

LUBRICATION

LU(H4DO)

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General Description

LUBRICATION

1. General Description

A: SPECIFICATION

- Non-turbo model

Lubrication method				Forced lubrication		
Oil pump	Pump type			Trochoid type		
	Number of teeth	Inner rotor		11		
		Outer rotor		12		
	Outer rotor diameter × Thickness			mm (in)		77 × 12 (3.03 × 0.47)
	Performance (Oil temperature 120°C (248°F))	600 rpm	Discharge pressure	kPa (kgf/cm ² , psi)	30 (0.3, 4.3)	
			Discharge rate	L (US qt, Imp qt)/min	6.0 (6.3, 5.3) or more	
		6,000 rpm	Discharge pressure	kPa (kgf/cm ² , psi)	260 (2.7, 37.7)	
			Discharge rate	L (US qt, Imp qt)/min	47 (49.7, 41.4) or more	
	Relief valve working pressure (2-step relief)	1st opening pressure		kPa (kgf/cm ² , psi)	150 (1.5, 21.7)	
Main opening pressure		kPa (kgf/cm ² , psi)	570 (5.8, 82.6)			
Oil filter	Filter type			Full-flow filter type		
	Filtration area	cm ² (sq in)	Outer diameter: 68 mm (2.68 in) (black)		1,100 (171)	
			Outer diameter: 67.4 mm (2.65 in) (blue)		867 (134.3)	
	By-pass valve opening pressure			kPa (kgf/cm ² , psi)	160 (1.6, 23.2)	
	Outer diameter × Width	mm (in)	Outer diameter: 68 mm (2.68 in) (black)		68 × 85 (2.68 × 3.35)	
			Outer diameter: 67.4 mm (2.65 in) (blue)		67.4 × 87.1 (2.65 × 3.43)	
	Installation screw specifications			M 20 × 1.5		
Oil pressure switch	Type			Immersed contact point type		
	Operating voltage			12 V		
	Warning light operating pressure			kPa (kgf/cm ² , psi)	14.7 (0.1, 2.1)	
	Proof pressure			kPa (kgf/cm ² , psi)	981 (10, 142.2)	
Engine oil	Total capacity (at overhaul)			L (US qt, Imp qt)	5.7 (6.0, 5.0)	
	When replacing engine oil and oil filter			L (US qt, Imp qt)	4.8 (5.1, 4.2)	
	When replacing engine oil only			L (US qt, Imp qt)	4.6 (4.9, 4.0)	

General Description

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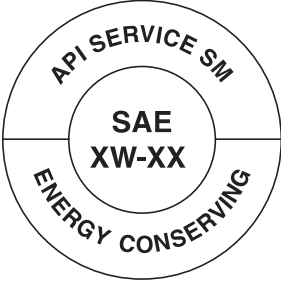
Specified oil:

CAUTION:

- Use 0W-20 (synthetic oil).
- It is acceptable to fill an engine with oil of another brand when replacing the oil, but make sure to use the following engine oil specified by Subaru.

NOTE:

The proper viscosity oil helps the engine maintain its ideal temperature, and cranking speed increased by reducing viscosity friction in hot condition.

Engine oil standard		SAE viscosity No.
 RM-00076 Those with the API standard SM "Energy Conserving" or SN "Resource Conserving" logo. or  RM-00002 Those with the ILSAC standard GF-4 or GF-5 "starburst mark" displayed on top of the container.		0W-20 (synthetic oil)

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General Description

LUBRICATION

- Turbo model

Lubrication method				Forced lubrication	
Oil pump	Pump type			Trochoid type	
	Number of teeth	Inner rotor		11	
		Outer rotor		12	
	Outer rotor diameter × Thickness			mm (in)	
	Performance (Oil temperature 120°C (248°F))	600 rpm	Discharge pressure	kPa (kgf/cm ² , psi)	35 (0.4, 5.1)
			Discharge rate	L (US qt, Imp qt)/min	7.4 (7.8, 6.5) or more
		6,000 rpm	Discharge pressure	kPa (kgf/cm ² , psi)	321 (3.3, 46.6)
			Discharge rate	L (US qt, Imp qt)/min	59 (62.4, 51.9) or more
	Relief valve working pressure		kPa (kgf/cm ² , psi)		700 (7.1, 102)
Oil filter	Filter type			Full-flow filter type	
	Filtration area	cm ² (sq in)	Outer diameter: 68 mm (2.68 in) (black)		1,100 (171)
			Outer diameter: 67.4 mm (2.65 in) (blue)		867 (134.3)
	By-pass valve opening pressure			kPa (kgf/cm ² , psi)	160 (1.6, 23.2)
	Outer diameter × Width	mm (in)	Outer diameter: 68 mm (2.68 in) (black)		68 × 85 (2.68 × 3.35)
			Outer diameter: 67.4 mm (2.65 in) (blue)		67.4 × 87.1 (2.65 × 3.43)
	Installation screw specifications			M 20 × 1.5	
Oil pressure switch	Type			Immersed contact point type	
	Operating voltage			12 V	
	Warning light operating pressure			kPa (kgf/cm ² , psi)	14.7 (0.1, 2.1)
	Proof pressure			kPa (kgf/cm ² , psi)	981 (10, 142.2)
Engine oil	Total capacity (at overhaul)			L (US qt, Imp qt)	6.0 (6.3, 5.3)
	When replacing engine oil and oil filter			L (US qt, Imp qt)	5.1 (5.4, 4.5)
	When replacing engine oil only			L (US qt, Imp qt)	4.9 (5.2, 4.3)

LU(H4DO)-4

General Description

LUBRICATION

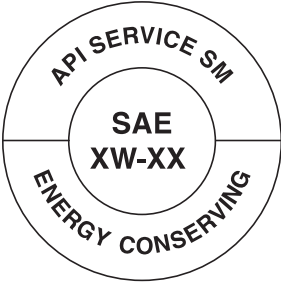
Specified oil:

CAUTION:

- Use 5W-30 (synthetic oil).
- It is acceptable to fill an engine with oil of another brand when replacing the oil, but make sure to use the following engine oil specified by Subaru.
- Do not use 0W-20 for turbo model. If used for turbo model, it may lead to trouble.

NOTE:

The proper viscosity oil helps the engine maintain its ideal temperature, and cranking speed increased by reducing viscosity friction in hot condition.

Engine oil standard		SAE viscosity No.
 RM-00076 Those with the API standard SM “Energy Conserving” or SN “Resource Conserving” logo. or  RM-00002 Those with the ILSAC standard GF-4 or GF-5 “starburst mark” displayed on top of the container.		5W-30 (synthetic oil)

LU(H4DO)-5



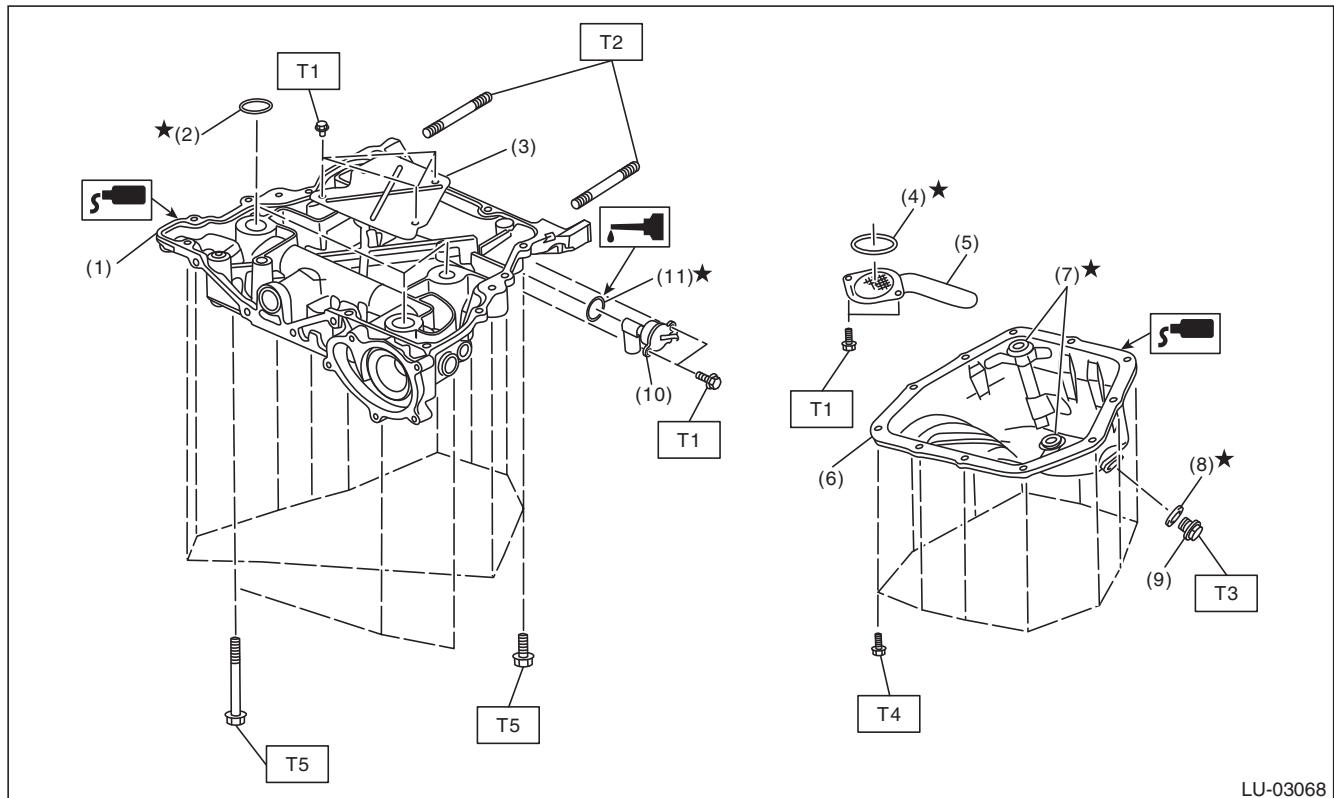
General Description

LUBRICATION

B: COMPONENT

1. OIL PAN AND STRAINER

- Non-turbo model



- | | |
|-------------------|-----------------------|
| (1) Oil pan upper | (7) Oil pan seal ring |
| (2) O-ring | (8) Drain plug gasket |
| (3) Baffle plate | (9) Drain plug |
| (4) O-ring | (10) Oil level switch |
| (5) Oil strainer | (11) O-ring |
| (6) Oil pan | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.7, 4.7)

T2: 10 (1.0, 7.4)

T3: 41.7 (4.3, 30.8)

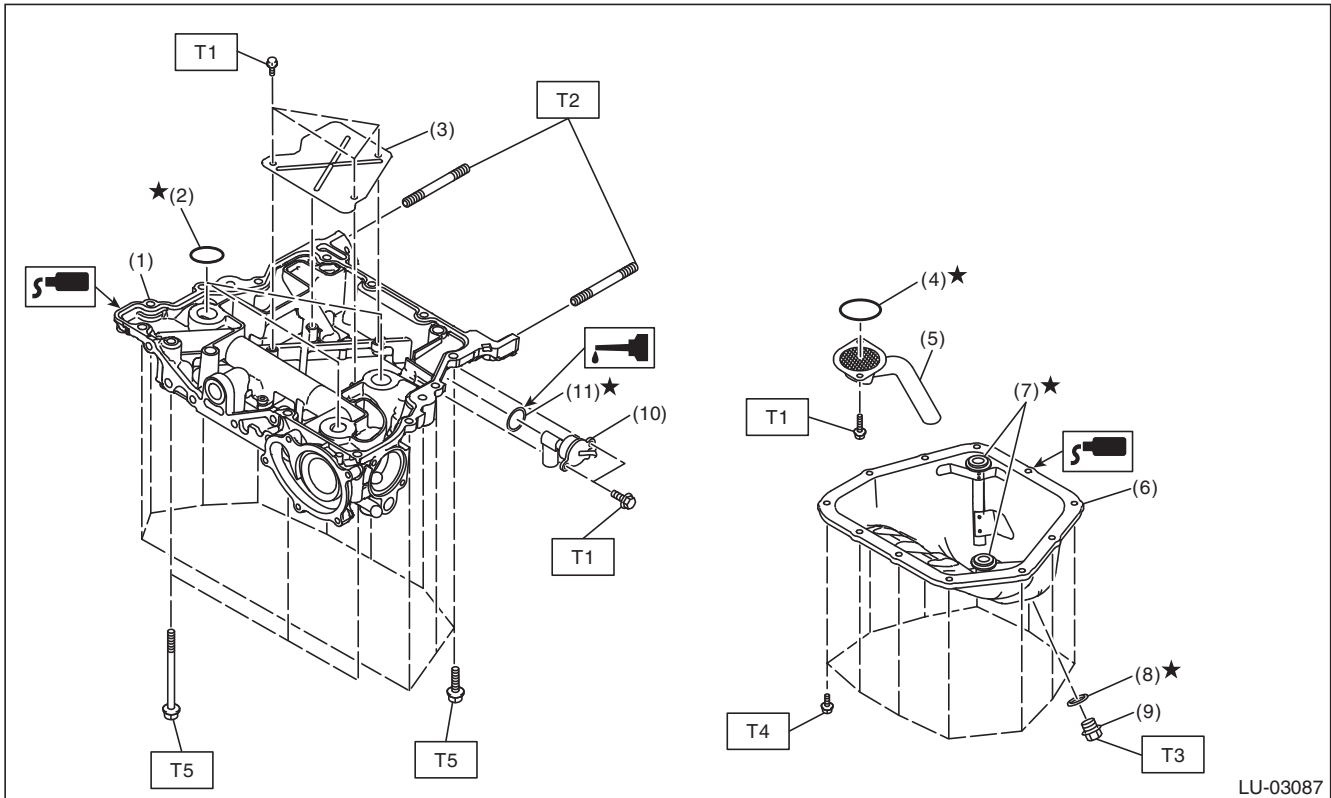
T4: <Ref. to LU(H4DO)-29, OIL PAN, INSTALLATION, Oil Pan and Strainer.>

T5: <Ref. to LU(H4DO)-37, OIL PAN UPPER, INSTALLATION, Oil Pan and Strainer.>

General Description

LUBRICATION

• Turbo model



LU-03087

- | | |
|-------------------|-----------------------|
| (1) Oil pan upper | (7) Oil pan seal ring |
| (2) O-ring | (8) Drain plug gasket |
| (3) Baffle plate | (9) Drain plug |
| (4) O-ring | (10) Oil level switch |
| (5) Oil strainer | (11) O-ring |
| (6) Oil pan | |

Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.7, 4.7)

T2: 10 (1.0, 7.4)

T3: 41.7 (4.3, 30.8)

T4: <Ref. to LU(H4DO)-29, OIL PAN, INSTALLATION, Oil Pan and Strainer.>

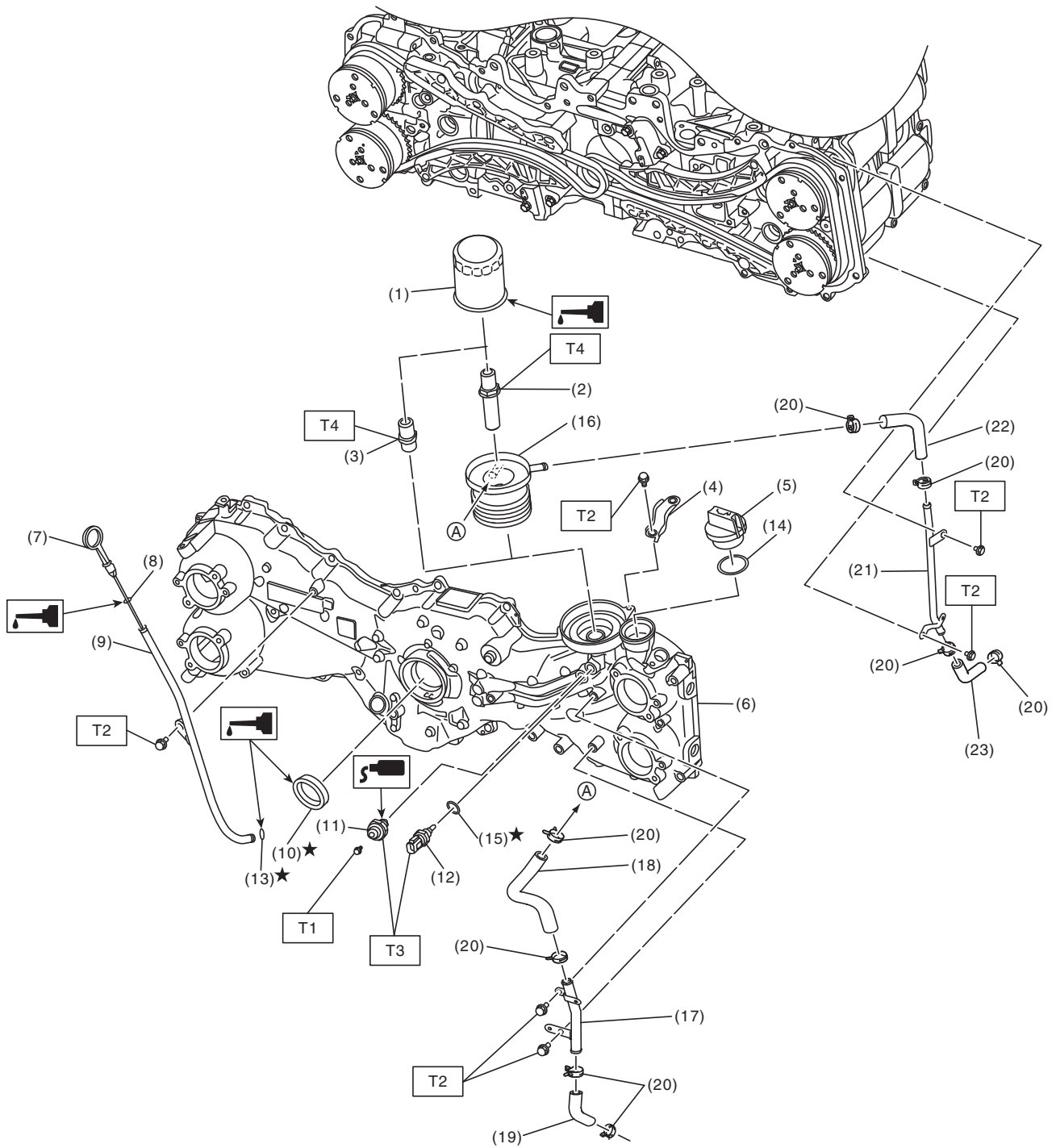
T5: <Ref. to LU(H4DO)-37, OIL PAN UPPER, INSTALLATION, Oil Pan and Strainer.>

LU(H4DO)-7

General Description

LUBRICATION

2. OIL FILTER AND OIL LEVEL GAUGE



LU-03086

LU(H4DO)-8

General Description

LUBRICATION

(1) Oil filter	(11) Oil pressure switch	(21) Side engine oil cooler pipe (turbo model)
(2) Oil cooler connector (turbo model)	(12) Engine oil temperature sensor	(22) Side engine oil cooler hose A (turbo model)
(3) Oil pump union (non-turbo model)	(13) O-ring	(23) Side engine oil cooler hose B (turbo model)
(4) Generator code stay (non-turbo model)	(14) O-ring	
(5) Oil filler cap	(15) Gasket	Tightening torque: N·m (kgf-m, ft-lb)
(6) Chain cover	(16) Oil cooler (turbo model)	T1: 1.5 (0.2, 1.1)
(7) Oil level gauge	(17) Front engine oil cooler pipe (turbo model)	T2: 6.4 (0.7, 4.7)
(8) O-ring	(18) Front engine oil cooler hose A (turbo model)	T3: 18 (1.8, 13.3)
(9) Oil level gauge guide	(19) Front engine oil cooler hose B (turbo model)	T4: 45 (4.6, 33.2)
(10) Front oil seal	(20) Clip (turbo model)	

C: CAUTION

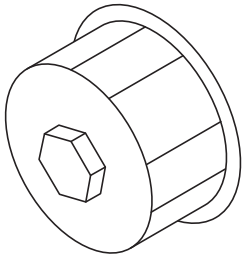
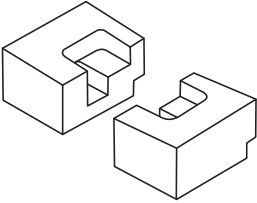
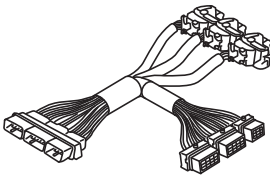
- Prior to starting work, pay special attention to the following:
 1. Always wear work clothes, a safety cap, protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
 2. Protect the vehicle using a seat cover, fender cover, etc.
 3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Prepare a container and cloth when performing work which oil possibly spills. If oil spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.
- If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emitting smoke or causing a fire.
- Follow all government and local regulations concerning disposal of refuse when disposing of oil.

General Description

LUBRICATION

D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18332AA000	18332AA000	OIL FILTER WRENCH	Used for removing and installing oil filter (black). (Outer diameter: 68 mm (2.68 in))
 ST18632AA020	18632AA020	STAND ASSY	Used for removing and installing oil pan. (Turbo model)
 ST18460AA030	18460AA030 (Newly adopted tool)	CHECK BOARD	Used for inspecting the oil level switch. (Turbo model)

2. GENERAL TOOL

TOOL NAME	REMARKS
Oil filter wrench (65/67 mm 14 Flutes)	Used for removing and installing oil filter (blue). (Outer diameter: 67.4 mm (2.65 in))
Circuit tester	Used for measuring resistance and voltage.

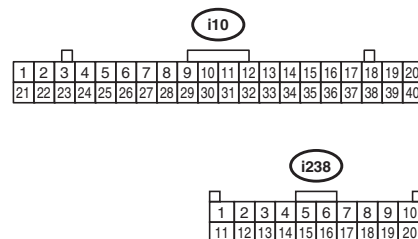
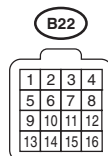
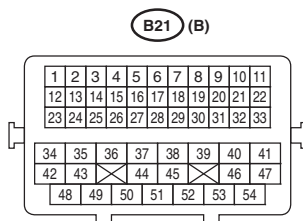
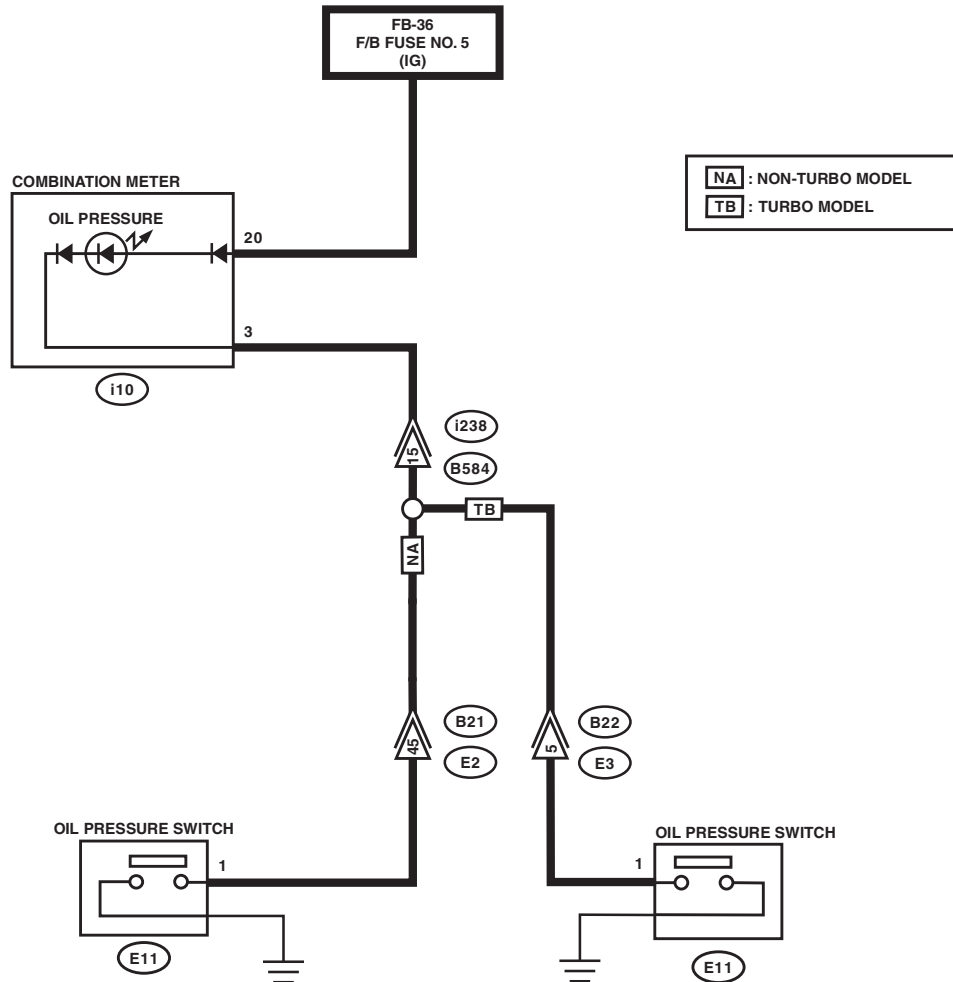
Oil Pressure System

LUBRICATION

2. Oil Pressure System

A: WIRING DIAGRAM

Oil pressure warning system <Ref. to WI-310, WIRING DIAGRAM, Oil Pressure Warning Light System.>



LU-03075

Oil Pressure System

LUBRICATION

B: INSPECTION

Step	Check	Yes	No
1 CHECK COMBINATION METER. 1) Turn the ignition switch to ON. (engine OFF) 2) Check the warning light in the combination meter.	Does the warning light illuminate?	Go to step 2.	Repair or replace the combination meter. <Ref. to IDI-11, INSPECTION, Combination Meter System.>
2 CHECK POWER SUPPLY TO OIL PRESSURE SWITCH. 1) Turn the ignition switch to OFF. 2) Disconnect the terminal from oil pressure switch. 3) Turn the ignition switch to ON. 4) Measure the voltage of harness between oil pressure switch harness terminal and chassis ground. Terminals (E11) No. 1 (+) — Chassis ground (-):	Is the voltage 10 V or more?	Replace the oil pressure switch. <Ref. to LU(H4DO)-42, Oil Pressure Switch.>	Go to step 3.
3 CHECK COMBINATION METER. 1) Turn the ignition switch to OFF. 2) Remove the combination meter. 3) Measure the resistance of combination meter. Terminals No. 20 — No. 3:	Is the resistance less than 10 Ω ?	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit of harness between combination meter and oil pressure switch • Poor contact of combination meter connector • Poor contact of oil pressure switch terminal • Poor contact of coupling connector	Repair or replace the combination meter. <Ref. to IDI-11, INSPECTION, Combination Meter System.>

3. Engine Oil

A: INSPECTION

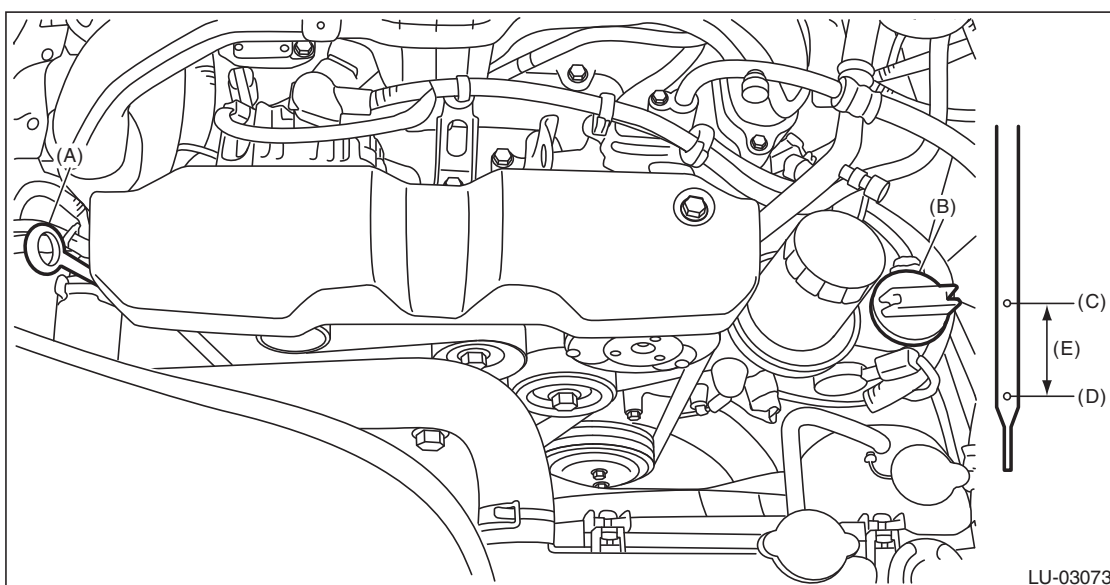
CAUTION:

If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emitting smoke or causing a fire.

- 1) Park the vehicle on a level surface.
- 2) Remove the oil level gauge and wipe away the oil.
- 3) Reinsert the oil level gauge all the way. Be sure that the oil level gauge is correctly inserted and properly orientated.
- 4) Pull out the oil level gauge again, and check both sides of the oil level gauge. Use a lower side to determine the engine oil level. If the engine oil level is below "L" line, check for oil leakage from engine and add oil to bring the level up to "F" line.
- 5) Start the engine to circulate the oil in engine.
- 6) After turning off the engine, wait a few minutes for the oil to return to the oil pan before checking the level.

NOTE:

- To prevent overfilling of engine oil, do not add oil above "F" line when the engine is cold.
- As the oil level gauge is used for daily maintenance, "F" line and "L" line is set assuming that the engine is cold.
- Non-turbo model



(A) Oil level gauge

(D) "L" line

(B) Oil filler cap

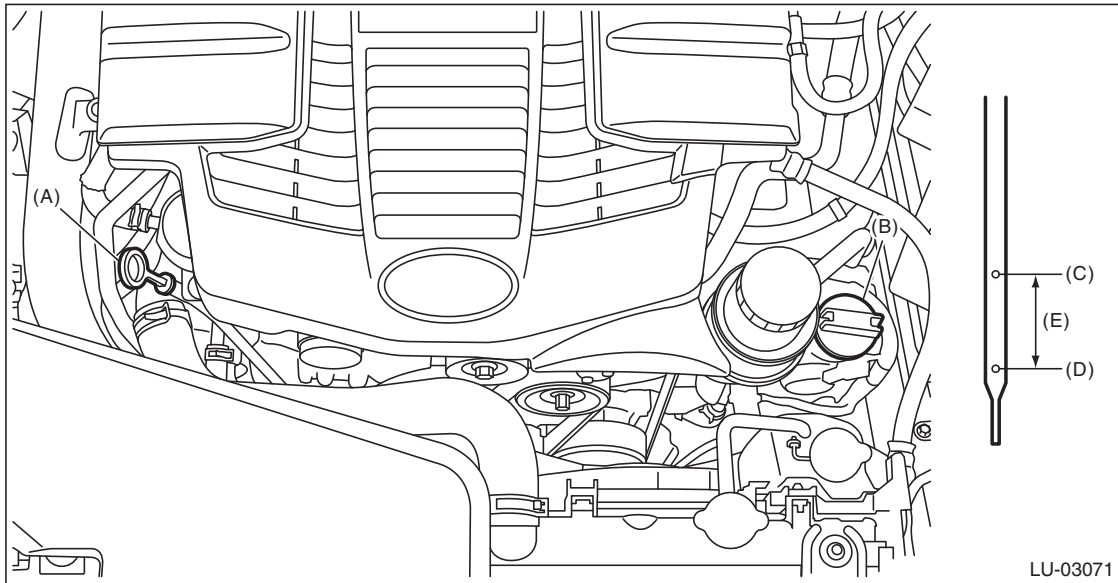
(E) Approx. 1.0 L (1.1 US qt,
0.9 Imp qt)

(C) "F" line

Engine Oil

LUBRICATION

- Turbo model



- | | | |
|---------------------|--|--------------|
| (A) Oil level gauge | (B) Oil filler cap | (C) "F" line |
| (D) "L" line | (E) Approx. 1.0 L (1.1 US qt,
0.9 Imp qt) | |

B: REPLACEMENT

CAUTION:

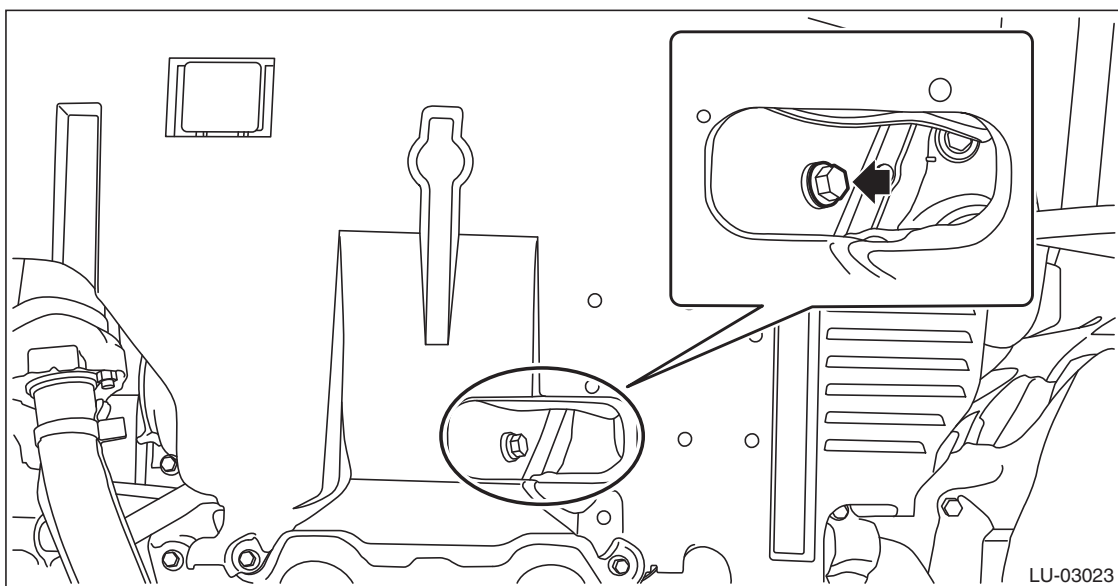
If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emitting smoke or causing a fire.

- 1) Open the oil filler cap for quick draining of engine oil.
- 2) Lift up the vehicle.
- 3) Drain engine oil by loosening the drain plug.

NOTE:

Prepare the container for draining of engine oil.

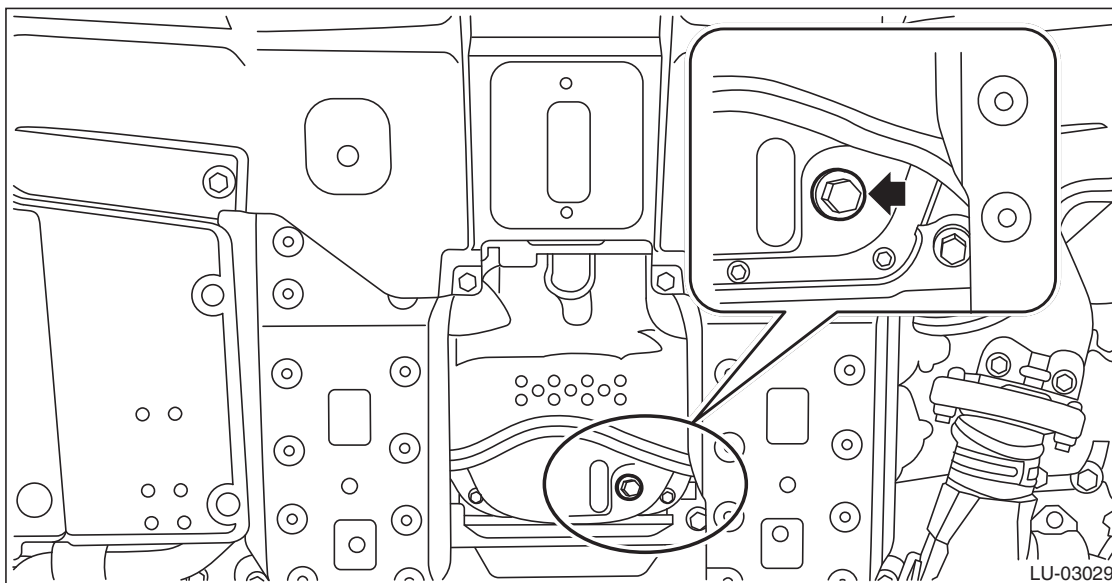
- Non-turbo model



Engine Oil

LUBRICATION

- Turbo model



4) After draining the engine oil, tighten the engine oil drain plug.

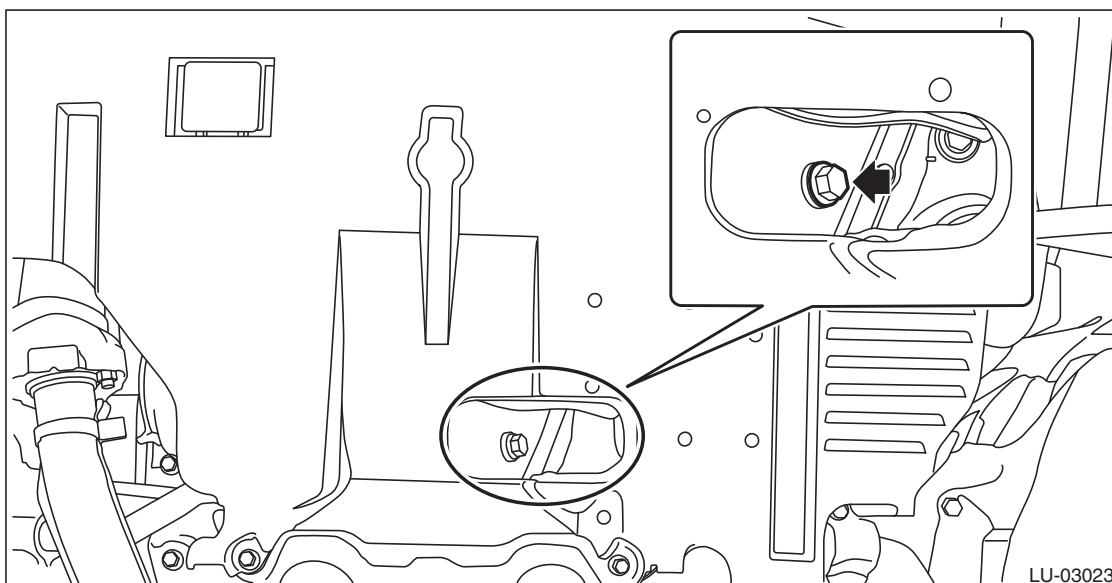
NOTE:

Use a new drain plug gasket.

Tightening torque:

41.7 N·m (4.3 kgf-m, 30.8 ft-lb)

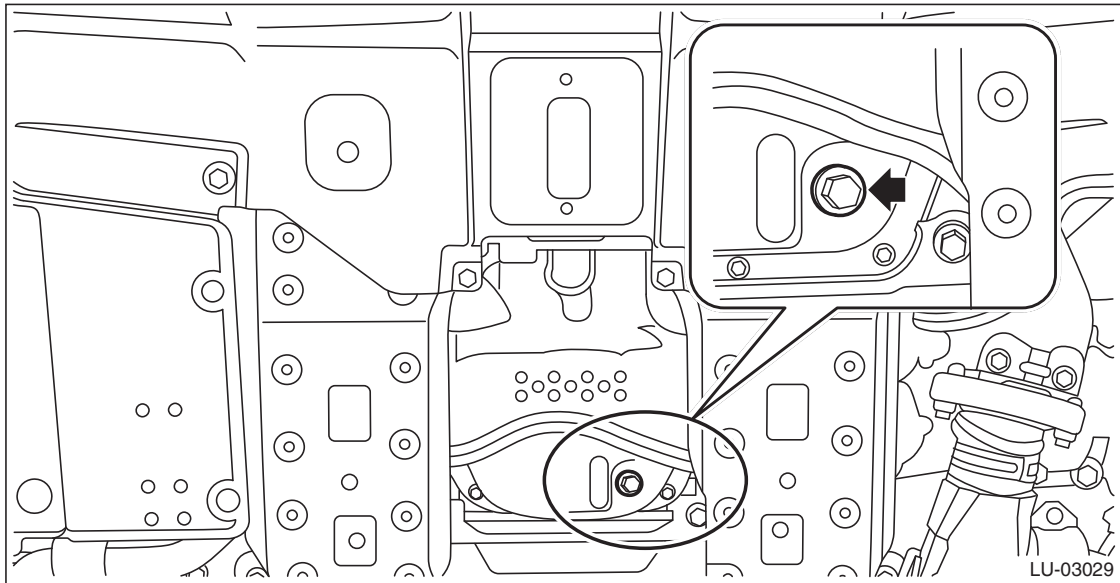
- Non-turbo model



Engine Oil

LUBRICATION

- Turbo model



- 5) Lower the vehicle.
- 6) Select engine oil of adequate quality and viscosity and fill it through the oil filler duct to the "F" line on the oil level gauge. Make sure that the vehicle is parked on a level surface when checking oil level.

Recommended oil:

Refer to "SPECIFICATION" for recommended oil. <Ref. to LU(H4DO)-2, SPECIFICATION, General Description.>

Engine oil capacity:

Refer to "SPECIFICATION" for engine oil capacity. <Ref. to LU(H4DO)-2, SPECIFICATION, General Description.>

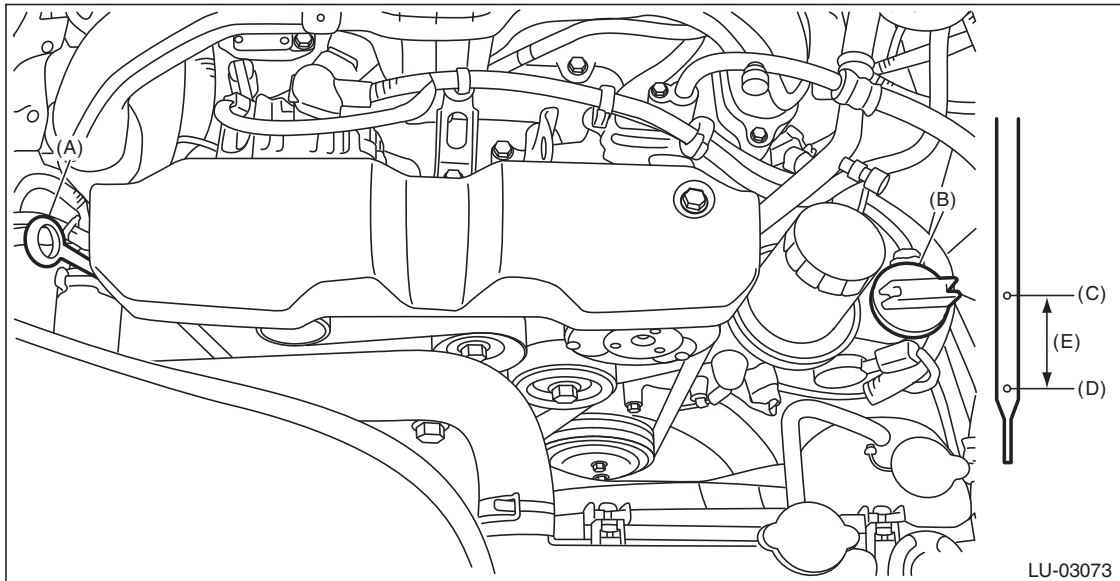
- 7) Close the oil filler cap.
- 8) Start the engine to circulate the oil in engine.

Engine Oil

LUBRICATION

9) Stop the engine and pull out the oil level gauge again, and check both sides of the oil level gauge. Use a lower side to check the engine oil level. If necessary, add engine oil up to the "F" line on oil level gauge.

- Non-turbo model



(A) Oil level gauge

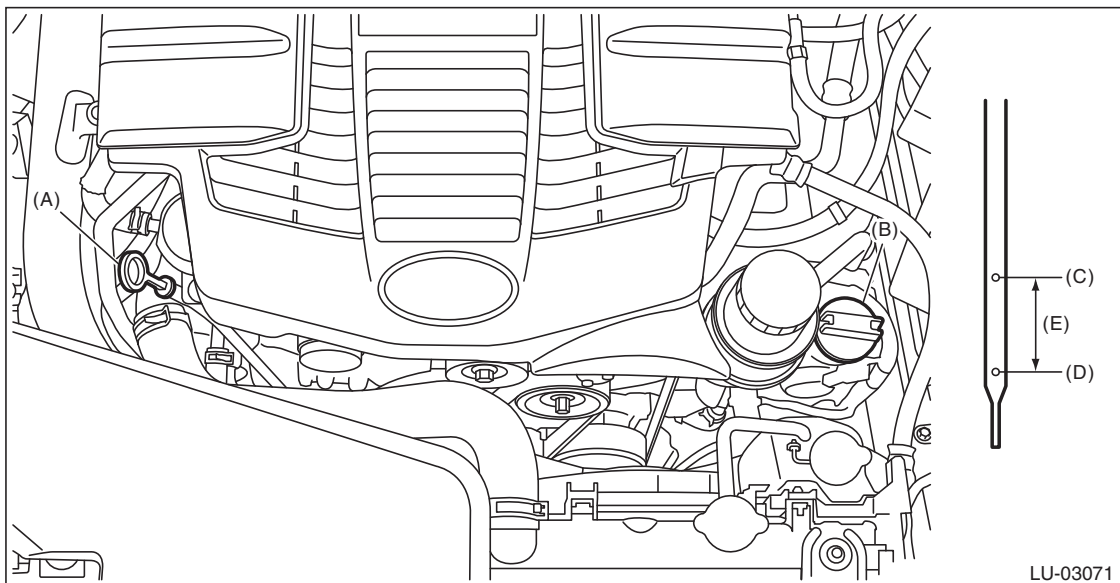
(B) Oil filler cap

(C) "F" line

(D) "L" line

(E) Approx. 1.0 L (1.1 US qt,
0.9 Imp qt)

- Turbo model



(A) Oil level gauge

(B) Oil filler cap

(C) "F" line

(D) "L" line

(E) Approx. 1.0 L (1.1 US qt,
0.9 Imp qt)

Oil Pump

LUBRICATION

4. Oil Pump

A: SPECIFICATION

The oil pump cannot be disassembled.

Refer to "Chain Cover" for removal and installation procedures. <Ref. to ME(H4DO)-100, REMOVAL, Chain Cover.> <Ref. to ME(H4DOTC)-90, REMOVAL, Chain Cover.> <Ref. to ME(H4DO)-105, INSTALLATION, Chain Cover.> <Ref. to ME(H4DOTC)-97, INSTALLATION, Chain Cover.>

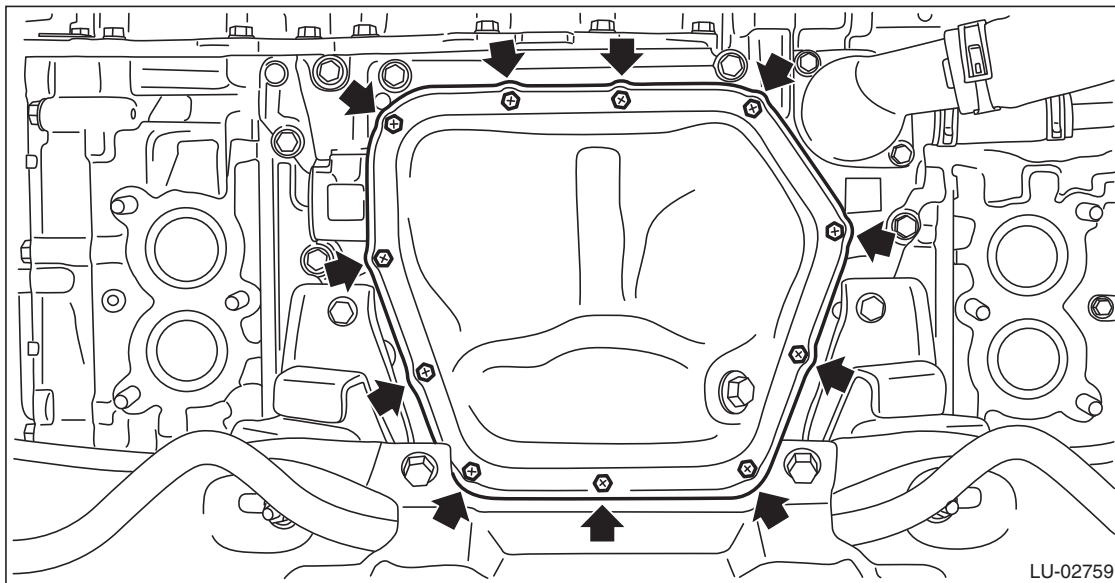
5. Oil Pan and Strainer

A: REMOVAL

1. OIL PAN

• Non-turbo model

- 1) Disconnect the ground cable from battery.
- 2) Lift up the vehicle.
- 3) Remove the under cover. <Ref. to EI-22, REMOVAL, Front Under Cover.>
- 4) Drain the engine oil. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.>
- 5) Remove the front exhaust pipe. <Ref. to EX(H4DO)-6, REMOVAL, Front Exhaust Pipe.>
- 6) Remove the bolts which secure oil pan to oil pan upper.



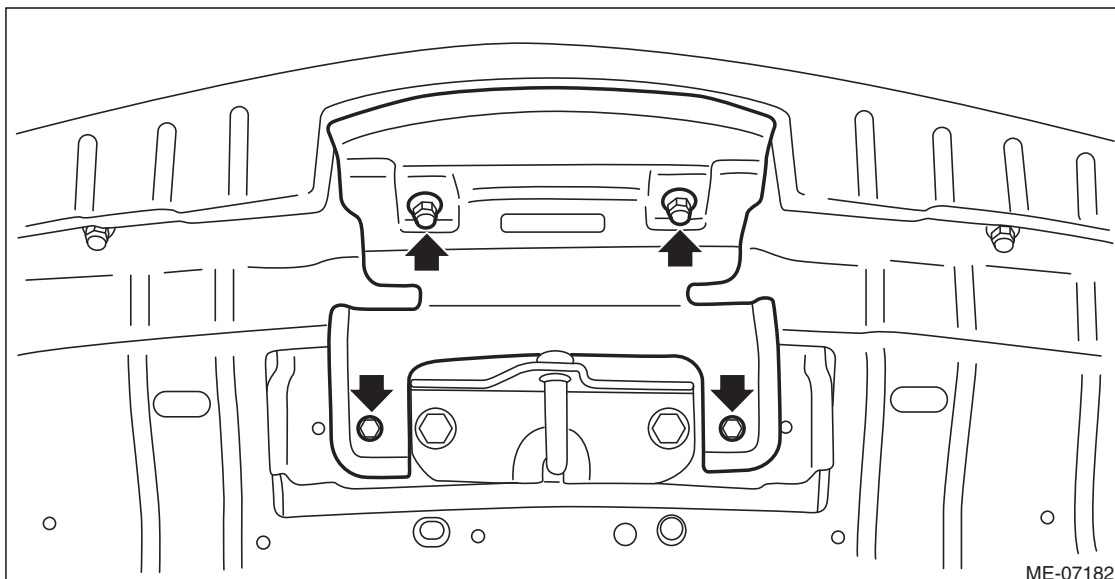
- 7) Insert an oil pan cutter blade into the gap between oil pan upper and oil pan, and remove the oil pan.

CAUTION:

Do not use a screwdriver or similar tool in place of oil pan cutter.

• Turbo model

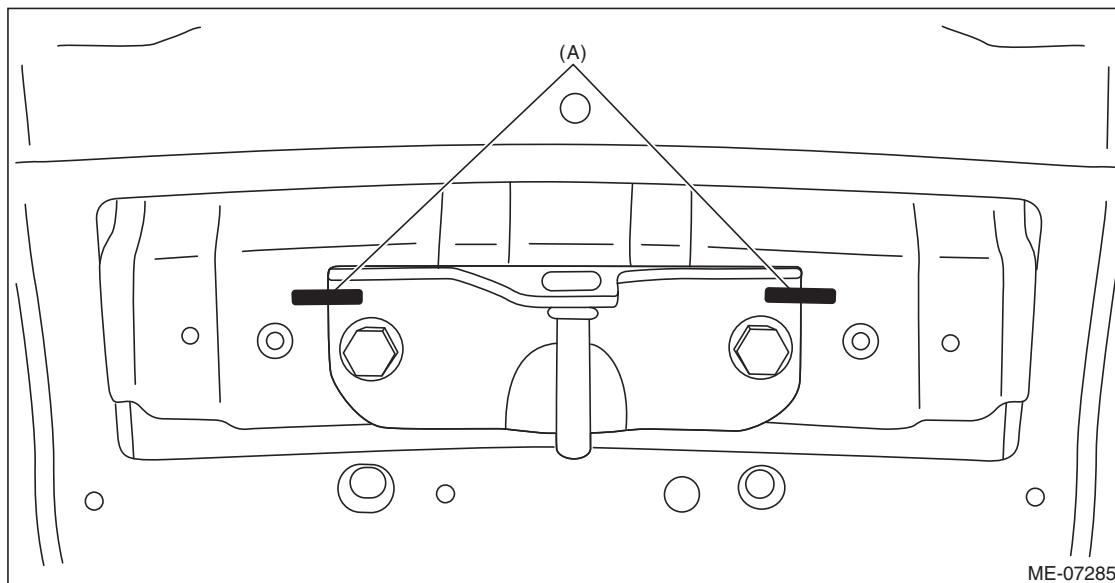
- 1) Open the front hood, and remove the upper grille bracket from the front hood.



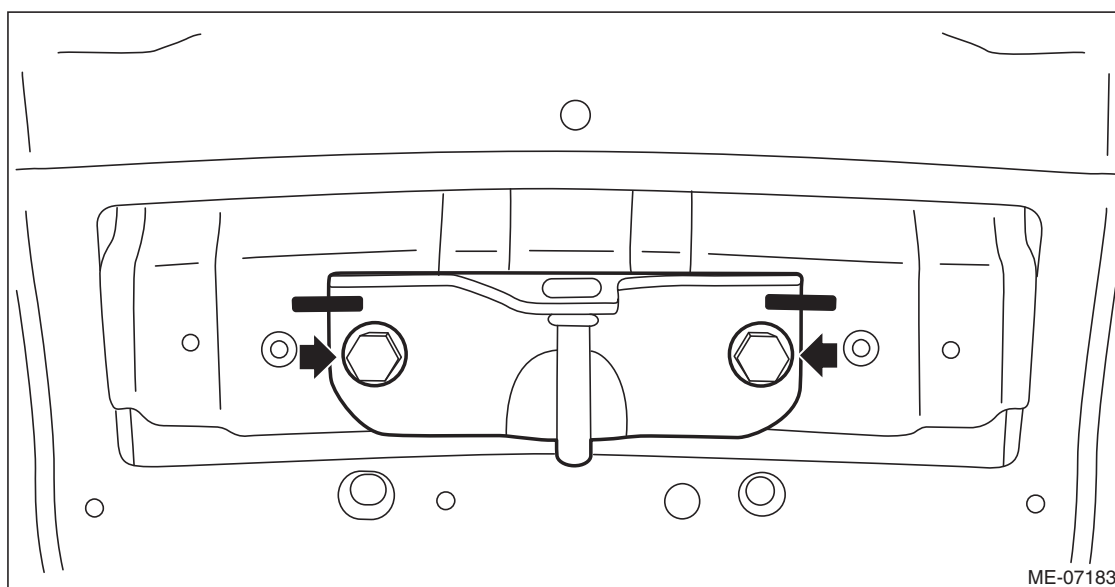
Oil Pan and Strainer

LUBRICATION

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



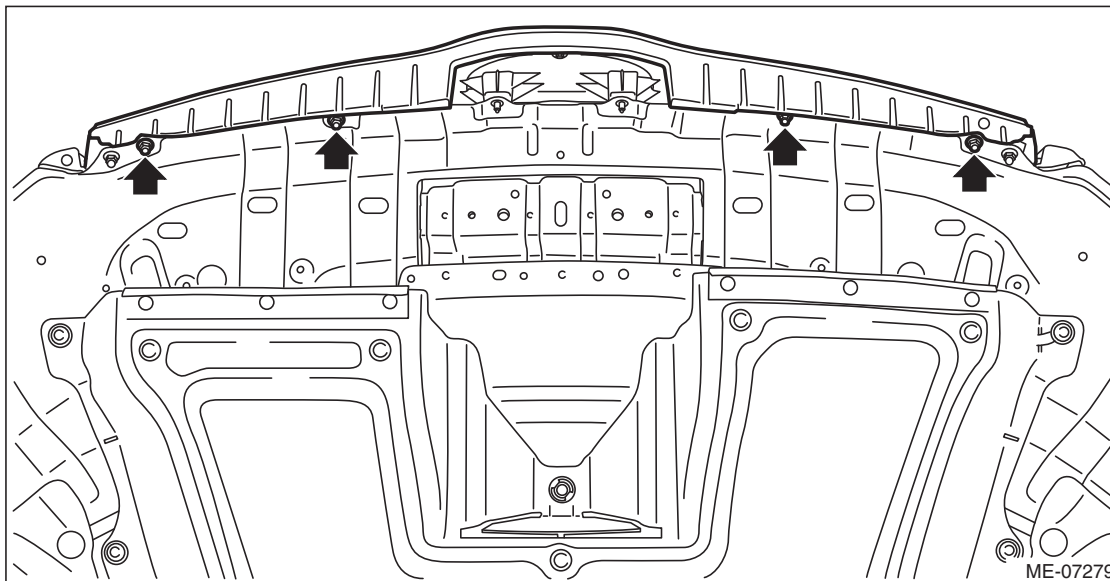
- 3) Remove the front hood striker from the front hood.



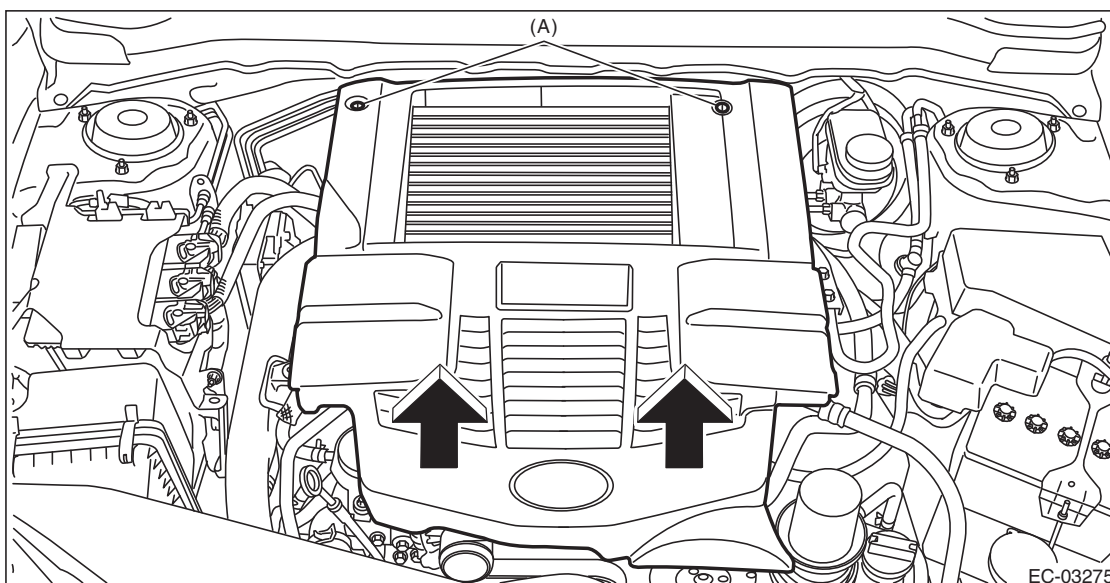
Oil Pan and Strainer

LUBRICATION

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



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



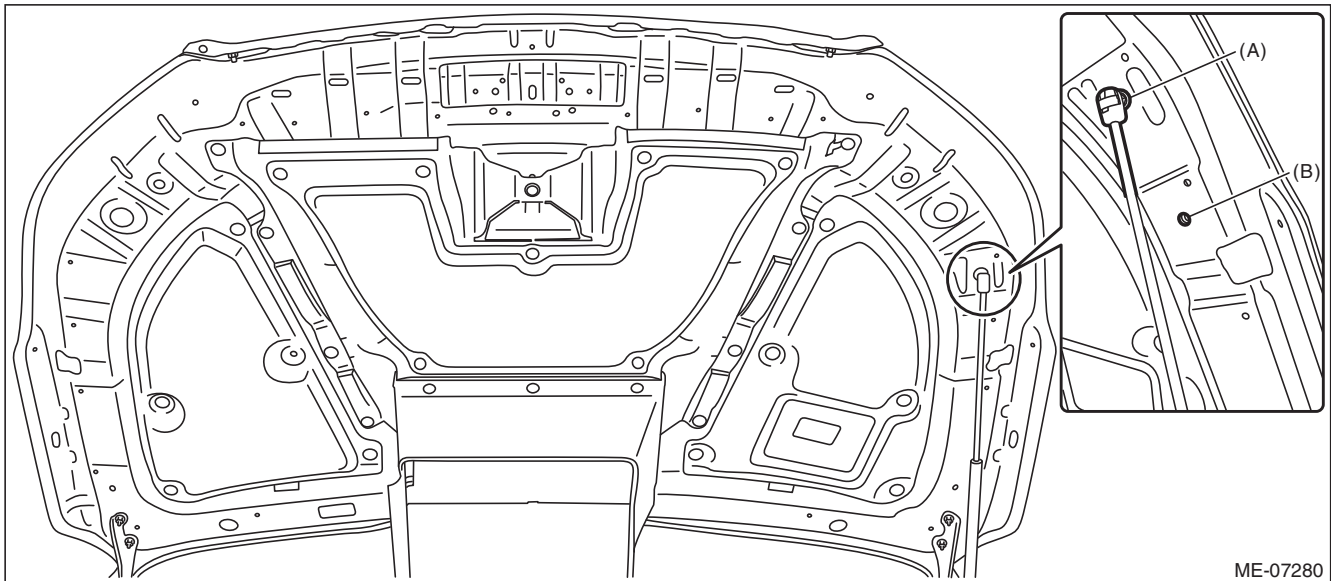
Oil Pan and Strainer

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6) 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)



7) Disconnect the ground cable from battery.

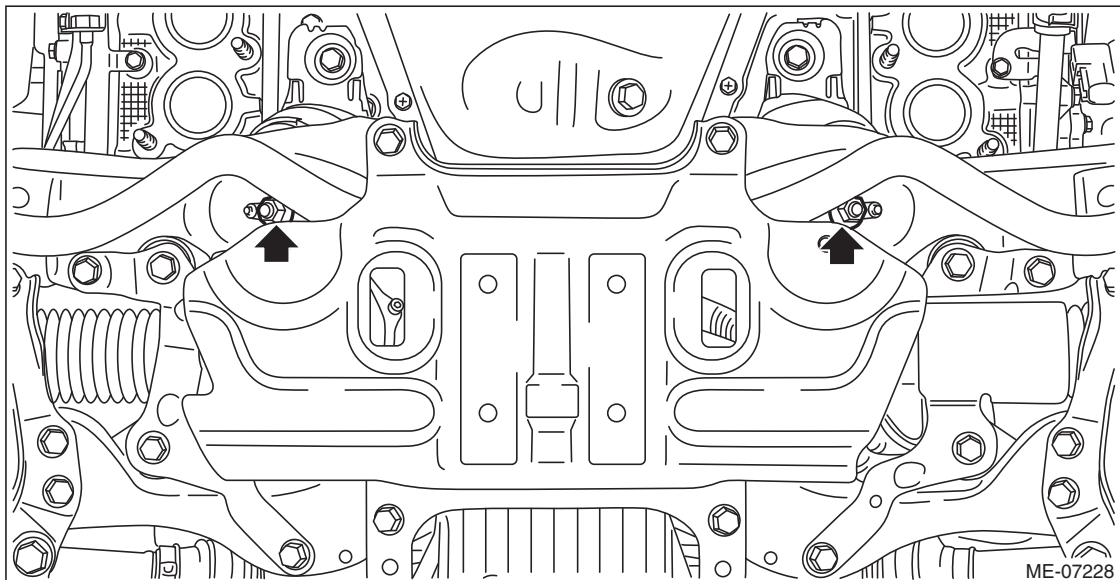
8) Remove the air intake duct (rear). <Ref. to IN(H4DOTC)-19, REMOVAL, Air Intake Duct.>

9) Remove the under cover. <Ref. to EI-22, REMOVAL, Front Under Cover.>

10) Drain the engine oil. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.>

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

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



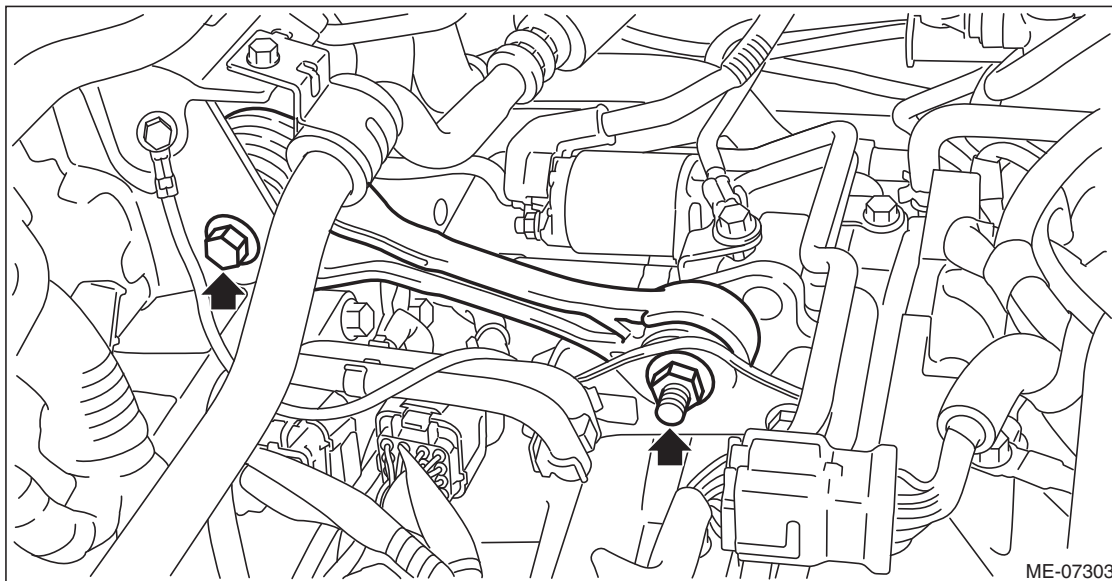
13) Lower the vehicle.

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

Oil Pan and Strainer

LUBRICATION

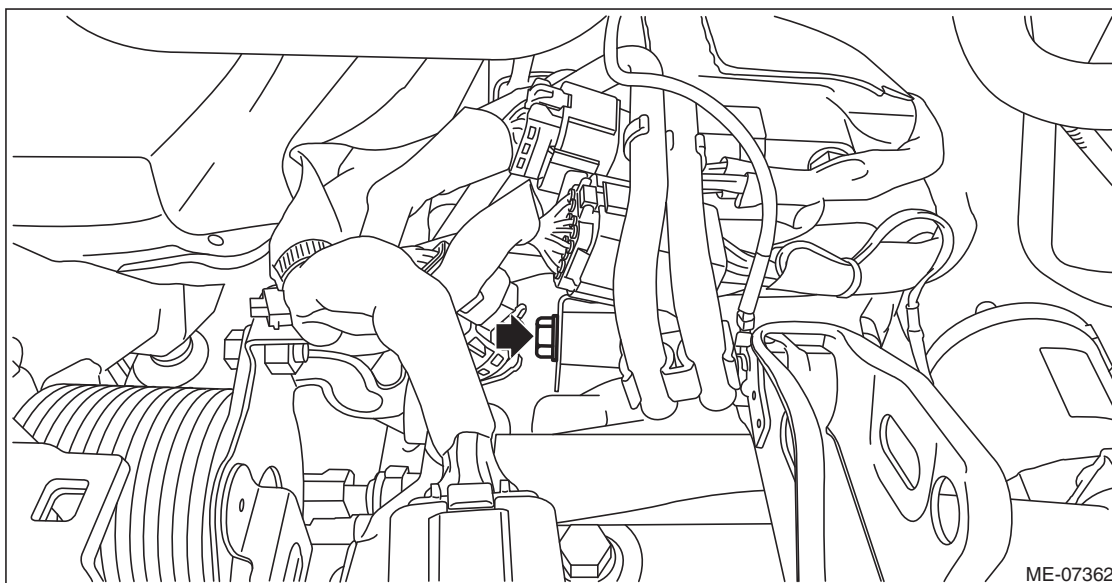
15) Remove the pitching stopper.



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

NOTE:

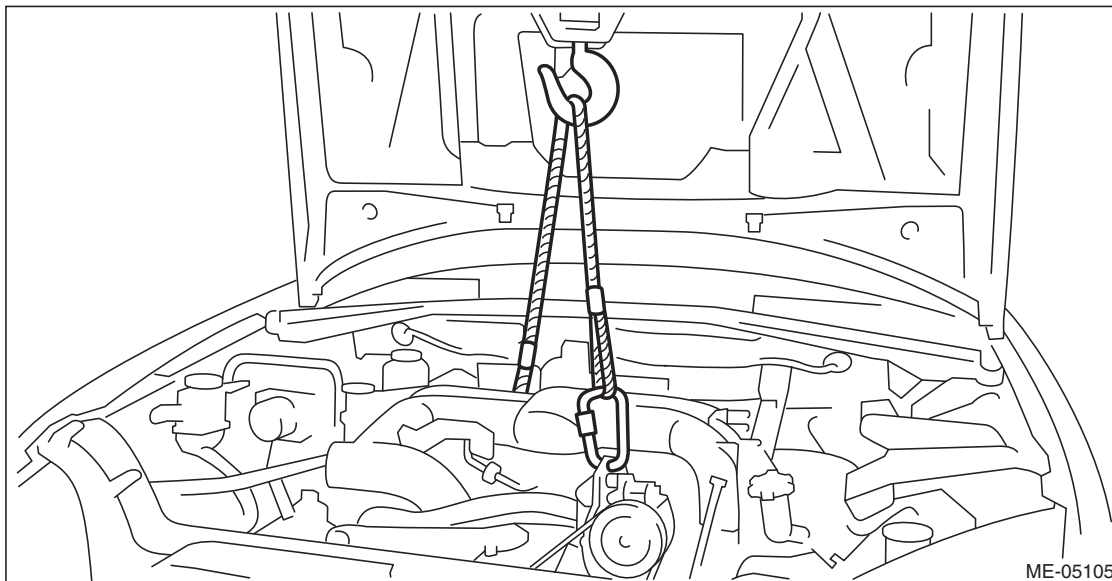
This procedure is required to prevent the transmission connector from touching the A/C pressure hose during engine removal/installation.



Oil Pan and Strainer

LUBRICATION

17) Support the engine with a lifting device and wire ropes.



18) Lift the engine high enough until the stud bolt of the engine mount is drawn out of the crossmember.

CAUTION:

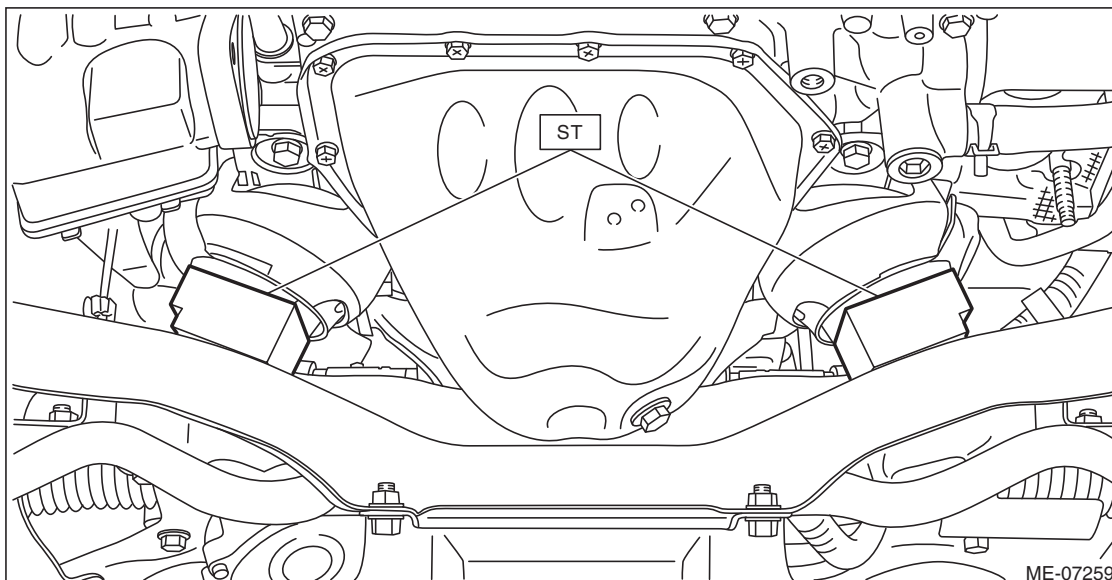
When lifting up the engine, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.

19) Set the ST between the engine mount and crossmember, and slowly lower the engine.

CAUTION:

After the engine is lowered, rock the engine to make sure that the ST is securely installed.

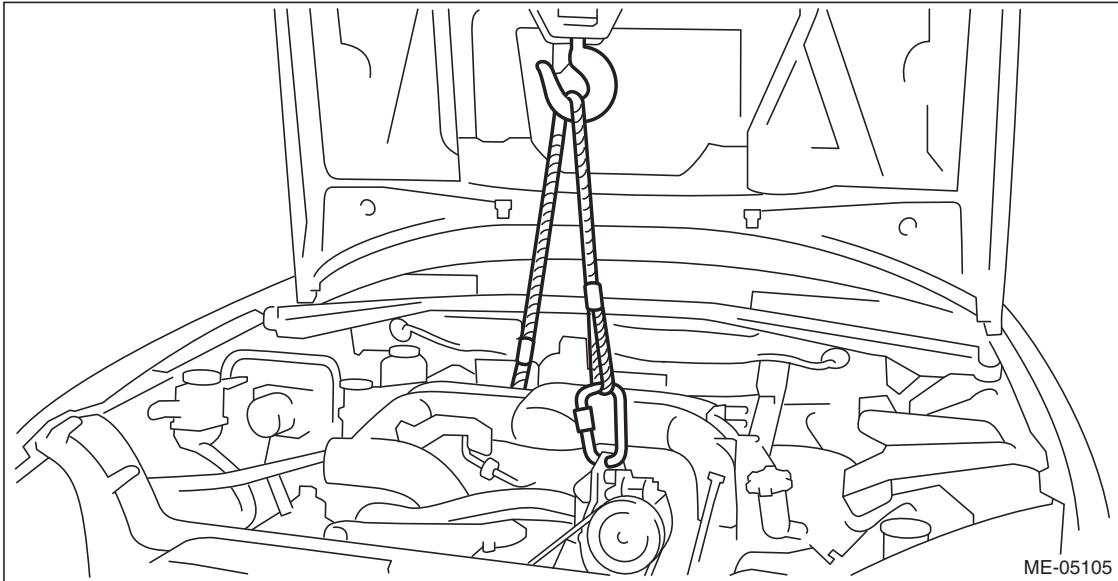
ST 18632AA020 STAND ASSY



Oil Pan and Strainer

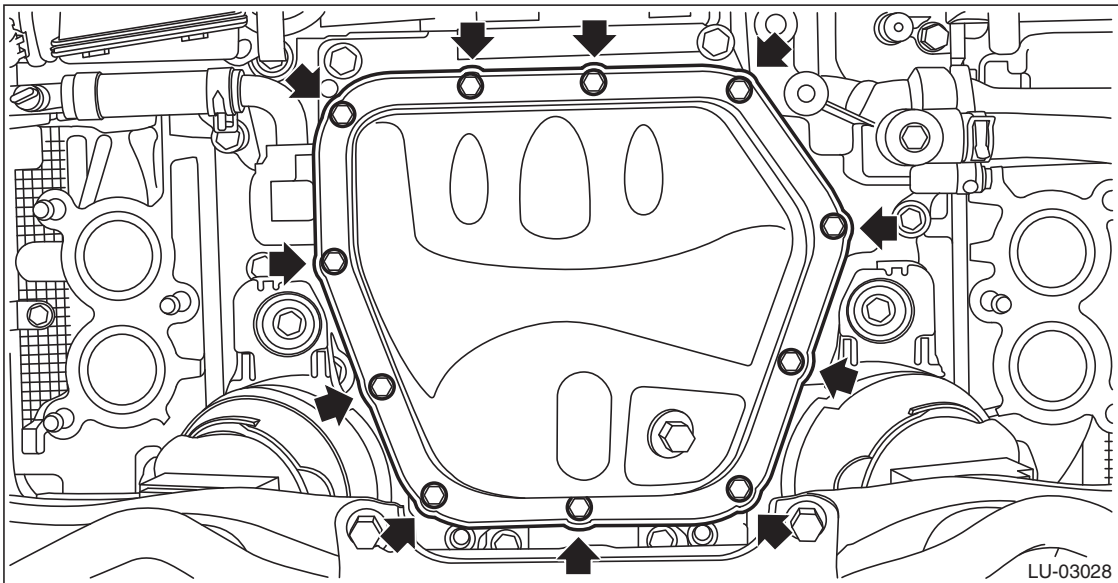
LUBRICATION

20) Remove the lifting device and wire ropes.



21) Lift up the vehicle.

22) Remove the bolts which secure oil pan to oil pan upper.



23) Insert an oil pan cutter blade into the gap between oil pan upper and oil pan, and remove the oil pan.

CAUTION:

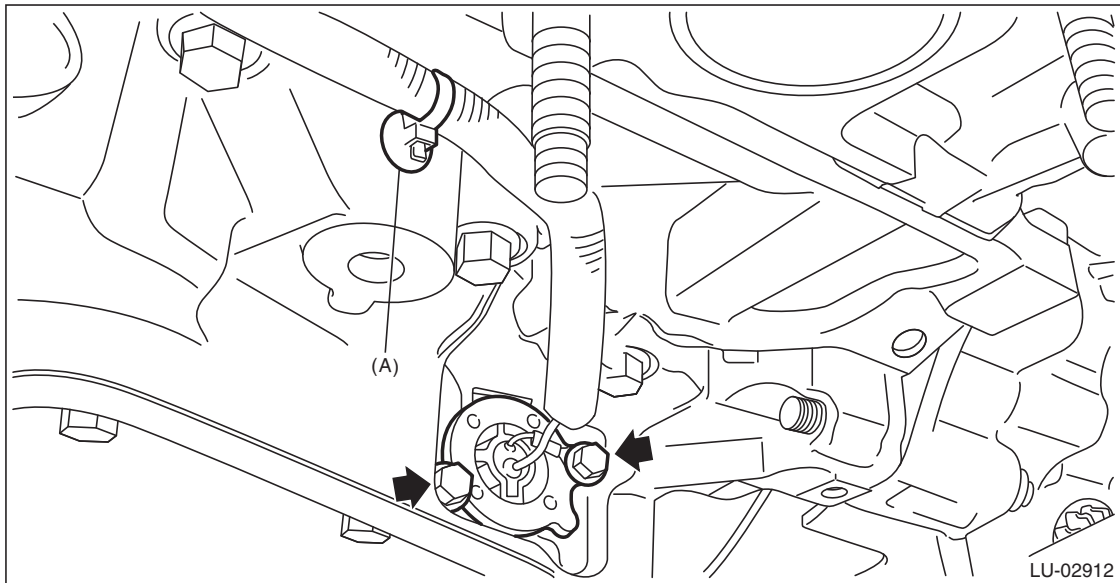
Do not use a screwdriver or similar tool in place of oil pan cutter.

Oil Pan and Strainer

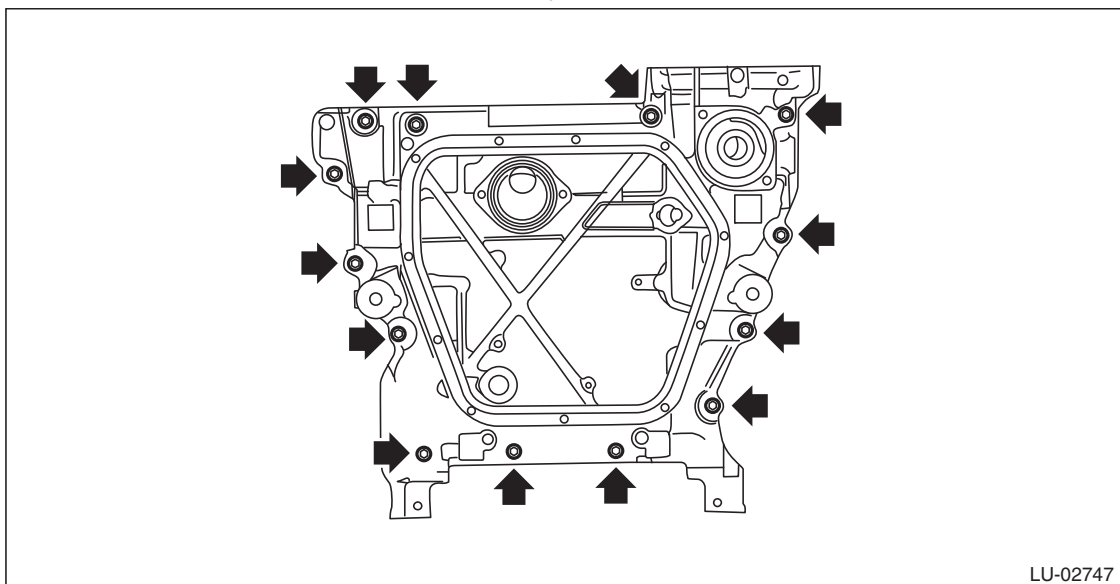
LUBRICATION

2. OIL PAN UPPER

- 1) Remove the engine from the vehicle. <Ref. to ME(H4DO)-46, REMOVAL, Engine Assembly.> <Ref. to ME(H4DOTC)-44, REMOVAL, Engine Assembly.>
- 2) Remove the water pump. <Ref. to CO(H4DO)-17, REMOVAL, Water Pump.> <Ref. to CO(H4DOTC)-16, REMOVAL, Water Pump.>
- 3) Remove the thermostat cover. <Ref. to CO(H4DO)-40, REMOVAL, Thermostat.> <Ref. to CO(H4DOTC)-35, REMOVAL, Thermostat.>
- 4) Remove the water pipe assembly. <Ref. to CO(H4DO)-20, REMOVAL, Water Pipe Assembly.> <Ref. to CO(H4DOTC)-19, REMOVAL, Water Pipe Assembly.>
- 5) Remove the oil pan. <Ref. to LU(H4DO)-19, OIL PAN, REMOVAL, Oil Pan and Strainer.>
- 6) Remove the chain cover. <Ref. to ME(H4DO)-100, REMOVAL, Chain Cover.> <Ref. to ME(H4DOTC)-90, REMOVAL, Chain Cover.>
- 7) Remove clip (A) from the oil pan upper, and remove the oil level switch.



- 8) Remove the bolts which secure oil pan upper to cylinder block, and remove the oil pan upper.



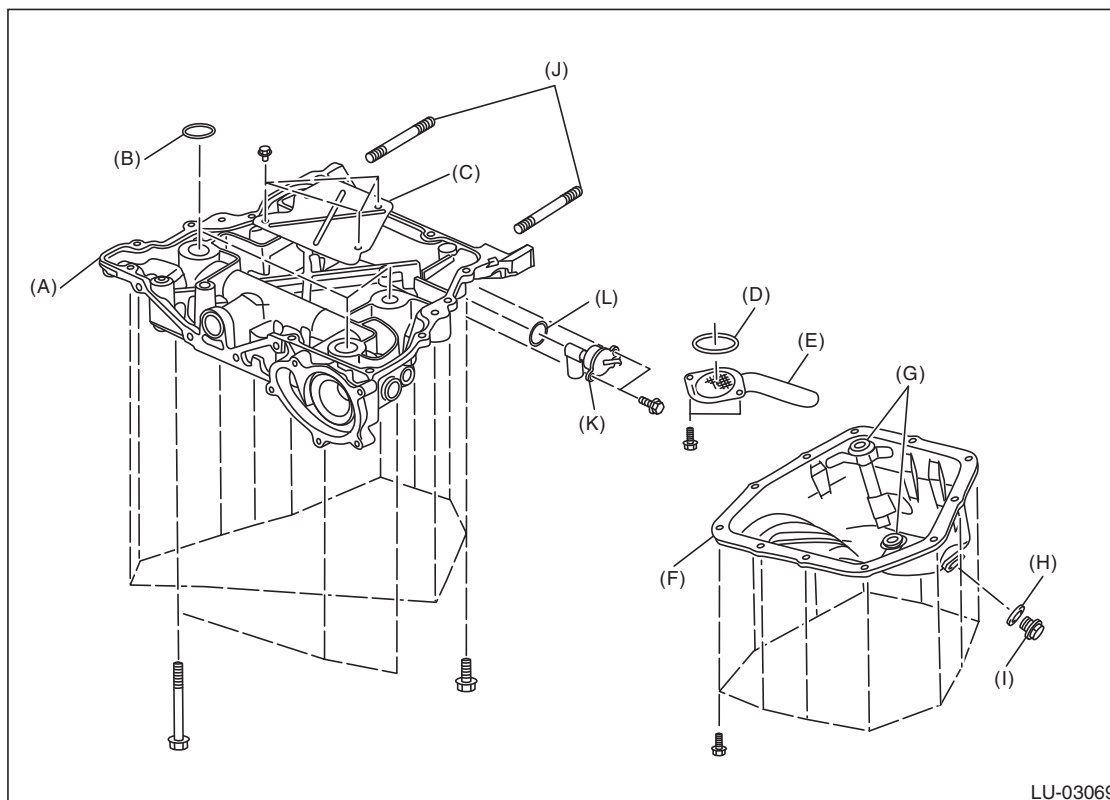
- 9) Remove the baffle plate from the oil pan upper.
- 10) Remove the oil strainer from the oil pan upper.

Oil Pan and Strainer

LUBRICATION

11) Remove stud bolts from the oil pan upper.

- Non-turbo model



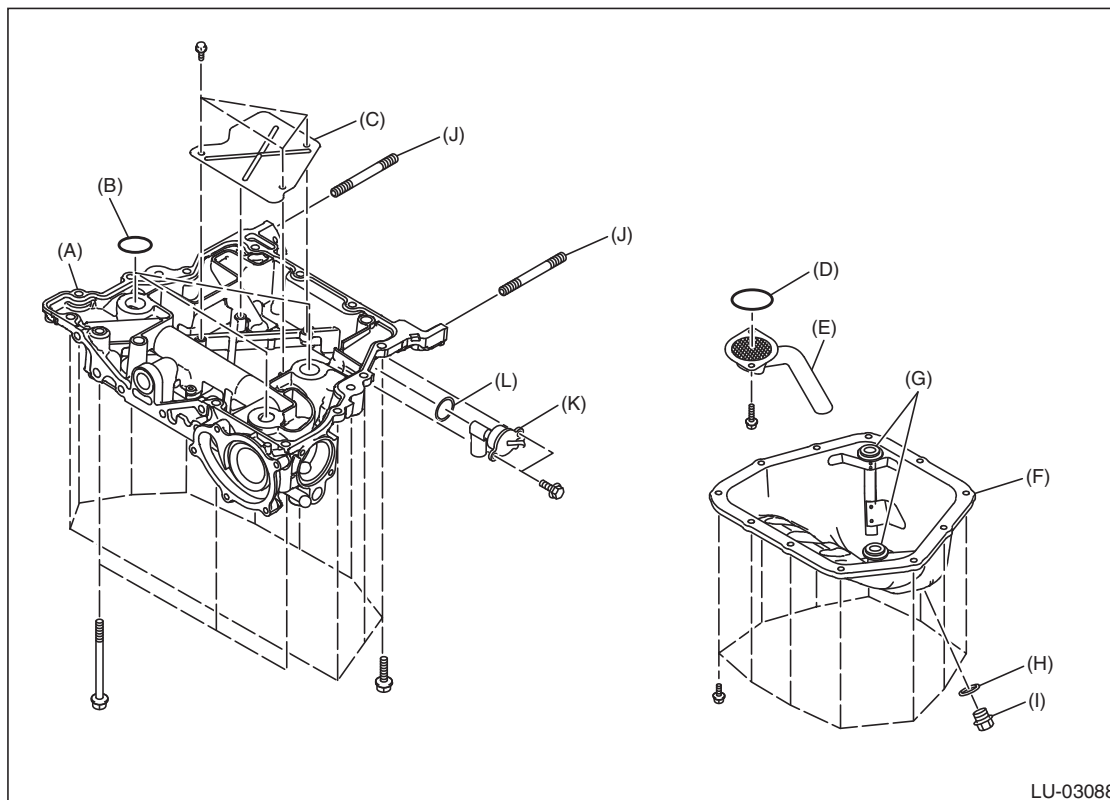
LU-03069

- | | | |
|-----------------------|-----------------------|------------------|
| (A) Oil pan upper | (B) O-ring | (C) Baffle plate |
| (D) O-ring | (E) Oil strainer | (F) Oil pan |
| (G) Oil pan seal ring | (H) Drain plug gasket | (I) Drain plug |
| (J) Stud bolt | (K) Oil level switch | (L) O-ring |

Oil Pan and Strainer

LUBRICATION

- Turbo model



- (A) Oil pan upper
- (D) O-ring
- (G) Oil pan seal ring
- (J) Stud bolt

- (B) O-ring
- (E) Oil strainer
- (H) Drain plug gasket
- (K) Oil level switch

- (C) Baffle plate
- (F) Oil pan
- (I) Drain plug
- (L) O-ring

B: INSTALLATION

1. OIL PAN

• Non-turbo model

NOTE:

- Before installing the oil pan, wipe and clean the mating surface of oil pan and oil pan upper.
- Use a new oil pan seal ring.

1) Apply liquid gasket to the mating surfaces of oil pan upper, and install the oil pan.

NOTE:

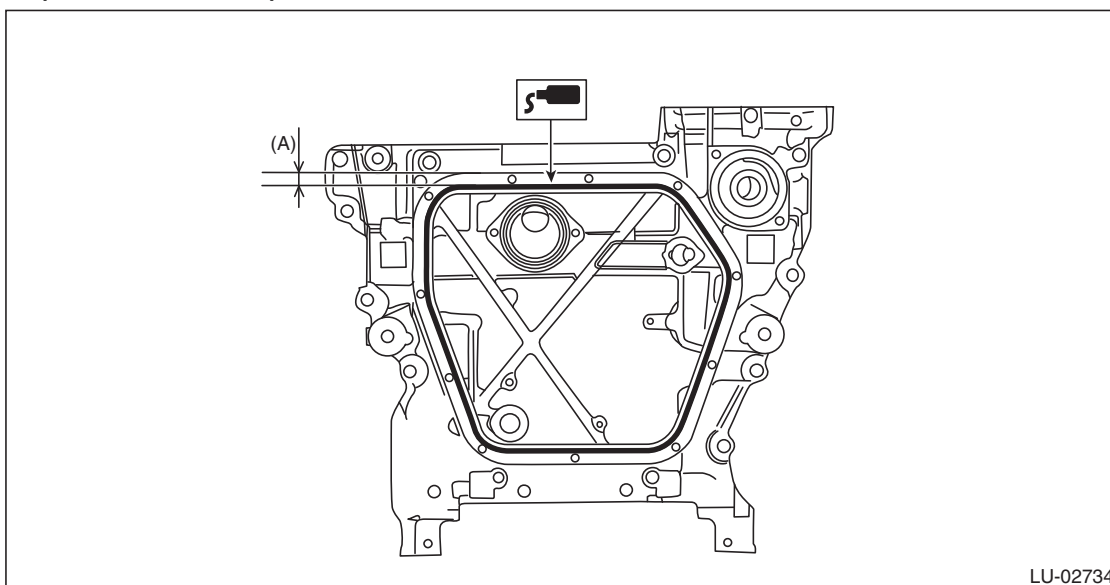
Install within 5 min. after applying liquid gasket.

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100) or equivalent

Liquid gasket applying diameter:

5±1 mm (0.1969±0.0394 in)



LU-02734

(A) 7.5 mm (0.295 in)

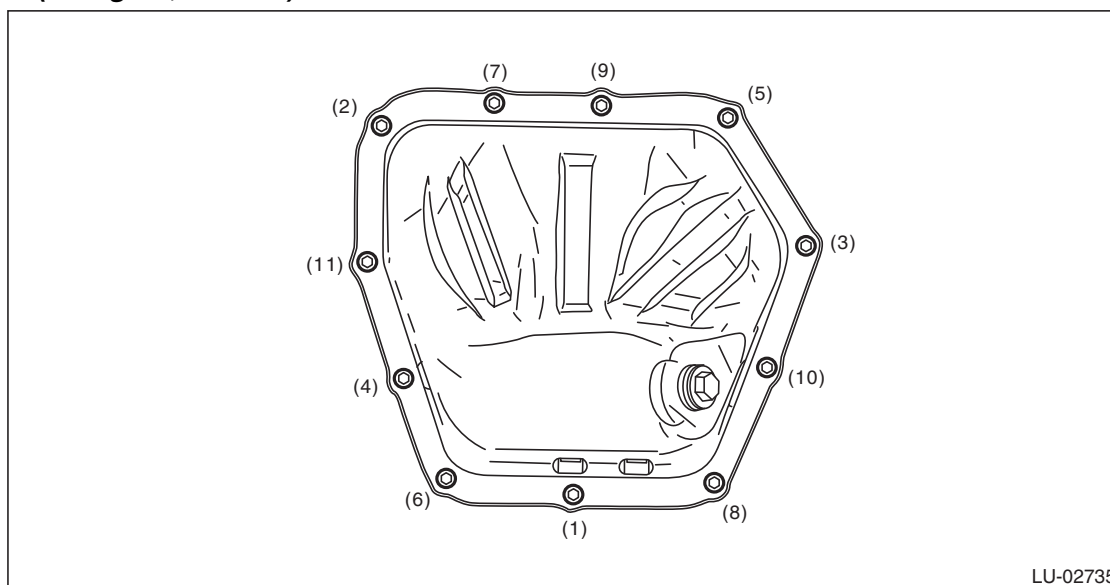
Oil Pan and Strainer

LUBRICATION

2) Tighten the bolts to install the oil pan to the oil pan upper in the numerical order.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



- 3) Install the front exhaust pipe. <Ref. to EX(H4DO)-8, INSTALLATION, Front Exhaust Pipe.>
- 4) Install the under cover. <Ref. to EI-22, INSTALLATION, Front Under Cover.>
- 5) Lower the vehicle.
- 6) Connect the battery ground terminal.
- 7) Refill the engine oil. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.>



Oil Pan and Strainer

LUBRICATION

• Turbo model

NOTE:

- Before installing the oil pan, wipe and clean the mating surface of oil pan and oil pan upper.
- Use a new oil pan seal ring.

1) Apply liquid gasket to the mating surfaces of oil pan upper, and install the oil pan.

NOTE:

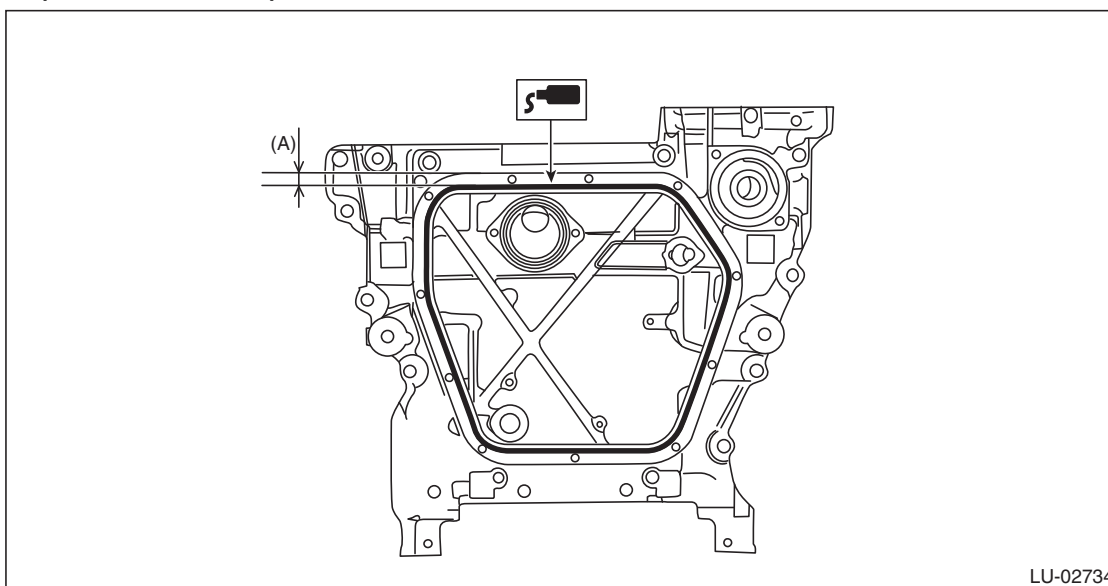
Install within 5 min. after applying liquid gasket.

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100) or equivalent

Liquid gasket applying diameter:

5 ± 1 mm (0.1969 ± 0.0394 in)

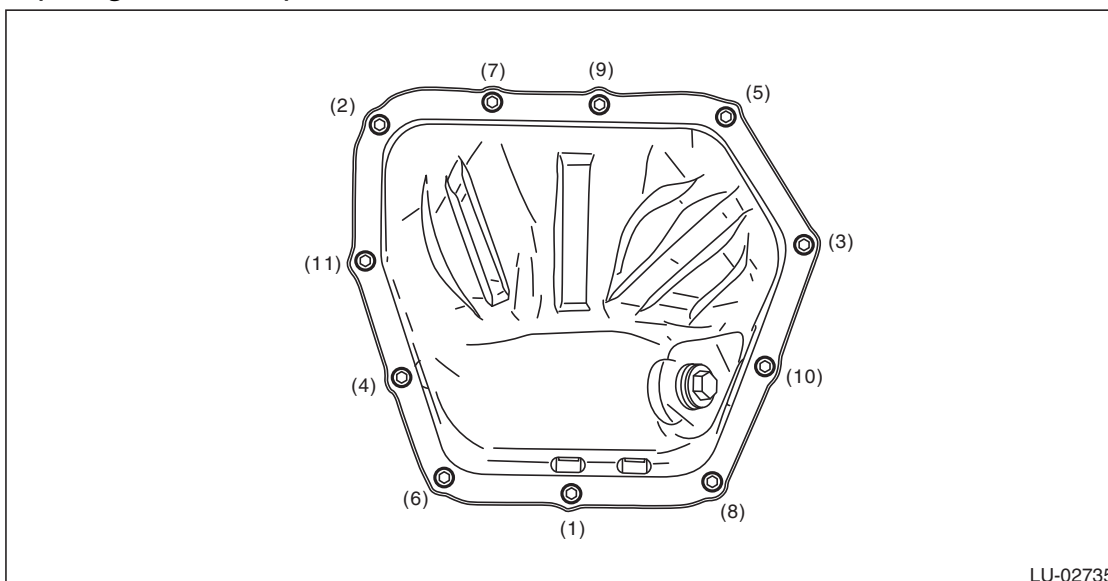


(A) 9.5 mm (0.374 in)

2) Tighten the bolts to install the oil pan to the oil pan upper in the numerical order.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

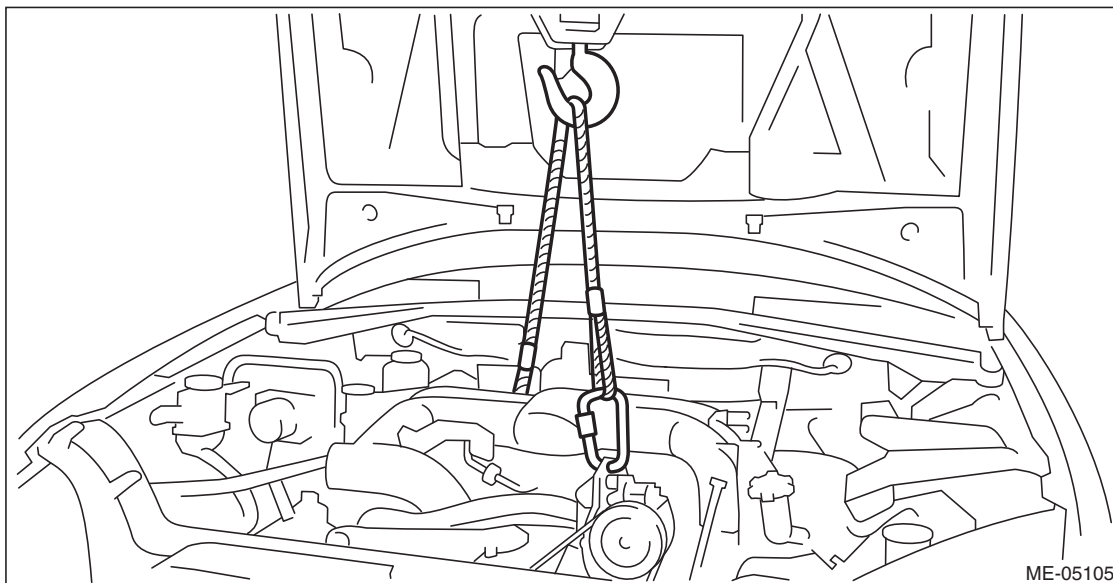


LU(H4DO)-31

Oil Pan and Strainer

LUBRICATION

- 3) Lower the vehicle.
- 4) Support the engine with a lifting device and wire ropes.

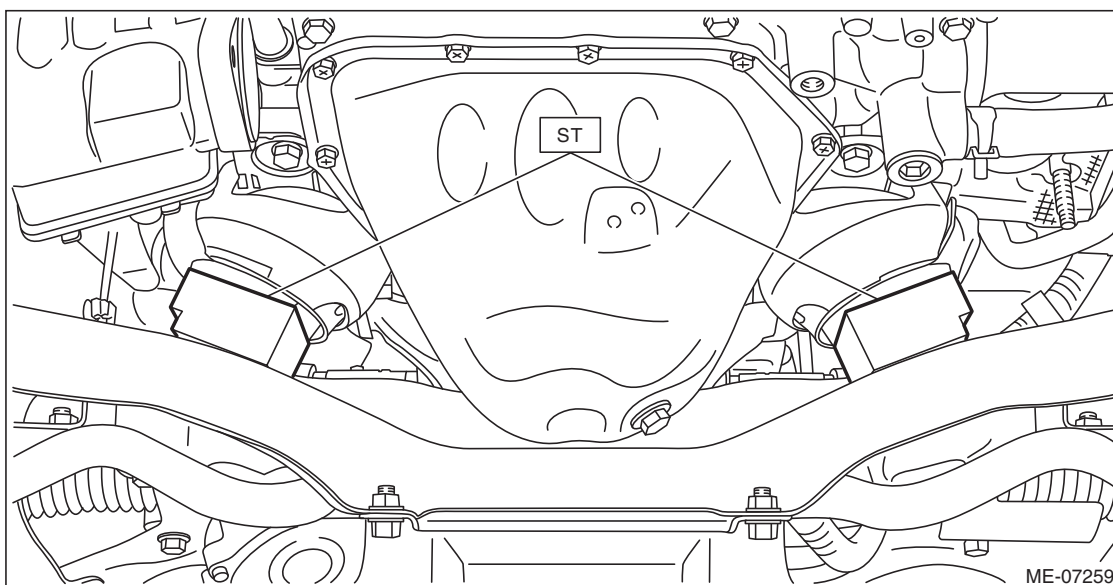


- 5) Lift the engine, and remove the ST.

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.

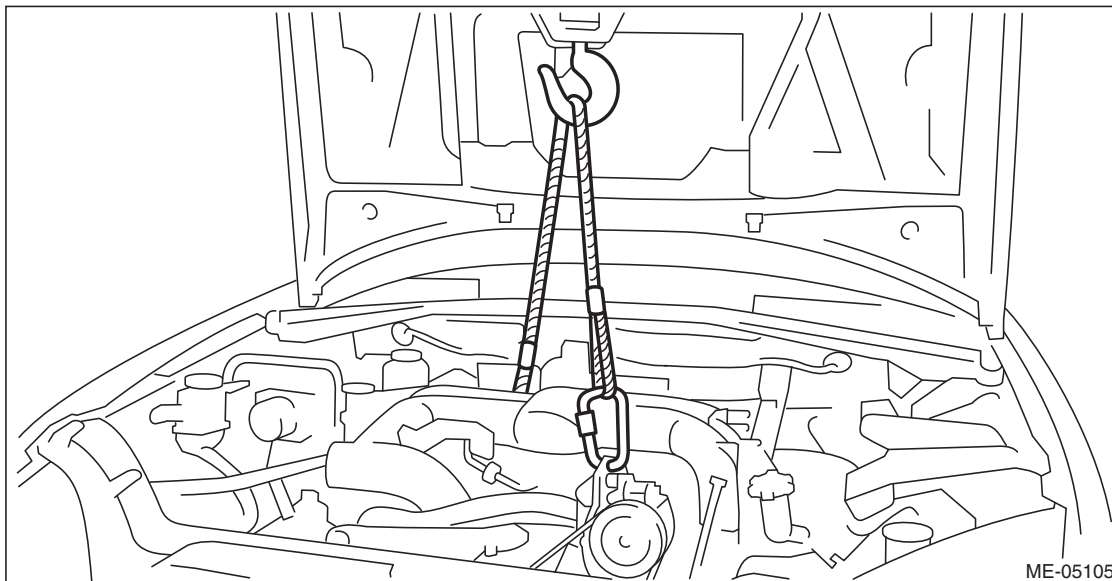
ST 18632AA020 STAND ASSY



Oil Pan and Strainer

LUBRICATION

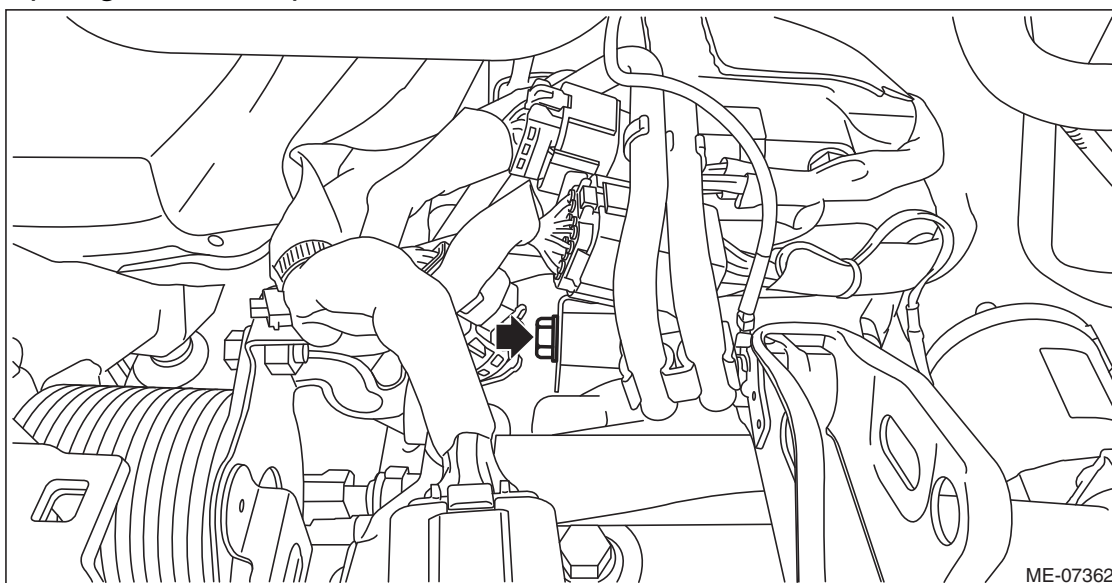
- 6) Lower the engine and remove the lifting device and wire ropes.



- 7) 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)



Oil Pan and Strainer

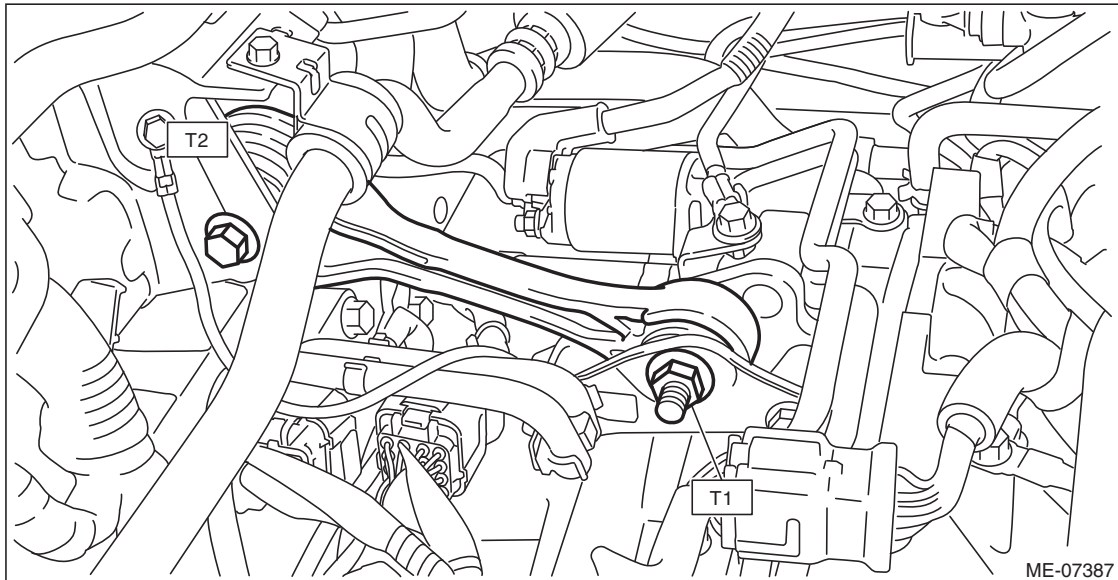
LUBRICATION

8) 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)



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

10) Lift up the vehicle.

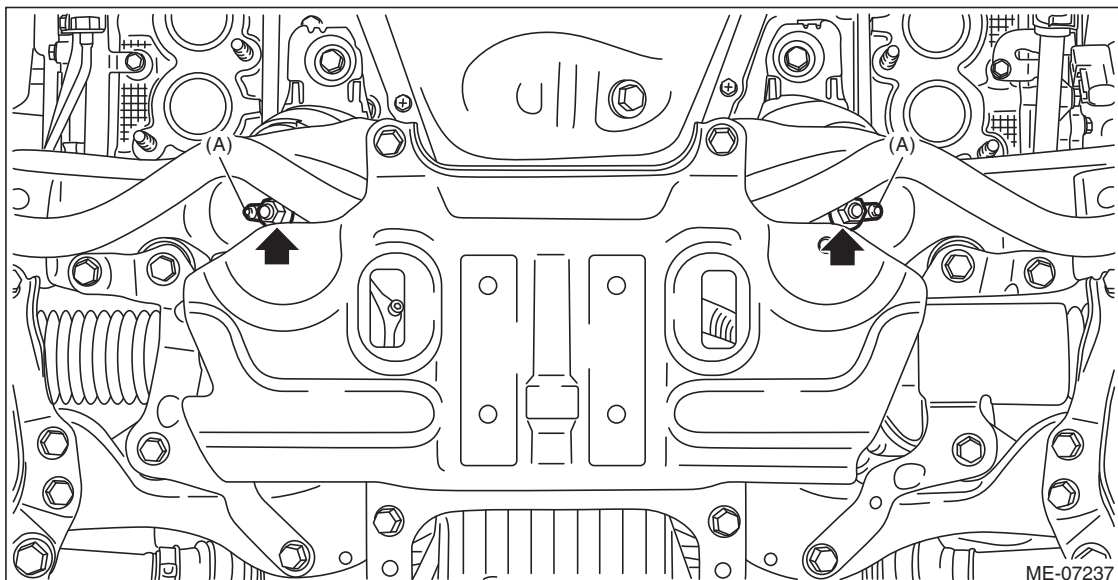
11) Install the nuts which hold the engine mounting to the crossmember.

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)



12) Install the front exhaust pipe. <Ref. to EX(H4DOTC)-15, INSTALLATION, Front Exhaust Pipe.>

13) Install the under cover. <Ref. to EI-22, INSTALLATION, Front Under Cover.>

14) Lower the vehicle.

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

16) Connect the battery ground terminal.

17) Refill the engine oil. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.>

LU(H4DO)-34

Oil Pan and Strainer

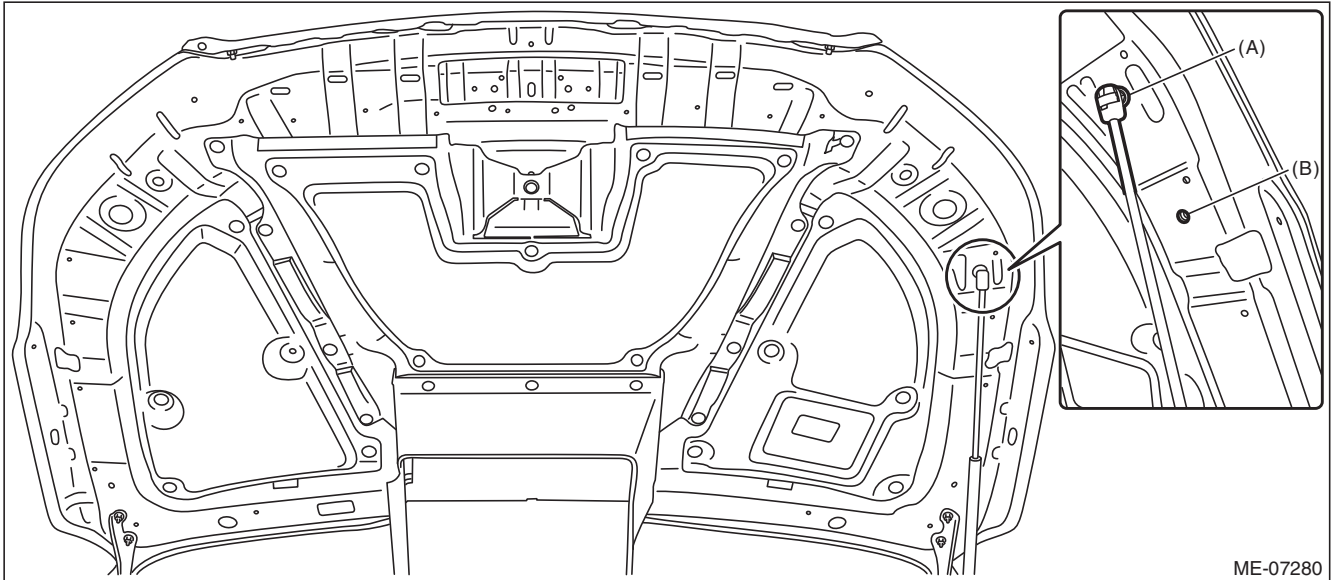
LUBRICATION

18) Install the collector cover.

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

Tightening torque:

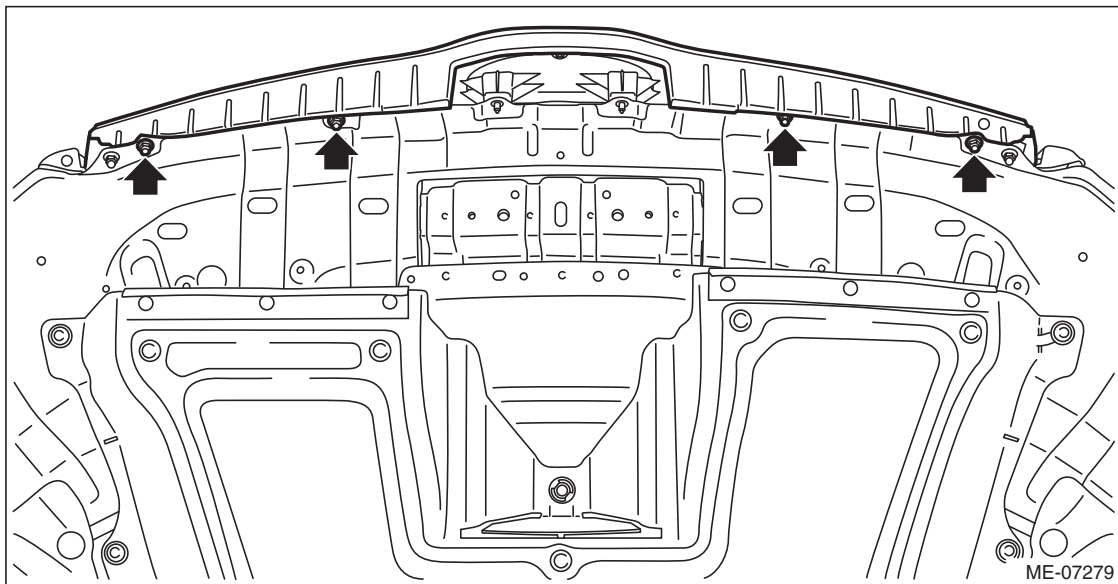
20 N·m (2.0 kgf-m, 14.8 ft-lb)



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

Tightening torque:

45 N·m (0.5 kgf-m, 3.3 ft-lb)



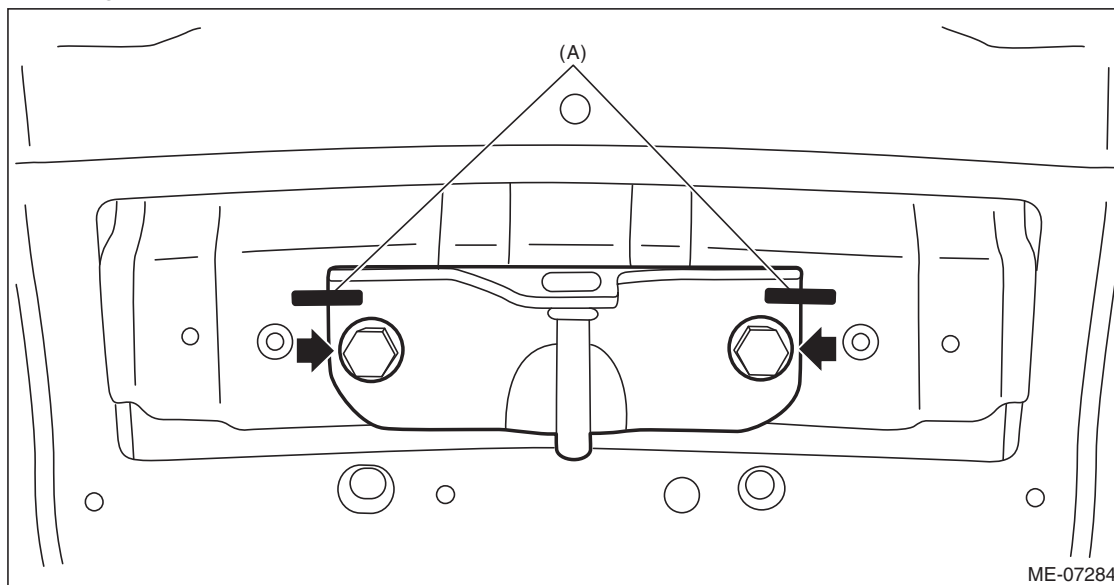
Oil Pan and Strainer

LUBRICATION

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

Tightening torque:

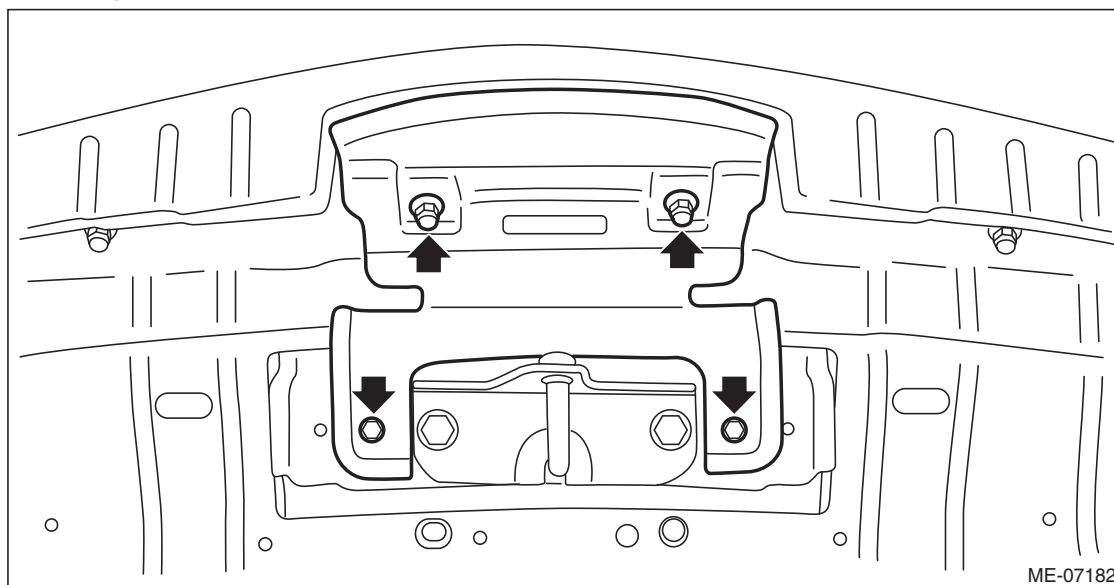
33 N·m (3.4 kgf-m, 24.3 ft-lb)



22) 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)



Oil Pan and Strainer

LUBRICATION

2. OIL PAN UPPER

NOTE:

Before installing the oil pan upper, clean the mating surface of oil pan upper and cylinder block.

- 1) Attach the stud bolts to the oil pan upper.
- 2) Attach the oil strainer to the oil pan upper.

NOTE:

Use new O-rings.

- 3) Attach the baffle plate to the oil pan upper.

- Non-turbo model

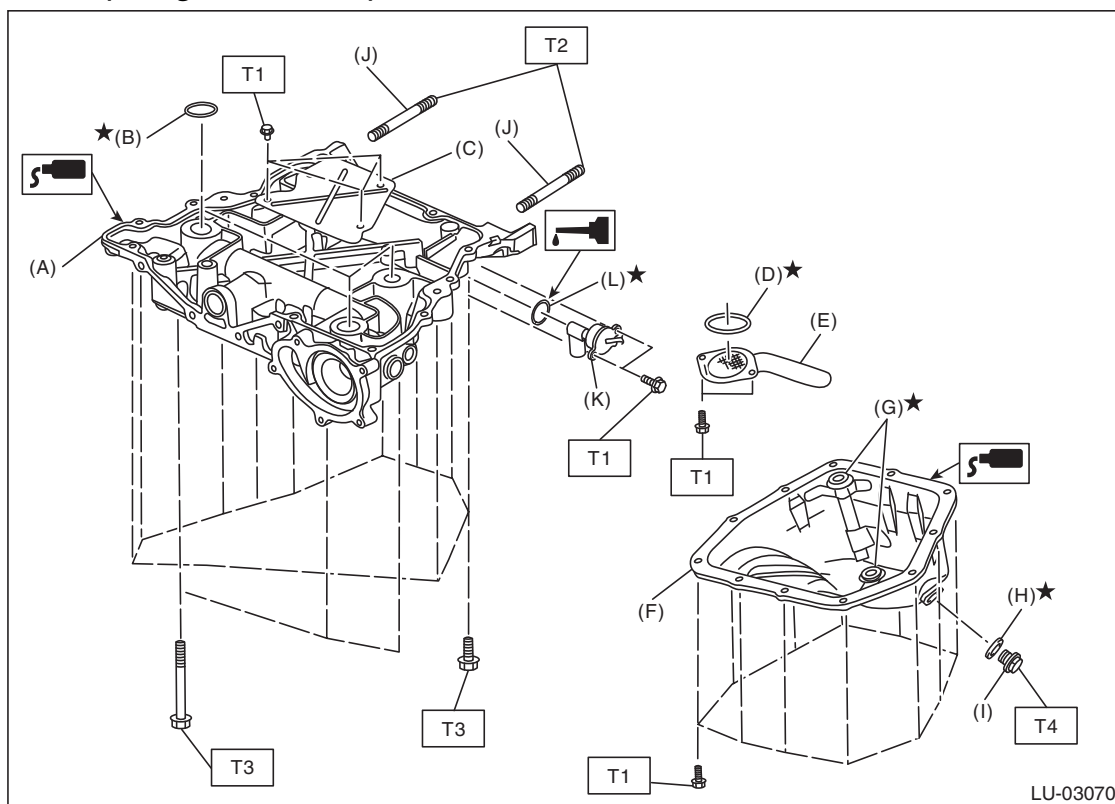
Tightening torque:

T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

T2: 10 N·m (1.0 kgf-m, 7.4 ft-lb)

T3: 18 N·m (1.8 kgf-m, 13.3 ft-lb)

T4: 41.7 N·m (4.3 kgf-m, 30.8 ft-lb)



- | | | |
|-----------------------|-----------------------|------------------|
| (A) Oil pan upper | (B) O-ring | (C) Baffle plate |
| (D) O-ring | (E) Oil strainer | (F) Oil pan |
| (G) Oil pan seal ring | (H) Drain plug gasket | (I) Drain plug |
| (J) Stud bolt | (K) Oil level switch | (L) O-ring |

Oil Pan and Strainer

LUBRICATION

- Turbo model

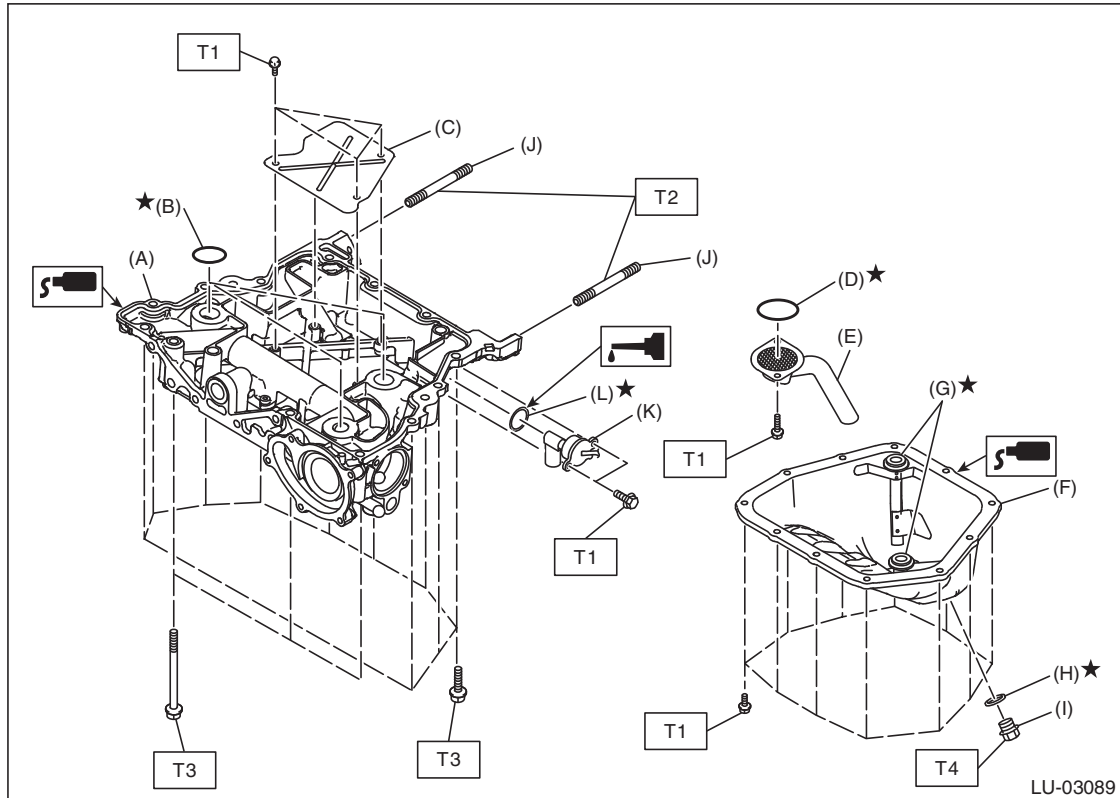
Tightening torque:

T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

T2: 10 N·m (1.0 kgf-m, 7.4 ft-lb)

T3: 18 N·m (1.8 kgf-m, 13.3 ft-lb)

T4: 41.7 N·m (4.3 kgf-m, 30.8 ft-lb)



LU-03089

- | | | |
|-----------------------|-----------------------|------------------|
| (A) Oil pan upper | (B) O-ring | (C) Baffle plate |
| (D) O-ring | (E) Oil strainer | (F) Oil pan |
| (G) Oil pan seal ring | (H) Drain plug gasket | (I) Drain plug |
| (J) Stud bolt | (K) Oil level switch | (L) O-ring |

Oil Pan and Strainer

LUBRICATION

4) Apply liquid gasket to the mating surface of the oil pan upper as shown in the figure, and install the oil pan upper to the cylinder block.

CAUTION:

Be careful not to apply any liquid gasket to the O-ring.

NOTE:

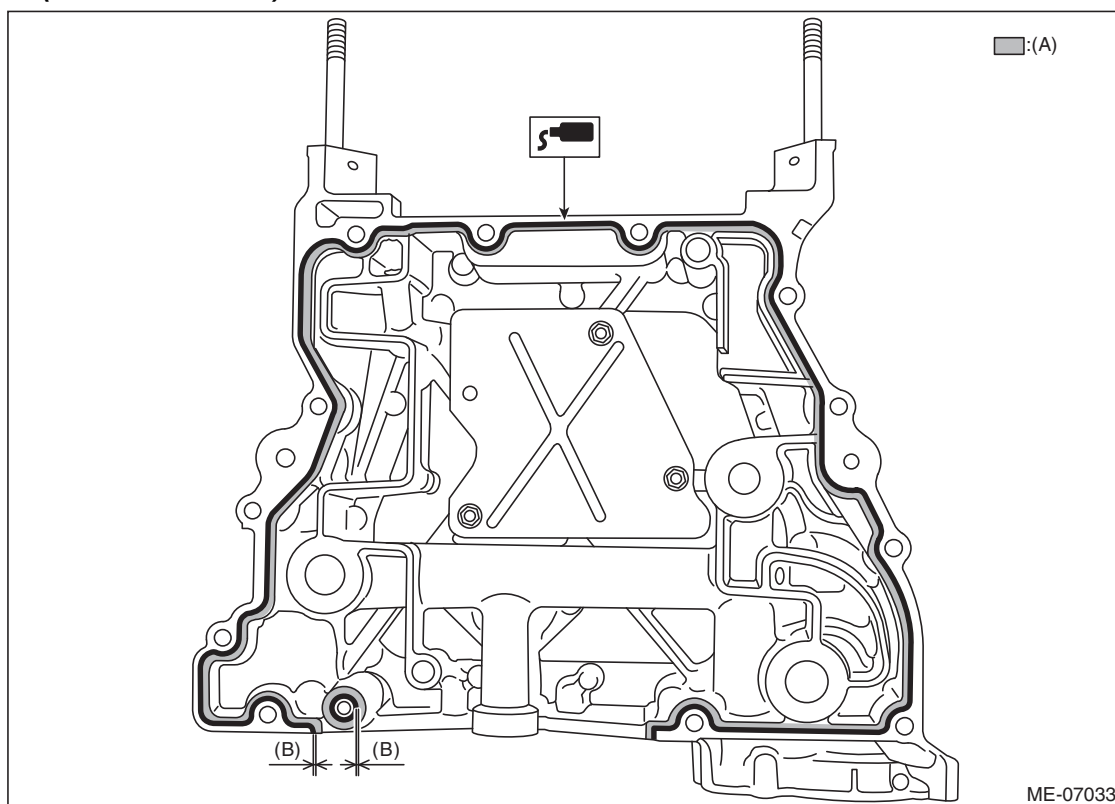
- Use new O-rings.
- Install within 5 min. after applying liquid gasket.
- Apply liquid gasket 1.5 mm (0.0591 in) outside from the chamfer surface. However, application of liquid gasket on the chamfer surface around the bolt hole is allowed.

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100) or equivalent

Liquid gasket applying diameter:

5 ± 1 mm (0.1969 ± 0.0394 in)



(A) Chamfer surface

(B) 1.5 mm (0.0591 in)

Oil Pan and Strainer

LUBRICATION

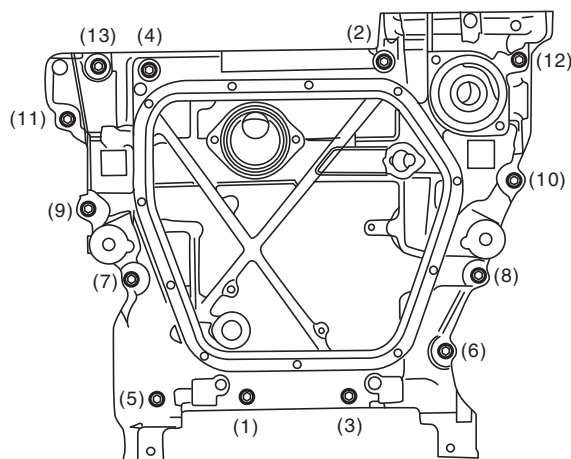
5) Tighten the bolts to install the oil pan upper to the cylinder block in the numerical order.

NOTE:

After tightening, if the liquid gasket is squeezed out onto the seal surface of the chain cover, completely remove any squeezed-out liquid gasket.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



LU-02736

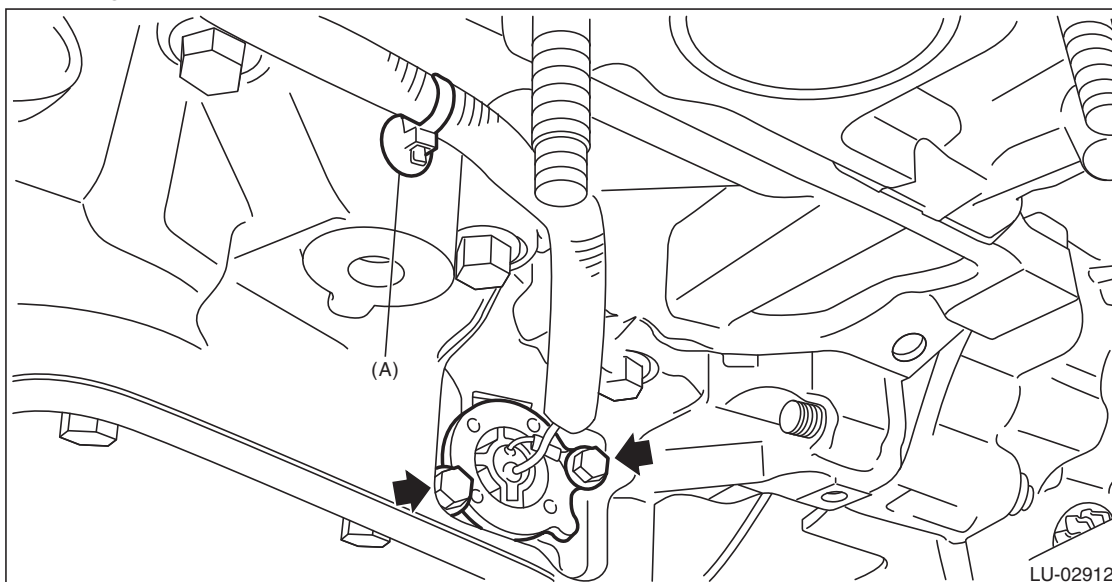
6) Install the oil level switch on the oil pan upper, and secure the harness with clips (A).

NOTE:

- Use new O-rings.
- Apply a coat of engine oil to the O-rings.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



LU-02912

Oil Pan and Strainer

LUBRICATION

- 7) Install the chain cover. <Ref. to ME(H4DO)-105, INSTALLATION, Chain Cover.> <Ref. to ME(H4DOTC)-97, INSTALLATION, Chain Cover.>
- 8) Install the oil pan. <Ref. to LU(H4DO)-29, OIL PAN, INSTALLATION, Oil Pan and Strainer.>
- 9) Install the water pipe assembly. <Ref. to CO(H4DO)-30, INSTALLATION, Water Pipe Assembly.> <Ref. to CO(H4DOTC)-27, INSTALLATION, Water Pipe Assembly.>
- 10) Install the thermostat cover. <Ref. to CO(H4DO)-45, INSTALLATION, Thermostat.> <Ref. to CO(H4DOTC)-36, INSTALLATION, Thermostat.>
- 11) Install the water pump. <Ref. to CO(H4DO)-18, INSTALLATION, Water Pump.> <Ref. to CO(H4DOTC)-17, INSTALLATION, Water Pump.>
- 12) Install the engine to the vehicle. <Ref. to ME(H4DO)-65, INSTALLATION, Engine Assembly.> <Ref. to ME(H4DOTC)-59, INSTALLATION, Engine Assembly.>
- 13) Refill the engine oil. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.>

C: INSPECTION

Check that the oil pan, oil pan upper, oil strainer and baffle plate do not have deformation, cracks or damage.

Oil Pressure Switch

LUBRICATION

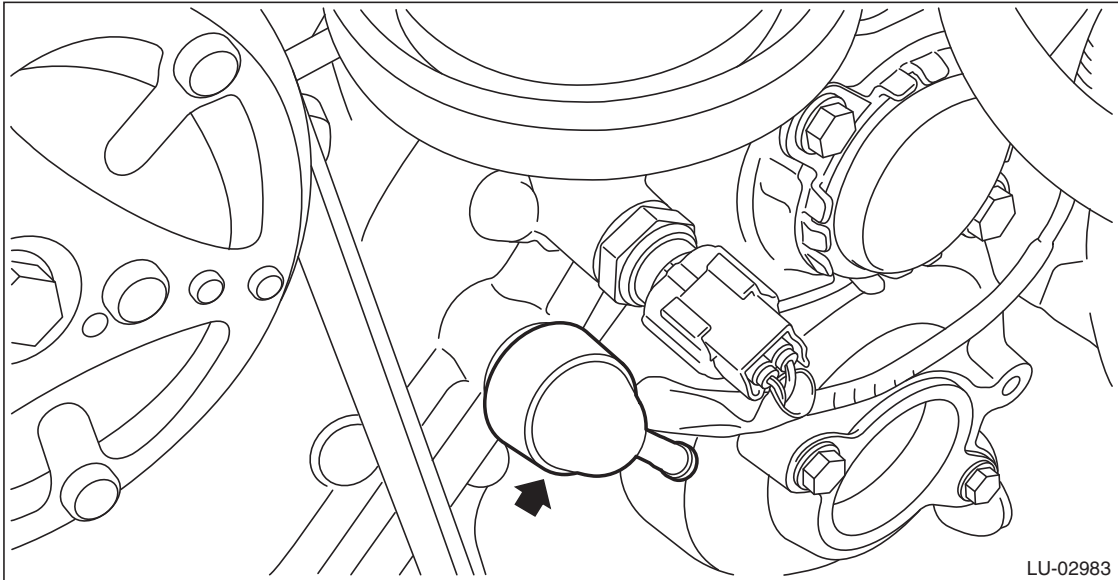
6. Oil Pressure Switch

A: REMOVAL

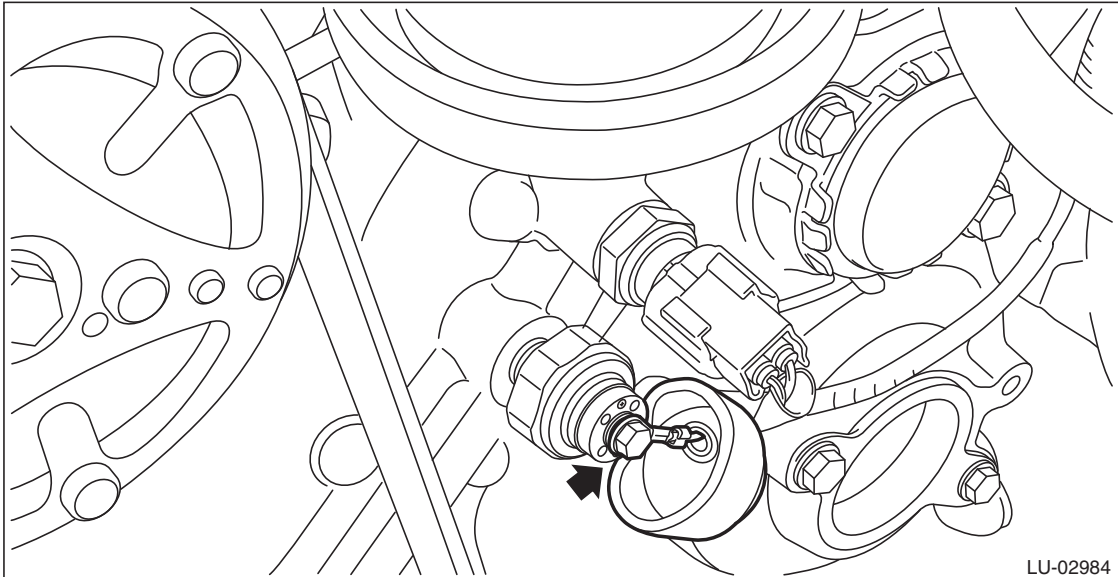
CAUTION:

If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emitting smoke or causing a fire.

- 1) Disconnect the ground cable from battery.
- 2) Remove the rubber cap.



- 3) Disconnect the terminal from oil pressure switch.



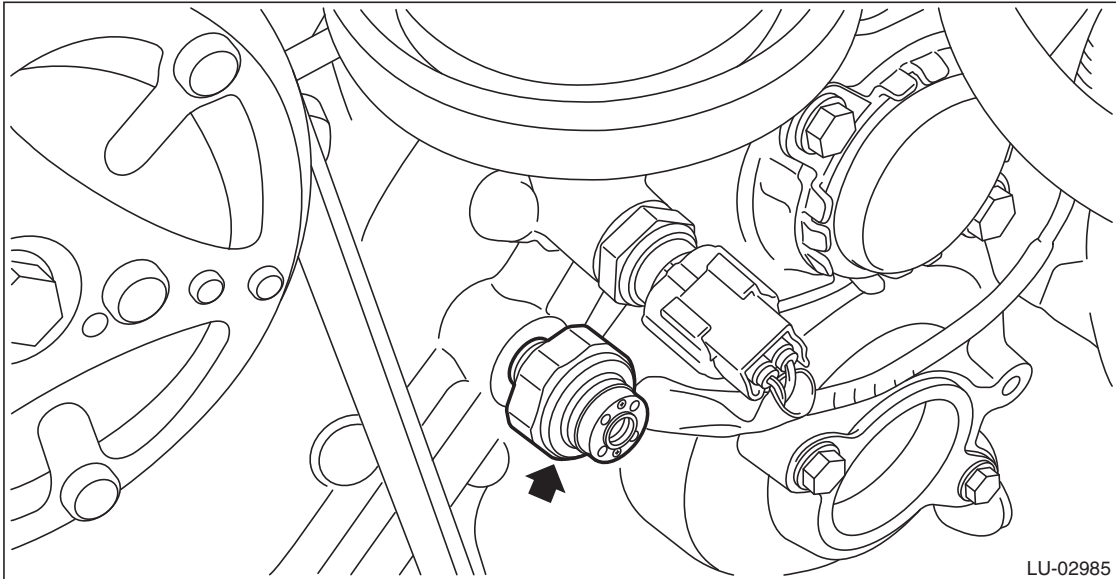
Oil Pressure Switch

LUBRICATION

4) Remove the oil pressure switch.

CAUTION:

Catch the engine oil using cloth to prevent it from splashing.

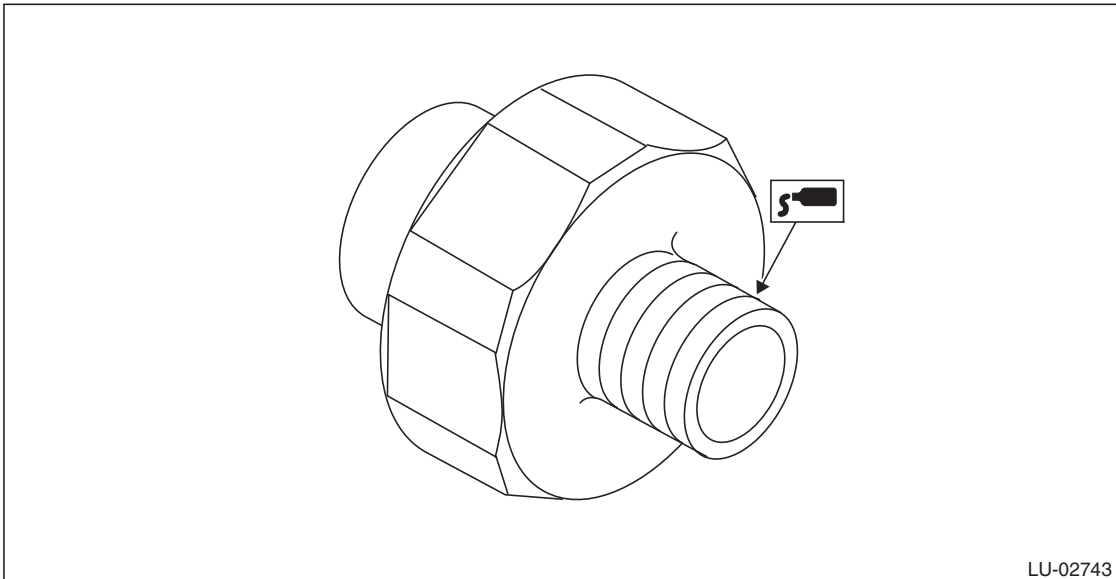


B: INSTALLATION

1) Apply liquid gasket to the oil pressure switch threads.

Liquid gasket:

THREE BOND 1324 (Part No. 004403042) or equivalent



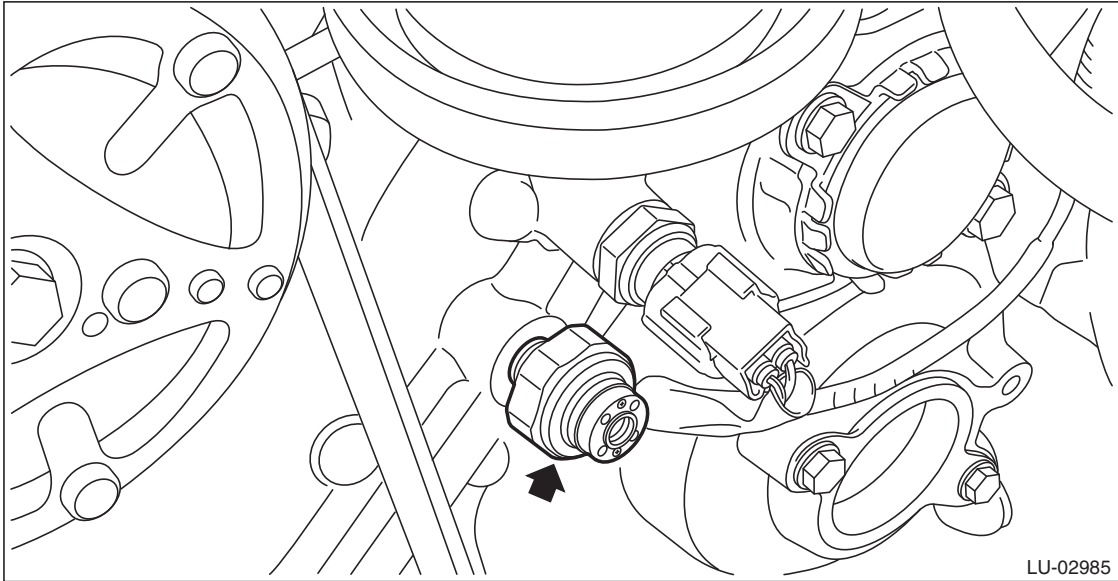
Oil Pressure Switch

LUBRICATION

2) Install the oil pressure switch to the chain cover.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



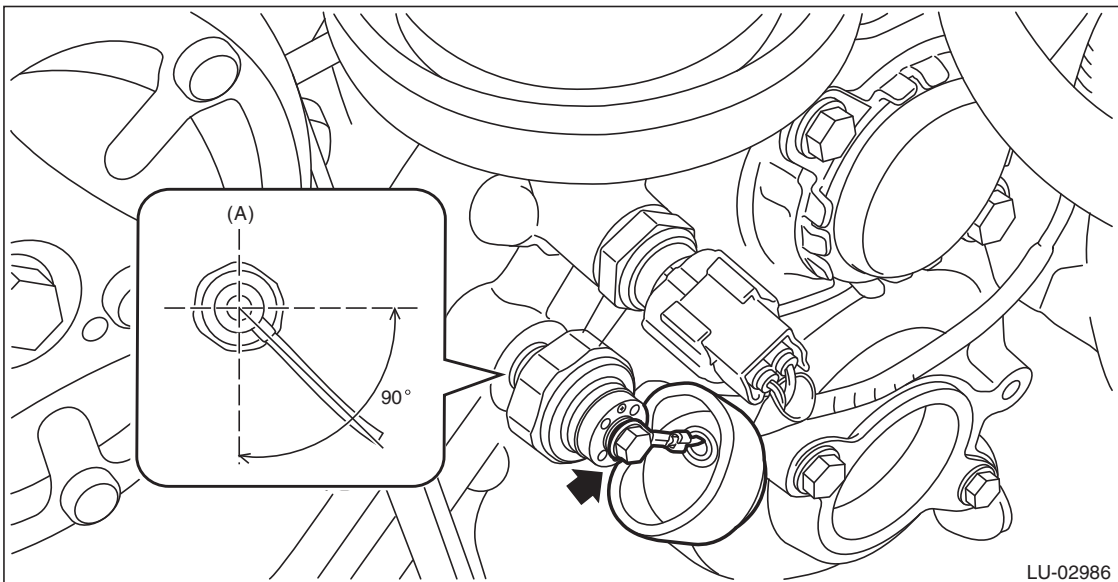
3) Connect the terminal to the oil pressure switch.

NOTE:

The oil pressure switch harness must be tightened within the range of a 90° angle as shown below.

Tightening torque:

1.5 N·m (0.2 kgf-m, 1.1 ft-lb)

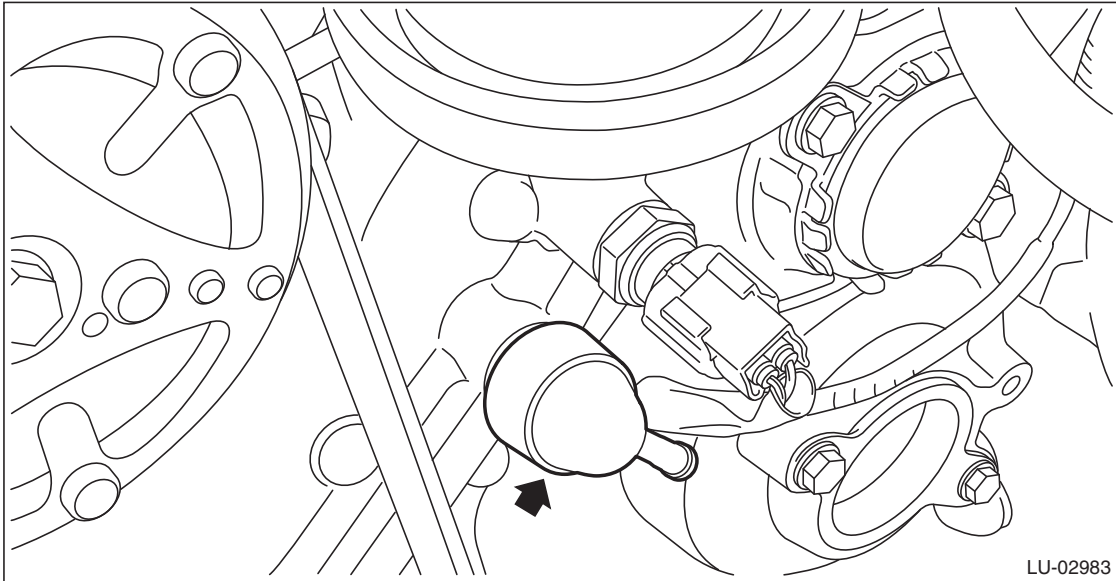


(A) Upper side of the engine

Oil Pressure Switch

LUBRICATION

4) Attach the rubber cap.



5) Connect the battery ground terminal.

C: INSPECTION

- 1) Check that the oil pressure switch does not have deformation, cracks or damage.
- 2) Check that there are no oil leaks or oil oozing from the oil pressure switch installation portion.



Engine Oil Cooler

LUBRICATION

7. Engine Oil Cooler

A: REMOVAL

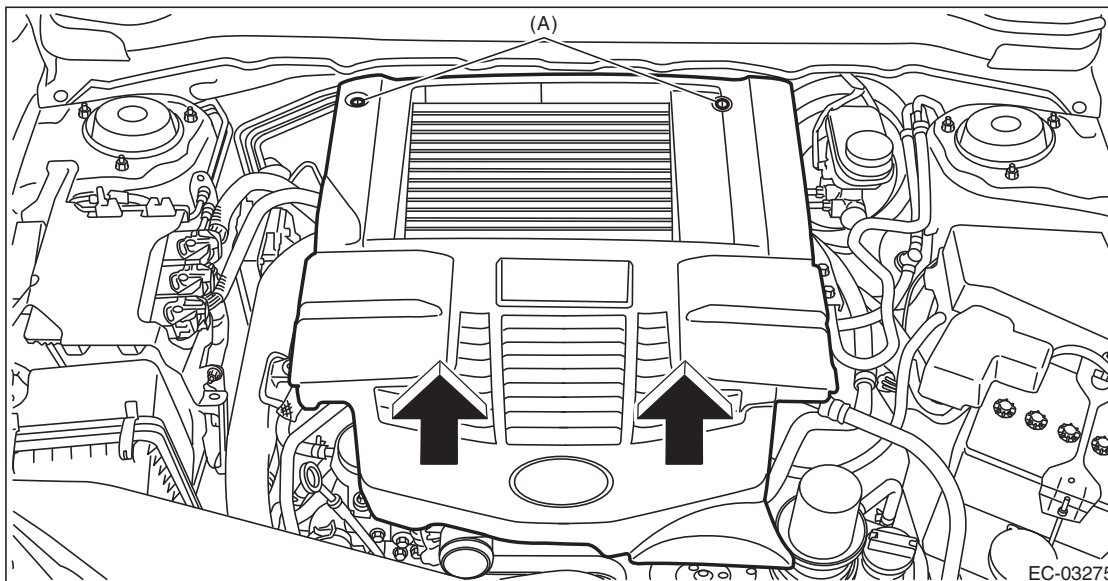
CAUTION:

If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emitting smoke or causing a fire.

NOTE:

Turbo model is equipped with engine oil cooler.

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



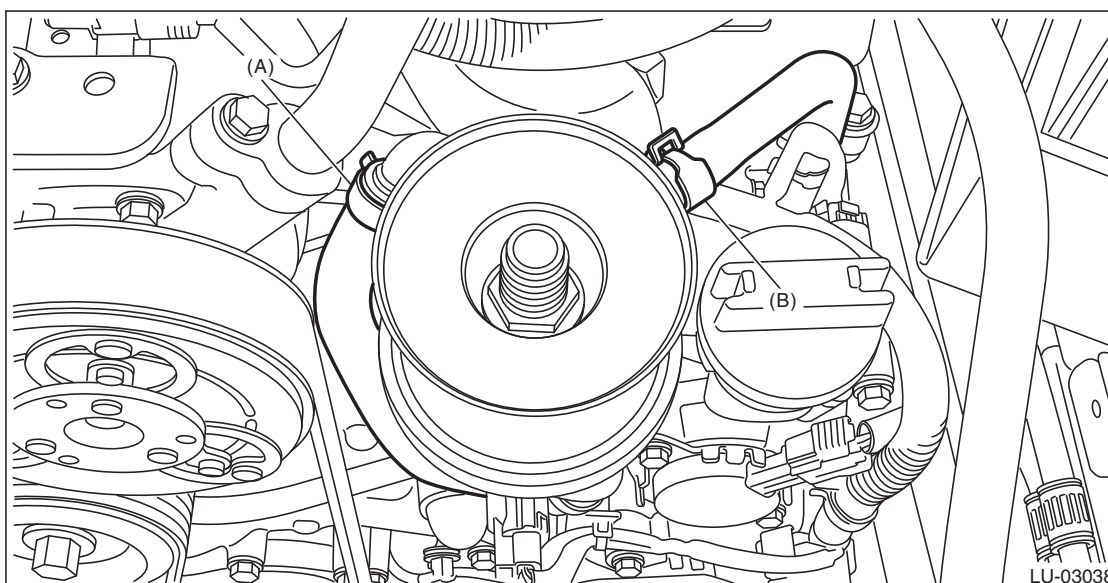
2) Lift up the vehicle.

3) Remove the under cover. <Ref. to EI-22, REMOVAL, Front Under Cover.>

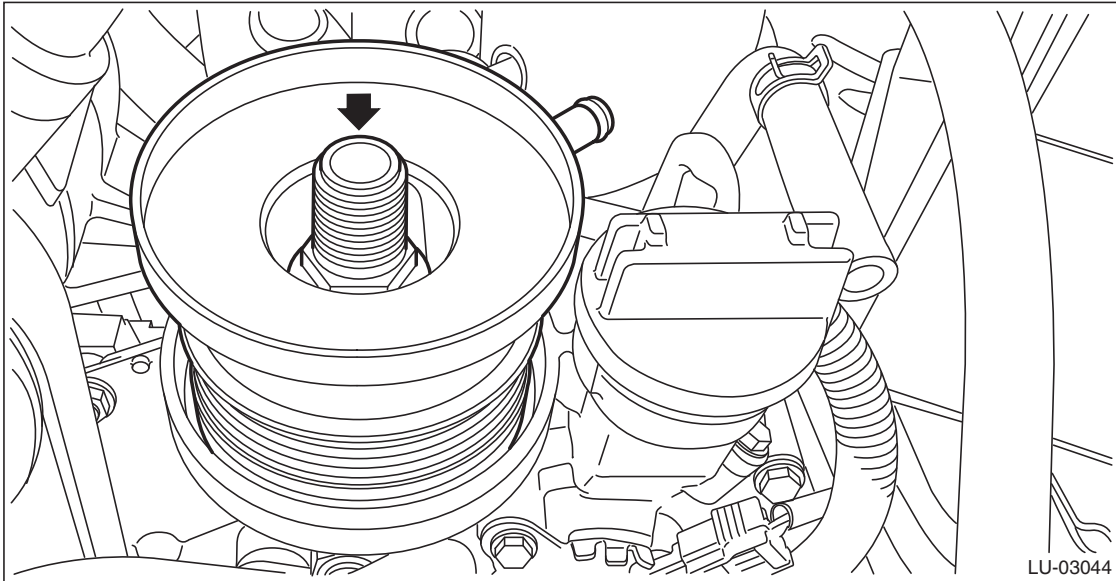
4) Drain engine coolant. <Ref. to CO(H4DOTC)-13, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

5) Remove the engine oil filter. <Ref. to LU(H4DO)-64, OIL FILTER, REMOVAL, Engine Oil Filter.>

6) Disconnect the front engine oil cooler hose A (A) and the side engine oil cooler hose A (B) from the engine oil cooler.



7) Remove the oil cooler connector and remove the engine oil cooler.



B: INSTALLATION

Install in the reverse order of removal.

NOTE:

- Use a new gasket.
- After installing, check the engine oil level and replenish it if necessary. <Ref. to LU(H4DO)-13, INSPECTION, Engine Oil.>

Tightening torque:

45 N·m (4.6 kgf-m, 33.2 ft-lb)

C: INSPECTION

- 1) Check that the engine oil cooler, engine oil cooler pipe, and oil cooler connector do not have deformation, cracks or damage.
- 2) Make sure the engine oil cooler hoses are not cracked, damaged or loose.
- 3) Blow with compressed air to make sure the coolant passages are not clogged.
- 4) Make sure the mating surfaces of the chain cover do not have damage.

Engine Oil Cooler Pipe

LUBRICATION

8. Engine Oil Cooler Pipe

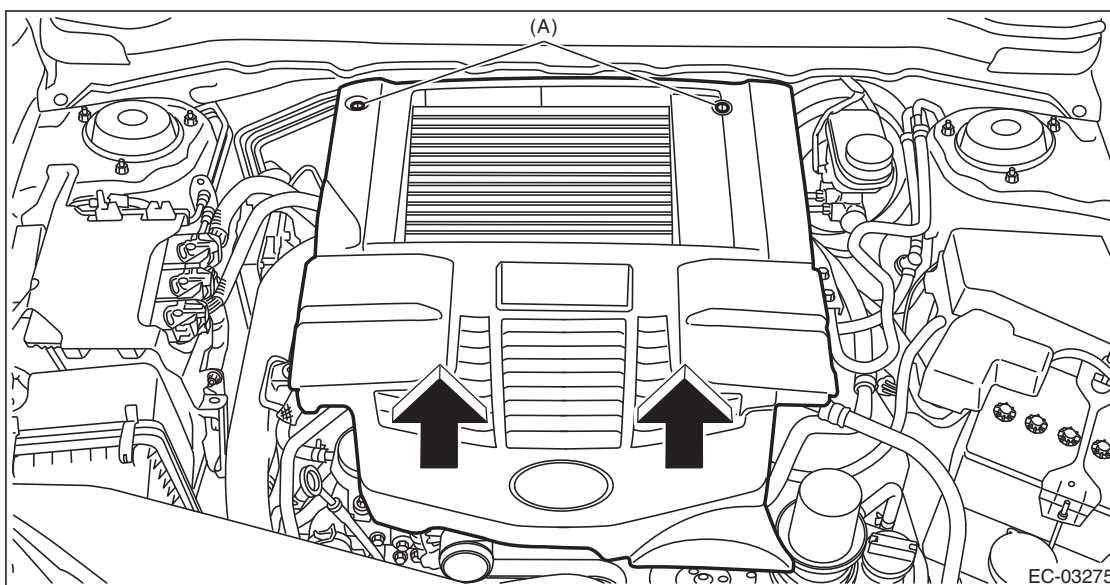
A: REMOVAL

NOTE:

Turbo model is equipped with engine oil cooler pipe.

1. FRONT ENGINE OIL COOLER PIPE

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



2) Disconnect the ground cable from battery.

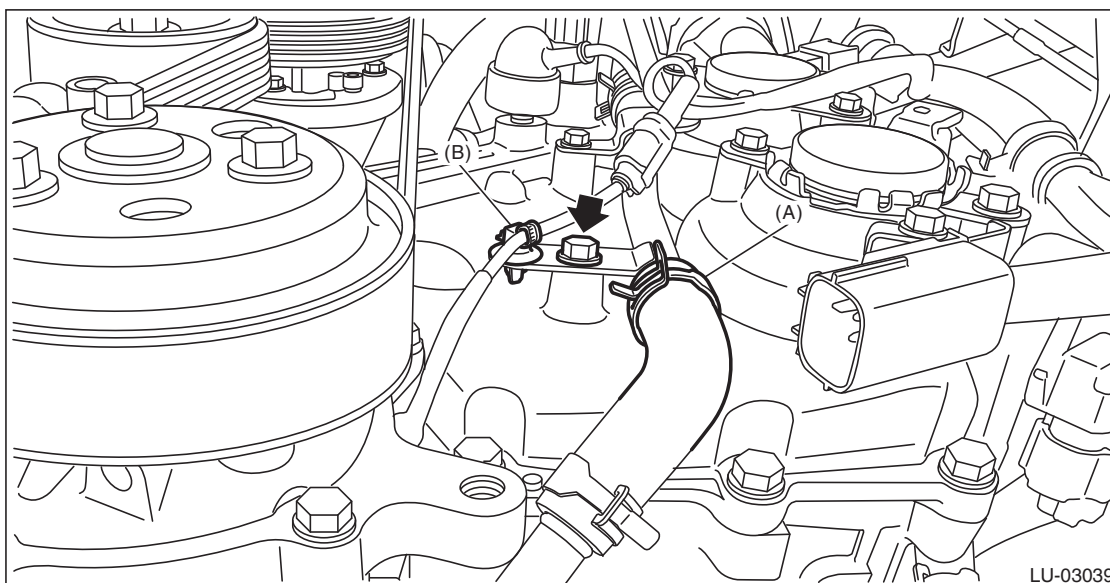
3) Lift up the vehicle.

4) Remove the under cover. <Ref. to EI-22, REMOVAL, Front Under Cover.>

5) Drain engine coolant. <Ref. to CO(H4DOTC)-13, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

6) Remove the center exhaust pipe. <Ref. to EX(H4DOTC)-30, REMOVAL, Center Exhaust Pipe.>

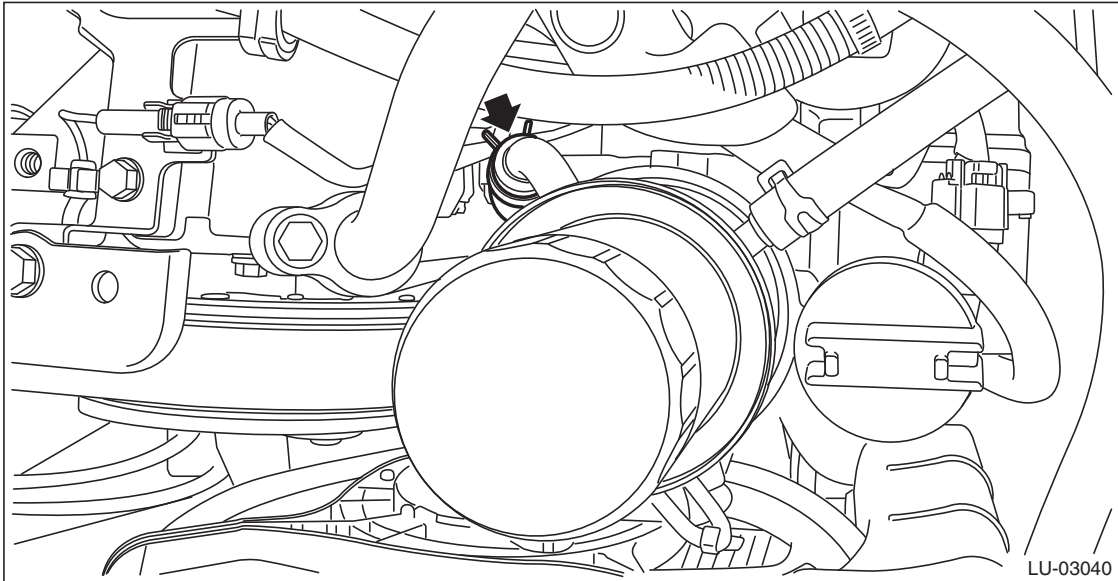
7) Remove the clip (B) which holds the front engine oil cooler hose B (A) and the oil level switch harness from the front engine oil cooler pipe. Remove the bolt which secures the front engine oil cooler pipe to the chain cover.



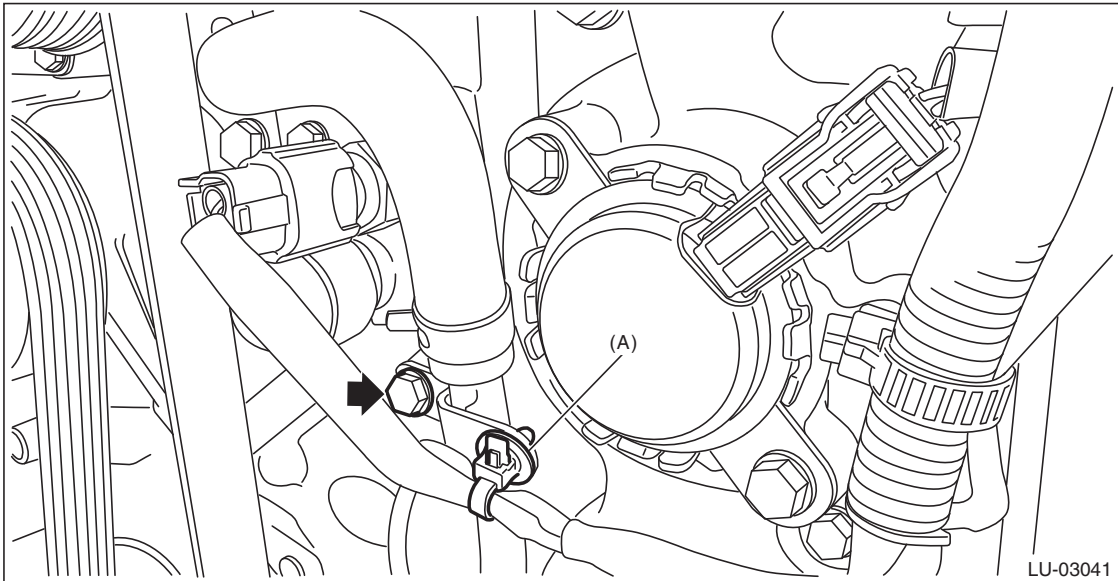
Engine Oil Cooler Pipe

LUBRICATION

- 8) Lower the vehicle.
- 9) Disconnect the front engine oil cooler hose A from the engine oil cooler.



- 10) Remove the clip (A) holding the engine oil temperature sensor harness from the front engine oil cooler pipe.
- 11) Remove the bolt which secures the front engine oil cooler pipe to the chain cover. Remove the front engine oil cooler pipe together with the front engine oil cooler hose A.



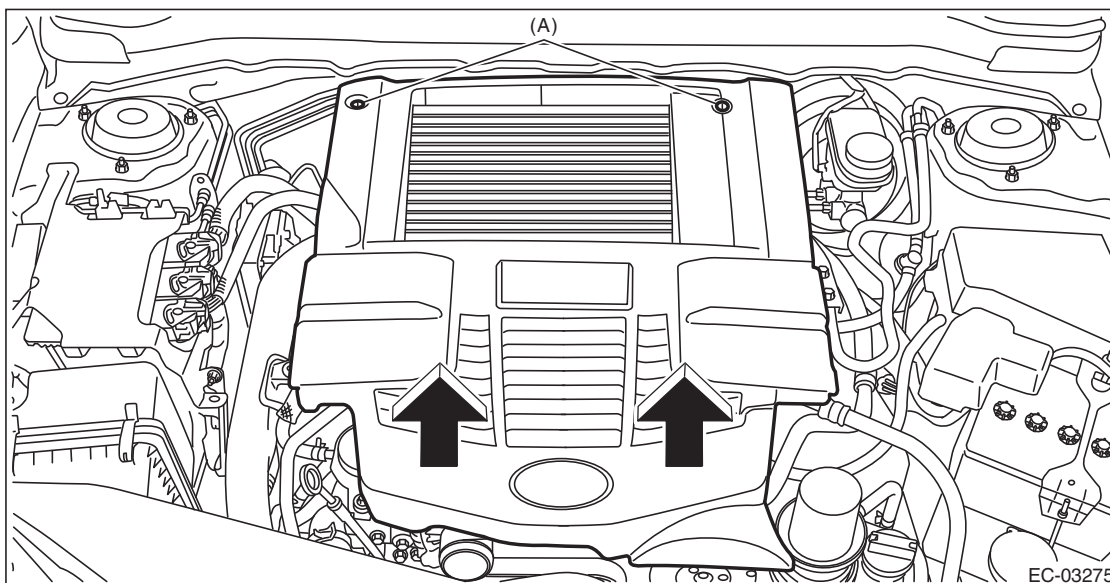
- 12) Remove the front engine oil cooler hose A from the front engine oil cooler pipe.

Engine Oil Cooler Pipe

LUBRICATION

2. SIDE ENGINE OIL COOLER PIPE

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



2) Disconnect the ground cable from battery.

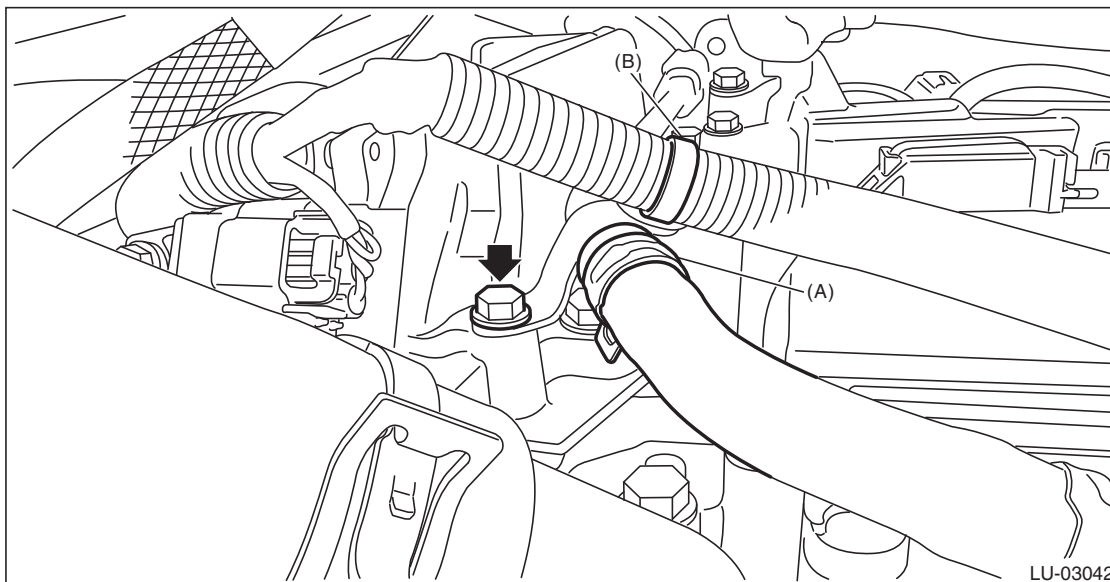
3) Lift up the vehicle.

4) Remove the under cover. <Ref. to EI-22, REMOVAL, Front Under Cover.>

5) Drain engine coolant. <Ref. to CO(H4DOTC)-13, DRAINING OF ENGINE COOLANT, REPLACEMENT, Engine Coolant.>

6) Remove the center exhaust pipe. <Ref. to EX(H4DOTC)-30, REMOVAL, Center Exhaust Pipe.>

7) Remove the clip (B) which holds the side engine oil cooler hose B (A) and the rear oxygen sensor harness from the side engine oil cooler pipe. Remove the bolt which secures the side engine oil cooler pipe to the cam carrier RH.

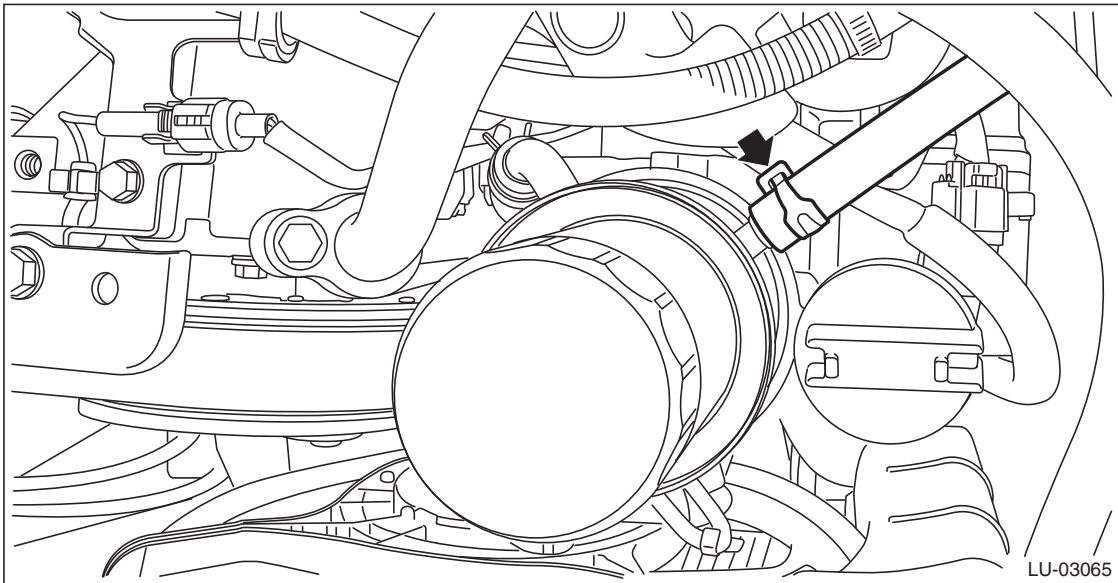


8) Lower the vehicle.

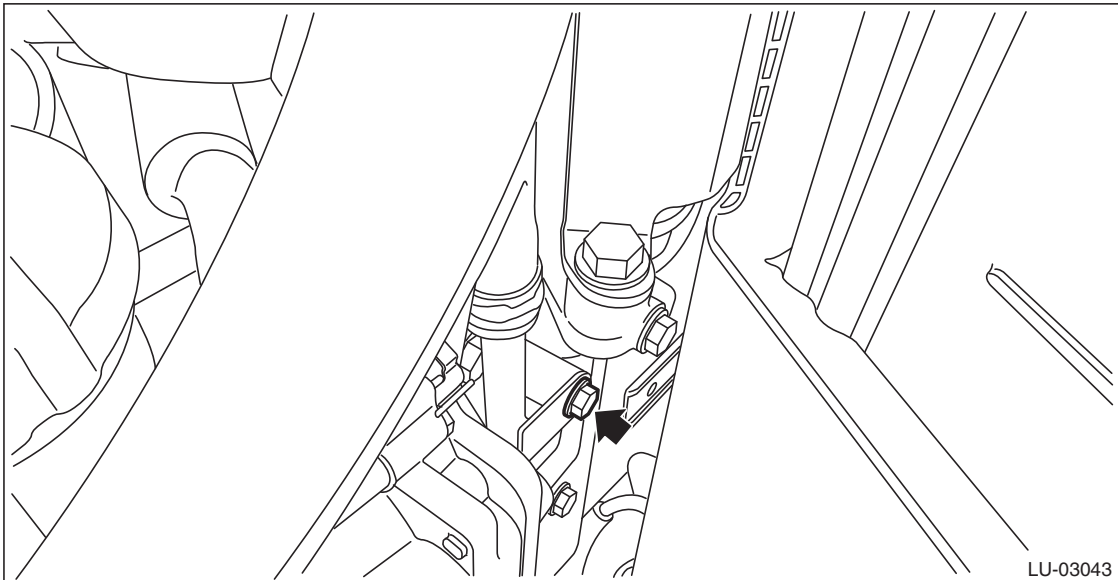
Engine Oil Cooler Pipe

LUBRICATION

- 9) Disconnect the side engine oil cooler hose A from the engine oil cooler.



- 10) Remove the bolt which secures the side engine oil cooler pipe to the cam carrier RH. Remove the side engine oil cooler pipe together with the side engine oil cooler hose A.



- 11) Remove the side engine oil cooler hose A from the side engine oil cooler pipe.

B: INSTALLATION

1. FRONT ENGINE OIL COOLER PIPE

Install in the reverse order of removal.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

2. SIDE ENGINE OIL COOLER PIPE

Install in the reverse order of removal.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

Engine Oil Cooler Pipe

LUBRICATION

C: INSPECTION

- 1) Check that the engine oil cooler pipes have no deformation, cracks or other damages.
- 2) Make sure the engine oil cooler hoses are not cracked, damaged or loose.

9. Oil Catch Tank

A: REMOVAL

Refer to "Oil Catch Tank" for removal procedure of the oil catch tank. <Ref. to IN(H4DOTC)-48, REMOVAL, Oil Catch Tank.>

B: INSTALLATION

Refer to "Oil Catch Tank" for installation procedure of the oil catch tank. <Ref. to IN(H4DOTC)-49, INSTALLATION, Oil Catch Tank.>

C: INSPECTION

Refer to "Oil Catch Tank" for inspection procedure of the oil catch tank. <Ref. to IN(H4DOTC)-52, INSPECTION, Oil Catch Tank.>

Scavenge Pump

LUBRICATION

10.Scavenge Pump

A: REMOVAL

CAUTION:

If engine oil is spilt onto the exhaust pipe, wipe it off with cloth to avoid emission of smoke or causing a fire.

NOTE:

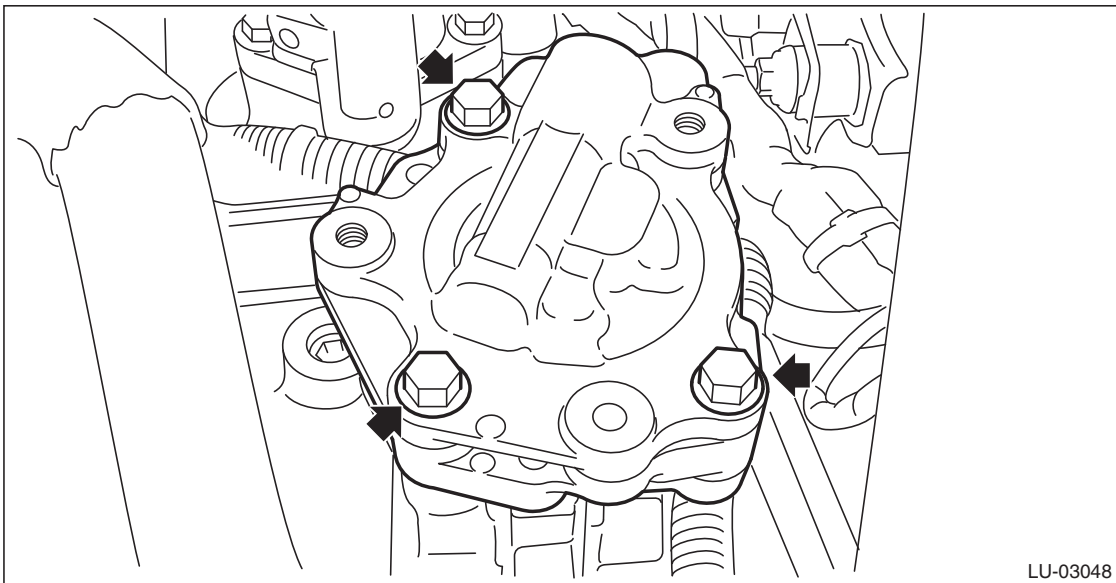
The scavenge pump is installed on turbo models.

1) Remove the oil pipe assembly. <Ref. to LU(H4DO)-56, OIL PIPE ASSEMBLY, REMOVAL, Oil Pipe.>

2) Remove the bolts which secure the scavenge pump to the intake rear camshaft cap RH and the cam carrier RH. Using a flat tip screwdriver or similar tool wrapped with protective tape, remove the scavenge pump.

CAUTION:

Be careful not to damage the mating surfaces of the cylinder head and scavenge pump.



Scavenge Pump

LUBRICATION

B: INSTALLATION

Install in the reverse order of removal.

CAUTION:

Do not start applying the gasket in the (A) region in the figure below.

NOTE:

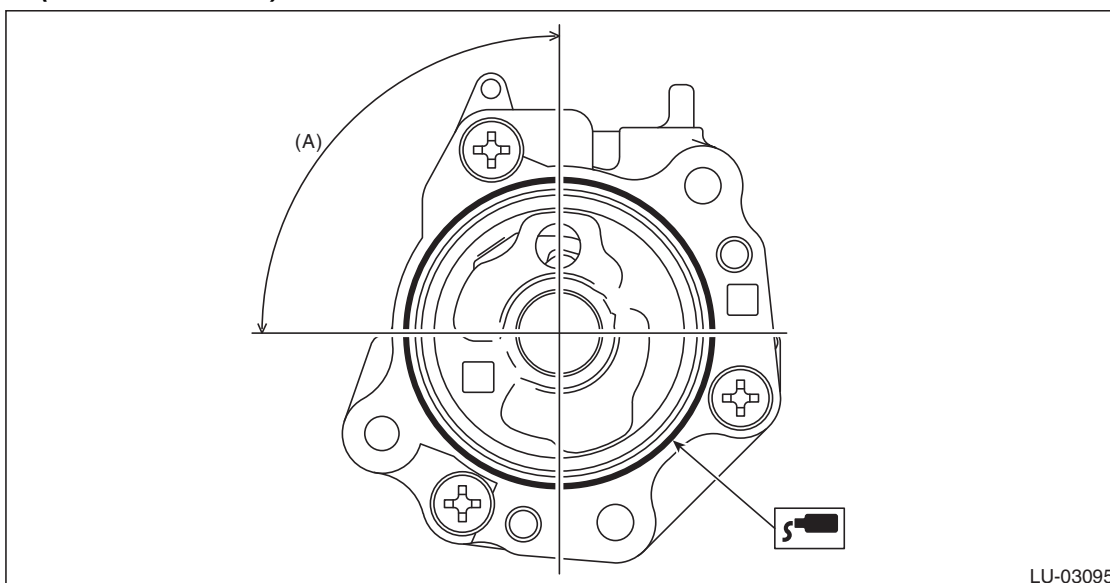
- Use a new gasket.
- Install within 5 min. after applying liquid gasket.

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100) or equivalent

Liquid gasket applying diameter:

3 ± 1 mm (0.1181 ± 0.0394 in)



Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

C: INSPECTION

- 1) Check that the scavenge hose has no deformation, cracks or other damages.
- 2) Check that the scavenge pump has no crack, damage, or looseness.

Oil Pipe

LUBRICATION

11.Oil Pipe

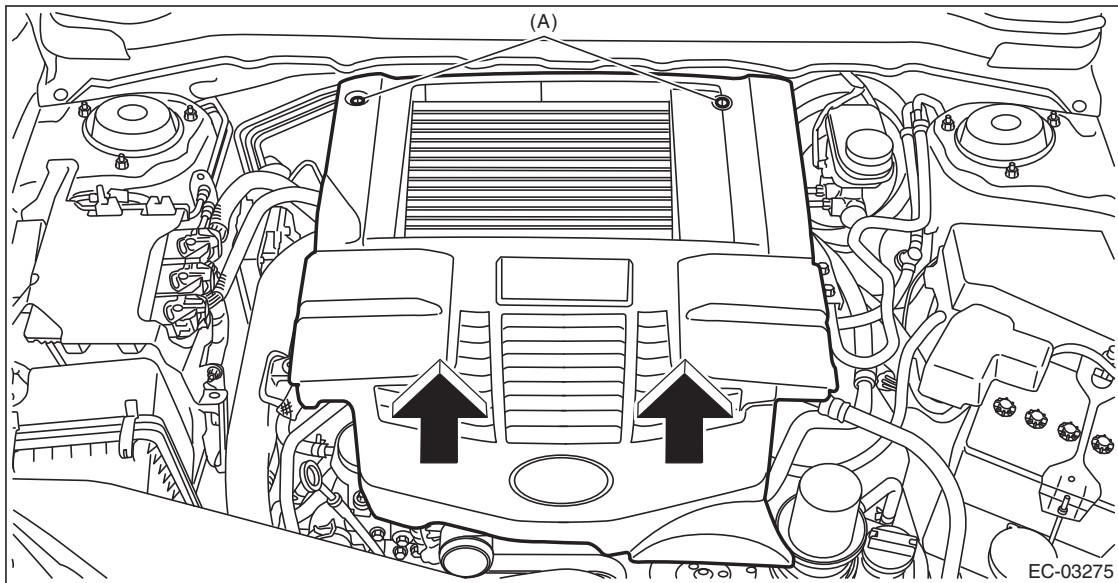
A: REMOVAL

NOTE:

Turbo model is equipped with the oil pump assembly and oil pipe.

1. OIL PIPE ASSEMBLY

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



2) Disconnect the ground cable from battery.

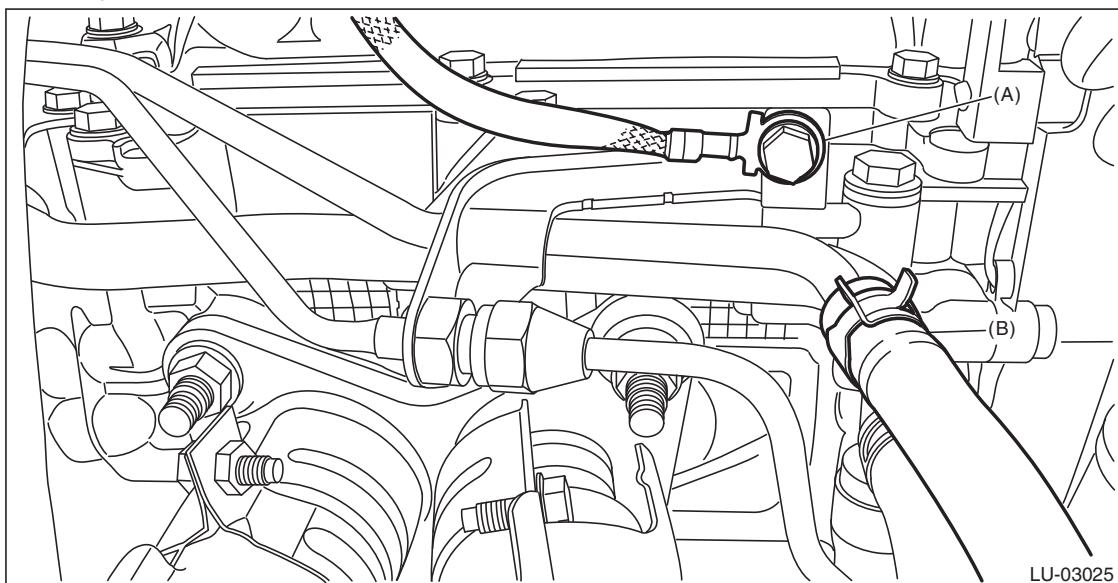
3) Remove the intercooler. <Ref. to IN(H4DOTC)-35, REMOVAL, Intercooler.>

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

5) Lift up the vehicle.

6) Remove the under cover. <Ref. to EI-22, REMOVAL, Front Under Cover.>

7) Remove the ground cable (A) from the oil pipe assembly, and disconnect the oil outlet hose (B) from the oil pipe assembly.



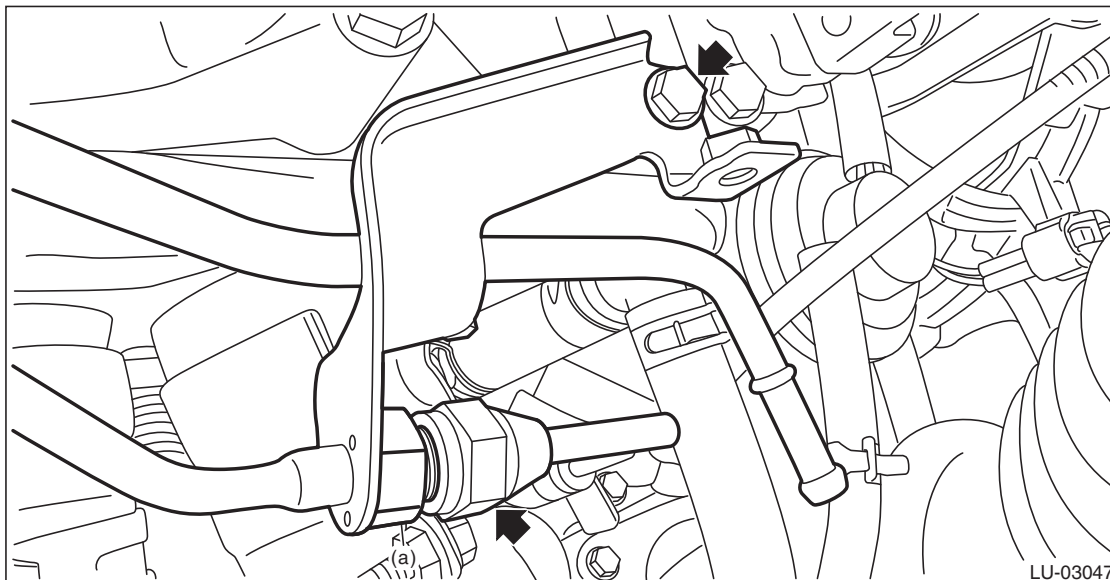
Oil Pipe

LUBRICATION

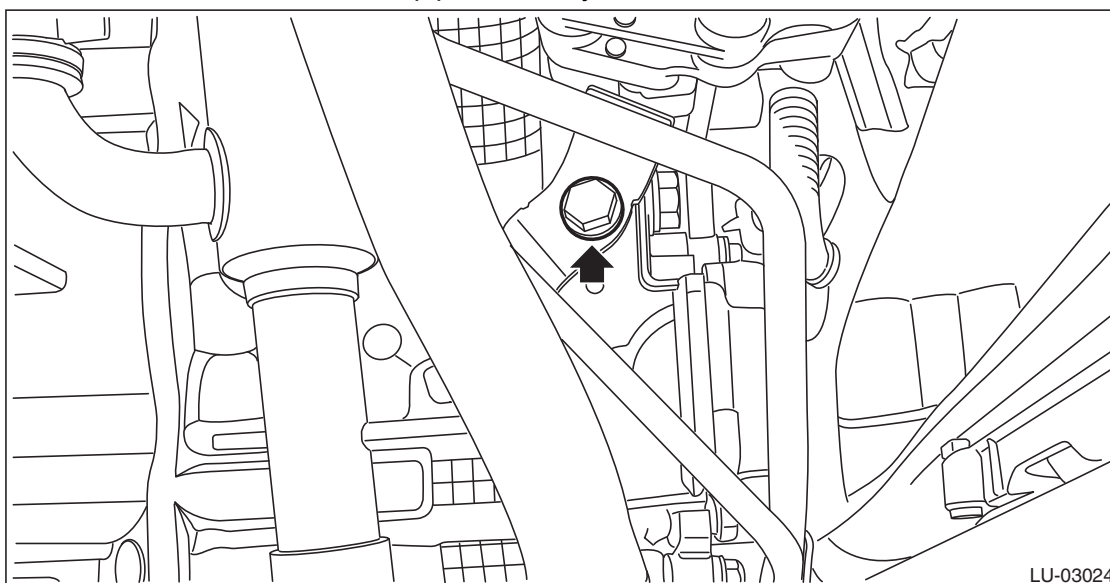
8) Disconnect the union screw pipe assembly from the oil pipe assembly, and remove the bolt which holds the oil pipe assembly.

CAUTION:

In order to prevent damaging the oil pipe assembly, fix the section (a) shown in the figure when loosening the flare nut on the union screw pipe assembly, and avoid the part from rotating together while loosening the nut.



9) Remove the bolt which secures the oil pipe assembly to the cam carrier RH.

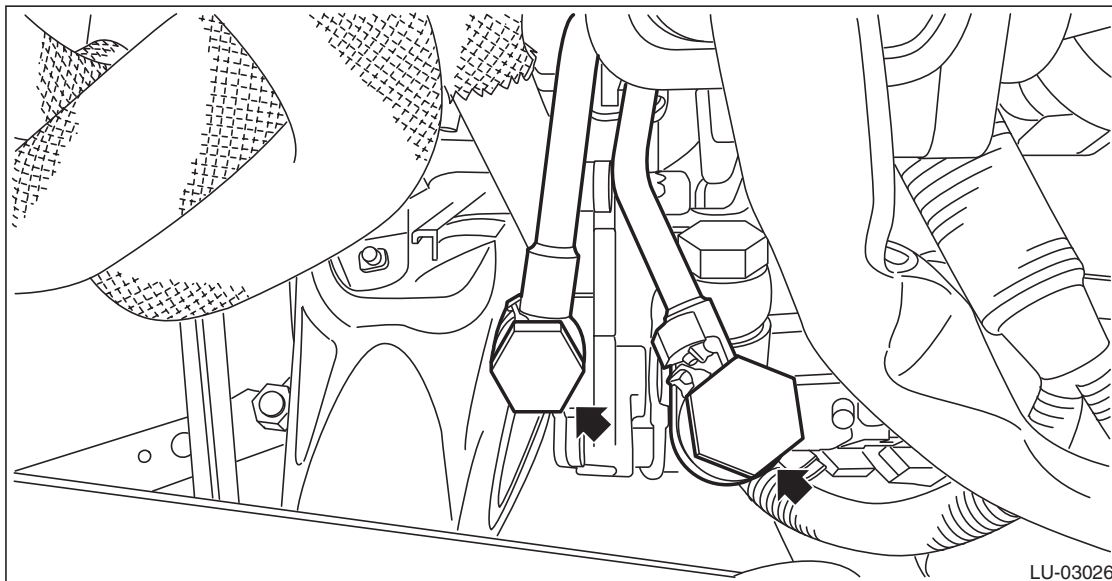


10) Lower the vehicle.

Oil Pipe

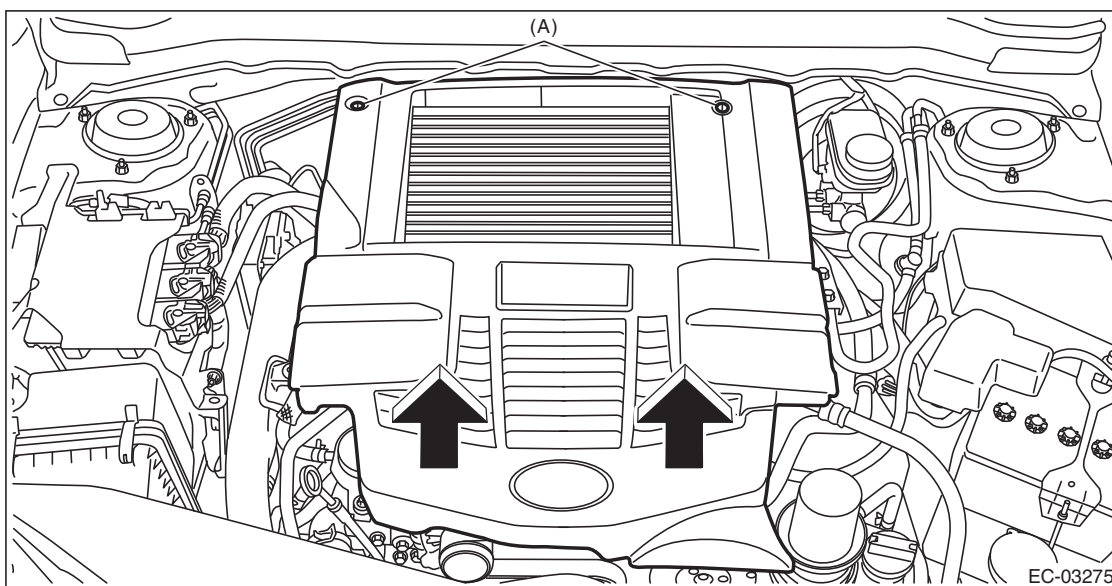
LUBRICATION

11) Remove the union bolts which secure the oil pipe assembly from the scavenge pump and the intake rear camshaft cap RH, and remove the oil pipe assembly.



2. OIL PIPE

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

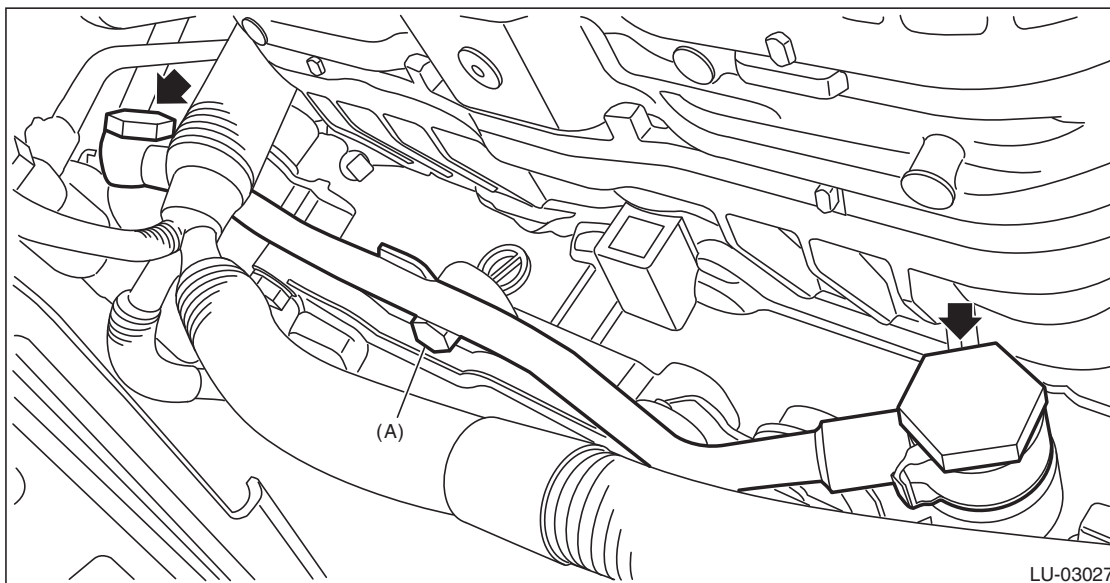


2) Remove the intake duct No. 2. <Ref. to IN(H4DOTC)-22, INTAKE DUCT NO. 2, REMOVAL, Intake Duct.>

Oil Pipe

LUBRICATION

3) Remove the bolt (A) which secures the oil pipe to the cam carrier RH. Remove the union bolts which secure the oil pipe from the intake rear camshaft cap RH and the cam carrier RH.



B: INSTALLATION

1. OIL PIPE ASSEMBLY

1) Temporarily install the oil pipe assembly.

(1) Temporarily tighten the union bolts (B) and (C) which secure the oil pipe assembly (A) to the scavenge pump and the intake rear camshaft cap RH.

NOTE:

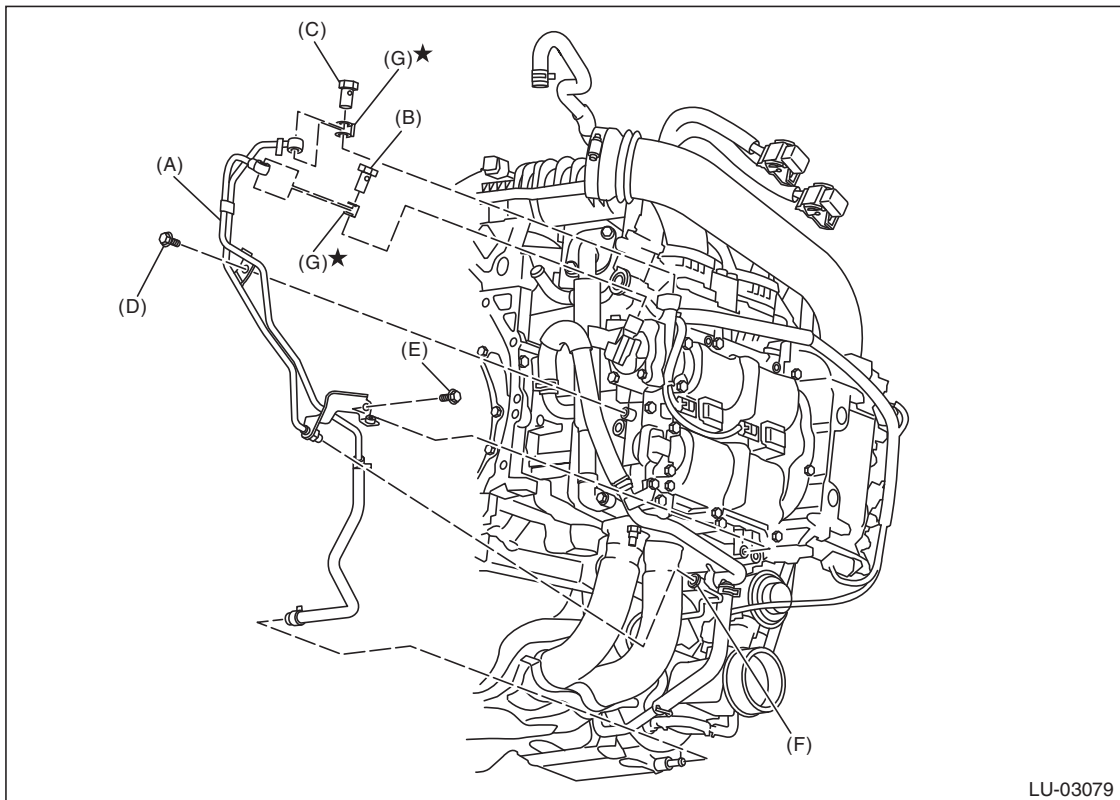
Use a new gasket.

(2) Temporarily tighten the bolts (D) and (E) which secure the oil pipe assembly (A) to the cam carrier RH.

Oil Pipe

LUBRICATION

(3) Temporarily tighten the union screw pipe assembly (F) to the oil pipe assembly (A).



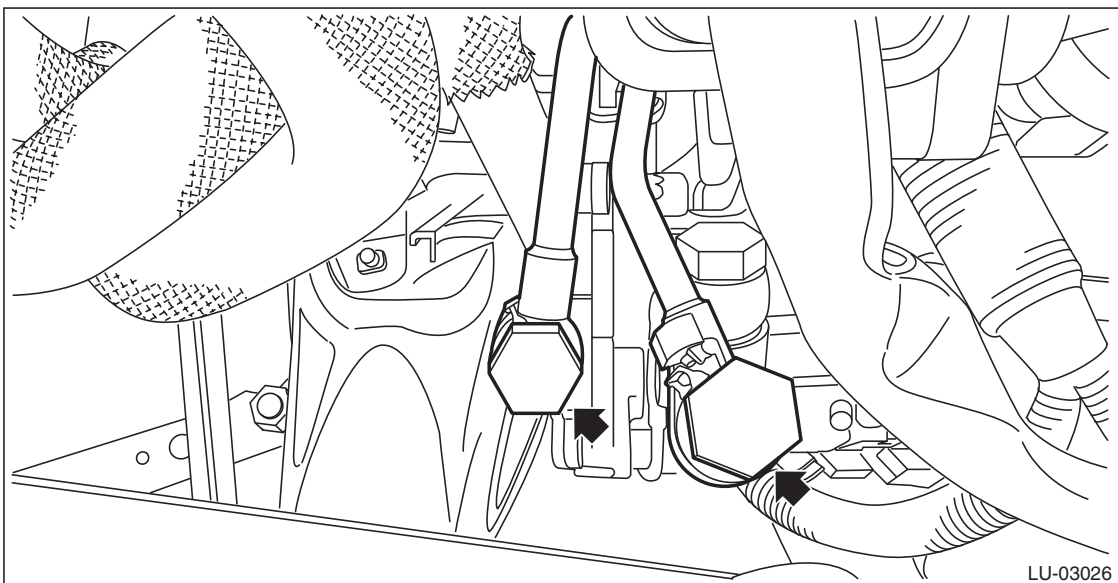
LU-03079

- | | | |
|-------------------|----------------|---------------------------|
| (A) Oil pipe ASSY | (B) Union bolt | (C) Union bolt |
| (D) Bolt | (E) Bolt | (F) Union screw pipe ASSY |
| (G) Gasket | | |

2) Tighten the union bolts which secure the oil pipe assembly to the scavenge pump and the intake rear cam-shaft cap RH.

Tightening torque:

29 N·m (3.0 kgf-m, 21.4 ft-lb)



LU-03026

3) Lift up the vehicle.

LU(H4DO)-60

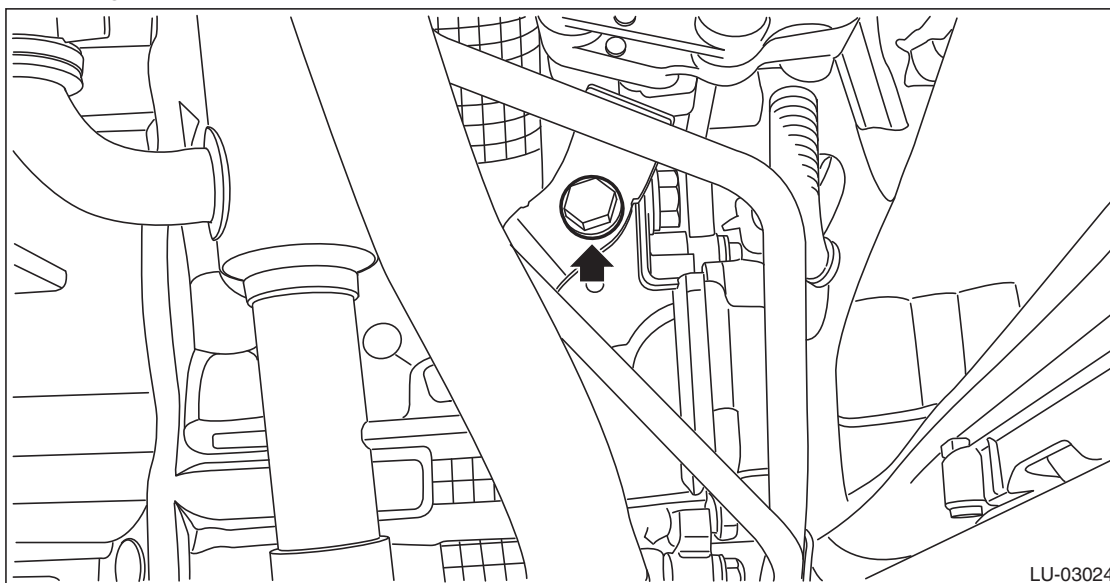
Oil Pipe

LUBRICATION

4) Tighten the bolt which secures the oil pipe assembly to the cam carrier RH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



5) Install the bolt which secures the oil pipe assembly, and install the union screw pipe assembly to the oil pipe assembly.

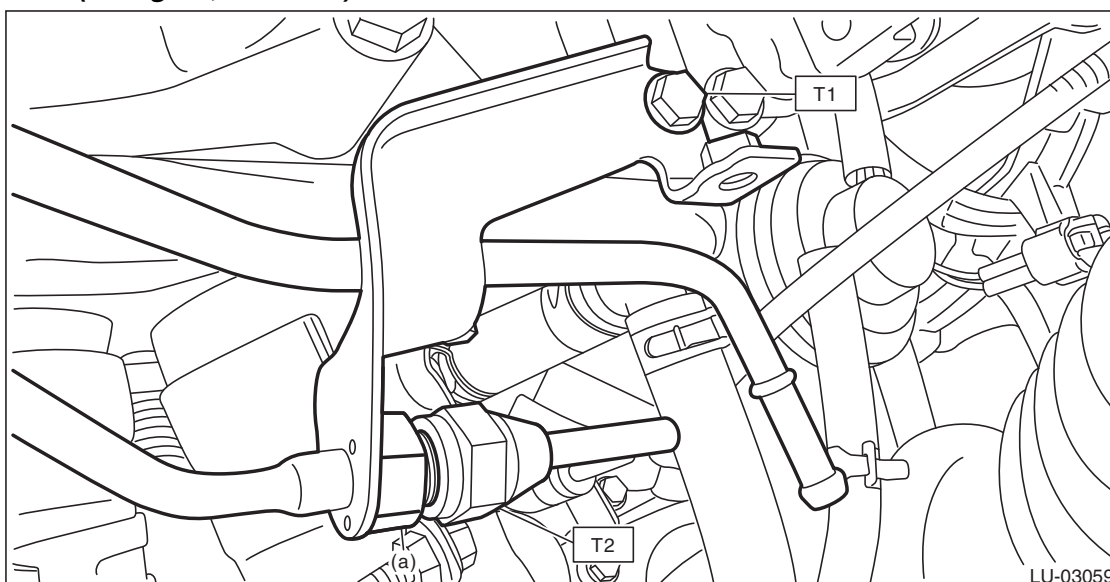
CAUTION:

In order to prevent damaging the oil pipe assembly, fix the section (a) shown in the figure when tightening the flare nut on the union screw pipe assembly, and avoid the part from rotating together while tightening the nut.

Tightening torque:

T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

T2: 20 N·m (2.0 kgf-m, 14.8 ft-lb)



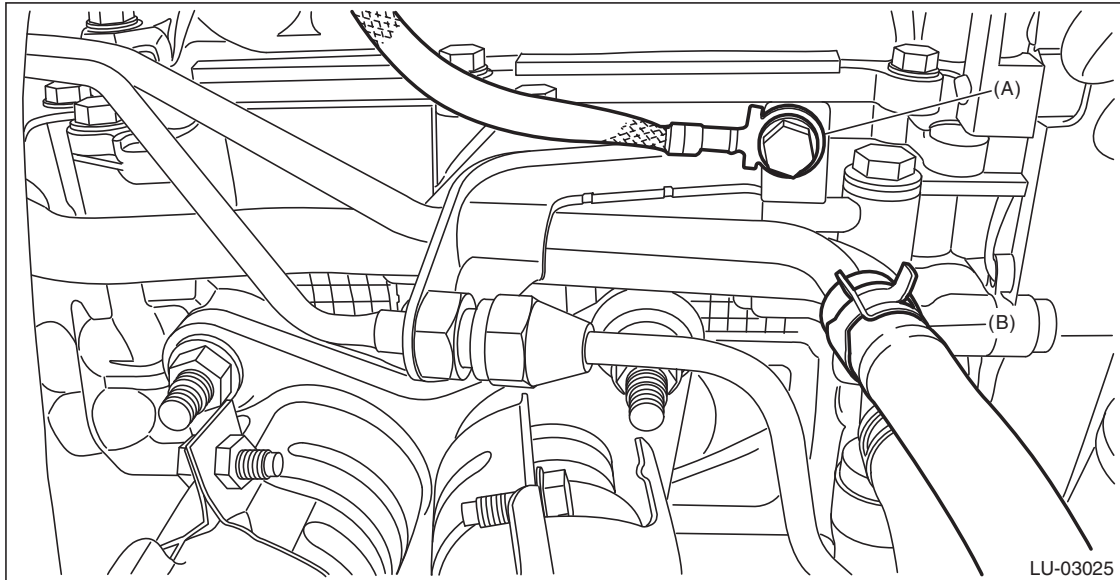
Oil Pipe

LUBRICATION

6) Connect the oil outlet hose (B) to the oil pipe assembly, and install the ground cable (A) to the oil pipe assembly.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)



7) Install the under cover. <Ref. to EI-22, INSTALLATION, Front Under Cover.>

8) Lower the vehicle.

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

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

11) Connect the battery ground terminal.

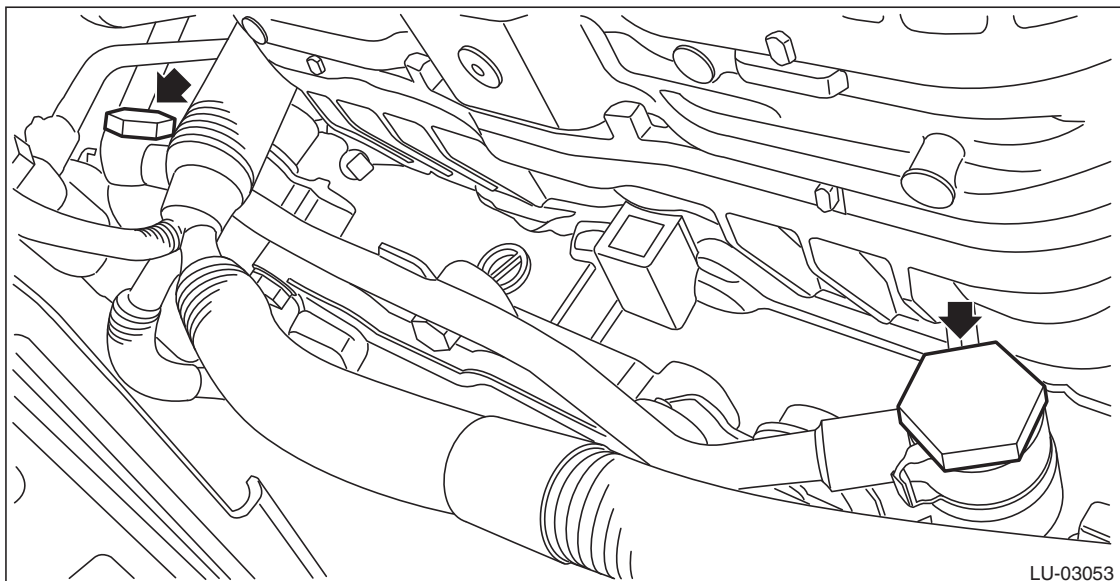
12) Install the collector cover.

2. OIL PIPE

1) Temporarily tighten the union bolts which secure the oil pipes to the intake rear camshaft cap RH and the cam carrier RH.

NOTE:

Use a new gasket.



Oil Pipe

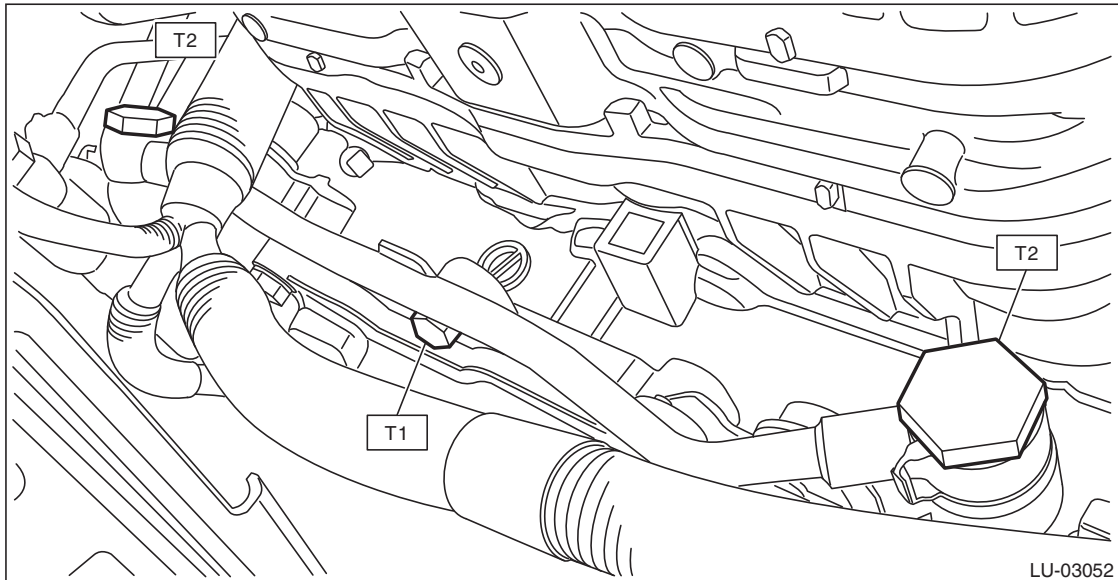
LUBRICATION

2) Install the bolt which secures the oil pipe to the cam carrier RH. Tighten the union bolts which secure the oil pipes to the intake rear camshaft cap RH and the cam carrier RH.

Tightening torque:

T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

T2: 31 N·m (3.2 kgf-m, 22.9 ft-lb)



LU-03052

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

4) Install the collector cover.

C: INSPECTION

1) Check that the oil pipe assembly, oil pipes, and the union bolts have no deformation, cracks and other damages.

2) Check that there are no oil leaks or oil oozing from the areas where the oil pipe assembly and oil pipes are installed.

Engine Oil Filter

LUBRICATION

12.Engine Oil Filter

A: REMOVAL

CAUTION:

If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emitting smoke or causing a fire.

1. OIL FILTER

Remove the oil filter.

NOTE:

Clean off water or dust from the oil element mating surface using air.

- Oil filter (black)

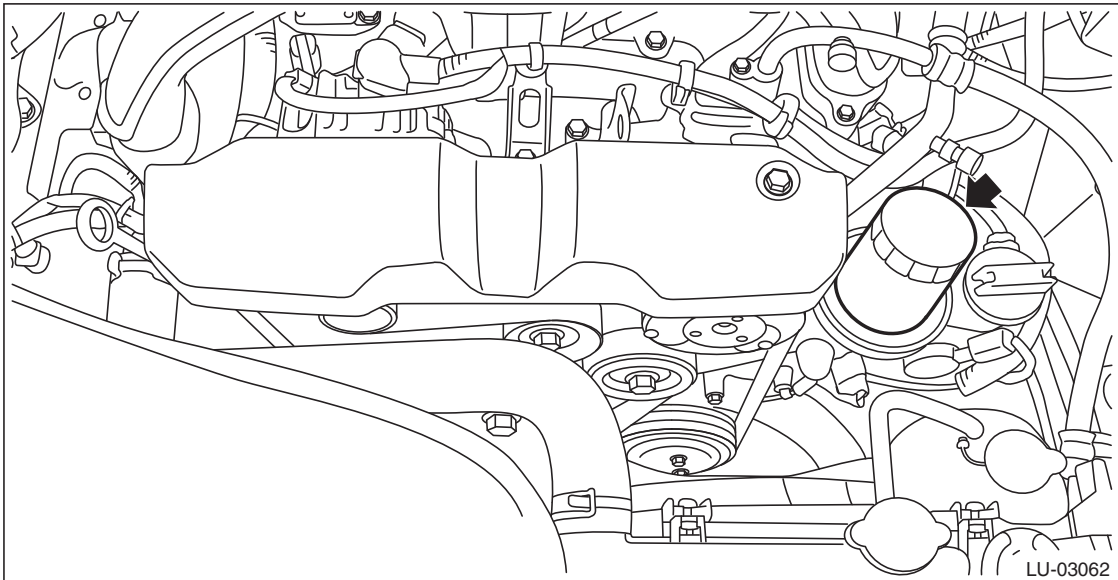
Remove the oil filter using ST.

ST 18332AA000 OIL FILTER WRENCH

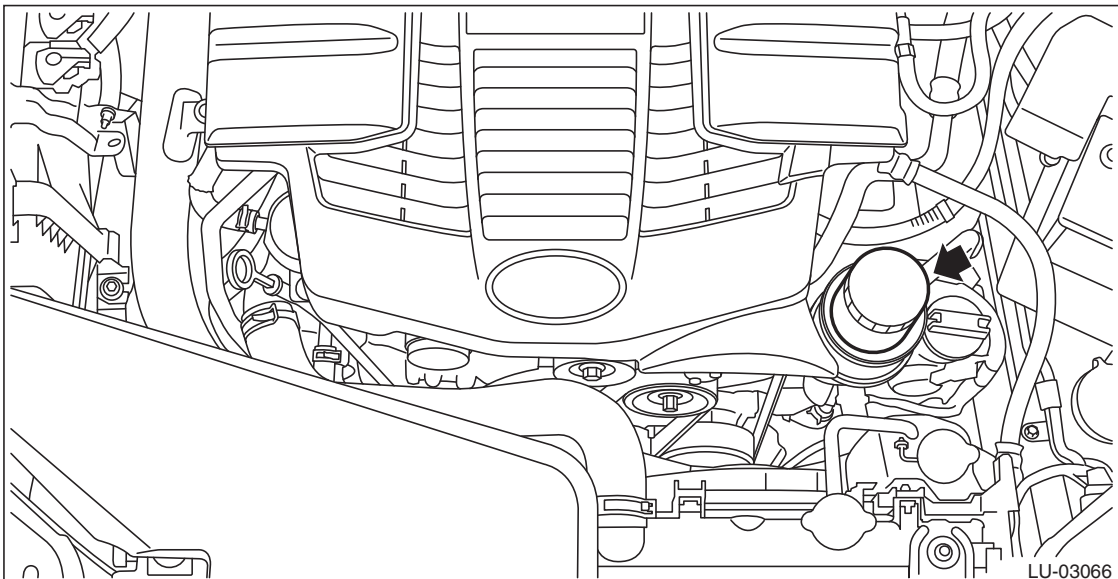
- Oil filter (blue)

Remove using a general tool (65/67 mm 14 Flutes).

- Non-turbo model



- Turbo model

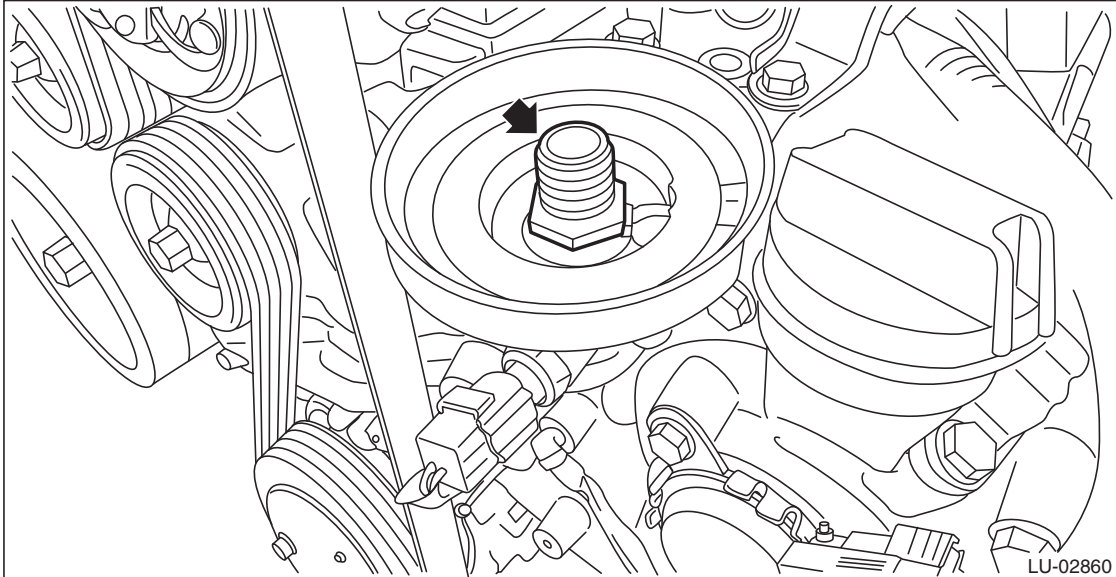


2. OIL PUMP UNION

NOTE:

Non-turbo model is equipped with the oil pump union.

- 1) Remove the oil filter. <Ref. to LU(H4DO)-64, OIL FILTER, REMOVAL, Engine Oil Filter.>
- 2) Remove the oil pump union from the chain cover.



B: INSTALLATION

1. OIL FILTER

CAUTION:

Do not tighten excessively, or oil may leak.

- 1) Clean the oil filter installing surface on the chain cover.
- 2) Obtain a new oil filter and apply a thin coat of engine oil to the seal rubber.
- 3) Install the oil filter by turning it by hand, being careful not to damage the seal rubber of the oil filter.
 - Tighten the oil filter (black) with an outer diameter of 68 mm (2.68 in) (approx. 1 rotation) after the seal rubber of the oil filter comes in contact with chain cover. When using a torque wrench, tighten to 14 N·m (1.4 kgf-m, 10.3 ft-lb).
 - Tighten the oil filter (blue) with an outer diameter of 67.4 mm (2.65 in) (approx. 7/8 rotation) after the seal rubber of the oil filter comes in contact with chain cover. When using a torque wrench, tighten to 12 N·m (1.2 kgf-m, 8.9 ft-lb).
- 4) After installing, check the engine oil level and replenish it if necessary. <Ref. to LU(H4DO)-13, INSPECTION, Engine Oil.>

2. OIL PUMP UNION

Install in the reverse order of removal.

Tightening torque:

45 N·m (4.6 kgf-m, 33.2 ft-lb)

C: INSPECTION

- 1) After installing the oil filter, run the engine and check for oil leakage.

NOTE:

The filter element and filter case are permanently jointed; therefore, interior cleaning is not necessary.

- 2) Check the engine oil level. <Ref. to LU(H4DO)-13, INSPECTION, Engine Oil.>

Oil Level Switch

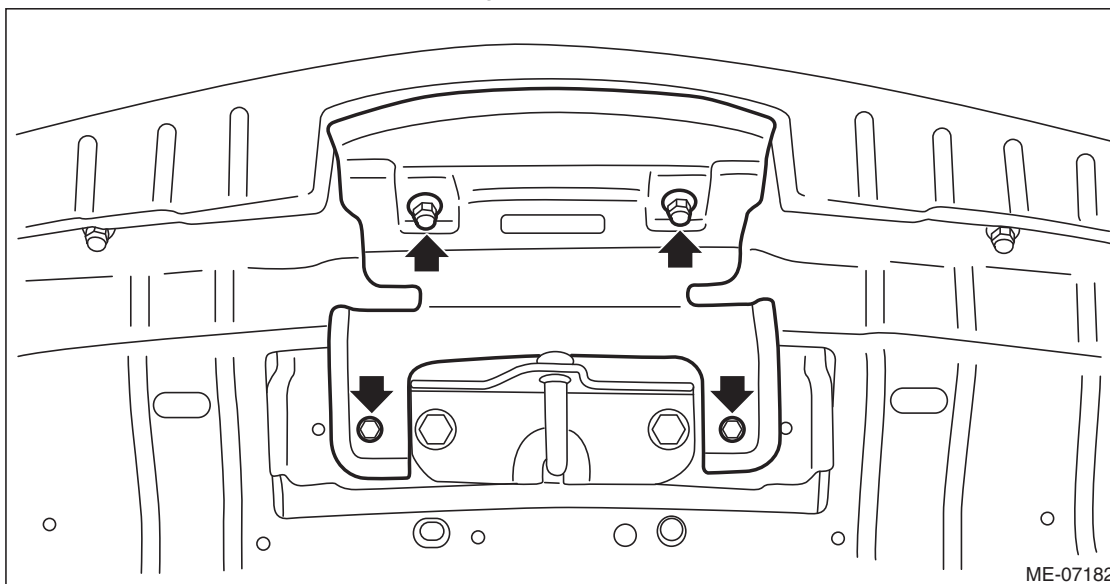
LUBRICATION

13.Oil Level Switch

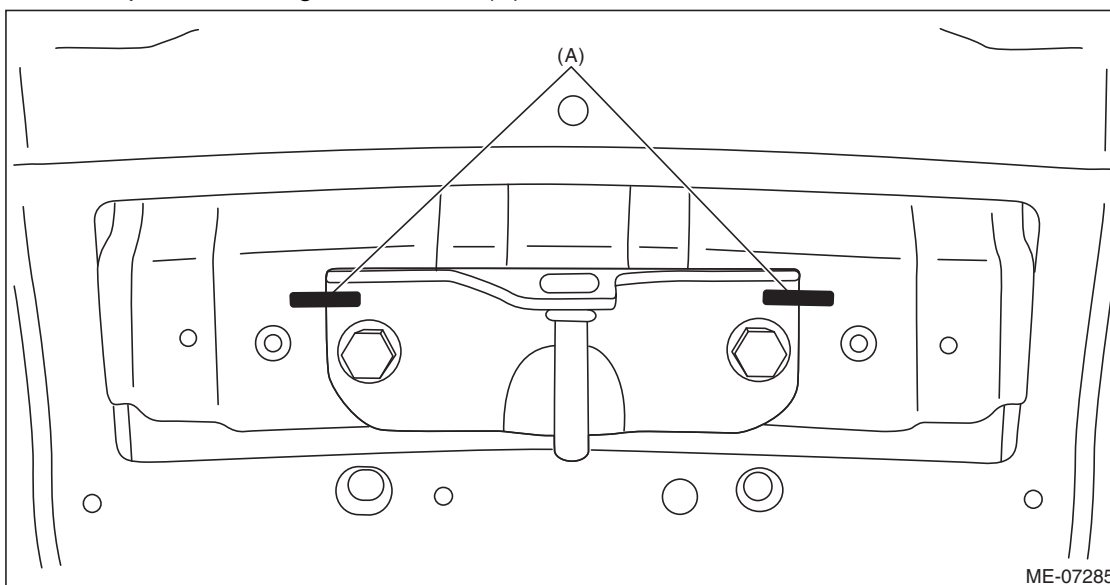
A: REMOVAL

1. NON-TURBO MODEL

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



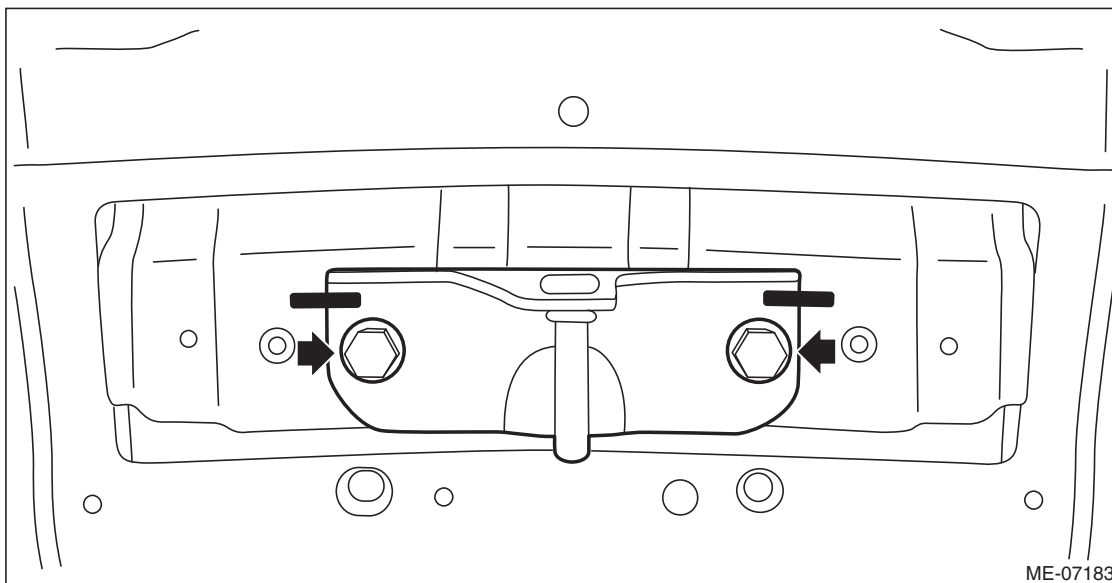
2) Using a marker pen, make alignment marks (A) on both the front hood striker and the front hood.



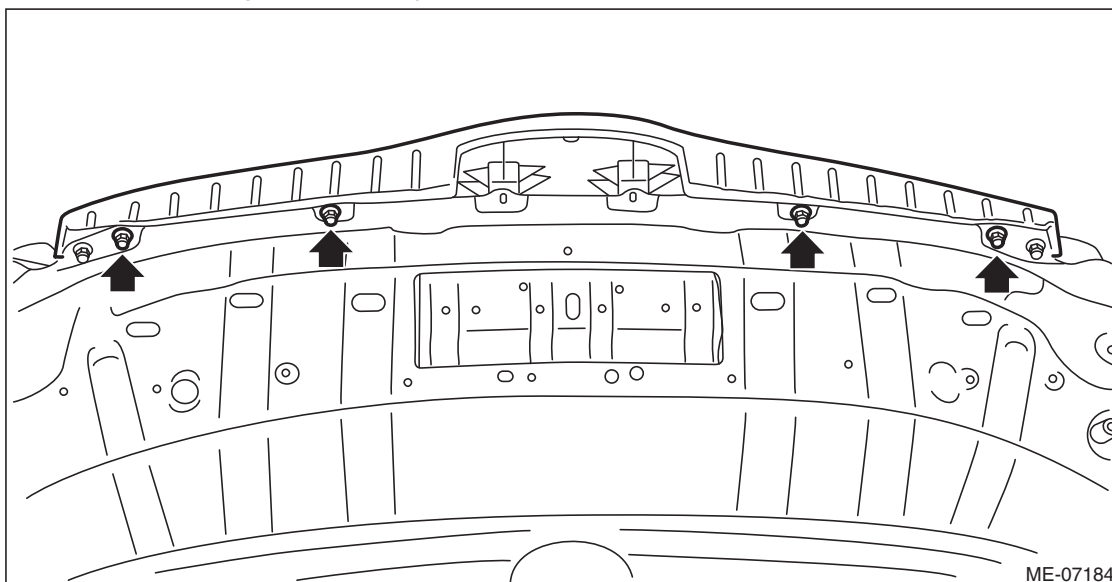
Oil Level Switch

LUBRICATION

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



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



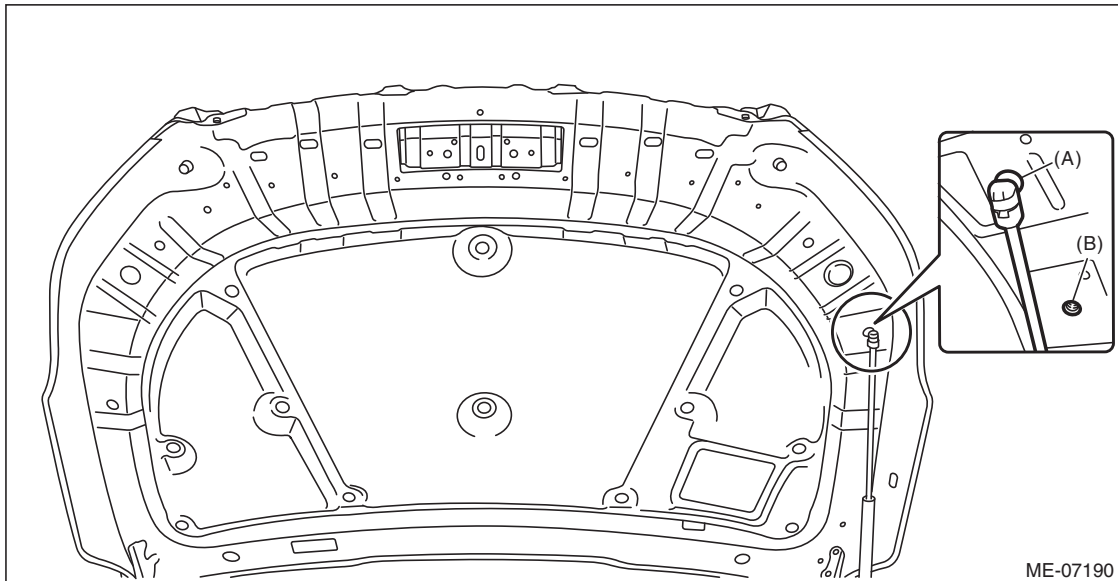
Oil Level Switch

LUBRICATION

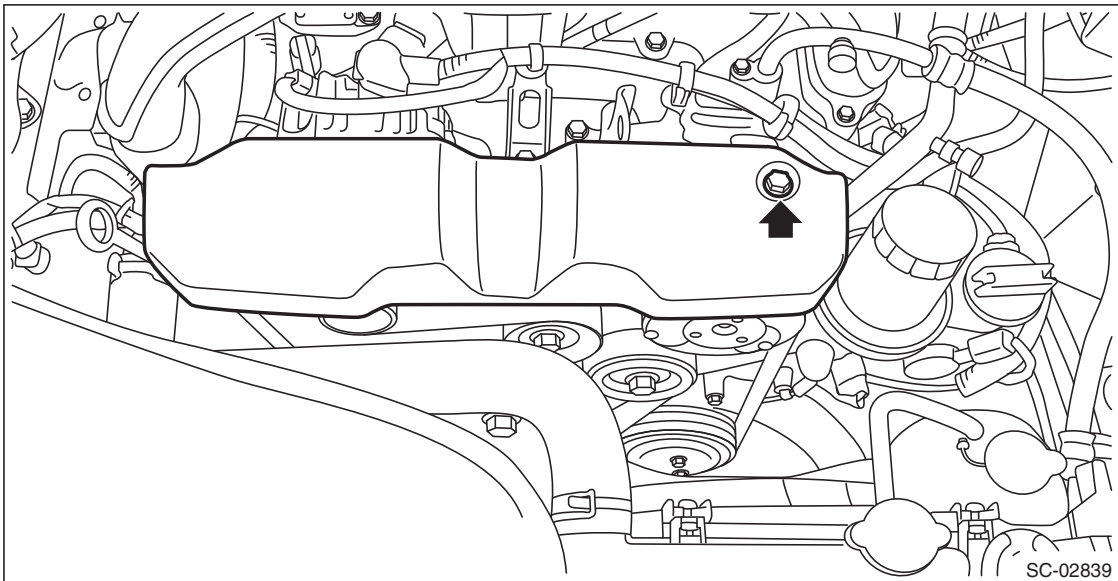
5) Change the front hood damper mounting position from (A) to (B), and completely open the front hood.

Tightening torque:

20 N·m (2.0 kgf-m, 14.8 ft-lb)



6) Remove the V-belt covers.



7) Disconnect the ground cable from battery.

8) Remove the air intake duct (rear). <Ref. to IN(H4DO)-12, REMOVAL, Air Intake Duct.>

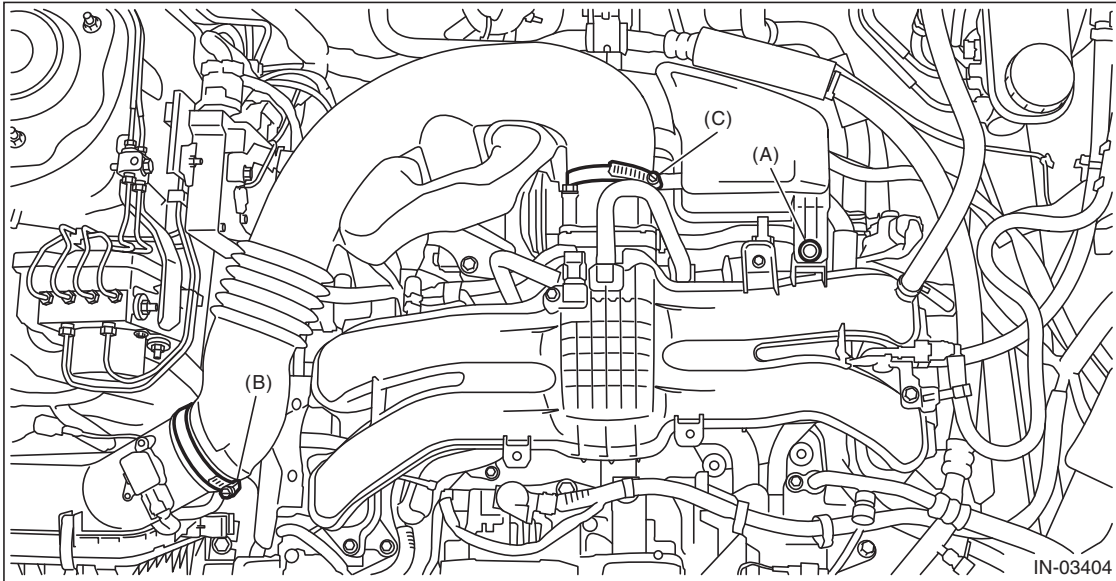
9) Remove the clip (A) from the air intake boot.

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

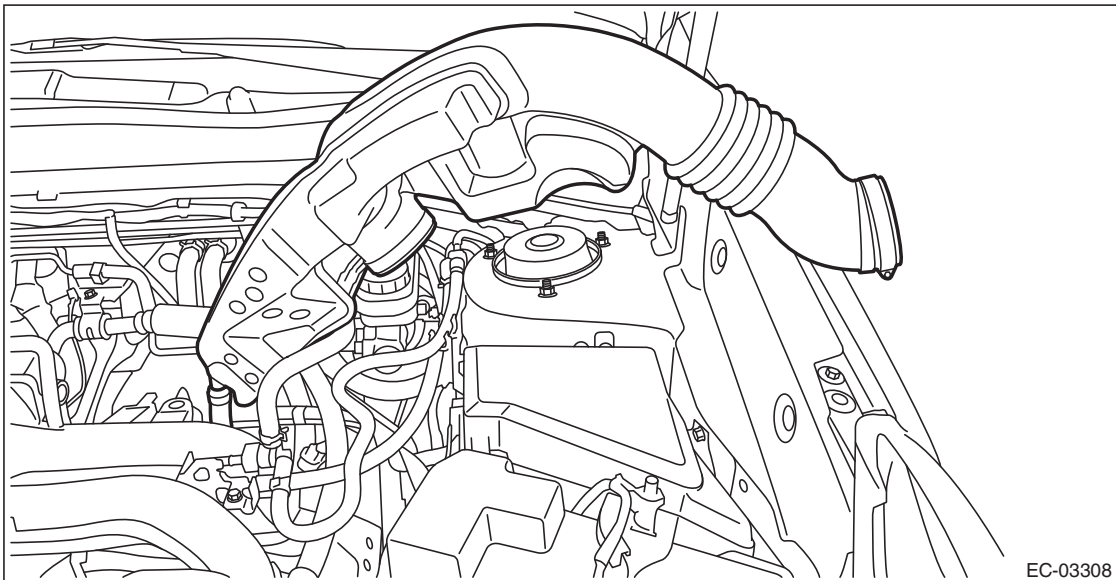
Oil Level Switch

LUBRICATION

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



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

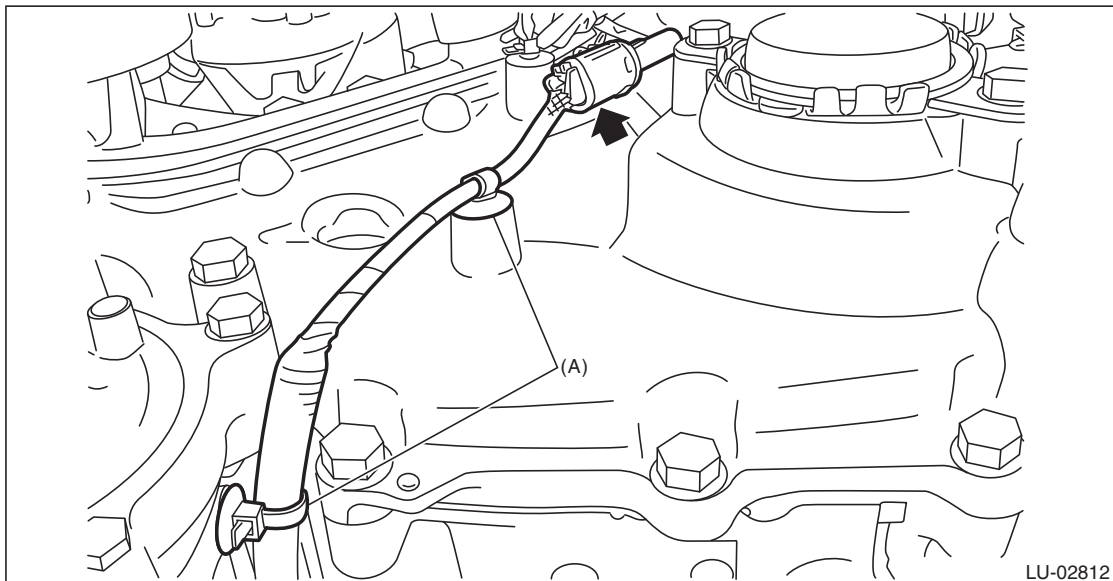


- 13) Lift up the vehicle.
14) Remove the under cover. <Ref. to EI-22, REMOVAL, Front Under Cover.>
15) Drain the engine oil. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.>
16) Remove the under cover front - transmission.
17) Remove the front exhaust pipe. <Ref. to EX(H4DO)-6, REMOVAL, Front Exhaust Pipe.>

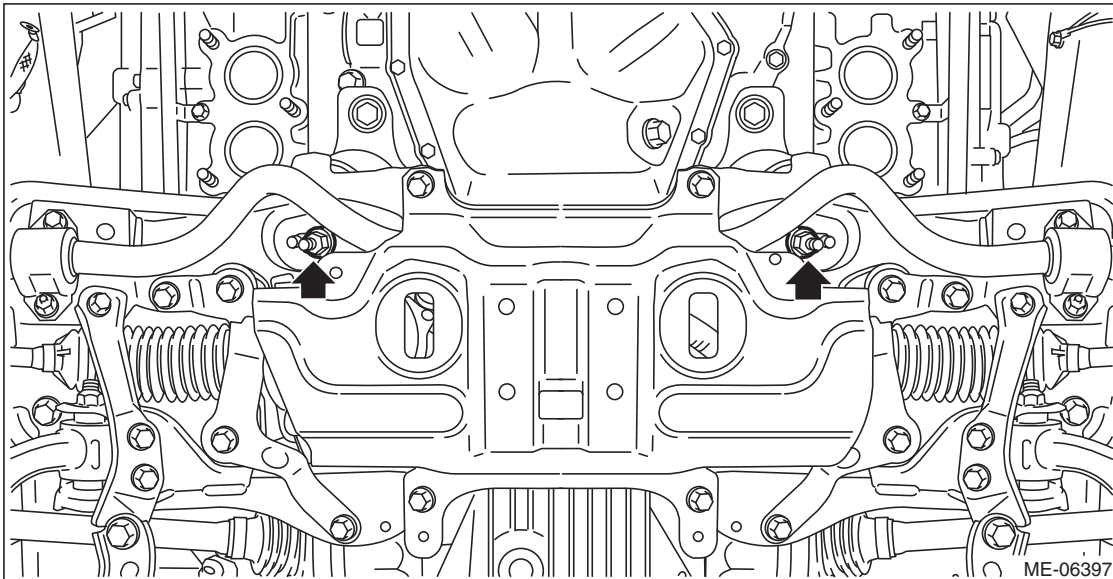
Oil Level Switch

LUBRICATION

18) Disconnect the oil level switch connector from the engine harness, and remove the clip (A) securing the harness.



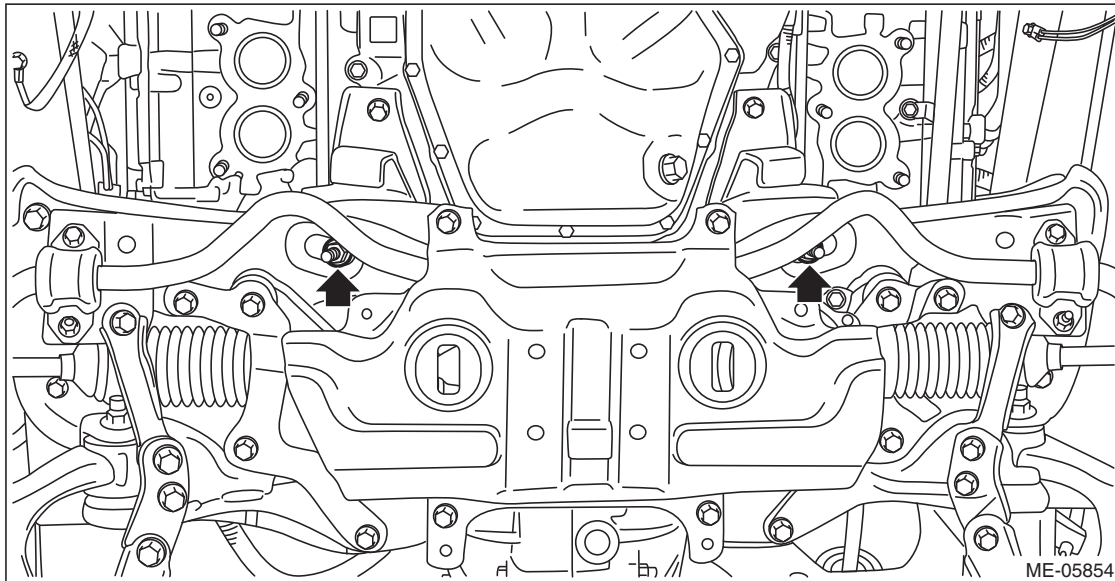
19) Remove the nuts which secure the engine mounting to the front crossmember. (Hydraulic engine mounting model)



Oil Level Switch

LUBRICATION

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

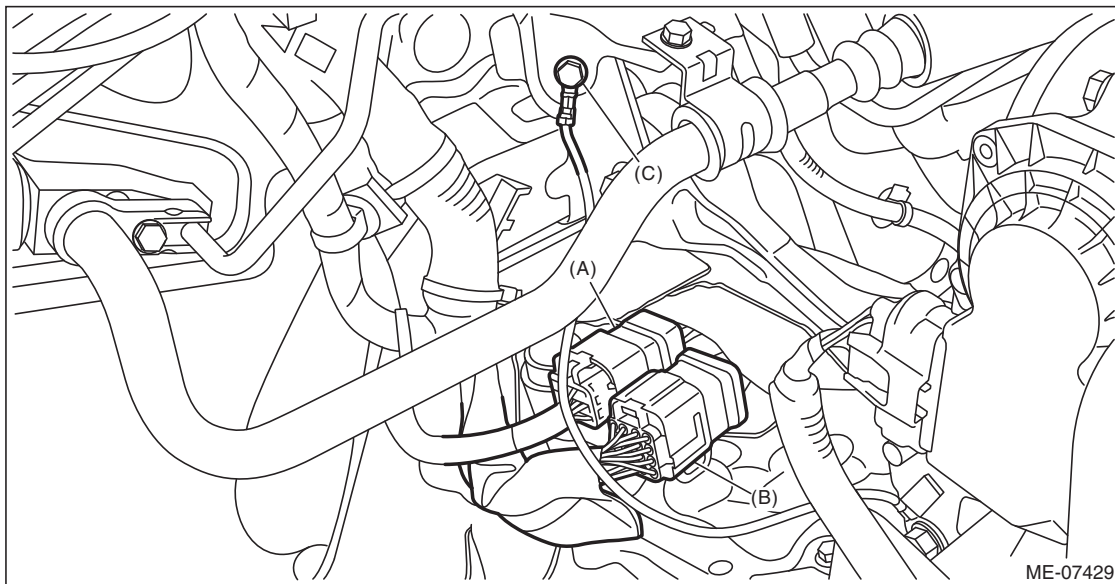


21) Remove the electric power steering gearbox. <Ref. to PS-25, REMOVAL, Electric Power Steering Gearbox.>

22) Remove the front drive shaft LH. <Ref. to DS-55, REMOVAL, Front Drive Shaft.>

23) Lower the vehicle.

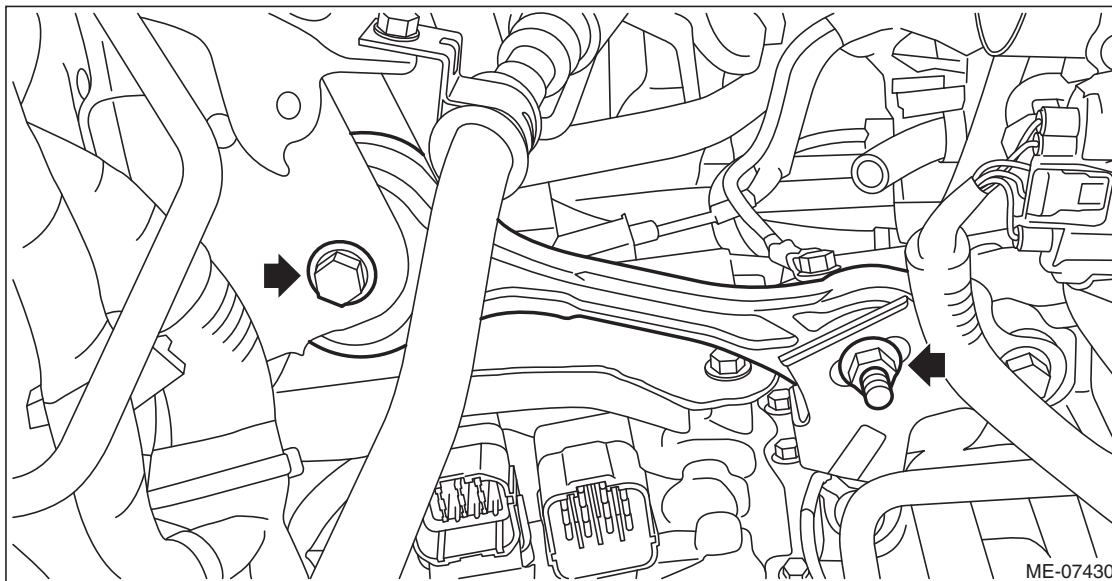
24) Disconnect the bulkhead connector from the transmission harness connector (A) and the inhibitor harness connector (B), and remove the transmission radio ground terminal (C) from the vehicle. (CVT model)



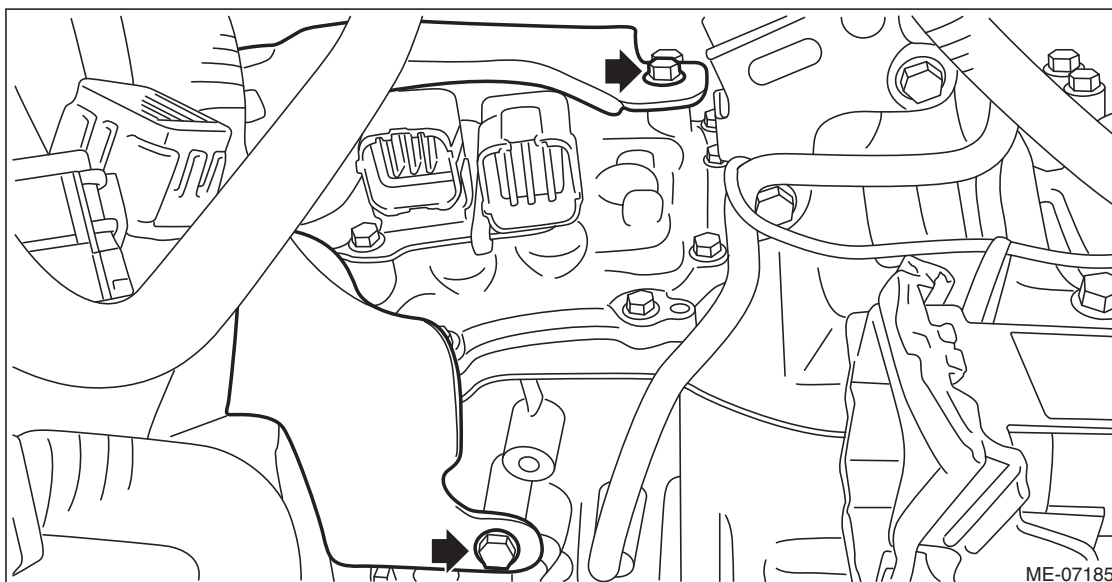
Oil Level Switch

LUBRICATION

25) Remove the pitching stopper.



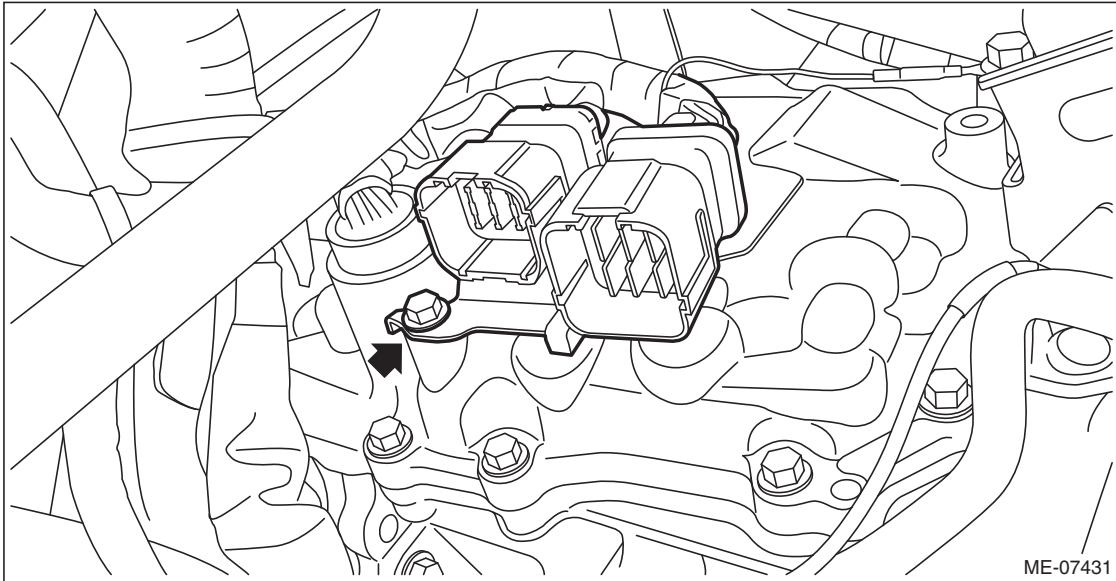
26) Remove the transmission cover. (CVT model)



Oil Level Switch

LUBRICATION

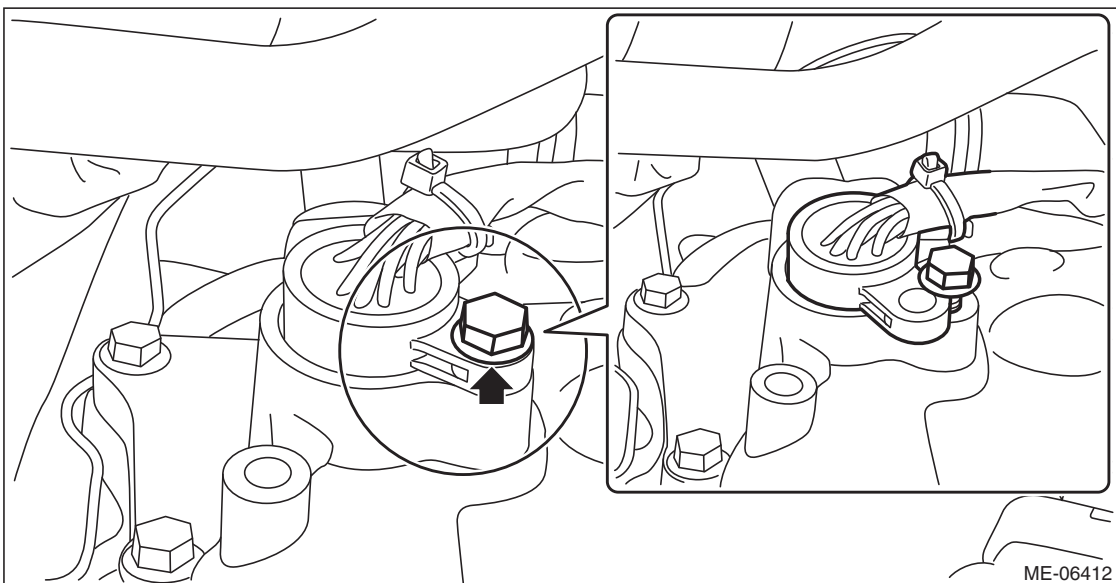
27) Remove the transmission harness stay and move to the engine side. (CVT model)



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. (CVT model)

NOTE:

This procedure is required to prevent the transmission harness from touching the vehicle body during engine removal/installation.



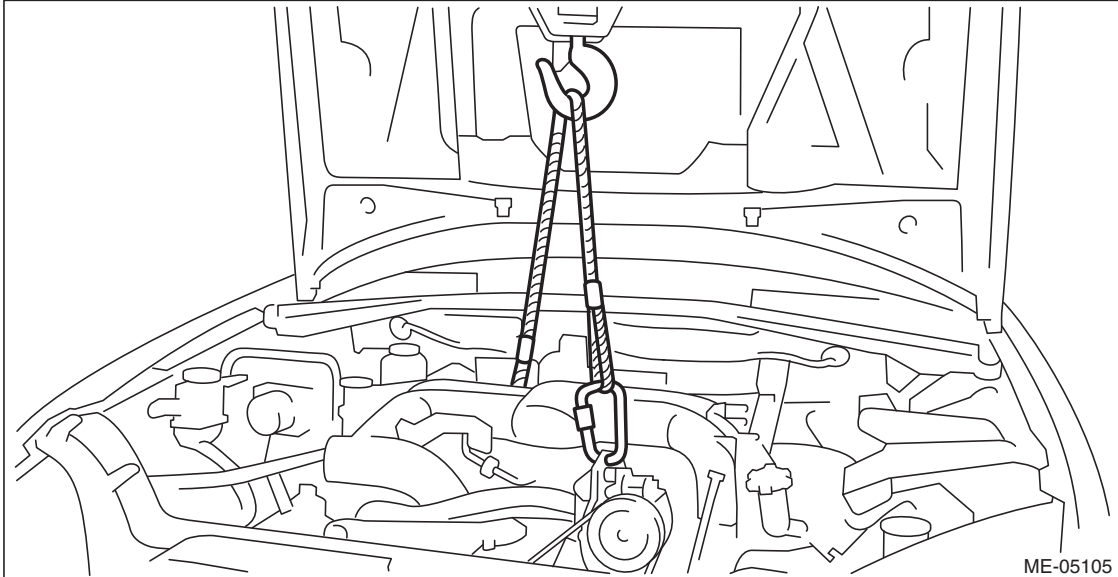
Oil Level Switch

LUBRICATION

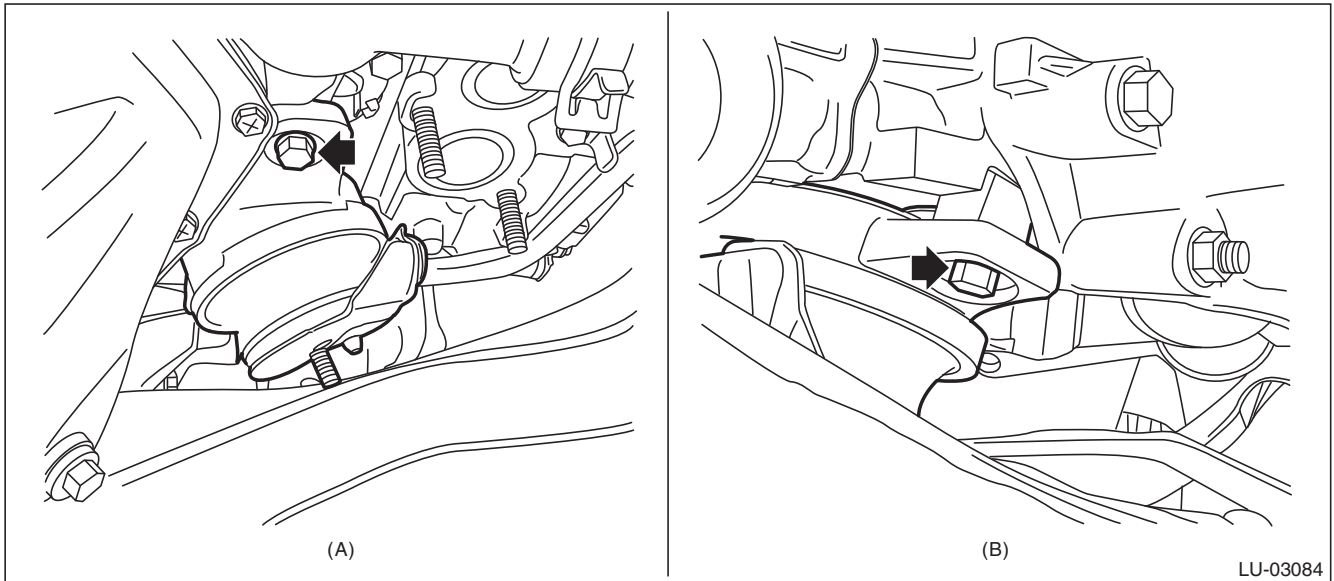
29) Lift up the engine with a lifting device and wire ropes.

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.



30) Remove the engine mounting LH from the engine.



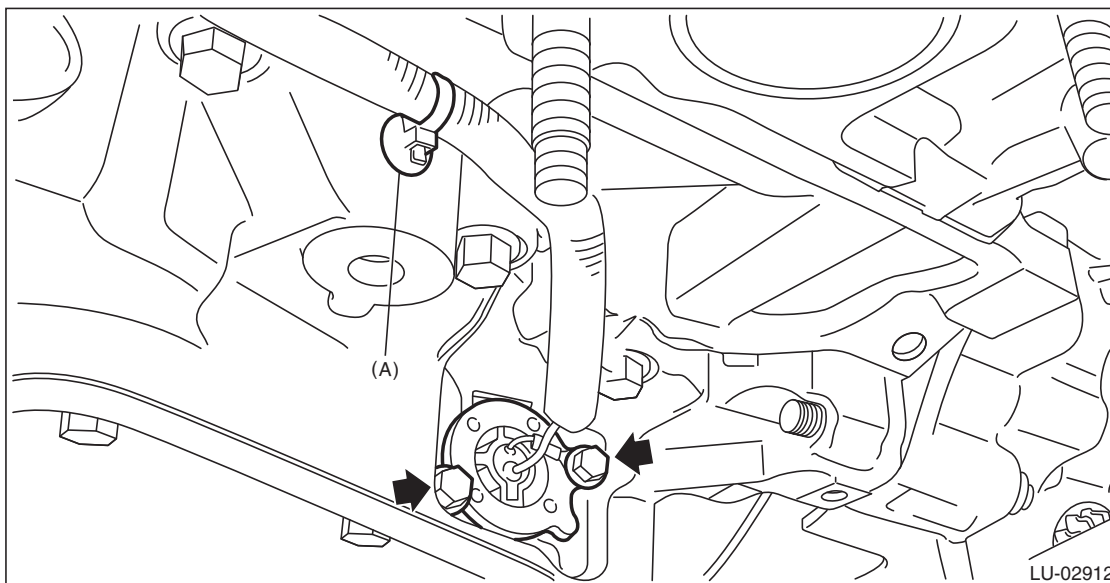
(A) Front side

(B) Rear side

Oil Level Switch

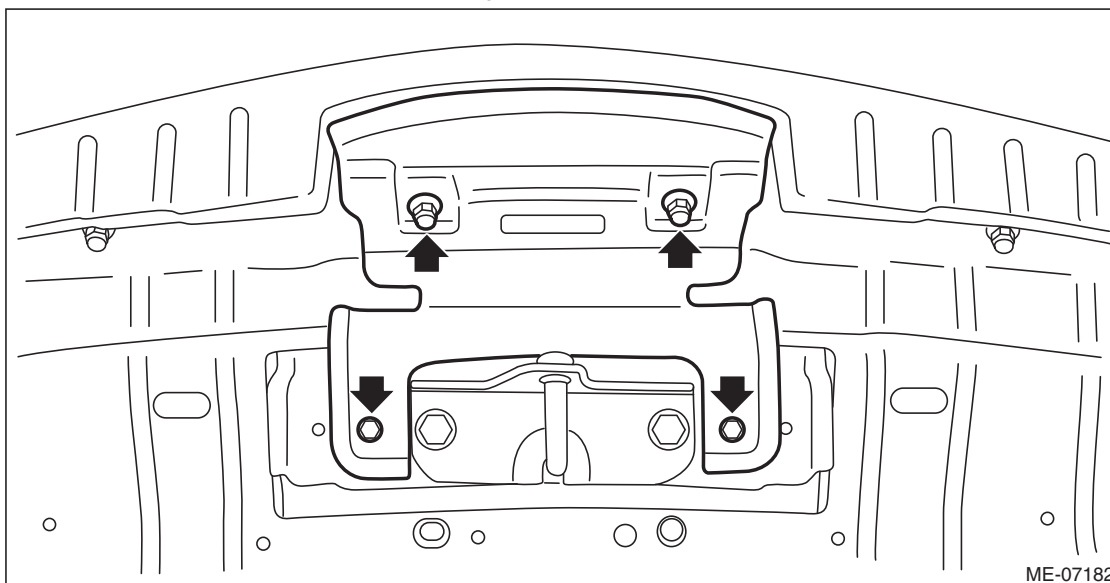
LUBRICATION

31) Remove clip (A) from the oil pan upper, and remove the oil level switch.



2. TURBO MODEL

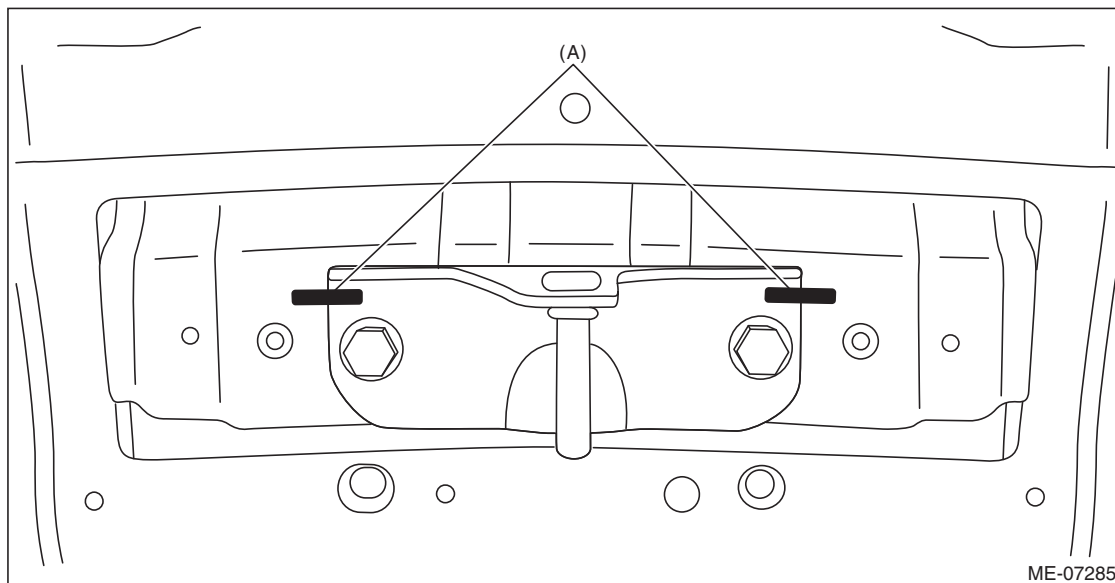
1) Open the front hood, and remove the upper grille bracket from the front hood.



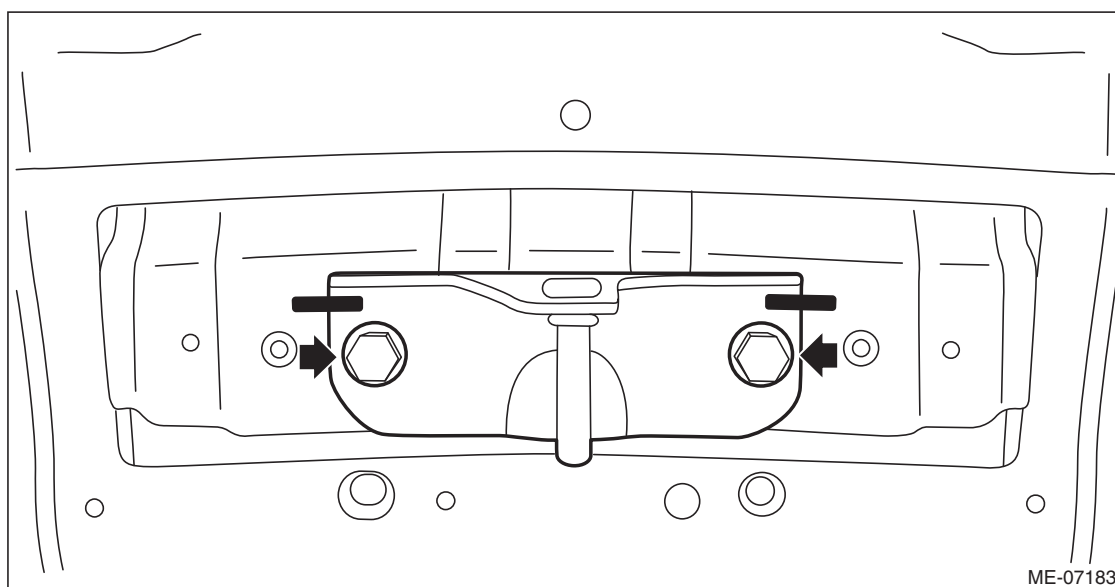
Oil Level Switch

LUBRICATION

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



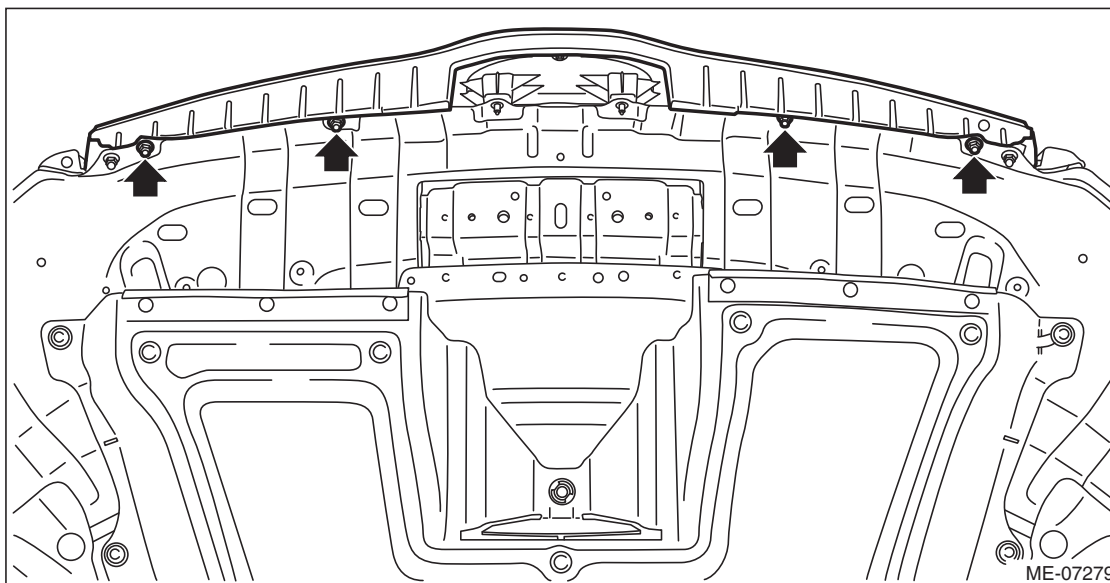
- 3) Remove the front hood striker from the front hood.



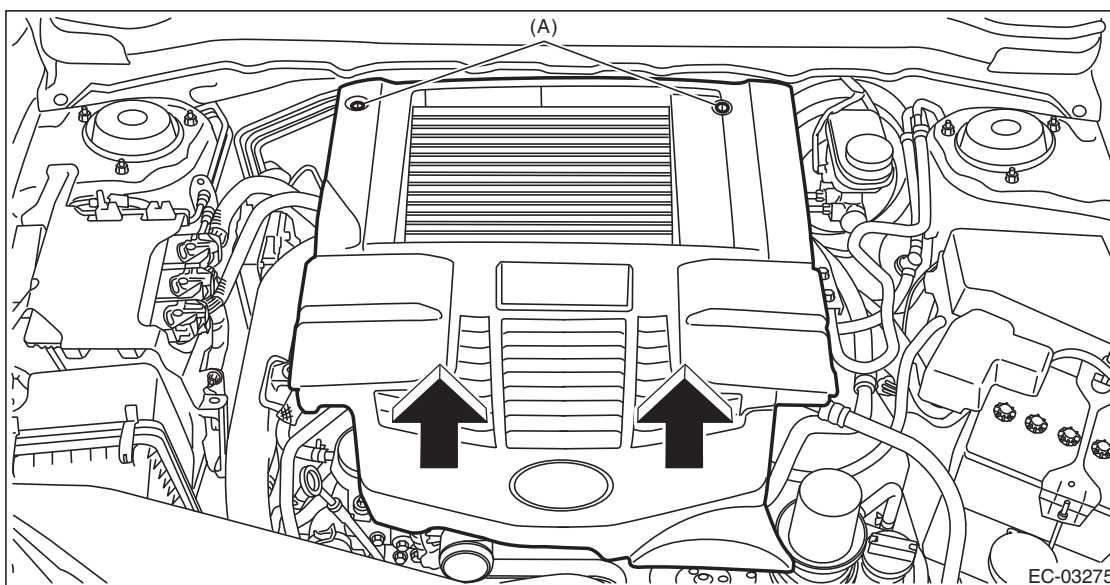
Oil Level Switch

LUBRICATION

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



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



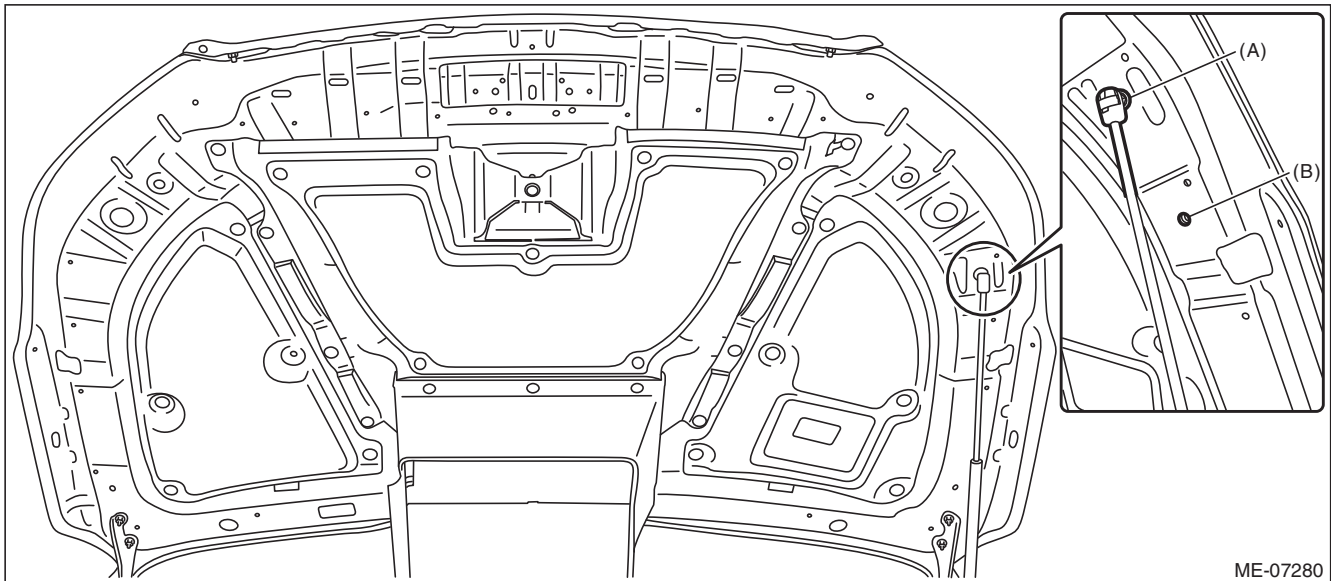
Oil Level Switch

LUBRICATION

6) 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)



7) Disconnect the ground cable from battery.

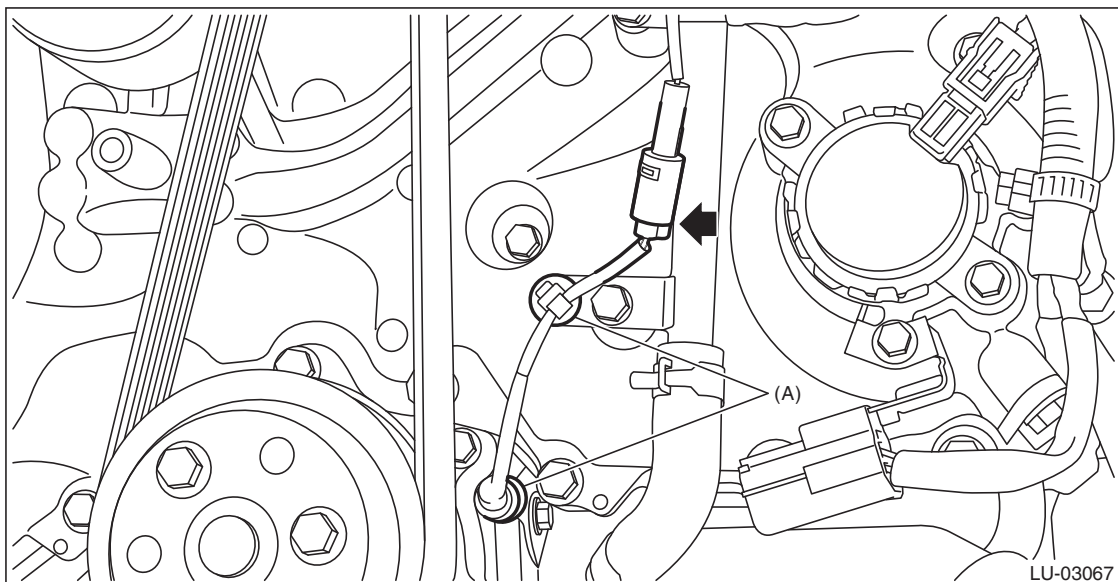
8) Remove the air intake duct (rear). <Ref. to IN(H4DOTC)-19, REMOVAL, Air Intake Duct.>

9) Remove the under cover. <Ref. to EI-22, REMOVAL, Front Under Cover.>

10) Drain the engine oil. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.>

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

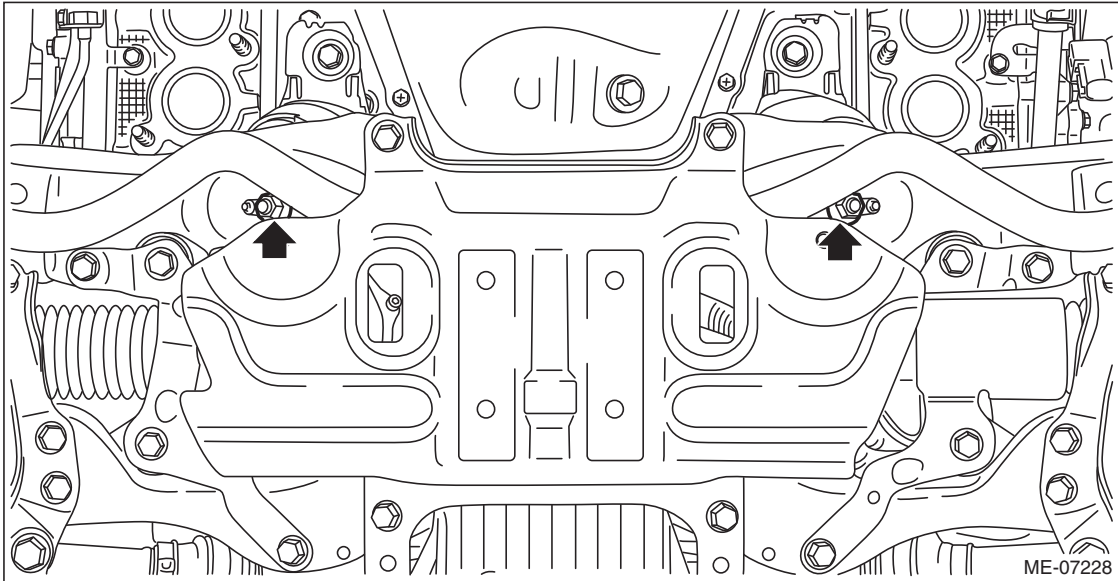
12) Disconnect the oil level switch connector from the engine harness, and remove the clip (A) securing the harness.



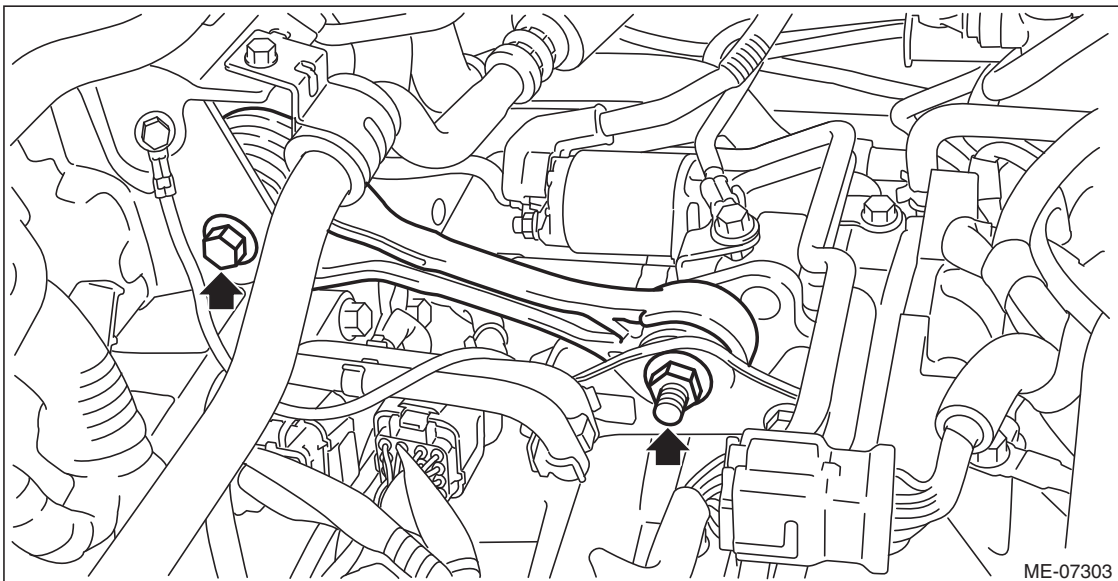
Oil Level Switch

LUBRICATION

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



- 14) Remove the electric power steering gearbox. <Ref. to PS-25, REMOVAL, Electric Power Steering Gearbox.>
15) Remove the front drive shaft LH. <Ref. to DS-55, REMOVAL, Front Drive Shaft.>
16) Lower the vehicle.
17) Remove the intercooler. <Ref. to IN(H4DOTC)-35, REMOVAL, Intercooler.>
18) Remove the pitching stopper.



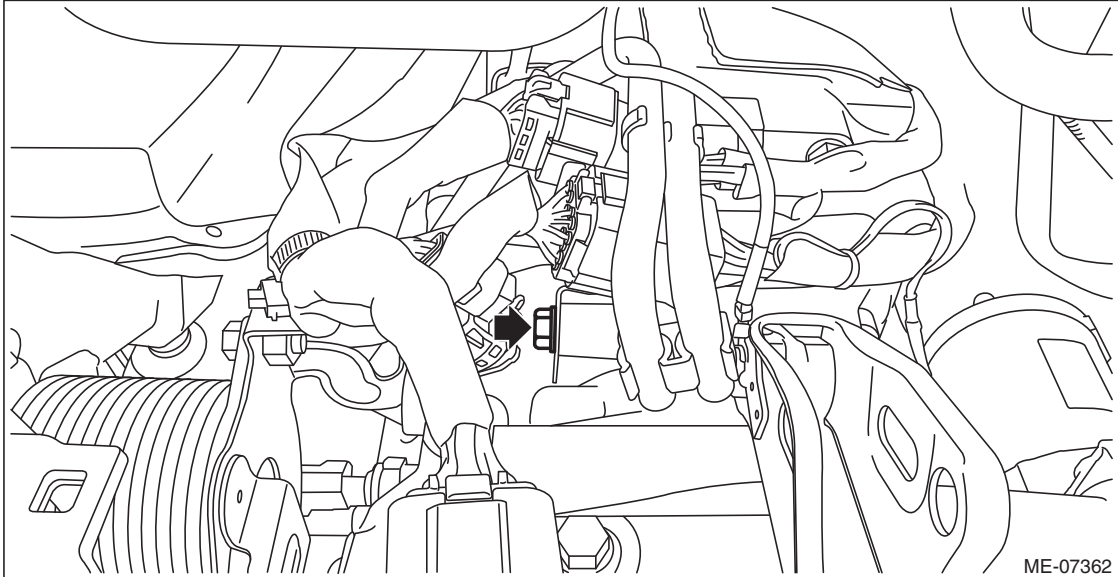
Oil Level Switch

LUBRICATION

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

NOTE:

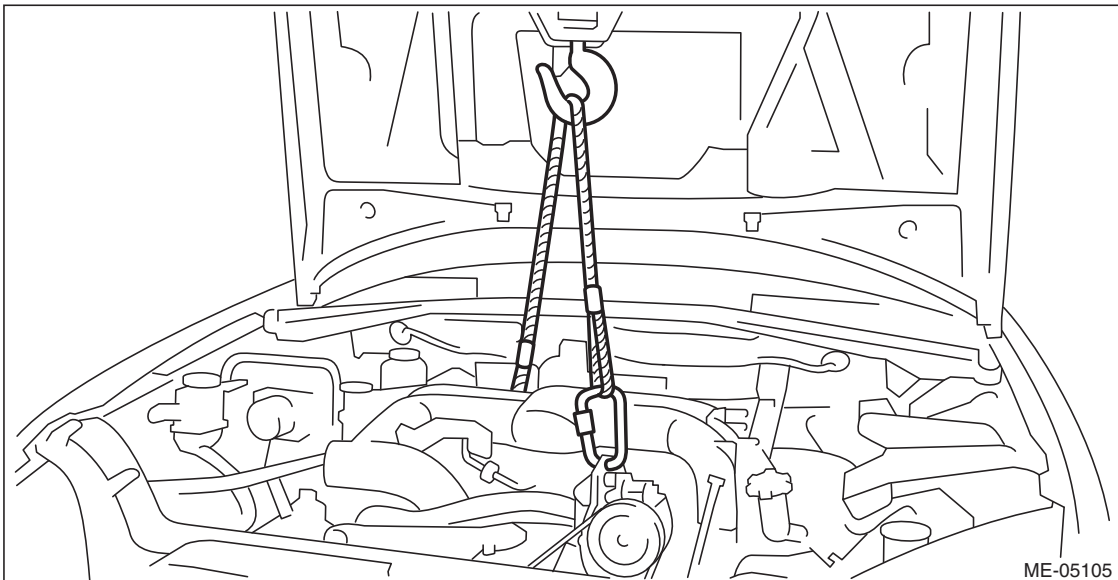
This procedure is required to prevent the transmission connector from touching the A/C pressure hose during engine removal/installation.



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

CAUTION:

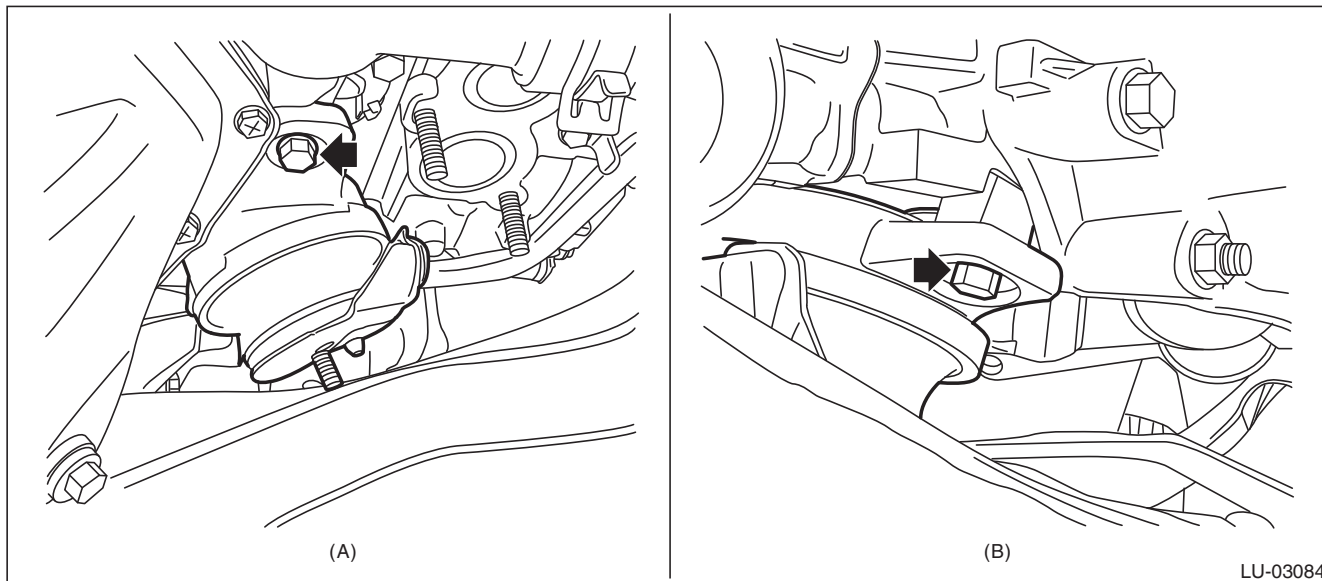
When lifting up the engine, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.



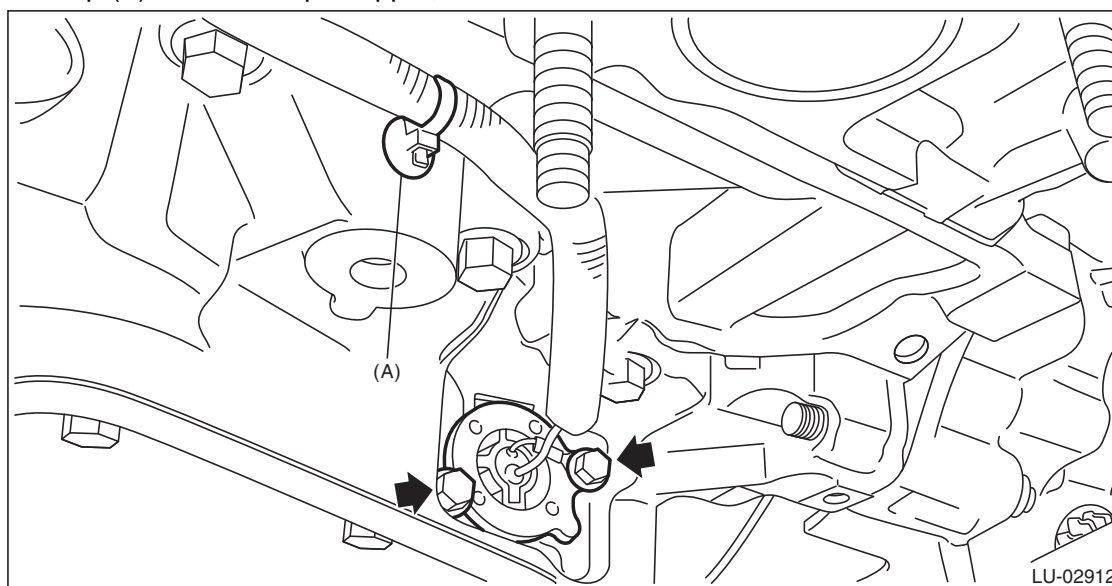
Oil Level Switch

LUBRICATION

21) Remove the engine mounting LH from the engine.



22) Remove clip (A) from the oil pan upper, and remove the oil level switch.



Oil Level Switch

LUBRICATION

B: INSTALLATION

1. NON-TURBO MODEL

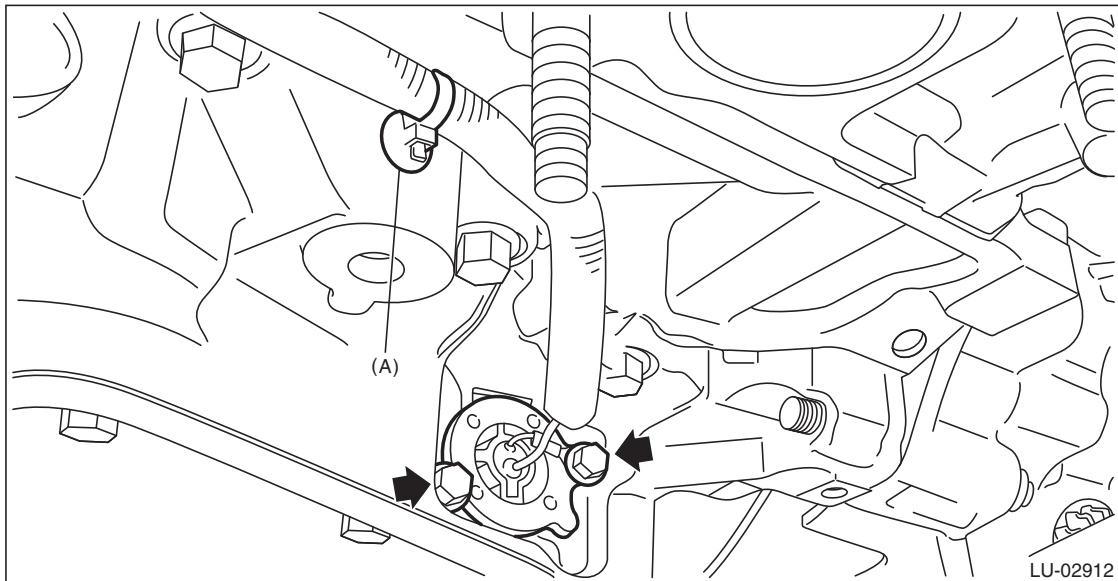
1) Install the oil level switch and the clip (A) to the oil pan upper.

NOTE:

- Use new O-rings.
- Apply a coat of engine oil to the O-rings.

Tightening torque:

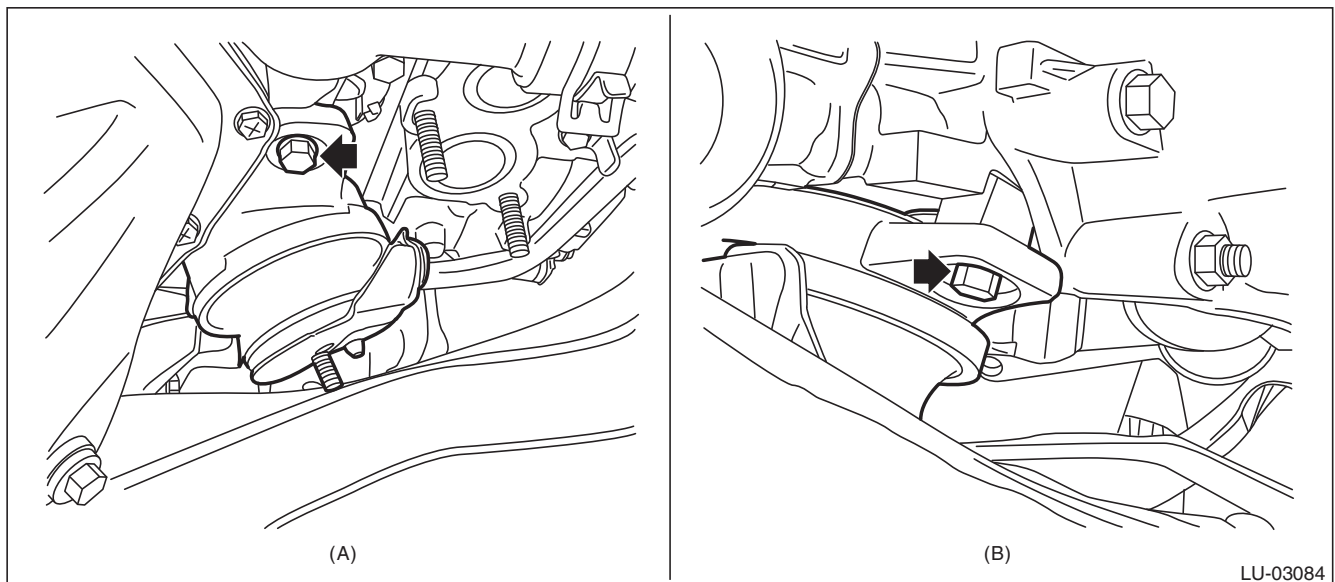
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



2) Install the engine mounting LH onto the engine.

Tightening torque:

35 N·m (3.6 kgf-m, 25.8 ft-lb)



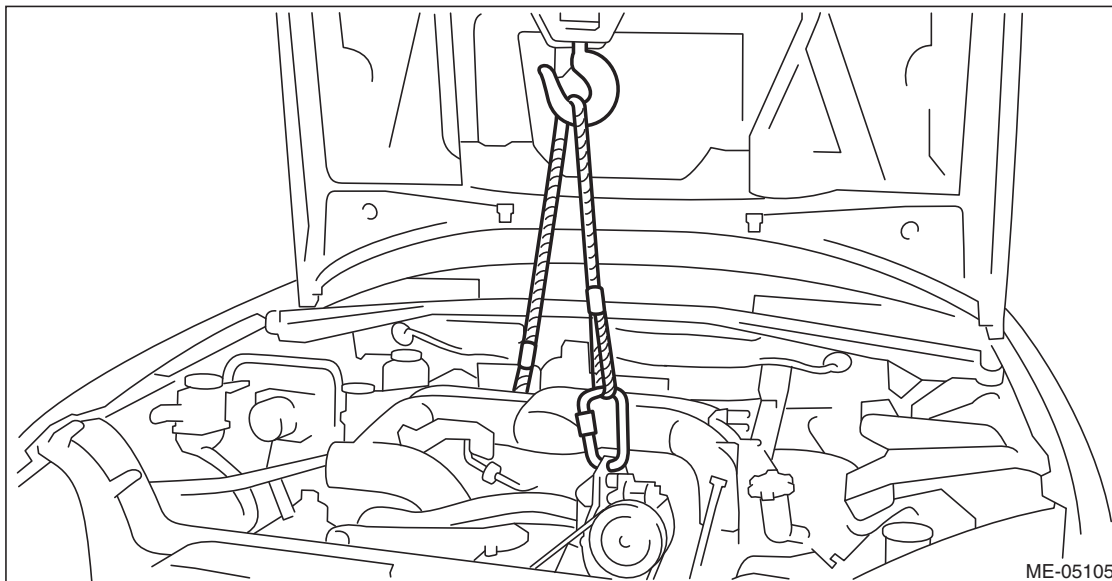
(A) Front side

(B) Rear side

Oil Level Switch

LUBRICATION

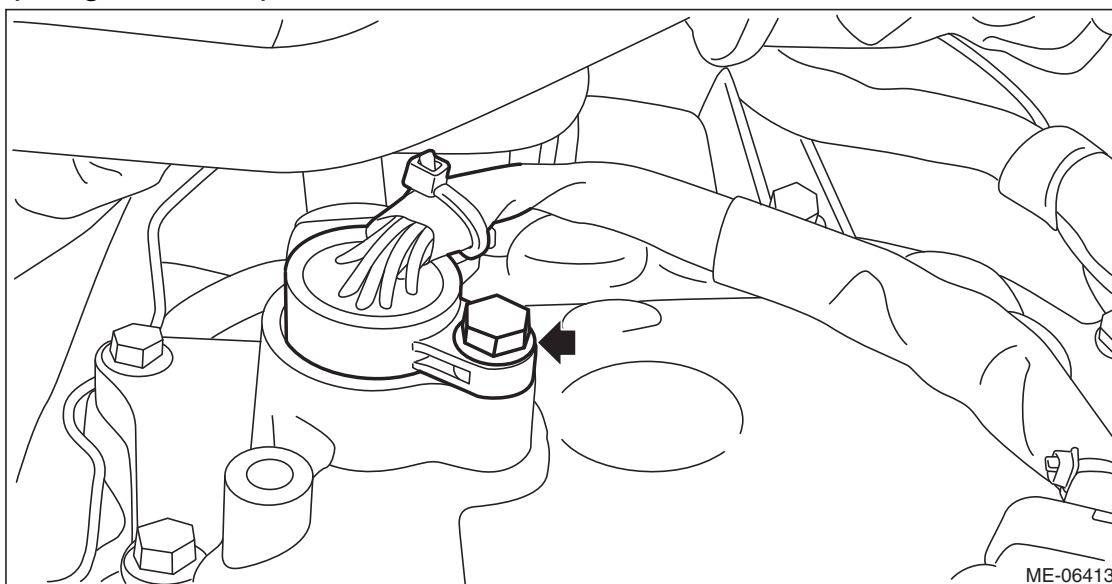
- 3) Lower the engine and remove the lifting device and wire ropes.



- 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)



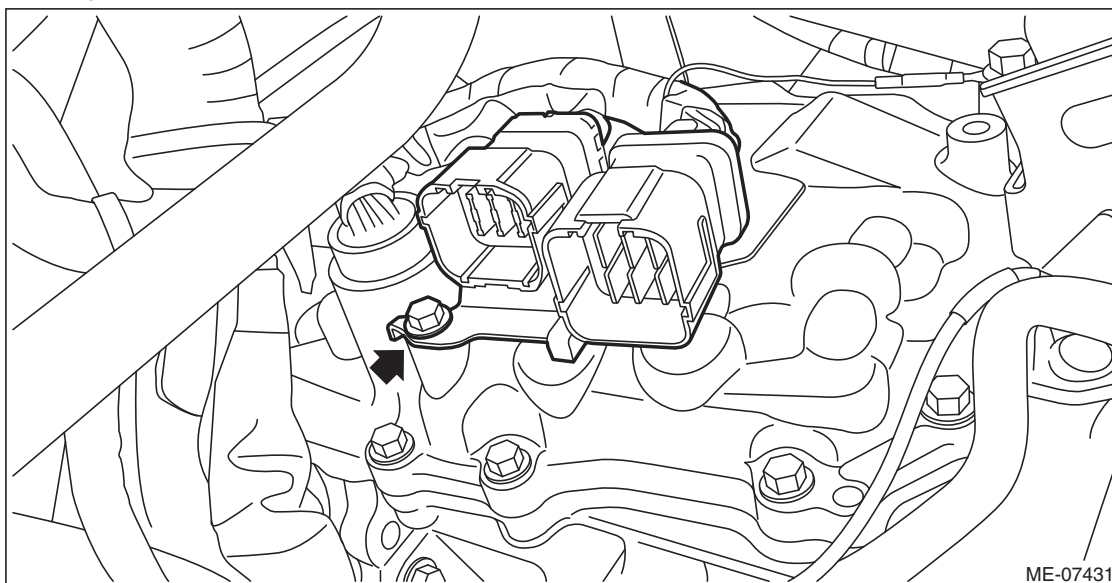
Oil Level Switch

LUBRICATION

5) Install the transmission harness stay. (CVT model)

Tightening torque:

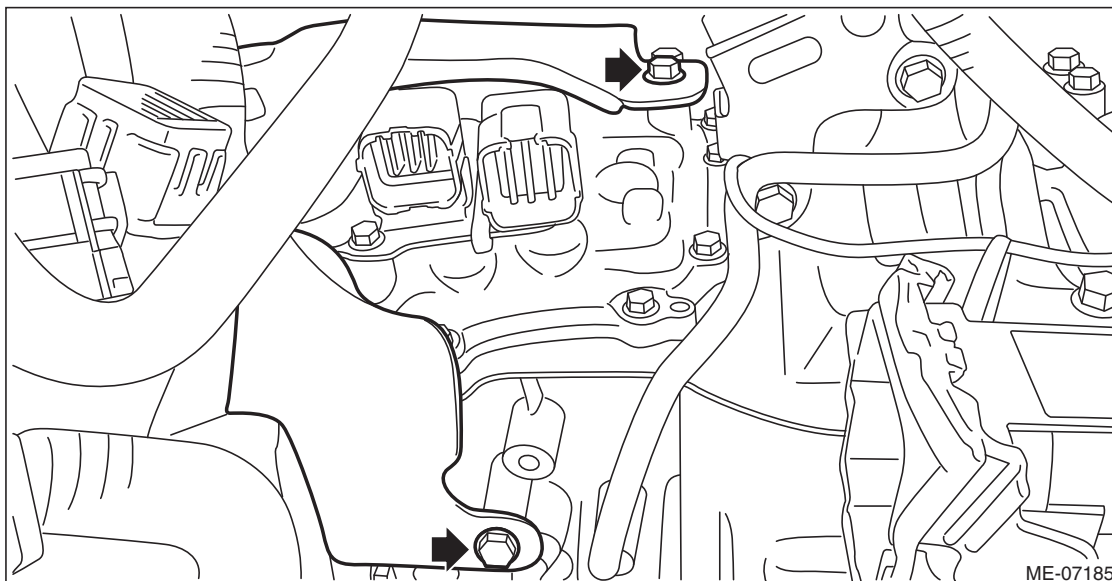
7 N·m (0.7 kgf-m, 5.2 ft-lb)



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

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)



Oil Level Switch

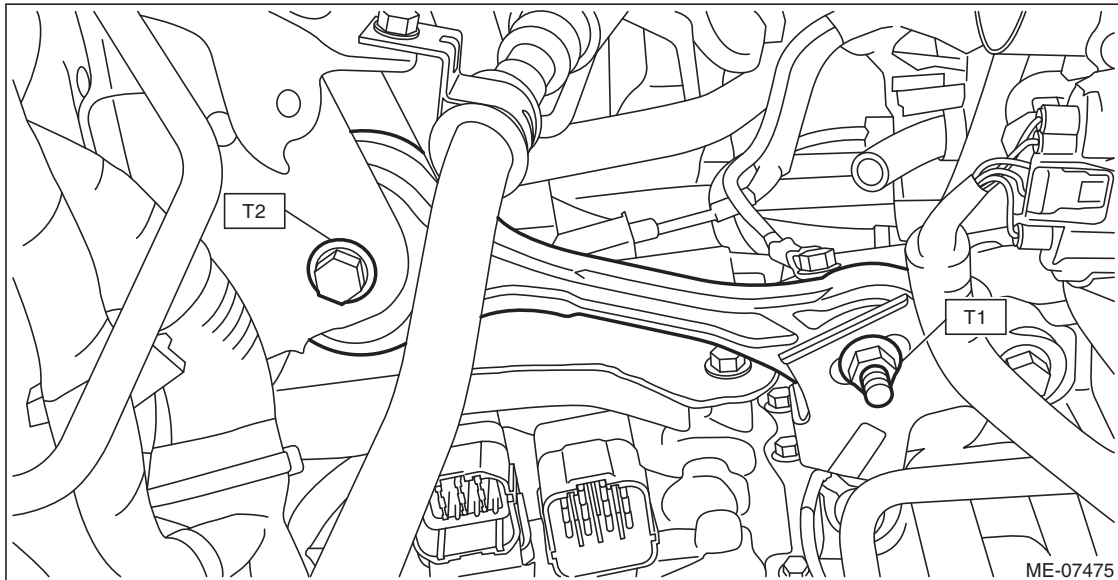
LUBRICATION

7) Install the pitching stopper.

Tightening torque:

T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)

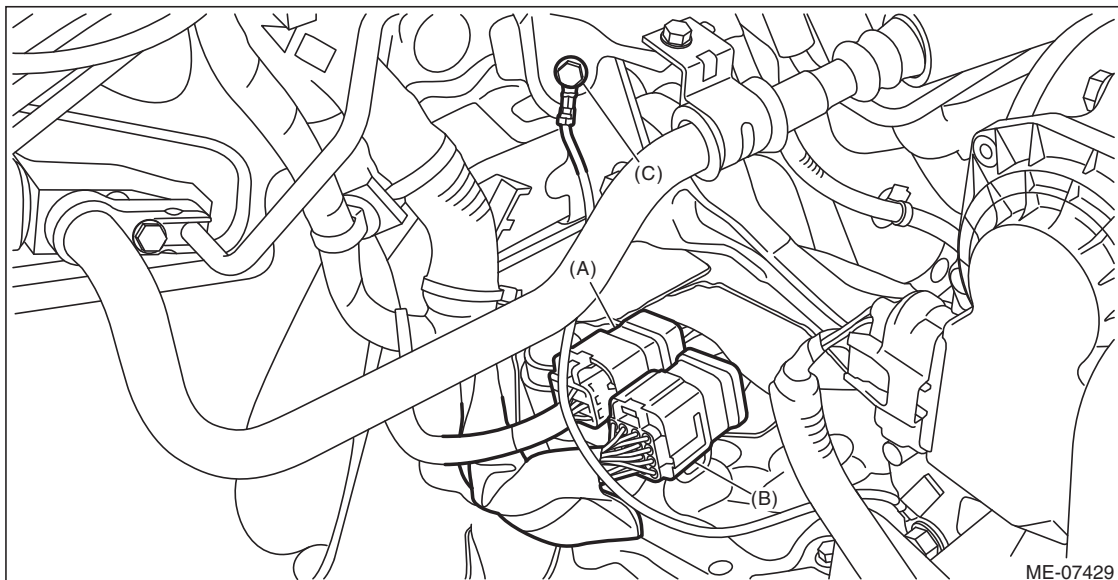
T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)



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) Install the electric power steering gearbox. <Ref. to PS-30, INSTALLATION, Electric Power Steering Gearbox.>

10) Install the front drive shaft LH. <Ref. to DS-56, INSTALLATION, Front Drive Shaft.>

Oil Level Switch

LUBRICATION

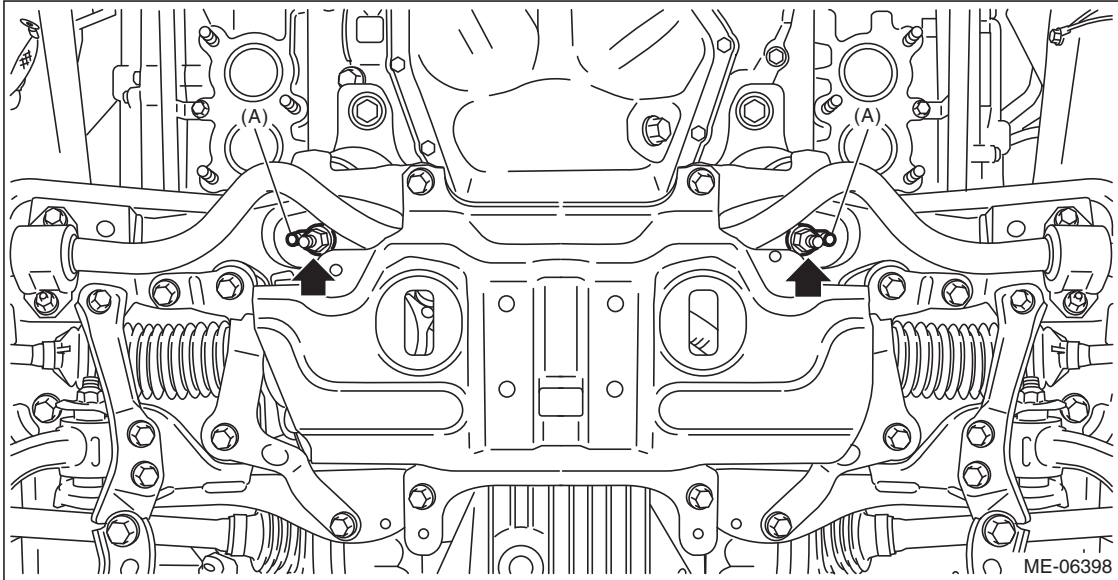
11) Install the nuts which hold the engine mounting to the crossmember. (Hydraulic engine mounting model)

NOTE:

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

Tightening torque:

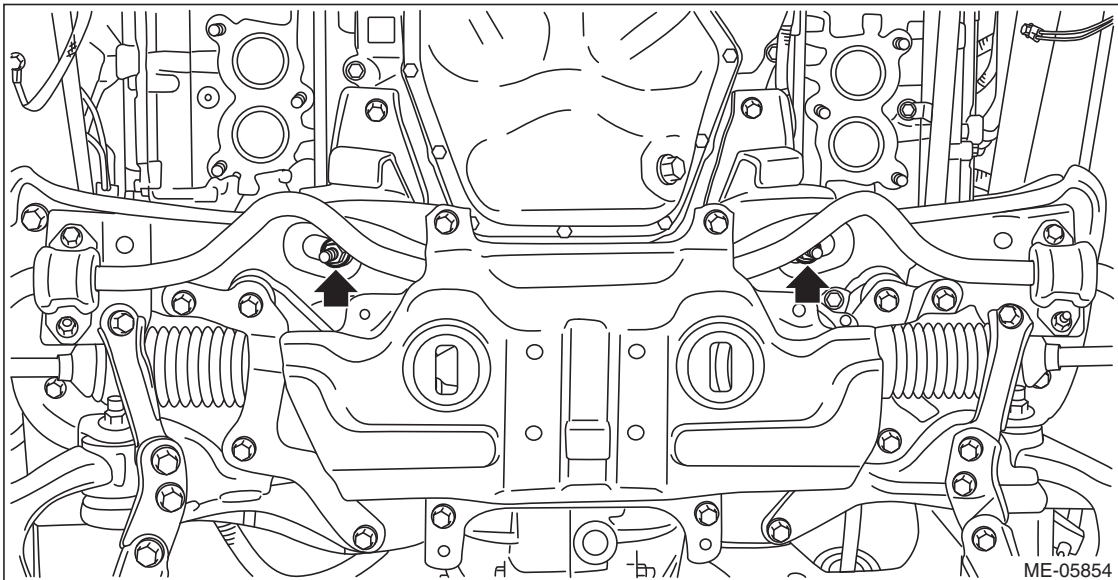
45 N·m (4.6 kgf-m, 33.2 ft-lb)



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

Tightening torque:

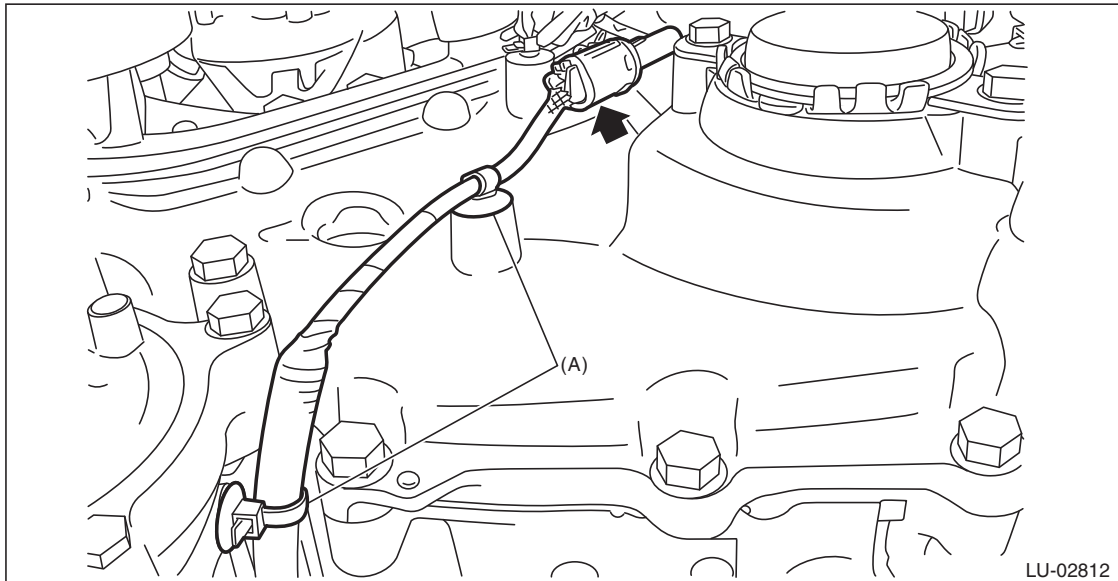
45 N·m (4.6 kgf-m, 33.2 ft-lb)



Oil Level Switch

LUBRICATION

13) Connect the connector of oil level switch to the engine harness, and install the clip (A) securing the harness.



14) Install the front exhaust pipe. <Ref. to EX(H4DO)-8, INSTALLATION, Front Exhaust Pipe.>

15) Install the under cover front - transmission.

16) Install the under cover.

17) Lower the vehicle.

18) Install the air intake boot. <Ref. to IN(H4DO)-11, INSTALLATION, Air Intake Boot.>

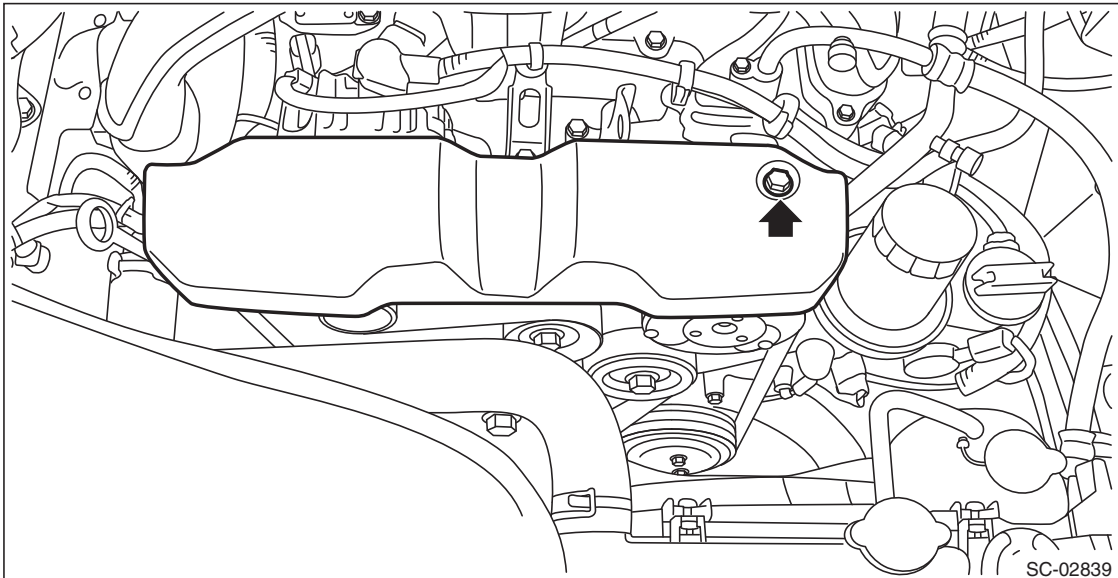
19) Install the air intake duct (rear). <Ref. to IN(H4DO)-12, INSTALLATION, Air Intake Duct.>

20) Connect the battery ground terminal.

21) Install the V-belt cover.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



22) Refill the engine oil. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.>

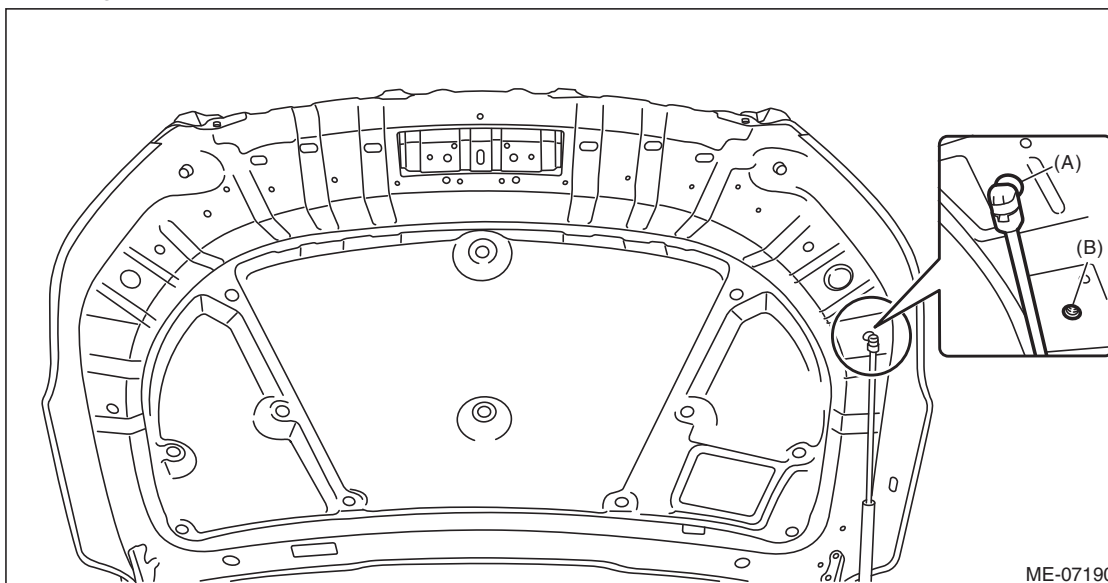
Oil Level Switch

LUBRICATION

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

Tightening torque:

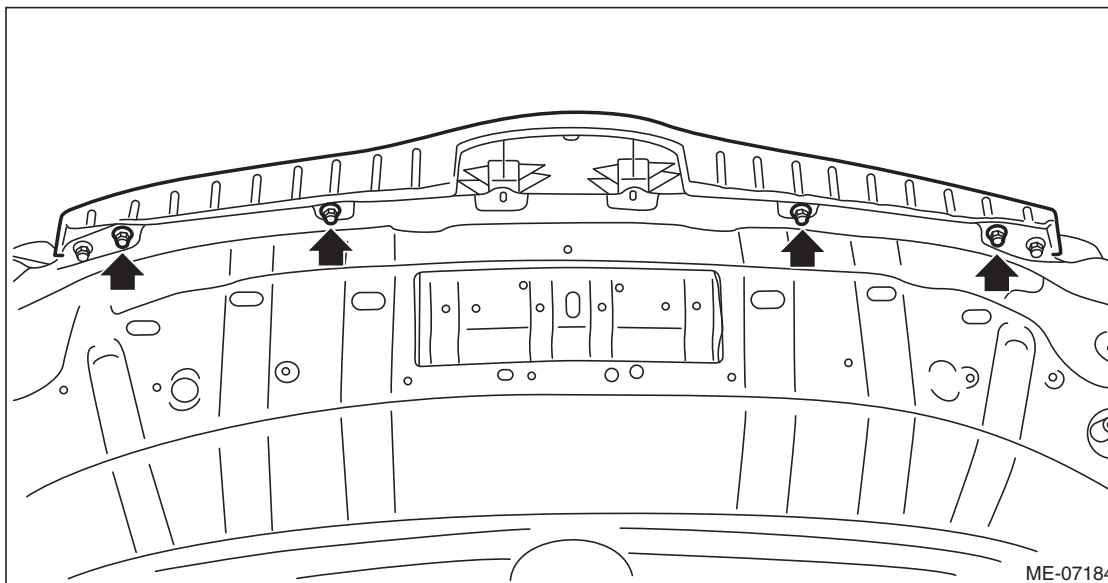
20 N·m (2.0 kgf-m, 14.8 ft-lb)



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

Tightening torque:

4.5 N·m (0.5 kgf-m, 3.3 ft-lb)



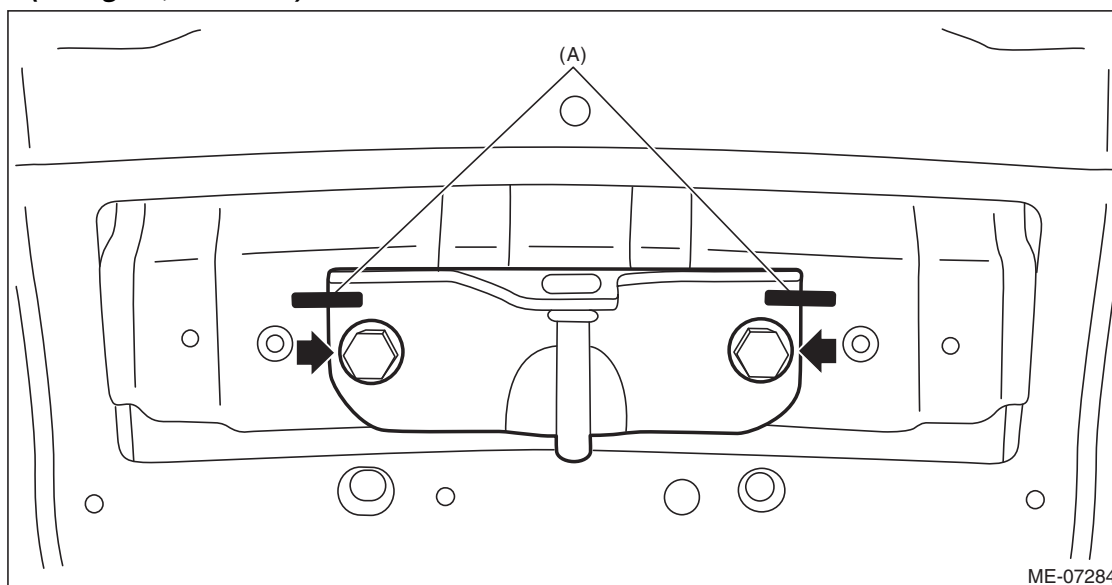
Oil Level Switch

LUBRICATION

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

Tightening torque:

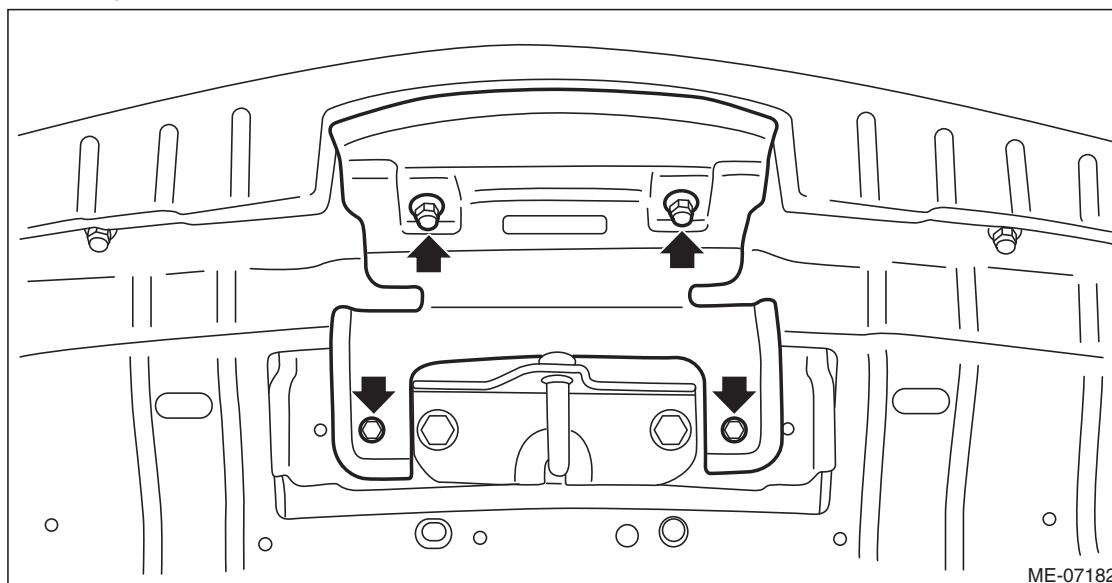
33 N·m (3.4 kgf-m, 24.3 ft-lb)



26) Install the upper grille bracket to the front hood.

Tightening torque:

4.5 N·m (0.5 kgf-m, 3.3 ft-lb)



Oil Level Switch

LUBRICATION

2. TURBO MODEL

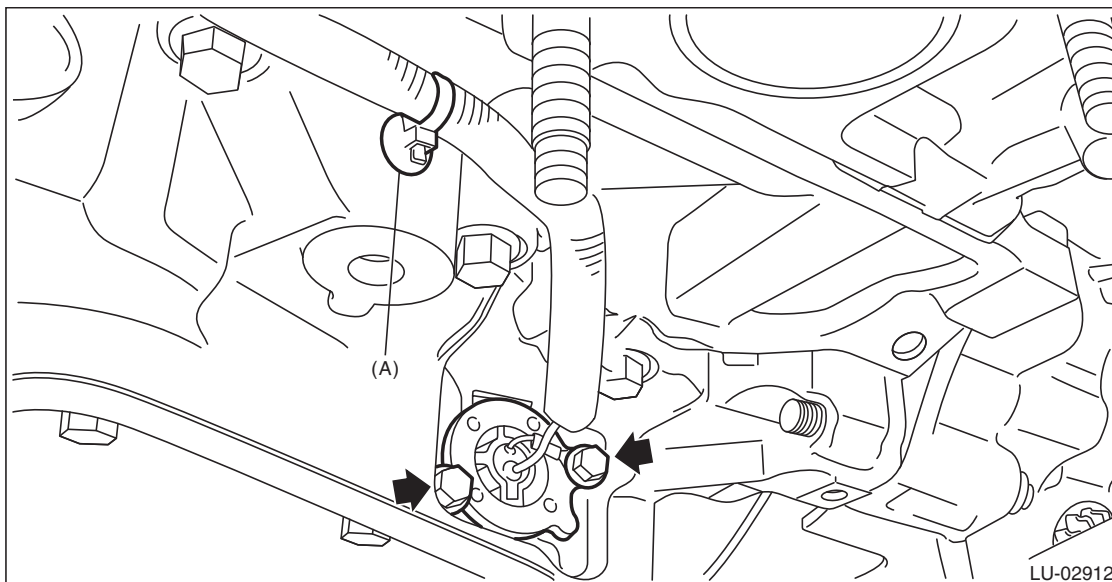
1) Install the oil level switch and the clip (A) to the oil pan upper.

NOTE:

- Use new O-rings.
- Apply a coat of engine oil to the O-rings.

Tightening torque:

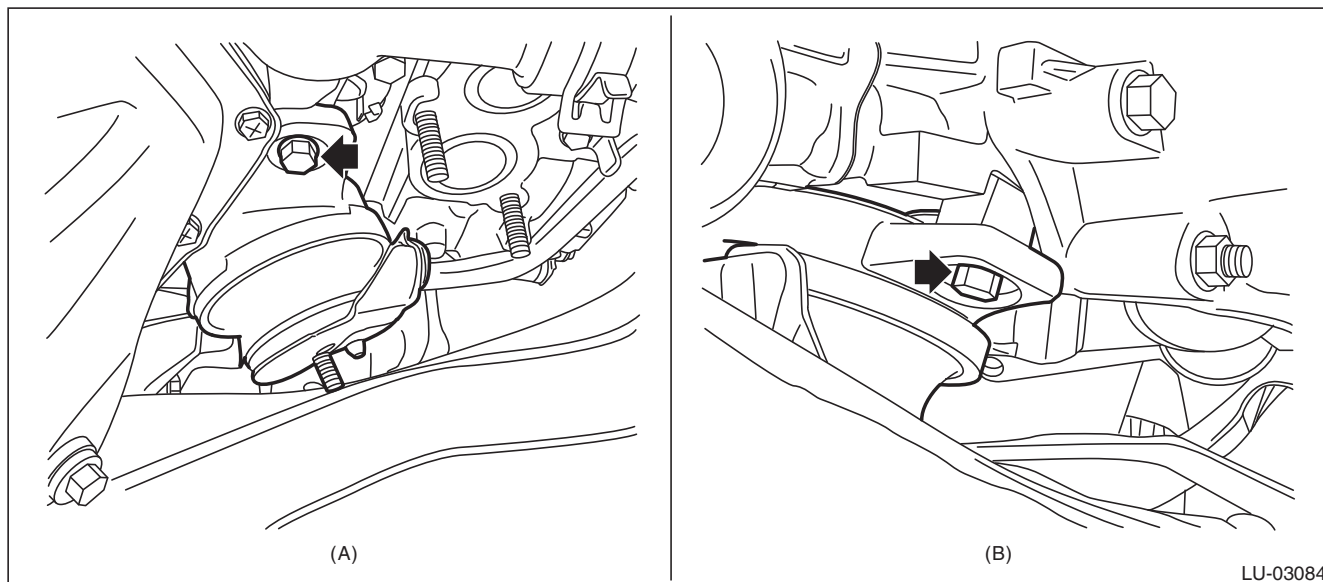
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



2) Install the engine mounting LH onto the engine.

Tightening torque:

35 N·m (3.6 kgf-m, 25.8 ft-lb)



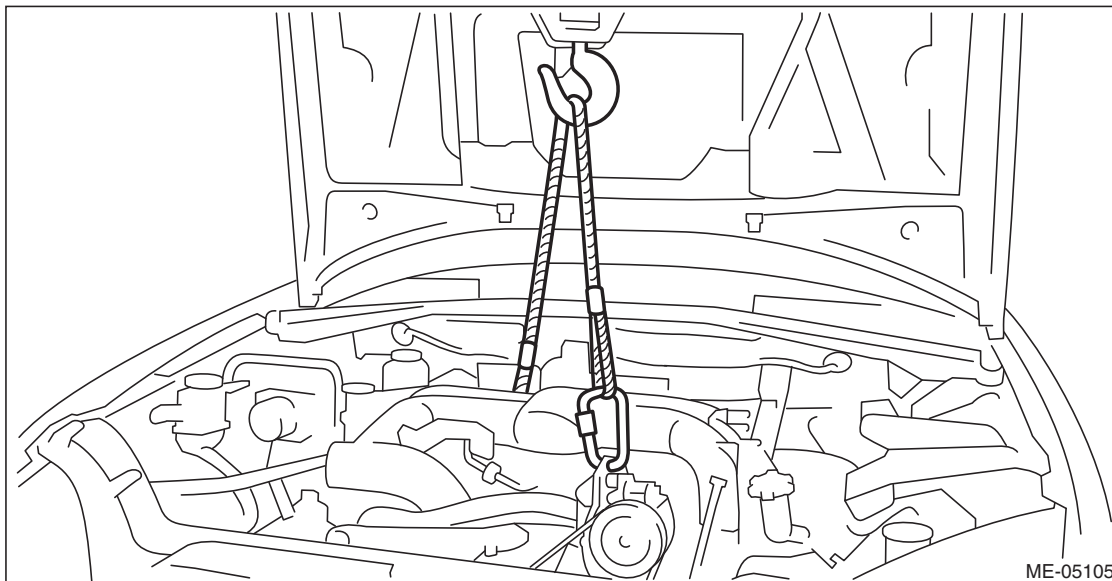
(A) Front side

(B) Rear side

Oil Level Switch

LUBRICATION

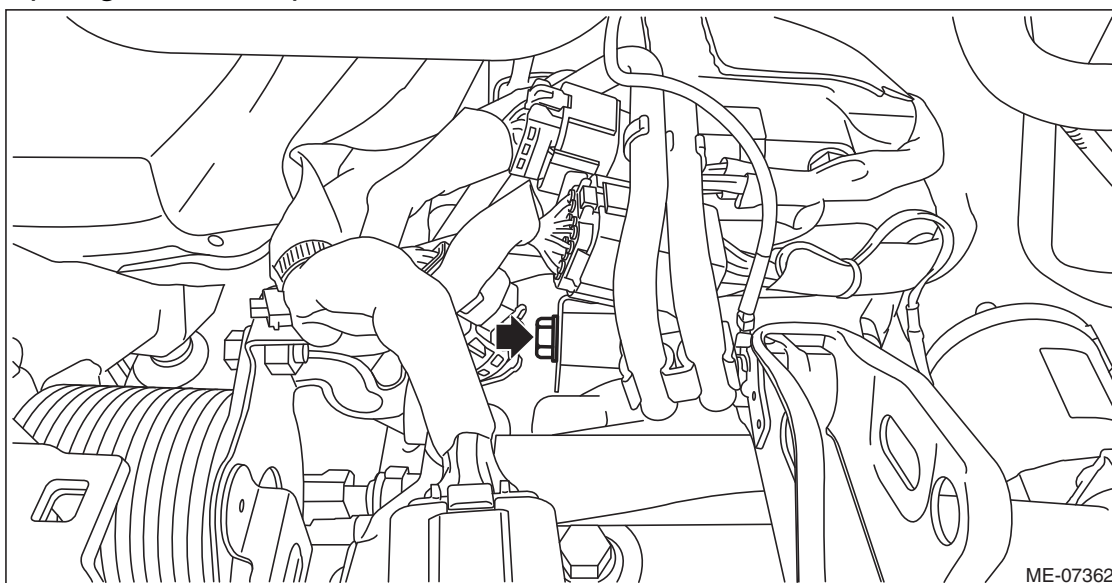
- 3) Lower the engine and remove the lifting device and wire ropes.



- 4) 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)



Oil Level Switch

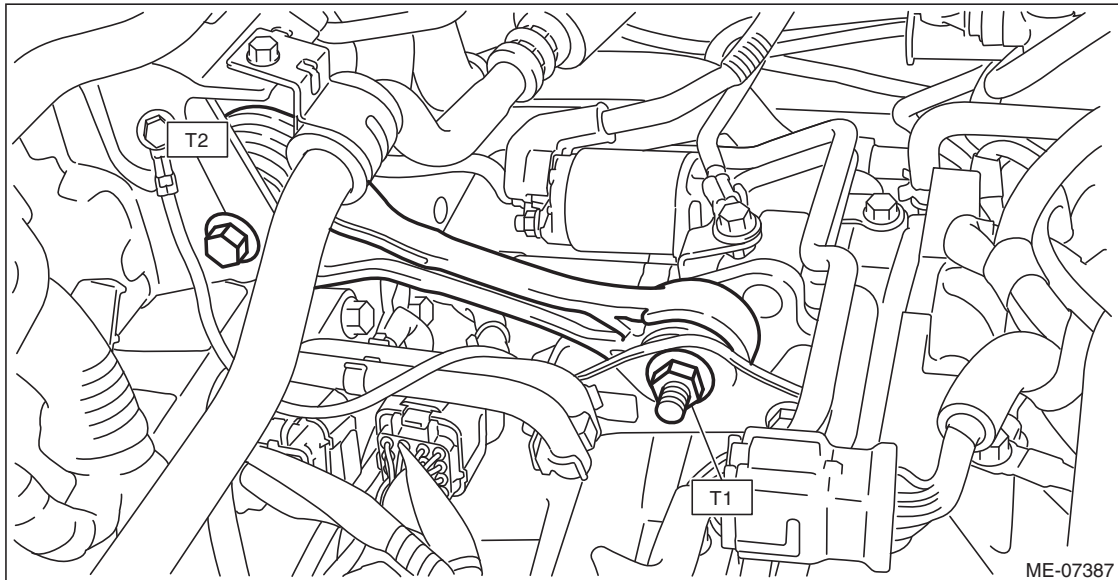
LUBRICATION

5) 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)



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

7) Lift up the vehicle.

8) Install the electric power steering gearbox. <Ref. to PS-30, INSTALLATION, Electric Power Steering Gearbox.>

9) Install the front drive shaft LH. <Ref. to DS-56, INSTALLATION, Front Drive Shaft.>

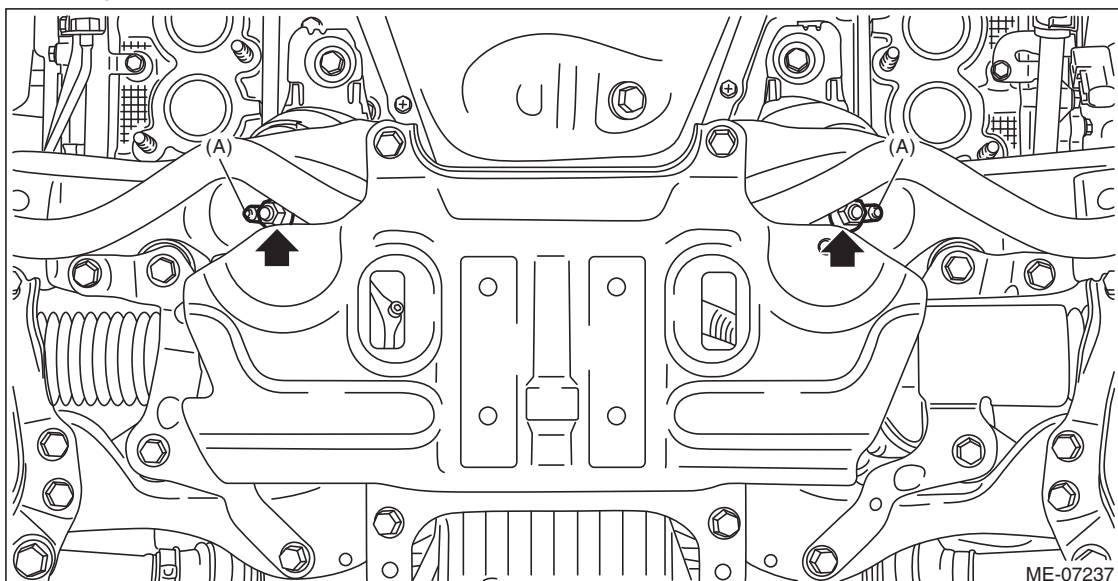
10) Install the nuts which hold the engine mounting to the crossmember.

NOTE:

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

Tightening torque:

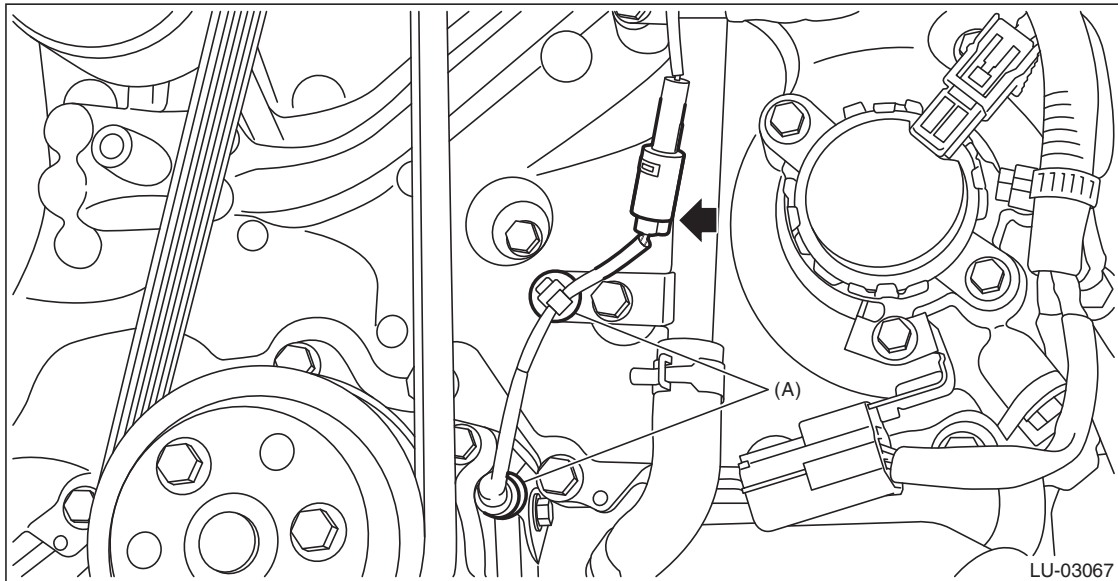
45 N·m (4.6 kgf-m, 33.2 ft-lb)



Oil Level Switch

LUBRICATION

11) Connect the connector of oil level switch to the engine harness, and install the clip (A) securing the harness.



12) Install the front exhaust pipe. <Ref. to EX(H4DOTC)-15, INSTALLATION, Front Exhaust Pipe.>

13) Install the under cover. <Ref. to EI-22, INSTALLATION, Front Under Cover.>

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

15) Connect the battery ground terminal.

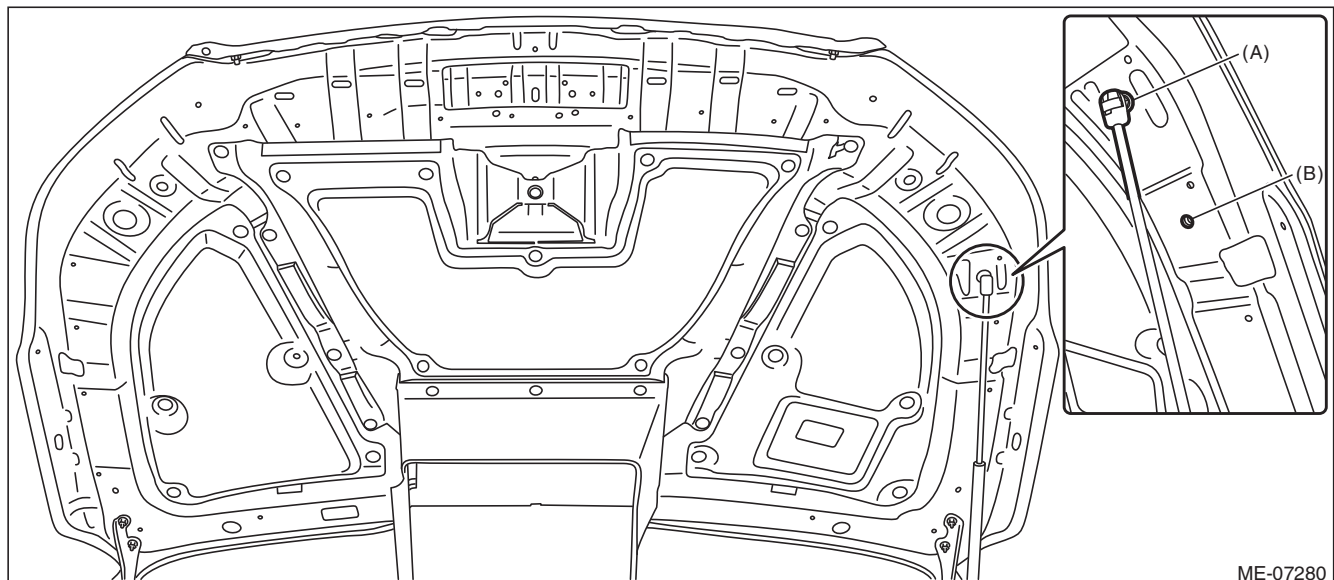
16) Install the collector cover.

17) Refill the engine oil. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.>

18) 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)



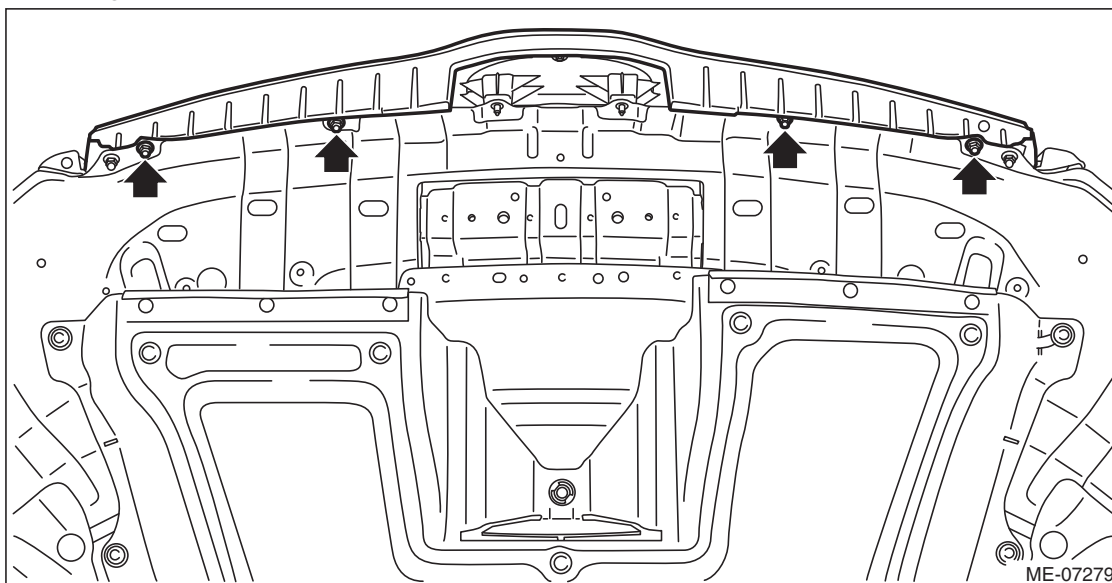
Oil Level Switch

LUBRICATION

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

Tightening torque:

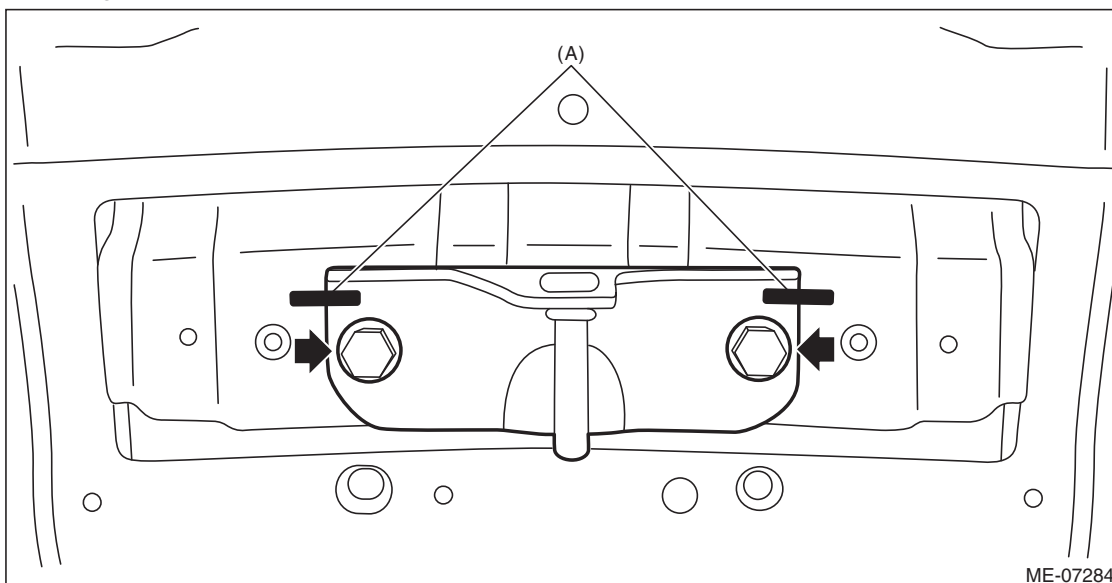
4.5 N·m (0.5 kgf-m, 3.3 ft-lb)



20) 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)



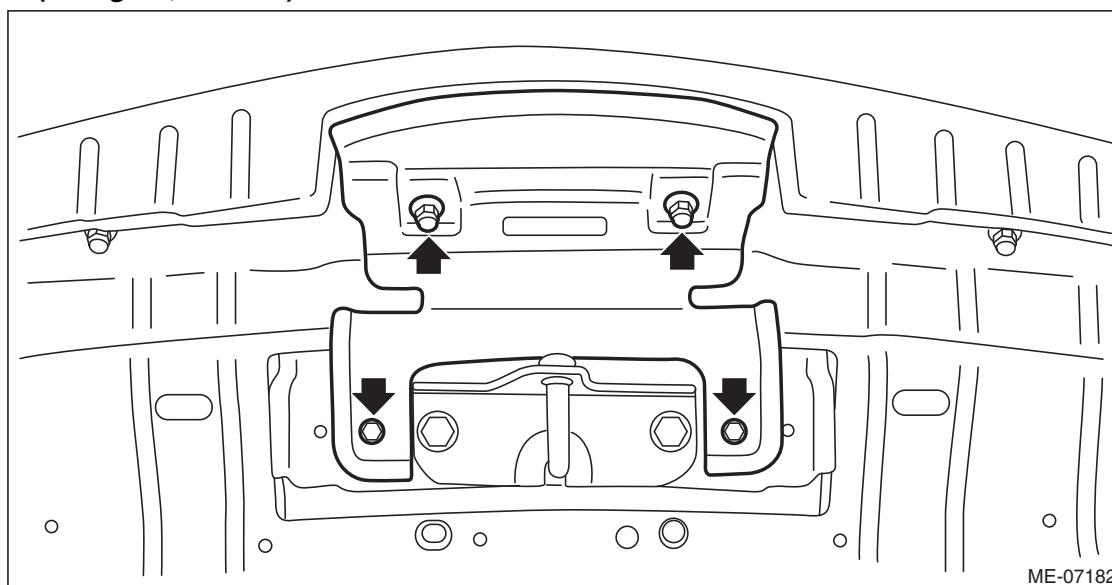
Oil Level Switch

LUBRICATION

21) 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)

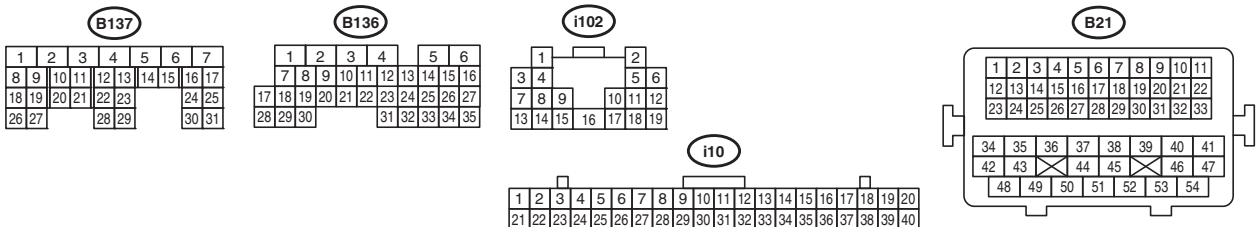
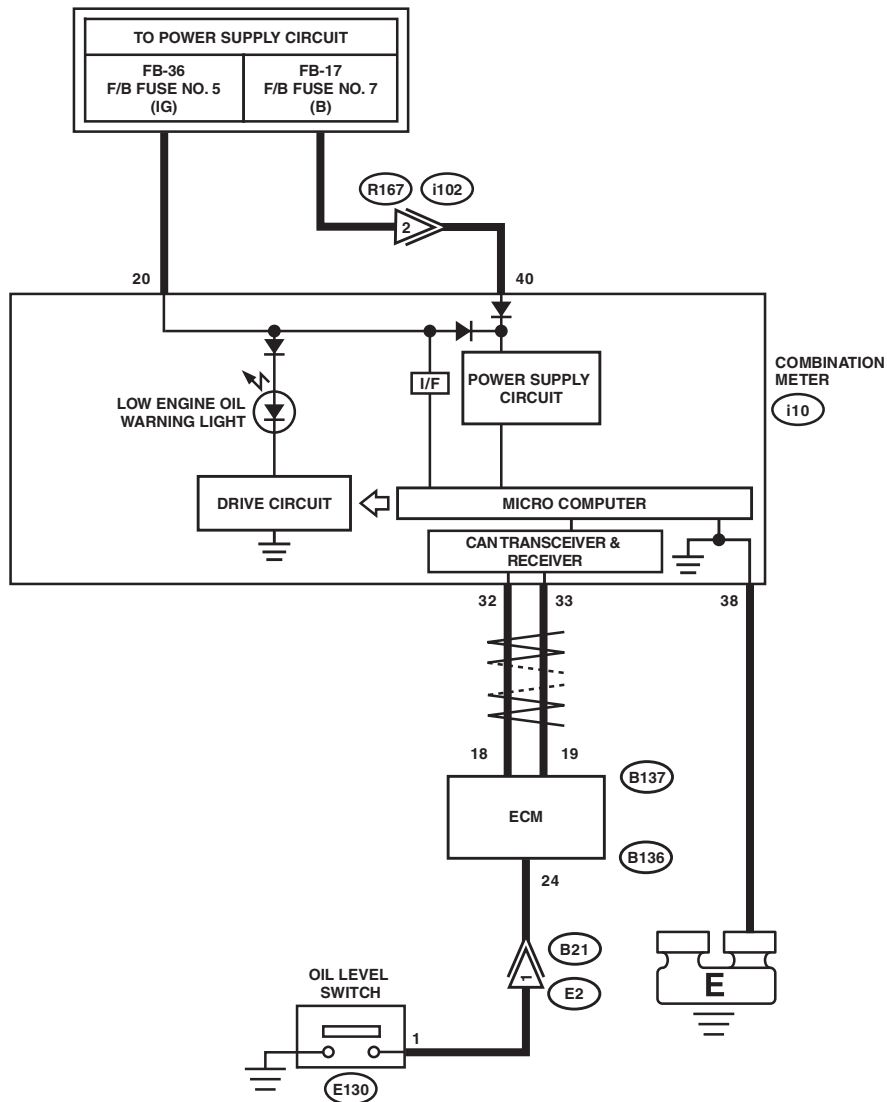


Oil Level Switch

LUBRICATION

C: WIRING DIAGRAM

- Engine electrical system <Ref. to WI-166, WIRING DIAGRAM, Engine Electrical System.>
- CAN communication system <Ref. to WI-96, WIRING DIAGRAM, CAN Communication System.>
- Non-turbo model

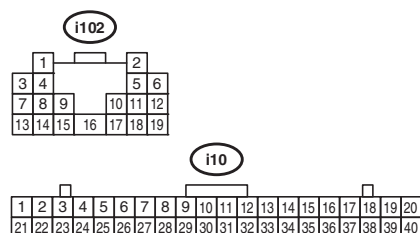
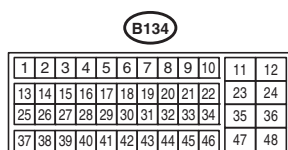
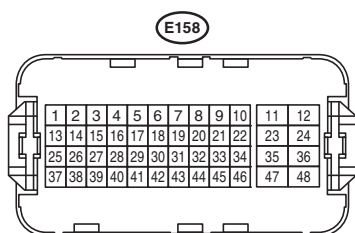
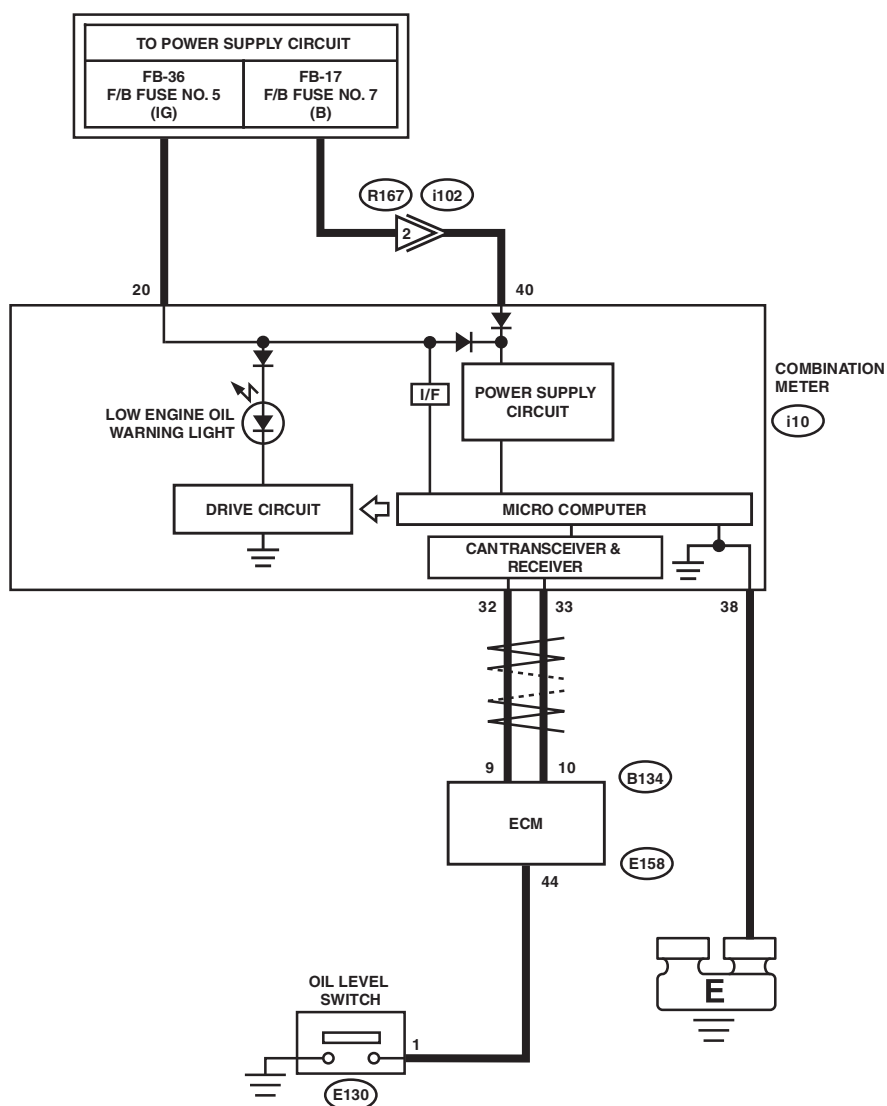


LU-03076

LU(H4DO)-96

LUBRICATION

- 
- Provided Exclusively on Ebay
by Seller "4SubaruManuals"



LU(H4DO)-97

Oil Level Switch

LUBRICATION

D: INSPECTION

1. INSPECTION WHILE LOW ENGINE OIL LEVEL WARNING LIGHT IS ON (NON-TURBO MODEL)

Step	Check	Yes	No
1 CHECK ENGINE OIL LEVEL.	Is engine oil level normal?	Go to step 2.	Replace engine oil or refill, and check again while the oil level is normal condition. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.> To turn off the low engine oil level warning light, install the spare fuse at the delivery mode fuse in the main fuse box. Then turn the ignition switch to ON (engine OFF) again to confirm the low engine oil level warning light turns off. Remove the spare fuse installed to finish. NOTE: The engine oil level switch is normal if the low engine oil level warning light turns off with the delivery mode fuse inserted.
2 CHECK LAN SYSTEM.	Has a DTC of the LAN system been input?	Perform the diagnosis according to DTC.	Go to step 3.

Oil Level Switch

LUBRICATION

Step	Check	Yes	No
3 CHECK OIL LEVEL SWITCH CIRCUIT. 1) Turn the ignition switch to ON (engine OFF). 2) Read the current data for engine in the Subaru Select Monitor to confirm the item for "Oil level switch". <Ref. to EN(H4DO)(diag)-36, DISPLAY CURRENT ENGINE DATA, OPERATION, Subaru Select Monitor.>	Is the "Oil level switch" signal displayed in Subaru Select Monitor HIGH?	To turn off the low engine oil level warning light, install the spare fuse at the delivery mode fuse in the main fuse box. Then turn the ignition switch to ON (engine OFF) again to confirm the low engine oil level warning light turns off. Remove the spare fuse installed to finish. NOTE: The engine oil level switch is normal if the low engine oil level warning light turns off with the delivery mode fuse inserted.	Go to step 4.
4 CHECK COMBINATION METER. Perform the self-diagnosis of combination meter to check if there are any faults in the combination meter. <Ref. to IDI-7, OPERATION, Combination Meter System.>	Is combination meter OK?	Go to step 5.	Replace the combination meter. <Ref. to IDI-18, REMOVAL, Combination Meter.>
5 CHECK SECURE CONNECTION OF CONNECTOR BETWEEN ENGINE HARNESS AND OIL LEVEL SWITCH.	Is there any insecure connection?	Remedy the connection condition. Then, to turn off the low engine oil level warning light, install the spare fuse at the delivery mode fuse in the main fuse box. Then turn the ignition switch to ON (engine OFF) again to confirm the low engine oil level warning light turns off. Remove the spare fuse installed to finish. NOTE: The engine oil level switch is normal if the low engine oil level warning light turns off with the delivery mode fuse inserted.	Go to step 6.



Oil Level Switch

LUBRICATION

Step	Check	Yes	No
6 CHECK OIL LEVEL SWITCH. 1) Deliberately short circuits by connecting the engine harness connector terminal and chassis ground. 2) Turn the ignition switch to ON (engine OFF). 3) Read the current data for engine in the Subaru Select Monitor to confirm the item for "Oil level switch". <Ref. to EN(H4DO)(diag)-36, DISPLAY CURRENT ENGINE DATA, OPERATION, Subaru Select Monitor.> Connector & terminal (E130) No. 1 — Chassis ground:	Is the "Oil level switch" signal displayed in Subaru Select Monitor HIGH?	Replace the oil level switch. <Ref. to LU(H4DO)-66, REMOVAL, Oil Level Switch.>	Go to step 7.
7 CHECK SECURE CONNECTION OF CONNECTOR BETWEEN BULKHEAD HARNESS AND ENGINE HARNESS.	Is there any insecure connection?	Remedy the connection condition. Then, to turn off the low engine oil level warning light, install the spare fuse at the delivery mode fuse in the main fuse box. Then turn the ignition switch to ON (engine OFF) again to confirm the low engine oil level warning light turns off. Remove the spare fuse installed to finish. NOTE: The engine oil level switch is normal if the low engine oil level warning light turns off with the delivery mode fuse inserted.	Go to step 8.
8 CHECK ENGINE HARNESS. 1) Disconnect the connector on the oil level switch side for the engine harness. 2) Disconnect the connector on the bulkhead harness side for the engine harness. 3) Measure the resistance between connector terminals. Connector & terminal (E2) No. 1 — (E130) No. 1:	Is the resistance less than 1 Ω ?	Go to step 9.	Repair or replace the open circuit of engine harness.

Oil Level Switch

LUBRICATION

Step	Check	Yes	No
9 CHECK SECURE CONNECTION OF CONNECTOR BETWEEN ENGINE CONTROL MODULE (ECM) AND BULKHEAD HARNESS. Remove the glove box lid assembly. <Ref. to EI-61, REMOVAL, Glove Box.>	Is there any insecure connection?	Remedy the connection condition. Then, to turn off the low engine oil level warning light, install the spare fuse at the delivery mode fuse in the main fuse box. Then turn the ignition switch to ON (engine OFF) again to confirm the low engine oil level warning light turns off. Remove the spare fuse installed to finish. NOTE: The engine oil level switch is normal if the low engine oil level warning light turns off with the delivery mode fuse inserted.	Go to step 10.
10 CHECK BULKHEAD HARNESS. 1) Remove the glove box lid assembly. <Ref. to EI-61, REMOVAL, Glove Box.> 2) Disconnect the engine control module (ECM) side connector for the bulkhead harness. 3) Disconnect the engine harness connectors from the bulkhead harness. 4) Measure the resistance between connector terminals. Connector & terminal (B136) No. 24 — (B21) No. 1:	Is the resistance less than 1 Ω?	Replace the engine control module (ECM). <Ref. to FU(H4DO)-94, REMOVAL, Engine Control Module (ECM).>	Repair or replace the open circuit of the bulkhead harness.

Oil Level Switch

LUBRICATION

2. INSPECTION WHILE LOW ENGINE OIL LEVEL WARNING LIGHT IS ON (TURBO MODEL)

Step	Check	Yes	No
1 CHECK ENGINE OIL LEVEL.	Is engine oil level normal?	Go to step 2.	Replace engine oil or refill, and check again while the oil level is normal condition. <Ref. to LU(H4DO)-14, REPLACEMENT, Engine Oil.> To turn off the low engine oil warning light, install the spare fuse at the delivery mode fuse in the main fuse box. Then turn the ignition switch to ON (engine OFF) again to confirm the low engine oil warning light turns off. Remove the spare fuse installed to finish. NOTE: The engine oil level switch is normal if the low engine oil level warning light turns off with the delivery mode fuse inserted.
2 CHECK LAN SYSTEM.	Has a DTC of the LAN system been input?	Perform the diagnosis according to DTC.	Go to step 3.
3 CHECK OIL LEVEL SWITCH CIRCUIT. 1) Turn the ignition switch to ON (engine OFF). 2) Read the current data for engine in the Subaru Select Monitor to confirm the item for "Oil Level Switch". <Ref. to EN(H4DOTC)(diag)-37, DISPLAY CURRENT ENGINE DATA, OPERATION, Subaru Select Monitor.>	Is the "Oil Level Switch" signal displayed in Subaru Select Monitor HIGH?	To turn off the low engine oil warning light, install the spare fuse at the delivery mode fuse in the main fuse box. Then turn the ignition switch to ON (engine OFF) again to confirm the low engine oil warning light turns off. Remove the spare fuse installed to finish. NOTE: The engine oil level switch is normal if the low engine oil level warning light turns off with the delivery mode fuse inserted.	Go to step 4.

Oil Level Switch

LUBRICATION

Step	Check	Yes	No
4 CHECK COMBINATION METER. Perform the self-diagnosis of combination meter to check if there are any faults in the combination meter. <Ref. to IDI-7, OPERATION, Combination Meter System.>	Is combination meter OK?	Go to step 5.	Replace the combination meter. <Ref. to IDI-18, REMOVAL, Combination Meter.>
5 CHECK SECURE CONNECTION OF CONNECTOR BETWEEN ENGINE HARNESS AND OIL LEVEL SWITCH.	Is there any insecure connection?	Remedy the connection condition. Then, to turn off the low engine oil warning light, install the spare fuse at the delivery mode fuse in the main fuse box. Then turn the ignition switch to ON (engine OFF) again to confirm the low engine oil warning light turns off. Remove the spare fuse installed to finish. NOTE: The engine oil level switch is normal if the low engine oil level warning light turns off with the delivery mode fuse inserted.	Go to step 6.
6 CHECK OIL LEVEL SWITCH. 1) Deliberately short circuits by connecting the engine harness connector terminal and chassis ground. 2) Turn the ignition switch to ON (engine OFF). 3) Read the current data for engine in the Subaru Select Monitor to confirm the item for "Oil Level Switch". <Ref. to EN(H4DOTC)(diag)-37, DISPLAY CURRENT ENGINE DATA, OPERATION, Subaru Select Monitor.> Connector & terminal (E130) No. 1 — Chassis ground:	Is the "Oil Level Switch" signal displayed in Subaru Select Monitor HIGH?	Replace the oil level switch. <Ref. to LU(H4DO)-66, REMOVAL, Oil Level Switch.>	Go to step 7.



Oil Level Switch

LUBRICATION

Step	Check	Yes	No
7 CHECK SECURE CONNECTION OF CONNECTOR BETWEEN ENGINE CONTROL MODULE (ECM) AND ENGINE HARNESS.	Is there any insecure connection?	Remedy the connection condition. Then, to turn off the low engine oil warning light, install the spare fuse at the delivery mode fuse in the main fuse box. Then turn the ignition switch to ON (engine OFF) again to confirm the low engine oil warning light turns off. Remove the spare fuse installed to finish. NOTE: The engine oil level switch is normal if the low engine oil level warning light turns off with the delivery mode fuse inserted.	Go to step 8.
8 CHECK ENGINE HARNESS. 1) Disconnect the engine control module (ECM) side connector. 2) Set the ST between the engine control module (ECM) and engine harness. <Ref. to EN(H4DOTC)(diag)-6, CAUTION, General Description.> 3) Disconnect the connector between the engine harness and the oil level switch. 4) Measure the resistance between connector terminals. Connector & terminal (B158) No. 44 — (B130) No. 1:	Is the resistance less than 1 Ω?	Replace the engine control module (ECM). <Ref. to FU(H4DOTC)-134, REMOVAL, Engine Control Module (ECM).>	Repair or replace the open circuit of engine harness.

3. OTHER INSPECTIONS

- 1) Check that the oil level switch does not have deformation, cracks, or damage.
- 2) Check the oil level switch installation part for oil leakage and oil seepage.

Engine Lubrication System Trouble in General

LUBRICATION

14.Engine Lubrication System Trouble in General

A: INSPECTION

Before performing diagnostics, make sure that the engine oil level is correct and no oil leakage exists.

Trouble	Possible cause	Corrective action
Warning light remains ON.	a. Oil pressure switch failure	
	○ Cracked diaphragm or oil leakage within switch	Replace.
	○ Broken spring or seized contacts	Replace.
	b. Low oil pressure	
	○ Clogging of oil filter	Replace.
	○ Malfunction of oil by-pass valve in oil filter	Replace.
	○ Clogged oil passage	Clean.
	○ Excessive tip clearance and side clearance of oil pump rotor	Replace.
	○ Clogged oil strainer or broken pipe	Clean or replace.
	c. No oil pressure	
	○ Insufficient engine oil (degradation, etc.)	Replace.
	○ Broken pipe of oil strainer	Replace.
	○ Stuck oil pump rotor	Replace.
Warning light does not illuminate.	a. Malfunction of combination meter	Replace.
	b. Poor contact of switch contact points	Replace.
	c. Disconnection of wiring	Repair.
Warning light flickers momentarily.	a. Defective terminal contact	Repair.
	b. Defective wiring harness	Repair.
	c. Oil pressure switch failure	
	○ Cracked diaphragm or oil leakage within switch	Replace.
	○ Broken spring or seized contacts	Replace.
	d. Low oil pressure	
	○ Clogging of oil filter	Replace.
	○ Malfunction of oil by-pass valve in oil filter	Replace.
	○ Clogged oil passage	Clean.
	○ Excessive tip clearance and side clearance of oil pump rotor	Replace.
	○ Clogged oil strainer or broken pipe	Clean or replace.

Engine Lubrication System Trouble in General

LUBRICATION
