAR NO.2 HARNESS		(R2)	DOOR NO.3 HARNESS	(DR3)
REAR NO.3 HARNESS		(R3)	DOOR NO.4 HARNESS	(DR4)
EMISSION HARNESS		(EM)	AIR CONDITIONER HARNESS	(AC)


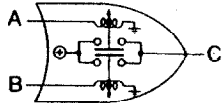

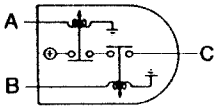
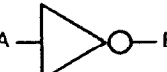
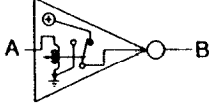

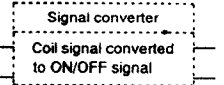


Symbols

Symbol	Meaning	Symbol	Meaning																																																																										
<p>Battery</p> 	<ul style="list-style-type: none"> Generates electricity through chemical reaction Supplies direct current to circuits 	<p>Resistance</p> 	<ul style="list-style-type: none"> A resistor with a constant value Mainly used to protect electrical components in circuits by maintaining rated voltage <p>● Reading resistance values <Colored type></p>  <table border="1"> <thead> <tr> <th rowspan="2">Color</th> <th>No.1</th> <th>No.2</th> <th>No.3</th> <th>No.4</th> </tr> <tr> <th>Resistance values</th> <th>Multiplier</th> <th>Tolerance</th> <th></th> </tr> </thead> <tbody> <tr> <td>Black</td> <td>0</td> <td>0</td> <td>$\times 10^0$</td> <td></td> </tr> <tr> <td>Brown</td> <td>1</td> <td>1</td> <td>$\times 10^1$</td> <td></td> </tr> <tr> <td>Red</td> <td>2</td> <td>2</td> <td>$\times 10^2$</td> <td></td> </tr> <tr> <td>Orange</td> <td>3</td> <td>3</td> <td>$\times 10^3$</td> <td></td> </tr> <tr> <td>Yellow</td> <td>4</td> <td>4</td> <td>$\times 10^4$</td> <td></td> </tr> <tr> <td>Green</td> <td>5</td> <td>5</td> <td>$\times 10^5$</td> <td></td> </tr> <tr> <td>Blue</td> <td>6</td> <td>6</td> <td>$\times 10^6$</td> <td></td> </tr> <tr> <td>Purple</td> <td>7</td> <td>7</td> <td>$\times 10^7$</td> <td></td> </tr> <tr> <td>Grey</td> <td>8</td> <td>8</td> <td>$\times 10^8$</td> <td></td> </tr> <tr> <td>White</td> <td>9</td> <td>9</td> <td>$\times 10^9$</td> <td></td> </tr> <tr> <td>Gold</td> <td></td> <td></td> <td>$\times 10^{-1}$</td> <td>$\pm 5\%$</td> </tr> <tr> <td>Silver</td> <td></td> <td></td> <td>$\times 10^{-2}$</td> <td>$\pm 10\%$</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>$\pm 20\%$</td> </tr> </tbody> </table> <p><Numerical type></p> 	Color	No.1	No.2	No.3	No.4	Resistance values	Multiplier	Tolerance		Black	0	0	$\times 10^0$		Brown	1	1	$\times 10^1$		Red	2	2	$\times 10^2$		Orange	3	3	$\times 10^3$		Yellow	4	4	$\times 10^4$		Green	5	5	$\times 10^5$		Blue	6	6	$\times 10^6$		Purple	7	7	$\times 10^7$		Grey	8	8	$\times 10^8$		White	9	9	$\times 10^9$		Gold			$\times 10^{-1}$	$\pm 5\%$	Silver			$\times 10^{-2}$	$\pm 10\%$					$\pm 20\%$
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<p>Ground (1)</p> 	<ul style="list-style-type: none"> Connecting point to vehicle body or other ground wire where current flows from positive to negative terminal of battery Ground (1) indicates a ground point to body through wire harness Ground (2) indicates point where component is grounded directly to body <p>Remark</p> <ul style="list-style-type: none"> Current will not flow through a circuit if ground is faulty 																																																																												
<p>Ground (2)</p> 																																																																													
<p>Fuse (1)</p>  <p>(box)</p>	<ul style="list-style-type: none"> Melts when current flow exceeds that specified for circuit, stopping current flow <p>Precautions</p> <ul style="list-style-type: none"> Do not replace with fuses exceeding specified capacity 																																																																												
<p>Fuse (2)</p>  <p>(Cartridge)</p>		<p><Box type></p> 	<p><Cartridge type></p> 																																																																										
<p>Main fuse/Fusible link</p> 		<p><Main fuse></p> 	<p><Fusible link></p> 																																																																										
<p>Transistor (1)</p> 	<ul style="list-style-type: none"> Electrical switching component Turns on when voltage is applied to the base(B) 	<p>Motor</p> 	<ul style="list-style-type: none"> Converts electrical energy into mechanical energy 																																																																										
<p>Transistor (2)</p> 		<p>● Reading code</p> <p>2 S C 828 A</p> <p>Revision mark</p> <p>Semiconductor</p> <p>Number of terminals</p> <p>A: High-frequency PNP B: Low-frequency PNP C: High-frequency NPN D: Low-frequency NPN</p>		<p>Pump</p> 																																																																									
<p>Lamp</p> 	<ul style="list-style-type: none"> Emits light and generates heat when current flows through filament 	<p>Cigarette lighter</p> 	<ul style="list-style-type: none"> Electrical coil that generates heat 																																																																										

Symbol	Meaning	Symbol	Meaning							
Horn 	<ul style="list-style-type: none"> Generates sound when current flows. 	Switch (1)  Normally open (NO)	<ul style="list-style-type: none"> Allows or breaks current flow by opening and closing circuits. 							
Speaker 		Switch (2)  Normally closed (NC)								
Heater 	<ul style="list-style-type: none"> Generates heat when current flows. 	Harness  (Not connected)	<ul style="list-style-type: none"> Unconnected intersecting harness.  Connected intersecting harness.  							
Speed sensor 		<ul style="list-style-type: none"> Movement of magnet in speedometer set turns contact within sensor on and off. 		 (Connected)						
Ignition switch  Normally open (NO)		<ul style="list-style-type: none"> Turning ignition key operates switch contacts to complete various circuits. 								
Relay (1) 	<ul style="list-style-type: none"> Current flowing through coil produces electromagnetic force causing contact to open or close. <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Open</th> <th>Closed</th> </tr> </thead> <tbody> <tr> <td>Normally open relay (NO)</td> <td>  No flow </td> <td>  Closed </td> </tr> <tr> <td>Normally closed relay (NC)</td> <td>  Flow </td> <td>  No flow </td> </tr> </tbody> </table>		Open	Closed	Normally open relay (NO)	 No flow	 Closed	Normally closed relay (NC)	 Flow	 No flow
		Open	Closed							
Normally open relay (NO)	 No flow	 Closed								
Normally closed relay (NC)	 Flow	 No flow								
Relay (2)  Normally closed (NC)										
Sensor (variable) 	<ul style="list-style-type: none"> Resistor whose resistance changes with operation of other components. 	Diode 	<ul style="list-style-type: none"> Known as a semiconductor rectifier, diode allows current flow in one direction only <p style="text-align: center;"> Cathode(K)  Anode(A) Flow of electric current </p> <p style="text-align: center;"> K  A </p>							
Sensor (thermistor) 	<ul style="list-style-type: none"> Resistor whose resistance changes with temperature. 	Light emitting diode (LED) 	<ul style="list-style-type: none"> Diode that lights when current flows Unlike ordinary light bulbs, diode does not generate heat when lit <p style="text-align: center;"> Cathode(K)  Anode(A) </p> <p style="text-align: center;">  Cathode(K) Anode(A) </p> <p style="text-align: center;">Flow of electric current</p>							
Capacitor 	<ul style="list-style-type: none"> Component that temporarily stores electrical charge. 		<ul style="list-style-type: none"> Allows current to flow in one direction up to a certain voltage, allows current to flow in other direction once that voltage is exceeded. 							
Solenoid 	<ul style="list-style-type: none"> Current flowing through coil generates electromagnetic force to operate plungers, etc. 	Reference(zener) diode 								

Logic symbols

Types of logic symbols	Operation	Expressing output	Simple relay circuits
<p>OR</p> 	Input to A or B will produce output at C	Low electrical potential (L) at A and B → No output (L) at C High electrical potential (H) at A or B → Output (H) at C	
<p>AND</p> 	Input to A and B will produce output at C	High electrical potential (H) at A and B → Output (H) at C Low electrical potential (L) at A or B → No output (L) at C	
<p>INV</p> 	No input to A will produce an output at B Input to A will not produce any output at B	Low electrical potential (L) at A → Ungrounds (H) B High electrical potential (H) at A → Grounds (L) B	
<p>PROCESS</p> 	Simplified representation of complex functions within circuit Describes main function 1.Signal detector for emission control unit, cooling unit and tachometer 2.Signal converter for turn and hazard flasher unit,breakerless transistor igniter unit, etc.	(Examples) Breakerless transistor igniters	

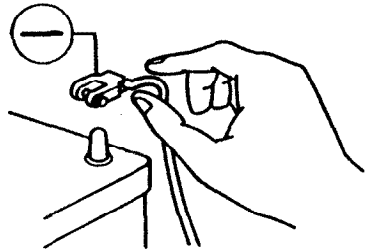
Abbreviations used in this booklet

A	Ampere	ELR	Emergency Locking Retractor	ON	Switch On
AAS	Auto Adjusting Suspension	ELEC	Electric	P	Power
ABS	Anti-lock Brake System	ETR	Electronic Tuner	PRCV	Pressure Regulator Control
ACV	Air Control Valve	EXH	Exhaust		Solenoid Valve
AE	Acoustic Equilibration	F	Front	PTC	Positive Temperature Coefficient Heater
AIS	Air Injection System	FICB	Fast Idle Cam Breaker	P/S	Power Steering
ALL	Automatic Load Leveling	FL	Front Left	PRG	Purge Solenoid Valve
AS	Auto Stop	FR	Front Right	QSS	Quick Start System
ASV	Air Supply Valve	F/B	Feedback	R	Rear
A/C	Air Conditioner	F/I	Fuel Injector	RH	Right Hand
A/F	Air Fuel	FM	Frequency Modulation	RL	Rear Left
A/R	Auto Reverse	GEN	Generator	RPM	Revolution Per Minute
A/T	Automatic Transmission	HEI	High Energy Ignition	RR	Rear Right
ACC	Accessory	H/D	Heat/Defroster	REC	Recirculation
ACCEL	Accelerator	HEAT	Heater	SOL	Solenoid
ADD	Additional	HI	High	ST	Start
ALT	Alternator	ISC	Idle Speed Control	SW	Short Wave
AM	Amplitude Modulation	IG	Ignition	SW	Switch
AMP	Amplifier	ILLUMI	Illumination	TCV	Twin Scroll Turbocharger Solenoid Valve
ANT	Antenna	INT	Intermittent	TICS	Triple Induction Control System
ATP	Atmospheric Pressure	JB	Joint Box	TEMP	Temperature
ATX	Automatic Transaxle	LH	Left Hand	TR	Transistor
B	Battery	LCD	Liquid Crystal Display	TWS	Total Wiring System
BAC	By-pass Air Control Valve	LO	Low	V	Volt
B/L	Bi-Level	LW	Low Wave	VRIS	Variable Resonance Induction System
CPU	Central Processing Unit	M	Motor	VENT	Ventilation
CSD	Cold Start Device	MIL	Malfunction Indicator Lamp	VOL	Volume
CARB	Carburetor	MTR	Mechanical Tuning Radio	W	Watt
CCT	Circuit	M/T	Manual Transmission		
CIGAR	Cigarette	MID	Middle		
COMBI	Combination	MIN	Minute		
CON	Conditioner	MIX	Mixture		
CONT	Control	MPX	Multiplex		
DOHC	Double Overhead Camshaft	MTX	Manual Transaxle		
DEF	Defroster	MW	Middle Wave		
ECPS	Electronically Controlled Power Steering	NC	Normally Closed		
EGI	Electronic Gasoline Injection	NO	Normally Open		
EGR	Exhaust Gas Recirculation	OD	Over Drive		
		OFF	Switch Off		

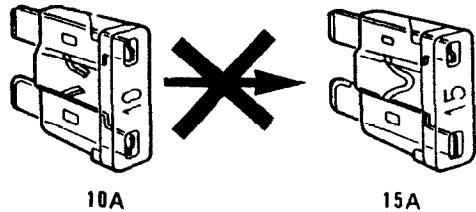
Precautions when servicing electrical system

- Note the following items when servicing the electrical system.
- Do not alter the wiring or electrical equipment in any way as this may damage the vehicle or cause a fire due to shorting or overcapacity of a circuit.

- Always disconnect the negative (-) battery cable first and reconnect it last when disconnecting the battery.



- Replace blown fuses with ones having the same designated capacity.



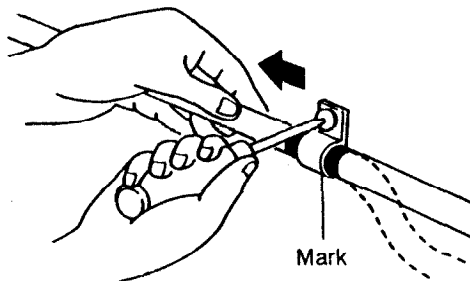
Caution

- Be sure that the ignition and other switches are OFF before disconnecting or connecting the battery terminals. Failure to do so may damage the semi-conductor components.

Caution

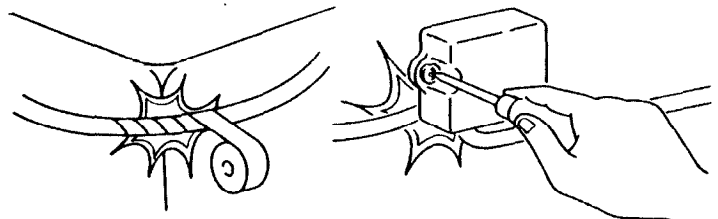
- Replacing a fuse with one of a larger capacity than designated may damage components or cause an electrical fire.

- Secure harnesses with a clamp when provided to take up any slack.



- Tape areas of the harness that may rub or bump against sharp edges to protect it from damage.

- Be sure that the harness is not caught or damaged when mounting components.



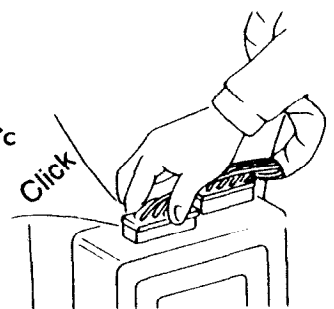
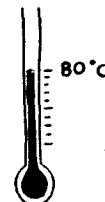
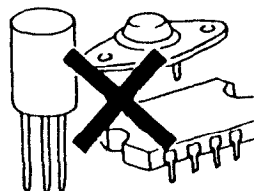
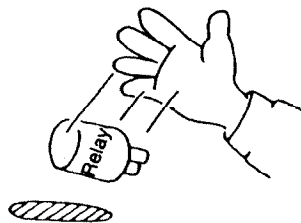
Caution

- Clamp all harnesses near vibrating components (e.g. the engine) to remove any slack and prevent contact due to vibration.

- Disconnect heat sensitive parts (e.g. relays, ECU) when performing maintenance where temperatures may exceed 80°C (176°F) (i.e. welding).

- Make sure that the connectors are securely connected when installed.

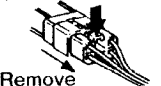
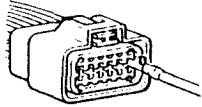
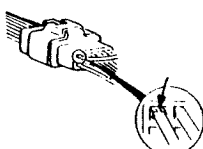
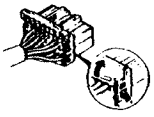
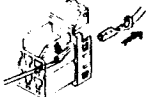
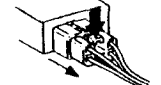
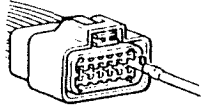
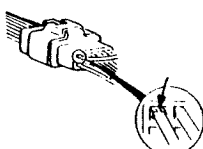
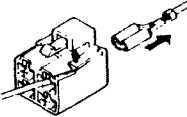
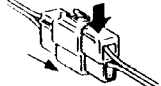
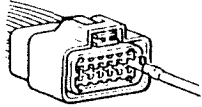
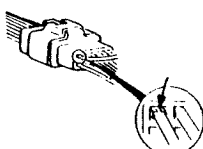
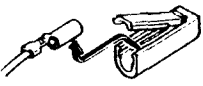
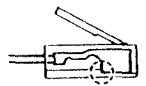

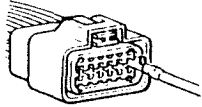
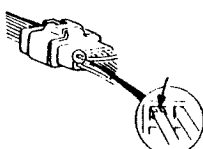



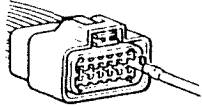
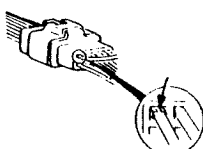
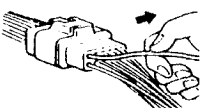

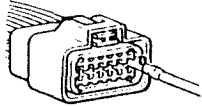
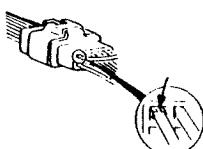

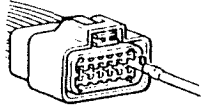
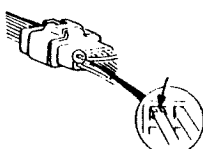
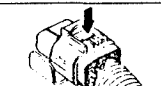
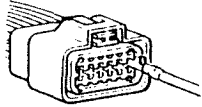
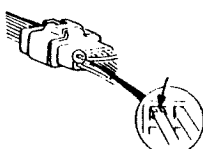
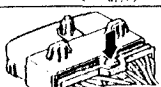
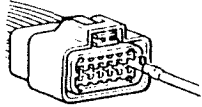
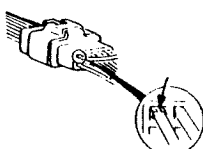

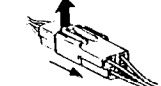
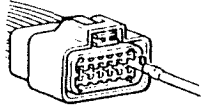
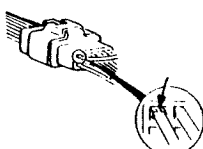
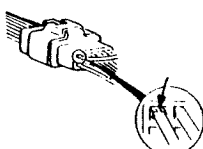

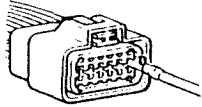
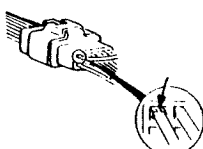
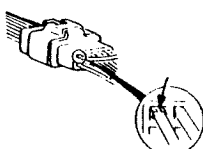
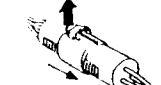
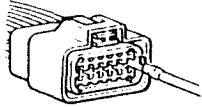
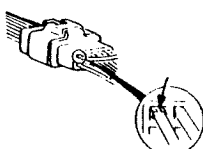
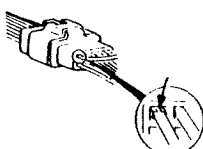

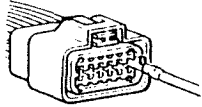
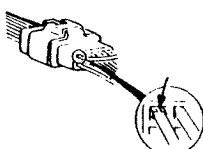
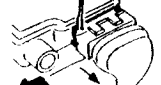
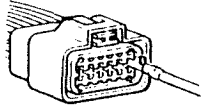
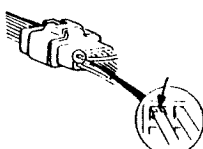
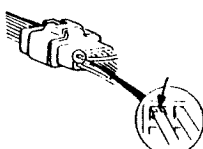
- Do not handle roughly or drop electrical components.



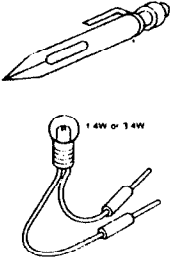
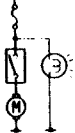


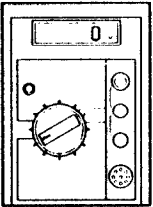
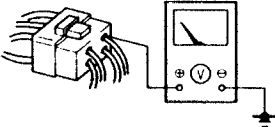

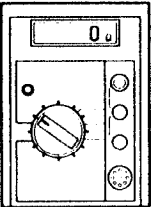
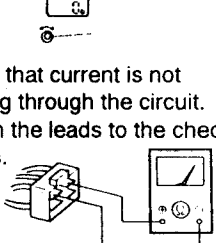
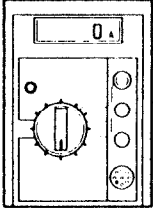
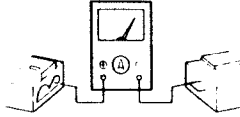
Handling connectors

Caution

- Be sure to grasp the connectors, not the wires, when disconnecting them.

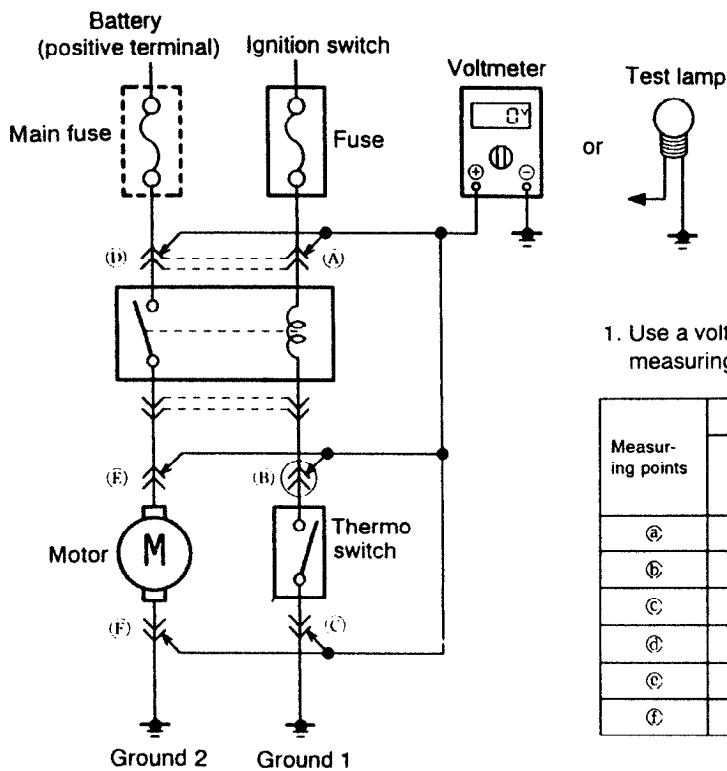
	Connector removal	Checking connector engagement	Checking for loose terminal	Repairing terminal																
Push type		<p>Caution Improperly engaged connectors will cause poor terminal contact.</p> 	<p>Caution A loose terminal will cause poor terminal contact.</p> 	<p><CPU connector></p>  <ol style="list-style-type: none"> 1. Open the rear cover. 2. Lift the tab with a small screwdriver and remove the terminal. 																
				<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 	<p><General connector></p>  <p>Lift the tab with a small screwdriver and remove the terminal.</p>														
						<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 	<p><Round connectors></p>  <ol style="list-style-type: none"> 1. Open the cover. 2. Lift the terminal to remove it. 3. Verify that the terminal is securely mounted in the connector when reinstalling. 												
								<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 	<p><Common ground connector></p>  <ol style="list-style-type: none"> 1. Open the cover. 2. Remove A. 3. Lift the tab with a small screwdriver and remove the terminal. 										
										<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 	<p>Lightly pull each wire to verify that the terminal does not pull out of the connector.</p> 								
													<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 						
															<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 				
																	<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 		
																			<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 
																				
Pull up type		<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 	<p>Lightly pull each wire to verify that the terminal does not pull out of the connector.</p> 																
Pull up type					<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 	<p>Lightly pull each wire to verify that the terminal does not pull out of the connector.</p> 													
								<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 	<p>Lightly pull each wire to verify that the terminal does not pull out of the connector.</p> 										
											<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 								
Spring type					<p>Using a matching male terminal make sure there is no looseness in the female terminal.</p> 	<p>Verify that terminals are not pushed out of the connector when engaged.</p> 	<p>Lightly pull each wire to verify that the terminal does not pull out of the connector.</p> 													

Using electrical test equipment

Equipment	Use	Operation	Handling precautions
<p>Test lamp</p> 	<p>Test for locating open or shorted circuits.</p>	<ul style="list-style-type: none"> ● Connect the test lamp between the circuit being measured and a ground. ● The lamp will light if the circuit is energized to the point tested. 	<ul style="list-style-type: none"> ● Test lamps use 12V 1.4 or 3.4W bulbs or light-emitting diodes (LED). Using a large capacity bulb may damage the CPU.
<p>Jumper wire</p> 	<p>Used to create a temporary circuit.</p>	<ul style="list-style-type: none"> ● Connect the jumper wire between the terminals of a circuit to bypass a switch, etc. 	<ul style="list-style-type: none"> ● Do not connect the power side directly to a ground as this may burn the harness or damage electrical components.
<p>Voltmeter</p> 	<p>Used for measuring the voltage of a circuit to locate possible opens or shorts.</p>	<ul style="list-style-type: none"> ● Connect the positive (+) lead to where voltage is to be measured and the negative (-) lead to a ground. 	<ul style="list-style-type: none"> ● Connect the voltmeter in parallel with the circuit. ● Set the range to the desired voltage. ● Use the service hole when measuring the voltage at the diagnosis connector.  <ul style="list-style-type: none"> ● Tie a thin wire to the positive (+) lead to access narrow terminals.
<p>Ohmmeter</p> 	<p>Used for locating opens and shorts in the circuit, confirming continuity of switches and checking sensor resistance.</p>	<ul style="list-style-type: none"> ● Zero the ohmmeter. ● Verify that current is not flowing through the circuit. ● Touch the leads to the check points. 	<ul style="list-style-type: none"> ● Zero the meter after switching to the measuring range. ● Before using the ohmmeter, make sure that the ignition switch is OFF or the negative (-) battery cable is disconnected to prevent burning the ohmmeter.
<p>Ammeter</p> 	<p>Used for checking alternator output, current supplied to the starter, and dark current within a circuit.</p> <p>Note Dark current is the current flowing through the circuit when the ignition switch is OFF.</p>	<ul style="list-style-type: none"> ● Connect the ammeter in series with the circuit by touching the positive (+) lead to the power side terminal and the negative (-) lead to the ground-side terminal. 	<ul style="list-style-type: none"> ● Set the range to the desired voltage. ● Connect the ammeter in series with the circuit. The ammeter may be burned if it is connected in parallel.

Measuring voltage

Checks



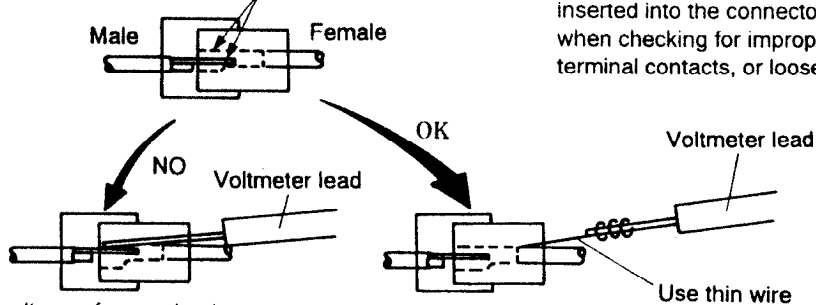
1. Use a voltmeter or test lamp to ascertain voltage at the measuring points.

Measuring points	Circuit operation		
	Ignition switch: OFF	Ignition switch: ON	
		Thermo switch: OFF	Thermo switch: ON
(A)	0V ×	12V ○	12V ○
(B)	0V ×	12V ○	0V ×
(C)	0V ×	0V ×	0V ×
(D)	12V ○	12V ○	12V ○
(E)	0V ×	0V ×	12V ○
(F)	0V ×	0V ×	0V ×

○ : Test lamp ON
 × : Test lamp OFF

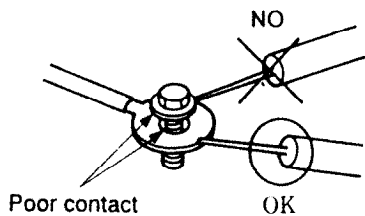
Precautions during checks

Measuring voltage of connectors Poor contact



A voltmeter lead may momentarily connect a terminal when inserted into the connector and give an erroneous reading when checking for improperly engaged connectors, poor terminal contacts, or loose terminals.

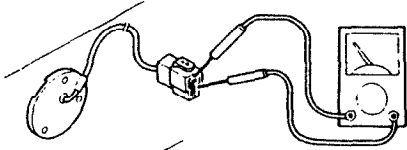
Measuring voltage of ground unit



Touch the voltmeter lead to the ground wire when checking the ground circuit.

Measuring continuity/resistance

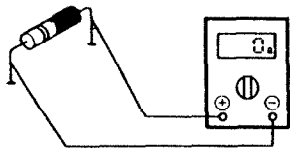
Checking switches



Touch the ohmmeter leads to the switch terminals to check continuity.

Caution
Verify the operating state of the switch before checking continuity because readings vary accordingly.

Checking diodes



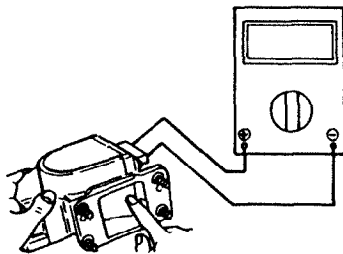
Continuity is checked according to the direction of the positive (+) and negative (-) leads of the ohmmeter in the circuit containing the diode.

Connection	Continuity
	Yes
	No

Remark

The negative (-) lead of the ohmmeter is connected to the positive terminal of the internal ohmmeter battery. The positive (+) lead to the negative terminal of the battery.

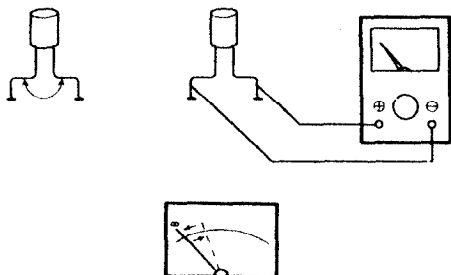
Checking sensors, solenoid valves



Connect the ohmmeter leads to the sensor or solenoid valve terminals to check resistance.

Caution
Verify the operating state of the sensor before checking resistance because readings vary accordingly.

Checking condensers



1. Short between the terminals with a jumper wire to discharge the capacitor.
2. Set the ohmmeter range to $\times 10k \Omega$ and connect it to the capacitor terminals.
3. The capacitor is good if the needle of the ohmmeter swings once and returns to its original position.

Finding short circuits

Shorts occur between the power(positive) and ground(negative) sides of a circuit.

Therefore, finding a short circuit requires determining how the circuit is routed.

Circuits not connected to control unit

Circuit Diagram	Examples		Finding short circuit
	Short location	Indication	
	Short (A)	<ul style="list-style-type: none"> ● Fuse melts. 	<p>Finding short circuit</p> <ol style="list-style-type: none"> 1. Remove the fuse and main fuse of the circuit. 2. Disconnect all connectors of electrical components in the circuit. 3. Attach a voltmeter or test lamp to the fuse box and reconnect each connector, beginning nearest the power source. 4. Check the voltmeter or see if the test lamp lights as the connectors are connected. <p>Test lamp</p> <p>A short has occurred where the voltmeter reading changes or the test lamp lights.</p>
	Short (B)	<ul style="list-style-type: none"> ● Main fuse melts. 	
	Short (C)	<ul style="list-style-type: none"> ● The motor operates regardless of whether thermo-switch ON or OFF when the ignition switch is ON. ● The fuse is not melted. 	
	Short (D)	<ul style="list-style-type: none"> ● The main fuse melts when the ignition switch and thermo-switch are ON and the relay is operating. 	

Circuits connected to control unit

Circuit Diagram	Examples		Finding short circuit
	Short location	Indication	
	Short (A)	<ul style="list-style-type: none"> ● Fuse melts. 	<p>Finding short circuit</p> <ol style="list-style-type: none"> 1. Remove the fuse and main fuse of the circuit. 2. Disconnect all connectors of electrical components in the circuit. 3. Attach a voltmeter or test lamp to the fuse box and reconnect each connector, beginning nearest the power source. 4. Check the voltmeter or see if the test lamp lights as the connectors are connected. <p>Test lamp</p> <p>A short has occurred where the voltmeter reading changes or the test lamp lights.</p>
	Short (B)	<ul style="list-style-type: none"> ● Solenoid A operates normally when the ignition switch is ON. 	
	Short (C)	<ul style="list-style-type: none"> ● The CPU transistor burns out when the ignition switch is turned ON. 	
	Short (D)	<ul style="list-style-type: none"> ● The CPU thinks the switch is ON because the same conditions exist as when the switch is ON. 	<p>Sensor/switch</p> <ol style="list-style-type: none"> 1. Attach the test lamp or voltmeter to the CPU connector. 2. Connect to the switch/sensor connector. 3. Check the voltmeter or see if the test lamp lights. <p>A short has occurred where voltmeter reads 0V or the test lamp goes out.</p>
	Short (E)	<ul style="list-style-type: none"> ● The CPU senses the sensor to be 0 Ω because the conditions exist as when resistance value is 0 Ω ● The CPU equipped with the self-diagnosis function outputs the malfunction code. 	

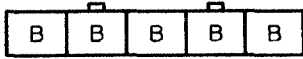
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■ GROUND POINT

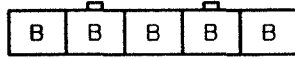
WIRING ORDER INTO JOINT CONNECTOR MAY BE CHANGED

Y

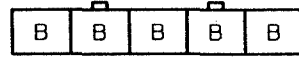
JC-01 JOINT CONNECTOR (F)



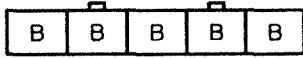
JC-02 JOINT CONNECTOR (F)



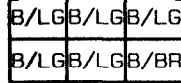
JC-03 JOINT CONNECTOR (F)



JC-04 JOINT CONNECTOR (EM)



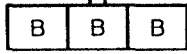
JC-06 JOINT CONNECTOR (EM)



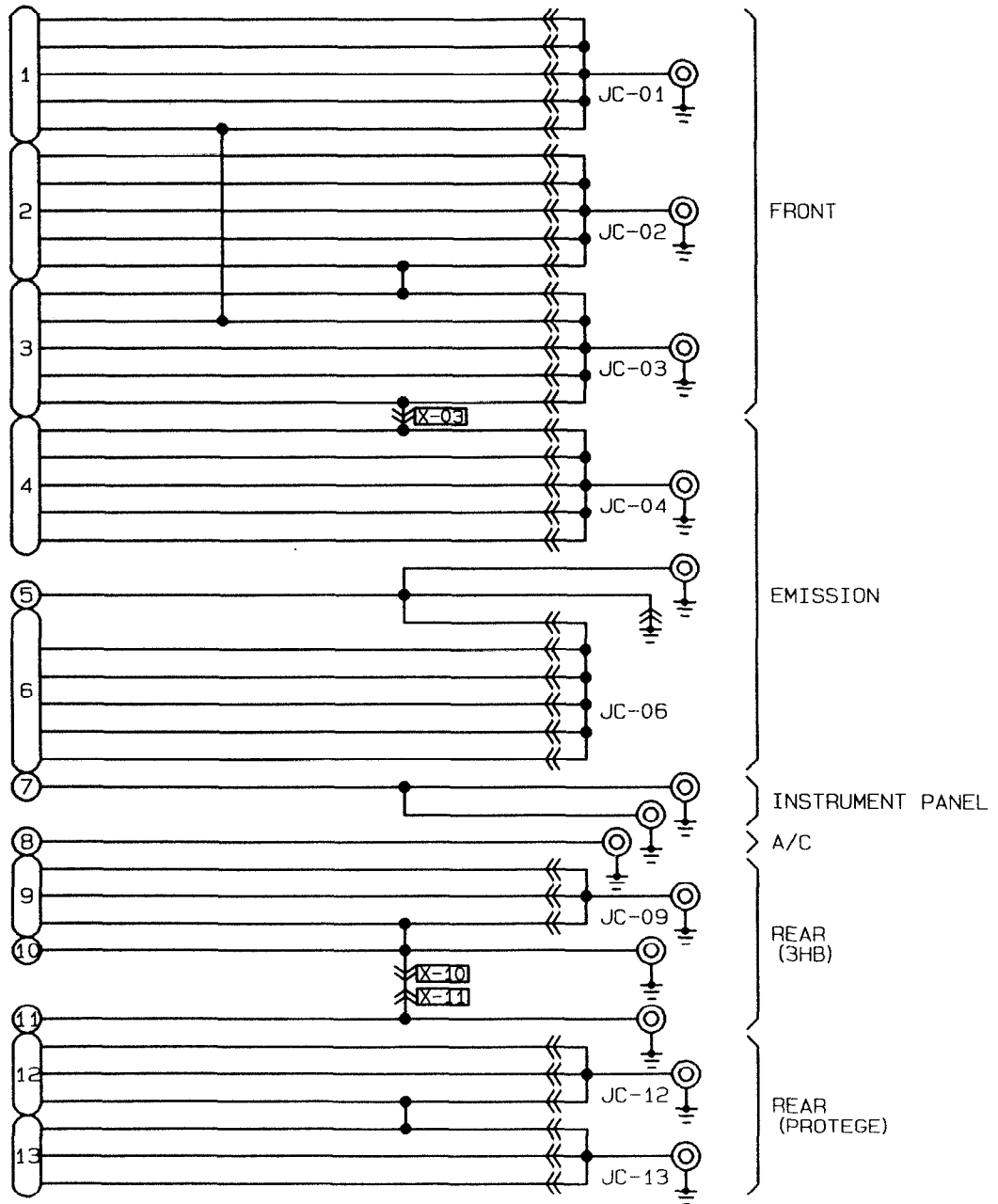
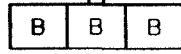
JC-09 JOINT CONNECTOR (R)
(3HB)



JC-12 JOINT CONNECTOR (R)
(PROTEGE)

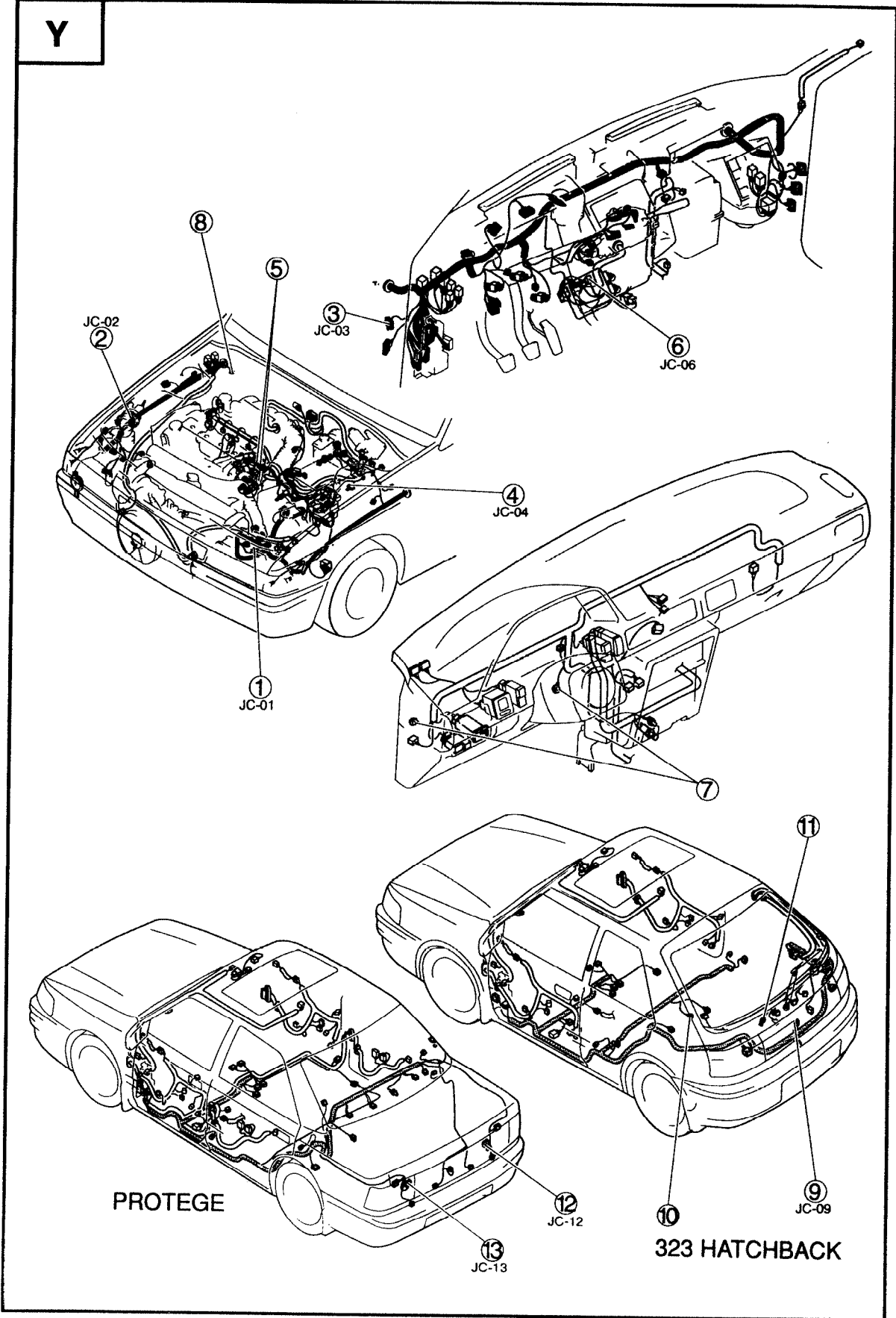


JC-13 JOINT CONNECTOR (R)
(PROTEGE)



Y

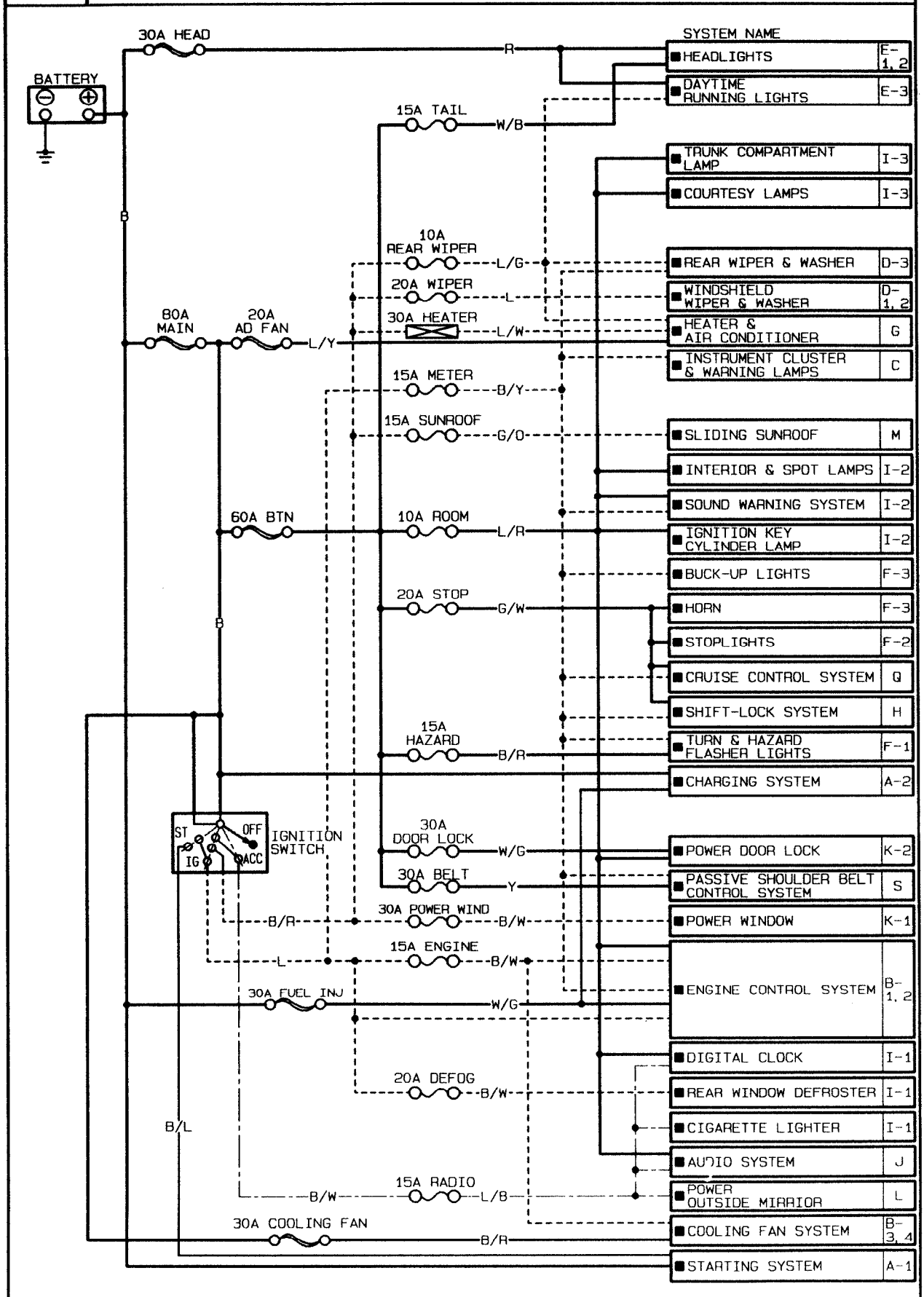
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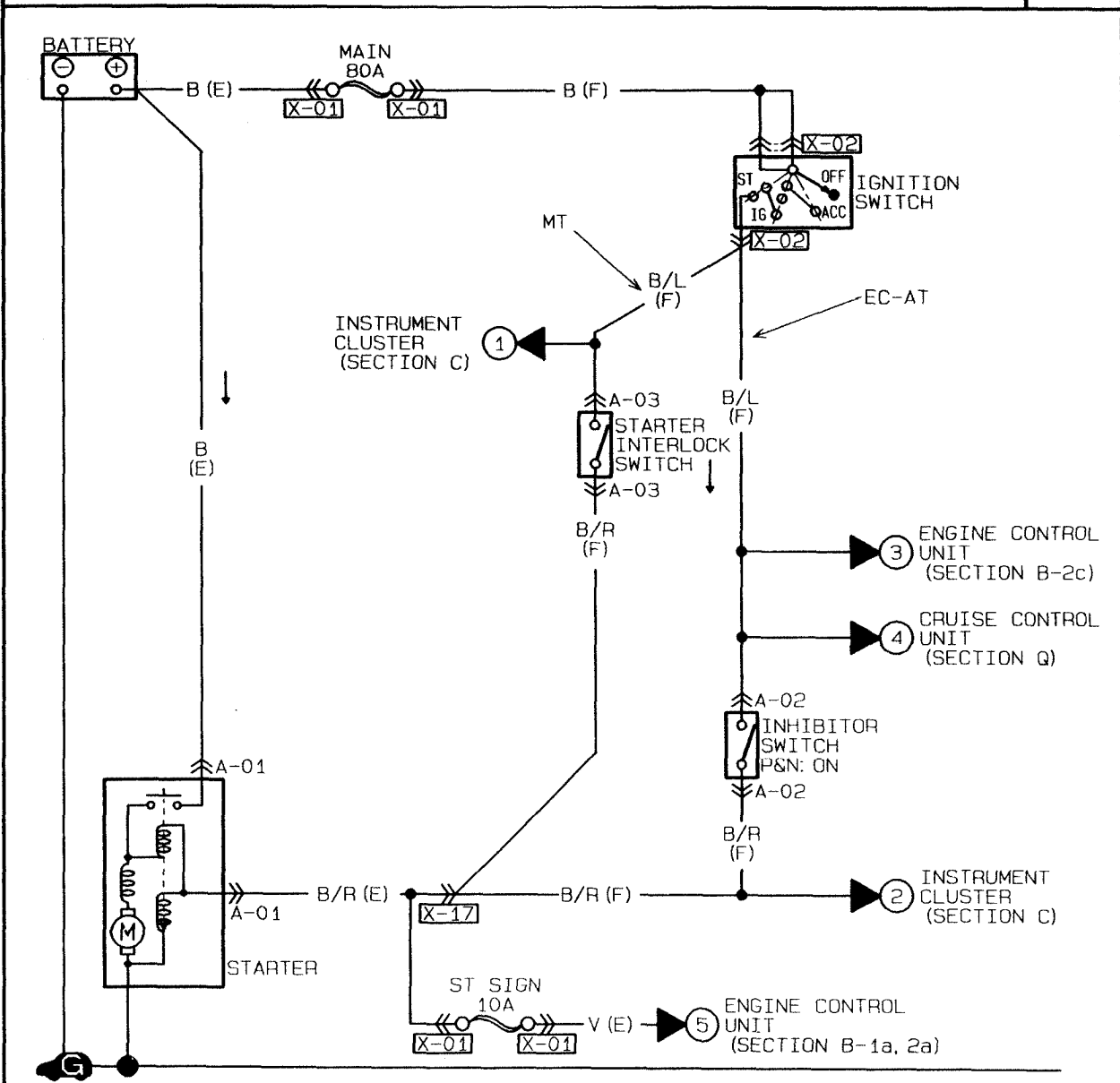
W ■ ELECTRICAL WIRING SCHEMATIC

— CURRENT FROM BATTERY
 - - - CURRENT FROM IG1, IG2
 - - - CURRENT FROM ACC
 — OTHERS



STARTING SYSTEM

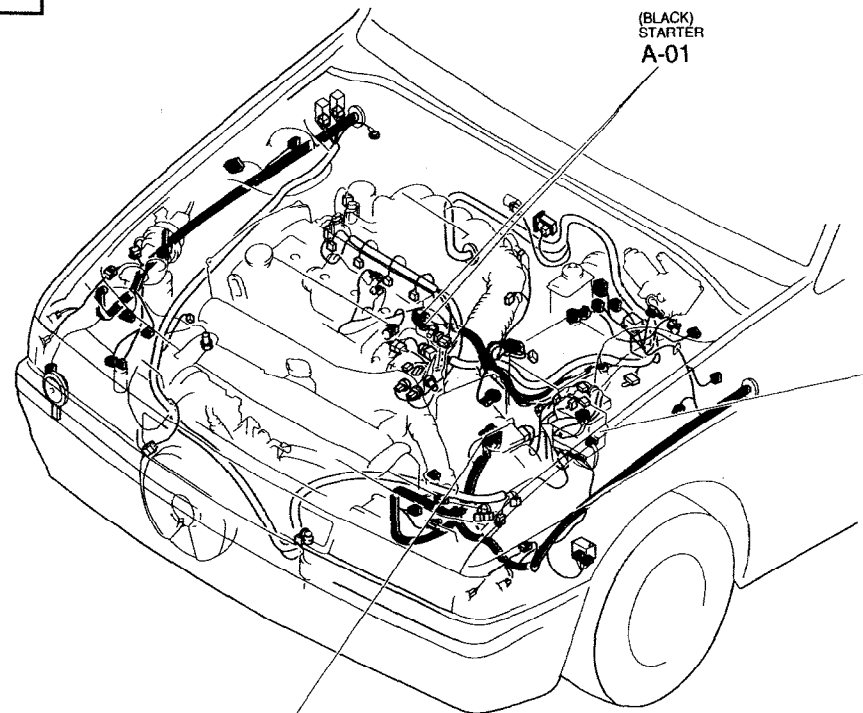
A-1



<p>A-01 STARTER (E)</p>	<p>A-02 INHIBITOR SWITCH (F)</p>	<p>A-03 STARTER INTER-LOCK SWITCH (F)</p>	

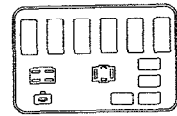
HARNESS COLOR : FRONT [] ENGINE []

A-1

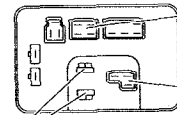


A-02
INHIBITOR SWITCH

FUSE BOX

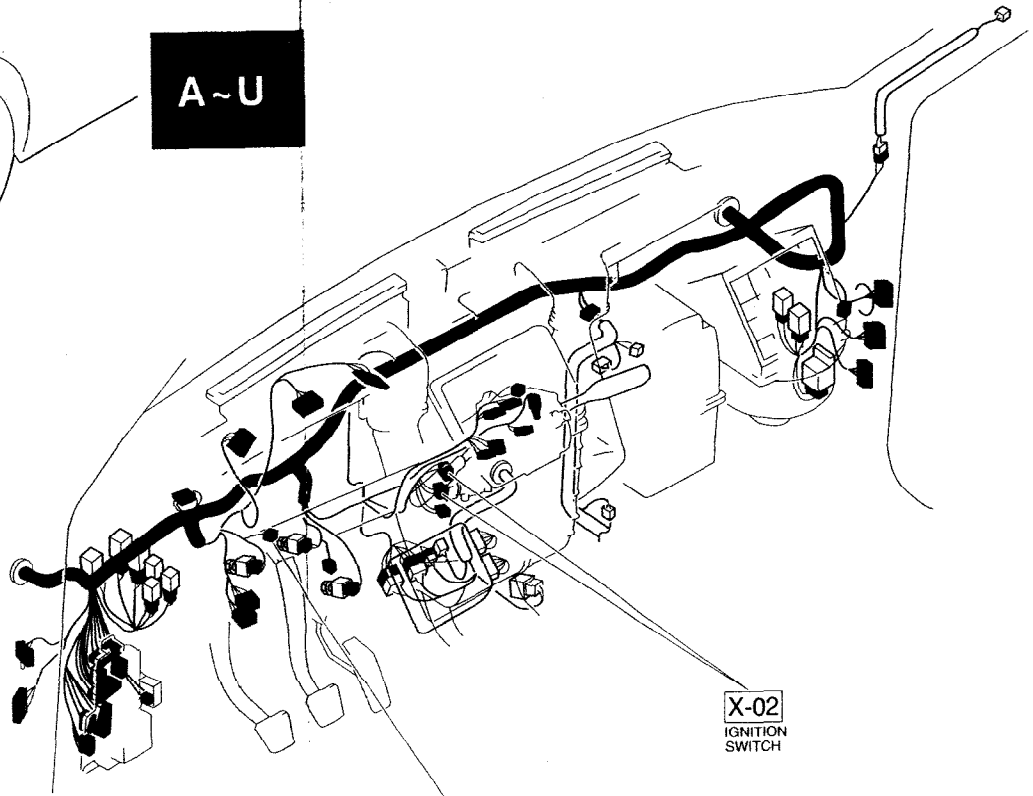


X-17
(F)-(E)



X-01
MAIN FUSE

X-01
FUSE BOX

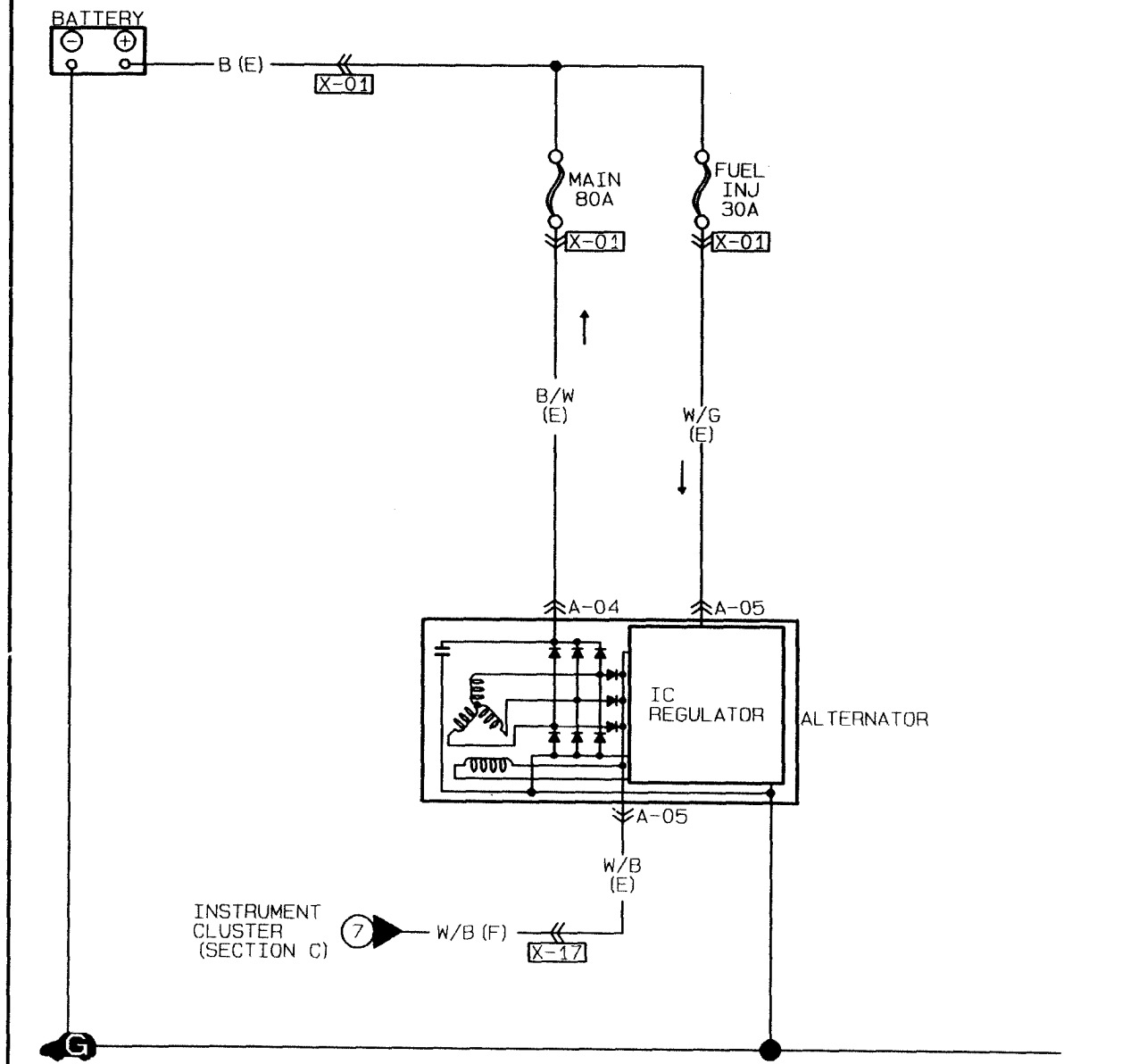


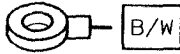
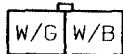
X-02
IGNITION
SWITCH

A-03
STARTER
INTERLOCK
SWITCH

■ CHARGING SYSTEM

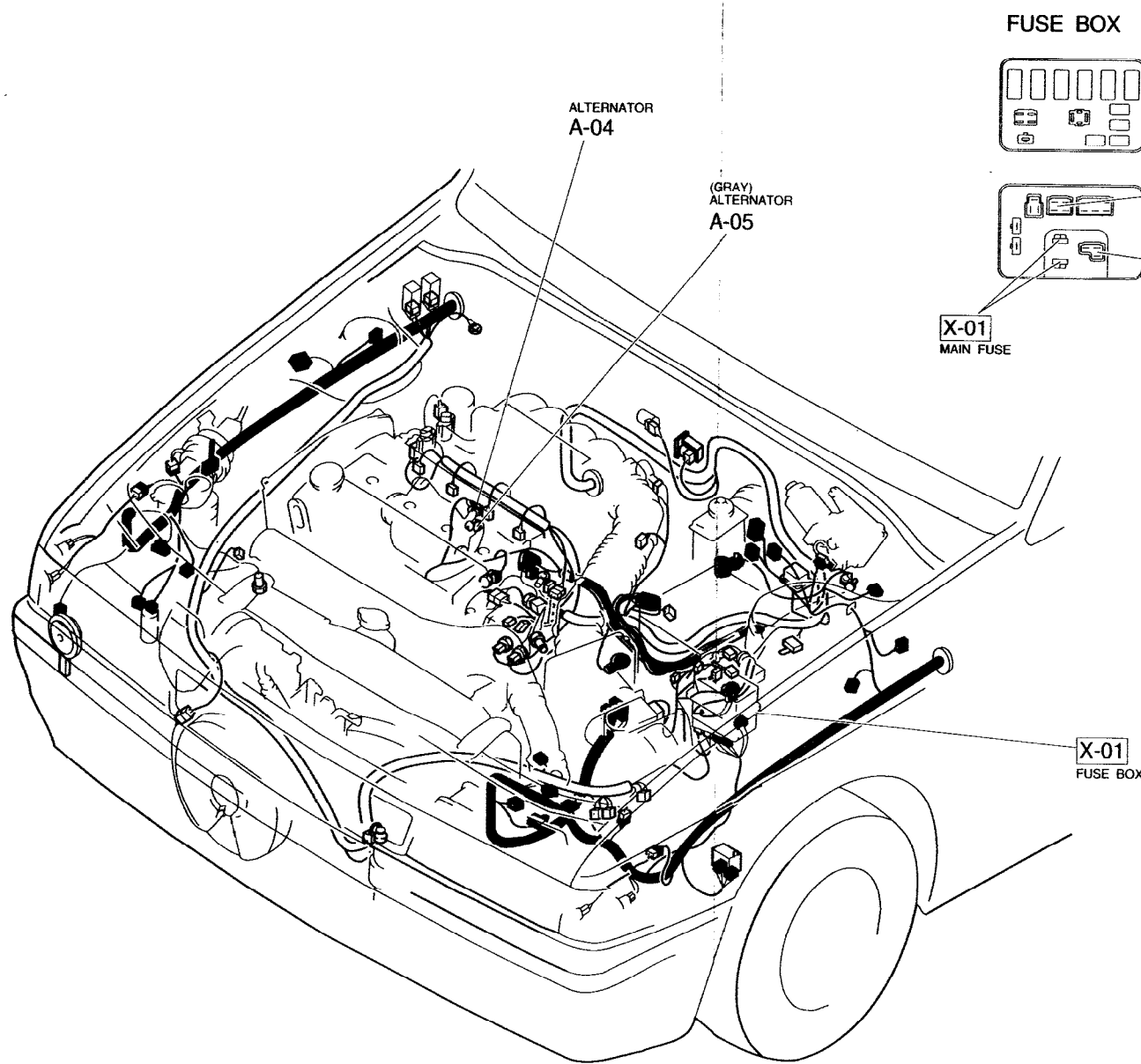
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A-04 ALTERNATOR (E)	A-05 ALTERNATOR (E)		
			



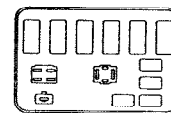
A-2



ALTERNATOR
A-04

(GRAY)
ALTERNATOR
A-05

FUSE BOX

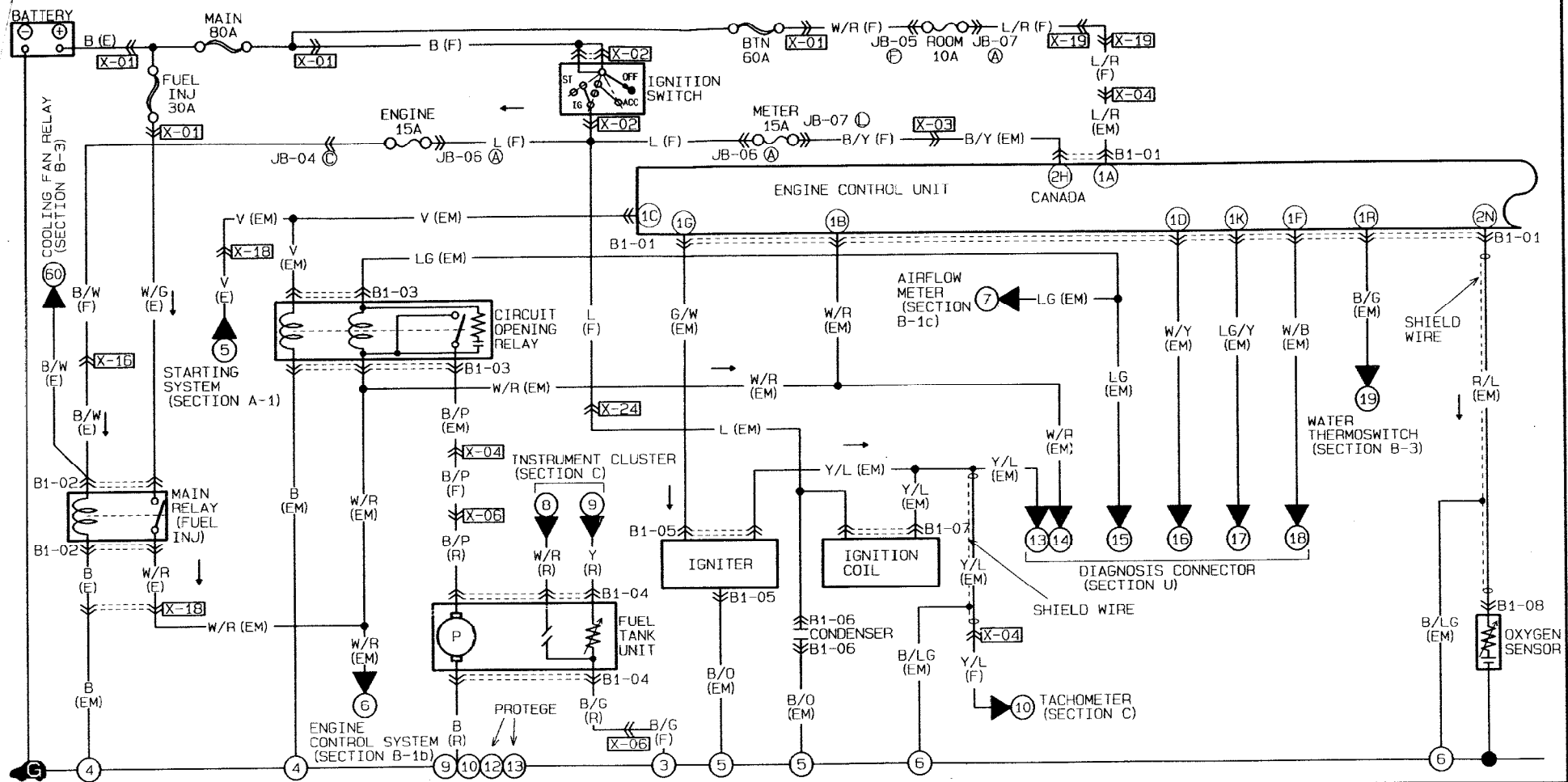


X-17
(F)-(E)

X-01
FUSE BOX

X-01
MAIN FUSE

X-01
FUSE BOX



B1-01 ENGINE CONTROL UNIT (EM)												
1U	1S	1Q	1D	1M	1K	1I	1G	1E	1C	1A	2Y	2W
R/B	O/L	G/B	G	*	LG/Y	*	G/W	Y/B	V	L/R	*	L/D
BR/Y	B/L	B/G	L/Y	R/W	(B/R)*	L/B	*	W/B	W/Y	W/R	*	W/L
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	2Z	2X
											2V	2T
											2R	2P
											2N	2L
											2J	2H
											2F	2D
											2B	

B1-02 MAIN RELAY (E) (FUEL INJ)		
W/G	B/W	B/W
W/R	B	

B1-03 CIRCUIT OPENING RELAY (EM)		
V	W/R	B/P
B	*	LG

B1-04 FUEL TANK UNIT (R)		
B/G	X	Y
B	*	W/R
		B/P

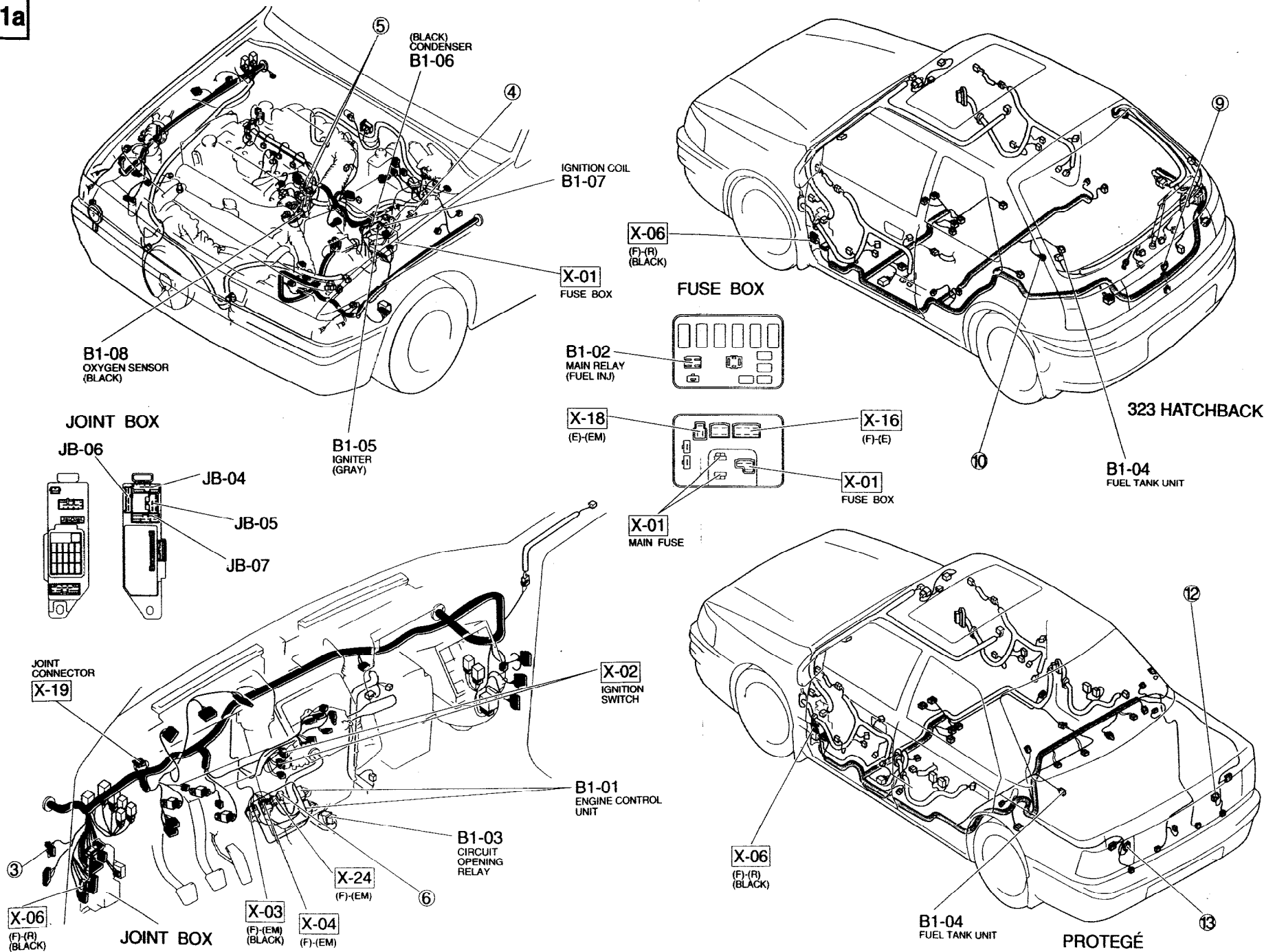
B1-05 IGNITER (EM)		
Y/L	B/O	G/W

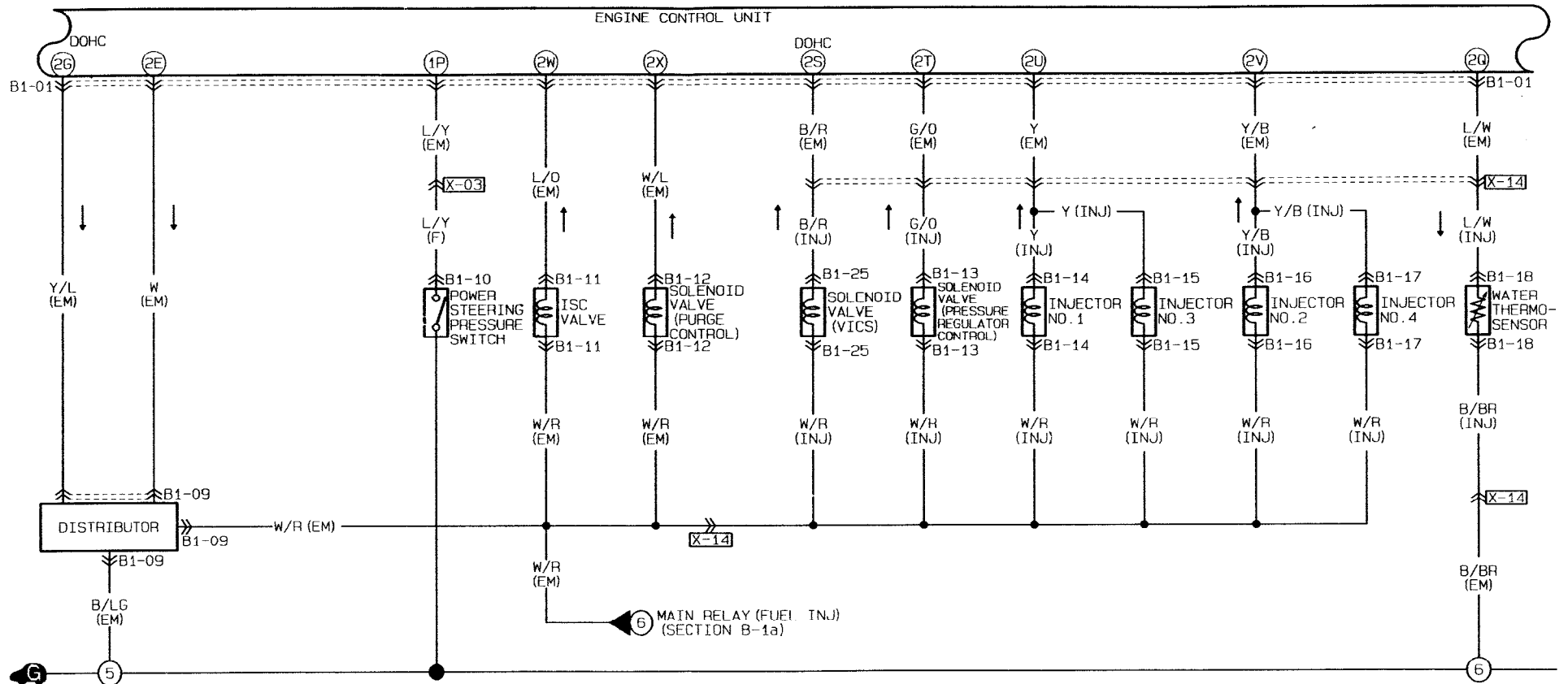
B1-06 CONDENSER (EM)	
B/O	I

B1-07 IGNITION COIL (EM)	
L	Y/L

B1-08 OXYGEN SENSOR (EM)	
R/L	

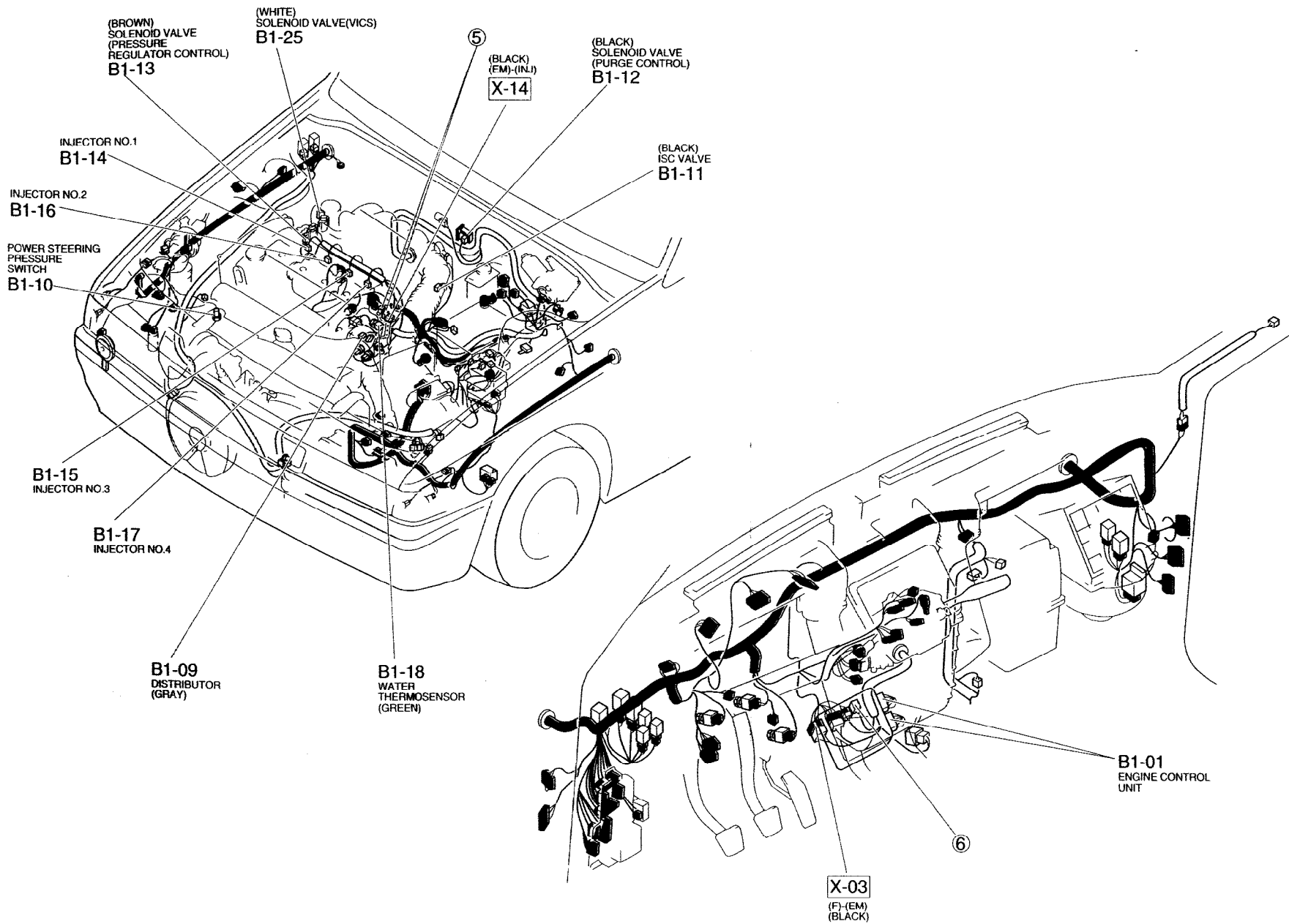
B-1a



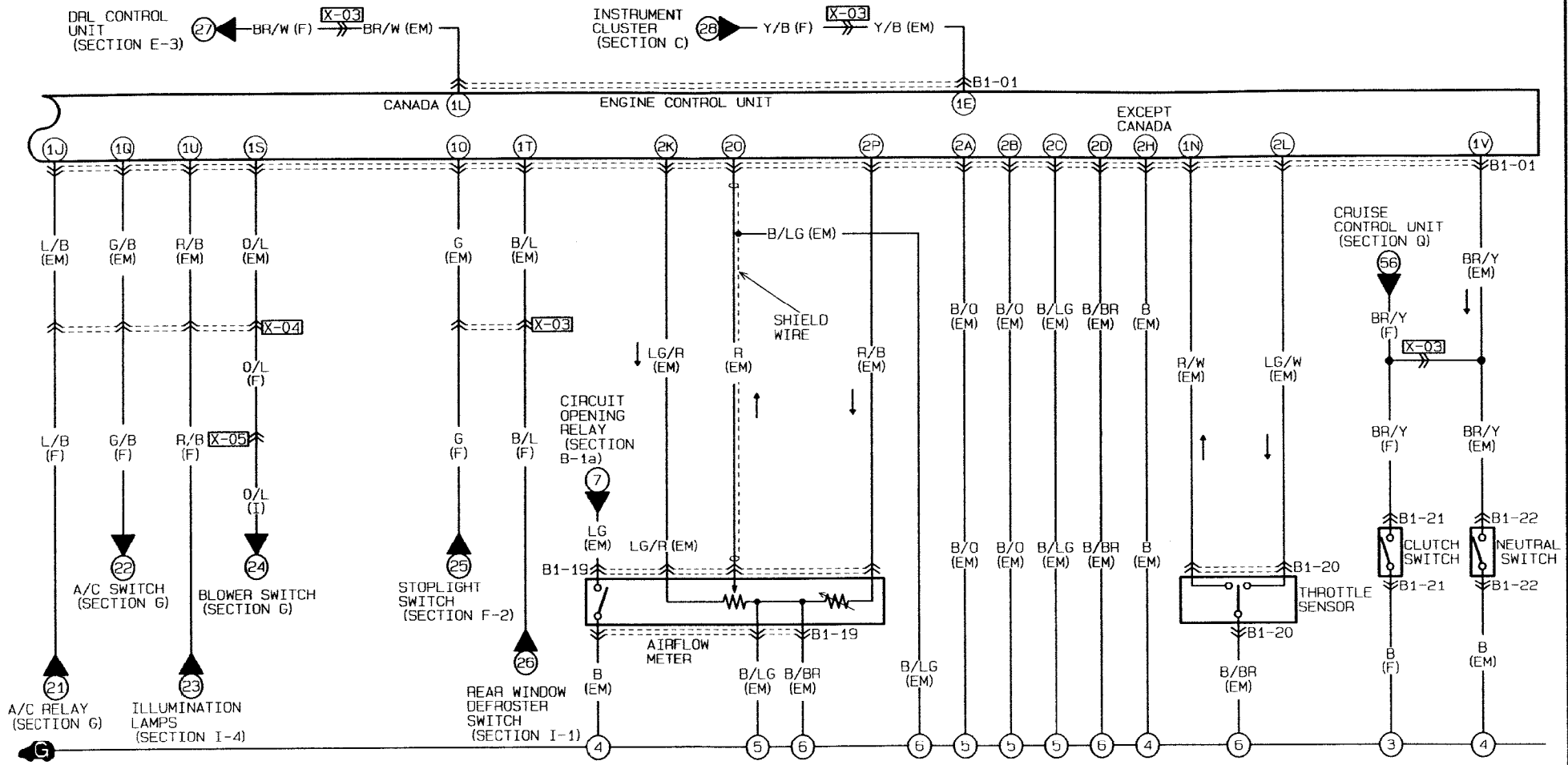


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1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A	2Y	2W	2U	2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A																																																																																							
R/B	O/L	G/B	G	*	LG/Y	*	G/W	Y/B	V	L/R	*	L/O	Y	R/B/R	L/W	R	*	LG/R	*	K/Y/L/S	W	B/LG	B/O																																																																																							
BR/Y	B/L	B/G	L/Y	R/W	(BR/W)	*	L/B	*	W/B	W/Y	W/R	*	W/L	Y/B	G/O	*	R/B	R/L	LG/W	*	(B/Y)	B	*	B/BR	B/O																																																																																					
1V	1T	1R	1P	1N	1L	1J	1H	1F	10	1B	2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B																																																																																							
<p>B1-11 ISC VALVE (EM)</p>		<p>B1-12 SOLENOID VALVE (PURGE CONTROL) (EM)</p>		<p>B1-13 SOLENOID VALVE (PRESSURE REGULATOR CONTROL) (INJ)</p>		<p>B1-14 INJECTOR NO.1 (INJ)</p>		<p>B1-15 INJECTOR NO.3 (INJ)</p>		<p>B1-16 INJECTOR NO.2 (INJ)</p>		<p>B1-17 INJECTOR NO.4 (INJ)</p>																																																																																																		
<p>B1-18 WATER THERMOSENSOR (INJ)</p>		<p>B1-25 SOLENOID VALVE (VICS) (INJ)</p>																																																																																																												

B-1b



NG
CH (F)
4 (INJ)

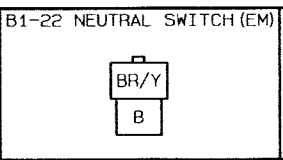
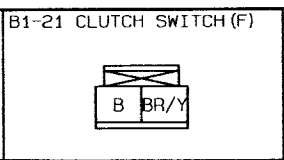
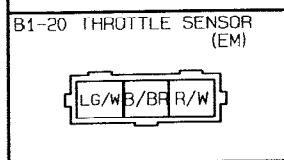


B1-01 ENGINE CONTROL UNIT (EM)

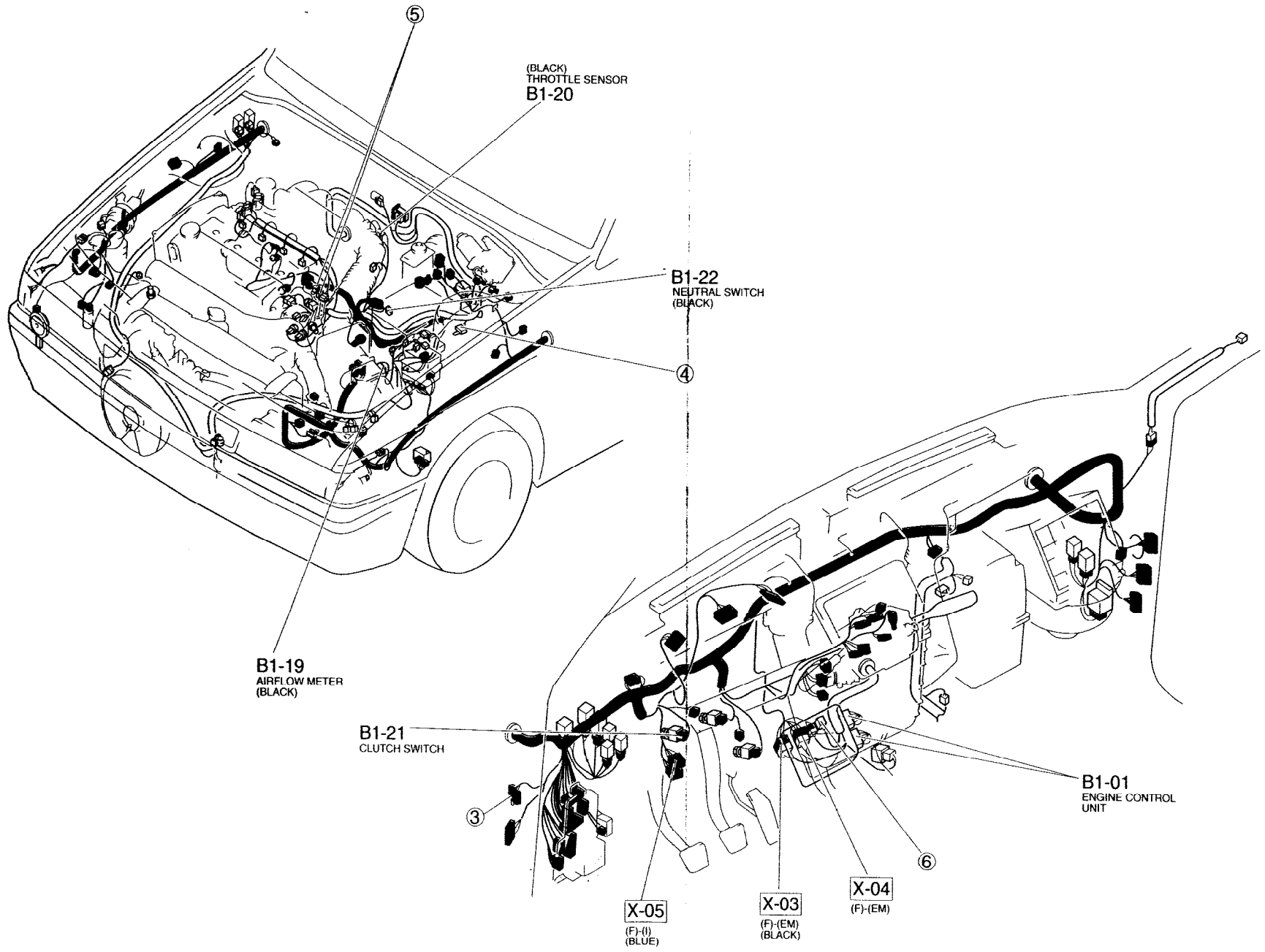
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R/B	O/L	G/B	G	*	LG/Y	x	G/W	Y/B	V	L/R	*	L/D	Y	<B/R>	L/W	R	*	LG/R	*	<Y/L>	W	B/LG	B/O	
BR/Y	B/L	B/G	L/Y	R/W	(BR/W)	*	L/B	*	W/B	W/Y	W/R	*	W/L	Y/B	G/O	*	R/B	R/L	LG/W	*	(B/Y)	*	B/BR	B/O
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	2Z	2X	2V	2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	

B1-19 AIRFLOW METER (EM)

R/B	R	B/BR	LG/R	B/LG	B	LG
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B-1c



V_B: Battery Voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
1A	—	—	Battery	Constant	V _B	For backup
1B	○		Main relay (FUEL INJ relay)	Ignition switch OFF	0V	—
				ON	V _B	
1C	○		Ignition switch (START)	While cranking	Approx. 10V	—
				Ignition switch ON	0V	
1D		○	Self-Diagnosis Checker (Monitor lamp)	Test switch at "SELF-TEST" Lamp illuminated for 3 sec. after ignition switch OFF→ON	4.5—5.5V	With Self-Diagnosis Checker and System Selector
				Lamp not illuminated after 3 sec.	V _B	
				Test switch at "O ₂ MONITOR" at idle Monitor lamp illuminated	4.5—5.5V	
				Test switch at "O ₂ MONITOR" at idle Monitor lamp not illuminated	V _B	
1E		○	Malfunction indicator lamp (MIL)	Lamp illuminated for 3 sec. after ignition switch OFF→ON	Below 2.5V	With System Selector test switch at "SELF-TEST"
				Lamp not illuminated after 3 sec.	V _B	
				Lamp illuminated	Below 2.5V	
				Lamp not illuminated	V _B	
1F		○	Self-Diagnosis Checker (Code Number)	Buzzer sounded for 3 sec. after ignition switch OFF→ON	Below 2.5V	• With Self-Diagnosis Checker and System Selector • With System Selector test switch at "SELF-TEST"
				Buzzer not sounded after 3 sec.	V _B	
				Buzzer sounded	Below 2.5V	
				Buzzer not sounded	V _B	
1G		○	Igniter	Ignition switch ON	0V	—
				Idle	Approx. 0.2V	
1H	—	—	—	—	—	—
1I	—	—	—	—	—	—
1J		○	A/C relay	Ignition switch ON	V _B	—
				A/C switch ON at idle	Below 2.5V	
				A/C switch OFF at idle	V _B	
1K	○		Diagnosis connector (TEN terminal)	System Selector test switch at "O ₂ MONITOR"	V _B	Ignition switch ON
				System Selector test switch at "SELF-TEST"	0V	
1L	○		DRL relay (canada)	Parking brake pulled with ignition switch ON (DRL OFF)	V _B	• DRL: Daytime Running Lights
				Idle (DRL ON)	Below 2.5V	
1M	—	—	—	—	—	—
1N	○		Throttle sensor (Idle switch)	Accelerator pedal released	0V	Ignition switch ON
				Accelerator pedal depressed	V _B	

V_B: Battery Voltage

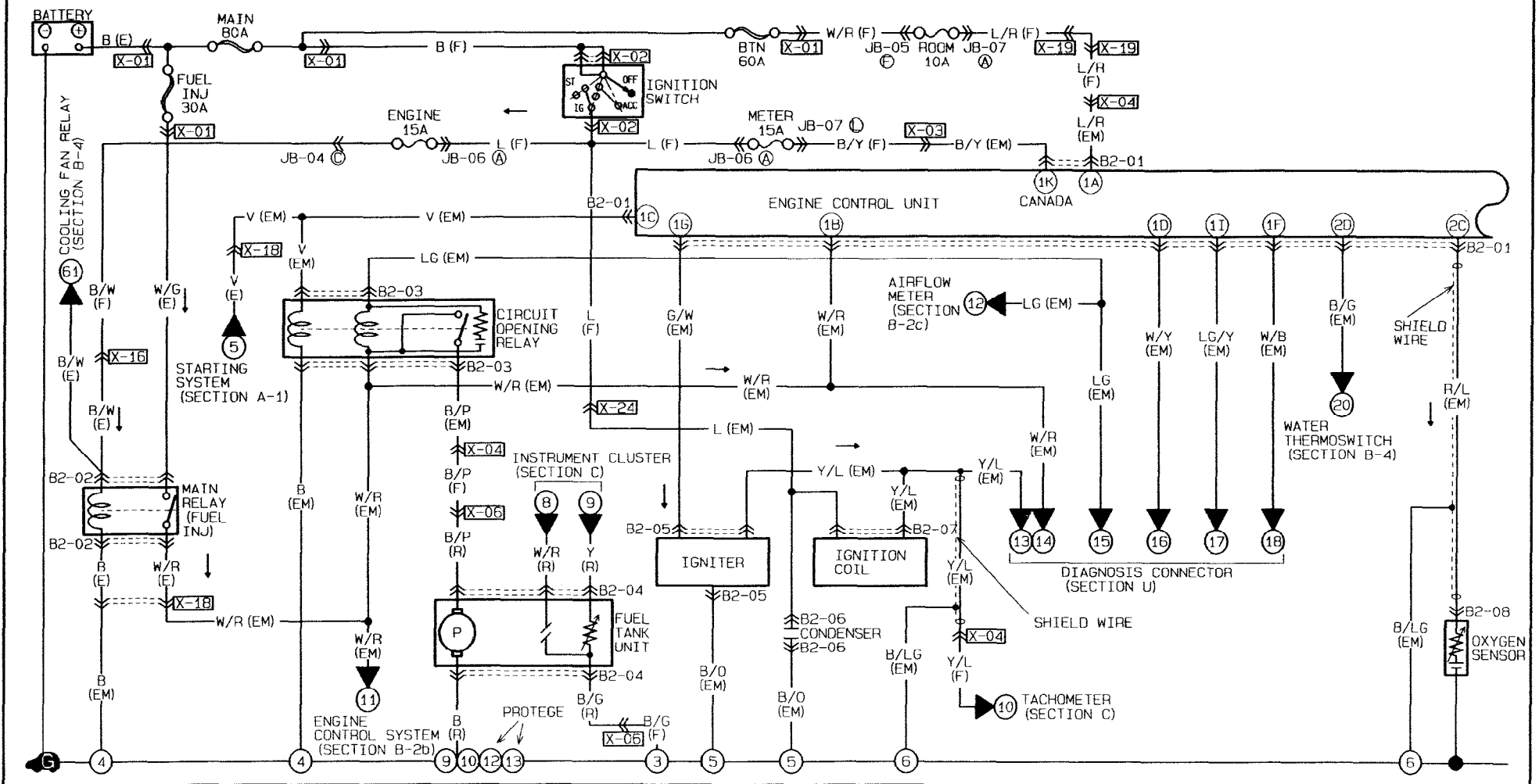
Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
1O	○		Stoplight switch	Brake pedal released	0V	—
				Brake pedal depressed	V _B	
1P	○		P/S pressure switch	Ignition switch ON	V _B	—
				P/S ON at idle	0V	
				P/S OFF at idle	V _B	
1Q	○		A/C switch	A/C switch ON	Below 2.5V	Ignition switch ON and blower motor ON
				A/C switch OFF	V _B	
1R	○		Cooling fan switch	Cooling fan operating (Engine coolant temperature over 97°C (207°F) or diagnosis connector terminal 1FA grounded) (IG ON)	0V	—
				Fan not operating (Idle)	V _B	
1S	○		Blower control switch	Blower control switch OFF or 1st position	V _B	Ignition switch ON
				Blower control switch 2nd or higher position	0V	
1T	○		Rear window defroster switch	Rear window defroster switch OFF	0V	Ignition switch ON
				Rear window defroster switch ON	V _B	
1U	○		Headlight switch	Headlights ON	V _B	—
				Headlights OFF	0V	
1V	○		Neutral/Clutch switches	Neutral position or clutch pedal depressed	0V	Ignition switch ON
				Others	V _B	
2A	—	—	Ground (Injector)	Constant	0V	—
2B	—	—	Ground (Output)	Constant	0V	—
2C	—	—	Ground (CPU)	Constant	0V	—
2D	—	—	Ground (Input)	Constant	0V	—
2E	○		Distributor (Ne-signal)	Ignition switch ON	Approx. 0V or 4.5—5.5V	—
				Idle	Approx. 2V	
2F	—	—	—	—	—	—
2G	○		Distributor (G-signal) (DOHC)	Ignition switch ON	Approx. 0V or 4.5—5.5V	—
				Idle	Approx. 1.5V	

Vs: Battery Voltage

Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
2H	○		Ground (california)	Constant	0V	—
			Main relay (canada)	Ignition switch ON	V _B	
2I	—	—	—	—	—	—
2J	—	—	—	—	—	—
2K	○		Air-flow meter	Constant	4.5—5.5V	Ignition switch ON
2L	○		Throttle sensor (Power switch)	Accelerator pedal released	4.5—5.5V	Ignition switch ON
				Accelerator pedal fully depressed	0V	
2M	—	—	—	—	—	—
2N	○		Oxygen sensor	Ignition switch ON	0V	—
				Idle (Cold engine)	0V	
				Idle (After warm-up)	0—1.0V	
				Increasing engine speed (After warm-up)	0.5V—1.0V	
				Deceleration	0—0.4V	
2O	○		Airflow meter	Ignition switch ON	Approx. 3.8V	—
				Idle	Approx. 3.3V	
2P	○		Intake air thermometer	Ambient air temperature 20°C (68°F) (IG ON)	Approx 2.5V	Built in airflow meter
2Q	○		Water thermosensor	Engine coolant temperature 20°C (68°F)	Approx. 2.5V	Ignition switch ON
				After warm-up	Below 0.5V	
2R	—	—	—	—	—	—
2S	○		Solenoid valve (VICS)	Engine speed below 5,000 rpm	Below 1.5V	• VICS: Variable Inertia Charging System [DOHC]
				Engine speed above 5,000 rpm	V _B	
2T	○		Solenoid valve (Pressure regulator) [BP]	60 [DOHC]/120 [SOHC] seconds after engine started when engine coolant temperature above 90°C (194°F) and intake air temperature above 58°C (136°F) [DOHC]/50°C (122°F) [SOHC]	0V	—
				Other condition at idle	V _B	
2U	○		Injector (Nos. 1,3)	Ignition switch ON	V _B	* Engine Signal Monitor: Green and red lamps flash
				Idle	V _B *	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	V _B	
2V	○		Injector (Nos. 2, 4)	Ignition switch at idle	V _B	
				Idle	V _B *	
				Engine speed above 2,000 rpm on deceleration (After warm-up)	V _B	

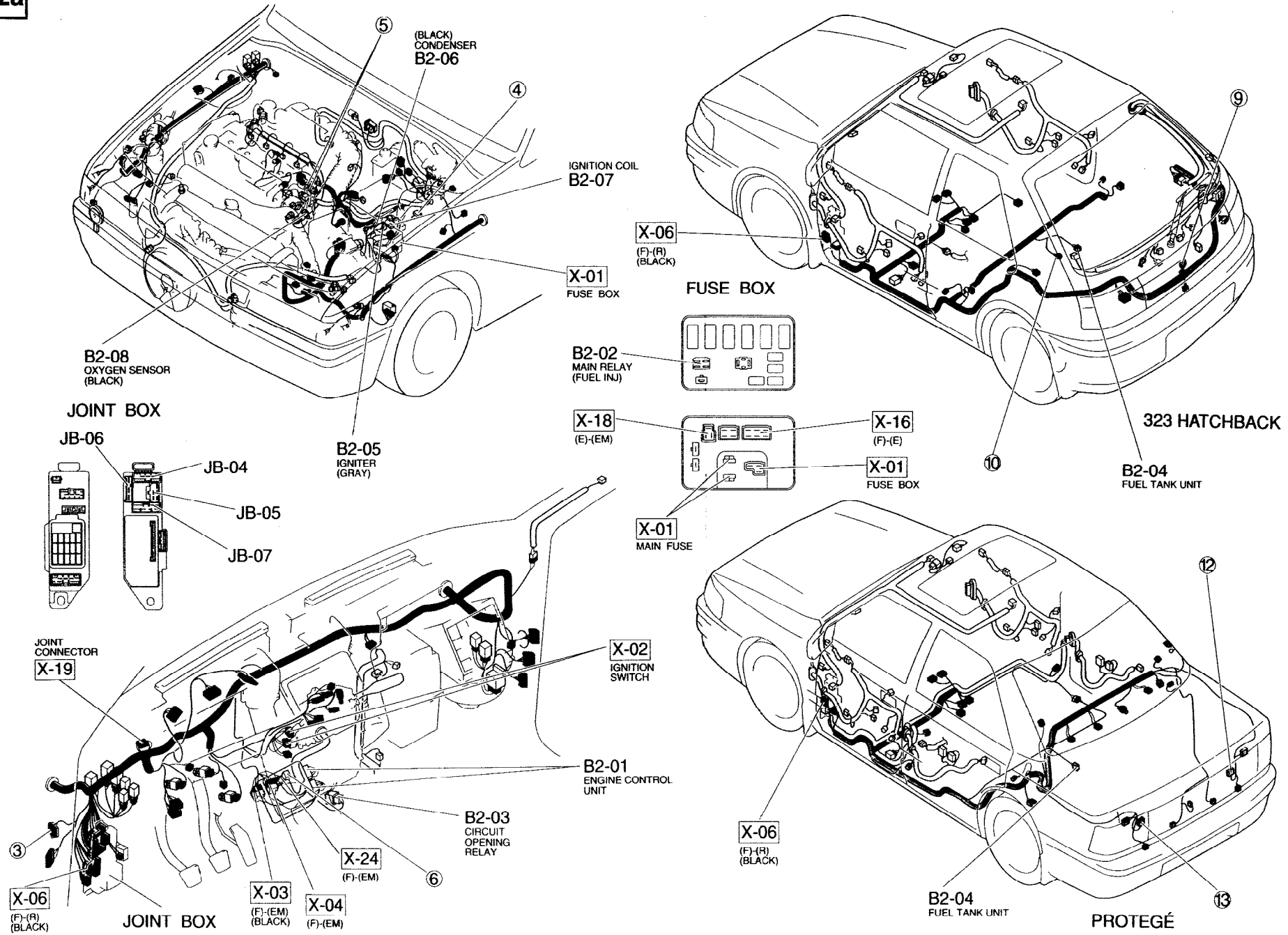
Vs: Battery Voltage

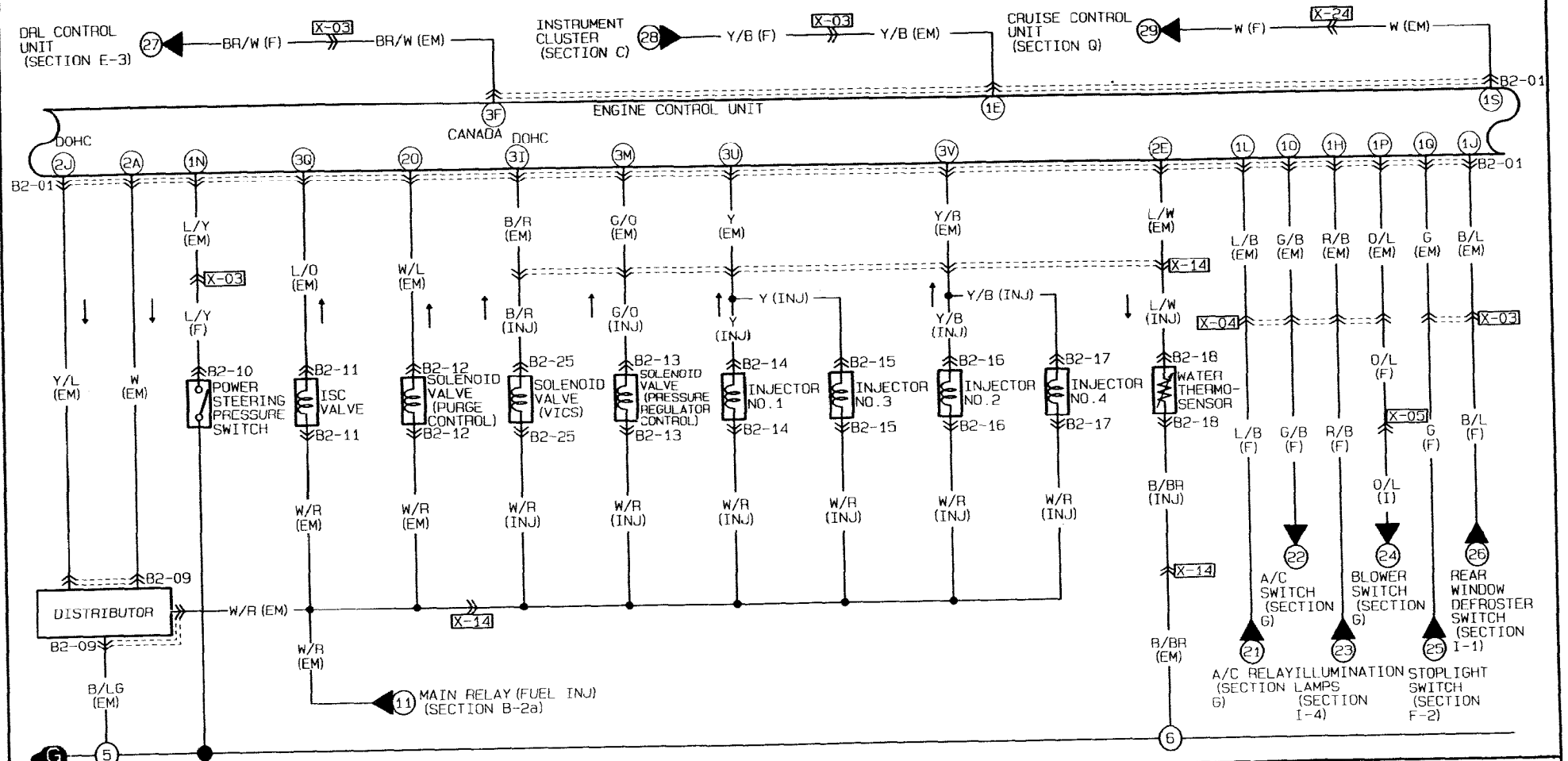
Terminal	Input	Output	Connection to	Test condition	Correct voltage	Remark
2W		○	ISC valve	Ignition switch ON	Approx. 7V	—
				Idle	Approx. 9V	
2X		○	Solenoid valve (Purge control)	Ignition switch ON	V _B	—
				Idle	V _B	
2Y	—	—	—	—	—	—
2Z	—	—	—	—	—	—



B2-01 ENGINE CONTROL UNIT (EM) <table border="1"> <tr> <td>1U</td><td>1S</td><td>1Q</td><td>1O</td><td>1M</td><td>1K</td><td>1I</td><td>1G</td><td>1E</td><td>1C</td><td>1A</td> </tr> <tr> <td>*</td><td>W</td><td>G</td><td>G/B</td><td>G/R</td><td>(B/Y) B</td><td>LG/Y</td><td>G/W</td><td>Y/B</td><td>V</td><td>L/R</td> </tr> <tr> <td>*</td><td>R/W</td><td>B/L</td><td>O/L</td><td>L/Y</td><td>L/B</td><td>B/L</td><td>R/B</td><td>W/B</td><td>W/Y</td><td>W/R</td> </tr> <tr> <td>1V</td><td>1T</td><td>1R</td><td>1P</td><td>1N</td><td>1L</td><td>1J</td><td>1H</td><td>1F</td><td>1D</td><td>1B</td> </tr> </table>										1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A	*	W	G	G/B	G/R	(B/Y) B	LG/Y	G/W	Y/B	V	L/R	*	R/W	B/L	O/L	L/Y	L/B	B/L	R/B	W/B	W/Y	W/R	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	B2-02 MAIN RELAY (E) (FUEL INJ.) <table border="1"> <tr> <td>20</td><td>2M</td><td>2K</td><td>2I</td><td>2G</td><td>2E</td><td>2C</td><td>2A</td> </tr> <tr> <td>W/L</td><td>W/L</td><td>R/B</td><td>LG/R</td><td>W/B</td><td>L/W</td><td>R/L</td><td>W</td> </tr> <tr> <td>BR/Y</td><td>Y/L</td><td>*</td><td>(Y/L) *</td><td>BR/B</td><td>LG/W</td><td>B/G</td><td>R</td> </tr> <tr> <td>3Y</td><td>3W</td><td>3U</td><td>3S</td><td>3Q</td><td>3O</td><td>3M</td><td>3K</td><td>3I</td><td>3G</td><td>3E</td><td>3C</td><td>3A</td> </tr> <tr> <td>O</td><td>L/O</td><td>Y</td><td>*</td><td>L/O</td><td>*</td><td>G/O</td><td>*</td><td>(B/R) *</td><td>Y/W</td><td>Y</td><td>B/LG</td><td>B/O</td> </tr> <tr> <td>L</td><td>L/Y</td><td>Y/B</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>Y/R</td><td>(BR/W) *</td><td>B/BR</td><td>B/O</td> </tr> <tr> <td>3Z</td><td>3X</td><td>3V</td><td>3T</td><td>3R</td><td>3P</td><td>3N</td><td>3L</td><td>3J</td><td>3H</td><td>3F</td><td>3D</td><td>3B</td> </tr> </table>										20	2M	2K	2I	2G	2E	2C	2A	W/L	W/L	R/B	LG/R	W/B	L/W	R/L	W	BR/Y	Y/L	*	(Y/L) *	BR/B	LG/W	B/G	R	3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A	O	L/O	Y	*	L/O	*	G/O	*	(B/R) *	Y/W	Y	B/LG	B/O	L	L/Y	Y/B	*	*	*	*	*	*	Y/R	(BR/W) *	B/BR	B/O	3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B
1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A																																																																																																																																	
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B2-03 CIRCUIT OPENING RELAY (EM) <table border="1"> <tr> <td>V</td><td>W/R</td><td>B/P</td> </tr> <tr> <td>B</td><td>*</td><td>LG</td> </tr> </table>			V	W/R	B/P	B	*	LG	B2-04 FUEL TANK UNIT (R) <table border="1"> <tr> <td>B/G</td><td>X</td><td>Y</td> </tr> <tr> <td>B</td><td>*</td><td>W/R</td><td>B/P</td> </tr> </table>			B/G	X	Y	B	*	W/R	B/P	B2-05 IGNITER (EM) <table border="1"> <tr> <td>Y/L</td><td>B/O</td><td>G/W</td> </tr> </table>			Y/L	B/O	G/W	B2-06 CONDENSER (EM) <table border="1"> <tr> <td>B/O</td><td>L</td> </tr> </table>			B/O	L	B2-07 IGNITION COIL (EM) <table border="1"> <tr> <td>L</td><td>Y/L</td> </tr> </table>			L	Y/L	B2-08 OXYGEN SENSOR (EM) <table border="1"> <tr> <td>R/L</td> </tr> </table>			R/L																																																																																																					
V	W/R	B/P																																																																																																																																									
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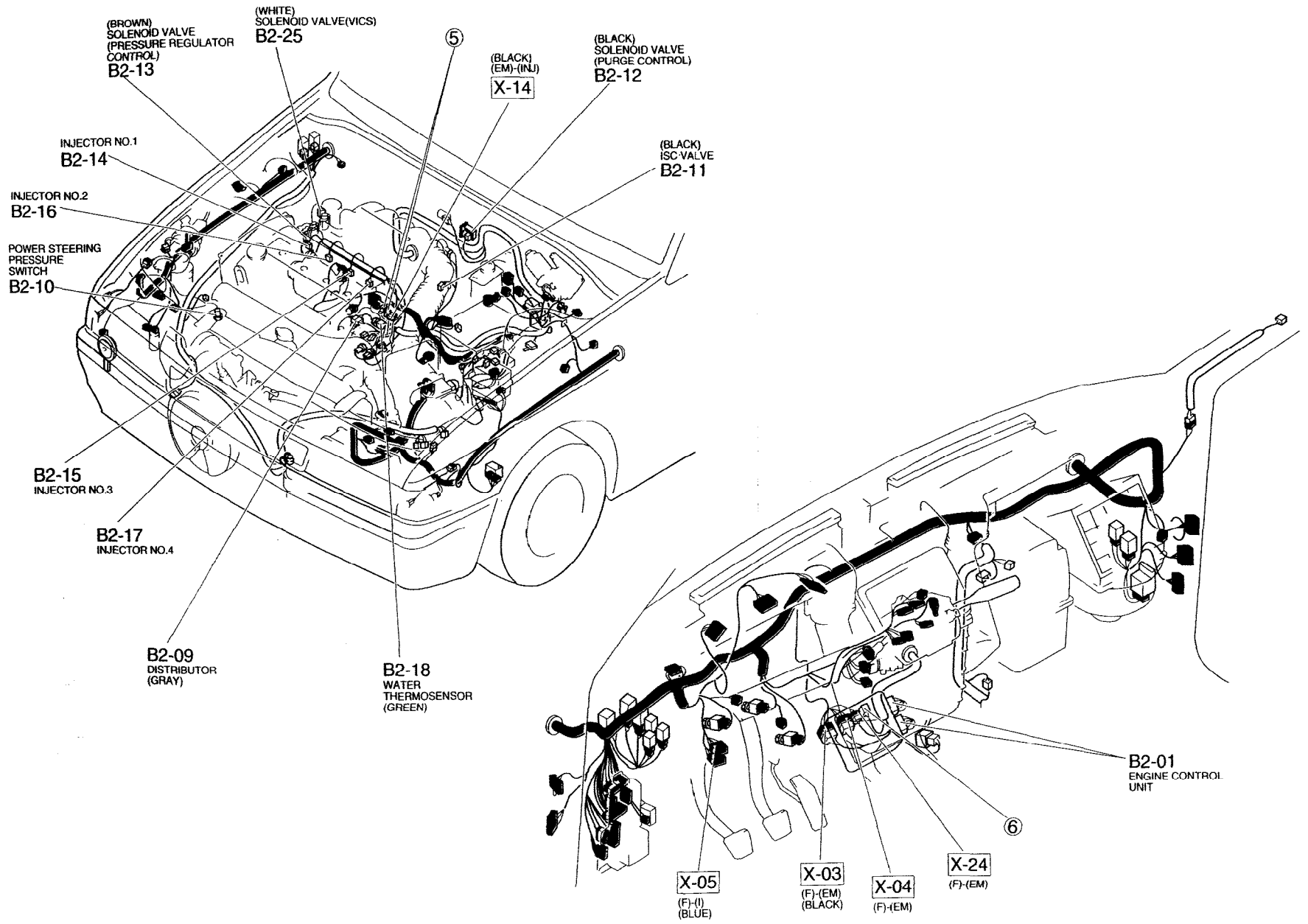
B-2a

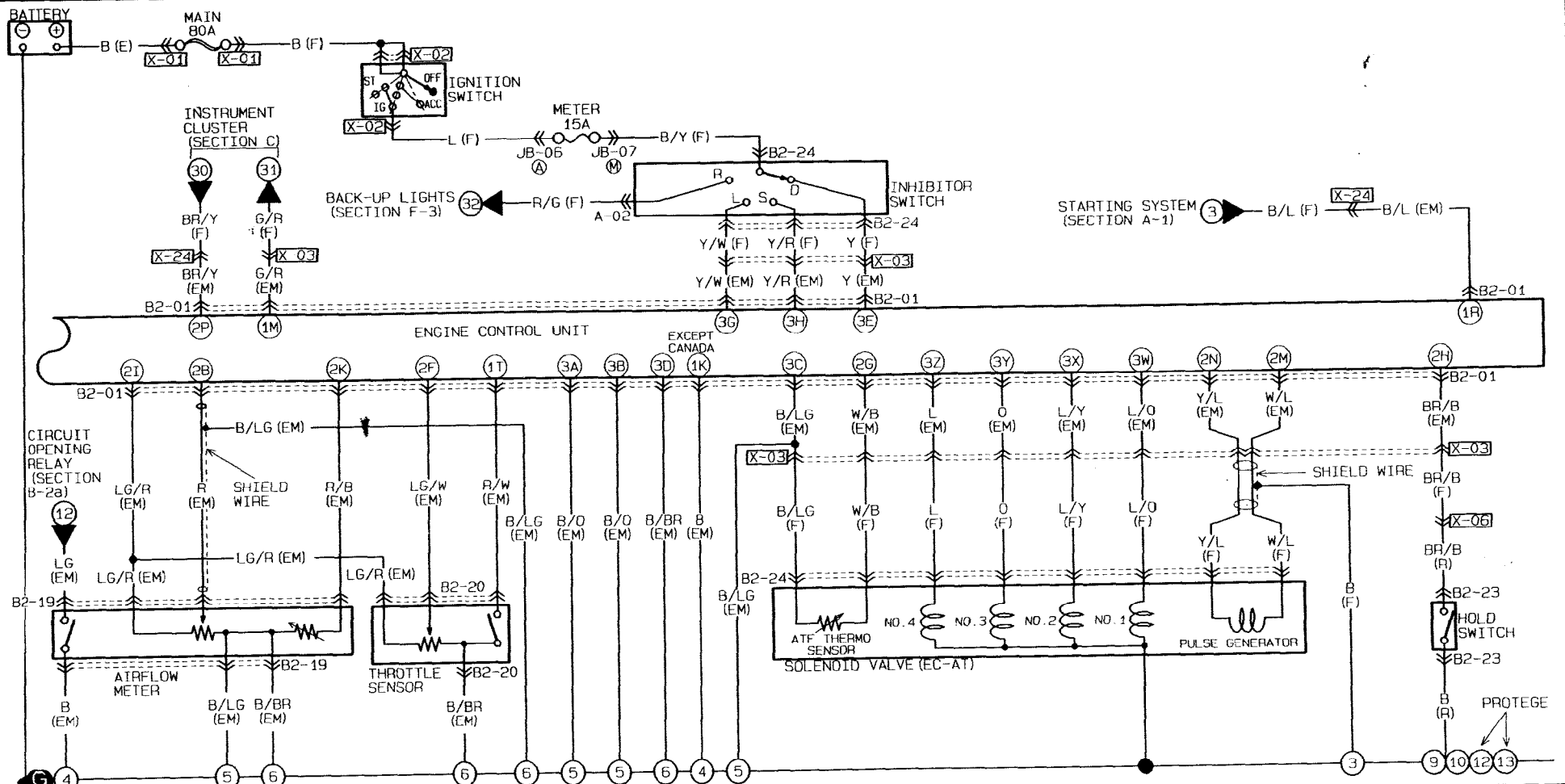




<p>B2-01 ENGINE CONTROL UNIT (EM)</p> <table border="1"> <tr> <td>1U</td><td>1S</td><td>1Q</td><td>10</td><td>1M</td><td>1K</td><td>1I</td><td>1G</td><td>1E</td><td>1C</td><td>1A</td> </tr> <tr> <td>*</td><td>W</td><td>G</td><td>G/B</td><td>G/R</td><td>(B/Y)</td><td>LG/Y</td><td>G/W</td><td>Y/B</td><td>V</td><td>L/R</td> </tr> <tr> <td>*</td><td>R/W</td><td>B/L</td><td>O/L</td><td>L/Y</td><td>L/B</td><td>B/L</td><td>R/B</td><td>W/B</td><td>W/Y</td><td>W/R</td> </tr> <tr> <td>1V</td><td>1T</td><td>1R</td><td>1P</td><td>1N</td><td>1L</td><td>1J</td><td>1H</td><td>1F</td><td>1D</td><td>1B</td> </tr> </table>										1U	1S	1Q	10	1M	1K	1I	1G	1E	1C	1A	*	W	G	G/B	G/R	(B/Y)	LG/Y	G/W	Y/B	V	L/R	*	R/W	B/L	O/L	L/Y	L/B	B/L	R/B	W/B	W/Y	W/R	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B	<p>B2-09 DISTRIBUTOR (EM)</p> <table border="1"> <tr> <td>20</td><td>2M</td><td>2K</td><td>2I</td><td>2G</td><td>2E</td><td>2C</td><td>2A</td> </tr> <tr> <td>W/L</td><td>W/L</td><td>R/B</td><td>LG/R</td><td>W/B</td><td>L/W</td><td>R/L</td><td>W</td> </tr> <tr> <td>BR/Y</td><td>Y/L</td><td>*</td><td>(Y/L)</td><td>*</td><td>BR/B</td><td>L/G</td><td>W/B</td> </tr> <tr> <td>2P</td><td>2N</td><td>2L</td><td>2J</td><td>2H</td><td>2F</td><td>2D</td><td>2B</td> </tr> </table>										20	2M	2K	2I	2G	2E	2C	2A	W/L	W/L	R/B	LG/R	W/B	L/W	R/L	W	BR/Y	Y/L	*	(Y/L)	*	BR/B	L/G	W/B	2P	2N	2L	2J	2H	2F	2D	2B	<p>B2-16 INJECTOR NO. 2 (INJ)</p> <table border="1"> <tr> <td>3Y</td><td>3W</td><td>3U</td><td>3S</td><td>3Q</td><td>3O</td><td>3M</td><td>3K</td><td>3I</td><td>3G</td><td>3E</td><td>3C</td><td>3A</td> </tr> <tr> <td>O</td><td>L/O</td><td>Y</td><td>*</td><td>L/O</td><td>*</td><td>G/O</td><td>*</td><td>(B/R)</td><td>Y/W</td><td>Y</td><td>B/LG</td><td>B/O</td> </tr> <tr> <td>L</td><td>L/Y</td><td>Y/B</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>*</td><td>Y/R</td><td>(BR/W)</td><td>B/BR</td><td>B/O</td> </tr> <tr> <td>3Z</td><td>3X</td><td>3V</td><td>3T</td><td>3R</td><td>3P</td><td>3N</td><td>3L</td><td>3J</td><td>3H</td><td>3F</td><td>3D</td><td>3B</td> </tr> </table>										3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A	O	L/O	Y	*	L/O	*	G/O	*	(B/R)	Y/W	Y	B/LG	B/O	L	L/Y	Y/B	*	*	*	*	*	*	Y/R	(BR/W)	B/BR	B/O	3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B
1U	1S	1Q	10	1M	1K	1I	1G	1E	1C	1A																																																																																																																																																			
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<p>B2-10 POWER STEERING PRESSURE SWITCH (F)</p>			<p>B2-11 ISC VALVE (EM)</p>			<p>B2-12 SOLENOID VALVE (PURGE CONTROL) (EM)</p>			<p>B2-13 SOLENOID VALVE (PRESSURE REGULATOR CONTROL) (INJ)</p>			<p>B2-14 INJECTOR NO. 1 (INJ)</p>			<p>B2-15 INJECTOR NO. 3 (INJ)</p>			<p>B2-16 INJECTOR NO. 2 (INJ)</p>																																																																																																																																											
<p>B2-17 INJECTOR NO. 4 (INJ)</p>			<p>B2-18 WATER THERMOSENSOR (INJ)</p>			<p>B2-25 SOLENOID VALVE (VICs) (INJ)</p>																																																																																																																																																							

B-2b





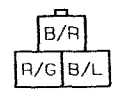
B2-01 ENGINE CONTROL UNIT (EM)

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*	W	G	G/B	G/R	(B/Y) B	LG/Y	G/W	Y/B	V	L/R
*	R/W	B/L	O/L	L/Y	L/B	B/L	R/B	W/B	W/Y	W/R
1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

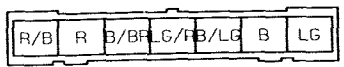
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W/L	W/L	R/B	LG/R	W/B	L/W	R/L	W
BR/Y	Y/L	*	RY/L	*	BR/B	LG/W	B/G
2P	2N	2L	2J	2H	2F	2D	2B

3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A
O	L/O	Y	*	L/O	*	G/O	*	(B/R) *	Y/W	Y	B/LG	B/O
L	L/Y	Y/B	*	*	*	*	*	*	Y/R	(BR/W) *	B/BR	B/O
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B

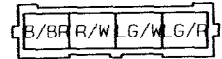
A-02 INHIBITOR SWITCH (F)



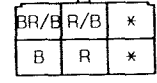
B2-19 AIRFLOW METER (EM)



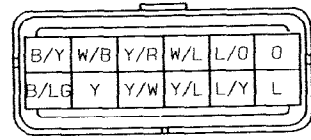
B2-20 THROTTLE SENSOR (EM)



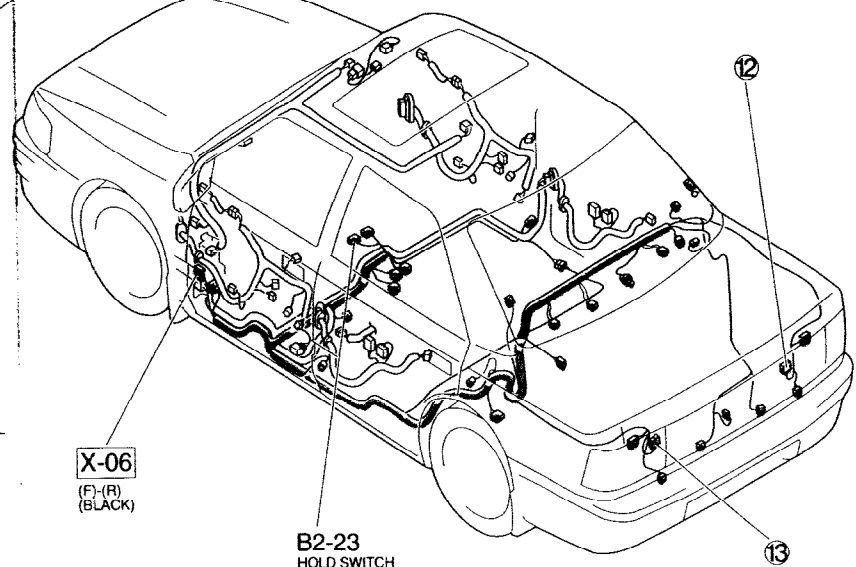
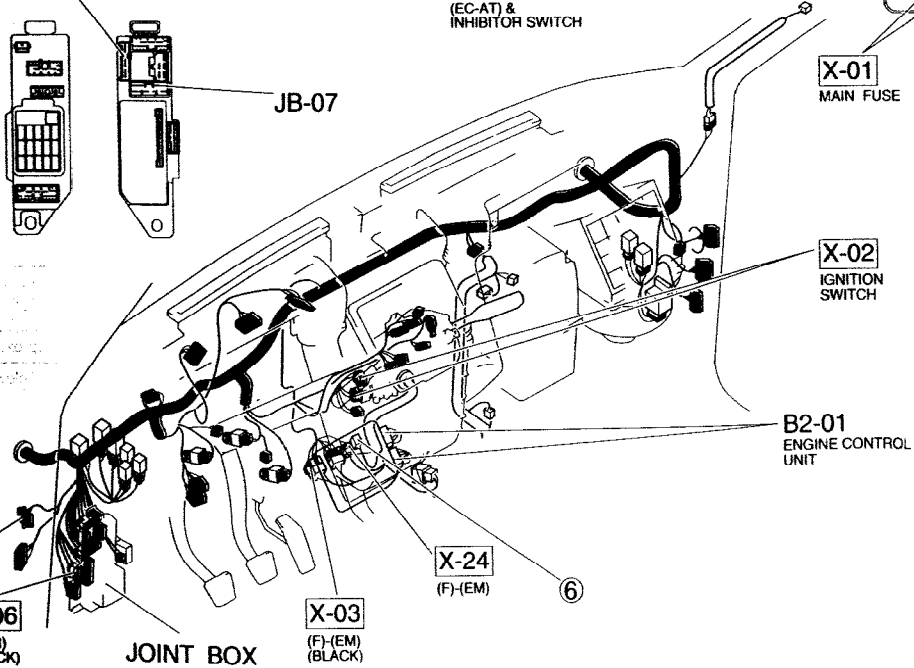
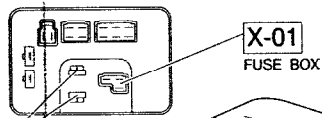
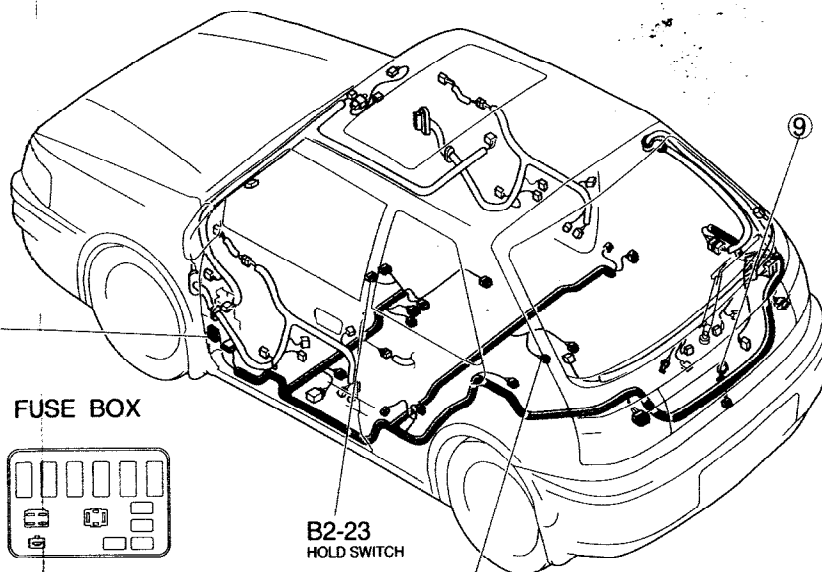
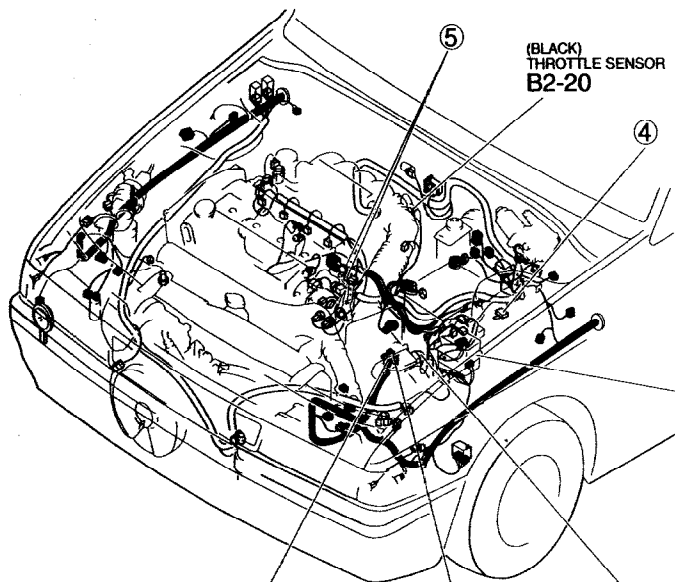
B2-23 HOLD SWITCH (R)



B2-24 SOLENOID VALVE (EC-AT) & INHIBITOR SWITCH (F)



B-2c



Terminal voltage (ATX)

Vs: Battery Voltage

Terminal	Input	Output	Connected to	Test condition	Correct voltage	Remark	
1A	—	—	Battery	Constant	V _B	For backup	
1B	○		Main relay (FUEL INJ relay)	Ignition switch	OFF	0V	—
					ON	V _B	
1C	○		Ignition switch (START)	While cranking	Approx. 10V	—	
				Ignition switch ON	0V		
1D		○	Self-Diagnosis Checker (monitor lamp)	Test switch at "SELF-TEST" Lamp illuminated for 3 sec. after ignition switch OFF→ON	4.5—5.5V	With Self-Diagnosis Checker and System Selector	
				Lamp not illuminated after 3 sec.	V _B		
				Test switch at "O ₂ MONITOR" at idle Monitor lamp illuminated	4.5→5.5V		
				Test switch at "O ₂ MONITOR" at idle Monitor lamp not illuminated	V _B		
1E		○	Malfunction indicator lamp (MIL)	Lamp illuminated for 3 sec. after ignition switch OFF→ON	Below 2.5V	With System selector test switch at "SELF-TEST"	
				Lamp not illuminated after 3 sec.	V _B		
				Lamp illuminated	Below 2.5V		
				Lamp not illuminated	V _B		
1F		○	Self-Diagnosis Checker (code number)	Buzzer sounded for 3 sec. after ignition switch OFF→ON	Below 2.5V	• With Self-Diagnosis Checker and System Selector	
				Buzzer not sounded after 3 sec.	V _B		
				Buzzer sounded	Below 2.5V	• With System Selector test switch at "SELF-TEST"	
				Buzzer not sounded	V _B		
1G		○	Igniter	Ignition switch ON	0V	—	
				Idle	Approx. 0.2V		
1H	○		Headlight switch	Headlights ON	V _B	—	
				Headlights OFF	0V		
1I	○		Diagnosis connector (TEN terminal)	System Selector test switch at "O ₂ MONITOR"	V _B	Ignition switch ON	
				System Selector test switch at "SELF-TEST"	0V		
1J	○		Rear window defroster switch	Rear window defroster switch OFF	0V	Ignition switch ON	
				Rear window defroster switch ON	V _B		
1K	○		Ground (california)	Constant	0V	—	
			Main relay (canada)	Ignition switch ON	V _B		
1L		○	A/C relay	Ignition switch ON	V _B	—	
				A/C switch ON at idle	Below 2.5V		
				A/C switch OFF at idle	V _B		
1M	○		Vehicle speed sensor	Vehicle stopped	0 or 8V	—	
				Vehicle driving	4—5V		
1N	○		P/S pressure switch	Ignition switch ON	V _B	—	
				P/S ON at idle (turning)	0V		
				P/S OFF at idle	V _B		

Terminal voltage

Vs: Battery Voltage

Terminal	Input	Output	Connected to	Test condition	Correct voltage	Remark	
1O	○		A/C switch	A/C switch ON	Below 2.5V	Ignition switch ON and blower motor ON	
				A/C switch OFF	V _B		
1P	○		Blower control switch	Blower control switch OFF or 1st position	V _B	Ignition switch ON	
				Blower control switch 2nd or higher position	0V		
1Q	○		Stoplight switch	Brake pedal released	Below 1.0V	—	
				Brake pedal depressed	V _B		
1R	○		Inhibitor switch (P.N range)	N or P range	0V	Ignition switch ON	
				Other ranges	V _B		
1S	○		Cruise control main switch	Set or Resume switch ON or vehicle speed 8km/h (5mph) lower than preset speed (Driving vehicle cruise control operation)	Below 1.5V	Ignition switch ON	
				Normal conditions	V _B		
1T	○		Throttle sensor (idle switch)	Accelerator pedal released	Below 1.0V	Ignition switch ON	
				Accelerator pedal depressed	V _B		
1U	—	—	—	—	—	—	
1V	—	—	—	—	—	—	
2A	○		Distributor (Ne-signal)	Ignition switch ON	Approx. 0V or 5V	—	
				Idle	Approx. 2V		
2B	○		Airflow meter	Ignition switch ON	Approx. 3.8V	—	
				Idle	Approx. 3.3V		
2C	○		Oxygen sensor	Ignition switch ON	0V	—	
				Idle (cold engine)	0V		
				Idle (after warm-up)	0—1.0V		
				Increasing engine speed (after warm-up)	0.5V—1.0V		
				Deceleration	0—0.4V		
2D	○		Cooling fan switch	Fan operating (engine coolant temperature over 97°C (207°F) or diagnosis connector terminal TFA grounded)	0V	—	
				Fan not operating (idle)	V _B		
2E	○		Water thermosensor	Engine coolant temperature 20°C (68°F)	Approx. 2.5V	Ignition switch ON	
				After warm-up	Below 0.5V		
2F	○		Throttle sensor	Accelerator pedal released	Approx. 0.5V	—	
				Accelerator pedal fully depressed	Approx. 4.0V		
2G	○		ATF thermosensor	ATF temp	-30°C (-20°F)—150°C (302°F)	Approx. 4.95—1.12V	Ignition switch ON
					20°C (68°F)	Approx. 4.6V	
					130°C (266°F)	Approx. 1.54V	
2H	○		Hold switch	Hold mode	Below 2V	Ignition switch ON	
				Normal mode	V _B		

V_B: Battery Voltage

Terminal	Input	Output	Connected to	Test condition	Correct voltage	Remark
2I	○		Throttle sensor/Air-flow meter/Water thermosensor	Constant	4.5—5.5V	Ignition switch ON
2J	○		Distributor (G-signal) [DOHC]	Ignition switch ON	0V or 5V	—
				Idle	Approx. 1.5V	
2K	○		Intake air thermosensor	Ambient air temperature 20°C (68°F)	Approx. 2.5V	Built in airflow meter
2L	—	—	—	—	—	—
2M	○		*Pulse generator	Engine running at idle (N range)	1V	—
				Engine stopped (Ignition switch ON)	0V	
2N	—	—	Pulse generator (Ground)	Constant	0V	—
2O	○		Solenoid valve (purge control)	Ignition switch ON	V _B	—
				Idle	V _B	
2P	○		Hold indicator	Hold mode	0V	Ignition switch ON
				Normal mode	V _B	
3A	—	—	Ground (Injector)	Constant	0V	—
3B	—	—	Ground (Output)	Constant	0V	—
3C	—	—	Ground (CPU)	Constant	0V	—
3D	—	—	Ground (Input)	Constant	0V	—
3E	○		Inhibitor switch (D range)	D range	V _B	Ignition switch ON
				Others ranges	0V	
3F	○		DRL relay (Canada)	Parking brake pulled with ignition switch ON (DRL OFF)	V _B	*DRL: Daytime Running Lights
				Idle (DRL ON)	Below 2.5V	
3G	○		Inhibitor switch (L range)	L range	V _B	Ignition switch ON
				Others ranges	0V	
3H	○		Inhibitor switch (S range)	S range	V _B	Ignition switch ON
				Others ranges	0V	
3I	○		Solenoid valve (VICS)	Engin speed below 5,000 rpm	Below 1.5V	*VICS: Variable Inertia Charging System [DOHC]
				Engin speed above 5,000 rpm	V _B	
3J	—	—	—	—	—	—
3K	—	—	—	—	—	—
3L	—	—	—	—	—	—
3M	○		Solenoid valve (pressure regulator) [BP]	60 [DOHC]/120 [SOHC] seconds after engine started when engine coolant temperature above 90°C (194°F) and intake air temperature above 58°C (136°F) [DOHC]/50°C (122°F) [SOHC]	Below 1.5V	—
				Other condition at idle	V _B	
3N	—	—	—	—	—	—
3O	—	—	—	—	—	—
3P	—	—	—	—	—	—
3Q	○		ISC valve	Ignition switch ON	Approx. 7V	*Engine Signal Monitor: Green and red lamps flash
				Idle	Approx. 9V	
3R	—	—	—	—	—	—
3S	—	—	—	—	—	—
3T	—	—	—	—	—	—

*Checked in AC range

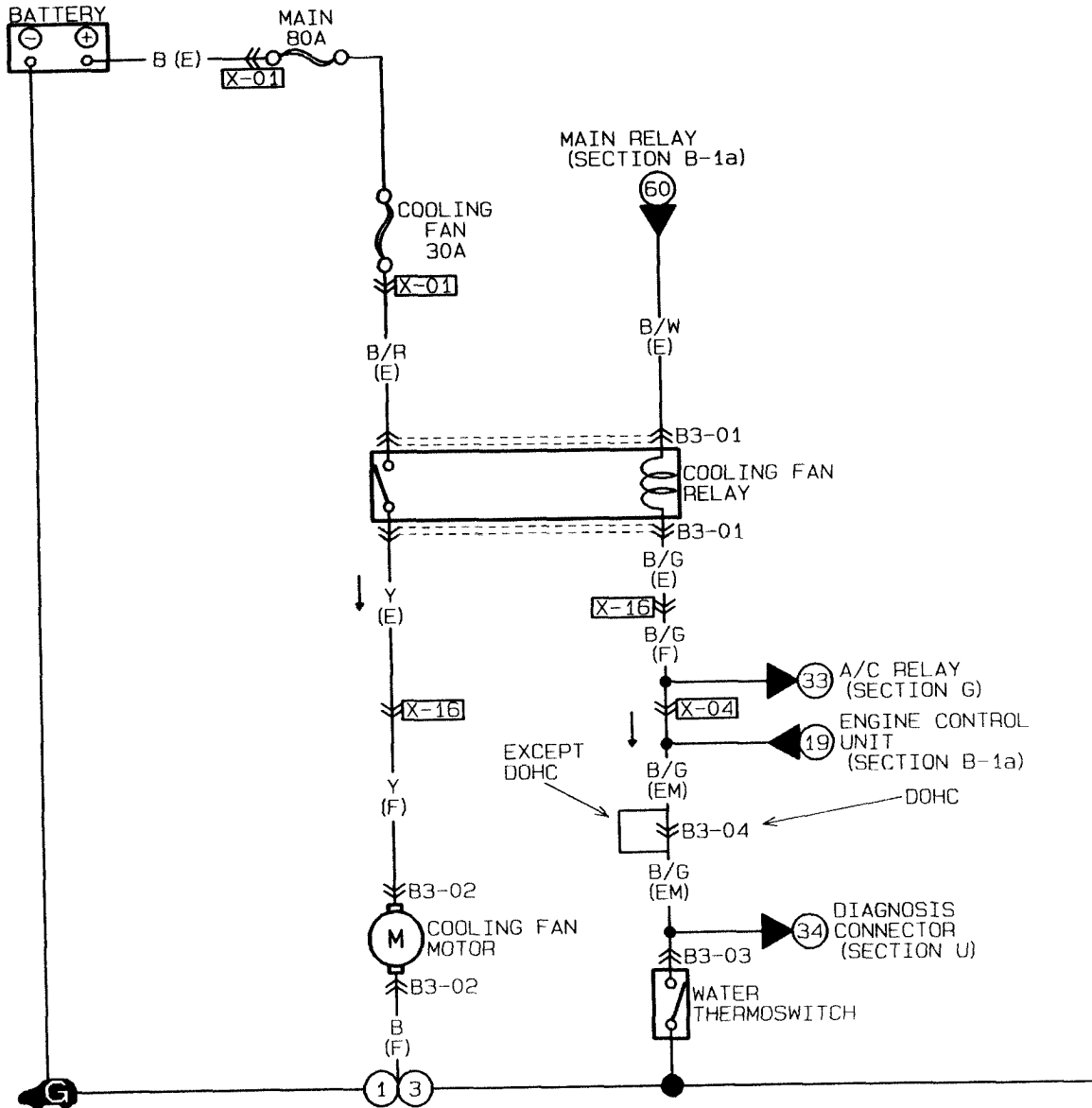
V_B: Battery Voltage

Terminal	Input	Output	Connected to	Test condition	Correct voltage	Remark
3U		○	Injector (Nos. 1, 3)	Ignition switch ON	V _B	*Engine Signal Monitor: Green and red lamps flash
				Idle	V _B	
				Engine speed above 2,000 rpm on deceleration (after warm-up)	V _B	
3V		○	Injector (Nos. 2, 4)	Ignition switch ON	V _B	
				Idle	V _B	
				Engine speed above 2,000 rpm on deceleration (after warm-up)	V _B	
3W		○	1—2 shift solenoid valve	Solenoid valve ON	V _B	while during
				Solenoid valve OFF	0V	
3X		○	2—3 shift solenoid valve	Solenoid valve ON	V _B	while during
				Solenoid valve OFF	0V	
3Y		○	3—4 shift solenoid valve	Solenoid valve ON	V _B	while during
				Solenoid valve OFF	0V	
3Z		○	Lock up solenoid valve	Solenoid valve ON	V _B	while during
				Solenoid valve OFF	0V	

Z WIRING DIAGRAM

EXCEPT PROTEGE EC-AT ■ COOLING FAN SYSTEM

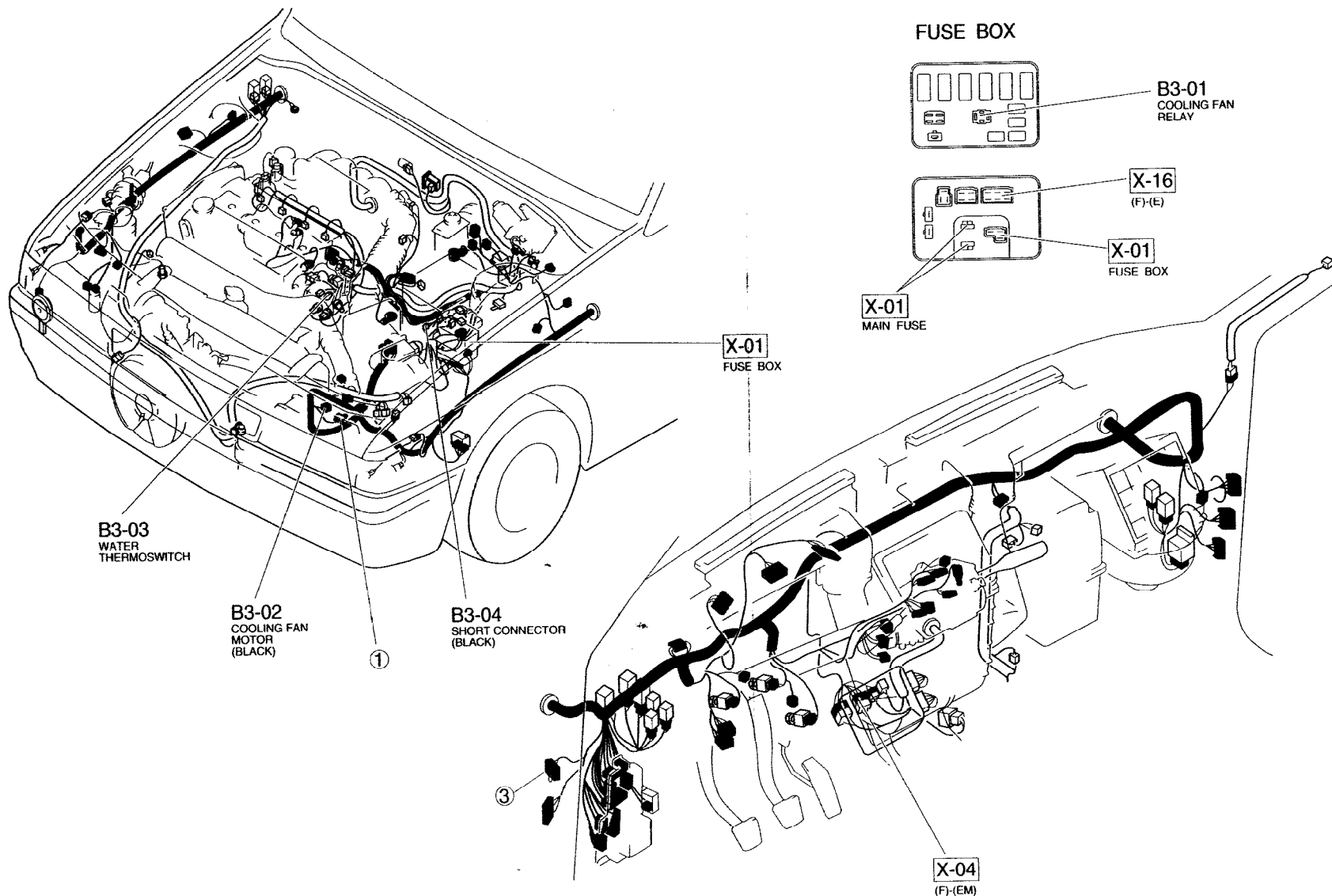
B-3

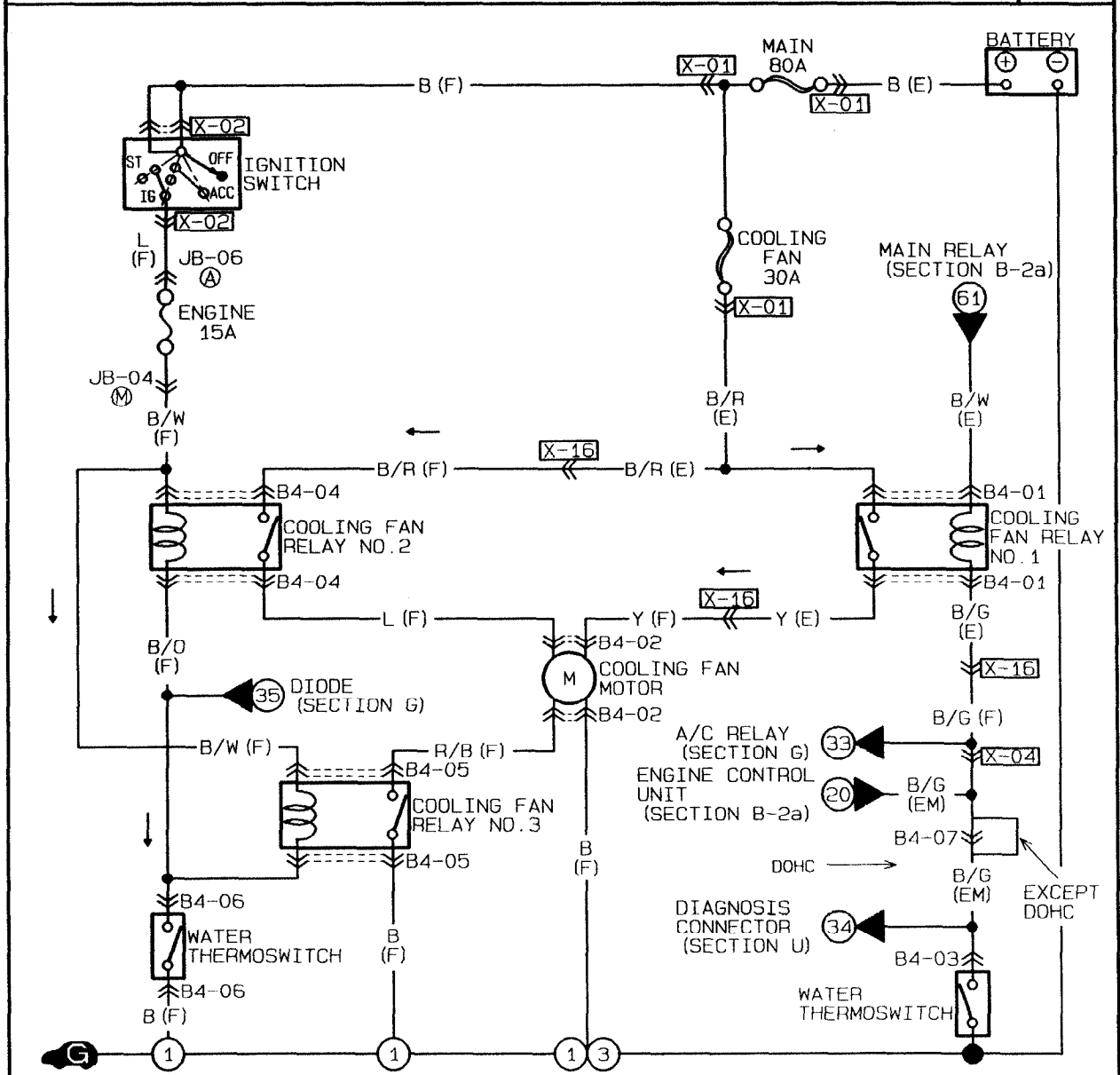


B3-01 COOLING FAN RELAY (E)	B3-02 COOLING FAN MOTOR (F)	B3-03 WATER THERMO-SWITCH (EM)	B3-04 SHORT CONNECTOR (EM)

HARNES COLOR : FRONT [] ENGINE []

B-3

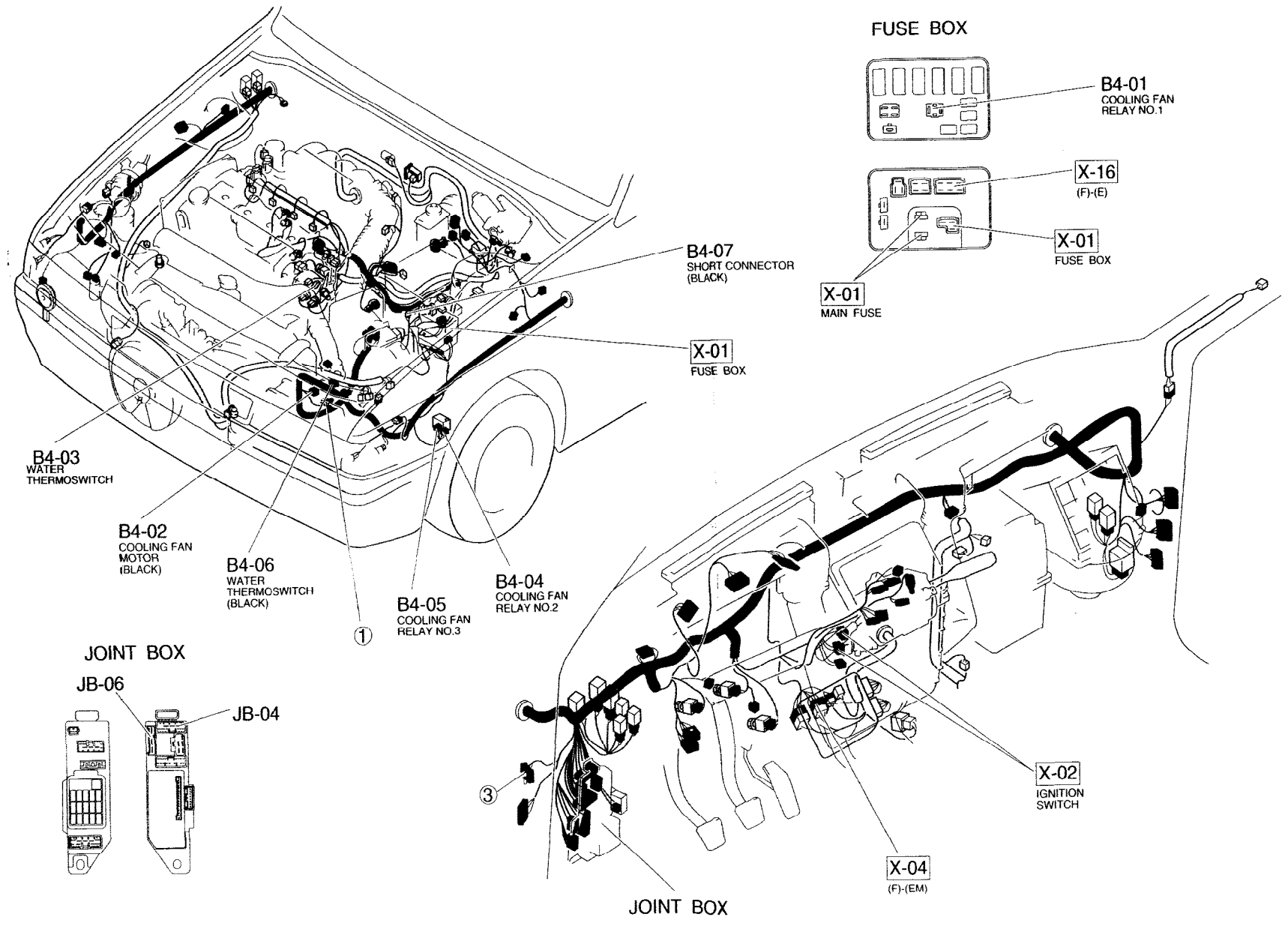




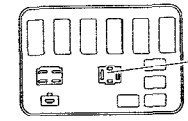
<p>B4-01 COOLING FAN RELAY NO. 1 (E)</p>	<p>B4-02 COOLING FAN MOTOR (F)</p>	<p>B4-03 WATER THERMO-SWITCH (EM)</p>	<p>B4-04 COOLING FAN RELAY NO. 2 (F)</p>
<p>B4-05 COOLING FAN RELAY NO. 3 (F)</p>		<p>B4-06 WATER THERMO-SWITCH (F)</p>	<p>B4-07 SHORT CONNECTOR (EM)</p>

HARNES COLOR : FRONT ENGINE

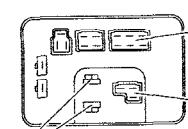
B-4



FUSE BOX



B4-01
COOLING FAN
RELAY NO.1



X-16
(F)-(E)

X-01
FUSE BOX

B4-07
SHORT CONNECTOR
(BLACK)

X-01
MAIN FUSE

X-01
FUSE BOX

B4-03
WATER
THERMOSWITCH

B4-02
COOLING FAN
MOTOR
(BLACK)

B4-06
WATER
THERMOSWITCH
(BLACK)

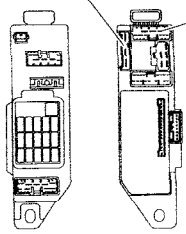
B4-05
COOLING FAN
RELAY NO.3

B4-04
COOLING FAN
RELAY NO.2

JOINT BOX

JB-06

JB-04



X-02
IGNITION
SWITCH

X-04
(F)-(EM)

JOINT BOX

G
LAY

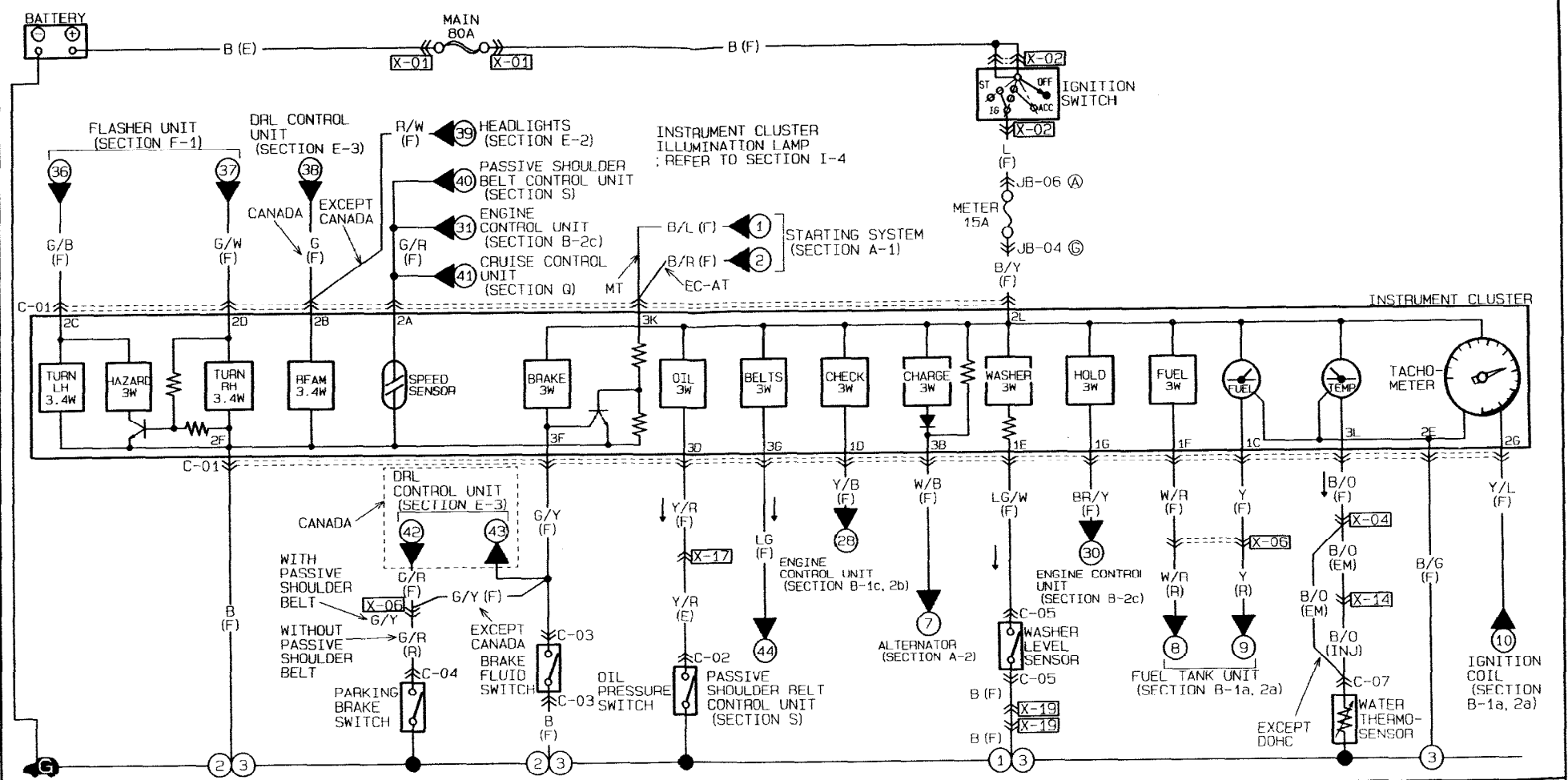
DEPT
4C

AN
=)

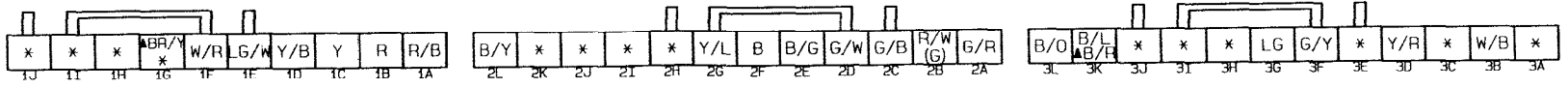
CONNECTOR
(EM)

V/G

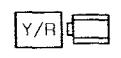
INSTRUMENT CLUSTER & WARNING LAMPS



C-01 INSTRUMENT CLUSTER (F)



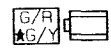
C-02 OIL PRESSURE SWITCH (E)



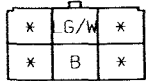
C-03 BRAKE FLUID SWITCH (F)



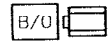
C-04 PARKING BRAKE SWITCH (R)



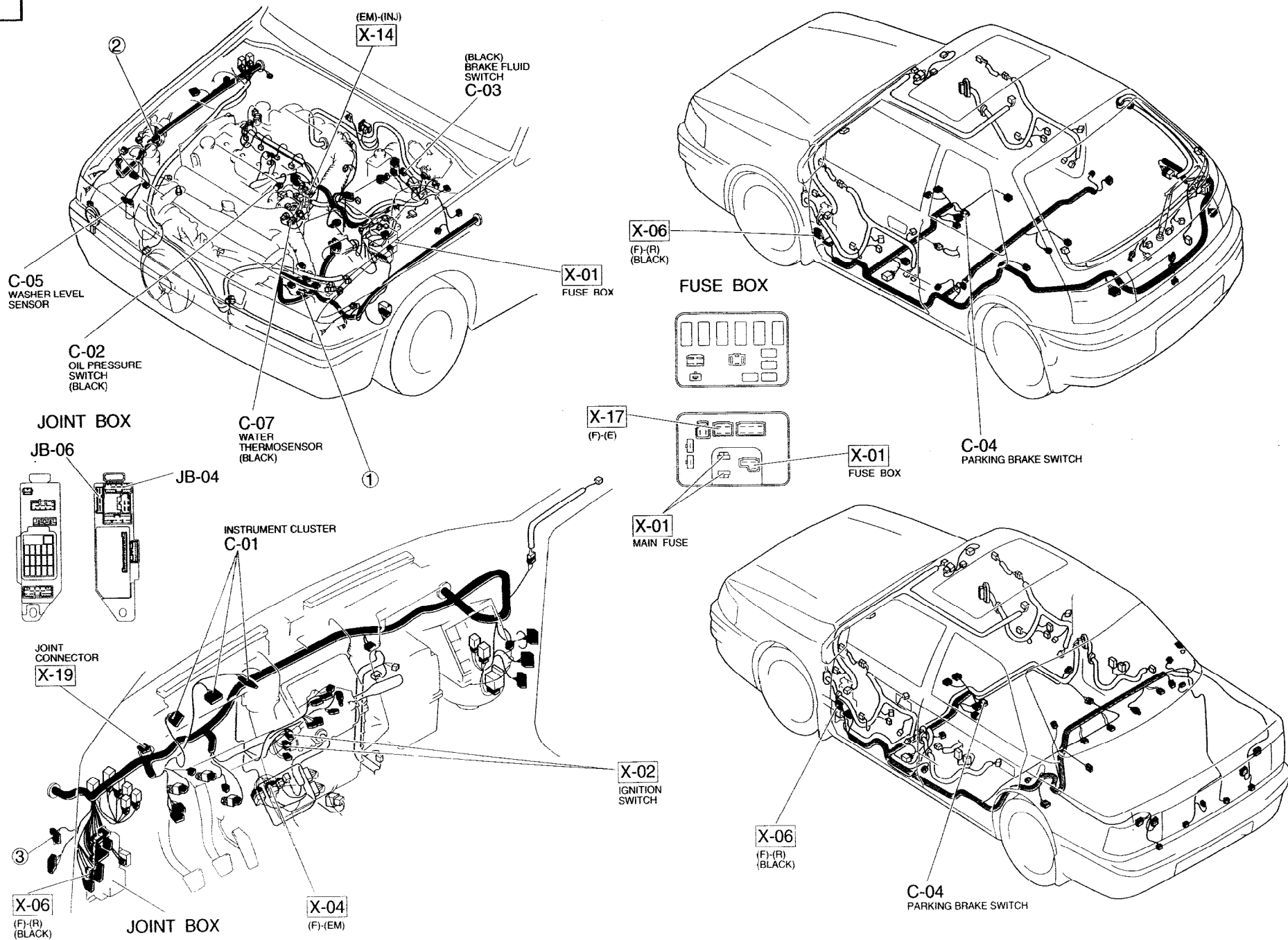
C-05 WASHER LEVEL SENSOR (F)



C-07 WATER THERMOSENSOR (EM) (INJ)



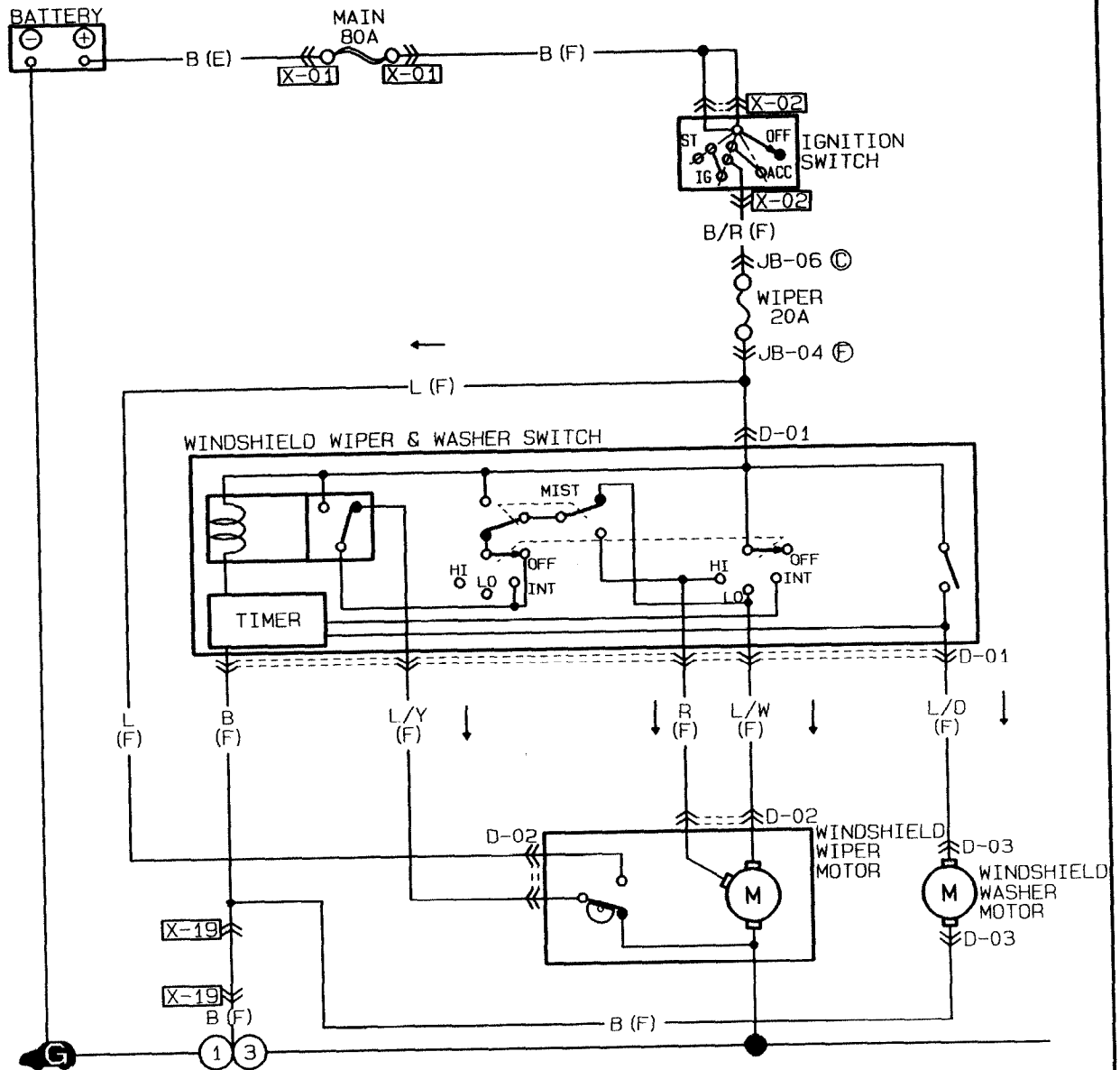
C



Z WIRING DIAGRAM

WITHOUT WINDSHIELD CRUISE CONTROL WIPER & WASHER

D-1



D-01 WINDSHIELD WIPER & WASHER SWITCH (F)

L/Y	L/O	L
L/W	B	R *

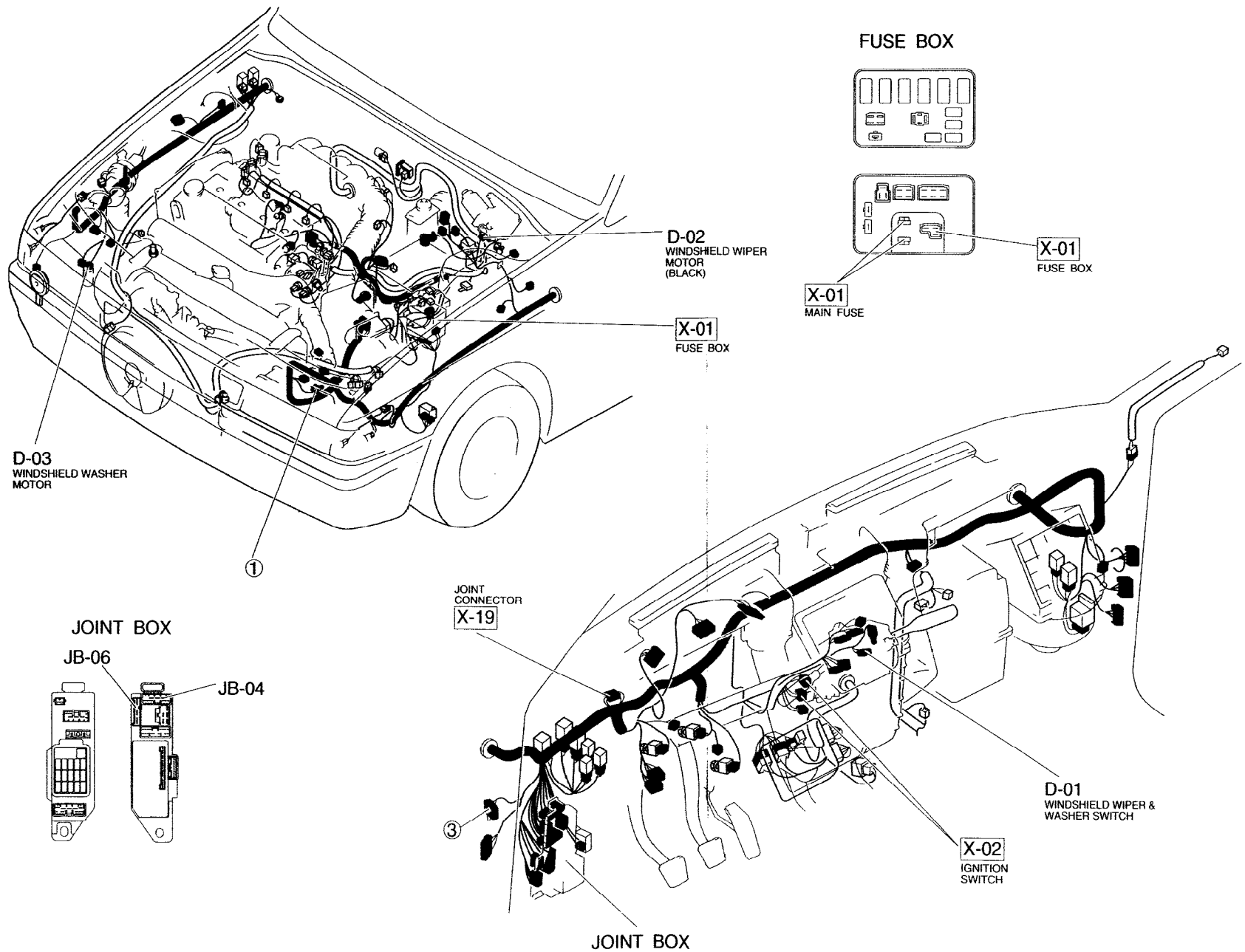
D-02 WINDSHIELD WIPER MOTOR (F)

L/W	R
L	L/Y

D-03 WINDSHIELD WASHER MOTOR (F)

B
L/O

D-1



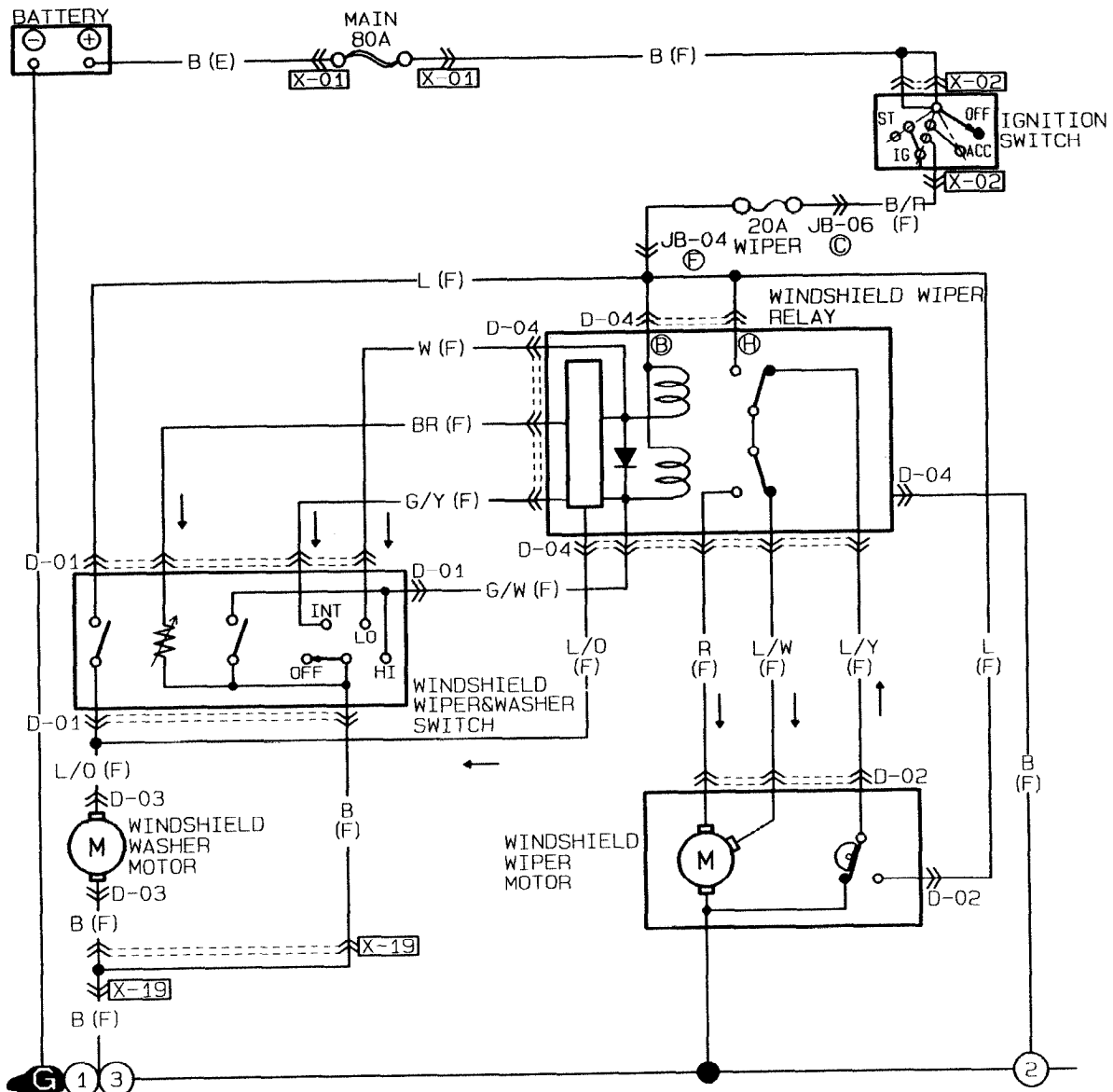
Z WIRING DIAGRAM

WITH CRUISE CONTROL

WINDSHIELD WIPER & WASHER

11...PROTEGE

D-2



D-01 WINDSHIELD WIPER & WASHER SWITCH (F)

L/B [*]	L	X		BR	G/Y	L/O
O [*]	G/W	L/R	V	*	B	W

D-02 WINDSHIELD WIPER MOTOR (F)

L/W	R
L	L/Y

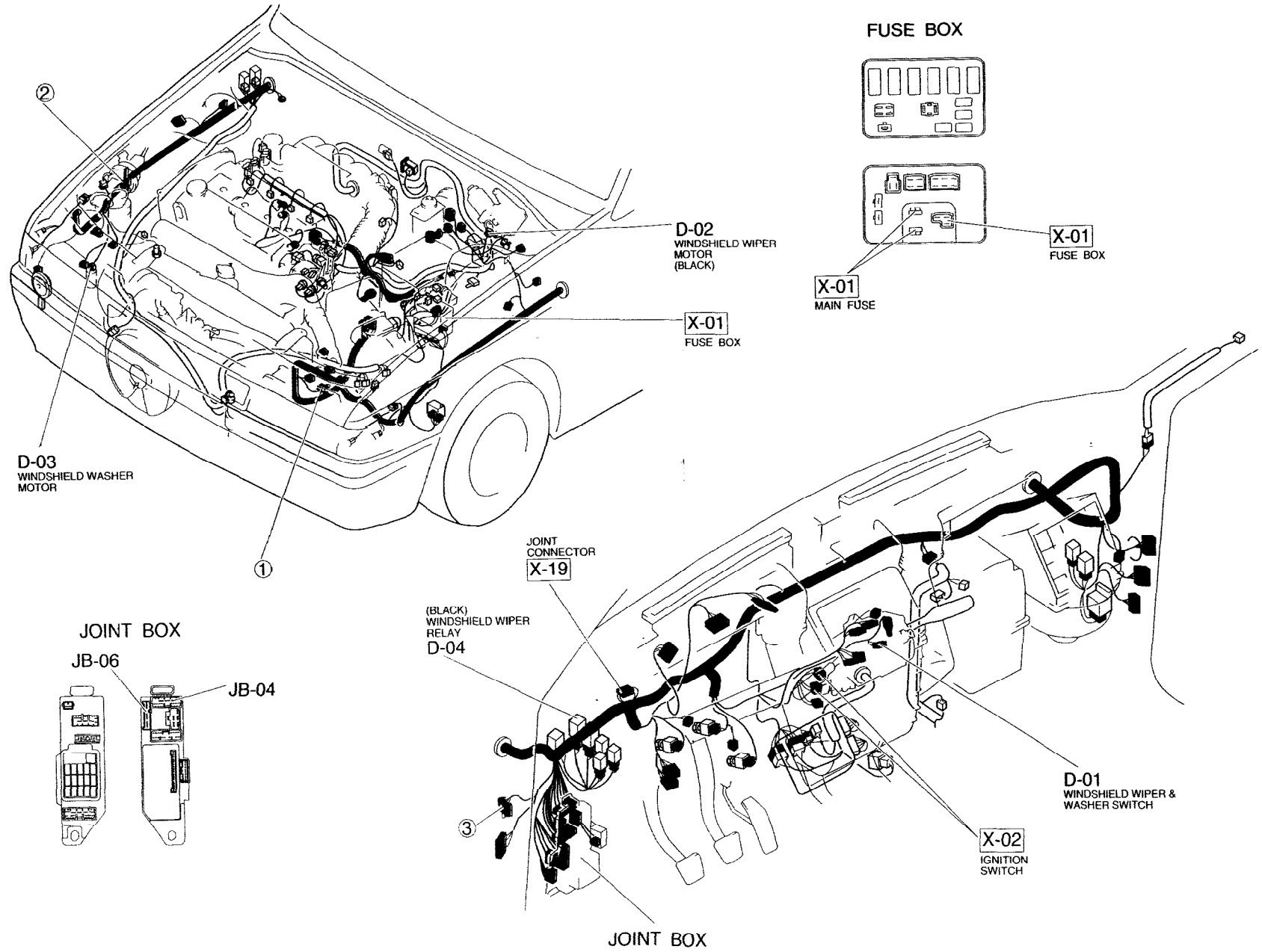
D-03 WINDSHIELD WASHER MOTOR (F)

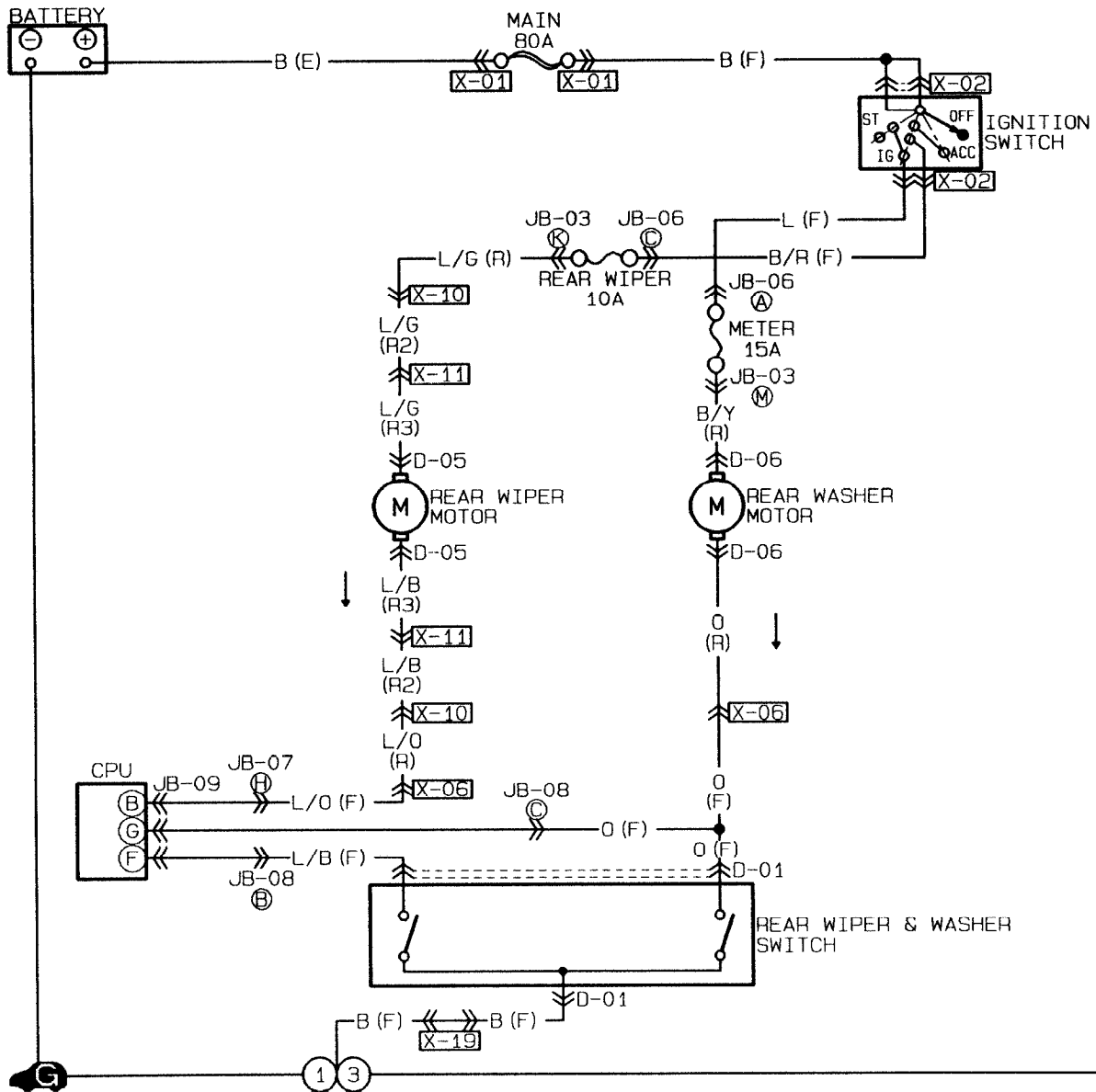
B
L/O

D-04 WINDSHIELD WIPER RELAY (F)

B	L/Y	G/Y	L/W	R
BR	L/O	L	W	G/W
		⊕	⊕	

D-2

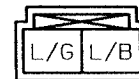




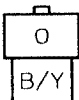
D-01 REAR WIPER & WASHER SWITCH (F)

WITHOUT CRUISE CONTROL			WITH CRUISE CONTROL						
B	O	L/B	L/B	L	L/R	V	BR	G/Y	L/O
			O	G/W	*	B		W	

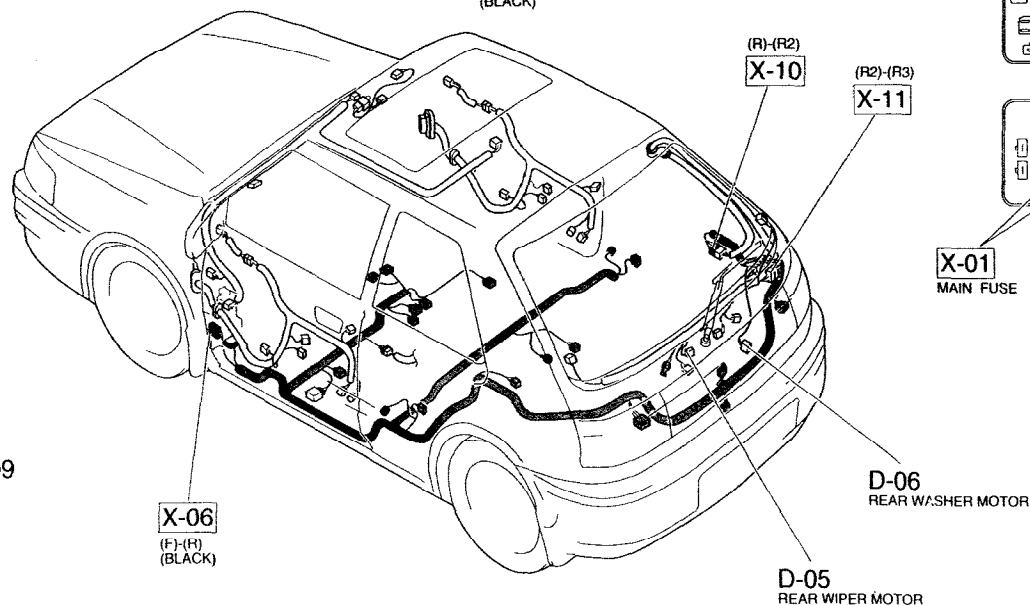
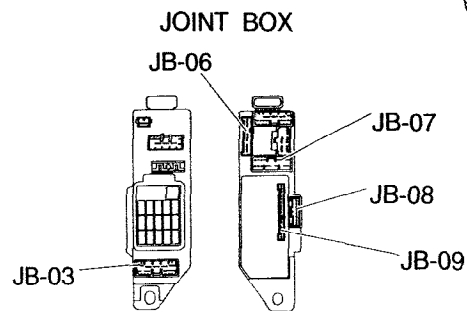
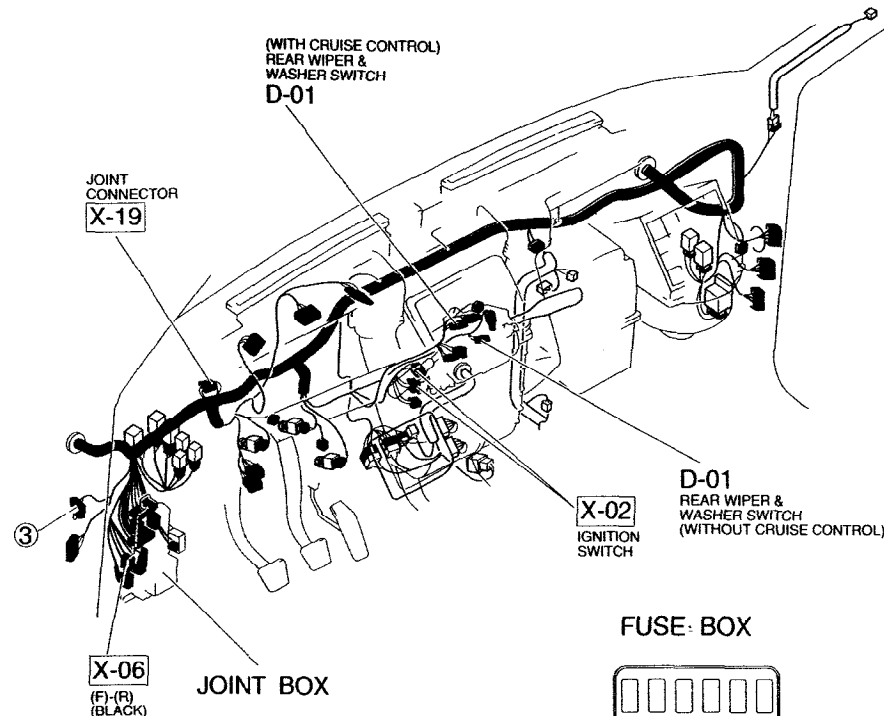
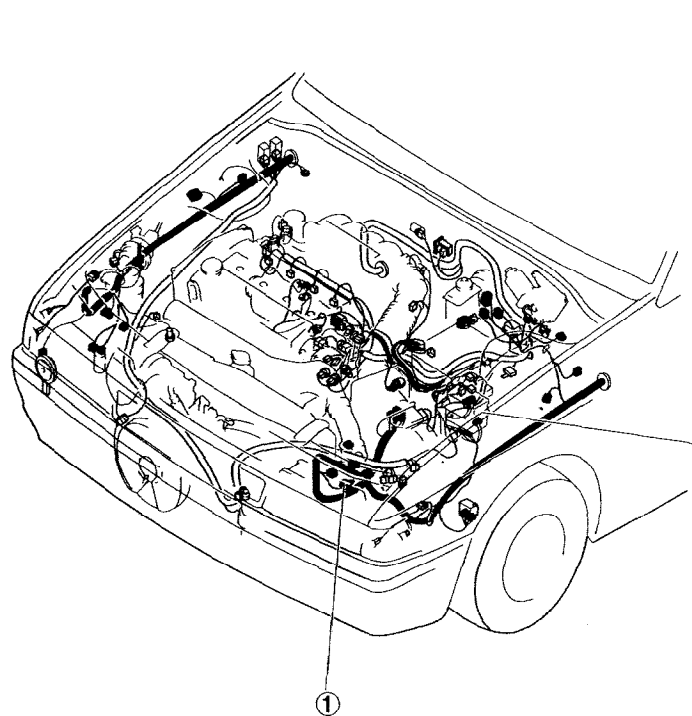
D-05 REAR WIPER MOTOR (R3)



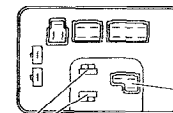
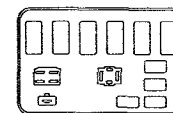
D-06 REAR WASHER MOTOR (R)



D-3



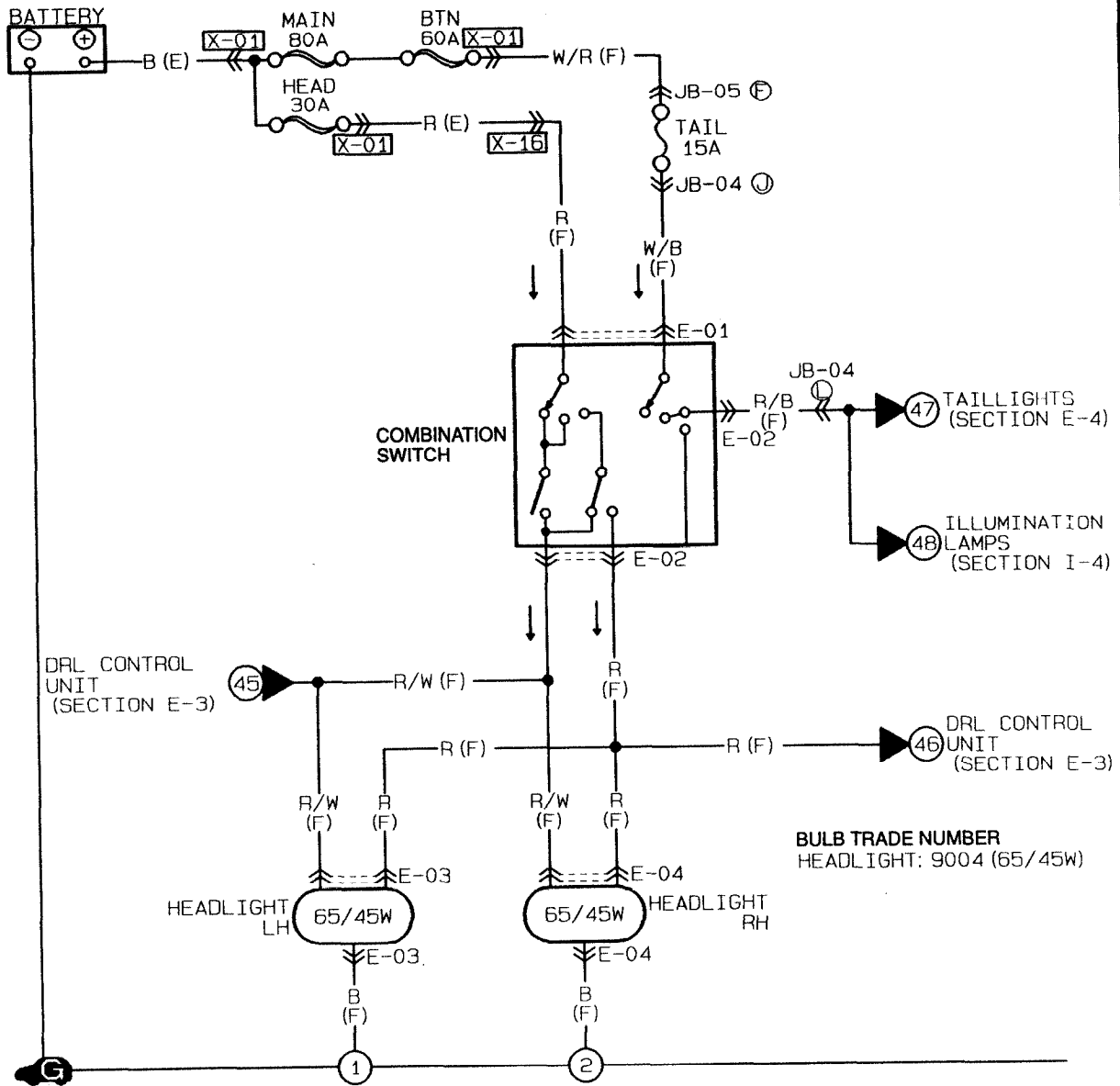
FUSE BOX

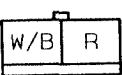
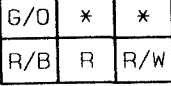
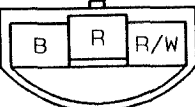



Z WIRING DIAGRAM

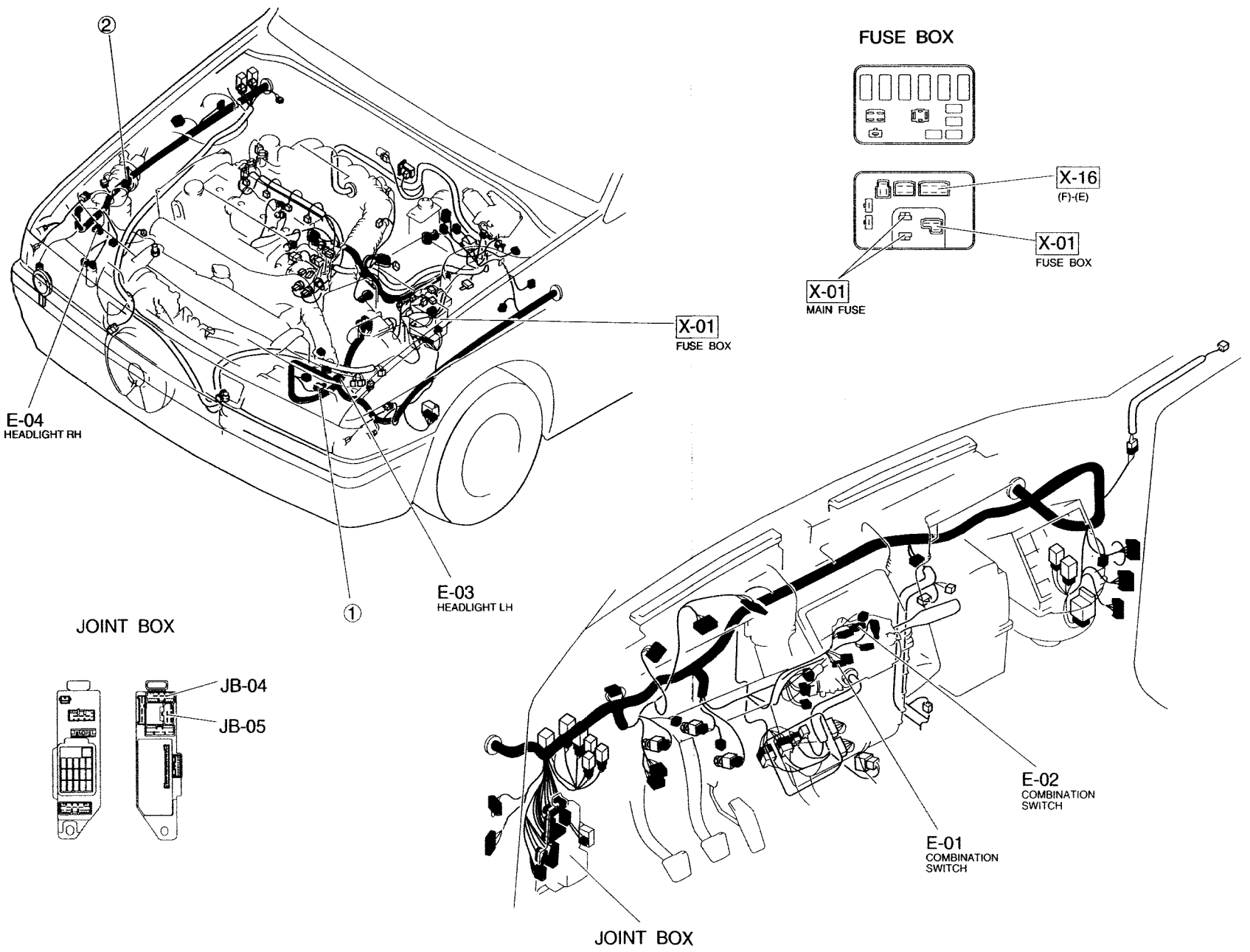
WITHOUT CRUISE CONTROL ■ HEADLIGHTS

E-1



E-01 COMBINATION SWITCH (F)	E-02 COMBINATION SWITCH (F)	E-03 HEADLIGHT LH (F)	E-04 HEADLIGHT RH (F)
			

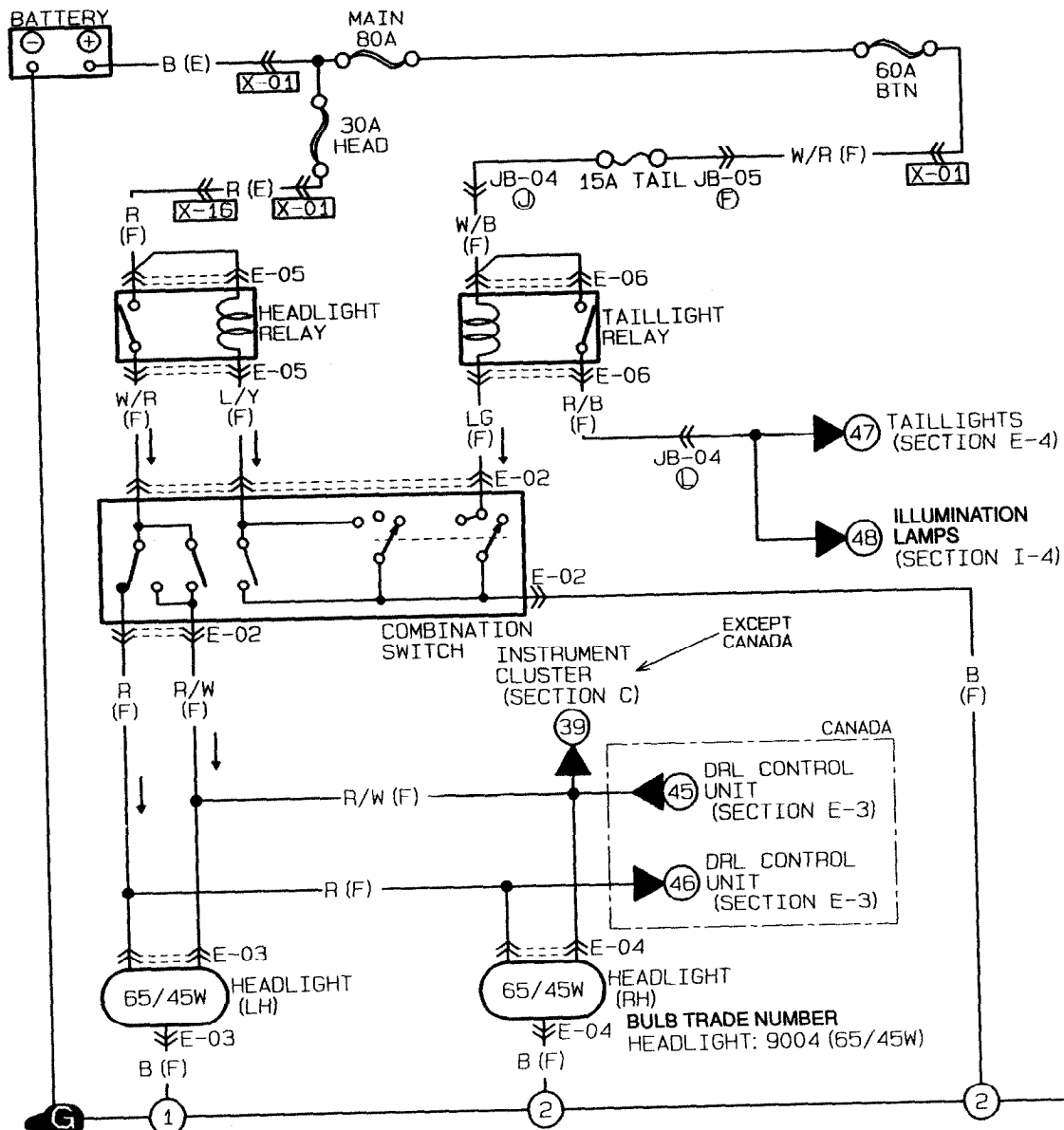
E-1



Z WIRING DIAGRAM

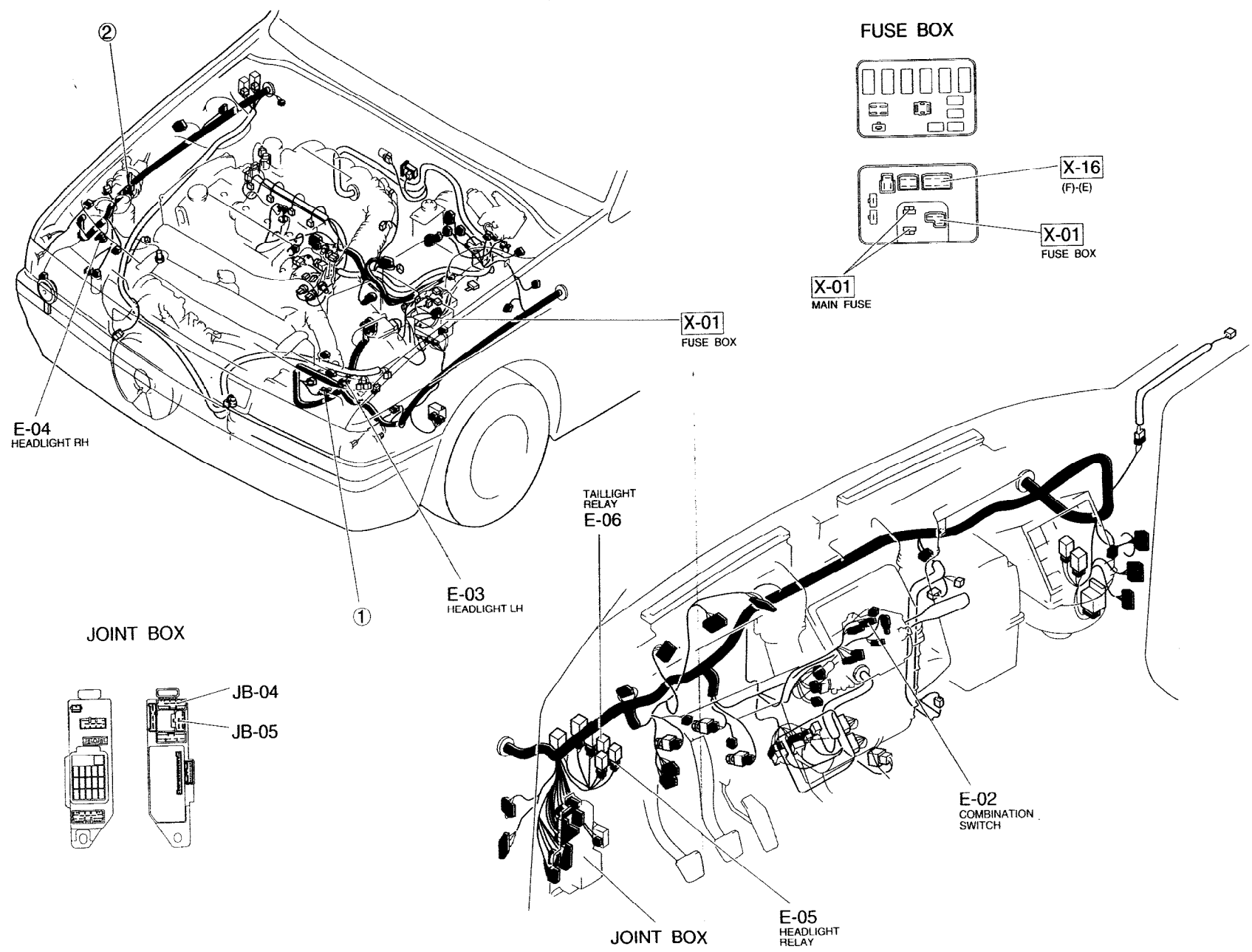
WITH CRUISE CONTROL ■ HEADLIGHTS

E-2

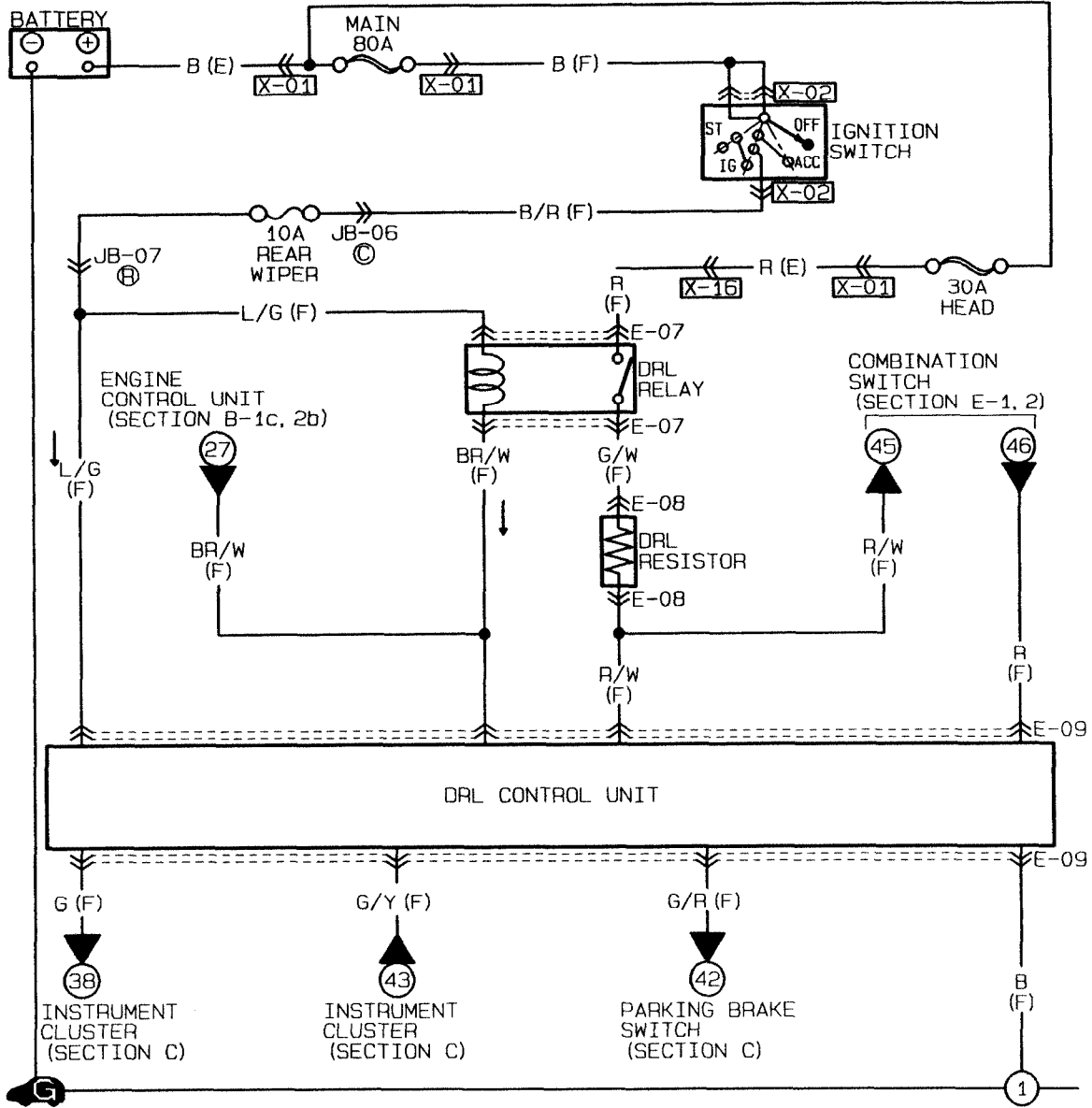


<p>E-02 COMBINATION SWITCH (F)</p> <table border="1"> <tr> <td>R/W</td> <td>R</td> <td>W/R</td> </tr> <tr> <td>B</td> <td>L/Y</td> <td>LG</td> </tr> </table>	R/W	R	W/R	B	L/Y	LG	<p>E-03 HEADLIGHT LH (F)</p> <table border="1"> <tr> <td>B</td> <td>R</td> <td>R/W</td> </tr> </table>	B	R	R/W	<p>E-04 HEADLIGHT RH (F)</p> <table border="1"> <tr> <td>B</td> <td>R</td> <td>R/W</td> </tr> </table>	B	R	R/W	<p>E-05 HEADLIGHT RELAY (F)</p> <table border="1"> <tr> <td>R</td> <td>R</td> </tr> <tr> <td>W/R</td> <td>L/Y</td> </tr> </table>	R	R	W/R	L/Y
R/W	R	W/R																	
B	L/Y	LG																	
B	R	R/W																	
B	R	R/W																	
R	R																		
W/R	L/Y																		
<p>E-06 TAILLIGHT RELAY (F)</p> <table border="1"> <tr> <td>W/B</td> <td>W/B</td> </tr> <tr> <td>R/B</td> <td>LG</td> </tr> </table>	W/B	W/B	R/B	LG															
W/B	W/B																		
R/B	LG																		

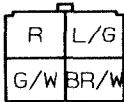
E-2



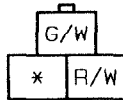
ELAY (F)



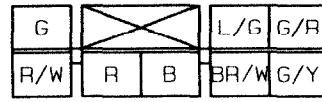
E-07 DRL RELAY (F)



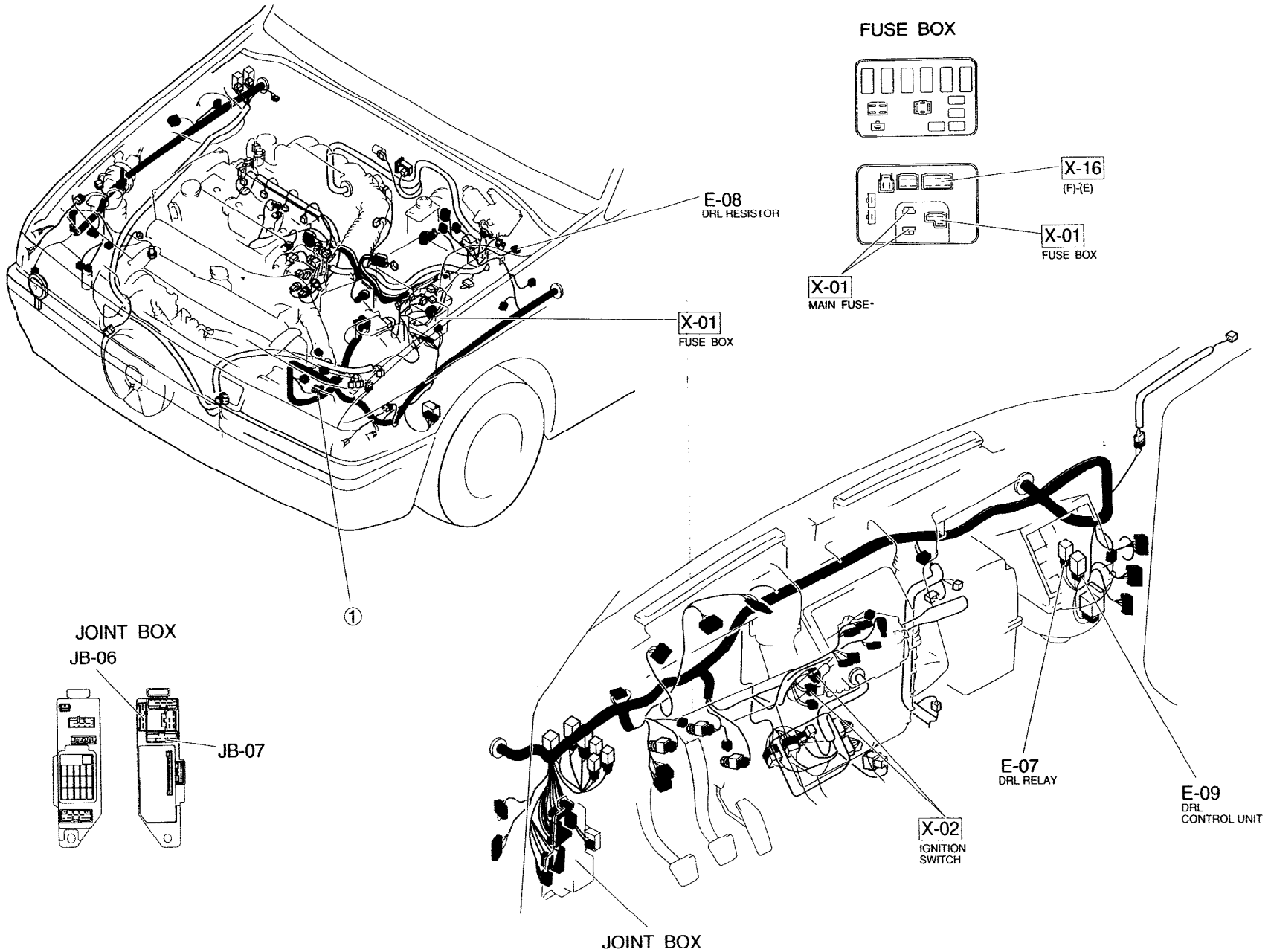
E-08 DRL RESISTOR (F)



E-09 DRL CONTROL UNIT (F)



E-3



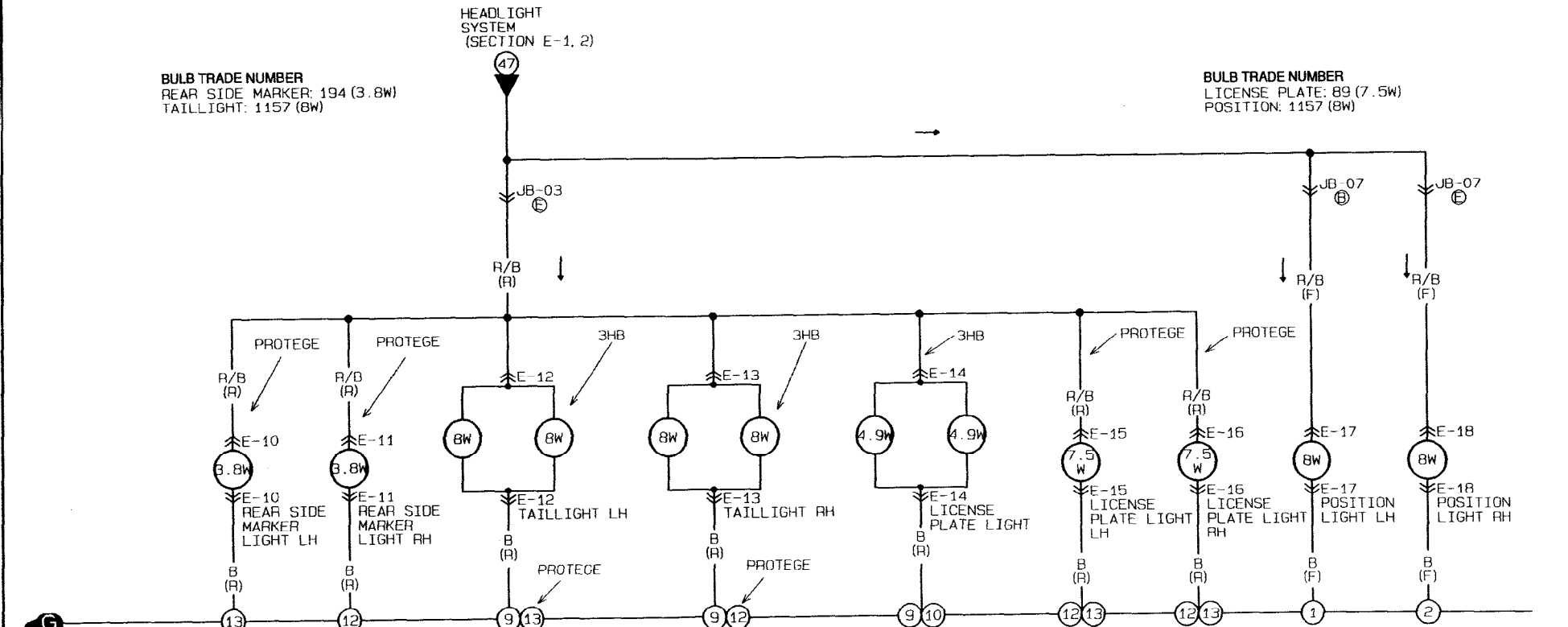
Z WIRING DIAGRAM

- TAILLIGHTS
- LICENSE PLATE LIGHTS
- REAR SIDE MARKER LIGHTS
- POSITION LIGHTS

BULB TRADE NUMBER
 REAR SIDE MARKER: 194 (3.8W)
 TAILLIGHT: 1157 (8W)

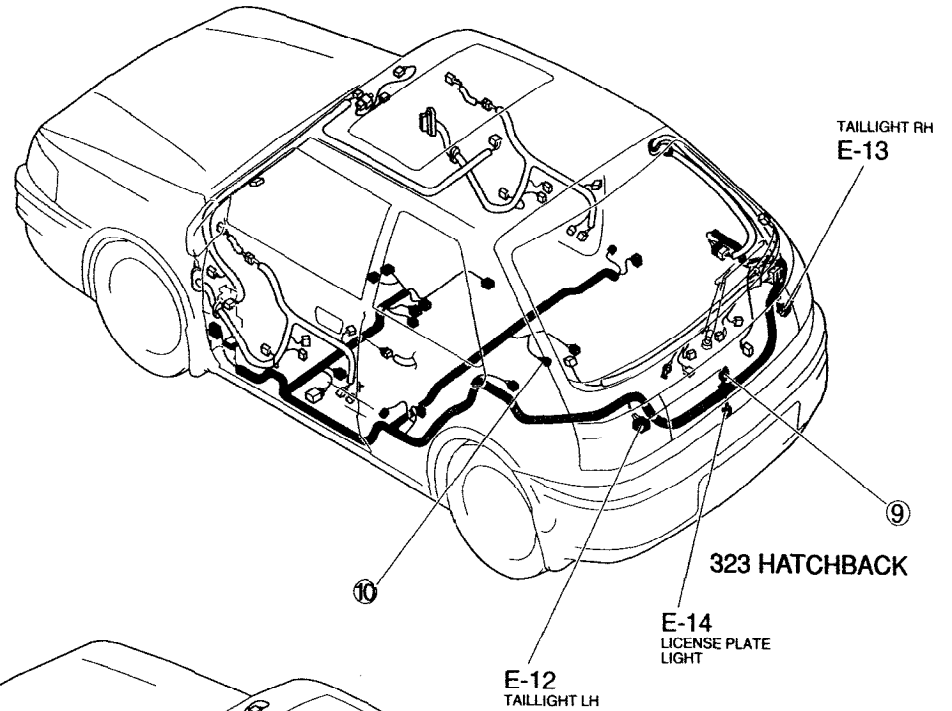
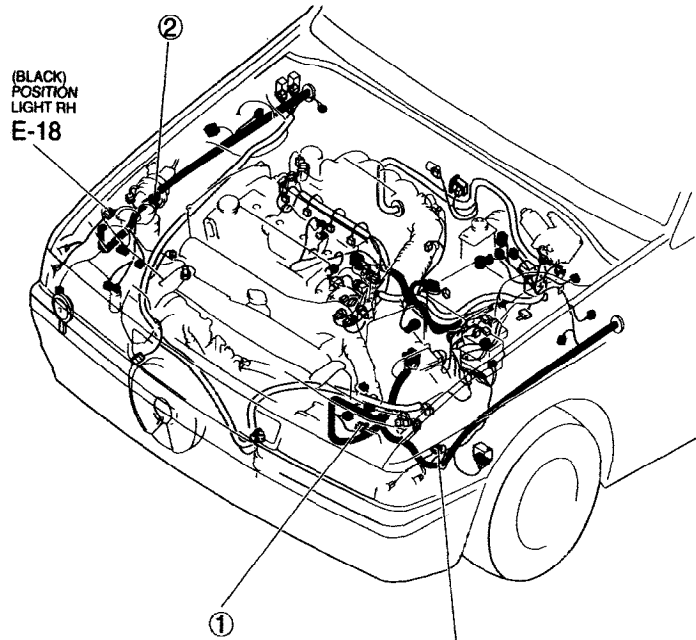
BULB TRADE NUMBER
 LICENSE PLATE: 89 (7.5W)
 POSITION: 1157 (8W)

HEADLIGHT SYSTEM
 (SECTION E-1, 2)

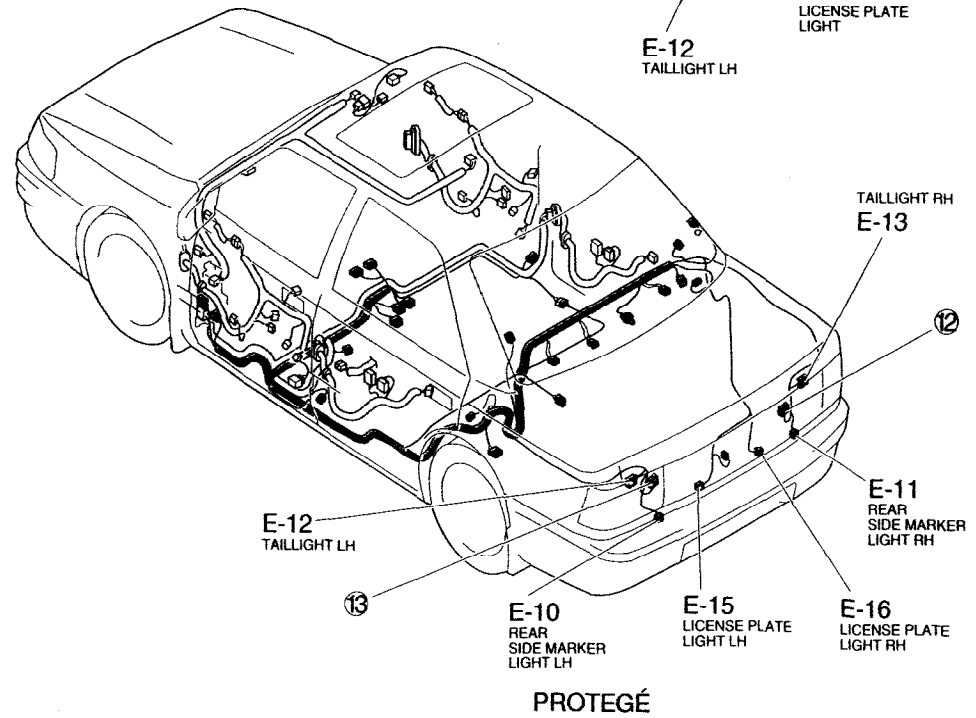
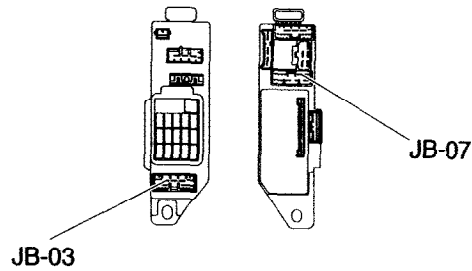


<p>E-10 REAR SIDE MARKER LIGHT LH (R)</p>	<p>E-11 REAR SIDE MARKER LIGHT RH (R)</p>	<p>E-12 TAILLIGHT LH (R)</p> <table border="1" style="margin: auto;"> <tr><td>*</td><td>R/G</td><td>G/B</td></tr> <tr><td>B</td><td>R/B</td><td>G</td></tr> </table>	*	R/G	G/B	B	R/B	G	<p>E-13 TAILLIGHT RH (R)</p> <table border="1" style="margin: auto;"> <tr><td>*</td><td>R/G</td><td>G/W</td></tr> <tr><td>B</td><td>R/B</td><td>G</td></tr> </table>	*	R/G	G/W	B	R/B	G	<p>E-14 LICENSE PLATE LIGHT (R)</p>	<p>E-15 LICENSE PLATE LIGHT LH (R)</p>	<p>E-16 LICENSE PLATE LIGHT RH (R)</p>
*	R/G	G/B																
B	R/B	G																
*	R/G	G/W																
B	R/B	G																
<p>E-17 POSITION LIGHT LH (F)</p>	<p>E-18 POSITION LIGHT RH (F)</p>																	

E-4

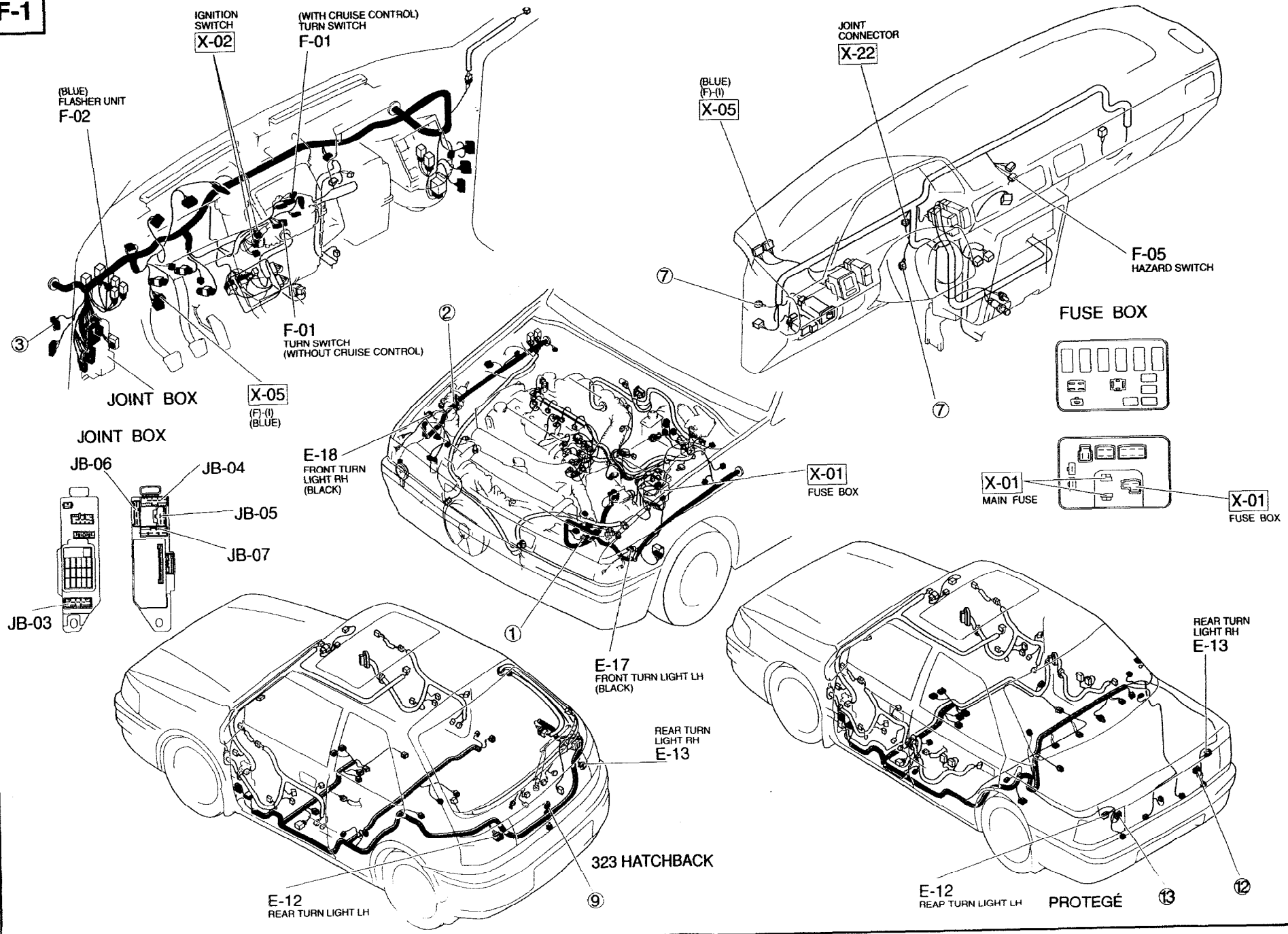


JOINT BOX

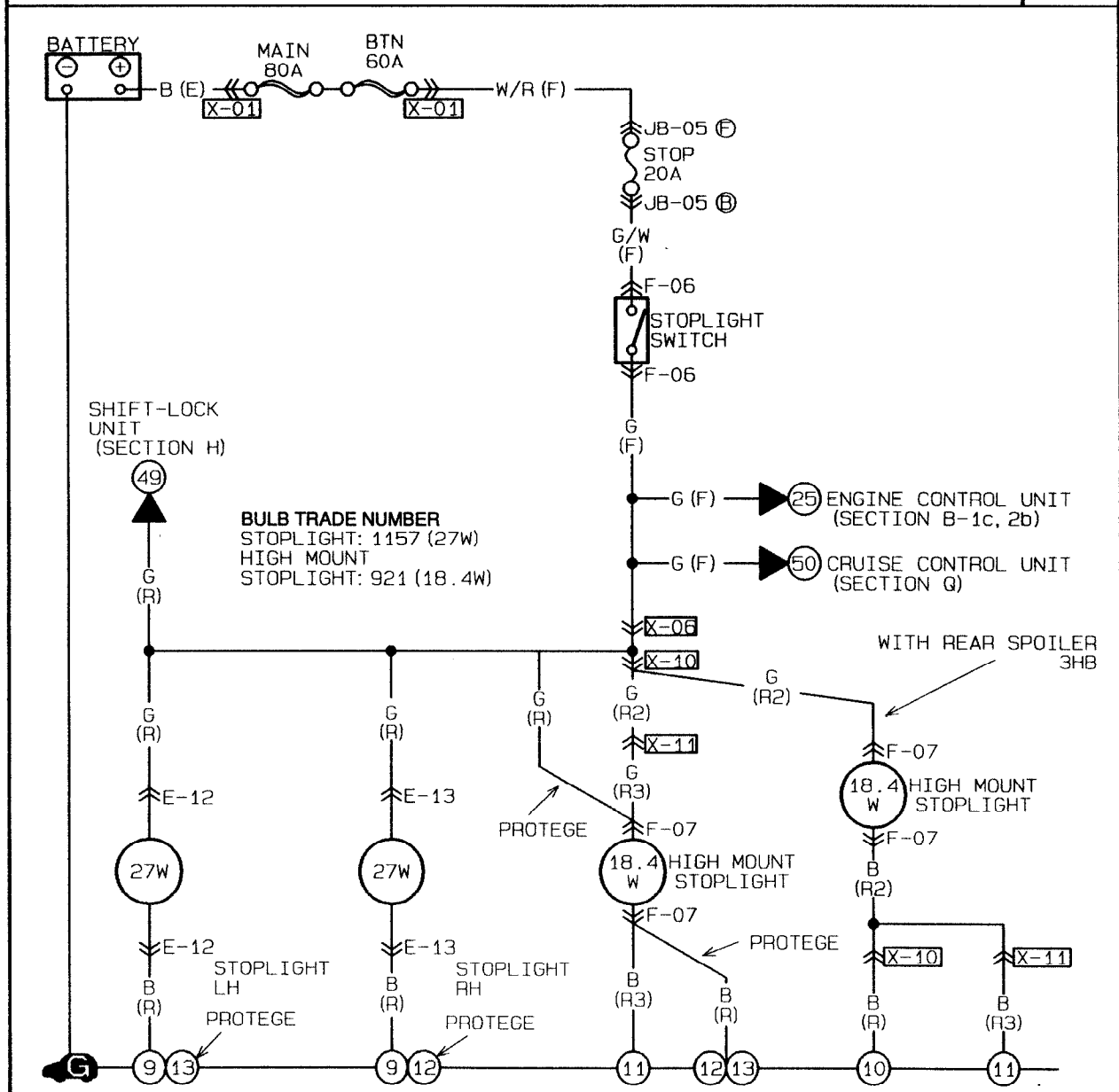


HARNES COLOR : FRONT [] ENGINE [] INSTRUMENT PANEL [] REAR []

F-1

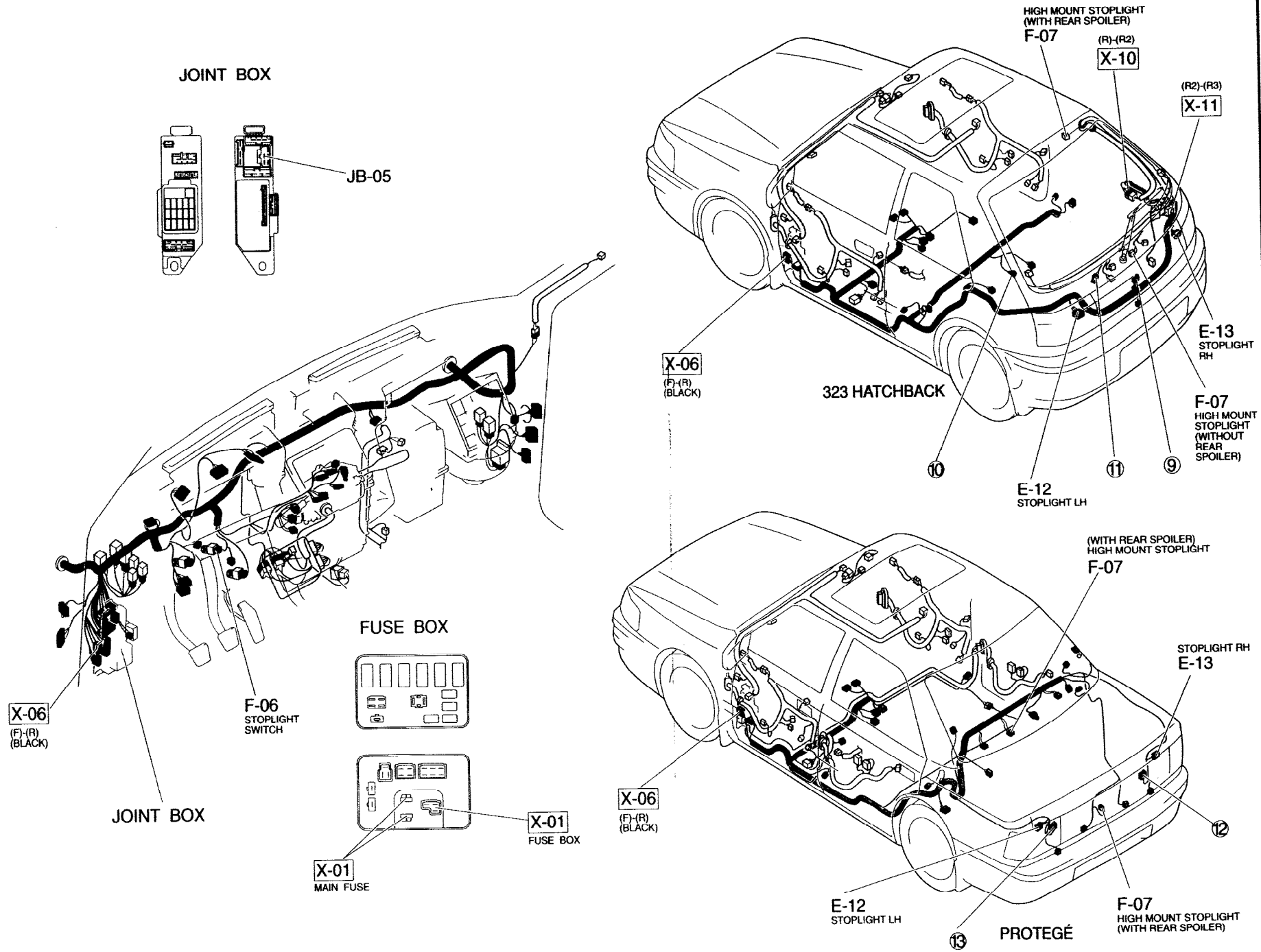


STOPLIGHTS



<p>F-06 STOPLIGHT SWITCH (F)</p> <table border="1"> <tr><td>G</td></tr> <tr><td>G/W</td></tr> </table>	G	G/W	<p>F-07 HIGH MOUNT STOPLIGHT (R3) (R)</p> <table border="1"> <tr><td>B</td><td>G</td></tr> </table> <p>WITH REAR SPOILER → (R2)</p> <p>PROTEGE</p>	B	G	<p>E-12 STOPLIGHT LH (R)</p> <table border="1"> <tr><td>*</td><td>R/G</td><td>G/W</td></tr> <tr><td>B</td><td>R/B</td><td>G</td></tr> </table>	*	R/G	G/W	B	R/B	G	<p>E-13 STOPLIGHT RH (R)</p> <table border="1"> <tr><td>*</td><td>R/G</td><td>G/W</td></tr> <tr><td>B</td><td>R/B</td><td>G</td></tr> </table>	*	R/G	G/W	B	R/B	G
G																			
G/W																			
B	G																		
*	R/G	G/W																	
B	R/B	G																	
*	R/G	G/W																	
B	R/B	G																	

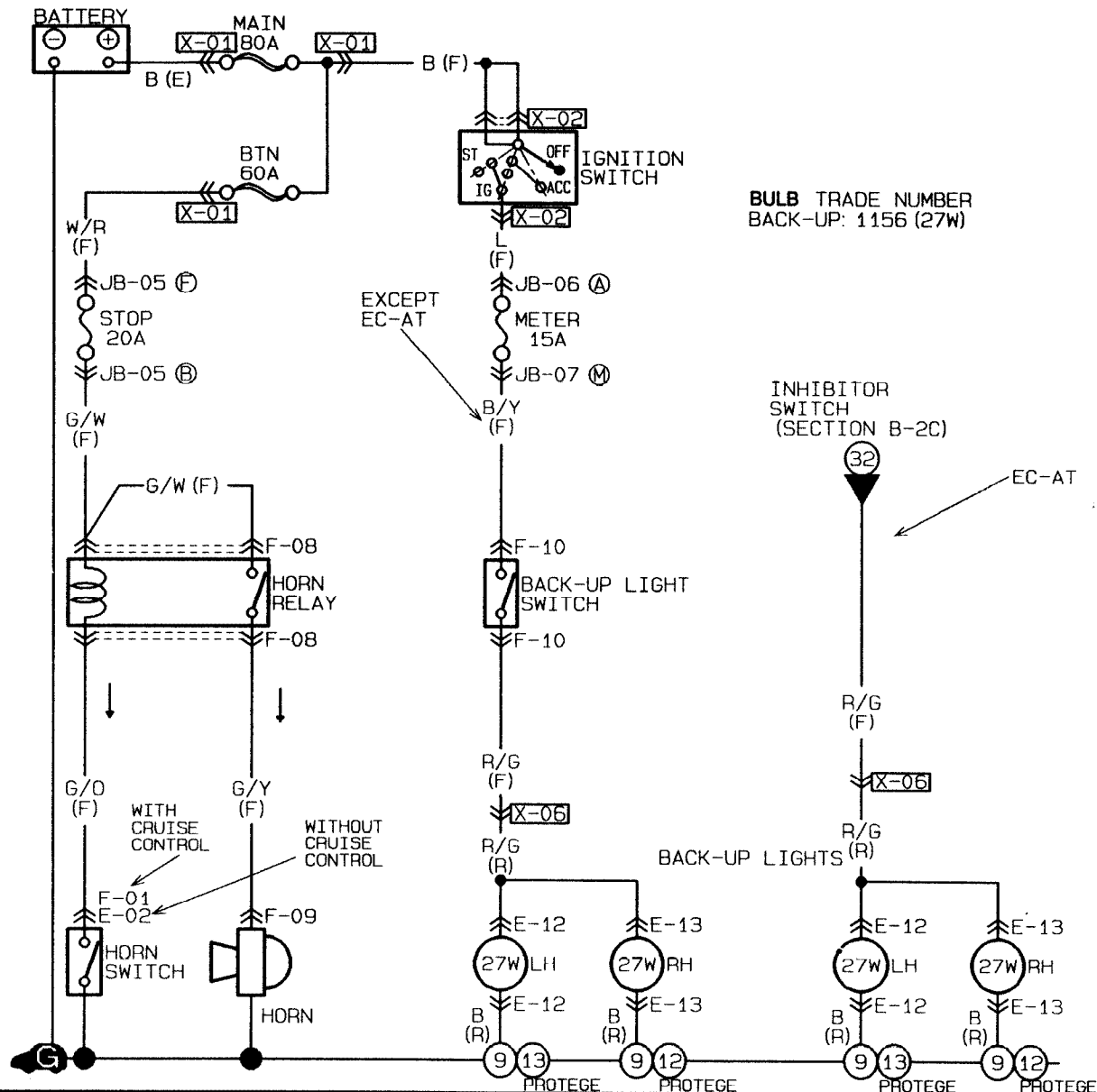
F-2



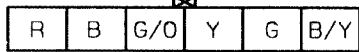
Z WIRING DIAGRAM

- HORN
- BACK-UP LIGHTS

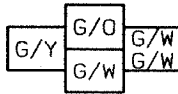
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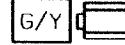
F-01 HORN SWITCH (F)



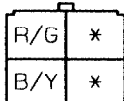
F-08 HORN RELAY (F)



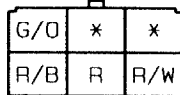
F-09 HORN (F)



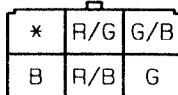
F-10 BACK-UP LIGHT SWITCH (F)



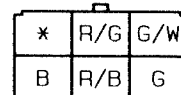
E-02 HORN SWITCH (F)



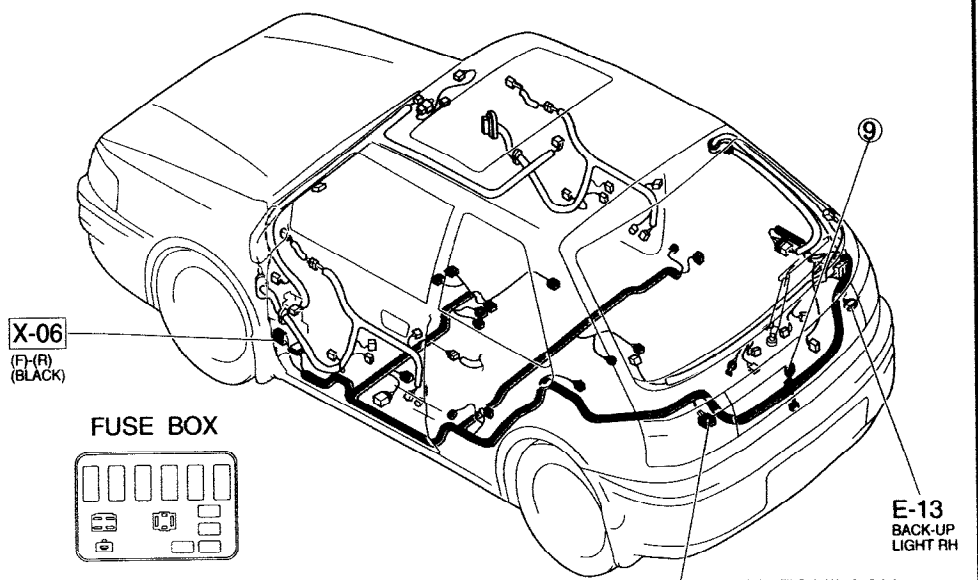
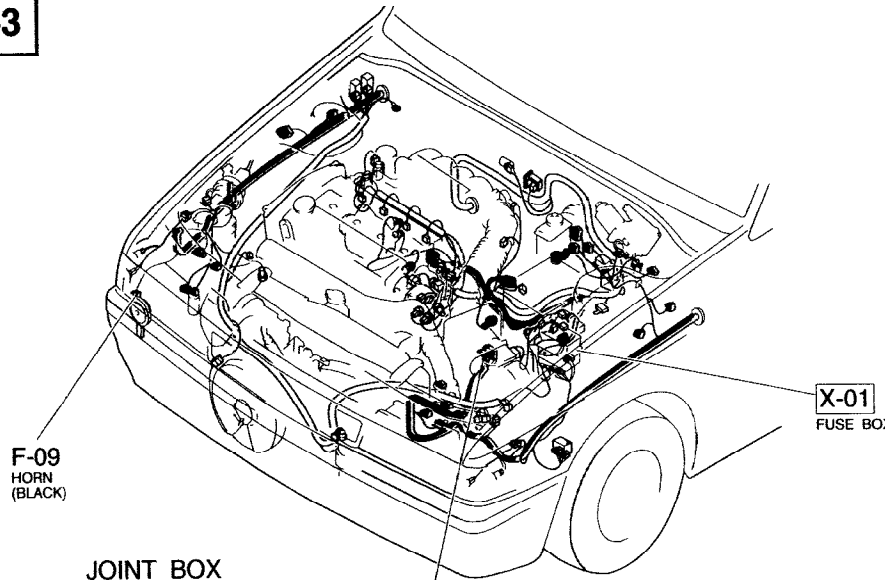
E-12 BACK-UP LIGHT LH (R)



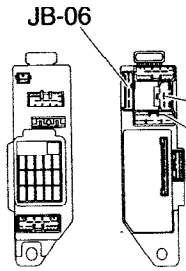
E-13 BACK-UP LIGHT RH (R)



F-3



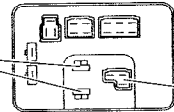
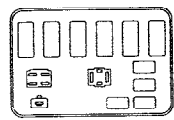
JOINT BOX



F-10 BACK-UP LIGHT SWITCH

HORN SWITCH F-01

FUSE BOX



X-01 MAIN FUSE

X-01 FUSE BOX

323 HATCHBACK

E-12 BACK-UP LIGHT LH

IGNITION SWITCH X-02

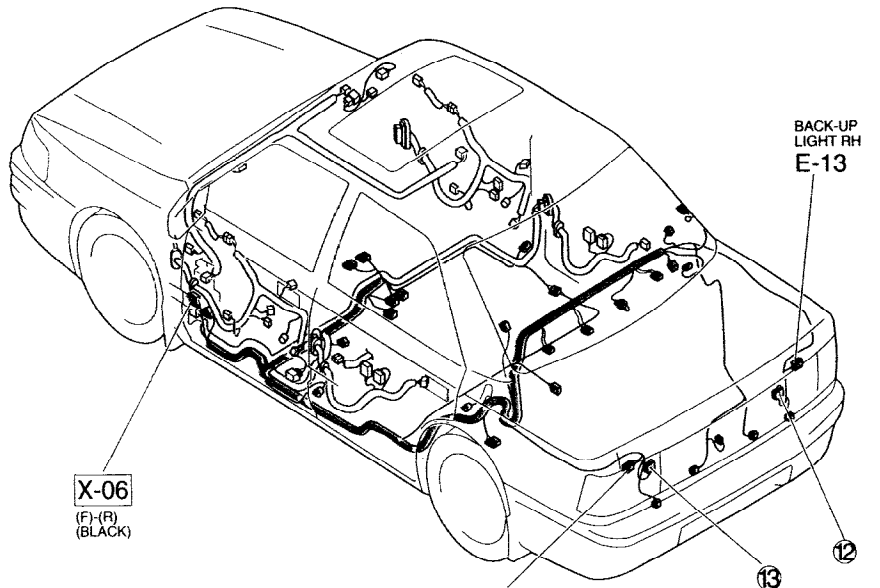
X-06 (F)-(R) (BLACK)

JOINT BOX

F-08 HORN RELAY (BLACK)

E-02 HORN SWITCH

X-06 (F)-(R) (BLACK)

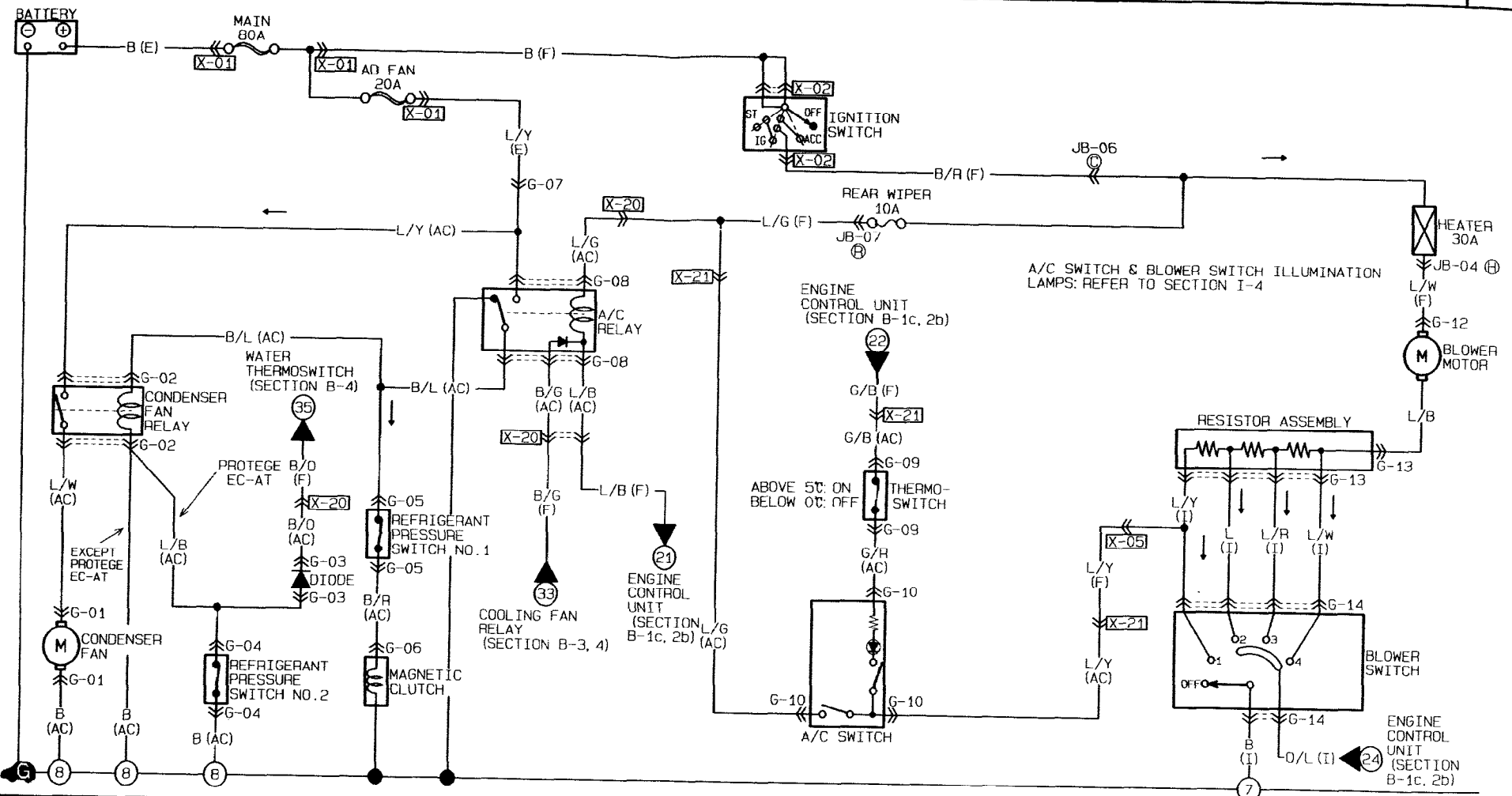


E-12 BACK-UP LIGHT LH

PROTEGE

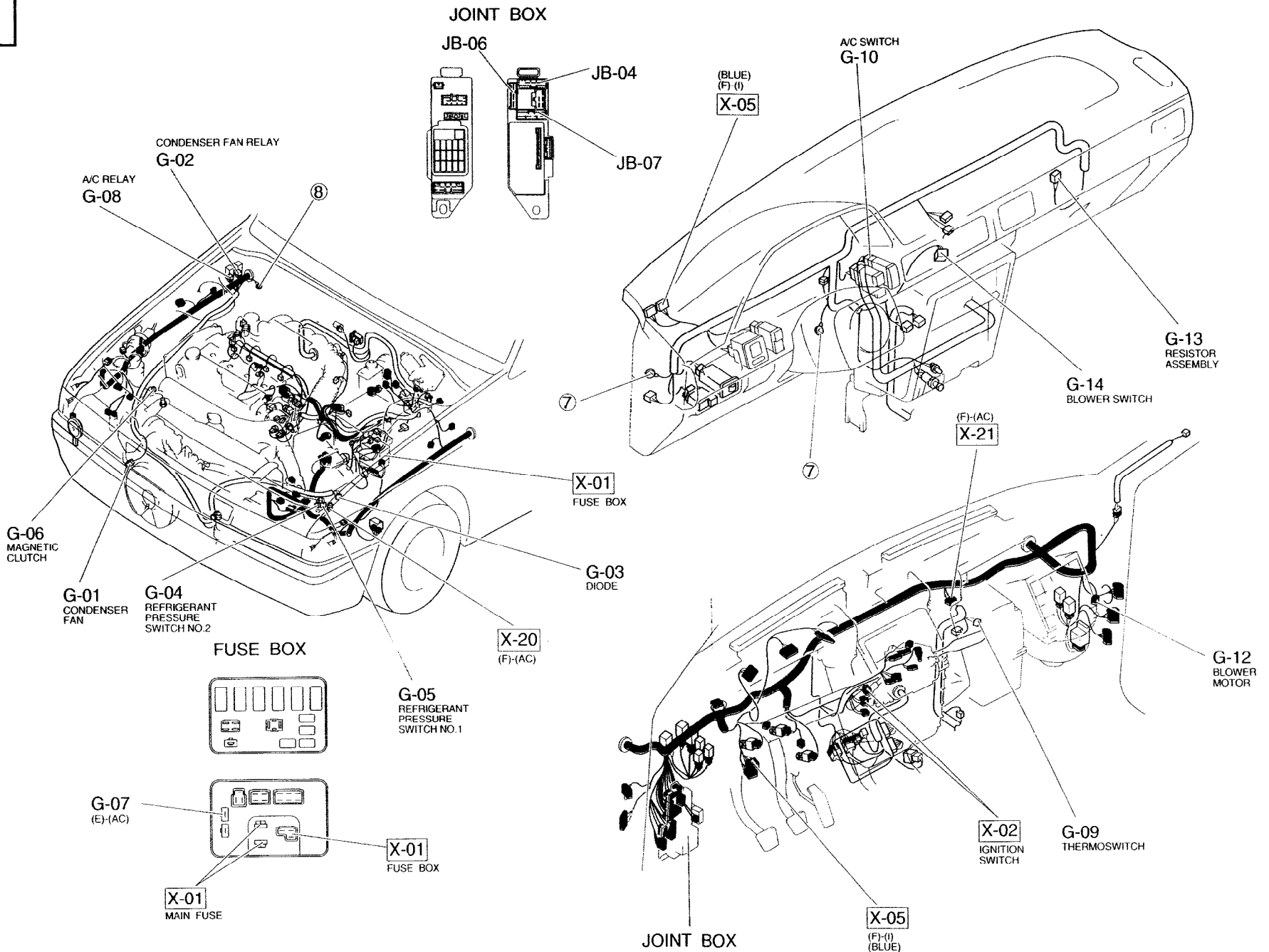
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12



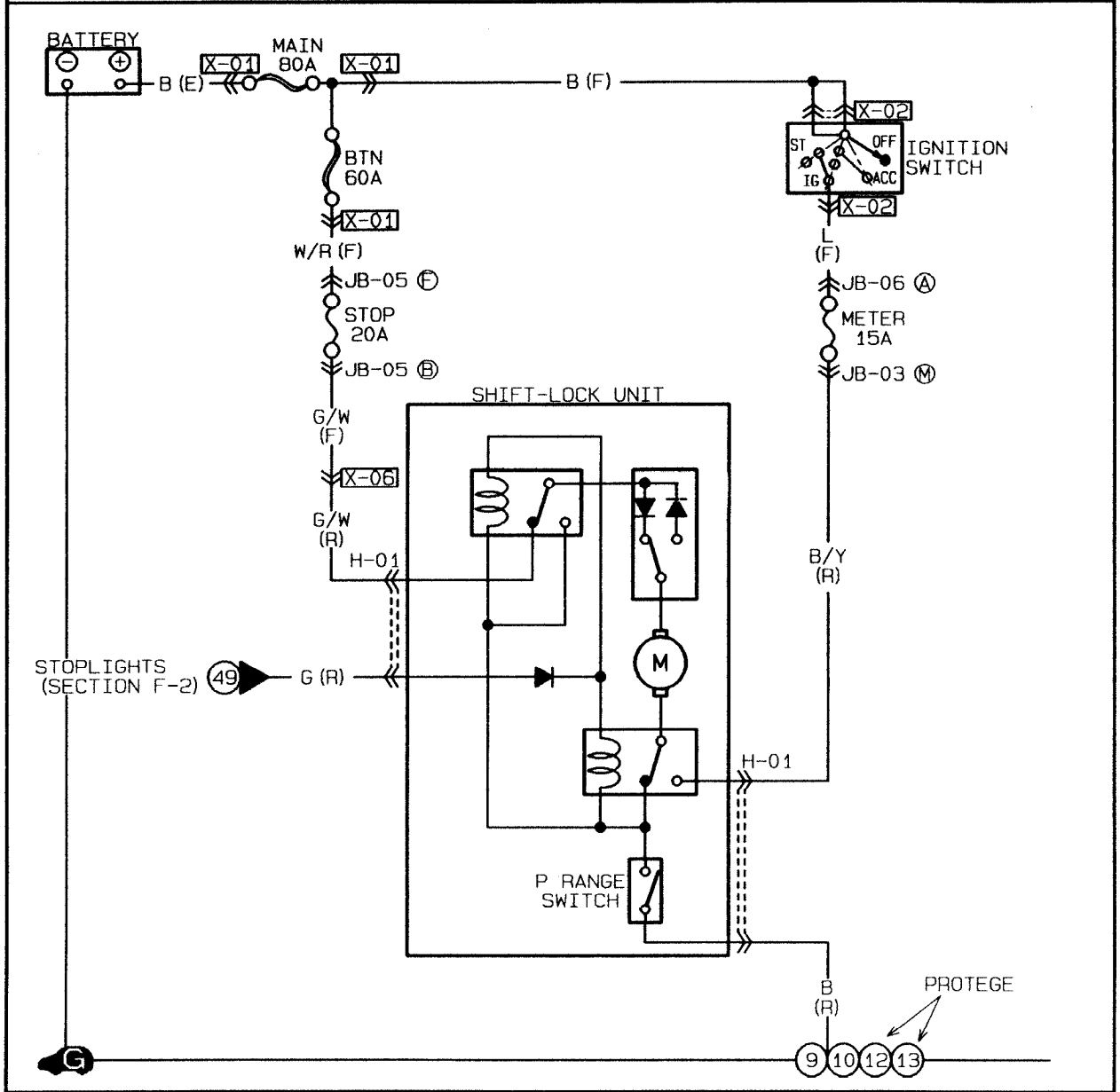
<p>G-01 CONDENSER FAN (AC)</p>	<p>G-02 CONDENSER FAN RELAY (AC)</p>	<p>G-03 DIODE (AC)</p>	<p>G-04 REFRIGERANT PRESSURE SWITCH NO. 2 (AC)</p>	<p>G-05 REFRIGERANT PRESSURE SWITCH NO. 1 (AC)</p>	<p>G-06 MAGNETIC CLUTCH (AC)</p>	<p>G-07 (E) - (AC) CONNECTOR</p>
<p>G-08 A/C RELAY (AC)</p>	<p>G-09 THERMOSWITCH (AC)</p>	<p>G-10 A/C SWITCH (AC)</p>	<p>G-12 BLOWER MOTOR (F)</p>	<p>G-13 RESISTOR ASSEMBLY (I)</p>		
<p>G-14 BLOWER SWITCH (I)</p>						

G



SHIFT-LOCK SYSTEM

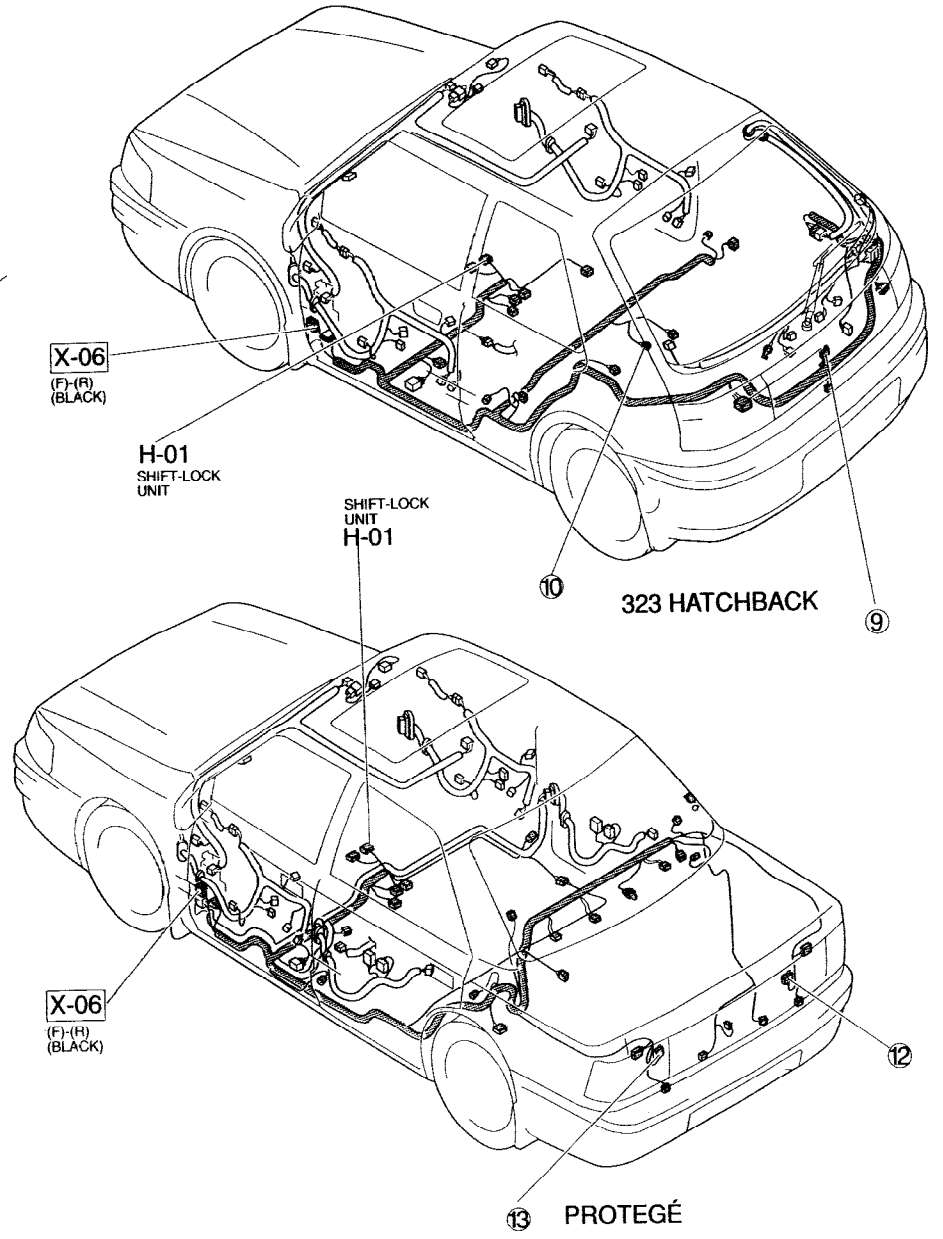
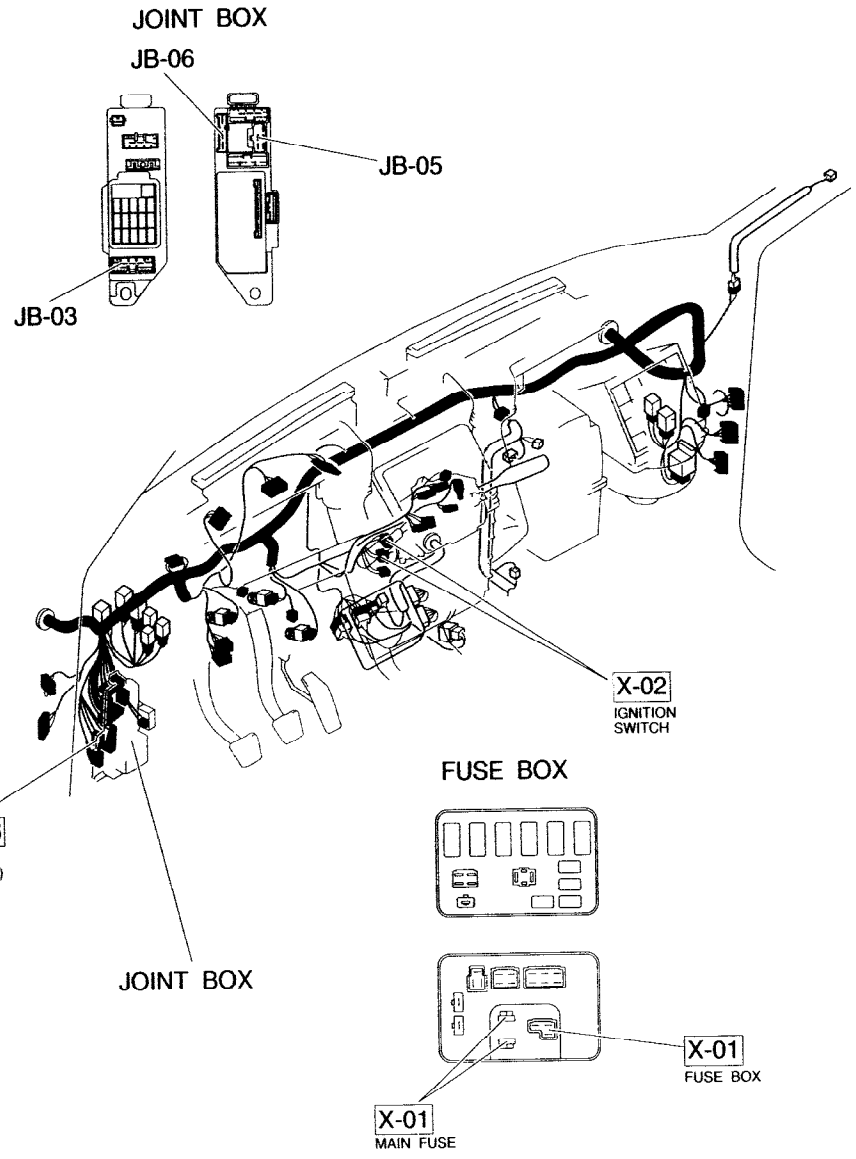
H



<p>H-01 SHIFT-LOCK UNIT (R)</p>			

HARNESS COLOR : FRONT [] REAR []

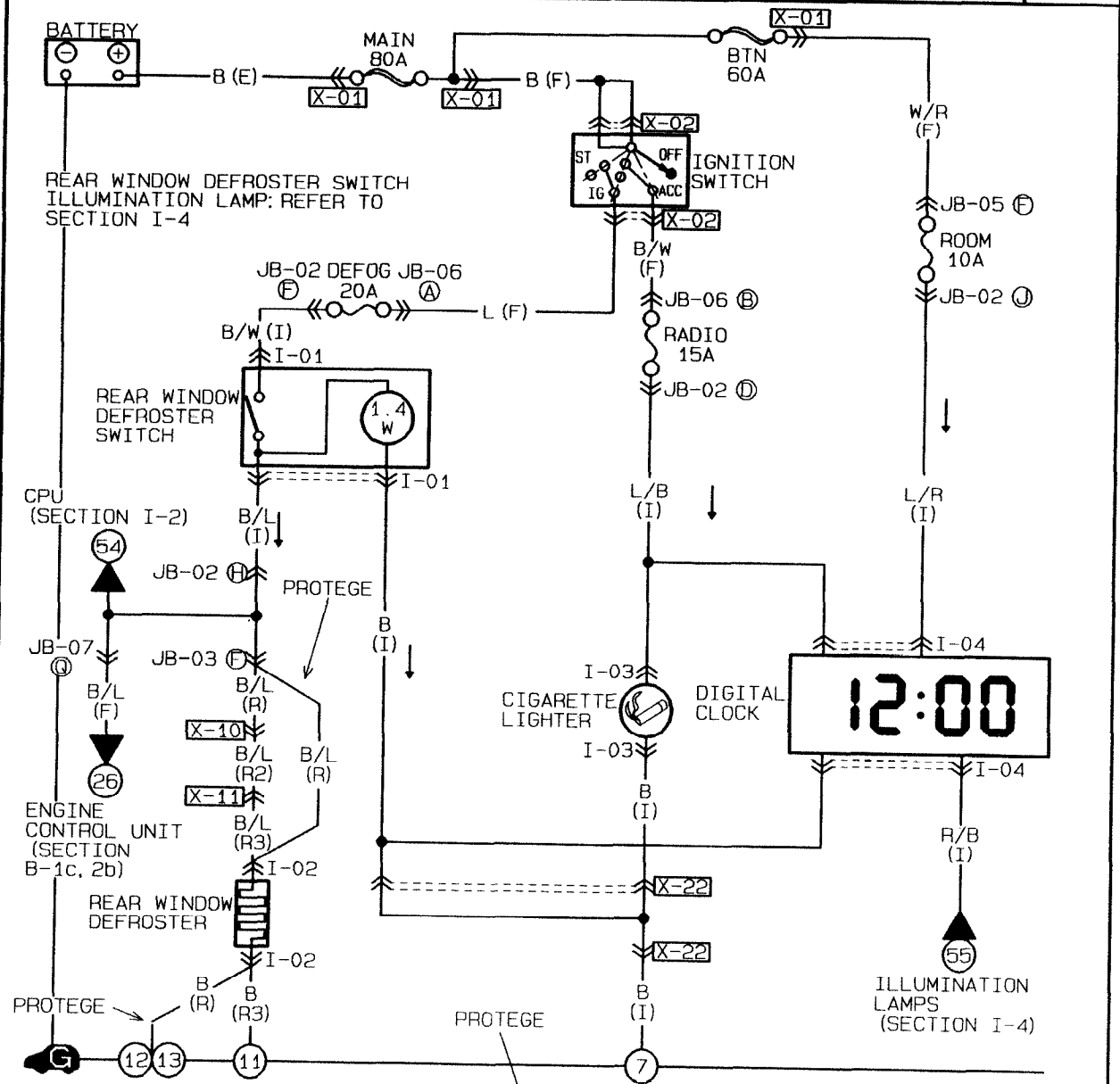
H



Z WIRING DIAGRAM

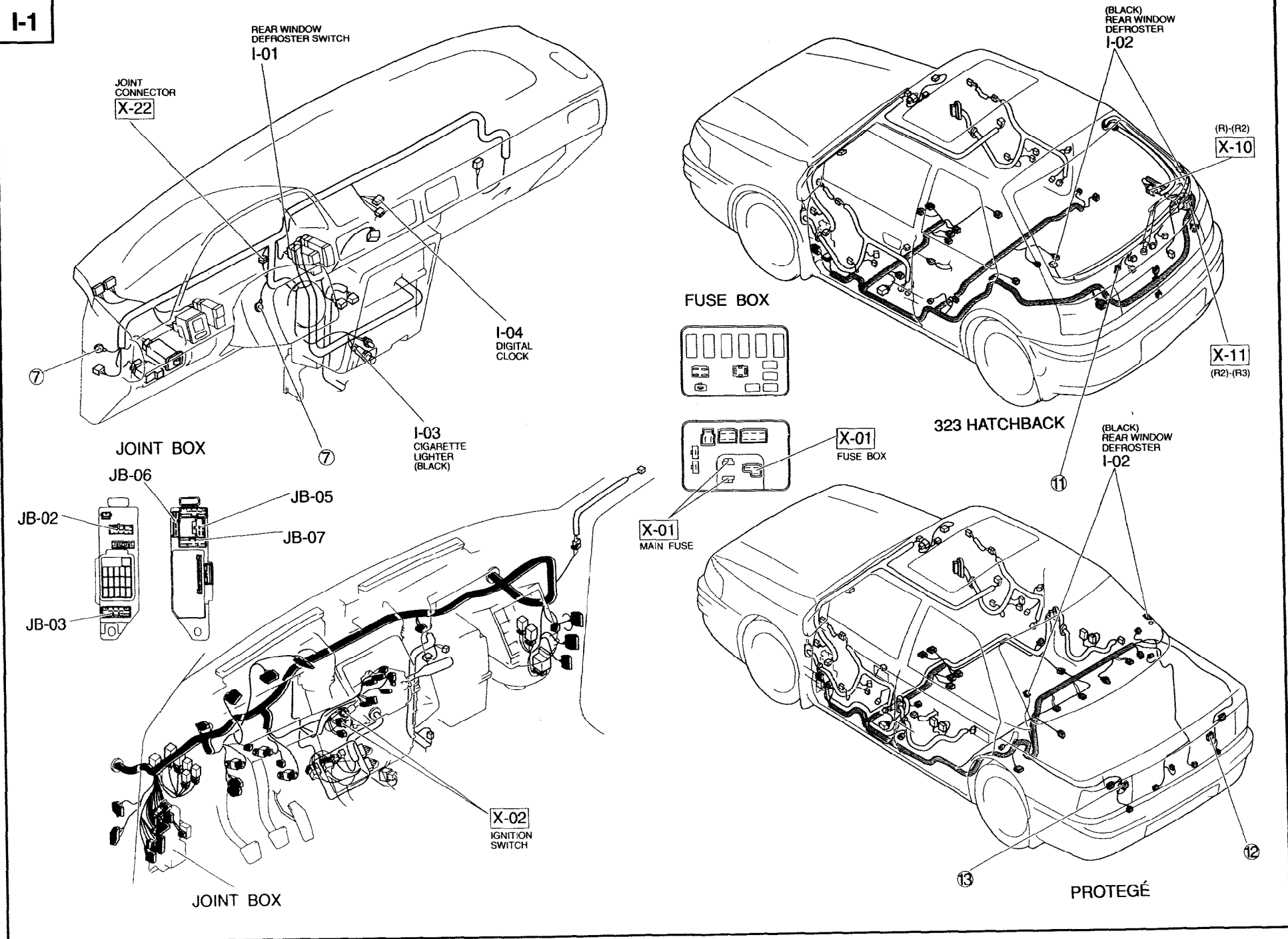
REAR WINDOW DEFROSTER
DIGITAL CLOCK CIGARETTE LIGHTER

I-1



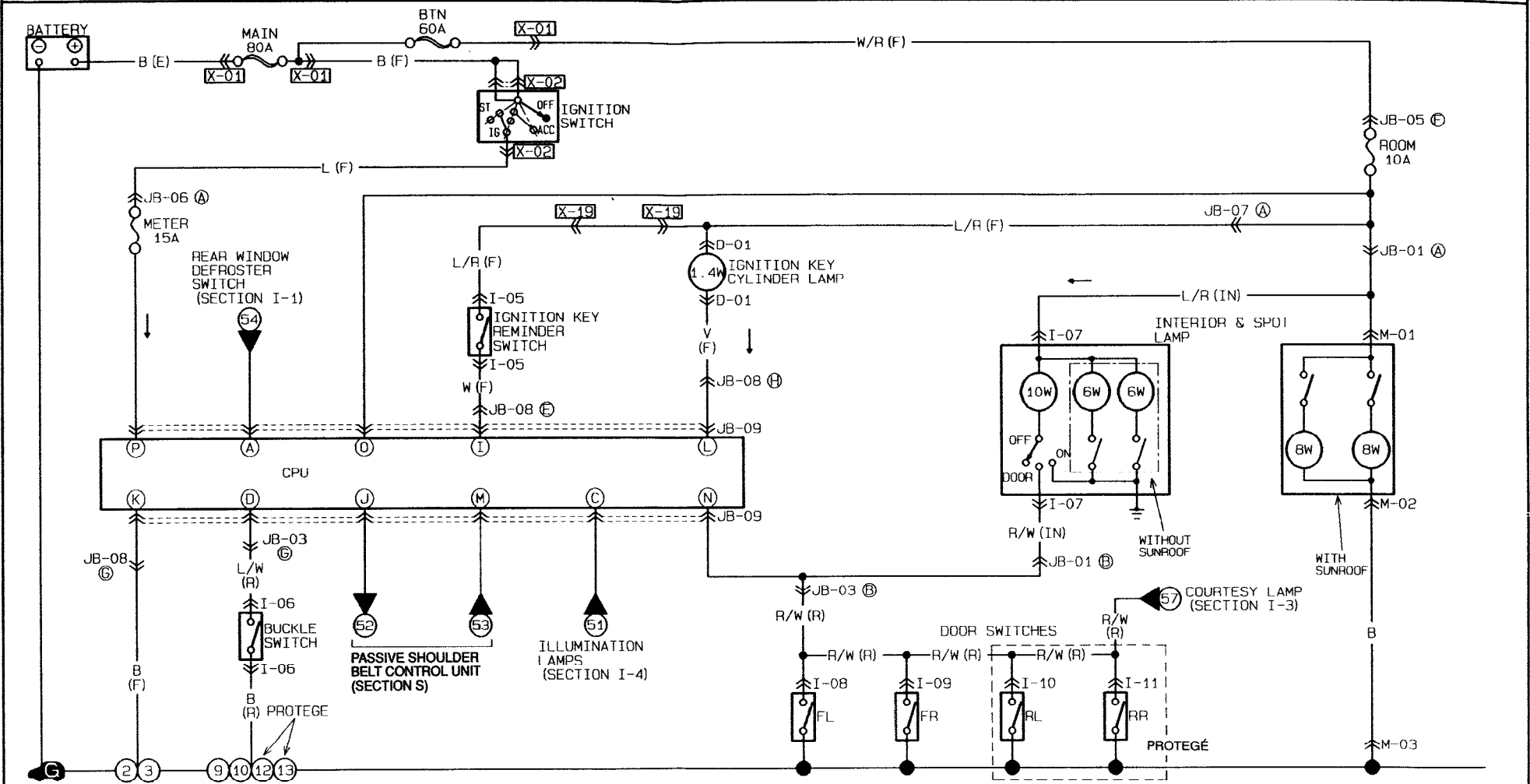
<p>I-01 REAR WINDOW DEFROSTER SWITCH (I)</p> <table border="1"> <tr> <td>*</td> <td>B/L</td> <td>R/B</td> </tr> <tr> <td>B</td> <td>B/W</td> <td>R</td> </tr> </table>	*	B/L	R/B	B	B/W	R	<p>I-02 REAR WINDOW DEFROSTER (R3) (R)</p> <table border="1"> <tr> <td>B/L</td> <td>B</td> </tr> </table>	B/L	B	<p>I-03 CIGARETTE LIGHTER (I)</p> <table border="1"> <tr> <td>L/B</td> </tr> <tr> <td>B</td> </tr> </table>	L/B	B	<p>I-04 DIGITAL CLOCK (I)</p> <table border="1"> <tr> <td>R/B</td> <td>B</td> </tr> <tr> <td>L/B</td> <td>L/R</td> </tr> </table>	R/B	B	L/B	L/R
*	B/L	R/B															
B	B/W	R															
B/L	B																
L/B																	
B																	
R/B	B																
L/B	L/R																

I-1



3K (1)

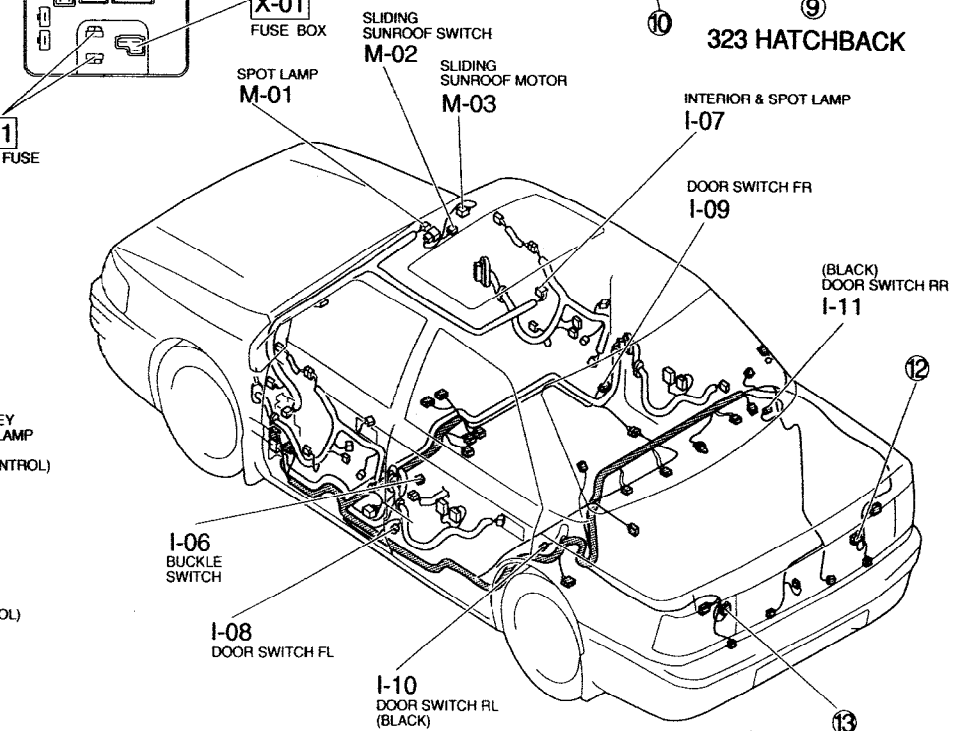
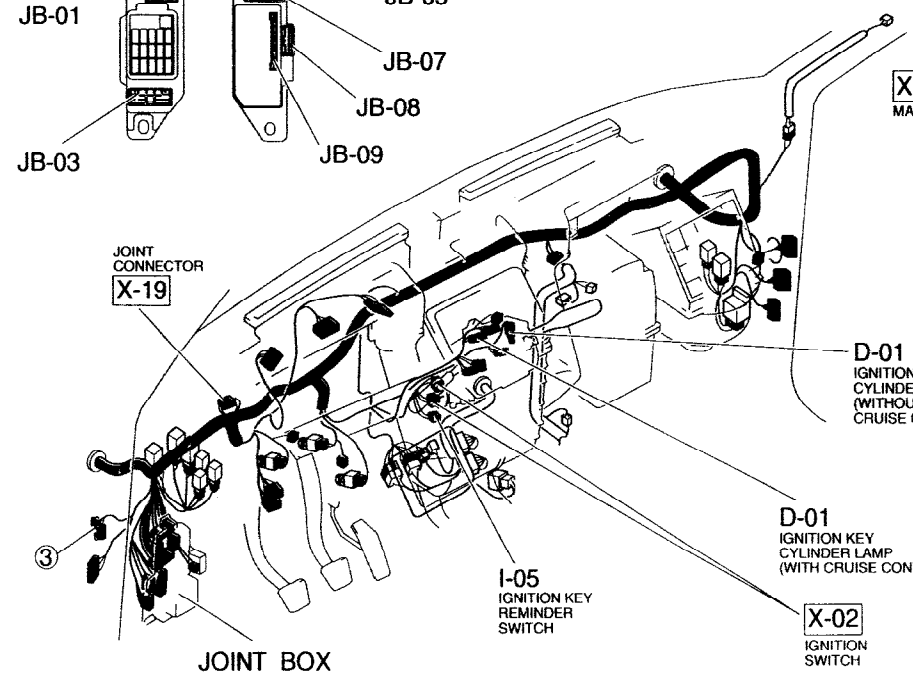
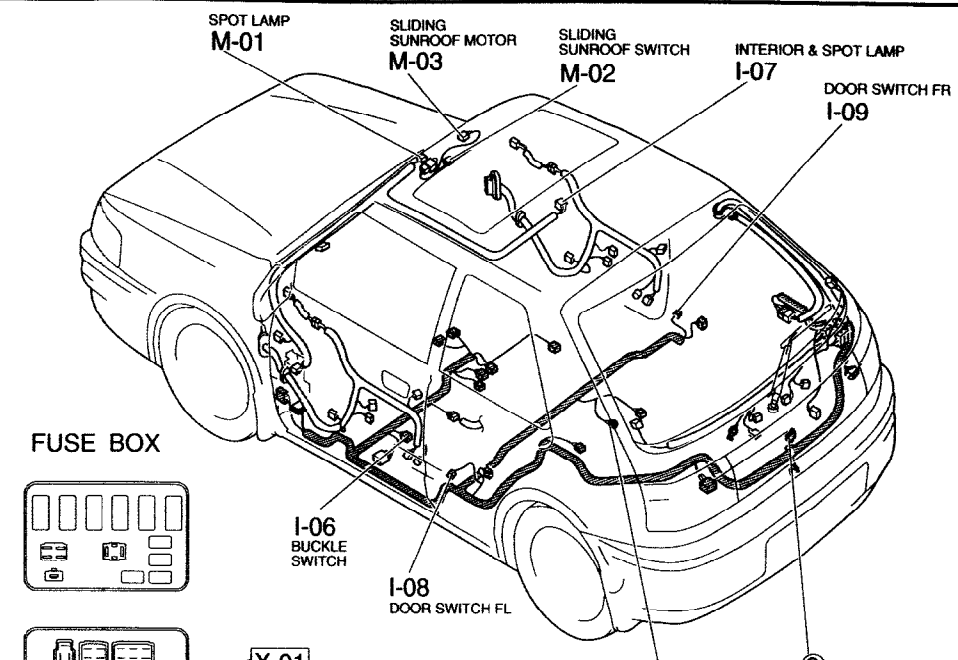
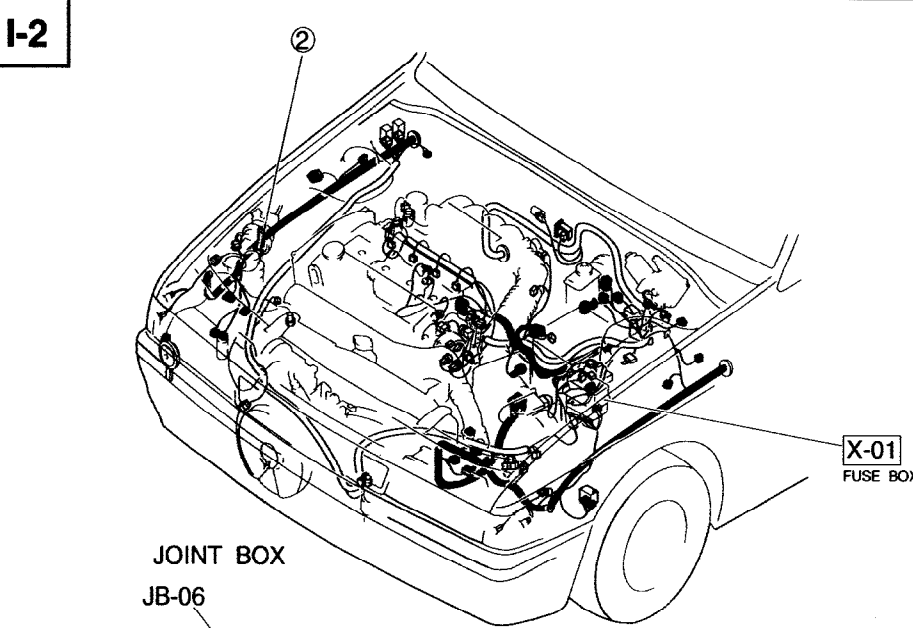
WIRING DIAGRAM
 ■ INTERIOR LAMP ■ SOUND WARNING SYSTEM
 ■ IGNITION KEY CYLINDER LAMP



<p>I-05 IGNITION KEY REMINDER SWITCH (F)</p>	<p>I-06 BUCKLE SWITCH (R)</p> <p>WITH PASSIVE SHOULDER BELT</p> <p>WITHOUT PASSIVE SHOULDER BELT</p>	<p>I-07 INTERIOR & SPOT LAMP (IN) (3HB)</p> <p>WITHOUT SUNROOF</p> <p>WITH SUNROOF</p>	<p>I-08 DOOR SWITCH FL (R)</p> <p>WITH PASSIVE SHOULDER BELT</p> <p>WITHOUT PASSIVE SHOULDER BELT</p>
<p>I-09 DOOR SWITCH FR (R)</p> <p>WITH PASSIVE SHOULDER BELT</p> <p>WITHOUT PASSIVE SHOULDER BELT</p>	<p>I-10 DOOR SWITCH RL (R)</p>	<p>I-11 DOOR SWITCH RR (R)</p>	<p>D-01 IGNITION KEY CYLINDER LAMP (F)</p> <p>WITH CRUISE CONTROL</p> <p>WITHOUT CRUISE CONTROL</p>
<p>M-02 SLIDING SUNROOF SWITCH</p>	<p>M-03 SLIDING SUNROOF MOTOR</p>		<p>M-01 SPOT LAMP (IN)</p>

HARNES COLOR : FRONT [] ENGINE [] REAR []

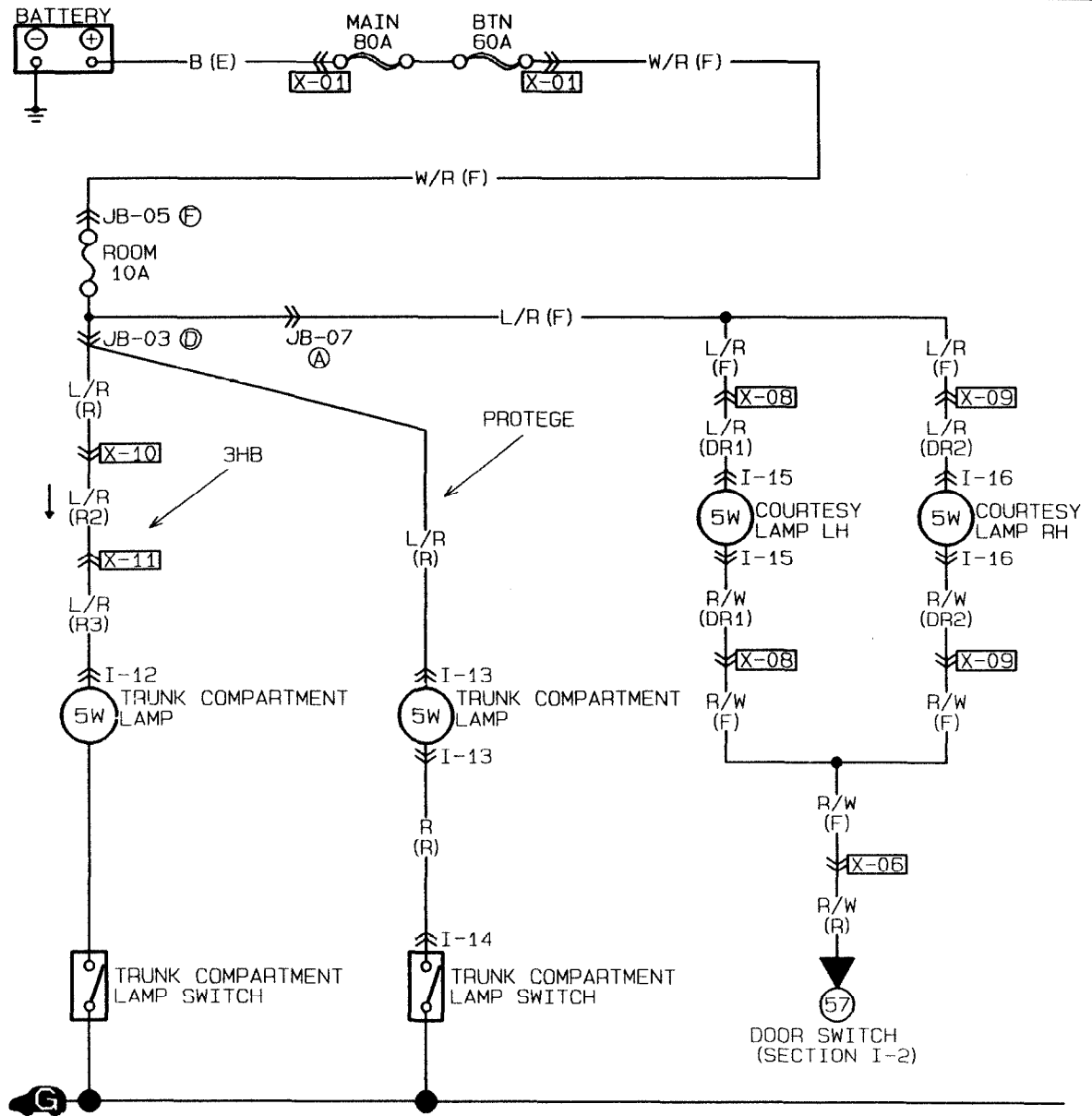
I-2


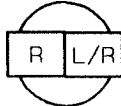

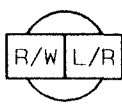



Z WIRING DIAGRAM

- TRUNK COMPARTMENT LAMPS
- COURTESY LAMPS

I-3

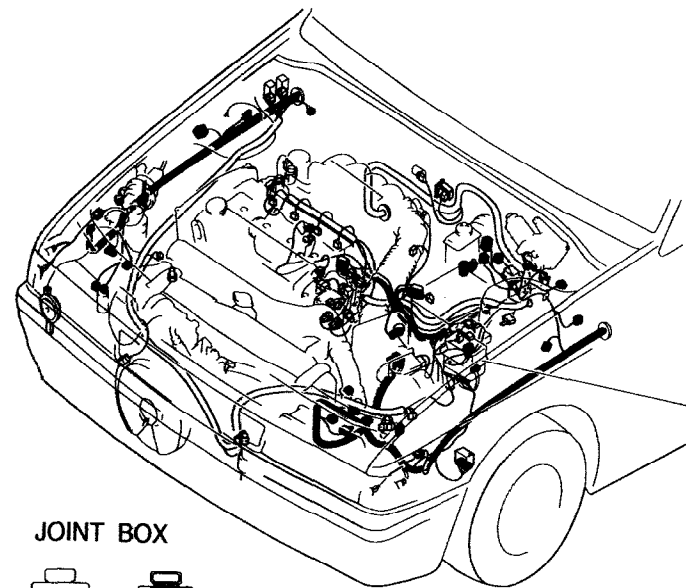


<p>I-12 TRUNK COMPARTMENT LAMP (R3)</p> 	<p>I-13 TRUNK COMPARTMENT LAMP (R)</p> 	<p>I-14 TRUNK COMPARTMENT LAMP SWITCH (R)</p> 	<p>I-15 COURTESY LAMP LH (DR1)</p> 
<p>I-16 COURTESY LAMP RH (DR2)</p> 			

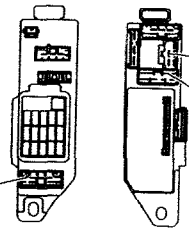
HARNES COLOR : FRONT ENGINE REAR

WIRING DIAGRAM Z

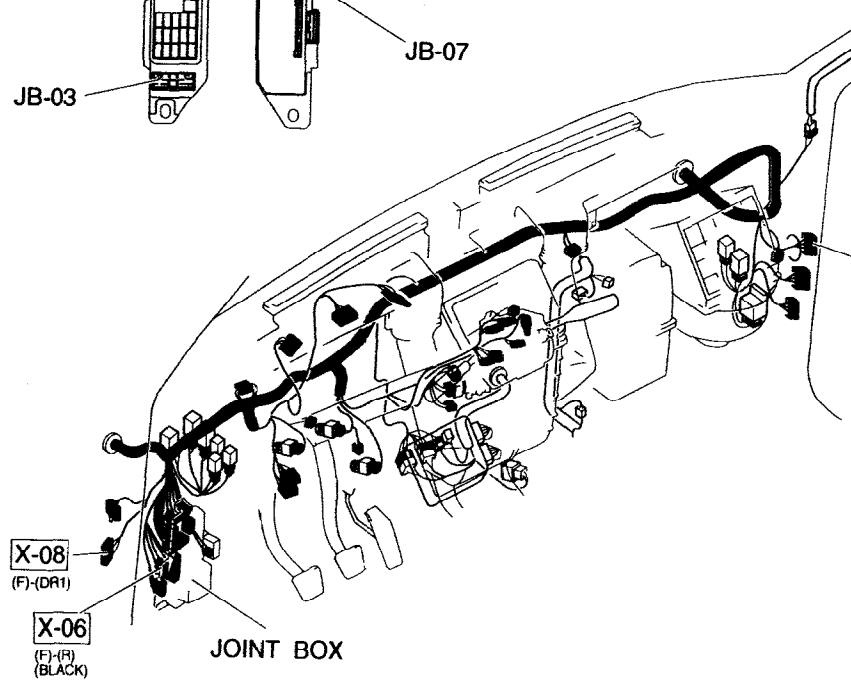
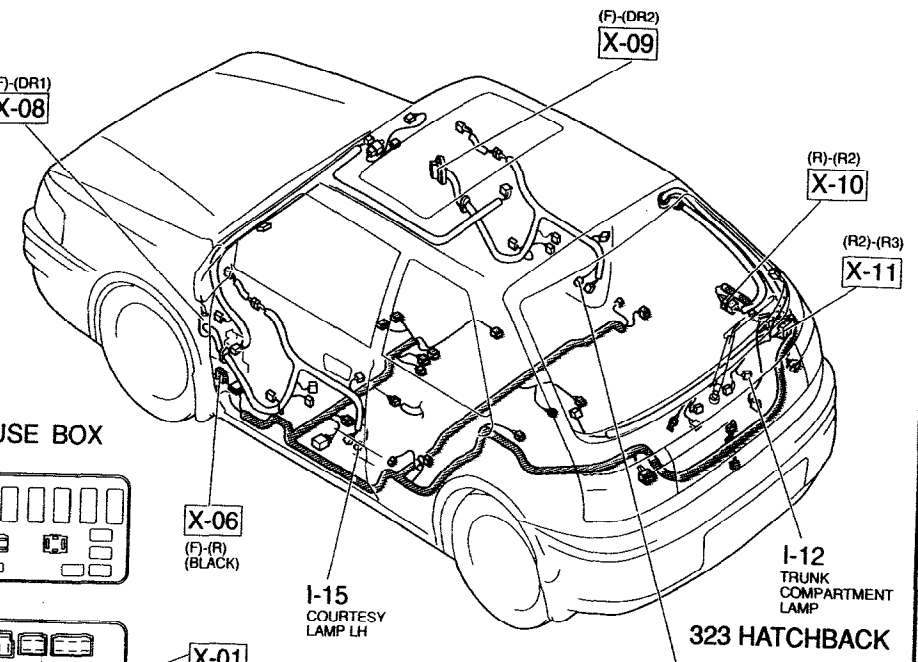
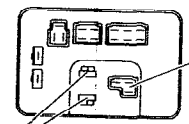
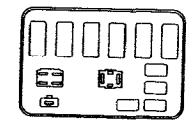
I-3



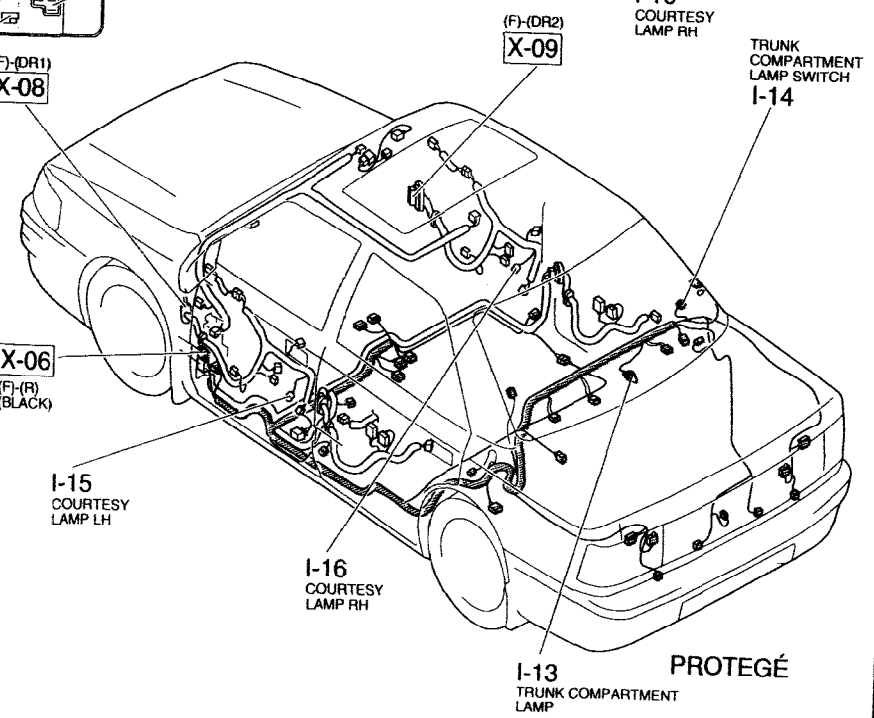
JOINT BOX



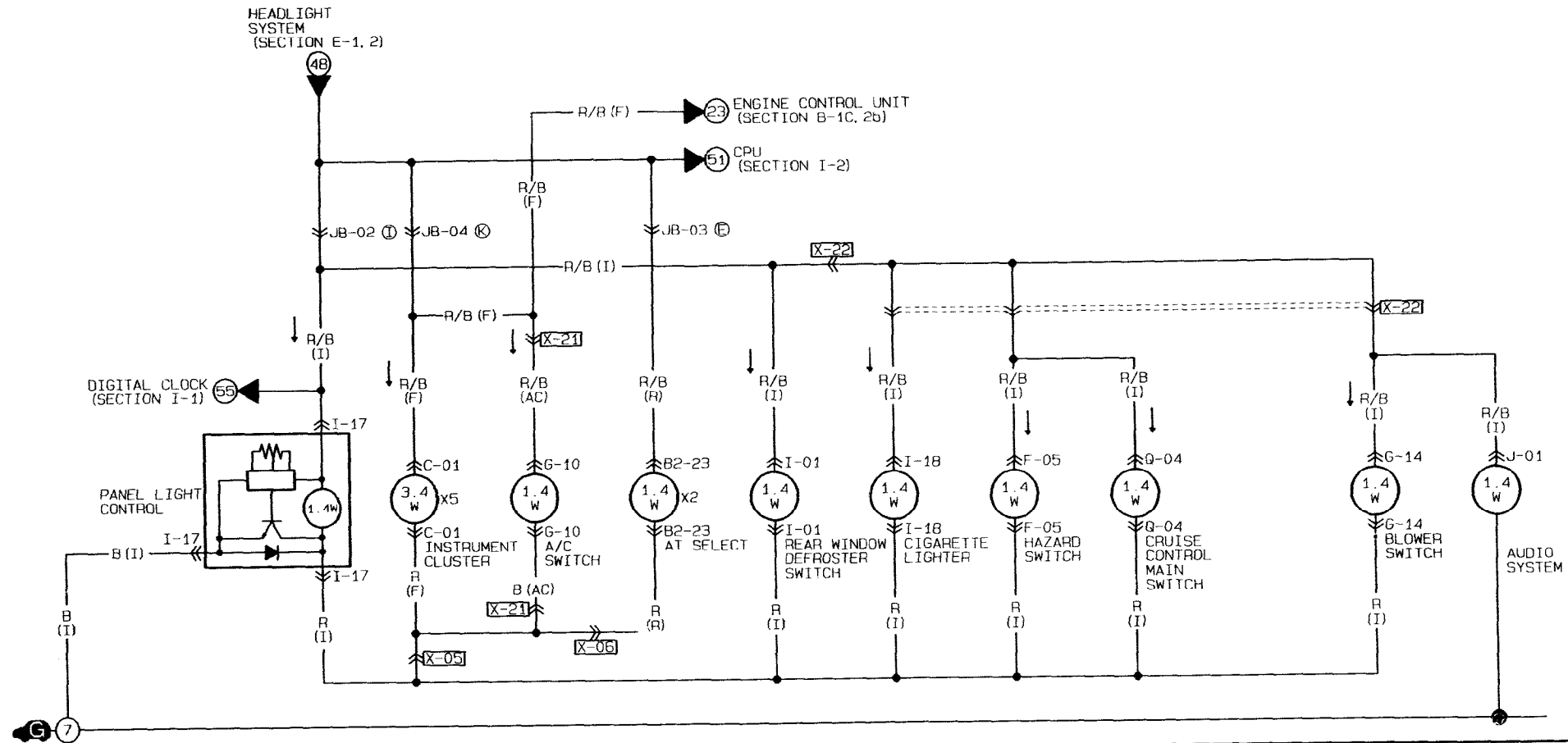
FUSE BOX



JOINT BOX



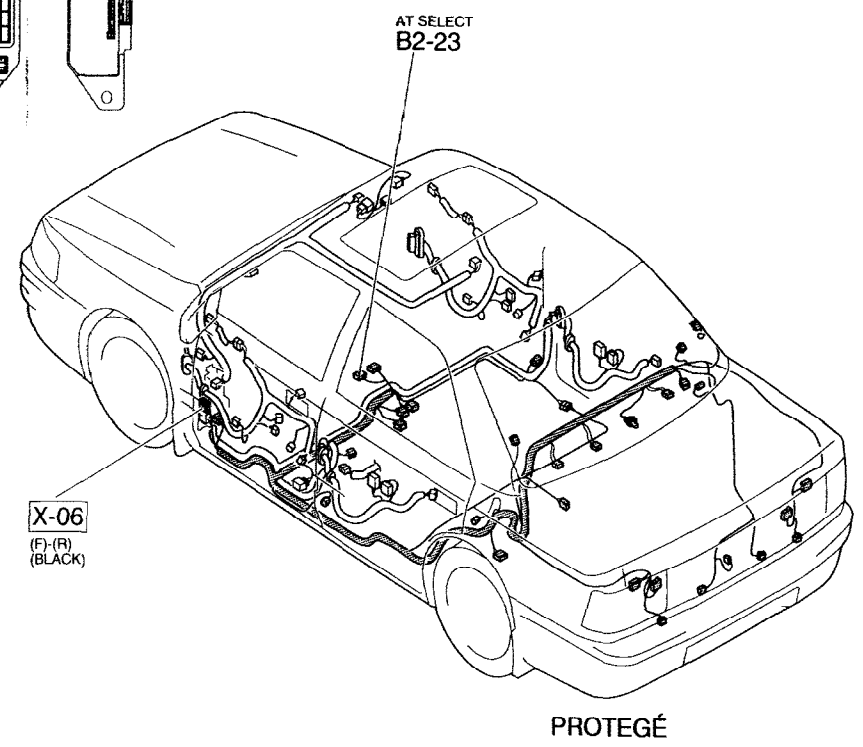
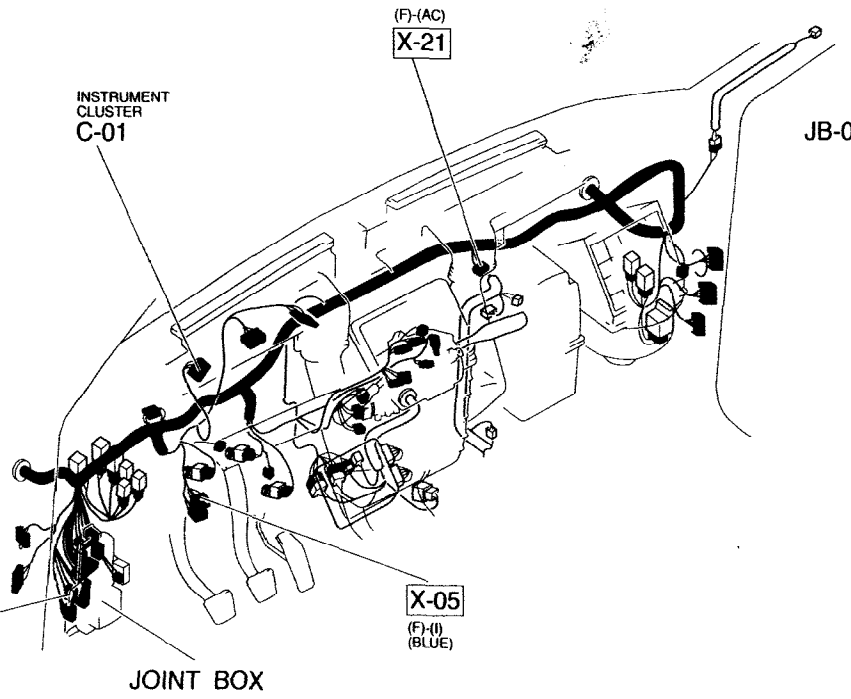
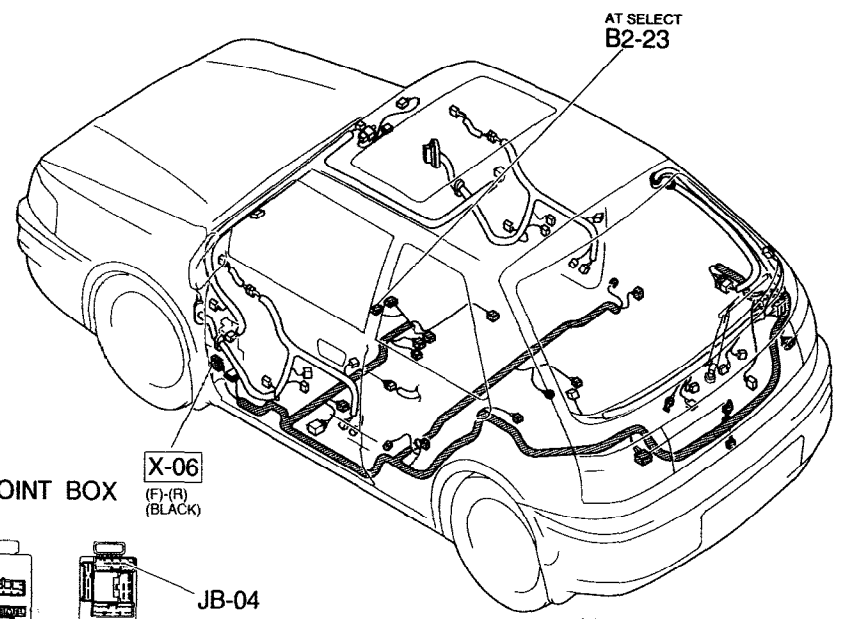
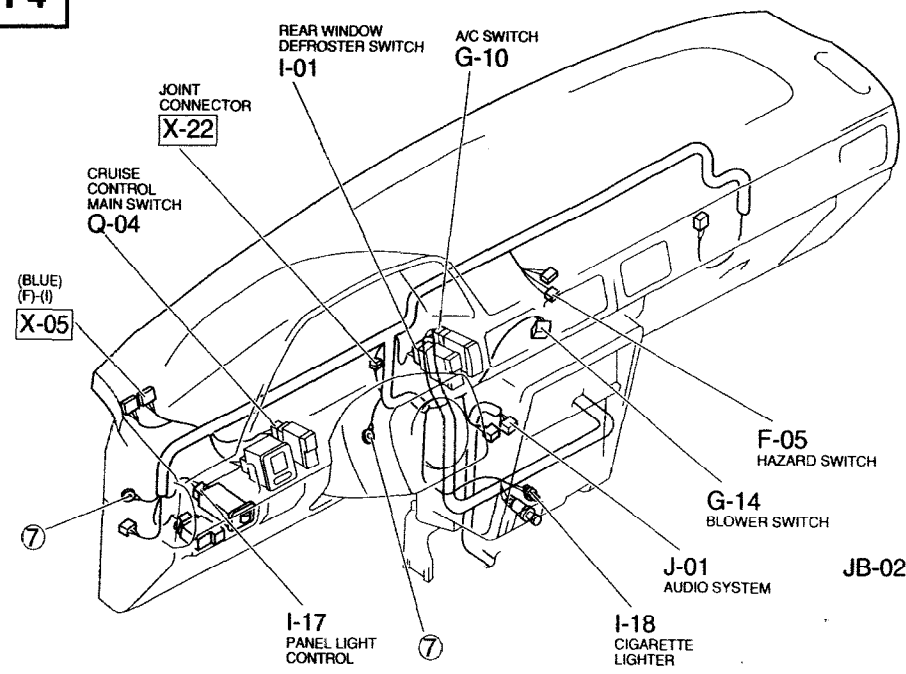
■ ILLUMINATION LAMPS



<p>I-01 REAR WINDOW DEFROSTER SWITCH (I)</p> <table border="1"> <tr><td>*</td><td>B/L</td><td>R/B</td></tr> <tr><td>B</td><td>B/W</td><td>R</td></tr> </table>	*	B/L	R/B	B	B/W	R	<p>I-17 PANEL LIGHT CONTROL (I)</p> <table border="1"> <tr><td>B</td><td></td><td>R</td></tr> <tr><td>*</td><td>*</td><td>R/B</td></tr> </table>	B		R	*	*	R/B	<p>I-18 CIGARETTE LIGHTER (I)</p> <table border="1"> <tr><td>R</td><td>R/B</td></tr> </table>	R	R/B	<p>C-01 INSTRUMENT CLUSTER (F)</p> <table border="1"> <tr><td>*</td><td>*</td><td>*</td><td>ABR/Y</td><td>*</td><td>W/R</td><td>L/G/W</td><td>Y/B</td><td>Y</td><td>R</td><td>R/B</td></tr> </table>	*	*	*	ABR/Y	*	W/R	L/G/W	Y/B	Y	R	R/B	<p>F-05 HAZARD SWITCH (I)</p> <table border="1"> <tr><td>*</td><td>*</td><td></td><td>O</td><td>B</td></tr> <tr><td>*</td><td>*</td><td>R/B</td><td>R</td><td>*</td><td>G/W</td></tr> </table>	*	*		O	B	*	*	R/B	R	*	G/W								
*	B/L	R/B																																														
B	B/W	R																																														
B		R																																														
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*	*	*	ABR/Y	*	W/R	L/G/W	Y/B	Y	R	R/B																																						
*	*		O	B																																												
*	*	R/B	R	*	G/W																																											
<p>G-10 A/C SWITCH (AC)</p> <table border="1"> <tr><td>*</td><td></td><td>G/R</td></tr> <tr><td>B</td><td>L/Y</td><td>L/G</td><td>R/B</td></tr> </table>	*		G/R	B	L/Y	L/G	R/B	<p>G-14 BLOWER SWITCH (I)</p> <table border="1"> <tr><td>L</td><td>L/Y</td><td></td><td>O/L</td><td>R</td><td>R/B</td></tr> <tr><td></td><td>L/W</td><td></td><td>L/R</td><td></td><td>B</td></tr> </table>	L	L/Y		O/L	R	R/B		L/W		L/R		B	<p>B2-23 AT SELECT (R)</p> <table border="1"> <tr><td>BR/B</td><td>R/B</td><td>*</td></tr> <tr><td>B</td><td>R</td><td>*</td></tr> </table>	BR/B	R/B	*	B	R	*	<p>J-01 AUDIO SYSTEM (I)</p> <table border="1"> <tr><td>O</td><td>V</td><td></td><td>R/B</td><td>L/R</td><td>L/B</td></tr> <tr><td>W</td><td>L/O</td><td>*</td><td>*</td><td>*</td><td>*</td></tr> </table>	O	V		R/B	L/R	L/B	W	L/O	*	*	*	*	<p>G-04 CRUISE CONTROL MAIN SWITCH (I)</p> <table border="1"> <tr><td>R/B</td><td></td><td>GY</td></tr> <tr><td>R</td><td>B/Y</td><td>Y</td><td>B</td></tr> </table>	R/B		GY	R	B/Y	Y	B
*		G/R																																														
B	L/Y	L/G	R/B																																													
L	L/Y		O/L	R	R/B																																											
	L/W		L/R		B																																											
BR/B	R/B	*																																														
B	R	*																																														
O	V		R/B	L/R	L/B																																											
W	L/O	*	*	*	*																																											
R/B		GY																																														
R	B/Y	Y	B																																													

HARNES COLOR : FRONT INSTRUMENT PANEL REAR

I-4

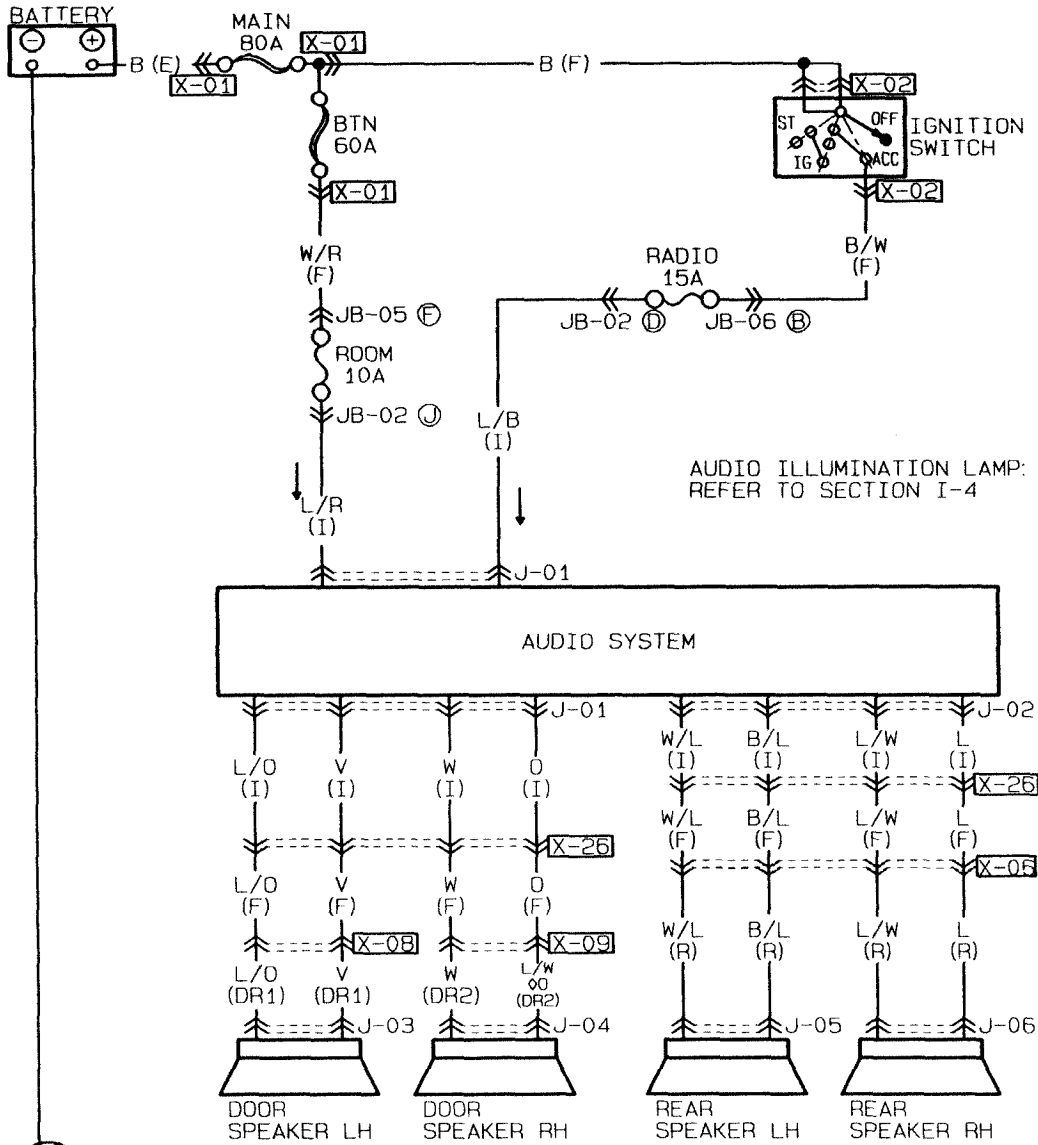


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■ AUDIO SYSTEM

J



J-01 AUDIO SYSTEM (I)

O	V	W	R/B	L/R	L/B
W	L/O	*	*	*	*

J-02 AUDIO SYSTEM (I)

*	W	*	W/L
*	L	L/W	* B/L

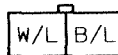
J-03 DOOR SPEAKER LH (DR1)



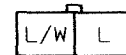
J-04 DOOR SPEAKER RH (DR2)



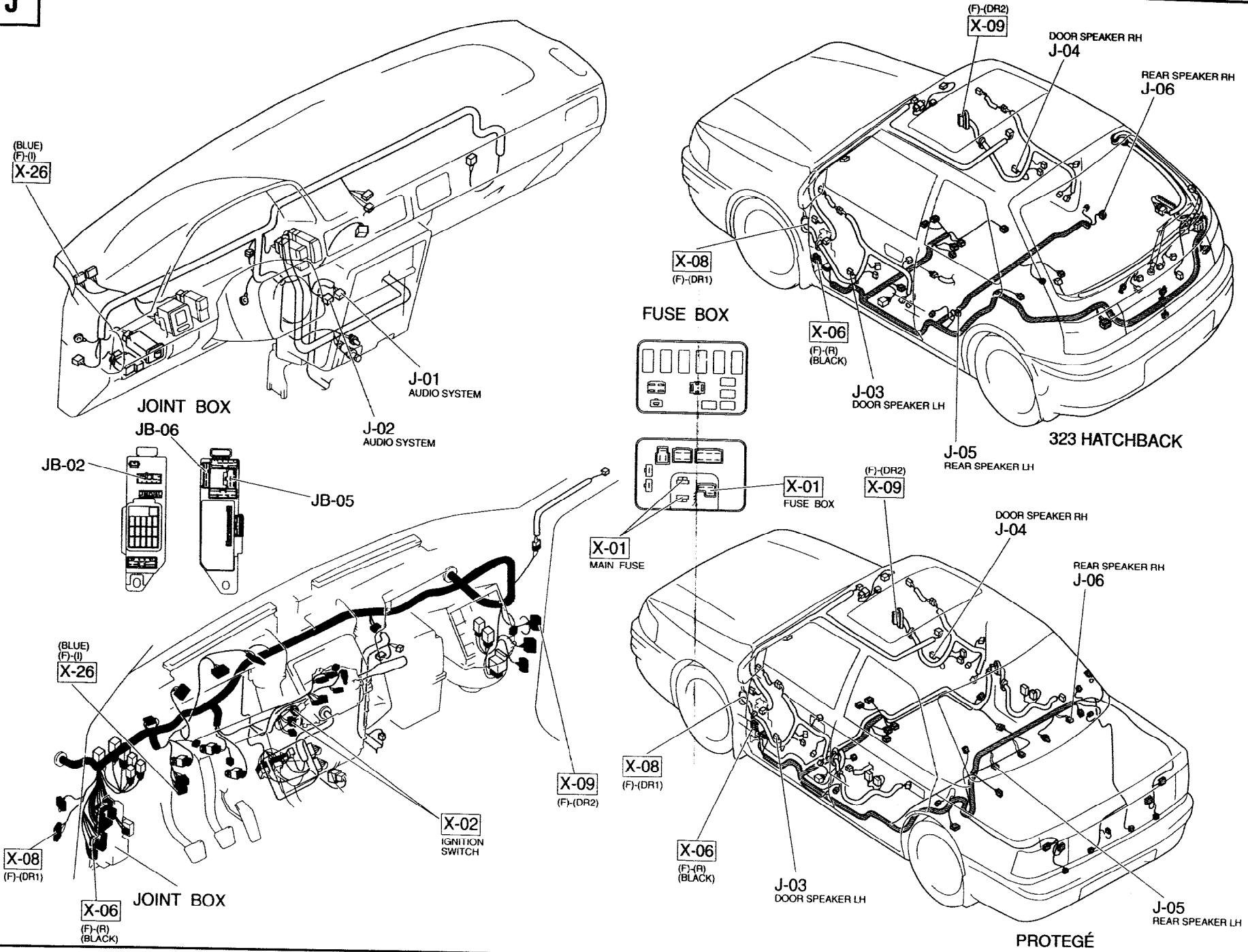
J-05 REAR SPEAKER LH (R)



J-06 REAR SPEAKER RH (R)



J

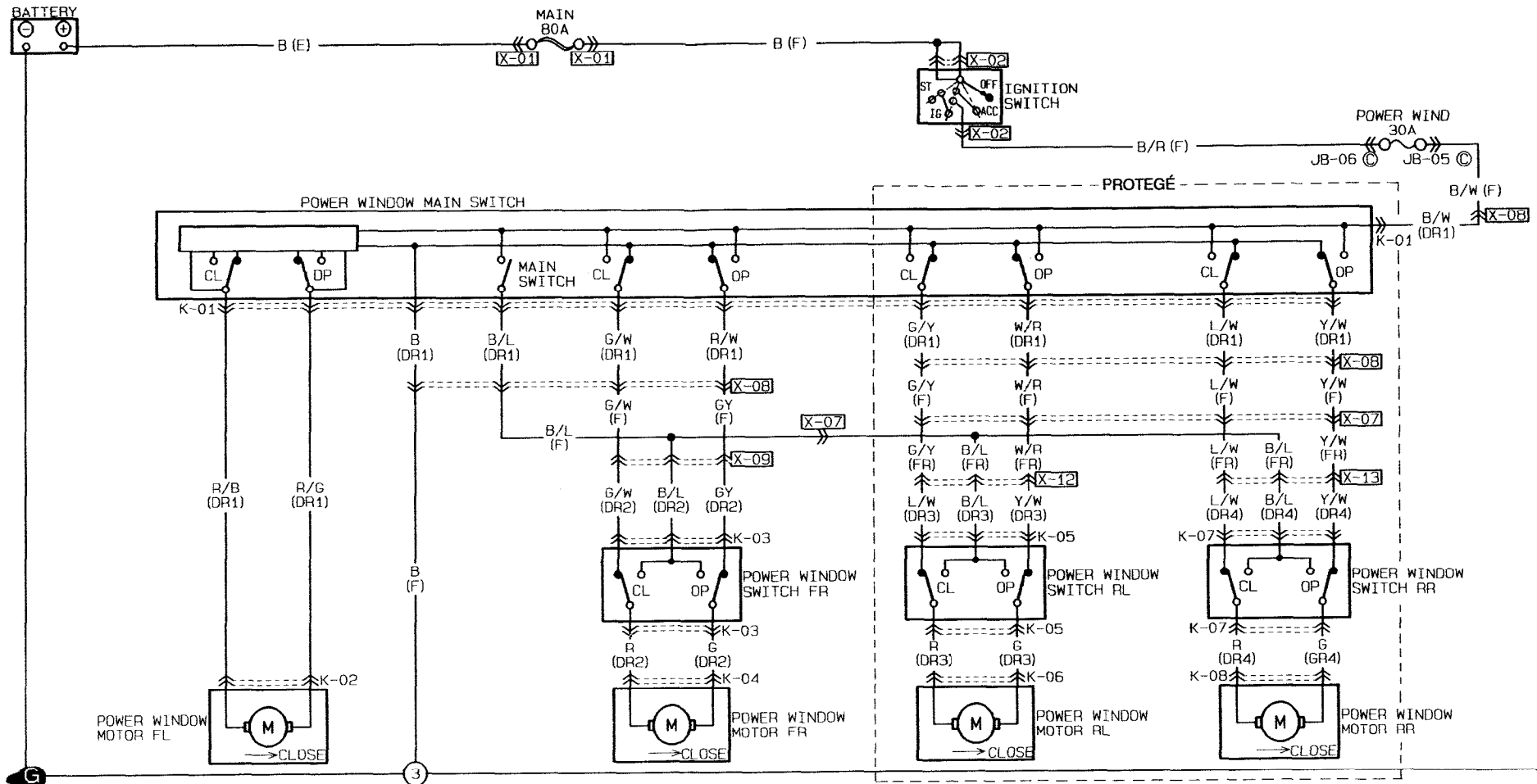


AKER RH (R)

PROTEGE

POWER WINDOW

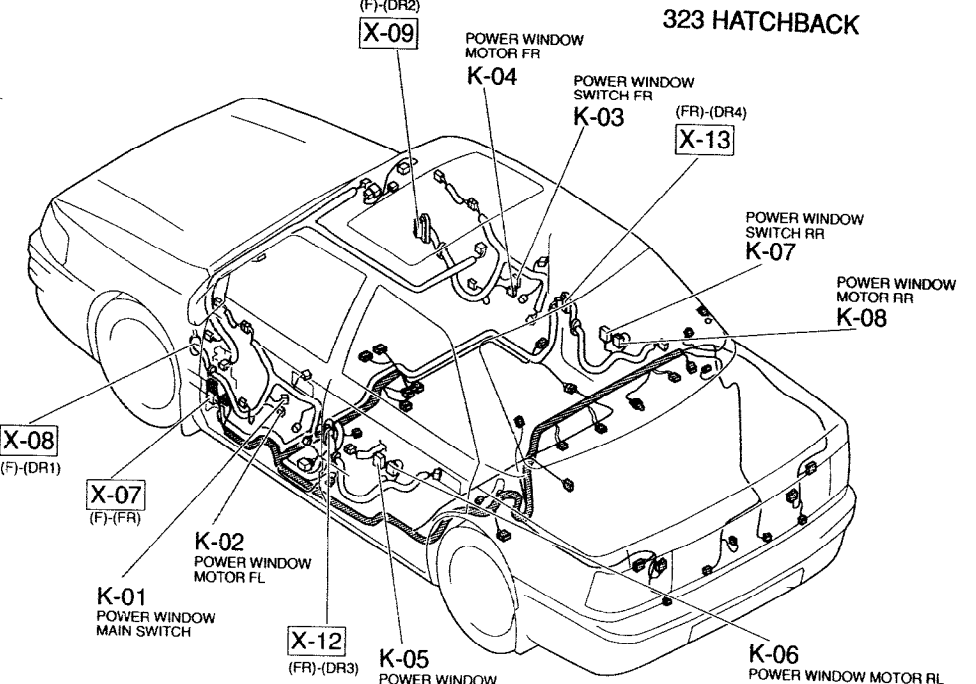
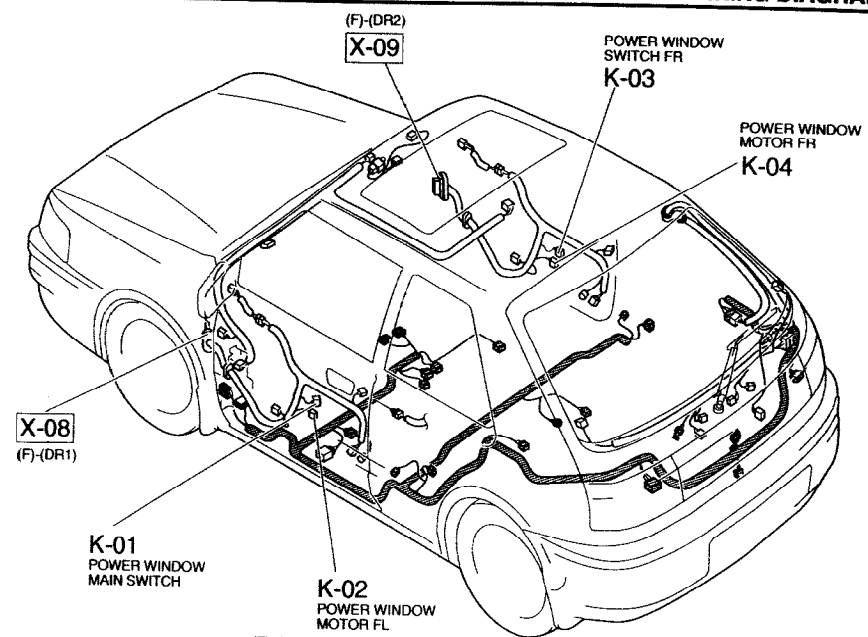
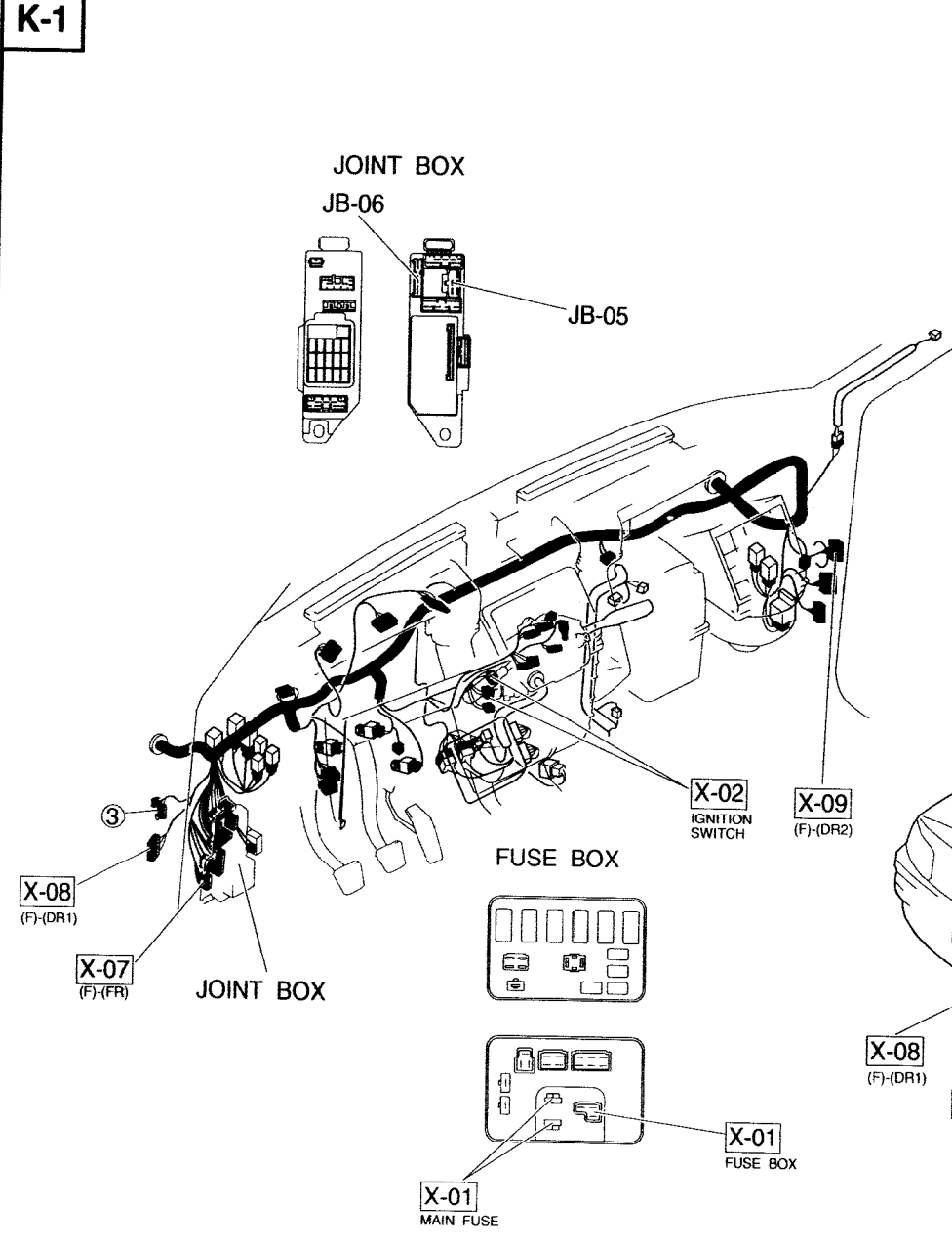
K-1



<p>K-01 POWER WINDOW MAIN SWITCH (DR1)</p> <p>PROTEGE</p> <table border="1"> <tr><td>G/Y</td><td>W/R</td><td>Y/W</td><td>L/W</td><td>B/W</td></tr> <tr><td>R/G</td><td>R/B</td><td>B</td><td>B/L</td><td>G/W</td><td>R/W</td></tr> </table> <p>3HB</p> <table border="1"> <tr><td>R/G</td><td>B</td><td>R/W</td></tr> <tr><td>R/B</td><td>R/W</td><td>B/L</td><td>G/W</td></tr> </table>	G/Y	W/R	Y/W	L/W	B/W	R/G	R/B	B	B/L	G/W	R/W	R/G	B	R/W	R/B	R/W	B/L	G/W	<p>K-02 POWER WINDOW MOTOR FL (DR1)</p> <table border="1"> <tr><td>R/B</td></tr> <tr><td>R/G</td></tr> </table>	R/B	R/G	<p>K-03 POWER WINDOW SWITCH FR (DR2)</p> <table border="1"> <tr><td>R</td><td>G/W</td><td>GY</td><td>*</td><td>G</td><td>B/L</td></tr> </table>	R	G/W	GY	*	G	B/L	<p>K-04 POWER WINDOW MOTOR FR (DR2)</p> <table border="1"> <tr><td>R</td></tr> <tr><td>G</td></tr> </table>	R	G	<p>K-05 POWER WINDOW SWITCH RL (DR3)</p> <table border="1"> <tr><td>R</td><td>G</td><td>L/W</td><td>Y/W</td><td>B/L</td><td>*</td></tr> </table>	R	G	L/W	Y/W	B/L	*
G/Y	W/R	Y/W	L/W	B/W																																		
R/G	R/B	B	B/L	G/W	R/W																																	
R/G	B	R/W																																				
R/B	R/W	B/L	G/W																																			
R/B																																						
R/G																																						
R	G/W	GY	*	G	B/L																																	
R																																						
G																																						
R	G	L/W	Y/W	B/L	*																																	
<p>K-06 POWER WINDOW MOTOR RL (DR3)</p> <table border="1"> <tr><td>R</td></tr> <tr><td>G</td></tr> </table>	R	G	<p>K-07 POWER WINDOW SWITCH RR (DR4)</p> <table border="1"> <tr><td>R</td><td>G</td><td>L/W</td><td>Y/W</td><td>B/L</td><td>*</td></tr> </table>	R	G	L/W	Y/W	B/L	*	<p>K-08 POWER WINDOW MOTOR RR (DR4)</p> <table border="1"> <tr><td>R</td></tr> <tr><td>G</td></tr> </table>	R	G																										
R																																						
G																																						
R	G	L/W	Y/W	B/L	*																																	
R																																						
G																																						

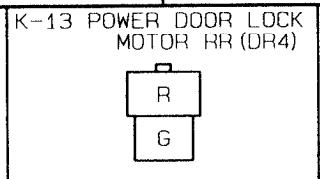
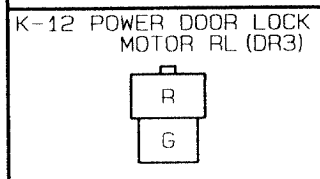
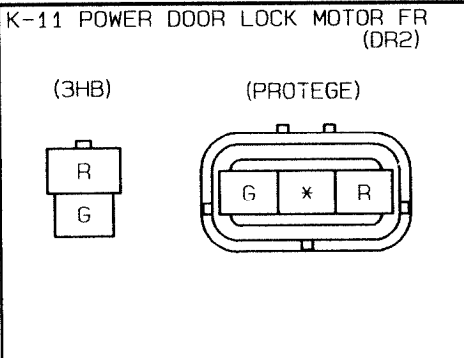
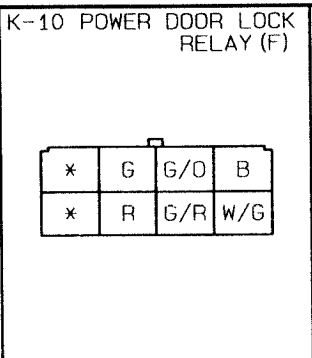
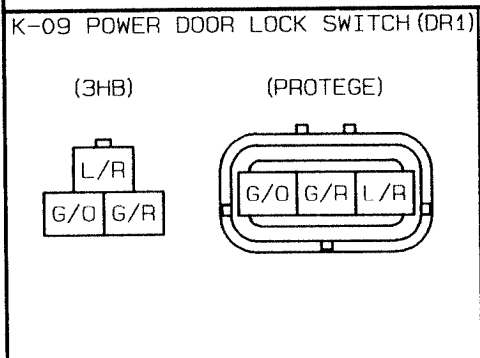
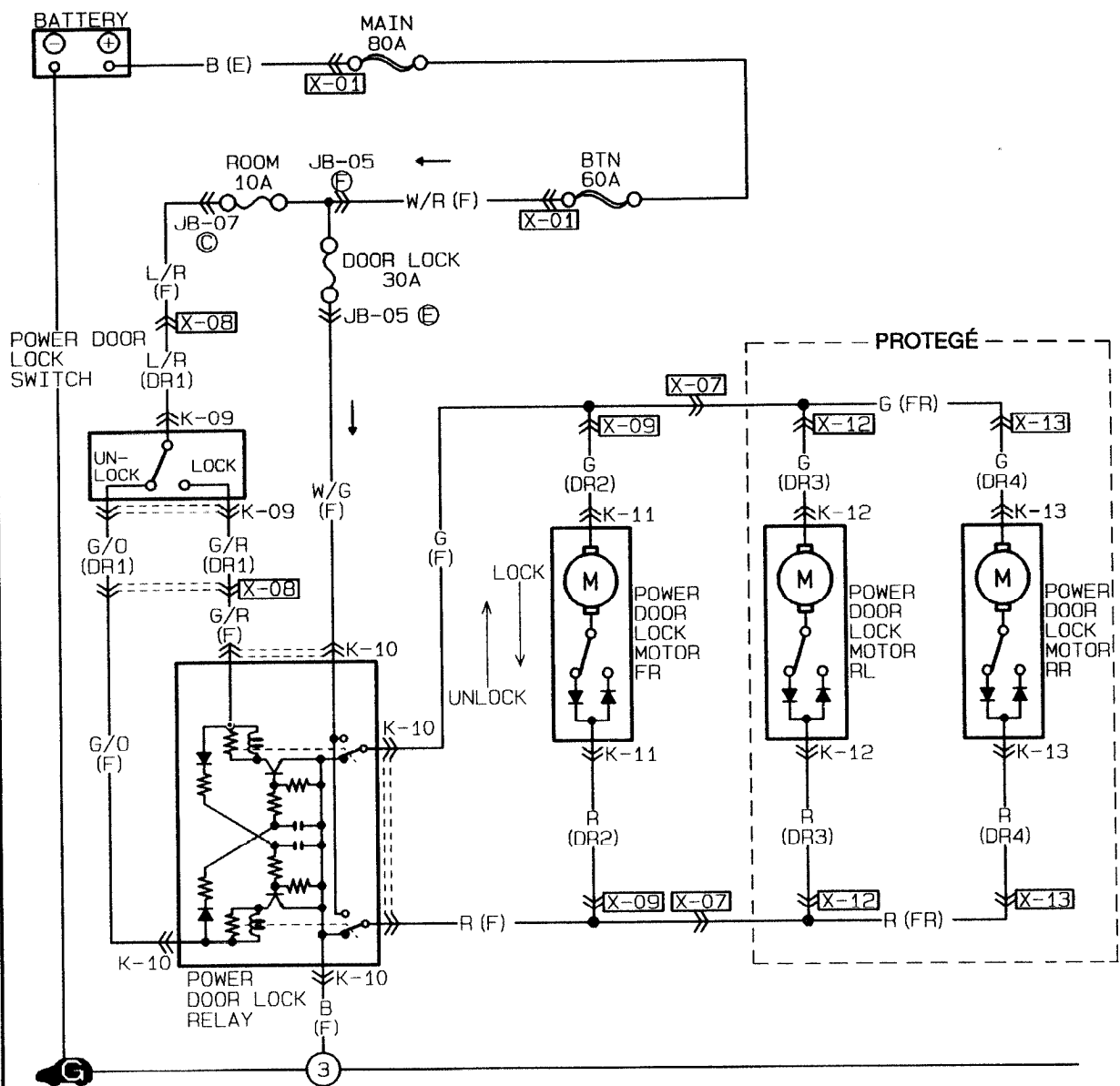
HARNES COLOR : FRONT [] REAR []

K-1



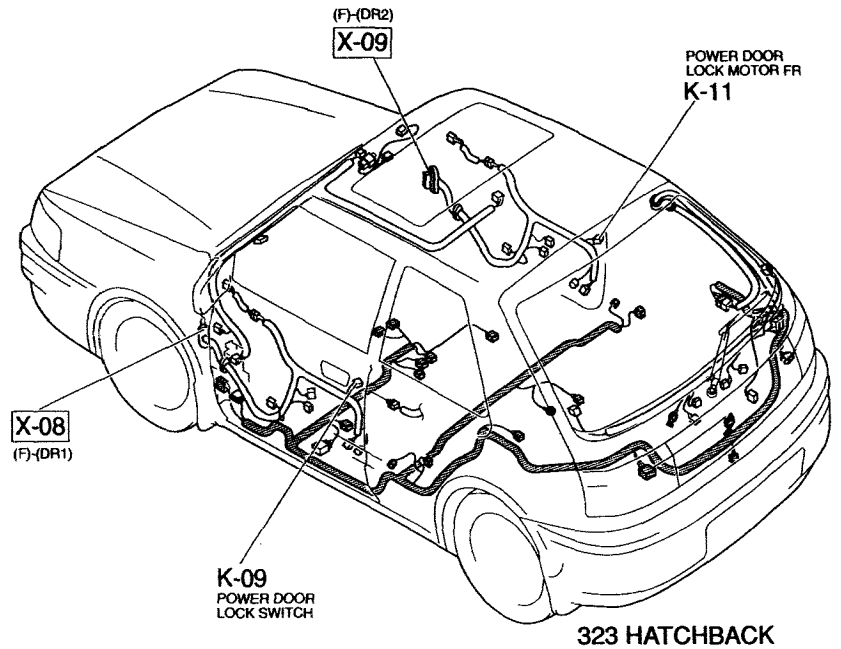
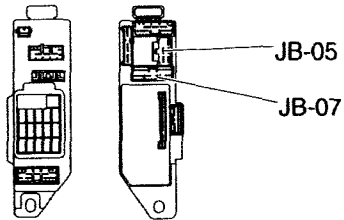
POWER DOOR LOCK

K-2



K-2

JOINT BOX



POWER DOOR LOCK RELAY
K-10

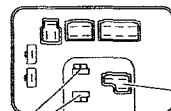
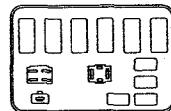
③

X-08 (F)-(DR1)

X-07 (F)-(FR)

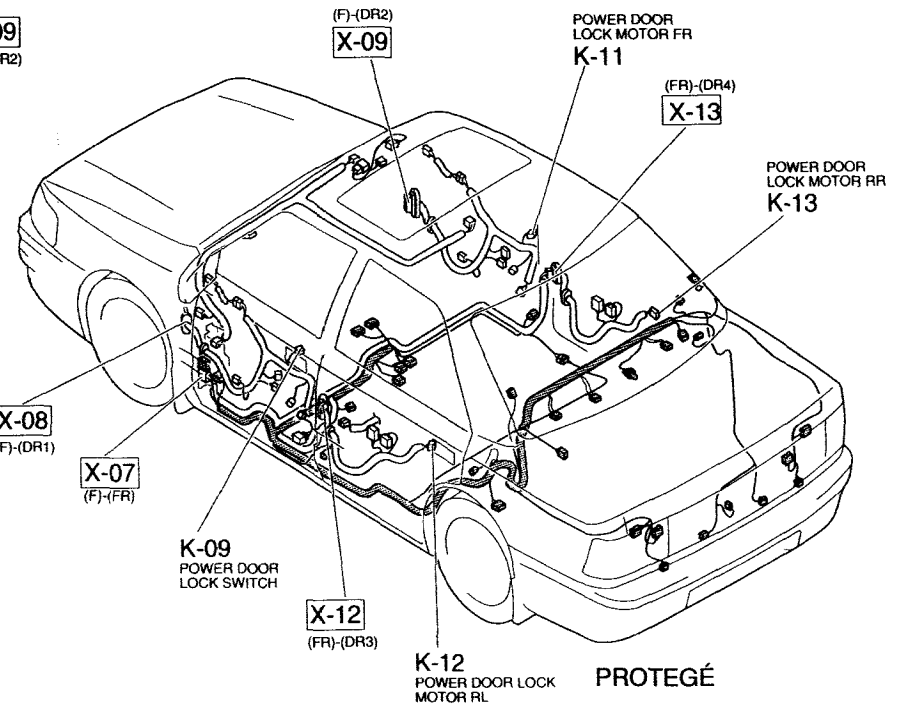
JOINT BOX

FUSE BOX



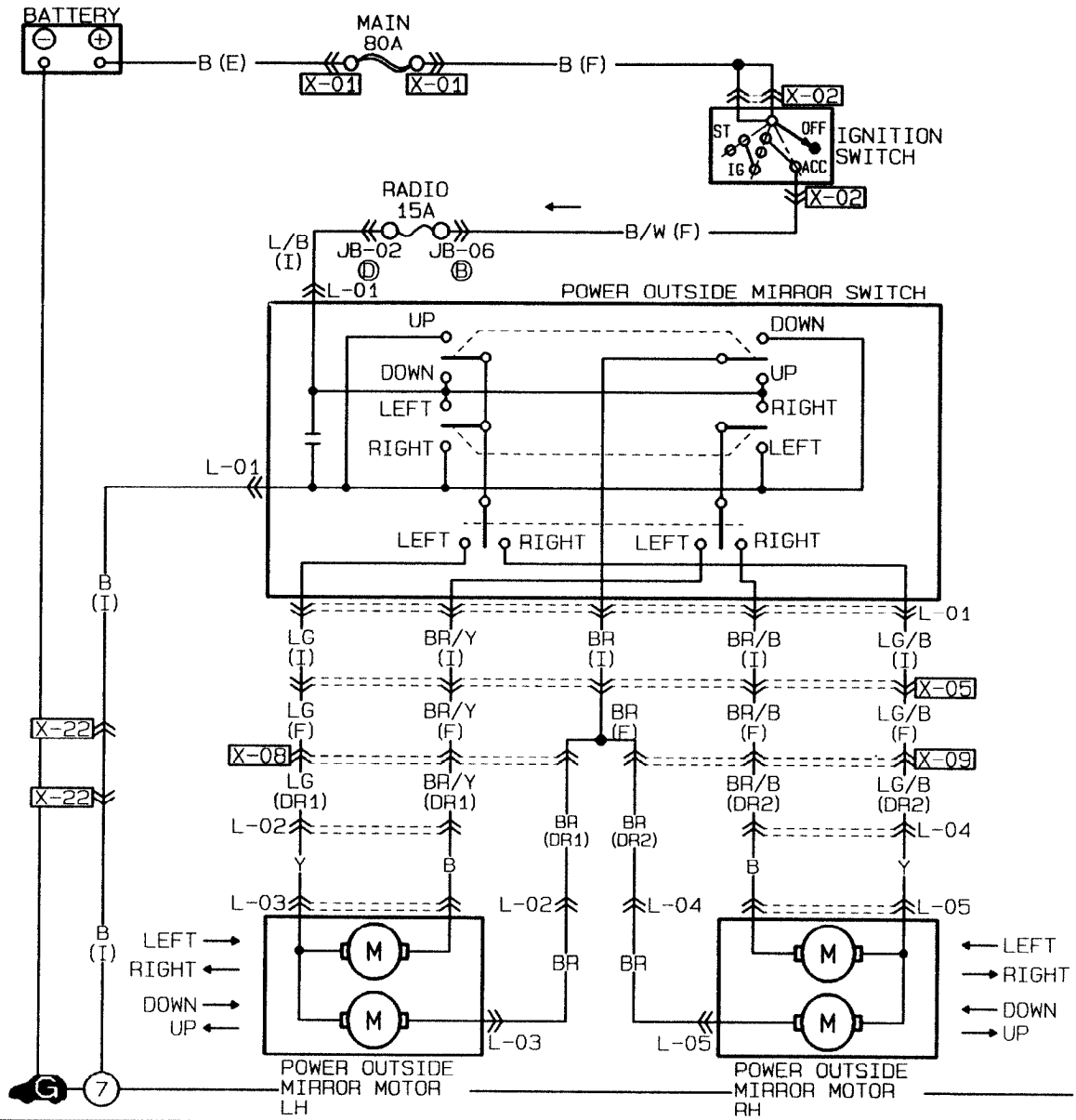
X-01 FUSE BOX

X-01 MAIN FUSE



POWER OUTSIDE MIRROR

L



L-01 POWER OUTSIDE MIRROR SWITCH (I)

BR	L/B		LG/B	LG
B	*	*	*	BR/YBR/B

L-02 DR1-MIRROR (DR1)

LG	BR	BR	Y
BR/Y	*	*	B

L-03 POWER OUTSIDE MIRROR MOTOR LH

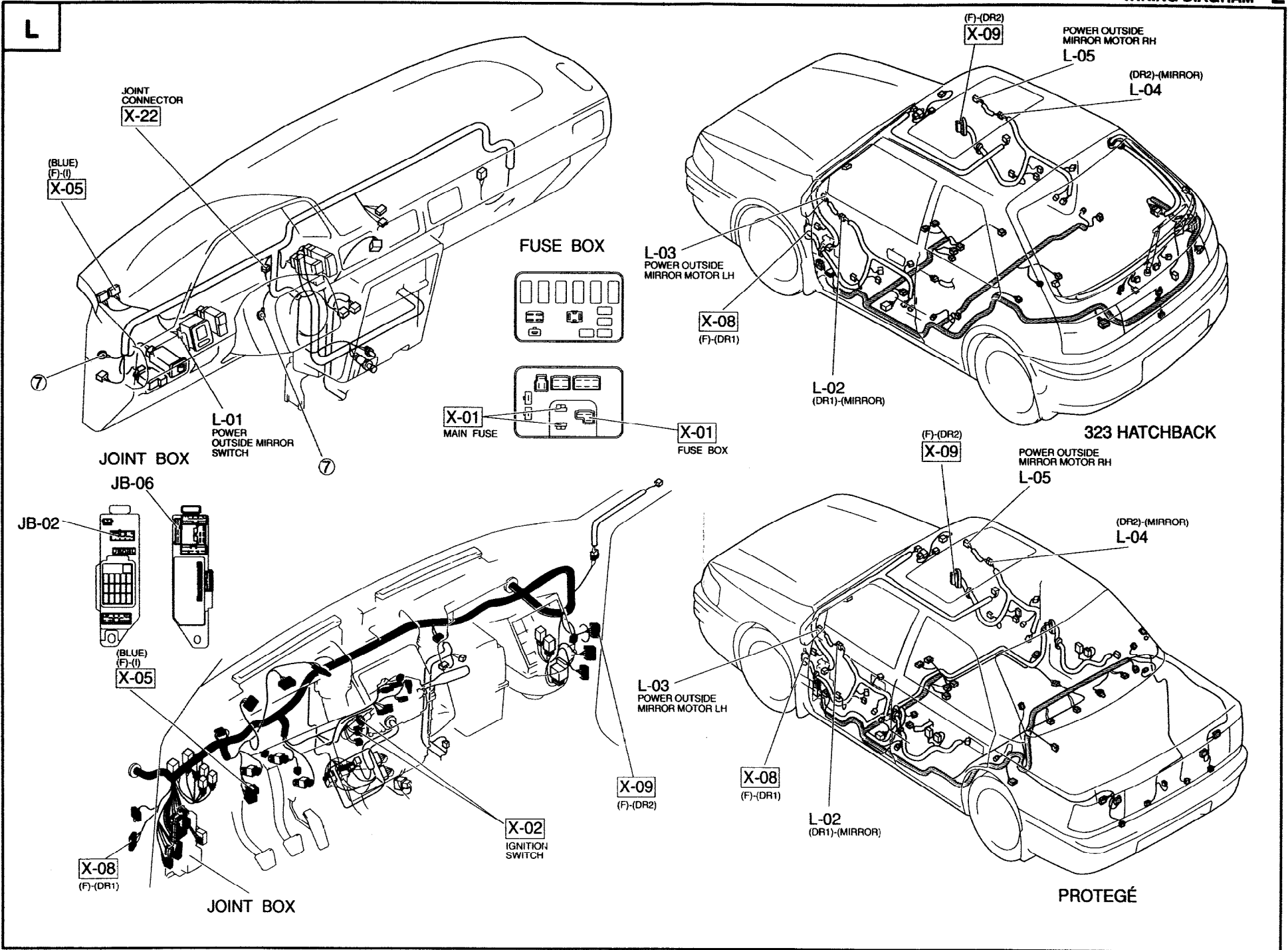
Y	BR
B	*

L-04 DR2-MIRROR (DR2)

LG/B	BR	BR	Y
BR/B	*	*	B

L-05 POWER OUTSIDE MIRROR MOTOR RH

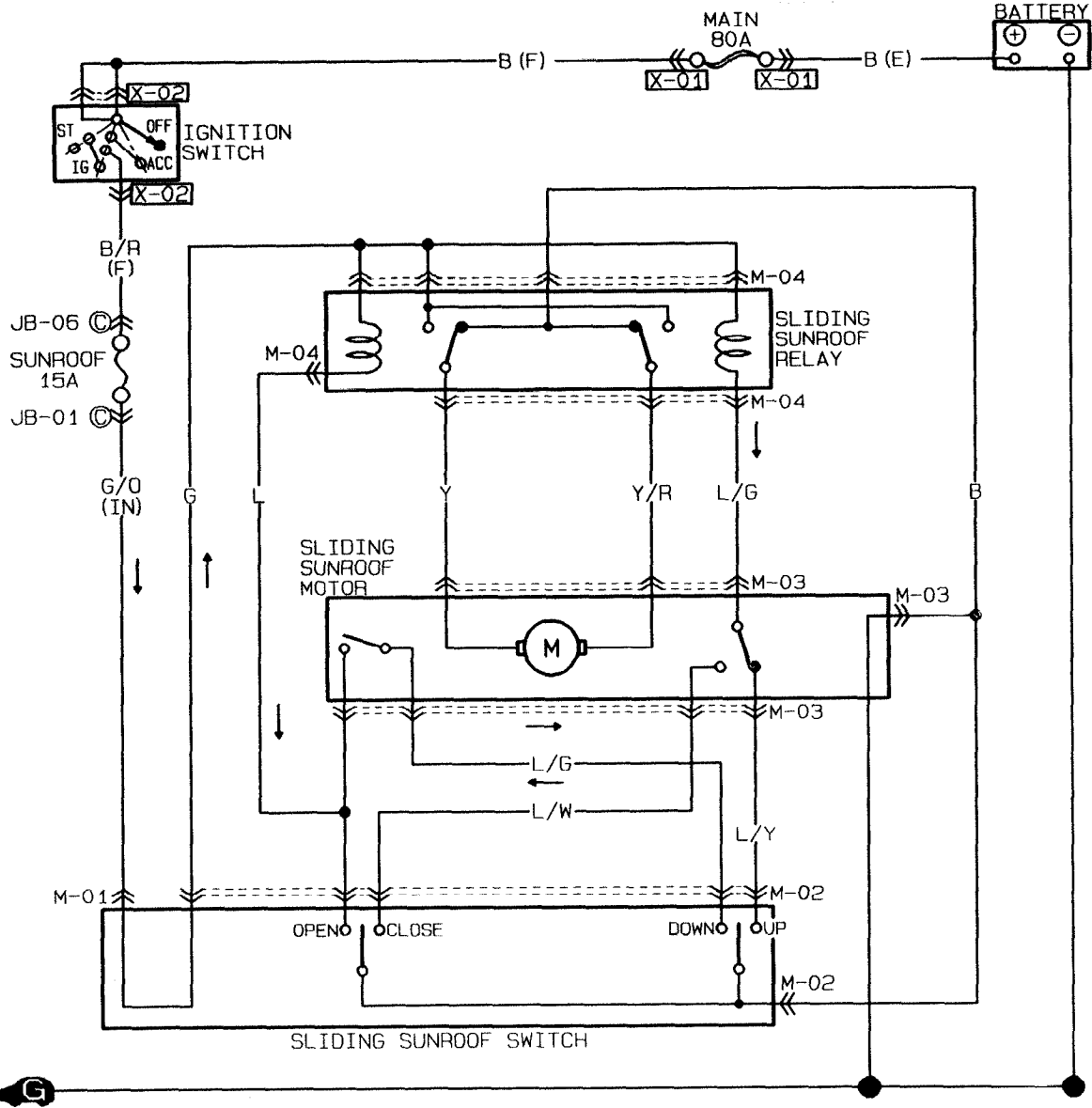
Y	BR
B	*



Z WIRING DIAGRAM

SLIDING SUNROOF

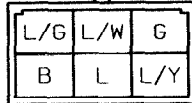
M



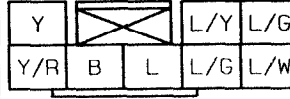
M-01 SLIDING SUNROOF (IN)



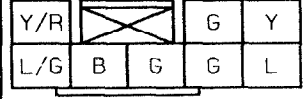
M-02 SLIDING SUNROOF SWITCH



M-03 SLIDING SUNROOF MOTOR

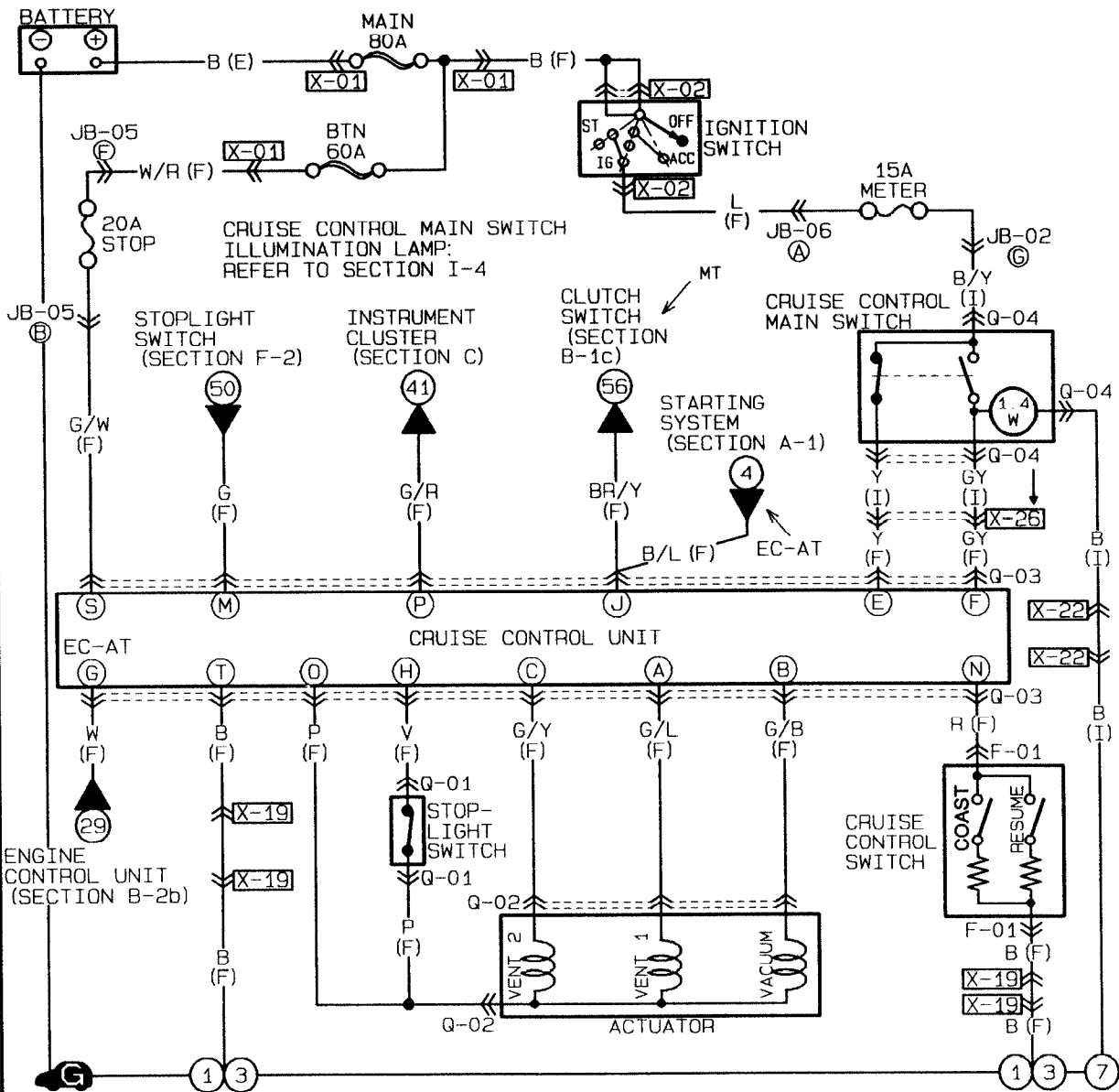


M-04 SLIDING SUNROOF RELAY



■ CRUISE CONTROL SYSTEM

Q

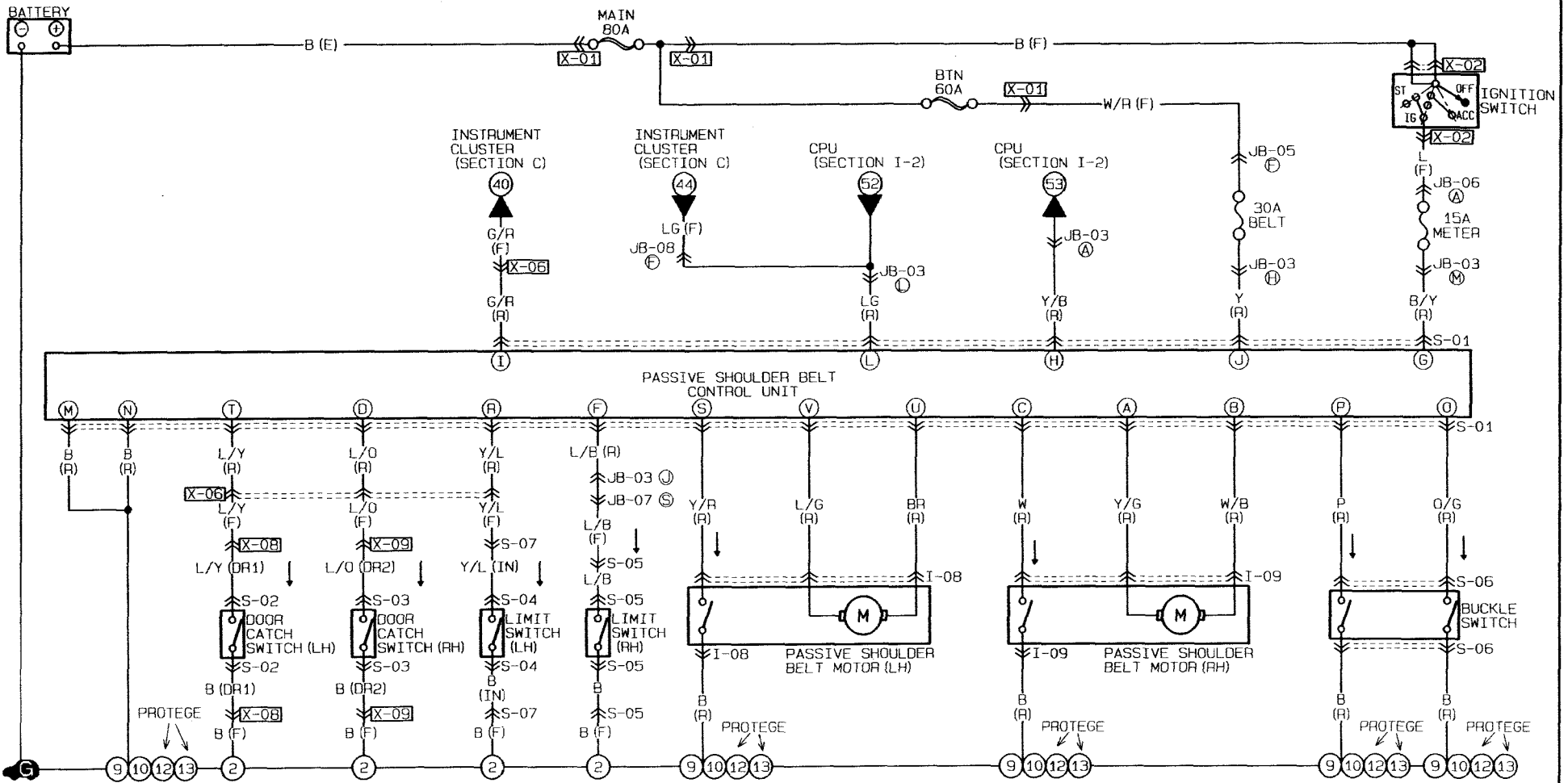


<p>F-01 CRUISE CONTROL SWITCH (F)</p> <table border="1"> <tr> <td>R</td> <td>B</td> <td>G/O</td> <td>Y</td> <td>G</td> <td>B/Y</td> </tr> </table>	R	B	G/O	Y	G	B/Y	<p>Q-01 STOPLIGHT SWITCH (F)</p> <table border="1"> <tr> <td>V</td> <td>P</td> </tr> </table>	V	P	<p>Q-02 ACTUATOR (F)</p> <table border="1"> <tr> <td>P</td> <td>G/Y</td> </tr> <tr> <td>G/L</td> <td>G/B</td> </tr> </table>	P	G/Y	G/L	G/B																																	
R	B	G/O	Y	G	B/Y																																										
V	P																																														
P	G/Y																																														
G/L	G/B																																														
<p>Q-03 CRUISE CONTROL UNIT (F)</p> <table border="1"> <tr> <td>S</td> <td>G</td> <td>O</td> <td>M</td> <td>G</td> <td>E</td> <td>C</td> <td>A</td> </tr> <tr> <td>G/W</td> <td>*</td> <td>P</td> <td>G</td> <td>X</td> <td>* ▲W</td> <td>Y</td> <td>G/Y</td> <td>G/L</td> </tr> <tr> <td>B</td> <td>*</td> <td>G/R</td> <td>R</td> <td>*</td> <td>BR/Y ▲B/L</td> <td>V</td> <td>GY</td> <td>* G/B</td> </tr> <tr> <td>T</td> <td>R</td> <td>P</td> <td>N</td> <td>L</td> <td>J</td> <td>H</td> <td>F</td> <td>D</td> </tr> </table>		S	G	O	M	G	E	C	A	G/W	*	P	G	X	* ▲W	Y	G/Y	G/L	B	*	G/R	R	*	BR/Y ▲B/L	V	GY	* G/B	T	R	P	N	L	J	H	F	D	<p>Q-04 CRUISE CONTROL MAIN SWITCH (I)</p> <table border="1"> <tr> <td>R/B</td> <td>X</td> <td>GY</td> </tr> <tr> <td>R</td> <td>B/Y</td> <td>Y</td> </tr> <tr> <td></td> <td>B</td> <td></td> </tr> </table>		R/B	X	GY	R	B/Y	Y		B	
S	G	O	M	G	E	C	A																																								
G/W	*	P	G	X	* ▲W	Y	G/Y	G/L																																							
B	*	G/R	R	*	BR/Y ▲B/L	V	GY	* G/B																																							
T	R	P	N	L	J	H	F	D																																							
R/B	X	GY																																													
R	B/Y	Y																																													
	B																																														
Empty space for additional components or notes																																															

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Terminal	Connected to	Voltage	Procedure
a (Output)	Actuator	0V Approx. 9V	Ignition switch ON Main switch ON
b (Output)	Actuator	0V Approx. 9V	Ignition switch ON Main switch ON
c (Output)	Actuator	0V Approx. 9V	Ignition switch ON Main switch ON
d			
e (Input)	Cruise control main switch (N.C)	Vb	Ignition switch ON
f (Input)	Cruise control main switch (N.O)	Vb	Main switch ON
g (Input)	EC-AT control unit (only ATX)	Vb	Ignition switch ON
h (Output)	Stoplight switch 2 (N.C)	Approx. 9V	Main switch ON
j (Input) Note Disconnect EGI control unit connector	Inhibitor switch (ATX)	0V Approx. 5V	"N" or "P" range and main switch ON Other range and main switch ON
	Clutch switch (MTX)	0V Approx. 5V	Clutch pedal depressed and main switch ON Main switch ON
l (Input)	Horn relay	Vb	Horn switch OFF
m (Input)	Stoplight switch 1 (N.O)	0V Vb	Ignition switch ON Brake pedal depressed
n (Input)	Cruise control switch (Resume/accel switch)	Vb Approx. 9V	Main switch ON While pushing the resume/accel switch after main switch ON
	Cruise control switch (Set/coast switch)	Vb Approx. 5V	Main switch ON While pushing the set/coast switch after main switch ON
o (Input)	Stoplight switch 2 (N.C)	Approx. 9V 0V	Main switch ON Brake pedal depressed
p (Input) Note Disconnect EC-AT control unit connector	Speed sensor	Run out between 0—5V	While rotating the rear tire
q			
r			
s	Battery	Vb	Constant
t	Ground	0V	Constant

■ PASSIVE SHOULDER BELT CONTROL SYSTEM



S-01 PASSIVE SHOULDER BELT CONTROL UNIT (R)

U	S	Q	D	M	I	G	E	C	A
BR	Y/R	*	O/G	B	G/R	B/Y	*	W	Y/G
L/G	L/Y	Y/L	P	B	LG	Y	Y/B	L/B	L/O
W/B									
V	T	R	P	N	L	J	H	F	D

S-02 DOOR CATCH SWITCH LH (DR1)

S-03 DOOR CATCH SWITCH RH (DR2)

S-04 LIMIT SWITCH LH (IN)

S-05 LIMIT SWITCH RH (R)

CONNECT

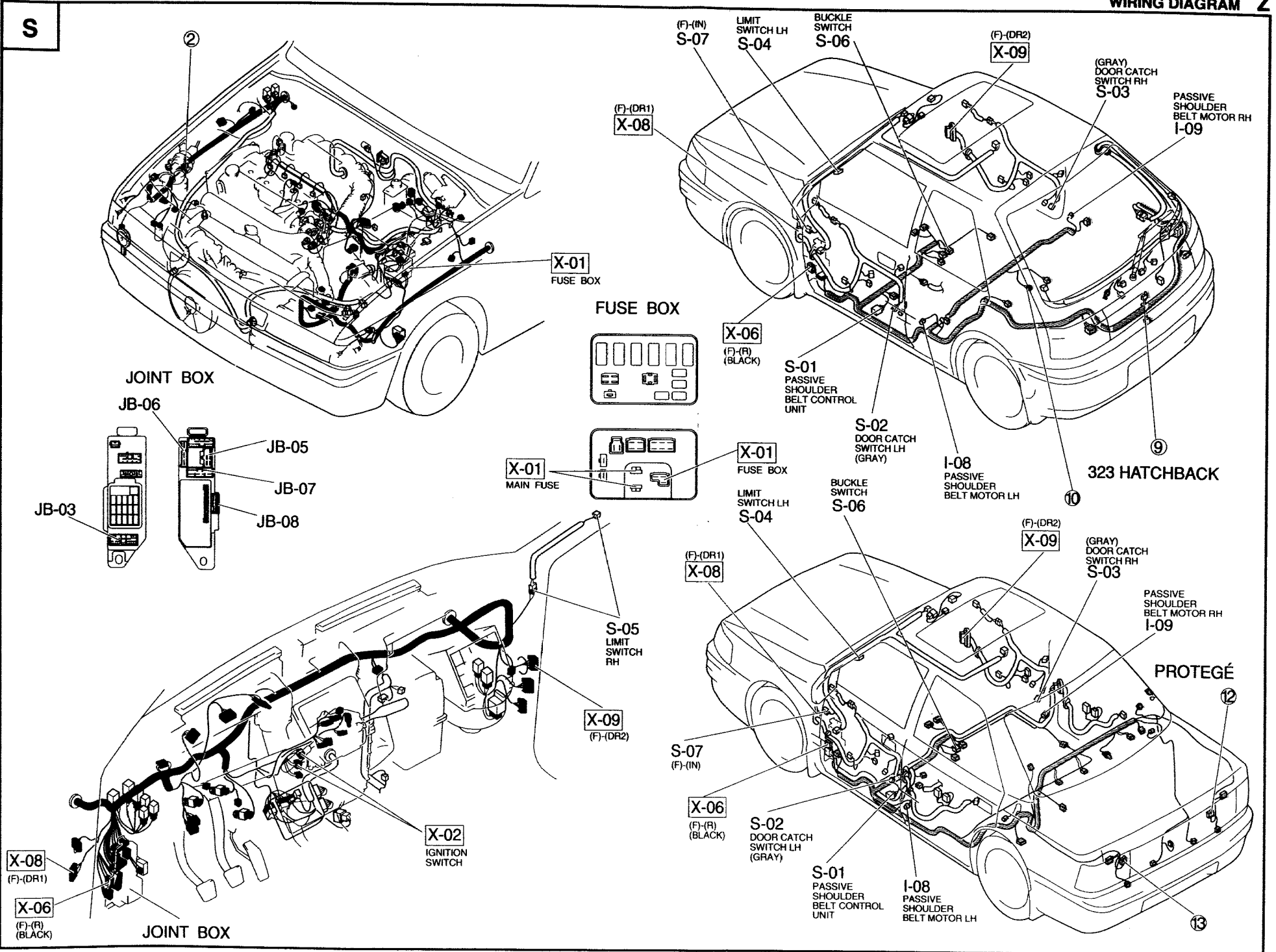
S-06 BUCKLE SWITCH (R)

S-07 FRONT (F) - INTERIOR LAMP (IN)

I-08 PASSIVE SHOULDER BELT MOTOR LH (R)

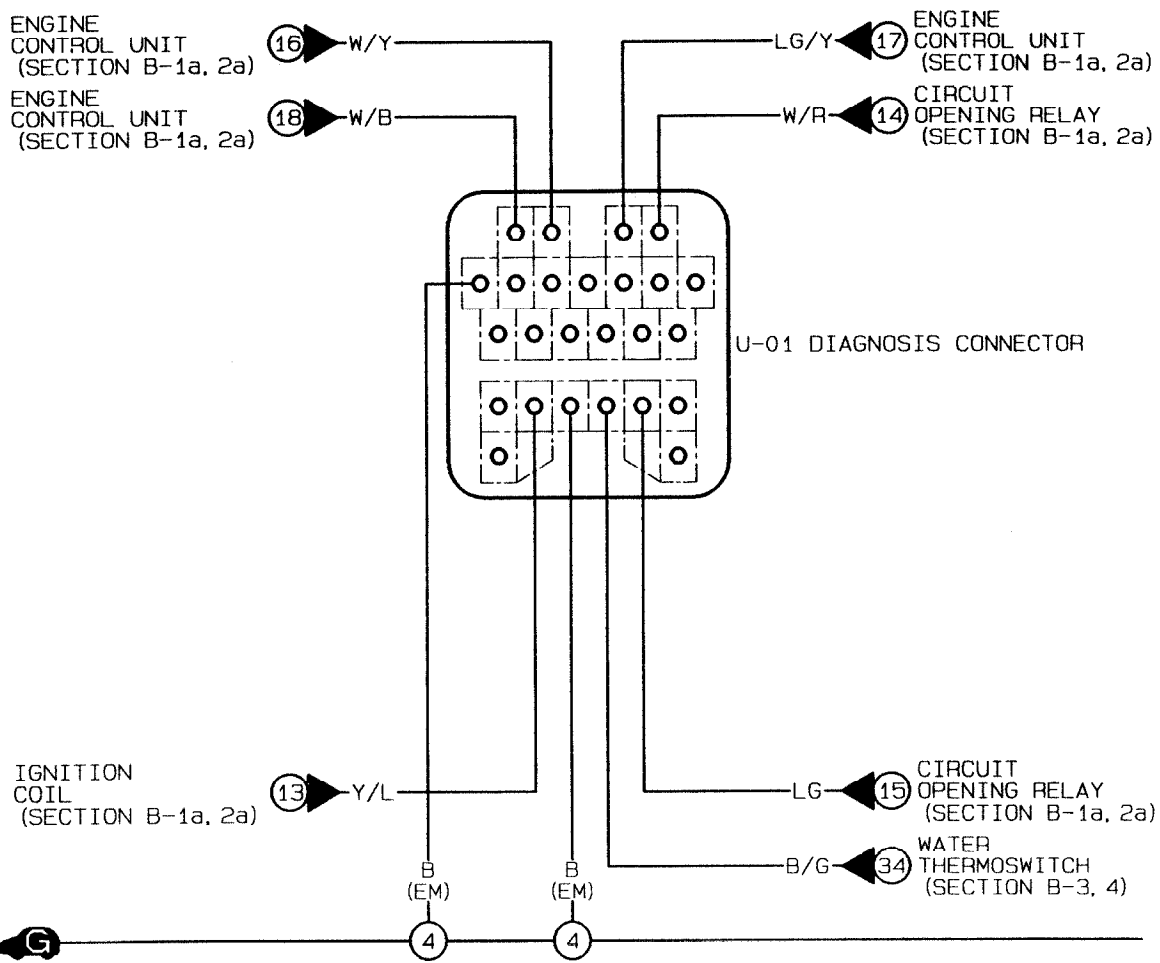
I-09 PASSIVE SHOULDER BELT MOTOR RH (R)

S



DIAGNOSIS CONNECTOR

U



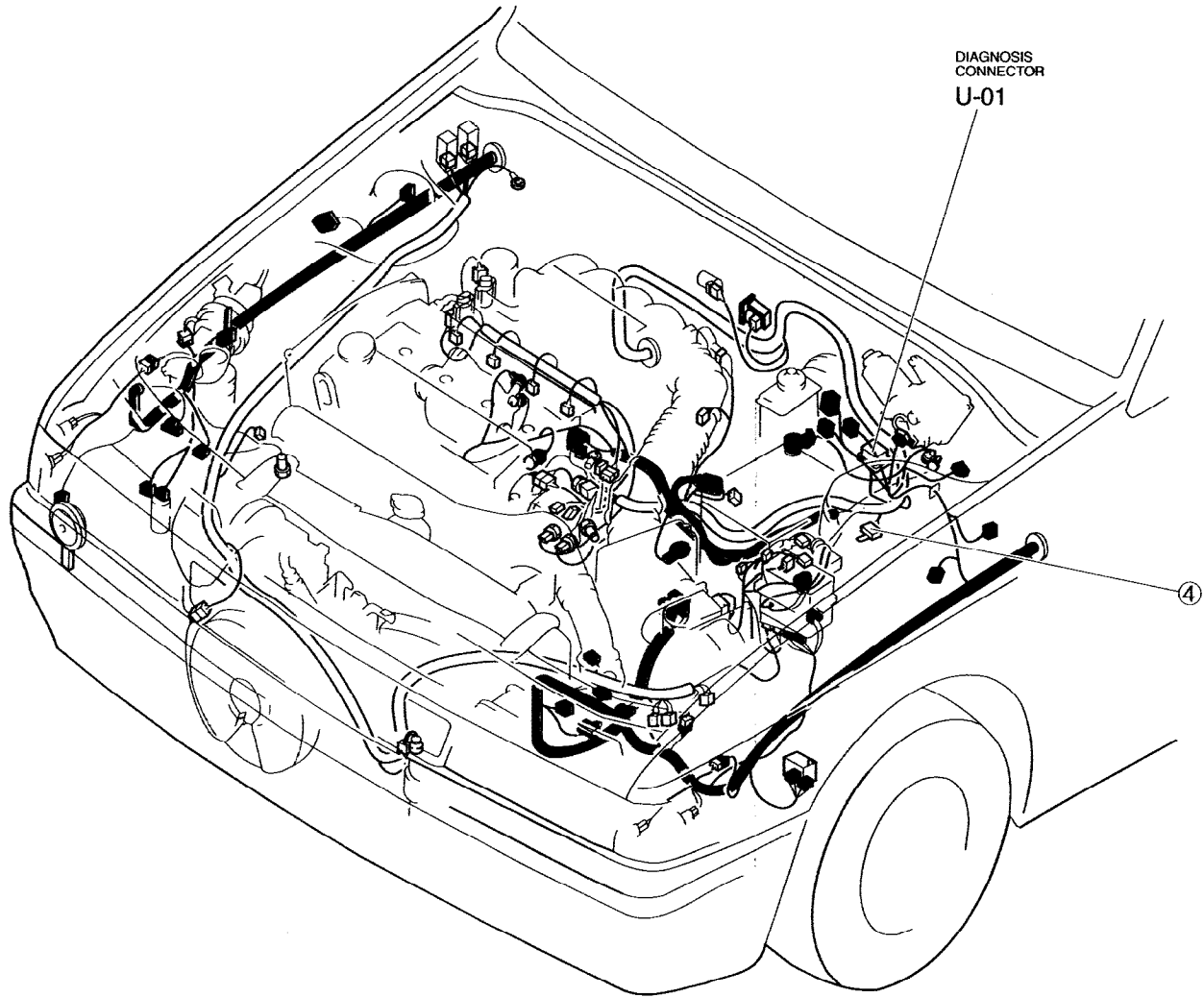
U-01 DIAGNOSIS CONNECTOR (EM)

	FEN	MEN		TEN	+B
GND	FAT	FBS	FAC	FWS	FSC
	TAT	TBS	TAC	TWS	TSC
FAB	IG-	GND	TFA	F/P	TAB

	W/B	W/Y		LG/Y	W/R
B	*	*	*	*	*
*	*	*	*	*	*
*	Y/L	B	B/G	LG	*
*					*

NOTE: THIS IS THE CONNECTOR AS SEEN FROM THE TERMINAL SIDE.

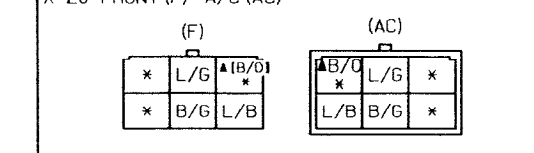
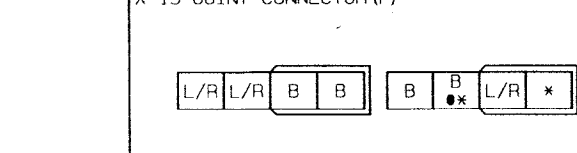
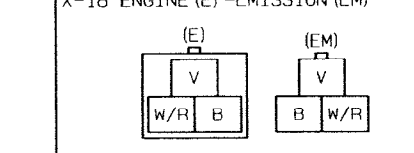
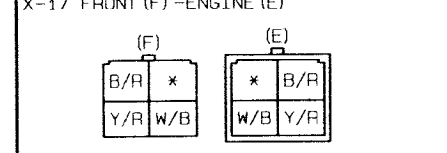
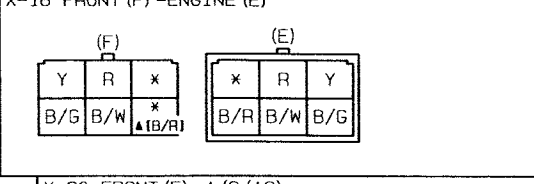
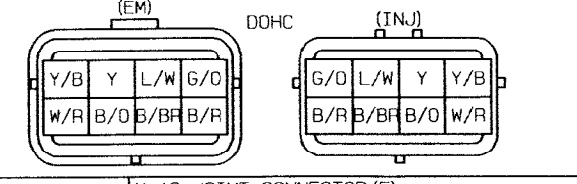
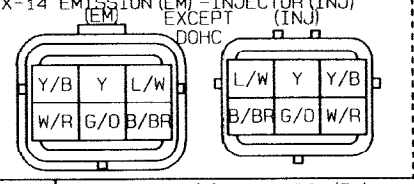
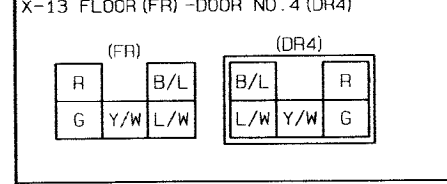
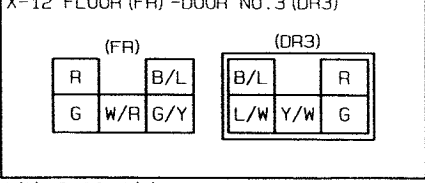
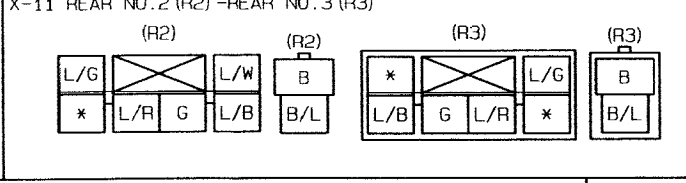
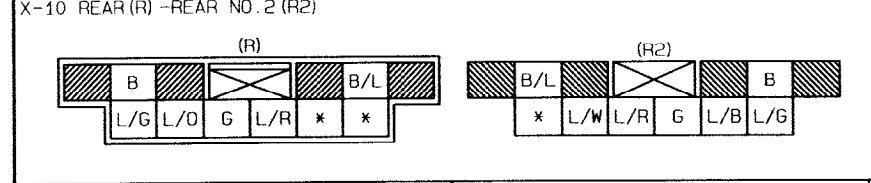
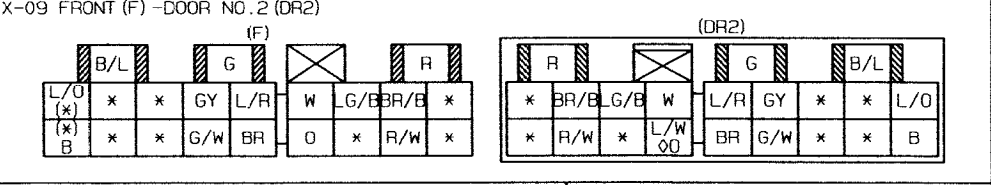
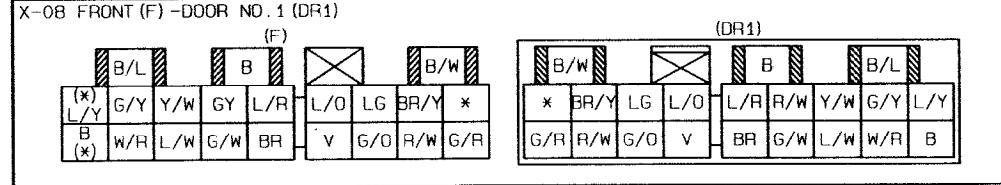
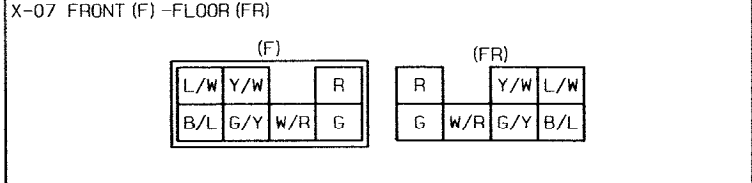
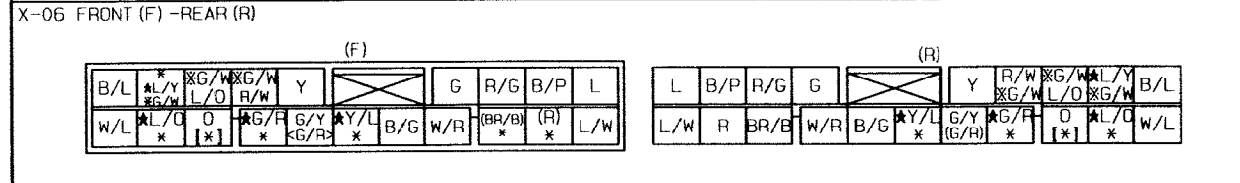
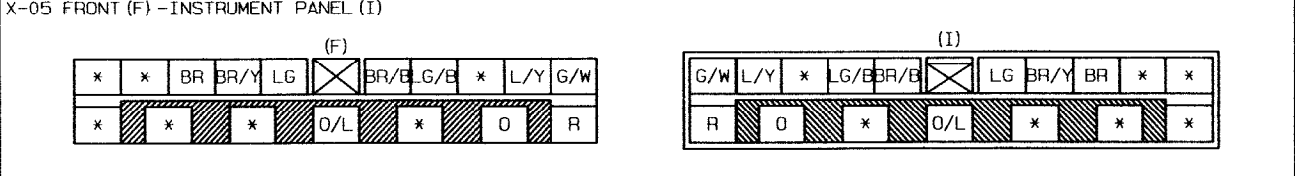
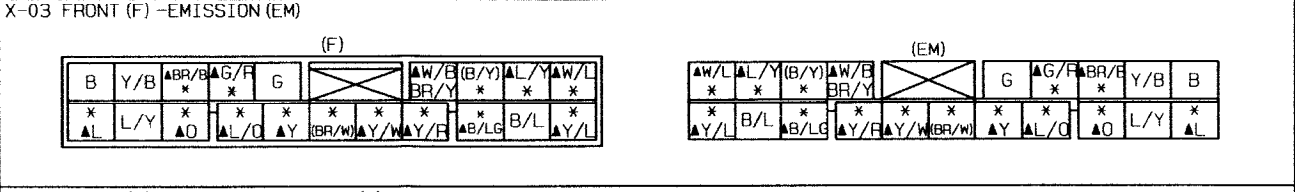
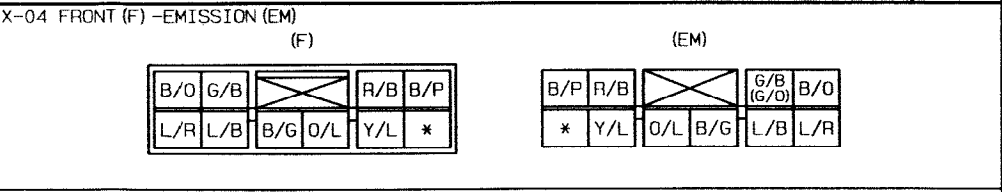
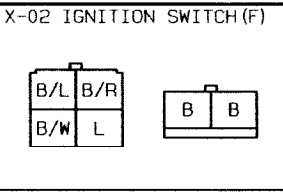
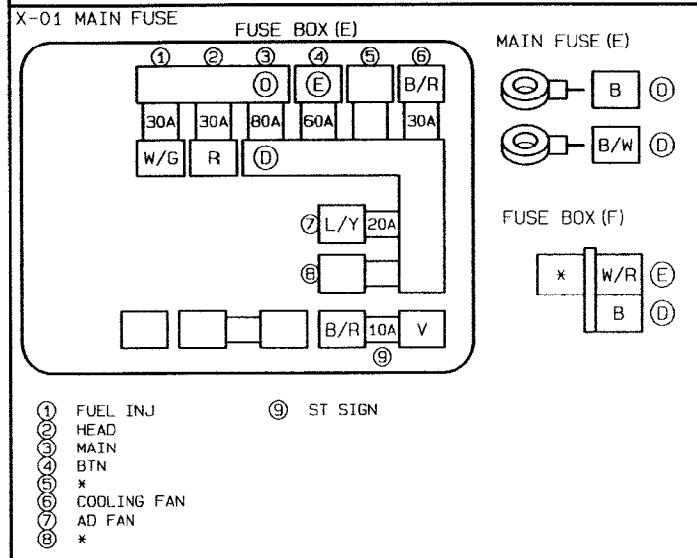
U



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COMMON CONNECTOR LIST

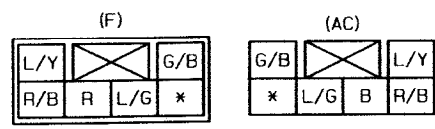
▲...EC-AT <...DOHC ()...CANADA ●...WITHOUT CRUISE CONTROL
 ★...WITH PASSIVE SHOULDER BELT []...PROTEGE *...WITH SHIFT-LOCK
 ◇...WITH POWER WINDOW



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COMMON CONNECTOR LIST

X-21 FRONT (F) -A/C (AC)



X-22 JOINT CONNECTOR (I)



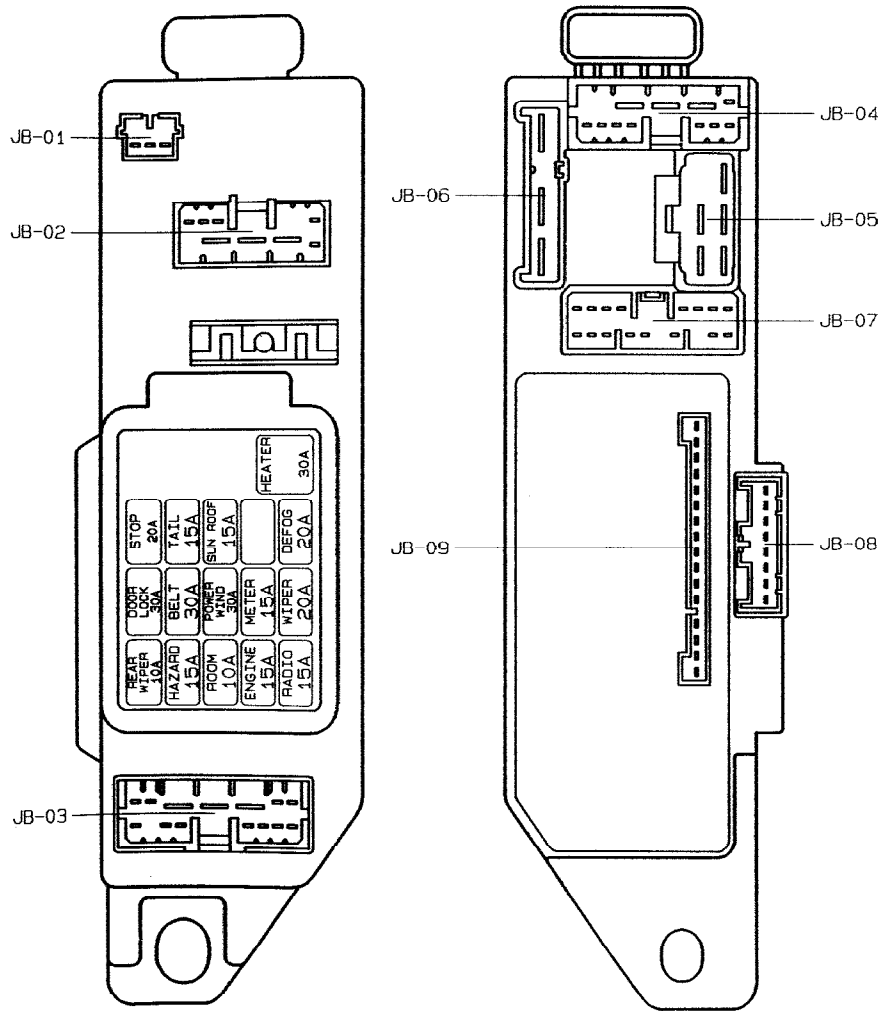
X-24 FRONT (F) -EMISSION (EM)



X-26 FRONT (F) -INSTRUMENT PANEL (I)



JB ■ JB CONNECTOR LOCATION



REAR WIPER 10A	HAZARD 15A	ROOM FAN 10A	ENGINE 15A	RADIO WIPER 15A
DOOR LOCK 30A	HAZARD 15A	ROOM FAN 10A	ENGINE 15A	RADIO WIPER 15A
STOP 20A	TAIL 15A	SUN ROOF 15A	METER 15A	DEFOG 20A
STOP 20A	TAIL 15A	SUN ROOF 15A	METER 15A	DEFOG 20A
HEATER 30A				

■ JOINT BOX

JB-01 INTERIOR LAMP HARNESS

G/O	R/W	L/R
*		
C	B	A

JB-02 INSTRUMENT PANEL HARNESS

L/R	R/B	B/Y						
*								*
K	H	F	D	B				

JB-03 REAR HARNESS

N	L	K	I		G	E	C	A
*	LG	[*]	G/B		L/W	R/B	*	*Y/B
G/W	B/Y		*		B/L		L/R	R/W
O	M	J	H	F	D	B		

JB-04 FRONT HARNESS

L	K	I		G	E	C	A
R/B	R/B	*		B/Y	G/W	B/W	G/B
B/W		W/B		L		*	*
M	J	H	F	D	B		

JB-05 FRONT HARNESS

E	C	A
W/G	B/W	*
W/R	*	G/W
F	D	B

JB-06 FRONT HARNESS

C	B	A
B/R	B/W	L

JB-07 FRONT HARNESS

S	G	O	M		G	E	C	A
(*)	B/L	G/W	B/Y		*	R/B	L/R	L/R
B/R	L/G	G/B		*	(B/Y)	*	L/O	[*]
T	R	P	N	L	J	H	F	D

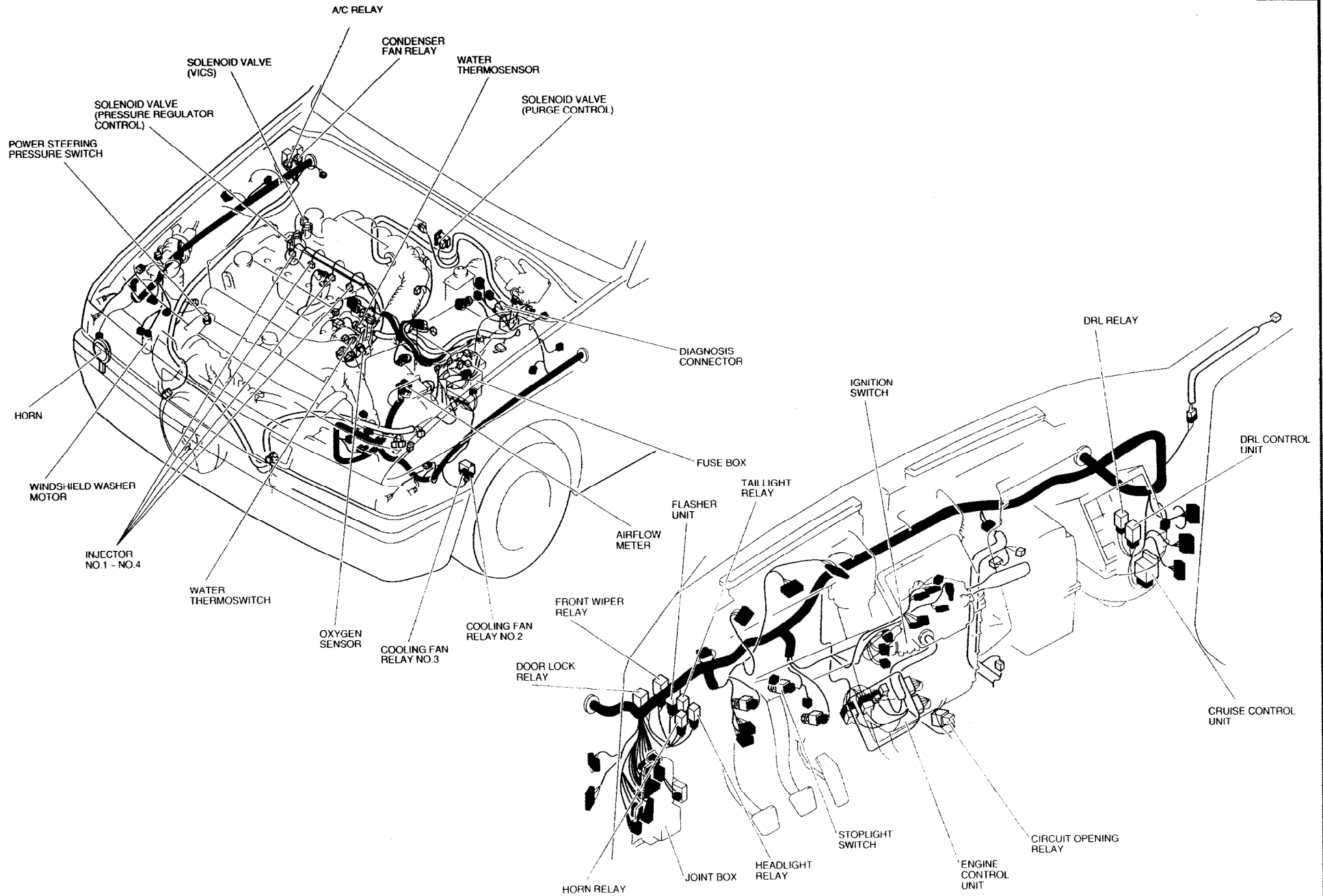
JB-08 FRONT HARNESS

V	B	LG	W	*	O	L/B	*
H	G	F	E	D	C	B	A

JB-09 CPU

P	O	N	M	L	K	J	I	H	G	F	E	D	C	B	A
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

☆...WITH SUNROOF ★...WITH PASSIVE SHOULDER BELT
 ▲...EC-AT ()...CANADA []...PROTEGE



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PI

PARTS INDEX

PARTS NAME	SECTION	PARTS NAME	SECTION
A ACTUATOR	Q	IGNITER	B-1a,2a
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AIRFLOW METER	B-1c,2c	IGNITION KEY REMINDER SWITCH	I-2
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