Automatic Transaxle Workshop Manual Supplement JA5AX-EL

FOREWORD

This manual explains the changes and/or additions relating to the disassembly, inspection, repair, and reassembly procedures for the above-indicated automatic transaxle.
In order to do these procedures safety, quickly, and correctly, you must first read this manual and any other relevant service materials carefully.

The information in this manual is current up to August, 2002. Any changes that occur after that time will not be reflected in this particular manual. Therefore, the contents of this manual may not exactly match the mechanism that you are currently serving.

Mazda Motor Corporation
HIROSHIMA, JAPAN

Note:
There is no description of the transfer in this manual as the transfer cannot be disassembled.

CONTENTS

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1765–1E–02H

RELATED MATERIALS

Automatic Transaxle Workshop Manual JA5A–EL . . . 1738–1*–02D

*** : Indicates the printing location**
E: Europe
0: Japan

WARNING

Servicing a vehicle can be dangerous. If you have not received service-related training, the risks of injury, property damage, and failure of servicing increase. The recommended servicing procedures for the vehicle in this workshop manual were developed with Mazda-trained technicians in mind. This manual may be useful to non-Mazda trained technicians, but a technician with our service-related training and experience will be at less risk when performing service operations. However, all users of this manual are expected to at least to know general safety procedures.

This manual contains "Warnings" and "Cautions" applicable to risks not normally encountered in a general technician's experience. They should be followed to reduce the risk of injury and the risk that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that the "Warnings" and "Cautions" are not exhaustive. It is impossible to warn of all the hazardous consequences that might result from failure to follow the procedures.

The procedures recommended and described in this manual are effective methods of performing service and repair. Some require tools specifically designed for a specific purpose. Persons using procedures and tools which are not recommended by Mazda Motor Corporation must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

The contents of this manual, including drawings and specifications, are the latest available at the time of printing, and Mazda Motor Corporation reserves the right to change the vehicle designs and alter the contents of this manual without notice and without incurring obligation.

Parts should be replaced with genuine Mazda replacement parts or with parts which match the quality of genuine Mazda replacement parts. Persons using replacement parts of lesser quality than that of genuine Mazda replacement parts must satisfy themselves thoroughly that neither personal safety nor safety of the vehicle will be jeopardized.

Mazda Motor Corporation is not responsible for any problems which may arise from the use of this manual. The cause of such problems includes but is not limited to insufficient service-related training, use of improper tools, use of replacement parts of lesser quality than that of genuine Mazda replacement parts, or not being aware of any revision of this manual.

GENERAL INFORMATION

HOW TO USE THIS MANUAL

RANGE OF TOPICS

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- This manual indicates only changes/additions, as it is the supplemental for the related materials. Therefore it may not contain the necessary reference service procedures to perform the services indicated in this manual.

ABBREVIATIONS

ABBREVIATIONS TABLE

A6E203000011301

ATF	Automatic transaxle fluid
SST	Special service tool

MECHANISM AND OPERATION

FEATURES

AUTOMATIC TRANSAXLE

AUTOMATIC TRANSAXLE OUTLINE

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- Adopted new JA5AX-EL automatic transaxle.
- The construction and operation of the JA5AX-EL type automatic transaxle is essentially carried over from that of the current JA5A-EL type automatic transaxle. (See Automatic Transaxle Workshop Manual JA5A-EL 1738-1*-02D.)

AUTOMATIC TRANSAXLE SPECIFICATIONS

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Item		Transaxle type
		JA5AX-EL
Gear ratio	1GR	3.801
	2GR	2.131
	3GR	1.364
	4GR	0.935
	5GR (O/D)	0.685
	Reverse	2.970
Final gear ratio		3.290
ATF	Type	ATF M-III or equivalent (e.g. Dexron III)
	Capacity (Approximate quantity) (L {US qt, Imp qt})	8.3 {8.8, 7.3}
Torque converter stall torque ratio		1.86:1
Hydraulic system (Number of drive/driven plates)	Low clutch	6/6
	2-4 brake	3/4
	High clutch	5/5
	Direct clutch	3/5
	Reverse clutch	2/2
	Low and reverse brake	6/5
Band servo (mm {in})	Reduction accumulator piston outer dia./reduction band servo piston outer dia.	49.66/57.64 {1.955/2.269}
Number of front planetary gear teeth	Ring gear	74
	Sun gear	34
	Pinion gear	20
Number of rear planetary gear teeth	Ring gear	75
	Sun gear	42
	Pinion gear	17
Number of reduction planetary gear teeth	Ring gear	85
	Sun gear	31
	Pinion gear	27
Number of output gear teeth		41
Number of idler gear teeth		47
Number of reduction gear teeth		22
Number of ring gear teeth		67

OVERHAUL

SERVICE

OUTLINE

SUPPLEMENTAL SERVICE INFORMATION

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- The following changes have been made since publication of the Automatic Transaxle Workshop Manual JA5A-EL (1738-1*-02D.).

DIRECT CLUTCH DISASSEMBLY

- Number of drive/driven plates have been modified.

DIRECT CLUTCH ASSEMBLY

- Assembly procedure has been modified.

AUTOMATIC TRANSAXLE

DIRECT CLUTCH DISASSEMBLY

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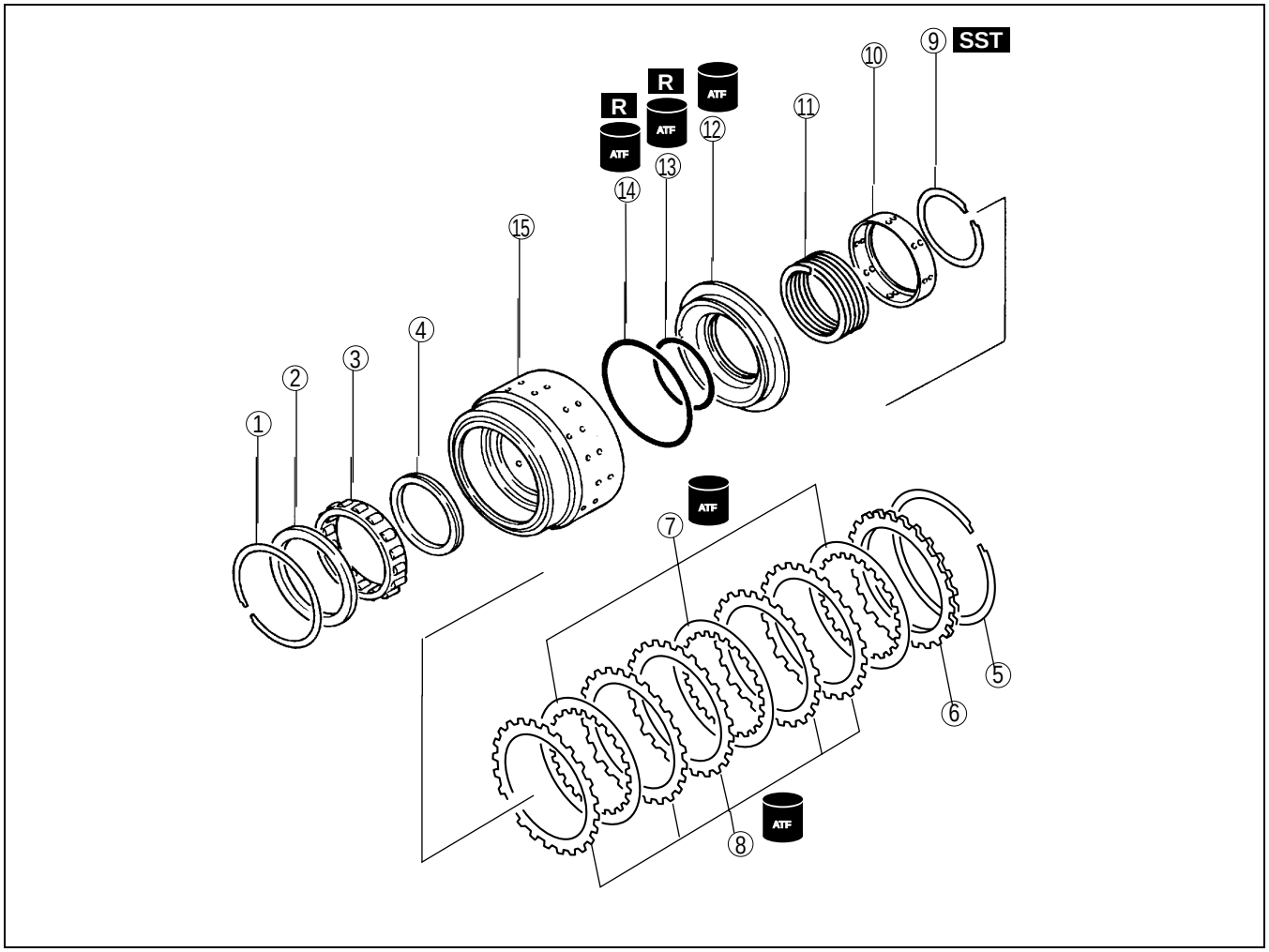
1. Disassemble in the order indicated in the table.



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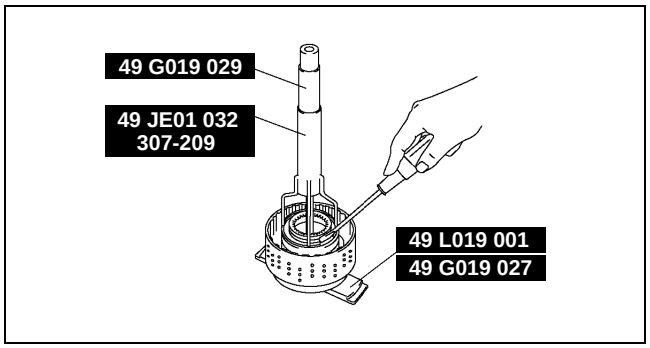
1	Snap ring
2	Retainer
3	One-way clutch
4	Needle bearing
5	Snap ring
6	Retaining plate
7	Drive plate
8	Driven plate

9	Snap ring (See K1–3 Snap Ring Disassembly Note)
10	Spring retainer
11	Return spring
12	Direct piston (See K1–3 Direct Piston Disassembly Note)
13	O-ring
14	O-ring
15	Direct clutch drum

Snap Ring Disassembly Note

Caution
- **Depress the spring retainer only enough to remove the snap ring. Overpressing will damage the retainer component edges.**

1. Install the **SSTs** in the clutch drum as shown.
2. Remove the snap ring.
3. Remove the **SSTs**.
4. Remove the spring retainer.
5. Remove the return spring.



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Direct Piston Disassembly Note

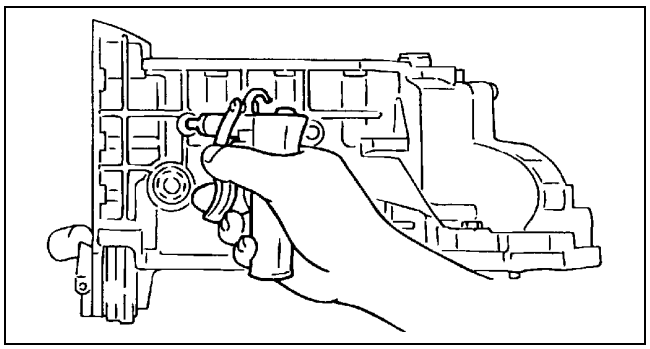
1. Assemble the clutch drum to the transaxle case.

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

Caution
- **Applying compressed air to the assembled clutch pack for longer than 3 seconds at a time will damage the seal. Do not apply compressed air for more than the aforementioned time when testing the system.**

Note
- Regarding the position of the hole into which air is blown, refer to item “Oil pressure circuit’’ in this manual.

2. Remove the direct piston by applying compressed air through the fluid passage.
3. Remove the O-ring from piston.



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DIRECT CLUTCH ASSEMBLY

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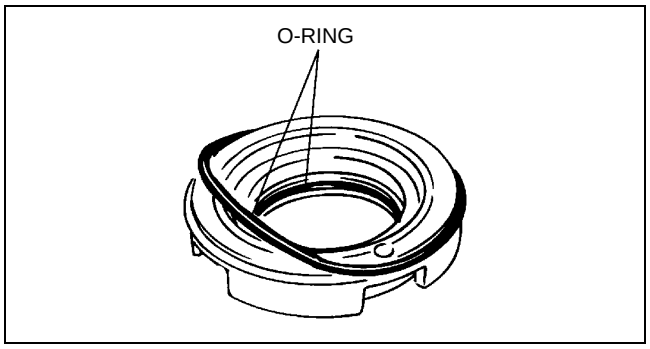
Assembly Procedure

1. Apply a coat of ATF to new O-rings, then install them to the piston.
2. Apply a coat of ATF to inside of the clutch drum, then install the piston while rotating it by hand.

Note
- After installing the drum, ensure that the piston rotates smoothly by hand.
  If not, the O-ring may be caught.

3. Install the return spring.
4. Position the spring retainer.



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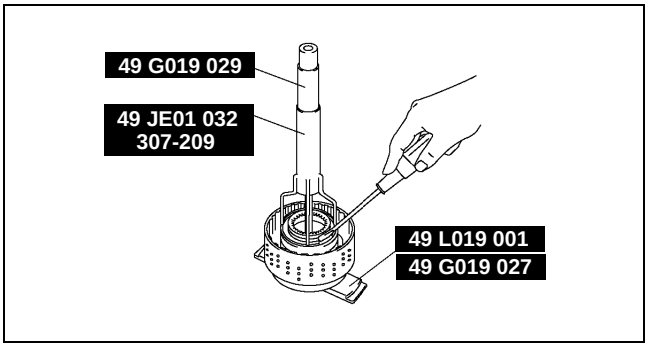
Caution
- **Depress the spring retainer only enough to remove the snap ring. Overpressing will damage the retainer component edges.**

5. Install the **SSTs** in the clutch drum as shown.
6. Install the snap ring.
7. Remove the **SSTs**.



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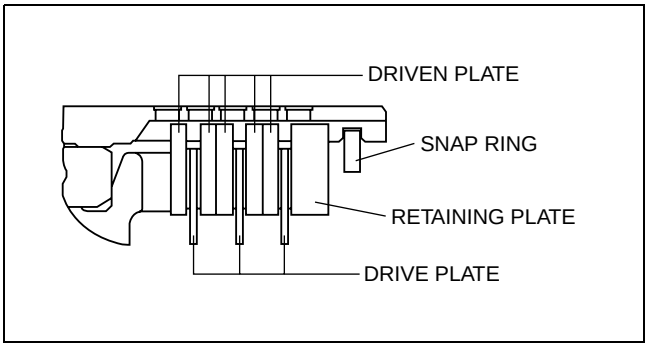
8. Install the drive plates and driven plates in the order as shown in the figure.
9. Install the retaining plate.
10. Install the snap ring.



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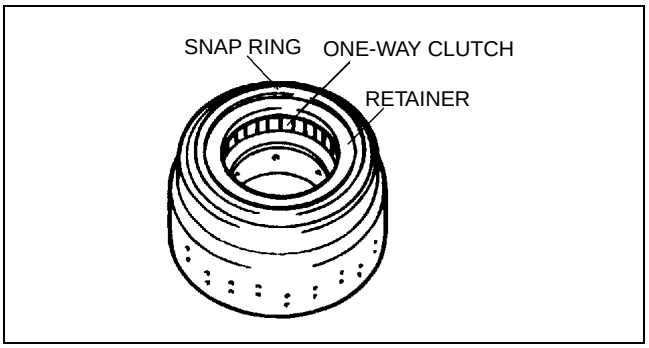
11. Place the direct clutch upside down, then install the one-way clutch and retainer.
12. Install the snap ring.



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TECHNICAL DATA

TECHNICAL DATA

AUTOMATIC TRANSAXLE

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Item			Transaxle type
			JA5AX-EL
Oil pump	Outer rotor and oil pump clearance(mm {in})	Standard	0.02—0.04 {0.0008—0.0015}
	Inner rotor and oil pump clearance(mm {in})	Standard	0.02—0.05 {0.0008—0.0019}
	Outer and inner rotor clearance(mm {in})	Standard	0.02—0.15 {0.0008—0.0059}
Reverse clutch	Number of drive/driven plates		2/2
	Drive plate thickness (mm {in})	Minimum	1.7 {0.067}
	Clutch clearance (mm {in})		0.5—0.8 {0.020—0.031}
	Retaining plate size(mm {in})		3.6 {0.142}, 3.8 {0.150}, 4.0 {0.157}, 4.2 {0.165}
	Snap ring size(mm {in})		2.0 {0.079}
High clutch	Number of drive/driven plates		5/5
	Drive plate thickness (mm {in})	Minimum	1.7 {0.067}
	Clutch clearance (mm {in})		0.8—1.1 {0.031—0.043}
	Retaining plate size(mm {in})		3.0 {0.118}, 3.2 {0.126}, 3.4 {0.134}, 3.6 {0.142}
	Snap ring size(mm {in})		2.0 {0.079}
Low clutch	Number of drive/driven plates		6/6
	Drive plate thickness (mm {in})	Minimum	1.7 {0.067}
	Clutch clearance (mm {in})		1.1—1.3 {0.044—0.051}
	Retaining plate size(mm {in})		3.8 {0.150}, 3.9 {0.154}, 4.0 {0.157}, 4.1 {0.161}, 4.2 {0.165} 4.3 {0.169}, 4.4 {0.173}, 4.5 {0.177}, 4.6 {0.181}
	Snap ring size(mm {in})		1.6 {0.063}
Direct clutch	Number of drive/driven plates		3/5
	Drive plate thickness (mm {in})	Minimum	1.7 {0.067}
	Clutch clearance (mm {in})		1.8—2.2 {0.07—0.09}
	Retaining plate size(mm {in})		4.0 {0.157}, 4.2 {0.165}, 4.4 {0.173}, 4.6 {0.181}, 4.8{0.189}, 5.0 {0.197}
	Snap ring size(mm {in})		2.0 {0.079}
Low and reverse brake	Number of drive/driven plates		6/5
	Drive plate thickness (mm {in})	Minimum	1.7 {0.067}
	Clutch clearance (mm {in})		0.8—1.1 {0.031—0.043}
	Retaining plate size(mm {in})		2.2 {0.087}, 2.4 {0.094}, 2.6 {0.102}, 2.8 {0.110}, 3.0 {0.118}
	Snap ring size(mm {in})		2.1 {0.083}, 2.2 {0.087}, 2.3 {0.091}
2-4 brake	Number of drive/driven plates		3/4
	Drive plate thickness (mm {in})	Minimum	1.7 {0.067}
	Clutch clearance (mm {in})		0.6—0.9 {0.02—0.04}
	Retaining plate size(mm {in})		3.0 {0.118}, 3.2 {0.126}, 3.4 {0.134}, 3.6 {0.142}, 3.8 {0.150}, 4.0 {0.157}, 4.2 {0.165}
	Snap ring size(mm {in})		2.0 {0.079}
Total end play(mm {in})			0.25—0.55 {0.01—0.02}
End play adjust race(mm {in})			1.4 {0.055}, 1.6 {0.063}, 1.8 {0.071}, 2.0 {0.079}, 2.2{0.087}
Output gear bearing preload (N·m {kgf·cm, in·lbf})			0.63—1.30 {6.4—13.3, 5.6—11.5}
Reduction gear bearing preload (N·m {kgf·cm, in·lbf})			0.60—1.75 {6.1—17.8, 5.3—15.5}

Spring		Item				
		Outer diameter (mm {in})	Free length (mm {in})	No. of coils	Wire diameter (mm {in})	Wire thickness x wire width (mm {in})
2-4 brake accumulator		27.0 {1.06}	73.8 {2.91}	6.8	2.6 {0.10}	—
Direct clutch accumulator	Large	27.0 {1.06}	54.6 {2.15}	5.2	2.5 {0.10}	—
	Small	20.0 {0.79}	54.5 {2.15}	7.5	1.9 {0.07}	—
Low clutch		108.8 {4.28}	24.4 {0.96}	9	—	1.1 x 6.0 {0.043 x 0.236}
High clutch and reverse clutch		73.0 {2.87}	27.0 {1.06}	14	—	1.1 x 5.5 {0.043 x 0.217}
2-4 brake (Spring and retainer component)		8.0 {0.31}	21.4 {0.84}	6.6	1.0 {0.039}	—
Low and reverse brake		178.9 {7.04}	20.3 {0.79}	4	—	1.3 x 5.2 {0.05 x 0.20}
Direct clutch		66.9 {2.63}	33.2 {1.30}	9	—	1.3 x 4.5 {0.05 x 0.17}

SPECIAL TOOLS

SPECIAL TOOLS

AUTOMATIC TRANSAXLE

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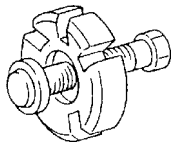
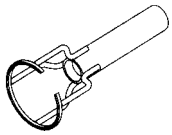
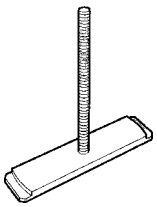
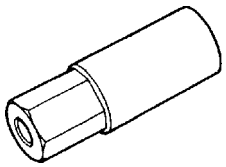
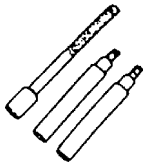
1: Mazda SST number
2: Global SST number
Example

1:49 UN30 3009 2:303-009 Crankshaft damper remover	

1:49 JE01 032 2:307-209 Compressor 	1:49 G019 027 2: – Attachment A 	1:49 G019 029 2: – Nut 
1:49 L019 001 2: – Bolt 	—	—