

## 11. Automatic Transmission Assembly

### A: REMOVAL

**WARNING:**

The hybrid system includes a high voltage circuit. Mishandling could cause accidents such as electric shock or leak. Always check “CAUTION (HYBRID SYSTEM)” and perform the proper operation. <Ref. to PC-7, CAUTION (HYBRID SYSTEM), Precaution.>

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 service disconnect plug. <Ref. to HEV-15, REMOVAL, Service Plug.>

**WARNING:**

After pulling out the service disconnect plug, a high voltage is accumulated in the condenser inside the inverter. If touching the high voltage parts, wiring harness, terminals and connectors is required, wait for 10 minutes before starting the operation.

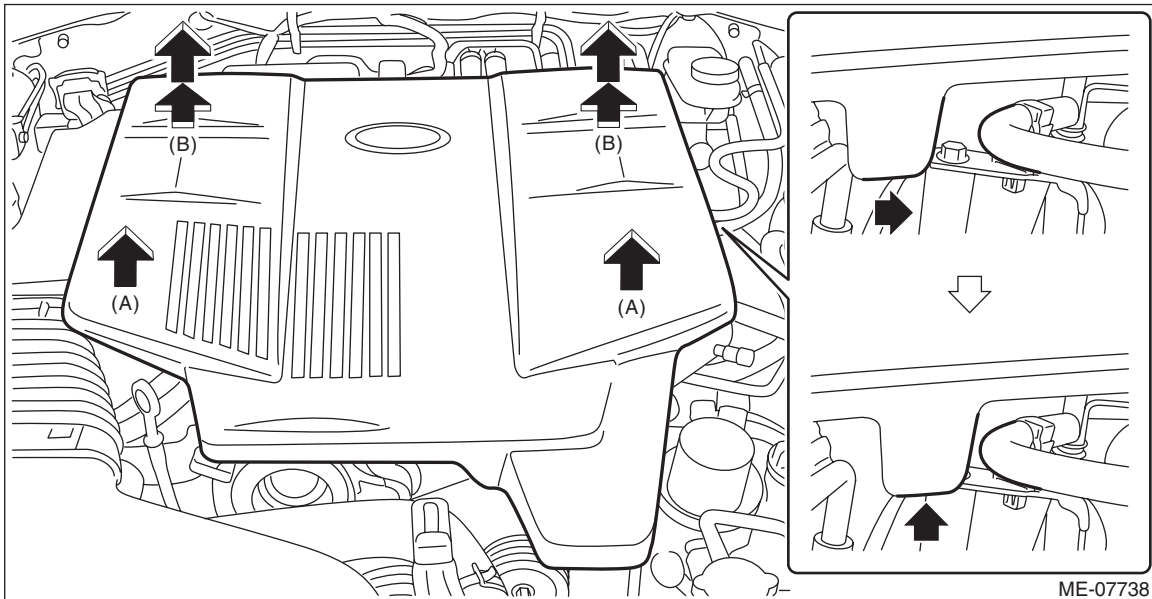
3) Remove the collector cover.

(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.



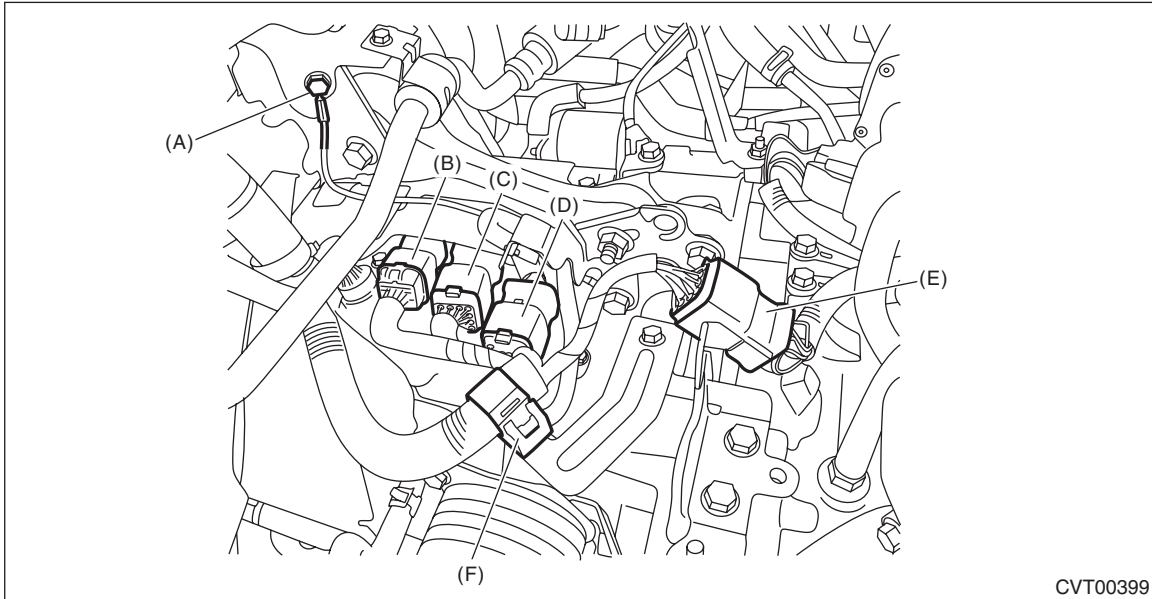
4) Remove the air cleaner case. <Ref. to IN(H4DO(HEV))-6, REMOVAL, Air Cleaner Case.>

# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

5) Disconnect the following connectors and harness clips.

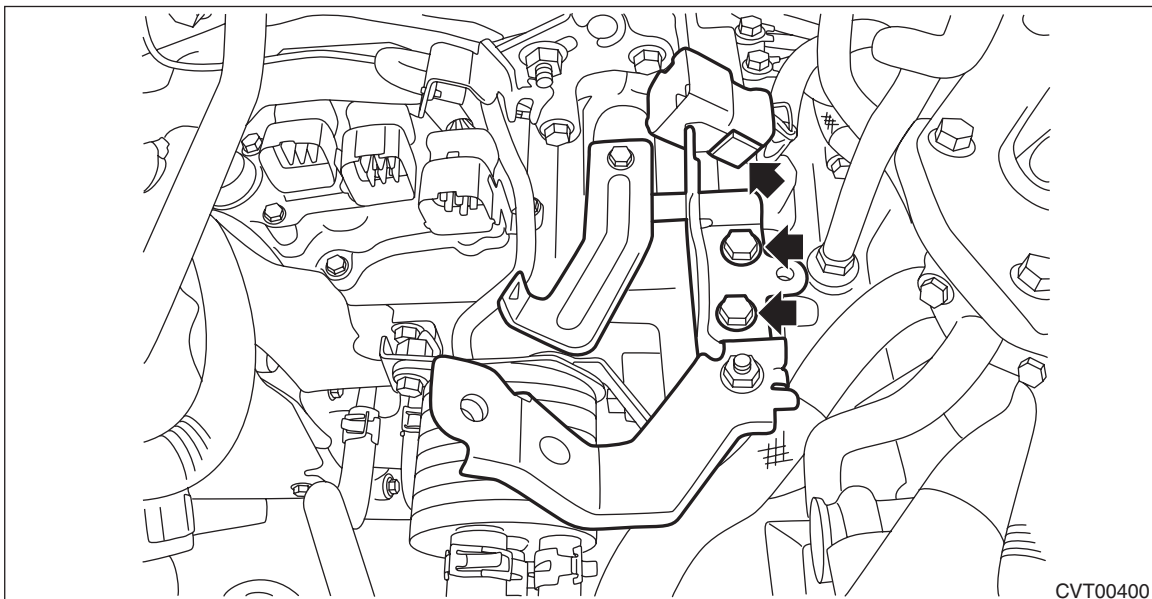
- Transmission radio ground terminal
- Transmission harness connectors
- Inhibitor harness connector
- Drive motor harness connector
- Engine harness connectors
- Harness clip



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

6) Remove the engine harness connector, and remove the engine hanger.

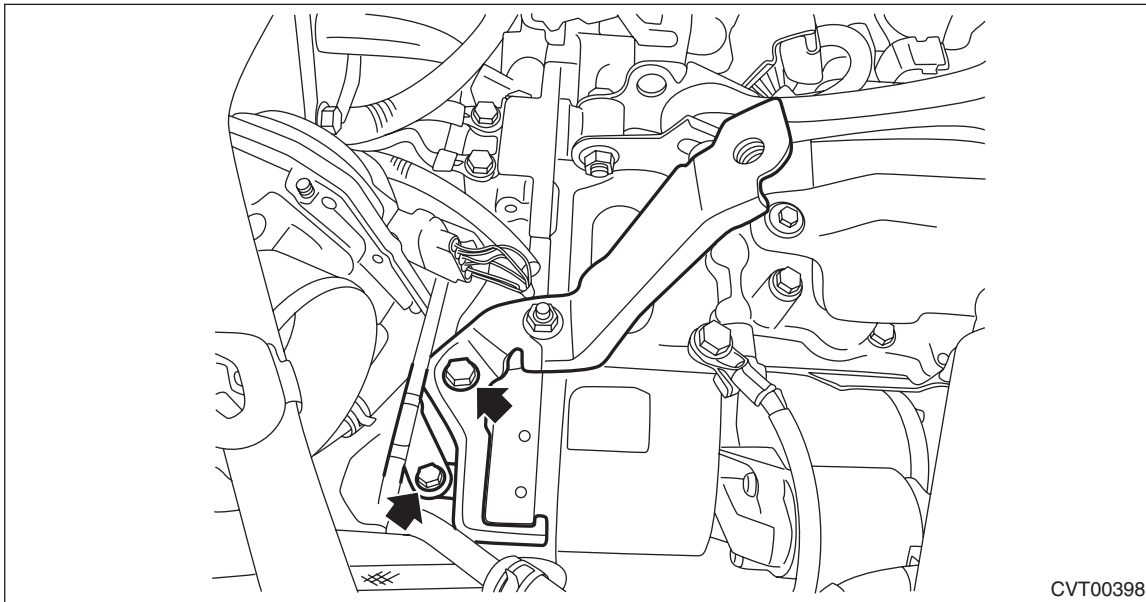


CVT00400

# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

7) Remove the air cleaner case bracket LH.

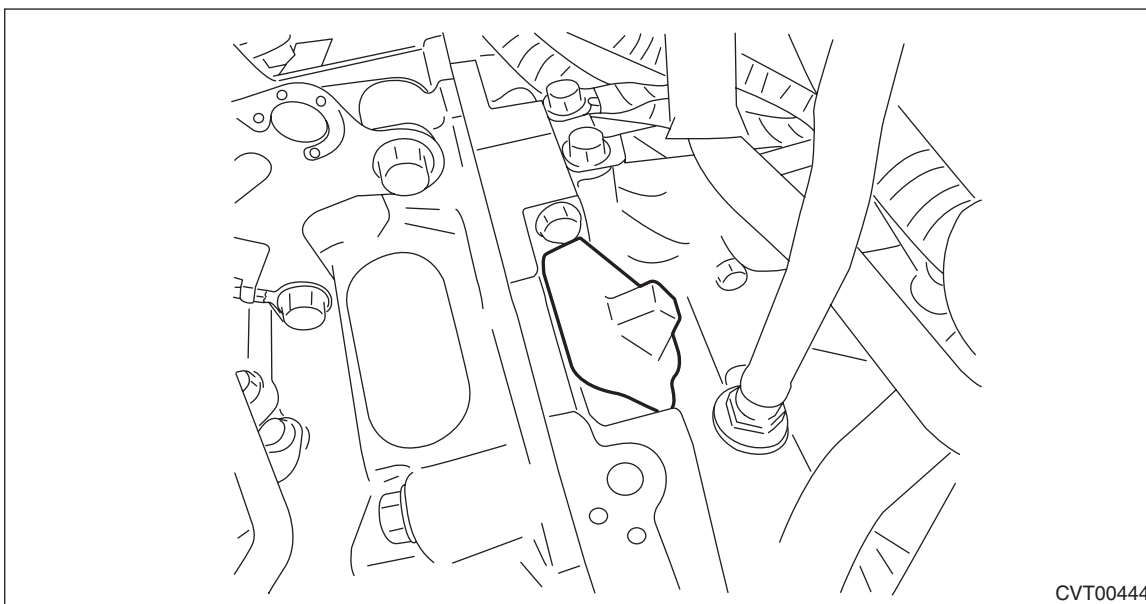


8) Remove the starter. <Ref. to SC(H4DO(HEV))-10, REMOVAL, Starter.>

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

10) Disconnect the throttle position sensor harness connector.

11) Remove the service hole plug.



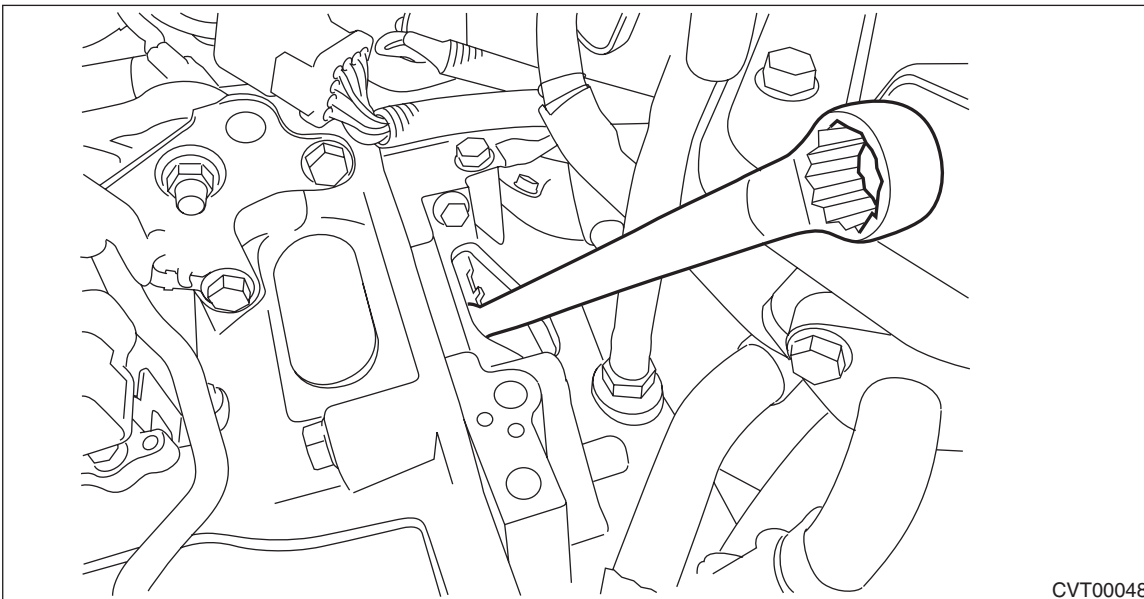
# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

12) Remove the four bolts combining the torque converter and drive plate while rotating the crank pulley a little at a time in the same direction as engine revolution.

### CAUTION:

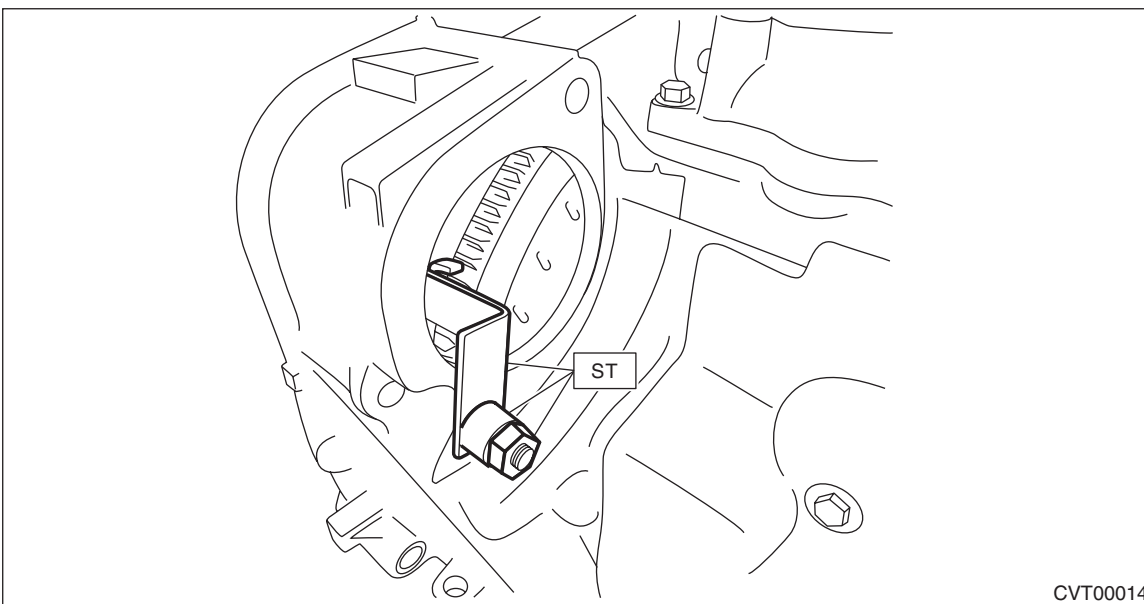
- Be careful not to drop bolts into the converter housing.
- Be careful not to damage the mounting bolts.



13) Make sure the torque converter moves freely by rotating with finger through the starter installation hole.

14) Attach the ST to the converter case.

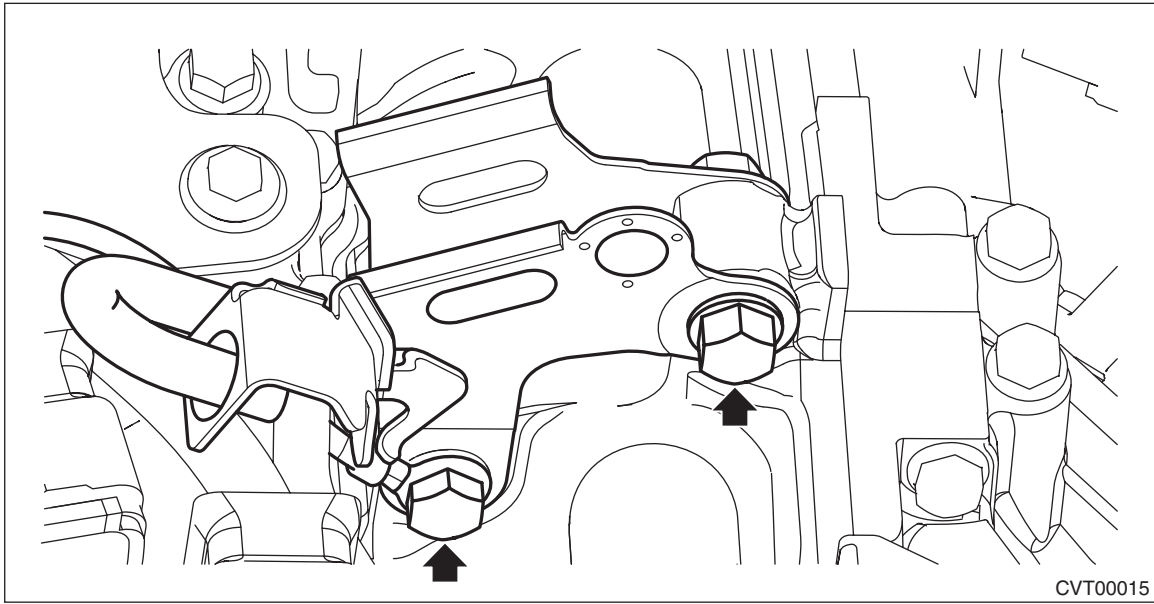
ST 498277200 STOPPER SET



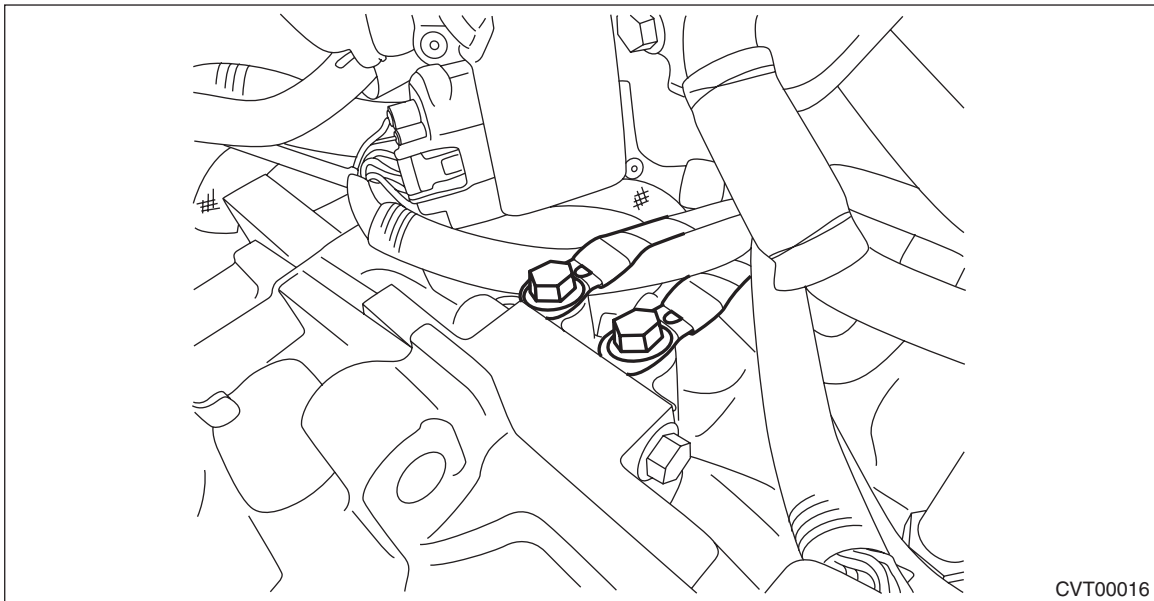
# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

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



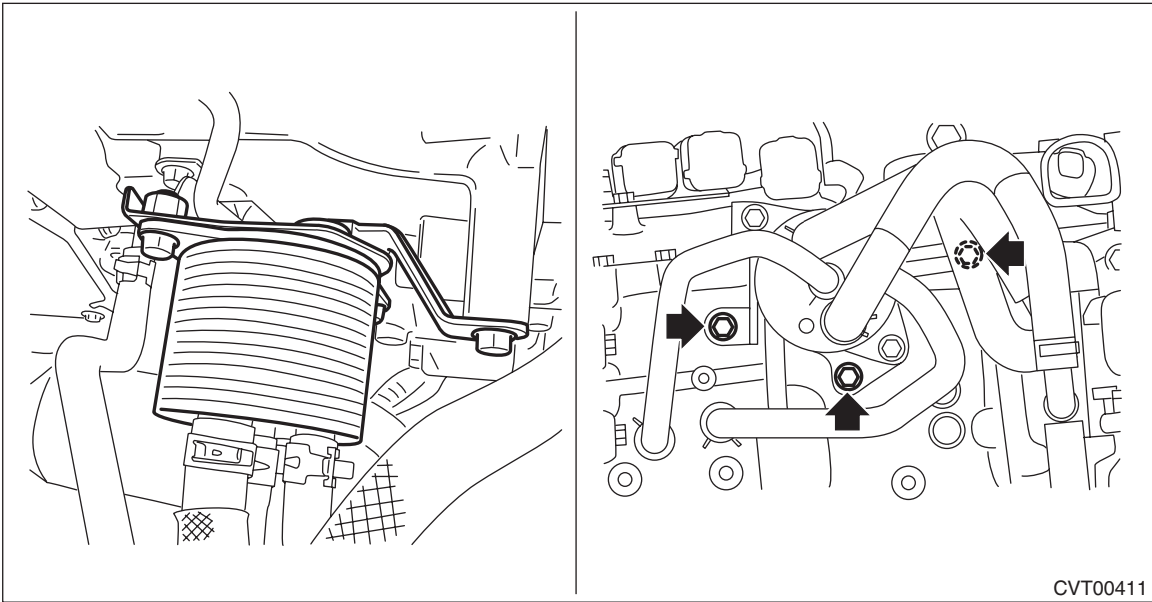
- 16) Disconnect the engine ground terminals.



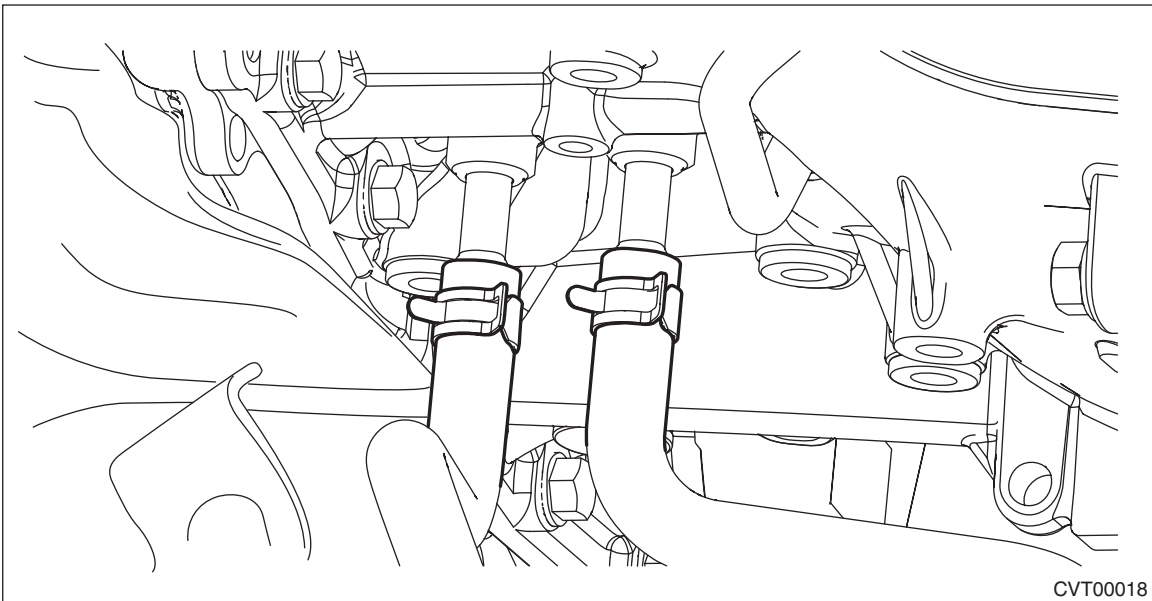
# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

17) Remove the CVTF cooler (with warmer feature) from the transmission, and using a piece of wire, affix to a location of the body where it will not interfere with the removal of the transmission.



18) Remove the CVTF inlet hose and outlet hose from the pipe.



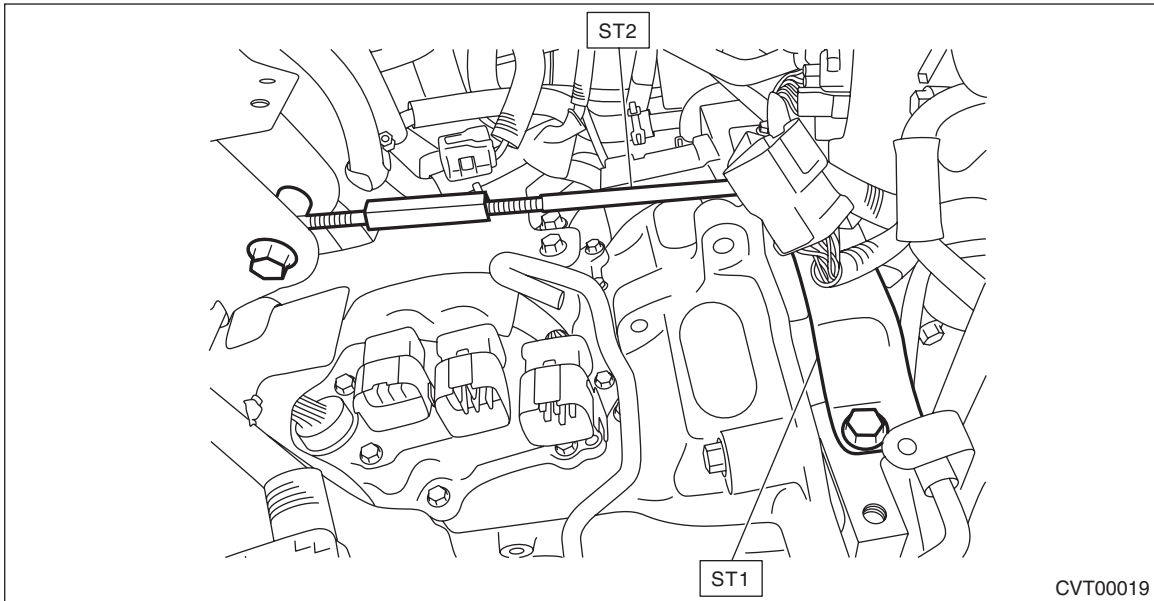
# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

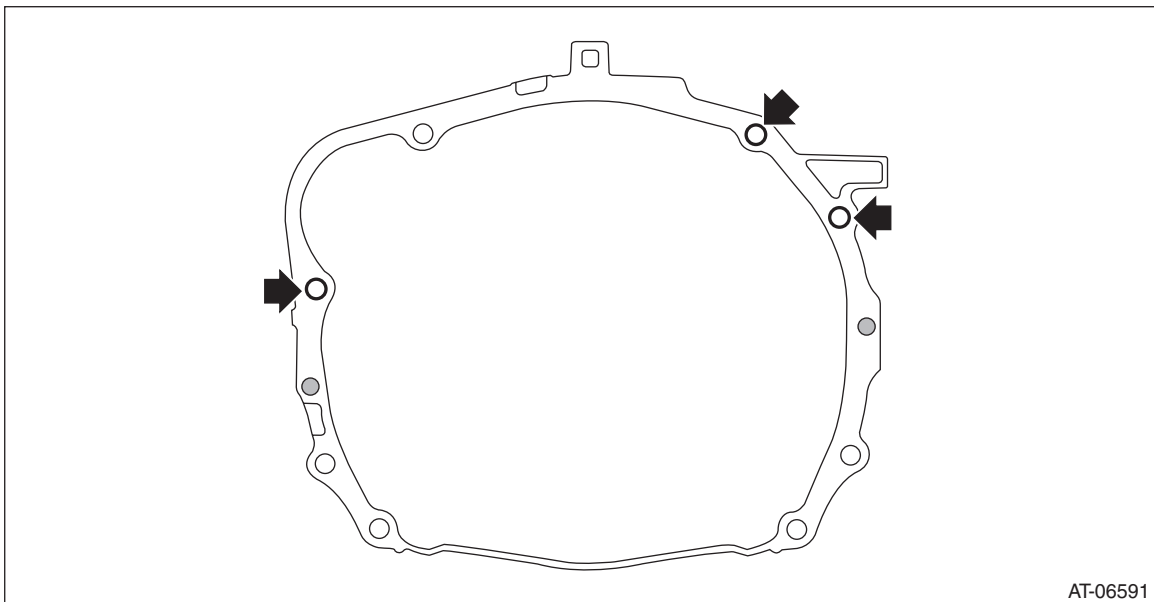
19) Set the ST.

ST1 41099AA012 ENGINE SUPPORT BRACKET

ST2 41099AA020 ENGINE SUPPORT



20) Remove the three transmission connecting bolts.



21) Lift up the vehicle.

22) Remove the front tires. <Ref. to WT-4, REMOVAL, Tire and Wheel.>

23) Remove the under cover - rear LH. <Ref. to EI-32, REMOVAL, Front Under Cover.>

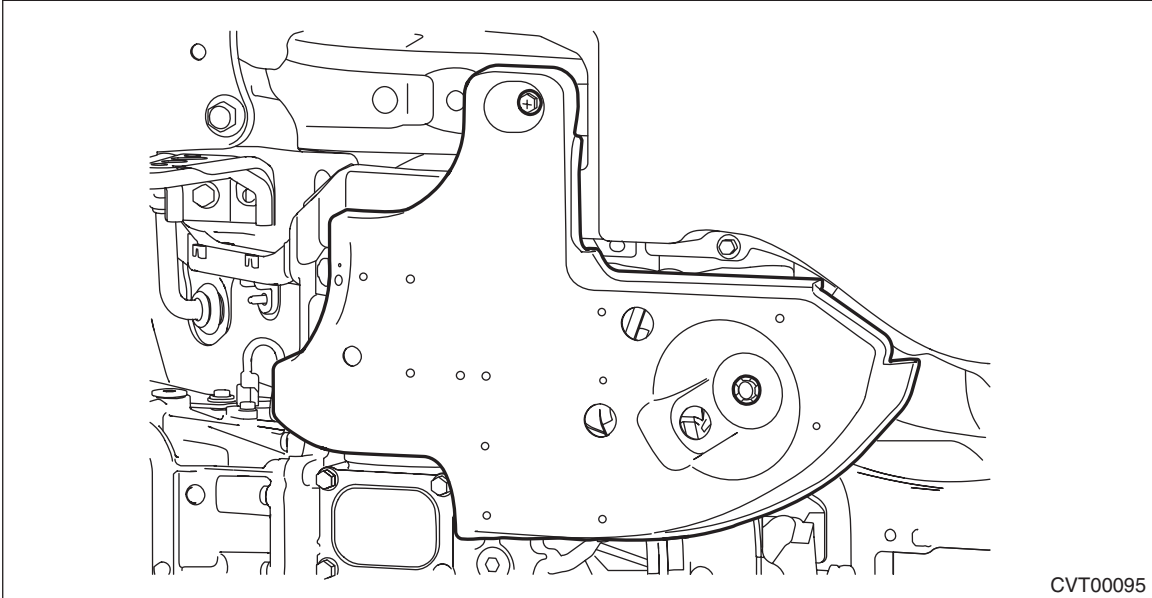


# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

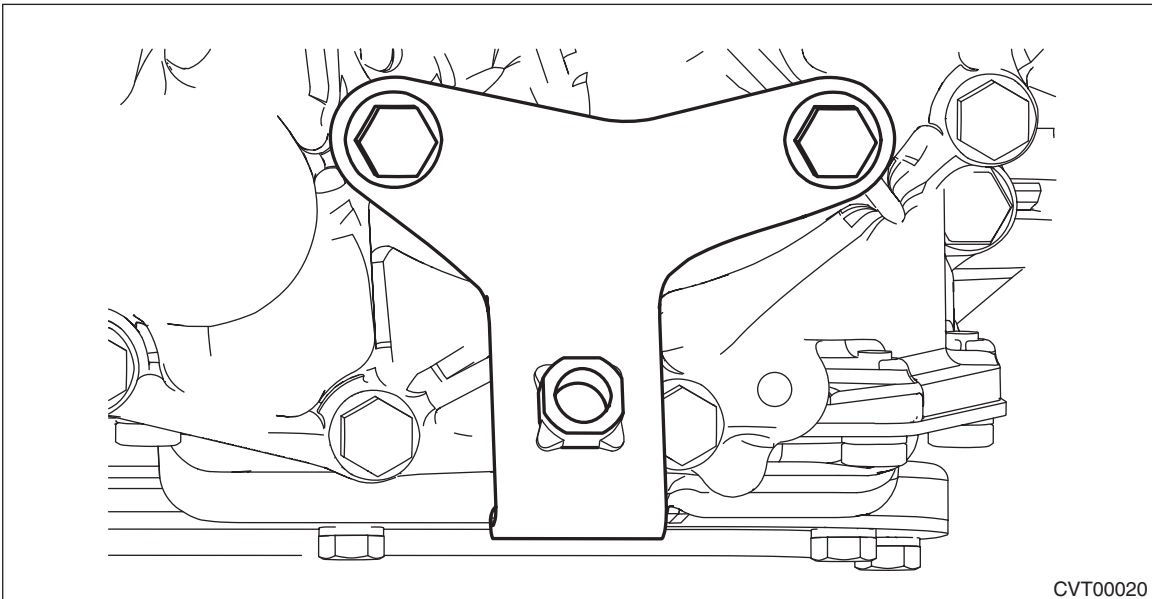
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24) Remove the under cover front - cable.



25) Remove the center exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-18, REMOVAL, Rear Exhaust Pipe.>

26) Remove the hanger bracket.

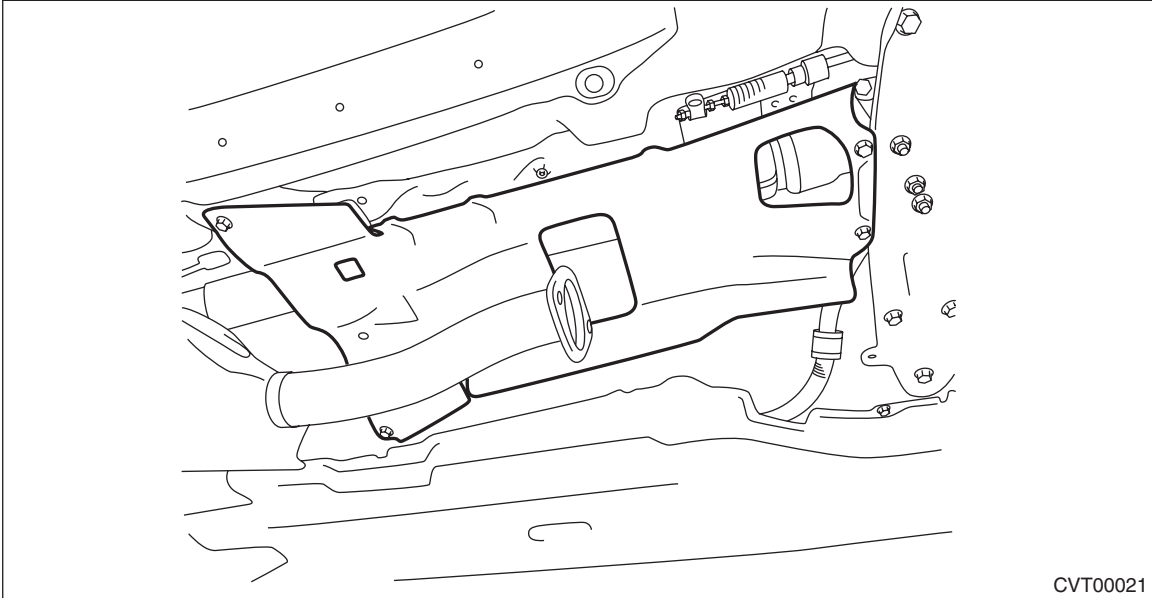




# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

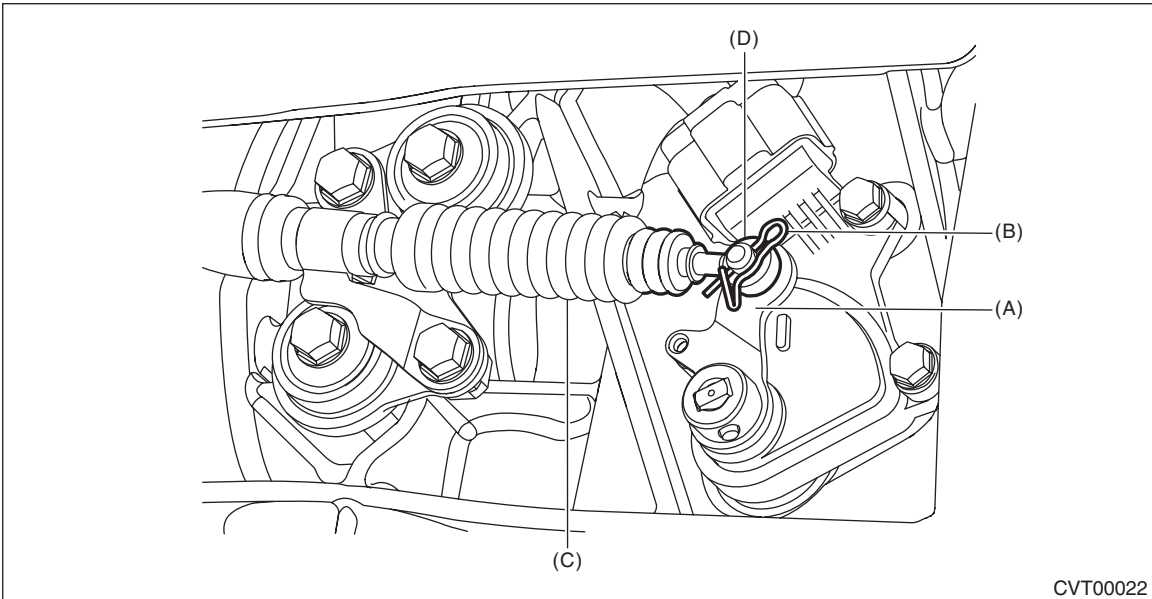
27) Remove the center exhaust cover.



28) Remove the CVTF drain plug to drain CVTF. <Ref. to CVT(TH58A)-43, REPLACEMENT, CVTF.>

29) Drain differential gear oil. <Ref. to CVT(TH58A)-47, REPLACEMENT, Differential Gear Oil.>

30) Remove the snap pin and washer from shifter arm and remove the select cable from shifter arm.

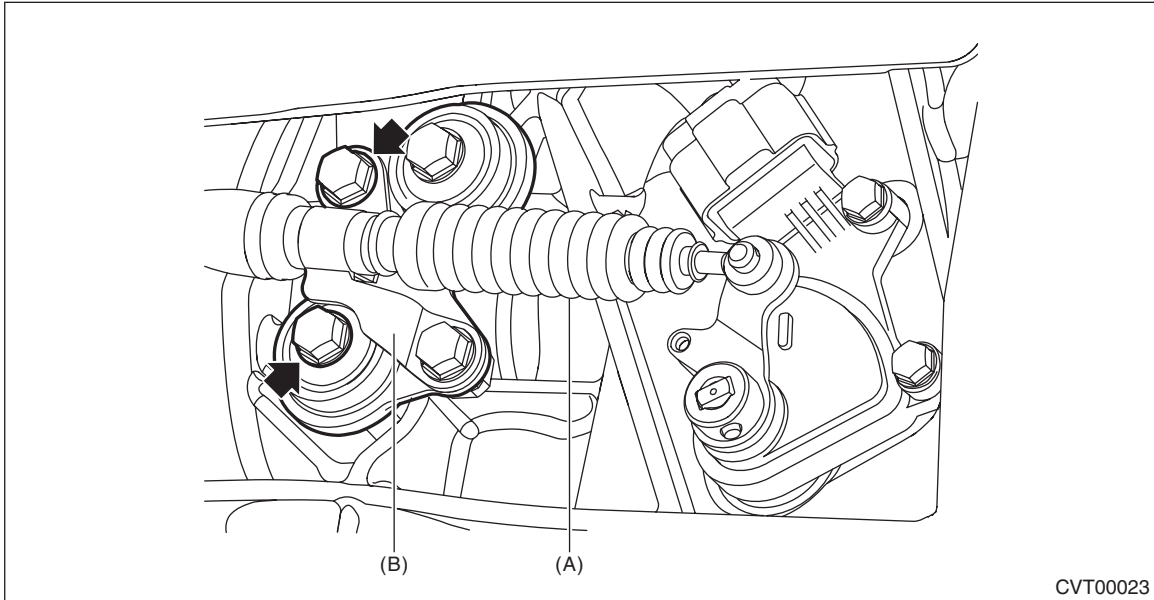


- (A) Shifter arm
- (B) Snap pin
- (C) Select cable
- (D) Washer

# Automatic Transmission Assembly

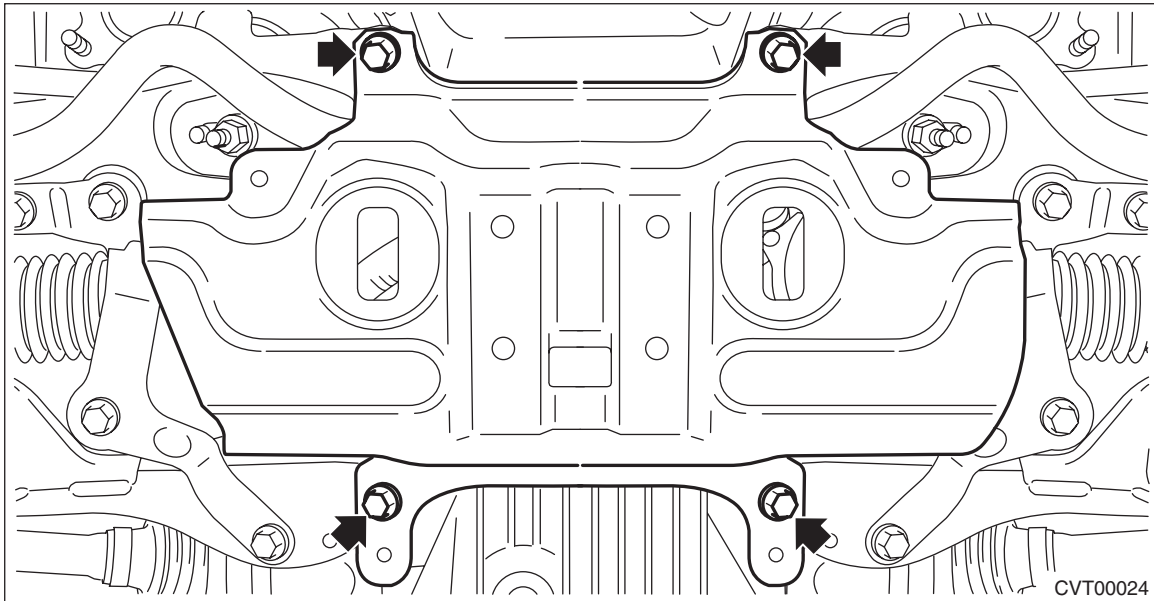
## CONTINUOUSLY VARIABLE TRANSMISSION

31) Remove the plate assembly from the transmission case.



32) Remove the propeller shaft. <Ref. to DS-12, REMOVAL, Propeller Shaft.>

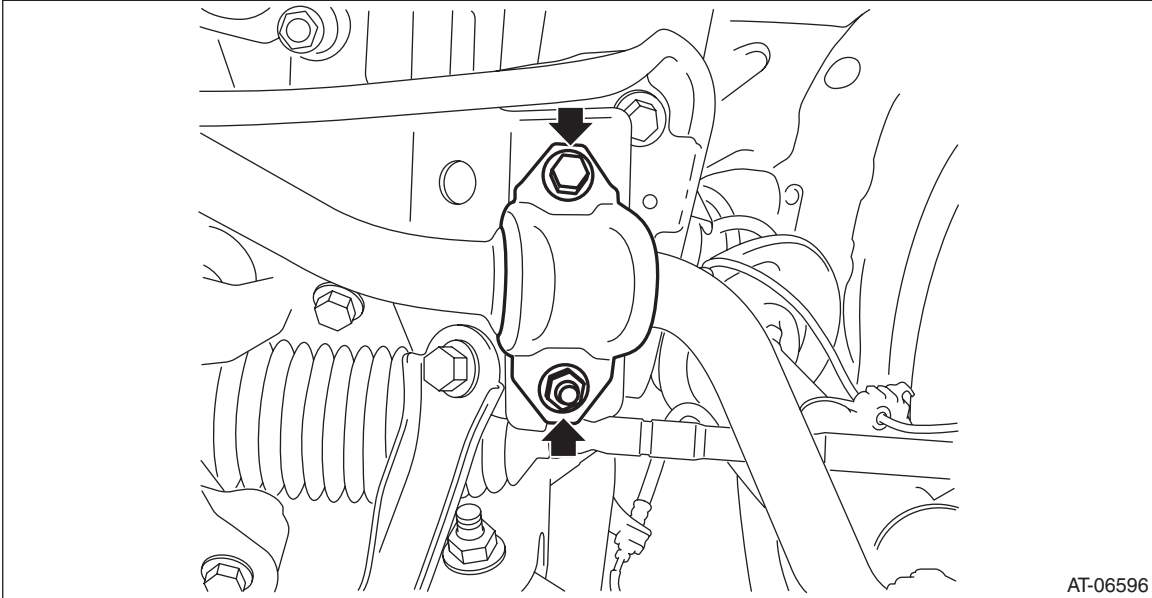
33) Remove the jack-up plate.



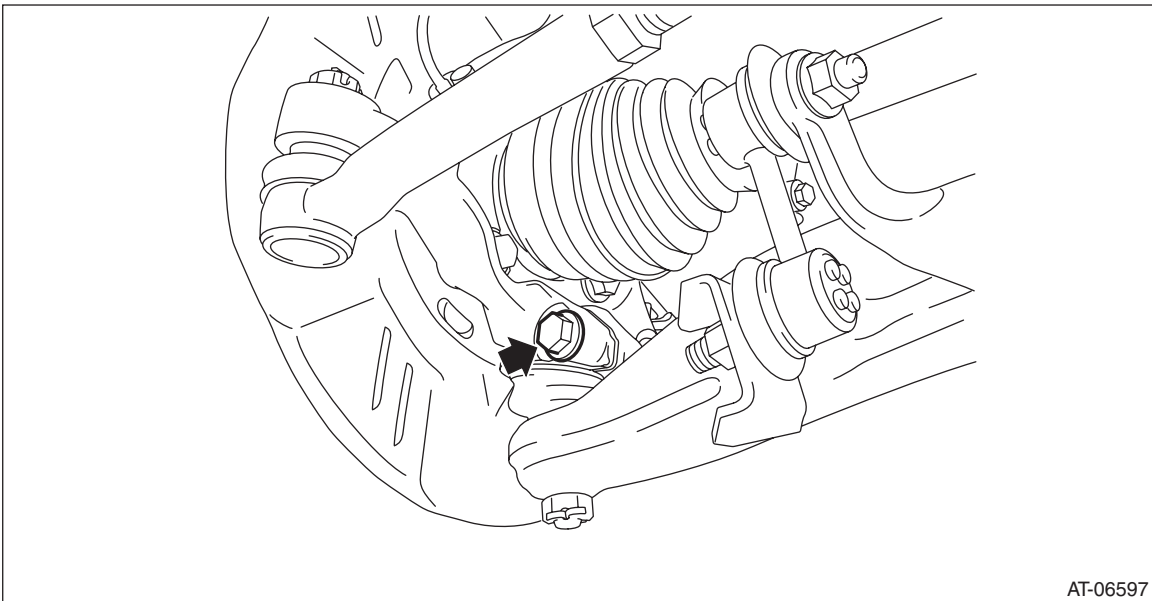
# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

34) Remove the stabilizer bracket.



35) Remove the bolts which secure to the front housing, and separate the front arm and housing.



36) Using a tire lever or a crow bar, etc., pull out until the front drive shaft transmission side joint slides move smoothly.

**NOTE:**

Place cloth between the tire lever or bar and the transmission in order to avoid damaging the transmission side retainer.

37) Hold the transmission side joint of the front drive shaft by hand and extract the housing from the transmission while pressing the housing outward, so as not to stretch the boot.

**NOTE:**

- Before pulling RH front drive shaft from transmission, turn the steering wheel to left hand full lock.
- Before pulling LH front drive shaft from transmission, turn the steering wheel to right hand full lock.

# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

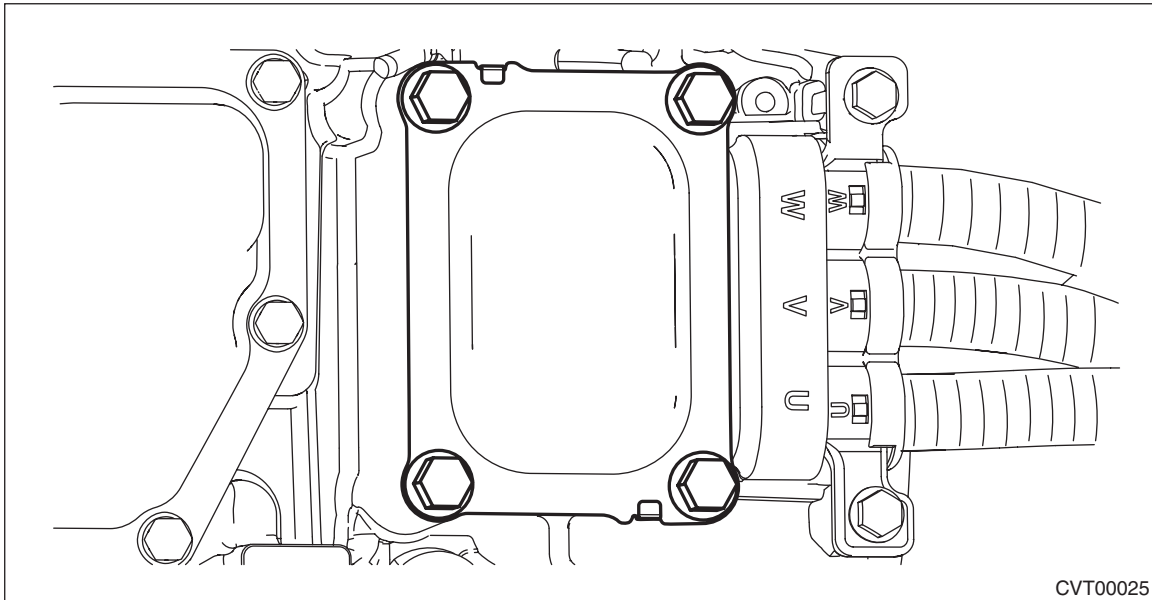
38) Remove the power cable.

### WARNING:

Be sure to wear insulated gloves.

### CAUTION:

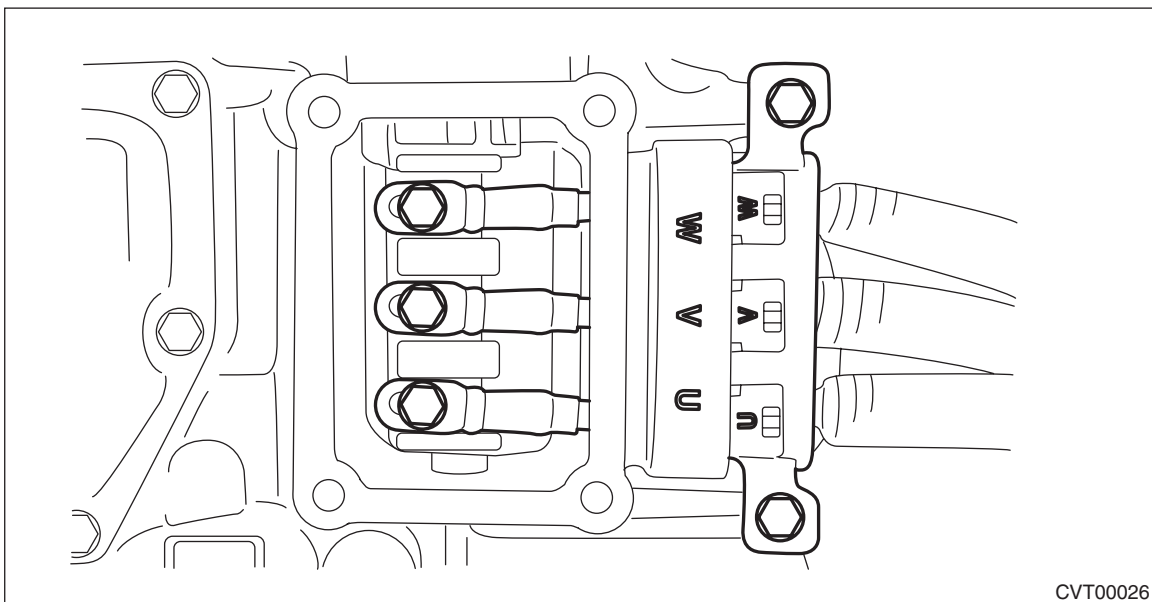
- Be sure to insulate the power cable terminal by wrapping it with insulating tape.
  - When removing the power cable, do not apply excessive force or damage it.
- (1) Clean any water, dirt and sand thoroughly from the area around the power connect cover using air, etc.
  - (2) Remove the power connect cover and gasket.



(3) Remove the power cable terminal, and remove the terminal box assembly.

### NOTE:

To prevent intrusion of foreign matter such as oil, water and dirt after removal, install the power connect cover and cover the terminal box assembly with tape.



39) Remove the under cover - rear LH. <Ref. to EI-34, REMOVAL, Floor Under Protector.>

# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

40) Remove the electric oil pump harness connector.

## WARNING:

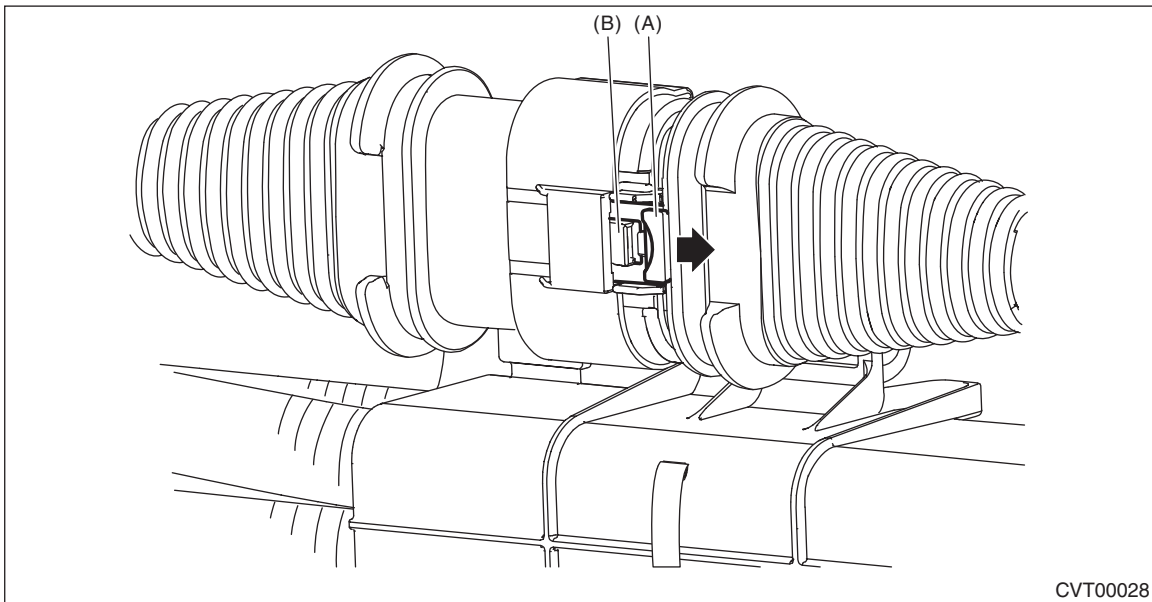
Be sure to wear insulated gloves.

## CAUTION:

- To prevent intrusion of foreign matter such as oil, water and dirt after removal, cover the female side connector with a clean cloth or a plastic bag and cover the coupler portion of the male side connector with insulating tape.
- When foreign matter is found, remove it while paying attention not to damage the electrode inside. If water is attached, dry it completely.
- When disconnecting the electric oil pump harness connector, do not apply excessive force or damage it.

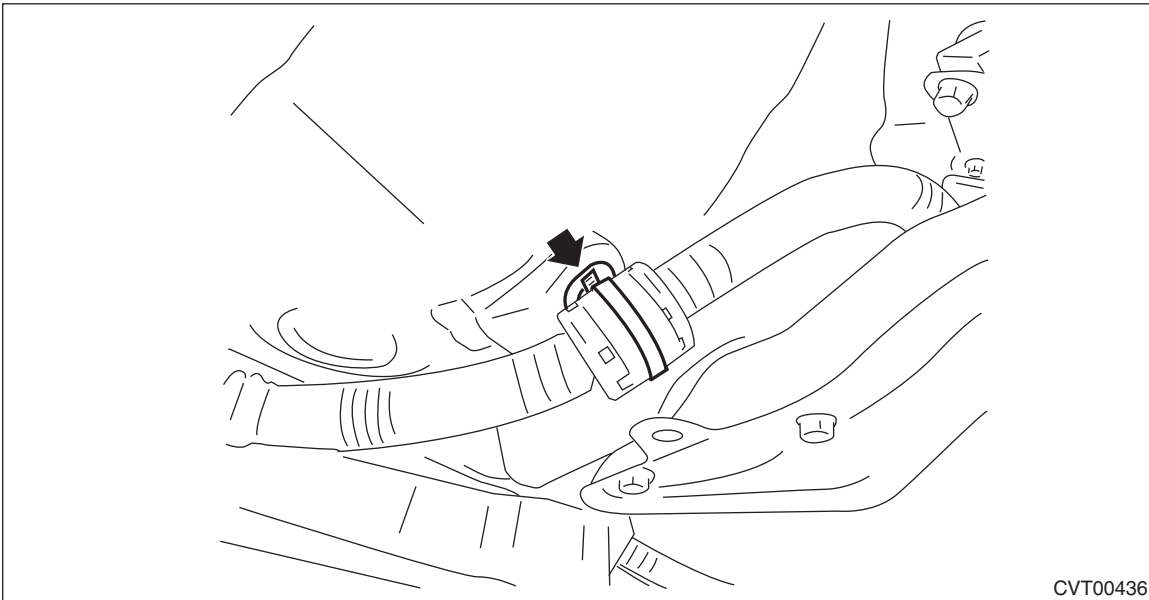
(1) Pull the slide lock (A) in the direction of arrow.

(2) Disconnect the harness connector by pushing the claw (B).



CVT00028

(3) Release the clip of the electric oil pump harness from the vehicle.



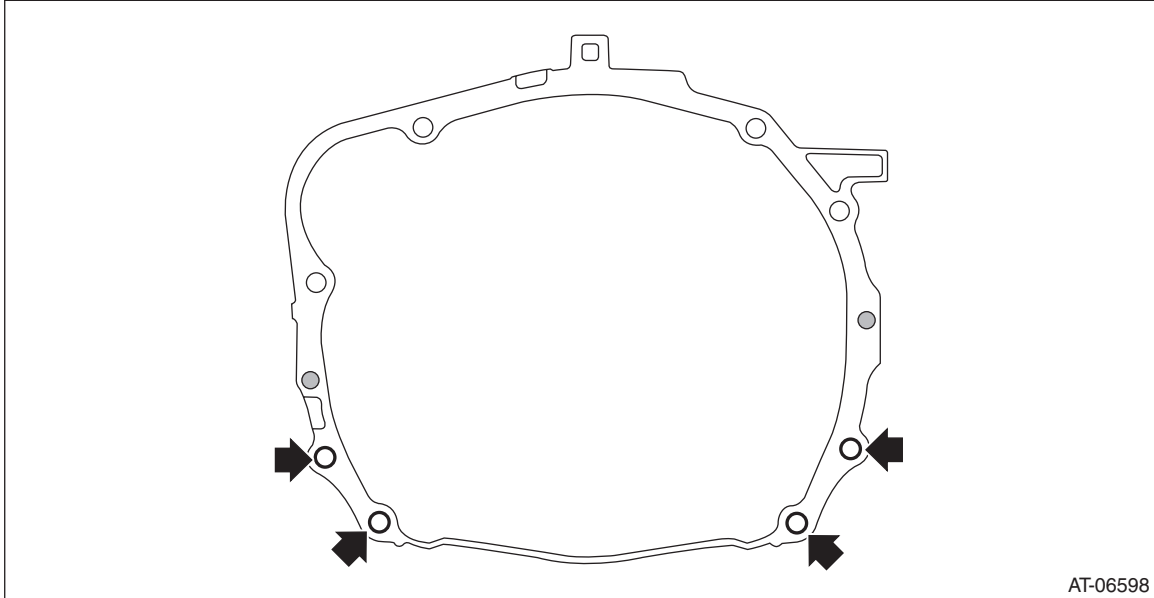
CVT00436

# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

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41) Remove the two transmission connecting bolts and two nuts (lower side).



42) Set the transmission jack under the transmission.

**NOTE:**

Make sure that the support plates of transmission jack do not touch the oil pan.

43) Release the clip of the electric oil pump harness from the transmission rear crossmember, and remove the transmission rear crossmember from the vehicle. <Ref. to CVT(TH58A)-88, TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER, REMOVAL, Transmission Mounting System.>

44) While lowering the transmission jack gradually, fully retract the engine support, and then tilt the engine rearward.

45) Remove the transmission assembly.

**CAUTION:**

**Be careful not to damage the electric oil pump harness.**

**NOTE:**

Remove it while moving the transmission jack up and down so that the engine and transmission remain directly aligned.

46) Remove the rear cushion rubber. <Ref. to CVT(TH58A)-88, TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER, REMOVAL, Transmission Mounting System.>

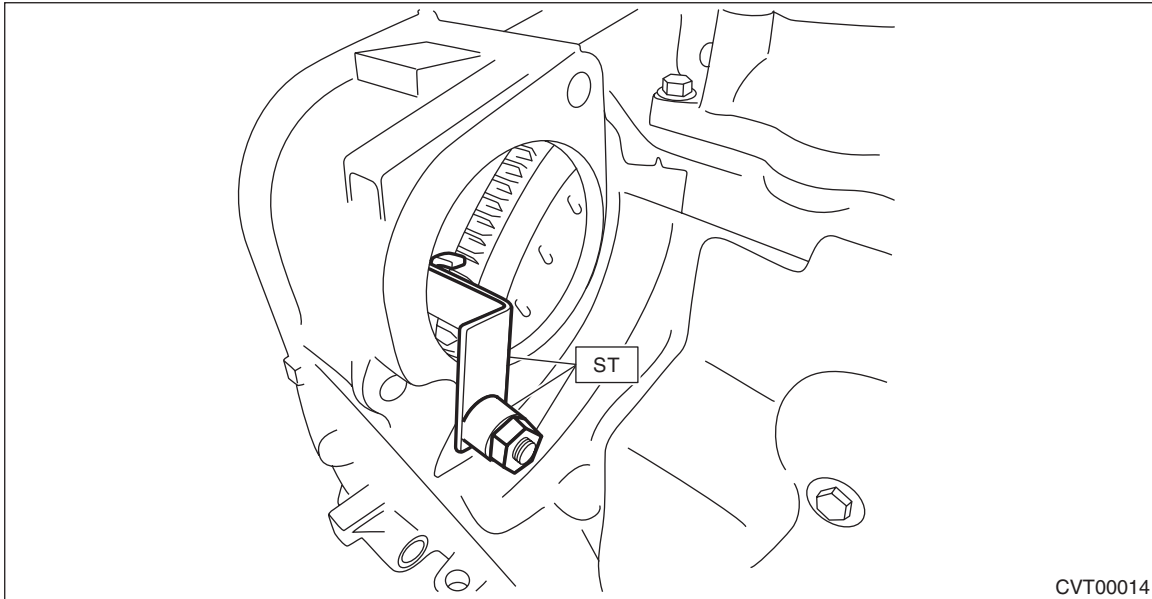
## B: INSTALLATION

### WARNING:

The hybrid system includes a high voltage circuit. Mishandling could cause accidents such as electric shock or leak. Always check “CAUTION (HYBRID SYSTEM)” and perform the proper operation. <Ref. to PC-7, CAUTION (HYBRID SYSTEM), Precaution.>

1) Attach the ST to converter case.

ST 498277200 STOPPER SET



2) When completely overhauling the transmission, refill CVTF through the transmission right side plug. <Ref. to CVT(TH58A)-180, Preparation for Overhaul.>

3) Replace the front differential side retainer oil seal. <Ref. to CVT(TH58A)-92, REPLACEMENT, Differential Side Retainer Oil Seal.>

### NOTE:

- Be sure to replace the differential side retainer oil seal with a new part whenever the front drive shaft is removed from the transmission.
- When a new differential side retainer oil seal has been installed, replacement is not required.

4) Install the rear cushion rubber on the transmission. <Ref. to CVT(TH58A)-90, TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER, INSTALLATION, Transmission Mounting System.>

5) Mount the transmission onto the transmission jack.

6) Remove the pitching stopper bracket, if mounted.

7) Install the transmission assembly onto the engine.

### CAUTION:

**Be careful not to damage the electric oil pump harness.**

### NOTE:

- While raising the transmission jack gradually, turn the screw of engine support, then tilt the engine forward.
- Temporarily attach the two engine connecting bolts and two nuts (lower side).

8) Attach the transmission rear crossmember, and install the clip of the electric oil pump cable to the transmission rear crossmember. <Ref. to CVT(TH58A)-90, TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER, INSTALLATION, Transmission Mounting System.>



# Automatic Transmission Assembly

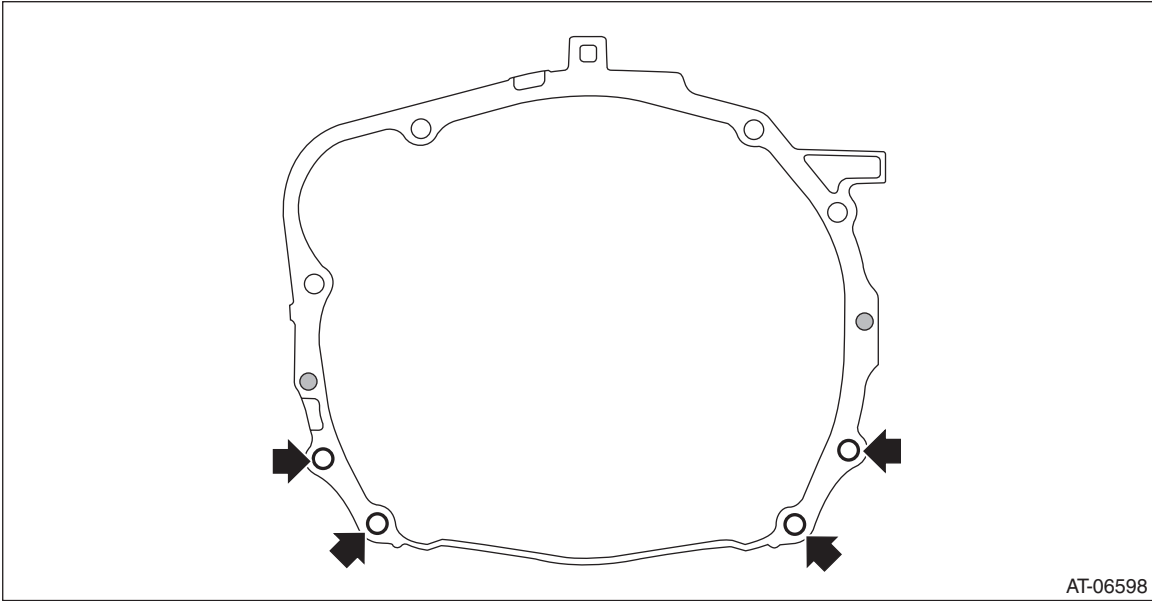
## CONTINUOUSLY VARIABLE TRANSMISSION

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9) Tighten the two engine connecting bolts and two nuts (lower side).

**Tightening torque:**

**50 N·m (5.1 kgf-m, 36.9 ft-lb)**



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10) Remove the transmission jack.

# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

11) Install the power cable.

## **WARNING:**

Be sure to wear insulated gloves.

## **CAUTION:**

- Do not allow foreign matter intrusion. If any foreign matter is found, remove them carefully so that the electrodes are not damaged.
- If water is attached, dry it completely before starting the operation.
- Do not apply excessive force to the terminals and watch to make sure the cable is not damaged or pinched.

(1) Match the letters (U, V, and W) imprinted on both the power cable and the transmission body, then insert the cable to the transmission and fix securely.

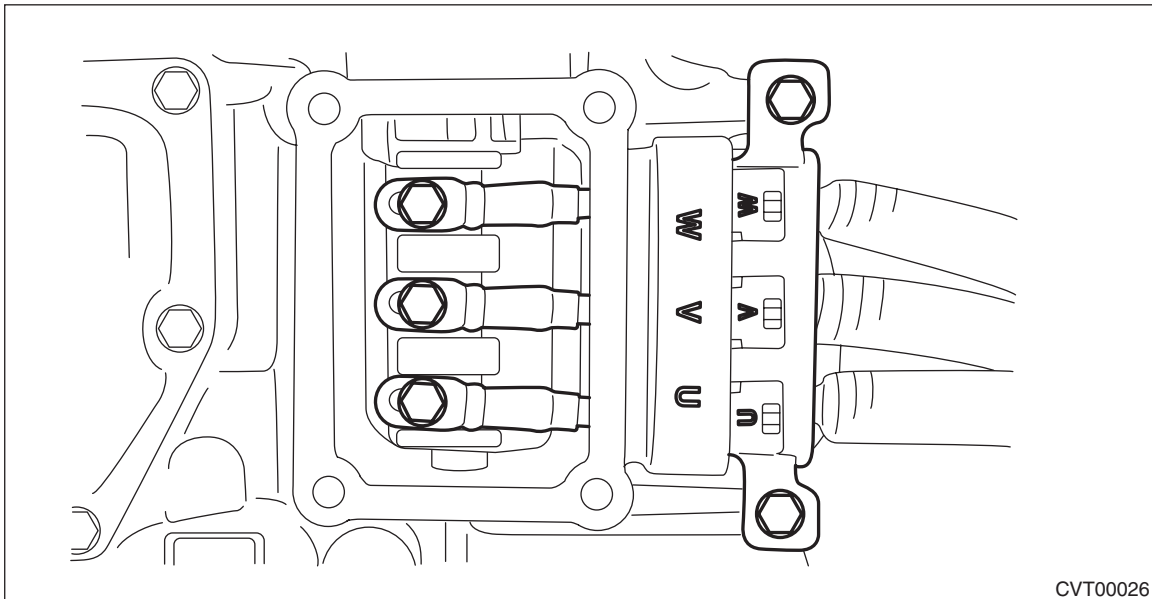
## **Tightening torque:**

**7.5 N·m (0.8 kgf-m, 5.5 ft-lb)**

(2) Install the power cable terminal.

## **Tightening torque:**

**7.5 N·m (0.8 kgf-m, 5.5 ft-lb)**



(3) Install the power connect cover.

## **NOTE:**

Use a new gasket.

## **Tightening torque:**

**25 N·m (2.5 kgf-m, 18.4 ft-lb)**

# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

12) Install the electric oil pump harness connector.

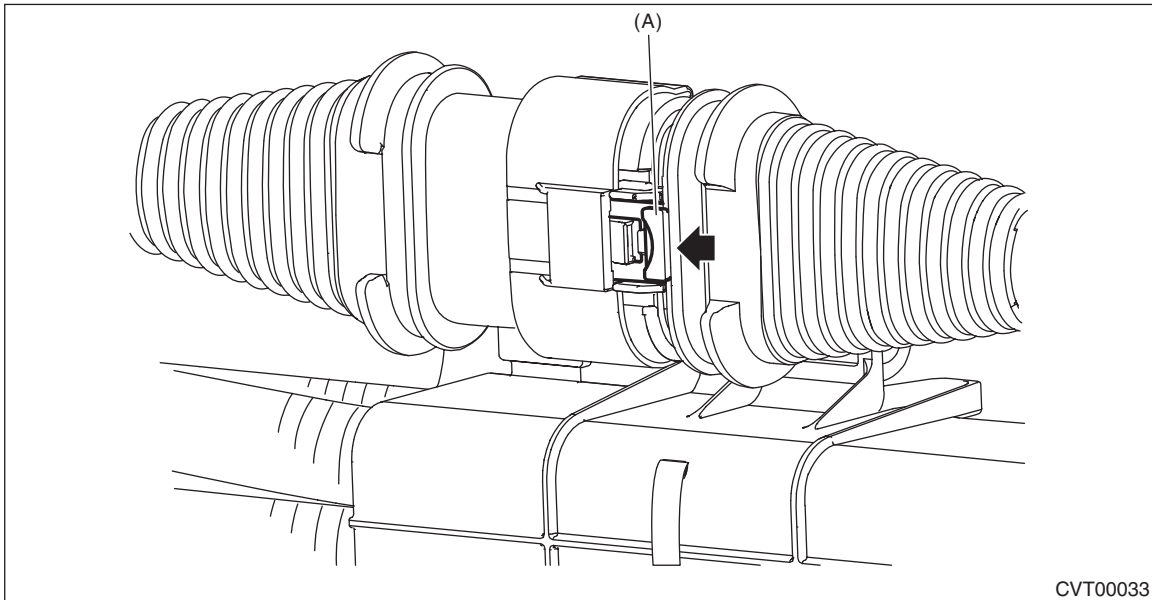
### WARNING:

Be sure to wear insulated gloves.

### CAUTION:

- Do not allow foreign matter intrusion. When foreign matter is found inside, remove it while paying attention not to damage the electrode inside.
- If water is attached, dry it completely before starting the operation.

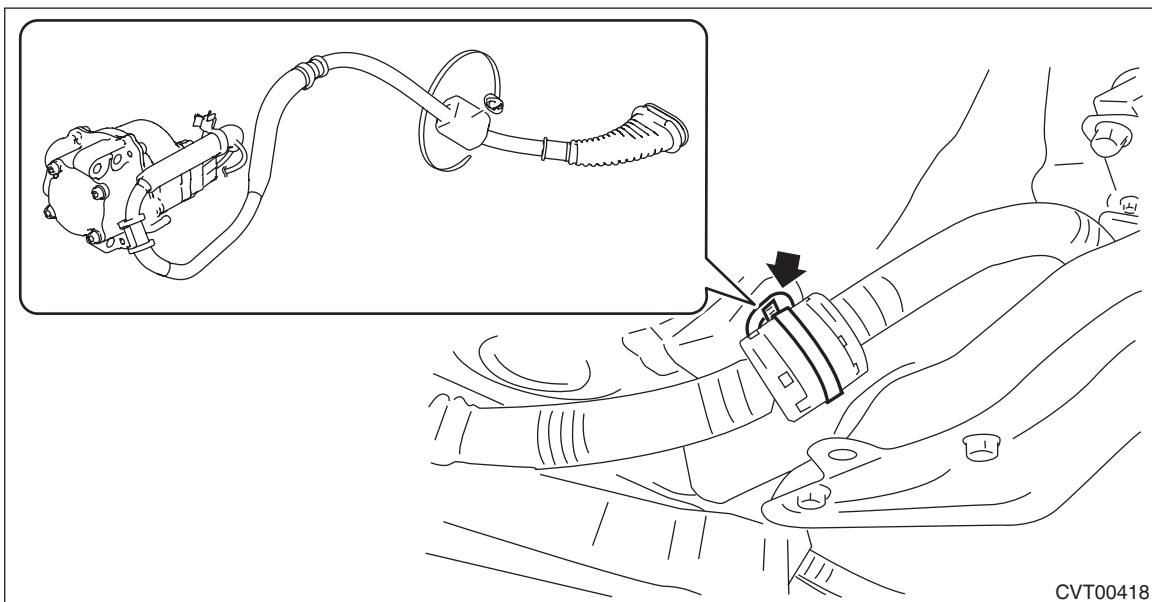
(1) Insert the harness connector until a click is heard, and move the slide lock (A) in the arrow direction to lock.



(2) Install the electric oil pump harness to the vehicle.

### NOTE:

- Use a new electric oil pump harness clip.
- Install the electric oil pump harness clip as shown in the figure.



(3) Make sure that the electric oil pump harness does not interfere with other parts.

13) Install the under cover - rear LH. <Ref. to EI-35, INSTALLATION, Floor Under Protector.>

14) Lower the vehicle.

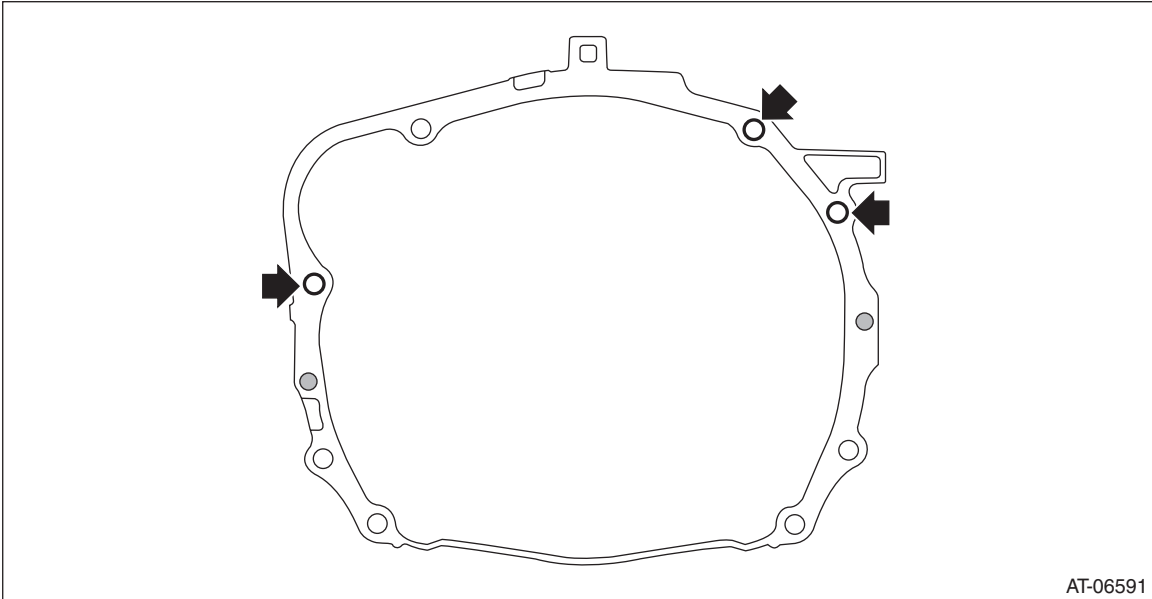
# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

15) Install the three engine mounting bolts (upper side).

**Tightening torque:**

**50 N·m (5.1 kgf-m, 36.9 ft-lb)**



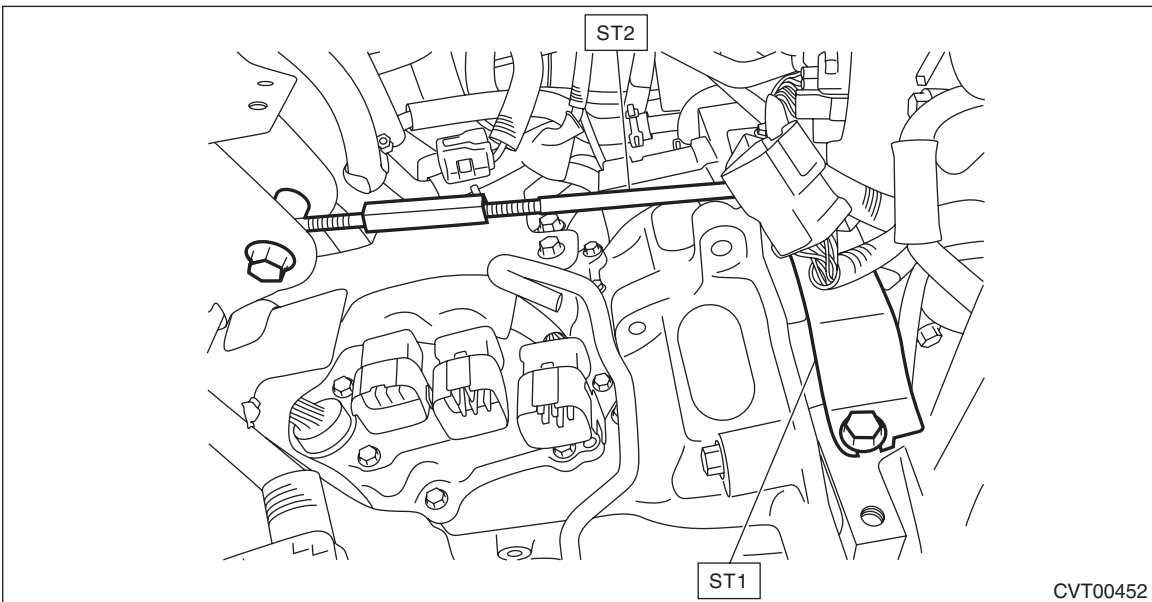
AT-06591

16) Remove the ST (STOPPER SET) from converter case.

17) Remove the ST (ENGINE SUPPORT BRACKET and ENGINE SUPPORT).

ST1 41099AA012 ENGINE SUPPORT BRACKET

ST2 41099AA020 ENGINE SUPPORT



CVT00452

18) Connect the throttle position sensor harness connector.

19) Match the torque converter screw hole with drive plate hole to install the bolt.

## CAUTION:

- Do not drop the mounting bolt in the converter housing.
- Do not damage the mounting bolt.

**Tightening torque:**

**25 N·m (2.5 kgf-m, 18.4 ft-lb)**

# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

20) Install the remaining three bolts by rotating the crank pulley a little at a time in the same direction as engine revolution.

**Tightening torque:**

**25 N·m (2.5 kgf-m, 18.4 ft-lb)**

21) Install the service hole plug.

22) Install the engine ground terminals.

**Tightening torque:**

**19 N·m (1.9 kgf-m, 14.0 ft-lb)**

23) Replace the CVTF inlet hose and CVTF outlet hose. <Ref. to CVT(TH58A)-162, CVTF Cooler (With Warmer Function).>

24) Install the CVTF inlet hose and CVTF outlet hose to transmission.

25) Install the CVTF cooler (with warmer feature) to the transmission.

**Tightening torque:**

**23 N·m (2.3 kgf-m, 17.0 ft-lb)**

26) Install the starter. <Ref. to SC(H4DO(HEV))-11, INSTALLATION, Starter.>

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

**Tightening torque:**

**41 N·m (4.2 kgf-m, 30.2 ft-lb)**

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

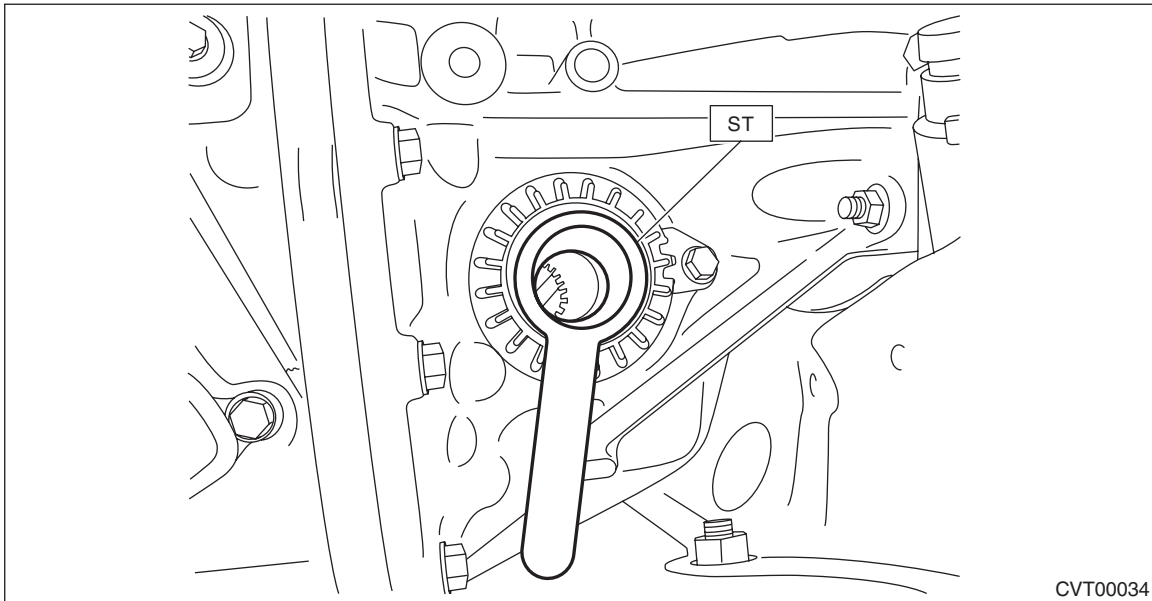
29) Install the pitching stopper. <Ref. to CVT(TH58A)-89, PITCHING STOPPER, INSTALLATION, Transmission Mounting System.>

30) Lift up the vehicle.

31) Apply grease to the side retainer oil seal lip.

32) Set the ST to side retainer.

ST 28399SA010 OIL SEAL PROTECTOR



33) Replace the circlip of the drive shaft with a new part.

34) Insert the front drive shaft spline section into transmission and remove the ST (OIL SEAL PROTECTOR).

**NOTE:**

- Before inserting RH front drive shaft into transmission, turn the steering wheel to left hand full lock.
- Before inserting LH front drive shaft into transmission, turn the steering wheel to right hand full lock.

35) Insert the drive shaft into the transmission securely by pressing the housing from outside of the vehicle.

# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

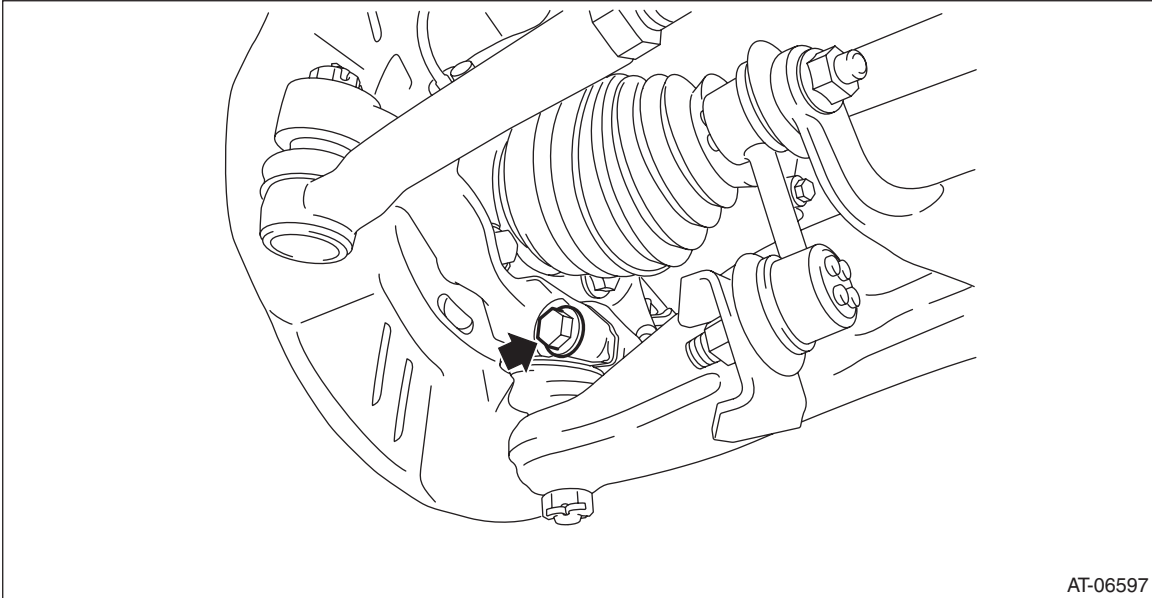
36) Insert the ball joint into housing and secure with bolt.

**Tightening torque:**

**50 N·m (5.1 kgf-m, 36.9 ft-lb)**

**CAUTION:**

- Do not apply grease to the tapered portion of ball stud.
- Before tightening, make sure the lower side of housing and stepped section of ball joint are in contact.

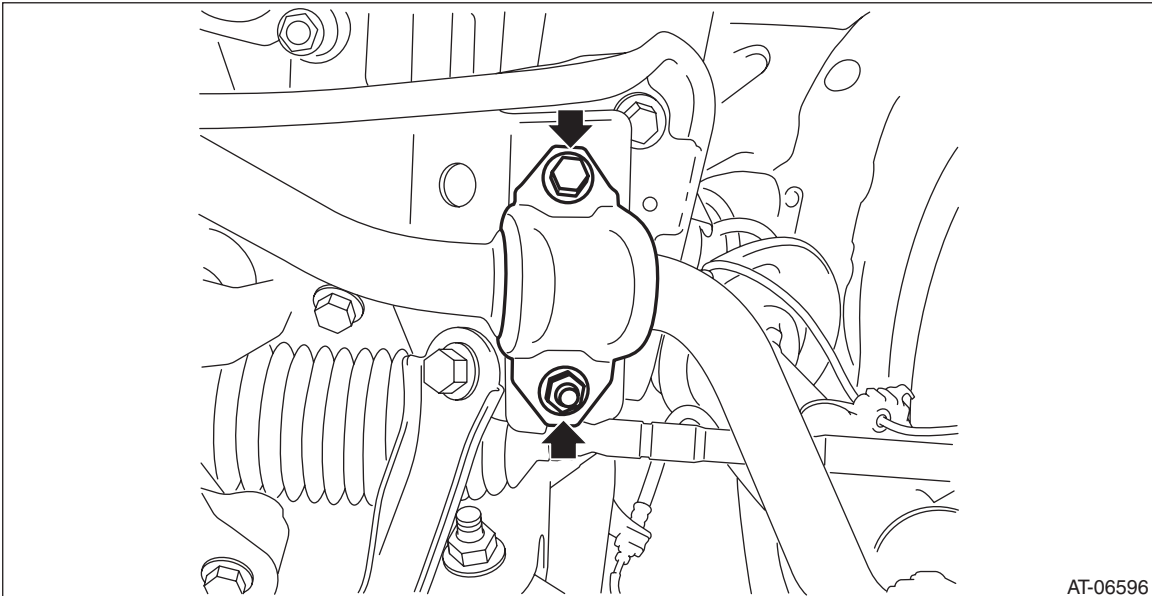


AT-06597

37) Install the stabilizer bracket.

**Tightening torque:**

**25 N·m (2.5 kgf-m, 18.4 ft-lb)**



AT-06596

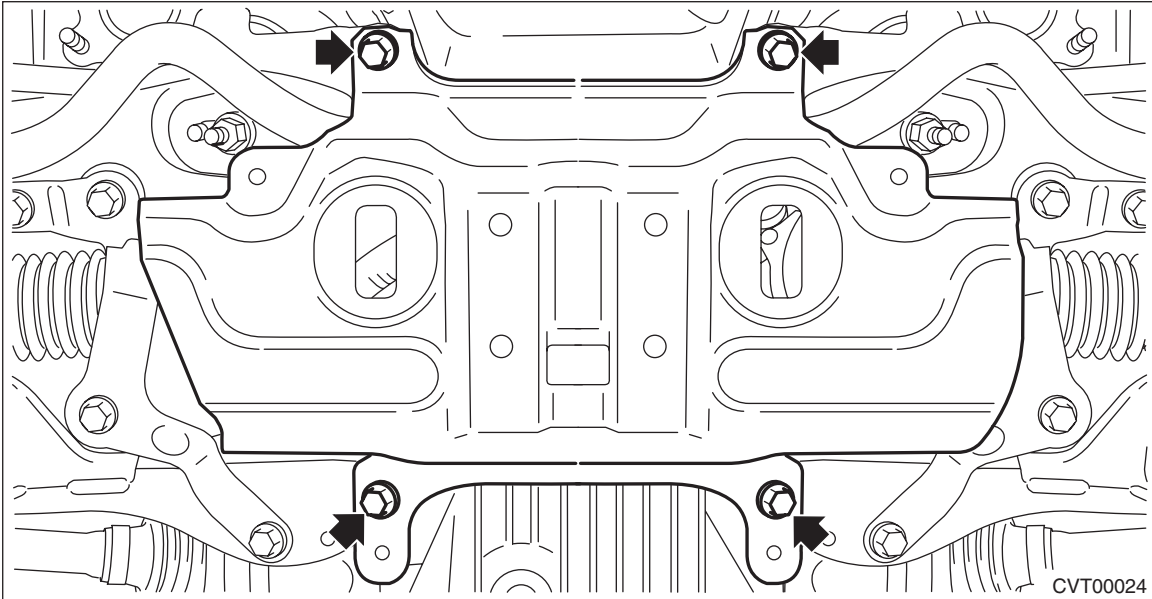
# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

38) Install the jack-up plate.

**Tightening torque:**

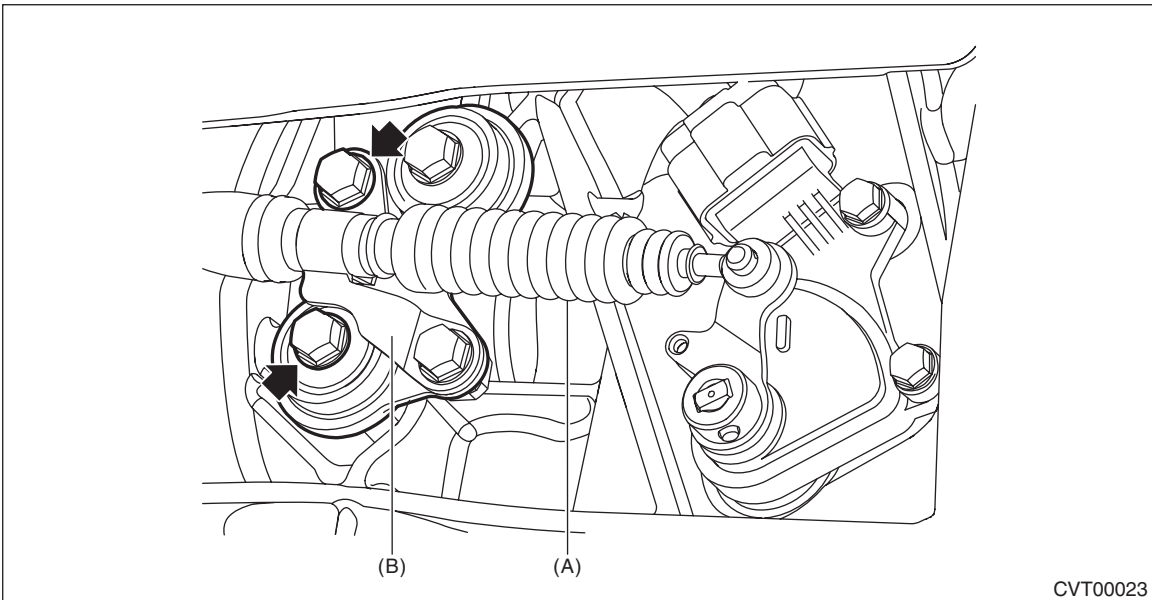
**60 N·m (6.1 kgf-m, 44.3 ft-lb)**



39) Install the plate assembly to transmission.

**Tightening torque:**

**25 N·m (2.5 kgf-m, 18.4 ft-lb)**



(A) Select cable

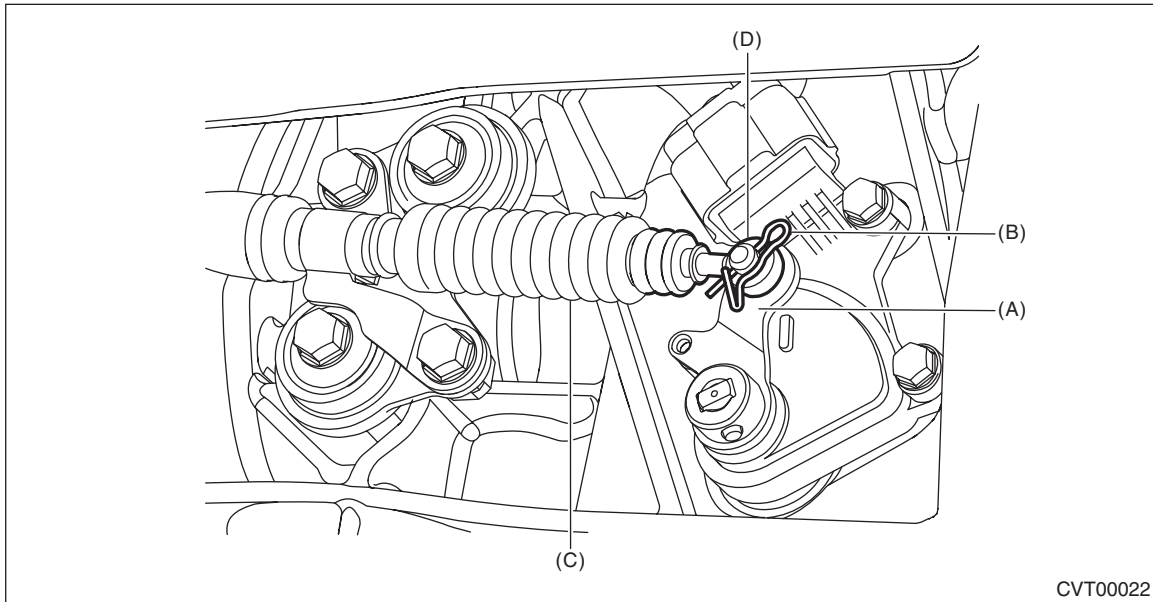
(B) Plate ASSY



# Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

40) Install the washer and snap pin to the shifter arm.



- (A) Shifter arm
- (B) Snap pin
- (C) Select cable
- (D) Washer

41) Install the propeller shaft. <Ref. to DS-13, INSTALLATION, Propeller Shaft.>

42) Install the center exhaust cover.

**Tightening torque:**

**18 N·m (1.8 kgf-m, 13.3 ft-lb)**

43) Install the hanger bracket.

**Tightening torque:**

**23 N·m (2.3 kgf-m, 17.0 ft-lb)**

44) Install the center exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-8, INSTALLATION, Front Exhaust Pipe.>

45) Install the under cover - rear LH. <Ref. to EI-32, INSTALLATION, Front Under Cover.>

46) Install the under cover front - cable.

**Tightening torque:**

**18 N·m (1.8 kgf-m, 13.3 ft-lb)**

47) Lower the vehicle.

48) Install the engine hanger rear and the vacuum pipe.

**Tightening torque:**

**Engine hanger rear**

**21 N·m (2.1 kgf-m, 15.5 ft-lb)**

**Vacuum pipe**

**6.4 N·m (0.7 kgf-m, 4.7 ft-lb)**

49) Install the air cleaner case bracket LH.

**Tightening torque:**

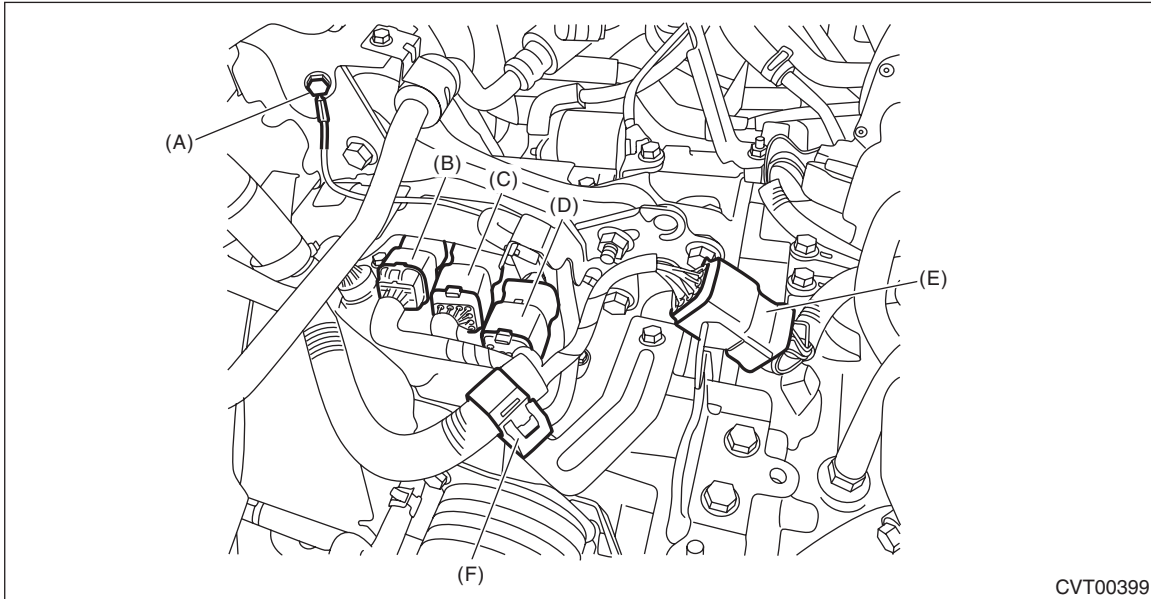
**18 N·m (1.8 kgf-m, 13.3 ft-lb)**

# Automatic Transmission Assembly

## CONTINUOUSLY VARIABLE TRANSMISSION

50) 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



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- (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

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

52) Install the front tires. <Ref. to WT-4, INSTALLATION, Tire and Wheel.>

53) Install the collector cover.

54) Install the service disconnect plug. <Ref. to HEV-16, INSTALLATION, Service Plug.>

55) 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.>

56) Refill differential gear oil to adjust the differential gear oil amount. <Ref. to CVT(TH58A)-45, Differential Gear Oil.>

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

58) Perform the operation for clearing AT learning value. <Ref. to CVT(HEV)(diag)-20, Clear Memory Mode.>

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

60) Execute the rear differential inspection mode. <Ref. to DI-63, Rear Differential Inspection Mode.>

### CAUTION:

**Always execute the rear differential inspection mode at the replacement of the following.**

- Replacement of transmission assembly
- Replacement of front differential hypoid gear set

61) Perform the road test to make sure there is no fault. <Ref. to CVT(TH58A)-50, INSPECTION, Road Test.>