

2008 Mazda CX-9 Grand Touring

2008 TRANSMISSION Automatic Transaxle (AW6A-EL, AW6AX-EL) - Mazda CX-9

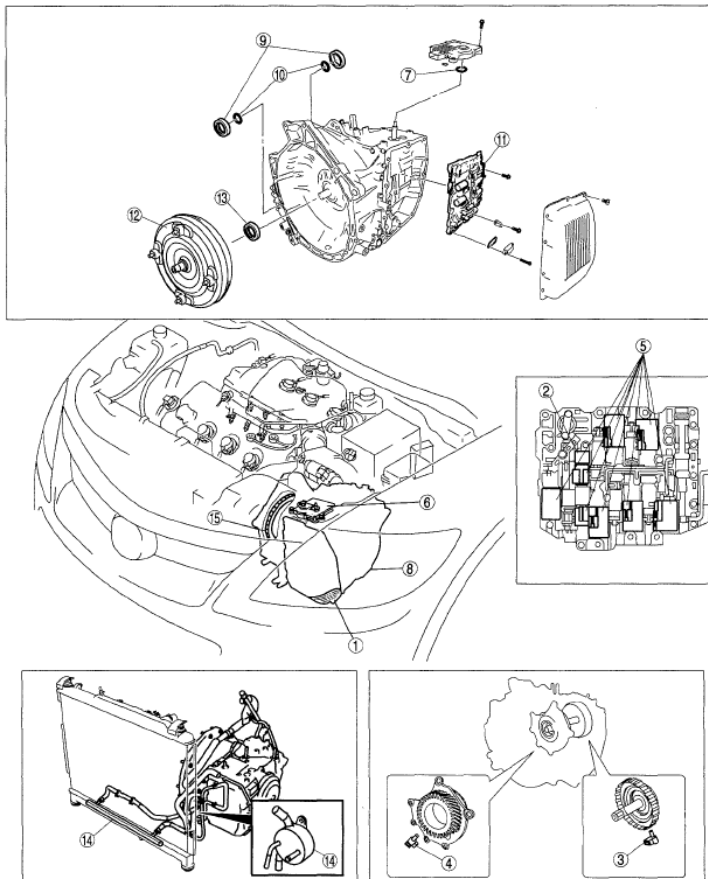
2008 TRANSMISSION

Automatic Transaxle (AW6A-EL, AW6AX-EL) - Mazda CX-9

AUTOMATIC TRANSAXLE LOCATION INDEX [AW6A-EL, AW6AX-EL]

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1	Automatic transaxle fluid (ATF) (See 05-17-11 AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [AW6A-EL, AW6AX-EL].) (See 05-17-12 AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].)	8	Automatic transaxle (See 05-17-35 AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
2	Transaxle fluid temperature (TFT) sensor (See 05-17-13 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [AW6A-EL, AW6AX-EL].) (See 05-17-15 TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)	9	Oil seal (differential) (See 05-17-44 OIL SEAL (DIFFERENTIAL) REPLACEMENT [AW6A-EL, AW6AX-EL].)
3	Input/Turbine speed sensor (See 05-17-17 INPUT/TURBINE SPEED SENSOR INSPECTION [AW6A-EL, AW6AX-EL].) (See 05-17-20 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)	10	Differential gear O-ring (See 05-17-46 DIFFERENTIAL GEAR O-RING REPLACEMENT [AW6A-EL, AW6AX-EL].)
4	Vehicle speed sensor (See 05-17-21 VEHICLE SPEED SENSOR (VSS) INSPECTION [AW6A-EL, AW6AX-EL].) (See 05-17-23 VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)	11	Control valve body (See 05-17-47 CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
5	Solenoid valve (See 05-17-24 SOLENOID VALVE INSPECTION [AW6A-EL, AW6AX-EL].)	12	Torque converter (See 05-17-56 TORQUE CONVERTER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
6	TCM (See 05-17-12 TRANSAXLE RANGE (TR) SWITCH INSPECTION [AW6A-EL, AW6AX-EL].) (See 05-17-26 TCM INSPECTION [AW6A-EL, AW6AX-EL].) (See 05-17-30 TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)	13	Oil seal (oil pump) (See 05-17-55 OIL SEAL (OIL PUMP) REPLACEMENT [AW6A-EL, AW6AX-EL].)
7	Oil seal (manual shaft) (See 05-17-34 OIL SEAL (MANUAL SHAFT) REPLACEMENT [AW6A-EL, AW6AX-EL].)	14	Oil cooler (See 05-17-57 OIL COOLER FLUSHING [AW6A-EL, AW6AX-EL].) (See 05-17-57 OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].) (See 05-17-60 OIL COOLER DISASSEMBLY/ASSEMBLY [AW6A-EL, AW6AX-EL].)
		15	Drive plate (See 05-17-63 DRIVE PLATE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)

Fig. 1: Identifying Automatic Transaxle Components Location
Courtesy of MAZDA MOTORS CORP.

MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL]

MECHANICAL SYSTEM TEST PREPARATION

1. Engage the parking brake and use wheel chocks at the front and rear of the wheels.
2. Inspect the engine coolant level. (See **COOLING SYSTEM SERVICE WARNINGS [MZI-3.7]** .) (See **ENGINE COOLANT LEVEL INSPECTION [MZI-3.7]** .)
3. Inspect the engine oil level. (See **ENGINE OIL LEVEL INSPECTION [MZI-3.7]** .)
4. Inspect the ATF level. (See **AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [AW6A-EL, AW6AX-EL]**.)
5. Inspect the idle speed. (See **ENGINE TUNE-UP [MZI-3.7]** .)
6. Inspect the ignition timing. (See **ENGINE TUNE-UP [MZI-3.7]** .)

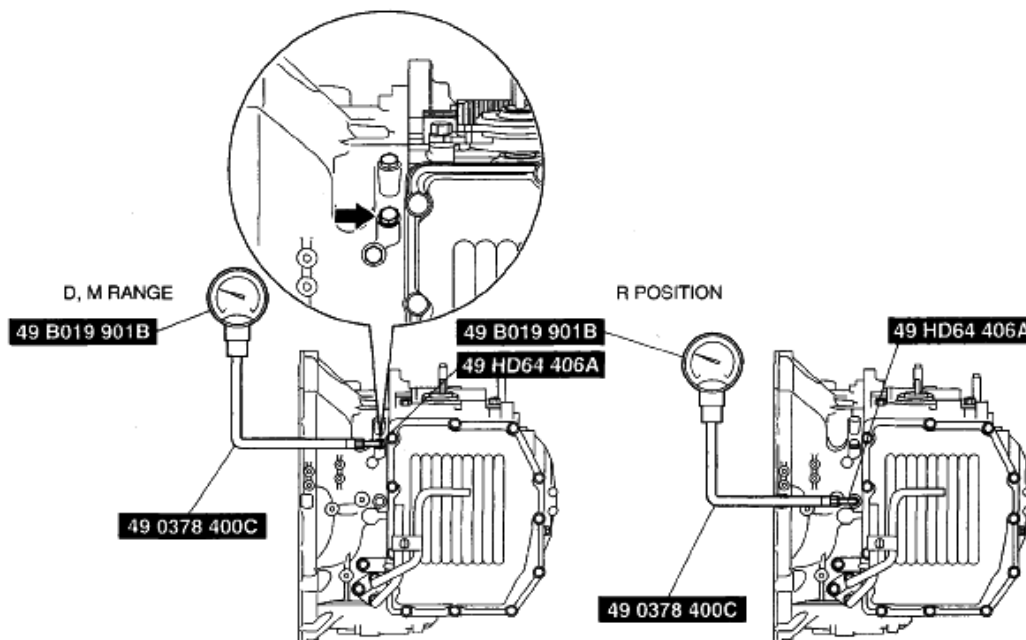
LINE PRESSURE TEST

1. Perform mechanical system test preparation. (See **MECHANICAL SYSTEM TEST PREPARATION**.)

WARNING:

- Removing the test plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the test plug, allow the ATF to cool.

2. Connect the SSTs (49 HD64 406A and, 49 0378 400C) to the line pressure inspection port and replace the gauge of the SST (49 0378 400C) with the SST (49 B019 901B) .



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Fig. 2: Identifying Line Pressure Inspection Port With SST
 Courtesy of MAZDA MOTORS CORP.

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3. Start the engine and warm it up until the ATF reaches 60-70 °C {140-158 °F}.
4. Shift the selector lever to the D range.

CAUTION: • Perform the test at least 3 times and calculate the average.

5. Read the line pressure while the engine is idling for the D range.
6. Read the line pressure while the engine is idling for the R position and M range in the same manner as in Steps 4--5.

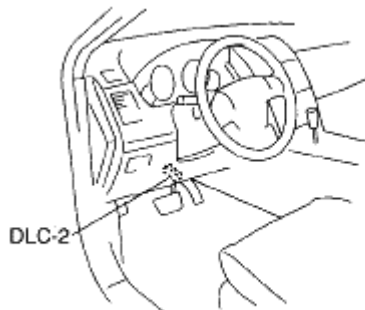
Line pressure

LINE PRESSURE RANGE REFERENCE

Position/range		Line pressure (kPa {kgf/cm ² , psi})
D, M	Idle	350-410 {3.6-4.1, 51-59}
R	Idle	580-670 {6.0-6.8, 85-97}

7. Stop the engine, then replace the SST (49 B019 901B) with the gauge of the SST (49 0378 400C).
8. Connect the M-MDS to the DLC-2.
9. Measure the LPS PID value.
10. Start the engine.
11. Firmly depress the brake pedal with the left foot.
12. Shift the selector lever to the D range.

CAUTION: • If the accelerator pedal is pressed for more than 5 s while the brake pedal is pressed, the transaxle could be damaged. Therefore, perform Steps 14 and 15 within 5 s.

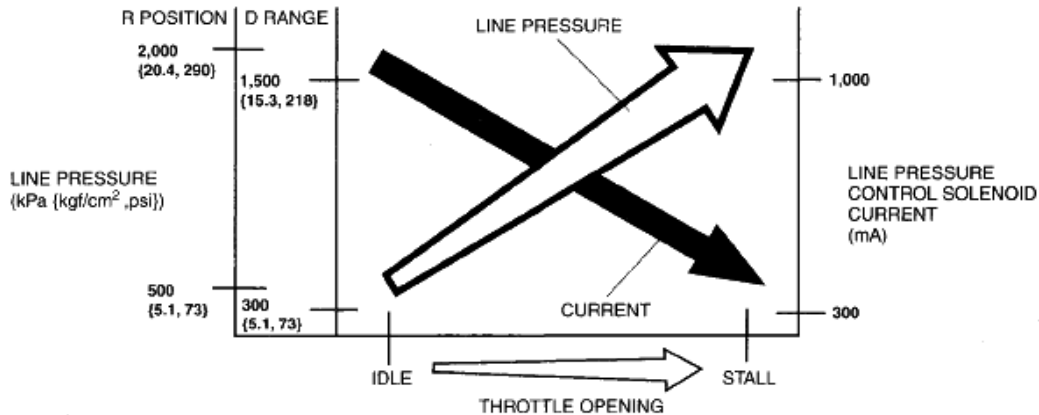


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Fig. 3: Identifying DLC-2 Connector
Courtesy of MAZDA MOTORS CORP.

13. Gradually depress the accelerator pedal with the right foot.

14. When the engine speed no longer increases, quickly read the line pressure and release the accelerator pedal.
15. Shift the selector lever to the N position and idle the engine for 1 min or more to cool the ATF.
16. Verify that the line pressure and LPS PID current values change according to the following graph by changing the shift throttle opening angle when shifting to the D range and R position with the engine running.
 - The line pressure standard other than when the engine is idling cannot be determined because the maximum line pressure for this automatic transaxle is controlled by vehicle conditions.



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Fig. 4: Line Pressure Control Solenoid Current Diagram
 Courtesy of MAZDA MOTORS CORP.

WARNING:

- Removing the SST when the ATF is hot can be dangerous. Hot ATF can come out of the opening and badly burn you. Before removing the SST, allow the ATF to cool.

17. Remove the SSTs.
18. Install a test plug in the inspection port.

Tightening torque

5.9-8.8 N.m {61-89 kgf.cm, 53-77 in.lbf}

Line pressure test evaluation

LINE PRESSURE TEST EVALUATION POSSIBLE CAUSE

Condition	Possible cause
Lower than specification in D range and R position	<ul style="list-style-type: none"> ● Line pressure control solenoid malfunction ● Primary regulator valve malfunction

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	<ul style="list-style-type: none"> • Oil pump malfunction • Oil leaking from D range or R position hydraulic circuit
Constant pressure without fluctuation in hydraulic pressure to throttle in D range and R position	<ul style="list-style-type: none"> • Line pressure control solenoid malfunction • Control valve body internal malfunction
Current to throttle does not change in D range and R position	<ul style="list-style-type: none"> • TCM internal malfunction • Connector malfunction
Hydraulic pressure in R position is not higher than D range	<ul style="list-style-type: none"> • Primary regulator valve malfunction

STALL TEST

1. Perform mechanical system test preparation. (See **MECHANICAL SYSTEM TEST PREPARATION.**)
2. Start the engine.
3. Firmly depress the brake pedal with the left foot.
4. Shift the selector lever to the D range.

CAUTION:

- If the accelerator pedal is depressed for more than 5 s while the brake pedal is depressed, the transaxle could be damaged. Therefore, perform Steps 5 and 6 within 5 s.
- Perform the test at least 3 times and calculate the average.

5. Gently depress the accelerator pedal with the right foot.
6. When the engine speed no longer increases, quickly read the engine speed and release the accelerator pedal.
7. Shift the selector lever to the N position and idle the engine for 1 min or more to cool the ATF.
8. Perform a stall test of the M range and R position in the same manner as in Steps 3--7.
9. Turn off the engine.

Engine stall speed

ENGINE STALL SPEED POSSIBLE CAUSE

Position/range	Engine stall speed (rpm)
D, M	2,637
R	2,555

Evaluation of stall test

EVALUATION OF STALL TEST POSSIBLE CAUSE

Condition	Possible cause

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Above specification	In D, M ranges	<ul style="list-style-type: none">• Low line pressure (Line pressure control solenoid malfunction, primary regulator valve malfunction)• Control valve body component malfunction (shift solenoid C hydraulic pressure system)• C1 clutch slipping• One-way clutch malfunction
	In R position	<ul style="list-style-type: none">• Low line pressure (Line pressure control solenoid malfunction, primary regulator valve malfunction)• Control valve body component malfunction (shift solenoid E hydraulic pressure system)• C3 clutch malfunction (slipping)• B2 brake malfunction (slipping)
	In all positions/ranges	<ul style="list-style-type: none">• Low line pressure (Line pressure control solenoid malfunction, primary regulator valve malfunction)• Oil pump malfunction• Oil strainer clogging
Below specification		<ul style="list-style-type: none">• Engine lack of power• Torque converter one-way clutch slipping

TIME LAG TEST

1. Perform mechanical system test preparation. (See MECHANICAL SYSTEM TEST PREPARATION.)
2. Start the engine.
3. Warm up the engine until the ATF temperature reaches **60-70°C {140-158°F}**.
4. Shift the selector lever from the N position to D range.
5. Use a stopwatch to measure the time it takes from shifting until shock is felt. Take three measurements for each test and average from the results using the following formula.

Formula

$$\text{Average time lag} = (\text{Time 1} + \text{Time 2} + \text{Time 3}) / 3$$

6. Perform the test for the following shifts in the same manner as in Step 5.
 - N position --> R position

Average time lag

N position --> D range: 1.5 s or less

N position --> R position: 1.5 s or less

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Evaluation of time lag test

EVALUATION OF TIME LAG TEST POSSIBLE CAUSE

Condition		Possible cause
N --> D shift	More than specification	<ul style="list-style-type: none">• Control valve body malfunction (shift solenoid C hydraulic pressure system)• C1 clutch slipping• One-way clutch malfunction• Oil pump malfunction• Oil strainer clogging
N --> R shift	More than specification	<ul style="list-style-type: none">• Control valve body malfunction (shift solenoid E hydraulic pressure system)• C3 clutch slipping• B2 brake slipping• Oil pump malfunction• Oil strainer clogging

ROAD TEST [AW6A-EL, AW6AX-EL]

WARNING:

- When performing a road test, be aware of other vehicles, people, and other impediments in order to avoid an accident.

NOTE:

- When the legal speed limit must be exceeded, use a chassis dynamometer instead of performing a road test.

ROAD TEST PREPARATION

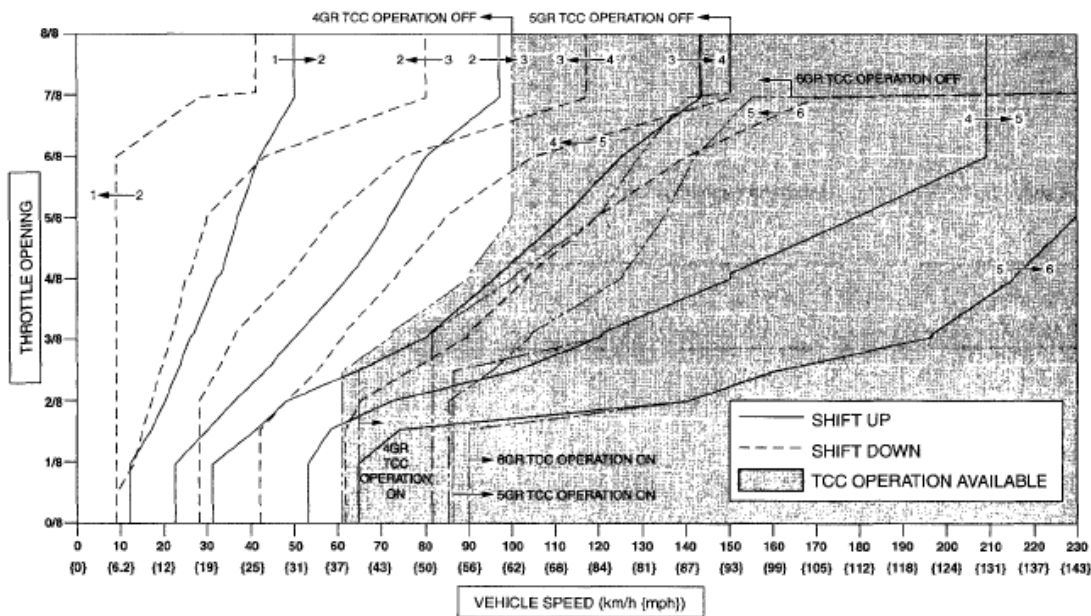
1. Inspect the engine coolant level. (See **COOLING SYSTEM SERVICE WARNINGS [MZI-3.7]** .) (See **ENGINE COOLANT LEVEL INSPECTION [MZI-3.7]** .)
2. Inspect the engine oil level. (See **ENGINE OIL LEVEL INSPECTION [MZI-3.7]** .)
3. Inspect the ATF level. (See **AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [AW6A-EL, AW6AX-EL]**.)
4. Inspect the idle speed. (See **ENGINE TUNE-UP [MZI-3.7]** .)
5. Inspect the ignition timing. (See **ENGINE TUNE-UP [MZI-3.7]** .)
6. Bring up the engine and transaxle to normal operating temperature.

SHIFT DIAGRAM

D range (normal mode)

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Fig. 5: Vehicle Speed & Throttle Opening Graph
 Courtesy of MAZDA MOTORS CORP.

D RANGE TEST

1. Perform road test preparation. (See **ROAD TEST PREPARATION.**)
2. Shift the selector lever to D range.
3. Accelerate with the depressing amount of accelerator pedal half and then fully depress.
4. Verify that 1-->2, 2-->3, 3-->4, 4-->5, and 5-->6 upshifts and downshifts are obtained. The shift points must be as shown in the table below.
 - If there is any malfunction, inspect the TCM and ATX. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [AW6A-EL, AW6AX-EL]** .)
5. Drive the vehicle in 6GR, 5GR, 4GR, 3GR, and 2GR and verify that kickdown occurs for 6-->5, 5-->4, 4-->3, 3-->2, 2-->1 downshifts, and that the shift points are as shown in the table below.
 - If there is any malfunction, inspect the TCM and ATX. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [AW6A-EL, AW6AX-EL]** .)
6. Drive the vehicle and verify that TCC operation is obtained. The operation points must be as shown in the table below.
 - If there is any malfunction, inspect the TCM and ATX. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [AW6A-EL, AW6AX-EL]** .)

Vehicle speed at shift point table

VEHICLE SPEED RANGE REFERENCE

Range	Mode	Throttle condition	Shift	Vehicle speed (km/h {mph})	Turbine speed (rpm)
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D	NORMAL	Wide open throttle	D ₁ -->D ₂	49-55 {31-34}	5,250-5,850
			D ₂ -->D ₃	95-103{59-63}	5,800-6,250
			D ₃ -->D ₄	140-150{87-93}	5,600-5,950
			TCC ON (D ₄)	140-150{87-93}	4,150-4,400
			D ₄ -->D ₅	206-216{128-133}	6,150-6,350
			TCC ON (D ₅)	206-216{128-133}	4,550-4,750
			D ₅ -->D ₆	227-237{141-146}	5,050-5,200
			TCC ON (D ₆)	227-237{141-146}	4,000-4,150
		Half throttle	D ₁ -->D ₂	28-35{18-21}	2,900-3,800
			D ₂ -->D ₃	53-69 {33-42}	3,200-4,200
			D ₃ -->D ₄	83-109{52-67}	3,350-4,350
			TCC ON (D ₄)	83-109{52-67}	2,500-3,200
			D ₄ -->D ₅	134-166{84-102}	4,000-4,900
			TCC ON (D ₅)	134-166{84-102}	2,950-3,650
			D ₅ -->D ₆	200-226{124-140}	4,450-4,950
			TCC ON (D ₆)	200-226{124-140}	3,550-3,950
		Closed throttle position	D ₆ -->D ₅	59-64 {37-39}	1,050-1,100
			D ₅ -->D ₄	39-45 {25-27}	900-950
			D ₄ -->D ₃	25-31 {16-19}	750-900
			D ₃ -->D ₁	6-12{4-7}	250-450
		Kickdown	D ₆ -->D ₅	225-235{140-145}	4,000-4,100
			D ₅ -->D ₄	145-155{90-96}	3,200-3,400
			D ₄ -->D ₃	112-122{70-75}	3,350-3,600
			D ₃ -->D ₂	76-84 {48-52}	3,050-3,350
			D ₂ -->D ₁	38-44 {24-27}	2,350-2,650
		Wide open throttle	D ₁ -->D ₂	49-55{31-34}	5,250-5,850
			D ₂ -->D ₃	95-103{59-63}	5,800-6,250
			D ₃ -->D ₄	140-150{87-93}	5,600-5,950

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D	AAS		D ₄ -->D ₅	206-216{128-133}	6,150-6,350
			D ₅ -->D ₆	227-237{141-146}	5,050-5,200
		Half throttle	D ₁ -->D ₂	28-35{18-21}	2,900-3,800
			D ₂ -->D ₃	53-69 {33-42}	3,200-4,200
			D ₃ -->D ₄	83-108{52-66}	3,300-4,300
			D ₄ -->D ₅	143-172{89-106}	4,250-5,050
			D ₅ -->D ₆	201-226{125-140}	4,450-4,950
			D ₆ -->D ₅	107-113{67-70}	1,900-1,950
		Closed throttle position	D ₅ -->D ₄	65-71 {41-44}	1,450-1,550
			D ₄ -->D ₃	27-33 {17-20}	800-950
			D ₃ -->D ₁	6-12 {4-7}	250-450
			D ₆ -->D ₅	225-235{140-145}	4,000-4,100
		Kickdown	D ₅ -->D ₄	145-155 {90-96}	3,200-3,400
			D ₄ -->D ₃	112-122{70-75}	3,350-3,600
			D ₃ -->D ₂	76-84 {48-52}	3,050-3,350
			D ₂ -->D ₁	38-44 {24-27}	2,350-2,650

M RANGE TEST

1. Perform road test preparation. (See **ROAD TEST PREPARATION.**)
2. Shift the selector lever to M range.
3. Verify that 1-->2, 2-->3, 3-->4, 4-->5 and 5-->6 upshifts and 6-->5, 5-->4, 4-->3, 3-->2, and 2-->1 downshifts are obtained by manual shifting of the selector lever forward and back.
 - If there is any malfunction, inspect the TCM and ATX. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [AW6A-EL, AW6AX-EL]** .)
4. Decelerate the vehicle and verify that 6-->5, 5-->4, 4-->3, 3-->1 downshifts are obtained. The shift points must be as shown in the table below.
 - If there is any malfunction, inspect the TCM and ATX. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [AW6A-EL, AW6AX-EL]** .)
5. Decelerate the vehicle and verify that engine braking effect is felt in 1GR.
 - If there is any malfunction, inspect the TCM and ATX. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [AW6A-EL, AW6AX-EL]** .)
6. Drive the vehicle and verify that TCC operation is obtained in 4GR, 5GR and 6GR. The operation points must be as shown in the table below.
 - If there is any malfunction, inspect the TCM and ATX. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [AW6A-EL, AW6AX-EL]** .)
7. Drive the vehicle in 6GR, 5GR, 4GR and 3GR and verify that kickdown occurs for 6-->5, 5-->4, 4-->3, 3-

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->2 downshifts, and that the shift points are as shown in the table below.

- If there is any malfunction, inspect the TCM and ATX. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [AW6A-EL, AW6AX-EL]** .)

Vehicle speed at shift point table

VEHICLE SPEED RANGE REFERENCE

Range	Mode	Throttle condition	Shift	Vehicle speed km/h {mph}	Turbine speed (rpm)
M	Manual	Half throttle	TCC ON (M6)	141-180{88-111}	2,500-3,150
		All round	M ₆ -->M ₅	44-50{28-31}	800-850
			M ₅ -->M ₄	34-40 {22-24}	750-850
			M ₄ -->M ₃	23-29{15-17}	700-850
			M ₃ -->M ₁	6-12{4-7}	250-450
		Kickdown	M ₅ -->M ₄	85-95 {53-58}	1,900-2,050
			M ₄ -->M ₃	60-70 {38-43}	1,800-2,050
			M ₃ -->M ₂	36-44 {23-27}	1,450-1,750

P POSITION TEST

1. Shift into P position on a gentle slope. Release the brake and verify that the vehicle does not roll.
 - If there is any malfunction, inspect the ATX. (See **SYMPTOM TROUBLESHOOTING ITEM TABLE [AW6A-EL, AW6AX-EL]** .)

AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [AW6A-EL, AW6AX-EL]

AUTOMATIC TRANSAXLE FLUID (ATF) CONDITION INSPECTION

1. Inspect the ATF for the following to determine whether the transaxle should be disassembled.
 - The ATF is muddy.
 - The ATF smells strange or unusual.

ATF Condition

ATF CONDITION POSSIBLE CAUSE

Condition		Possible cause
Clear dark red	Normal	-
Light red (pink)	Contaminated	<ul style="list-style-type: none"> • Damaged oil cooler • Poor filler tube installation:

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		with water	Problem could occur to parts inside the transaxle due to water contamination. If necessary, replace the transaxle.
Reddish brown	Has burnt smell and metal particles are found	Deteriorated ATF	Defective powertrain components inside the transaxle: Particles cause wide range of problems by clogging the oil pipe, control valve body and oil cooler. <ul style="list-style-type: none">• A large amount of metal particles are found. If necessary, replace the transaxle.• Flush the system due to possible clogging of the oil pipe or oil cooler.
	Has no burnt smell	Normal	<ul style="list-style-type: none">• Discoloration by oxidation

AUTOMATIC TRANSAXLE FLUID (ATF) LEVEL INSPECTION

CAUTION:

- **The ATF amount varies according to ATF temperature. Therefore, when checking the ATF level or replacing the ATF, use a thermometer to measure the temperature and adjust the ATF amount to the specified level according to the specified temperature.**

1. Place the vehicle on level ground.
2. Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.
3. Adjust the length of thermometer probe so that the length is the same as the depth gauge, and hold the probe with a paper holder. Insert into the filler tube and measure the temperature.
 - If necessary, inspect the ATF before warming up the engine. In this case, use the ATF temperature (15-25 °C {59-77 °F}).
4. Warm up the engine until the ATF reaches 60-70 °C {140-158 °F}.
5. Shift the selector lever and pause momentarily in each range (P--D) while depressing the brake pedal.
6. Shift the selector lever to P position.
7. Verify that the ATF level is in the HOT range (65 °C {149 °F}) while the engine is idling.
 - If necessary, add ATF to the specification.

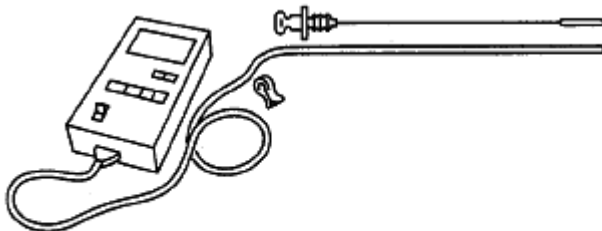


Fig. 6: Adjusting Length Or Thermometer Probe
Courtesy of MAZDA MOTORS CORP.

ATF type

JWS3309

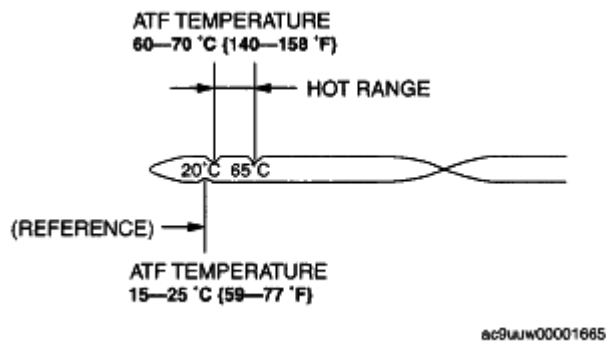


Fig. 7: Identifying ATF Level In HOT Range
Courtesy of MAZDA MOTORS CORP.

AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL]

WARNING: • A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing the ATF.

1. Remove the oil dipstick.
2. Remove the oil drain plug and gasket.
3. Drain the ATF into a container.
4. Install a new gasket and the drain plug.

Tightening torque

23.5-54.9 N.m {2.4-5.5 kgf.m, 17.4-40.4 ft.lbf}

5. Add the specified ATF through the oil filler tube until it reaches the lower notch of dipstick.

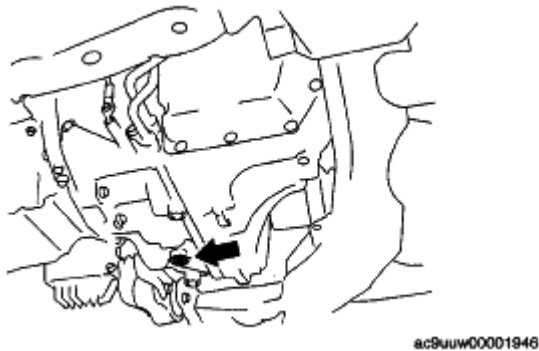


Fig. 8: Locating Oil Drain Plug
Courtesy of MAZDA MOTORS CORP.

ATF

Type: JWS3309

Capacity (Approx. quantity): 7.0 L {7.4 US qt, 6.2 Imp qt}

6. Ensure that the ATF level is in the HOT range (65 °C {149 °F}).
 - Add ATF to the specified level as necessary.

TRANSAXLE RANGE (TR) SWITCH INSPECTION [AW6A-EL, AW6AX-EL]

NOTE:

- TR switch function is installed as one part of TCM.

1. Inspect the TCM. (See TCM INSPECTION [AW6A-EL, AW6AX-EL].)

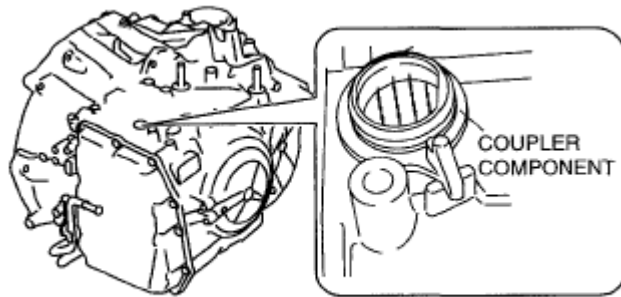
TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION [AW6A-EL, AW6AX-EL]

ON-VEHICLE INSPECTION

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.
- Do not damage the terminals.

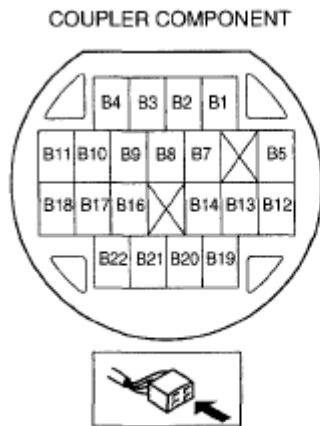
1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7].)
3. Remove the TCM. (See TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
4. Verify that there is no continuity between coupler component terminals B7 and GND, or B8 and GND.



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Fig. 9: Identifying Air Cleaner Component
Courtesy of MAZDA MOTORS CORP.

- If there is any malfunction, perform an off-vehicle inspection of TFT sensor. (See **OFF-VEHICLE INSPECTION**.)
- 5. Install the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
- 6. Install the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
- 7. Connect the negative battery cable.



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Fig. 10: Identifying Air Cleaner Component Connector Terminal
Courtesy of MAZDA MOTORS CORP.

OFF-VEHICLE INSPECTION

WARNING:

- A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing the ATF.

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign

material on the connector when disconnecting.

- Do not damage the terminals.

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .)
3. Drain the ATF. (See AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].)
4. Remove the oil cooler.
5. Remove the oil pipe. (See OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
6. Remove the control valve body. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
7. Remove the TFT sensor. (See TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)

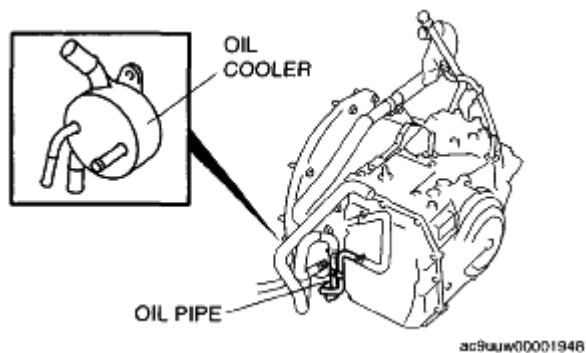


Fig. 11: Identifying Oil Cooler
Courtesy of MAZDA MOTORS CORP.

8. Place the TFT sensor and a thermometer in ATF as shown in the figure, and heat the ATF gradually.

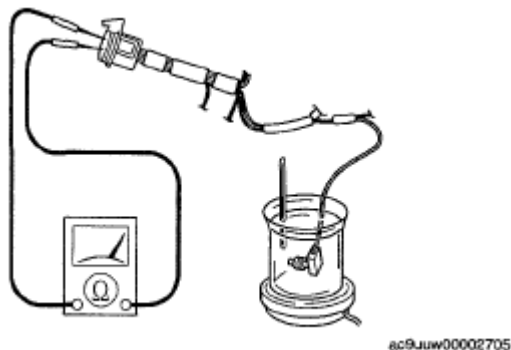


Fig. 12: Identifying TFT Sensor & Thermometer In ATF
Courtesy of MAZDA MOTORS CORP.

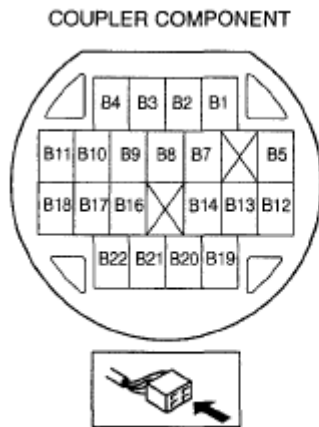
9. Measure the resistance between the coupler component terminals B7 and B8.
 - If there is any malfunction, replace the TFT sensor. (See **TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)

Transaxle fluid temperature (TFT) sensor

RESISTANCE REFERENCE

ATF temperature (°C {°F})	Resistance (kilohm)
10 {50}	5.62-7.31
25 {77}	Approx. 3.5
110 {230}	0.22-0.27

10. Install the TFT sensor. (See **TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
11. Install the control valve body. (See **CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)



as:9uuw00002730

Fig. 13: Measuring Resistance Between Coupler Component Terminals B7 & B8
 Courtesy of MAZDA MOTORS CORP.

12. Install the oil pipe. (See **OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
13. Install the oil cooler. (See **OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
14. Add ATF to the specified level. (See **AUTOMATIC TRANSMAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL]**.)
15. Install the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
16. Connect the negative battery cable.

TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR

REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]

WARNING:

- A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing the ATF.

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.
- Do not damage the terminals.

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[MZL-3.7\]](#) .)
3. Drain the ATF. (See [AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT \[AW6A-EL, AW6AX-EL\]](#).)
4. Remove the TCM. (See [TCM REMOVAL/INSTALLATION \[AW6A-EL, AW6AX-EL\]](#).)
5. Remove the oil cooler.
6. Remove the oil pipe. (See [OIL COOLER REMOVAL/INSTALLATION \[AW6A-EL, AW6AX-EL\]](#).)
7. Remove the control valve body. (See [CONTROL VALVE BODY REMOVAL/INSTALLATION \[AW6A-EL, AW6AX-EL\]](#).)

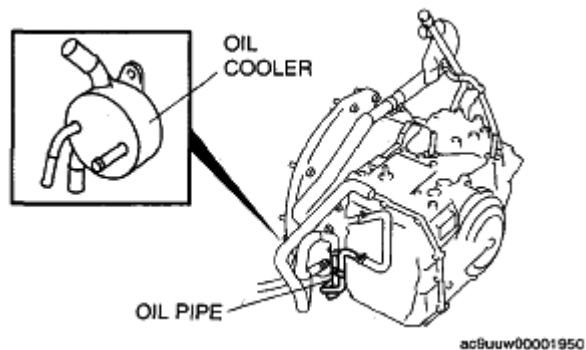


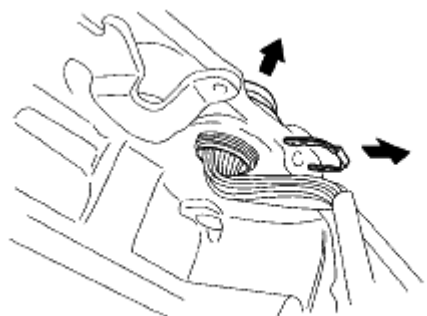
Fig. 14: Identifying Oil Cooler
Courtesy of MAZDA MOTORS CORP.

8. Remove the coupler component lock plate.

CAUTION:

- Do not damage the wiring harness.
- Do not pull hard on the wiring harness.

9. Remove the coupler component from the transaxle case.

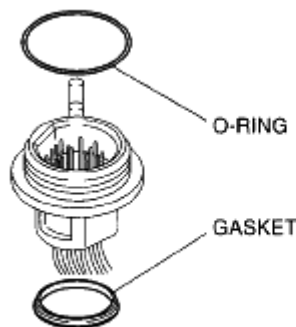


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Fig. 15: Identifying Coupler Component Lock Plate
Courtesy of MAZDA MOTORS CORP.

10. Remove the O-ring and the gasket from the coupler component.
11. Apply ATF to a new gasket and install it on the coupler component.

CAUTION: • Do not apply ATF to the O-ring.



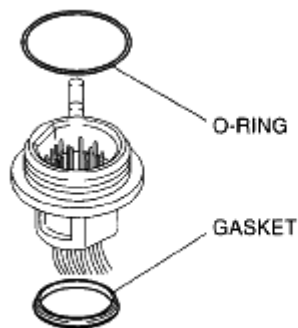
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Fig. 16: Identifying O-Ring & Gasket
Courtesy of MAZDA MOTORS CORP.

12. Install a new O-ring to the coupler component.

CAUTION: • Do not apply too much force to the coupler component.
 • Do not damage the coupler component.

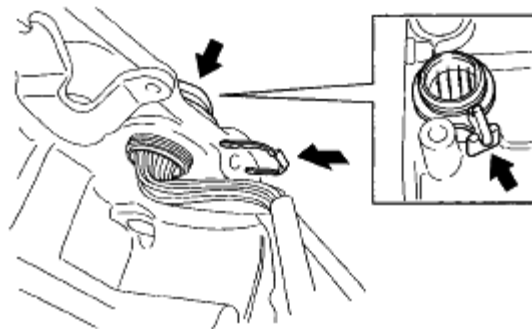
13. Install the coupler component to the transaxle case.



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Fig. 17: Identifying O-Ring & Gasket
 Courtesy of MAZDA MOTORS CORP.

14. Install a new coupler component lock plate.
15. Install the control valve body. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
16. Install the oil pipe. (See OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
17. Install the oil cooler. (See OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
18. Install the TCM. (See TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
19. Add ATF to the specified level. (See AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].)



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Fig. 18: Locating Coupler Component Lock Plate
 Courtesy of MAZDA MOTORS CORP.

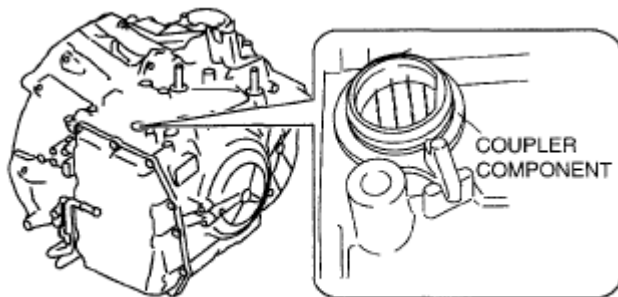
20. Install the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .)
21. Connect the negative battery cable.
22. Perform the mechanical system test. (See MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL].)

INPUT/TURBINE SPEED SENSOR INSPECTION [AW6A-EL, AW6AX-EL]

ON-VEHICLE INSPECTION

- CAUTION:**
- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.
 - Do not damage the terminals.

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .)
3. Remove the TCM. (See TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
4. Verify that there is no continuity between the coupler component terminals B12 and GND or B13 and GND.

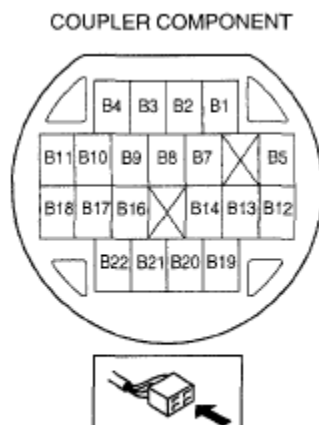


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Fig. 19: Identifying Coupler Component
Courtesy of MAZDA MOTORS CORP.

- If there is any malfunction, inspect the coupler component.
- If the coupler component is normal, perform an off-vehicle inspection of input/turbine speed sensor. (See OFF-VEHICLE INSPECTION.)

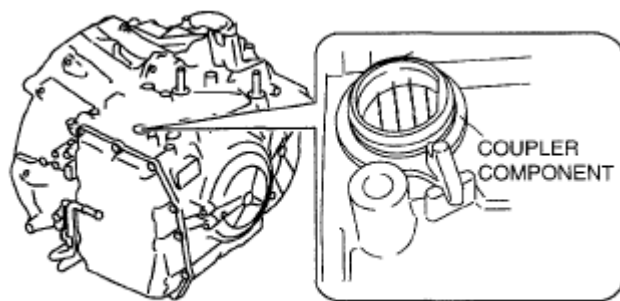
- NOTE:**
- Inspect with a tester that can indicate more than 10 megohms and confirm that the value is more than 1 megohm.



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Fig. 20: Identifying Coupler Component Connector Terminal
 Courtesy of MAZDA MOTORS CORP.

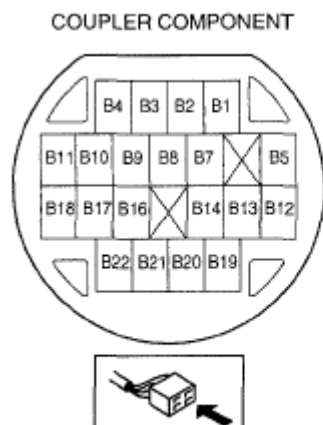
5. Verify that there is continuity between coupler component terminals B12 and B13.



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Fig. 21: Identifying Coupler Component
 Courtesy of MAZDA MOTORS CORP.

- If there is any malfunction, inspect the coupler component.
 - If the coupler component is normal, replace the input/turbine speed sensor. (See **INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
6. Install the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
 7. Install the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7].**)
 8. Connect the negative battery cable.



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Fig. 22: Identifying Coupler Component Connector Terminal
 Courtesy of MAZDA MOTORS CORP.

OFF-VEHICLE INSPECTION

WARNING:

- A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing the ATF.

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.
- Do not damage the terminals.

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .)
3. Drain the ATF. (See AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].)
4. Remove the oil cooler.
5. Remove the oil pipe. (See OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
6. Remove the control valve body. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
7. Remove the input/turbine speed sensor. (See INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)

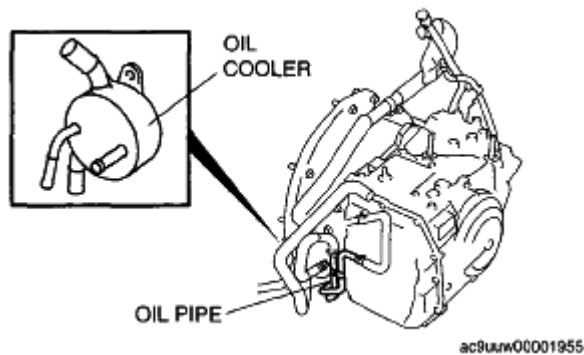


Fig. 23: Identifying Oil Cooler & Oil Pipe
 Courtesy of MAZDA MOTORS CORP.

8. Connect the input/turbine speed sensor terminal 2 to the battery positive terminal, connect the battery negative terminal to input/turbine speed sensor terminal 1 through an ammeter set to a resistance of **100 ohm**.

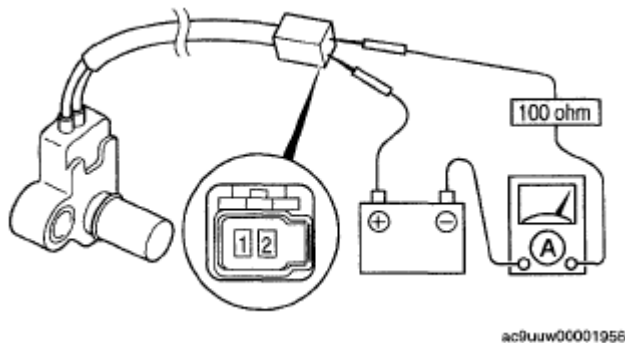


Fig. 24: Connecting Input/Turbine Speed Sensor Terminal 2 To Battery Positive Terminal
 Courtesy of MAZDA MOTORS CORP.

9. Measure the current while waving a magnet back and forth over the top of the input/turbine speed sensor (less than 5 mm {0.197 in}).
 - If there is any malfunction, replace the input/turbine speed sensor. (See **INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)

Input/turbine speed sensor

SIGNAL REFERENCE

Signal	Current (mA)
High	12.0-16.0
Low	4.0-8.0

10. Install the input/turbine speed sensor. (See **INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
11. Install the control valve body. (See **CONTROL VALVE BODY REMOVAL/INSTALLATION**

[AW6A-EL, AW6AX-EL.]

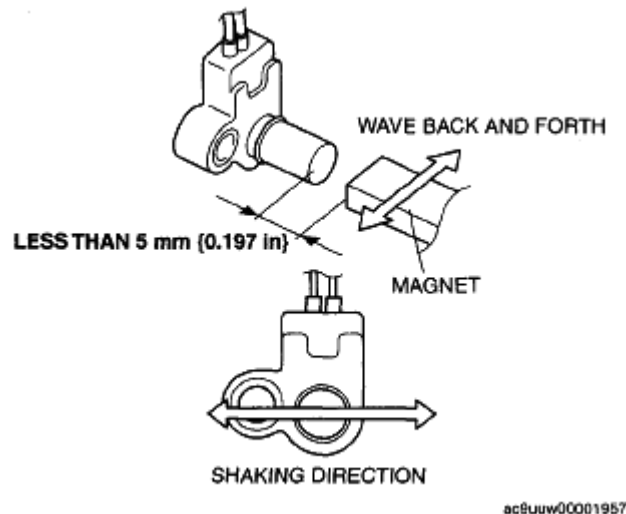


Fig. 25: Measuring Current Of Input/Turbine Speed Sensor
Courtesy of MAZDA MOTORS CORP.

12. Install the oil pipe. (See [OIL COOLER REMOVAL/INSTALLATION \[AW6A-EL, AW6AX-EL\].](#))
13. Install the oil cooler. (See [OIL COOLER REMOVAL/INSTALLATION \[AW6A-EL, AW6AX-EL\].](#))
14. Add ATF to the specified level. (See [AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT \[AW6A-EL, AW6AX-EL\].](#))
15. Install the air cleaner component. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[MZI-3.7\] .](#))
16. Connect the negative battery cable.
17. Perform the mechanical system test. (See [MECHANICAL SYSTEM TEST \[AW6A-EL, AW6AX-EL\].](#))

INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]

WARNING:

- A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until then are cool before replacing the ATF.

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See [INTAKE-AIR SYSTEM REMOVAL/INSTALLATION \[MZI-3.7\] .](#))
3. Drain the ATF. (See [AUTOMATIC TRANSAXLE FLUID \(ATF\) REPLACEMENT \[AW6A-EL, AW6AX-EL\].](#))
4. Remove the oil cooler.
5. Remove the oil pipe. (See [OIL COOLER REMOVAL/INSTALLATION \[AW6A-EL, AW6AX-EL\].](#))

6. Remove the control valve body. (See **CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)

CAUTION: • Do not damage the input/turbine speed sensor.

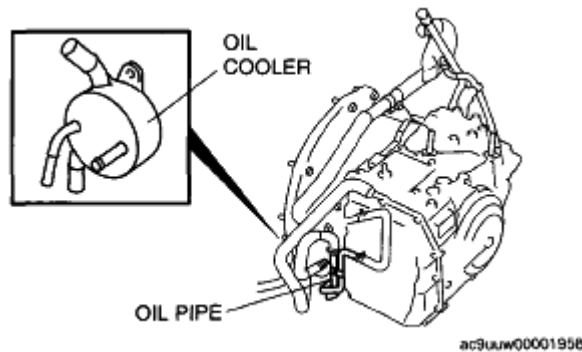


Fig. 26: Identifying Oil Cooler & Oil Pipe
Courtesy of MAZDA MOTORS CORP.

7. Remove the input/turbine speed sensor.
8. Install the input/turbine speed sensor.

Tightening torque

3.9-6.9 N.m {40-70 kgf.cm, 26-60 in.lbf}

9. Install the control valve body. (See **CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
10. Install the oil pipe. (See **OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
11. Install the oil cooler. (See **OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)

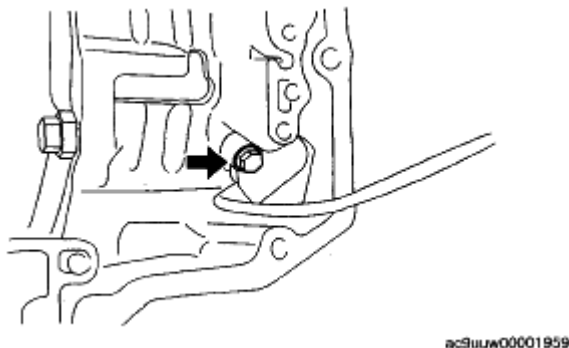


Fig. 27: Locating Input/Turbine Speed Sensor
Courtesy of MAZDA MOTORS CORP.

12. Add ATF to the specified level. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT**)

[AW6A-EL, AW6AX-EL].)

13. Install the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
14. Connect the negative battery cable.
15. Perform the mechanical system test. (See **MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL]**.)

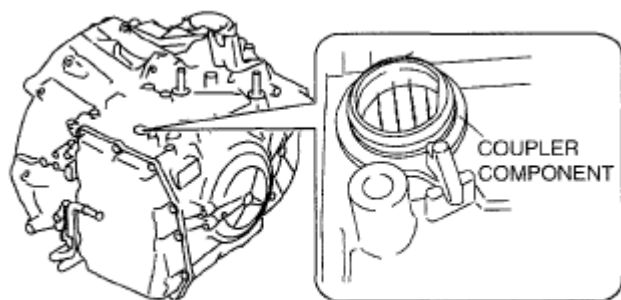
VEHICLE SPEED SENSOR (VSS) INSPECTION [AW6A-EL, AW6AX-EL]

ON-VEHICLE INSPECTION

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.
- Do not damage the terminals.

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
3. Remove the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
4. Verify that there is no continuity between the coupler component terminals B19 and GND or B20 and GND.



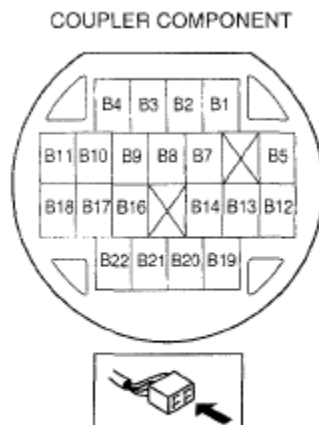
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Fig. 28: Identifying Coupler Component
 Courtesy of MAZDA MOTORS CORP.

- If there is any malfunction, inspect the coupler component.
- If the coupler component is normal, replace the ATX. (See **AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)

NOTE:

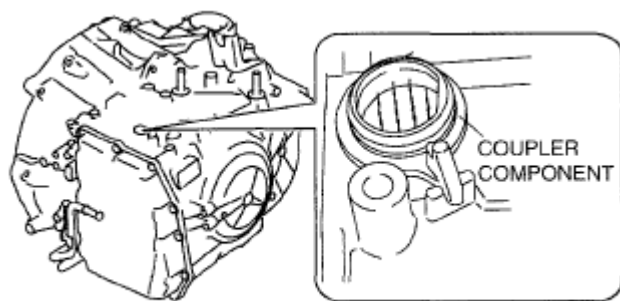
- Inspect with a tester that can indicate more than 10 megohms and confirm that the value is more than 1 megohm.



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Fig. 29: Identifying Coupler Component Connector Terminal
Courtesy of MAZDA MOTORS CORP.

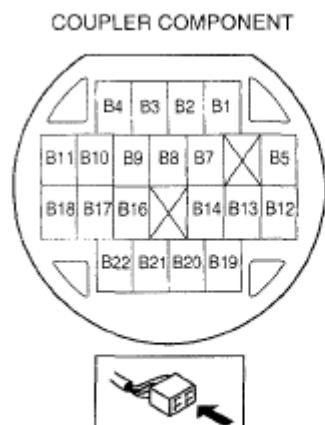
5. Verify that there is continuity between coupler component terminals B19 and B20.



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Fig. 30: Identifying Coupler Component
Courtesy of MAZDA MOTORS CORP.

- If there is any malfunction, inspect the coupler component.
 - If the coupler component is normal, replace the ATX. (See **AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
6. Install the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
 7. Install the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .**)
 8. Connect the negative battery cable.



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Fig. 31: Identifying Coupler Component Connector Terminal
 Courtesy of MAZDA MOTORS CORP.

OFF-VEHICLE INSPECTION

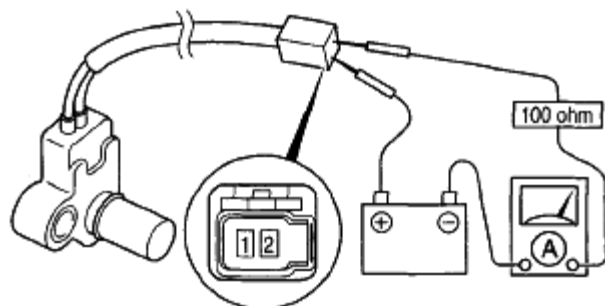
WARNING:

- A hot transaxle and ATF can cause severe burns. Turn off the engine and wait until they are cool before replacing the ATF.

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.
- Do not damage the terminals.

1. Disconnect the negative battery cable.
2. Remove the VSS. (See **VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
3. Connect the VSS terminal 2 to the battery positive terminal, connect the battery negative terminal to VSS terminal 1 through an ammeter set to a resistance of **100 ohm**.



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Fig. 32: Connecting VSS Terminal 2 To Battery Positive Terminal

Courtesy of MAZDA MOTORS CORP.

4. Measure the current while waving a magnet back and forth over the top of the VSS (less than 5 mm {0.197 in}).
 - If there is any malfunction, replace the VSS. (See VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)

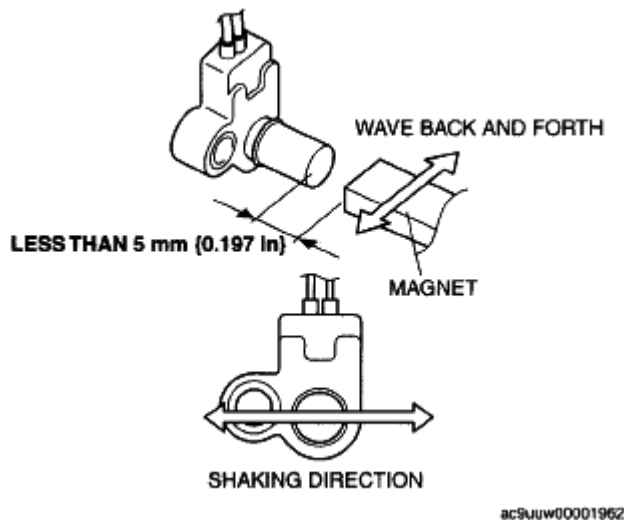


Fig. 33: Measuring Magnet Back & Forth Over Top Of VSS
 Courtesy of MAZDA MOTORS CORP.

VSS

VSS SIGNAL REFERENCE

Signal	Current (mA)
High	12.0-16.0
Low	4.0-8.0

5. Install the VSS. (See VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
6. Connect the negative battery cable.
7. Perform the mechanical system test. (See MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL].)

VEHICLE SPEED SENSOR (VSS) REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to drop water or foreign material on the connector when disconnecting it.

- If foreign materials are stuck to the VSS, disturbance by magnetic flux can cause sensor output to be abnormal and thereby negatively affect control. Make sure that foreign materials such as iron filings are not stuck to the VSS during installation.

1. Remove the automatic transaxle. (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
2. Remove the VSS. (See Automatic Transaxle and Transfer Workshop Manual AW6A-EL, AW6AX-EL)

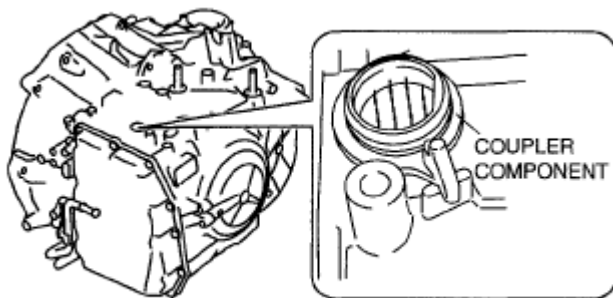
SOLENOID VALVE INSPECTION [AW6A-EL, AW6AX-EL]

RESISTANCE INSPECTION (ON-VEHICLE INSPECTION)

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.
- Do not damage the terminals.

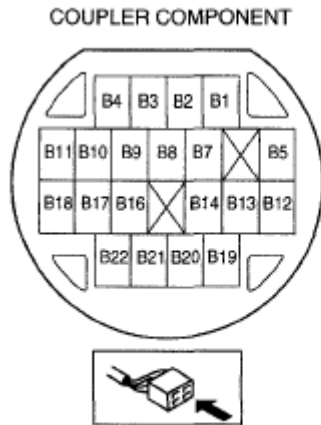
1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .)
3. Remove the TCM. (See TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
4. Measure the resistance between the following terminals.



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Fig. 34: Identifying Coupler Component
Courtesy of MAZDA MOTORS CORP.

- If there is any malfunction, inspect the coupler component.
- If the coupler component is normal, replace the control valve body. (See CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)



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Fig. 35: Identifying Coupler Component Connector Terminal
 Courtesy of MAZDA MOTORS CORP.

Solenoid valve resistance (ATF temperature: 20°C {68°F})

SOLENOID VALVE RESISTANCE REFERENCE

Terminal	Solenoid valve	Resistance (ohm)
B5-GND	Shift solenoid A	11-15
B2-GND	Shift solenoid B	11-15
B11-B10	Shift solenoid C	5.0-5.6
B17-B18	Shift solenoid D	5.0-5.6
B14-B22	Shift solenoid E	5.0-5.6
B21-B16	Shift solenoid F	5.0-5.6
B9-B4	TCC control solenoid	5.0-5.6
B3-B1	Line pressure control solenoid	5.0-5.6

5. Install the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
6. Install the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
7. Connect the negative battery cable.

CONTINUITY INSPECTION (ON-VEHICLE INSPECTION)

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.
- Do not damage the terminals.

1. Disconnect the negative battery cable.

2. Remove the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
3. Remove the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
4. Verify that there is no continuity between coupler component terminals B1, B3, B4, B9, B10, B11, B14, B17, B18, B21, B22 and GND.
 - If there is any malfunction, inspect the coupler component.
 - If the coupler component is normal, replace the control valve body. (See **CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
5. Install the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
6. Install the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
7. Connect the negative battery cable.

TCM INSPECTION [AW6A-EL, AW6AX-EL]

TR SWITCH OPERATING INSPECTION

1. Verify that the starter operates only when the ignition switch is turned to the START position with the selector lever in P or N position.
 - If there is any malfunction, neutral position learning. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
2. Verify that the back-up lights illuminate when shifted to R position with the ignition switch at the ON position.
 - If there is any malfunction, neutral position learning. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
3. Verify that the positions of the selector lever and the indicator light correspond.
 - If there is any malfunction, perform the neutral position learning. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
4. Verify that the TR PID is normal.
 - If there is any malfunction, perform the neutral position learning. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)

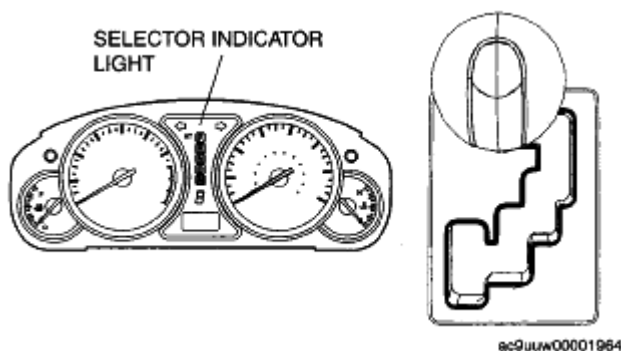


Fig. 36: Identifying Selector Indicator Light
Courtesy of MAZDA MOTORS CORP.

CONTROL MODULE INSPECTION

1. Remove the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
2. Measure the voltage at each TCM connector (wiring harness-side) terminal and refer to the **TERMINAL VOLTAGE TABLE**.
 - If the voltage is not as specified in the Terminal Voltage Table (Reference), inspect the parts under "Inspection item (s)".

WARNING:

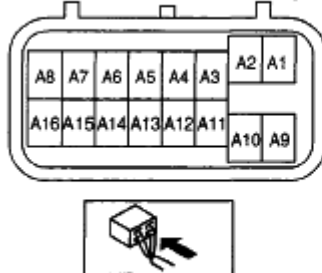
- Be careful not to damage the connector waterproofing when measuring the TCM terminal voltage. If damaged, the waterproofing efficiency could be negatively affected.

NOTE:

- Use the ground of terminal A9 of the TCM connector (wiring harness-side) when measuring terminal voltage, as an error may occur when connecting the negative circuit tester to ground.

Terminal Voltage Table (Reference)

TCM SHORT CORD CONNECTOR (TCM SIDE)



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Fig. 37: Identifying TCM Short Cord Connector Terminal (TCM Side)
Courtesy of MAZDA MOTORS CORP.

VOLTAGE SPECIFICATION

Terminal	Signal	Connected to	Test condition	Voltage (V)	Inspection item (s)
A1	Battery back up supply	Battery	Constant	B+	<ul style="list-style-type: none"> • Inspect battery • Inspect related harness
				Below	<ul style="list-style-type: none"> • Inspect selector lever component (See

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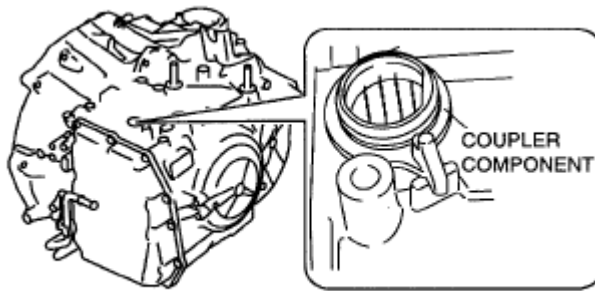
A3	Up switch (Selector lever component)	Up switch (Selector lever component)	Shift up (M range)		1.0	<p style="text-align: center;"><u>SELECTOR LEVER COMPONENT INSPECTION</u></p> <ul style="list-style-type: none"> Inspect related harness
			Other ranges, all positions		B+	
A4	Down switch (Selector lever component)	Down switch (Selector lever component)	Shift down (M range)		Below 1.0	<ul style="list-style-type: none"> Inspect selector lever component (See <u>SELECTOR LEVER COMPONENT INSPECTION</u>) Inspect related harness
			Other ranges, all positions		B+	
A5	Starter lock output signal	PCM	Shift the selector lever to P or N position.	Ignition switch ON	B+	<ul style="list-style-type: none"> Inspect PCM Inspect related harness
				Ignition switch OFF	Below 1.0	
A6	CAN_L	PCM	Because this terminal is for serial communication, good/no good judgment by terminal voltage is not possible. Carry out inspection according to DTCs.		-	<ul style="list-style-type: none"> Inspect related harness
A7	M range switch	M range switch	M range		Below 1.0	<ul style="list-style-type: none"> Inspect selector lever component (See <u>SELECTOR LEVER COMPONENT INSPECTION</u>) Inspect related harness
			Other positions, all ranges		B+	
A11	Power supply	Ignition switch	Ignition switch ON		B+	<ul style="list-style-type: none"> Inspect Ignition switch Inspect related harness
			Ignition switch OFF		Below 1.0	
A13	Back-up light relay	Back-up light relay	Ignition switch ON	Shift the selector lever to R position.	Below 1.0	<ul style="list-style-type: none"> Inspect back-up light relay (See <u>RELAY INSPECTION</u>) Inspect related harness
				Other	B+	
			Because this terminal is for			

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A14	CAN_H	PCM	serial communication, good/no good judgment by terminal voltage is not possible. Carry out inspection according to DTCs.	-	<ul style="list-style-type: none"> Inspect related harness
-----	-------	-----	--	---	---

3. Remove the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
4. Verify that continuity or resistance at terminal is as indicated in the terminal continuity/resistance table.
 - If there is any malfunction, inspect the parts under "Inspection item (s)".
 - If the system does not work properly even though the parts or related wiring harnesses do not have any malfunction, replace the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)



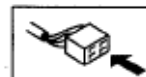
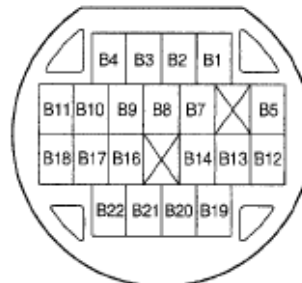
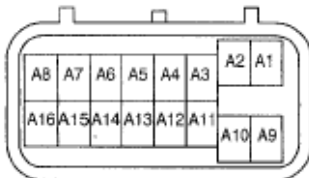
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Fig. 38: Identifying Coupler Component
Courtesy of MAZDA MOTORS CORP.

Terminal Continuity/Resistance Table (Reference)

TCM SHORT CORD CONNECTOR (TCM SIDE)

COUPLER COMPONENT



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Fig. 39: Identifying Coupler Component & TCM Short Cord Connector (TCM Side)
Courtesy of MAZDA MOTORS CORP.

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CONTINUITY RESISTANCE REFERENCE

Terminal	Signal	Connected to	Test Condition		Continuity/Resistance	Inspection item
A9	System GND	GND	Constant		Continuity	<ul style="list-style-type: none"> Inspect relate harness
B1	Line pressure control solenoid control GND	Line pressure control solenoid	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B3 and B1 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect line pressure cont solenoid (See <u>SOLENOID VALVE INSPECTIO</u> [AW6A-EL, AW6AX-EL]) Inspect relate harness
B2	Shift solenoid B control	Shift solenoid B	ATF temperature: 20°C {68°F}		11-15 (ohms)	<ul style="list-style-type: none"> Inspect sh solenoid B (<u>SOLENOID VALVE INSPECTIO</u> [AW6A-EL, AW6AX-EL]) Inspect relate harness
B3	Line pressure control solenoid control	Line pressure control solenoid	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B3 and B1 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect line pressure cont solenoid (See <u>SOLENOID VALVE INSPECTIO</u> [AW6A-EL, AW6AX-EL]) Inspect relate harness
B4	TCC control solenoid control GND	TCC control solenoid	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B9 and B4 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect TCC control solenoid (See <u>SOLENOID VALVE INSPECTIO</u> [AW6A-EL, AW6AX-EL]) Inspect relate harness

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B5	Shift solenoid A control	Shift solenoid A	ATF temperature: 20°C {68°F}		11-15 (ohms)	<ul style="list-style-type: none"> Inspect shift solenoid A <u>SOLENOID VALVE INSPECTIO</u> <u>[AW6A-EL, AW6AX-EL]</u> Inspect related harness
B7	TFT sensor GND	TFT sensor	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B7 and B8 (wiring harness-side). 	ATF temperature: 10°C {50°F}	5.62-7.31 (kilohms)	<ul style="list-style-type: none"> Inspect TFT sensor (See <u>TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR INSPECTION</u>) <u>[AW6A-EL, AW6AX-EL]</u> Inspect related harness
				ATF temperature: 25°C {77°F}	Approx. 3.5 (kilohms)	
B8	TFT sensor			ATF temperature: 110°C {230°F}	0.22-0.27 (kilohms)	
B9	TCC control solenoid control	TCC control solenoid	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B9 and B4 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect TCC control solenoid (See <u>SOLENOID VALVE INSPECTION</u>) <u>[AW6A-EL, AW6AX-EL]</u> Inspect related harness
B10	Shift solenoid C control GND	Shift solenoid C	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B11 and B10 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect shift solenoid C (See <u>SOLENOID VALVE INSPECTION</u>) <u>[AW6A-EL, AW6AX-EL]</u> Inspect related harness
B11	Shift solenoid C control					
B12	Input/turbine speed sensor					<ul style="list-style-type: none"> Inspect input/turbine sensor (See

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	(-)					<u>INPUT/TUR SPEED SEN INSPECTIO [AW6A-EL, AW6AX-EL</u>
B13	Input/turbine speed sensor (+)	Input/turbine speed sensor	<ul style="list-style-type: none"> Inspect for continuity between couple component terminals B12 and B13 (wiring harness-side). 		Continuity	<ul style="list-style-type: none"> Inspect relate harness
B14	Shift solenoid E control	Shift solenoid E	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B14 and B22 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect shift solenoid E (S <u>SOLENOID VALVE INSPECTIO [AW6A-EL, AW6AX-EL</u>) Inspect relate harness
B16	Shift solenoid F control GND	Shift solenoid F	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B21 and B16 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect shift solenoid F (S <u>SOLENOID VALVE INSPECTIO [AW6A-EL, AW6AX-EL</u>) Inspect relate harness
B17	Shift solenoid D control	Shift solenoid D	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B17 and B18 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect shift solenoid D (S <u>SOLENOID VALVE INSPECTIO [AW6A-EL, AW6AX-EL</u>) Inspect relate harness
B18	Shift solenoid D control GND					
B19	Vehicle speed (-)	VSS	<ul style="list-style-type: none"> Inspect for continuity between couple component terminals 		Continuity	<ul style="list-style-type: none"> Inspect VSS (<u>VEHICLE SPEED SEN (VSS) INSPECTIO</u>)

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B20	Vehicle speed (+)	VSS	B19 and B20 (wiring harness-side).			<u>[AW6A-EL, AW6AX-EL]</u>
B21	Shift solenoid F control	Shift solenoid F	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B21 and B16 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect shift solenoid F (<u>S SOLENOID VALVE INSPECTIO</u> <u>[AW6A-EL, AW6AX-EL]</u>) Inspect relate harness
B22	Shift solenoid E control GND	Shift solenoid E	<ul style="list-style-type: none"> Inspect resistance between couple component terminals B14 and B22 (wiring harness-side). 	ATF temperature: 20°C {68°F}	5.0-5.6 (ohms)	<ul style="list-style-type: none"> Inspect shift solenoid E (<u>S SOLENOID VALVE INSPECTIO</u> <u>[AW6A-EL, AW6AX-EL]</u>) Inspect relate harness

TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.

- Disconnect the negative battery cable.
- Remove the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZL-3.7] .)
- Disconnect the TCM connector.
- Remove the clip and disconnect the selector cable.

CAUTION:

- Do not use an impact wrench. Hold the manual shaft lever when removing the manual shaft nut, or the transaxle may be damaged.

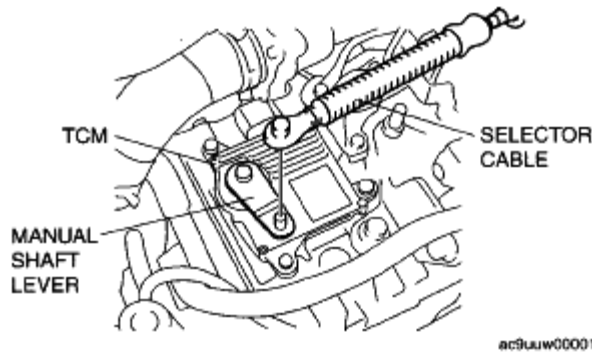


Fig. 40: Identifying Manual Shaft Lever & TCM Connector
Courtesy of MAZDA MOTORS CORP.

5. Set the adjustable wrench as shown in the figure to hold the manual shaft lever.

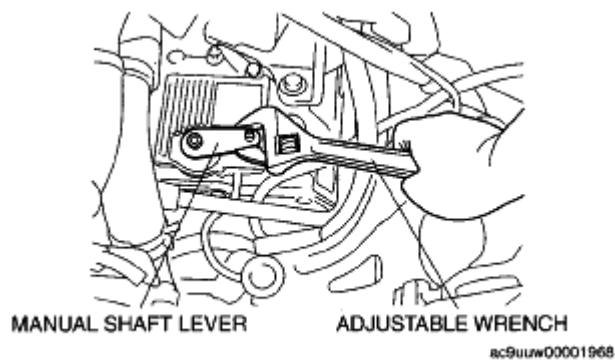


Fig. 41: Identifying Manual Shaft Lever
Courtesy of MAZDA MOTORS CORP.

6. Remove the manual shaft nut and washer.

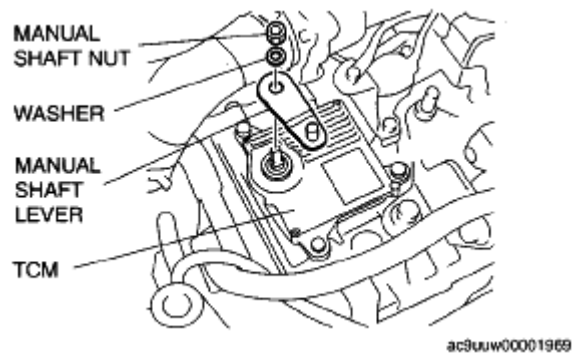
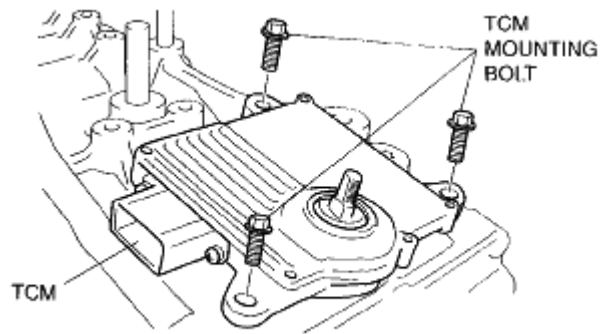


Fig. 42: Identifying Manual Shaft Nut & Washer
Courtesy of MAZDA MOTORS CORP.

7. Remove the TCM.

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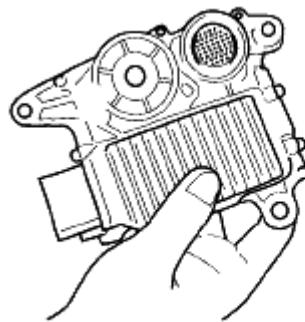
2008 TRANSMISSION Automatic Transaxle (AW6A-EL, AW6AX-EL) - Mazda CX-9



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Fig. 43: Identifying TCM
Courtesy of MAZDA MOTORS CORP.

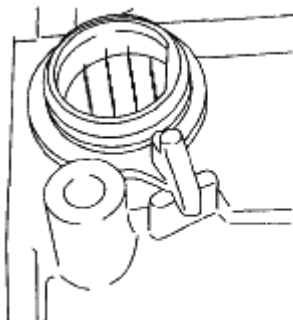
CAUTION: • Do not touch the terminals.



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Fig. 44: Identifying Air Filter
Courtesy of MAZDA MOTORS CORP.

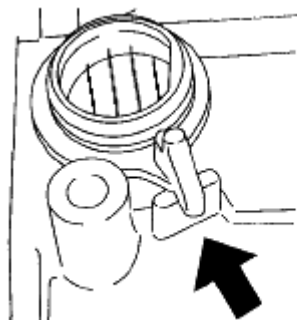
8. Inspect the condition of the connector pin of the coupler component (foreign material, bent pins, broken pins) and O-ring after the TCM is removed.



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Fig. 45: Identifying Connector Pin Of Coupler Component
Courtesy of MAZDA MOTORS CORP.

- Align the transaxle case and coupler component connector.



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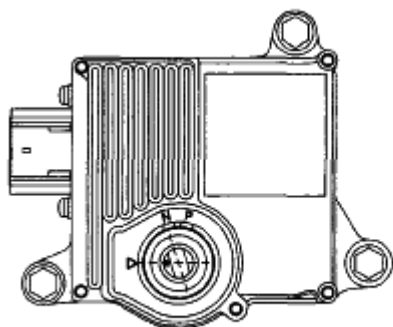
Fig. 46: Locating Transaxle Case
Courtesy of MAZDA MOTORS CORP.

- Be sure to match the position of the TCM marking.

CAUTION:

- Do not turn more than 60° from the marking.

- Install the TCM.



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Fig. 47: Identifying TCM
Courtesy of MAZDA MOTORS CORP.

- Verify the correct positioning of the TCM and coupler component.
- Tighten the TCM mounting bolts.

Tightening torque

19.6-29.4 N.m {2.0-2.9 kgf.m, 14.5-21.6 ft.lbf}

CAUTION:

- Do not use an impact wrench. Hold the manual shaft lever when

removing the manual shaft nut, or the transaxle may be damaged.

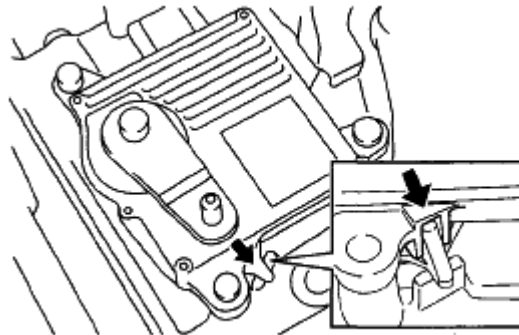


Fig. 48: Identifying TCM Mounting Bolts
Courtesy of MAZDA MOTORS CORP.

14. Install the manual shaft lever and the washer.

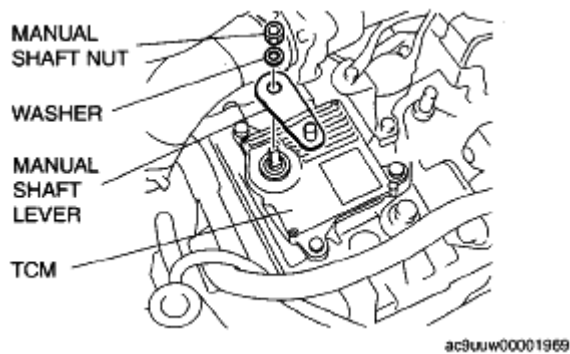


Fig. 49: Identifying Manual Shaft Lever & Washer
Courtesy of MAZDA MOTORS CORP.

15. Set the adjustable wrench as shown in the figure to hold the manual shaft lever, and tighten the manual shaft nut.

Tightening torque

9.8-14.7 N.m {100-142 kgf.cm, 87-123 in.lbf}

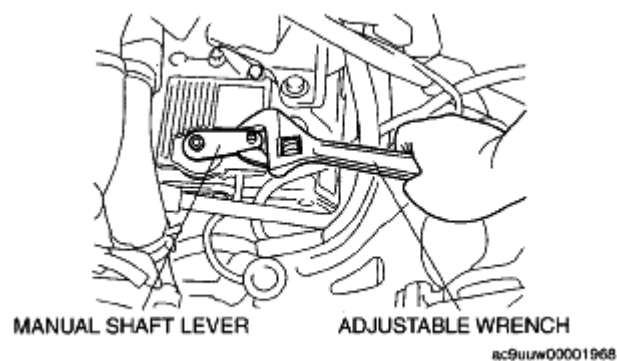


Fig. 50: Identifying Manual Shaft Lever
Courtesy of MAZDA MOTORS CORP.

16. Install the clip to the selector cable as shown in the figure.
17. Shift the selector lever to P position.
18. Turn the manual shaft lever to P position.

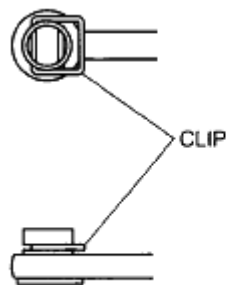


Fig. 51: Identifying Clip To Selector Cable
Courtesy of MAZDA MOTORS CORP.

19. Connect the selector cable and install the clip.
20. Connect the TCM connector.
21. Install the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .)
22. Connect the negative battery cable.

WARNING:

- If you replace the ATX or TCM, be sure to initialize the learned values and perform neutral position learning.

23. Perform the neutral position learning. (See NEUTRAL POSITION LEARNING.)

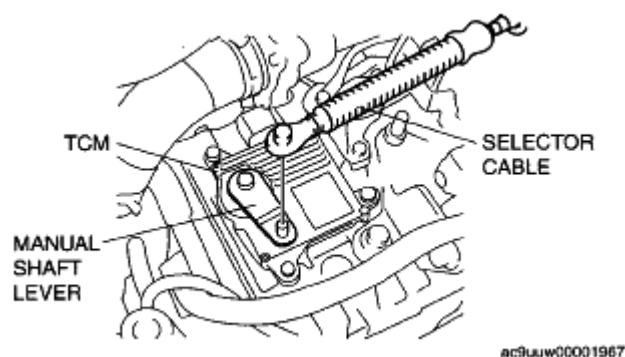


Fig. 52: Identifying TCM, Manual Shaft Lever & Selector Cable
Courtesy of MAZDA MOTORS CORP.

NEUTRAL POSITION LEARNING

1. Engage the parking brake and use wheel chocks at the front and rear of the wheels.
2. Connect the M-MDS to the DLC-2.
3. After the vehicle is identified, select the following items from the initialization screen of the M-MDS.
 - When using the IDS (laptop PC)
 1. Select "Power train".
 2. Select "Transmission".
 - When using the PDS (Pocket PC)
 1. Select "All Tests and Calibrations".
4. Then, select the "Transmission Learning".
5. Perform the N range learning according to the directions on the screen.
 - When "Operation Successful" is displayed, shift the selector lever to the P position and turn the ignition switch to the LOCK position, then to the ON position **after 5 s**.
 - If "Reinstall TCM properly and then try again" is displayed, perform the following inspection:

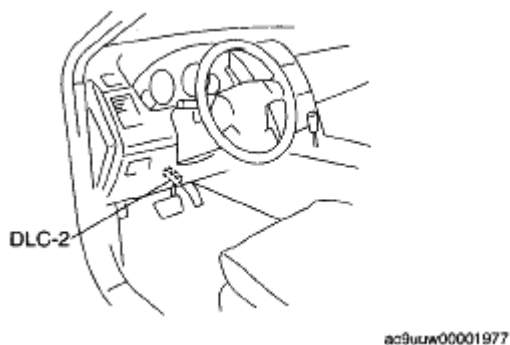


Fig. 53: Identifying DLC-2 Connector
Courtesy of MAZDA MOTORS CORP.

- Verify that the transaxle manual shaft is in the N position.

- If the manual shaft is in a position other than N, shift it to the N position.
 - Verify that the selector cable is adjusted properly.
 - If the selector cable is not adjusted properly, adjust it. (See **SELECTOR CABLE ADJUSTMENT** .)
 - Inspect the manual shaft lever for deformation.
 - If there is any malfunction, replace the manual shaft lever.
6. Shift the selector lever from P position to D range, then verify that the positions of the selector lever and the indicator are aligned.
- If there is any malfunction, inspect the DTC. (See **DTC TABLE [AW6A-EL, AW6AX-EL]** .)

OIL SEAL (MANUAL SHAFT) REPLACEMENT [AW6A-EL, AW6AX-EL]

CAUTION:

- Water or foreign material entering the connector can cause a poor connection or corrosion. Be sure not to allow water or foreign material on the connector when disconnecting.

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
3. Remove the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)

CAUTION:

- Do not damage the transaxle case.
- Do not damage the manual shaft.

4. Remove and discard the oil seal using a tape-wrapped flathead screwdriver.

CAUTION:

- Do not damage the oil seal.

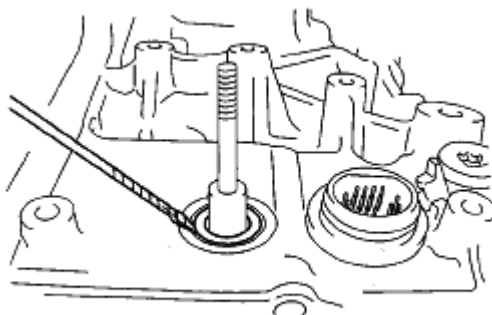


Fig. 54: Removing Oil Seal
Courtesy of MAZDA MOTORS CORP.

5. Using the SST and a hammer, tap a new oil seal so that the specified oil seal position is obtained

Substitution SST

- 49 F026 102

Outer diameter: 27 mm {1.06 in} or more

Inner diameter: 15-18 mm {0.60-0.70 in}

6. Install the TCM. (See **TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
7. Install the air cleaner component. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .**)
8. Connect the negative battery cable.

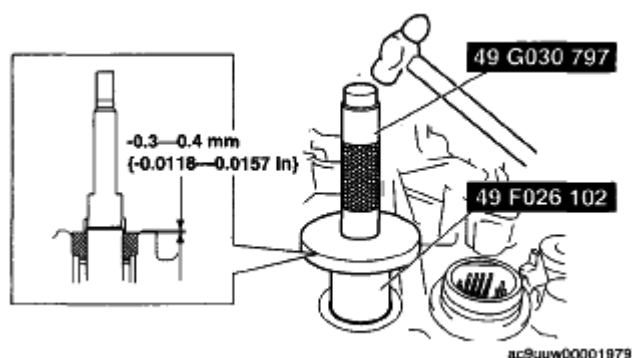


Fig. 55: Tapping Oil Seal

Courtesy of MAZDA MOTORS CORP.

AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]

1. Disconnect the negative battery cable.
2. Remove the following parts.
 1. Battery and battery tray (See **BATTERY REMOVAL/INSTALLATION [MZI-3.7] .**)
 2. Air cleaner component (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .**)
 3. Engine cover
 4. Windshield wiper arm and blade (See **WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION .**)
 5. Cowl grille (See **COWL GRILLE REMOVAL/INSTALLATION .**)
 6. Cowl panel (See **COWL PANEL REMOVAL/INSTALLATION .**)
 7. Front wheel
 8. Splash shield
 9. Side cover
 10. Propeller shaft (transfer side) (See **PROPELLER SHAFT REMOVAL/INSTALLATION .**)

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3. Drain the ATF. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].**)

WARNING:

- Improperly jacking a transaxle is dangerous. It can slip off the jack and may cause serious injury.

CAUTION:

- To prevent the torque converter and transaxle from separating, remove the transaxle without tilting it toward the torque converter.

4. Remove in the order shown in the figure.
5. Install in the reverse order of removal.
6. Add ATF to the specified level. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].**)
7. Perform the mechanical system test. (See **MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL].**)

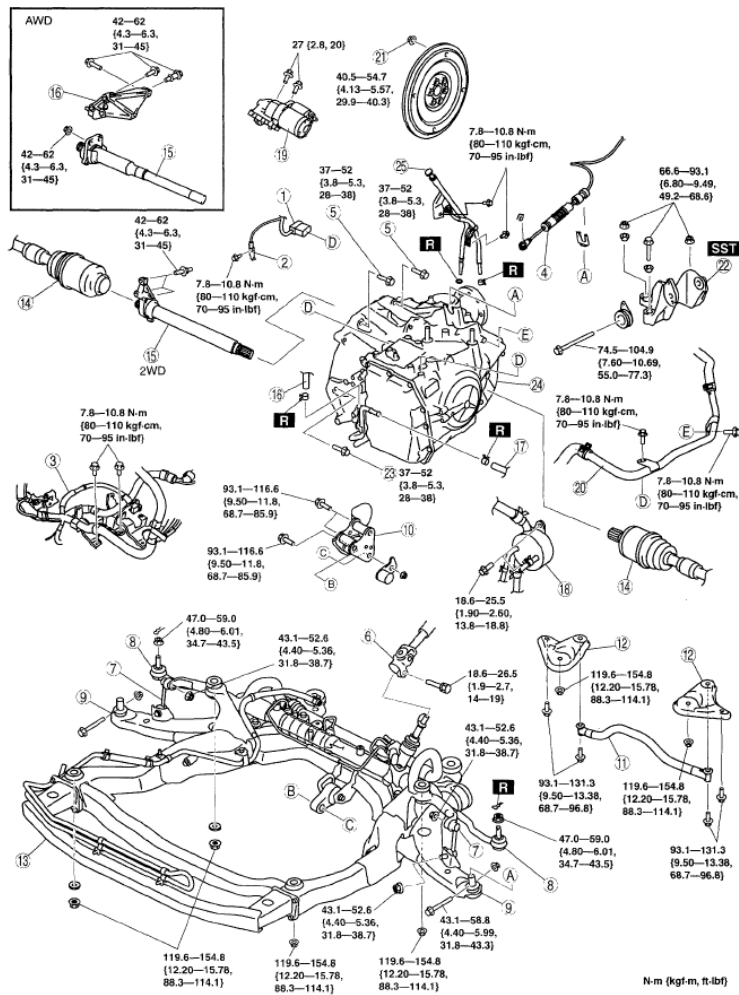
LINE PRESSURE TEST REFERENCE

Service item	Test item			
	Line pressure test	Stall test	Time lag test	Time lag test
ATX replacement	X			
ATX overhaul	X	X	X	X
Torque converter replacement	X	X		
Oil pump replacement	X			
Control valve body component	X			
Clutch system replacement	X		X	X

X : Test to be performed after the service work

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1	TCM connector	15	Joint shaft (See 03-13-11 JOINT SHAFT REMOVAL/INSTALLATION [2WD].)
2	Ground	16	Transfer bracket (AWD)
3	Wiring harness bracket	17	Oil hose (See 05-17-57 OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
4	Selector cable (See 05-17-43 Selector Cable Installation Note.)	18	Oil cooler
5	Transaxle mounting bolt (Upper side)	19	Starter (See 01-19-2 STARTER REMOVAL/INSTALLATION [MZI-3.7].)
6	Steering shaft (See 06-14-6 STEERING WHEEL AND COLUMN REMOVAL/INSTALLATION.)	20	Heater pipe
7	Stabilizer control link	21	Torque converter installation nuts (See 05-17-38 Torque Converter Nuts Removal Note.) (See 05-17-42 Torque Converter Nuts Installation Note.)
8	Tie-rod end ball joint (See 02-13-10 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)	22	No.4 engine mount bracket (See 05-17-39 No.4 Engine Mount Bracket Removal Note.) (See 05-17-41 No.4 Engine Mount Bracket Installation Note.)
9	Lower arm ball joint (See 02-13-7 FRONT LOWER ARM REMOVAL/INSTALLATION.)	23	Transaxle mounting bolt (lower side)
10	No.1 engine mount bracket (See 05-17-38 No.1 Engine Mount Removal Note.) (See 05-17-41 No.1 Engine Mount Installation Note.)	24	Transaxle (2WD) (See 05-17-40 Transaxle Removal Note.) (See 05-17-40 Transaxle Installation Note.)
11	Transverse member (See 02-13-15 TRANSVERSE MEMBER REMOVAL/INSTALLATION.)	25	Oil filter tube, Dipstick, breather hose
12	Crossmember bracket		
13	Crossmember (See 02-13-10 FRONT CROSSMEMBER REMOVAL/INSTALLATION.)		
14	Drive shaft (See 03-13-3 FRONT DRIVE SHAFT REMOVAL/INSTALLATION.)		

Fig. 56: View Of Automatic Transaxle Components & Torque Specifications (1 Of 2)
 Courtesy of MAZDA MOTORS CORP.

AWD

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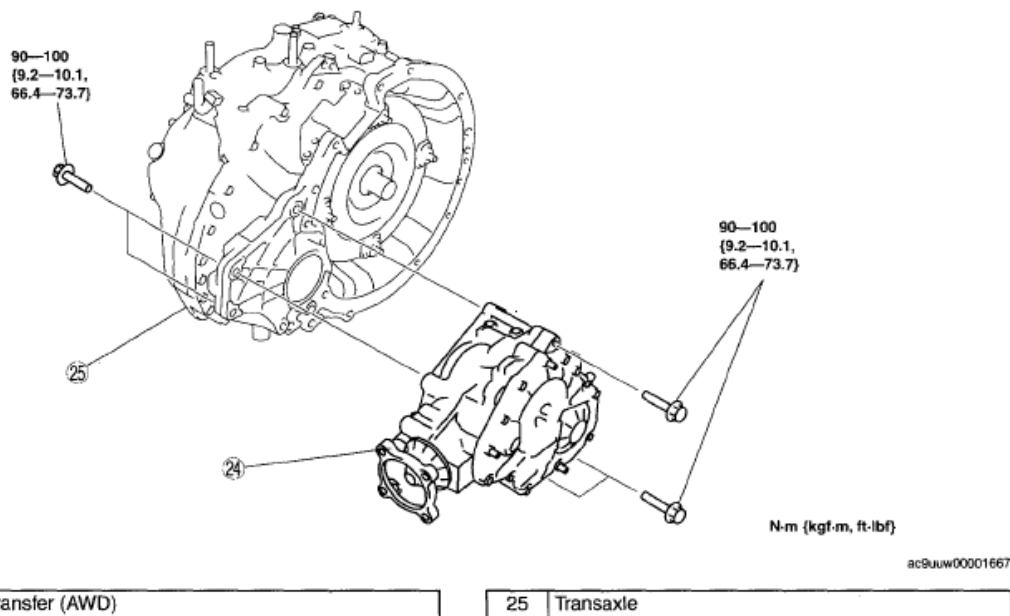


Fig. 57: View Of Automatic Transaxle Components & Torque Specifications (2 Of 2)
Courtesy of MAZDA MOTORS CORP.

TORQUE CONVERTER NUTS REMOVAL NOTE

1. Remove the cover as shown in the figure.
2. Align the holes by turning the torque converter.

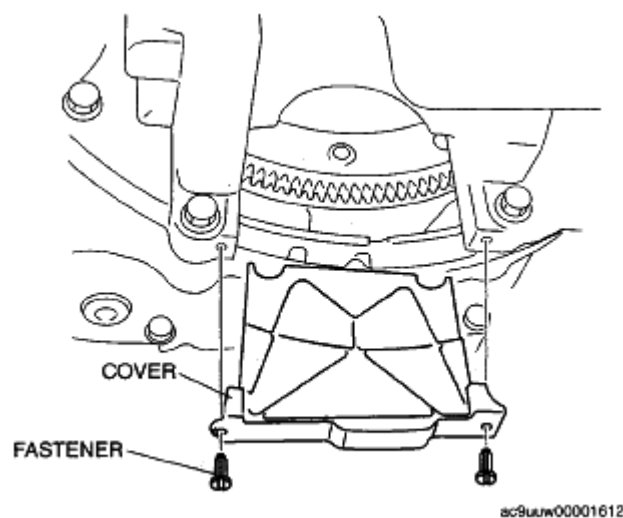
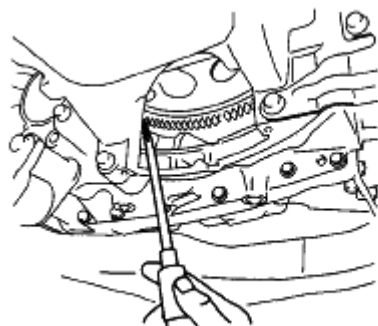


Fig. 58: Identifying Fastener & Cover
Courtesy of MAZDA MOTORS CORP.

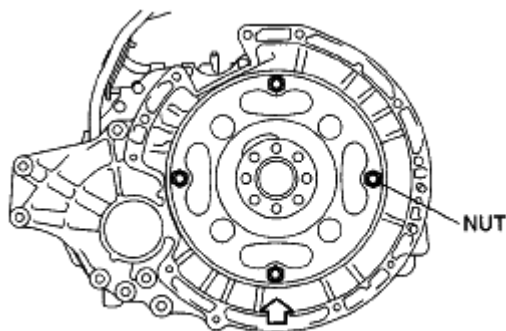
3. Insert a flathead screwdriver through the converter housing service hole, and lock the drive plate.



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Fig. 59: Locking Drive Plate
Courtesy of MAZDA MOTORS CORP.

4. Remove the torque converter nuts.

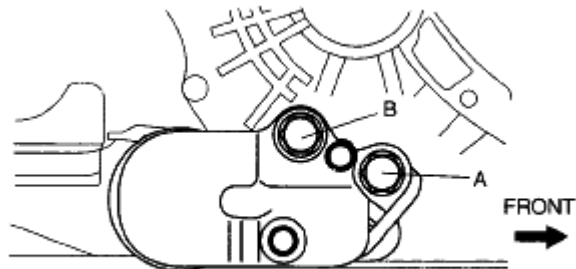


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Fig. 60: Identifying Torque Converter Nuts
Courtesy of MAZDA MOTORS CORP.

NO.1 ENGINE MOUNT REMOVAL NOTE

1. Remove the No.1 engine mount bracket bolts A and B as shown.



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Fig. 61: Identifying No.1 Engine Mount Bracket Bolts
Courtesy of MAZDA MOTORS CORP.

2. Remove the No.1 engine mount, No.1 engine mount bracket and the front crossmember as a single unit.
(See **FRONT CROSSMEMBER REMOVAL/INSTALLATION** .)

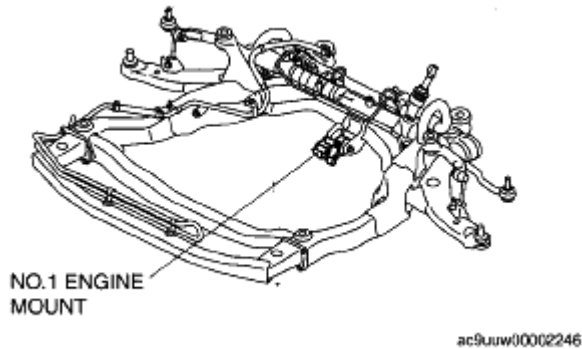


Fig. 62: Identifying No.1 Engine Mount
Courtesy of MAZDA MOTORS CORP.

NO.4 ENGINE MOUNT BRACKET REMOVAL NOTE

1. Install the SST using the following procedure.

CAUTION:

- Refer to the SST instruction manual for the basic handling procedure.

NOTE:

- When installing the SST , adjust the position of each shaft so that they do not interfere with the vehicle body.

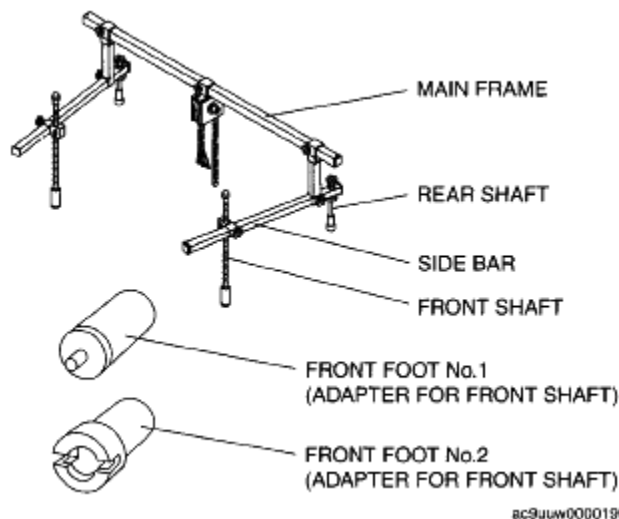


Fig. 63: Identifying No.4 Engine Mount Bracket
Courtesy of MAZDA MOTORS CORP.

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1. Install the right rear shaft of the **SST** to the bolt of the right shock absorber shown in the figure.
2. Install the left rear shaft of the **SST** to the bolt of the left shock absorber (Identical position to the right side).

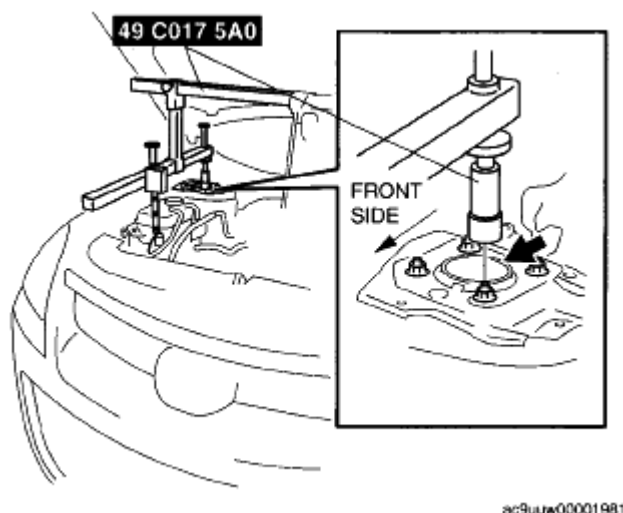


Fig. 64: View Of Right Rear Shaft Of SST
Courtesy of MAZDA MOTORS CORP.

3. Install the left/right front shaft of the SST with front foot No.2 to the bolt shown in the figure.
4. Adjust the positions of the SST side bars so that they are the same height (left and right) and horizontal.
5. Make sure each joint is securely tightened.

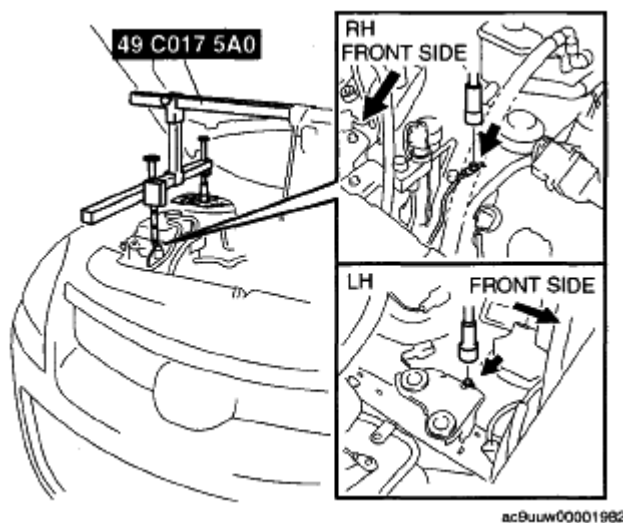


Fig. 65: View Of Left/Right Front Shaft Of SST
Courtesy of MAZDA MOTORS CORP.

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2. Support the engine using the SSTs.

NOTE:

- The SST (49 E017 5A0) can be used in place of the SST (49 C017 5A0).

3. Remove the No.4 engine mount bracket.

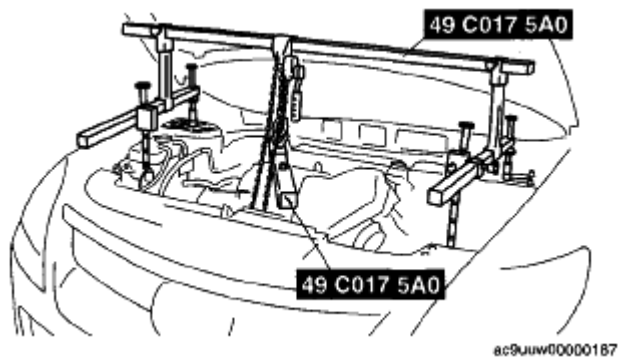


Fig. 66: Removing No.4 Engine Mount Bracket
Courtesy of MAZDA MOTORS CORP.

TRANSAXLE REMOVAL NOTE

1. Support the transaxle on a jack.
2. Remove the transaxle mounting bolts.
3. Remove the transaxle.

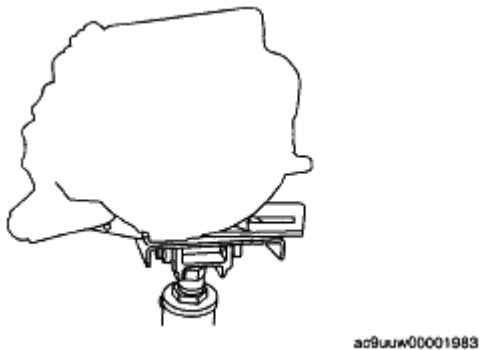


Fig. 67: Supporting Transaxle On Jack
Courtesy of MAZDA MOTORS CORP.

TRANSAXLE INSTALLATION NOTE

1. Set the transaxle on a jack and lift it.
2. Rotate the drive plate so that the logo mark faces upward.

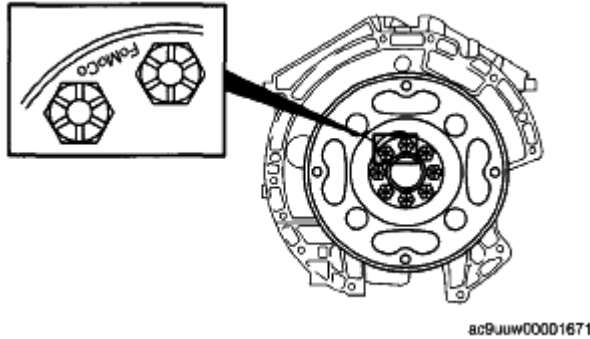


Fig. 68: Identifying Drive Plate Logo Mark Faces Upward
Courtesy of MAZDA MOTORS CORP.

3. Rotate the torque converter so that the mark faces upward.

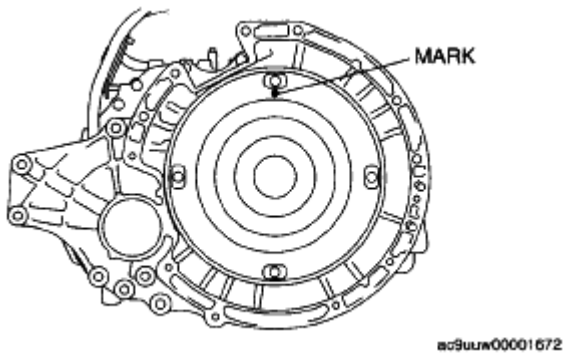


Fig. 69: Rotating Torque Converter
Courtesy of MAZDA MOTORS CORP.

4. Install the transaxle mounting bolts and bracket.

Tightening torque

37-52 N.m {3.8-5.3 kgf.m, 28-38 ft.lbf}

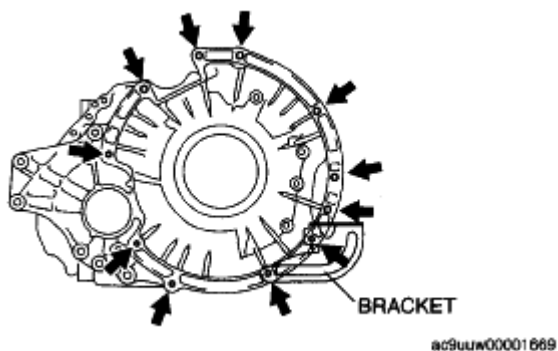


Fig. 70: Locating Transaxle Mounting Bolts & Bracket

Courtesy of MAZDA MOTORS CORP.

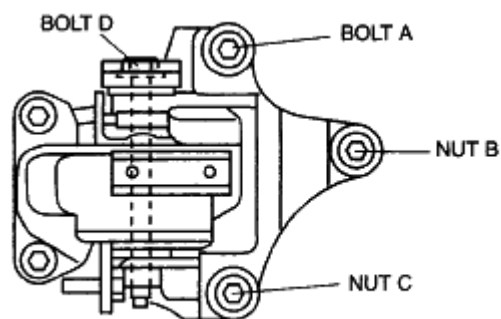
NO.4 ENGINE MOUNT BRACKET INSTALLATION NOTE

1. Install the No.4 engine mount bracket to the transaxle and temporarily tighten nuts.
2. Temporarily tighten bolt.
3. Temporarily tighten bolt A and nuts B, C.
4. Tighten bolt A, nuts B and C in the order of B-->A-->C.
5. Tighten bolt D.

Tightening torque

Bolt A, Nut B, C: 66.6-93.1 N.m {6.80-9.49 kgf.m, 49.2-68.6 ft.lbf}

Bolt D: 74.5-104.9 N.m {7.60-10.69 kgf.m, 55.0-77.3 ft.lbf}

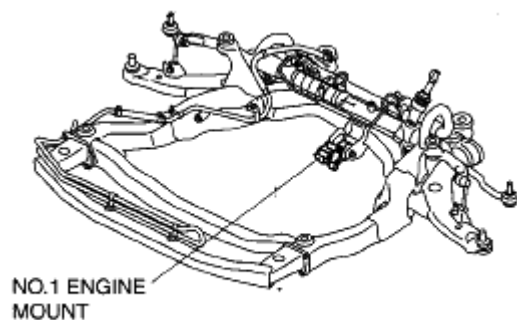


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Fig. 71: Identifying No.4 Engine Mount Bracket
 Courtesy of MAZDA MOTORS CORP.

NO.1 ENGINE MOUNT INSTALLATION NOTE

1. Install the No.1 engine mount, No.1 engine mount bracket and the front crossmember as a single unit.
 (See **FRONT CROSSMEMBER REMOVAL/INSTALLATION** .)



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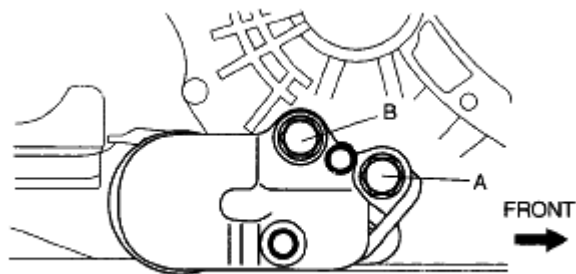
Fig. 72: Identifying No.1 Engine Mount

Courtesy of MAZDA MOTORS CORP.

2. Tighten the bolts on the No.1 engine mounting bracket in the order of A, B.

Tightening torque

93.1-116.6 N.m {9.50-11.8 kgf.m, 68.7-85.9 ft.lbf}



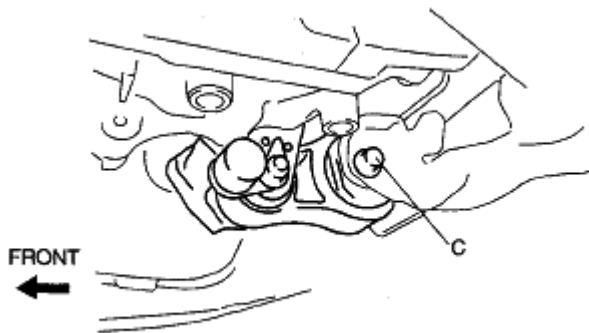
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Fig. 73: Identifying Bolts On No.1 Engine Mounting Bracket
Courtesy of MAZDA MOTORS CORP.

3. Tighten the No.1 engine mount bolt C at the specified torque.

Tightening torque

93.1-116.6 N.m {9.50-11.8 kgf.m, 68.7-85.9 ft.lbf}



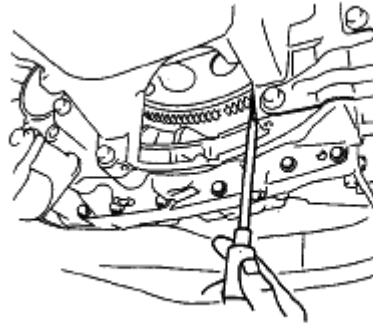
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Fig. 74: Identifying No.1 Engine Mount Bolt
Courtesy of MAZDA MOTORS CORP.

TORQUE CONVERTER NUTS INSTALLATION NOTE

1. Align the holes by turning the torque converter.
2. Insert a screwdriver through the converter housing service hole, and lock the drive plate.

- CAUTION:**
- Loosely and equally tighten the torque converter nuts, then further tighten them to the specified tightening torque.



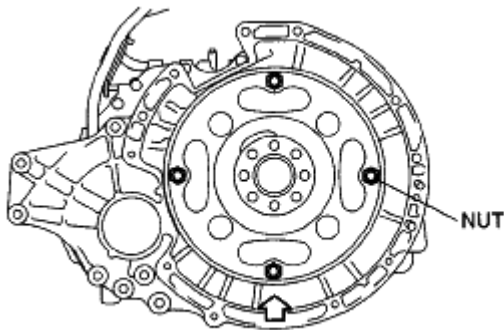
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Fig. 75: Locking Drive Plate
Courtesy of MAZDA MOTORS CORP.

3. Tighten the torque converter mounting nuts.

Tightening torque

40.5-54.7 N.m {4.13-5.57 kgf.m, 29.9-40.3 ft.lbf}



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Fig. 76: Identifying Converter Mounting Nuts
Courtesy of MAZDA MOTORS CORP.

4. Install the cover as shown in the figure.

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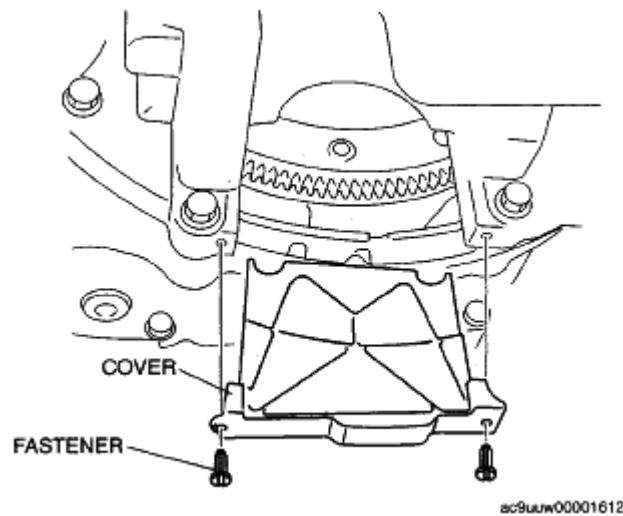


Fig. 77: Identifying Fastener & Cover
Courtesy of MAZDA MOTORS CORP.

SELECTOR CABLE INSTALLATION NOTE

1. Install the selector lever to the manual shaft lever so that no load acts on the selector cable.

NOTE:

- Install the selector lever to the manual shaft lever with the clip side of the selector cable end facing up.

2. Confirm that the tip of the manual shaft lever projects out of the end of the selector cable.

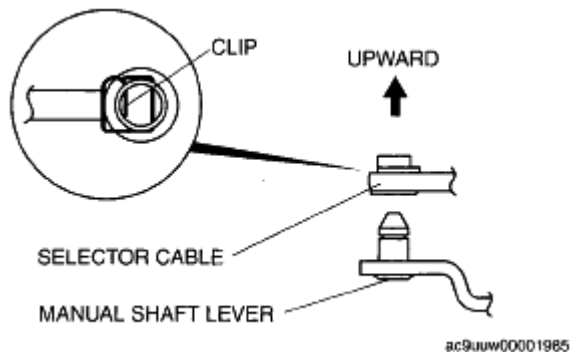


Fig. 78: Identifying Selector Lever To Manual Shaft Lever
Courtesy of MAZDA MOTORS CORP.

OIL SEAL (DIFFERENTIAL) REPLACEMENT [AW6A-EL, AW6AX-EL]

TRANSAXLE CASE SIDE

1. Disconnect the negative battery cable.

2. Drain the ATF. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].**)

CAUTION:

- The oil seal is easily damaged by the sharp edges of the drive shaft splines. Do not let the splines contact the oil seal.

3. Remove the drive shaft (left side). (See **FRONT DRIVE SHAFT REMOVAL/INSTALLATION .**)

CAUTION:

- Do not damage the transaxle case.
- Do not damage the differential case.

4. Remove the oil seal lip using a razor.
5. Remove and discard the oil seal using a tape-wrapped flathead screwdriver.

CAUTION:

- Do not damage the oil seal.

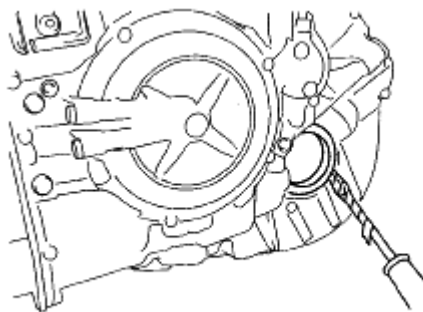


Fig. 79: Removing Oil Seal
Courtesy of MAZDA MOTORS CORP.

6. Using the SST and a hammer, tap a new oil seal so that the specified oil seal position is obtained.

Substitution SST

- **49 H028 202**

Outer diameter: 54.5-61 mm {2.15-2.40 in}

Inner diameter: 52 mm {2.05 in} or more

Plate thickness: 2 mm {0.08 in} or more

7. Install the drive shaft (left side). (See **FRONT DRIVE SHAFT REMOVAL/INSTALLATION .**)
8. Add ATF to the specified level. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT**

[AW6A-EL, AW6AX-EL.]

9. Connect the negative cable.
10. Perform the mechanical system test. (See **MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL.]**)

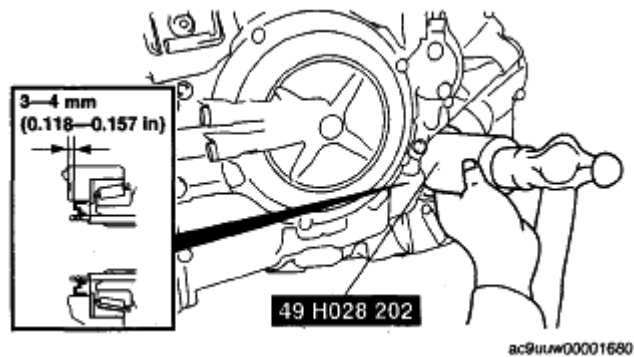


Fig. 80: Tapping Oil Seal
Courtesy of MAZDA MOTORS CORP.

CONVERTER HOUSING SIDE (2WD)

1. Disconnect the negative battery cable.
2. Drain the ATF. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL.]**)

CAUTION:

- The oil seal is easily damaged by the sharp edges of the drive shaft splines. Do not let the splines contact the oil seal.

3. Remove the drive shaft (right side). (See **FRONT DRIVE SHAFT REMOVAL/INSTALLATION** .)
4. Remove the joint shaft. (2WD) (See **JOINT SHAFT REMOVAL/INSTALLATION [2WD]** .)

CAUTION:

- Do not damage the converter housing.
- Do not damage the differential case.

5. Remove the oil seal lip using a razor.
6. Remove and discard the oil seal using a tape-wrapped flathead screwdriver.

CAUTION:

- Do not damage the oil seal.

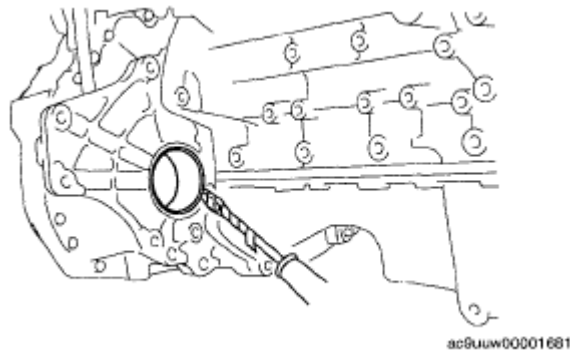


Fig. 81: Removing Oil Seal
Courtesy of MAZDA MOTORS CORP.

- Using the SST and a hammer, tap a new oil seal so that the specified oil seal position is obtained.

Substitution SST

- **49F027 009**

Outer diameter: 76.8 mm {3.02 in}

Plate thickness: 2 mm {0.08 in} or more

- Install the joint shaft. (2WD) (See **JOINT SHAFT REMOVAL/INSTALLATION [2WD]** .)
- Install the drive shaft (right side). (See **FRONT DRIVE SHAFT REMOVAL/INSTALLATION** .)
- Add ATF to the specified level. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL]**.)

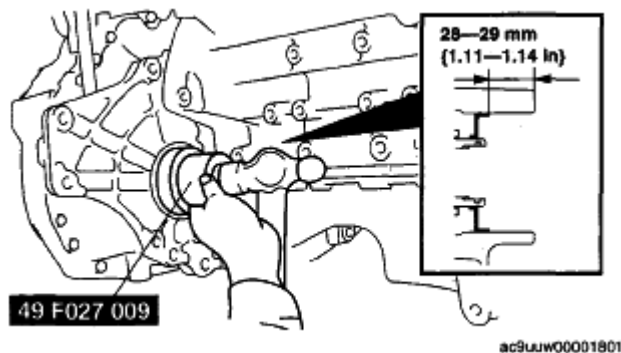


Fig. 82: Tapping Oil Seal
Courtesy of MAZDA MOTORS CORP.

- Connect the negative cable.
- Perform the mechanical system test. (See **MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL]**.)

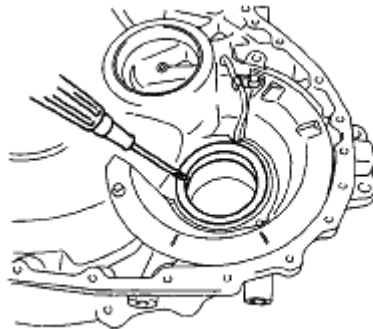
CONVERTER HOUSING SIDE (AWD)

1. Disconnect the negative battery cable.
2. Drain the ATF. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL]**.)
3. Remove the transaxle. (See **AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
4. Remove the converter housing from the transaxle case. (See Automatic Transaxle Workshop Manual [AW6A-EL, AW6AX-EL].)

CAUTION: • Do not damage the transaxle case.

5. Remove and discard the oil seal using a tape-wrapped flathead screwdriver.

CAUTION: • Do not damage the oil seal.



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Fig. 83: Removing Oil Seal
Courtesy of MAZDA MOTORS CORP.

6. Using the SST and a hammer, tap a new oil seal so that the specified oil seal position is obtained.
Substitution SST

- **49L033 101**

Outer diameter: 73-76.3 mm {2.88-3.00 in}

Inner diameter: 69 mm {2.72 in} or more

Plate thickness: 2 mm {0.08 in} or more

Length: 20 mm {0.79 in} or more

7. Install the converter housing to the transaxle case. (See Automatic Transaxle Workshop Manual [AW6A-EL, AW6AX-EL].)

8. Install the transaxle (See **AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
9. Add ATF to the specified level. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].**)
10. Connect the negative cable.
11. Perform the mechanical system test. (See **MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL].**)

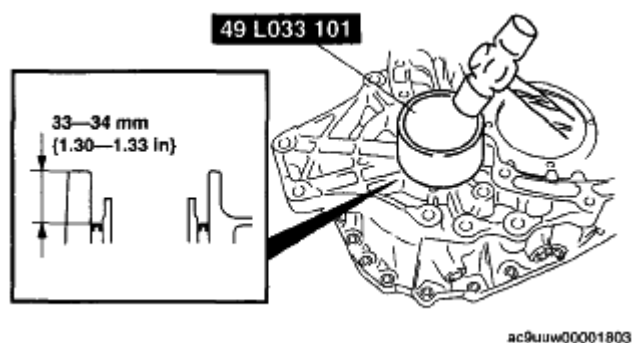


Fig. 84: Tapping Oil Seal
 Courtesy of MAZDA MOTORS CORP.

DIFFERENTIAL GEAR O-RING REPLACEMENT [AW6A-EL, AW6AX-EL]

- CAUTION:**
- The O-ring is easily damaged by the sharp edges of the drive shaft splines. Do not let the splines contact the O-ring.

1. Remove the drive shaft and joint shaft. (See **JOINT SHAFT REMOVAL/INSTALLATION [2WD] .**)
 (See **FRONT DRIVE SHAFT REMOVAL/INSTALLATION .**)

- CAUTION:**
- Do not damage the differential case.

2. Remove and discard the O-ring using a tape-wrapped flathead screwdriver.

- CAUTION:**
- Do not damage the O-ring.
 - Do not damage the differential case.

3. Apply ATF to a new O-ring and install it to the differential case.
4. Install the drive shaft and joint shaft. (See **JOINT SHAFT REMOVAL/INSTALLATION [2WD] .**)
 (See **FRONT DRIVE SHAFT REMOVAL/INSTALLATION .**)

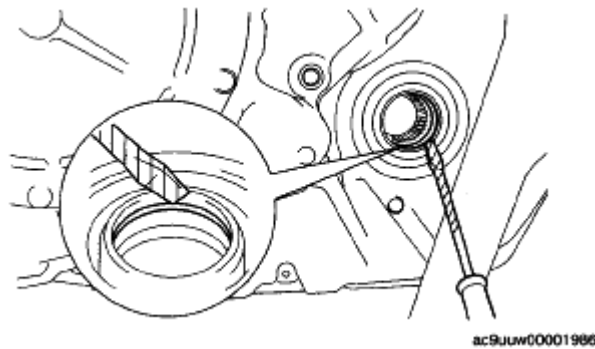


Fig. 85: Removing O-ring
Courtesy of MAZDA MOTORS CORP.

CONTROL VALVE BODY REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]

ON-VEHICLE REMOVAL

WARNING:

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

CAUTION:

- Clean the transaxle exterior throughout with a steam cleaner or cleaning solvents before removal.
- If any old sealant gets into the transaxle during installation of the control valve body cover, trouble may occur in the transaxle case and control valve body cover. Clean with cleaning fluid.

1. Disconnect the negative battery cable.
2. Remove the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .)
3. Drain the ATF. (See AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].)
4. Remove the oil cooler.
5. Remove the oil pipe. (See OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)

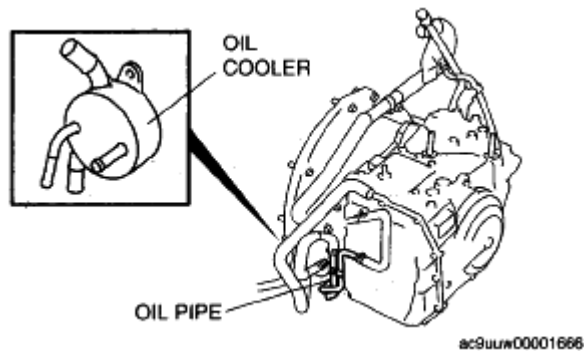


Fig. 86: Identifying Oil Cooler & Oil Pipe
Courtesy of MAZDA MOTORS CORP.

6. Remove the control valve body cover installation bolt.

CAUTION:

- Do not damage the fitting surface of the transaxle case and the control valve body cover.
- Do not deform the control valve body cover.

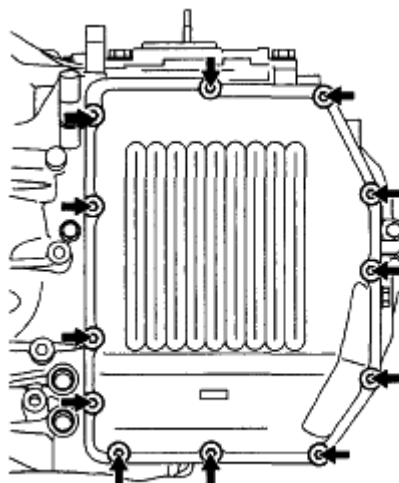


Fig. 87: Locating Control Valve Body Cover Bolt
Courtesy of MAZDA MOTORS CORP.

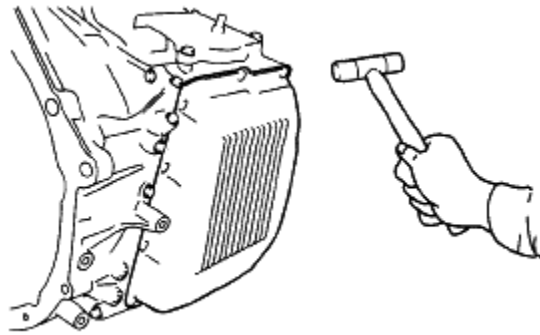
7. Using a plastic hammer, tap the control valve body cover to remove it.

CAUTION:

- Be careful not to damage the solenoid valves and connectors.
- Do not pull the wiring harnesses when removing the connector.

NOTE:

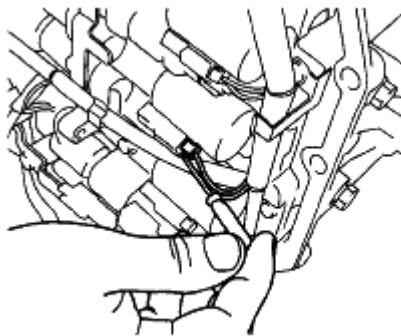
- Disconnect the solenoid connector according to the following procedure:



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Fig. 88: Tapping Control Valve Body Cover
Courtesy of MAZDA MOTORS CORP.

1. Insert a precision screwdriver from the backside into the connector as shown in the figure.



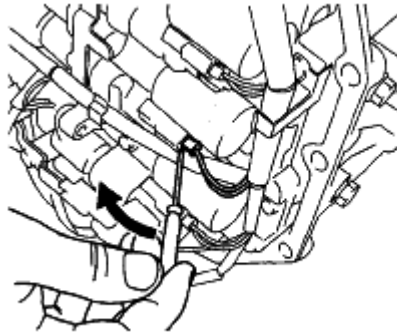
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Fig. 89: Identifying Backside Into Connector
Courtesy of MAZDA MOTORS CORP.

2. Pry the screwdriver in the direction of the arrow and disconnect the connector.

CAUTION:

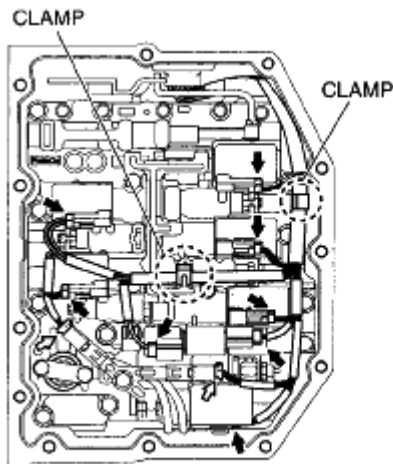
- Do not damage the solenoid valves and connectors with the screwdriver.
- When disconnecting connectors, grasp the connectors, not the harnesses. Otherwise, the harnesses may be pulled out of the connector causing poor contact.



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Fig. 90: Removing Connector
Courtesy of MAZDA MOTORS CORP.

8. Disconnect the solenoid connectors, VSS connector and the input/turbine speed sensor connector.
9. Disconnect the coupler component from the clamp.



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Fig. 91: Identifying Coupler Component Of Clamp
Courtesy of MAZDA MOTORS CORP.

10. Remove the lock plate, and pull out the TFT sensor from the control valve body.
11. Remove the O-ring from the TFT sensor.

NOTE:

- Be sure to secure the coupler component with tape so that it will not interfere with the control valve body component.

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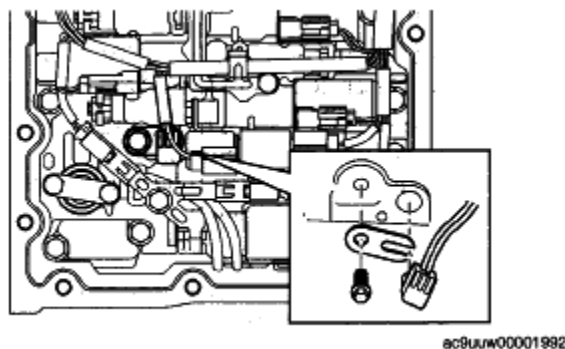


Fig. 92: Identifying O-ring Of TFT Sensor
Courtesy of MAZDA MOTORS CORP.

12. Fix the coupler component with tape to the transaxle case as shown in the figure.

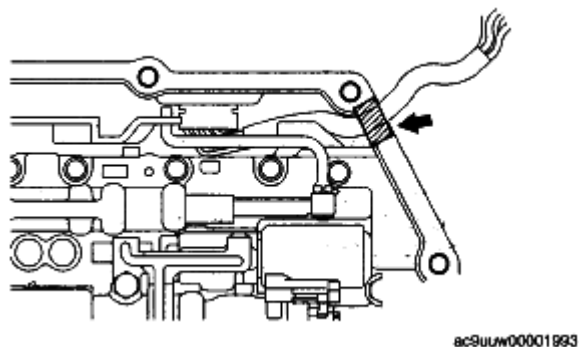


Fig. 93: Tapping To Transaxle Case
Courtesy of MAZDA MOTORS CORP.

13. Remove the VSS connector and input/turbine speed sensor connector from the solenoid clamp.

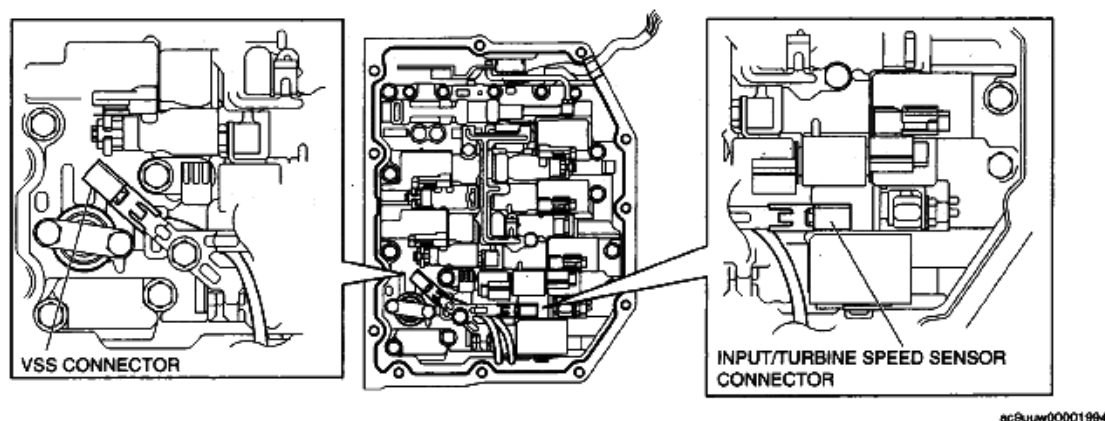
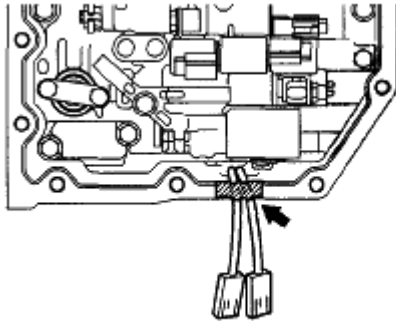


Fig. 94: Identifying VSS Connector & Input/Turbine Speed Sensor Connector
Courtesy of MAZDA MOTORS CORP.

NOTE:

- Be sure to secure the VSS and input/turbine speed sensor with tape so that they will not interfere with the control valve body component.

14. Fix the VSS wiring harness and input/turbine speed sensor wiring harness with tape to the transaxle case as shown in the figure.



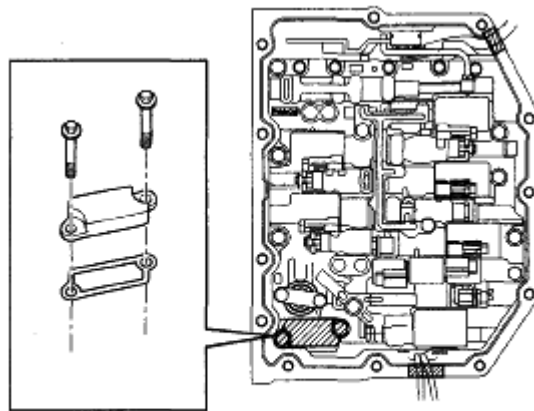
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Fig. 95: Locating VSS Wiring Harness & Input/Turbine Speed Sensor Wiring Harness
Courtesy of MAZDA MOTORS CORP.

15. Remove the suction cover and the gasket.

CAUTION:

- Evenly loosen the bolts a little at a time in the order shown in the figure.



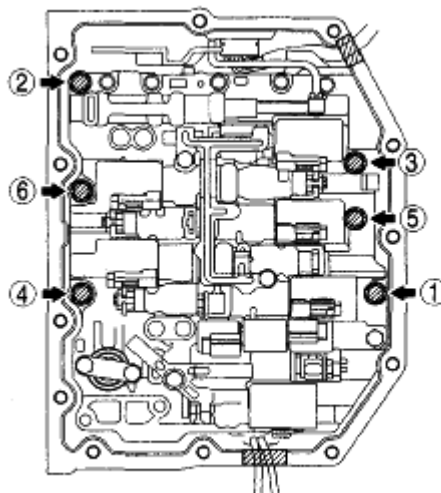
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Fig. 96: Identifying Suction Cover & Gasket
Courtesy of MAZDA MOTORS CORP.

16. Remove the control valve body installation bolts.

CAUTION:

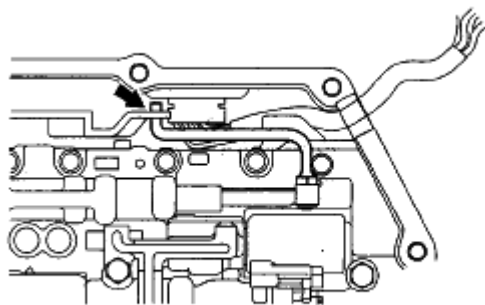
- Do not drop the control valve body component.



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Fig. 97: Locating Control Valve Body Component
Courtesy of MAZDA MOTORS CORP.

17. Disconnect the manual valve link and remove the control valve body component.



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Fig. 98: Locating Control Valve Body Component
Courtesy of MAZDA MOTORS CORP.

ON-VEHICLE INSTALLATION

CAUTION:

- When installing the control valve body component, do not put the coupler component in the open space of the separate plate in the control valve body component.
- Do not pinch the coupler component between the separate plate and the control valve body component.

1. Connect the manual valve link and install the control valve body component.

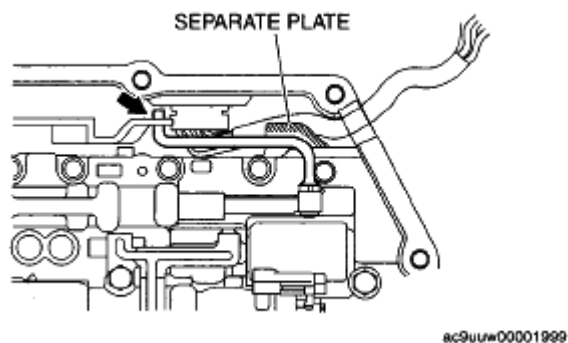


Fig. 99: Locating Separate Plate
Courtesy of MAZDA MOTORS CORP.

2. Temporarily install the control valve body component with the bolts.

Bolt length (measured from below the head)

A: 31 mm {1.220 in}

B: 17 mm {0.669 in}

C: 21 mm {0.827 in}

NOTE:

- Aligning the bolt holes, temporarily tighten the bolt by hand.

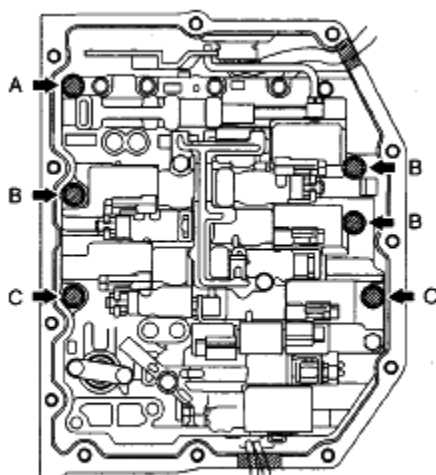
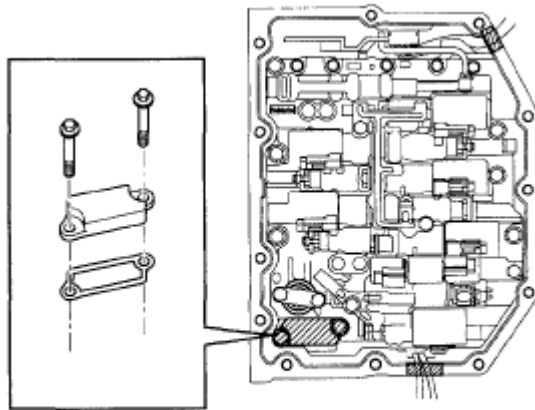


Fig. 100: Locating Control Valve Body Component With Bolts
Courtesy of MAZDA MOTORS CORP.

3. Temporarily install the suction cover and a new gasket with the bolts.

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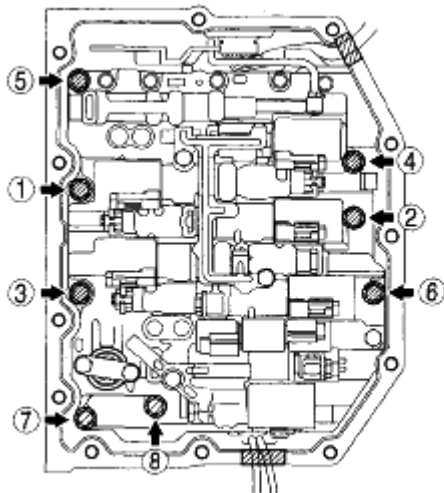
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Fig. 101: Identifying Suction Cover Gasket With Bolts
Courtesy of MAZDA MOTORS CORP.

4. Tighten the bolts in the order shown in the figure.

Tightening torque

8-12 N.m {82-122 kgf.cm, 72-105 in.lbf}



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Fig. 102: Identifying Suction Cover Bolts Tighten Sequence
Courtesy of MAZDA MOTORS CORP.

5. Install the connector of the VSS and input/turbine speed sensor to the solenoid clamp.

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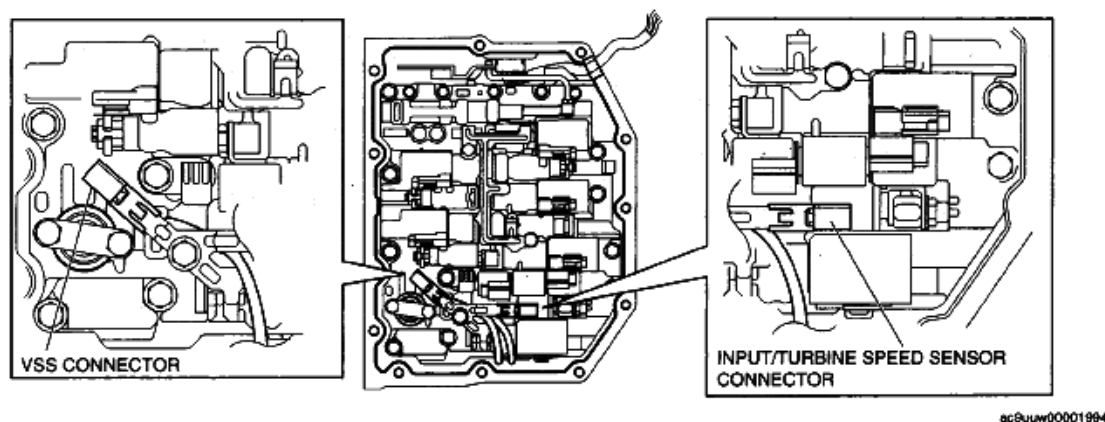


Fig. 103: Identifying Connector Of VSS & Input/Turbine Speed Sensor
Courtesy of MAZDA MOTORS CORP.

CAUTION:

- If the control valve body cover is installed with the wiring harness overlapped, the wiring harnesses may be pinched between the control valve body causing the wiring harnesses to be damaged. Therefore that the wiring harnesses are not overlapped when installing the valve body cover.

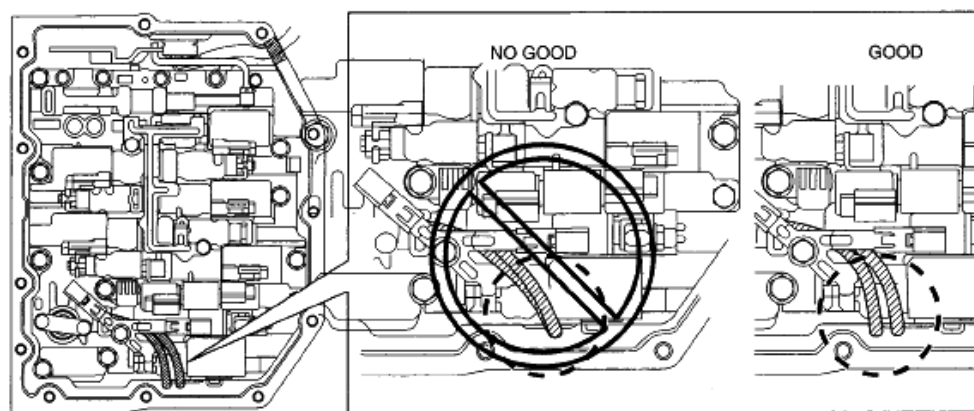


Fig. 104: Precaution Of Control Valve Body Cover
Courtesy of MAZDA MOTORS CORP.

6. Apply ATF to a new O-ring and install it on the TFT sensor.
7. Install the TFT sensor with the lock plate and a bolt to the control valve body component as shown in the figure.

Tightening torque

8-12 N.m {82-122 kgf.cm, 72-105 in.lbf}

8. Connect the solenoid connectors, VSS connector and the input/turbine speed sensor connector.

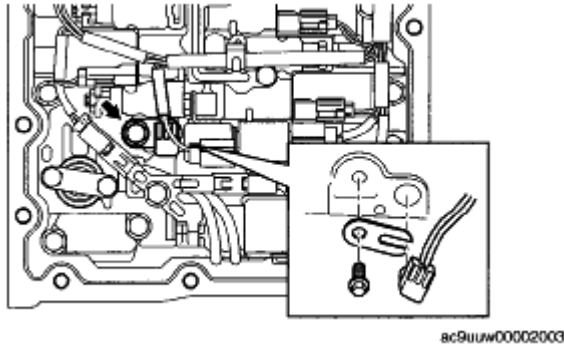


Fig. 105: Connecting Solenoid Connectors, VSS Connector & Input/Turbine Speed Sensor Connector
Courtesy of MAZDA MOTORS CORP.

9. Connect the coupler component to the clamps.

NOTE:

- Completely remove sealant and oil with white gasoline or similar.

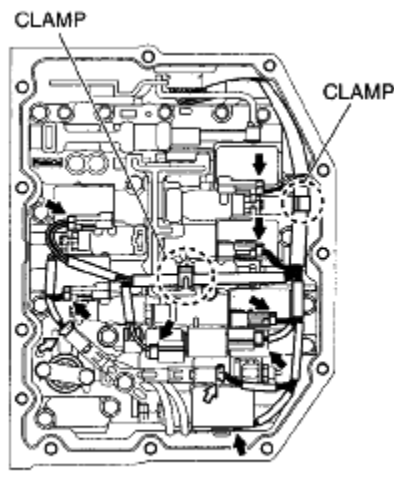


Fig. 106: Connecting Coupler Component To Clamps
Courtesy of MAZDA MOTORS CORP.

10. Clean sealant and oil off the contact surface of the transaxle case with the control valve body cover and the bolt holes.

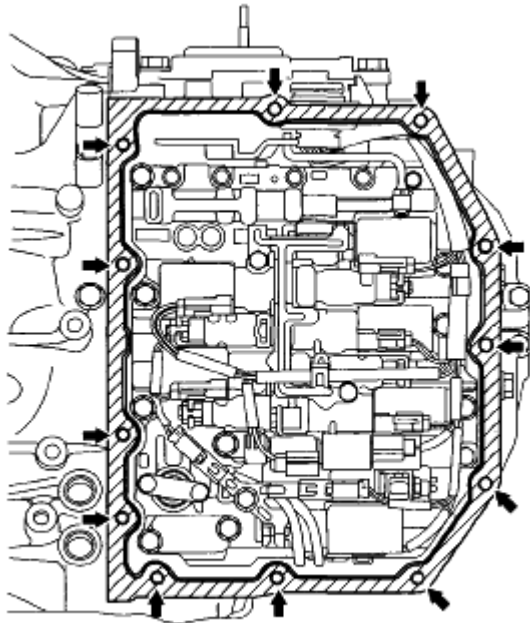
NOTE:

- Completely remove oil with white gasoline or similar.

11. Clean oil off the contact surface of the new control valve body cover with the transaxle case.

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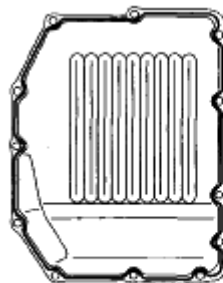
ac9tww00002004

Fig. 107: Locating Transaxle Case & Bolt Holes
Courtesy of MAZDA MOTORS CORP.

12. Apply sealant to the new control valve body cover as shown in the figure.

CAUTION:

- Be careful that the coupler component will not become caught between the control valve body cover and transaxle case.



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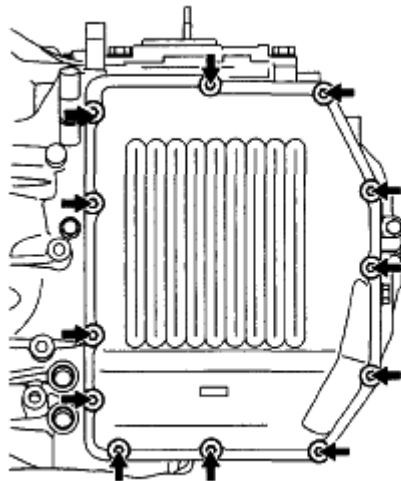
Fig. 108: Applying Sealant To Control Valve Body Cover
Courtesy of MAZDA MOTORS CORP.

13. Install the new control valve body cover with new seal bolts.

Tightening torque

9.8-15.7 N.m {100-160 kgf.cm, 87-138 in.lbf}

14. Install the oil pipe. (See OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
15. Install the oil cooler. (See OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
16. Install the TCM. (See TCM REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
17. Add ATF to the specified level. (See AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].)
18. Install the air cleaner component. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7].)



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Fig. 109: Locating Control Valve Body Cover With Seal Bolts
Courtesy of MAZDA MOTORS CORP.

19. Connect the negative battery cable.
20. Perform the mechanical system test. (See MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL].)

OIL SEAL (OIL PUMP) REPLACEMENT [AW6A-EL, AW6AX-EL]

1. Remove the transaxle. (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)

CAUTION:

- The oil seal is easily damaged by the sharp edges of the torque converter splines. Do not let the splines contact the oil seal.
- Do not drop the torque converter.
- Do not pinch fingers.

2. Remove the torque converter. (See TORQUE CONVERTER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)

CAUTION: • Do not to damage the bushing on the oil pump body.

- Using a tape-wrapped flathead screwdriver, remove the oil seal from the oil pump body.

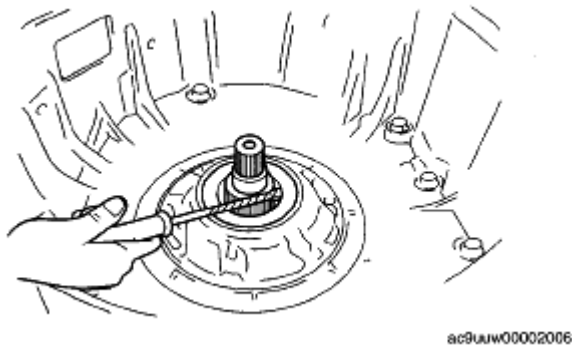


Fig. 110: Removing Oil Seal
Courtesy of MAZDA MOTORS CORP.

- Using the SST and a hammer, install the oil seal to the oil pump body.

Substitution SST

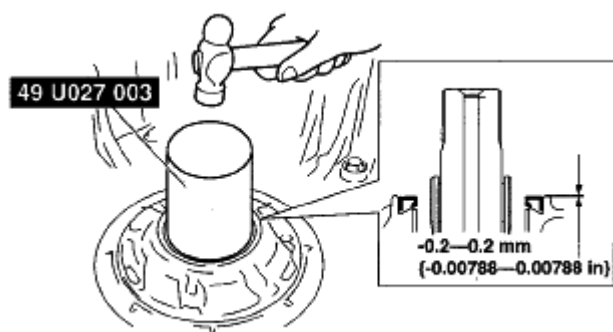
- 49U027 003

Outer diameter: 67 mm {2.64 in} or more

Inner diameter: 54-61 mm {2.13-2.40 in}

Plate thickness: 2 mm {0.08 in} or more

- Coat the lip of the oil seal with grease.
- Install the torque converter. (See TORQUE CONVERTER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)
- Install the transaxle. (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)



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Fig. 111: Tapping Oil Seal

Courtesy of MAZDA MOTORS CORP.

8. Perform the mechanical system test. (See MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL].)

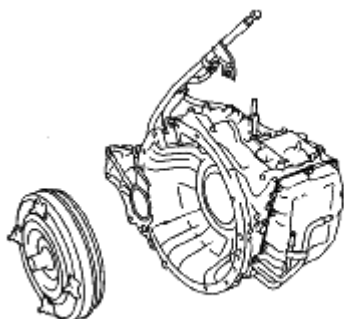
TORQUE CONVERTER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]

1. Remove the transaxle. (See AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].)

CAUTION:

- The oil seal is easily damaged by the sharp edges of the torque converter splines. Do not let the splines contact the oil seal.
- Do not drop the torque converter.
- Do not pinch fingers.

2. Remove the torque converter, and immediately turn it so that the hole faces upward. This will help to keep any remaining fluid from spilling.
3. Drain any ATF remaining in the torque converter.
4. Using a flathead screwdriver, position the drive gear on the oil pump component in the center.
5. Install the torque converter to the transaxle.



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Fig. 112: Identifying Torque Converter & Transaxle

Courtesy of MAZDA MOTORS CORP.

6. To ensure that the torque converter is installed accurately, measure distance A between the end of the torque converter and the end of the converter housing.

Distance A ((between the end of the torque converter and the end of the converter housing))

20 mm {0.79 in}

7. Install the transaxle. (See **AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)
8. Perform the mechanical system test. (See **MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL].**)

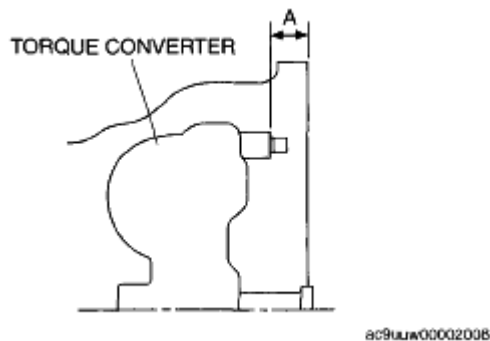


Fig. 113: Identifying Torque Converter
Courtesy of MAZDA MOTORS CORP.

OIL COOLER FLUSHING [AW6A-EL, AW6AX-EL]**NOTE:**

- If the automatic transaxle is replaced, flush and inspect the oil cooler.
- When replacing the automatic transaxle, inspect the oil cooler together with flushing it using the following procedure, and with the oil cooler hose removed.

1. Disconnect the oil cooler hose.
2. Set a clean oil pan up to the oil cooler hose inlet.
3. Blow **491-882 kPa {5-9 kgf/cm², 72-127 psi}** of compressed air from the oil cooler hose outlet to drain remaining oil.
4. Add new ATF from the oil cooler hose outlet and blow **491-882 kPa {5-9 kgf/cm², 72-127 psi}** of compressed air to flush. (Repeat 2 or 3 times)
5. Verify that none of the following foreign material is mixed in with the drained ATF:
 - Large metal fragments of \varnothing 0.5 mm {0.02 mm} or more that cannot pass through the oil strainer
 - Fibrous clutch facing

6. Repeat the procedures from Step 1 to 2 and flush the inside of the oil cooler.
7. If foreign material such as metal fragments or clutch facing remains even after the oil cooler is flushed repeatedly, replace the oil cooler (radiator).

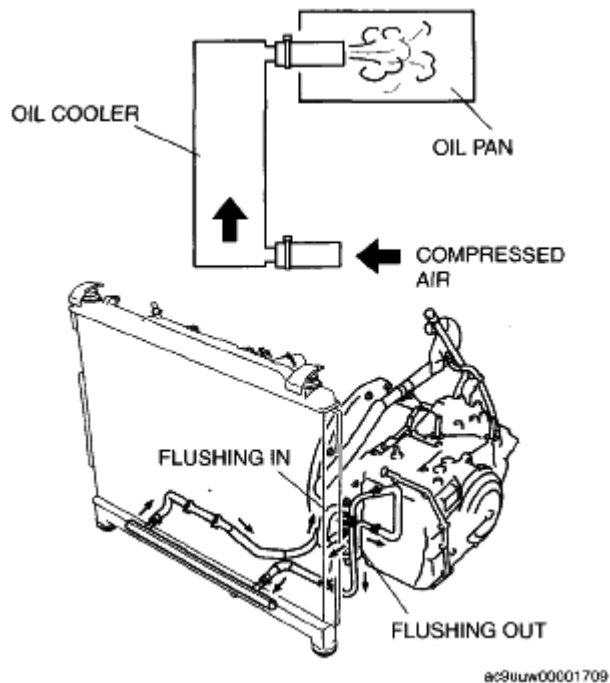


Fig. 114: Identifying Oil Cooler Flushing
 Courtesy of MAZDA MOTORS CORP.

OIL COOLER REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]

1. Disconnect the negative battery cable.
2. Drain the ATF into a container. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].**)
3. Drain the engine coolant. (See **ENGINE COOLANT REPLACEMENT [MZI-3.7]** .)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Add the engine coolant. (See **ENGINE COOLANT REPLACEMENT [MZI-3.7]** .)
7. Add ATF to the specified level. (See **AUTOMATIC TRANSAXLE FLUID (ATF) REPLACEMENT [AW6A-EL, AW6AX-EL].**)
8. Connect the negative battery cable.
9. Inspect for oil leakage from the oil pipes and oil hoses.
10. Inspect for coolant from the hoses.
11. Inspect for engine coolant leakage. (See **ENGINE COOLANT LEAKAGE INSPECTION [MZI-3.7]** .)

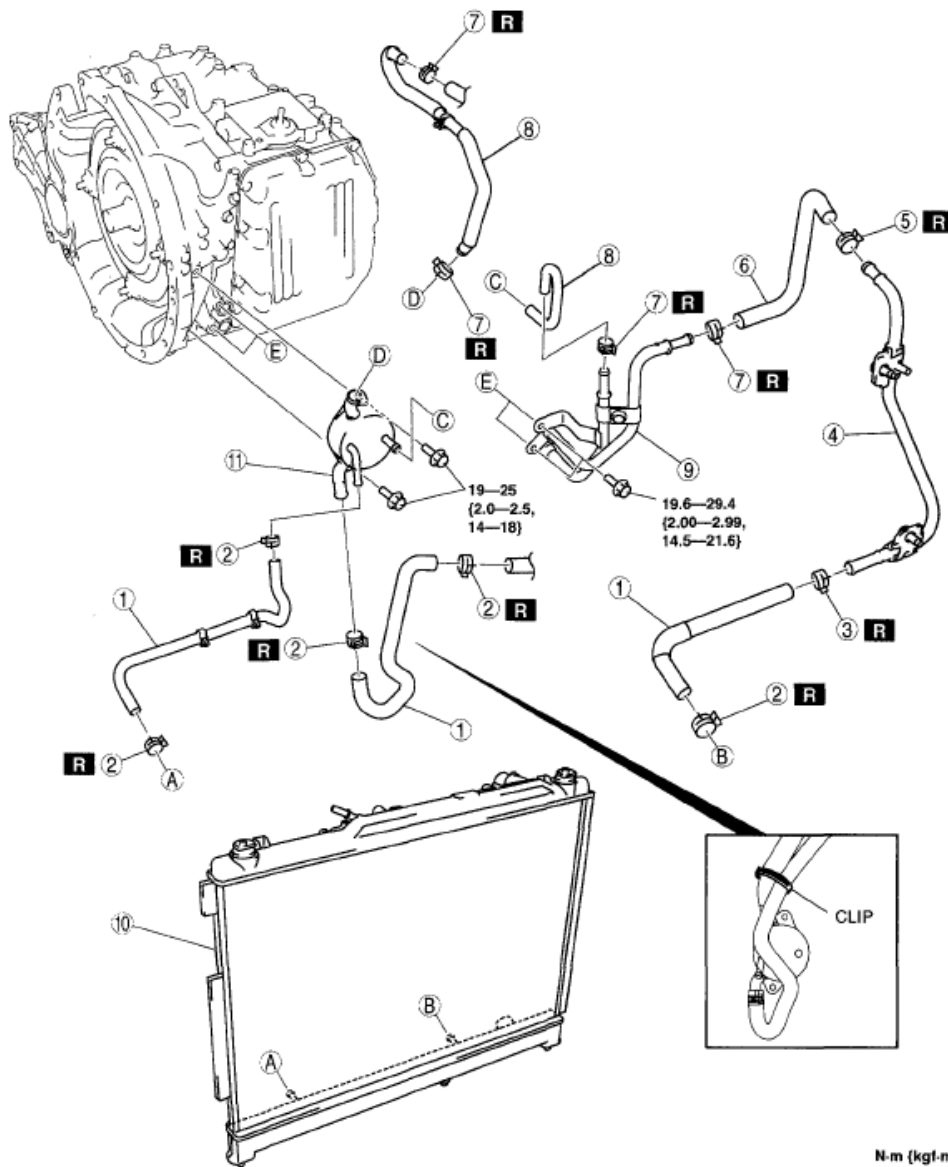
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12. Inspect the ATF level and condition. (See **AUTOMATIC TRANSAXLE FLUID (ATF) INSPECTION [AW6A-EL, AW6AX-EL]**.)
13. Perform the line pressure test. (See **MECHANICAL SYSTEM TEST [AW6A-EL, AW6AX-EL]**.)

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N·m (kgf·m, ft·lbf)

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1	Oil hose A (See05-17-59 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
2	Hose clamp A (See05-17-59 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
3	Hose clamp B (See05-17-59 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
4	Oil pipe A (See05-17-59 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)

5	Hose clamp C (See05-17-59 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
6	Oil hose B (See05-17-59 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
7	Hose clamp D (See05-17-59 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
8	Oil hose C (See05-17-59 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
9	Oil pipe B (See05-17-59 Oil Pipe, Hose Clamp, Oil Hose Installation Note.)
10	Radiator (in tank oil cooler) (See 01-12-8 RADIATOR REMOVAL/ INSTALLATION [MZI-3.7].) (See 05-17-59 Radiator (In Tank Oil Cooler) Installation Note.)
11	Oil cooler

Fig. 115: View Of Oil Cooler Components & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

RADIATOR (IN TANK OIL COOLER) INSTALLATION NOTE

1. The automatic transaxle oil cooler flushing must be performed whenever a transaxle is removed for service because the existing fluid may be contaminated, and to prevent contamination of new fluid.

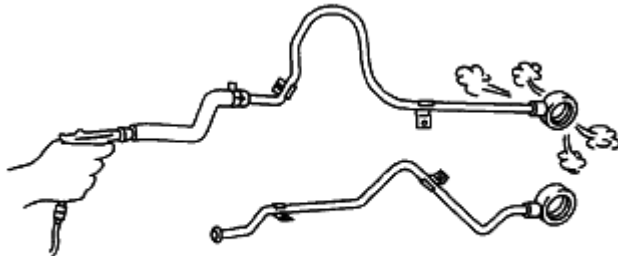
NOTE:

- **Flushing must be performed after installation of an overhauled or replaced transaxle.**

2. Follow the instructions in the manufacturer's publication for flushing operation.

OIL PIPE, HOSE CLAMP, OIL HOSE INSTALLATION NOTE

1. Apply compressed air to the cooler-side opening, and blow any remaining grime and foreign material from the cooler pipes. Compressed air should be applied for no **less than 1 min.**



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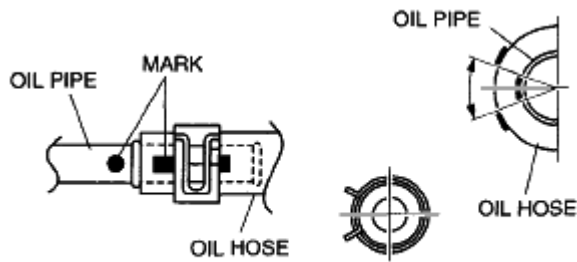
Fig. 116: Applying Compressed Air To Cooler-Side
Courtesy of MAZDA MOTORS CORP.

2. Align the marks, and slide the oil hose onto the oil pipe until it is fully seated as shown in the figure.

NOTE:

- **If reusing the hose, install the new hose clamp exactly on the mark left by the previous hose camp.**

3. Install the new hose clamp onto the hose.
4. Verify that the hose clamp does not interfere with any other components.

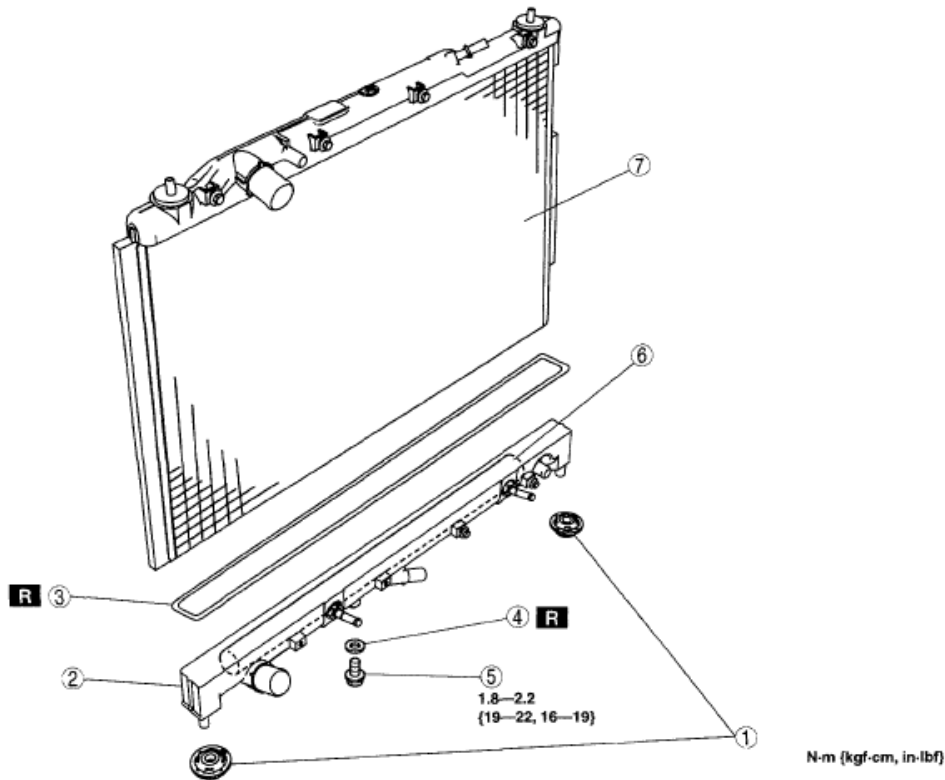


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Fig. 117: Identifying Oil Pipe Mark
Courtesy of MAZDA MOTORS CORP.

OIL COOLER DISASSEMBLY/ASSEMBLY [AW6A-EL, AW6AX-EL]

1. Disassemble in the order indicated in the table.
2. Assemble in the reverse order of disassembly.



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1	Mount rubber
2	Radiator outer tank (in tank oil cooler) (See 05-17-61 Radiator Outer Tank (In Tank Oil Cooler) Removal Note.) (See 05-17-61 Radiator Outer Tank (In Tank Oil Cooler) Installation Note.)

3	O-ring
4	Washer
5	Drain cock
6	ATF cooler
7	Radiator

Fig. 118: Identifying Radiator Outer Tank, Mount Rubber, O-Ring, Washer, ATF Cooler & Radiator

Torque Specifications

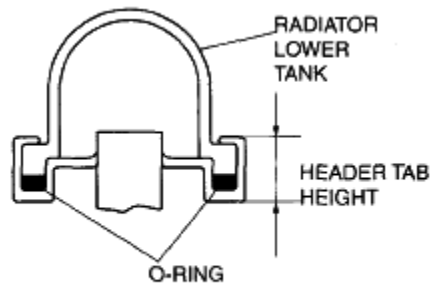
Courtesy of MAZDA MOTORS CORP.

RADIATOR OUTER TANK (IN TANK OIL COOLER) REMOVAL NOTE

1. Inspect the height of the header tabs.
2. Insert the end of a medium tip screwdriver between the end of the header tab and the outer tank.

NOTE:

- Do not open more tabs than necessary for tank removal.



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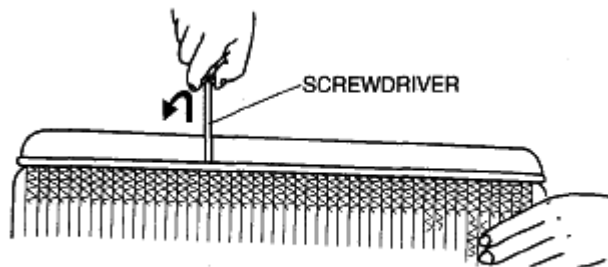
Fig. 119: Identifying Radiator Outer Tank Height
Courtesy of MAZDA MOTORS CORP.

3. Pivot the screwdriver to pry the tab away from the tank and repeat the procedure for each tab.
4. Remove the radiator outer tank and O-ring (gasket) from the core header when all of the tabs are opened.

NOTE:

- If any header tabs are missing from the core, replace the radiator.

5. Inspect the gasket surface of the radiator core header to ensure it is clean and free of foreign material or damage.
6. Inspect the radiator outer tank for warping. If it is warped, replace radiator tank.



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Fig. 120: Removing Radiator Outer Tank
Courtesy of MAZDA MOTORS CORP.

RADIATOR OUTER TANK (IN TANK OIL COOLER) INSTALLATION NOTE

1. Install a new O-ring and ensure it is not twisted.
2. Position the radiator tank in the original direction to the core using care not to scratch the tank sealing surface with the header tabs.

NOTE:

- Step 3 will set jaw opening to the correct specification.

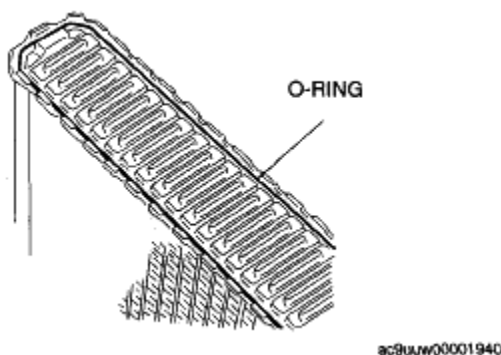


Fig. 121: Identifying Radiator Outer Tank
Courtesy of MAZDA MOTORS CORP.

3. With the jaws of locking-type pliers (vise grips) closed and locked, turn the adjusting screw to position the jaws against the drill bit with the diameter measured (height) in the removal procedure 1. Tighten the lock nut on the adjusting screw against the handle to lock the adjustment in place.

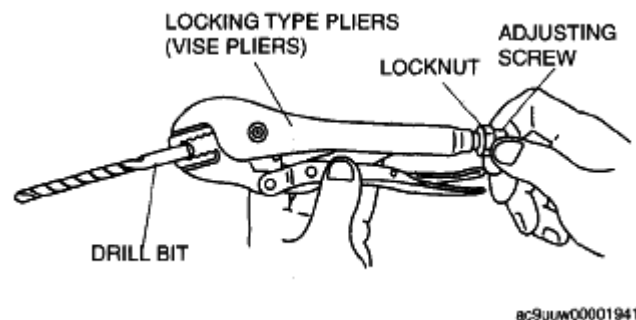


Fig. 122: Identifying Jaws Of Locking-Type Pliers
Courtesy of MAZDA MOTORS CORP.

4. Squeeze the header tabs down in the order as shown against the lip of the radiator outer tank base with the locking-type pliers while rotating the pliers toward the tank.

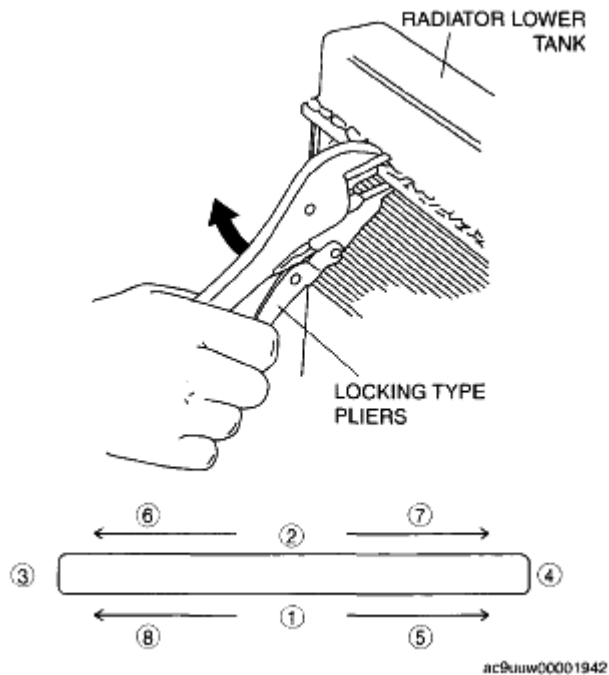


Fig. 123: Identifying Squeeze Of Header Tabs Down
 Courtesy of MAZDA MOTORS CORP.

5. Verify that the height of the header tabs is same as the height before removal.
6. Inspect for leakage from radiator. (See **ENGINE COOLANT LEAKAGE INSPECTION [MZI-3.7]** .)

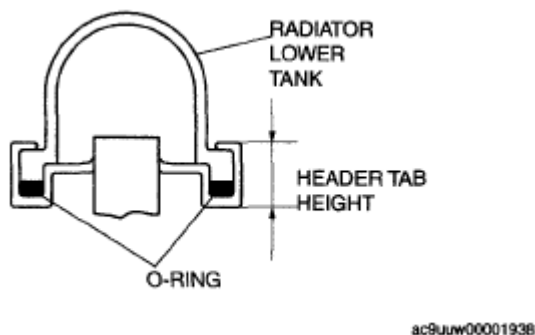


Fig. 124: Identifying Tab Height
 Courtesy of MAZDA MOTORS CORP.

DRIVE PLATE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]

1. Remove the transaxle. (See **AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL]**.)
2. Remove in the order indicated in the figure.

2008 Mazda CX-9 Grand Touring

2008 TRANSMISSION Automatic Transaxle (AW6A-EL, AW6AX-EL) - Mazda CX-9

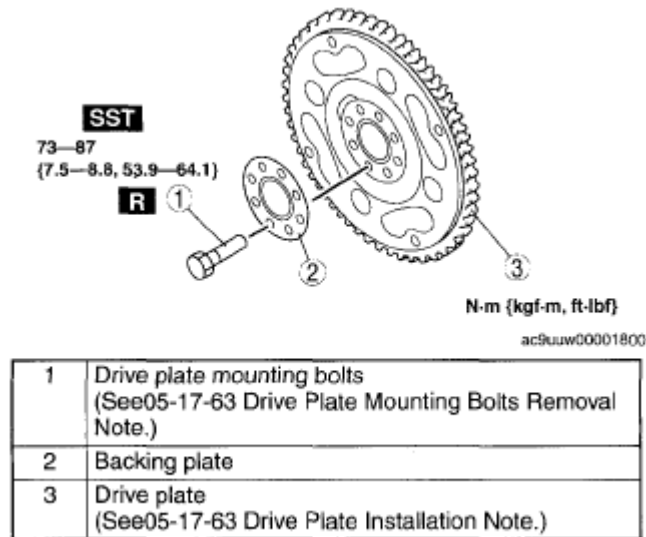


Fig. 125: Identifying Drive Plate Mounting Bolts & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

3. Install in the reverse order of removal.

DRIVE PLATE MOUNTING BOLTS REMOVAL NOTE

1. Set the SST or equivalent against the drive plate.
2. Remove the bolts and the drive plate.

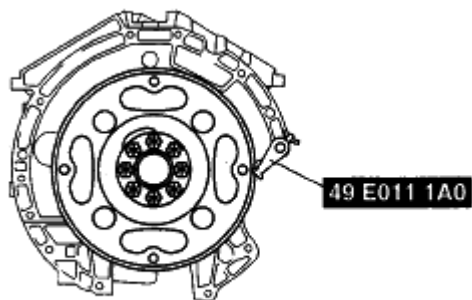


Fig. 126: Identifying Drive Plate With SST
Courtesy of MAZDA MOTORS CORP.

DRIVE PLATE INSTALLATION NOTE

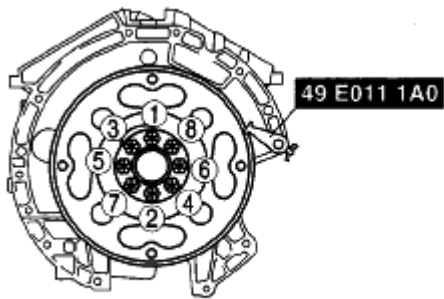
1. Remove the sealant from the bolt holes in the crankshaft and from the drive plate mounting bolts.
2. Install the drive plate.
3. Install the backing plate.
4. Set the SST or equivalent against the drive plate.

5. Tighten the new drive plate mounting bolts in two or three steps in the order shown.

Tightening torque

73-87 N.m {7.5-8.8 kgf.m, 53.9-64.1 ft.lbf}

6. Install the transaxle. (See **AUTOMATIC TRANSAXLE REMOVAL/INSTALLATION [AW6A-EL, AW6AX-EL].**)



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Fig. 127: Identifying Drive Plate With SST
Courtesy of MAZDA MOTORS CORP.