22.Electric Fluid Pump

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.>

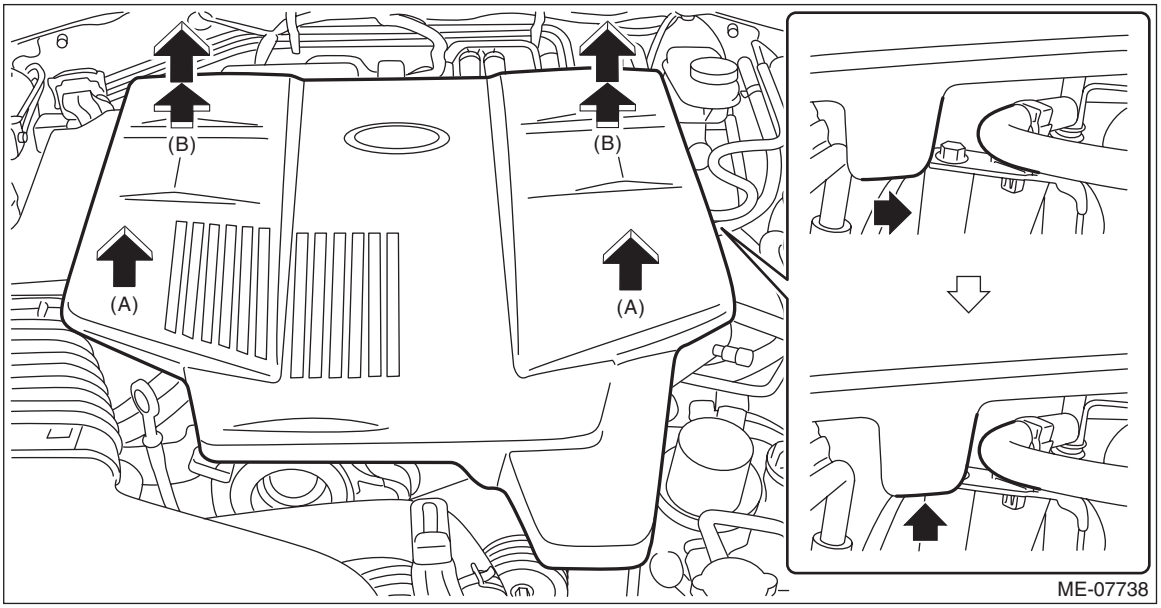
CAUTION:
• Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.
• Be careful not to spill CVTF on the exhaust pipe to prevent it from emitting smoke or causing a fire. If the CVTF adheres, wipe it off completely.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

NOTE:
The electric oil pump 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 service disconnect plug. <Ref. to HEV-15, REMOVAL, Service Plug.>

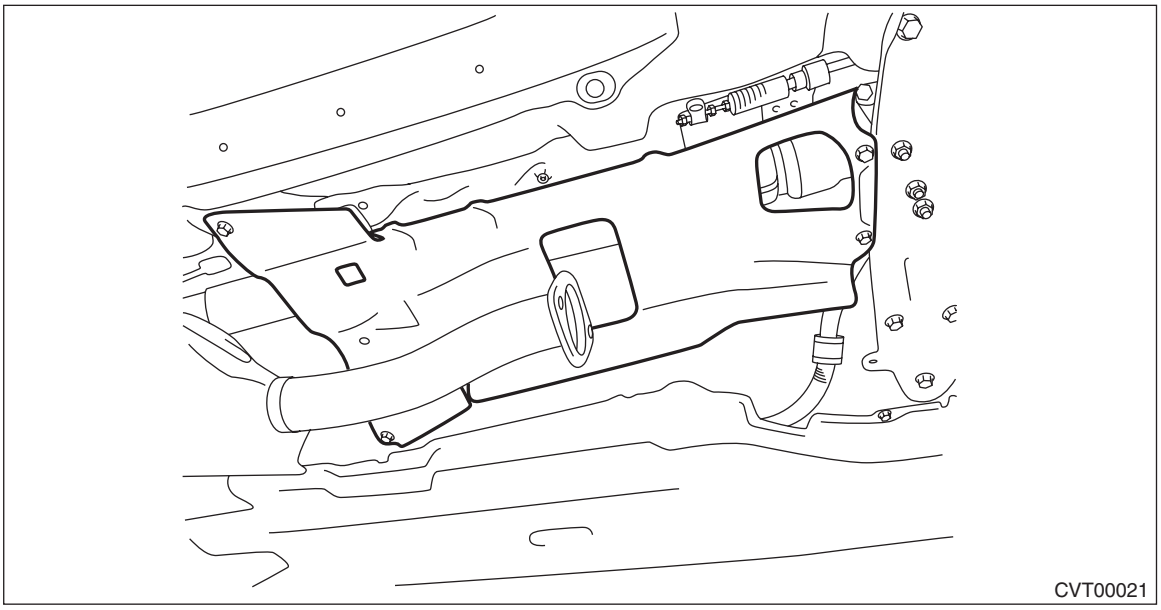
WARNING:
After pulling out the service disconnect plug, a high voltage is accumulated in the condenser inside the inverter. If touching the high voltage parts, wiring harness, terminals and connectors is required, wait for 10 minutes before starting the operation.
3) Remove the collector cover.
(1) Pull up the two points at the front of collector cover (A).
(2) Pull up the two points at the rear of collector cover (B) while moving them rearward.

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

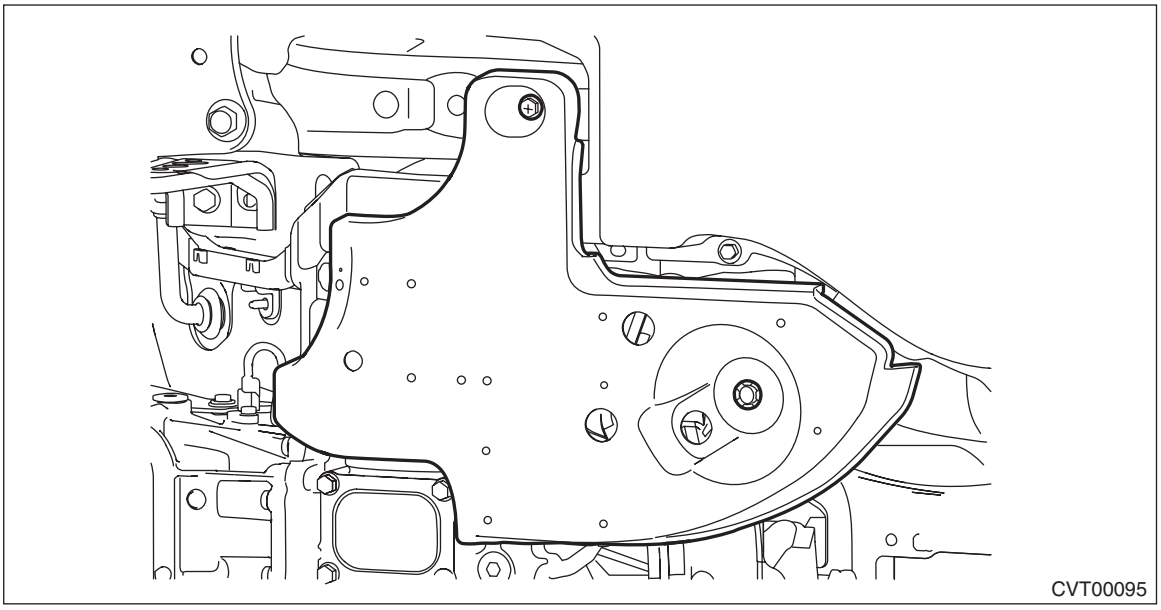


4) Remove the air cleaner case. <Ref. to IN(H4DO(HEV))-6, REMOVAL, Air Cleaner Case.>
5) Remove the pitching stopper. <Ref. to CVT(TH58A)-87, PITCHING STOPPER, REMOVAL, Transmission Mounting System.>
6) Lift up the vehicle.
7) Remove the center exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-18, REMOVAL, Rear Exhaust Pipe.>

8) Remove the center exhaust cover.



9) Remove the under cover - cable.



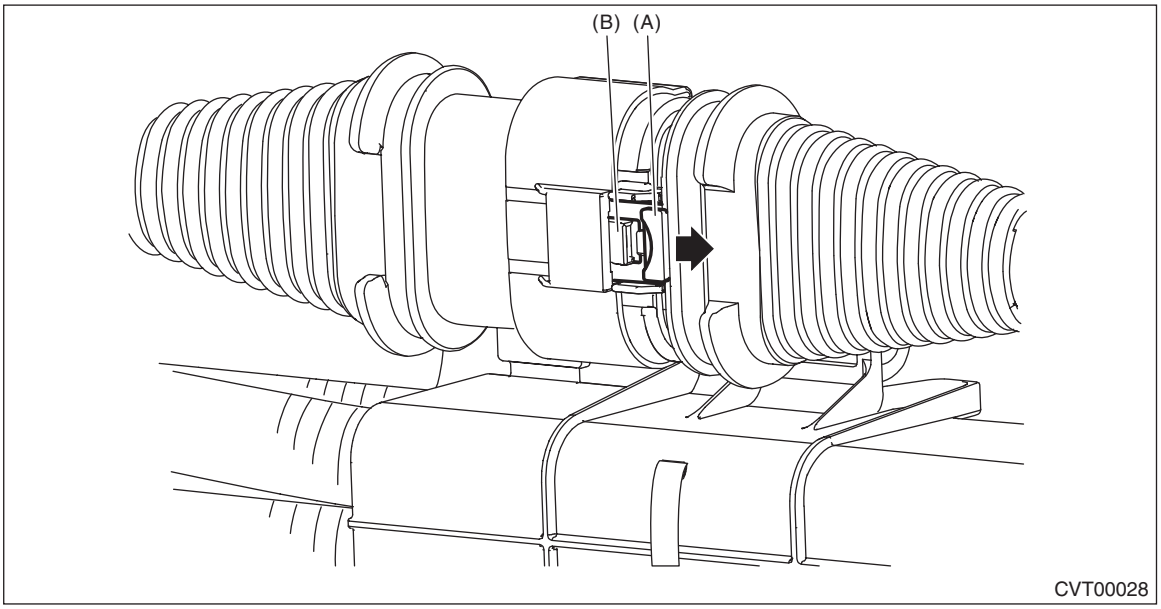
10) Remove the under cover - rear LH. <Ref. to EI-34, REMOVAL, Floor Under Protector.>

11) Remove the electric oil pump harness connector.

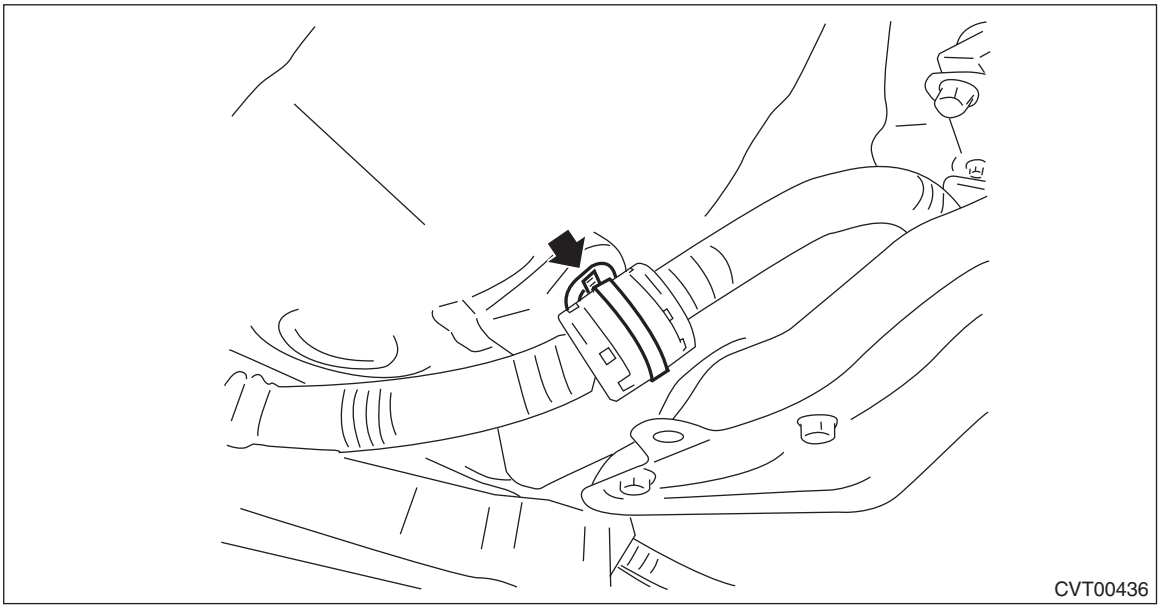
WARNING:
Be sure to wear insulated gloves.

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).

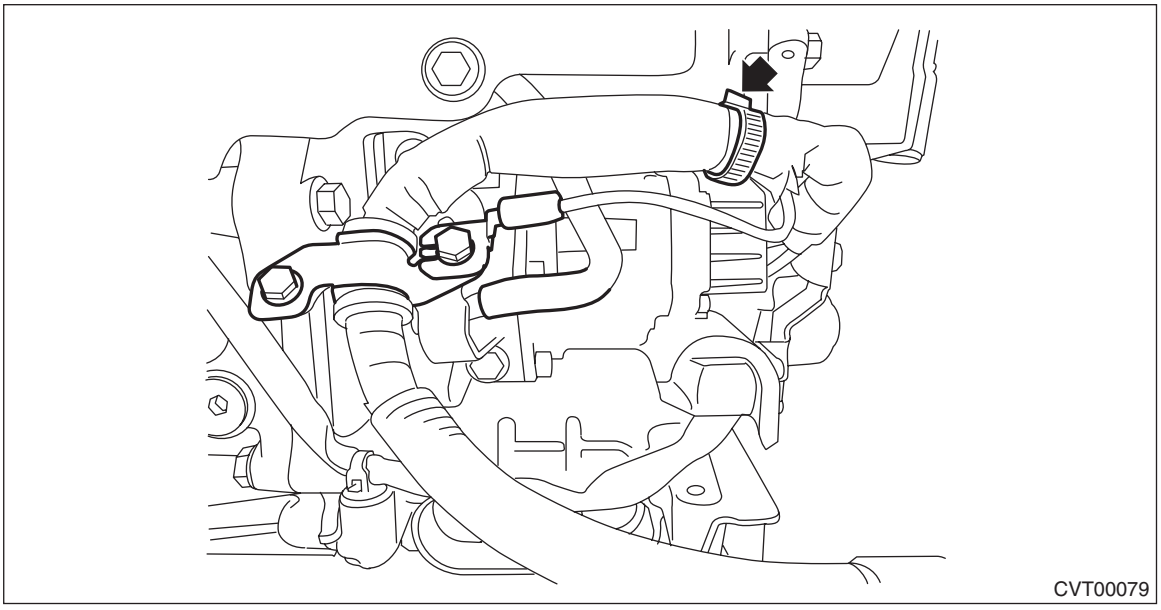


(3) Release the clip of the electric oil pump harness from the vehicle.

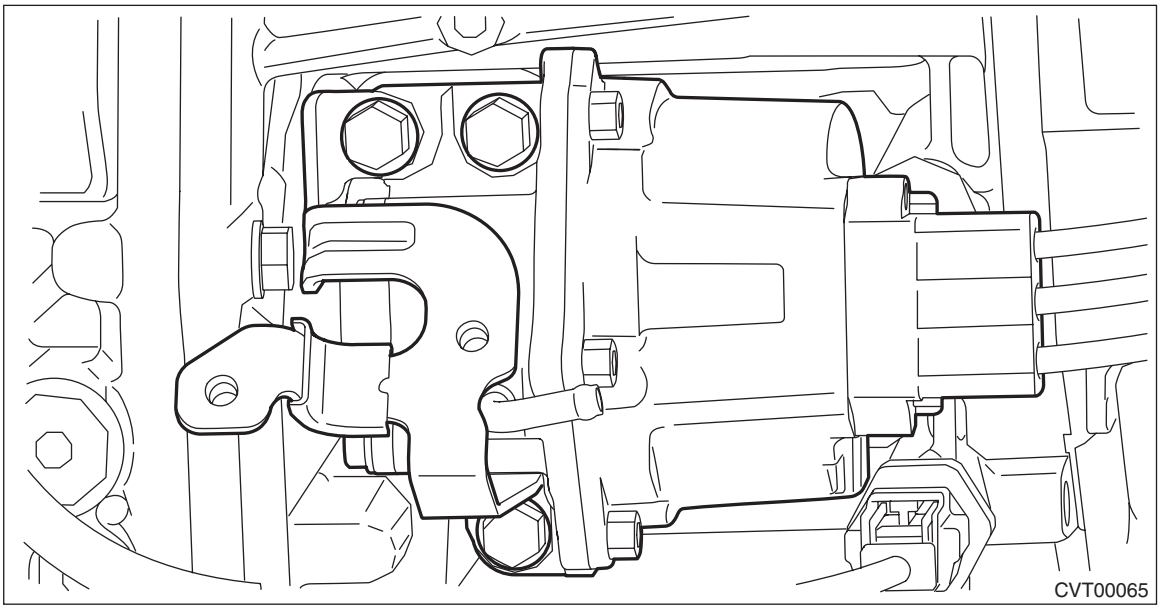


12) Set the transmission jack under the transmission.
13) Remove the rear crossmember. <Ref. to CVT(TH58A)-88, TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER, REMOVAL, Transmission Mounting System.>

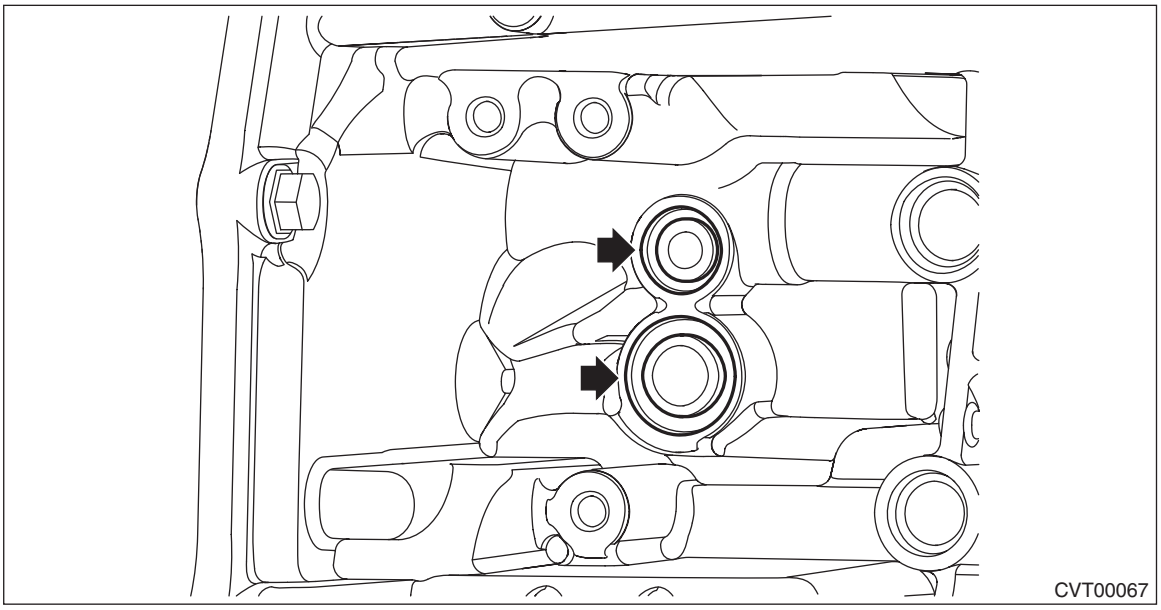
14) Lower the transmission.
15) Release the harness clips, then remove the air breather hose, harness bracket and ground terminal.



16) Remove the electric oil pump assembly and the harness bracket COMP.



17) Remove the O-ring.



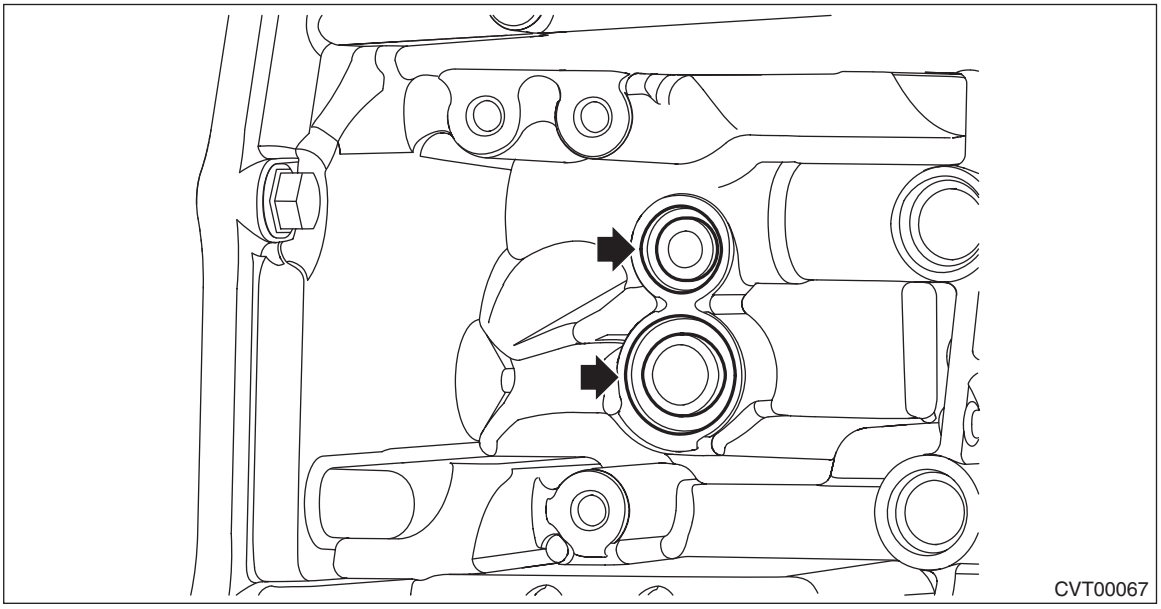
B: INSTALLATION

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.>

CAUTION:
- **Do not apply excessive force or damage the electric oil pump harness.**
- **Be careful not to twist the electric oil pump harness.**
- **When cleaning the mating surface of the transmission side, be careful not to allow any dust or dirt to enter the transmission.**

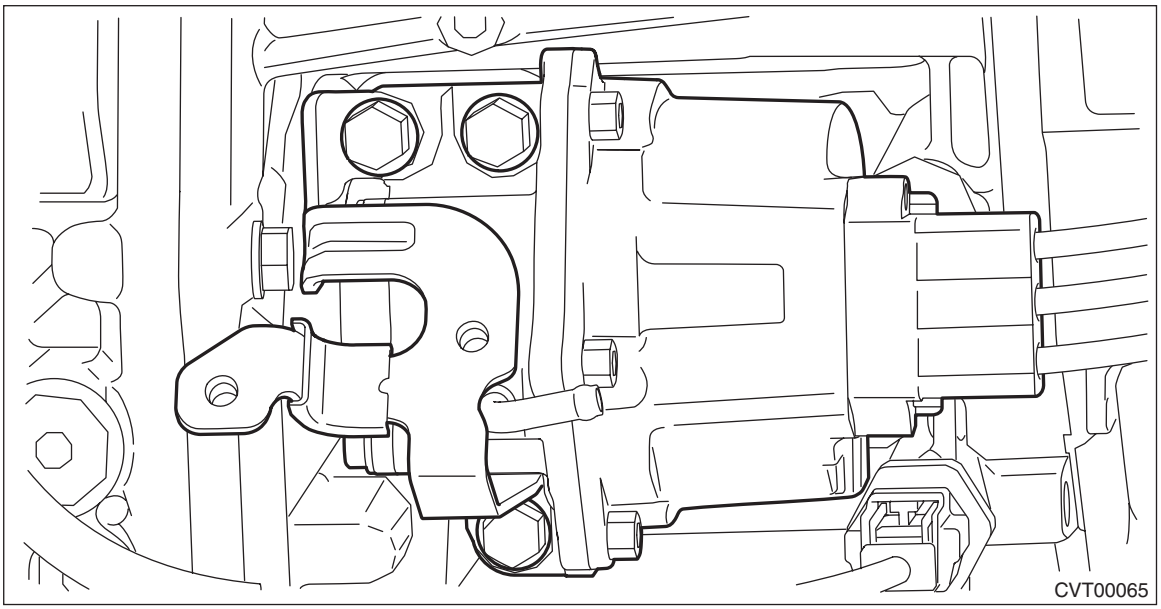
1) Install the O-ring to the transmission case.

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



2) Install the electric oil pump assembly and the harness bracket COMP.

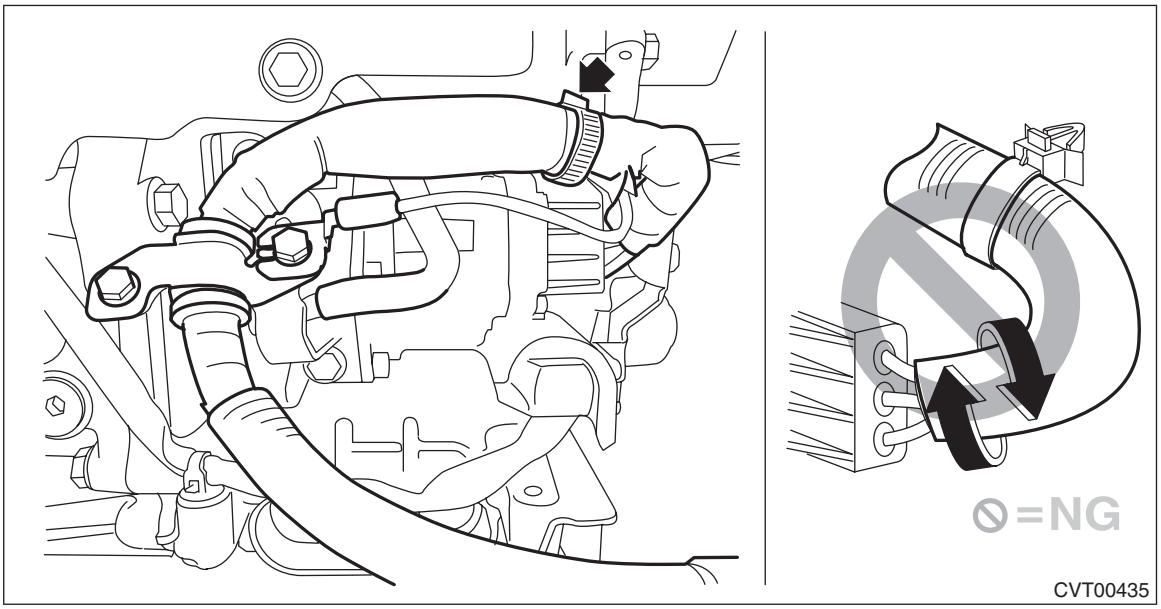
Tightening torque:
22 N·m (2.2 kgf-m, 16.2 ft-lb)



3) Install the harness clips to the bracket, then install the air breather hose, electric oil pump harness, harness bracket and ground terminal.

CAUTION:
When installing the electric oil pump harness clips, be careful not to twist the electric oil pump harness by 360°.

Tightening torque:
8 N·m (0.8 kgf-m, 13.3 ft-lb)



4) Raise the transmission, and install the rear crossmember. <Ref. to CVT(TH58A)-90, TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER, INSTALLATION, Transmission Mounting System.>
5) Install the exhaust cover.

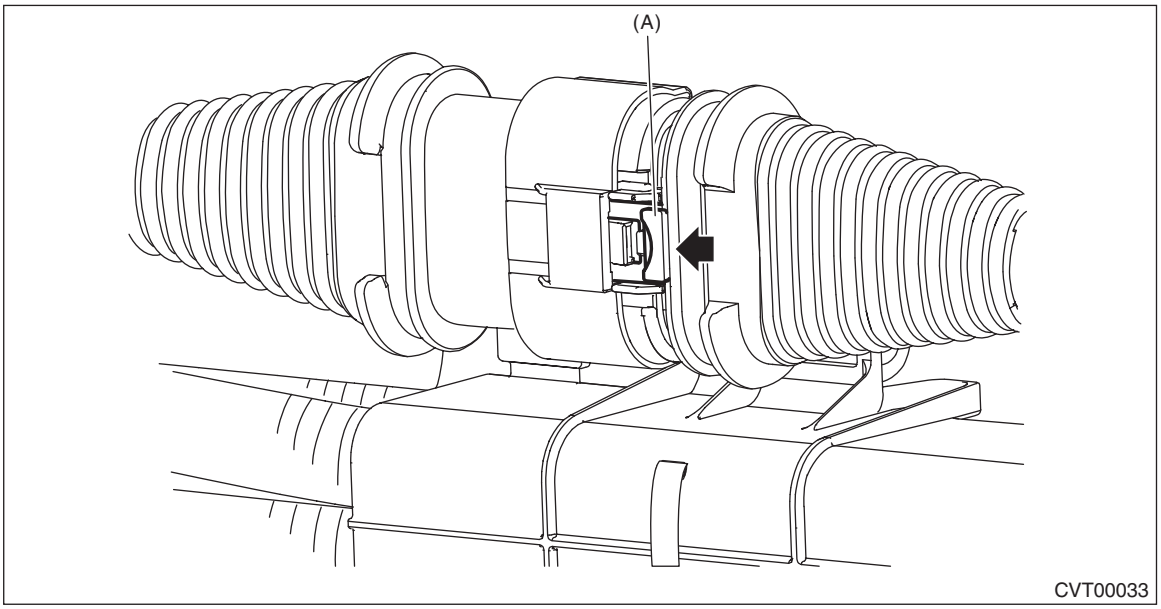
Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)

6) Install the electric oil pump harness connector.

WARNING:
Be sure to wear insulated gloves.

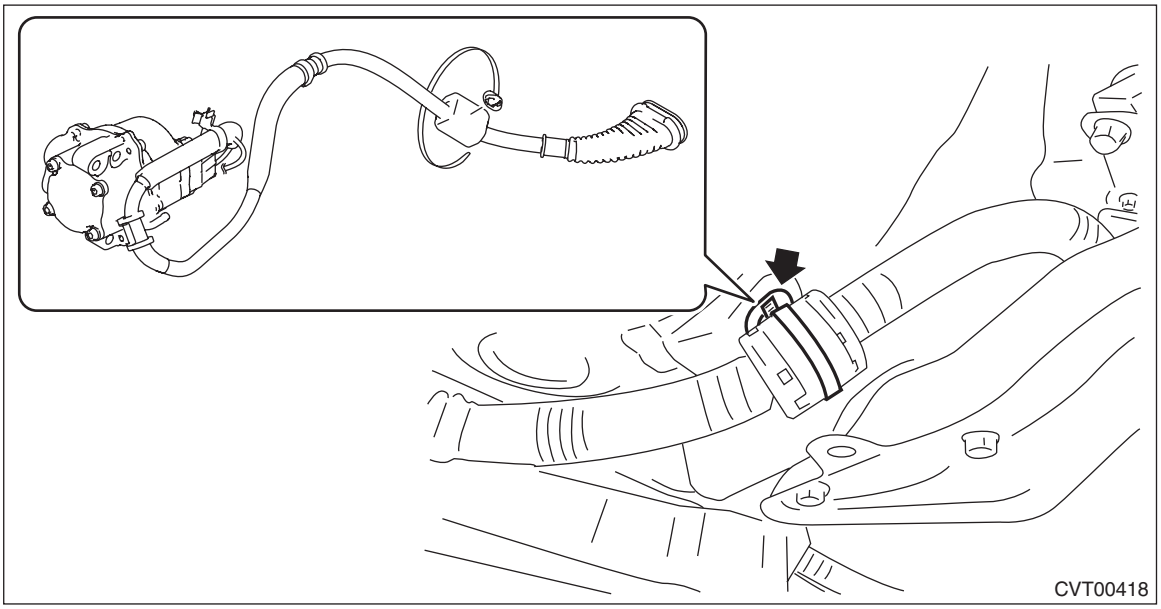
CAUTION:
• Do not allow foreign matter intrusion. When foreign matter is found inside, remove it while paying attention not to damage the electrode inside.
• If water is attached, dry it completely before starting the operation.

(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.

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

Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)
9) Install the center exhaust cover.

Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)
10) Install the center exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-20, INSTALLATION, Rear Exhaust Pipe.>
11) Lower the vehicle.
12) Install the pitching stopper. <Ref. to CVT(TH58A)-89, PITCHING STOPPER, INSTALLATION, Transmission Mounting System.>
13) Install the air cleaner case. <Ref. to IN(H4DO(HEV))-8, INSTALLATION, Air Cleaner Case.>
14) Install the collector cover.
15) Install the service disconnect plug. <Ref. to HEV-16, INSTALLATION, Service Plug.>
16) 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.>
17) Refill CVTF to adjust the CVTF level. <Ref. to CVT(TH58A)-41, CVTF.>

C: INSPECTION

1. GENERAL DESCRIPTION

Perform this inspection as necessary when replacing or troubleshooting the electric oil pump to check that the electric oil pump works correctly.

2. PROCEDURE

CAUTION:
Do not turn the power of the Subaru Select Monitor OFF during work, and do not disconnect the data link connector.
1) Idle the engine until the CVTF temperature becomes 60 — 100°C (140 — 212°F) on Subaru Select Monitor.
2) Turn the ignition switch to OFF.
3) Apply the parking brake.
4) Connect the Subaru Select Monitor to data link connector.
5) Turn the ignition switch to ON.
6) Shift the select lever to “P” range.
7) Select {Work Support} in the «Transmission Diagnosis» display screen of the Subaru Select Monitor.
8) Select {Maintenance mode} in the «Work Support» screen of Subaru Select Monitor.
9) Select {Electric Fluid Pump inspection mode} in the «Maintenance mode» screen of the Subaru Select Monitor.
10) Follow the messages displayed on the Subaru Select Monitor screen when working.

NOTE:
If the operation does not follow the messages displayed on the Subaru Select Monitor screen, the inspection mode is finished.

11) The results of the electric oil pump inspection mode are displayed on the Subaru Select Monitor screen.
- Malfunction of TCM is detected or TCM is out of conditions: “Finished by abnormality of TCU.”
- The operation is ended normally: “Successful. Turn off the ignition switch.”
- Malfunction of hybrid system is detected or it is out of conditions: “Error finished.”
- Another malfunction is detected: “By high pressure abnormality of the secondary pressure, finished work.” or “Abnormal termination by Time out”

NOTE:
- For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.
- If the hybrid system is defective, perform the remedy displayed on the Subaru Select Monitor and inspect the electric oil pump again.
- When the inspection mode does not end normally, the following message is displayed.

Message	Main reasons for abnormal termination and actions to take
“By high pressure abnormality of the secondary pressure, finished work.”	• The secondary pressure is high. • The relief valve is damaged. Replace the drive motor assembly.
“Abnormal termination by Time out”	• The actual speed of electric oil pump does not follow the specified speed. Inspect the electric oil pump again. • The secondary pressure does not increase more than necessary. • Check the CVTF level. • Inspect the electric oil pump again. • Check for oil leaks in the secondary pressure oil passage. • If no malfunctions are found, the relief valve or the spring is damaged. Replace the drive motor assembly.
“Finished by abnormality of TCU”	• TCM detects a trouble code. Repair it according to the trouble code. • Other than P range is detected. Do not shift the select lever to other than P range during inspection. In addition, make sure the range SW is in the P range continuously using Subaru Select Monitor. • Engine speed is detected. • The CVTF temperature is out of 60 — 100°C (140 — 212°F). The CVTF temperature should be within 60 — 100°C (140 — 212°F). • Vehicle speed is detected. • 12 V battery voltage is low. • Malfunction of CAN communication with other than TCM is detected. Stop the inspection, and after starting the engine, check that no U codes exist in the current and past malfunctions of transmission using Subaru Select Monitor. • Electric oil pump temperature is high. Turn the ignition switch to OFF, stop the electric oil pump for approx. 60 seconds, and then perform the inspection mode again.
“Hybrid system is out of order”	• The hybrid system has a failure. Check the hybrid system.
“Safety plug has not been set”	• The safety plug is out of position or is not set properly. Inspect according to the troubleshooting for the battery energy control module.
“High voltage battery capacity is low”	• The battery remaining capacity of high voltage battery is low. Charge the high voltage battery.
“12V battery capacity is low”	• 12 V battery voltage is low. Charge the 12 V battery.
“Can not Test for a Hybrid system of other factors”	• High voltage start is inhibited by immobilizer. • A collision is detected. (P1C1E) Check the hybrid system.

12) After the message “Successful. Turn off the ignition switch.” appears, turn the ignition switch to OFF and finish the electric oil pump inspection mode.