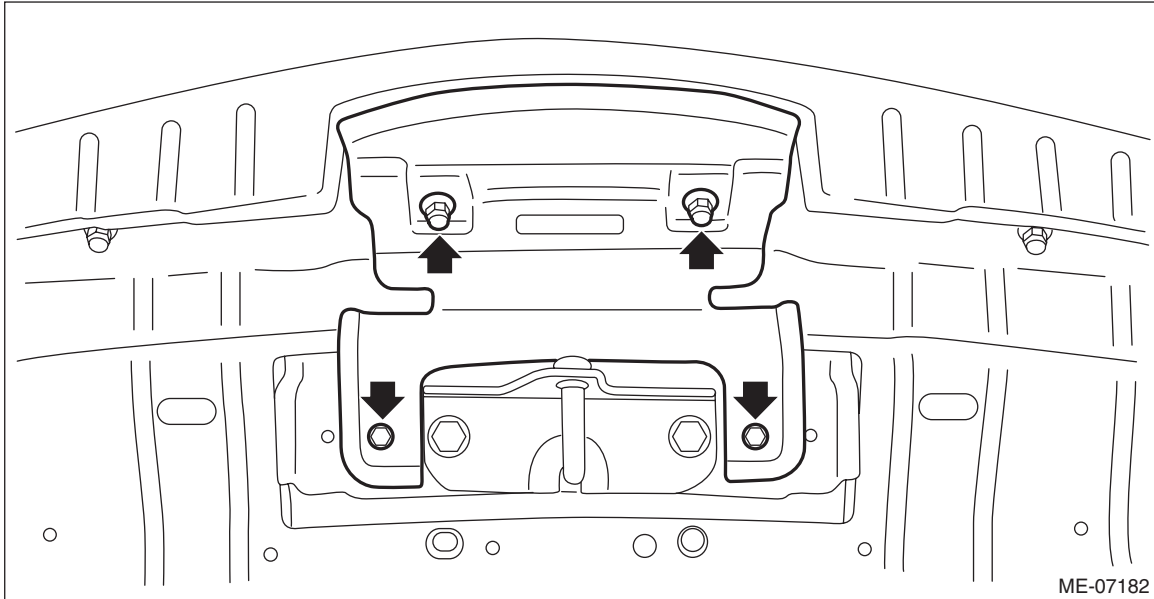


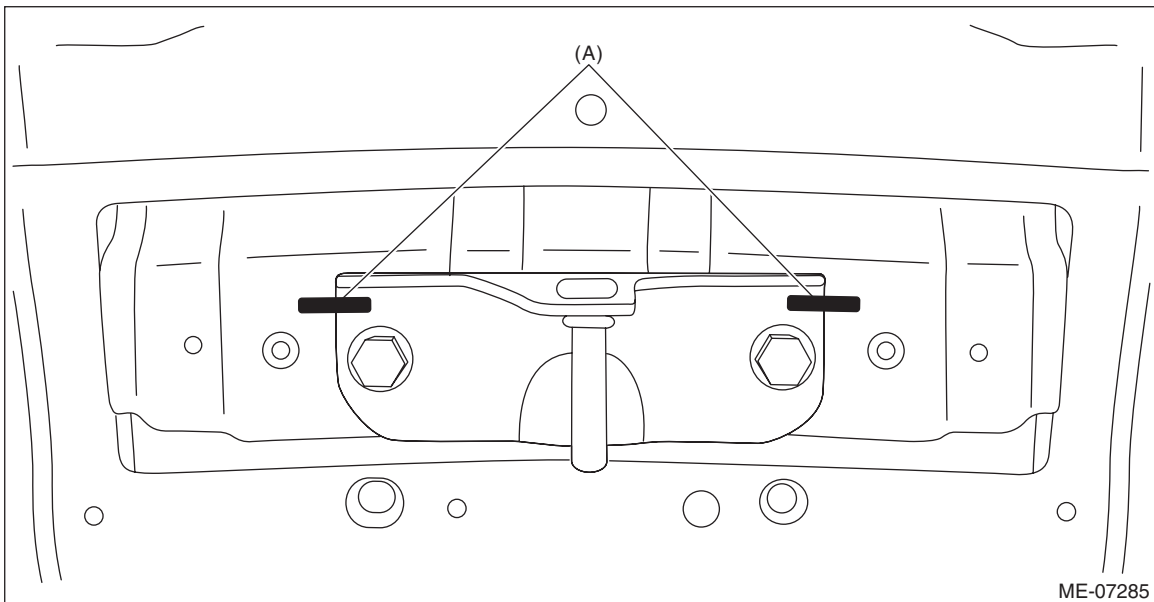
## 9. Engine Assembly

### A: REMOVAL

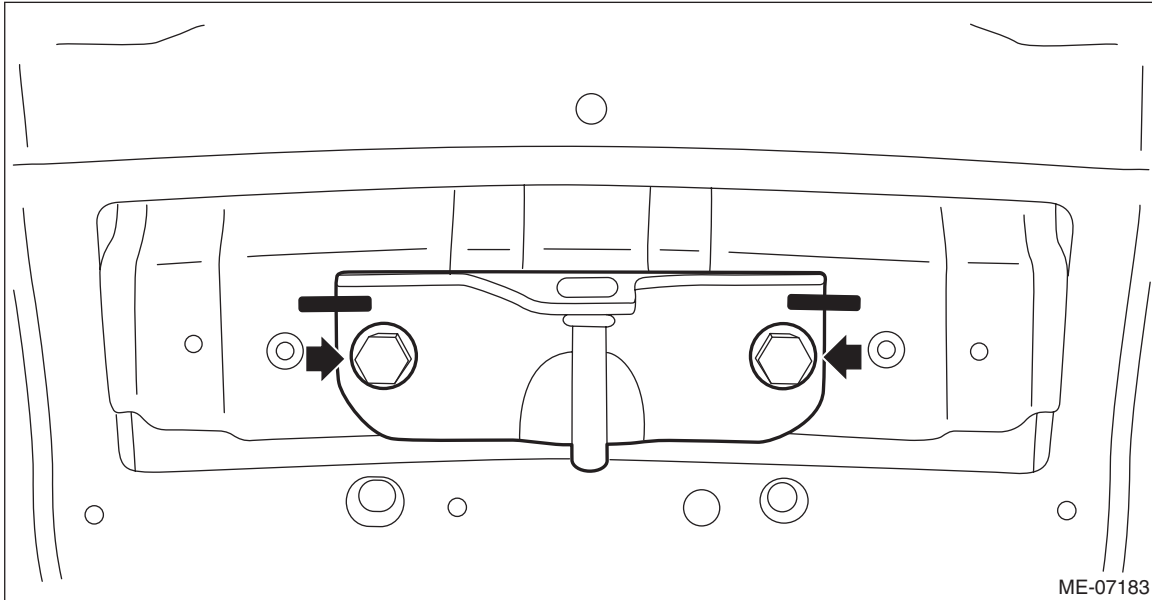
- 1) Open the front hood, and remove the upper grille bracket from the front hood.



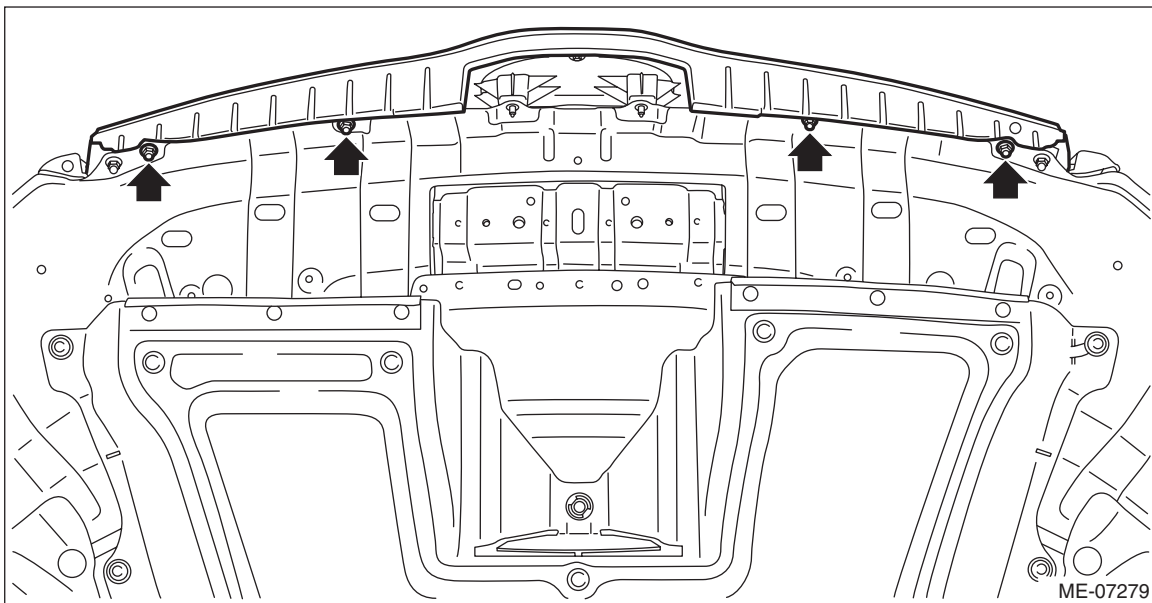
- 2) Using a marker pen, make alignment marks (A) on both the front hood and the front hood striker.



3) Remove the front hood striker from the front hood.



4) Remove the front center grille assembly from the front hood.



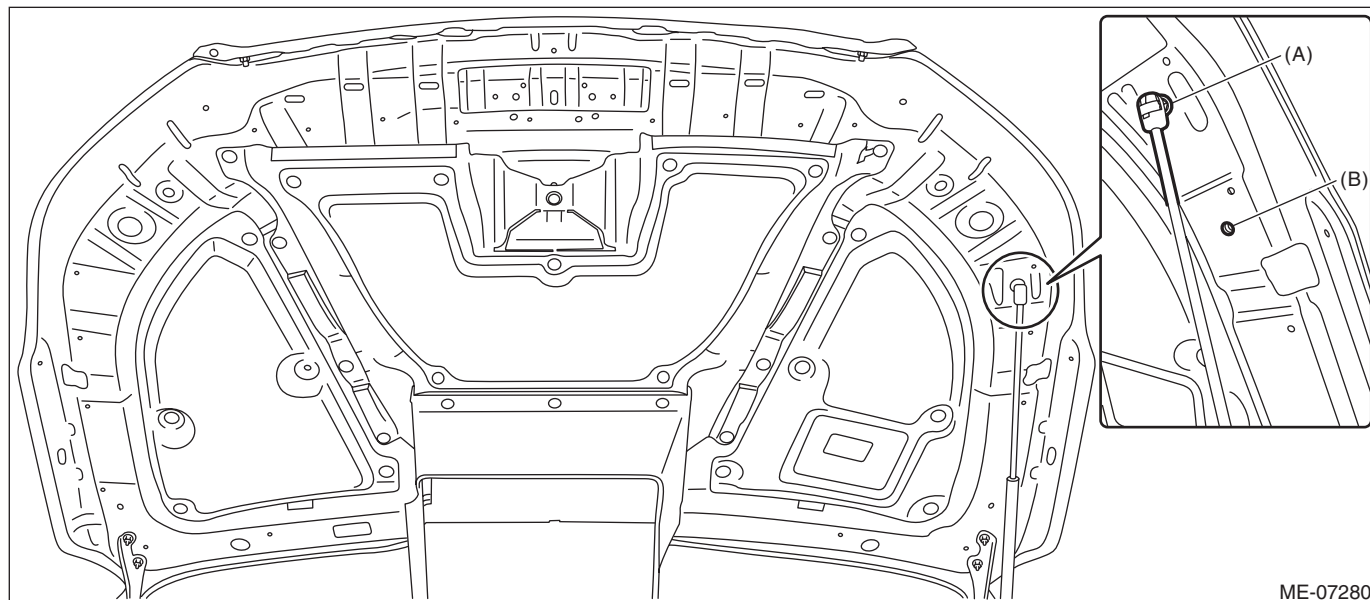
# Engine Assembly

## MECHANICAL

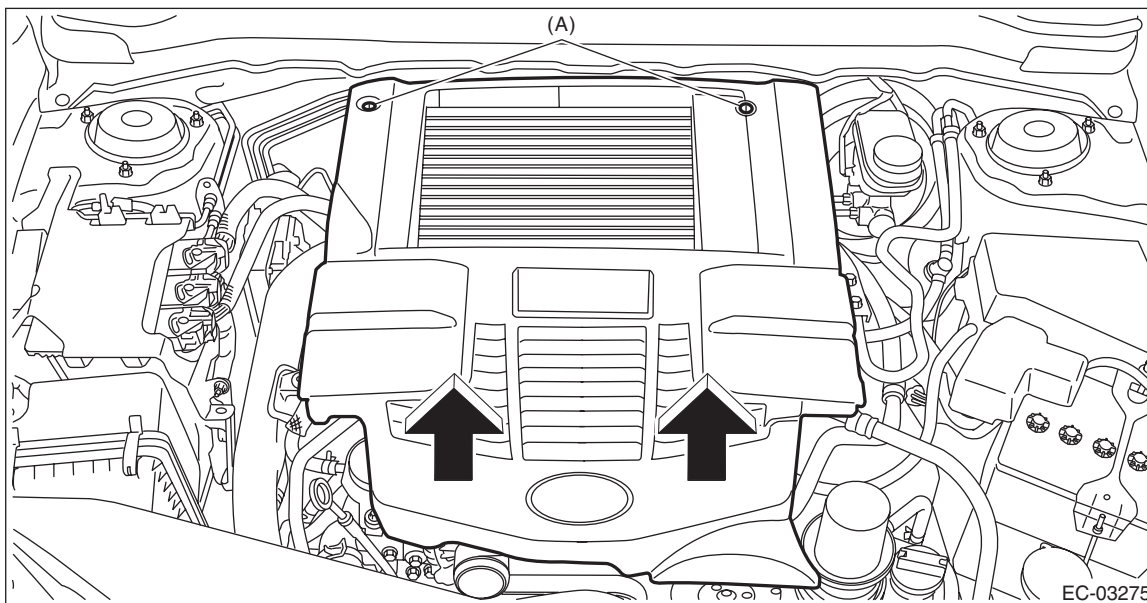
5) Change the front hood damper mounting position from (A) to (B), and completely open the front hood.

**Tightening torque:**

**20 N·m (2.0 kgf-m, 14.8 ft-lb)**



6) Remove the clip (A), lift the front of the collector cover in the direction of arrow, and then remove the collector cover.



7) Collect the refrigerant from A/C system.<Ref. to AC-28, Refrigerant Recovery Procedure.>

8) Release the fuel pressure.<Ref. to FU(H4DOTC)-152, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>

9) Disconnect the ground cable from battery.

10) Open the fuel filler lid and remove the fuel filler cap.

### NOTE:

This operation is required to release the inner pressure of the fuel tank.

11) Remove the air intake duct.<Ref. to IN(H4DOTC)-19, REMOVAL, Air Intake Duct.>

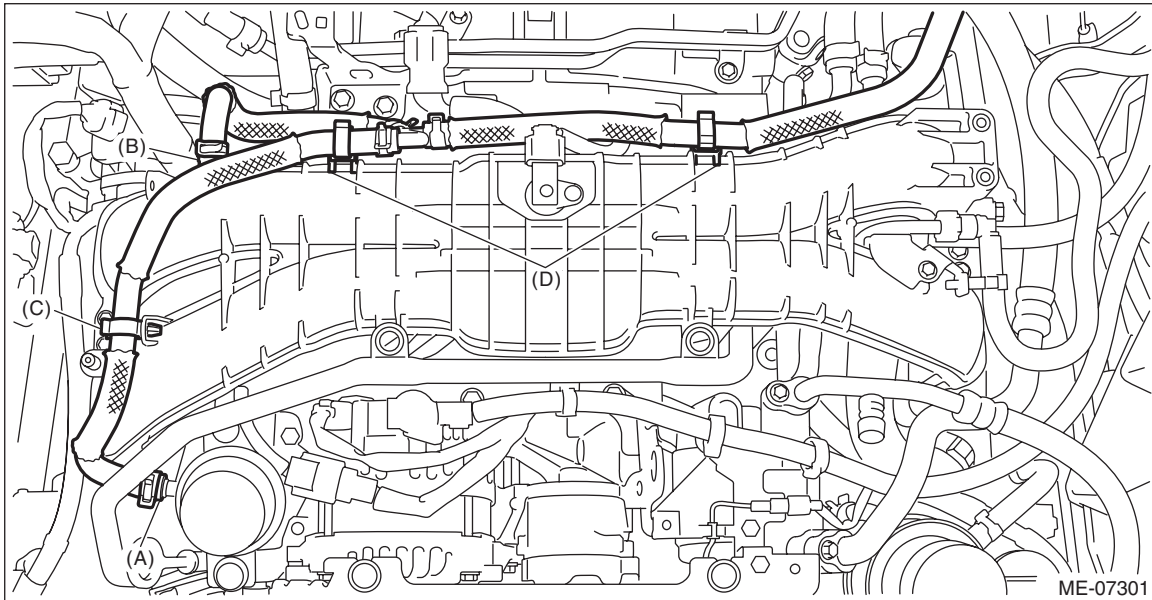
12) Remove the intercooler.<Ref. to IN(H4DOTC)-35, REMOVAL, Intercooler.>

13) Remove the intake duct No. 1 and intake duct No. 2.<Ref. to IN(H4DOTC)-20, INTAKE DUCT NO. 1, REMOVAL, Intake Duct.> <Ref. to IN(H4DOTC)-22, INTAKE DUCT NO. 2, REMOVAL, Intake Duct.>

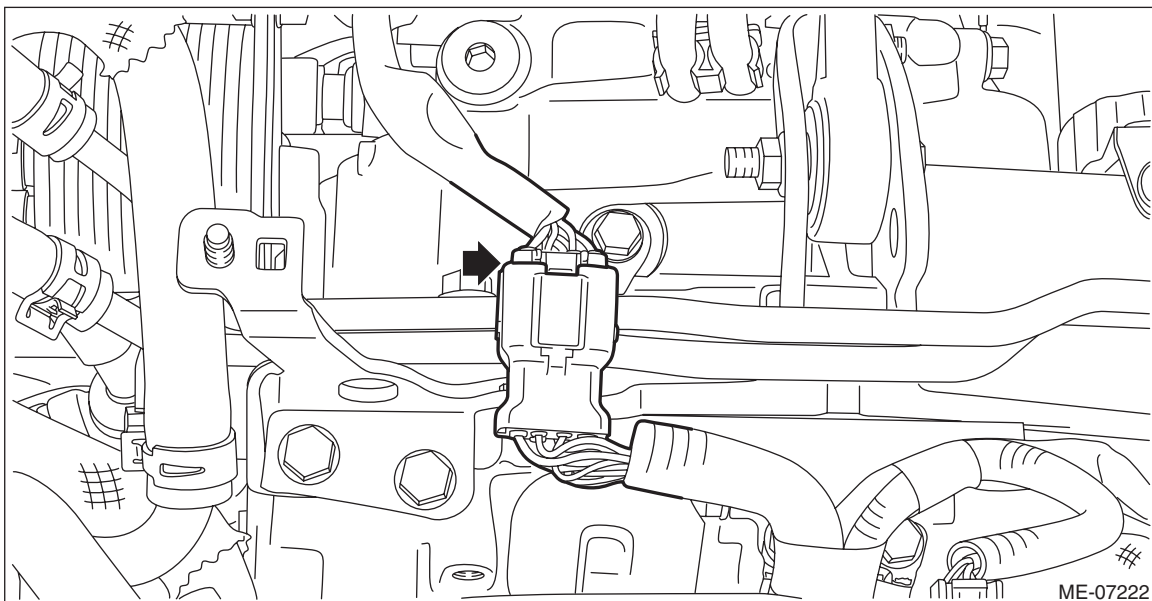
14) Remove the radiator.<Ref. to CO(H4DOTC)-39, REMOVAL, Radiator.>

15) Disconnect sections (A) and (B) of the brake booster vacuum hose from the brake vacuum pump and intake manifold, and remove the brake booster vacuum hose from the clip (C).

16) Remove the clip (D) securing the brake booster vacuum hose to the intake manifold, and move the brake booster vacuum hose at the locations that do not interfere operation.



17) Disconnect the bulkhead harness connectors from the engine harness connectors.

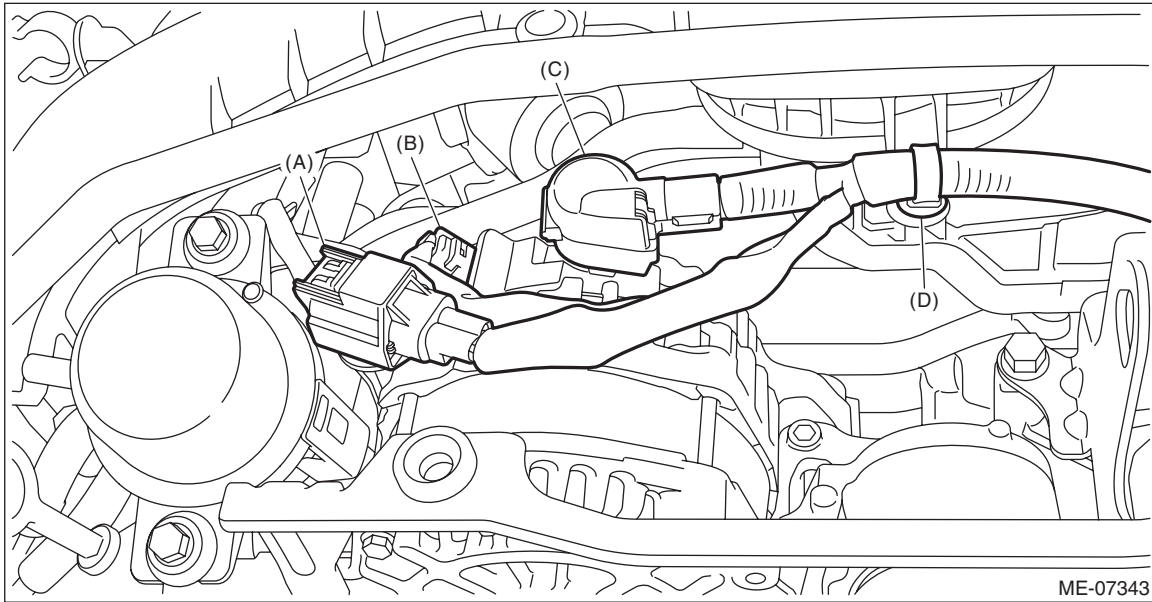


18) Disconnect the connector (A) from the brake vacuum pump.

## Engine Assembly

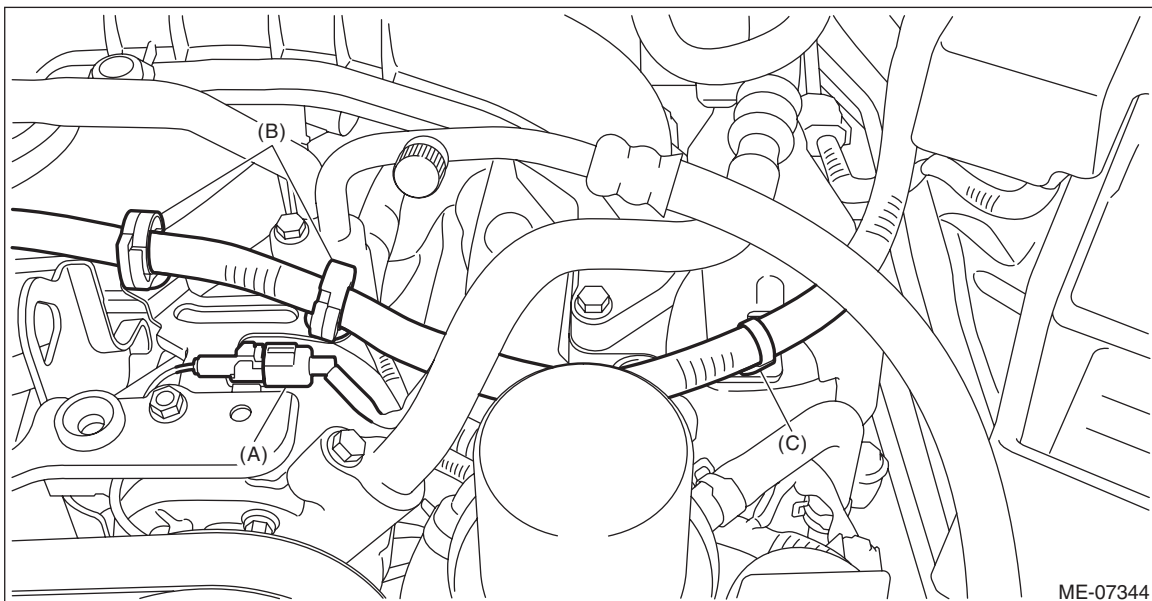
### MECHANICAL

19) Disconnect connector (B) and terminal (C) from the generator, and remove the clip (D) securing the generator cord to the intake manifold.

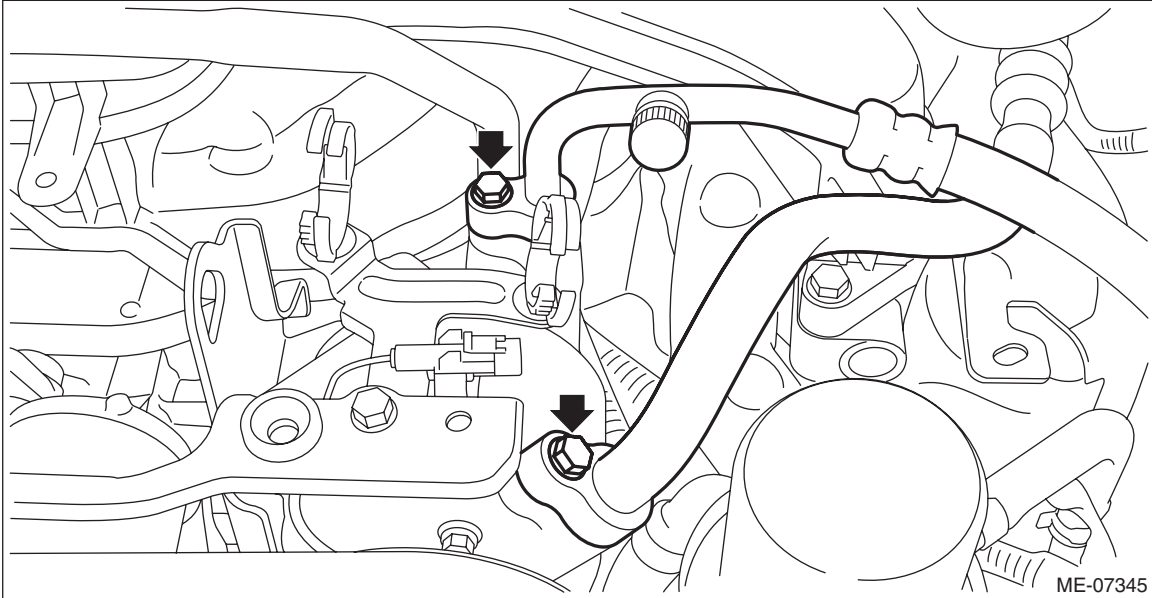


20) Disconnect connector (A) from A/C compressor, and remove the generator cord from clip (B).

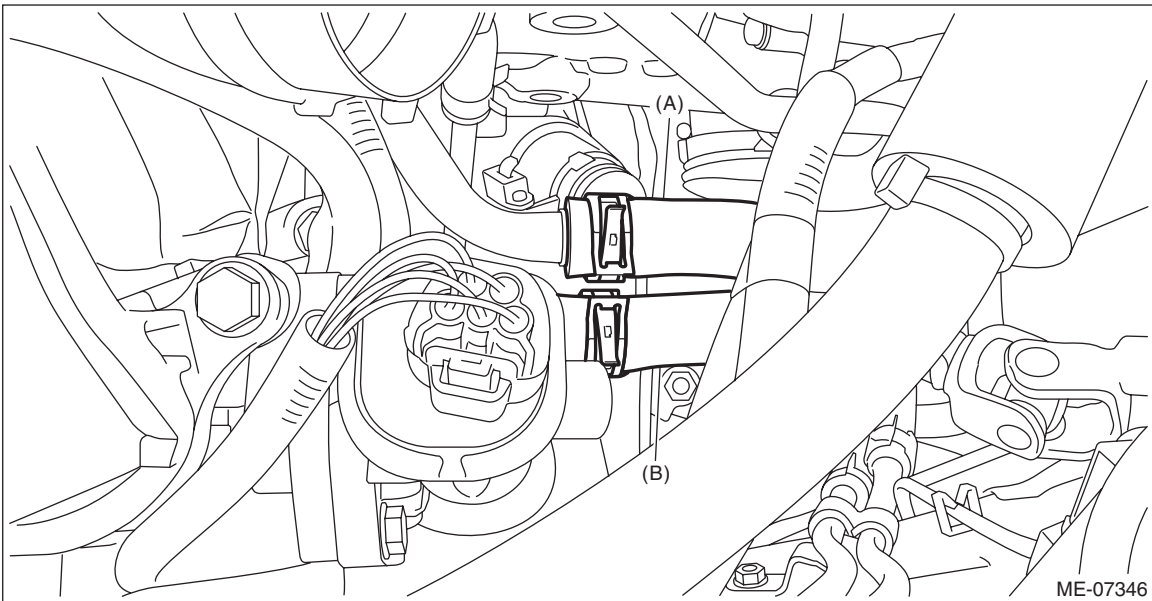
21) Remove the clip (C) securing the generator cord to the fuel pipe protector, and move the generator cord to the left side wheel apron.



22) Disconnect the A/C pressure hoses from A/C compressor.<Ref. to AC-74, REMOVAL, Hose and Pipe.>



23) Disconnect the heater inlet hose (A) from the water pipe assembly, and disconnect the heater outlet hose (B) from the water pipe LH.

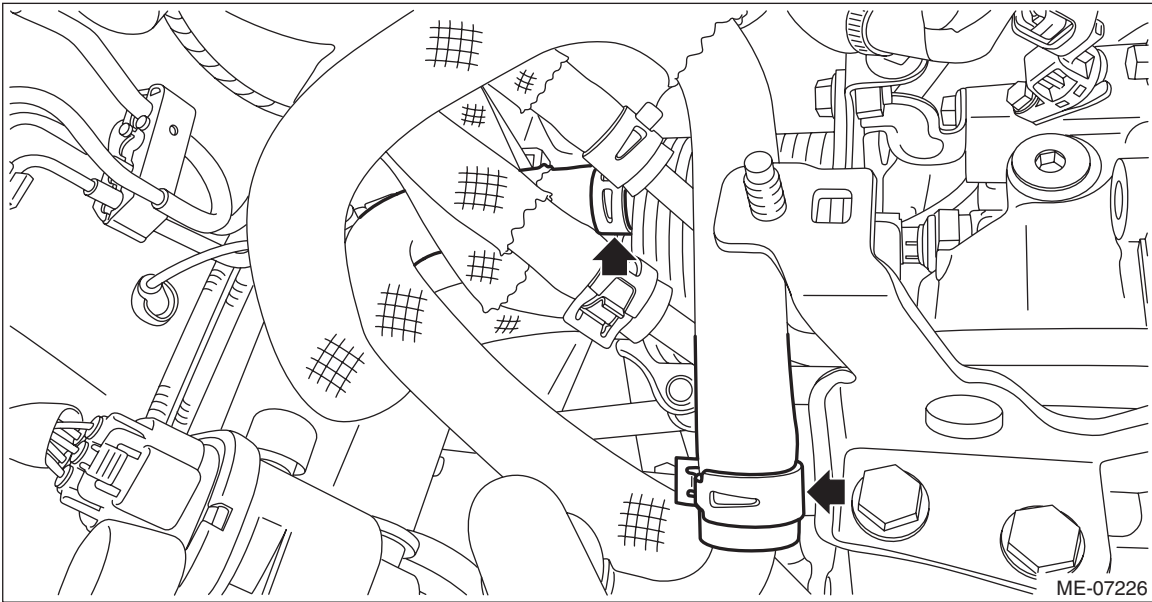




# Engine Assembly

## MECHANICAL

24) Disconnect the engine coolant inlet hose and engine coolant outlet hose from the CVTF cooler (with warmer feature) and EGR cooler.



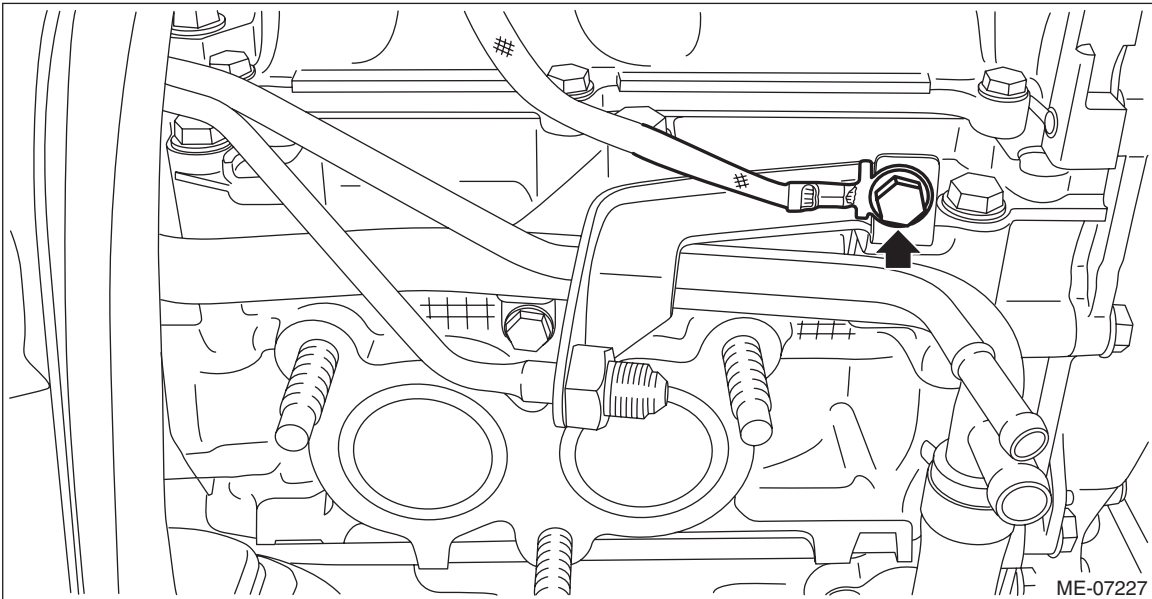
25) Remove the oil catch tank.<Ref. to IN(H4DOTC)-48, REMOVAL, Oil Catch Tank.>

26) Lower the vehicle.

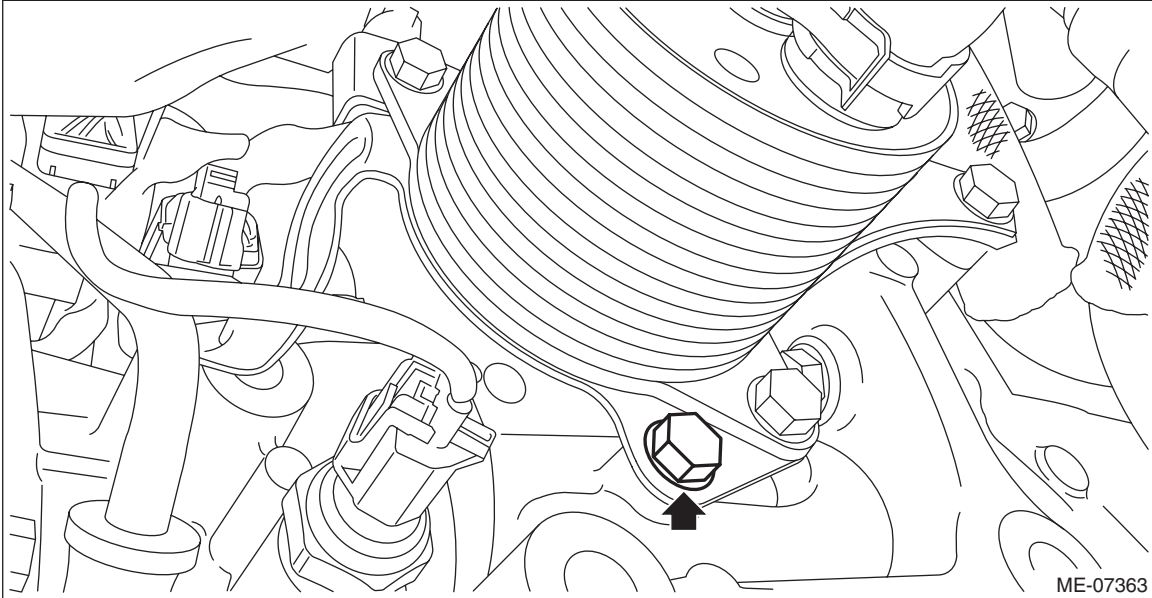
27) Remove the front exhaust pipe.<Ref. to EX(H4DOTC)-7, REMOVAL, Front Exhaust Pipe.>

28) Lift up the vehicle.

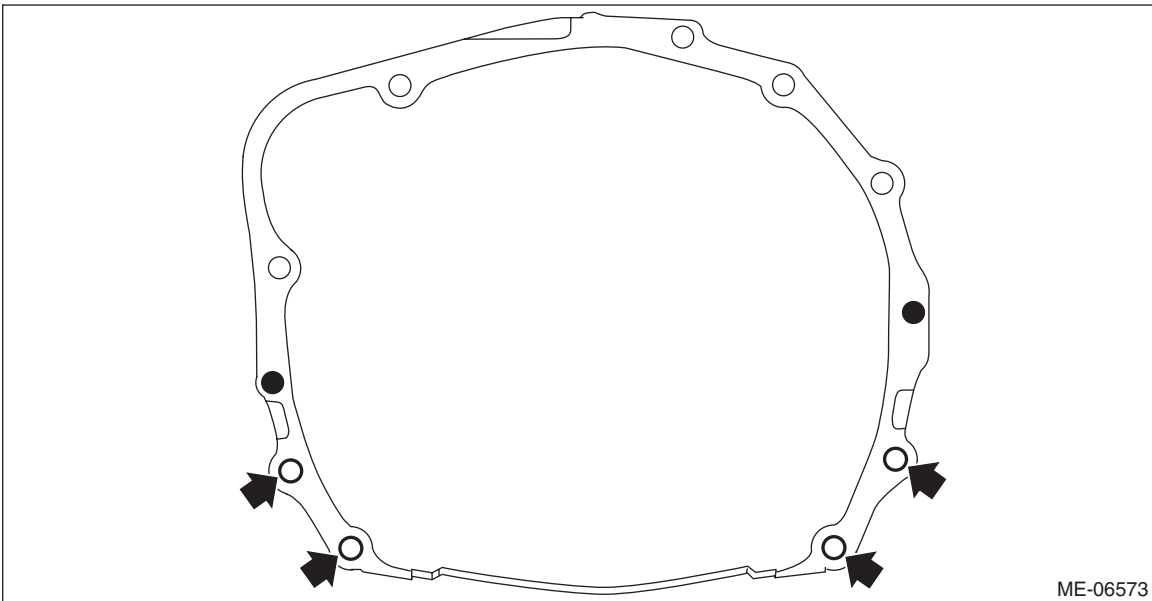
29) Disconnect the ground cable from the oil pipe assembly.



30) Remove the lower bolt securing the CVTF cooler (with warmer feature) to the CVT.



31) Remove the bolts and nuts which hold the lower side of transmission to the engine.

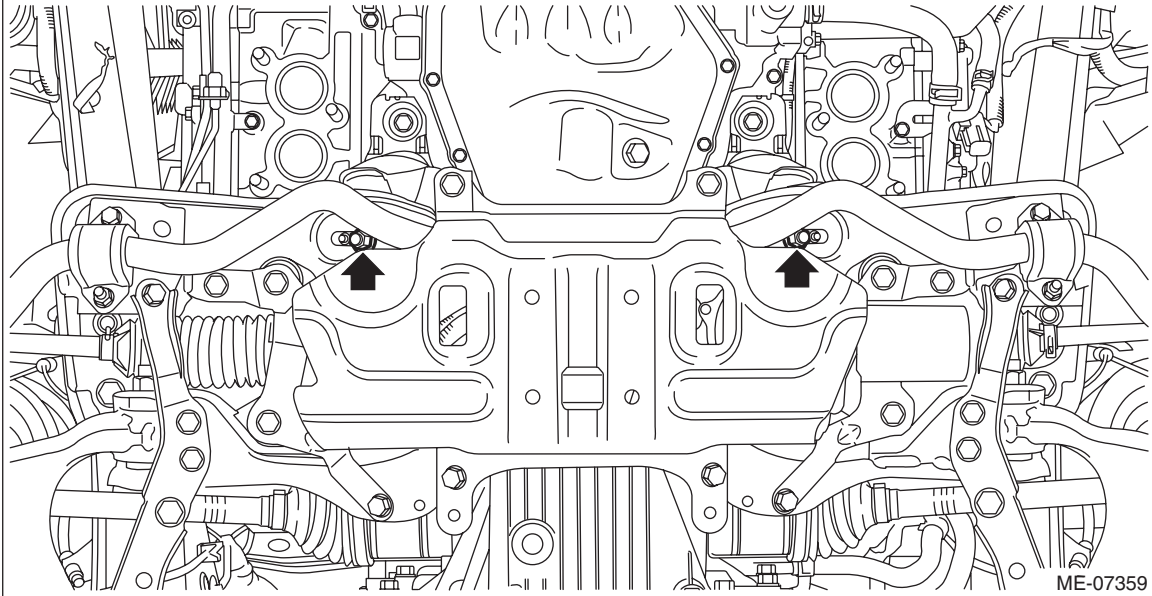




# Engine Assembly

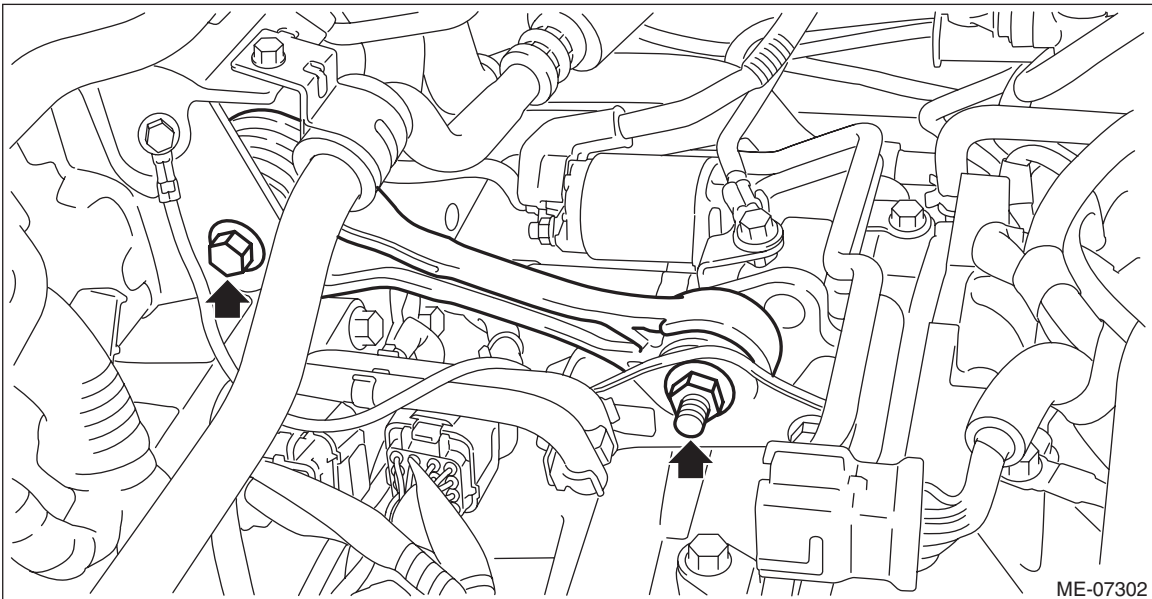
## MECHANICAL

32) Remove the nuts which secure the engine mounting to the front crossmember.

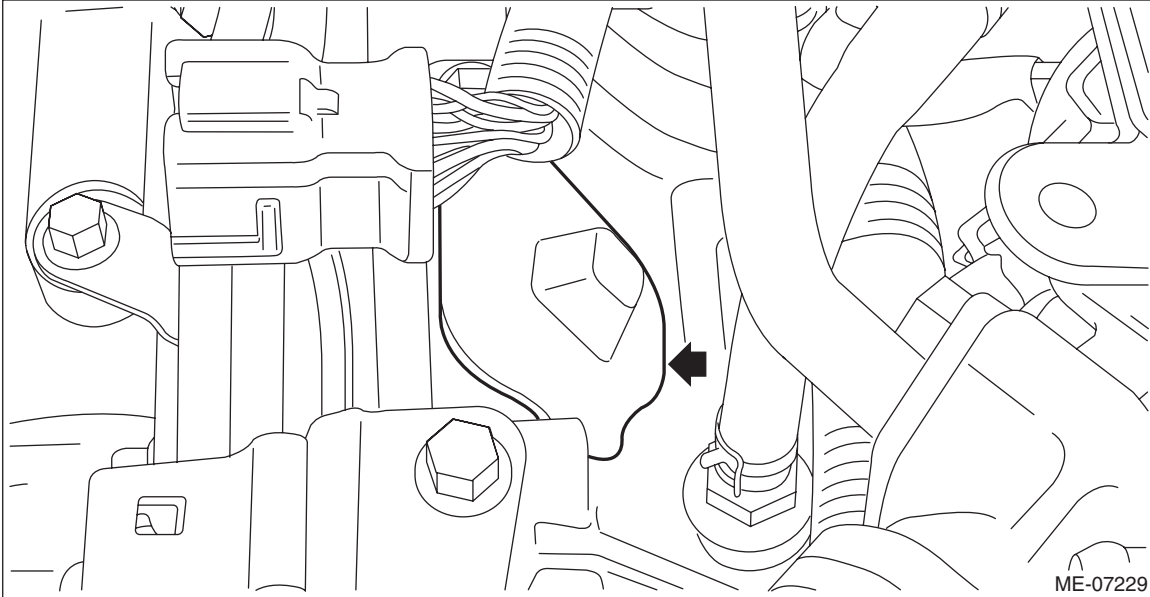


33) Lower the vehicle.

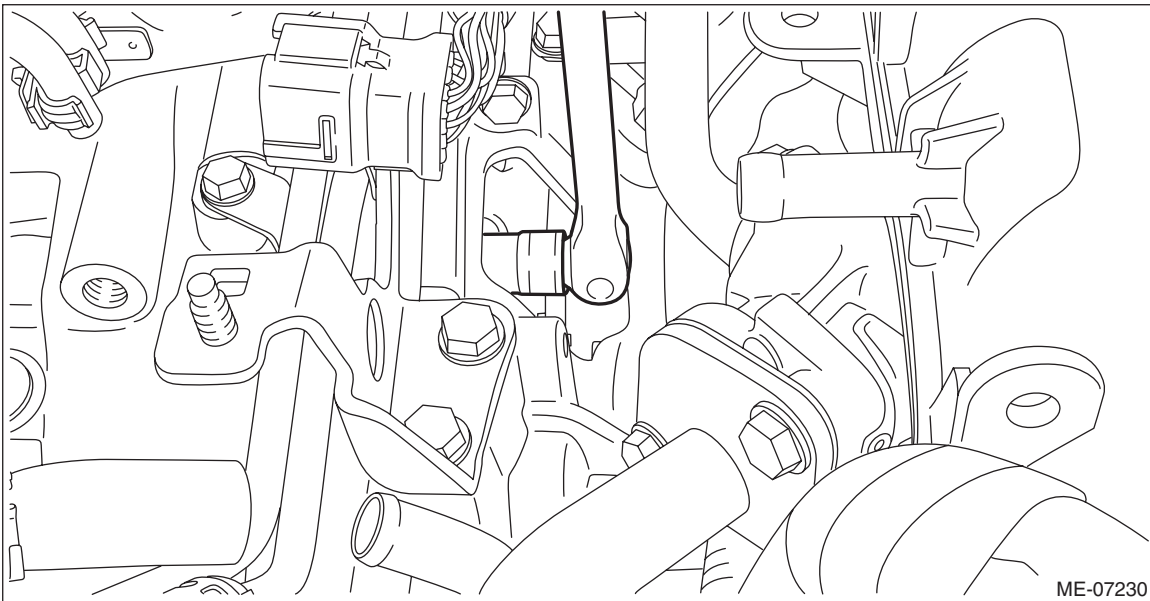
34) Remove the pitching stopper.



- 35) Separate the torque converter clutch from the drive plate.
- (1) Remove the starter.<Ref. to SC(H4DO)-8, REMOVAL, Starter.>
  - (2) Remove the service hole plug.



- (3) Insert the wrench into the crank pulley bolt and rotate the crank pulley to remove the bolts which hold torque converter clutch to drive plate.

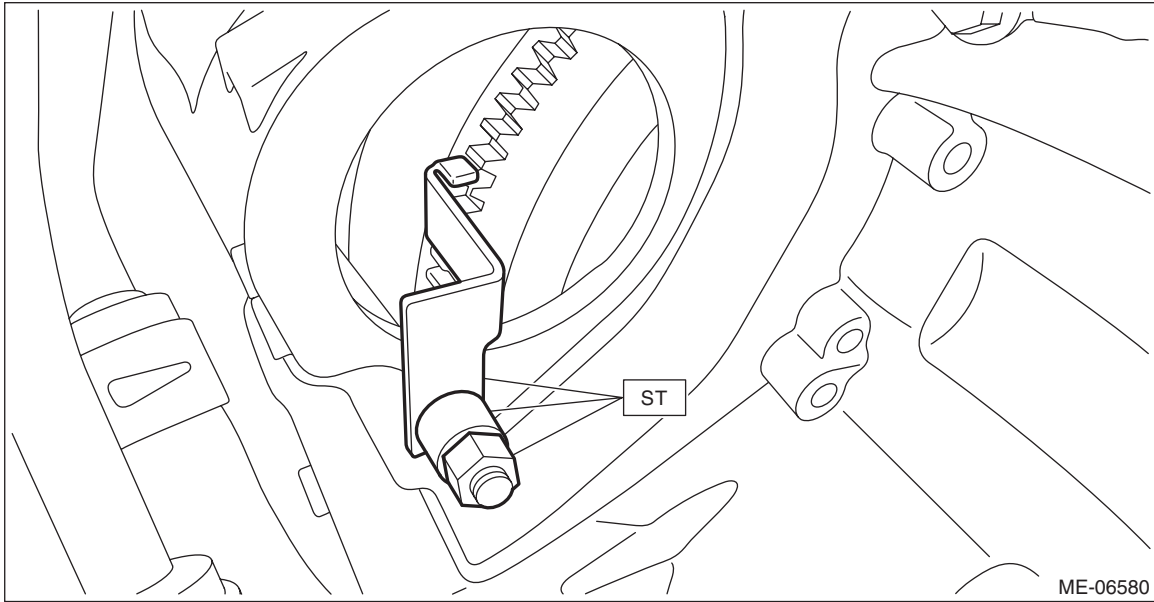


# Engine Assembly

## MECHANICAL

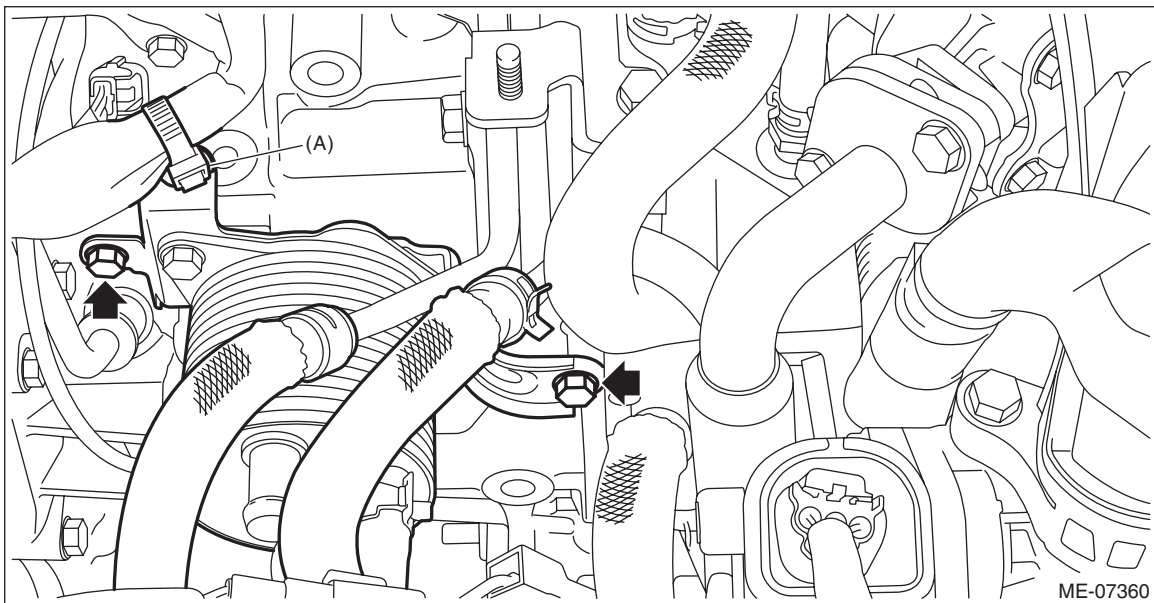
(4) Attach the ST to the torque converter clutch case.

ST 498277200 STOPPER SET



36) Remove the clip (A) securing the bulkhead harness to the CVTF cooler (with warmer feature).

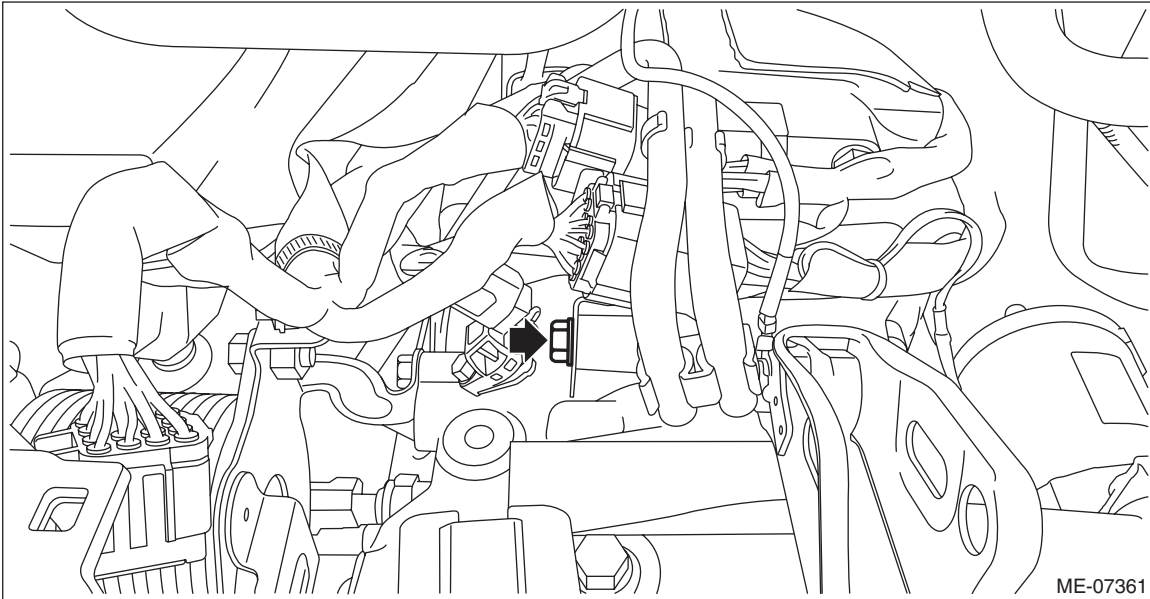
37) Remove the upper bolt securing the CVTF cooler (with warmer feature) to the CVT, and move the CVTF cooler (with warmer feature) at the locations that do not interfere operation.



38) Remove the bolt securing the transmission harness stay to the CVT.

**NOTE:**

This procedure is required to prevent the transmission connector from touching the A/C pressure hose during engine removal/installation.



# Engine Assembly

## MECHANICAL

39) Disconnect the fuel delivery tube and evaporation hose.

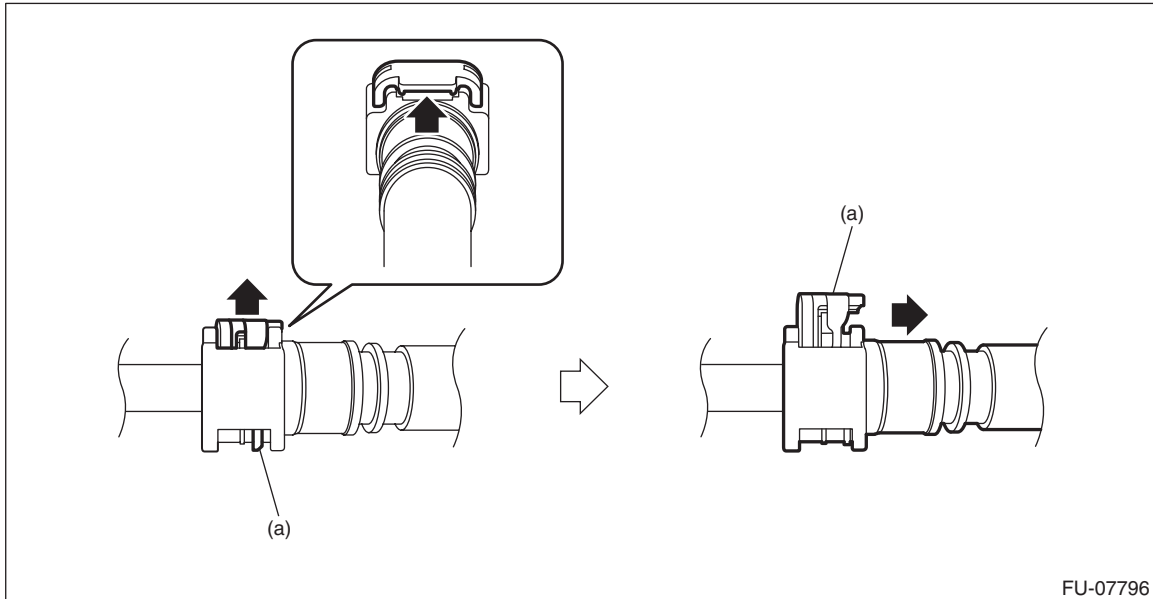
### CAUTION:

- Be careful not to spill fuel.
- Catch the fuel from the tubes using a container or cloth.

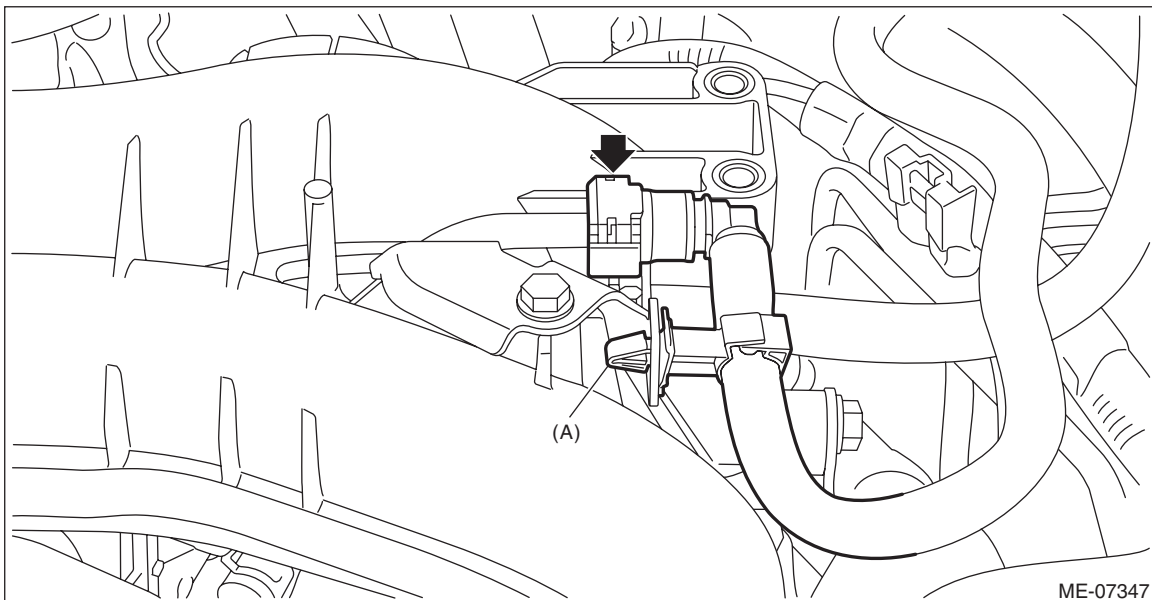
(1) Disconnect the quick connector on the fuel delivery tube from the fuel pipe assembly, and remove the clip (A) securing the fuel delivery tube.

### NOTE:

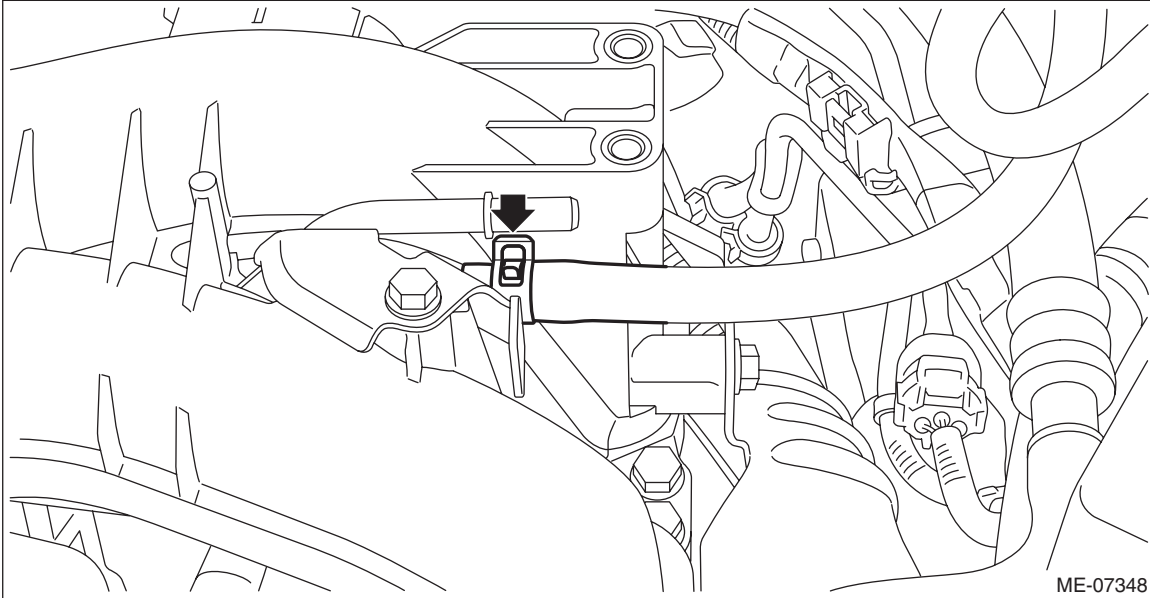
Disconnect the quick connector as shown in the figure.



(a) Slider



- (2) Disconnect the evaporation hose from the fuel pipe assembly.

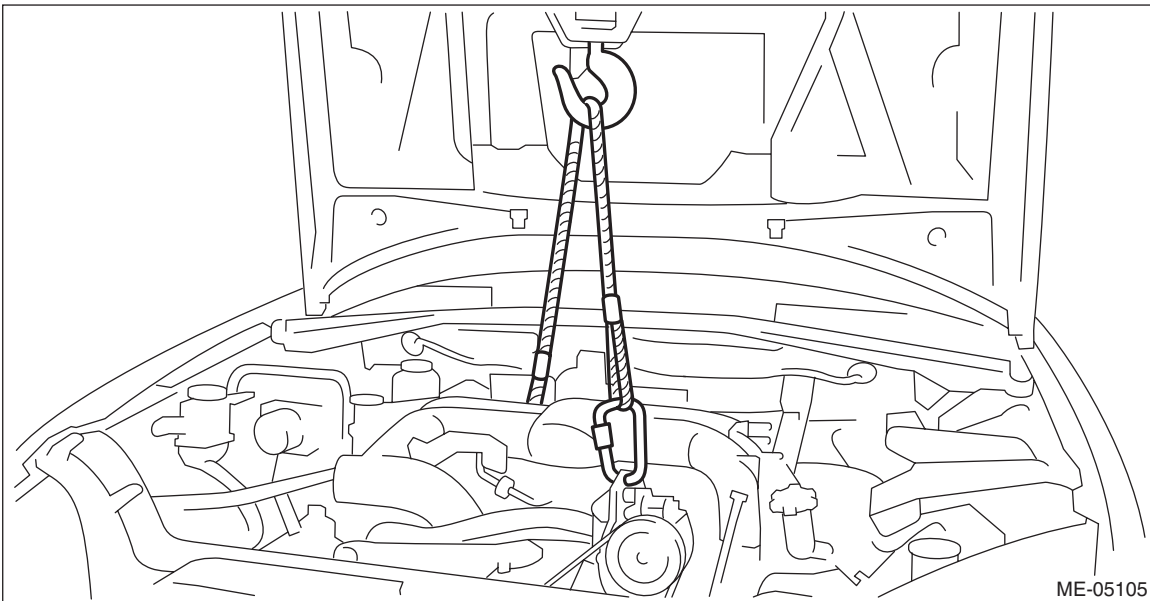


- 40) Separate the engine and transmission.

**CAUTION:**

**Before removing the engine away from transmission, check to be sure no work has been overlooked.**

- (1) Support the engine with a lifting device and wire ropes.





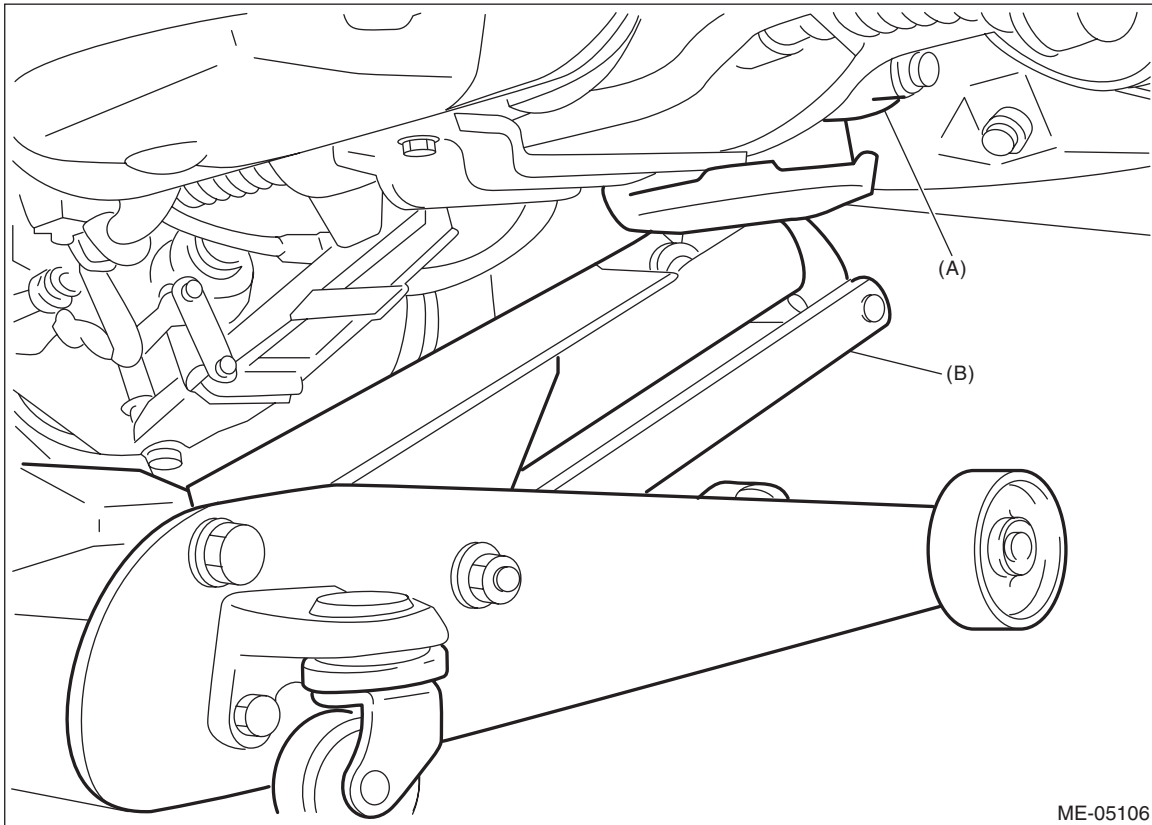
# Engine Assembly

## MECHANICAL

(2) Support the transmission with a garage jack.

### CAUTION:

Be sure to perform this procedure to prevent the transmission from lowering by its own weight.

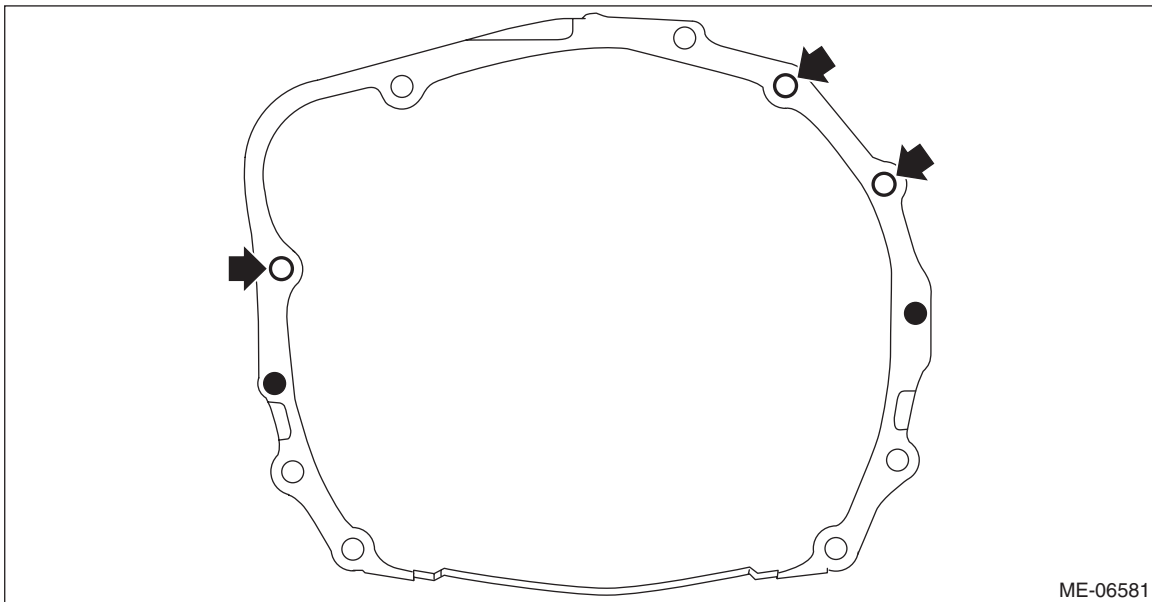


ME-05106

(A) Transmission

(B) Garage jack

(3) Remove the bolts which hold the upper side of the transmission to the engine.



ME-06581

41) Remove the engine from the vehicle.

**NOTE:**

Be careful not to damage adjacent parts or body panels with crank pulley, oil level gauge, etc.

(1) Move the engine horizontally until engine is withdrawn from transmission.

(2) Slowly move the engine away from engine compartment.

42) Remove the engine mounting from the engine.

## B: INSTALLATION

1) Install the engine mounting onto the engine.

**Tightening torque:**

**35 N·m (3.6 kgf-m, 25.8 ft-lb)**

2) Position the engine in engine compartment and align it with transmission.

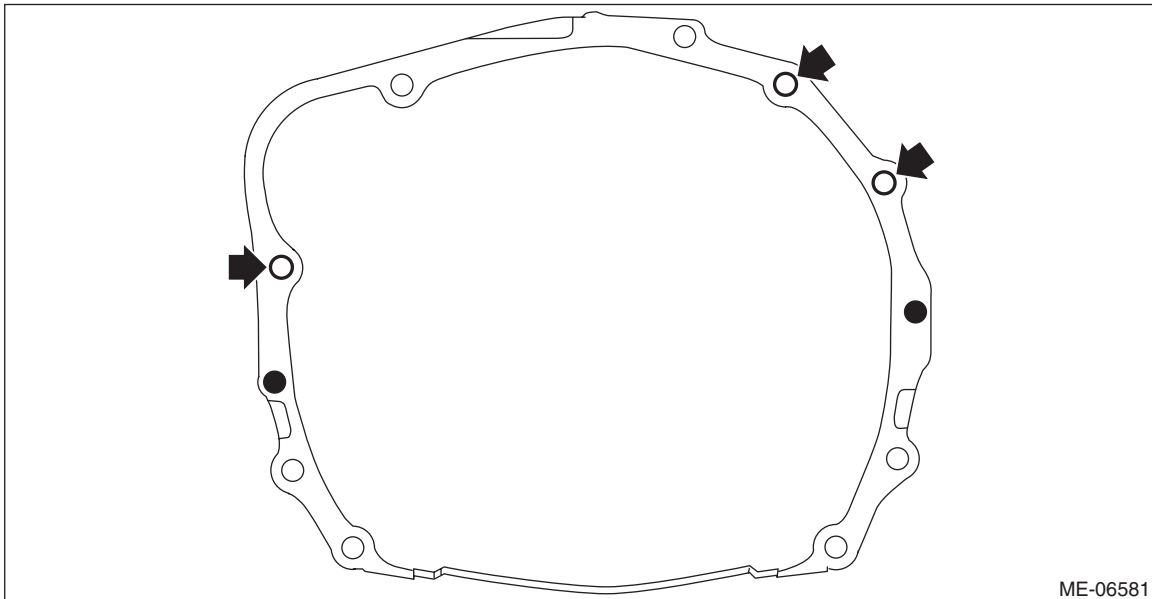
**NOTE:**

Be careful not to damage adjacent parts or body panels with crank pulley, oil level gauge, etc.

3) Install the bolts which hold upper side of transmission to engine.

**Tightening torque:**

**50 N·m (5.1 kgf-m, 36.9 ft-lb)**

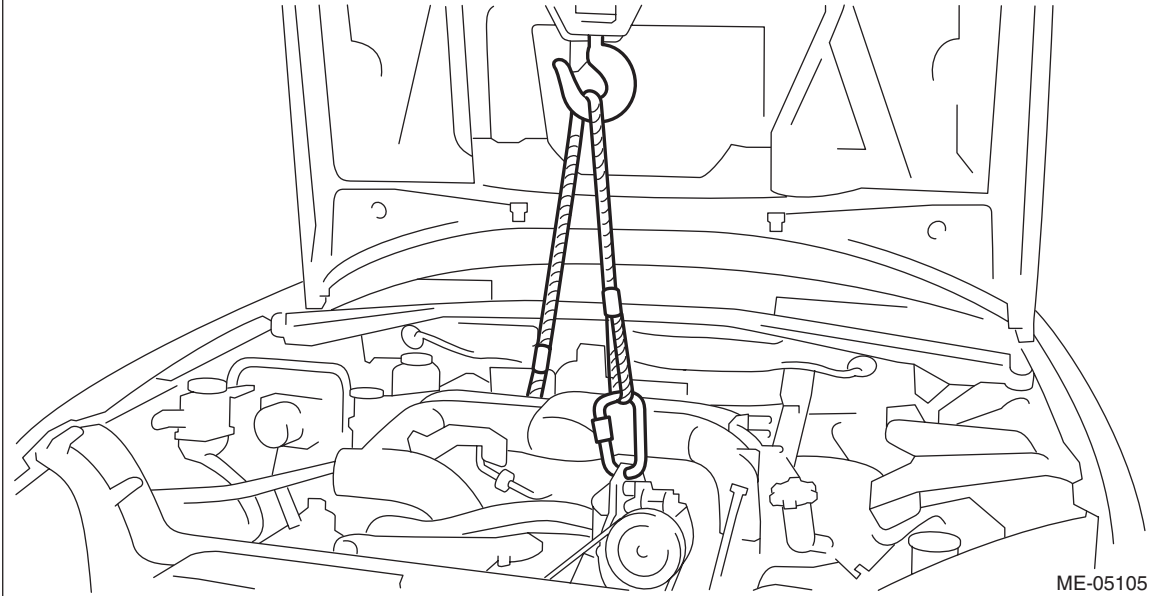


ME-06581

# Engine Assembly

## MECHANICAL

4) Remove the lifting device and wire ropes.

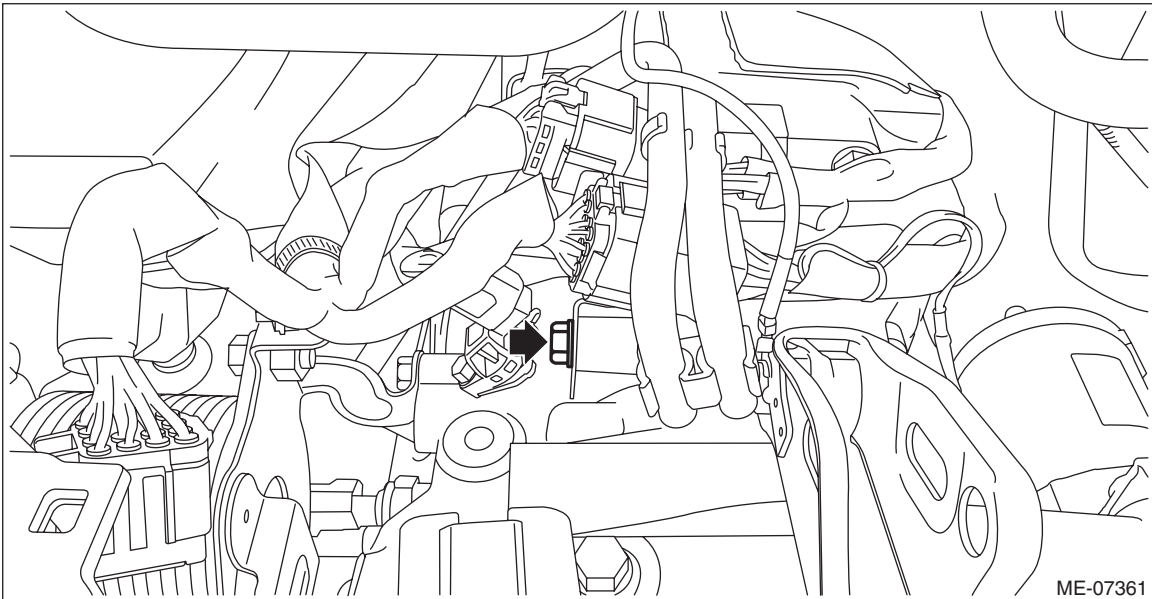


5) Remove the garage jack.

6) Install the bolt which secures the transmission harness stay to the CVT.

**Tightening torque:**

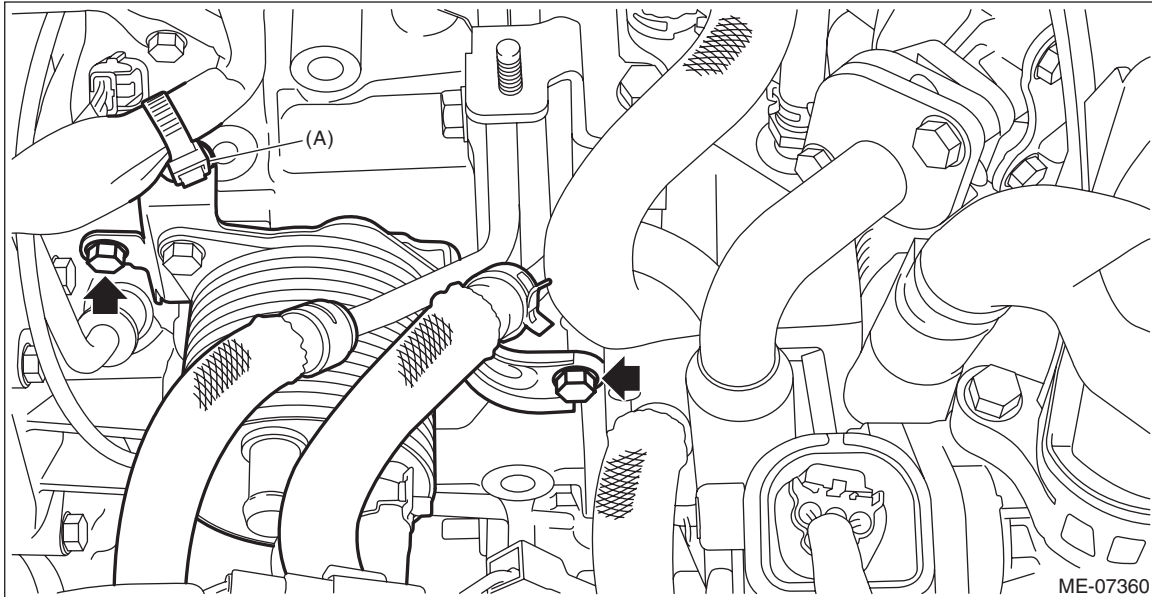
**15 N·m (1.6 kgf-m, 11.8 ft-lb)**



7) Install the CVTF cooler (with warmer feature) to the CVT.

(1) Temporarily tighten the upper bolt which secures the CVTF cooler (with warmer feature) to the CVT.

(2) Using clip (A), fix the bulkhead harness to the CVTF cooler (with warmer feature).

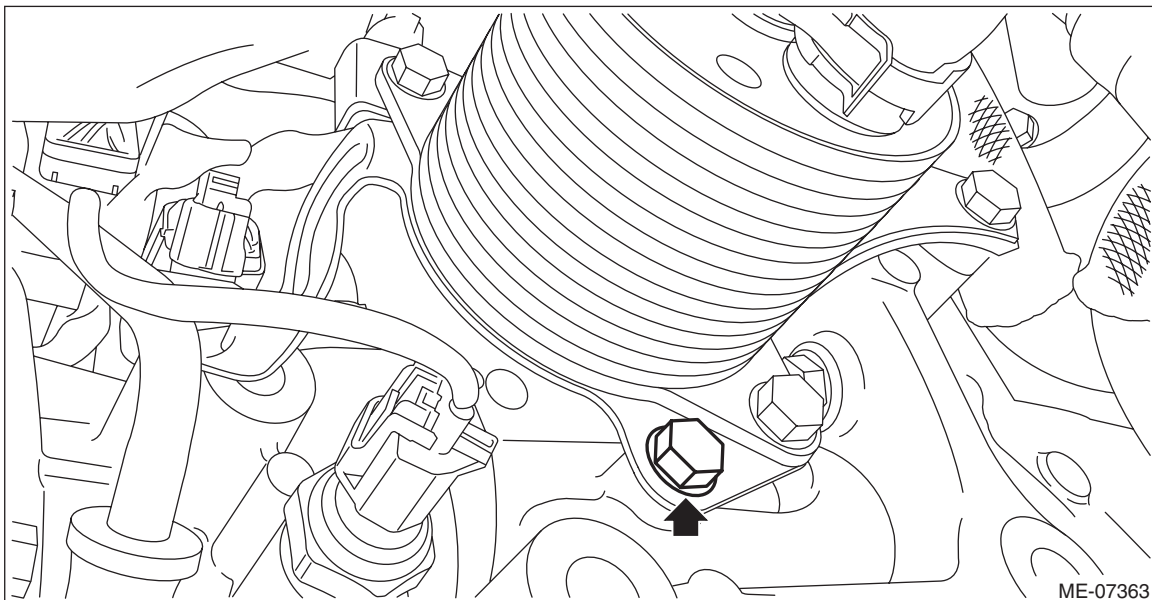


(3) Lift up the vehicle.

(4) Install the lower bolt which secures CVTF cooler (with warmer feature) to the CVT.

**Tightening torque:**

**23 N·m (2.3 kgf-m, 17.0 ft-lb)**



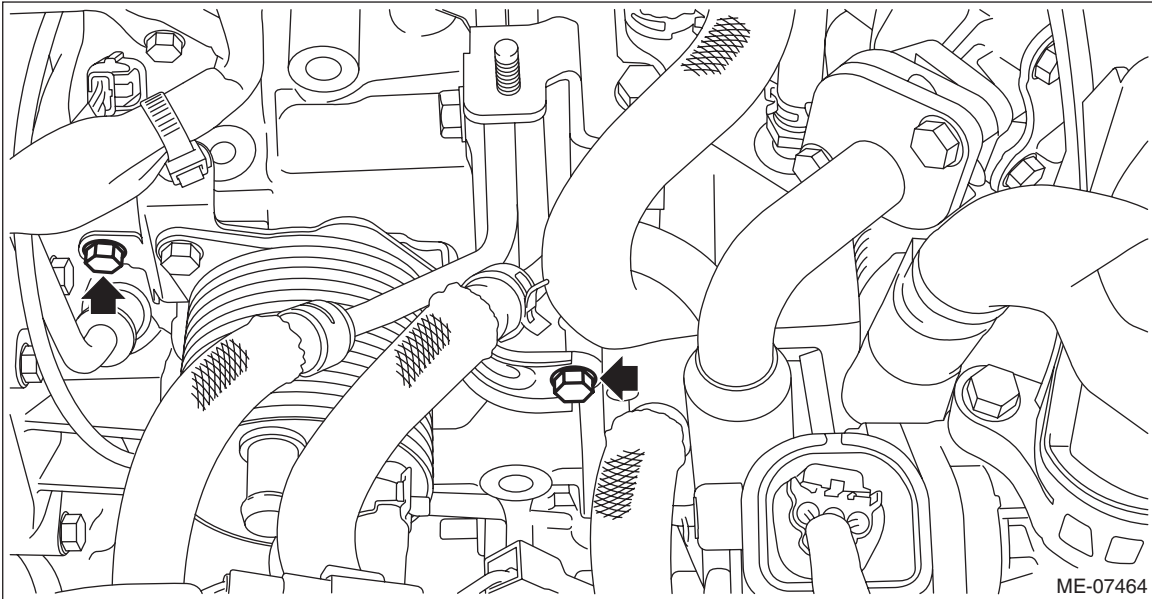
# Engine Assembly

## MECHANICAL

- (5) Lower the vehicle.
- (6) Tighten the upper bolt which secures the CVTF cooler (with warmer feature) to the CVT.

### **Tightening torque:**

**23 N·m (2.3 kgf-m, 17.0 ft-lb)**

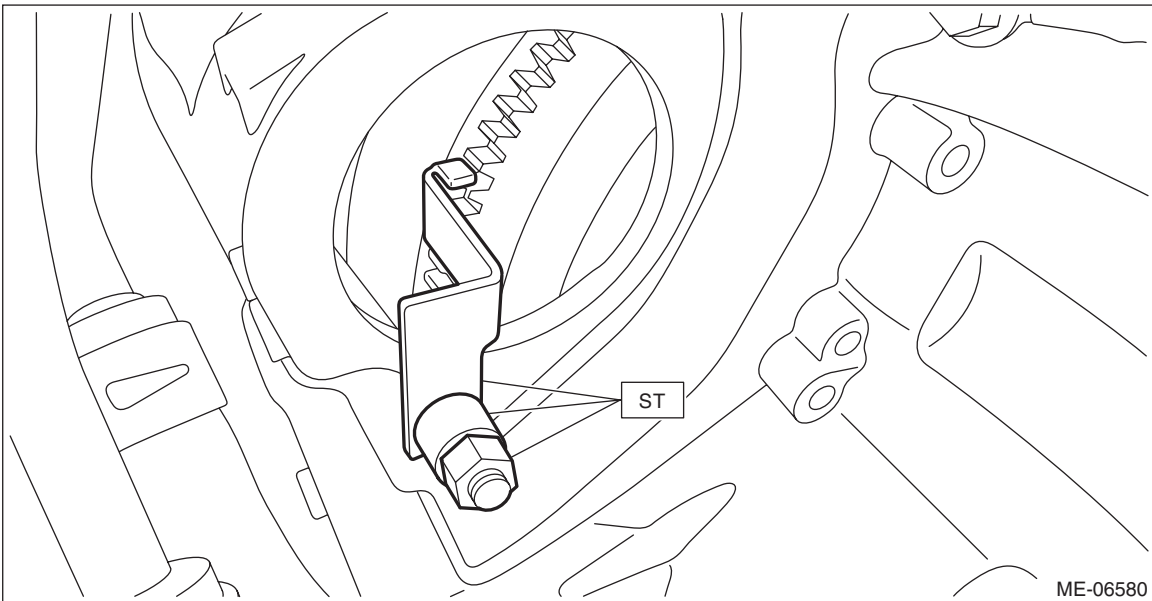


- 8) Install the torque converter clutch to drive plate.
  - (1) Remove the ST from torque converter clutch case.

### **NOTE:**

Be careful not to drop the ST into the torque converter clutch case when removing the ST.

ST 498277200 STOPPER SET



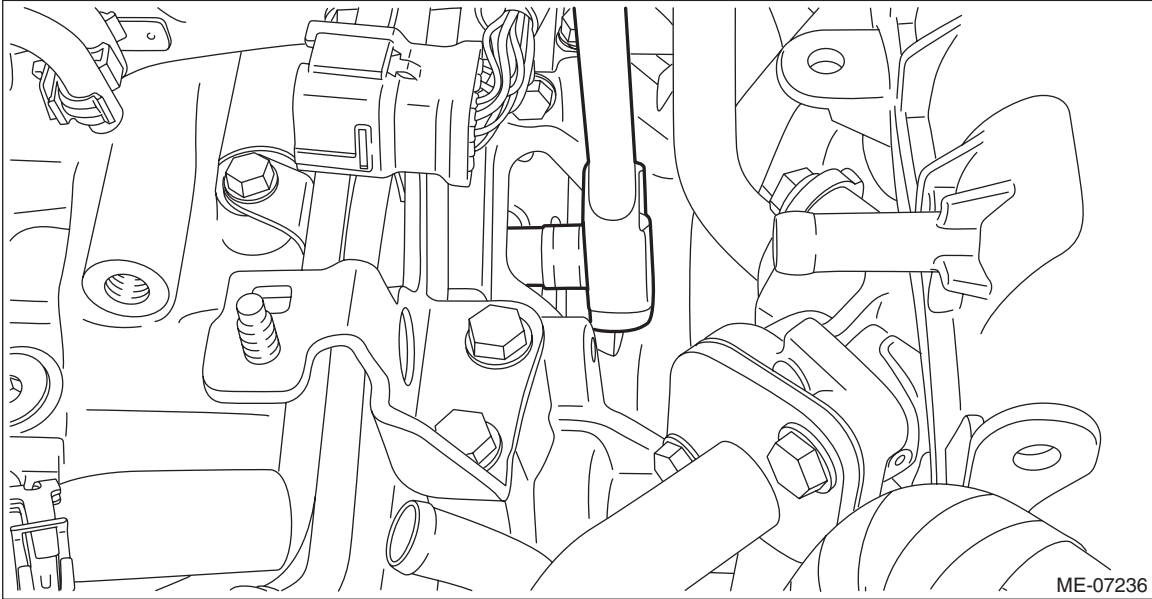
- (2) Insert the wrench into the crank pulley bolt and rotate the crank pulley to install the bolts which hold torque converter clutch to drive plate.

**NOTE:**

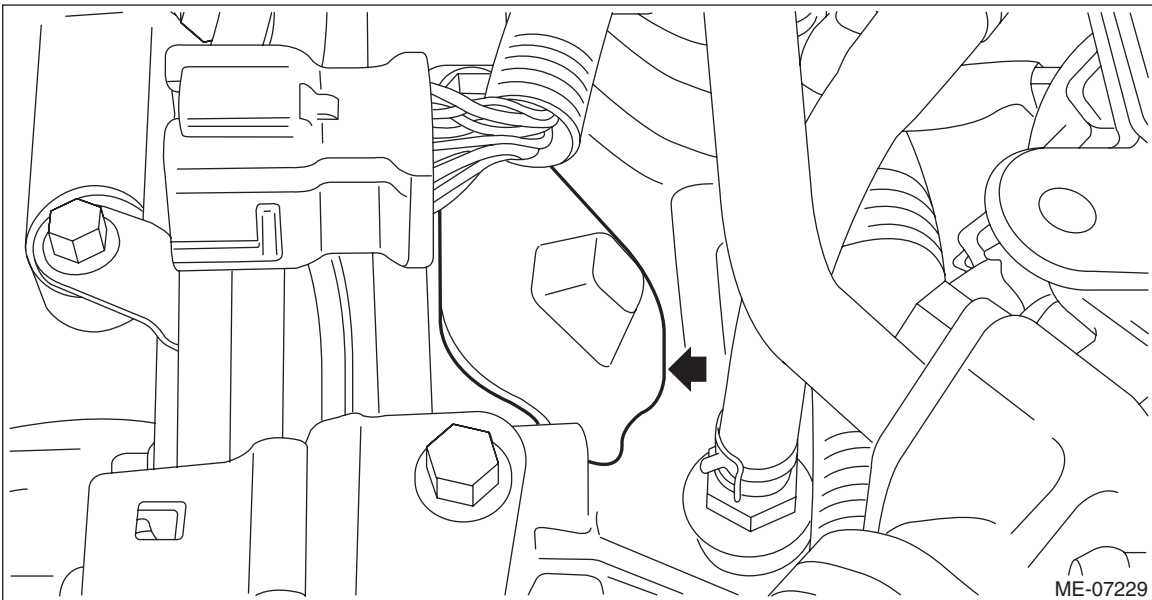
Be careful not to drop bolts into the torque converter clutch case.

**Tightening torque:**

**25 N·m (2.5 kgf-m, 18.4 ft-lb)**



- (3) Fit the plug to service hole.



- (4) Install the starter.<Ref. to SC(H4DO)-12, INSTALLATION, Starter.>



# Engine Assembly

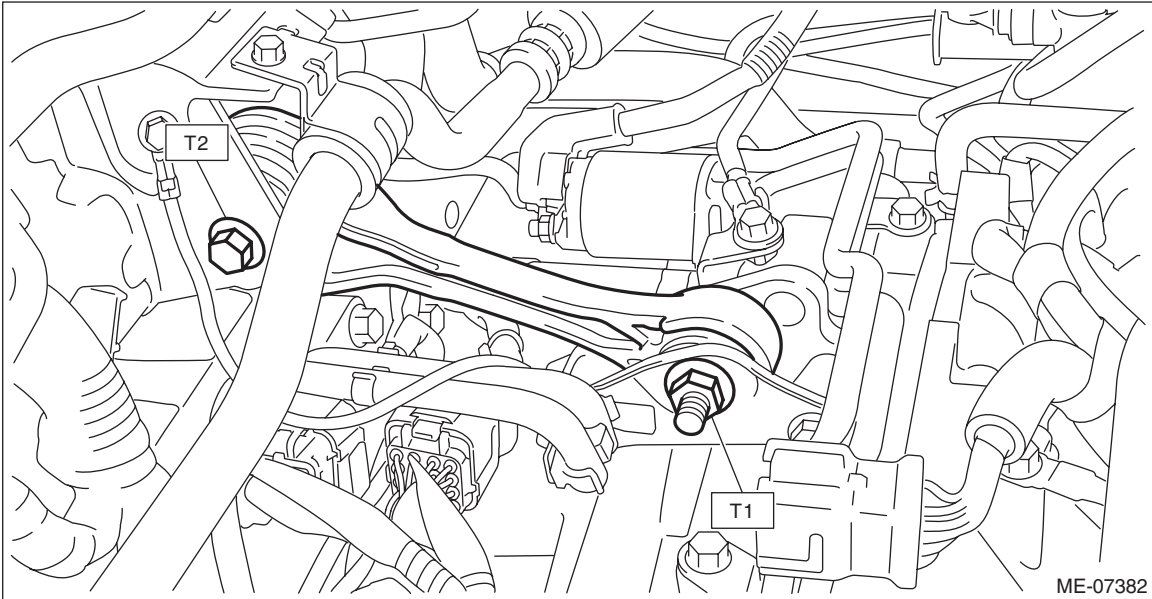
## MECHANICAL

9) Install the pitching stopper.

**Tightening torque:**

**T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)**

**T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)**

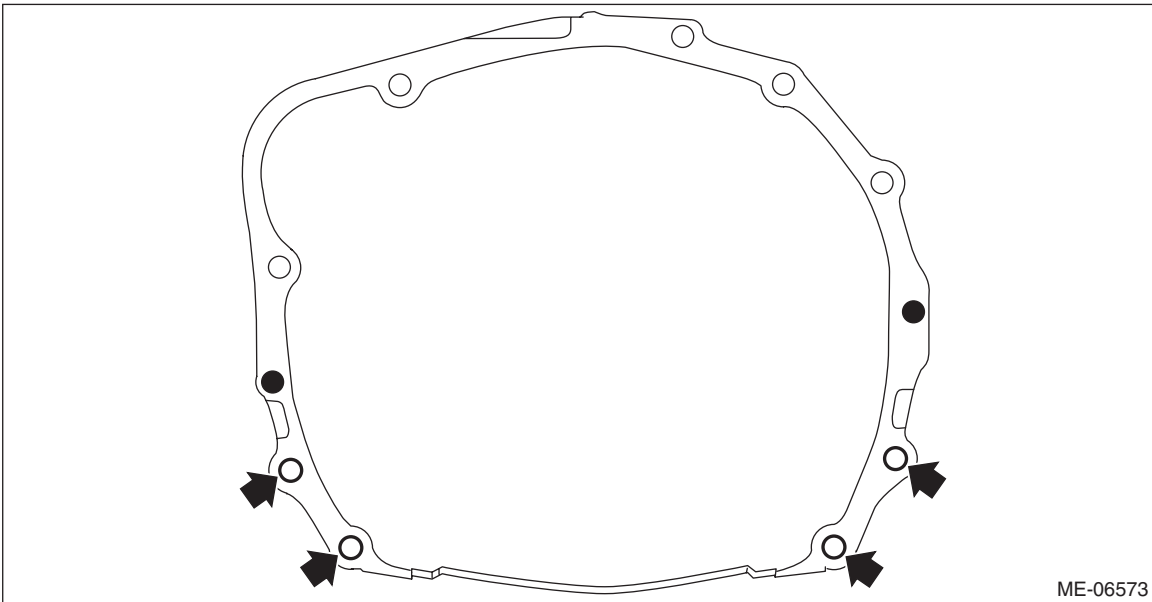


10) Lift up the vehicle.

11) Install the bolts and nuts which hold lower side of the transmission to engine.

**Tightening torque:**

**50 N·m (5.1 kgf-m, 36.9 ft-lb)**



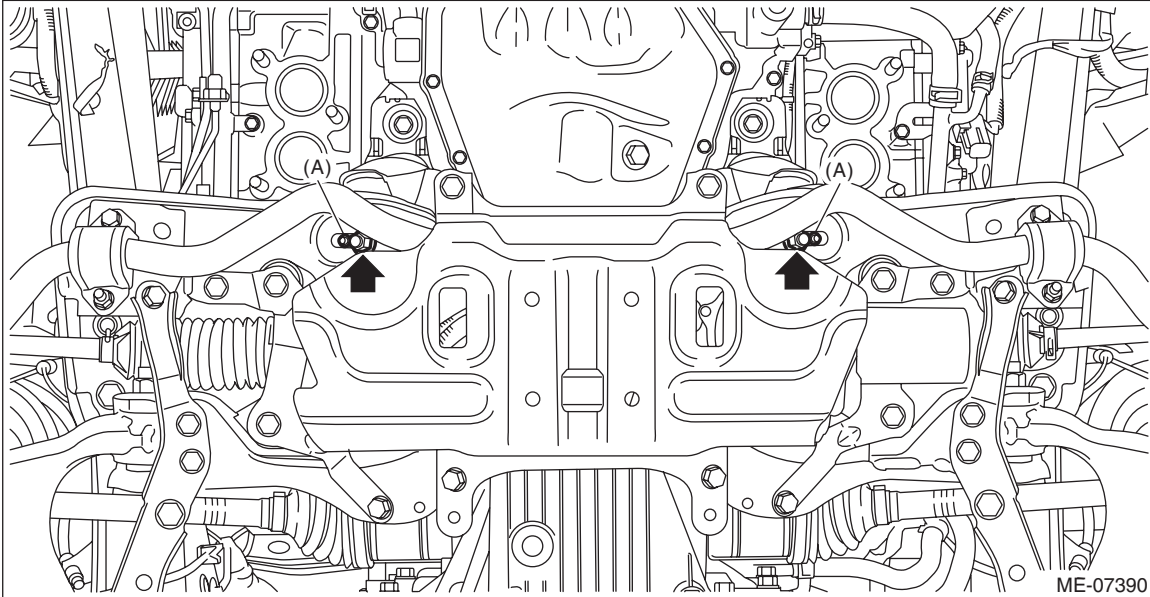
12) Install the nuts which hold the engine mounting to the crossmember.

NOTE:

Make sure that locators (A) of the engine mounting are securely inserted.

**Tightening torque:**

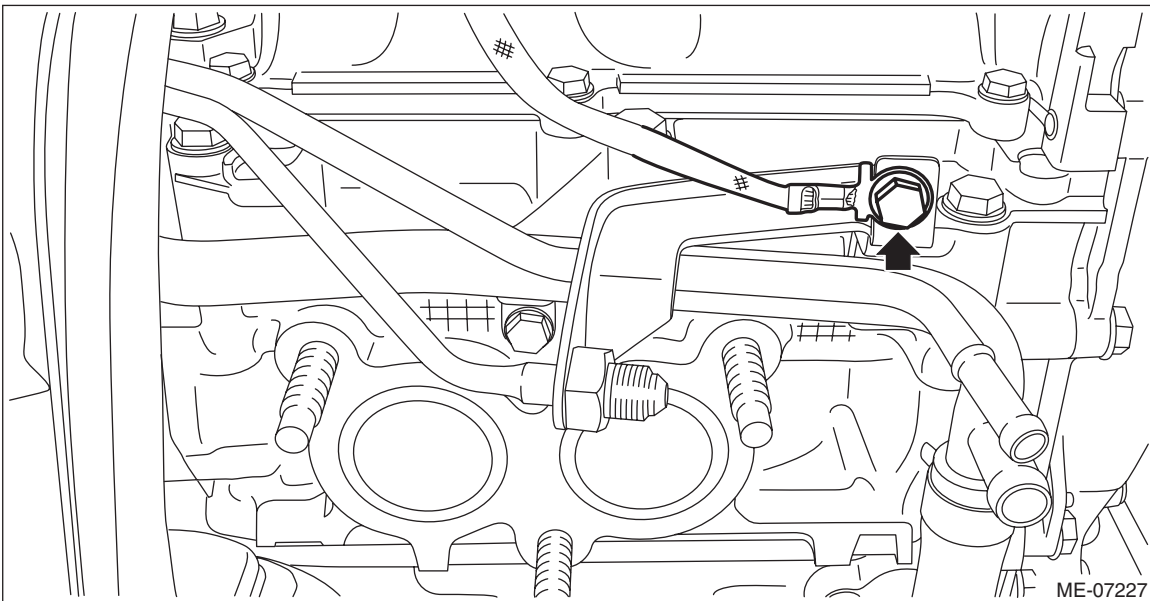
**45 N·m (4.6 kgf-m, 33.2 ft-lb)**



13) Connect the ground cable to the oil pipe assembly.

**Tightening torque:**

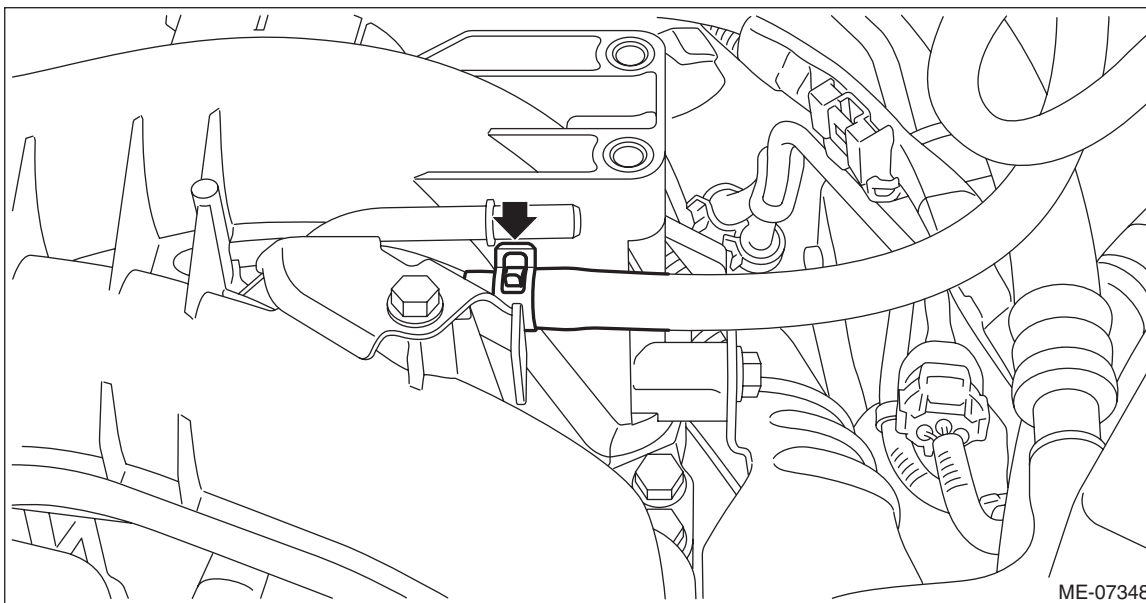
**7 N·m (0.7 kgf-m, 5.2 ft-lb)**



# Engine Assembly

## MECHANICAL

- 14) Install the front exhaust pipe.<Ref. to EX(H4DOTC)-15, INSTALLATION, Front Exhaust Pipe.>
- 15) Lift up the vehicle.
- 16) Install the oil catch tank.<Ref. to IN(H4DOTC)-49, INSTALLATION, Oil Catch Tank.>
- 17) Connect the fuel delivery tube and evaporation hose.
  - (1) Connect the evaporation hose to fuel pipe assembly.



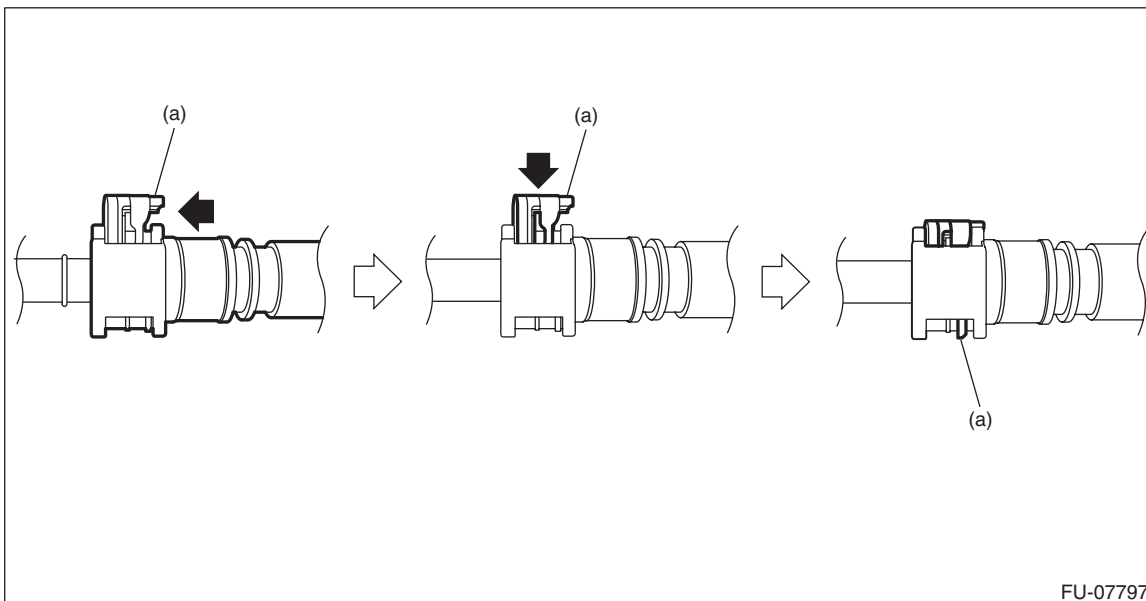
- (2) Connect the quick connector on the fuel delivery tube to the fuel pipe assembly, and fix the fuel delivery tube using clip (A).

### CAUTION:

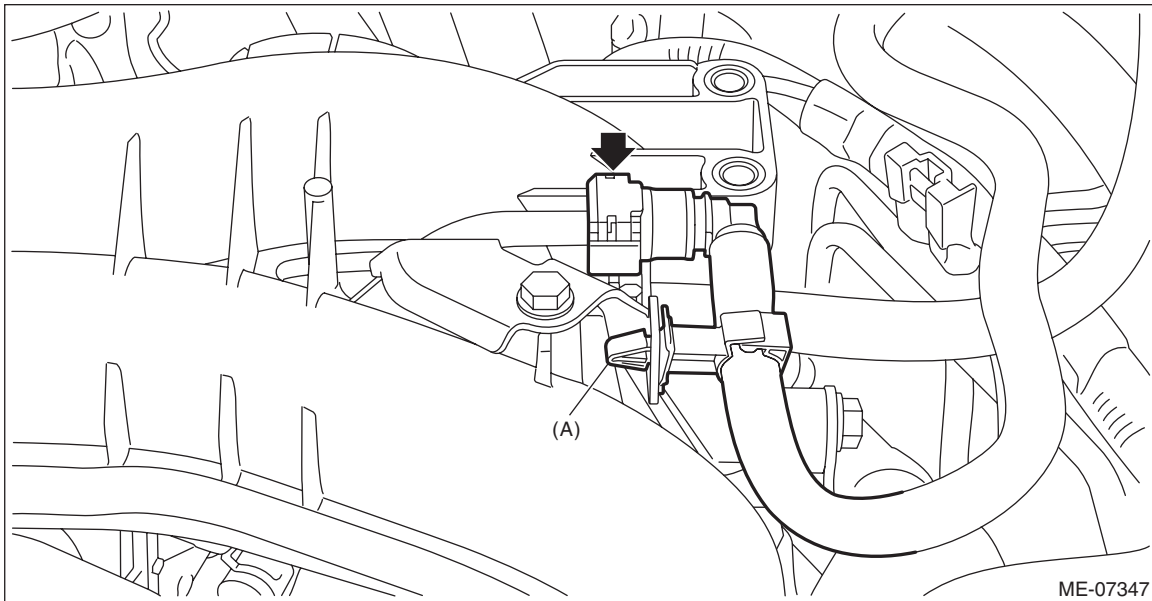
- Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.
- When connecting the quick connector, make sure to insert the pipe all the way in before locking the slider.
- When it is difficult to lock the slider, check that the pipe is fully inserted.
- Make sure that the quick connector is securely connected.

### NOTE:

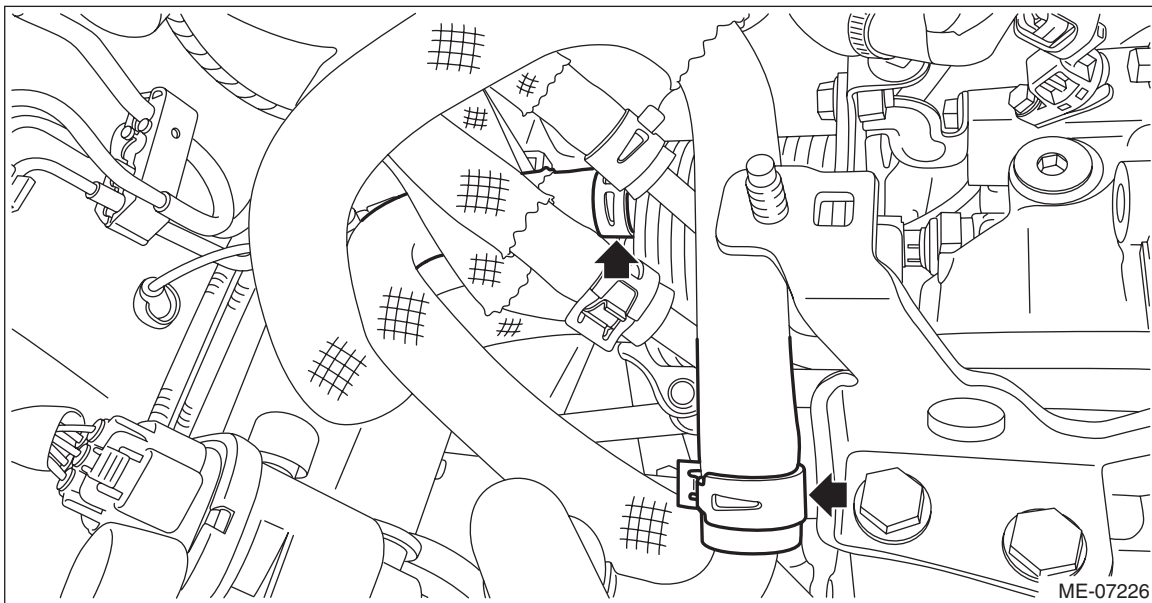
Connect the quick connector as shown in the figure.



(a) Slider



18) Connect the engine coolant inlet hose and engine coolant outlet hose to the CVTF cooler (with warmer feature) and EGR cooler.



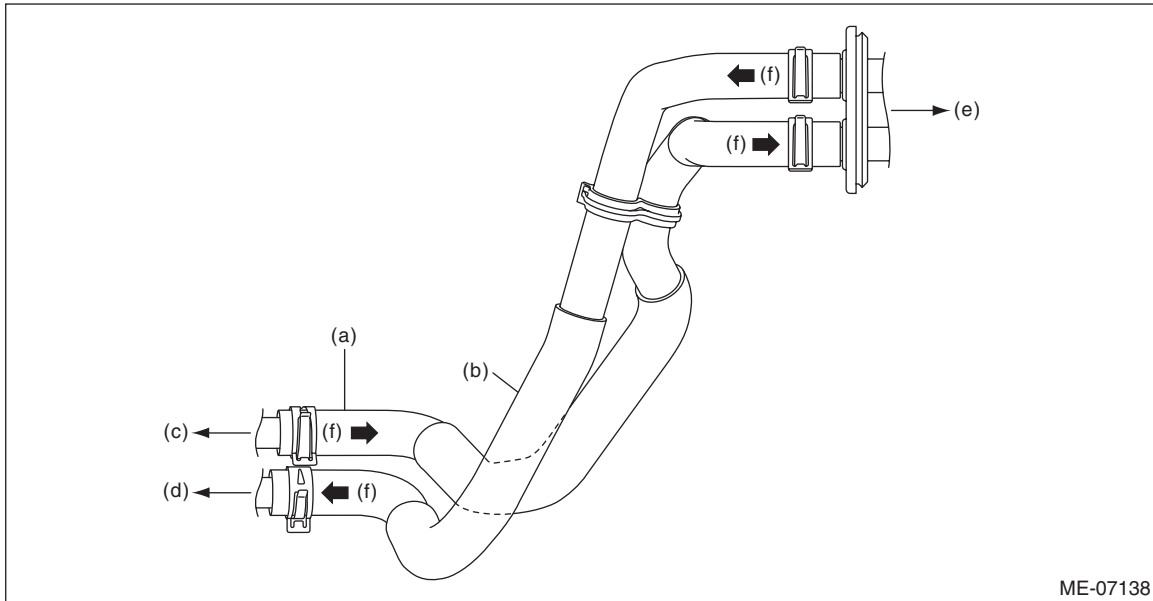
# Engine Assembly

## MECHANICAL

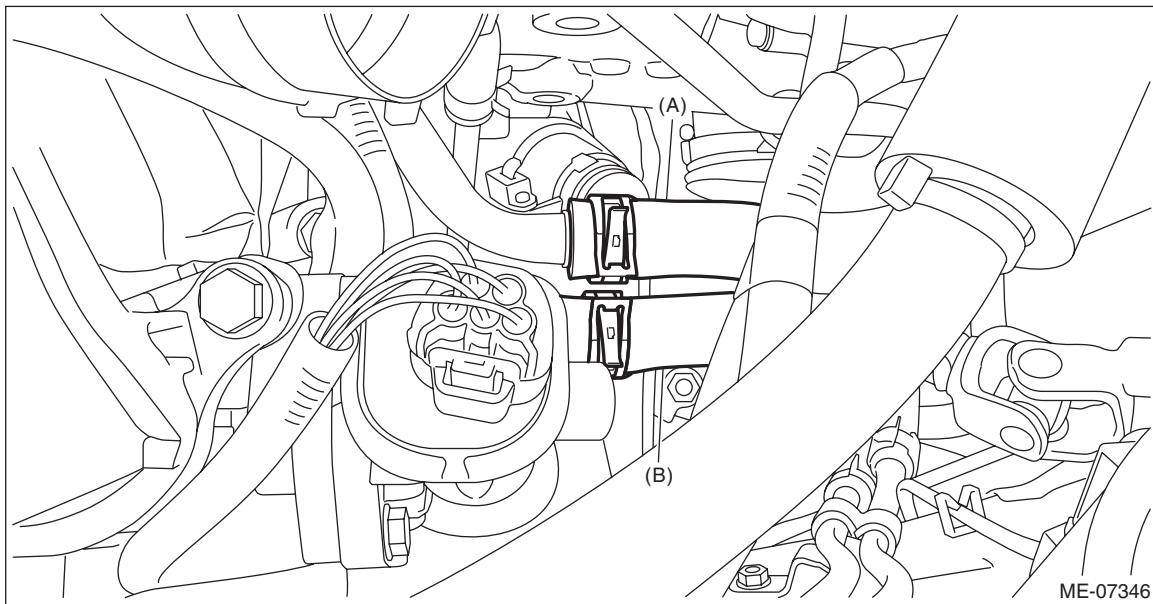
19) Connect the heater inlet hose (A) to the water pipe assembly, and connect the heater outlet hose (B) to the water pipe LH.

### NOTE:

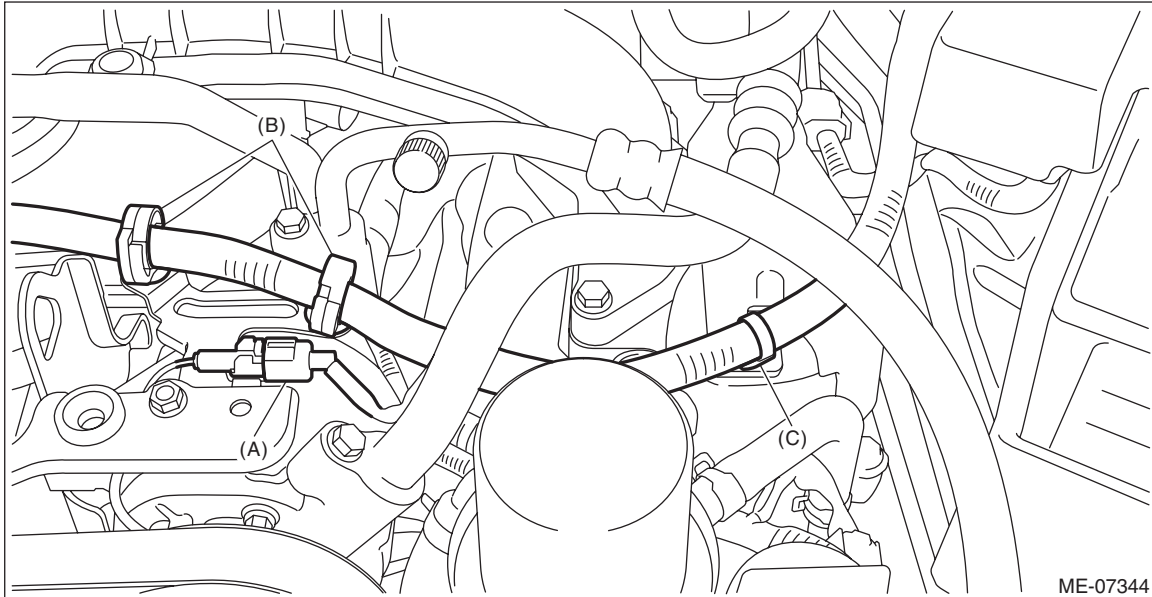
Be careful not to mix up the heater inlet hose and the heater outlet hose when connecting them.



- |                        |                        |                         |
|------------------------|------------------------|-------------------------|
| (a) Heater inlet hose  | (c) To water pipe ASSY | (e) To heater core ASSY |
| (b) Heater outlet hose | (d) To water pipe LH   | (f) Engine coolant flow |



- 20) Connect the A/C pressure hose to A/C compressor.<Ref. to AC-77, INSTALLATION, Hose and Pipe.>
- 21) Set the generator cord, and fix the generator cord to the fuel pipe protector using clip (C).
- 22) Install the generator cord to clip (B), and connect the connector (A) to A/C compressor.

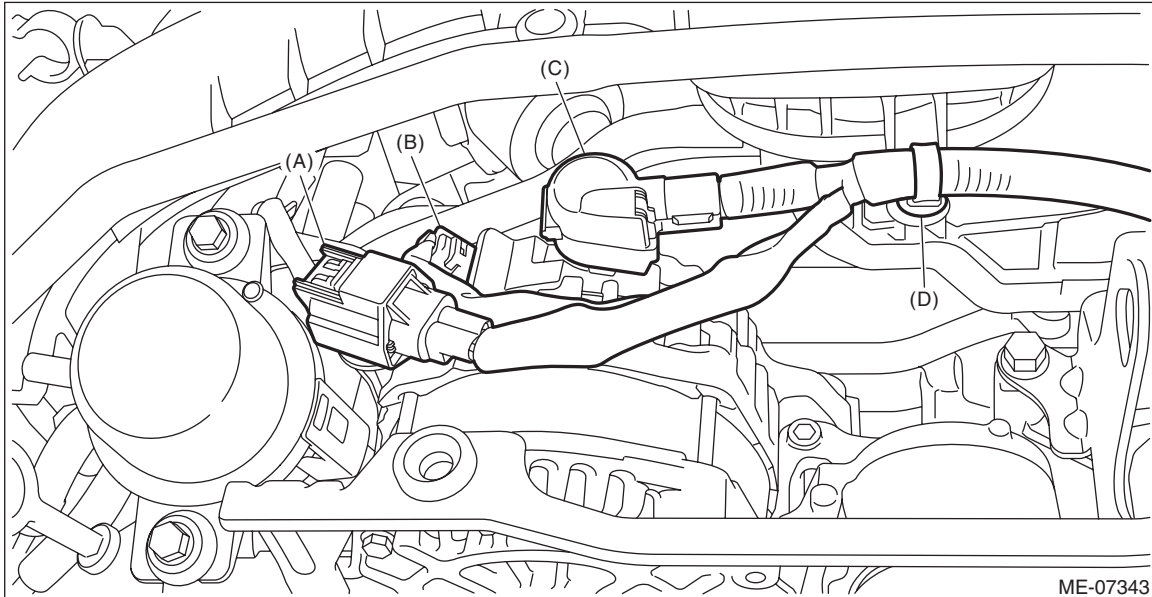


- 23) Using clip (D), fix the generator cord to the generator cord stay, and connect the connector (B) and the terminal (C) to the generator.

**Tightening torque:**

**15 N·m (1.5 kgf-m, 11.1 ft-lb)**

- 24) Connect the connector (A) to the brake vacuum pump.

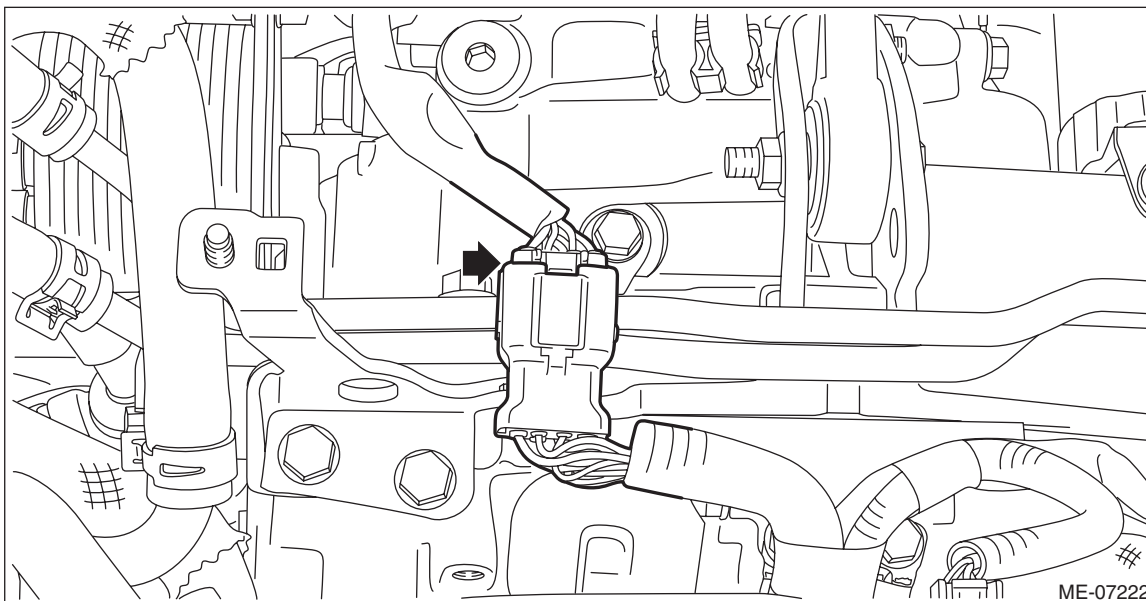




# Engine Assembly

## MECHANICAL

25) Connect the bulkhead harness connector to the engine harness connector.

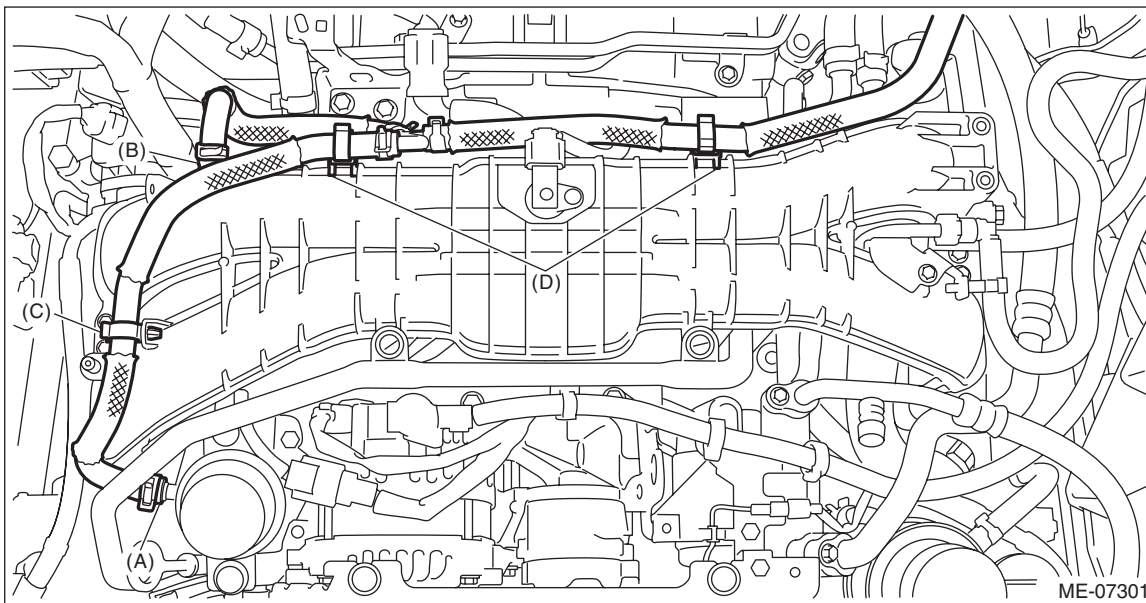


26) Using clip (D), fix the brake booster vacuum hose to the intake manifold.

27) Connect sections (A) and (B) of the brake booster vacuum hose to the brake vacuum pump and intake manifold, and install the brake booster vacuum hose to the clip (C).

### NOTE:

Install the clip to the position of alignment mark ▼ of intake manifold.



28) Install the radiator.<Ref. to CO(H4DOTC)-44, INSTALLATION, Radiator.>

29) Install the intake duct No. 1 and intake duct No. 2.<Ref. to IN(H4DOTC)-26, INTAKE DUCT NO. 1, INSTALLATION, Intake Duct.> <Ref. to IN(H4DOTC)-29, INTAKE DUCT NO. 2, INSTALLATION, Intake Duct.>

30) Install the intercooler.<Ref. to IN(H4DOTC)-37, INSTALLATION, Intercooler.>

31) Install the air intake duct.<Ref. to IN(H4DOTC)-19, INSTALLATION, Air Intake Duct.>

32) Connect the battery ground terminal.

33) Fill engine coolant.<Ref. to CO(H4DOTC)-14, FILLING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

34) Check the CVTF level and replenish it if necessary.<Ref. to CVT(TR690)-36, ADJUSTMENT, CVTF.>

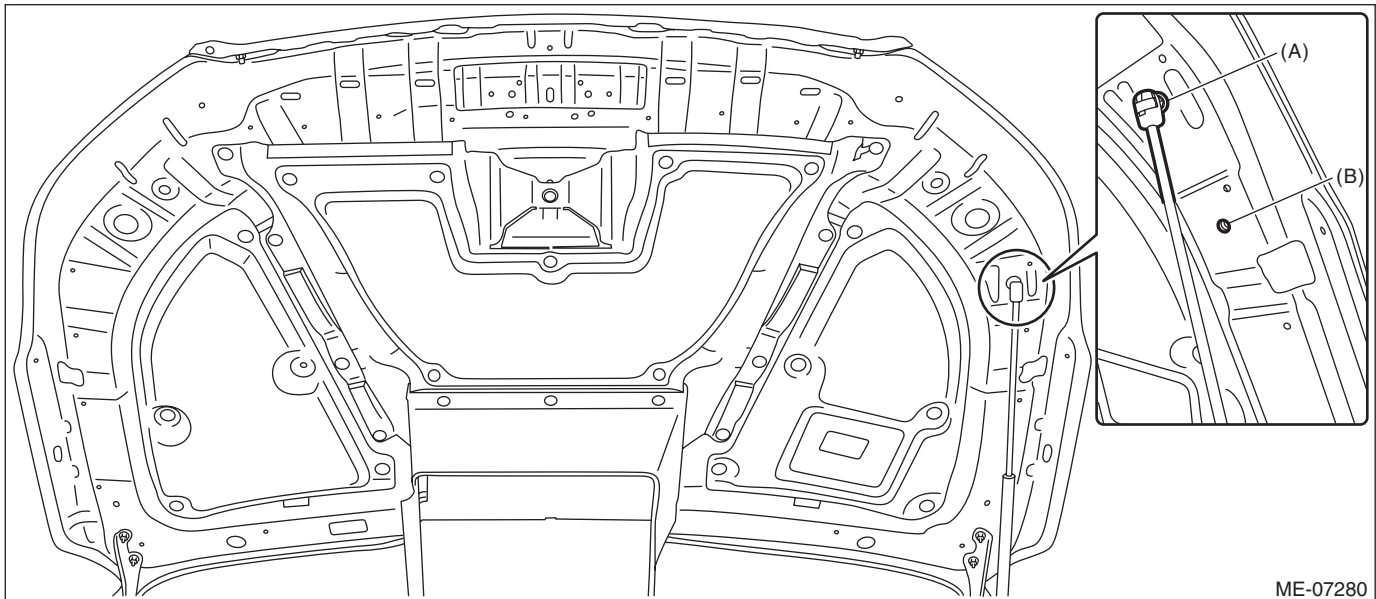
35) Charge the A/C system with refrigerant.<Ref. to AC-29, PROCEDURE, Refrigerant Charging Procedure.>

36) Install the collector cover.

37) Change the installation position of the front hood damper from (B) to (A).

**Tightening torque:**

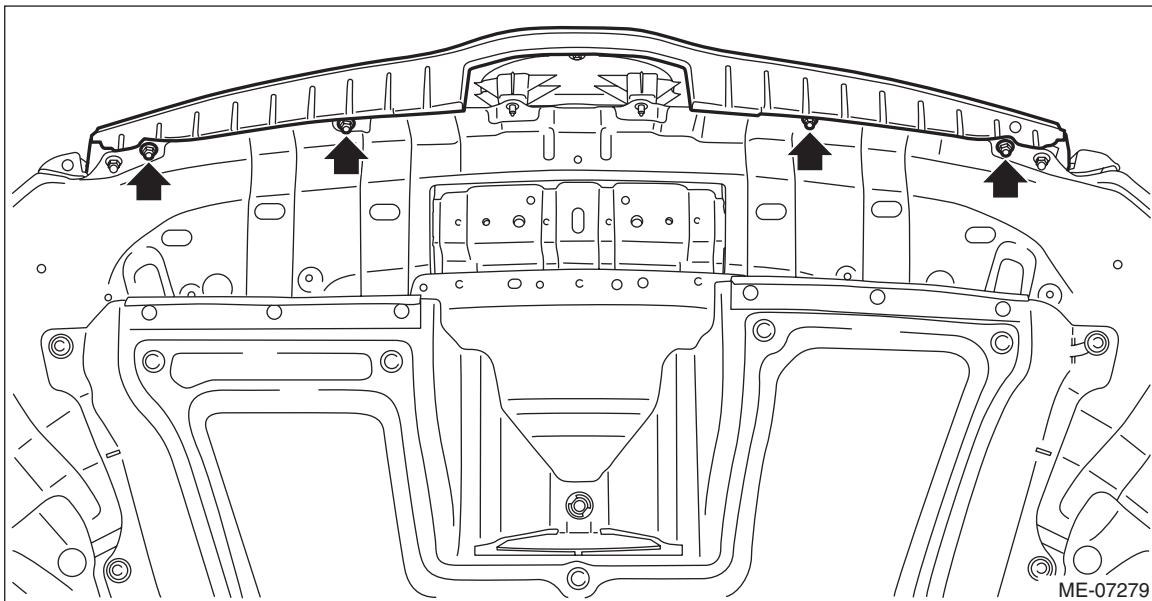
**20 N·m (2.0 kgf-m, 14.8 ft-lb)**



38) Install the front center grille assembly to the front hood.

**Tightening torque:**

**4.5 N·m (0.5 kgf-m, 3.3 ft-lb)**



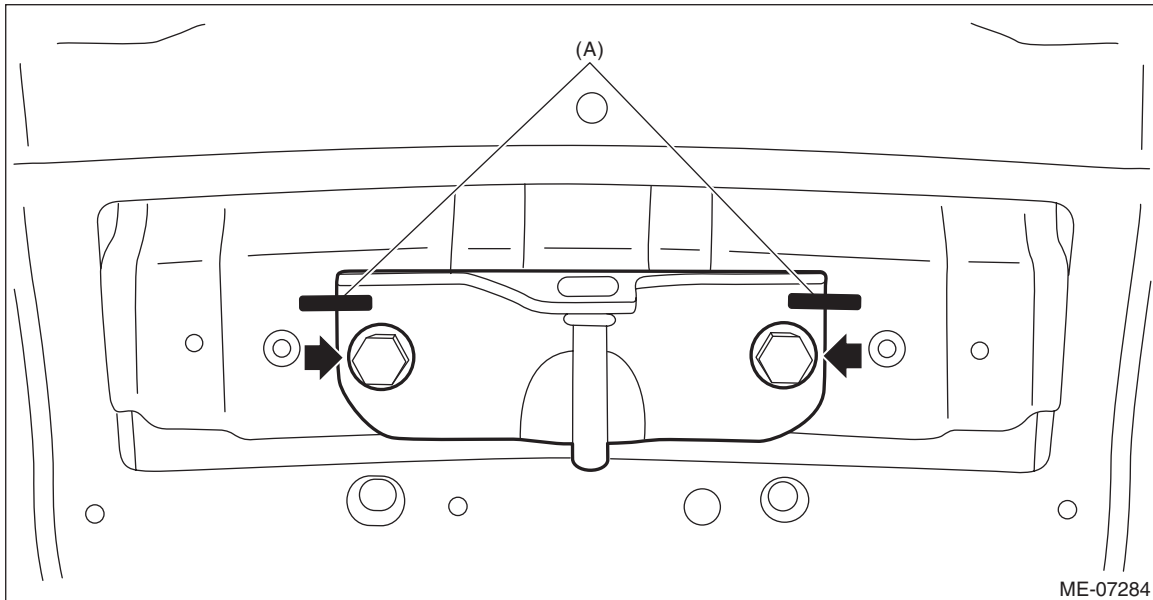
# Engine Assembly

## MECHANICAL

39) Align the alignment marks (A), and install the front hood striker to the front hood.

**Tightening torque:**

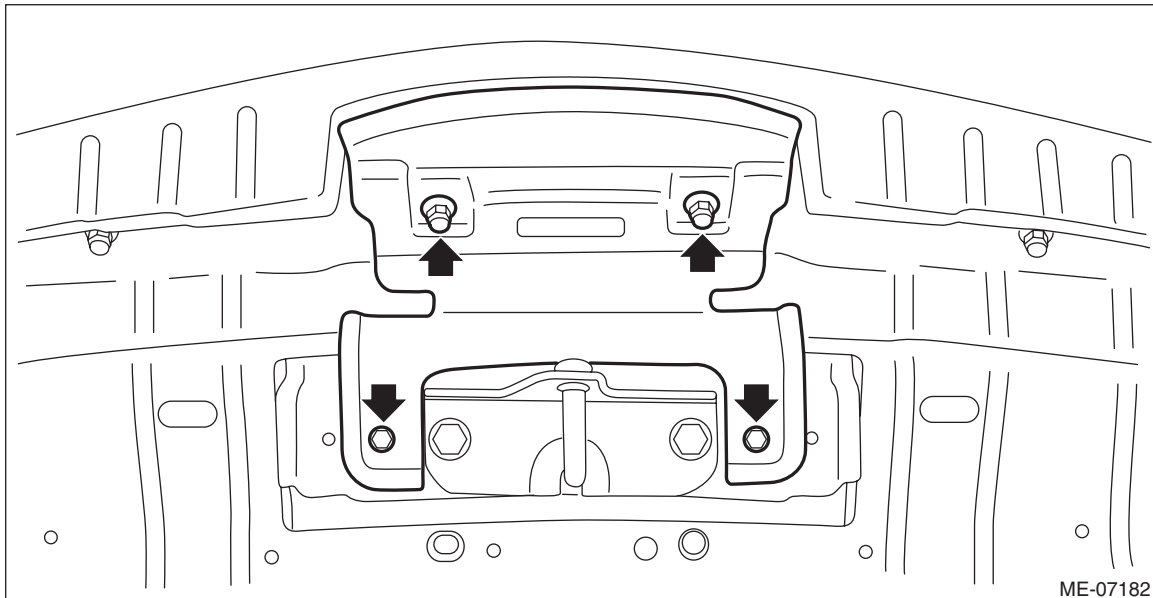
**33 N·m (3.4 kgf-m, 24.3 ft-lb)**



40) Install the upper grille bracket to the front hood, and close the front hood.

**Tightening torque:**

**4.5 N·m (0.5 kgf-m, 3.3 ft-lb)**



## C: INSPECTION

- 1) Check that pipes, hoses, connectors and clamps are installed firmly.
- 2) Check the engine coolant is at specified level.
- 3) Check CVTF is at the specified level.
- 4) Start the engine and check for exhaust gas, engine coolant, leaks of fuel, etc. Also check for noise and vibrations.