

05-13 AUTOMATIC TRANSMISSION

AUTOMATIC TRANSMISSION

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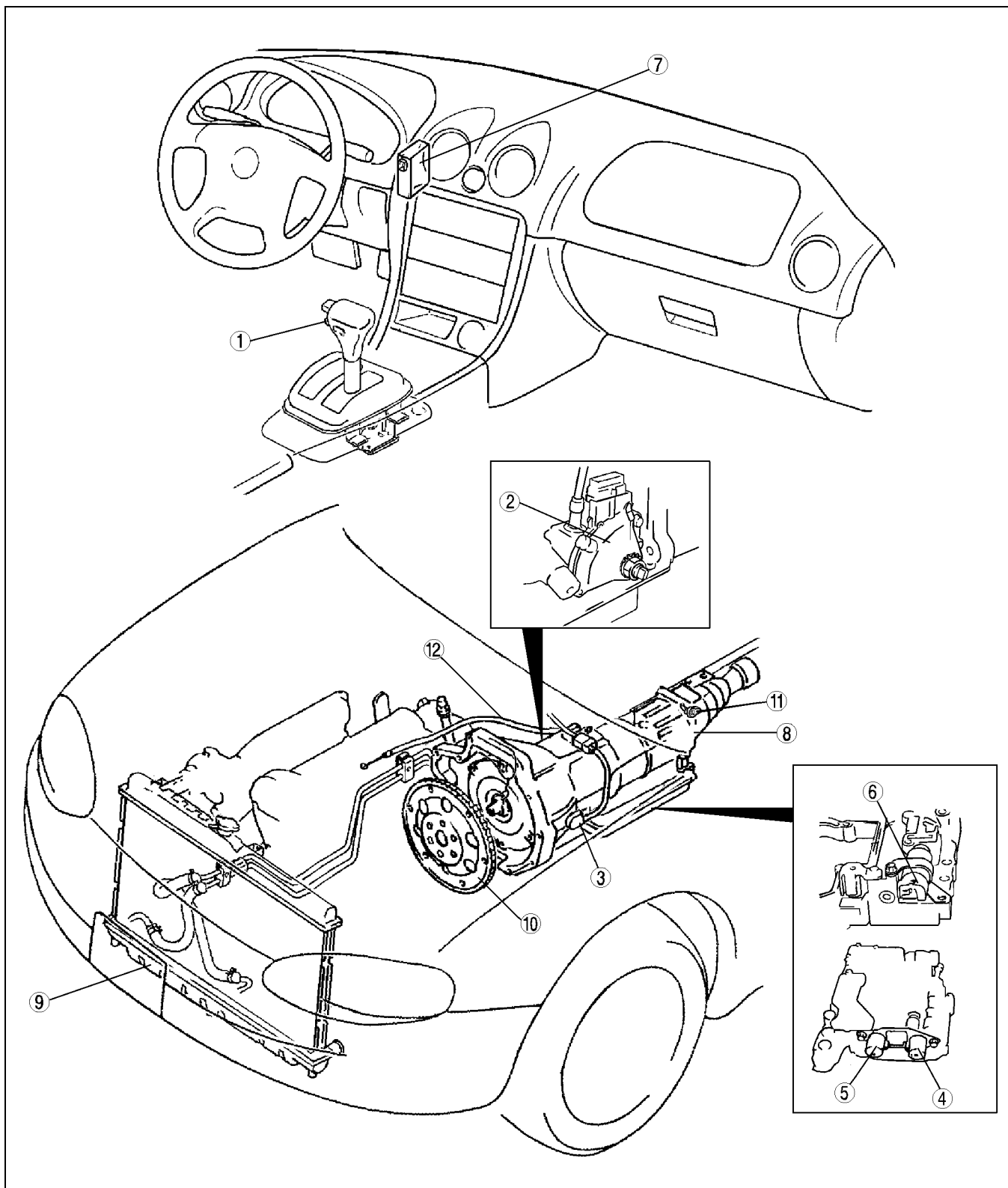
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A5U051301026W01



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1	O/D OFF Switch (See 05-13-13 O/D OFF SWITCH INSPECTION) (See 05-13-14 O/D OFF SWITCH REMOVAL/ INSTALLATION)
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2	Transmission Range (TR) Switch (See 05-13-14 TRANSMISSION RANGE (TR) SWITCH INSPECTION) (See 05-13-16 TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT) (See 05-13-15 TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION)
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3	Input/Turbine Speed Sensor (See 05-13-16 INPUT/TURBINE SPEED SENSOR INSPECTION) (See 05-13-16 INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION)
4	Shift Solenoid A (See 05-13-17 SOLENOID VALVES INSPECTION) (See 05-13-18 SOLENOID VALVES REMOVAL/INSTALLATION)
5	Shift Solenoid B (See 05-13-17 SOLENOID VALVES INSPECTION) (See 05-13-18 SOLENOID VALVES REMOVAL/INSTALLATION)
6	Torque Converter Clutch Solenoid Valve (See 05-13-17 SOLENOID VALVES INSPECTION) (See 05-13-18 SOLENOID VALVES REMOVAL/INSTALLATION)
7	Transmission Control Module (TCM) (See 05-13-20 TRANSMISSION CONTROL MODULE (TCM) INSPECTION) (See 05-13-24 TRANSMISSION CONTROL MODULE (TCM) REMOVAL/INSTALLATION)

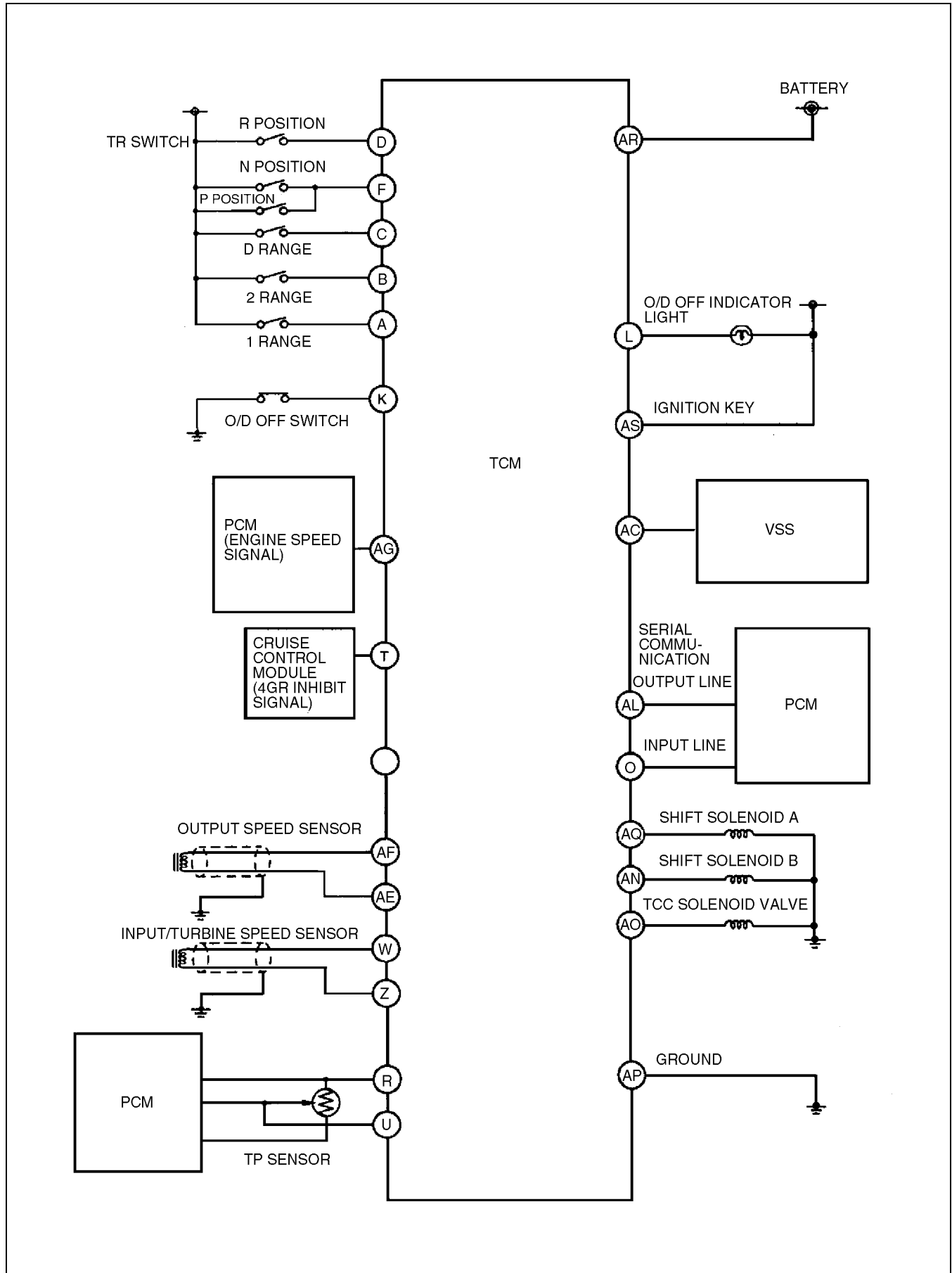
8	Automatic Transmission (See 05-13-25 AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION)
9	Oil Cooler (See 05-13-35 OIL COOLER REMOVAL/INSTALLATION)
10	Drive Plate (See 05-13-37 DRIVE PLATE REMOVAL/INSTALLATION)
11	Output Speed Sensor (See 05-13-17 OUTPUT SPEED SENSOR INSPECTION) (See 05-13-17 OUTPUT SPEED SENSOR REMOVAL/INSTALLATION)
12	Throttle Cable (See 05-13-10 THROTTLE CABLE INSPECTION) (See 05-13-10 THROTTLE CABLE ADJUSTMENT) (See 05-13-11 THROTTLE CABLE REMOVAL/INSTALLATION)

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AUTOMATIC TRANSMISSION

AUTOMATIC TRANSMISSION CONTROL SYSTEM WIRING DIAGRAM

A5U051301026W02



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MECHANICAL SYSTEM TEST

Mechanical System Test Preparation

1. Apply the parking brake and use wheel chocks at the front and rear of the wheels.
2. Inspect the engine coolant. (See 01-12-2 ENGINE COOLANT LEVEL INSPECTION.)
3. Inspect the engine oil. (See 01-11-2 ENGINE OIL LEVEL INSPECTION.)
4. Inspect the ATF levels. (See 05-13-9 ATF Level Inspection.)
5. Inspect the ignition timing. (See 01-10-27 ENGINE TUNE-UP.)
6. Inspect the idle speed. (See 01-10-27 ENGINE TUNE-UP.)

Line Pressure Test

1. Perform mechanical system test preparation. (See 05-13-5 Mechanical System Test Preparation.)

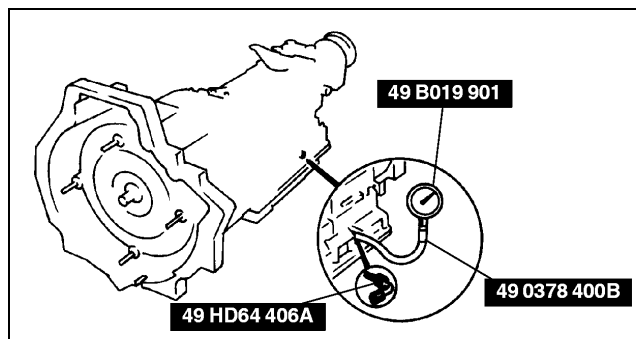
Warning

- Removing the plug when the ATF is hot can be dangerous. Hot ATF can come out of the opening and cause severe burns. Before removing the plug, allow the ATF to cool.

2. Connect the **SSTs** to the line pressure inspection port.
3. Shift the selector lever to D range and read the line pressure at idle.
4. Connect the **SST** to the line pressure inspection port.

Caution

- If the accelerator pedal (AP) is pressed for longer than 5 seconds while the brake pedal is pressed, the transmission could be damaged. Therefore, perform both Steps 5 and 6 within 5 seconds.



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5. Firmly depress the brake pedal with the left foot, and gently depress the AP to the floor with the right.
6. When the engine speed no longer increases, quickly read the line pressure and release the AP.
7. Shift the selector lever to the N position and let the engine idle for 1 minute or more to cool the ATF.
8. Read the line pressure at idle and at the engine stall speed for the 2, 1 ranges, and R position in the same manner.

Specified line pressure

Position/ Range	Line pressure kPa {kgf/cm ² , psi}	
	Idle	Stall
D, 2, 1	370—420 {3.7— 4.2, 53—59}	960—1110 {9.8— 11.4, 140—162}
R	520—580 {5.3— 5.9, 76—83}	1270—1520 {13.0—15.4, 185— 218}

Warning

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

9. Remove the **SSTs**.
10. Apply ATF to a new O-ring.
11. Install the O-ring to the plug.
12. Install a plug in the inspection port.

Tightening torque

5.9—8.8 N·m {60—90 kgf·cm, 53—78 in·lbf}

AUTOMATIC TRANSMISSION

Evaluation of line pressure test

Line pressure	Possible cause
Low pressure in all ranges	Primary regulator valve sticking Throttle valve sticking Throttle cable misadjustment Worn oil pump
Low pressure in D range	Oil is leaking from hydraulic circuit of D range
Low pressure in R position	Oil is leaking from hydraulic circuit of R position
High pressure in all ranges	Primary regulator valve sticking Throttle valve sticking Throttle cable misadjustment

Stall Test

1. Perform mechanical system test preparation. (See 05–13–5 Mechanical System Test Preparation.)
2. Shift the selector lever to the R position.

Caution

- If the accelerator pedal is pressed for longer than 5 seconds while the brake pedal is pressed, the transmission could be damaged. Therefore, perform both Steps 3 and 4 within 5 seconds.

3. Firmly depress the brake pedal with the left foot, and gently depress the accelerator pedal (AP) to the floor with the right.
4. When the engine speed no longer increases, quickly read the speed and release the AP.
5. Shift the selector lever to the N position and let the engine idle for 1 minute or more to cool the ATF.
6. Perform a stall test of D, 2, and 1 ranges in the same manner.

Engine stall speed

2,370—2,740 rpm

Evaluation of stall test

Condition	Possible cause
Above specification	In D range Insufficient line pressure <ul style="list-style-type: none"> • Forward clutch slipping • One-way clutch No.2 slipping
	In R position Insufficient line pressure <ul style="list-style-type: none"> • Direct clutch slipping • Reverse brake slipping
	In all range and R position Insufficient line pressure <ul style="list-style-type: none"> • 4GR clutch or one-way clutch No.0 slipping
Below specification	Engine out of tune
	One-way clutch slipping in torque converter

Time Lag Test

1. Perform mechanical system test preparation. (See 05–13–5 Mechanical System Test Preparation.)
2. Shift the selector lever from the N position to D range. (O/D OFF switch OFF)
3. Use a stopwatch to measure the time it takes from shifting until engagement is felt. Make three measurements for each test and take the average from the results.
4. Perform the test for the following shifts in the same manner.
 - a. N position → D range (O/D OFF SW ON)
 - b. N position → R position

Time lag

N position → D range: 0.7 sec.

N position → R position: 1.2 sec.

AUTOMATIC TRANSMISSION

Evaluation of time lag test

Condition	Possible cause
N → D select	Insufficient line pressure Forward clutch slipping One-way clutch No. 2 slipping
N → R select	Insufficient line pressure Direct clutch slipping Reverse brake slipping

ROAD TEST

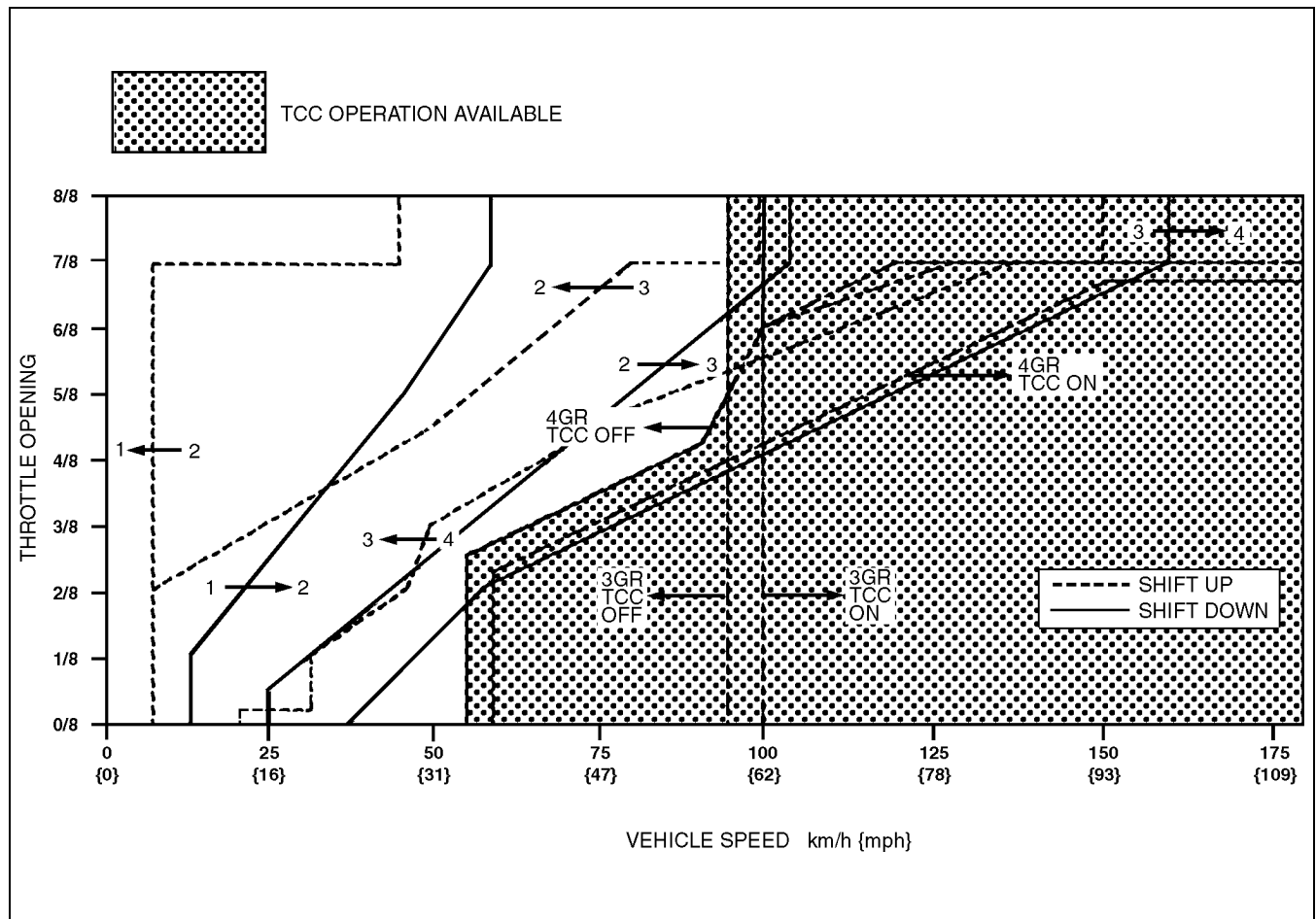
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Road Test Preparation

1. Inspect the engine coolant. (See 01-12-2 ENGINE COOLANT LEVEL INSPECTION.)
2. Inspect the engine oil. (See 01-11-2 ENGINE OIL LEVEL INSPECTION.)
3. Inspect the ATF levels. (See 05-13-8 AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION.)
4. Inspect the idle speed and ignition timing. (See 01-10-27 ENGINE TUNE-UP.)
5. Bring up the engine and transmission to normal operating temperature.

Typical Shift Diagram

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Shift Schedule Test

1. Drive the vehicle with wide open throttle, half throttle, closed throttle position and kickdown, and verify that following shifts are obtained. The shift points must be as shown in the table below.
 - 1GR→2GR, 2GR→3GR, and 3GR→4GR upshifts and downshifts are obtained in D range (O/D OFF switch OFF).
 - 1GR→2GR and 2GR→3GR upshifts and downshifts are obtained in D range (O/D OFF switch ON).
 - 2GR is held in 2 range.
 - 1GR is held in 1 range.
2. Decelerate the vehicle and verify that engine braking effect is felt in 4GR.
3. Drive the vehicle and verify that TCC operation is obtained in 3GR and 4GR in D range.

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Note

- The shift solenoid electrical ON-OFF pattern in this chart describes the stabilized condition before and after shift control. The pattern may oscillate between ON and OFF momentarily while shifting-up or down. This is normal.

Vehicle speed at shift point table

Range/Mode	Throttle condition	Shift	Vehicle speed (km/h {mph})	Shift solenoid A	Shift solenoid B
D range (O/D OFF switch OFF)	Wide open throttle	1GR→2GR	58—64 {36—40}	ON	OFF→ON
		2GR→3GR	102—110 {63—68}	ON→OFF	ON
		3GR→4GR	157—167 {97—103}	OFF	ON→OFF
	Half throttle	1GR→2GR	33—42 {20—26}	ON	OFF→ON
		2GR→3GR	59—76 {37—47}	ON→OFF	ON
		3GR TCC operation	94—106 {58—65}	OFF	ON
		3GR→4GR	85—112 {52—69}	OFF	ON→OFF
	Closed throttle position	4GR TCC operation	81—109 {50—67}	OFF	OFF
		4GR→3GR	17—23 {11—14}	OFF	OFF→ON
	Kickdown (wide open throttle)	3GR→1GR	5—11 {3—6}	OFF→ON	ON→OFF
		4GR→3GR	145—155 {90—96}	OFF	OFF→ON
		3GR→2GR	95—103 {59—63}	OFF→ON	ON
D range (O/D OFF switch ON)	Wide open throttle	2GR→1GR	42—48 {26—29}	ON	ON→OFF
		1GR→2GR	58—64 {36—40}	ON	OFF→ON
	Half throttle	2GR→3GR	102—110 {63—68}	ON→OFF	ON
		1GR→2GR	33—42 {20—26}	ON	OFF→ON
		2GR→3GR	59—76 {37—47}	ON→OFF	ON
	Closed throttle position	3GR TCC operation	94—106 {58—65}	OFF	ON
		3GR→1GR	5—11 {3—6}	OFF→ON	ON→OFF
	Kickdown (wide open throttle)	3GR→2GR	95—103 {59—63}	OFF→ON	ON
		2GR→1GR	42—48 {26—29}	ON	ON→OFF
2	—	3GR→2GR	101—107 {63—66}	OFF→ON	ON
1	—	2GR→1GR	35—41 {22—25}	ON	ON→OFF

Noise and Vibration Test

- Drive the vehicle and listen closely for any noise or vibration. The torque converter, drive shaft, and differential can be sources of noise and vibration if they are not functioning properly. Inspect these when searching for sources of noise and vibration.

P Position Test

- Shift into P position on a gentle slope. Release the brake, and verify that the vehicle does not roll.
 - If the vehicle rolls, inspect the AT. (See 05-03-4 AUTOMATIC TRANSMISSION SYMPTOM TROUBLESHOOTING.)

AUTOMATIC TRANSMISSION FLUID (ATF) INSPECTION

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ATF Condition Inspection

- One way of determining whether the transmission should be disassembled is by noting:
 - If the ATF is muddy or varnished.
 - If the ATF smells strange or unusual.
 - If ATF condition is poor, repair as follows.
 - Dark color condition
 - Overhaul transmission and repair or replace parts if necessary.
 - Light pink and/or reddish-brown condition.
 - Replace ATF.

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ATF condition

Condition		Possible cause
Clear red	Normal	—
Light red (pink)	Contaminated with water	<ul style="list-style-type: none"> Broken oil cooler inside of radiator Poor breather hose installation: By water contamination, problem could be occurring to parts inside of transmission. It is necessary to overhaul transmission and detect defective parts. If necessary, repair or replace transmission.
Reddish brown	Has burnt smell and metal pieces are found	Defective powertrain components inside of transmission: Specks cause wide range of problems by plugging up in oil pipe, control valve body, and oil cooler in radiator. <ul style="list-style-type: none"> When large amount of specks are found. Overhaul transmission and detect defective parts. If necessary, repair or replace transmission. Implement flushing operation as there is a possibility of having specks plugged up oil pipe and/or oil cooler inside of radiator.
	Has no burnt smell	Normal <ul style="list-style-type: none"> Discoloration by oxidation.

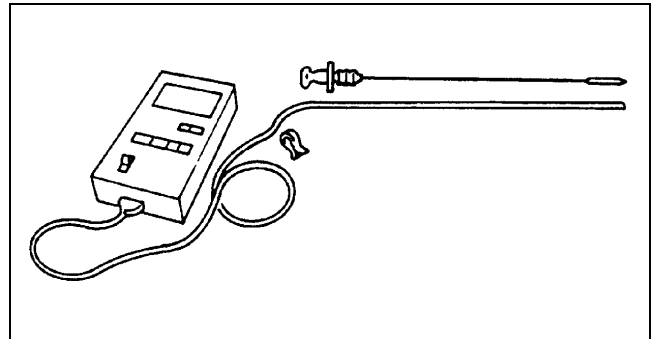
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ATF Level Inspection

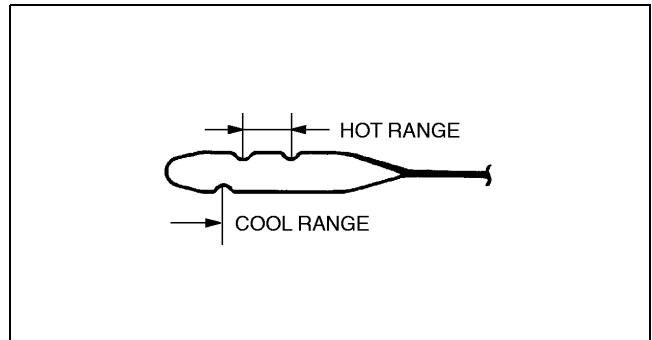
Caution

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

- Park the vehicle on level ground.
- Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.
- Adjust the length or thermistor probe measure to the measure same as the dipstick and hold the probe with a paper holder.
- Insert into the filler tube and measure the temperature.
- Inspect the ATF level before warming up the engine. In this case, use the cool range (15—25°C {59—77°F}).
- Warm up the engine until the ATF reaches 60—70°C {140—158°F}.
- While depressing the brake pedal, shift the selector lever to each range (P—1), pausing momentarily in each range.
- Shift back to the P position.
- While the engine is idling, verify that the ATF level is in the HOT 65°C {149°F} range.
 - Adjust ATF level to the specification, if necessary.



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ATF type

M-III or equivalent (e. g. Dexron®III)

AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT

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Warning

- Hot transmissions and ATF can cause severe burns. Turn off the engine and wait until the transmission and ATF are cool before replacing the ATF.

- Remove the dipstick.

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2. Remove the drain plug and washer.
3. Drain the ATF into a container.
4. Install a new washer and the drain plug.

Tightening torque

18—22 N·m {1.8—2.3 kgf·m, 14—16 in·lbf}

5. Add the specified amount and type of ATF through the oil filler tube.

ATF type

M-III or equivalent (e. g. Dexron®III)

Fill amount (approximate quantity)

6.7 L {7.1 US qt, 5.9 Imp qt}

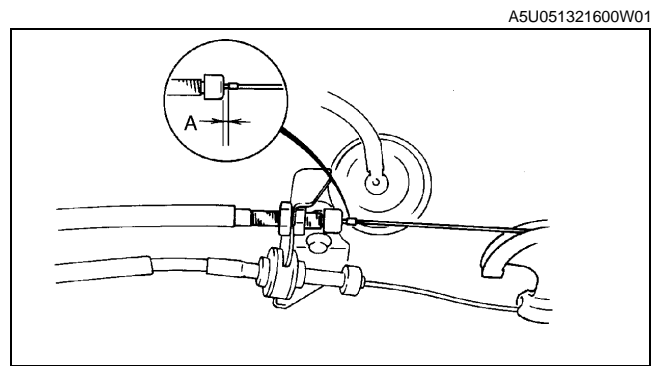
6. Install the dipstick.
7. Verify that the ATF level is in the HOT 65°C {149°F} range.
 - Add ATF to the specified level if necessary.

THROTTLE CABLE INSPECTION

1. Verify that the throttle cable is adjusted within dimension A as show in the figure below when the throttle cable is in closed throttle position.
 - If it is not within specification, adjust the throttle cable. (See 05-13-10 THROTTLE CABLE ADJUSTMENT.)

Dimension A

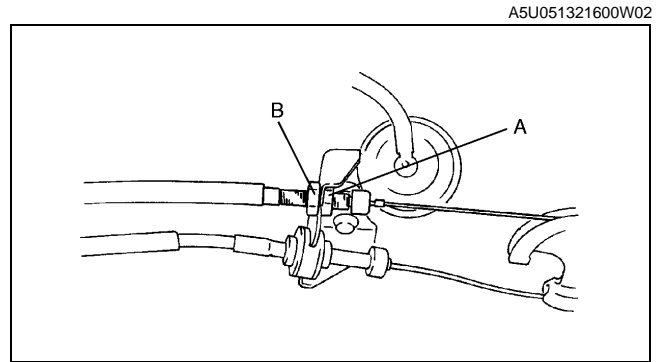
0.8—1.5 mm {0.03—0.05 in}



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THROTTLE CABLE ADJUSTMENT

1. Loosen nuts A and B.



X5U513WA5

2. Put nut B in the direction of the arrow as shown in the figure, with the throttle lever in closed throttle position. Then tighten the nut by hand.

Note

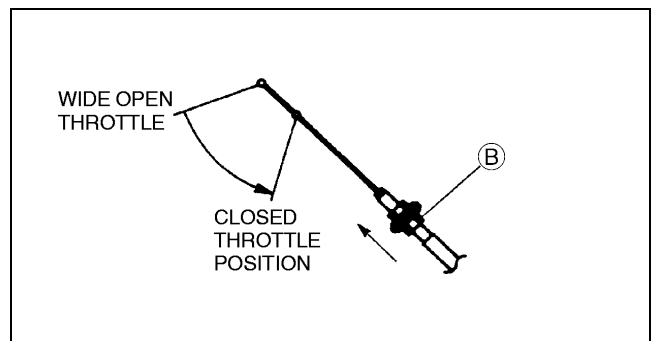
- Tighten nut A by pushing it down so that the throttle cable will not come off from the bracket.

3. Tighten nut A with the throttle lever totally closed.

Tightening torque

12—16 N·m {1.2—1.7 kgf·m, 8.7—12.2 ft·lbf}

4. Verify that the throttle cable moves smoothly.



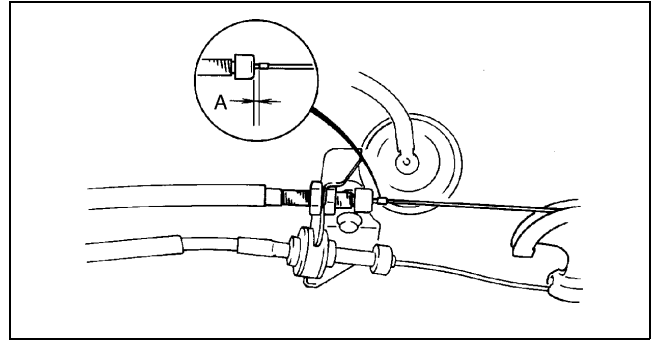
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AUTOMATIC TRANSMISSION

5. Verify that there is no deflection, and that the throttle cable is adjusted within dimension A as shown in the figure below when the throttle cable is in closed throttle position.

Dimension A

0.8—1.5 mm {0.03—0.05 in}



X5U513WA7

THROTTLE CABLE REMOVAL/INSTALLATION

On-Vehicle Removal

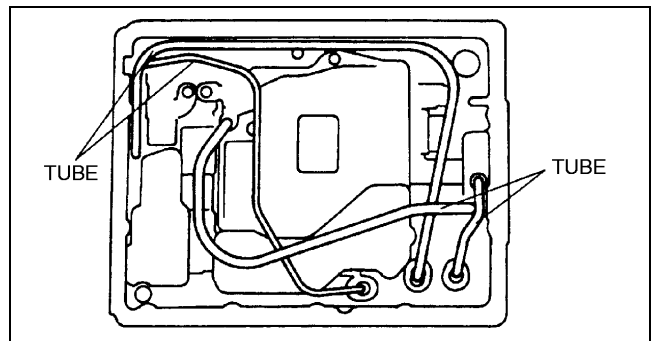
1. Disconnect the negative battery cable.
2. Clean the transmission exterior thoroughly with a steam cleaner or cleaning solvents.
3. Drain the ATF into separate suitable containers. (See 05-13-9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
4. Remove the throttle cable from the throttle lever.
5. Remove the oil pan and gasket.

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Caution

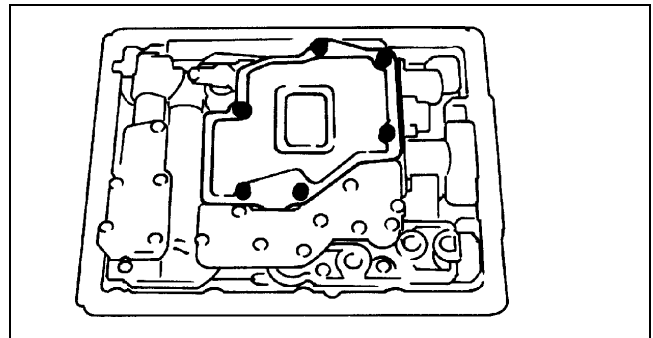
- To prevent deformation of the tube, remove the tube by pulling both ends up.

6. Remove the tube.
7. Disconnect the shift solenoids A, B, and torque converter clutch solenoid valve connectors.



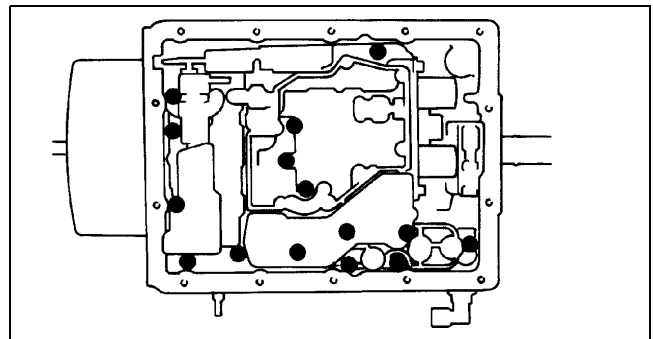
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8. Remove the oil strainer.



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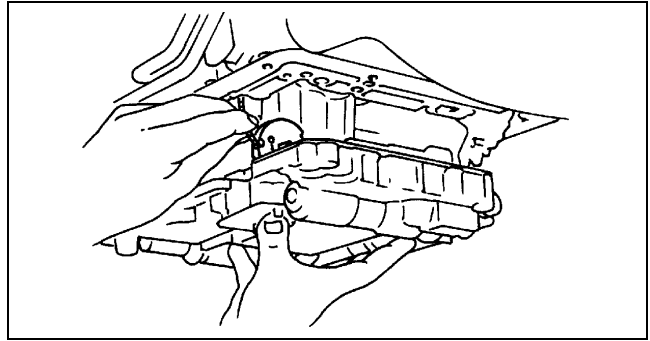
9. Remove the control valve body installation bolts.



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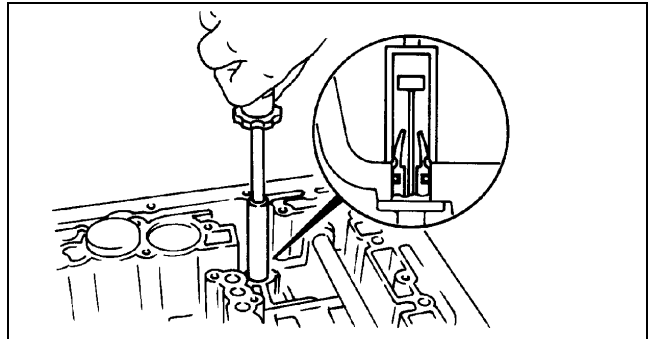
AUTOMATIC TRANSMISSION

10. Remove the nipple of the throttle cable from the throttle cam.
11. Remove the control valve body.
12. Remove the accumulator spring.



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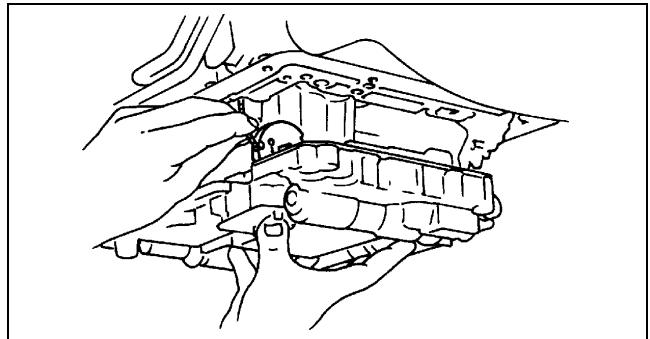
13. Remove the throttle cable from the transmission case using a **10 mm {0.4 in}** socket wrench.
14. Remove the throttle cable.
15. Remove the O-ring from the throttle cable.



X5U513WAB

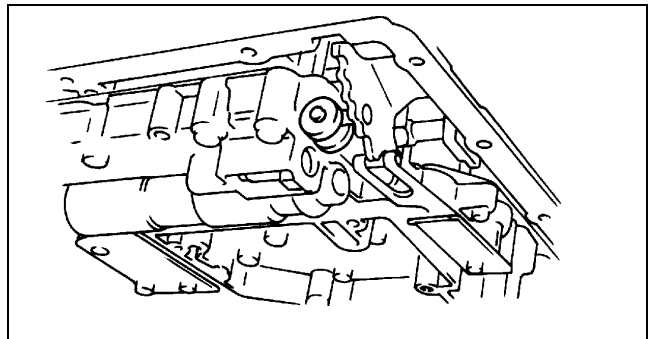
On-Vehicle Installation

1. Apply ATF to a new O-ring.
2. Install the O-ring to the throttle cable.
3. Install the throttle cable.
4. Install the nipple of the throttle cable to the throttle cam.



X5U513WAD

5. Verify that the manual valve and manual shaft are assembled correctly.



X5U513WAE

AUTOMATIC TRANSMISSION

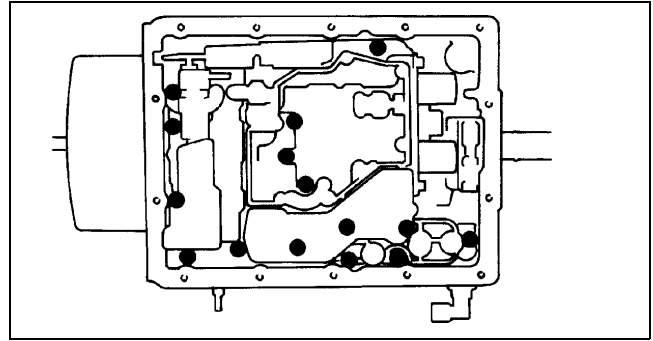
6. Install the control valve body.

Tightening torque

7.9—11.7 N·m {80—120 kgf·cm, 70—104 in·lbf}

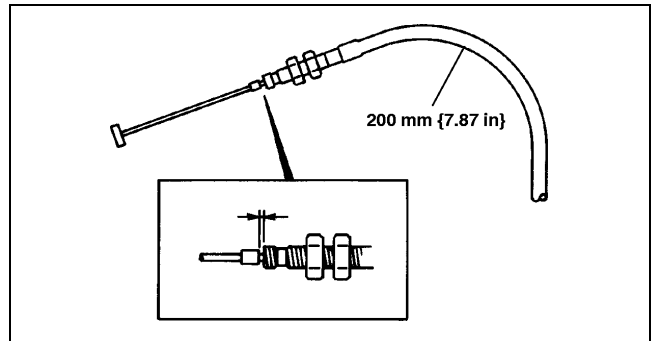
Note

- Step 7 is for the throttle cable replacement only.



X5U513WA9

7. With throttle cable installed to the throttle cam, bend near the center of the throttle cable to a radius of **200 mm {7.87 in}**. Then, pull the throttle cable until there is no play or just before the throttle cam starts to move, and stake the adjustment mark at the position shown in the figure.



X5U513WAG

8. Install the oil strainer.

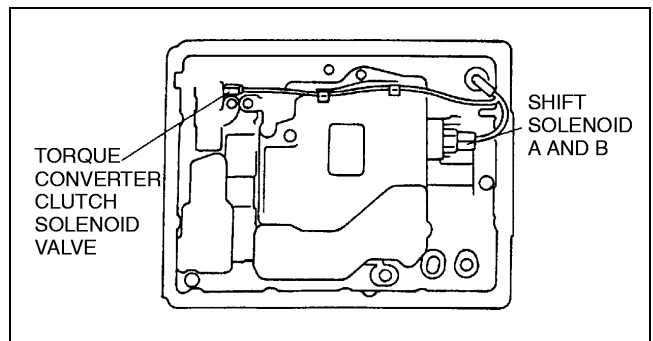
Tightening torque

5.0—5.8 N·m {50—60 kgf·cm, 44—52 in·lbf}

9. Connect the shift solenoids A, B, and torque converter clutch solenoid valve connectors.
10. Install the tube.
11. Install the new gasket and oil pan.

Tightening torque

4.0—4.9 N·m {40—50 kgf·cm, 35—43 in·lbf}



X5U513WAH

12. Install the throttle cable to the throttle lever.
13. Adjust the throttle cable. (See 05-13-10 THROTTLE CABLE ADJUSTMENT.)
14. Add ATF to the specified level. (See 05-13-9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
15. Carry out mechanical test. (See 05-13-5 MECHANICAL SYSTEM TEST.)
16. Carry out road test. (See 05-13-7 ROAD TEST.)

O/D OFF SWITCH INSPECTION

A5U051346040W01

Inspection of Operation

1. Turn the ignition switch from OFF to ON.
2. Verify that the O/D OFF indicator light is not illuminated. Depress the O/D OFF switch and verify that the O/D OFF indicator light illuminates.
 - If not as specified, inspect the terminal voltage of the O/D OFF switch.

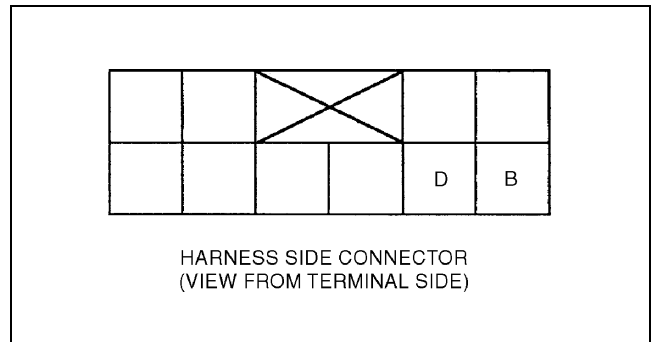
AUTOMATIC TRANSMISSION

Inspection of Voltage

1. Remove the rear console.
2. Turn the ignition switch to the ON position.
3. Measure the voltage at the O/D OFF switch connector.
 - If not as specified, inspect for continuity at the O/D OFF switch.

Position	Connector terminal (V)	
	B	D
Normal	B+	0
Depressed	0	0

4. Install the rear console.



Y5U513WA0

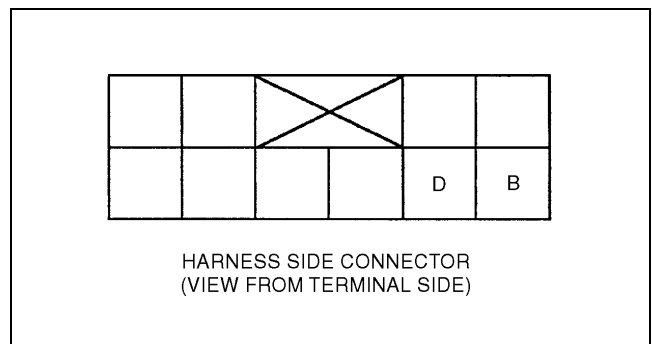
Inspection of Continuity

1. Disconnect the negative battery cable.
2. Remove the rear console.
3. Disconnect the O/D OFF switch connector.
4. Inspect for continuity at the O/D OFF switch.
 - If not as specified, replace the selector lever knob component.
 - If the switch is okay, inspect the wiring harness. (O/D OFF switch — transmission control module, O/D OFF switch — Body ground.)

○—○ : Continuity

Position	Connector terminal	
	B	D
Normal		
Depressed	○—○	○—○

Y5U513WA8



Y5U513WA1

5. Install the rear console.
6. Connect the negative battery cable.

O/D OFF SWITCH REMOVAL/INSTALLATION

A5U051346040W02

1. Disconnect the negative battery cable.
2. Remove the rear console.
3. Disconnect the connector and remove the O/D OFF switch terminals. (See 05-14-8 SELECTOR LEVER DISASSEMBLY/ASSEMBLY.)
4. Remove the selector lever knob component.
5. Install a selector lever knob component.

Tightening torque

2.0—2.9 N·m {20—30 kgf·cm, 18—26 in·lbf}

6. Install the O/D OFF switch terminals and connect the connector. (See 05-14-8 SELECTOR LEVER DISASSEMBLY/ASSEMBLY.)
7. Install the rear console.
8. Connect the negative battery cable.

TRANSMISSION RANGE (TR) SWITCH INSPECTION

A5U051319440W01

Inspection of Operation

1. Verify that the starter operates only with the ignition switch at the START position and selector lever in the P/N position.
2. Verify that the back-up lights illuminate when shifted to the R position with the ignition switch at the ON position.
 - If not as specified, inspect the continuity of the TR switch.

Inspection of Continuity

1. Inspect the OBD trouble code. (See 05-02-5 DTC TABLE.)

AUTOMATIC TRANSMISSION

2. Remove the TR switch. (See 05-13-15 TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION.)
3. Inspect for continuity at the TR switch.
 - If not as specified, replace the TR switch.

Range/position	Terminals	Continuity
P	D—C	Yes
	I—B	
	Other	No
R	I—F	Yes
	Other	No
N	D—C	Yes
	I—J	
	Other	No
D	I—H	Yes
	Other	No
2	I—E	Yes
	Other	No
1	I—G	Yes
	Other	No



Y5U513WA2

05-13

4. Install the TR switch. (See 05-13-15 TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION.)

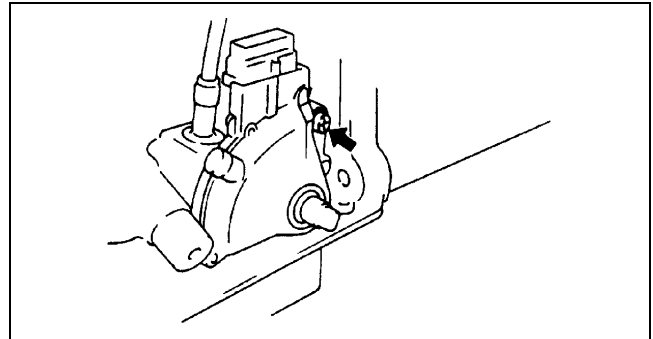
TRANSMISSION RANGE (TR) SWITCH REMOVAL/INSTALLATION

A5U051319440W02

1. Disconnect the negative battery cable.
2. Disconnect the TR switch connector.
3. Remove the selector rod from the manual shaft lever.
4. Remove the manual shaft lever.
5. Remove the staking of the lock washer using a screwdriver.
6. Remove the nut, lock washer, and packing.
7. Remove the TR switch.
8. Rotate the manual shaft to the N position.
9. Hand-tighten the TR switch bolt.
10. Install a new packing.
11. Install a new lock washer.
12. Tighten the nut.

Tightening torque

3.0—4.9 N·m {30—50 kgf·cm, 27—43 in·lbf}



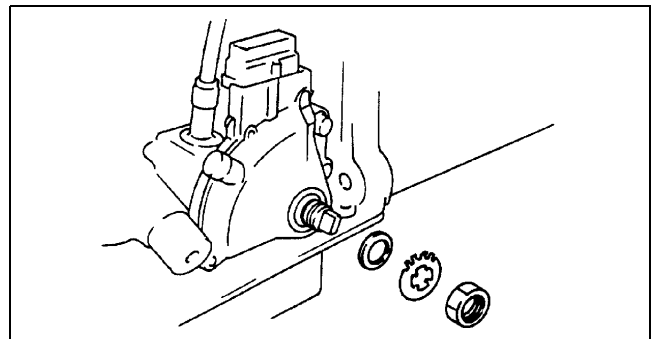
X5U513WAM

13. Bend claws of the lock washer.
14. Adjust the TR switch. (See 05-13-16 TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT.)
15. Tighten the TR switch mounting bolt.

Tightening torque

4.0—6.8 N·m {40—70 kgf·cm, 35—60 in·lbf}

16. Rotate the manual shaft to the P position.
17. Install the manual shaft lever.
18. Install the selector rod to the manual shaft lever.



X5U513WAN

AUTOMATIC TRANSMISSION

TRANSMISSION RANGE (TR) SWITCH ADJUSTMENT

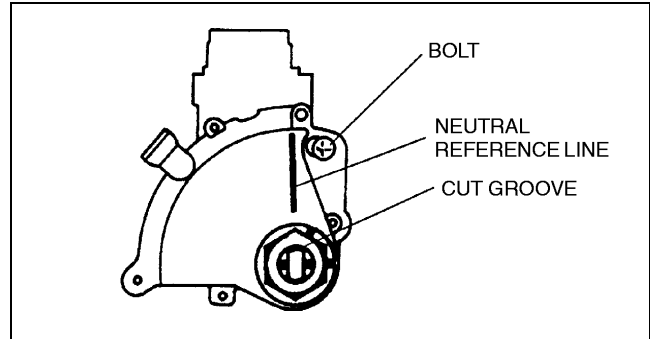
A5U051319440W03

1. Disconnect the negative battery cable.
2. Remove the selector rod from the manual shaft lever.
3. Rotate the manual shaft to the N position.
4. Loosen the TR switch mounting bolt.
5. Align the cut groove in the switch with the neutral reference line.
6. Tighten the TR switch mounting bolt.

Tightening torque

4.0—6.8 N·m {40—70 kgf·cm, 35—60 in·lbf}

7. Install the selector rod to the manual shaft lever.
8. Connect the negative battery cable.
9. Inspect the operation of the TR switch. (See 05—13—14 TRANSMISSION RANGE (TR) SWITCH INSPECTION.)



X5U513WAP

INPUT/TURBINE SPEED SENSOR INSPECTION

A5U051321550W01

1. Remove the bracket and front pipe. (See 01—15—1 EXHAUST SYSTEM REMOVAL/INSTALLATION.)
2. Disconnect the input/turbine speed sensor connector.

Note

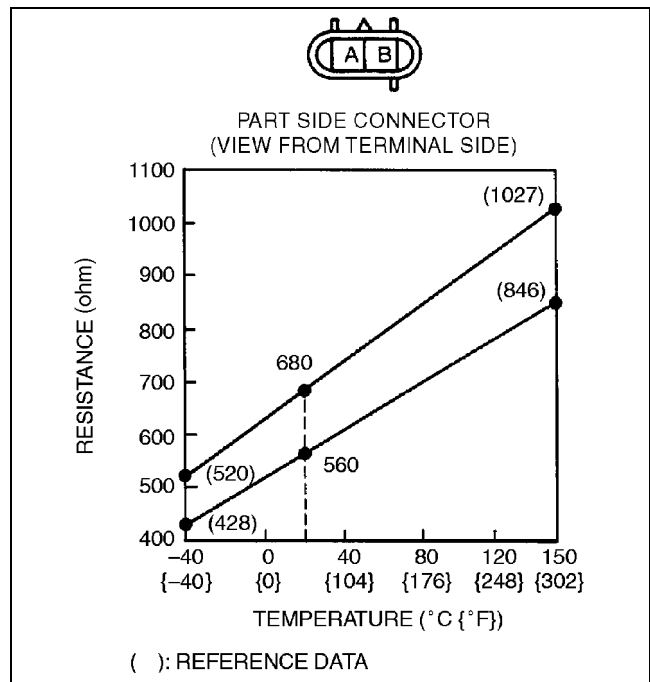
- Resistance value of the input/turbine speed sensor varies with temperature. Normal resistance value occurs when the temperature is **20°C {68°F}**, but it may be abnormal at high temperatures. Therefore, do not determine the resistance value only at **20°C {68°F}**.

3. Measure the resistance between the terminals of the input/turbine speed sensor.
 - If not correct, replace the input/turbine speed sensor.

Resistance

560—680 ohms (20°C {68°F})

4. Connect the input/turbine speed sensor connector.
5. Install the front pipe and bracket. (See 01—15—1 EXHAUST SYSTEM REMOVAL/INSTALLATION.)
6. Connect the negative battery cable.



A5U0513W001

INPUT/TURBINE SPEED SENSOR REMOVAL/INSTALLATION

A5U051321550W02

1. Disconnect the negative battery cable.
2. Remove the bracket and front pipe. (See 01—15—1 EXHAUST SYSTEM REMOVAL/INSTALLATION.)
3. Disconnect the input/turbine speed sensor connector.
4. Remove the input/turbine speed sensor.
5. Remove the O-ring from the input/turbine speed sensor.
6. Apply ATF to a new O-ring.
7. Install the O-ring to the input/turbine speed sensor.
8. Install the input/turbine speed sensor.

Tightening torque

5.8—8.8 N·m {59—90 kgf·cm, 52—78 in·lbf}

AUTOMATIC TRANSMISSION

9. Connect the input/turbine speed sensor connector.
10. Install the front pipe and bracket. (See 01–15–1 EXHAUST SYSTEM REMOVAL/INSTALLATION.)
11. Connect the negative battery cable.

OUTPUT SPEED SENSOR INSPECTION

A5U051321551W01

1. Disconnect the output speed sensor connector.
2. Remove the output speed sensor.

Note

- Resistance value of the output speed sensor varies with temperature. Normal resistance value occurs when the temperature is **20°C {68°F}**, but it may be abnormal at high temperatures. Therefore, do not determine the resistance value only at **20°C {68°F}**.

3. Measure the resistance between the terminals of the output speed sensor.
 - If not correct, replace the output speed sensor.

Resistance

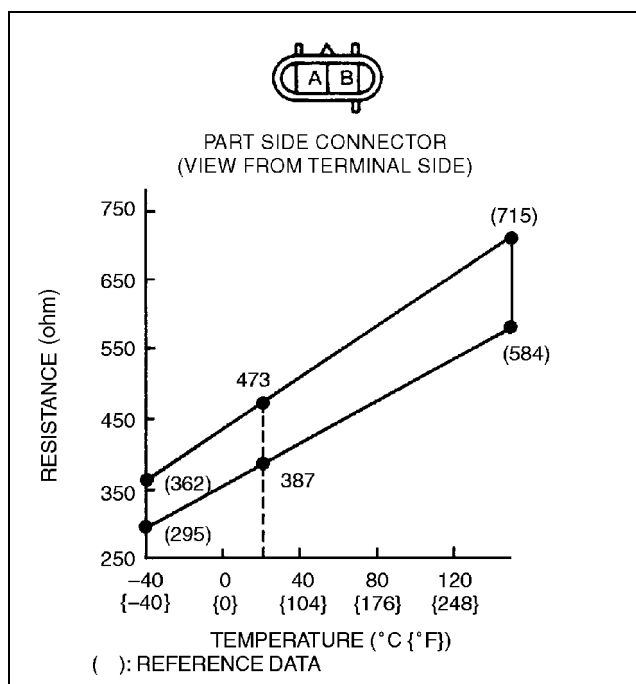
387—473 ohms (20°C {68°F})

4. Install the output speed sensor.

Tightening torque

5.0—6.8 N·m {50—70 kgf·cm, 44—60 in·lbf}

5. Connect the output speed sensor connector.
6. Connect the negative battery cable.



A5U0513W002

OUTPUT SPEED SENSOR REMOVAL/INSTALLATION

A5U051321551W02

1. Disconnect the negative battery cable.
2. Disconnect the output speed sensor connector.
3. Remove the output speed sensor from the transmission.
4. Apply ATF to a new O-ring.
5. Install the O-ring to the output speed sensor.
6. Install the output speed sensor to the transmission.

Tightening torque

5.0—6.8 N·m {50—70 kgf·cm, 44—60 in·lbf}

7. Connect the output speed sensor connector.
8. Connect the negative battery cable.

SOLENOID VALVES INSPECTION

A5U051321280W01

Inspection of Solenoid Valves

1. Inspect the OBD trouble code. (See 05–02–5 DTC TABLE.)
2. Remove the solenoid valves. (See 05–13–18 SOLENOID VALVES REMOVAL/INSTALLATION.)

Note

- Resistance value of the solenoid valve varies with temperature. Normal resistance value occurs when the temperature is **20°C {68°F}**, but it may be abnormal at high temperatures. Therefore, do not determine the resistance value only at **20°C {68°F}**.

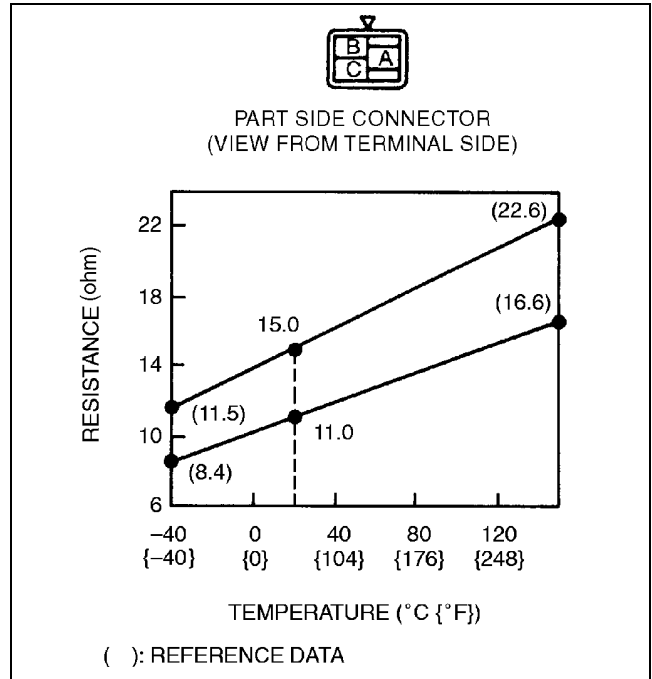
AUTOMATIC TRANSMISSION

3. Measure the resistance between solenoid valve terminals.

- If not correct, replace the solenoid valves.

Solenoid	Resistance (ohm)
Shift solenoid B	11—15
Shift solenoid A	11—15
Torque converter clutch solenoid valve	11—15

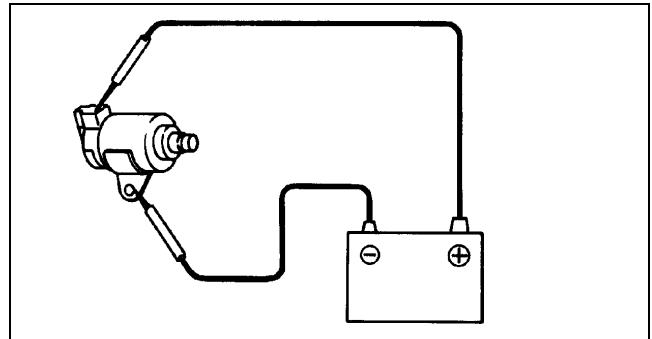
4. Install the solenoid valves. (See 05-13-18 SOLENOID VALVES REMOVAL/INSTALLATION.)
5. Connect the solenoid valve connector.
6. Connect the negative battery cable.



A5U0513W003

Operating Inspection

1. Disconnect the negative battery cable.
2. Remove the solenoid valves. (See 05-13-18 SOLENOID VALVES REMOVAL/INSTALLATION.)
3. Apply the voltage at terminal and listen for a "click" sound at all solenoid valves.
 - If a "click" is not heard, replace the solenoid valve.
4. Install the solenoid valves. (See 05-13-18 SOLENOID VALVES REMOVAL/INSTALLATION.)
5. Connect the solenoid valve connector.
6. Connect the negative battery cable.



X5U513WAT

Fail-safe Function

Gear/solenoid condition	D range				2 range	1 range
Required gear position	1GR	2GR	3GR	4GR	2GR	1GR
Shift solenoid A malfunction	3GR	3GR	3GR	4GR	3GR	1GR
Shift solenoid B malfunction	1GR	4GR	4GR	4GR	3GR	1GR
Shift solenoids A and B both malfunction	4GR	4GR	4GR	4GR	3GR	1GR

SOLENOID VALVES REMOVAL/INSTALLATION

A5U051321280W02

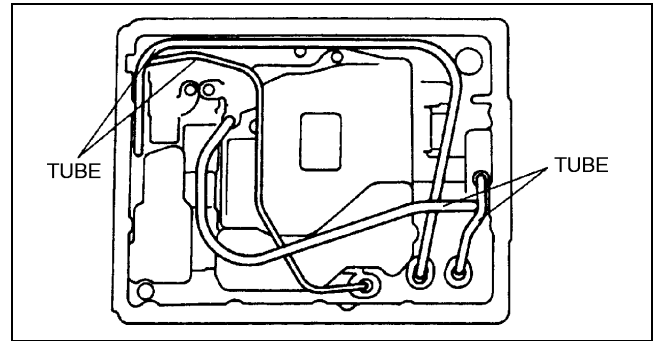
1. Clean the transmission exterior thoroughly with a steam cleaner or cleaning solvents.
2. Disconnect the negative battery cable.
3. Drain the ATF. (See 05-13-9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
4. Remove the oil pan and gasket.

Caution

- To prevent deformation of the tube, remove the tube by pulling both ends up.

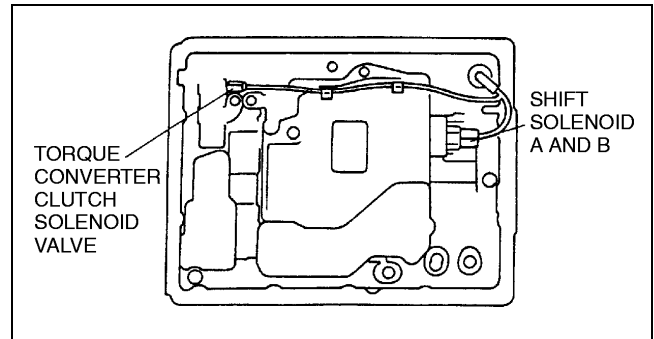
AUTOMATIC TRANSMISSION

5. Remove the tubes.



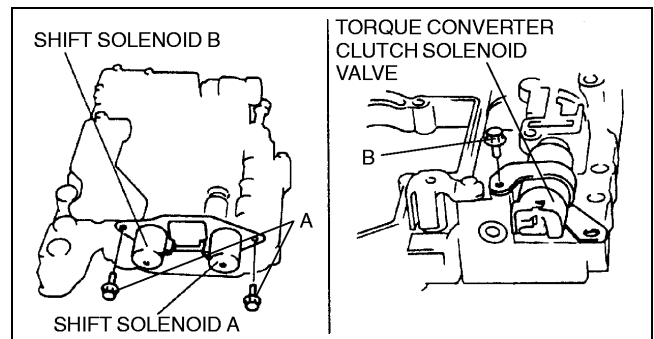
X5U513WAW

6. Disconnect the shift solenoids A, B and torque converter clutch solenoid valve connectors.



X5U513WAV

7. Remove the solenoid valve.
8. Apply ATF to a new O-ring.
9. Install the O-ring to the torque converter clutch solenoid valve.



X5U513WAW

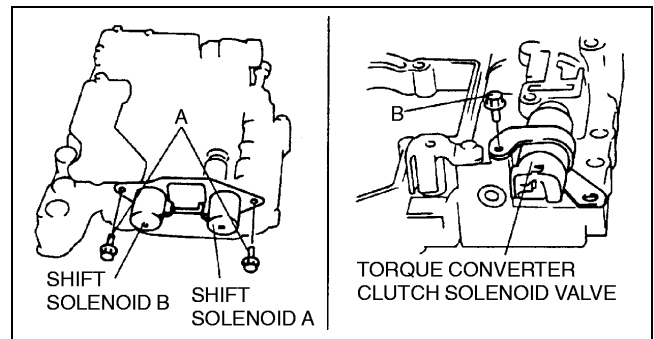
10. Install a new gasket and solenoid valve to the control valve body.

Tightening torque

A: 7.9—11.7 N·m {80—120 kgf·cm, 70—104 in·lbf}

B: 5.0—5.8 N·m {50—60 kgf·cm, 44—52 in·lbf}

11. Connect shift solenoids A, B, and torque converter clutch solenoid valve connectors.
12. Install the tubes.
13. Install the new gasket and oil pan.



X5U513WAX

Tightening torque

4.0—4.9 N·m {40—50 kgf·cm, 35—43 in·lbf}

14. Add ATF to the specified level. (See 05-13-9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
15. Carry out mechanical test. (See 05-13-5 MECHANICAL SYSTEM TEST.)
16. Carry out road test. (See 05-13-7 ROAD TEST.)

AUTOMATIC TRANSMISSION

TRANSMISSION CONTROL MODULE (TCM) INSPECTION

A5U051318901W01

- Turn the ignition switch to the ON position, and inspect the TCM terminal voltage, referring to the Terminal Voltage Chart.

- If any TCM terminal voltage is incorrect, inspect the related input of output devices and wiring.
- If no problem is found, replace the TCM.

Note

- Use the ground of terminal AP of the TCM when measuring terminal voltage as an error may occur when the negative (-) lead of the circuit tester is connected to ground.

Terminal Voltage Table (Reference Data)

AQ	AN		*	AE					*	*		D	A	
AR	AO	AL	*	AF	AC	Z	W	T	*	*	K	*	*	B
AS	AP		*	AG	*	*		U	R	O	L		F	C

HARNESS SIDE CONNECTOR
(VIEW FROM TERMINAL SIDE)

Y5U513WA6

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
A	TR switch (1 range)	TR switch	1 range	B+	<ul style="list-style-type: none"> Inspect TR switch (See 05–13–14 TRANSMISSION RANGE (TR) SWITCH INSPECTION) Inspect related harness
			All other ranges	below 1	
B	TR switch (2 range)	TR switch	2 range	B+	<ul style="list-style-type: none"> Inspect TR switch (See 05–13–14 TRANSMISSION RANGE (TR) SWITCH INSPECTION) Inspect related harness
			All other ranges	below 1	
C	TR switch (D range)	TR switch	D range	B+	<ul style="list-style-type: none"> Inspect TR switch (See 05–13–14 TRANSMISSION RANGE (TR) SWITCH INSPECTION) Inspect related harness
			All other ranges	below 1	
D	TR switch (R position)	TR switch	R position	B+	<ul style="list-style-type: none"> Inspect TR switch (See 05–13–14 TRANSMISSION RANGE (TR) SWITCH INSPECTION) Inspect related harness
			All other ranges	below 1	
E	—	—	—	—	—

AUTOMATIC TRANSMISSION

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
F	TR switch (P or N position)	TR switch	P or N position	B+	<ul style="list-style-type: none"> Inspect TR switch (See 05–13–14 TRANSMISSION RANGE (TR) SWITCH INSPECTION) Inspect related harness
			All other ranges	below 1	
H	—	—	—	—	—
J	—	—	—	—	—
K	O/D OFF switch	O/D OFF switch	O/D OFF switch is released.	above 10	<ul style="list-style-type: none"> Inspect O/D OFF switch (See 05–13–13 O/D OFF SWITCH INSPECTION) Inspect related harness
			O/D OFF switch is depressed.	below 1	
L	O/D OFF indicator light	O/D OFF indicator light	O/D OFF indicator light illuminates.	below 1	<ul style="list-style-type: none"> Inspect O/D OFF indicator light (See 09–18–20 PANEL LIGHT CONTROL SWITCH INSPECTION) Inspect related harness
			O/D OFF indicator light does not illuminate.	B+	
M	—	—	—	—	—
N	—	—	—	—	—
O	PCM/TCM communication	PCM	Because PCM/TCM communication is carried out by serial communication, the condition of the PCM/TCM communication cannot be decided by inspection of terminal voltage only. Perform inspection according to DTC as well.	—	<ul style="list-style-type: none"> Inspect PCM (See 01–03–56 ENGINE CONTROL SYSTEM OPERATION INSPECTION) Inspect related harness
Q	—	—	—	—	—
R	TP (V-ref)	TP sensor	Ignition switch is off.	below 1	<ul style="list-style-type: none"> Inspect TP sensor (See 01–40–24 THROTTLE POSITION (TP) SENSOR INSPECTION) Inspect related harness
			Ignition switch is on.	4.5–5.5	
T	4GR inhibit signal (Auto speed control signal)	Cruise control module	Idle	above 10	<ul style="list-style-type: none"> Inspect cruise control module (See 01–20–2 CRUISE CONTROL MODULE INSPECTION) Inspect related harness
			When 4GR inhibit signal is input	below 1	

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AUTOMATIC TRANSMISSION

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
U	TP (TVO)	TP sebsor	CTP	0.3—1.0	<ul style="list-style-type: none"> Inspect TP sensor (See 01—40—24 THROTTLE POSITION (TP) SENSOR INSPECTION) Inspect related harness
			WOT	3.7—4.4	
W	Input/turbine speed sensor	Input/turbine speed sensor	Idle	Pulse generation*	<ul style="list-style-type: none"> Inspect input/turbine speed sensor (See 05—13—16 INPUT/TURBINE SPEED SENSOR INSPECTION) Inspect related harness
Z	Ground (Input/turbine speed sensor)	Input/turbine speed sensor	Ignition switch is ON.	2.5 (DC) 0 (AC)	<ul style="list-style-type: none"> Inspect input/turbine speed sensor (See 05—13—16 INPUT/TURBINE SPEED SENSOR INSPECTION) Inspect related harness
AA	—	—	—	—	—
AC	Vehicle speed signal	VSS	Vehicle speed at 30km/h {18.6 mph}	Pulse generation*	<ul style="list-style-type: none"> Inspect VSS (See 05—11A—4 VEHICLE SPEEDOMETER SENSOR INSPECTION [M15M-D]) Inspect related harness
AD	—	—	—	—	—
AE	Output speed sensor	Output speed sensor	Ignition switch is on.	2.5 (DC) 0 (AC)	<ul style="list-style-type: none"> Inspect output speed sensor (See 05—13—17 OUTPUT SPEED SENSOR INSPECTION) Inspect related harness
AF	Output speed sensor	Output speed sensor	Vehicle speed at 30 km/h {18.6 mph}	Pulse generation*	<ul style="list-style-type: none"> Inspect output speed sensor (See 05—13—17 OUTPUT SPEED SENSOR INSPECTION) Inspect related harness

AUTOMATIC TRANSMISSION

Terminal	Signal	Connected to	Test condition	Voltage (V)	Action
AG	Engine speed signal	PCM	Idle	Pulse generation*	<ul style="list-style-type: none"> Inspect PCM (See 01–03–56 ENGINE CONTROL SYSTEM OPERATION INSPECTION) Inspect related harness
AH	—	—	—	—	—
AI	—	—	—	—	—
AJ	—	—	—	—	—
AL	PCM/TCM communication	PCM	Because PCM/TCM communication is carried out by serial communication, the condition of the PCM/TCM communication cannot be decided by inspection of terminal voltage only. Perform inspection according to DTC as well.	—	<ul style="list-style-type: none"> Inspect PCM (See 01–03–56 ENGINE CONTROL SYSTEM OPERATION INSPECTION) Inspect related harness
AN	Shift solenoid B	Shift solenoid B	Except 2GR or 3GR	B+	<ul style="list-style-type: none"> Inspect shift solenoid B (See 05–13–17 SOLENOID VALVES INSPECTION) Inspect related harness
			1GR or 4GR	below 1	
AO	TCC solenoid valve	TCC solenoid valve	TCC is ON	B+	<ul style="list-style-type: none"> Inspect TCC solenoid valve (See 05–13–17 SOLENOID VALVES INSPECTION) Inspect related harness
			TCC released	below 1	
AP	TCM ground	—	Under any condition	below 1	<ul style="list-style-type: none"> Inspect related harness
AQ	Shift solenoid A	Shift solenoid A	1GR or 2GR	B+	<ul style="list-style-type: none"> Inspect shift solenoid A (See 05–13–17 SOLENOID VALVES INSPECTION) Inspect related harness
			3GR or 4GR	below 1	
AR	Power supply	—	Under any condition	B+	<ul style="list-style-type: none"> Inspect battery (See 01–17–2 BATTERY INSPECTION) Inspect related harness
AS	Power supply	Main relay	Ignition switch is off.	below 1	<ul style="list-style-type: none"> Inspect main relay Inspect related harness
			Ignition switch is on.	B+	

* : See 05–13–24 Input/Output Pulse (Reference)

AUTOMATIC TRANSMISSION

Input/Output Pulse (Reference)

Input/turbine speed sensor

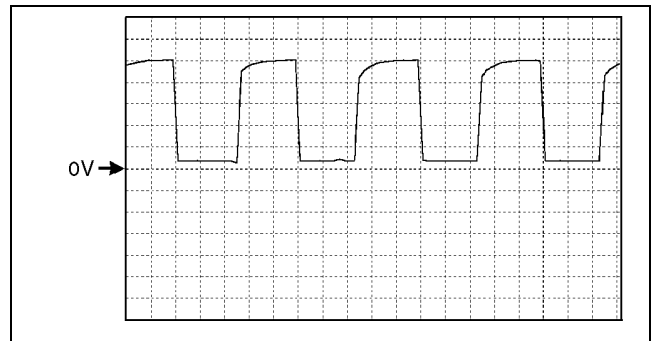
- Connecting terminal: W (+)-AP (-)
- Measuring device setting: 1V/DIV (Y) 5 ms/DIV (X)
- Measuring condition: Idle



Z5U513WA6

Vehicle speed signal

- Connecting terminal: AC (+)-AP (-)
- Measuring device setting: 1V/DIV (Y) 5ms/DIV (X)
- Measuring condition: Vehicle speed at 30 km/h {18.6 mph}



Z5U513WA7

Output speed sensor

Connecting terminal: AF (+)-AP (-)

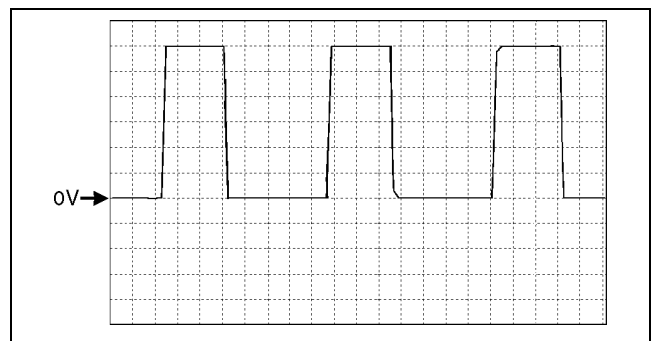
- Measuring device setting: 1V/DIV (Y) 5ms/DIV (X)
- Measuring condition: Vehicle speed at 30 km/h {18.6 mph}



Z5U513WA8

Engine speed signal

- Connecting terminal: AG (+)-AP (-)
- Measuring device setting: 2V/DIV (Y) 5 ms/DIV (X)
- Measuring condition: Idle



Z5U513WA9

TRANSMISSION CONTROL MODULE (TCM) REMOVAL/INSTALLATION

A5U051318901W02

1. Disconnect the negative battery cable.
2. Disconnect the TCM connector.
3. Remove the TCM.

4. Install the TCM.

Tightening torque

36 N·m {3.7 kgf·m, 27 ft·lbf}

5. Connect the TCM connector.
6. Connect the negative battery cable.

AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION

A5U051301026W05

1. Disconnect the negative battery cable.
2. Drain the ATF. (See 05–13–9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
3. Remove the cross member bracket. (16-inch wheel model) (See 02–14–9 CROSSMEMBER BRACKET REMOVAL/INSTALLATION.)
4. Remove the rear crossbar. (16-inch wheel model) (See 02–14–8 REAR CROSSMEMBER REMOVAL/INSTALLATION.)
5. Remove the exhaust system. (See 01–15–1 EXHAUST SYSTEM REMOVAL/INSTALLATION.)
6. Remove the propeller shaft. (See 03–15–2 PROPELLER SHAFT REMOVAL/INSTALLATION.)

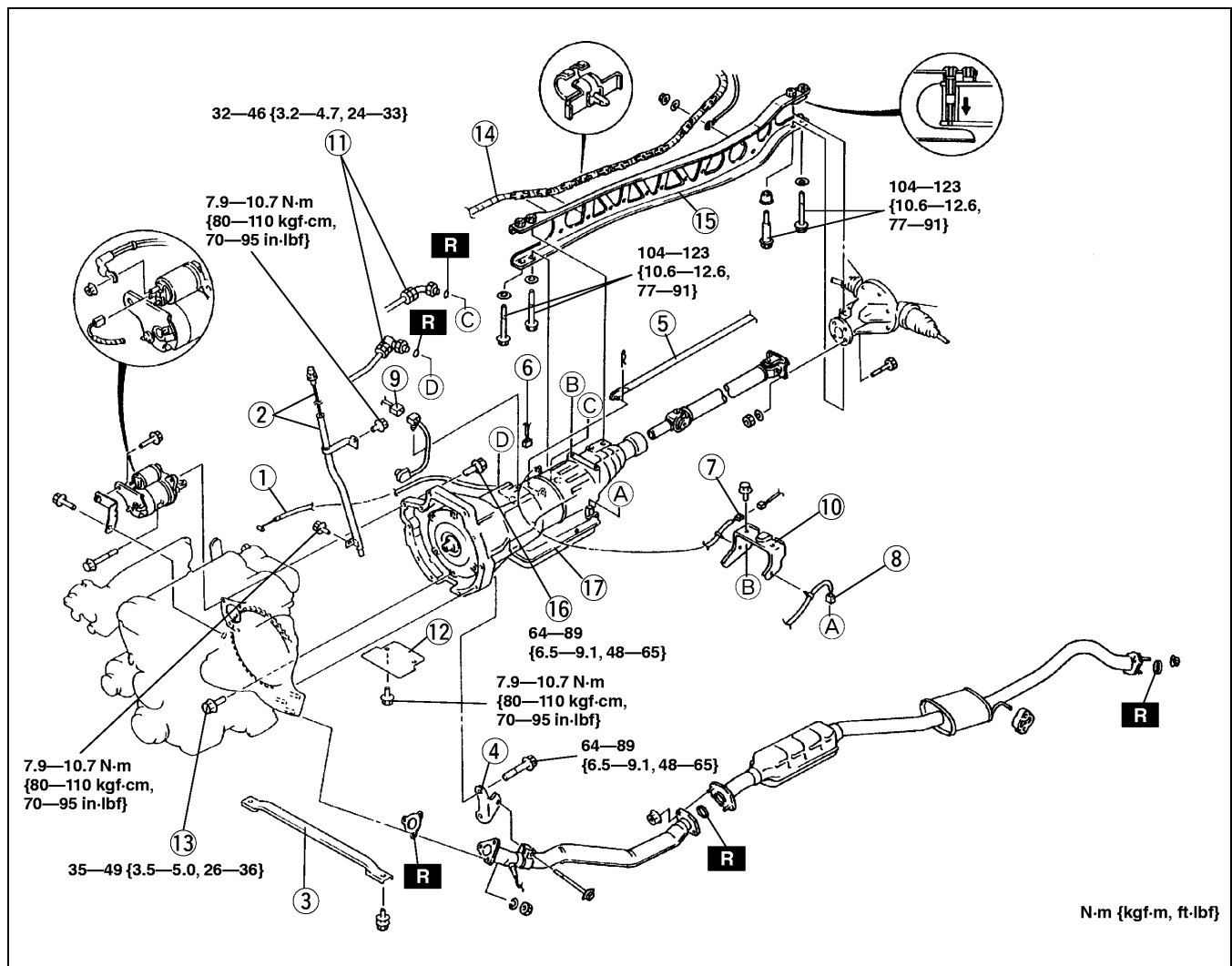
Warning

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

7. Remove in the order indicated in the table.
8. Install in the reverse order of removal.
9. Add ATF to the specified level. (See 05–13–9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
10. Connect the negative battery cable.
11. Inspect the operation of the transmission range switch. (See 05–13–14 Inspection of Operation.)
12. Inspect the operation of the selector lever. (See 05–14–5 SELECTOR LEVER INSPECTION.)
13. Carry out the mechanical system test. (See 05–13–5 MECHANICAL SYSTEM TEST.)
14. Carry out the road test. (See 05–13–7 ROAD TEST.)

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AUTOMATIC TRANSMISSION



X5U513WB0

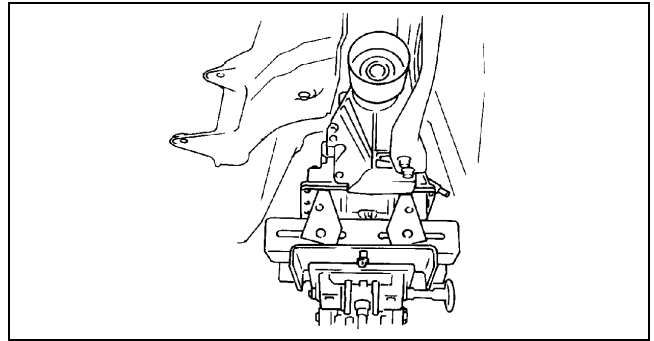
1	Throttle cable (See 01-13-9 ACCELERATOR CABLE INSPECTION/ADJUSTMENT)
2	Filler tube, dipstick
3	Performance rod
4	Exhaust bracket
5	Shift rod
6	TR switch connector
7	Output speed sensor connector
8	Solenoid connector
9	Input/turbine speed sensor
10	Harness bracket
11	Oil pipe (See 01-11-4 OIL COOLER REMOVAL/ INSTALLATION)

12	Undercover
13	Torque converter bolts (See 05-13-29 Torque Converter Bolts Installation Note)
14	Harness
15	Power plant frame (See 05-13-27 Power Plant Frame (PPF) Removal Note) (See 05-13-29 Power Plant Frame (PPF) Installation Note)
16	Transmission mount bolts
17	Transmission (See 05-13-28 Transmission Installation Note)

AUTOMATIC TRANSMISSION

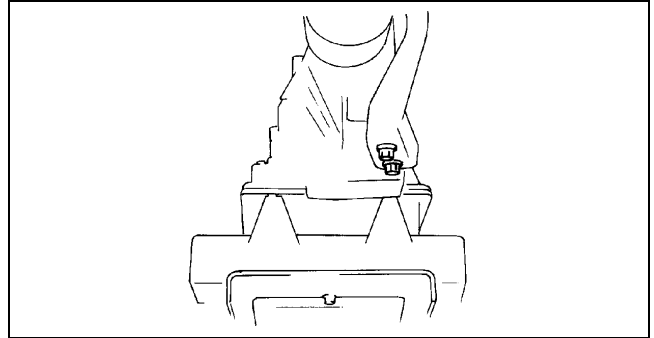
Power Plant Frame (PPF) Removal Note

1. Disconnect the wire harness from the power plant frame.
2. Support the transmission on a jack.



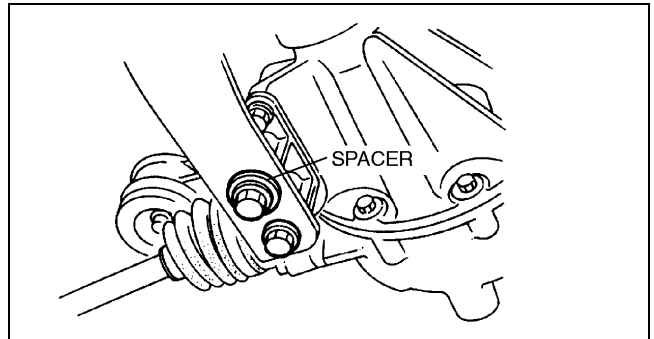
X5U513WB1

3. Remove the front bolts.



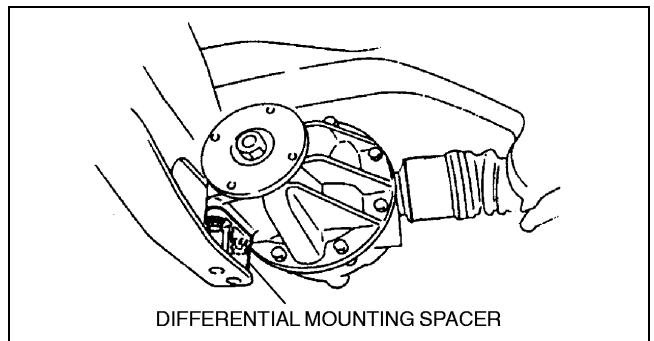
X5U513WB2

4. Remove the differential side bolts, and pry out the bolt spacer.



X5U513WB3

5. Remove the differential mounting spacer.



X5U513WB4

05-13

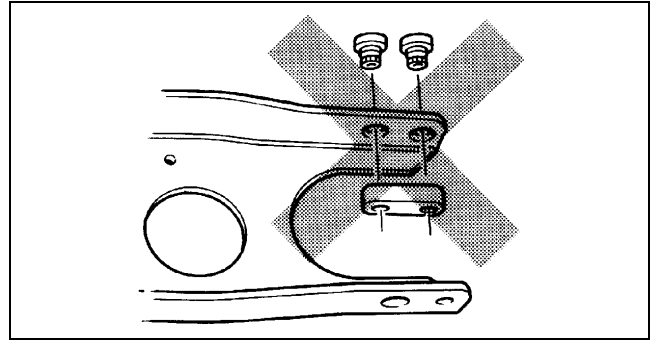
AUTOMATIC TRANSMISSION

6. Remove the transmission side bolts, and remove the PPF. Do not remove the spacers from the PPF.

- If the spacers are removed, replace the PPF as a component.

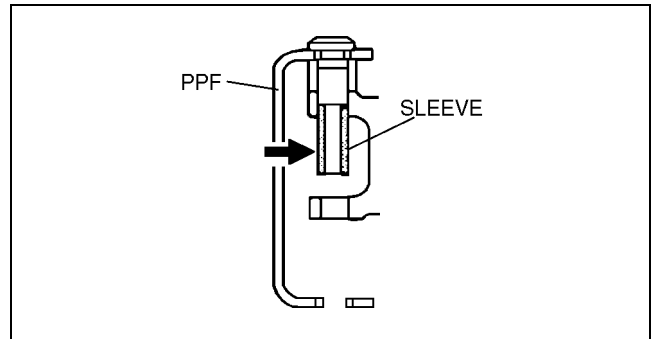
Note

- If the sleeve cannot be removed easily, tap the side of the sleeve with a plastic hammer.



X5U513WB5

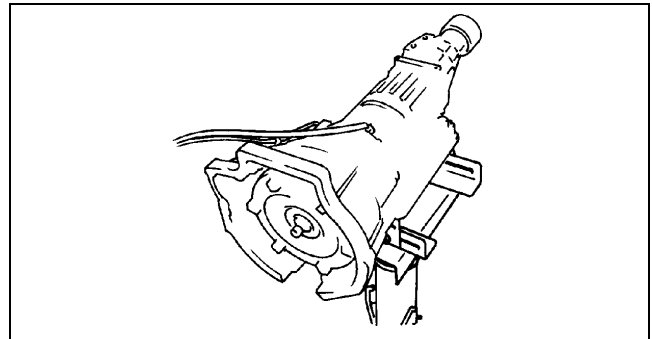
7. Remove the sleeve.



Z5U513WAA

Transmission Removal Note

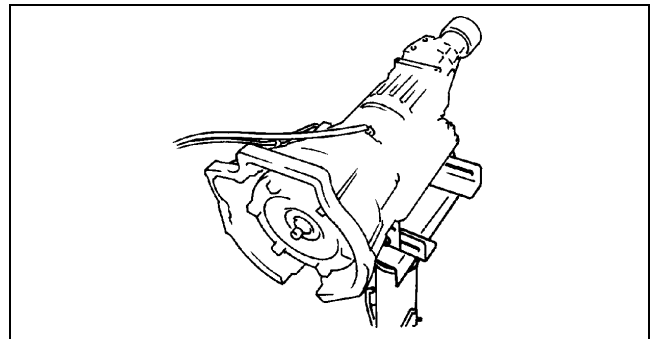
1. Set the transmission onto the transmission jack, paying special attention not to damage the oil pipes. Make sure that the torque converter side of the transmission is tilted slightly upward during removal. Carefully lower the transmission from the vehicle.



X5U513WB6

Transmission Installation Note

1. Set the transmission onto the transmission jack, paying special attention not to damage the oil pipes. Make sure that the torque converter side of the transmission is tilted slightly upward.



X5U513WB6

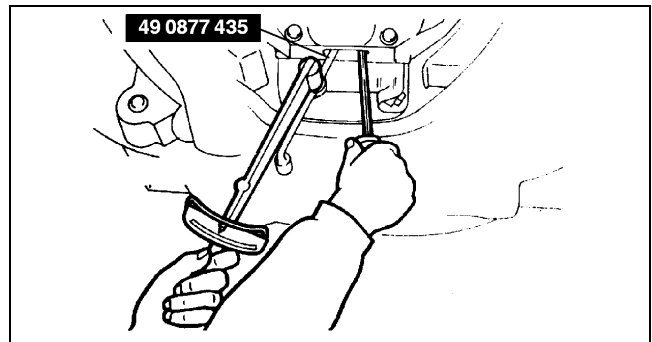
AUTOMATIC TRANSMISSION

Torque Converter Bolts Installation Note

1. Align the holes while turning the torque converter.
2. Lock the drive plate using a screwdriver.
3. Hand-tighten the torque converter mounting bolts in a crisscross pattern.
4. Modify the torque converter mounting bolts tightening torque to allow for a torque wrench **SST combination**. (See 00-00-15 Torque Formulas.)
5. Tighten the torque converter mounting bolts using the **SST**.

Tightening torque

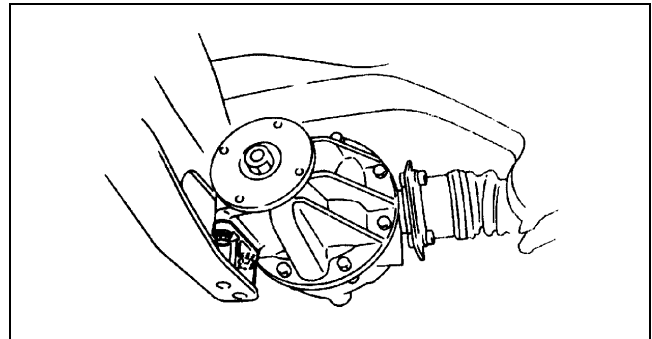
35—49 N·m {3.5—5.0 kgf·m, 26—36 ft·lbf}



X5U513WB8

Power Plant Frame (PPF) Installation Note

1. Install the differential mounting spacer.
2. Support the transmission on a jack so that it is level.
3. Position the PPF and install the sleeve.
4. Install the spacer and bolts, and tighten the reamer bolt firmly. The reamer bolt should be installed in the forward hole.

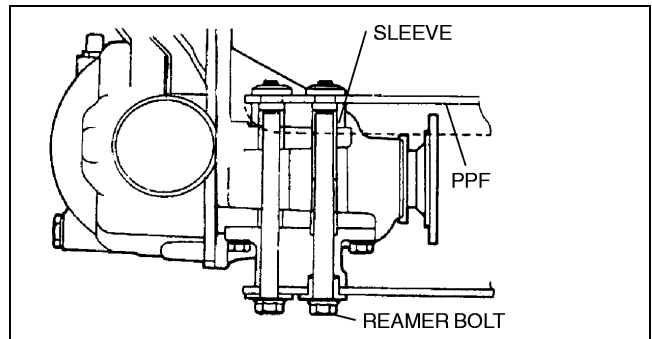


X5U513WB9

5. Tighten the outer bolts snugly.

Tightening torque

104—123 N·m {10.6—12.6 kgf·m, 77—91 ft·lbf}



X5U513WBA

05-13

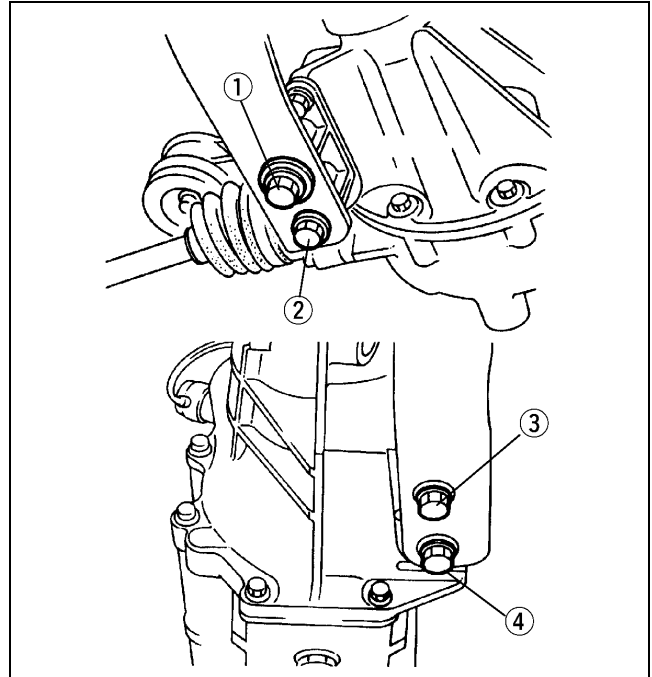
AUTOMATIC TRANSMISSION

6. Tighten the bolts to the specified torque in the order shown.

Tightening torque

104—123 N·m {10.6—12.6 kgf·m, 77—91 ft·lbf}

7. Remove the jack.

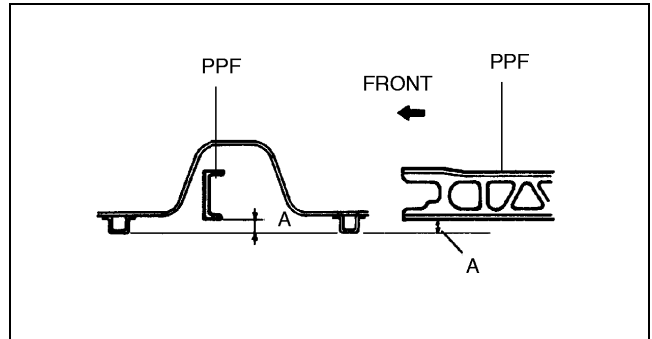


X5U513WBB

8. Measure distance A using a straightedge and vernier calipers.
 - If the distance is not within the specification, reposition the power plant frame at the transmission.

Distance A

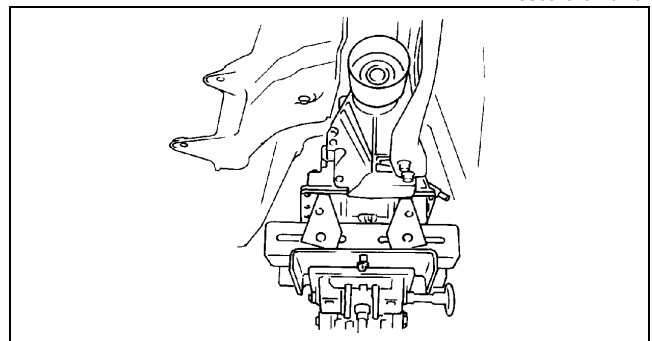
50.5—62.5 mm {1.99—2.46 in}



X5U513WBC

EXTENSION HOUSING REMOVAL/INSTALLATION

1. Clean the transmission exterior thoroughly using a steam cleaner or cleaning solvent.
2. Disconnect the negative battery cable.
3. Drain the ATF. (See 05-13-9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
4. Disconnect the output speed sensor connector.
5. Remove the exhaust system. (See 01-15-1 EXHAUST SYSTEM REMOVAL/INSTALLATION.)
6. Remove the propeller shaft. (See 03-15-2 PROPELLER SHAFT REMOVAL/INSTALLATION.)
7. Support the transmission on a jack.
8. Remove the power plant frame.



X5U513WAC

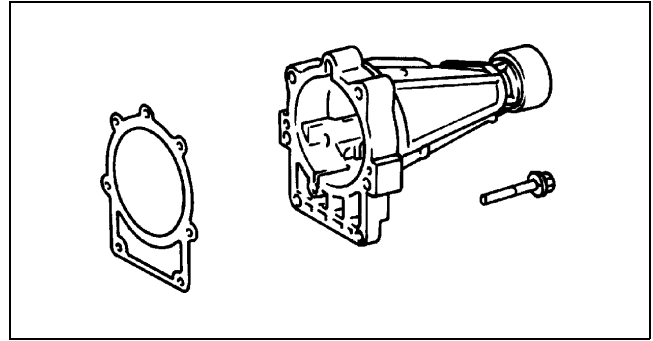
AUTOMATIC TRANSMISSION

9. Remove the extension housing and gasket.
10. Install a new gasket and extension housing on the transmission case.

Tightening torque

24—41 N·m {2.4—4.2 kgf·m, 18—30 ft·lbf}

11. Install the power plant frame.
12. Install the propeller shaft. (See 03-15-2 PROPELLER SHAFT REMOVAL/INSTALLATION.)
13. Install the exhaust system. (See 01-15-1 EXHAUST SYSTEM REMOVAL/INSTALLATION.)
14. Connect the speed sensor connector.
15. Add ATF to the specified level. (See 05-13-9 ATF Level Inspection.)
16. Carry out the line pressure test. (See 05-13-5 Line Pressure Test.)
17. Carry out the road test. (See 05-13-7 ROAD TEST.)



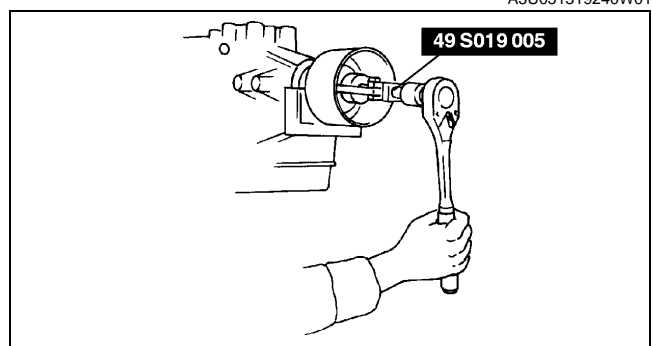
X5U513WBD

OIL SEAL (TRANSMISSION) REPLACEMENT

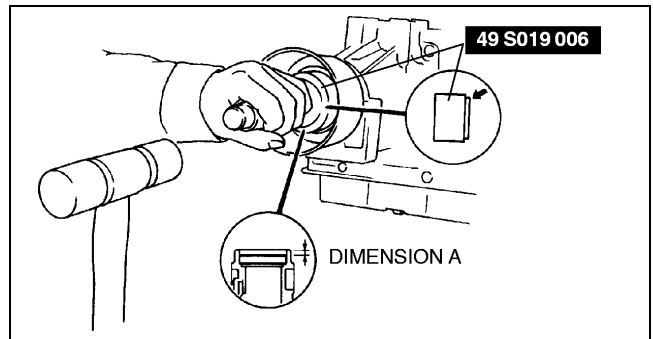
1. Clean the transmission exterior thoroughly using a steam cleaner or cleaning solvent.
2. Drain the ATF. (See 05-13-9 ATF Level Inspection.)
3. Remove the exhaust pipe. (See 01-15-1 EXHAUST SYSTEM REMOVAL/INSTALLATION.)
4. Remove the propeller shaft. (See 03-15-2 PROPELLER SHAFT REMOVAL/INSTALLATION.)
5. Remove the oil seal using the **SST**.
6. Apply ATF to a new oil seal lip.
7. Install the oil seal to the position shown in the figure within dimension A as follows using the convex part of the **SST**.

Dimension A

6. 2—6.8 mm {0.25—0.26 in}



X5U513WBE



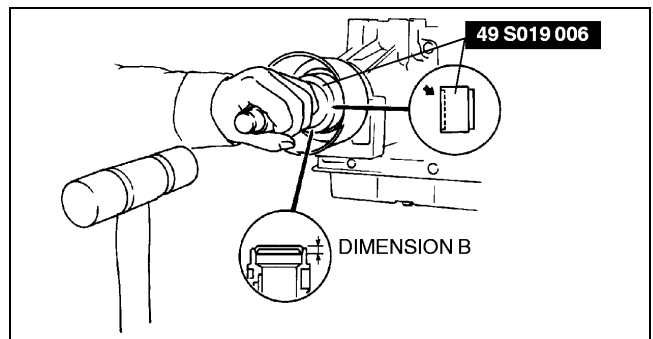
X5U513WBF

8. Install the retainer to dimension B position using the concave part of the **SST**.

Dimension B

0. 7—1.3 mm {0.03—0.05 in}

9. Install the propeller shaft. (See 03-15-2 PROPELLER SHAFT REMOVAL/INSTALLATION.)
10. Install the exhaust pipe. (See 01-15-1 EXHAUST SYSTEM REMOVAL/INSTALLATION.)
11. Add ATF to the specified level. (See 05-13-9 ATF Level Inspection.)
12. Carry out the line pressure test. (See 05-13-5 Line Pressure Test.)
13. Carry out the road test. (See 05-13-7 ROAD TEST.)



X5U513WBG

AUTOMATIC TRANSMISSION

CONTROL VALVE BODY REMOVAL/INSTALLATION

A5U051321100W01

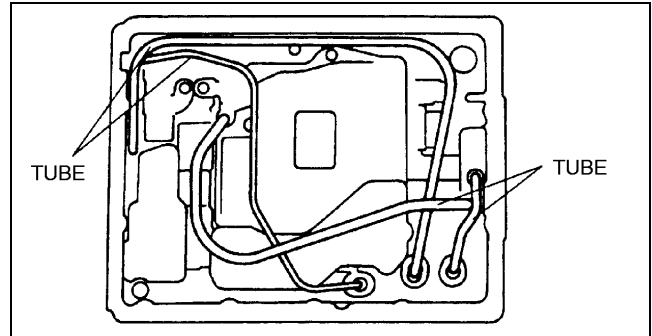
On-Vehicle Removal

1. Clean the transmission exterior thoroughly with a steam cleaner or cleaning solvents.
2. Disconnect the negative battery cable.
3. Drain the ATF. (See 05-13-9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
4. Remove the oil pan and gasket.

Caution

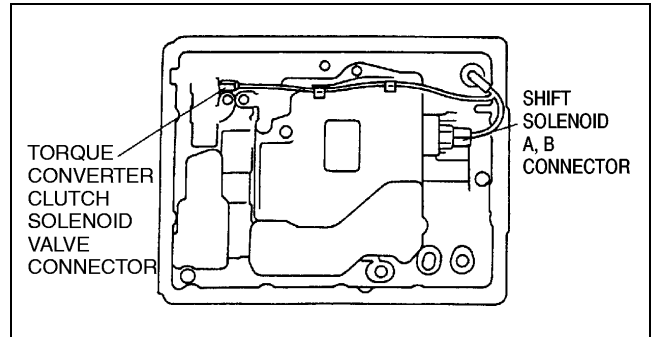
- To prevent deformation of the tube, remove the tube by pulling both ends up.

5. Remove the tubes.
6. Disconnect shift solenoids A, B, and torque converter clutch solenoid valve connectors.



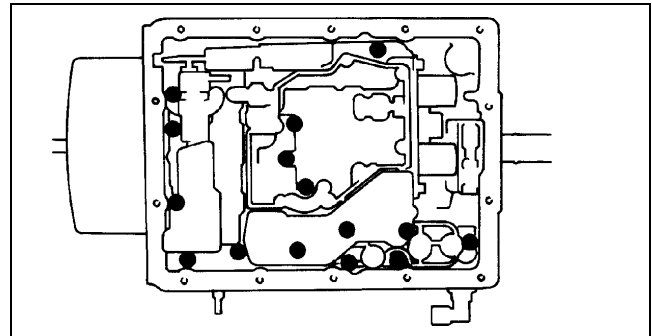
X5U513WBH

7. Remove the oil strainer.



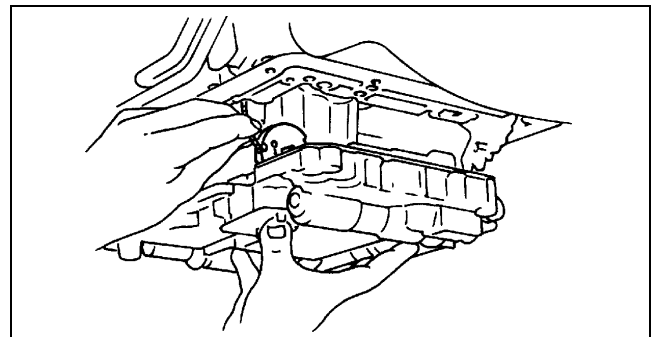
X5U513WBJ

8. Remove the control valve body installation bolts.



X5U513WA9

9. Remove the nipple of the throttle cable from the throttle cam.
10. Remove the control valve body.
11. Remove the accumulator spring.

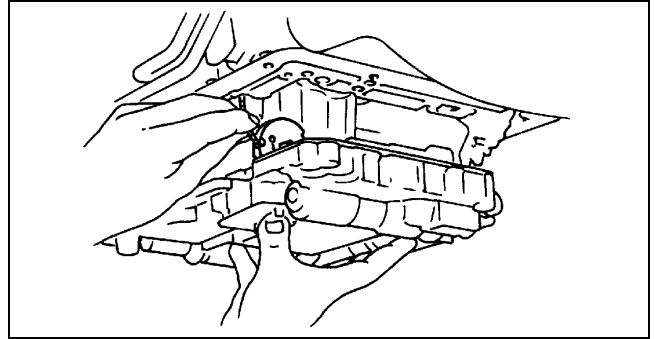


X5U513WBL

AUTOMATIC TRANSMISSION

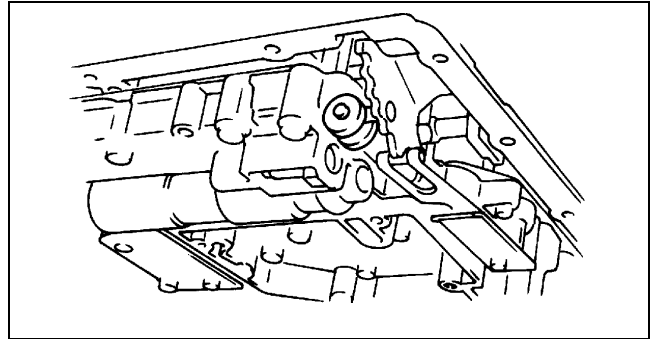
On-Vehicle Installation

1. Set the accumulator springs into the control valve body as shown.
2. Install the nipple of the throttle cable to the throttle cam.



X5U513WBN

3. Verify that the manual valve and manual shaft are assembled correctly.
4. Install the control valve body.



X5U513WBP

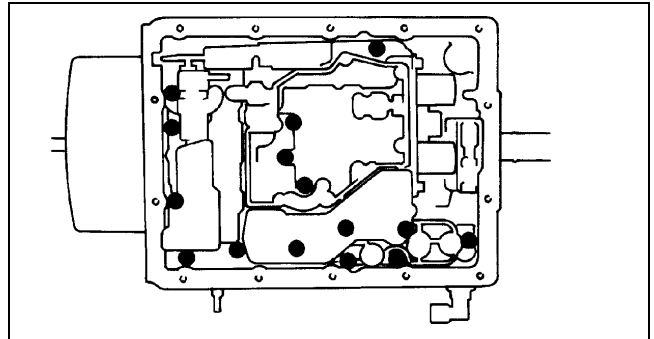
Tightening torque

7. 9—11.7 N·m {80—120 kgf·cm, 70—104 in·lbf}

5. Install the oil strainer.

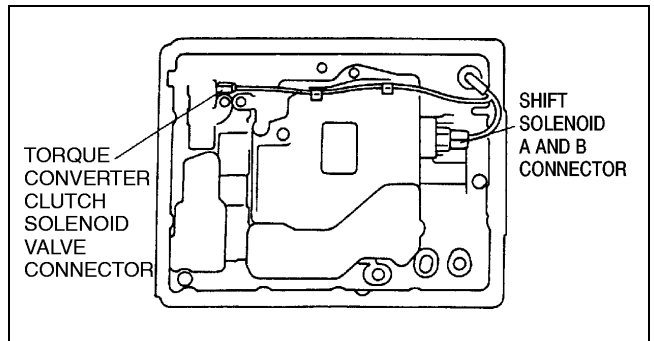
Tightening torque

5.0—5.8 N·m {50—60 kgf·cm, 44—52 in·lbf}



X5U513WA9

6. Connect shift solenoids A, B, and torque converter clutch solenoid valve connectors.



X5U513WBR

05-13

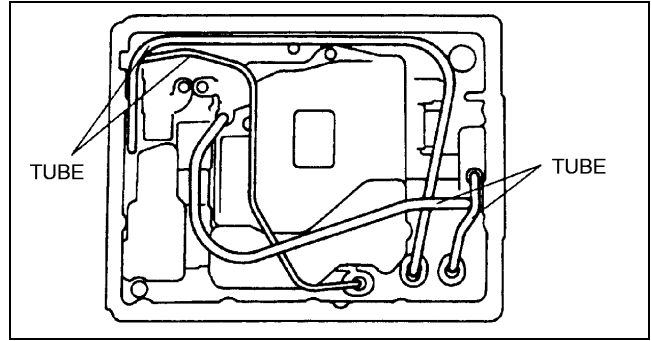
AUTOMATIC TRANSMISSION

7. Install the tubes.
8. Install the new gasket and oil pan.

Tightening torque

4.0—4.9 N·m {40—50 kgf·cm, 35—43 in·lbf}

9. Add ATF to the specified level. (See 05-13-9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
10. Carry out the mechanical test. (See 05-13-5 MECHANICAL SYSTEM TEST.)
11. Carry out the road test. (See 05-13-7 ROAD TEST.)



X5U513WBH

TORQUE CONVERTER REMOVAL/INSTALLATION

A5U051319100W01

1. Remove the transmission. (See 05-13-25 AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION.)

Caution

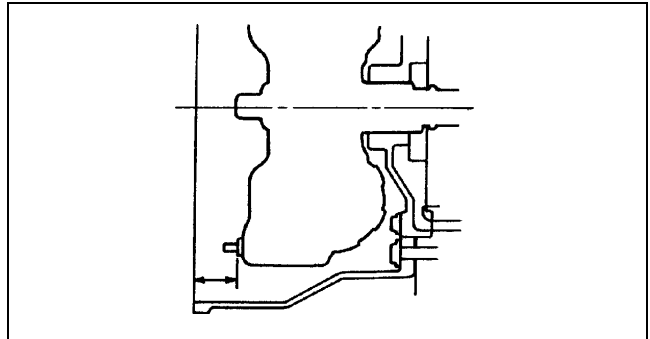
- The oil seal is easily damaged by the sharp edges of the torque converter splines. Do not let the splines contact the oil seal.

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. Pour in solvent (**approx. 0.50 L {0.53 Us qt, 0.44 Imp qt}**).
5. Shake the torque converter to clean the inside. Pour out the solvent.
6. Install the torque converter in the converter housing while rotating it to align the splines.
7. 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

22.7 mm {0.894 in}

8. Install the transmission. (See 05-13-25 AUTOMATIC TRANSMISSION REMOVAL/INSTALLATION.)



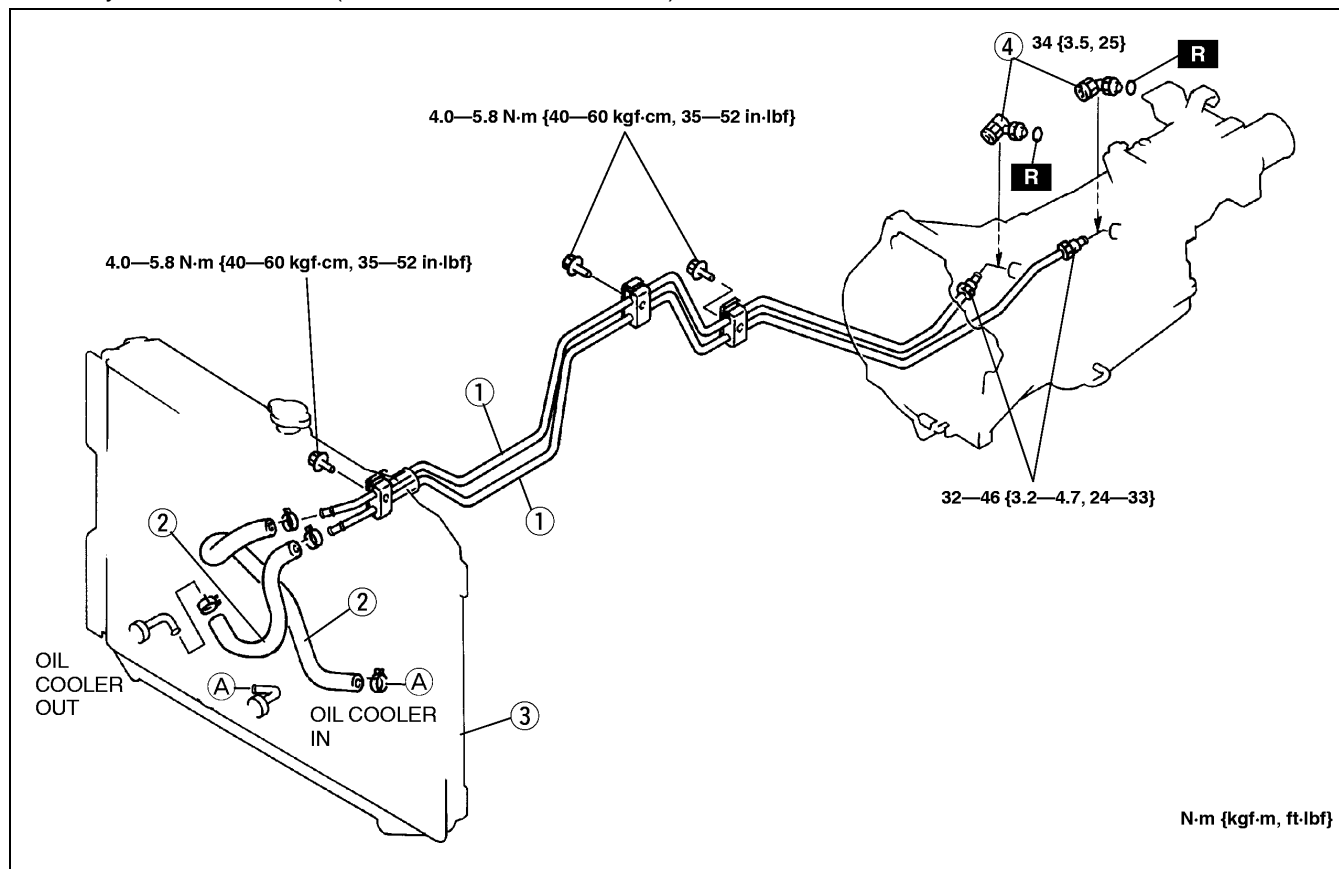
X5U513WBS

AUTOMATIC TRANSMISSION

OIL COOLER REMOVAL/INSTALLATION

A5U051319900W01

1. Disconnect the negative battery cable.
2. Drain the ATF. (See 05-13-9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
3. Remove in the order indicated in the table.
4. Install in the reverse order of removal.
5. Add ATF to the specified level. (See 05-13-9 AUTOMATIC TRANSMISSION FLUID (ATF) REPLACEMENT.)
6. Connect the negative battery cable.
7. Inspect for oil leakage from the oil pipes and oil hoses.
8. Inspect the ATF level and condition. (See 05-13-9 ATF Level Inspection.)
9. Carry out the mechanical system test. (See 05-13-5 MECHANICAL SYSTEM TEST.)
10. Carry out the road test. (See 05-13-7 ROAD TEST.)



X5U513WBU

1	Oil pipe
2	Oil hose

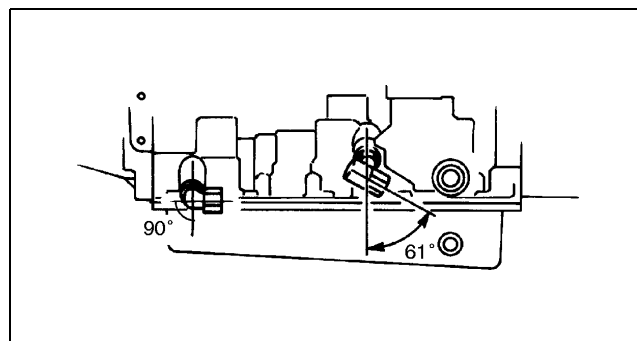
3	Radiator (in tank oil cooler) (See 05-13-36 Radiator (In Tank Oil Cooler) Installation Note)
4	Elbow (See 05-13-35 Elbow Installation Note)

Elbow Installation Note

1. Apply ATF to the O-ring, then install it to the elbow.
2. Install the elbows in the angle shown in the figure, then tighten the nut.

Tightening torque

34 N-m {3.5 kgf-m, 25 ft-lbf}



X5U513WBV

05-13

AUTOMATIC TRANSMISSION

Radiator (In Tank Oil Cooler) Installation Note

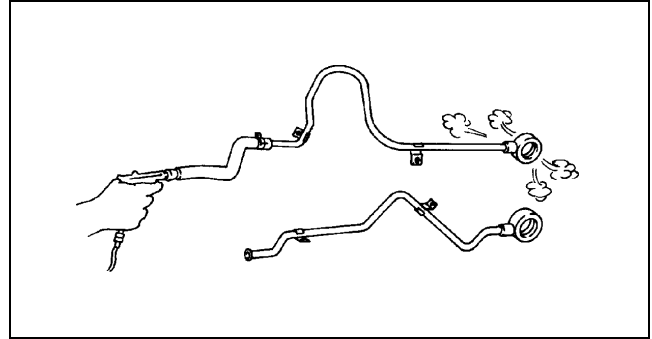
1. The automatic transmission oil cooler flushing must be performed whenever a transmission is removed for service to remove existing fluid which may be contaminated to prevent contamination of new fluid. The flushing must be performed after installation of the overhauled or replaced transmission.
2. Follow the instruction in the manufacturers publication for flushing operation.

Oil Hose Installation Note

Caution

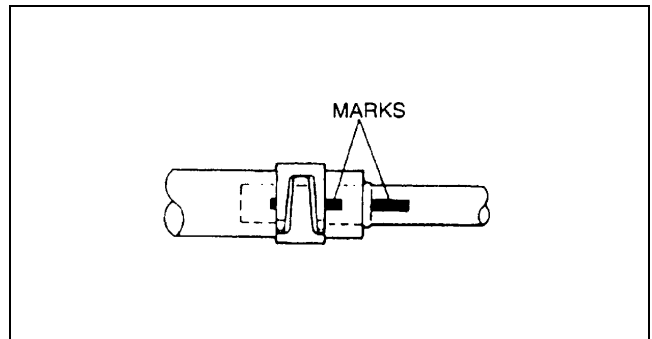
- In order to prevent ATF leakage, replace the hose when any damage is found inside or outside of the hose, especially on areas contacting with pipes.

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



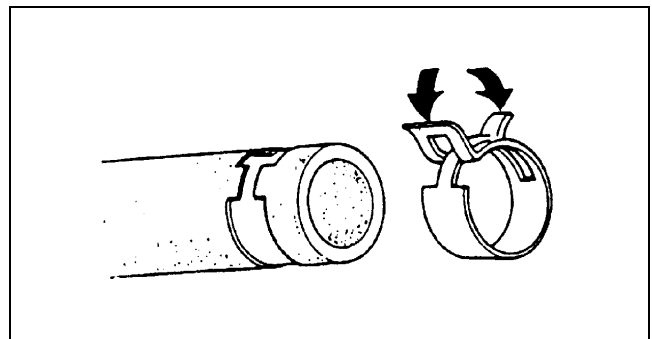
X5U513WBW

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



X5U513WBX

3. Install the hose clamp onto the hose.
 - If reusing the hose, install a new hose clamp exactly onto the mark left by the previous hose clamp.
4. Verify that the hose clamp does not interfere with any other parts.



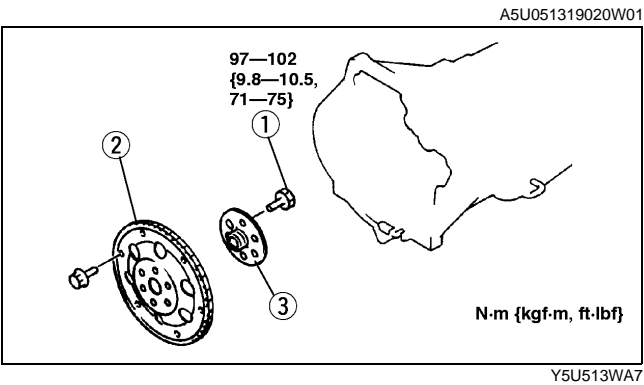
X5U513WBY

AUTOMATIC TRANSMISSION

DRIVE PLATE REMOVAL/INSTALLATION

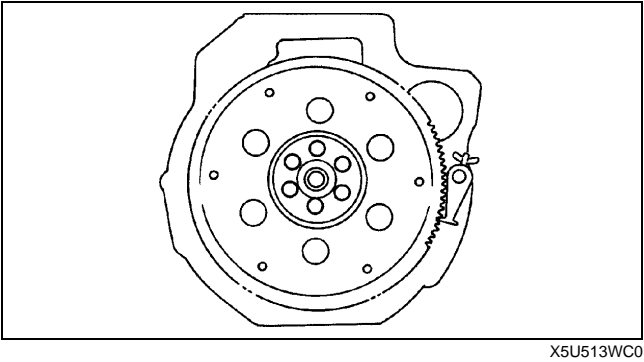
1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.

1	Drive plate mounting bolts (See 05-13-37 Drive Plate Mounting Bolts Removal Note) (See 05-13-37 Drive Plate Mounting Bolts Installation Note)
2	Drive plate
3	Adapter



Drive Plate Mounting Bolts Removal Note

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



05-13

Drive Plate Mounting Bolts Installation Note

1. Set the **SST** against the drive plate.
2. Tighten the drive plate mounting bolts gradually in the order shown.

Tightening torque

97—102 N·m {9.8—10.5 kgf·m, 71—75 ft·lbf}

