

AUTOMATIC TRANSAXLE SYSTEM

PRECAUTION

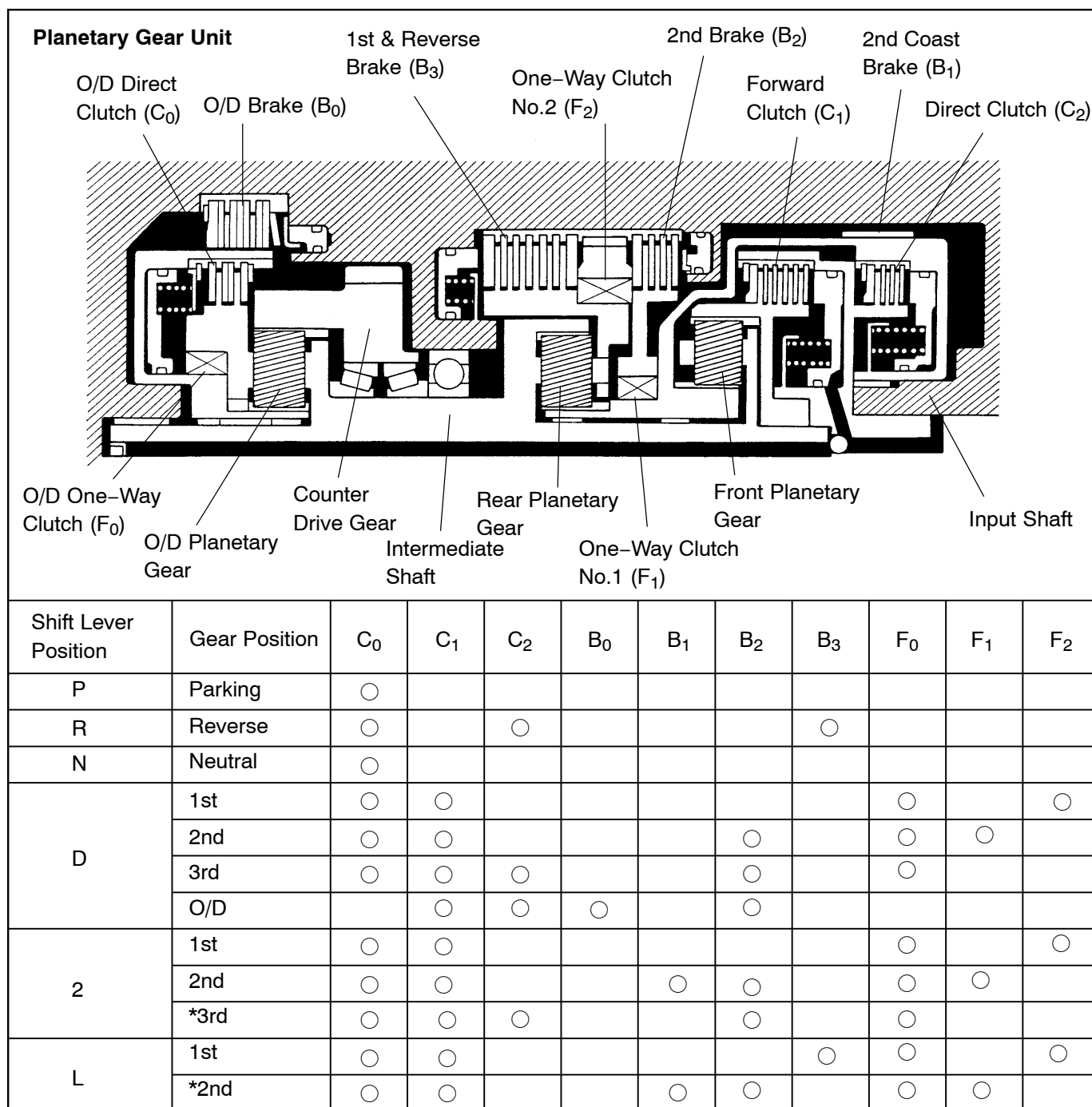
AX04K-02

When working with FIPG material, you must observe the followings.

- Using a razor blade and a gasket scraper, remove all the old FIPG material from the gasket surfaces.
- Thoroughly clean all components to remove all the loose material.
- Clean both sealing surfaces with a non-residue solvent.
- Apply FIPG in an approx. 1 mm (0.04 in.) wide bead along the sealing surface.
- Parts must be assembled within 10 minutes of application. Otherwise, the FIPG material must be removed and reapplied.

If the vehicle is equipped with a mobile communication system, refer to the precaution in the IN section.

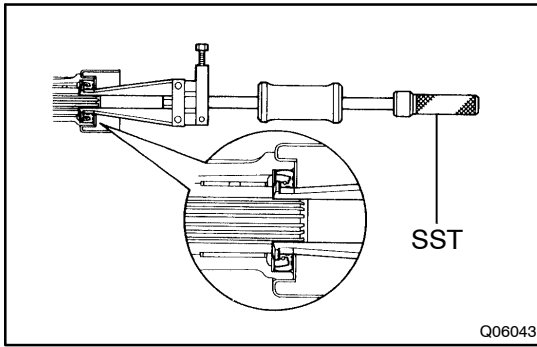
OPERATION



*Down-shift only – no up-shift

○ : Operating

D00690



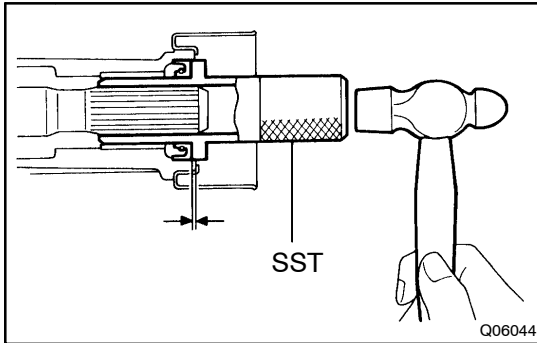
EXTENSION HOUSING OIL SEAL ON-VEHICLE REPAIR

AX04M-02

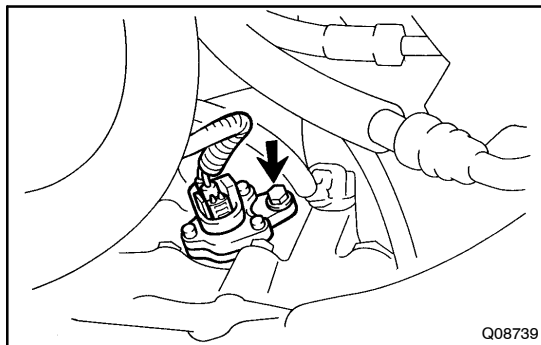
1. DRAIN TRANSFER OIL
2. REMOVE PROPELLER SHAFT
(See page [PR-3](#))
3. REMOVE EXTENSION HOUSING OIL SEAL

Using SST, remove the oil seal.

SST 09308-00010



4. INSTALL EXTENSION HOUSING OIL SEAL
 - (a) Using SST and a hammer, driver in a new oil seal.
SST 09325-20010
Oil seal depth: 1.5 ± 0.4 mm (0.059 ± 0.016 in.)
 - (b) Coat the lip of the oil seal with MP grease.
5. INSTALL PROPELLER SHAFT
(See page [PR-9](#))
6. FILL TRANSFER WITH OIL
(See page [DI-173](#))

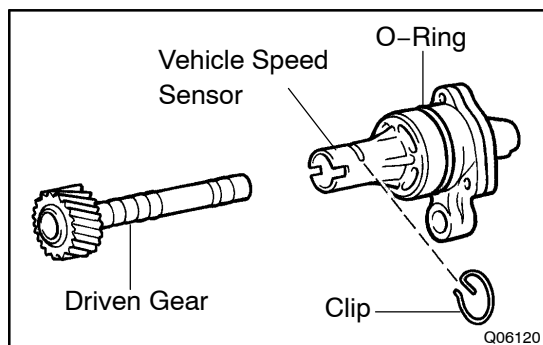


VEHICLE SPEED SENSOR ON-VEHICLE REPAIR

AX04N-01

1. REMOVE FRONT SPEED SENSOR

- Remove the air cleaner assembly.
- Disconnect the front speed sensor connector.
- Remove the bolt and front speed sensor assembly.

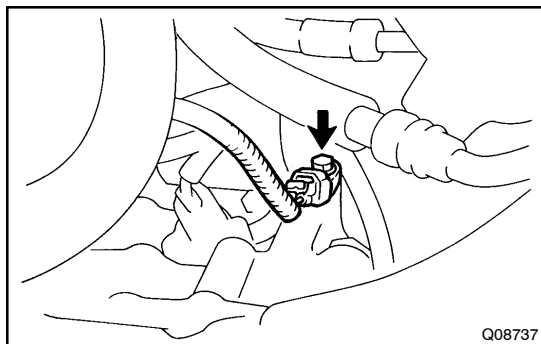


- Remove the clip and speedometer driven gear from the front speed sensor.

- Remove the O-ring from the front speed sensor.

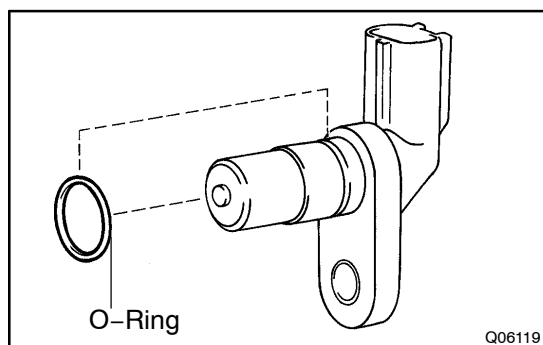
2. INSTALL FRONT SPEED SENSOR ASSEMBLY

- Coat a new O-ring with ATF and install it to the front speed sensor.
 - Install the speedometer driven gear to the front speed sensor with the clip.
 - Install the front speed sensor assembly with the bolt.
- Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)**
- Connect the front speed sensor connector.
 - Install the air cleaner assembly.



3. REAR SPEED SENSOR

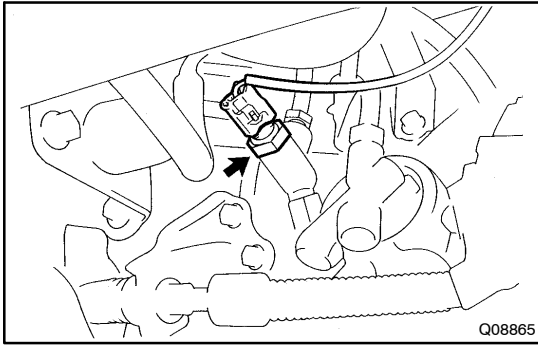
- Remove the air cleaner assembly.
- Disconnect the rear speed sensor connector.
- Remove the bolt and rear speed sensor.



- Remove the O-ring from the rear speed sensor.

4. INSTALL REAR SPEED SENSOR

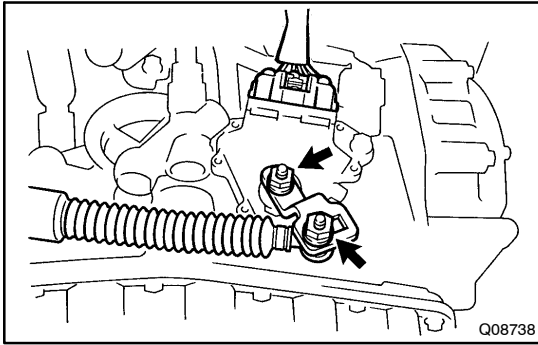
- Coat a new O-ring with ATF and install it to the rear speed sensor.
 - Install the rear speed sensor with the bolt.
- Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)**
- Connect the rear speed sensor connector.
 - Install the air cleaner assembly.



ATF TEMPERATURE SWITCH ON-VEHICLE REPAIR

AX040-01

- 1. REMOVE NO.2 ENGINE UNDER COVER**
- 2. REMOVE ATF TEMPERATURE SWITCH**
 - (a) Disconnect the ATF temperature switch connector.
 - (b) Remove the ATF temperature switch.
- 3. INSTALL ATF TEMPERATURE SWITCH**
 - (a) Install the ATF temperature switch.
 - (b) Connect the ATF temperature switch connector.
- 4. INSTALL NO.2 ENGINE UNDER COVER**

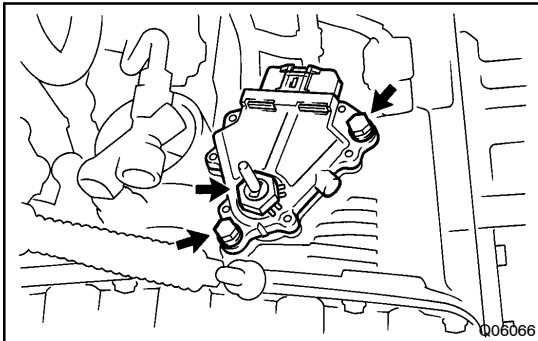


PARK/NEUTRAL POSITION (PNP) SWITCH

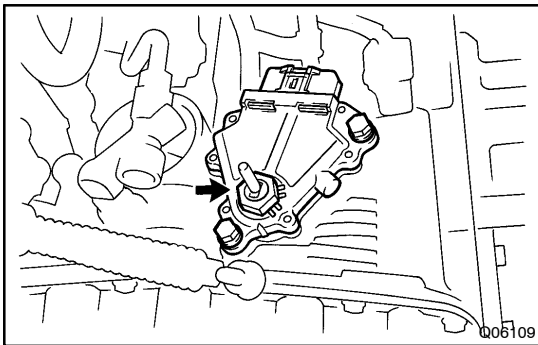
AX128-01

ON-VEHICLE REPAIR

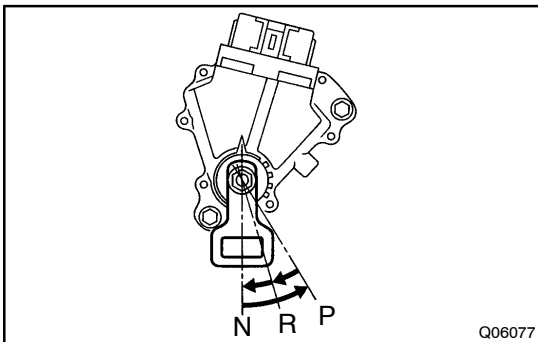
1. REMOVE NO.2 ENGINE UNDER COVER
2. DISCONNECT PARK/NEUTRAL POSITION SWITCH CONNECTOR
3. REMOVE PARK/NEUTRAL POSITION SWITCH
 - (a) Remove the nut and disconnect the shift control cable.
 - (b) Remove the nut and shift control lever.
 - (c) Using a screwdriver, pry off the lock plate.



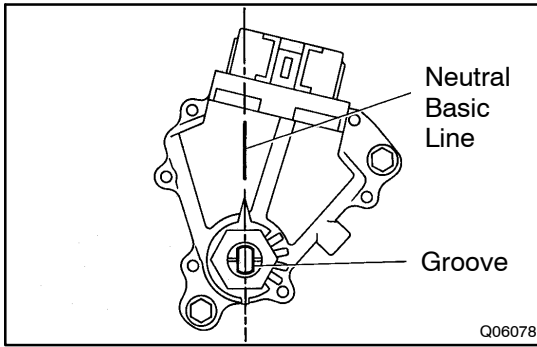
- (d) Remove the nut and lock plate.
- (e) Remove the 2 bolts and pull out the park/neutral position switch.



4. INSTALL AND ADJUST PARK/NEUTRAL POSITION SWITCH
 - (a) Install the park/neutral position switch to the manual valve shaft with the 2 bolts and nut.
 - (b) Install a new lock plate and tighten the nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)
 - (c) Stake the nut with the lock plate.
 - (d) Temporarily install the manual valve lever shaft.



- (e) Turn the lever counterclockwise until it stops, then turn it clockwise 2 notches.
- (f) Remove the shaft control lever.



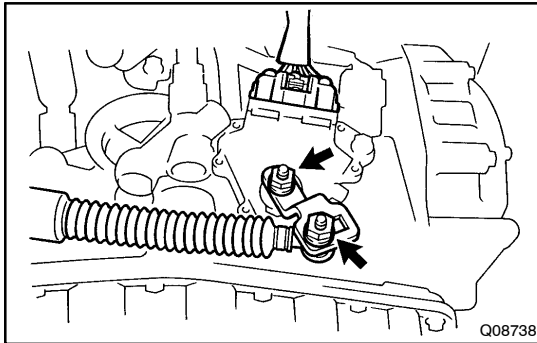
- (g) Adjust the park/neutral position switch
(See page [AX-6](#)).

HINT:

Align the groove and park/neutral basic line

- (h) Tighten the 2 bolts.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



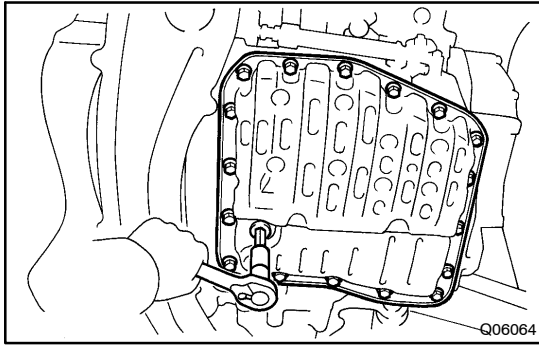
- (i) Install the shaft control lever with the nut.

Torque: 12.7 N·m (130 kgf·cm, 9 ft·lbf)

- (j) Connect the control cable with the nut.

5. CONNECT PARK/NEUTRAL POSITION SWITCH CONNECTOR

6. INSTALL NO.2 ENGINE UNDER COVER



VALVE BODY ASSEMBLY ON-VEHICLE REPAIR

AX129-01

1. **REMOVE NO.2 ENGINE UNDER COVER**
2. **DRAIN ATF**

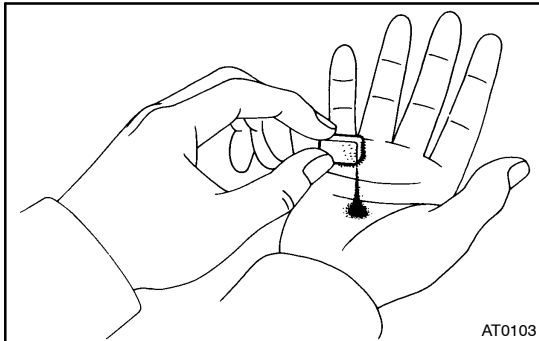
Using a 10 mm hexagon wrench, remove the drain plug, and drain the ATF into a suitable container.

3. **REMOVE OIL PAN AND GASKET**

- (a) Remove the 17 bolts.
- (b) Remove the oil pan by lifting transaxle case.

NOTICE:

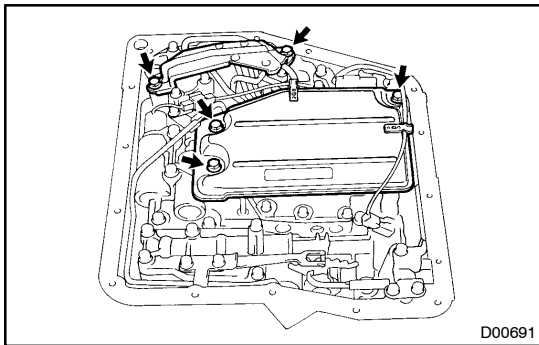
Some fluid remain in the oil pan.



4. **EXHAUST PARTICLES IN PAN**

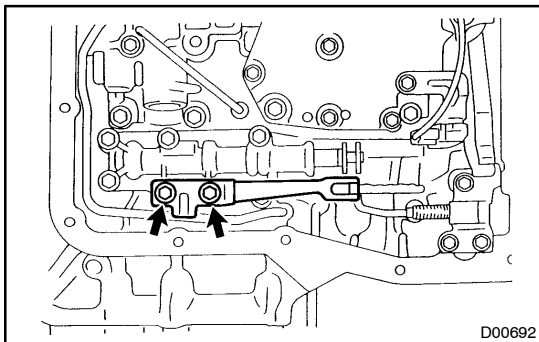
Remove the magnet and use it to collect any steel chips. Lock carefully at the chips and particles in the oil pan and on the magnet to anticipate when type of wear you will find in the trans-axle.

- Steel (magnetic): bearing, gear and plate wear
- Brass (non-magnetic): bushing wear



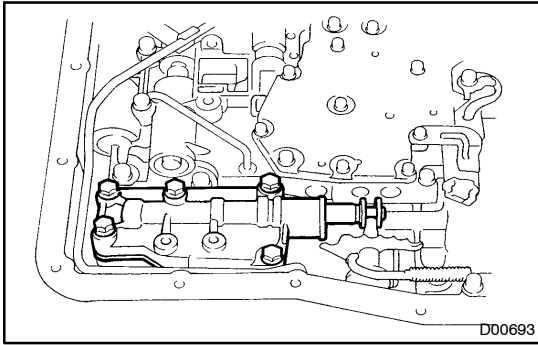
5. **REMOVE OIL PIPE BRACKET AND STRAINER**

- (a) Remove the 2 bolts and oil pipe bracket.
- (b) Remove the 3 bolts and strainer.
- (c) Remove the gasket from the strainer.

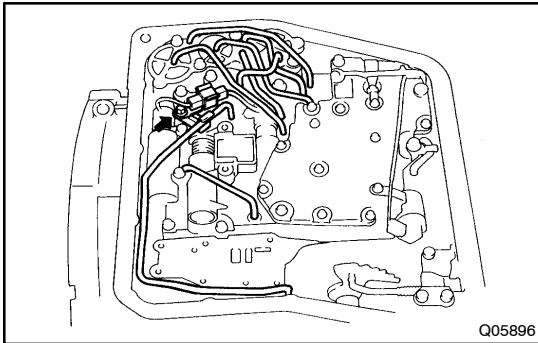


6. **REMOVE MANUAL VALVE BODY**

- (a) Remove the 2 bolts and detent spring.



- (b) Remove the 5 bolts and manual valve body with the manual valve.
- (c) Remove the manual valve from the manual valve body.

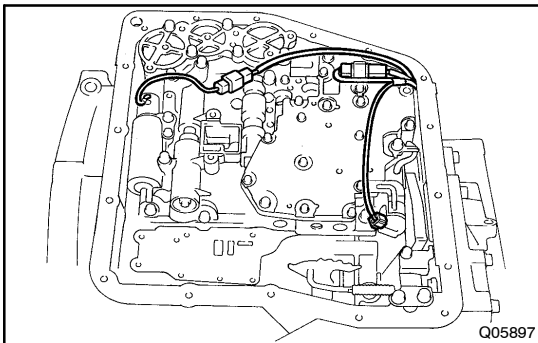


7. REMOVE OIL PIPE

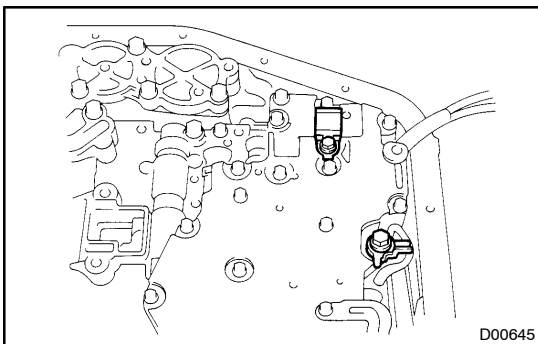
- (a) Remove the bolt and retainer.
- (b) Pry up both pipe ends with a large screwdriver and remove the 8 pipes.

NOTICE:

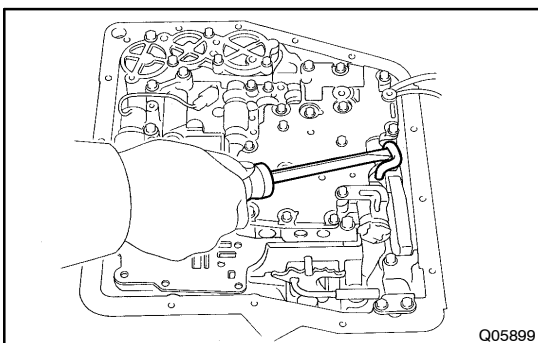
Be careful not to bend or damage the pipes.



8. DISCONNECT 3 SOLENOID CONNECTORS



9. REMOVE CONNECTOR CLAMP AND PIPE RETAINER

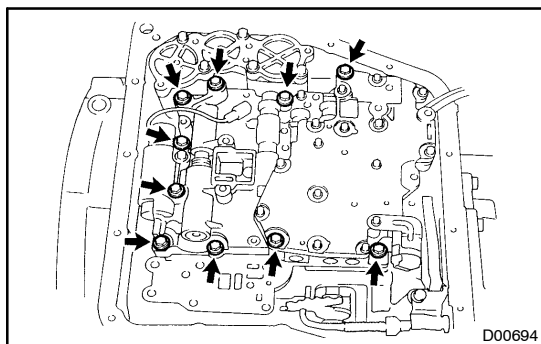


10. REMOVE B₃ APPLY PIPE

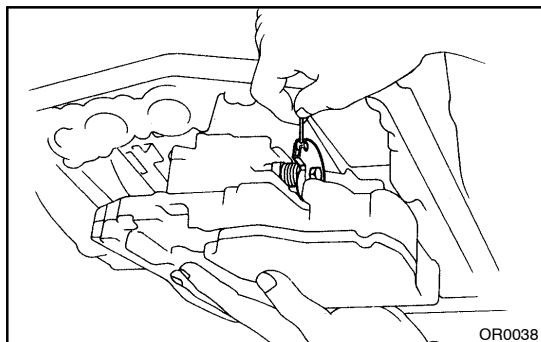
Pry up the pipe with a screwdriver and remove the pipe.

NOTICE:

Be careful not to bend or damage the pipes.

**11. REMOVE VALVE BODY**

- (a) Remove the 10 bolts.



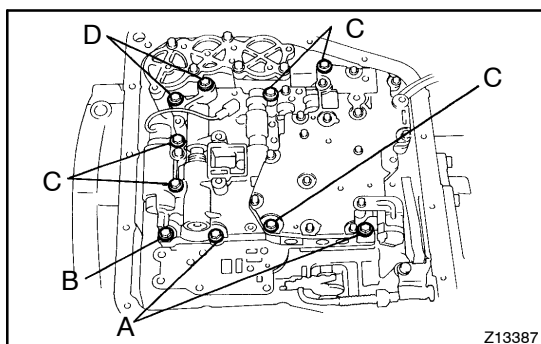
- (b) Disconnect the throttle cable from the cam and remove the valve body.

12. INSTALL VALVE BODY TO TRANSAXLE CASE

- (a) While holding the cam down with your hand, slip the cable end into the slot.
(b) Raise up the valve body into place.

NOTICE:

Do not entangle the solenoid wire.



- (c) Install and tighten the 10 bolts.

Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

HINT:

- Each bolt length is indicated below.
- Hand-tighten the 10 bolts first, then torque with a torque wrench.

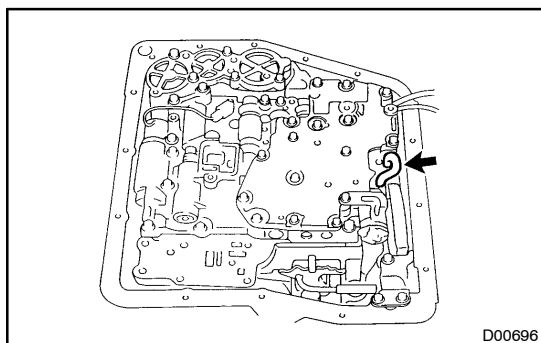
Bolt length:

Bolt A: 22 mm (0.87 in.)

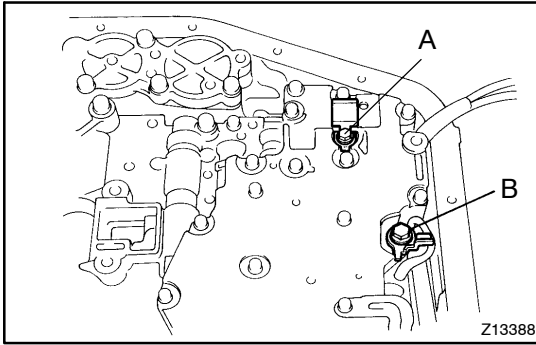
Bolt B: 32 mm (1.26 in.)

Bolt C: 43 mm (1.69 in.)

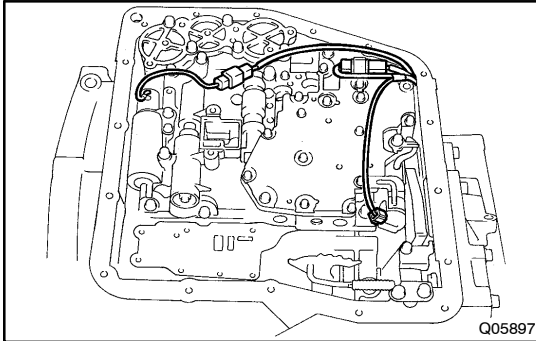
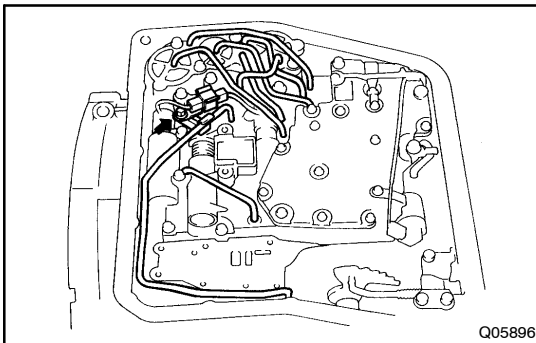
Bolt D: 55 mm (2.17 in.)

**13. INSTALL B₃ APPLY PIPE****NOTICE:**

Be careful not to bend or damage the pipe.

**14. INSTALL CONNECTOR CLAMP AND PIPE RETAINER****Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)****HINT:**

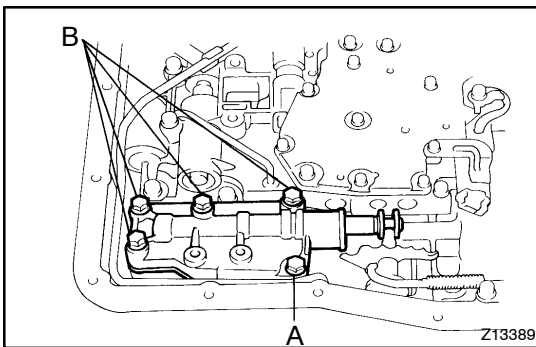
Each bolt length is indicated below.

Bolt length:**Bolt A: 39 mm (1.54 in.)****Bolt B: 43 mm (1.69 in.)****15. CONNECT 3 SOLENOID CONNECTORS****16. INSTALL OIL PIPE**

- (a) Using a plastic hammer, install the 8 pipes into their positions.

NOTICE:**Be careful not to bend or damage the pipes.**

- (b) Install and tighten the bolt and retainer.

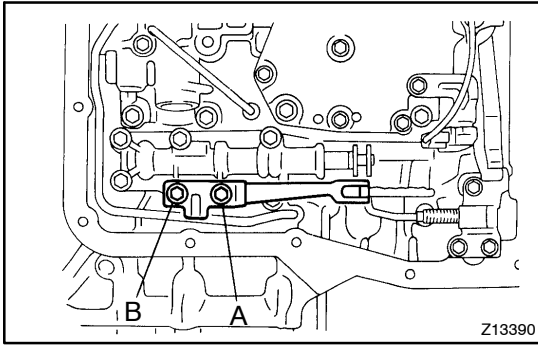
Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)**17. INSTALL MANUAL VALVE BODY AND DETENT SPRING**

- (a) Align the manual valve with the pin on the manual shaft lever.
- (b) Lower the manual valve body into place.
- (c) Hand-tighten the 5 bolts first. Then, tighten them with a torque wrench.

Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)**HINT:**

Each bolt length is indicated below.

Bolt length:**Bolt A: 22 mm (0.87 in.)****Bolt B: 37 mm (1.46 in.)**



- (d) Place the detent springs on the manual valve body and hand-tighten the 2 bolts first. Then, tighten them with a torque wrench.

Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

HINT:

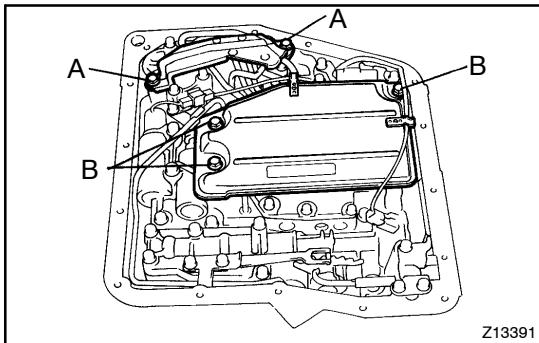
Each bolt length is indicated below.

Bolt length:

Bolt A: 14 mm (0.55 in.)

Bolt B: 37 mm (1.46 in.)

- (e) Check that the manual valve lever is touching the center of the detent spring tip roller.



18. INSTALL PIPE BRACKET AND OIL STRAINER

Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

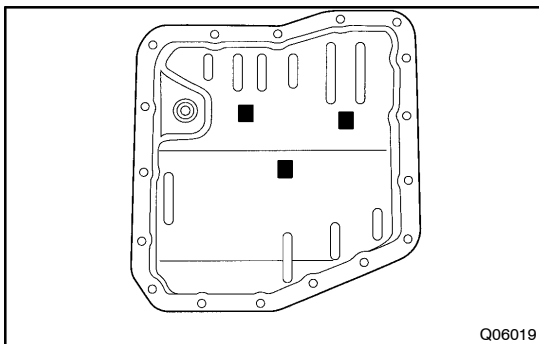
HINT:

Each bolt length is indicated below.

Bolt length:

Bolt A: 22 mm (0.87 in.)

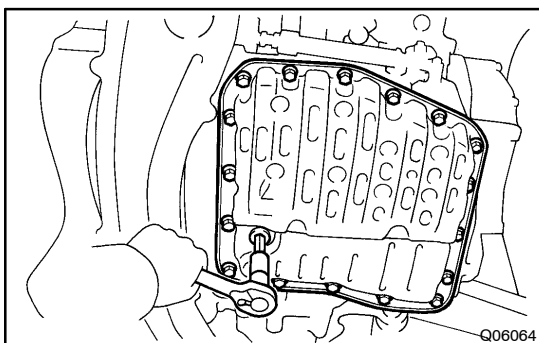
Bolt B: 53 mm (2.09 in.)



19. INSTALL MAGNETS IN PLACE

NOTICE:

Make sure that the magnets do not interfere with the oil pipes.



20. INSTALL OIL PAN WITH NEW GASKET

- (a) Install a new gasket and oil pan.
(b) Install and tighten 17 bolts.

Torque: 7.9 N·m (80 kgf·cm, 70 in·lbf)

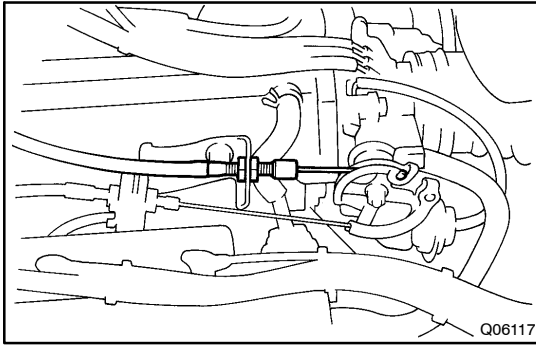
21. FILL ATF AND CHECK FLUID LEVEL

- (a) Using a 10 mm hexagon wrench, install a new gasket and the drain plug.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

- (b) Fill the ATF and check the fluid level (See page [DI-173](#)).

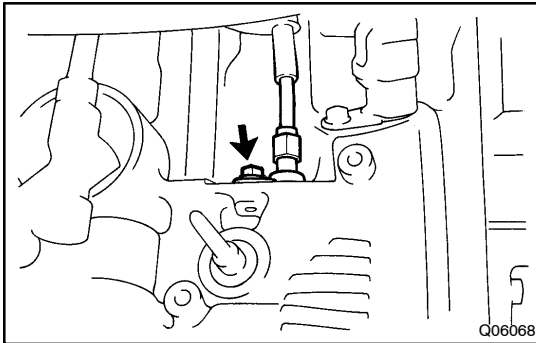
22. INSTALL NO.2 ENGINE UNDER COVER



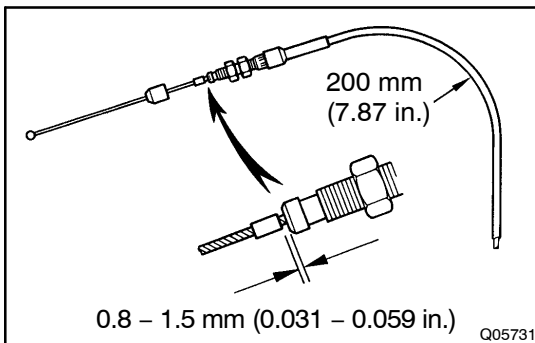
THROTTLE CABLE ON-VEHICLE REPAIR

AX04R-02

1. DISCONNECT THROTTLE CABLE FROM LINKAGE
2. REMOVE PARK/NEUTRAL POSITION SWITCH
(See page [AX-6](#))
3. REMOVE VALVE BODY
(See page [AX-8](#))



4. REMOVE THROTTLE CABLE
 - (a) Remove the bolt and pull the cable out of the transaxle case.
 - (b) Remove the O-ring from the throttle cable.



5. INSTALL THROTTLE CABLE INTO TRANSAXLE CASE

If the throttle cable is new do the following operations (a) – (c).

- (a) Bend the cable so there is a radius of about 200 mm (7.87 in.).
- (b) Pull the inner cable lightly until a slight resistance is felt, and hold it.
- (c) Stake the stopper 0.8 – 1.5 mm (0.031 – 0.059 in.) from the end of outer cable.
- (d) Install a new O-ring to the throttle cable.
- (e) Make sure to push it in all the way.
- (f) Install and torque the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

6. INSTALL VALVE BODY

(See page [AX-8](#))

7. CONNECT THROTTLE CABLE TO LINKAGE

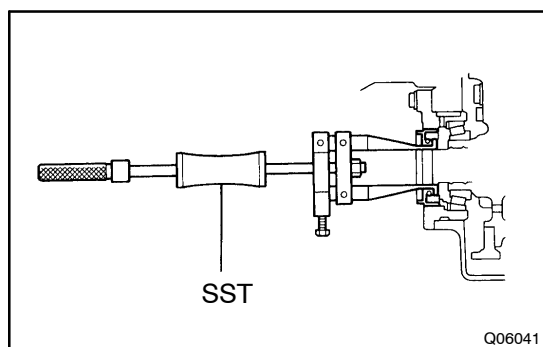
8. ADJUST THROTTLE CABLE

(See page [DI-173](#))

9. INSTALL PARK/NEUTRAL POSITION SWITCH

(See page [AX-6](#))

10. TEST DRIVE VEHICLE



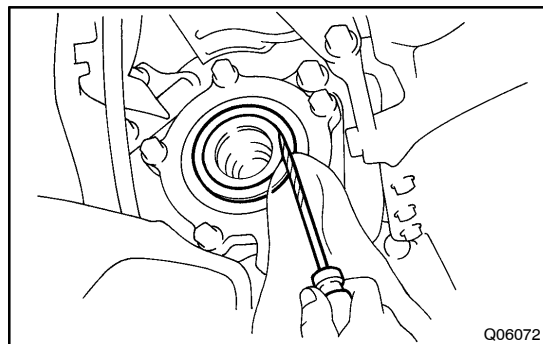
SIDE GEAR SHAFT OIL SEAL ON-VEHICLE REPAIR

1. REMOVE BOTH DRIVE SHAFTS
(See page [SA-20](#))

2. REMOVE LH SIDE GEAR SHAFT OIL SEAL

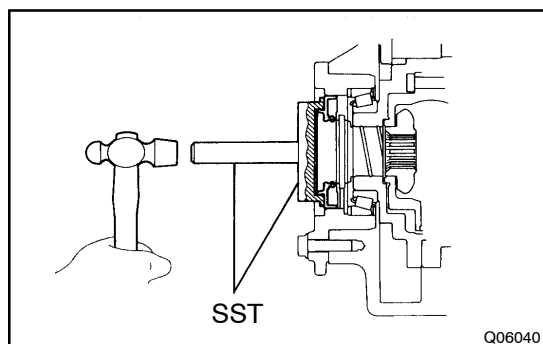
Using SST, pull out the oil seal.

SST 09308-00010



3. REMOVE RH SIDE GEAR SHAFT OIL SEAL

Using a screwdriver, remove the oil seal.



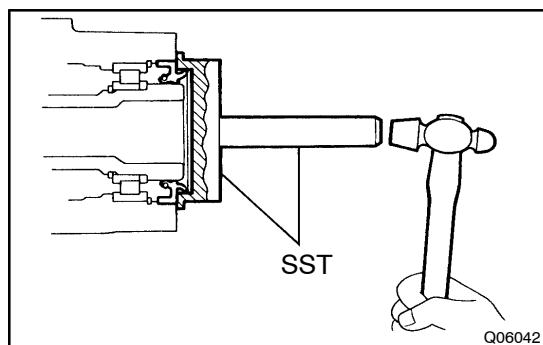
4. INSTALL LH SIDE GEAR SHAFT OIL SEAL

- (a) Using SST and a hammer, driver in a new oil seal.

SST 09608-32010, 09950-70010 (09951-07100)

Oil seal depth: 0 ± 0.5 mm (0 ± 0.020 in.)

- (b) Coat the lip of the oil seal with MP grease.



5. INSTALL RH SIDE GEAR SHAFT OIL SEAL

- (a) Using SST and a hammer, drive in a new oil seal.

SST 09608-32010, 09950-70010 (09951-07100)

Oil seal depth: 0 ± 0.5 mm (0 ± 0.020 in.)

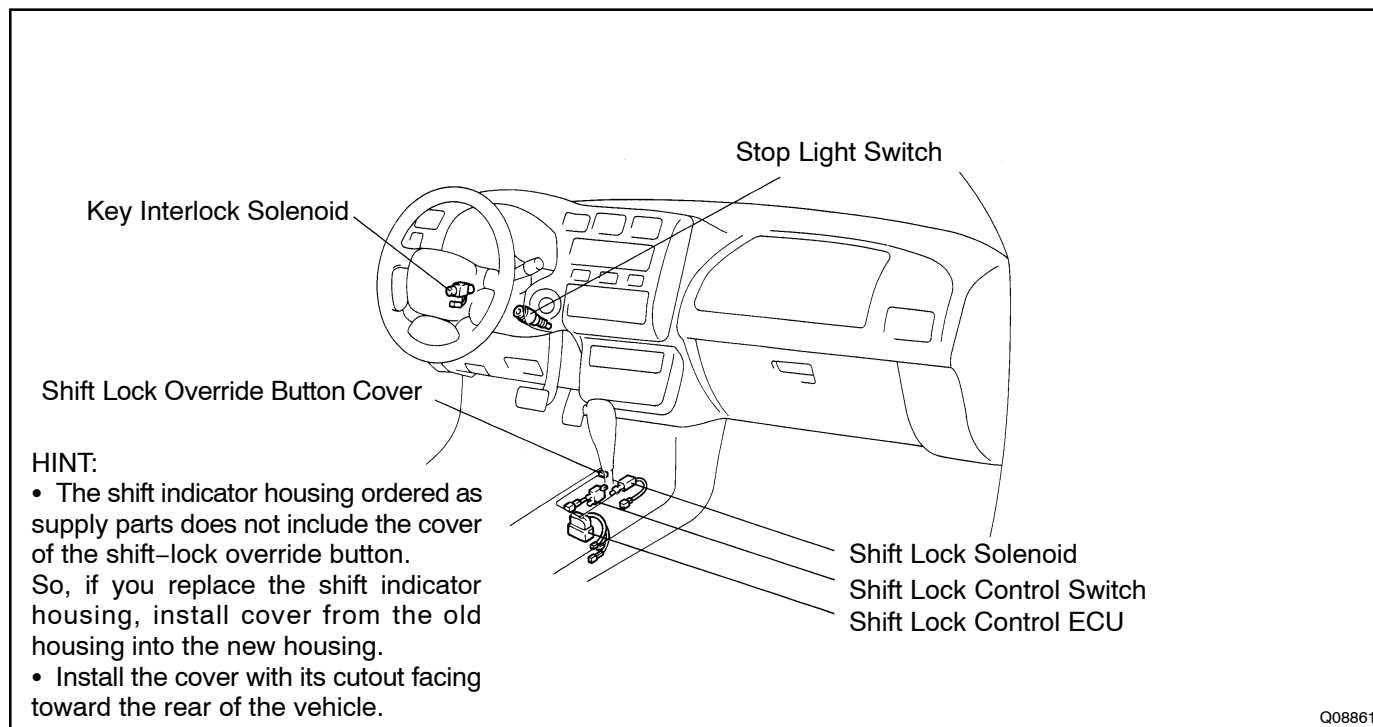
- (b) Coat the lip of the oil seal with MP grease.

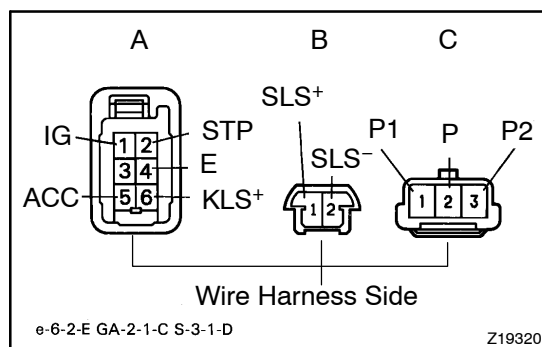
6. INSTALL BOTH DRIVE SHAFTS (See page [SA-31](#))

7. CHECK FLUID LEVEL (See page [DI-173](#))

SHIFT LOCK SYSTEM LOCATION

AX04X-03





INSPECTION

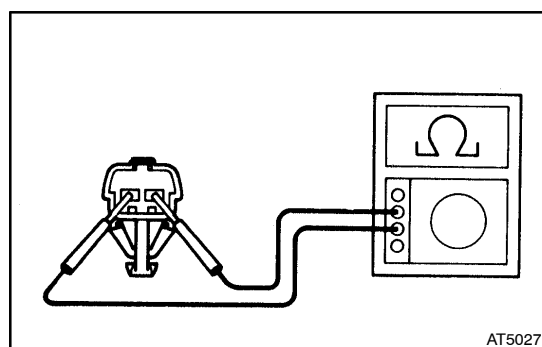
1. INSPECT SHIFT LOCK CONTROL ECU

Using a voltmeter, measure the voltage at each terminal.

HINT:

Do not disconnect the ECU connector.

Connector	Terminal	Measuring condition	Voltage (V)
A	1 – 3 (ACC – E)	IG SW ACC	10 – 14
	5 – 3 (IG – E)	IG SW ON	10 – 14
	4 – 3 (STP – E)	Depress brake pedal	10 – 14
	2 – 3 (KLS+ – E)	3. IG SW ACC and shift lever at P position	0
		4. Shift lever at R, N, D, 2, L position	7.5 – 11
		5. (after approx 1 second)	5.5 – 10
B	2 – 1 (SLS+ – SLS-)	1. IG SW ON and shift lever at P position	0
		2. Depress brake pedal	8.5 – 14
		3. Except P position	0
C	3 – 2 (P1 – P)	1. IG SW ON, shift lever at P position and depress brake pedal	0
		2. Shift except P position under condition above	10 – 14
	1 – 2 (P2 – P)	1. IG SW ACC and shift lever at P position	10 – 14
		2. Shift except P position under condition above	0

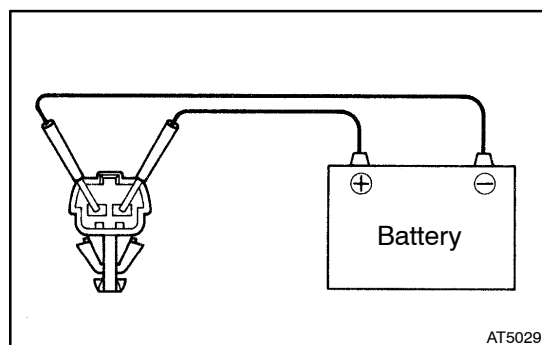


2. INSPECT SHIFT LOCK SOLENOID

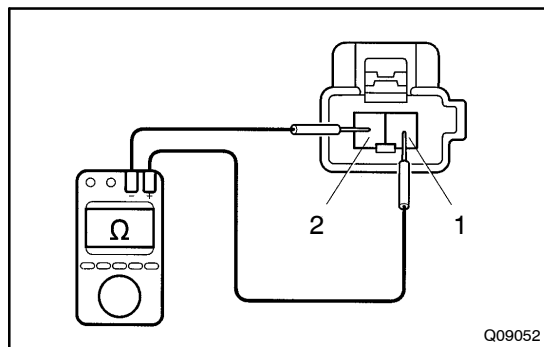
- Disconnect the solenoid connector.
- Using an ohmmeter, measure resistance between the terminals.

Standard resistance: 26 – 33 Ω

If resistance value is not as specified, replace the solenoid.



- Apply battery positive voltage between the terminals. Check that the solenoid can be heard operating. If the solenoid does not operate, replace the solenoid.

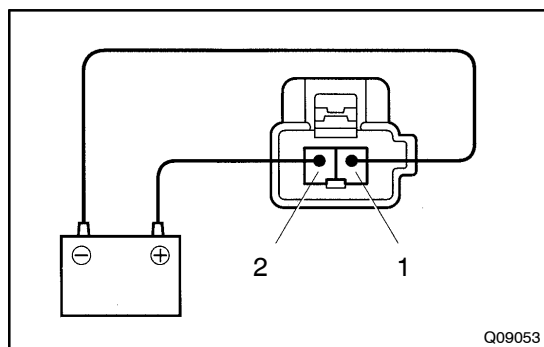


3. INSPECT KEY INTERLOCK SOLENOID

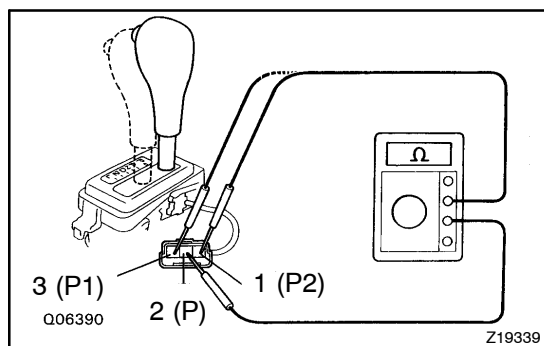
- (a) Disconnect the solenoid connector.
- (b) Using an ohmmeter, measure resistance between the terminals.

Standard resistance: 12.5 – 16.5 Ω

If resistance value is not as specified, replace the solenoid.



- (c) Apply battery positive voltage between the terminals. Check that the solenoid can be heard operating. If the solenoid does not operate, replace the solenoid.



4. INSPECT SHIFT LOCK CONTROL SWITCH

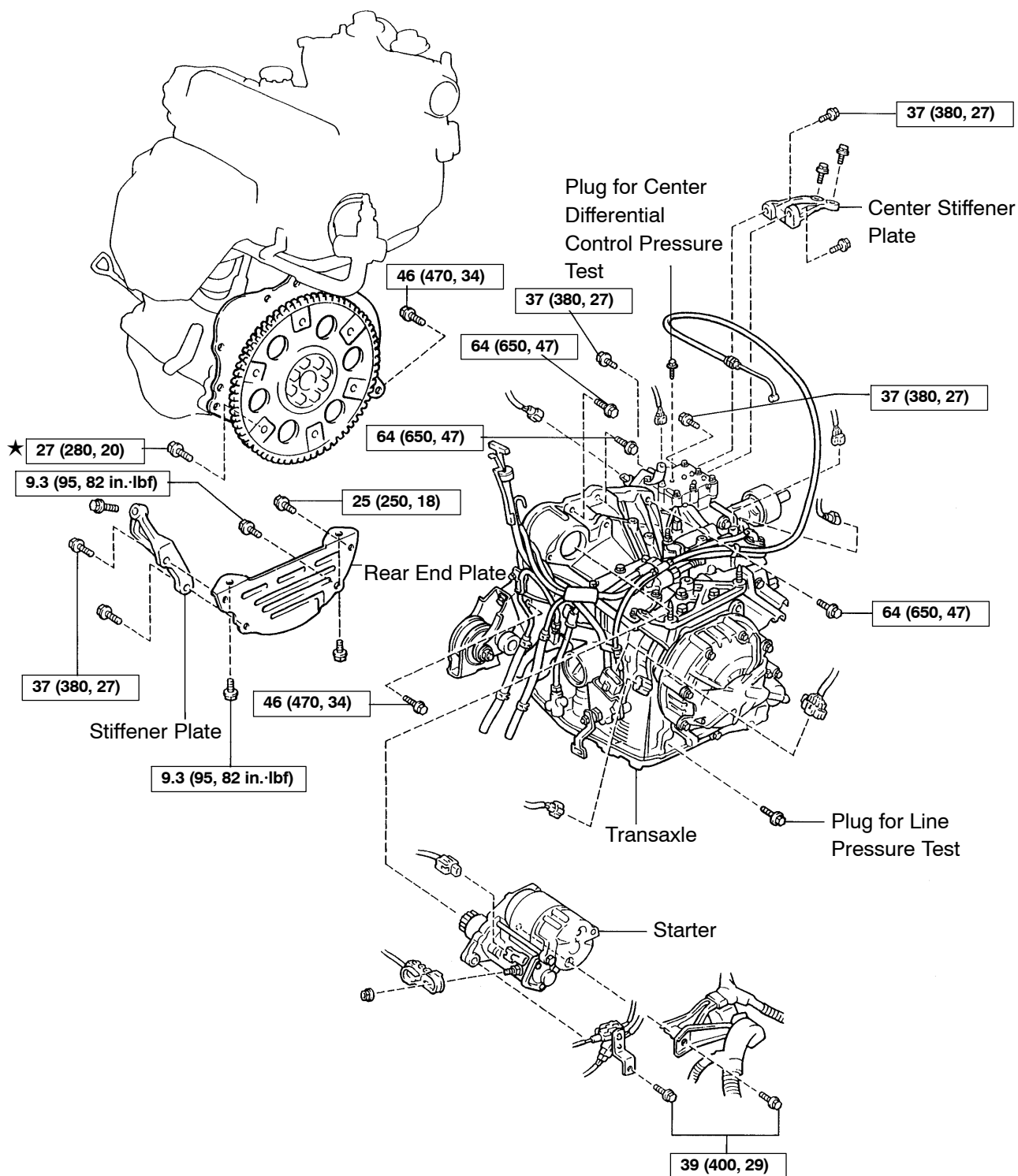
Inspect that there is continuity between each terminal.

Shift position	Tester connection	Specified value
P position (Release button is not pushed)	2 – 3 (P – P1)	Continuity
P position (Release button is pushed)	2 – 3 (P – P1) 2 – 1 (P – P2)	Continuity
R, N, D, 2, L position	2 – 1 (P – P2)	Continuity

If continuity is not as specified, replace the switch.

AUTOMATIC TRANSAXLE UNIT COMPONENTS

AX04T-01

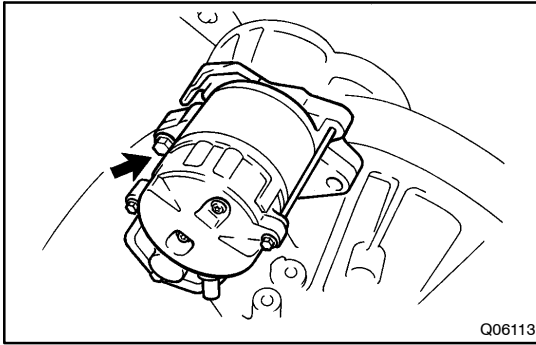


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

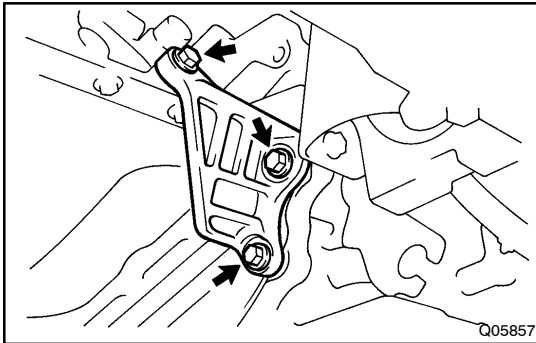
★ Precoated part

Z19462

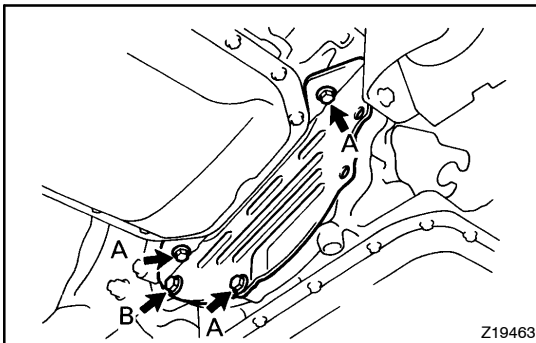


REMOVAL

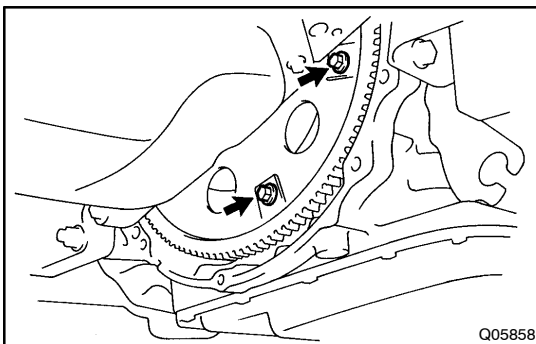
1. REMOVE TRANSAXLE WITH ENGINE (See page [EM-68](#))
2. REMOVE STARTER
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



3. REMOVE STIFFENER PLATE
Remove the 3 bolts and stiffener plate.
Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)



4. REMOVE REAR END PLATE
Remove the 4 bolts and rear end plate.
Torque:
Bolt A: 9.3 N·m (95 kgf·cm, 82 in.·lbf)
Bolt B: 25 N·m (250 kgf·cm, 18 ft·lbf)



5. REMOVE TORQUE CONVERTER CLUTCH MOUNTING BOLTS

Turn the crankshaft to gain access and remove the 6 bolts with holding the crankshaft pulley nut by a wrench.

Torque: 27 N·m (280 kgf·cm, 20 ft·lbf)

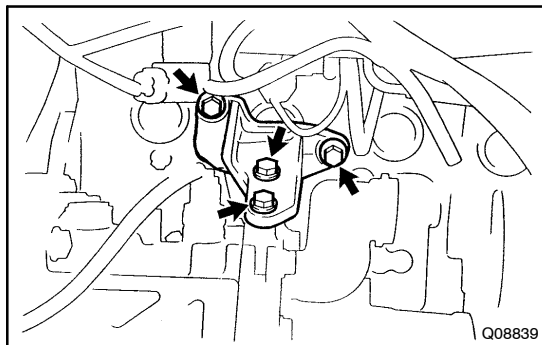
HINT:

At the time of installation, please refer to the following item.
Coat the threads of the bolts with sealant.

Sealant: Part No. 08833 – 00070, THREE BONDS 1324 or equivalent

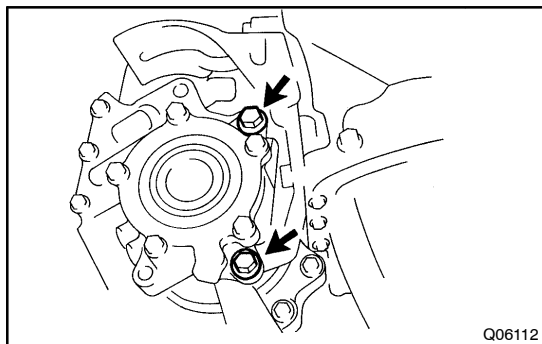
- Tighten the bolts evenly.
- First install dark green colored bolt and then the 5 bolts.

6. DISCONNECT CONNECTORS AND WIRE HARNESS FROM TRANSAXLE

**7. REMOVE CENTER STIFFENER PLATE**

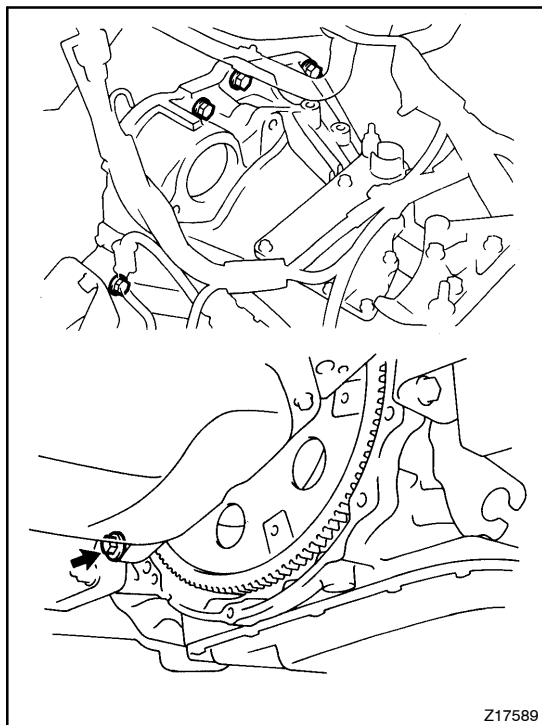
Remove the 4 bolts and stiffener plate.

Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)

**8. REMOVE TRANSAXLE WITH TRANSFER ASSEMBLY**

(a) Remove the 2 bolts.

Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)



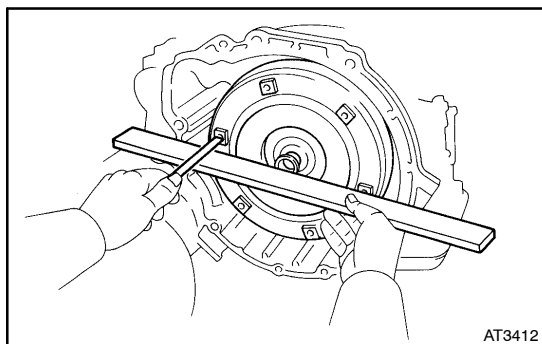
(b) Remove the 5 transaxle mounting bolts.

Torque:

14 mm head bolt: 64 N·m (650 kgf·cm, 47 ft·lbf)

12 mm head bolt: 46 N·m (470 kgf·cm, 34 ft·lbf)

(c) Separate the transaxle assembly.



INSTALLATION

1. CHECK TORQUE CONVERTER CLUTCH INSTALLATION

Using calipers and a straight edge, measure the distance from the installed surface to front surface of the transaxle housing.

Correct distance: More than 13.7 mm (0.539 in.)

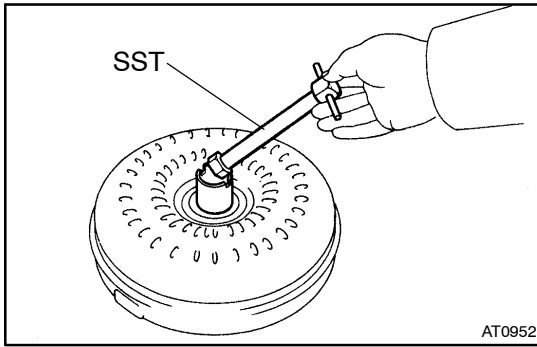
2. TRANSAXLE INSTALLATION

Installation is in the reverse order of removal (See page [AX-19](#)).

HINT:

After installation, check and inspect the following items.

- Fluid level (See page [DI-173](#))
- Front wheel alignment (See page [SA-4](#))
- Do the road test

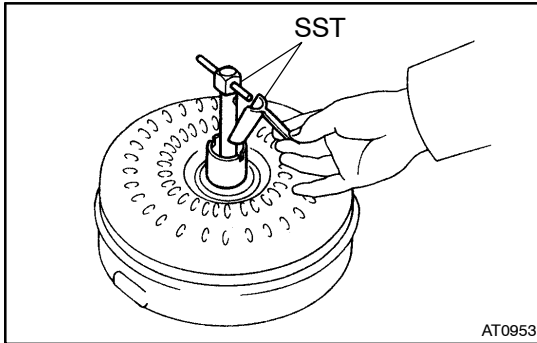


TORQUE CONVERTER CLUTCH AND DRIVE PLATE INSPECTION

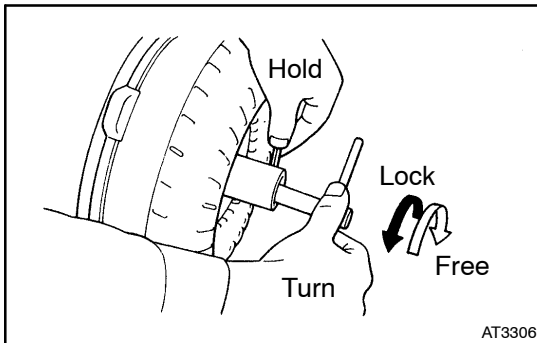
AX04W-01

1. INSPECT ONE-WAY CLUTCH

- (a) Install SST into the inner race of the one-way clutch.
SST 09350-32014 (09351-32010)

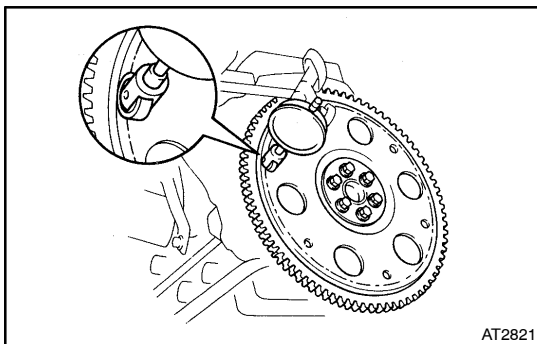


- (b) Install SST so that it fits in the notch of the converter clutch hub and outer race of the one-way clutch.
SST 09350-32014 (09351-32020)



- (c) With the torque converter clutch standing on its side, the clutch locks when turned counterclockwise, and rotates freely and smoothly clockwise.

If necessary, clean the converter clutch and retest the clutch.
Replace the converter clutch if the clutch still fails the test.



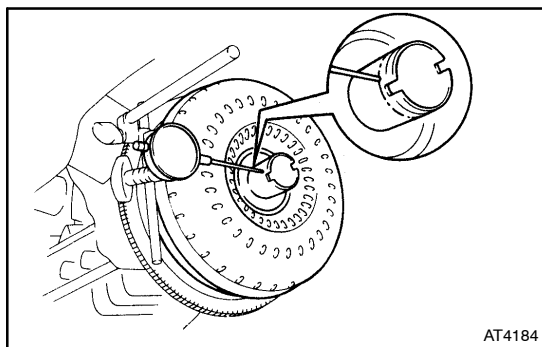
2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

- (a) Set up a dial indicator and measure the drive plate runout.
(b) Check the damage of the ring gear.

Maximum runout: 0.20 mm (0.0079 in.)

If the runout is not within the specification, or ring gear is damaged replace the drive plate.

Torque: 83 N·m (850 kgf·cm, 61 ft·lbf)



3. MEASURE TORQUE CLUTCH CONVERTER SLEEVE RUNOUT

- (a) Temporarily mount the torque converter clutch to the drive plate. Set up a dial indicator and measure the torque converter clutch sleeve runout.

Maximum runout: 0.30 mm (0.0118 in.)

If the runout is not within the specification, try to correct by reorienting the installation of the converter clutch.

HINT:

Mark the position of the converter clutch to ensure correct installation.

- (b) Remove the torque converter clutch.