

17. Control Valve Body

A: REMOVAL

1. NON-TURBO MODEL

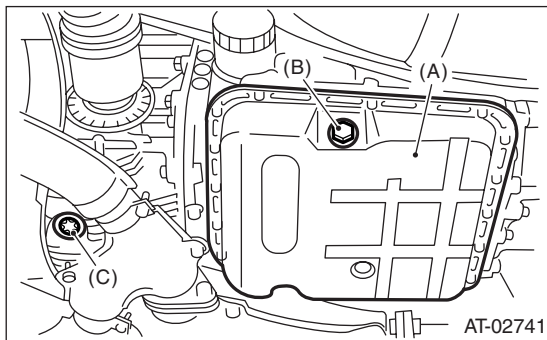
- 1) Lift-up the vehicle.
- 2) Clean the transmission exterior.
- 3) Drain the ATF completely.

NOTE:

- Tighten the ATF drain plug after draining the ATF.
- Replace the gasket with a new one.

Tightening torque:

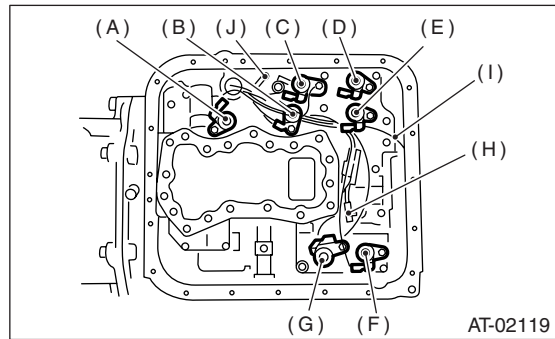
25 N·m (2.5 kgf-m, 18.1 ft-lb)



- (A) Oil pan
- (B) Drain plug
- (C) Differential oil drain plug

- 4) Remove the oil pan.
- 5) Remove and clean the magnet.
- 6) Remove the old gasket on the oil pan and transmission case completely.

- 7) Disconnect each solenoid connector and remove ATF temperature sensor from control valve.

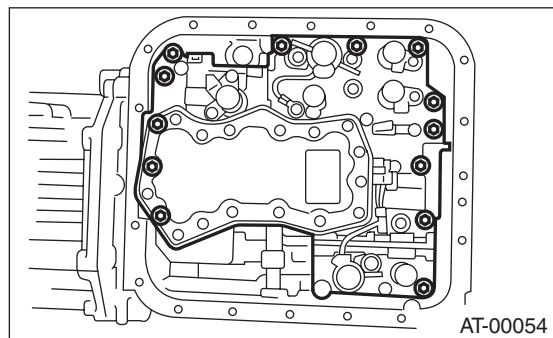


- (A) Lock-up duty solenoid (Blue)
- (B) Low clutch timing solenoid (Gray)
- (C) Line pressure duty solenoid (Red)
- (D) Shift solenoid 2 (Yellow)
- (E) Shift solenoid 1 (Green)
- (F) 2-4 brake timing solenoid (Black)
- (G) 2-4 brake duty solenoid (Red)
- (H) ATF temperature sensor
- (I) Transfer duty solenoid (Brown)
- (J) Transmission ground

- 8) Remove the control valve.

NOTE:

When removing the control valve body, be careful not to interfere with transfer duty solenoid wiring.

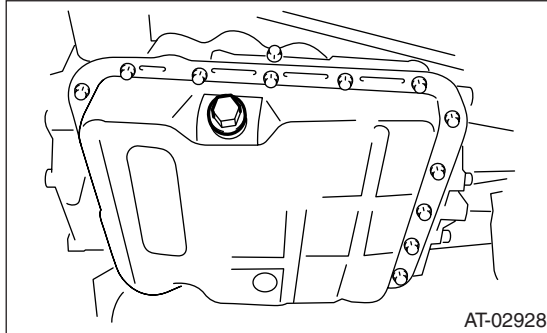


CONTROL VALVE BODY

AUTOMATIC TRANSMISSION

2. TURBO MODEL

- 1) Set the vehicle on a lift.
- 2) Disconnect the ground cable from battery.
- 3) Lift-up the vehicle.
- 4) Clean the transmission exterior.
- 5) Remove the drain plug and gasket, and then drain ATF.



- 6) Replace the gasket with a new one, and then tighten the drain plug.

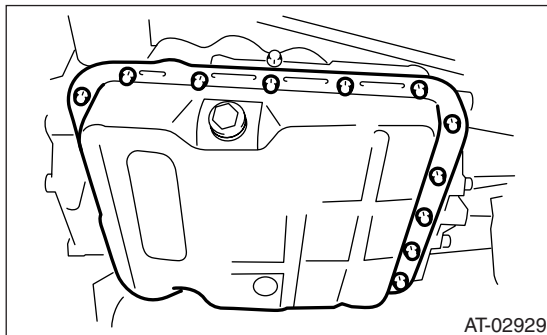
Tightening torque:

25 N·m (2.5 kgf-m, 18.1 ft-lb)

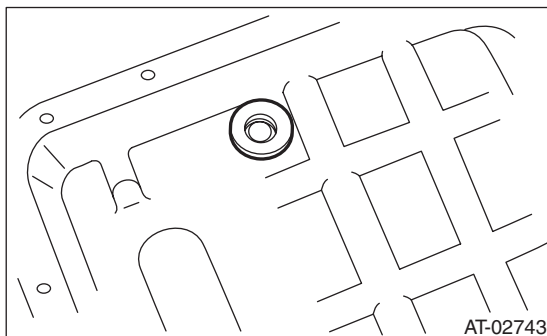
- 7) Remove the oil pan.

CAUTION:

Be careful not to allow dirt or dust to get into the oil pan.

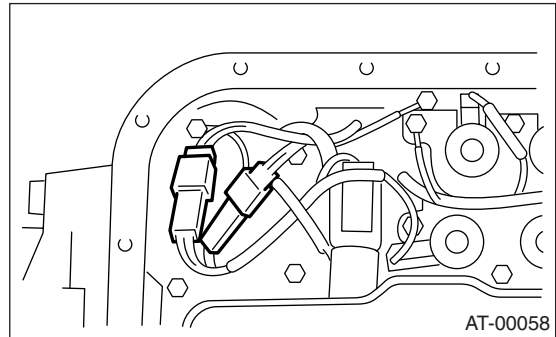


- 8) Remove the magnet.

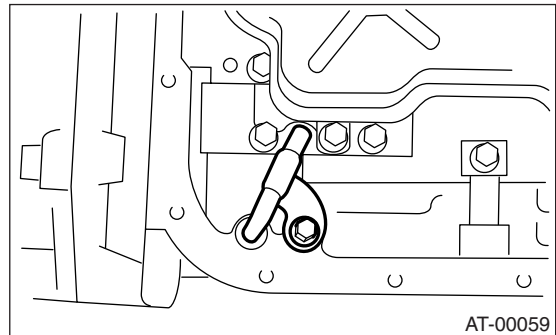


- 9) Clean the magnet.
- 10) Remove the liquid gasket completely from oil pan and transmission case.

- 11) Remove the control valve connector.



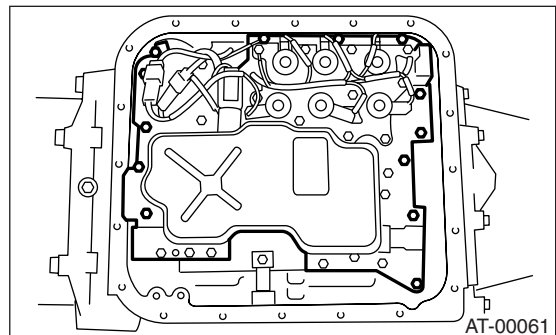
- 12) Remove the oil cooler pipe.



- 13) Remove the control valve body.

NOTE:

Replace the control valve body as assembly, because the control valve body can not be disassembled.



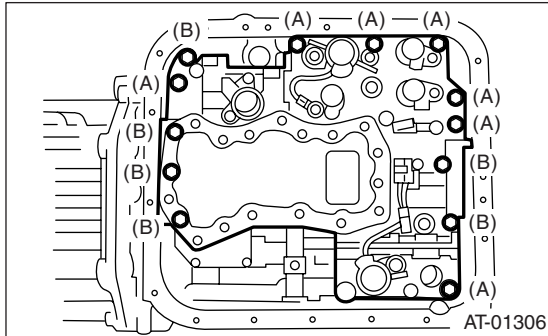
B: INSTALLATION

1. NON-TURBO MODEL

- 1) Set the range select lever in "N" range.
- 2) Install the control valve, ATF temperature sensor and ground connectors.

Tightening torque:

8 N·m (0.8 kgf-m, 5.8 ft-lb)

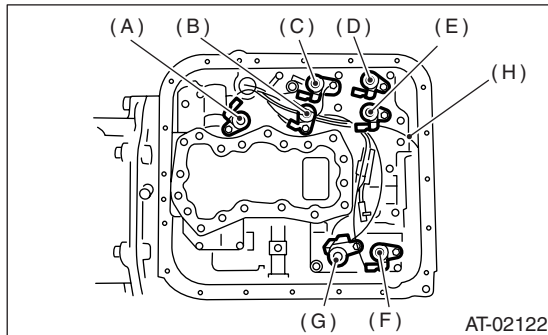


Bolt length mm (in)

(A) 30 (1.18)

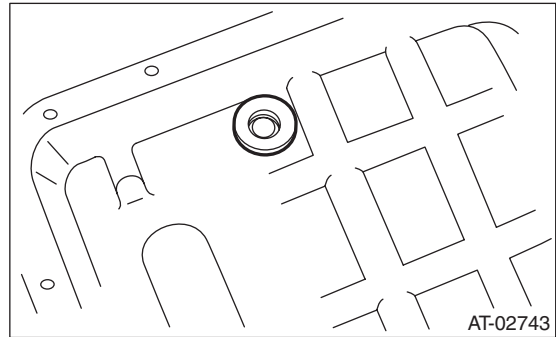
(B) 55 (2.17)

- 3) Connect all connectors.



- (A) Lock-up duty solenoid (Blue)
- (B) Low clutch timing solenoid (Gray)
- (C) Line pressure duty solenoid (Red)
- (D) Shift solenoid 2 (Yellow)
- (E) Shift solenoid 1 (Green)
- (F) 2-4 brake timing solenoid (Black)
- (G) 2-4 brake duty solenoid (Red)
- (H) Transfer duty solenoid (Brown)

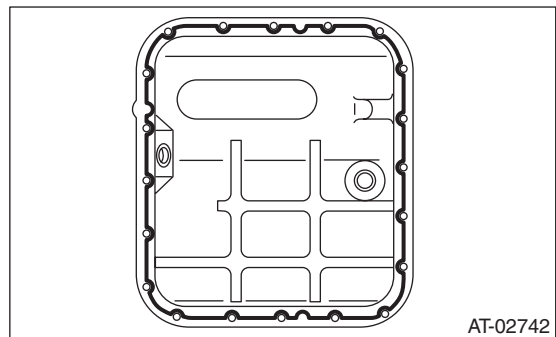
- 4) Attach the magnet at specified position.



- 5) Apply proper amount of liquid gasket to the entire oil pan mating surface.

Liquid gasket:

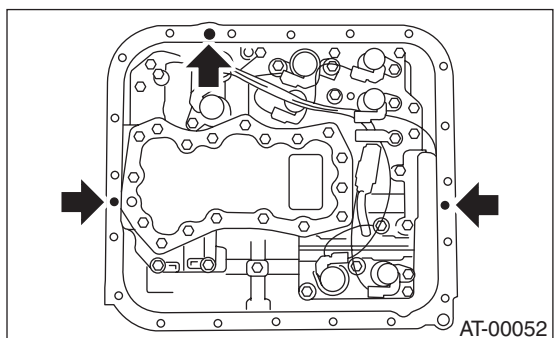
THREE BOND 1217B (Part No. K0877YA020)



- 6) Apply liquid gasket fully to three holes other than screw holes on transmission case.

Liquid gasket:

THREE BOND 1217B (Part No. K0877YA020)



- 7) Install the oil pan by equally tightening the bolts.

Tightening torque:

5 N·m (0.5 kgf-m, 3.6 ft-lb)

CONTROL VALVE BODY

AUTOMATIC TRANSMISSION

8) Pour ATF from the oil charge pipe.

Recommended fluid:
Dexron III

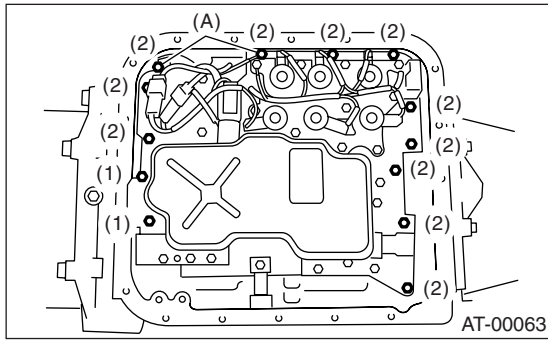
Fluid capacity:
Fill the same amount of fluid drained from drain plug hole.

9) Check the level of ATF.
<Ref. to 4AT-31, Automatic Transmission Fluid.>

2. TURBO MODEL

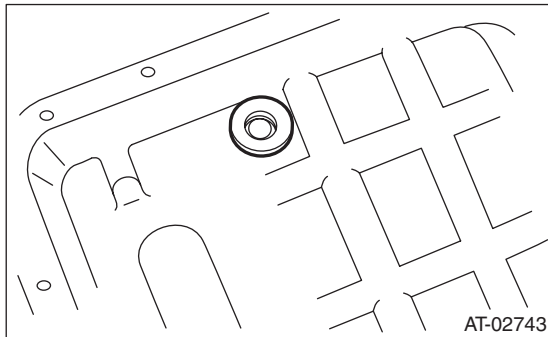
- 1) Check the control valve body for dirt and dust.
- 2) Install the control valve body and ground cable to transmission by tightening bolts evenly.

Tightening torque:
8 N·m (0.8 kgf·m, 5.8 ft·lb)



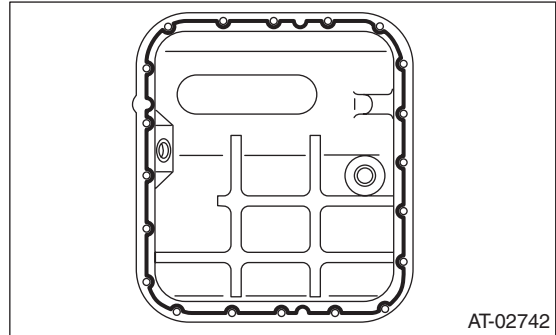
- (A) Transmission ground
Bolt length mm (in)
- | | |
|-----|-----------|
| (1) | 30 (1.18) |
| (2) | 35 (1.38) |

3) Attach the magnet at specified position of oil pan.



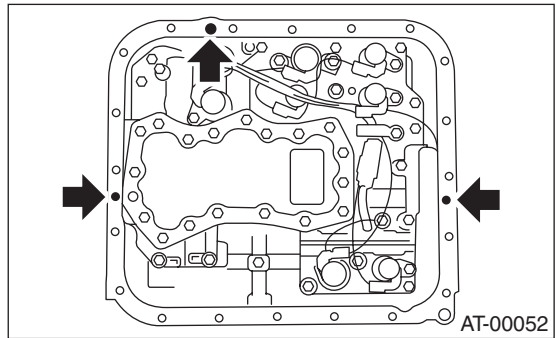
4) Apply proper amount of liquid gasket to the entire oil pan mating surface.

Liquid gasket:
THREE BOND 1217B (Part No. K0877YA020)



5) Apply liquid gasket fully to three holes other than screw holes on transmission case.

Liquid gasket:
THREE BOND 1217B (Part No. K0877YA020)



6) Install the oil pan with tightening bolts evenly.

Tightening torque:
5 N·m (0.5 kgf·m, 3.6 ft·lb)

7) Pour ATF into the oil charge pipe.

Recommended fluid:
DEXRON III TYPE AUTOMATIC TRANSMISSION FLUID

Fluid capacity:
Fill the same amount of fluid drained from drain plug hole.

8) Bleed the air from control valve. <Ref. to 4AT-70, Air Bleeding of Control Valve.>

9) Check the level of ATF. <Ref. to 4AT-31, Automatic Transmission Fluid.>

10) Perform the advance operation of learning control. (TURBO model)

(1) Set the select lever to "P" range and apply parking brake, then lift-up the vehicle.

(2) Connect the SUBARU Select Monitor to vehicle.

(3) Using SUBARU Select Monitor, check that the DTC is not output.

(4) Select "Clear Memory - 2" on the Select Monitor. <Ref. to 4AT(D)-14, OPERATION, Subaru Select Monitor.>

(5) Using SUBARU Select Monitor, warm up the engine until the ATF temperature becomes within 60 to 90°C (140 to 194° F). <Ref. to 4AT(D)-14, OPERATION, Subaru Select Monitor.>

(6) Set the select lever to "R" range.

(7) Set the switches for headlights, air conditioner, rear defogger, etc. to OFF.

(8) Turn ignition switch to OFF, and wait for 30 seconds or more.

(9) Depress the brake pedal fully with left foot until learning promotion task is completed.

(10) Turn the ignition switch to ON.

(11) Confirm that the Select Monitor screen returns to normal.

(12) Set the select lever to "P" range, and then wait for more than three seconds.

(13) Set the select lever to "R" range, and then wait for more than three seconds.

(14) Set the select lever to "N" range, and then wait for more than three seconds.

(15) Set the select lever to "D" range, and then wait for more than three seconds.

(16) Set the select lever to "N" range, and then wait for more than three seconds.

(17) Slightly depress the accelerator pedal to full open.

(18) Slightly release the accelerator pedal to close.

(19) Start the engine.

(20) Set the select lever to "D" range.

(21) ATF temperature warning light in the combination meter blinks at 2 Hz. If ATF temperature warning light does not blink, repeat the procedure from step (4).

(22) Learning promotion task is completed when blinking of ATF temperature warning light in the combination meter changes from 2 to 0.5 Hz.

NOTE:

Repeat the procedure from step (4) if blinking of ATF temperature warning light changes from 2 Hz to 4 Hz.

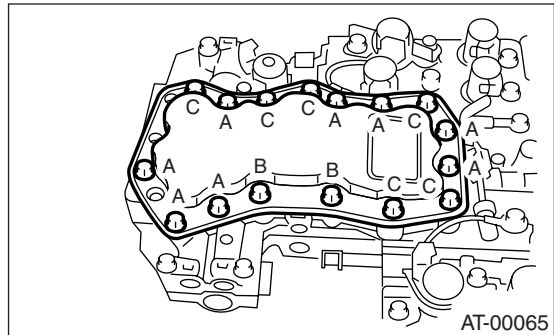
(23) Set the select lever to "N" range, and turn the ignition switch to OFF.

C: DISASSEMBLY

1) Remove oil strainer from lower control valve body.

NOTE:

Arrange the removed bolts in good order to assemble in the same place as disassembly, because the bolt lengths are different.

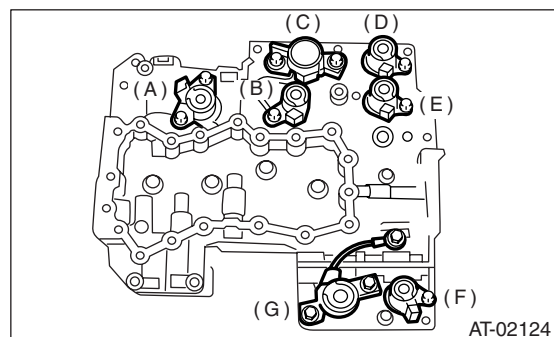


- (A) Short bolt
- (B) Middle bolt
- (C) Long bolt

2) Remove the duty solenoids, solenoids and sensor from the lower valve body.

NOTE:

Arrange the removed bolts in good order to assemble in the same place as disassembly, because the bolt lengths are different.



- (A) Lock-up duty solenoid (Blue)
- (B) Low clutch timing solenoid (Gray)
- (C) Line pressure duty solenoid (Red)
- (D) Shift solenoid 1 (Yellow)
- (E) Shift solenoid 2 (Green)
- (F) 2-4 brake timing solenoid (Black)
- (G) 2-4 brake duty solenoid (Red)

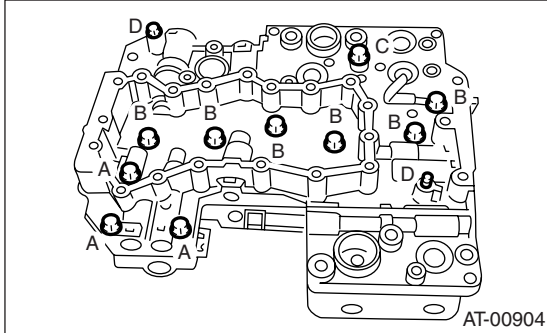
CONTROL VALVE BODY

AUTOMATIC TRANSMISSION

3) Remove the upper-lower valve body tightening bolts.

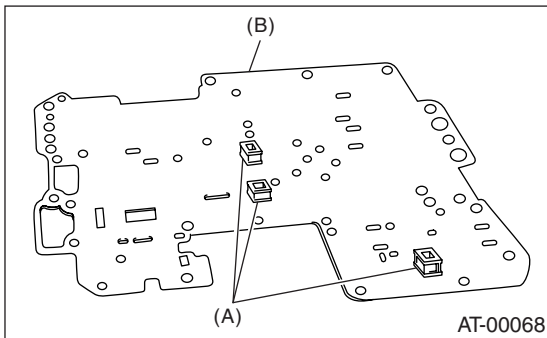
NOTE:

Arrange the removed bolts in good order to assemble in the same place as disassembly, because the bolt lengths are different.



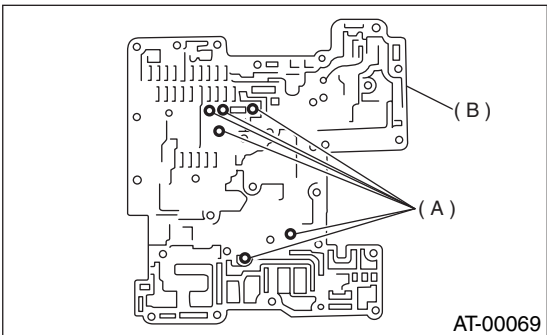
- Bolt length mm (in)
- (A) 40 (1.57)
 - (B) 62 (2.44)
 - (C) 73 (2.87)
 - (D) 79 (3.11)

4) Remove the lower valve body.
5) Remove the oil filter and plate.



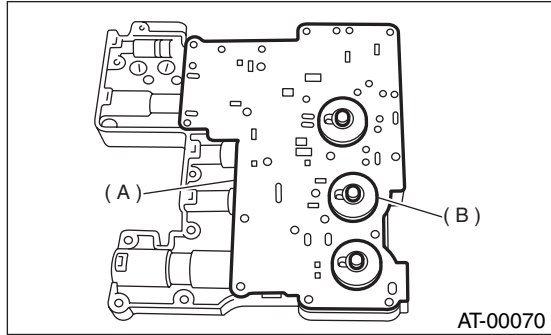
- (A) Oil filter
- (B) Plate

6) Remove six steel balls from middle valve body.



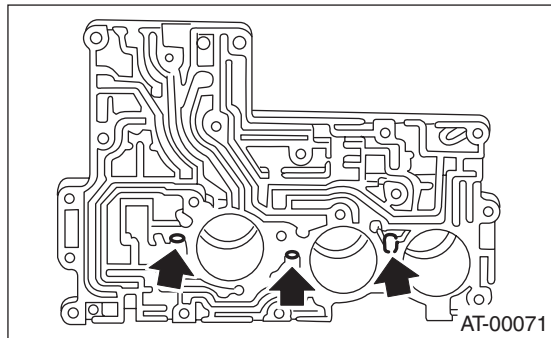
- (A) Steel ball
- (B) Middle valve body

7) Remove the middle valve body.
8) Remove upper separator plate from middle valve body.

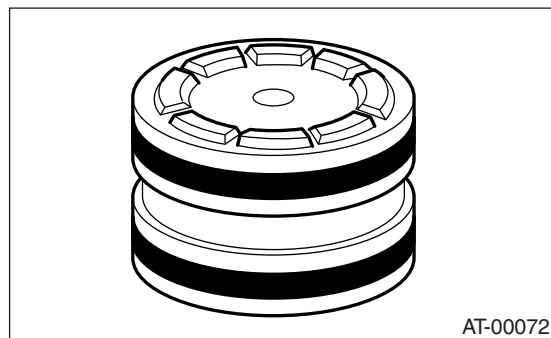


- (A) Upper separator plate
- (B) Side plate

9) Remove valve springs and four steel balls from upper valve body.
10) Place a shop cloth to the piston removal hole.
11) Using an air compressor, apply air slowly to each piston hole and remove the pistons.

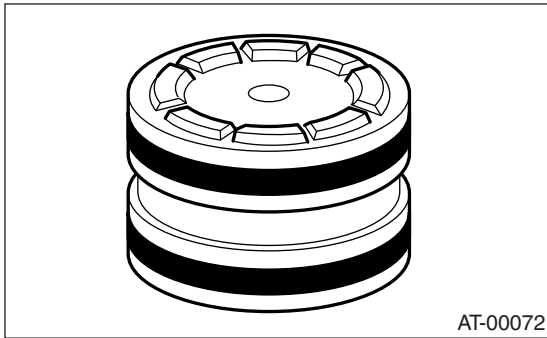


12) Remove the seal ring from piston.



D: ASSEMBLY

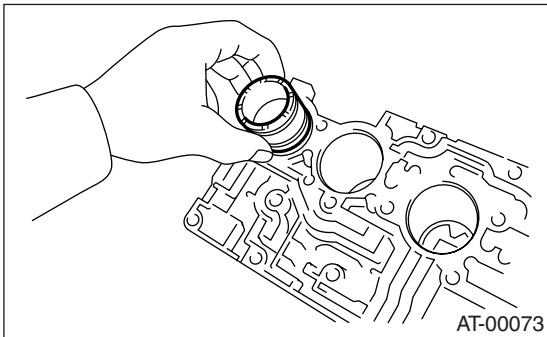
1) Install a new seal ring to piston.



AT-00072

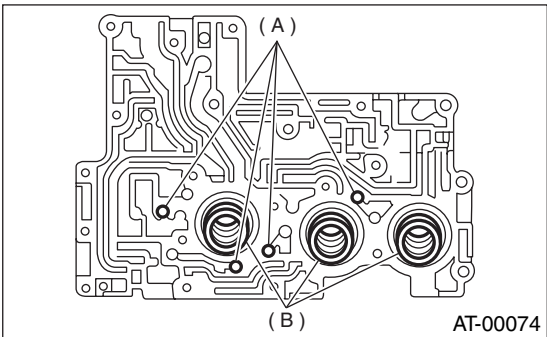
2) Apply ATF to the seal ring.

3) Insert the piston fully into upper valve body.



AT-00073

4) Install the spring and four steel balls to specified positions of upper valve body.



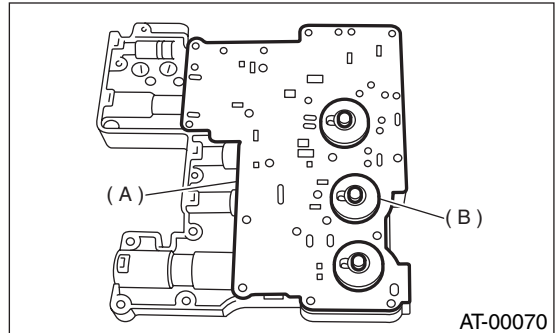
- (A) Steel ball
- (B) Spring

AT-00074

5) Align the hole in side plate with the hole in separator plate, and then install support plate and upper separator plate to middle valve body.

Tightening torque:

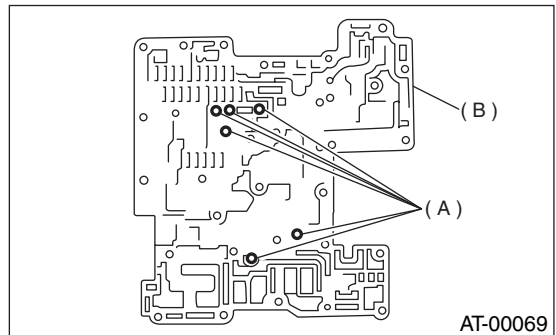
8 N·m (0.8 kgf·m, 5.8 ft·lb)



AT-00070

- (A) Upper separator plate
- (B) Side plate

6) Insert six steel balls in their proper positions to middle valve body.



AT-00069

- (A) Steel ball
- (B) Middle valve body

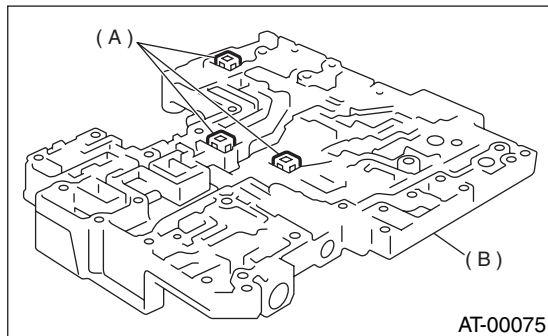
CONTROL VALVE BODY

AUTOMATIC TRANSMISSION

7) Install three filters to lower valve body.

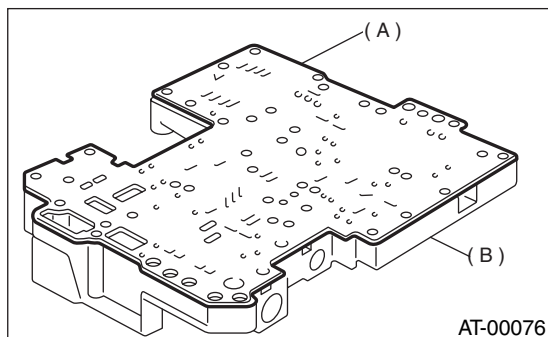
NOTE:

Pay attention to the location of filters.



- (A) Strainer
- (B) Lower valve body

8) Install the lower separate plate to lower valve body.

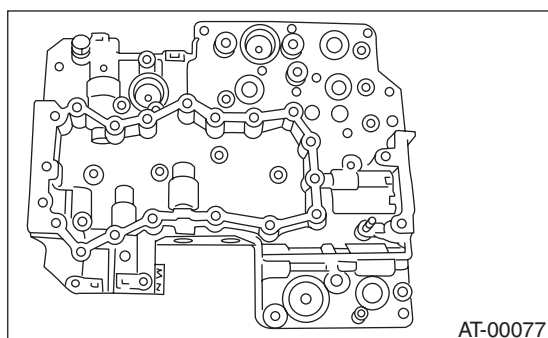


- (A) Lower separator plate
- (B) Lower valve body

9) Temporarily assemble the valve body.

NOTE:

Be careful not to drop the middle valve body and upper body interior steel ball, or the lower body filter.



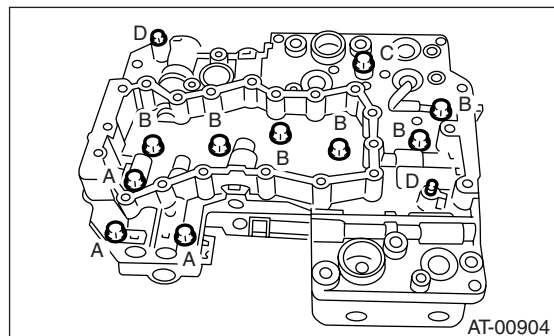
10) Tighten the bolts and nuts.

NOTE:

Install the bolts (D) from upper valve body side.

Tightening torque:

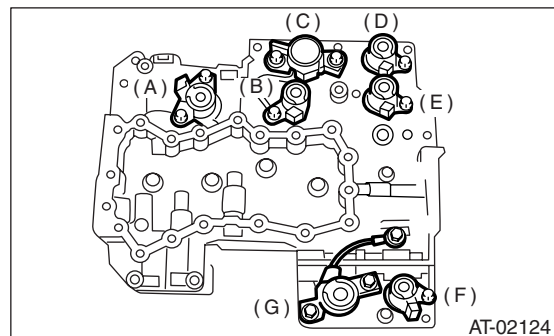
8 N·m (0.8 kgf-m, 5.8 ft-lb)



Bolt length mm (in)

- (A) 40 (1.57)
- (B) 62 (2.44)
- (C) 73 (2.87)
- (D) 79 (3.11)

11) Install the sensor, solenoids and duty solenoids to specified positions.

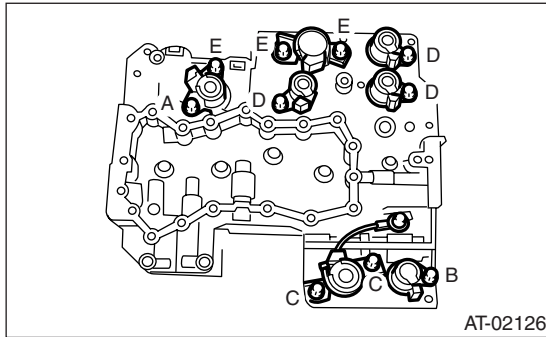


- (A) Lock-up duty solenoid (Blue)
- (B) Low clutch timing solenoid (Gray)
- (C) Line pressure duty solenoid (Red)
- (D) Shift solenoid 1 (Yellow)
- (E) Shift solenoid 2 (Green)
- (F) 2-4 brake timing solenoid (Black)
- (G) 2-4 brake duty solenoid (Red)

12) Tighten the bolts.

Tightening torque:

8 N·m (0.8 kgf-m, 5.8 ft-lb)



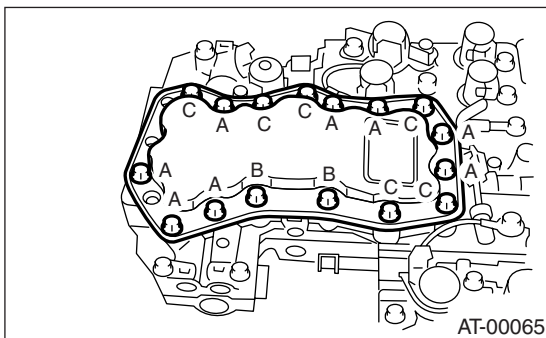
Bolt length mm (in)

- (A) 12 (0.47)
- (B) 40 (1.57)
- (C) 45 (1.77)
- (D) 62 (2.44)
- (E) 73 (2.87)

13) Install oil strainer to lower valve body.

Tightening torque:

8 N·m (0.8 kgf-m, 5.8 ft-lb)



Bolt length mm (in)

- (A) 12 (0.47)
- (B) 62 (2.44)
- (C) 81 (3.19)

E: INSPECTION

Make sure that each component is free of harmful gouges, cuts, or dust.