

5. Water Pipe Assembly

A: REMOVAL

1. WATER PIPE ASSEMBLY RH

NOTE:

Water pipe assembly RH is installed to CVT model.

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

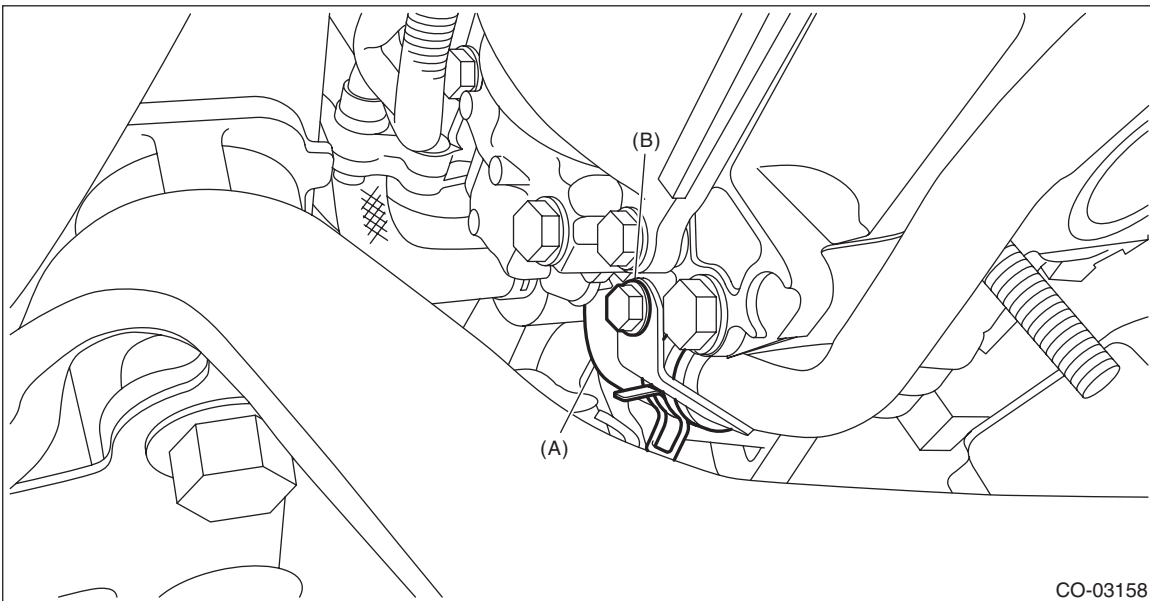
NOTE:

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

2) Drain engine coolant. <Ref. to CO(H4DO(w/o HEV))-16, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

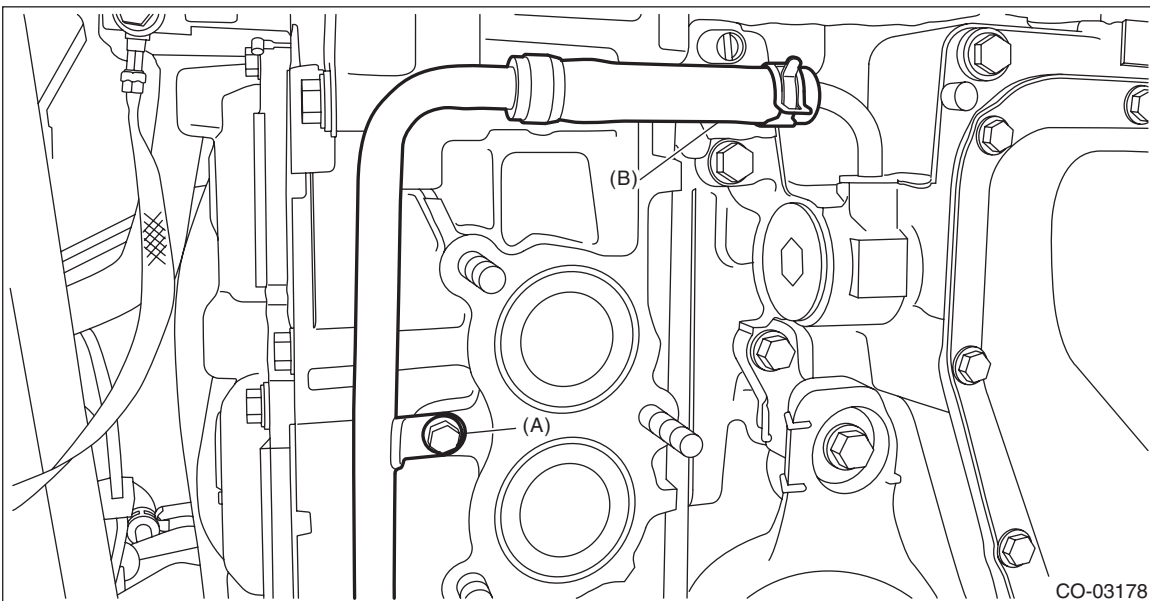
3) Remove the front exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-6, REMOVAL, Front Exhaust Pipe.>

4) Disconnect the water hose (A) from the water pipe assembly RH, and remove the bolt (B) securing the water pipe assembly RH to the cam carrier RH.



5) Remove the bolt (A) which secures the water pipe assembly RH to the cylinder head RH.

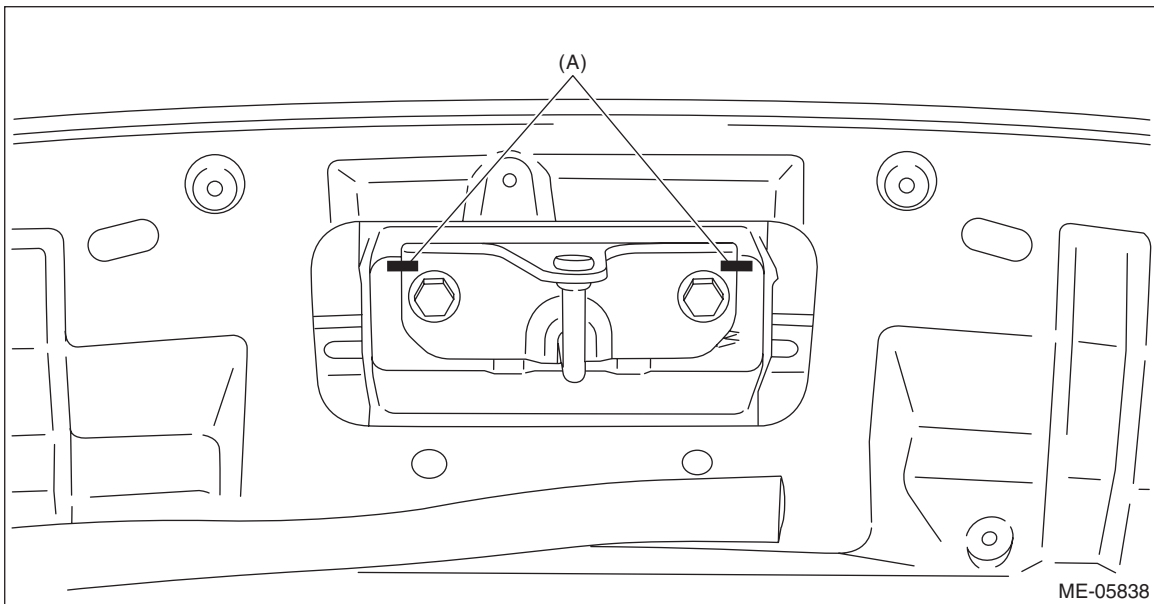
6) Disconnect the water pipe hose RH (B) from oil pan upper, and remove the water pipe assembly RH.



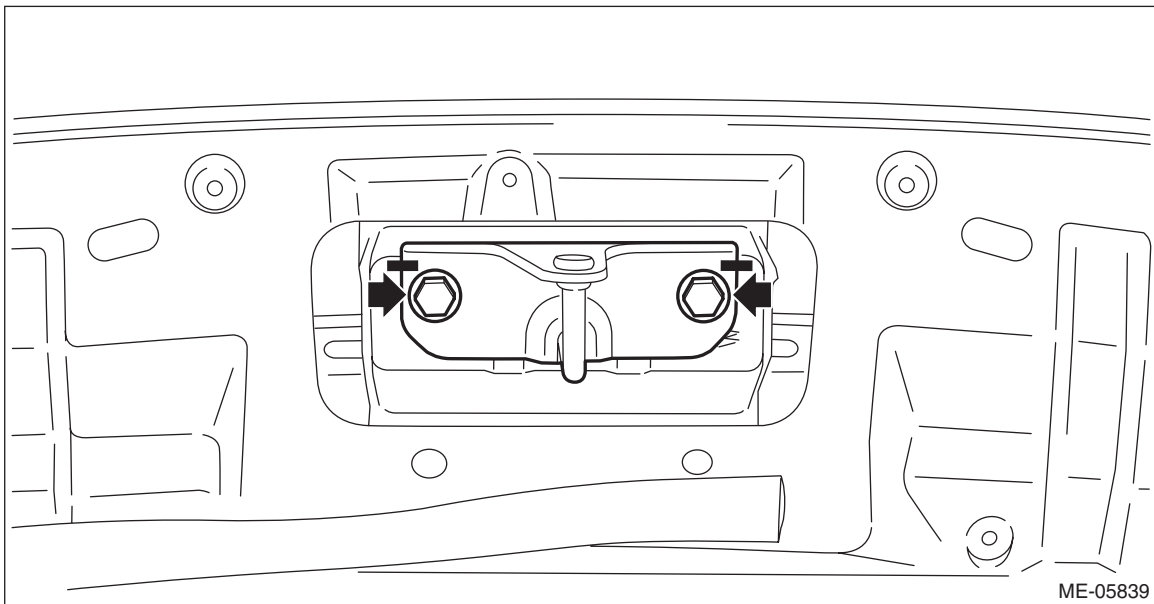
2. WATER PIPE ASSEMBLY LH

- Gasoline engine model

1) Open the front hood, and make alignment marks (A) on both the front hood and the front hood striker by using a marker pen.



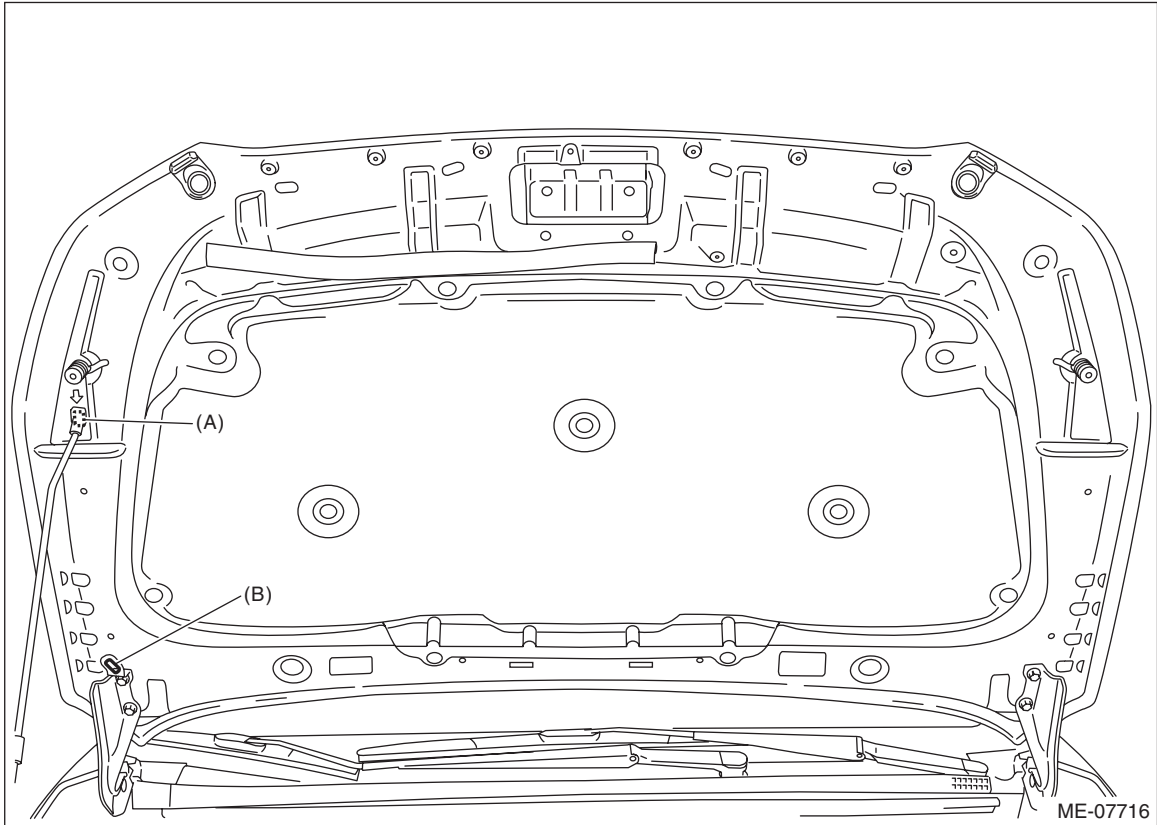
2) Remove the front hood striker from the front hood.



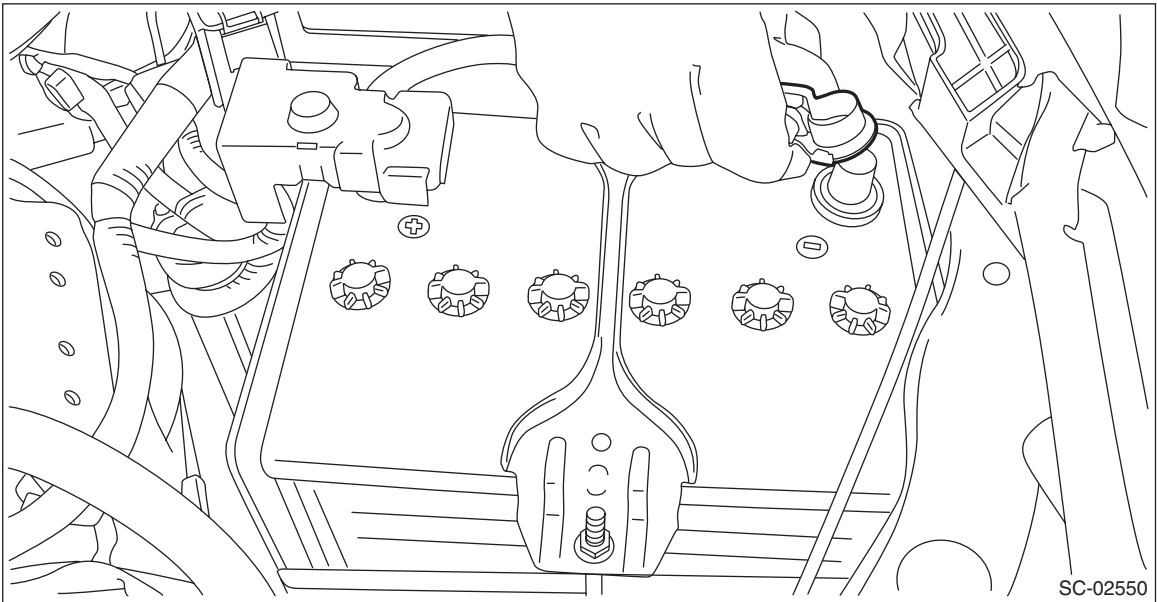
Water Pipe Assembly

COOLING

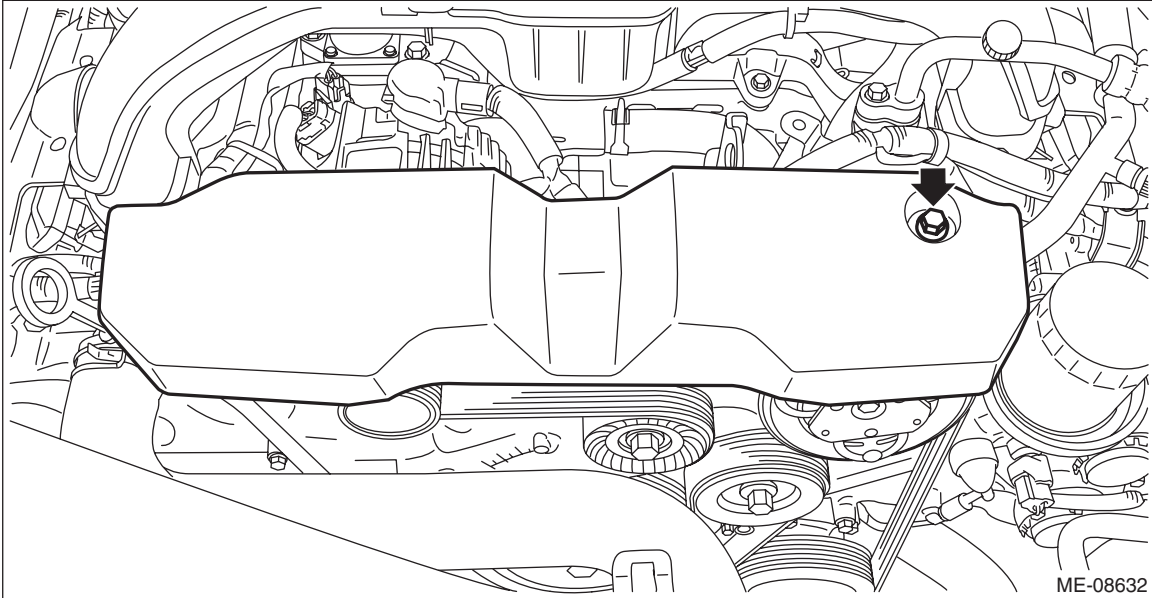
- 3) Change the front hood stay position from (A) to (B), and completely open the front hood.



- 4) Disconnect the ground cable from battery.



5) Remove the V-belt covers.

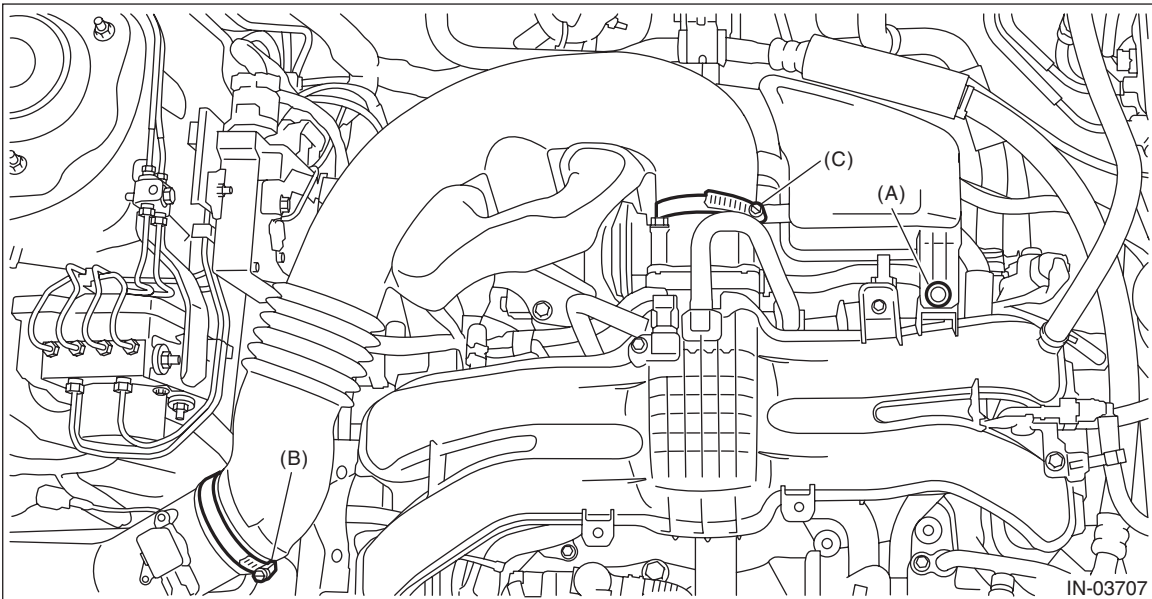


6) Remove the air intake duct. <Ref. to IN(H4DO(w/o HEV))-13, REMOVAL, Air Intake Duct.>

7) Remove the clip (A) from the air intake boot.

8) Loosen the clamp (B) securing the air cleaner case (rear) to the air intake boot.

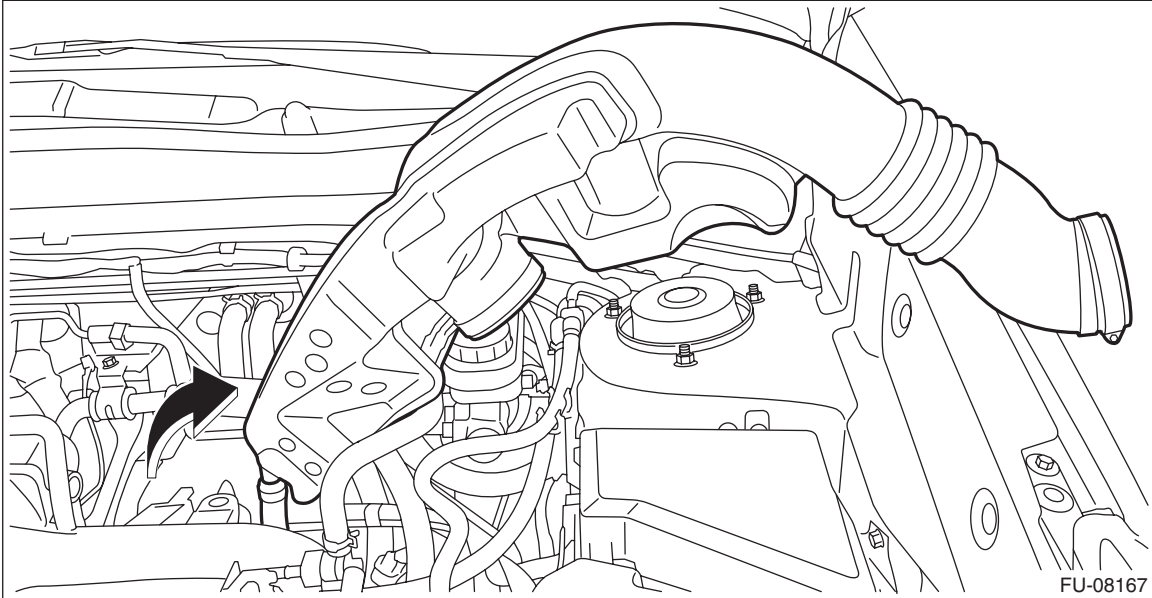
9) Loosen the clamp (C) which secures the throttle body to the air intake boot.



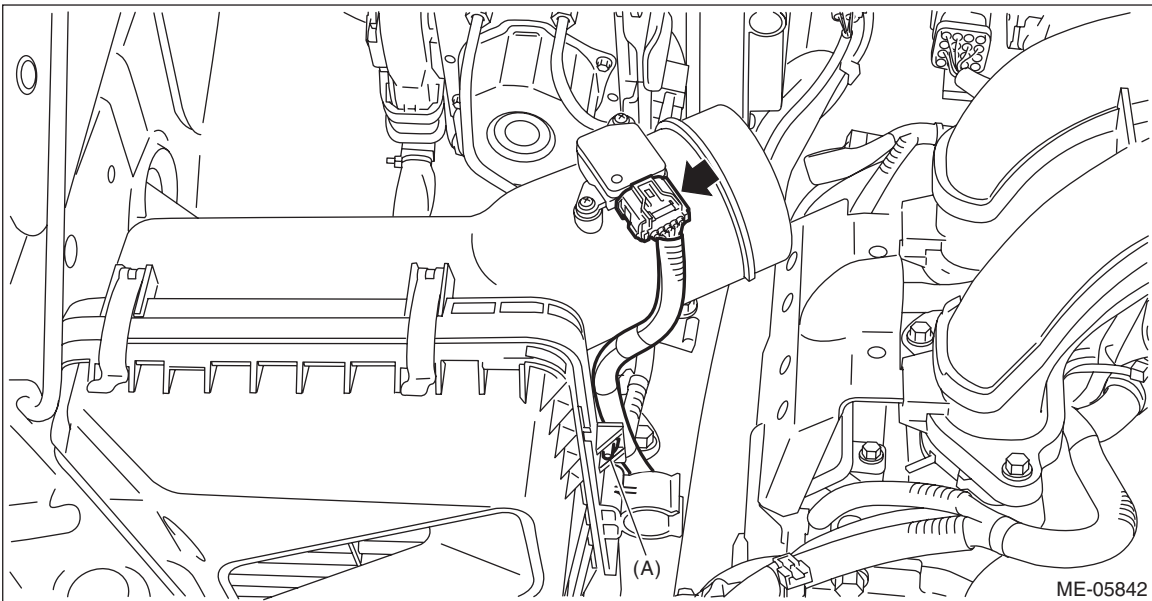
Water Pipe Assembly

COOLING

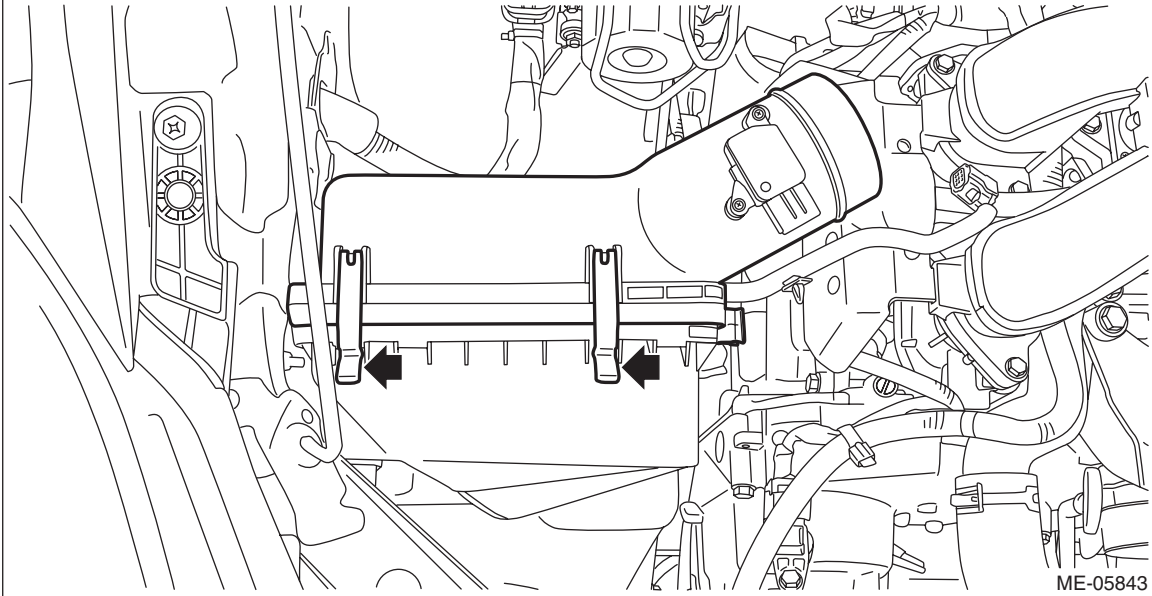
- 10) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.



- 11) Disconnect the connector from the mass air flow and intake air temperature sensor, and remove the clip (A) which holds the mass air flow and intake air temperature sensor harness.

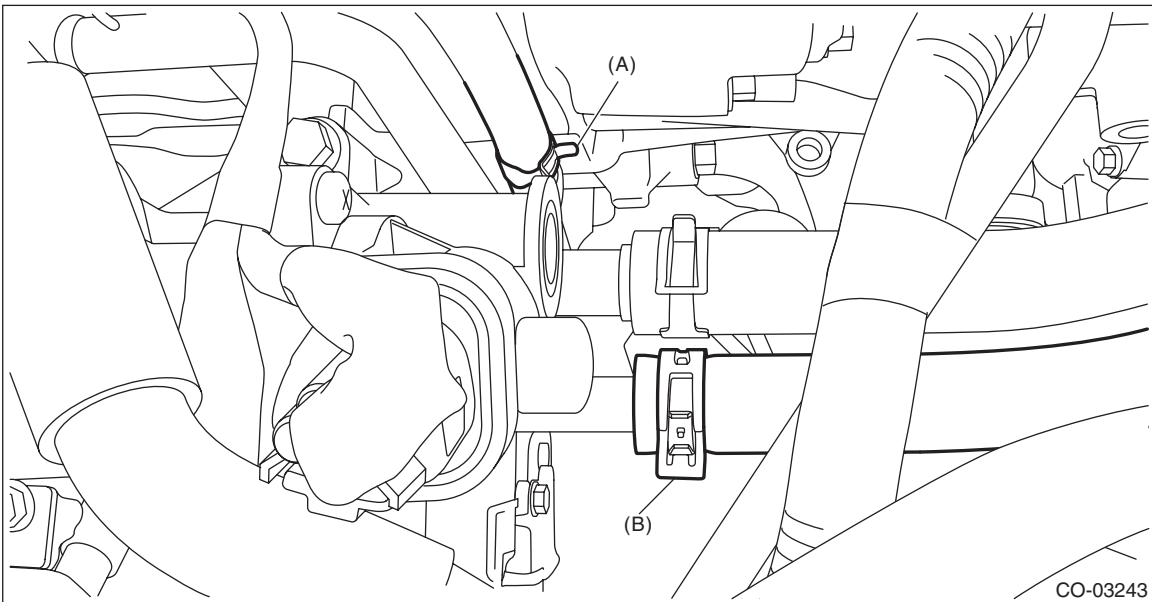


12) Remove the air cleaner case (rear).



13) Drain engine coolant. <Ref. to CO(H4DO(w/o HEV))-16, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

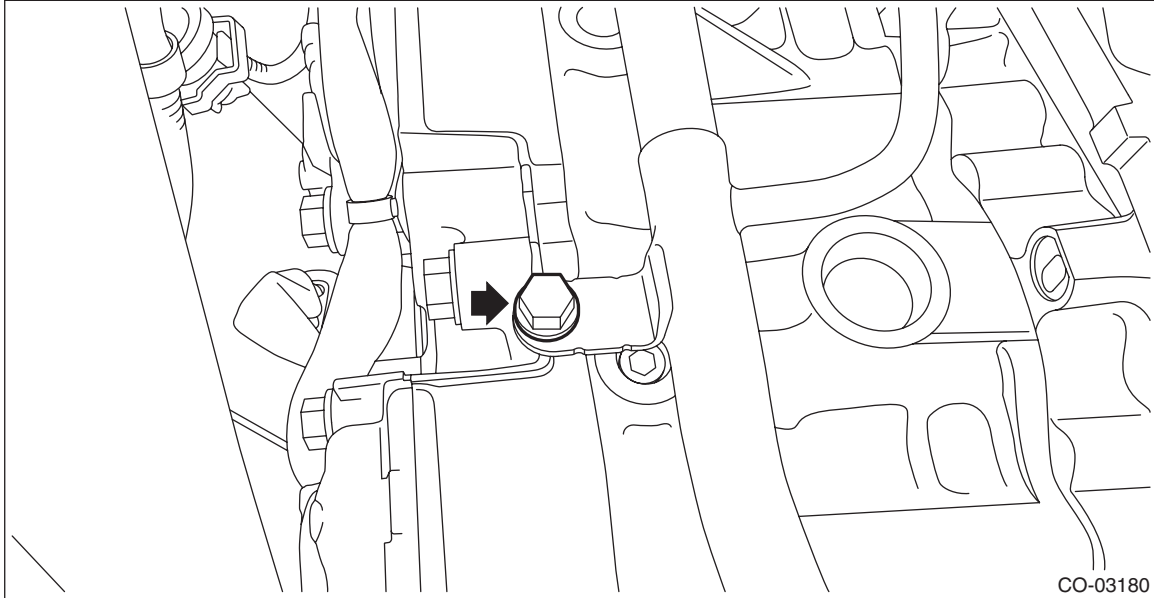
14) Disconnect the preheater hose (A) and the heater outlet hose (B) from the water pipe assembly LH.



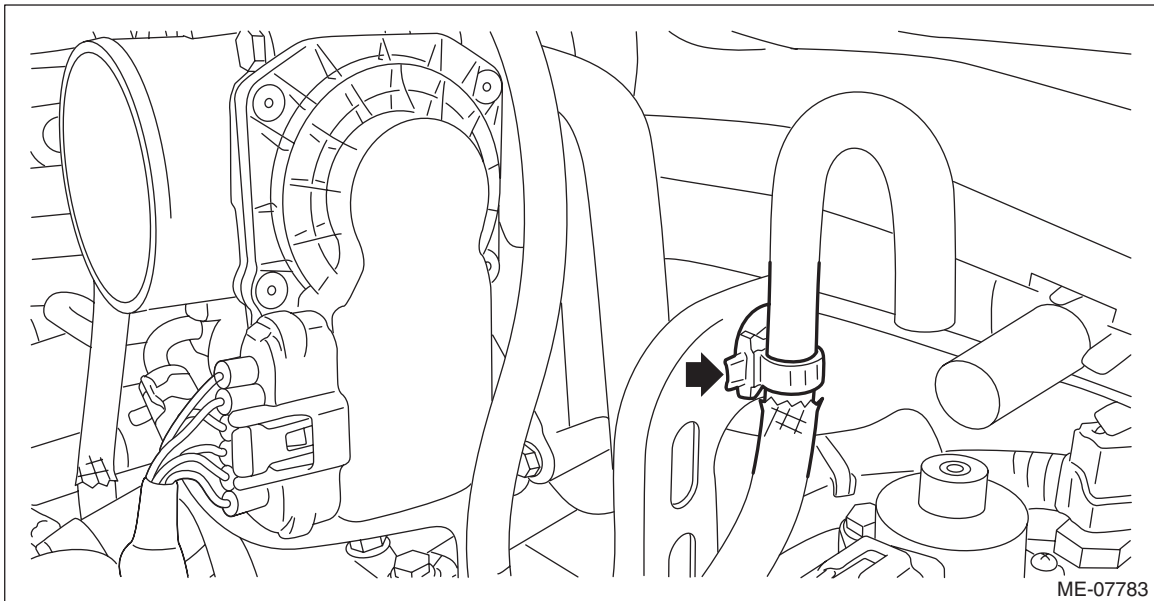
Water Pipe Assembly

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- 15) Remove the bolt which holds the water pipe assembly LH from the cylinder head LH.

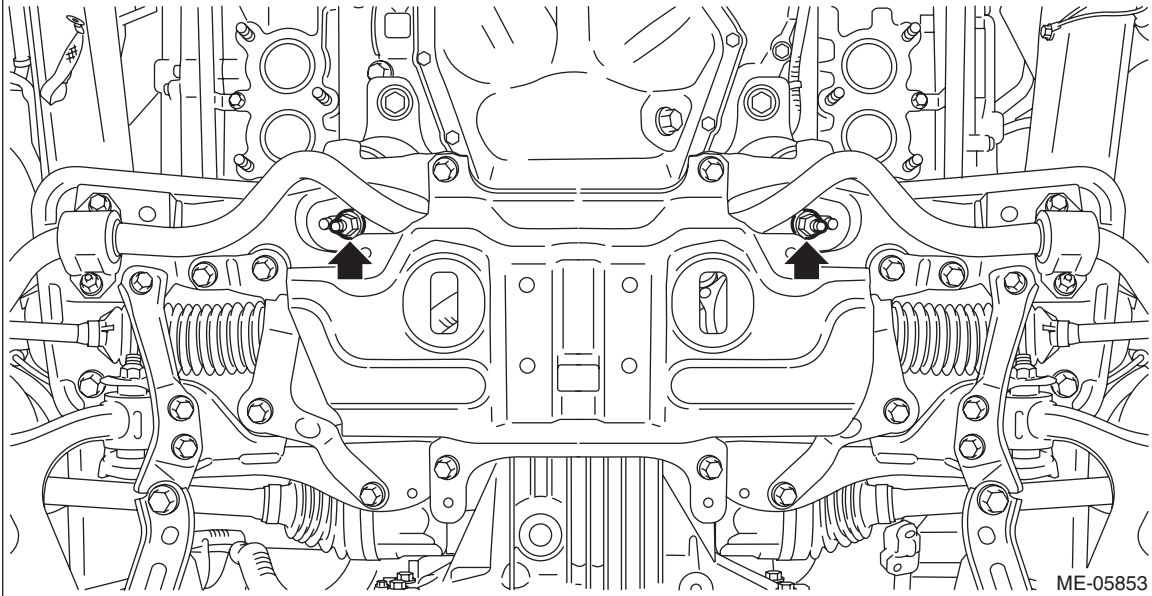


- 16) Remove the clip holding the air breather hose to the engine rear hanger. (MT model)

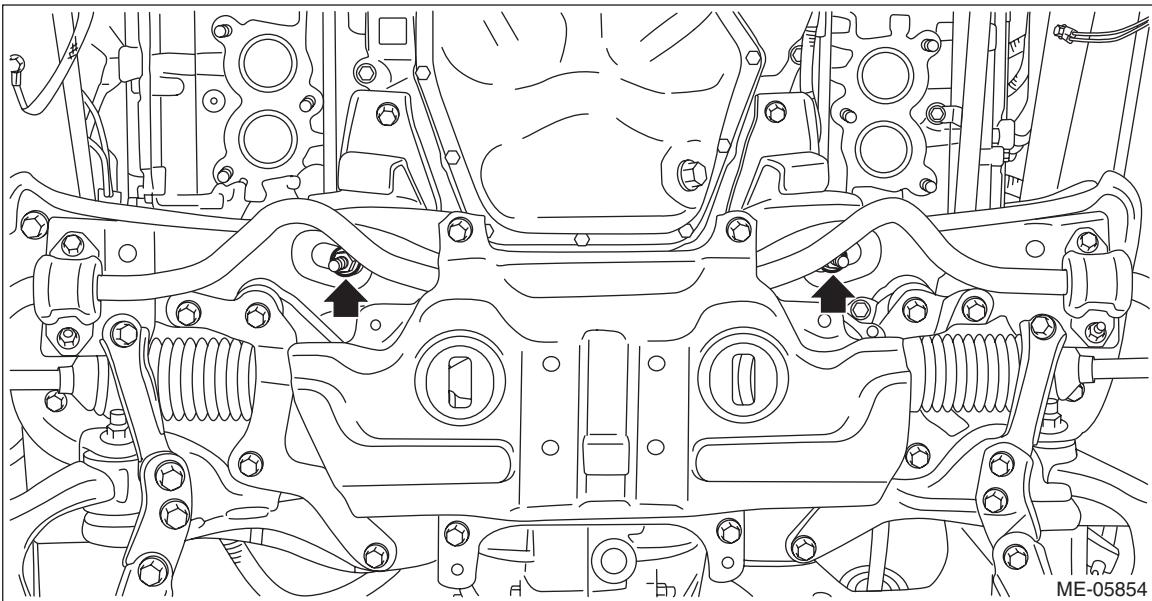


- 17) Lift up the vehicle.
18) Remove the front exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-6, REMOVAL, Front Exhaust Pipe.>

- 19) Remove the nuts which secure the engine mounting to the front crossmember. (CVT model)



- 20) Remove the nuts which secure the engine mounting to the front crossmember. (MT model)

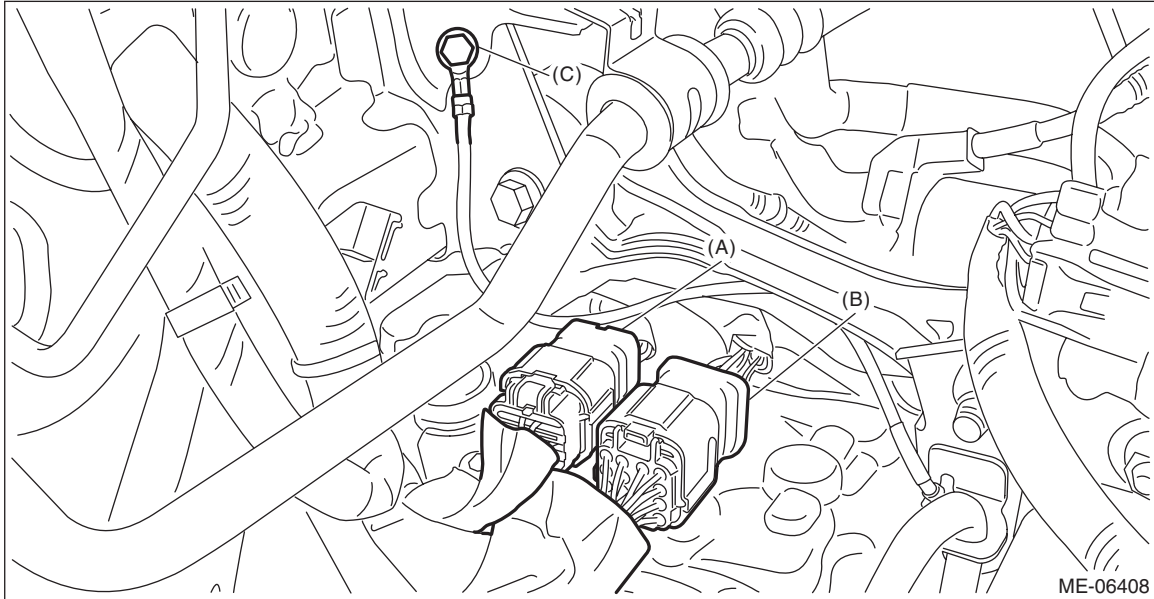


- 21) Lower the vehicle.

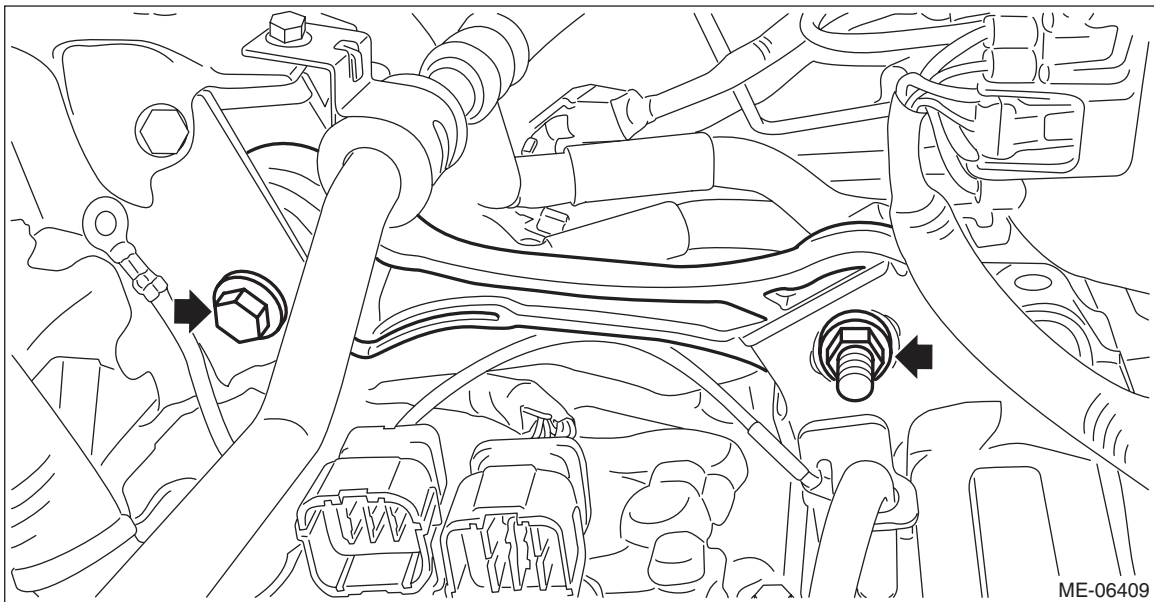
Water Pipe Assembly

COOLING

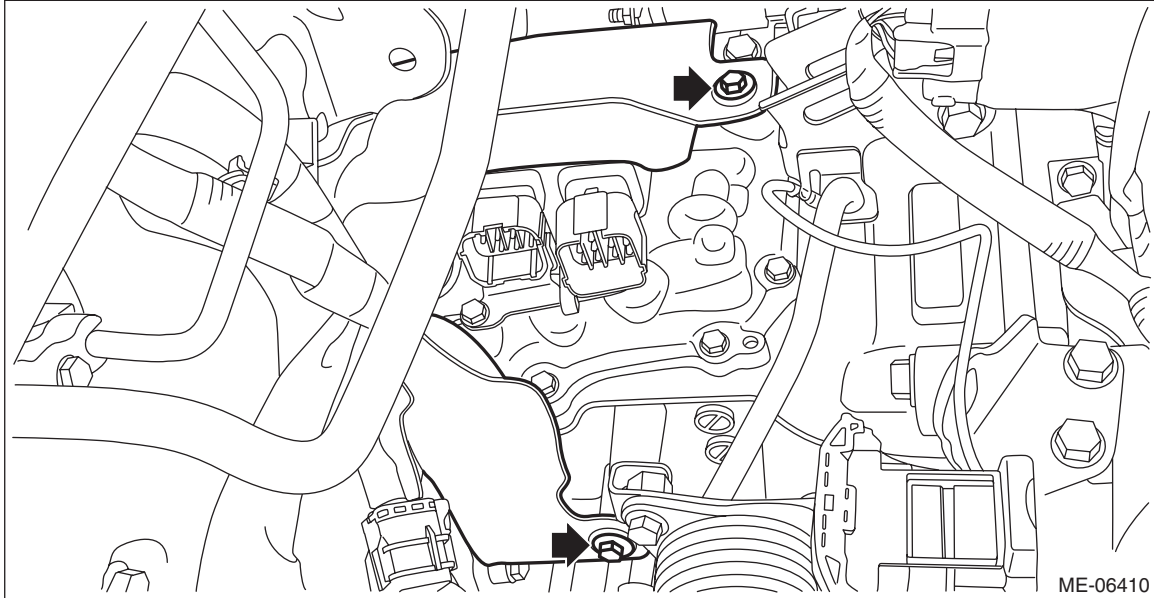
22) Disconnect the bulkhead harness connector from the transmission harness connector (A) and the inhibitor harness connector (B), and disconnect the transmission radio ground terminal (C) from the vehicle body. (CVT model)



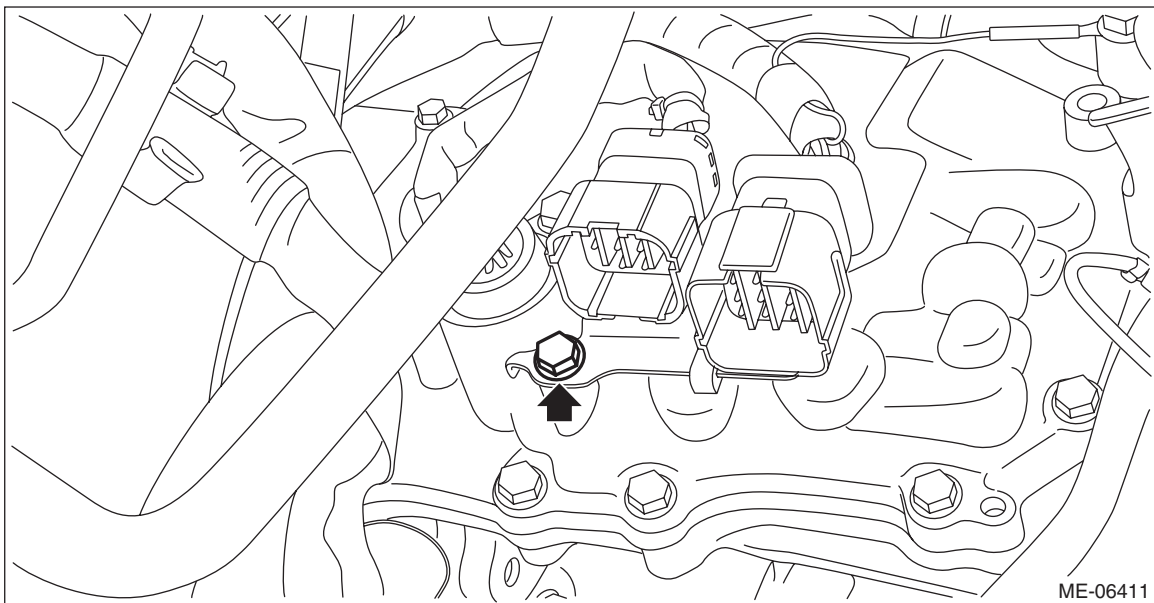
23) Remove the pitching stopper.



24) Remove the transmission case cover. (CVT model)



25) Remove the bolt which holds the transmission harness stay. (CVT model)



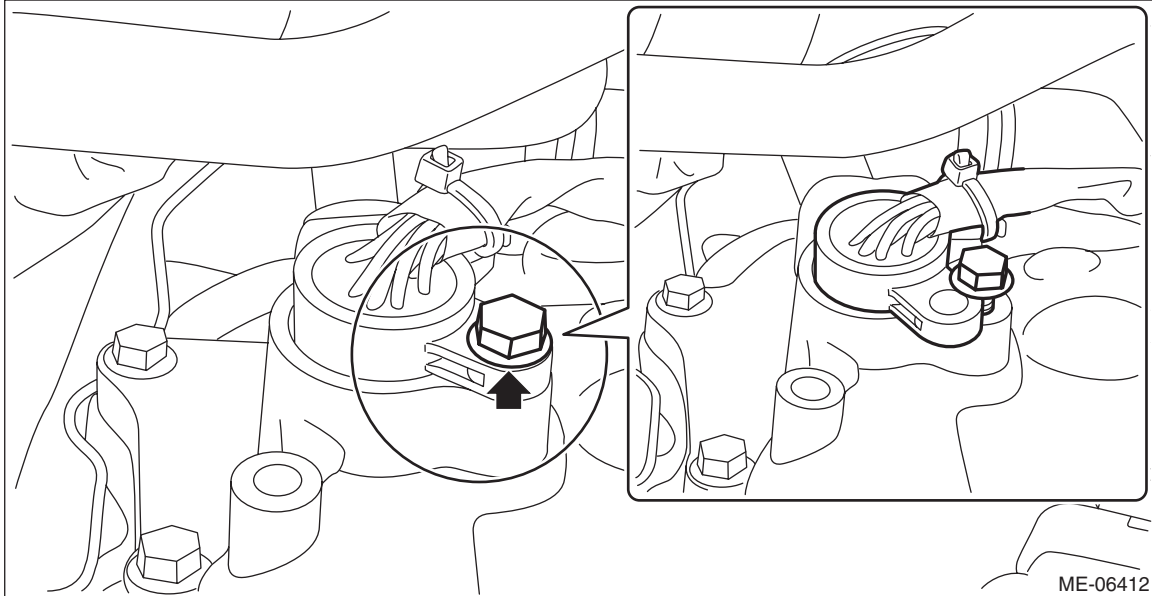
Water Pipe Assembly

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26) Remove the bolt which holds the transmission harness to the control valve body, and turn the transmission harness clockwise till the bolt hole can be seen as shown in the figure, and tighten the bolt to temporary lock the harness. (CVT model)

NOTE:

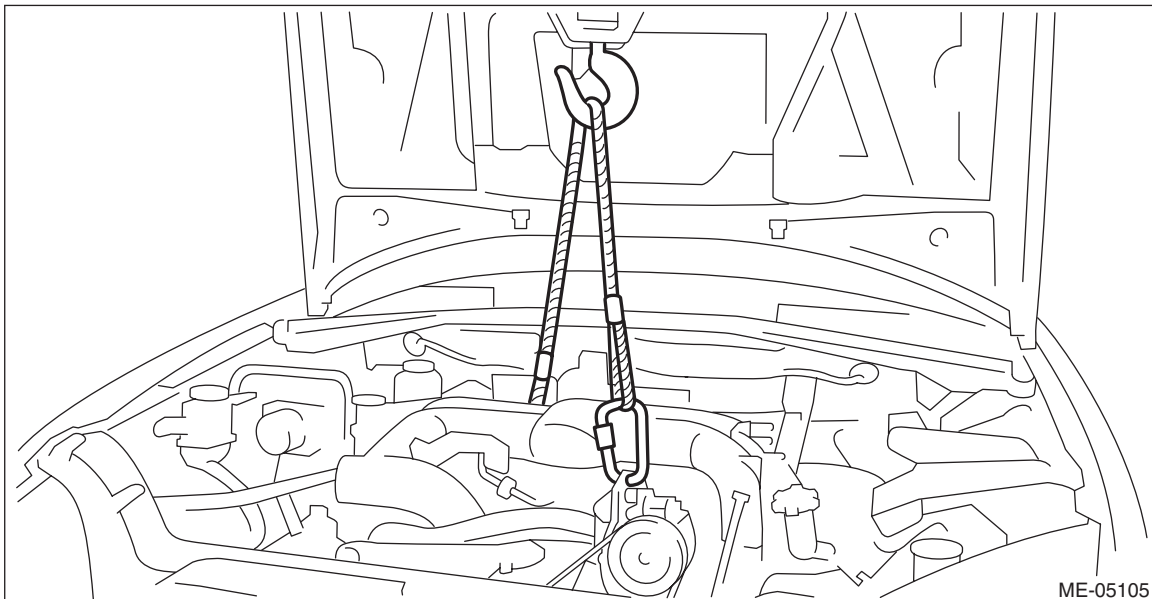
This procedure is required to prevent the transmission harness from touching the vehicle body during engine lift-up.



27) Lift up the engine with a lifting device and wire ropes.

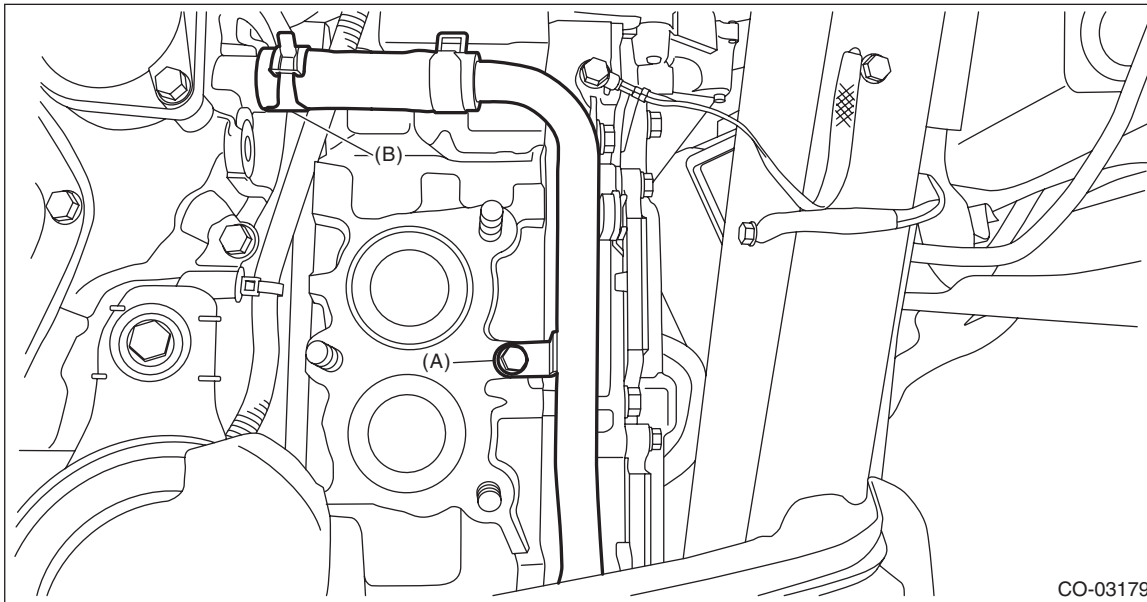
CAUTION:

When lifting up the engine, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.



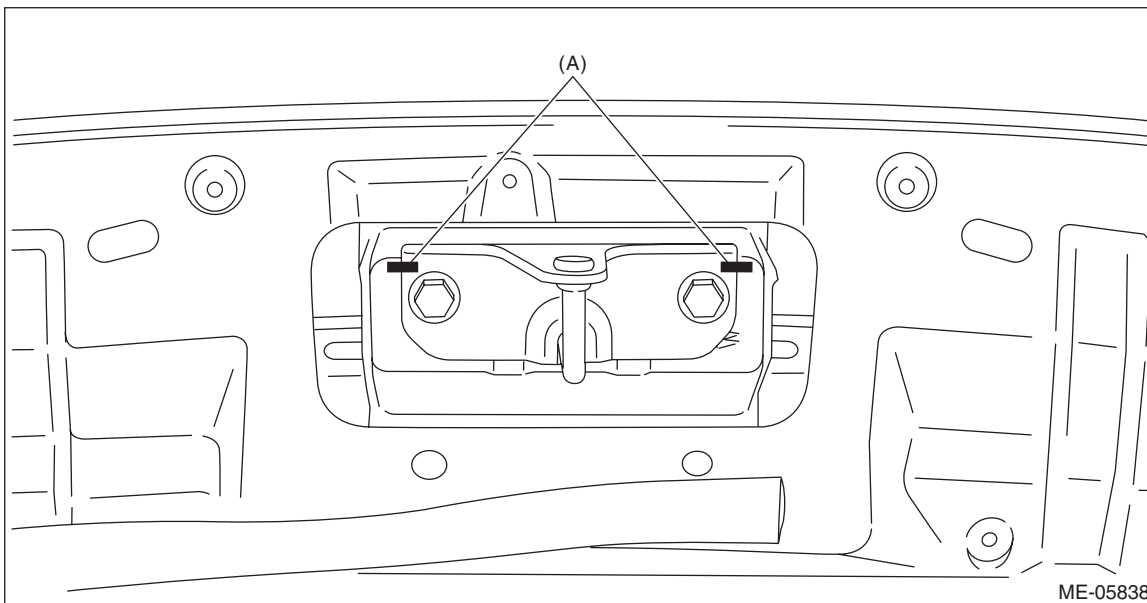
28) Remove the bolt (A) which secures the water pipe assembly LH to the cylinder head LH.

29) Disconnect the water pipe hose LH (B) from oil pan upper, and remove the water pipe assembly LH.



• HEV model

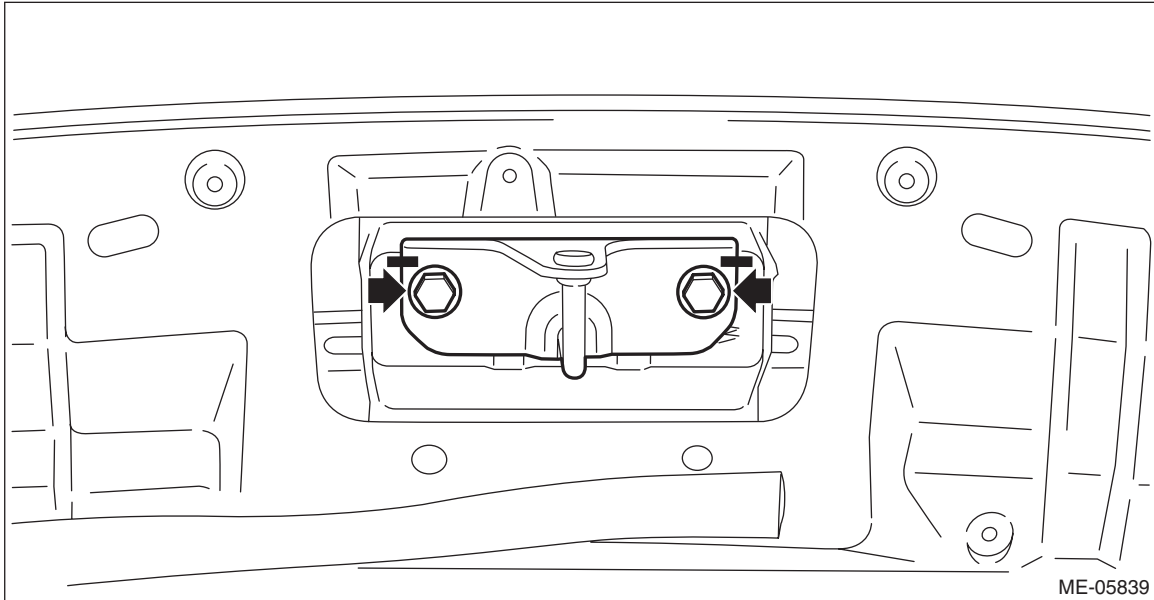
- 1) Turn the ignition switch to OFF.
- 2) Open the front hood, and make alignment marks (A) on both the front hood and the front hood striker by using a marker pen.



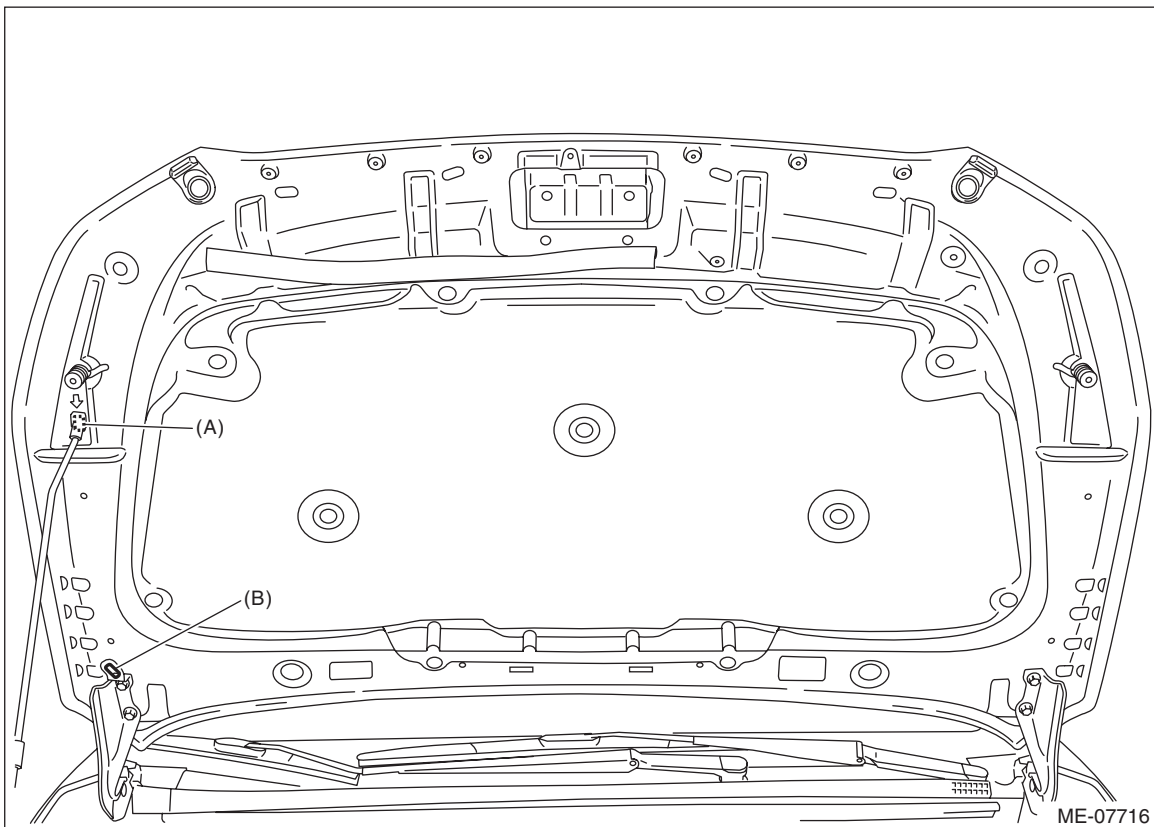
Water Pipe Assembly

COOLING

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



4) Change the front hood stay position from (A) to (B), and completely open the front hood.



5) 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.

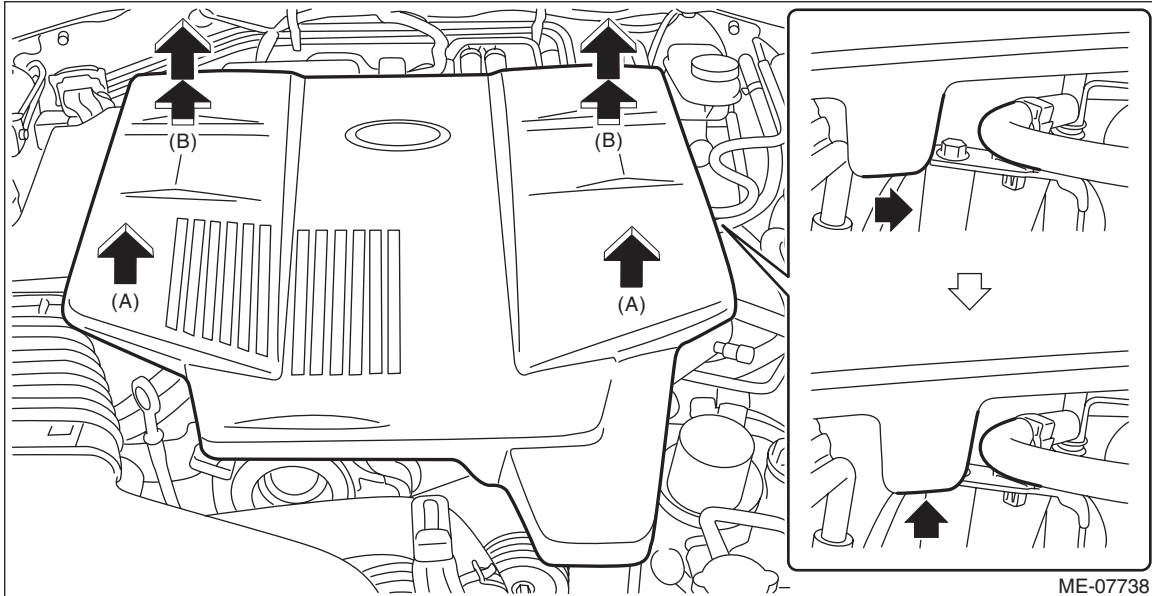
6) Remove the collector cover.

(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.



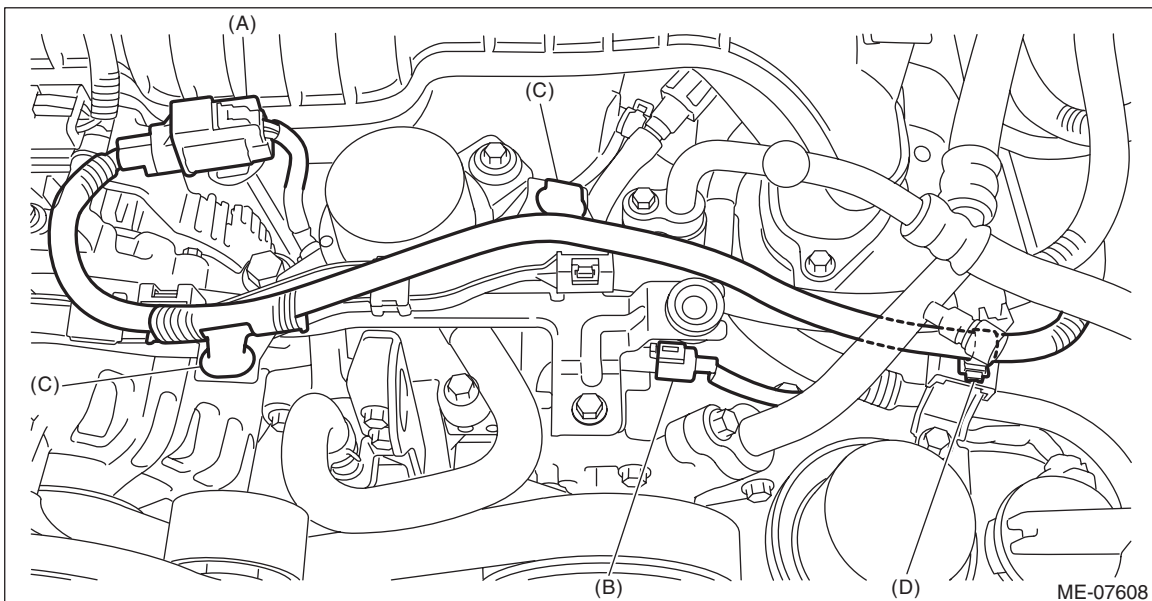
7) Remove the air intake duct. <Ref. to IN(H4DO(HEV))-15, REMOVAL, Air Intake Duct.>

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

9) Drain engine coolant. <Ref. to CO(H4DO(w/o HEV))-16, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

10) Disconnect the connector (A) from the brake vacuum pump, and disconnect the connector (B) from the A/C compressor.

11) Remove the clip (C) and the clip (D) securing the harness to the battery cable assembly, and move the harness to the left side wheel apron.

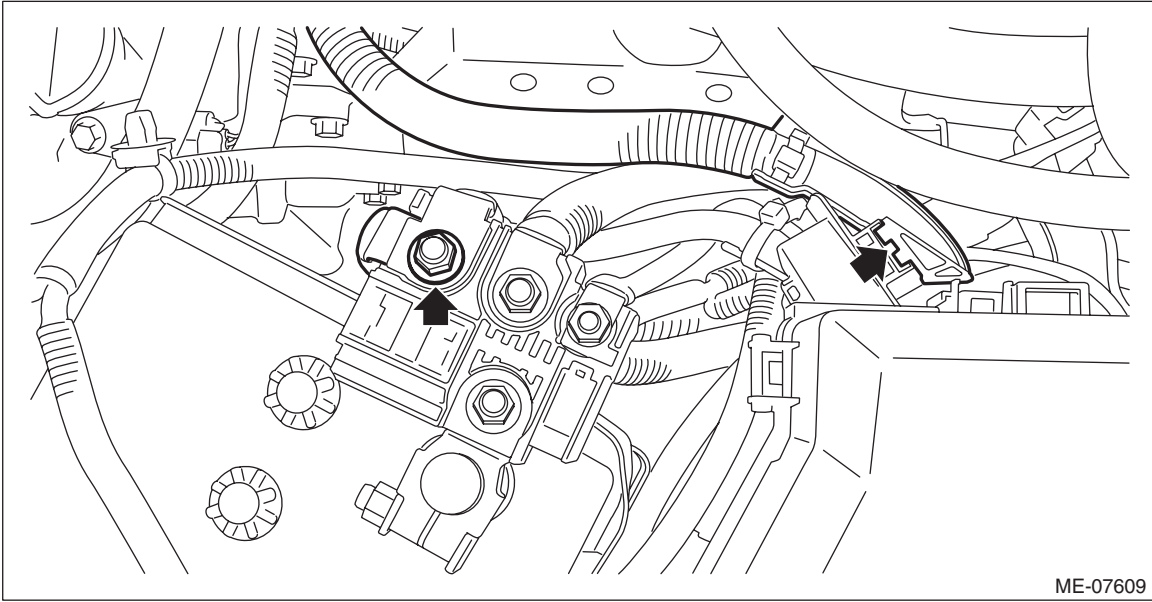


12) Remove the terminal boot from the positive terminal of the 12 volt auxiliary battery.

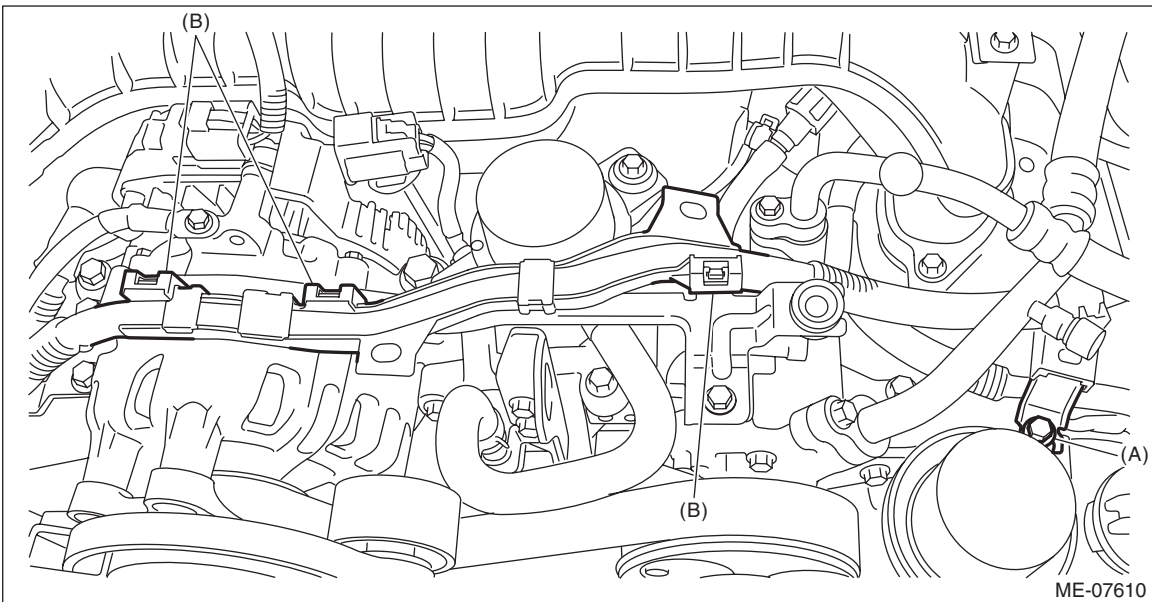
Water Pipe Assembly

COOLING

13) Remove the nuts fastening the battery cable assembly to the slow blow fuse (12 volt auxiliary battery), and remove the battery cable assembly from the main fuse box.

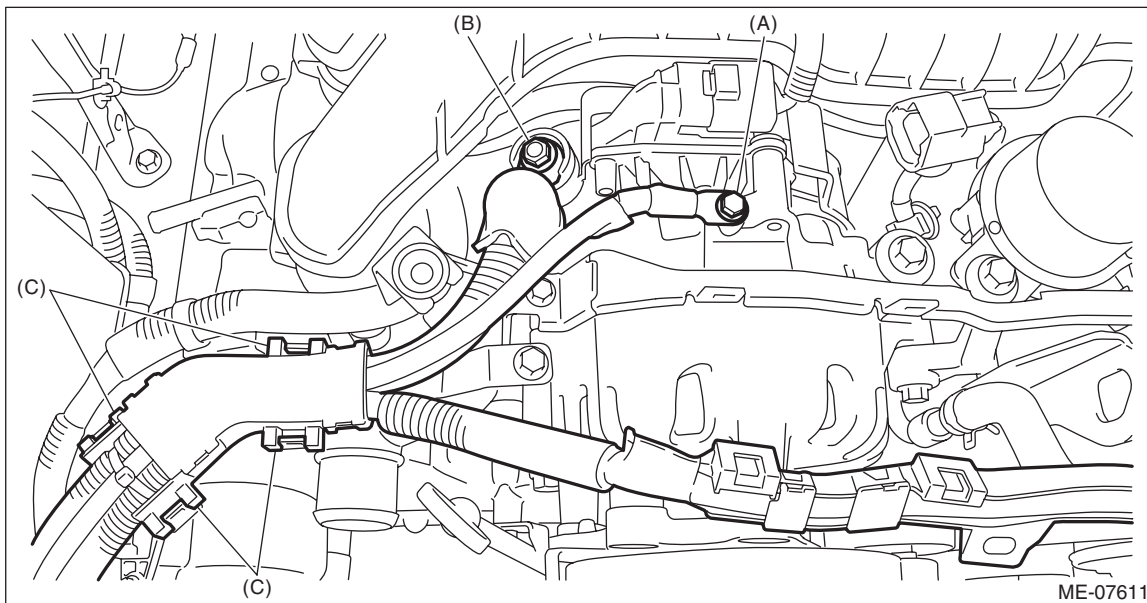


14) Remove the bolt (A) securing the battery cable stay to the chain cover, and remove the clip (B) securing the battery cable assembly to the collector cover bracket.

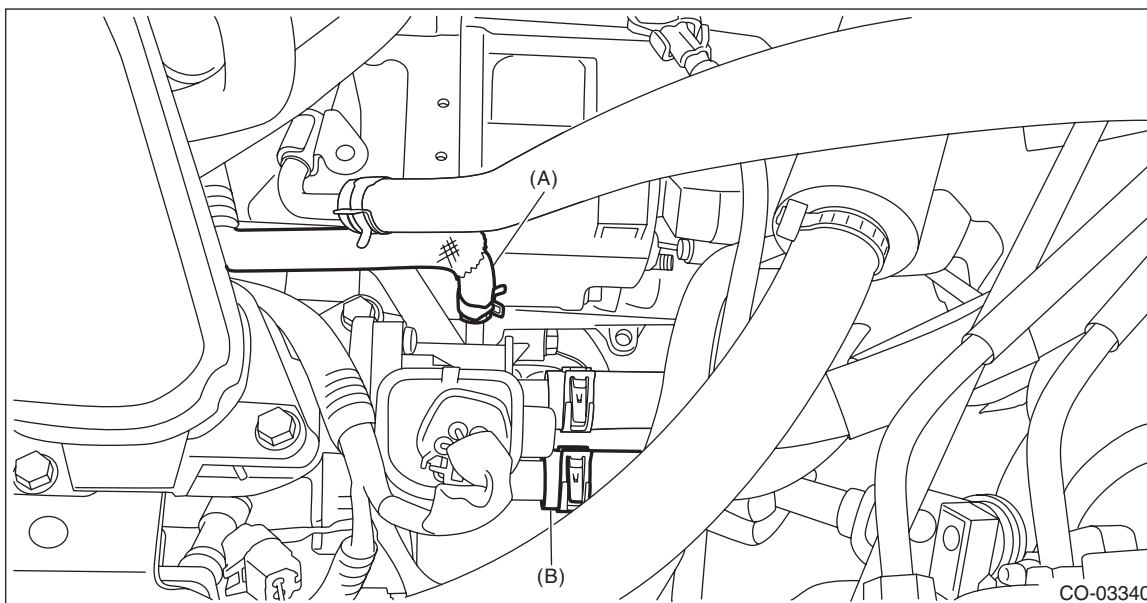


15) Disconnect the terminal (A) and the terminal (B) from ISG.

- 16) Remove the clip (C) securing the battery cable assembly to the battery cable bracket No. 1, and move the battery cable assembly to the right side wheel apron.



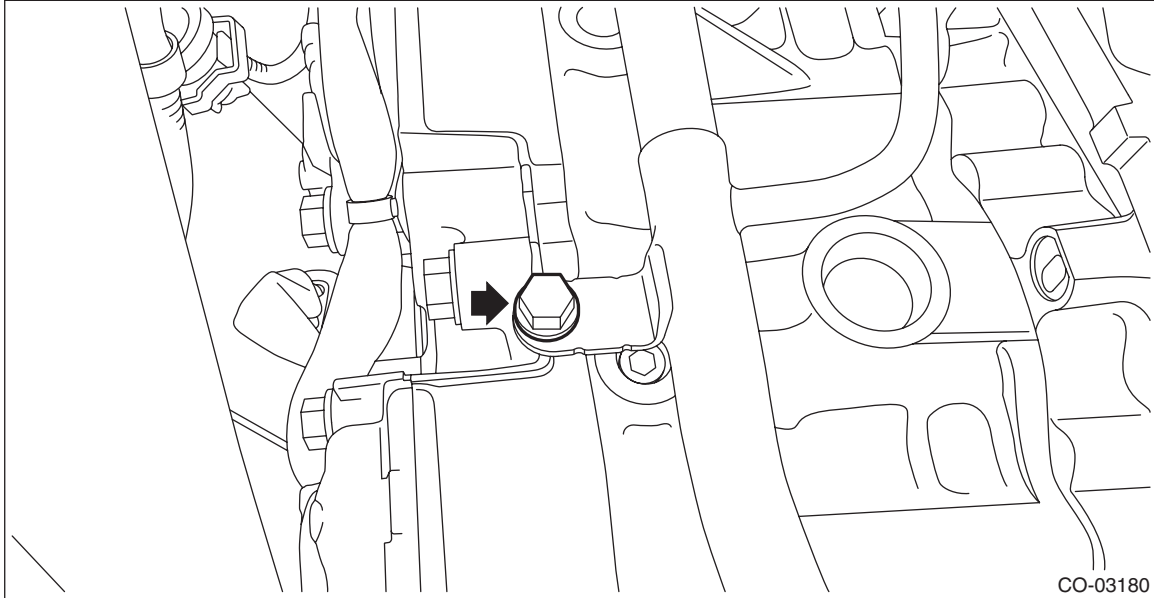
- 17) Disconnect the preheater hose (A) and the heater outlet hose (B) from the water pipe assembly LH.



Water Pipe Assembly

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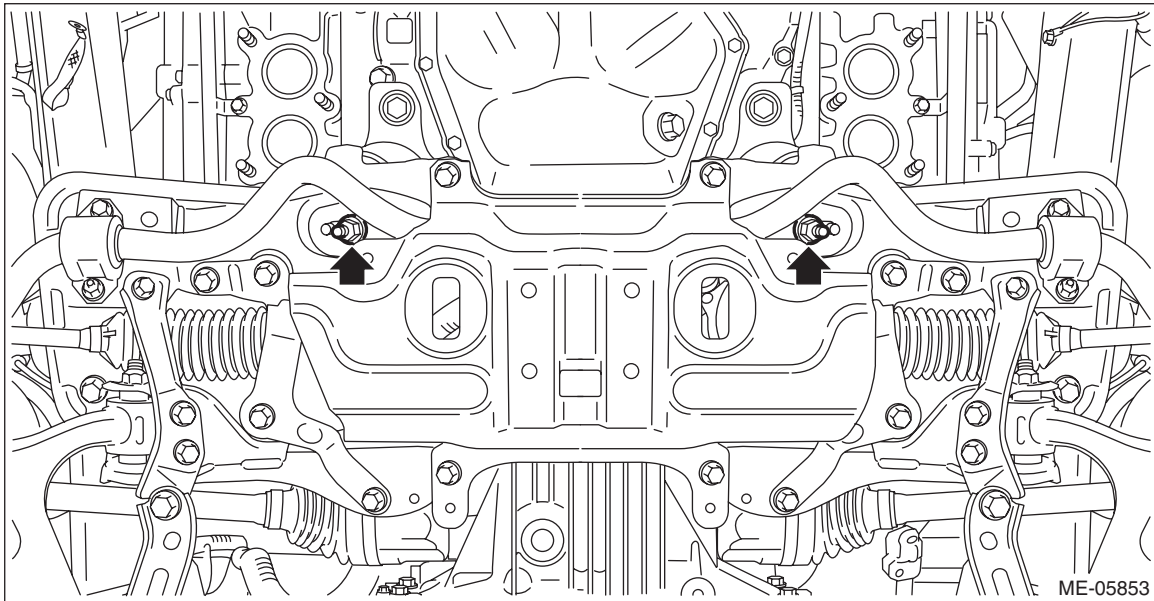
18) Remove the bolt which holds the water pipe assembly LH from the cylinder head LH.



19) Lift up the vehicle.

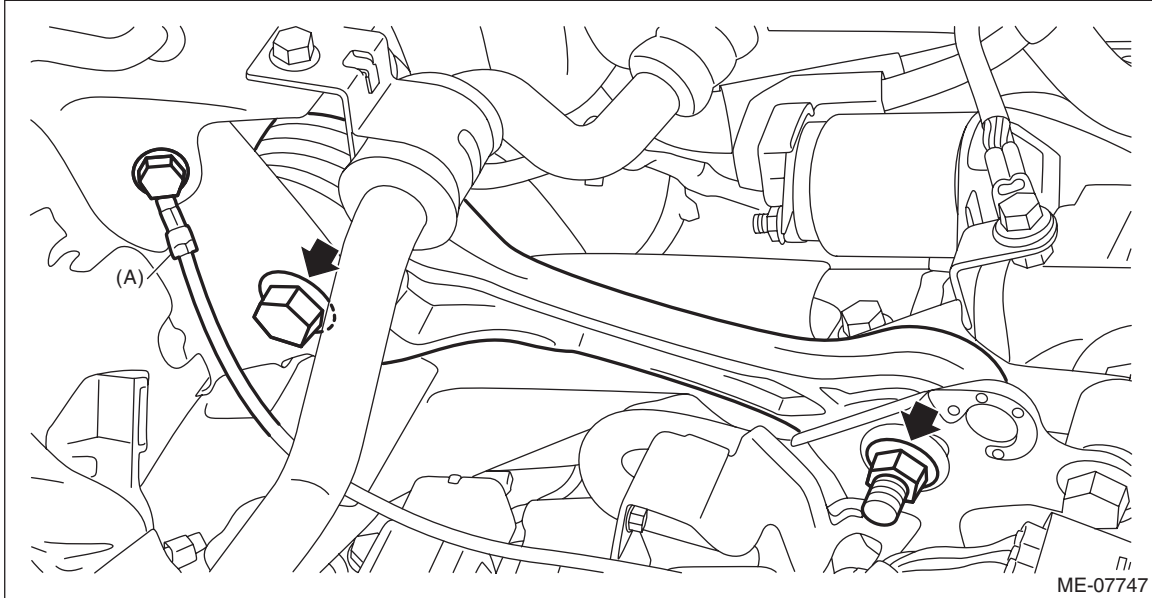
20) Remove the front exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-6, REMOVAL, Front Exhaust Pipe.>

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



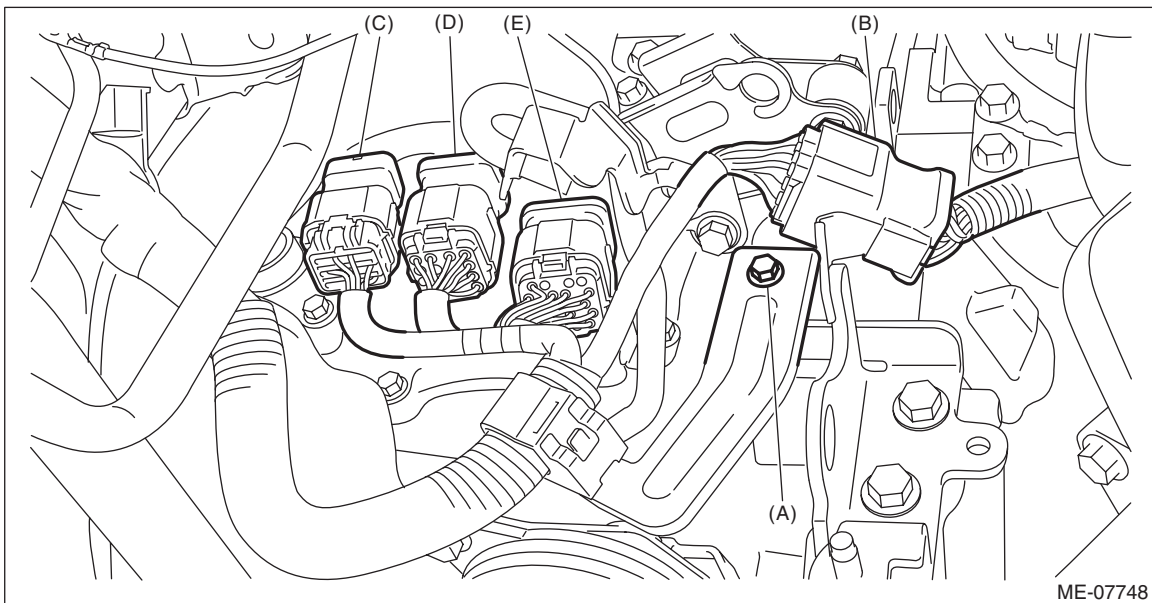
22) Lower the vehicle.

23) Disconnect the transmission radio ground terminal (A) from the vehicle, and remove the pitching stopper.



24) Remove the bolt (A) securing the bulkhead harness connector bracket, and disconnect the bulkhead harness connector from the engine harness connector (brown) (B).

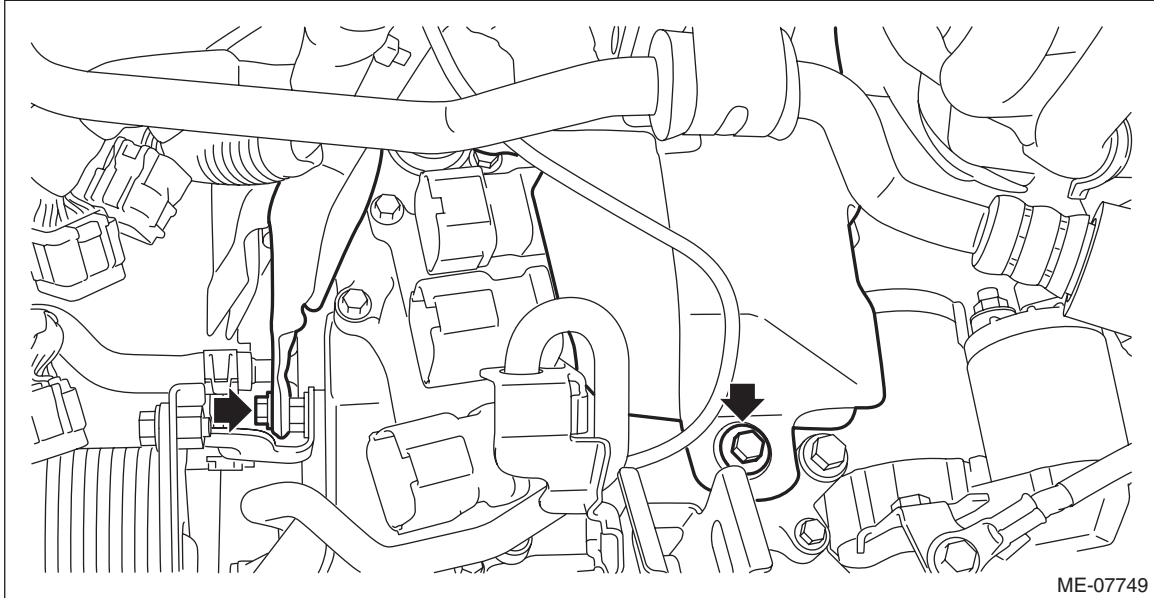
25) Disconnect the bulkhead harness connector from the transmission harness connector (C), inhibitor harness connector (D) and drive motor harness connector (E).



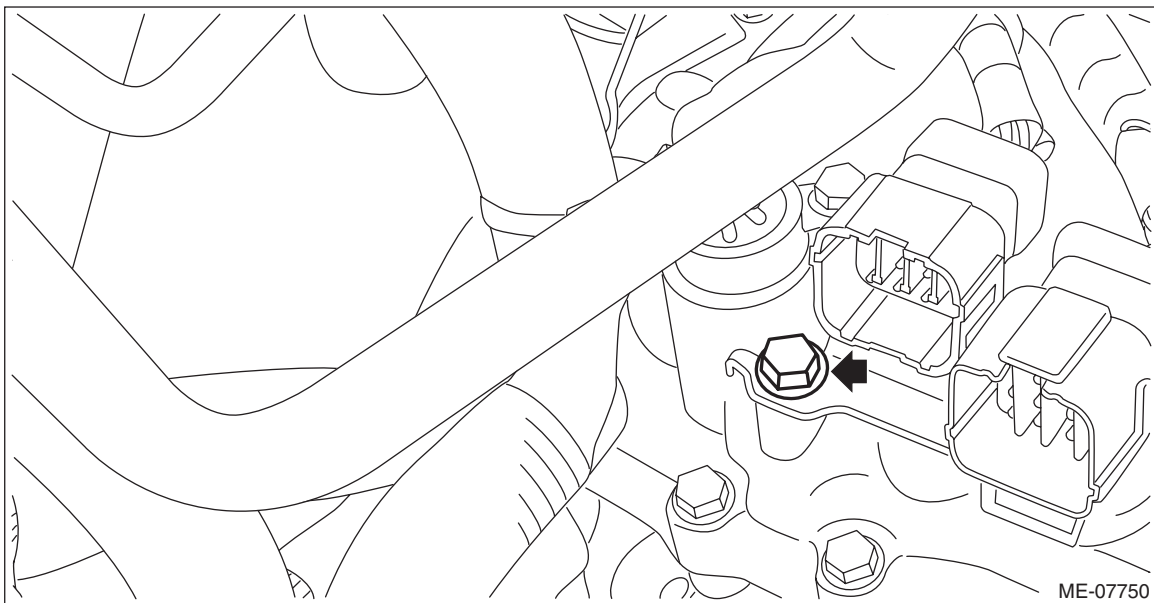
Water Pipe Assembly

COOLING

26) Remove the transmission case cover.



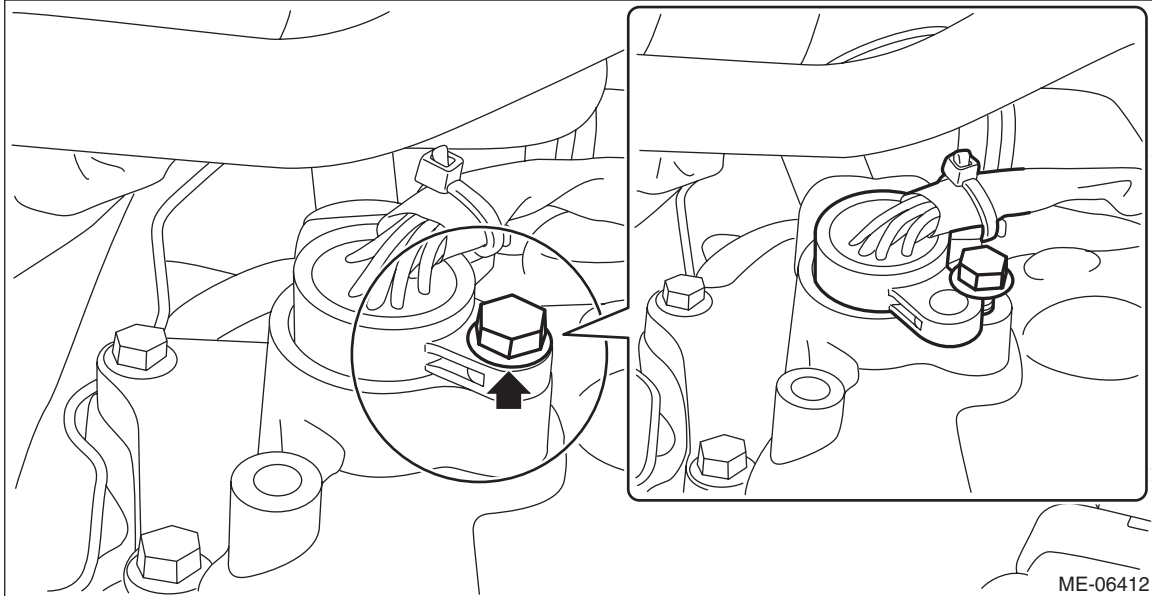
27) Remove the bolt which holds the transmission harness stay.



28) Remove the bolt which holds the transmission harness to the control valve body, and turn the transmission harness clockwise till the bolt hole can be seen as shown in the figure, and tighten the bolt to temporary lock the harness.

NOTE:

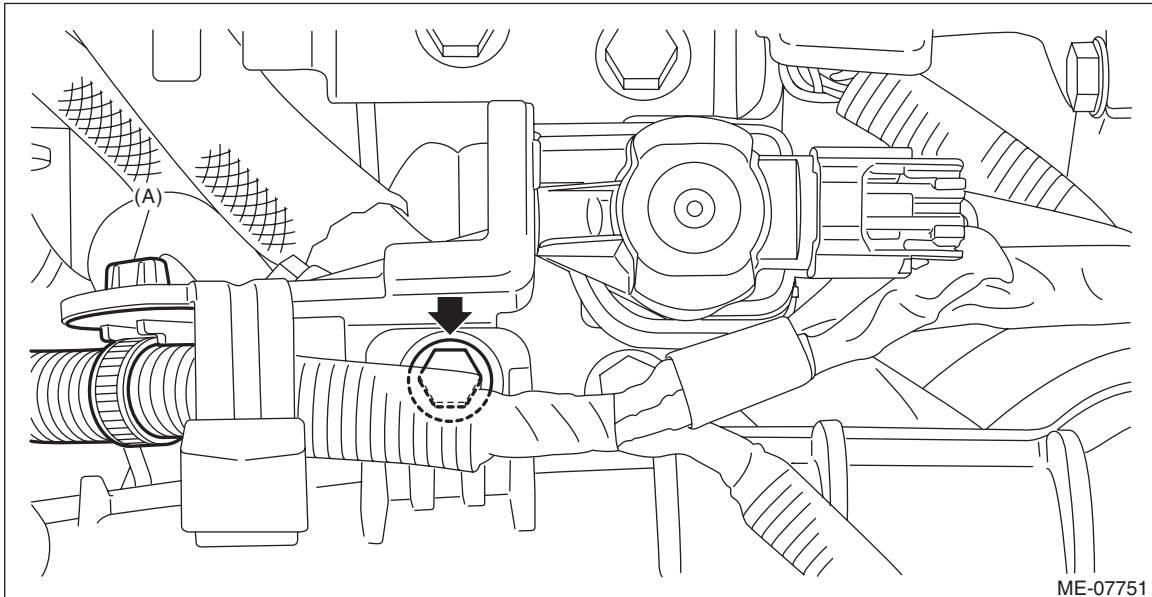
This procedure is required to prevent the transmission harness from touching the vehicle body during engine lift-up.



29) Remove the clip (A) securing the engine harness to the purge control solenoid valve bracket, and disconnect the bolt securing the purge control solenoid valve bracket to the intake manifold.

NOTE:

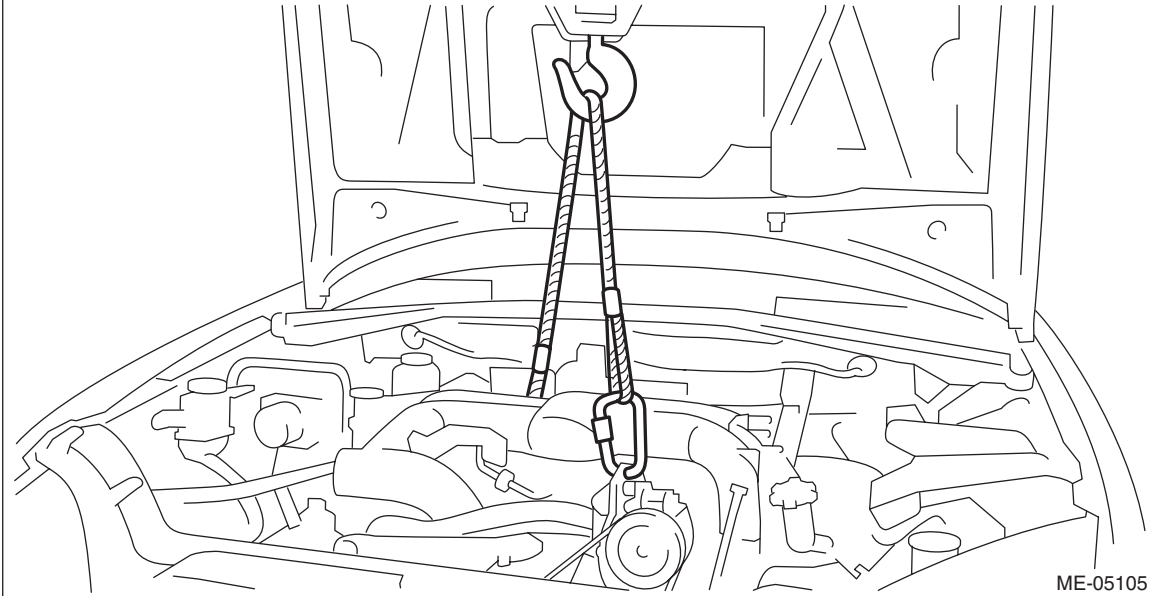
This operation is required to prevent the wire rope from contacting the purge control solenoid valve while lifting the engine.



Water Pipe Assembly

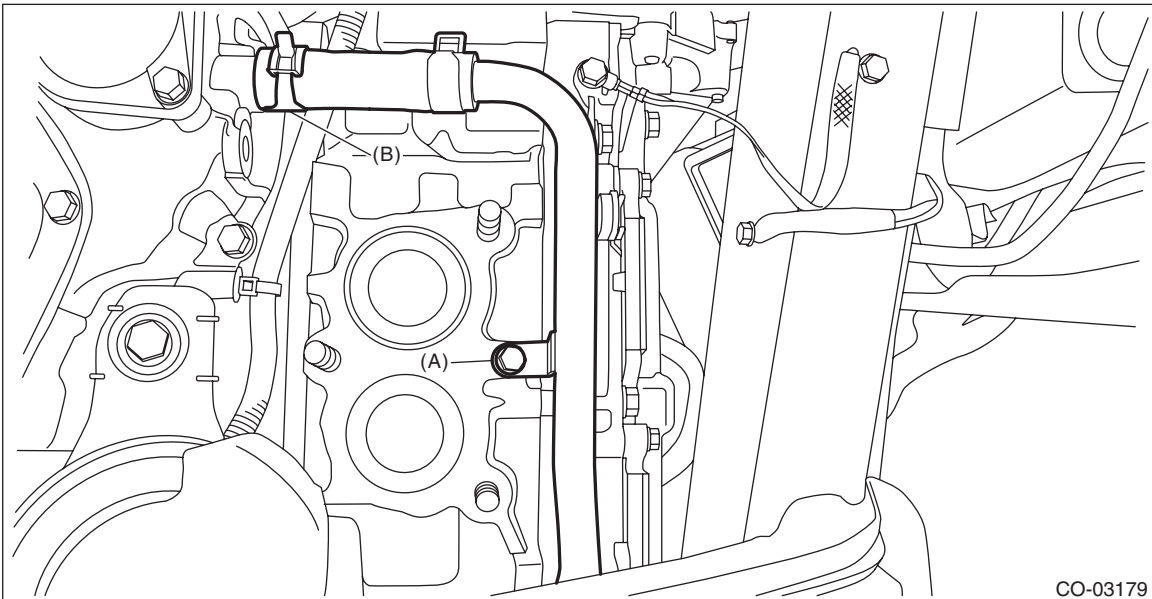
COOLING

30) Lift up the engine with a lifting device and wire ropes.



31) Remove the bolt (A) which secures the water pipe assembly LH to the cylinder head LH.

32) Disconnect the water pipe hose LH (B) from oil pan upper, and remove the water pipe assembly LH.



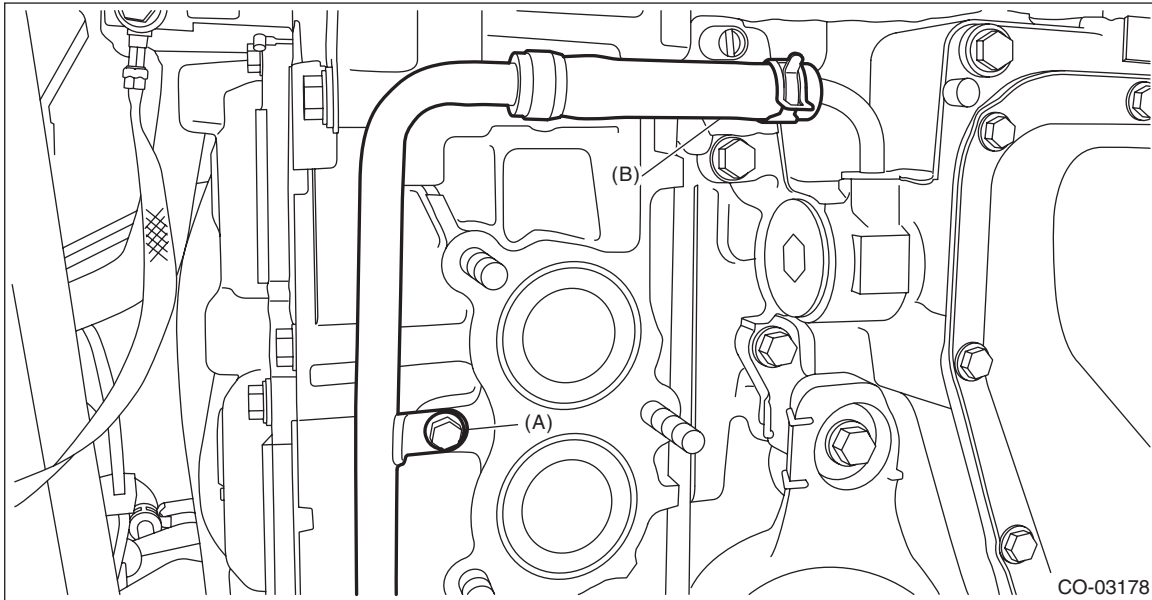
B: INSTALLATION

1. WATER PIPE ASSEMBLY RH

- 1) Set the water pipe assembly RH on the engine, and connect the water pipe hose RH (B) to the oil pan upper.
- 2) Secure the water pipe assembly RH to the cylinder head RH with bolt (A).

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

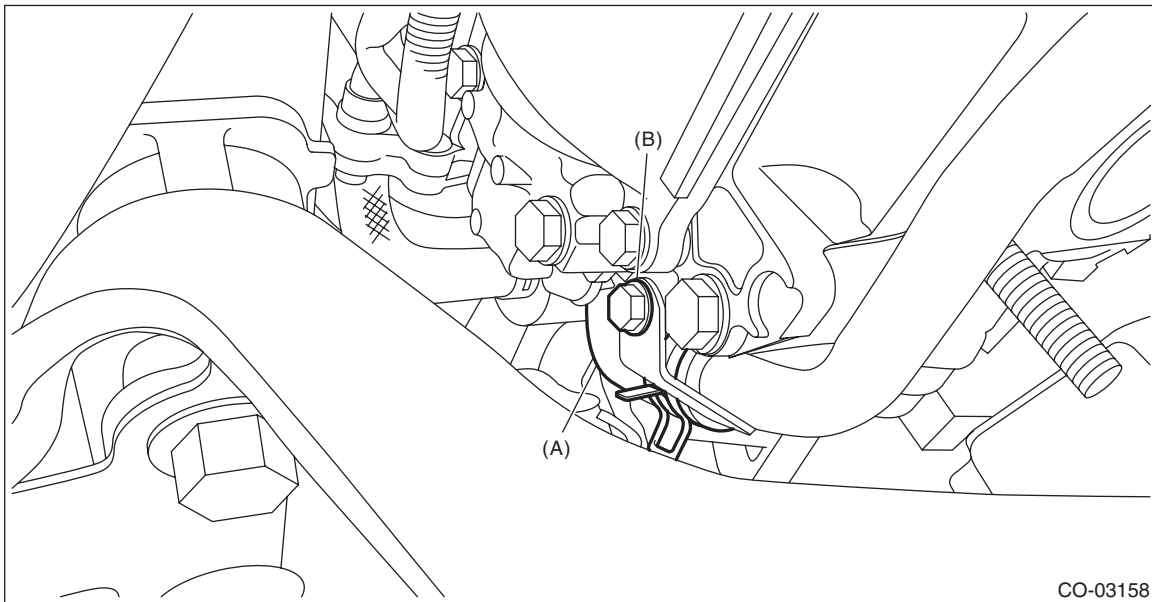


- 3) Install the bolt (B) which secures the water pipe assembly RH to the cam carrier RH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

- 4) Connect the water hose (A) to the water pipe assembly RH.



- 5) Install the front exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-8, INSTALLATION, Front Exhaust Pipe.>
- 6) Connect the battery ground terminal. <Ref. to NT-5, BATTERY, NOTE, Note.>
- 7) Fill engine coolant. <Ref. to CO(H4DO(w/o HEV))-16, FILLING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

Water Pipe Assembly

COOLING

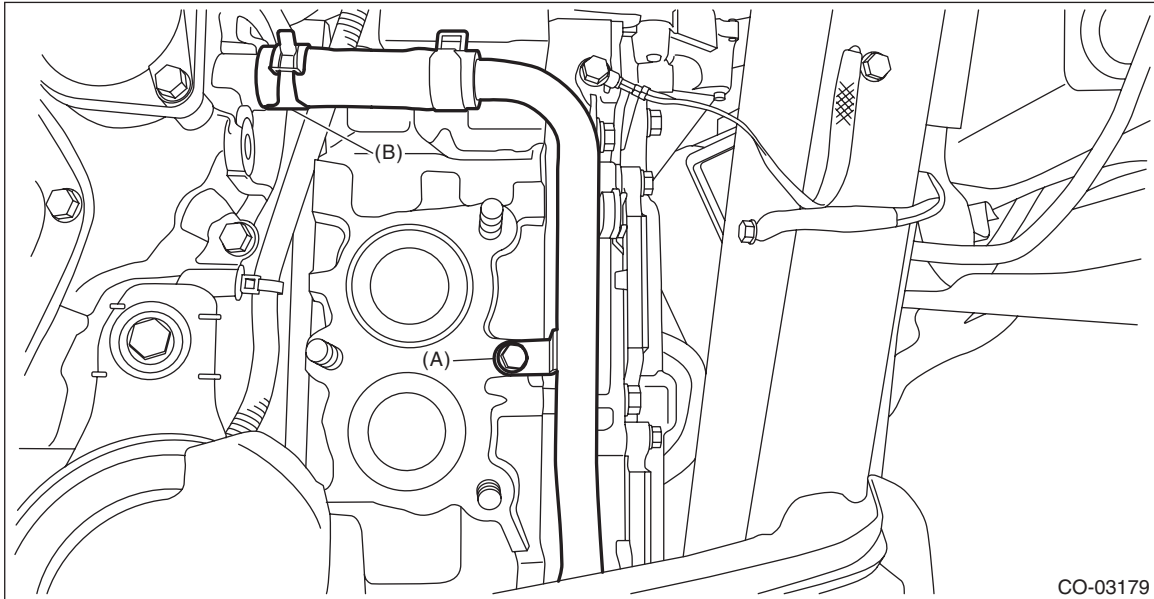
2. WATER PIPE ASSEMBLY LH

- Gasoline engine model

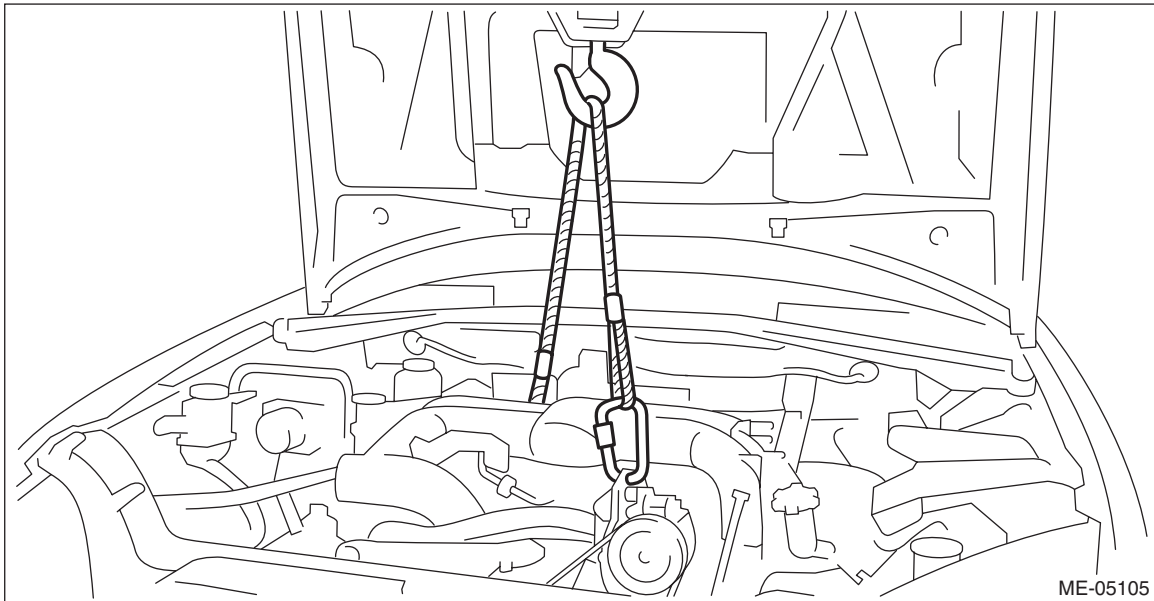
- 1) Set the water pipe assembly LH on the engine, and connect the water pipe hose LH (B) to the oil pan upper.
- 2) Secure the water pipe assembly LH to the cylinder head LH with bolt (A).

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



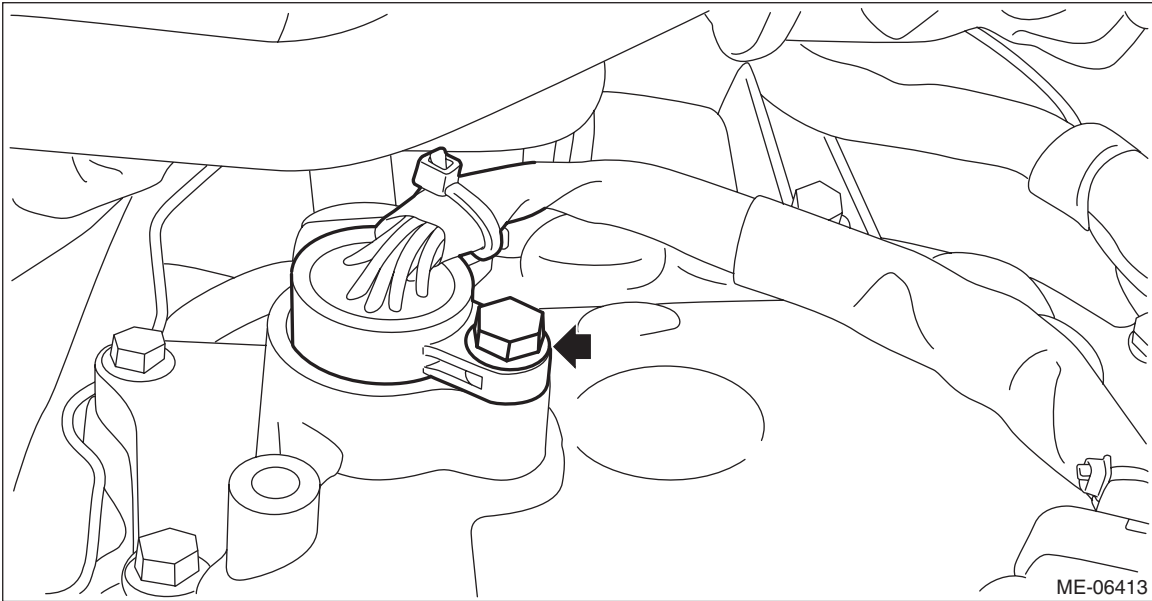
- 3) Lower the engine and remove the lifting device and wire ropes.



- 4) Remove the bolt and turn the transmission harness counterclockwise to install the transmission harness to the control valve body. (CVT model)

Tightening torque:

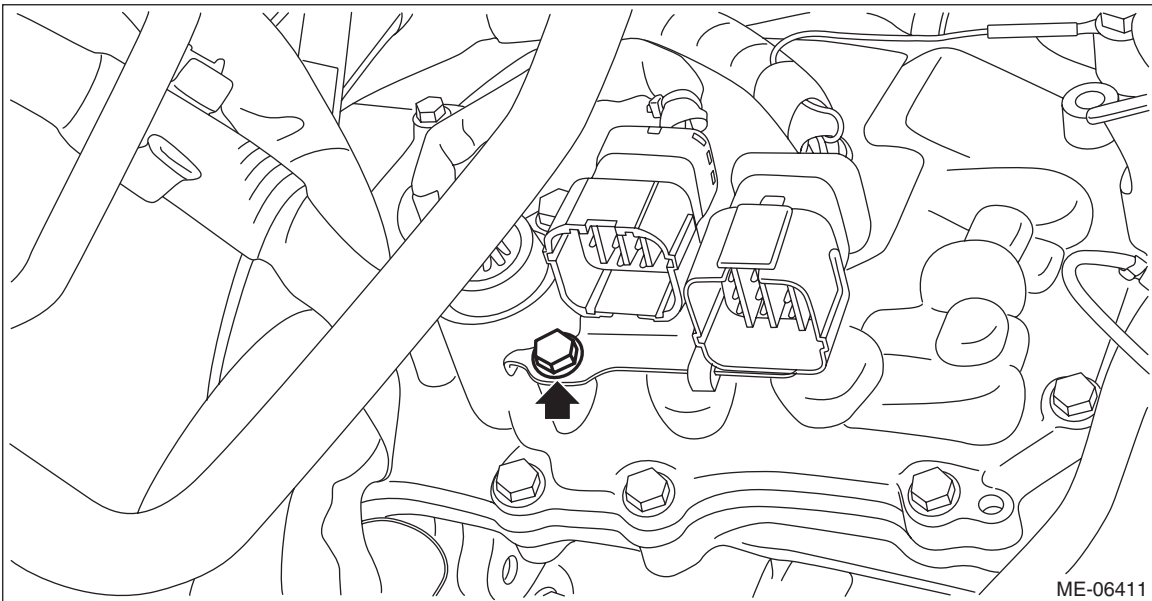
7 N·m (0.7 kgf-m, 5.2 ft-lb)



- 5) Install the bolt which holds the transmission harness stay. (CVT model)

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)



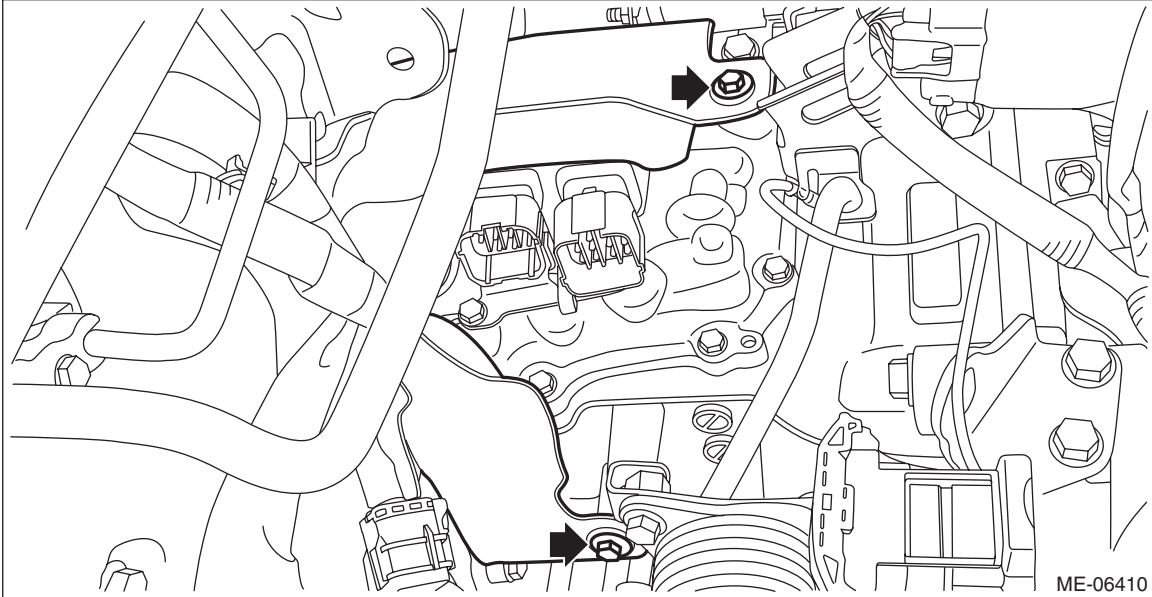
Water Pipe Assembly

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6) Install the transmission case cover. (CVT model)

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)

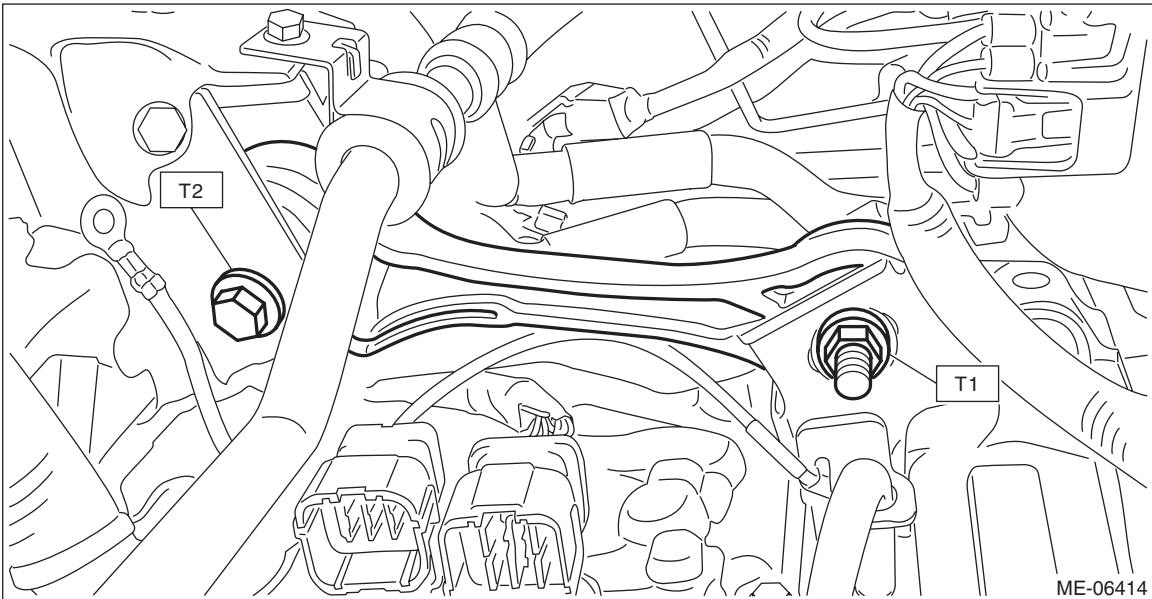


7) Install the pitching stopper.

Tightening torque:

T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)

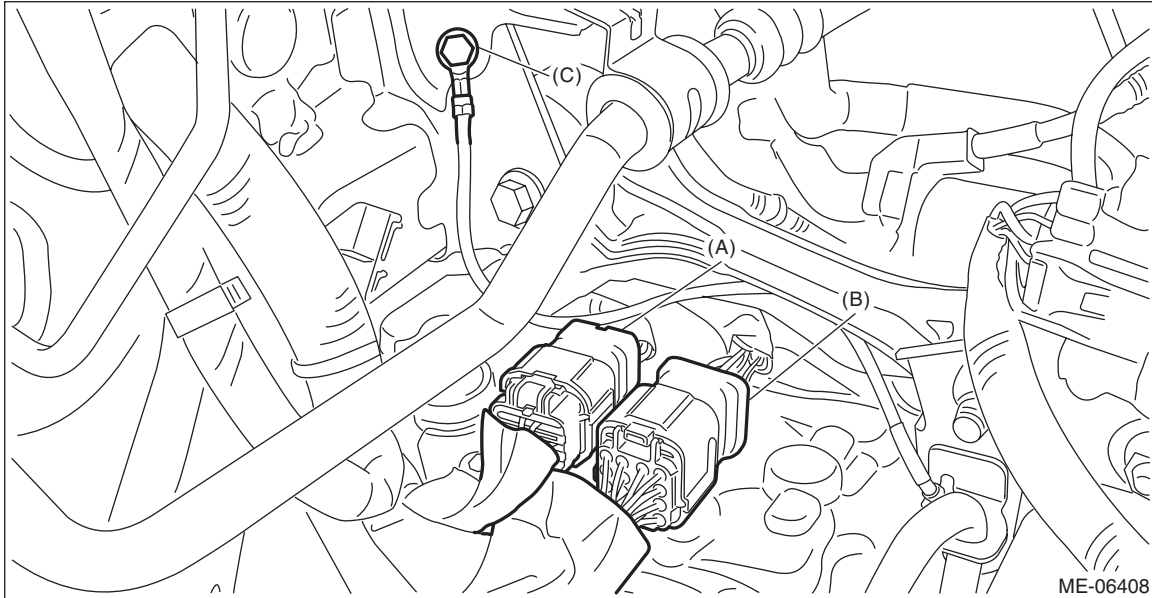
T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)



8) Connect the transmission radio ground terminal (C) to the vehicle body, and connect the bulkhead harness connector to the transmission harness connector (A) and the inhibitor harness connector (B). (CVT model)

Tightening torque:

13 N·m (1.3 kgf-m, 9.6 ft-lb)



9) Lift up the vehicle.

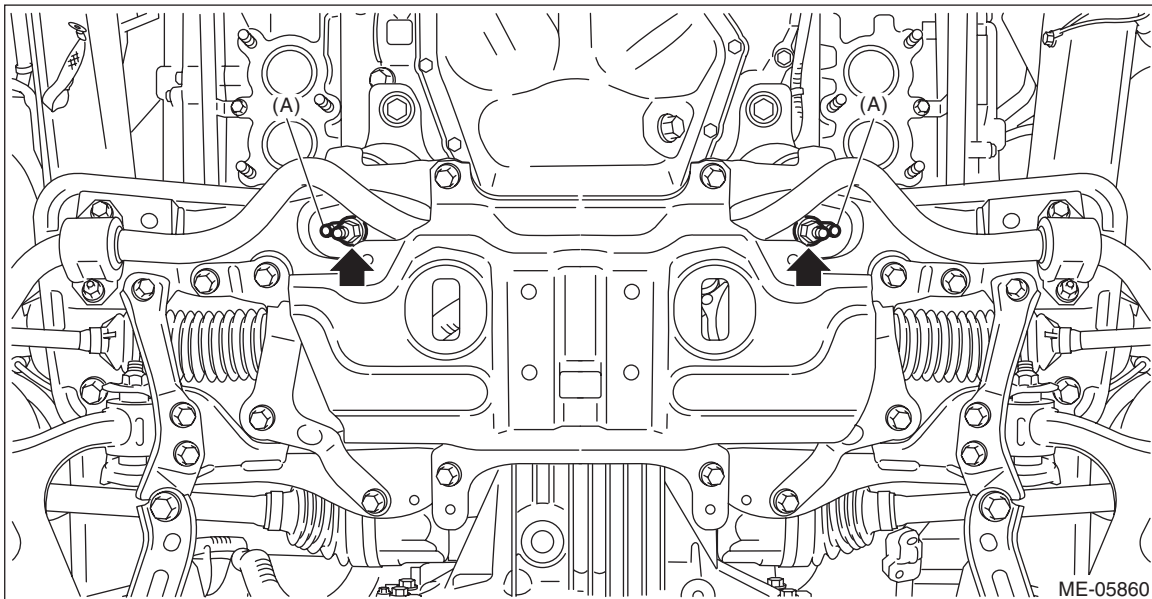
10) Install the nuts which hold the engine mounting to the crossmember. (CVT model)

NOTE:

- Make sure that locators (A) of the engine mounting are securely inserted.
- Use a new nut.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)



Water Pipe Assembly

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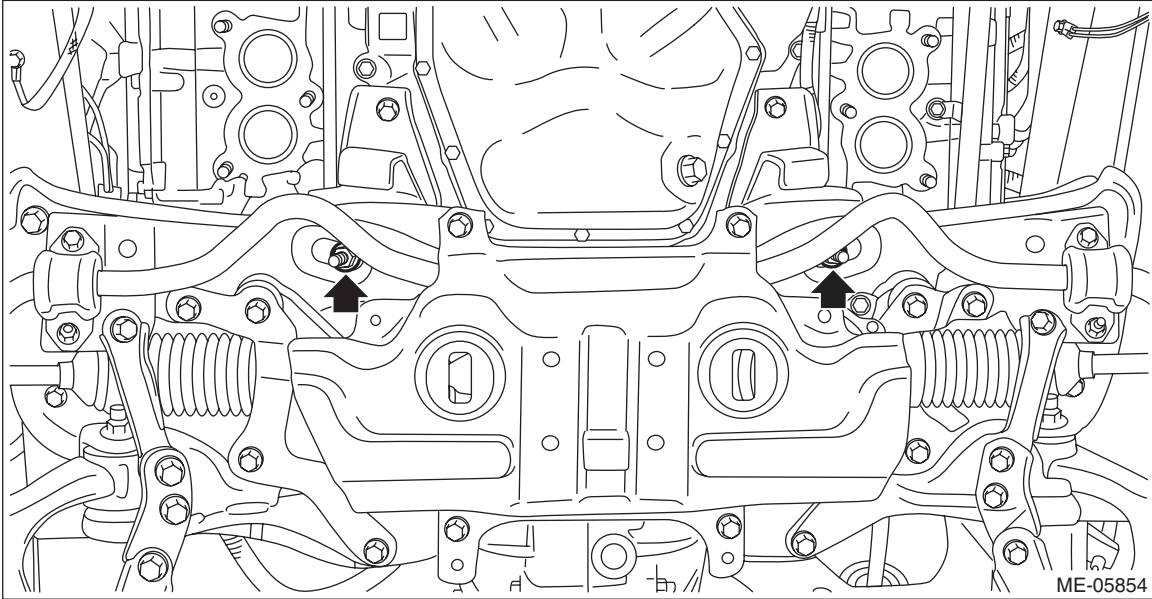
11) Install the nuts which hold the engine mounting to the crossmember. (MT model)

NOTE:

Use a new nut.

Tightening torque:

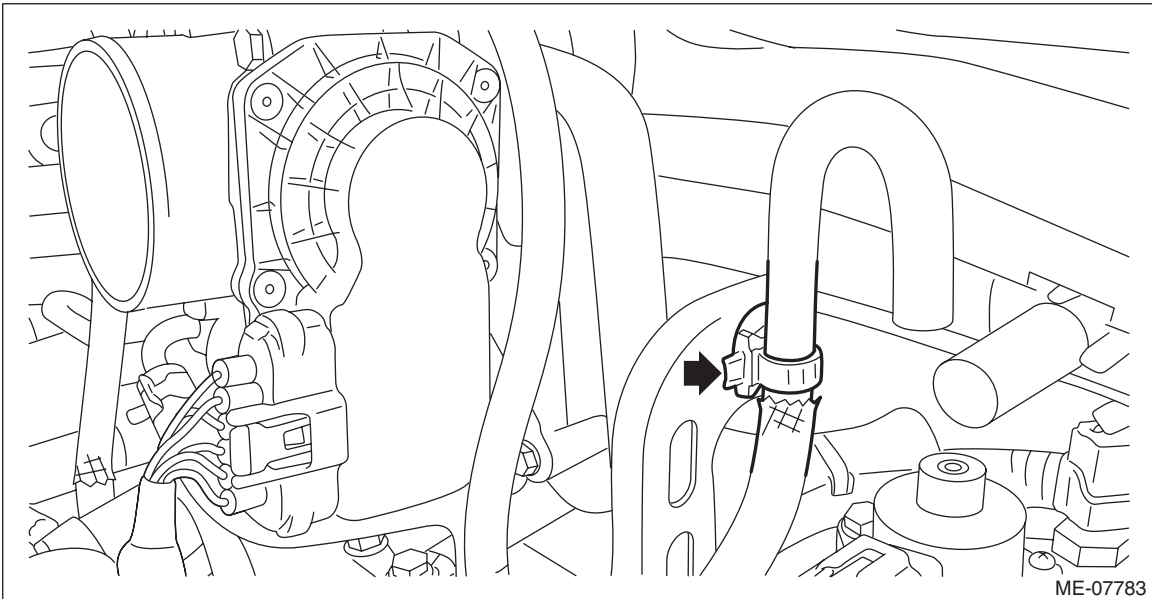
60 N·m (6.1 kgf-m, 44.3 ft-lb)



12) Install the front exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-6, REMOVAL, Front Exhaust Pipe.>

13) Lower the vehicle.

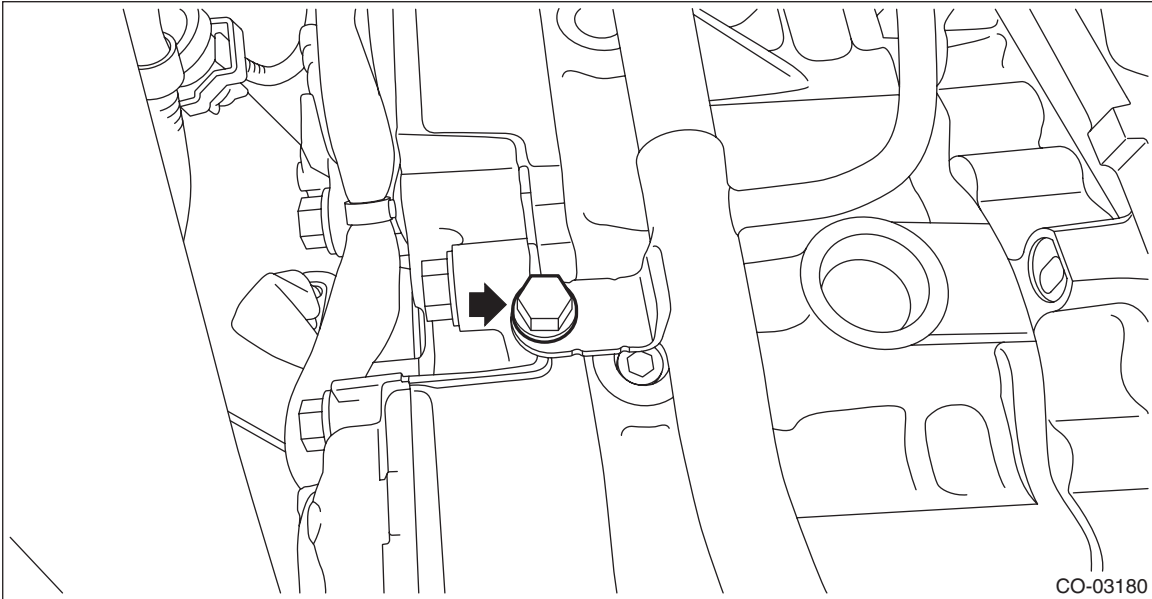
14) Secure the air breather hose to the engine rear hanger using clip. (MT model)



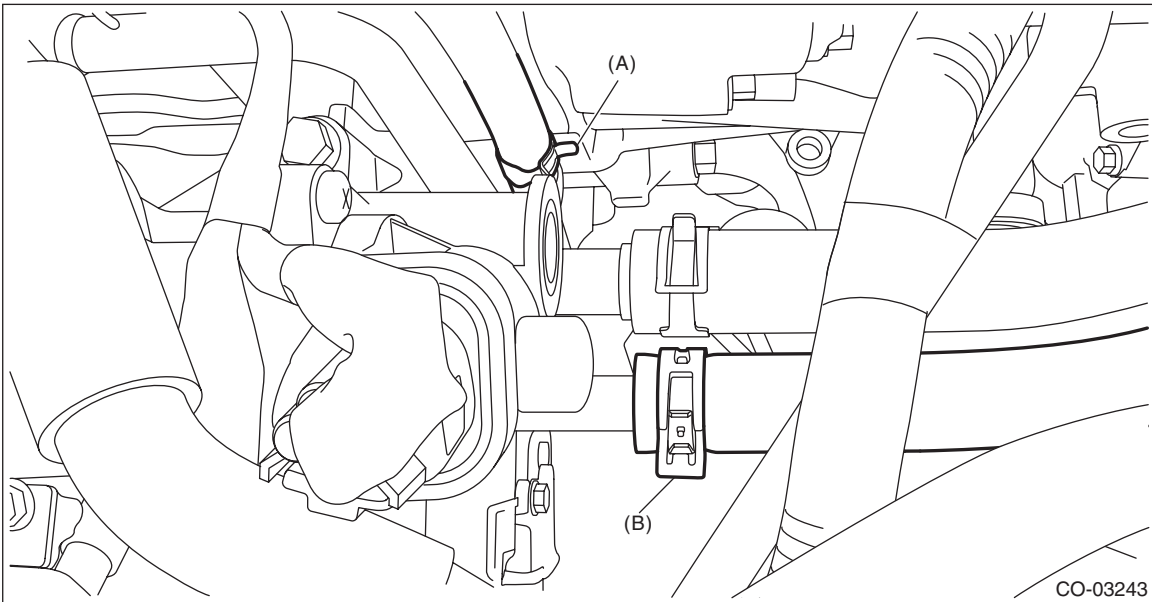
15) Install the bolt which secures the water pipe assembly LH to the cylinder head LH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



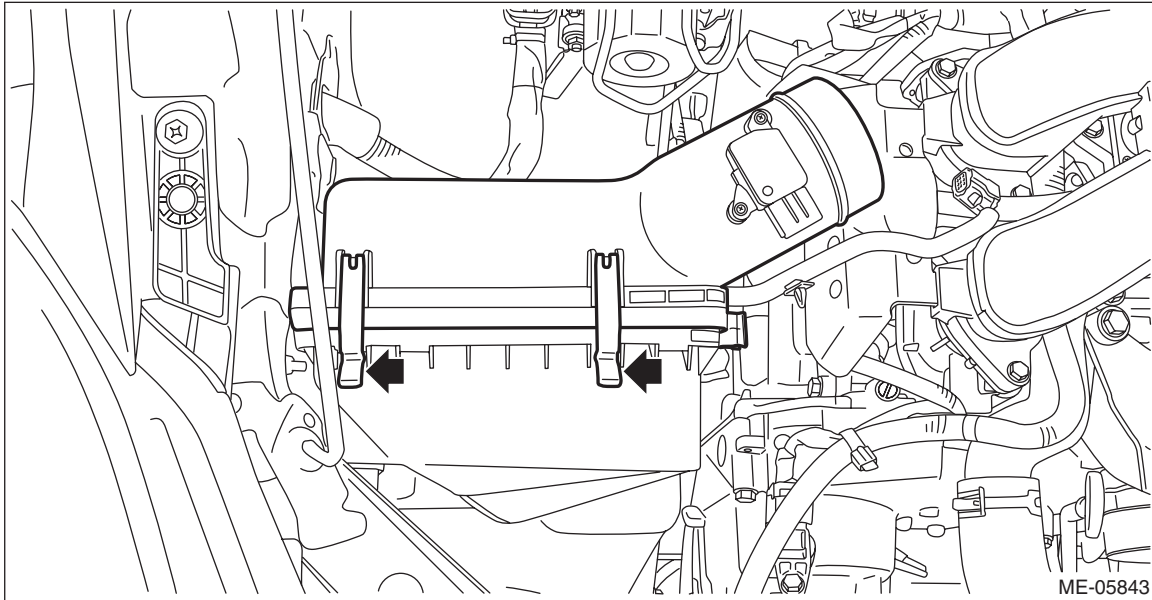
16) Connect the preheater hose (A) and the heater outlet hose (B) to the water pipe assembly LH.



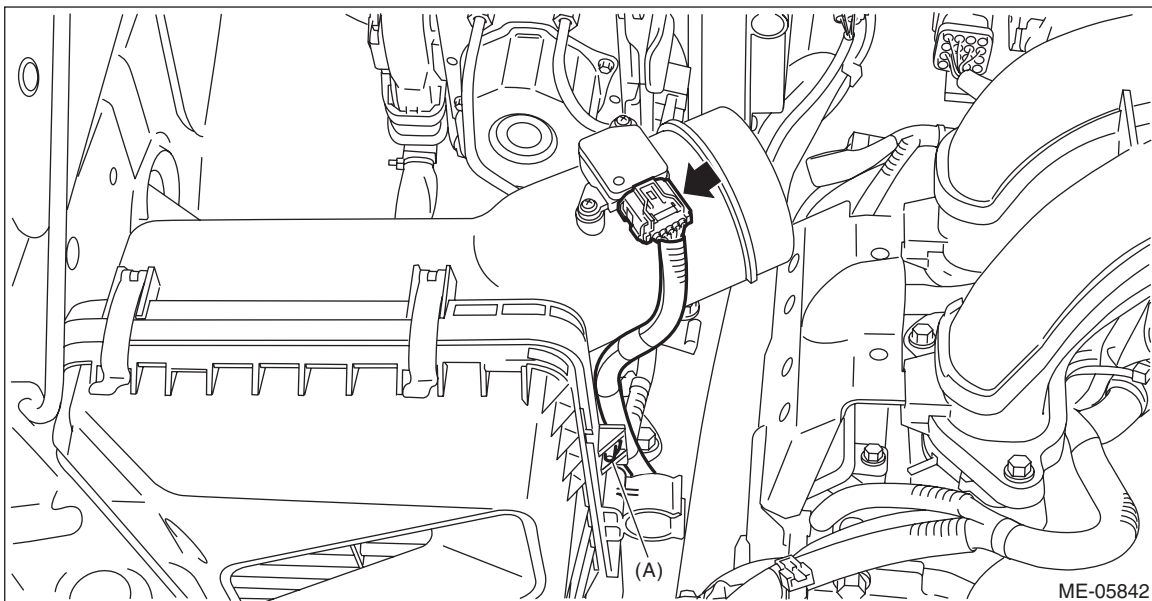
Water Pipe Assembly

COOLING

17) Install the air intake case (rear).



18) Install the clip (A) which secures the air flow and intake air temperature sensor harness, and connect the connector to the air flow and intake air temperature sensor.



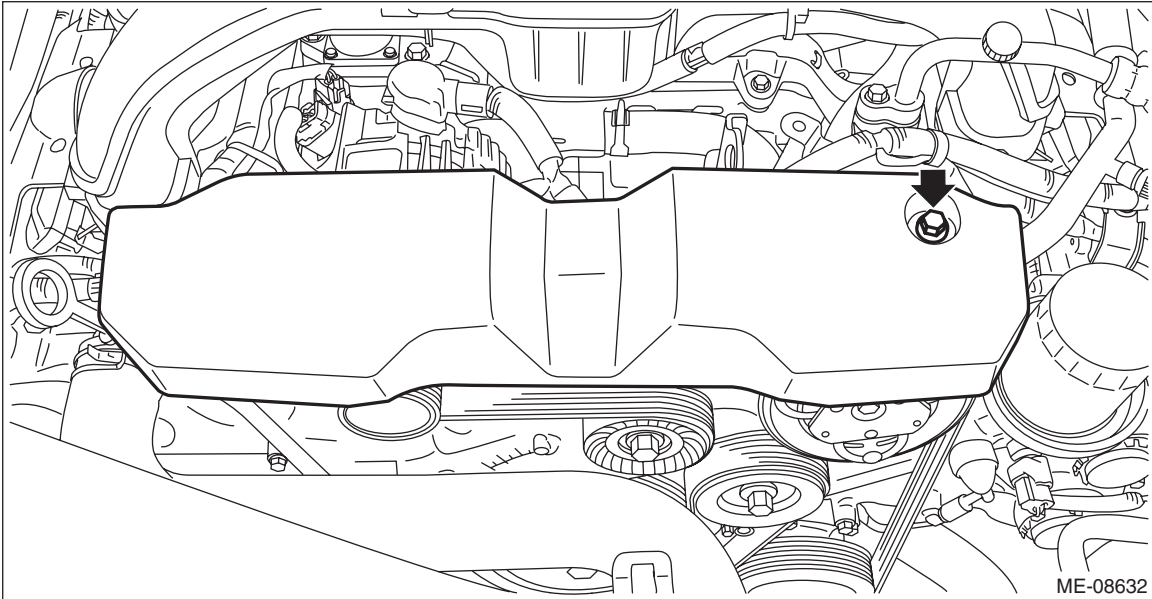
19) Install the air intake boot. <Ref. to IN(H4DO(w/o HEV))-12, INSTALLATION, Air Intake Boot.>

20) Install the air intake duct. <Ref. to IN(H4DO(w/o HEV))-13, INSTALLATION, Air Intake Duct.>

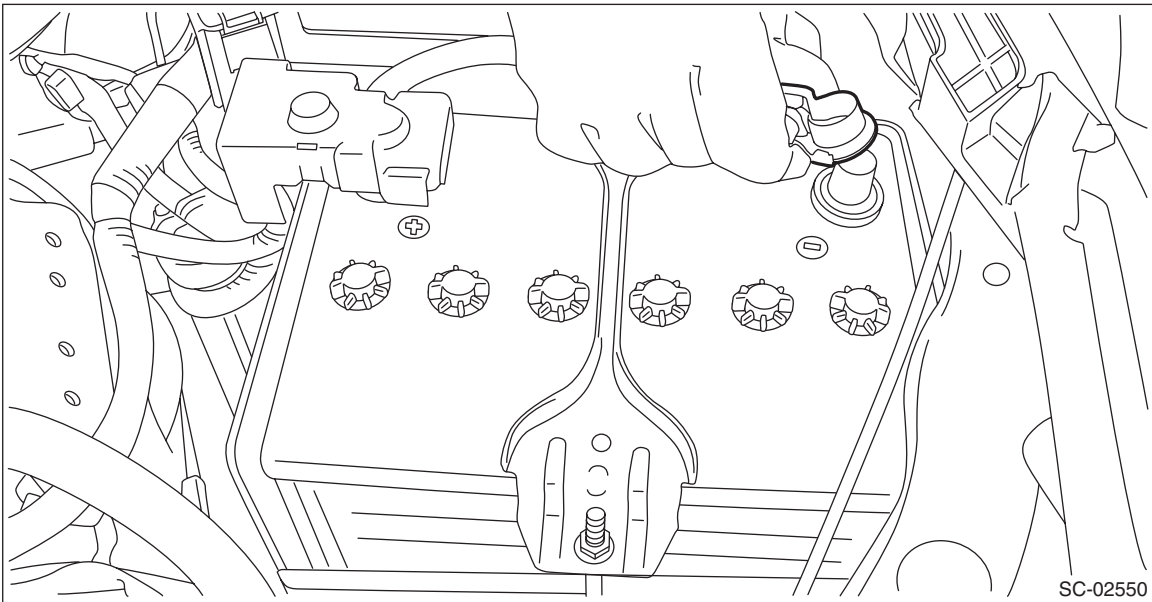
21) Install the V-belt cover.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



22) Connect the battery ground terminal.

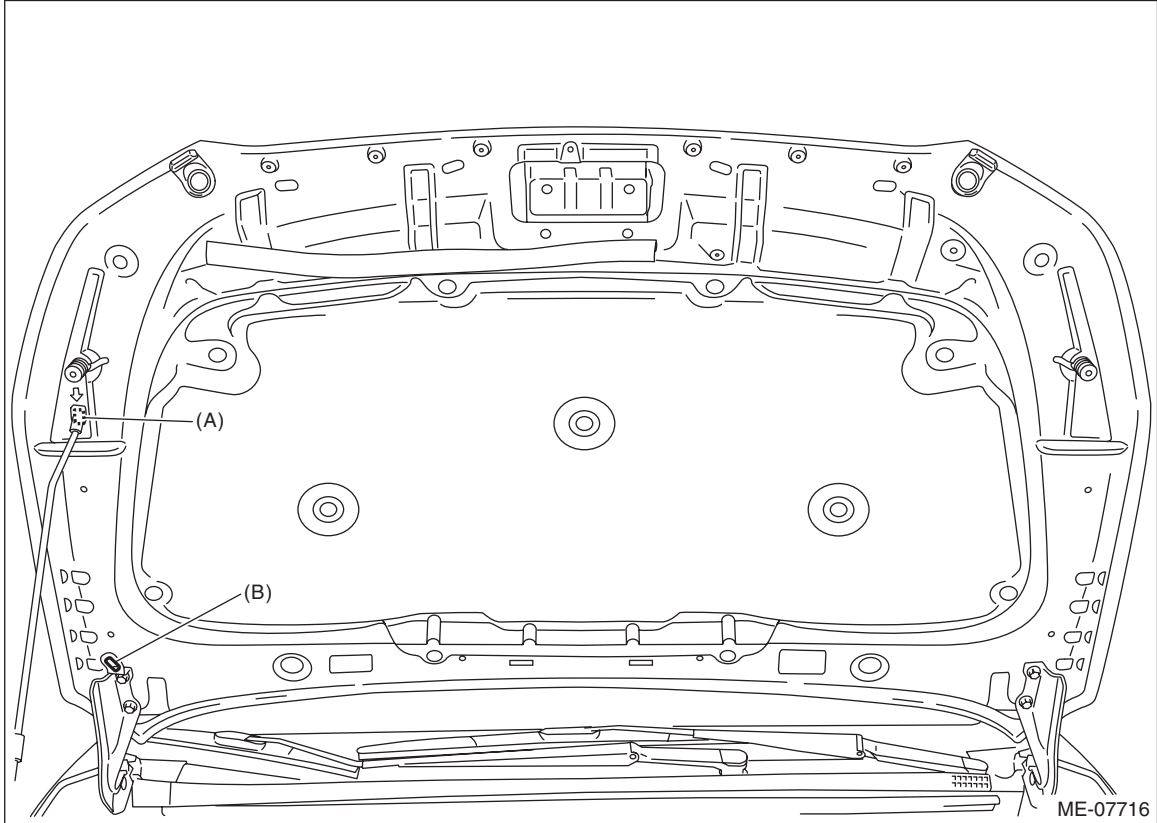


23) Fill engine coolant. <Ref. to CO(H4DO(w/o HEV))-16, FILLING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

Water Pipe Assembly

COOLING

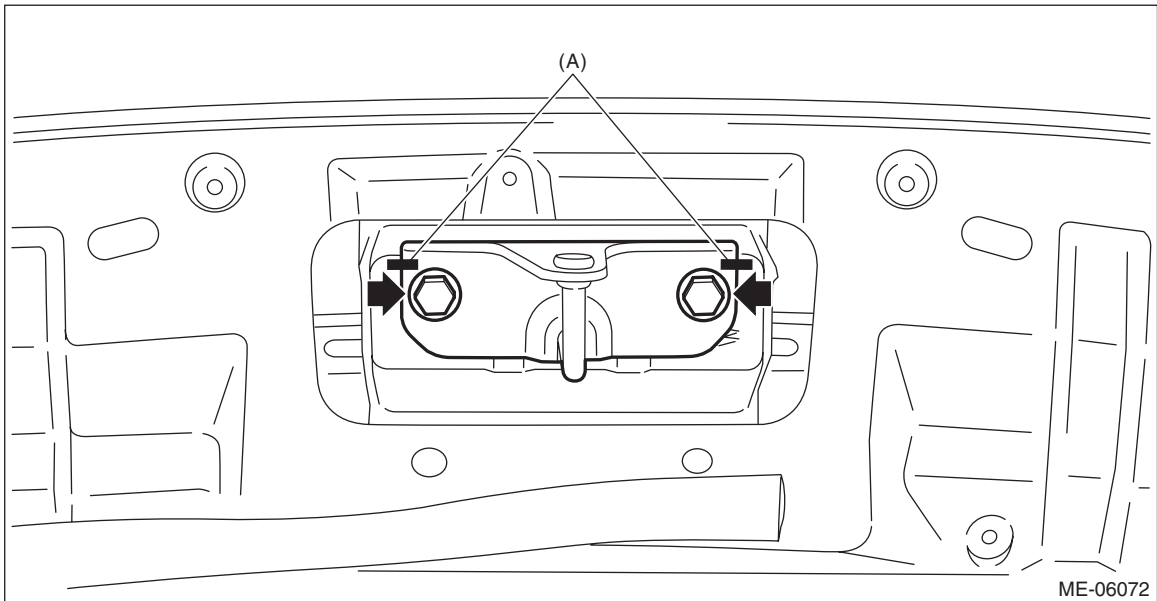
24) Change the front hood stay position from (B) to (A).



25) Install the front hood striker to the front hood by aligning the alignment marks (A), and close the front hood.

Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)

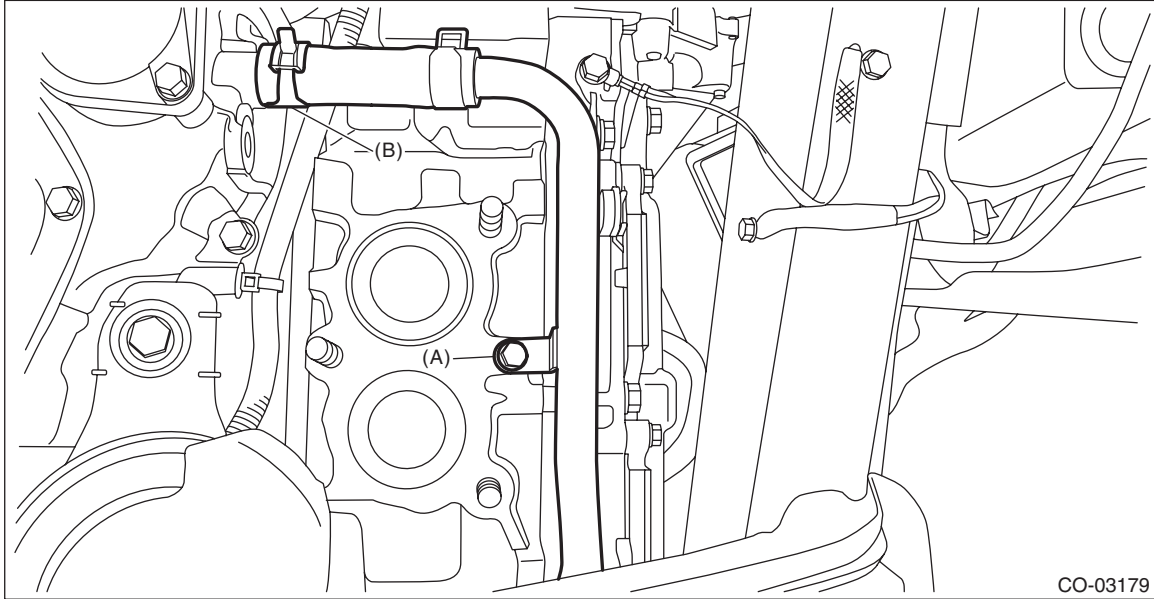


- HEV model

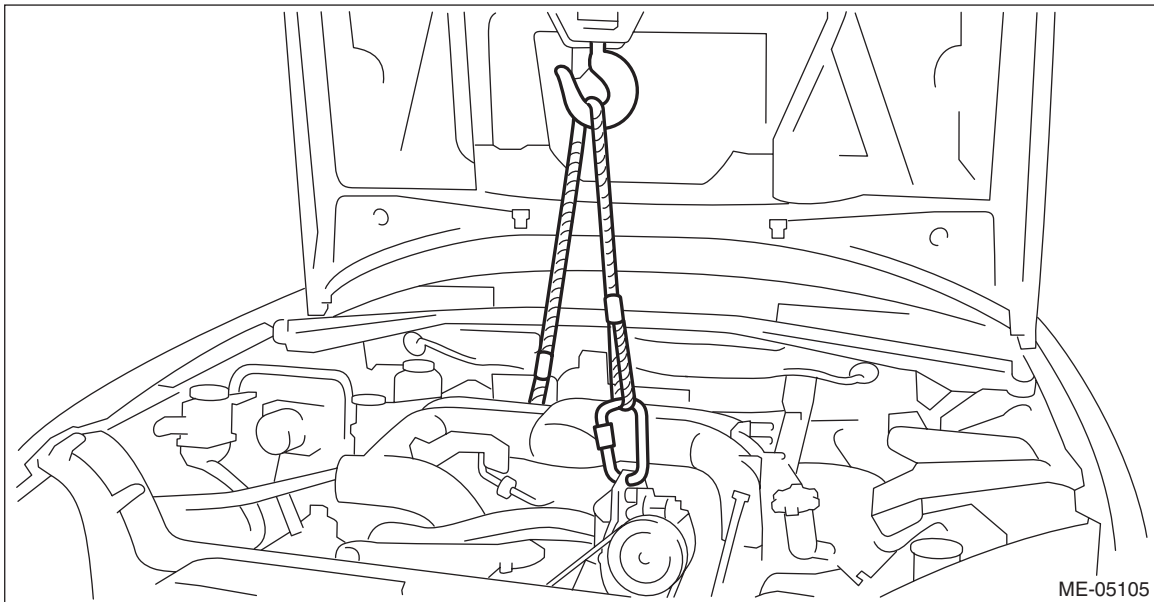
- 1) Set the water pipe assembly LH on the engine, and connect the water pipe hose LH (B) to the oil pan upper.
- 2) Secure the water pipe assembly LH to the cylinder head LH with bolt (A).

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



- 3) Remove the lifting device and wire ropes.



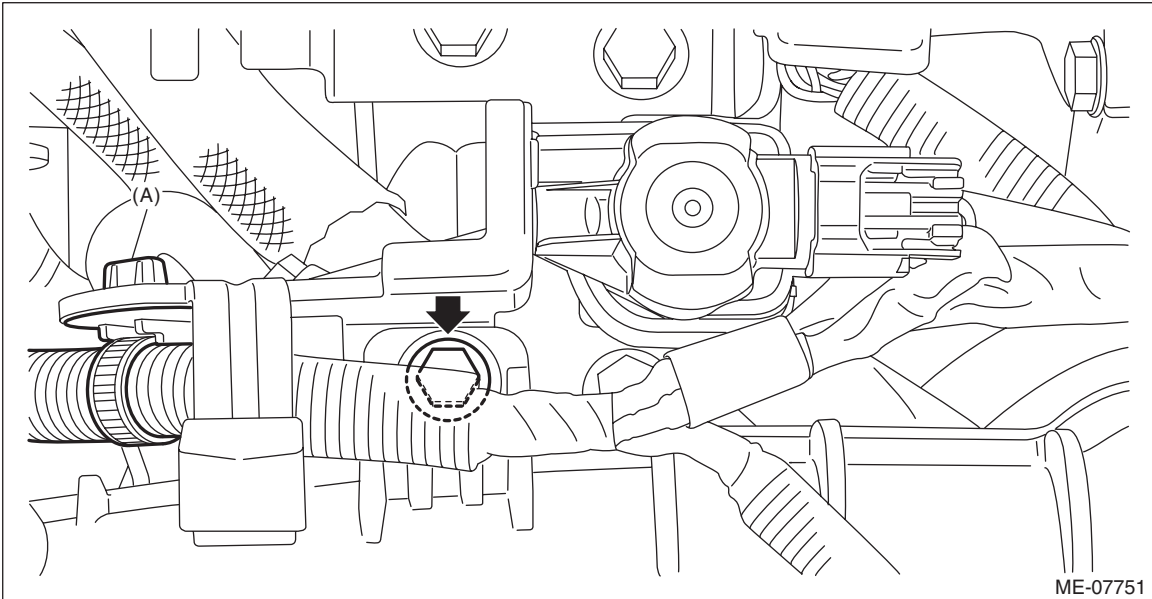
Water Pipe Assembly

COOLING

4) Install the bolts which secure the purge control solenoid valve bracket to the intake manifold, and secure the engine harness to the purge control solenoid valve bracket with the clip (A).

Tightening torque:

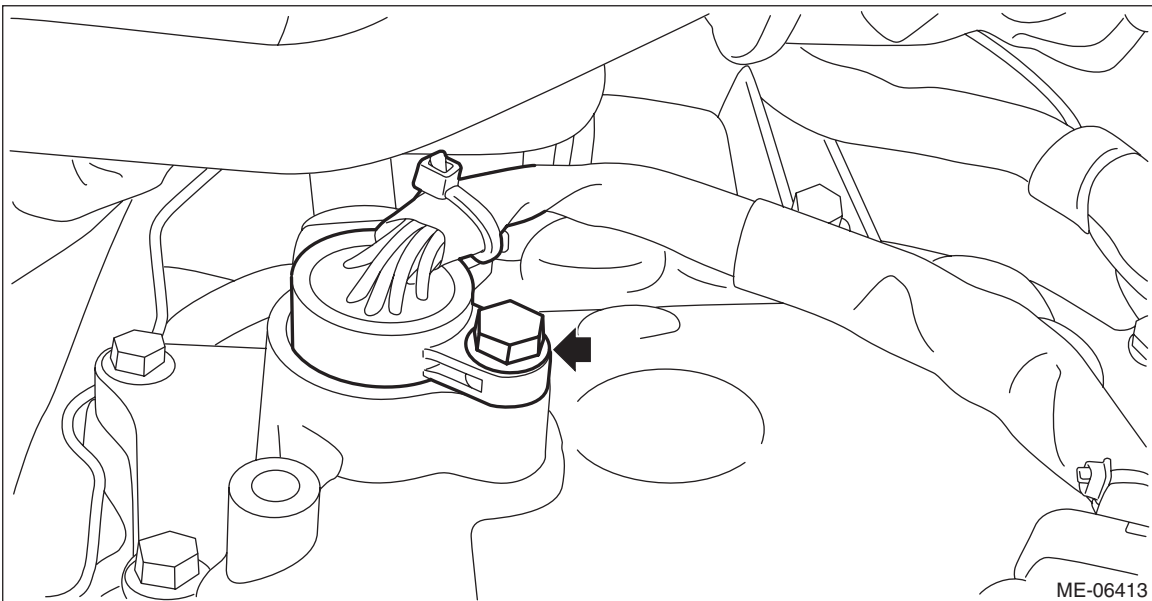
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



5) Remove the bolt and turn the transmission harness counterclockwise to install the transmission harness to the control valve body.

Tightening torque:

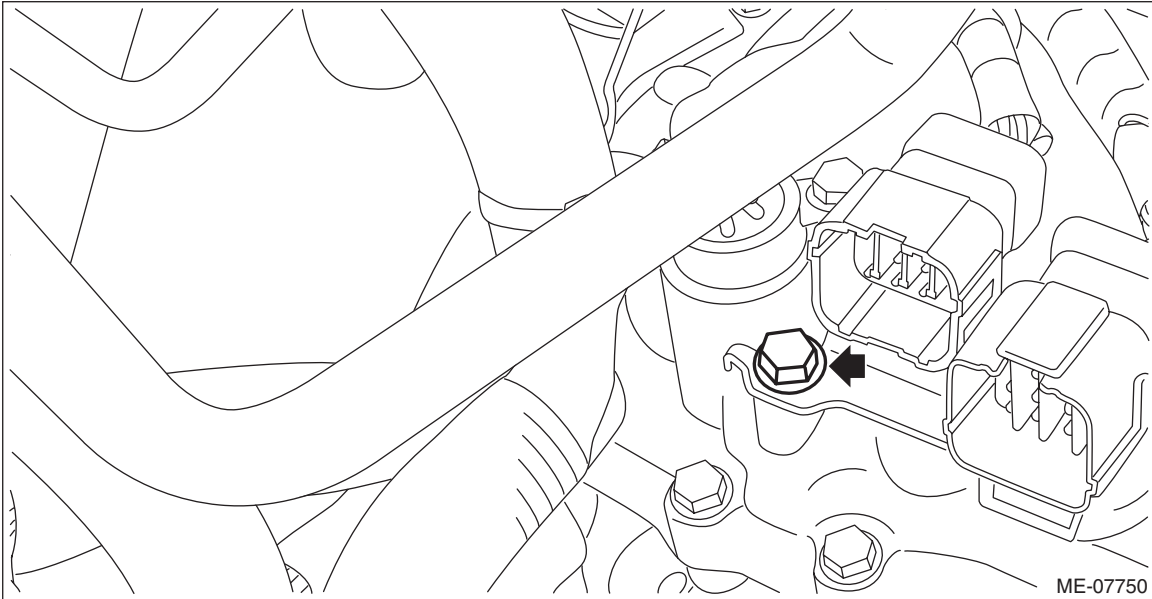
7 N·m (0.7 kgf-m, 5.2 ft-lb)



6) Install the bolt which holds the transmission harness stay.

Tightening torque:

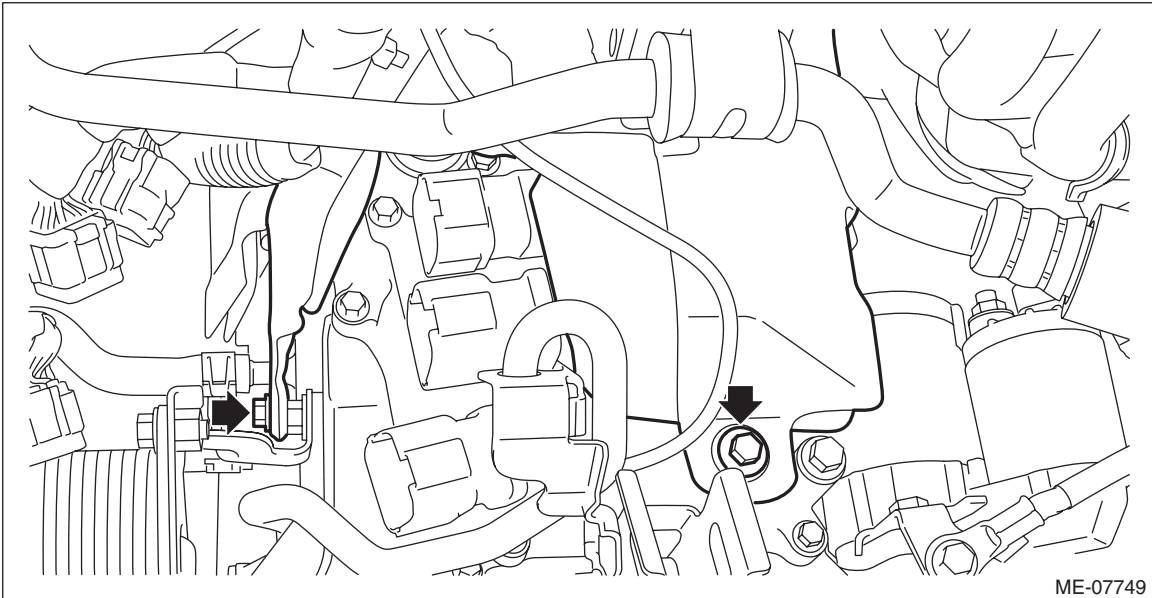
7 N·m (0.7 kgf-m, 5.2 ft-lb)



7) Install the transmission case cover.

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)



8) Connect the bulkhead harness connector to the transmission harness connector (C), inhibitor harness connector (D) and drive motor harness connector (E).

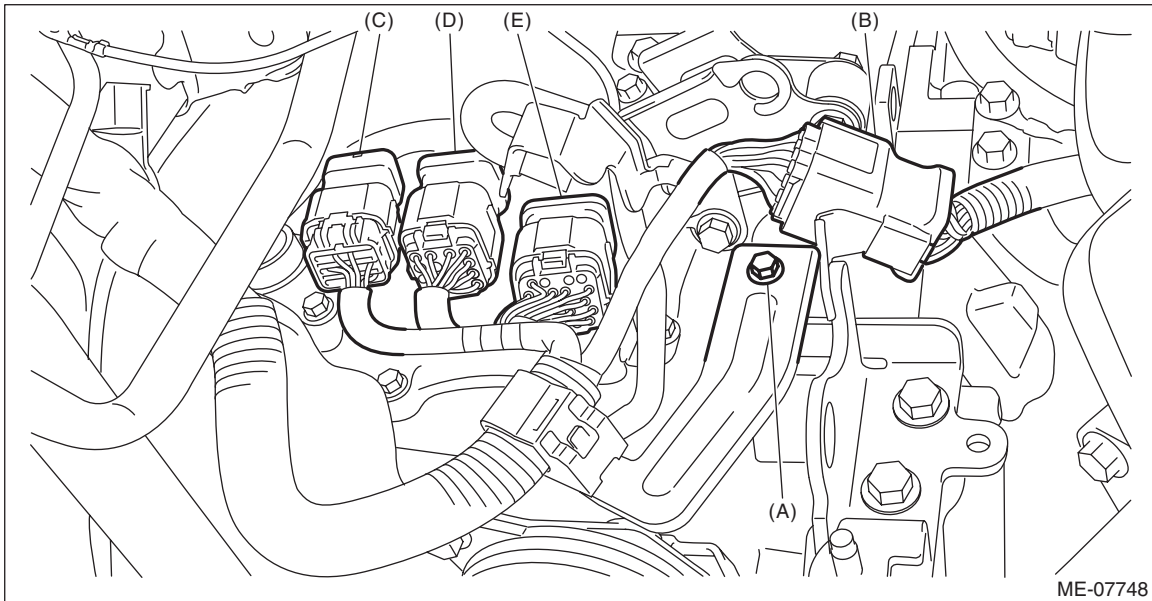
Water Pipe Assembly

COOLING

9) Connect the bulkhead harness connector to the engine harness connector (brown) (B), and install the bolt (A) securing the bulkhead harness connector bracket.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



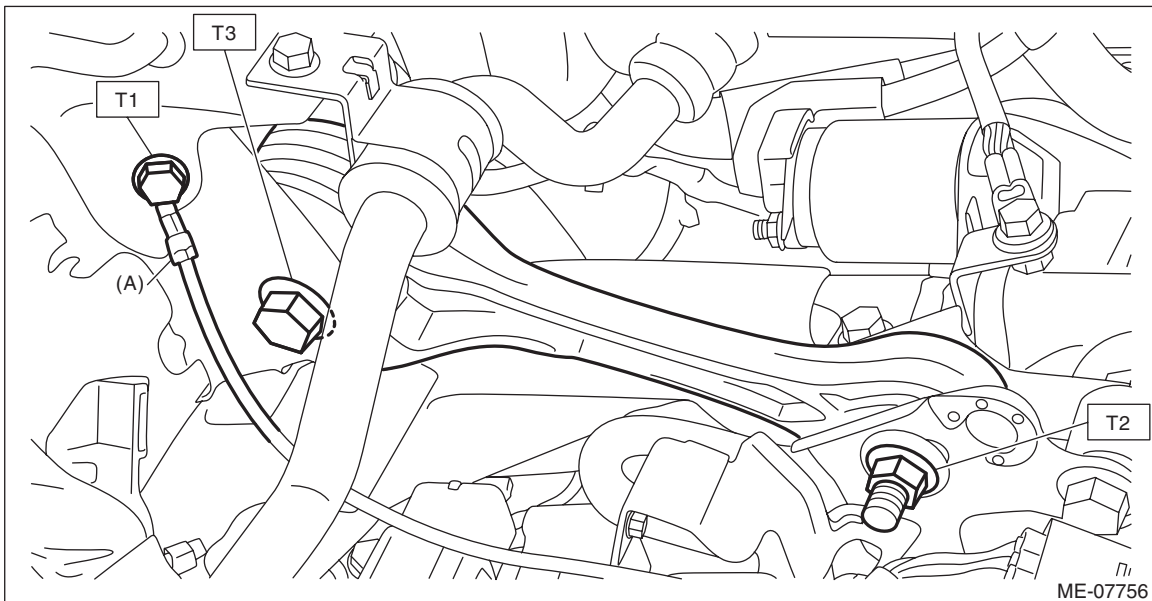
10) Install the pitching stopper, and connect the transmission radio ground terminal (A) to the vehicle.

Tightening torque:

T1: 13 N·m (1.3 kgf-m, 9.6 ft-lb)

T2: 50 N·m (5.1 kgf-m, 36.9 ft-lb)

T3: 58 N·m (5.9 kgf-m, 42.8 ft-lb)



11) Lift up the vehicle.

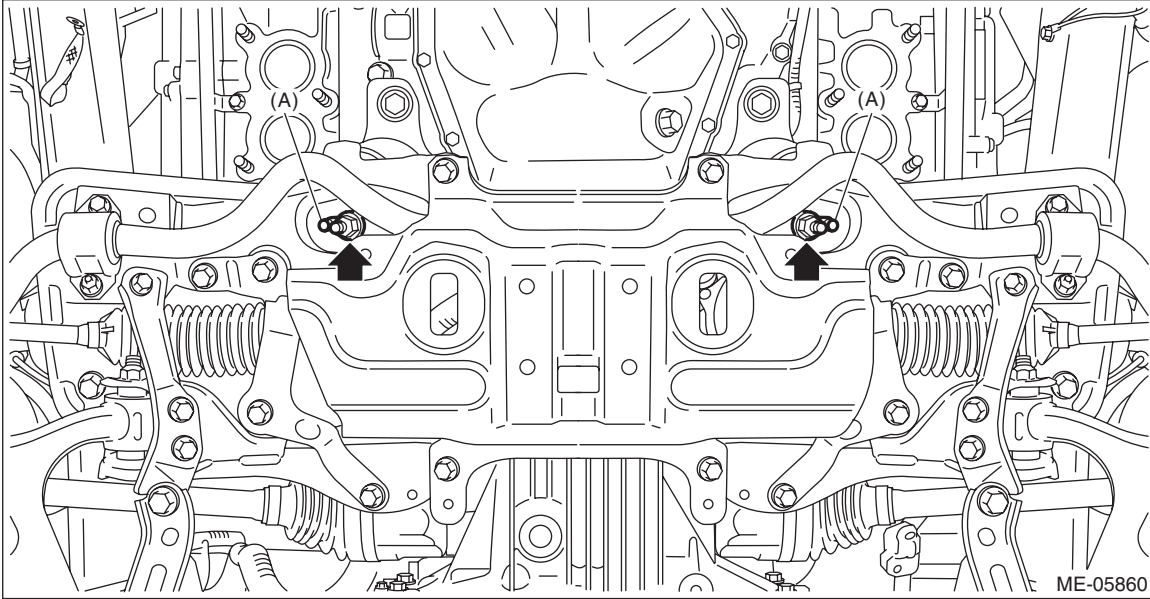
12) Install the nuts which hold the engine mounting to the crossmember.

NOTE:

- Make sure that locators (A) of the engine mounting are securely inserted.
- Use a new nut.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)



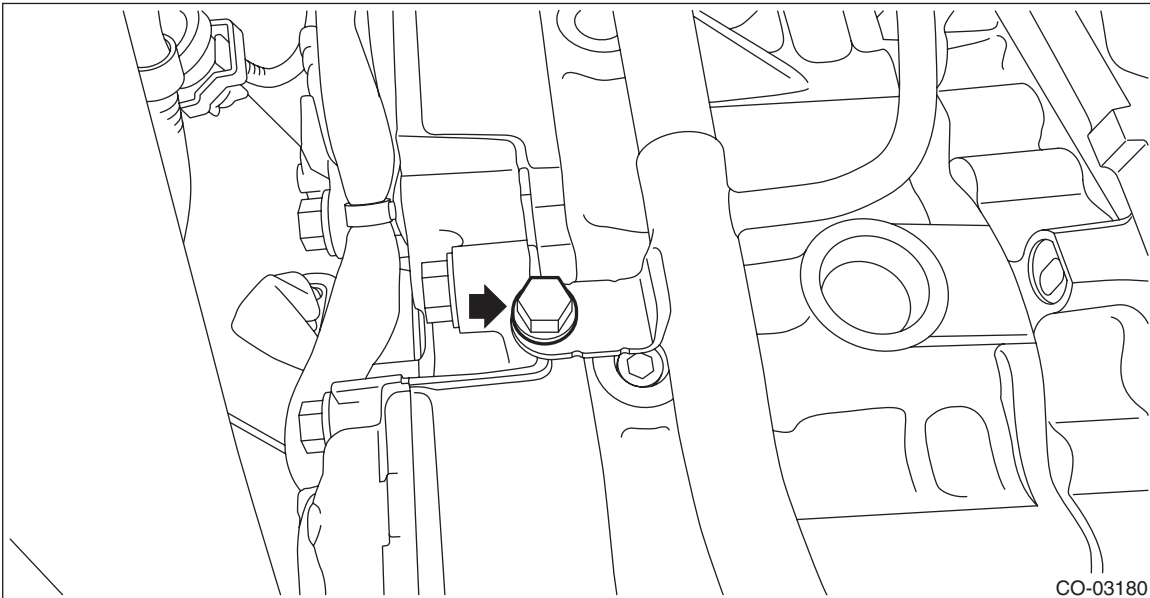
13) Install the front exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-8, INSTALLATION, Front Exhaust Pipe.>

14) Lower the vehicle.

15) Install the bolt which secures the water pipe assembly LH to the cylinder head LH.

Tightening torque:

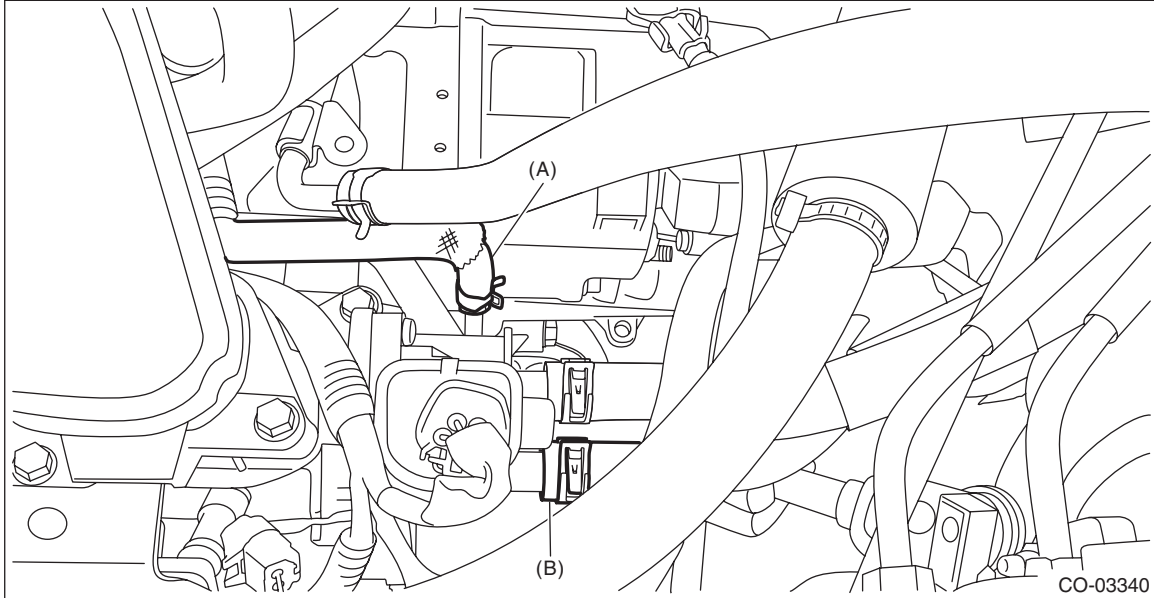
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



Water Pipe Assembly

COOLING

16) Connect the preheater hose (A) and the heater outlet hose (B) to the water pipe assembly LH.



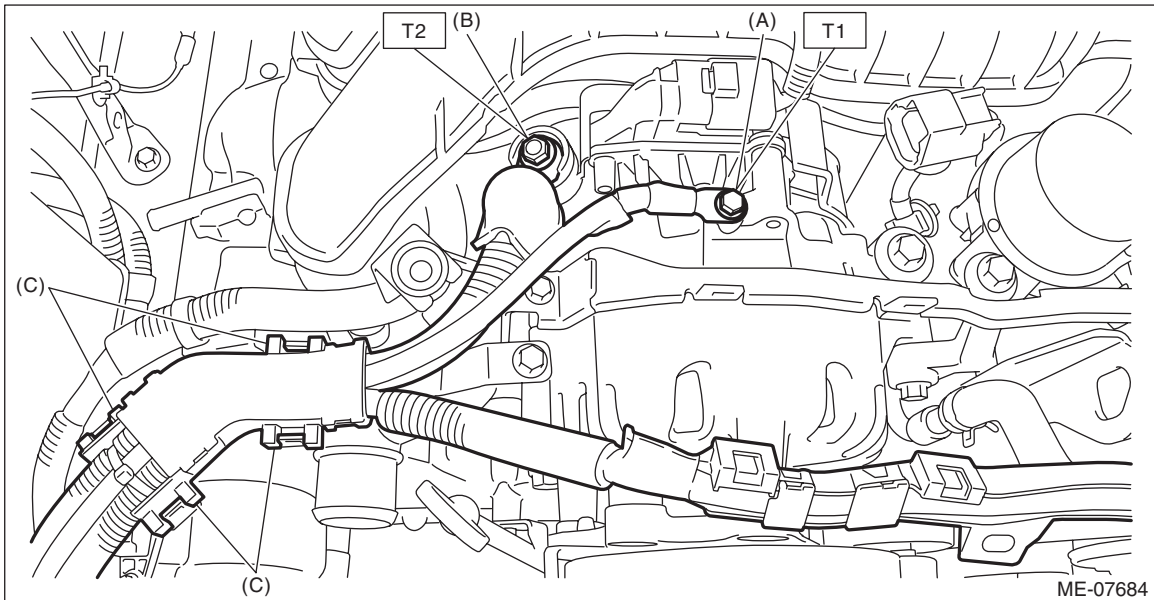
17) Set the battery cable assembly, and install the clip (C) which secures the battery cable assembly to the battery cable bracket No. 1.

18) Connect the terminal (A) and the terminal (B) to ISG.

Tightening torque:

T1: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

T2: 15.5 N·m (1.6 kgf-m, 11.4 ft-lb)



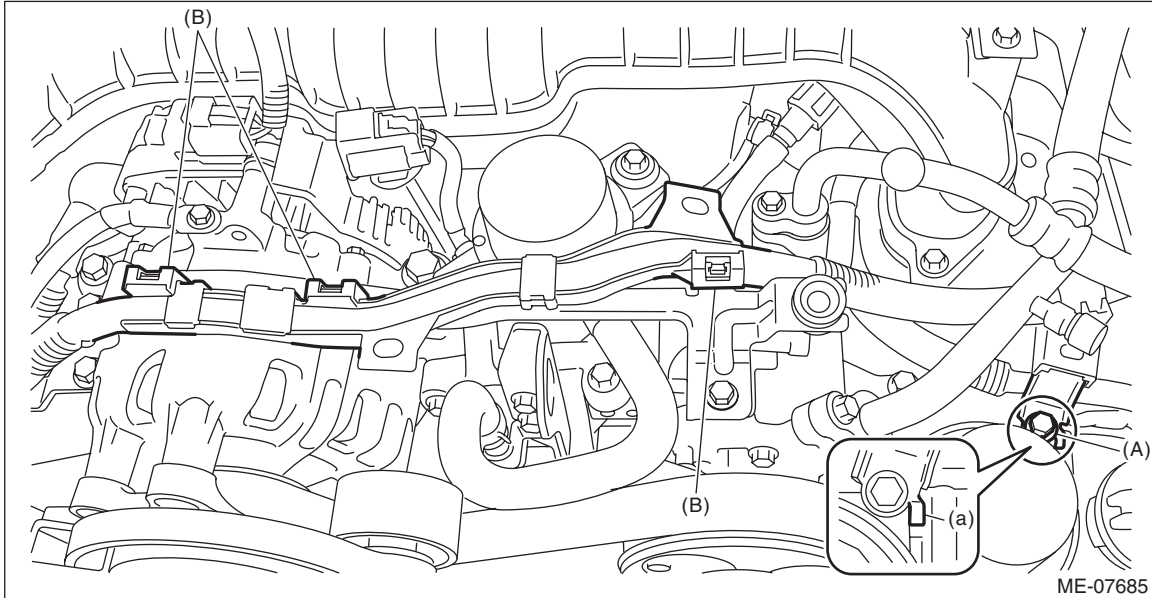
19) Secure the battery cable assembly to the collector cover bracket with the clip (B), and install the bolt (A) which secures the battery cable stay to the chain cover.

NOTE:

When installing the battery cable stay, install it by fitting the folded end (a) of the battery cable stay to the chain cover boss.

Tightening torque:

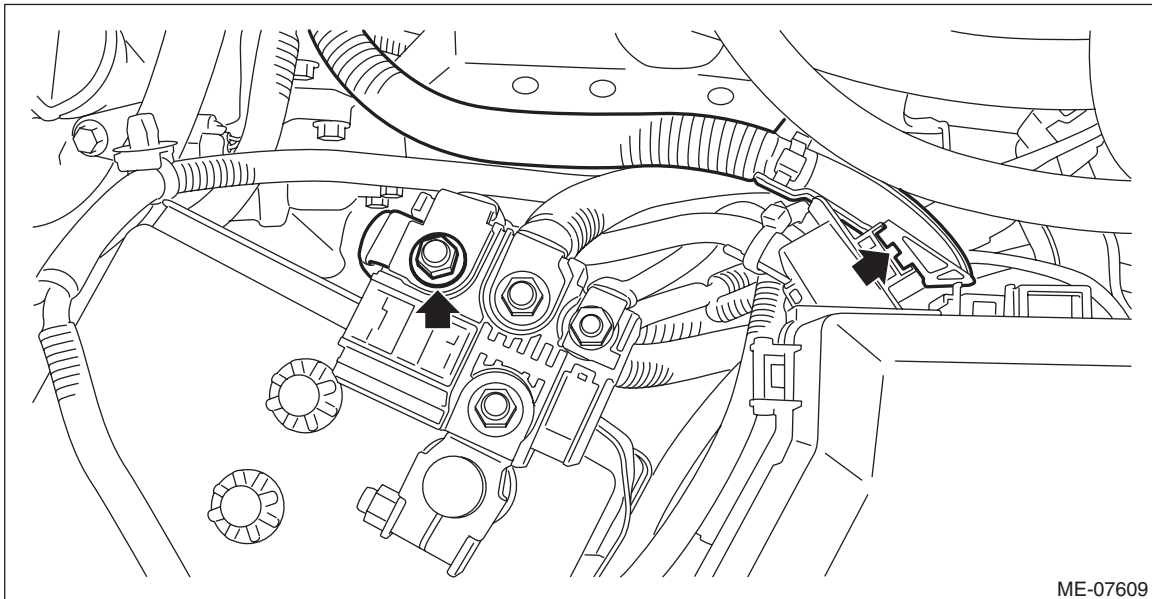
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



20) Install the battery cable assembly to the main fuse box, and install the nut which secures the battery cable assembly to the slow blow fuse (12 volt auxiliary battery).

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



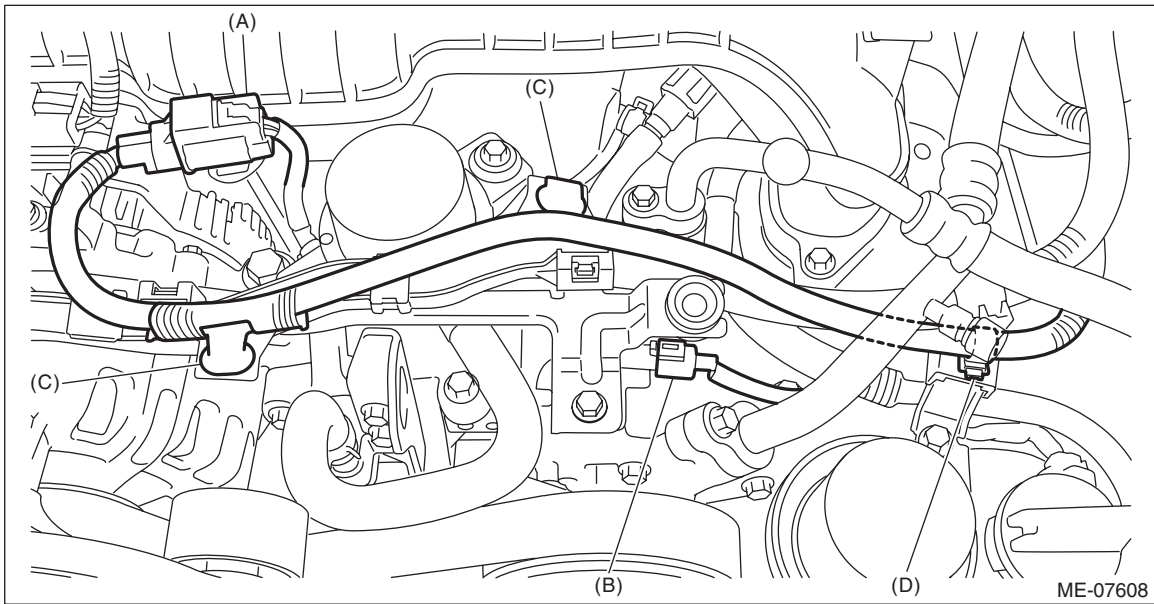
21) Install the terminal boot to the positive terminal of the 12 volt auxiliary battery.

22) Set the harness, and secure the harness to the battery cable assembly with the clip (C) and the clip (D).

Water Pipe Assembly

COOLING

23) Connect the connector (A) to the brake vacuum pump, and connect the connector (B) to the A/C compressor.



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

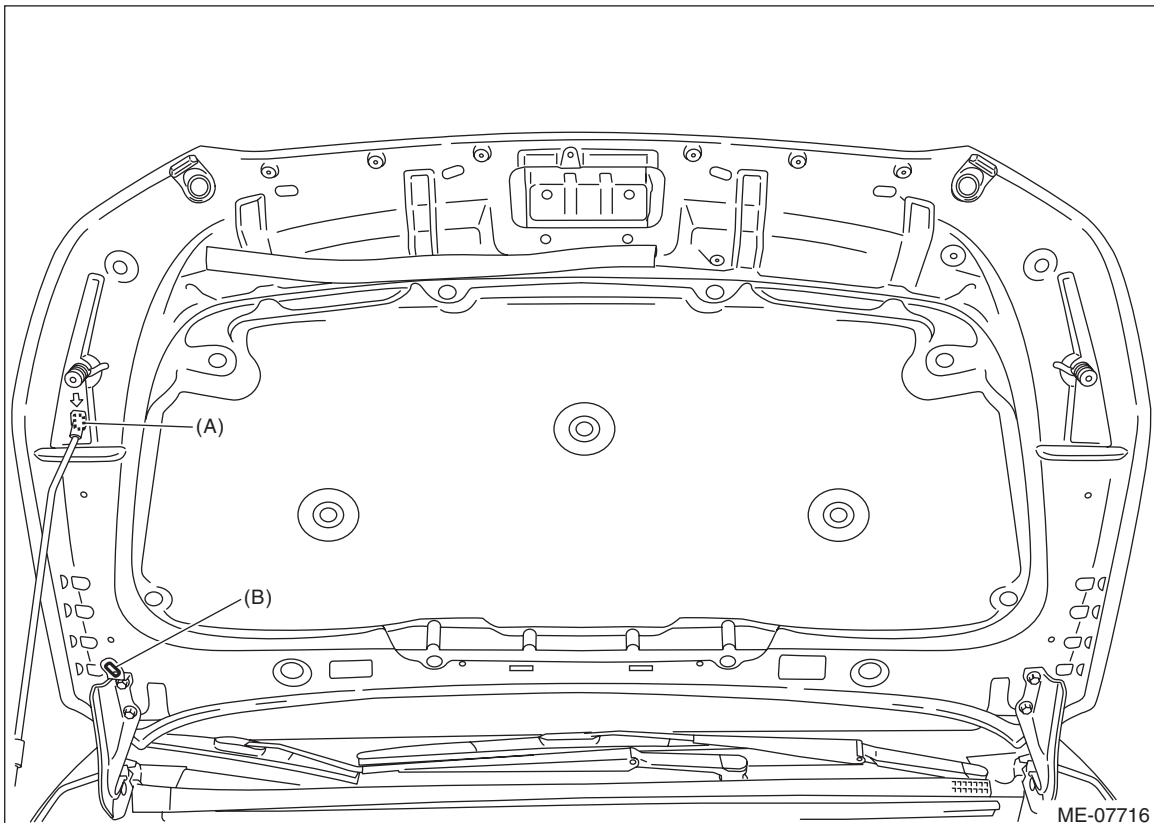
25) Install the air intake duct. <Ref. to IN(H4DO(HEV))-15, INSTALLATION, Air Intake Duct.>

26) Fill engine coolant. <Ref. to CO(H4DO(w/o HEV))-16, FILLING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

27) Install the collector cover.

28) Connect the battery ground terminal. <Ref. to NT-5, BATTERY, NOTE, Note.>

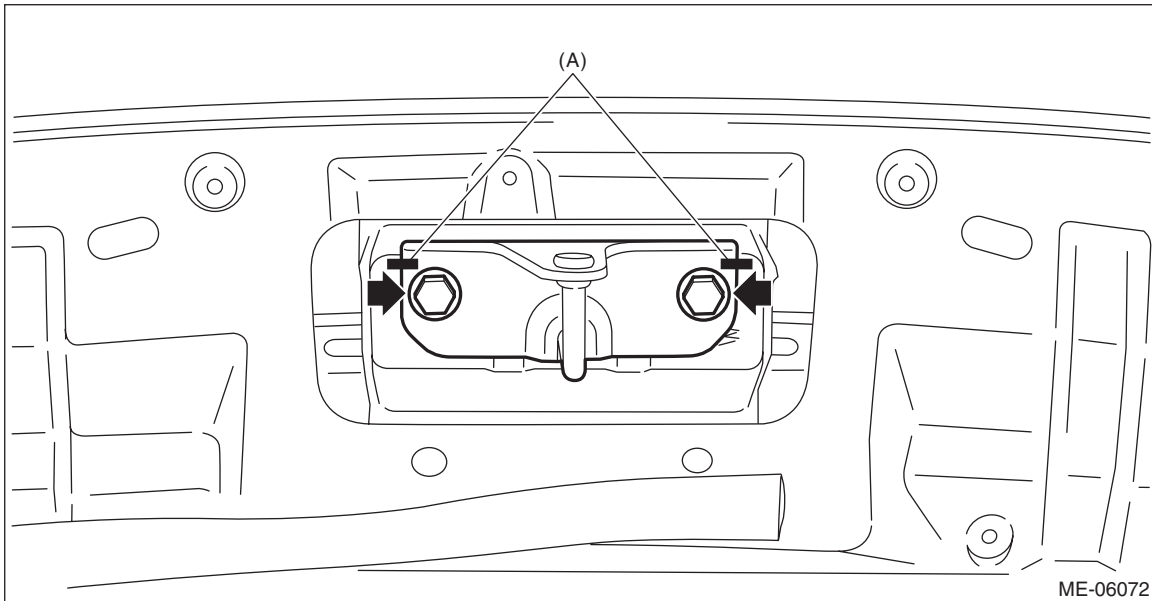
29) Change the front hood stay position from (B) to (A).



30) Install the front hood striker to the front hood by aligning the alignment marks (A), and close the front hood.

Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)



C: INSPECTION

- 1) Check that the water pipe assembly has no deformation, cracks or other damages.
- 2) Check that the hose has no cracks, damage or loose part.