

## 21. Control Valve Body

### A: REMOVAL

#### 1. MAIN CONTROL VALVE BODY

**CAUTION:**

- Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.
- Be careful not to spill CVTF on the exhaust pipe to prevent it from emitting smoke or causing a fire. If the CVTF adheres, wipe it off completely.
- Always clean the engine compartment before removal.

**NOTE:**

The control valve body is replaced as an assembly only, because it is a non-disassembly part.

1) Disconnect the ground cable from battery. <Ref. to NT-5, BATTERY, NOTE, Note.>

**NOTE:**

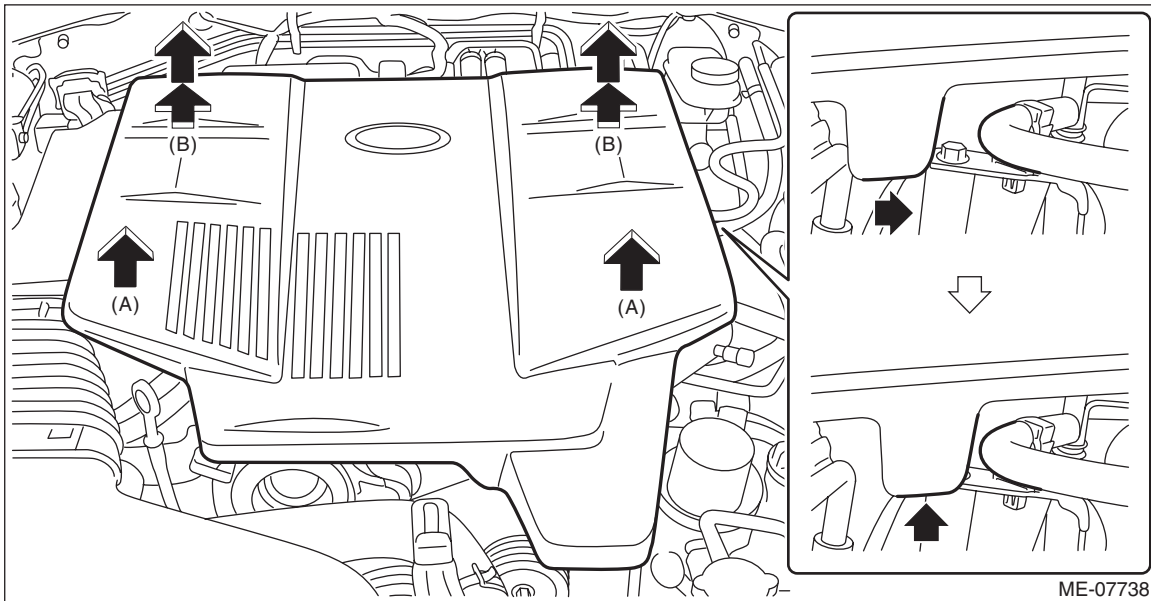
For the 12 volt engine restart battery, disconnect the ground terminal from 12V engine restart battery sensor.

2) Remove the collector cover.

- (1) Carefully pull up the front of collector cover at two positions (A).
- (2) Carefully pull up the rear of collector cover at two positions (B) while moving it backward.

**NOTE:**

Be careful not to contact the fuel delivery tube when moving the collector cover rearward.



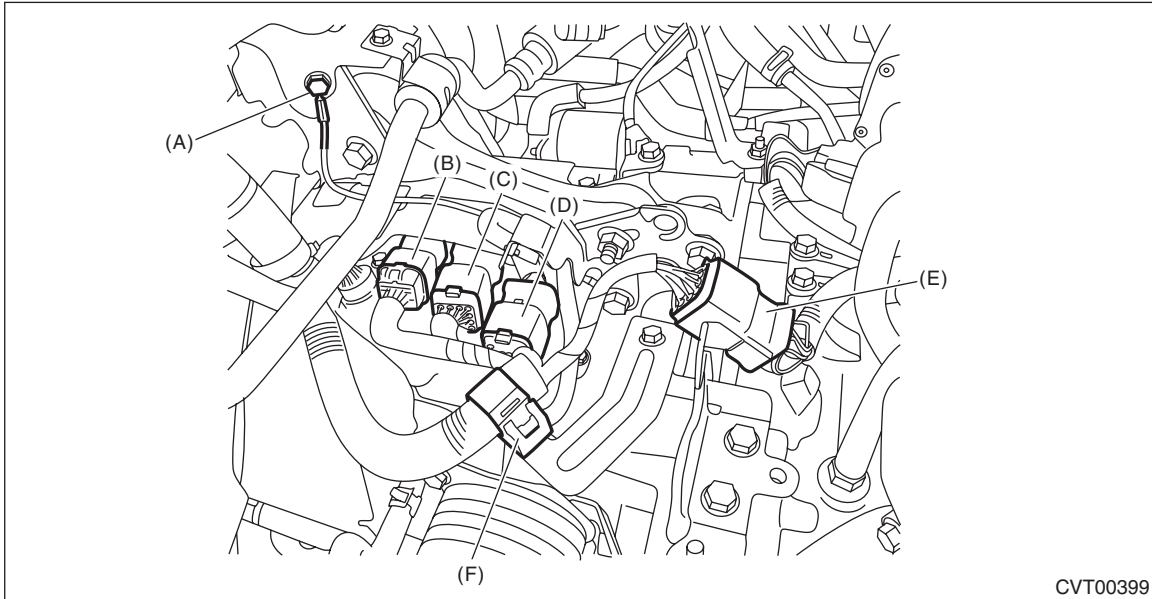
3) Remove the air cleaner case and bracket. <Ref. to IN(H4DO(HEV))-6, REMOVAL, Air Cleaner Case.>

# Control Valve Body

## CONTINUOUSLY VARIABLE TRANSMISSION

4) Disconnect the following connectors and harness clips.

- Transmission radio ground terminal
- Transmission harness connectors
- Inhibitor harness connector
- Drive motor harness connector
- Engine harness connectors
- Harness clip

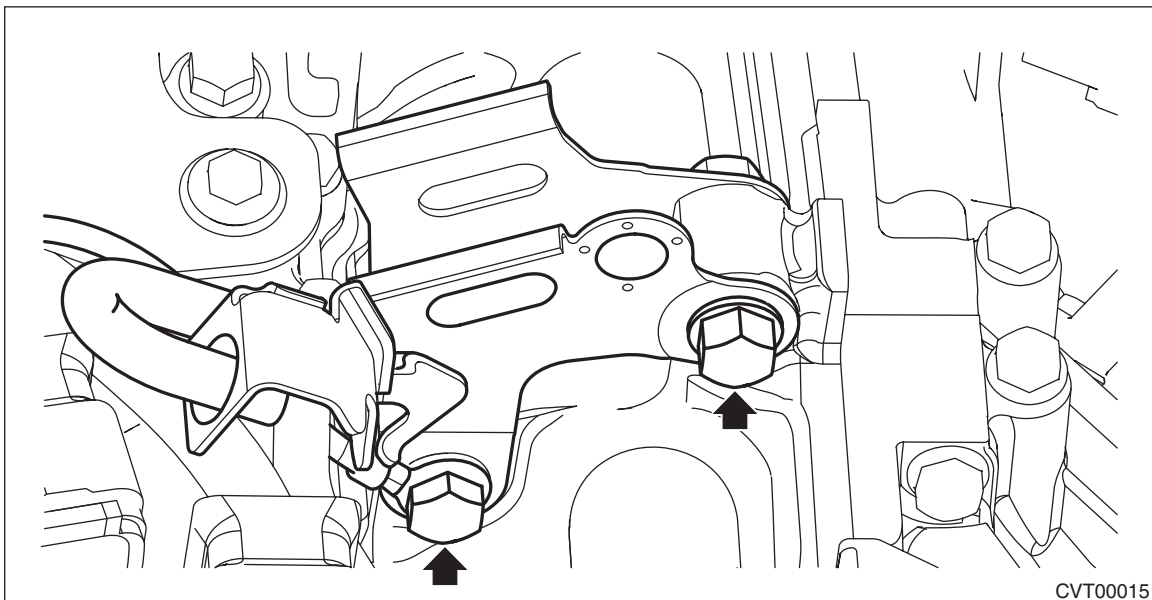


CVT00399

- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Inhibitor harness connector
- (D) Drive motor harness connector
- (E) Engine harness connectors
- (F) Harness clip

5) Remove the pitching stopper. <Ref. to CVT(TH58A)-87, PITCHING STOPPER, REMOVAL, Transmission Mounting System.>

6) Remove the air breather hose from the pitching stopper bracket, and then remove the pitching stopper bracket and transmission radio ground cord.

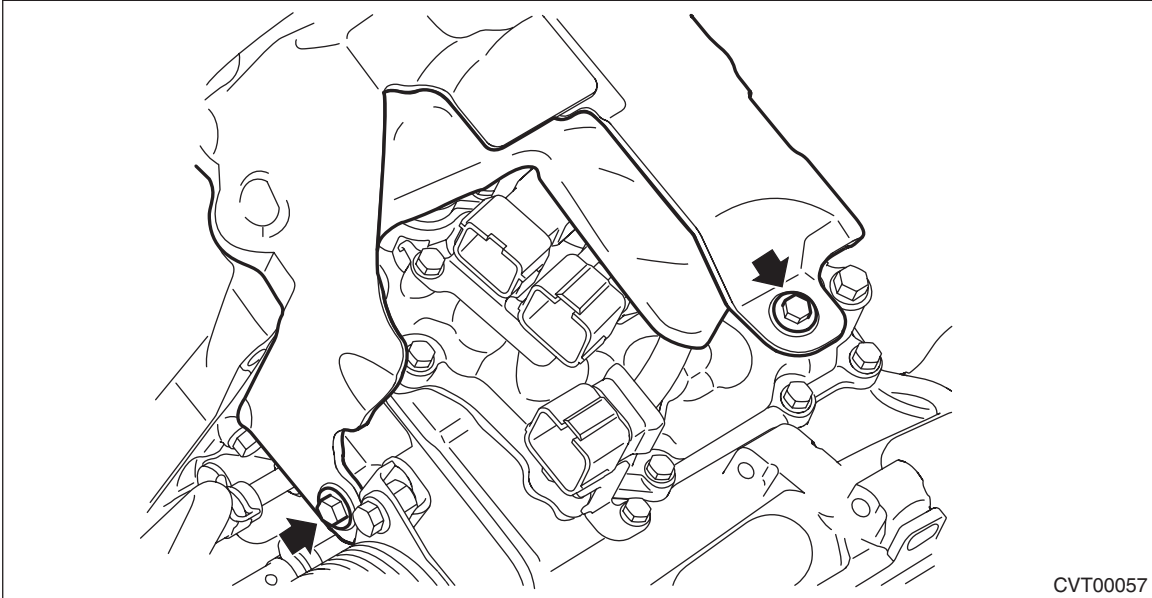


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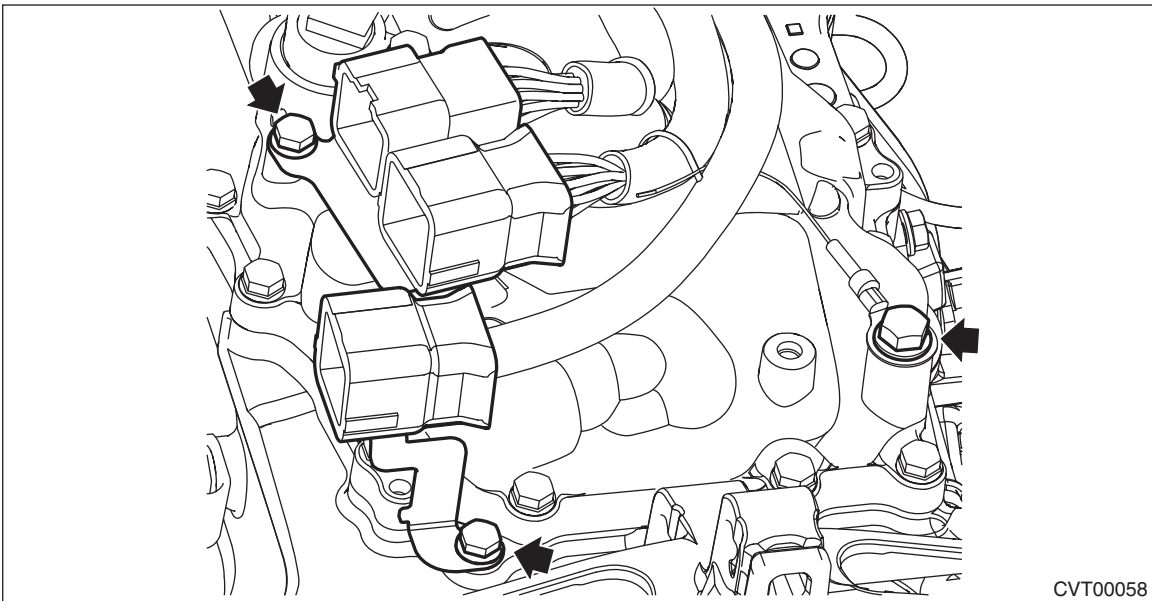
## Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

- 7) Remove the transmission case cover.



- 8) Remove the transmission harness stay, drive motor harness stay and transmission ground terminal.



- 9) Remove the transmission harness connector from the harness stay.  
10) Clean the transmission exterior.

# Control Valve Body

## CONTINUOUSLY VARIABLE TRANSMISSION

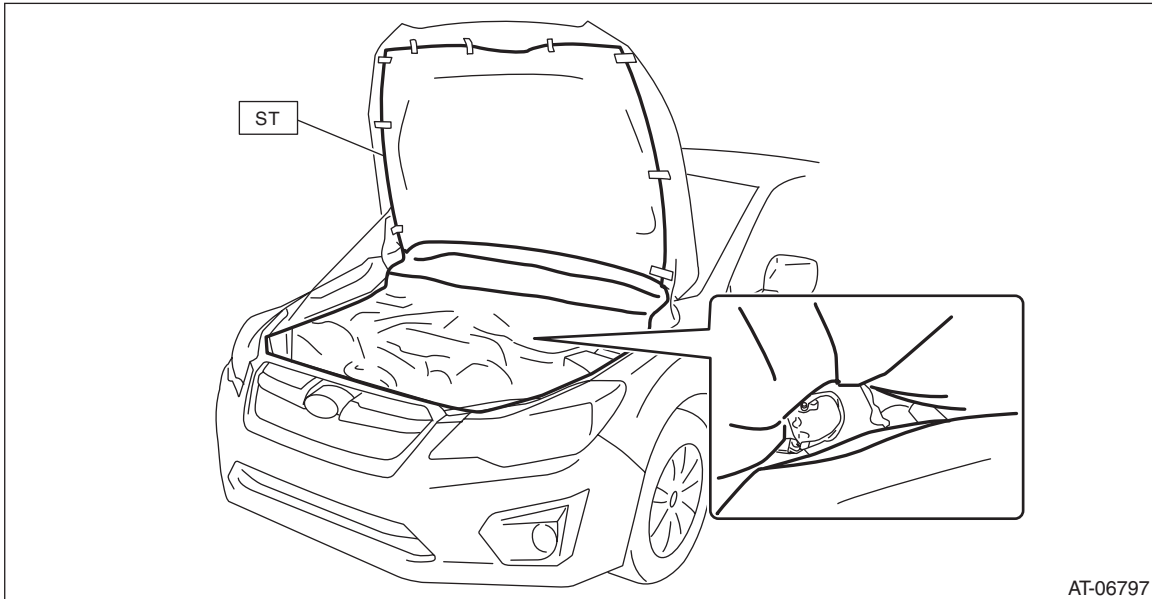
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11) Fix the ST with tape, and set the ST to the vehicle.

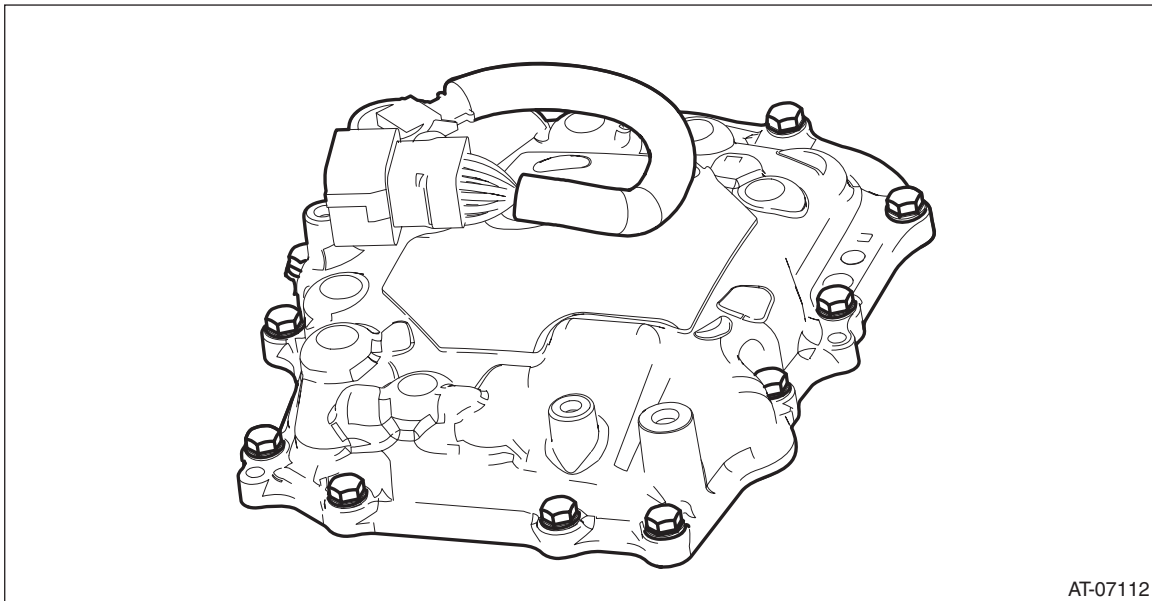
**NOTE:**

When replacing the control valve body, the sheet is included in the control valve body for repairs.

ST 18761AA010 SHEET SPECIAL TOOL



12) Remove the valve cover and gasket.

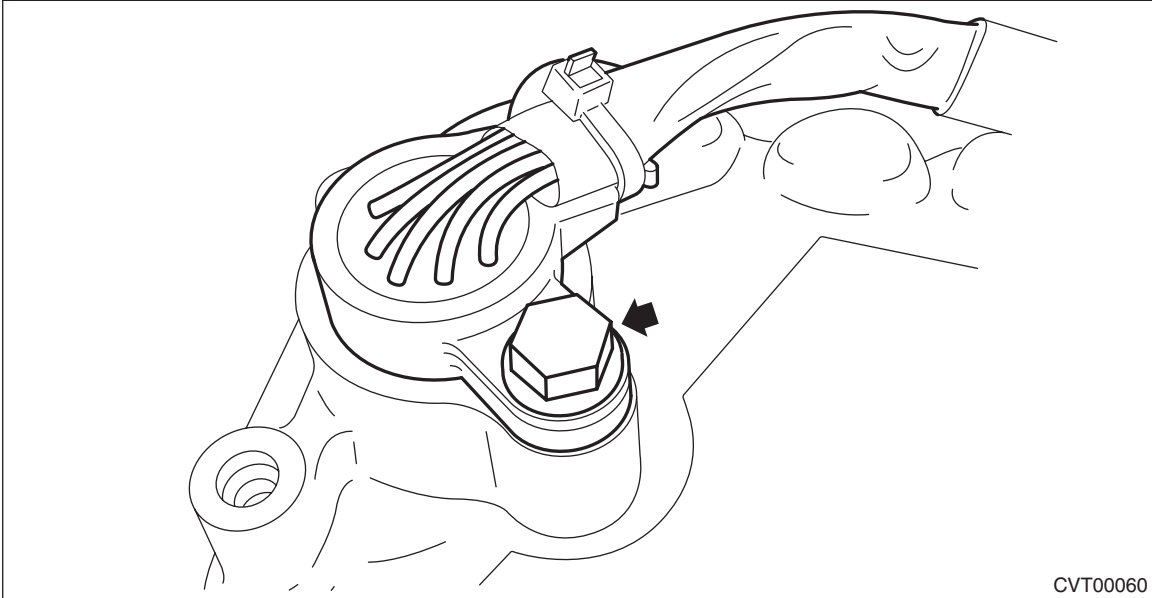


13) Disconnect the harness connector from the control valve body.

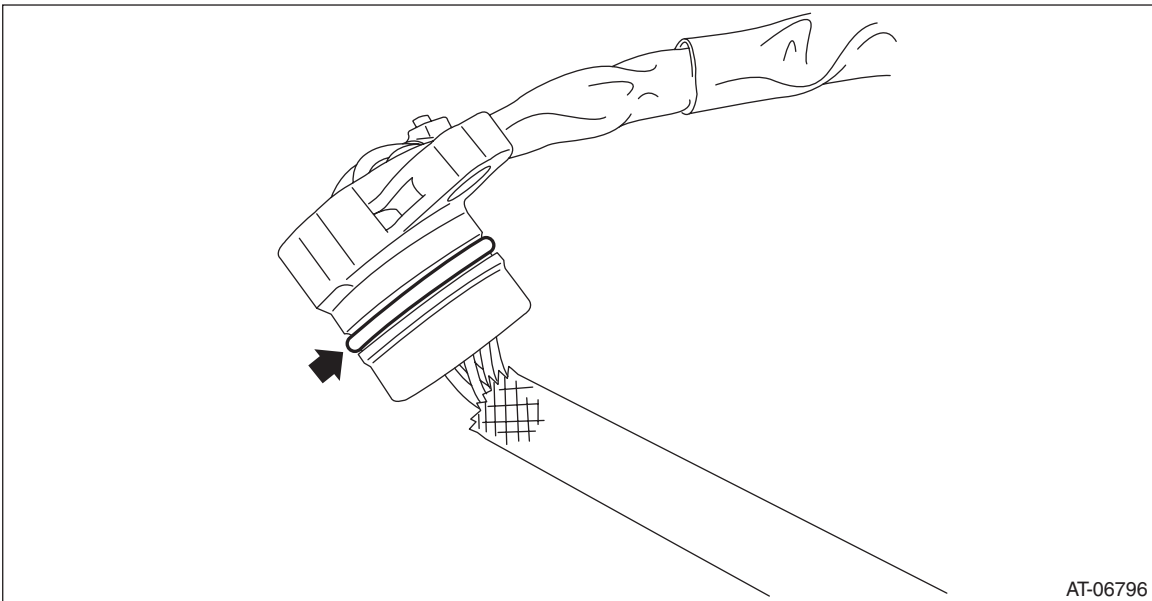
## Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

- 14) Remove the transmission harness from the valve cover.



- 15) Remove the O-ring from the transmission harness.

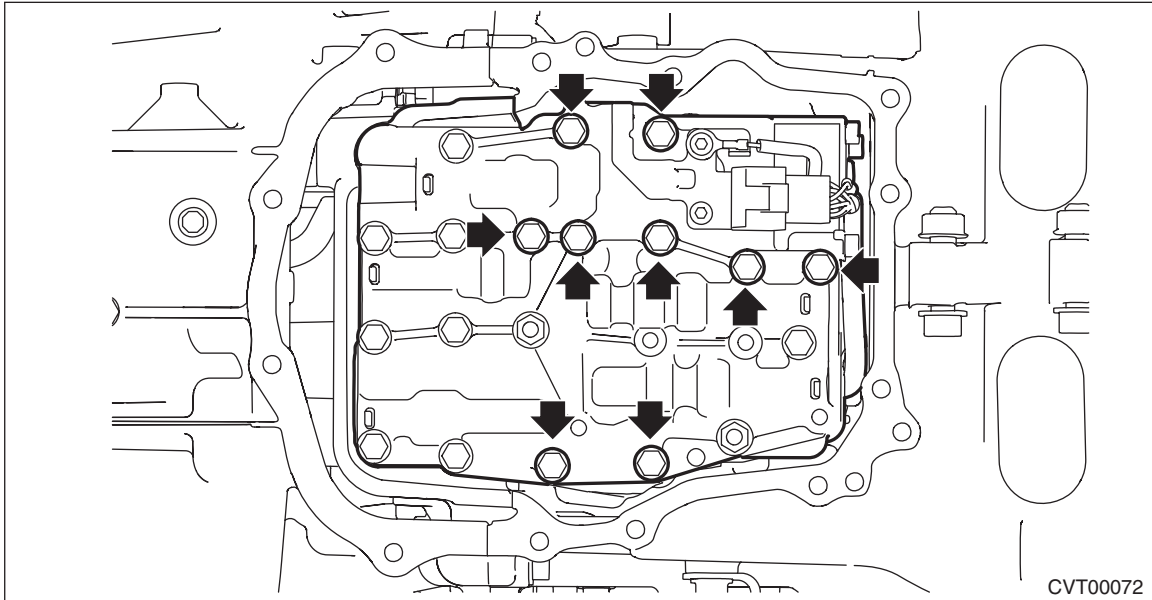


## Control Valve Body

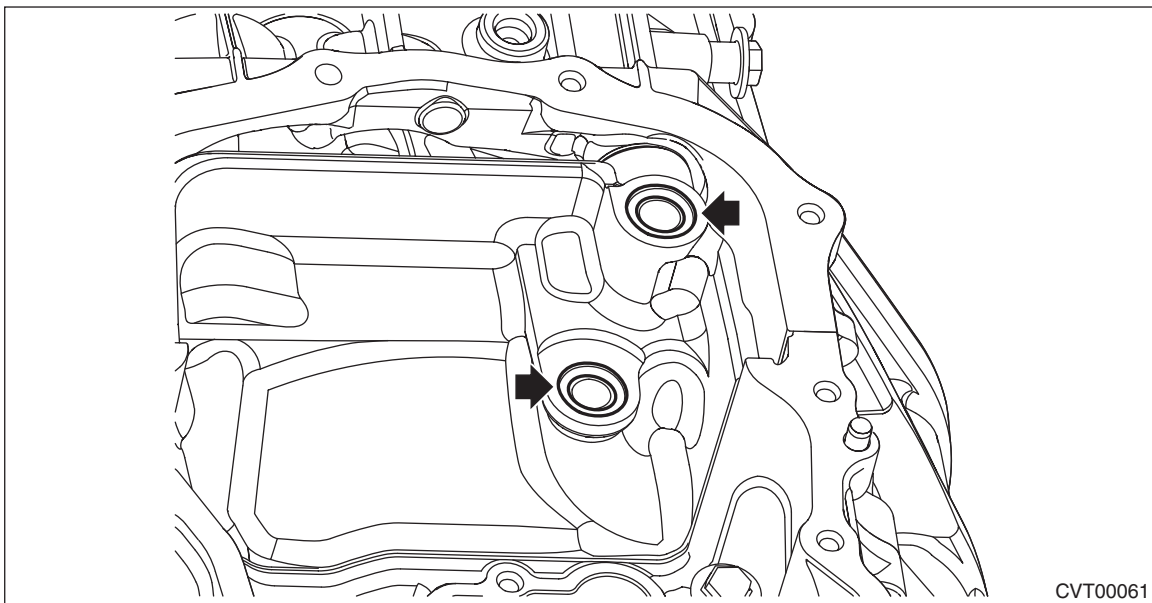
### CONTINUOUSLY VARIABLE TRANSMISSION

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16) Remove the control valve body.



17) Remove the O-ring from the transmission.



## 2. OUTPUT CLUTCH CONTROL VALVE BODY

### CAUTION:

- Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.
- Be careful not to spill CVTF on the exhaust pipe to prevent it from emitting smoke or causing a fire. If the CVTF adheres, wipe it off completely.
- Always clean the transmission before removal.

### NOTE:

The output clutch control valve body is replaced as an assembly only, because it is a non-disassembly part.

1) Disconnect the ground cable from battery. <Ref. to NT-5, BATTERY, NOTE, Note.>

### NOTE:

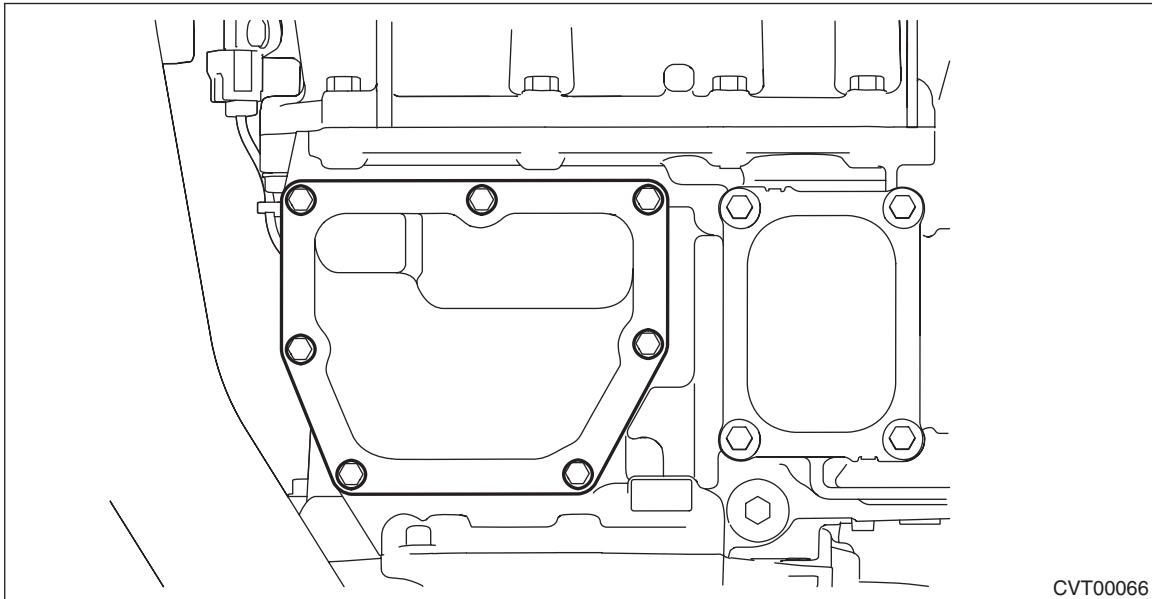
For the 12 volt engine restart battery, disconnect the ground terminal from 12V engine restart battery sensor.

2) Lift up the vehicle.

3) Remove the oil pan.

### CAUTION:

Be careful not to allow foreign matter such as dust or dirt to enter the oil pan.



4) Remove the magnet.

5) Disconnect the harness connector from the solenoid.

## Control Valve Body

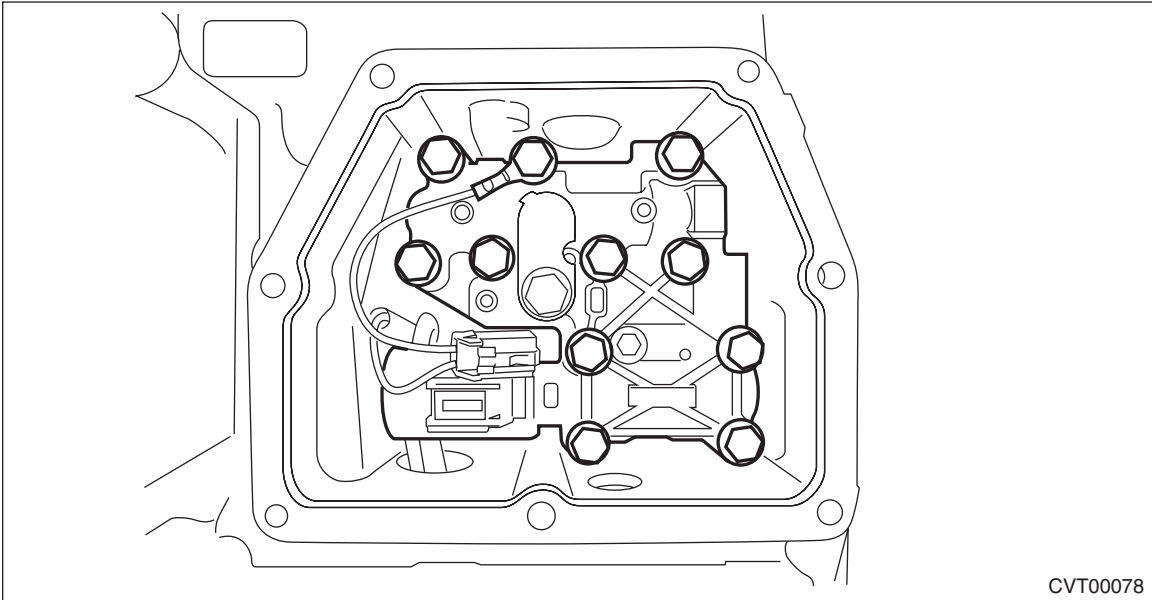
### CONTINUOUSLY VARIABLE TRANSMISSION

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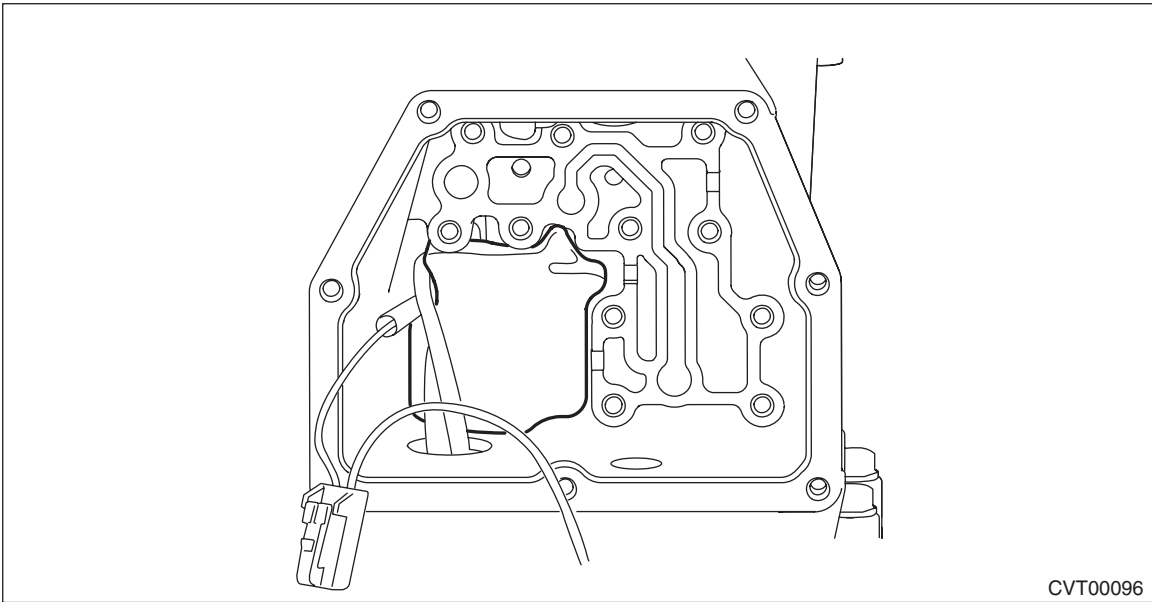
6) Remove the control valve body and separate plate.

**CAUTION:**

**Do not remove any bolts other than specified.**



7) Remove the oil spacer.





## B: INSTALLATION

### 1. MAIN CONTROL VALVE BODY

1) Clean the mating surface of valve cover and transmission side.

#### CAUTION:

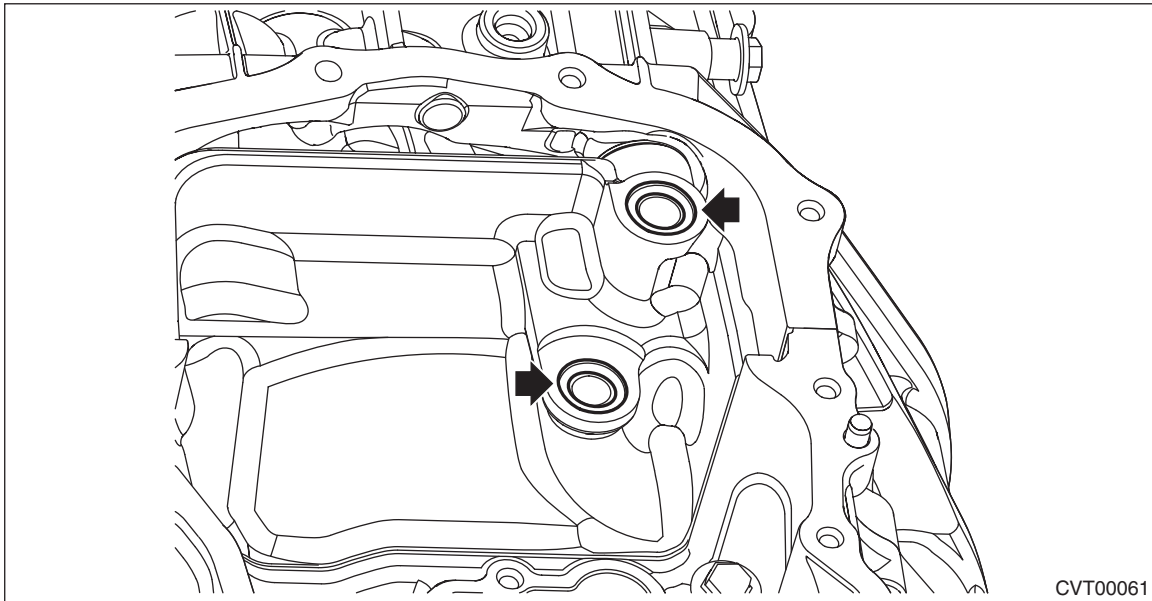
**When cleaning the mating surface of the transmission side, be careful not to allow any dust, foreign matter and used liquid gasket to enter the transmission.**

2) Check the control valve body for dust and other foreign matter.

3) Install the O-ring.

#### NOTE:

- Use new O-rings.
- Apply CVTF to the O-ring.



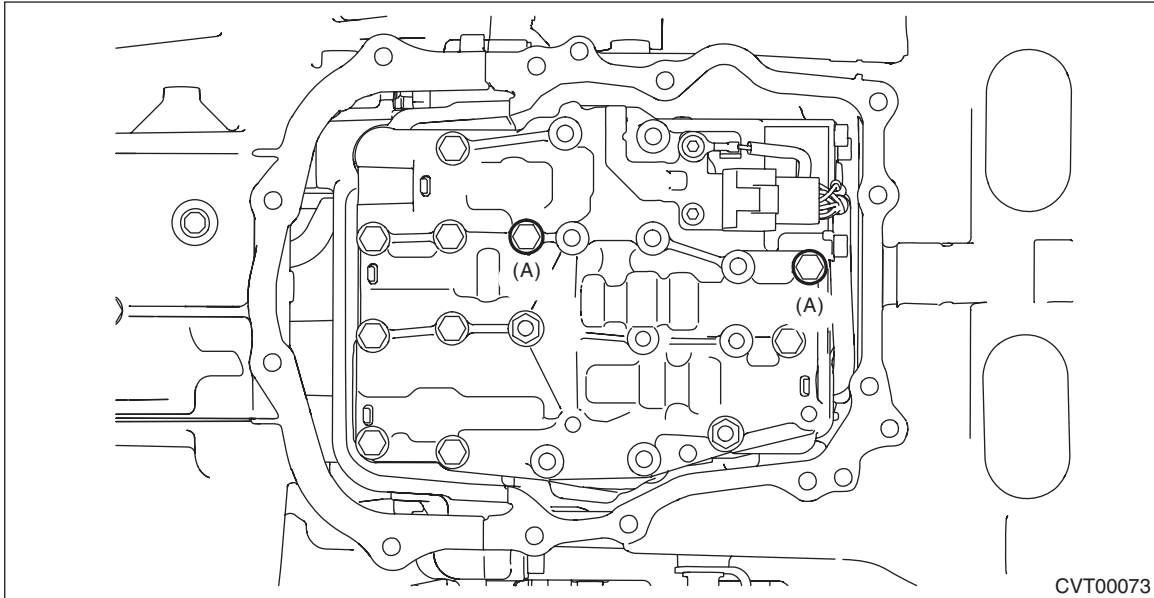
## Control Valve Body

### CONTINUOUSLY VARIABLE TRANSMISSION

- 4) Install the control valve body.
- (1) Install the control valve body to the transmission.

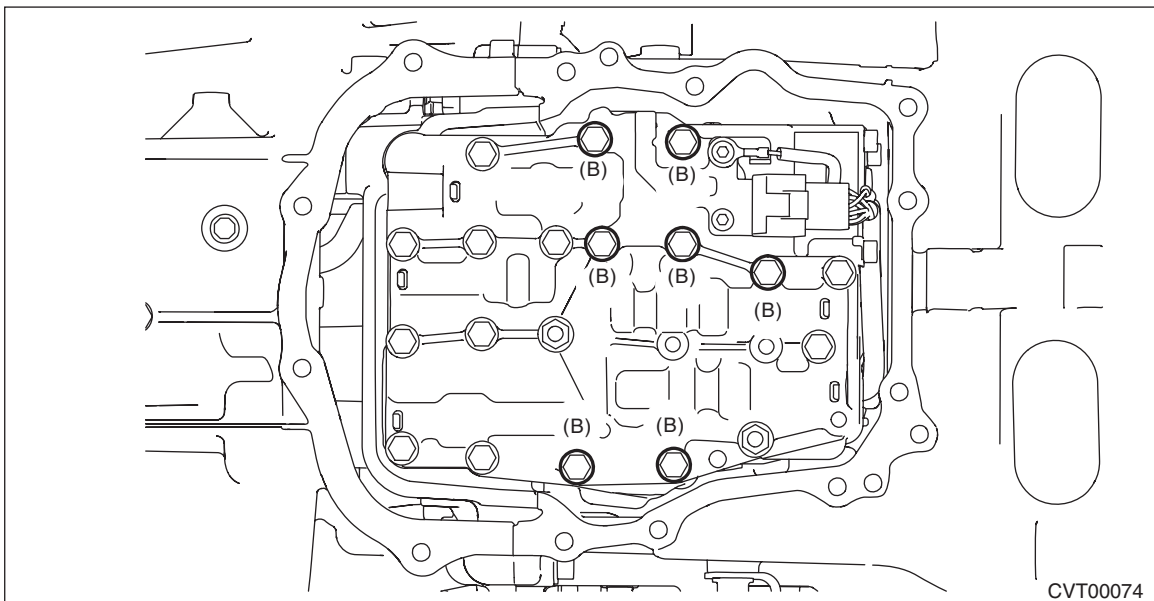
#### CAUTION:

- Do not damage the O-ring.
  - Perform installation so that the O-ring is not displaced.
- (2) Temporarily tighten the bolt (A: silver).



- (3) Attach the bolt (B).

**Tightening torque:**  
**9 N·m (0.9 kgf·m, 6.6 ft·lb)**



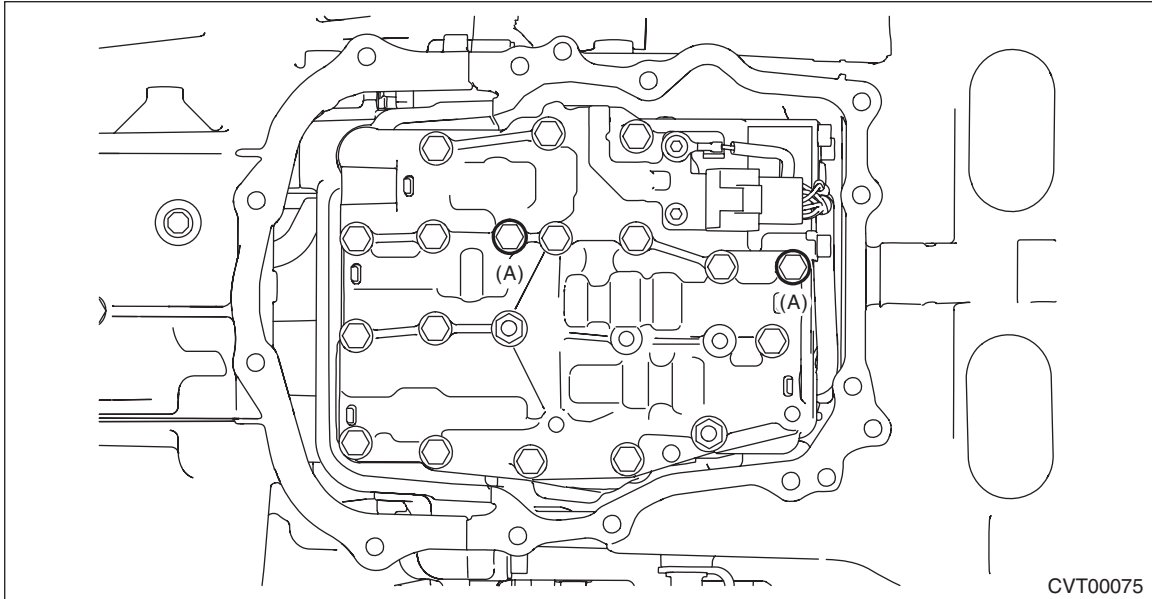
# Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

(4) Tighten the bolt (A: silver).

**Tightening torque:**

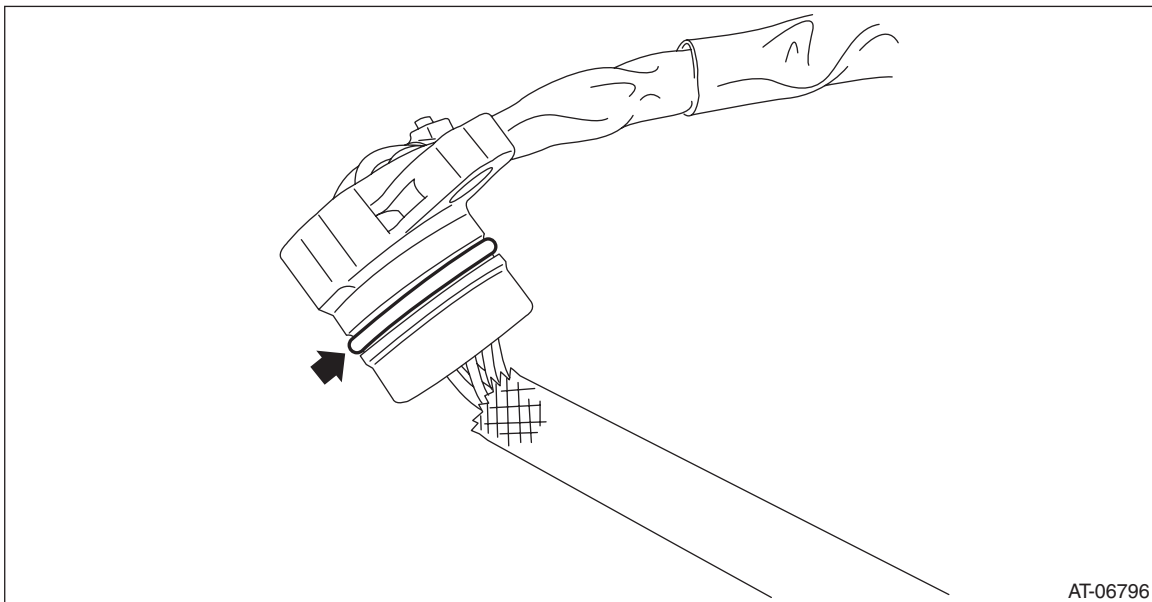
**9 N·m (0.9 kgf-m, 6.6 ft-lb)**



5) Install the O-ring to the transmission harness.

**NOTE:**

- Use new O-rings.
- Apply CVTF to the O-ring.



## Control Valve Body

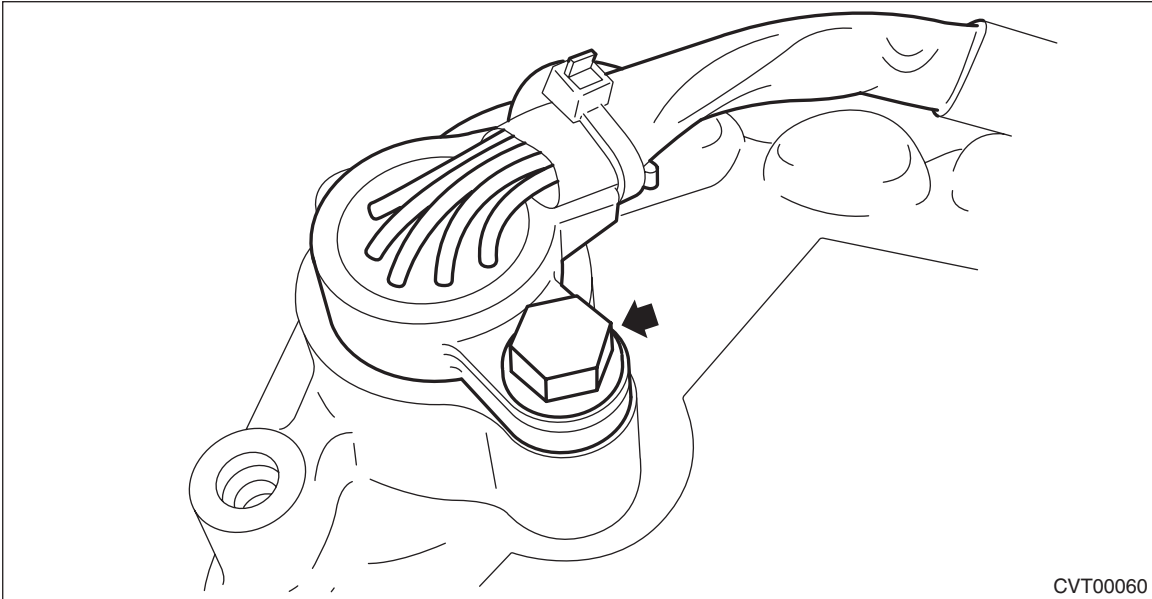
### CONTINUOUSLY VARIABLE TRANSMISSION

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6) Install the transmission harness to the valve cover.

**Tightening torque:**

**7 N·m (0.7 kgf-m, 5.2 ft-lb)**



CVT00060

7) Install the gasket to the transmission.

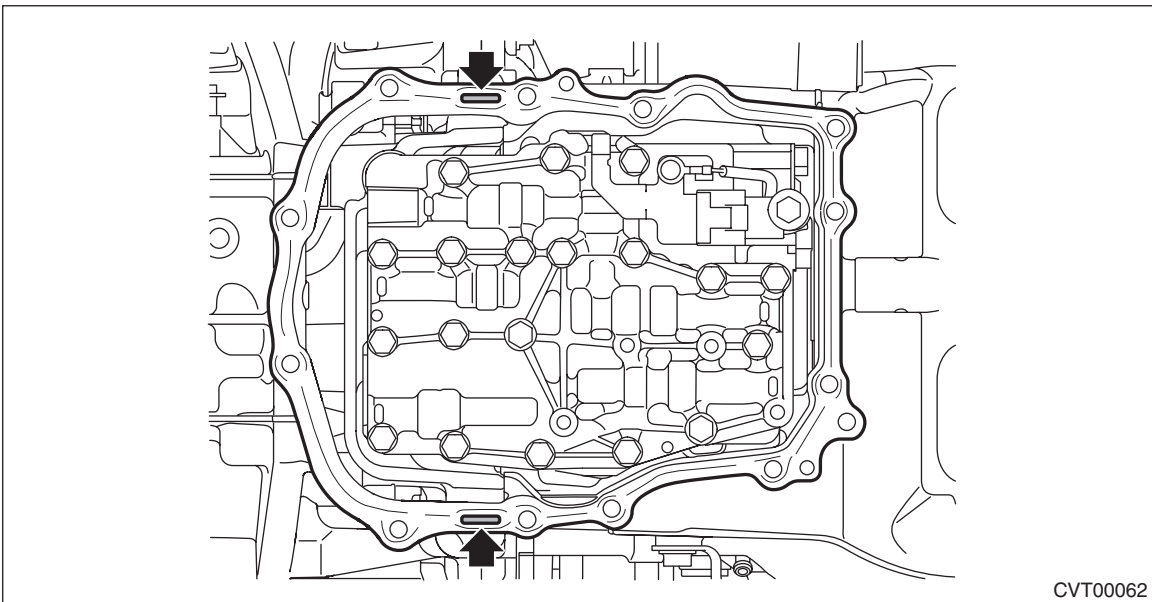
**NOTE:**

Use a new gasket.

8) Apply liquid gasket to the oval hole of gasket.

**Liquid gasket:**

**THREE BOND 1215B or equivalent**



CVT00062

# Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

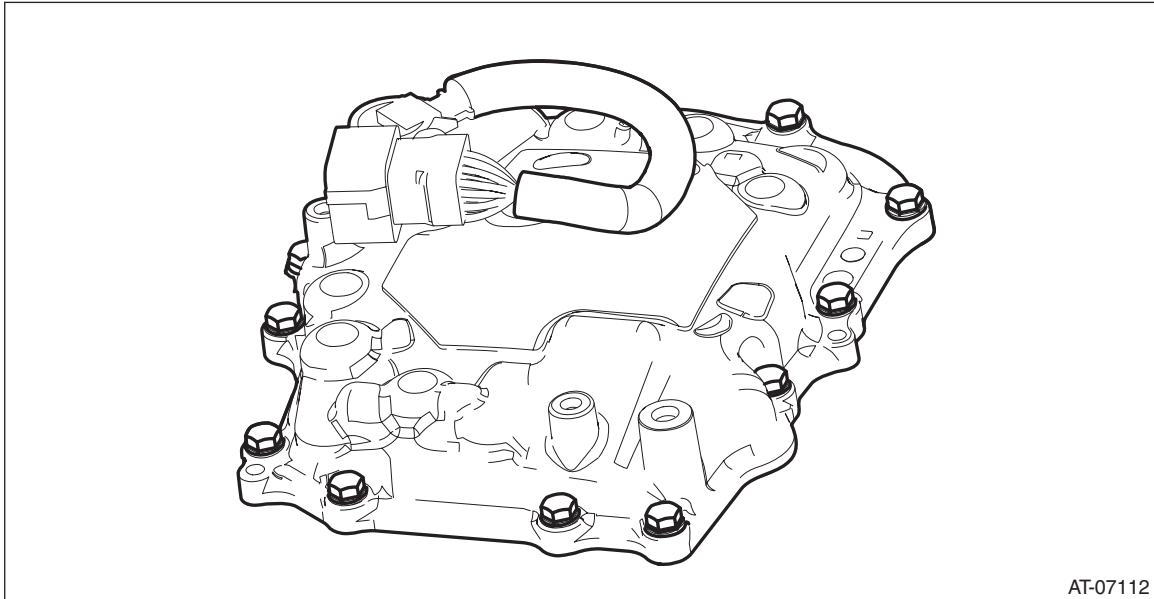
9) Connect the transmission harness connector to the control valve body, and install the valve cover.

## CAUTION:

Be careful not to catch the sheet of the ST.

### Tightening torque:

**9 N·m (0.9 kgf-m, 6.6 ft-lb)**



10) Remove the ST (SHEET SPECIAL TOOL).

11) Install the transmission harness connector to the harness stay.

12) Install the transmission harness stay, drive motor harness stay and transmission ground terminal.

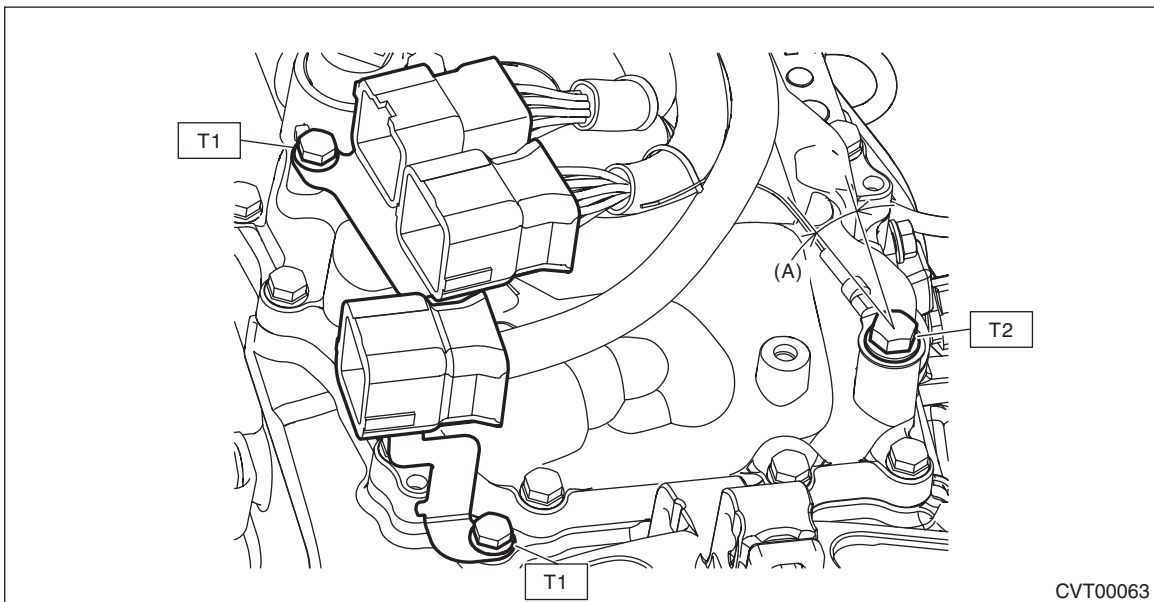
## NOTE:

Install the transmission ground terminal in the direction within the range of approx. 30° (A).

### Tightening torque:

**T1: 7 N·m (0.7 kgf-m, 5.2 ft-lb)**

**T2: 14 N·m (1.4 kgf-m, 10.3 ft-lb)**



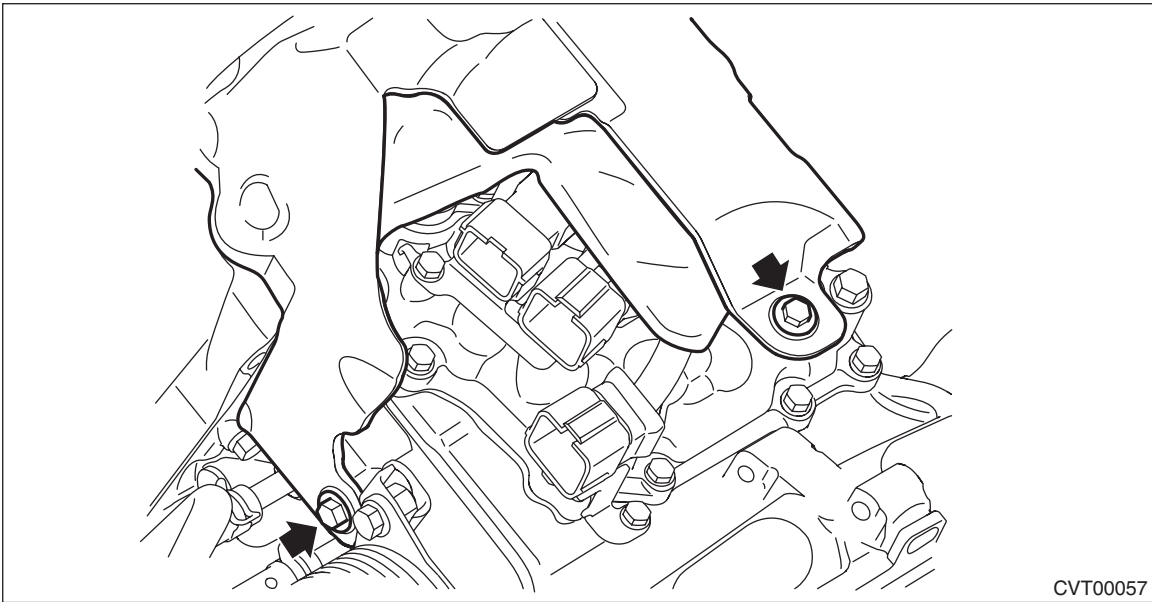
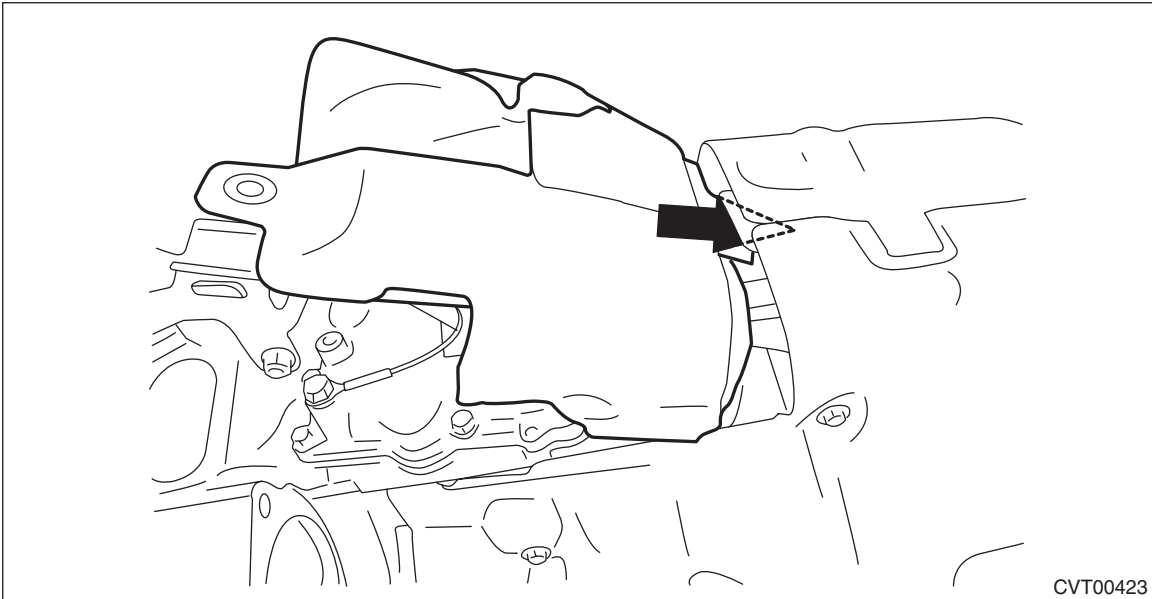
## Control Valve Body

### CONTINUOUSLY VARIABLE TRANSMISSION

13) Insert the transmission case cover (small) between the transmission case cover (large) and the transmission to install.

**Tightening torque:**

**8 N·m (0.8 kgf-m, 5.9 ft-lb)**



14) Install the pitching stopper bracket and transmission radio ground cord.

**Tightening torque:**

**41 N·m (4.2 kgf-m, 30.2 ft-lb)**

15) Install the air breather hose to the pitching stopper bracket. <Ref. to CVT(TH58A)-173, FRONT DIFFERENTIAL SIDE, INSTALLATION, Air Breather Hose.>

16) Install the pitching stopper. <Ref. to CVT(TH58A)-89, PITCHING STOPPER, INSTALLATION, Transmission Mounting System.>

# Control Valve Body

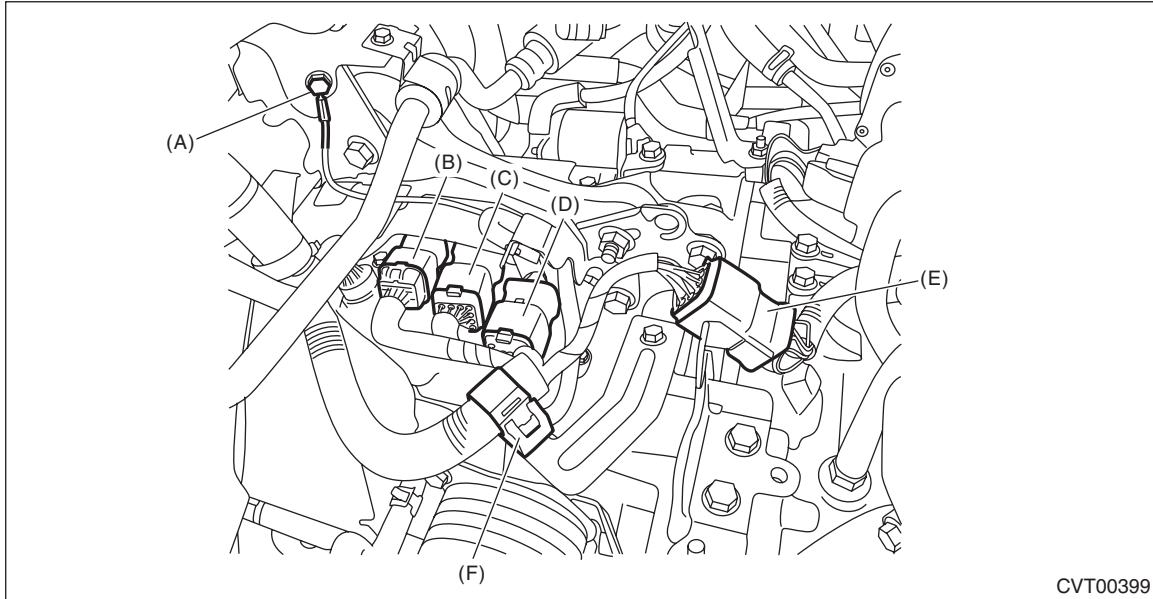
CONTINUOUSLY VARIABLE TRANSMISSION

17) Connect the following connectors and install the harness clip to the bracket.

- Transmission radio ground terminal
- Transmission harness connectors
- Inhibitor harness connector
- Drive motor harness connector
- Engine harness connectors
- Harness clip

**Tightening torque:**

**13 N·m (1.3 kgf-m, 9.6 ft-lb)**



CVT00399

- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Inhibitor harness connector
- (D) Drive motor harness connector
- (E) Engine harness connectors
- (F) Harness clip

18) Install the air cleaner case and bracket. <Ref. to IN(H4DO(HEV))-8, INSTALLATION, Air Cleaner Case.>

19) Install the collector cover.

20) Install the 12 volt auxiliary battery ground terminal and ground terminal to the 12V engine restart battery sensor of the 12 volt engine restart battery. <Ref. to NT-5, BATTERY, NOTE, Note.>

21) Refill CVTF to adjust the CVTF level. <Ref. to CVT(TH58A)-41, ADJUSTMENT, CVTF.>

22) Perform the learning again. <Ref. to CVT(HEV)(diag)-26, Learning Control.>

# Control Valve Body

## CONTINUOUSLY VARIABLE TRANSMISSION

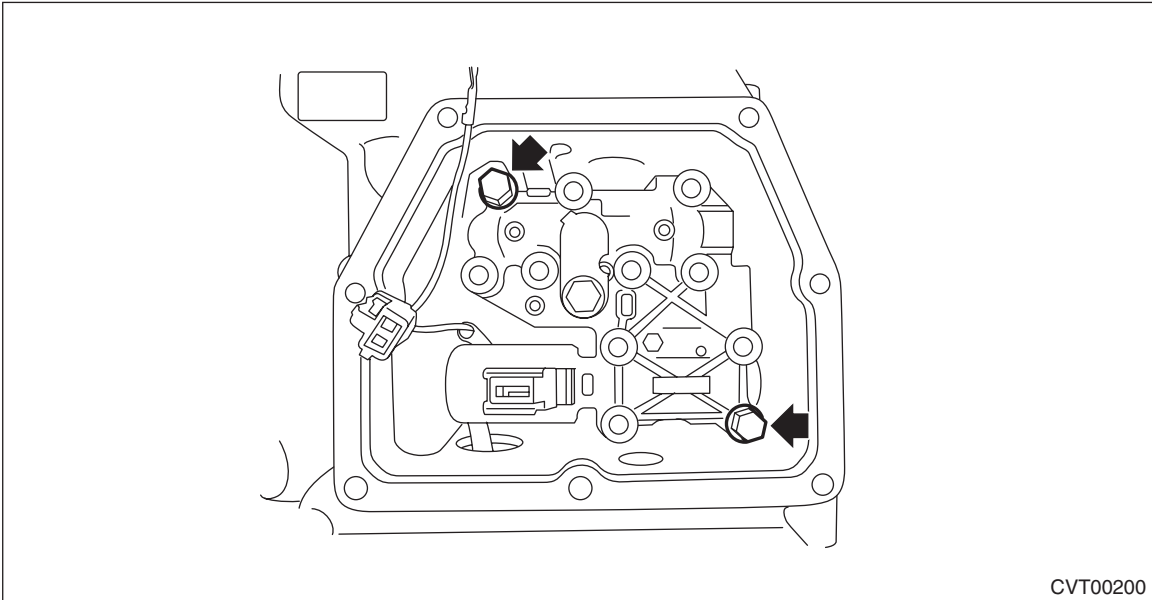
### 2. OUTPUT CLUTCH CONTROL VALVE BODY

- 1) Clean the mating surface of oil pan and drive motor case.
- 2) Clean the magnet.
- 3) Attach the magnet at the specified position of the oil pan.
- 4) Install the oil spacer.
- 5) Install the control valve body.

(1) Temporarily attach the separator plate and output clutch control valve with two bolts.

NOTE:

Apply CVTF to the bolt seating surface.



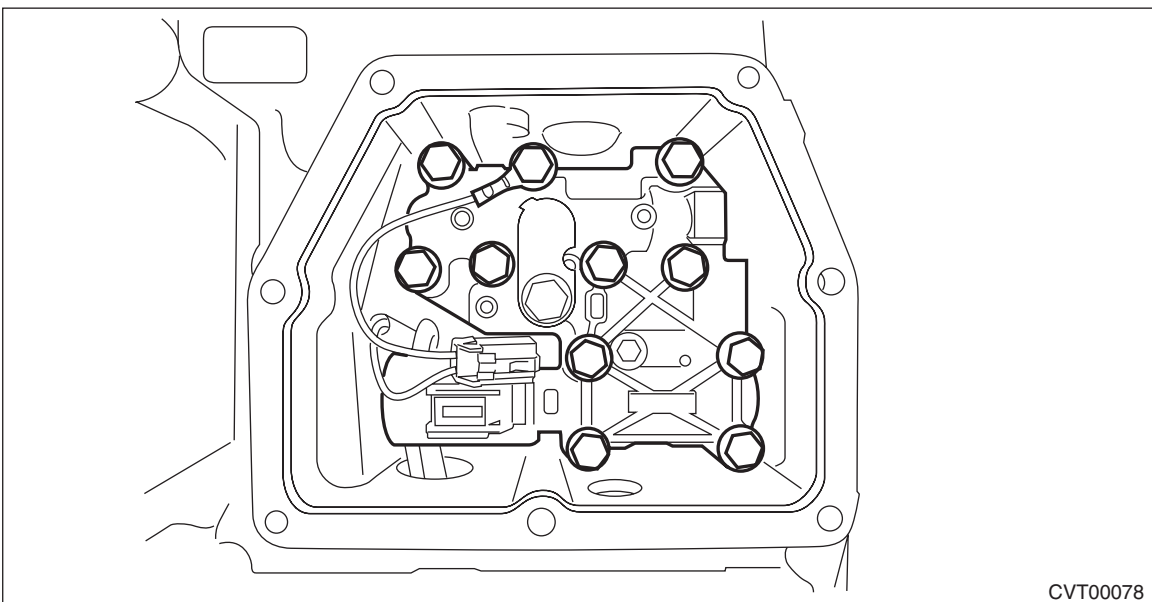
(2) Install the bolt and the ground terminal.

NOTE:

Apply CVTF to the bolt seating surface.

**Tightening torque:**

**9 N·m (0.9 kgf-m, 6.6 ft-lb)**



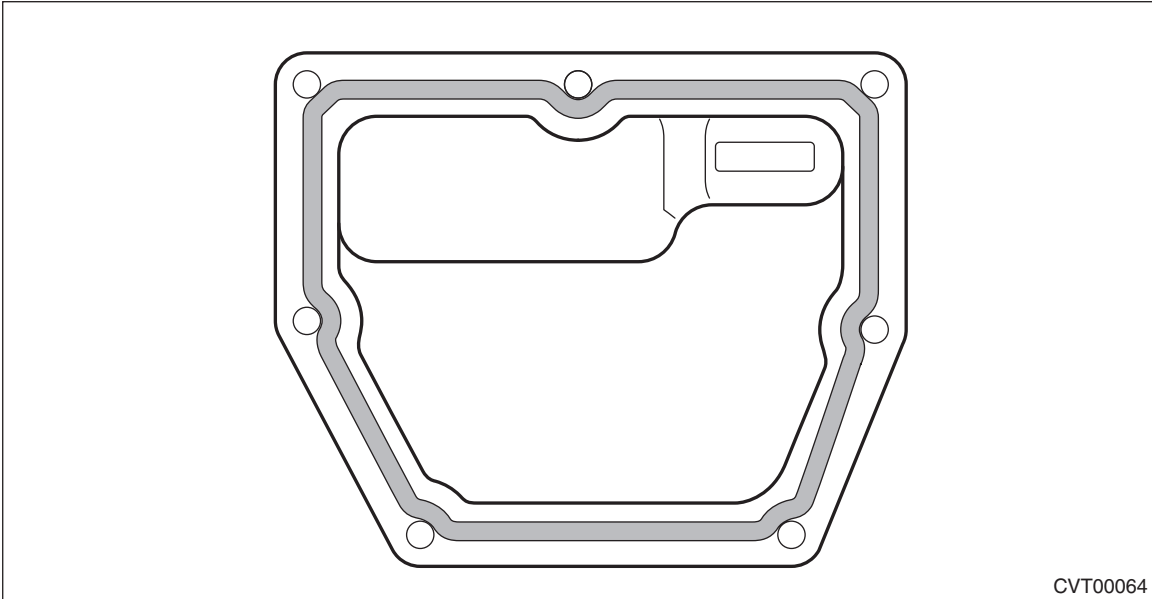
(3) Install the harness connector to the solenoid.



6) Apply liquid gasket all around the oil pan mating surface seamlessly.

**Liquid gasket:**

**THREE BOND 1217B (Part No. K0877YA020) or equivalent**



CVT00064

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

**Tightening torque:**

**5 N·m (0.5 kgf-m, 3.7 ft-lb)**

8) Install the 12 volt auxiliary battery ground terminal and ground terminal to the 12V engine restart battery sensor of the 12 volt engine restart battery. <Ref. to NT-5, BATTERY, NOTE, Note.>

9) Refill CVTF to adjust the CVTF level. <Ref. to CVT(TH58A)-41, ADJUSTMENT, CVTF.>

10) Perform the learning five times. <Ref. to CVT(HEV)(diag)-26, Learning Control.>

# Control Valve Body

## CONTINUOUSLY VARIABLE TRANSMISSION

### C: INSPECTION

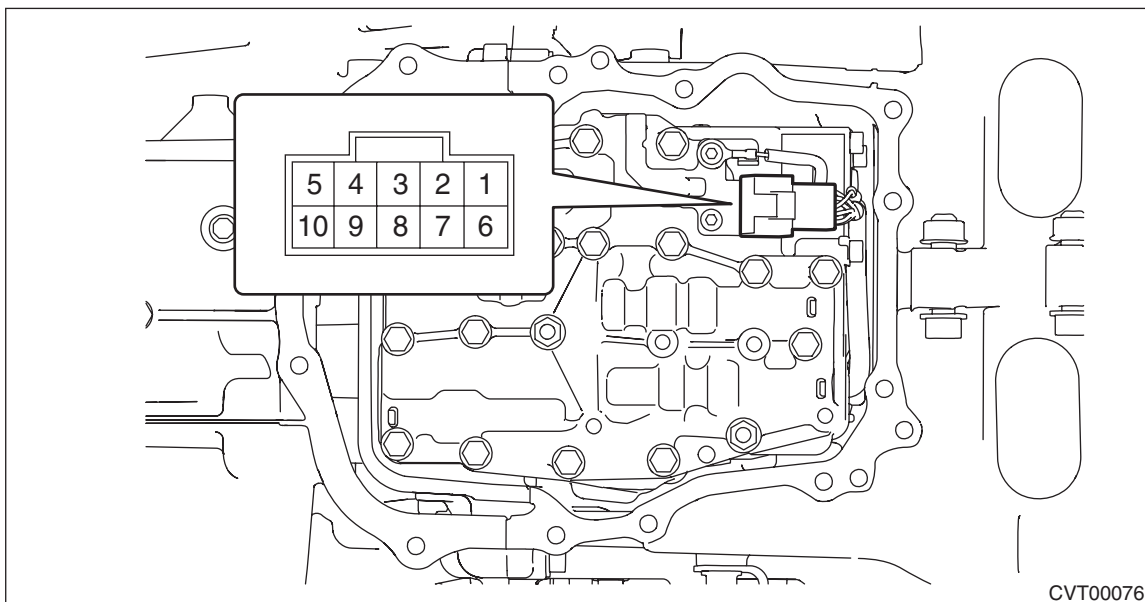
- Check each part for damage or dust.
- Measure the resistance of each solenoid, sensor and ground wire.

#### NOTE:

Measurement should be performed at a temperature of 20°C (68°F).

### 1. MAIN CONTROL VALVE BODY

- **Solenoid**



Solenoid	Terminal No.	Standard ( $\Omega$ )
Primary UP solenoid	No. 2 — control valve body	Approx. 10 — 13.5 $\Omega$
Secondary solenoid	No. 3 — control valve body	Approx. 5 — 7 $\Omega$
F&R clutch solenoid	No. 4 — control valve body	Approx. 4 — 6 $\Omega$
Primary DOWN solenoid	No. 7 — control valve body	Approx. 10 — 13.5 $\Omega$
Lock-up duty solenoid	No. 9 — control valve body	Approx. 10 — 13.5 $\Omega$
AWD solenoid	No. 10 — control valve body	Approx. 2 — 4.5 $\Omega$

- **Oil temperature sensor**

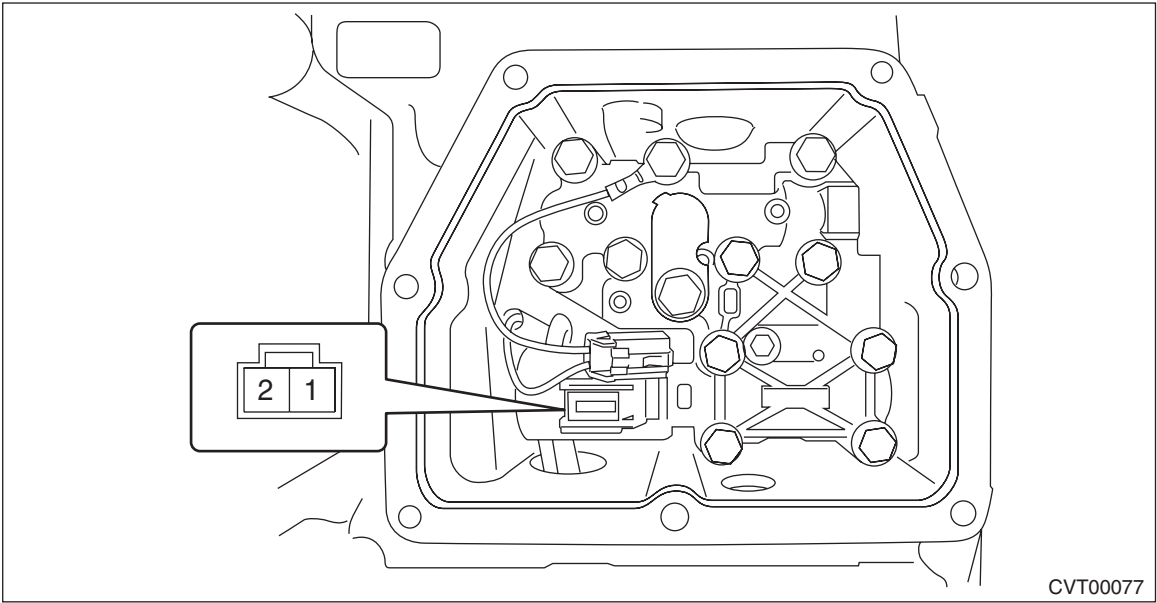
Sensor	Terminal No.	Standard ( $\Omega$ ) At 20°C (68°F)
Oil temperature sensor	No. 1 — No. 6	Approx. 2.5 k $\Omega$

- **Transmission ground**

Terminal No.	Standard ( $\Omega$ )
No. 8 — control valve body	Less than 1 $\Omega$

2. OUTPUT CLUTCH CONTROL VALVE BODY

- Solenoid



Solenoid	Terminal No.	Standard (Ω)
Output clutch solenoid	No. 1 — No. 2	Approx. 4 — 6 Ω