

14.Chain Cover

A: REMOVAL

NOTE:

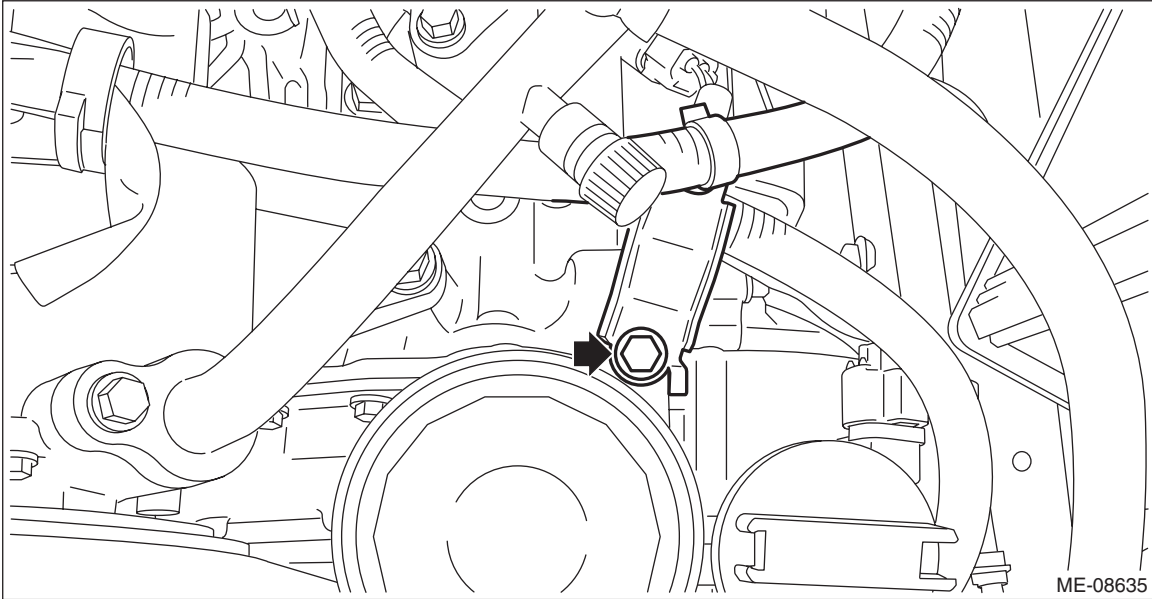
When replacing a single part, perform the work with the engine assembly installed to body.

1) When working on the vehicle

NOTE:

When working on the vehicle, perform the following steps also.

- (1) Remove the radiator. <Ref. to CO(H4DO(w/o HEV))-78, REMOVAL, Radiator.>
- (2) Remove the front exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-6, REMOVAL, Front Exhaust Pipe.>
- (3) Remove the bolts which secure the generator cord stay to the chain cover. (Gasoline engine model)



2) Remove the ISG. (HEV model) <Ref. to SC(H4DO(HEV))-32, REMOVAL, Integrated Starter Generator (ISG).>

NOTE:

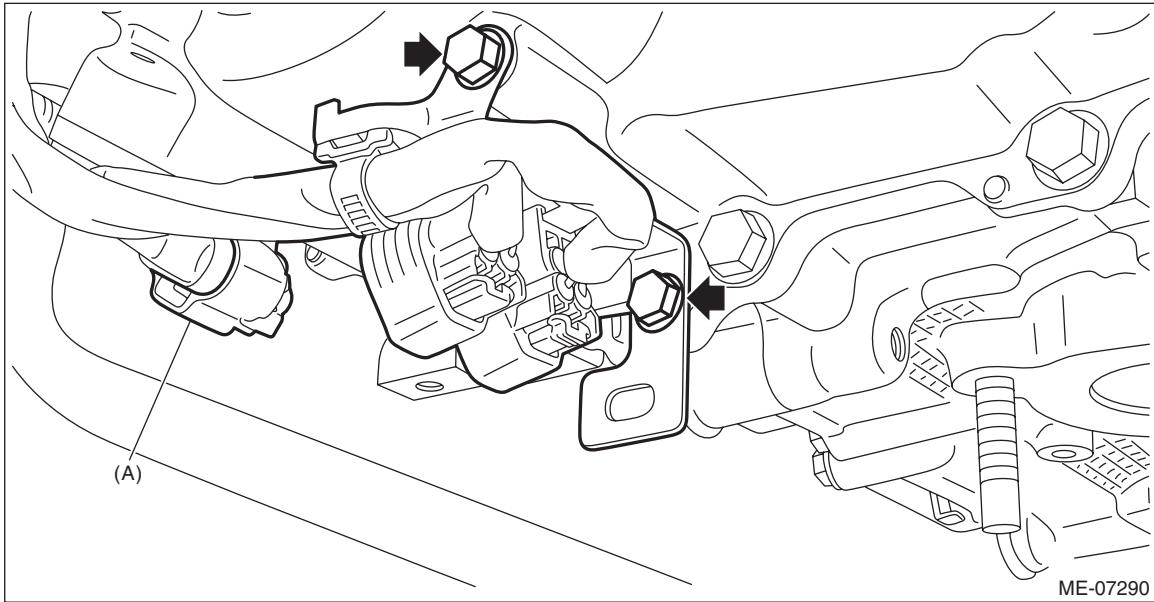
When working on the vehicle, move the battery cable assembly at the locations that do not interfere operation after the ISG is removed.

- 3) Remove the generator. (Gasoline engine model) <Ref. to SC(H4DO(w/o HEV))-32, REMOVAL, Generator.>
- 4) Drain the engine oil. <Ref. to LU(H4DO(w/o HEV))-13, REPLACEMENT, Engine Oil.>
- 5) Remove the water pump pulley. <Ref. to CO(H4DO(w/o HEV))-20, WATER PUMP, REMOVAL, Water Pump.>
- 6) Remove the crank pulley. <Ref. to ME(H4DO(w/o HEV))-140, REMOVAL, Crank Pulley.>

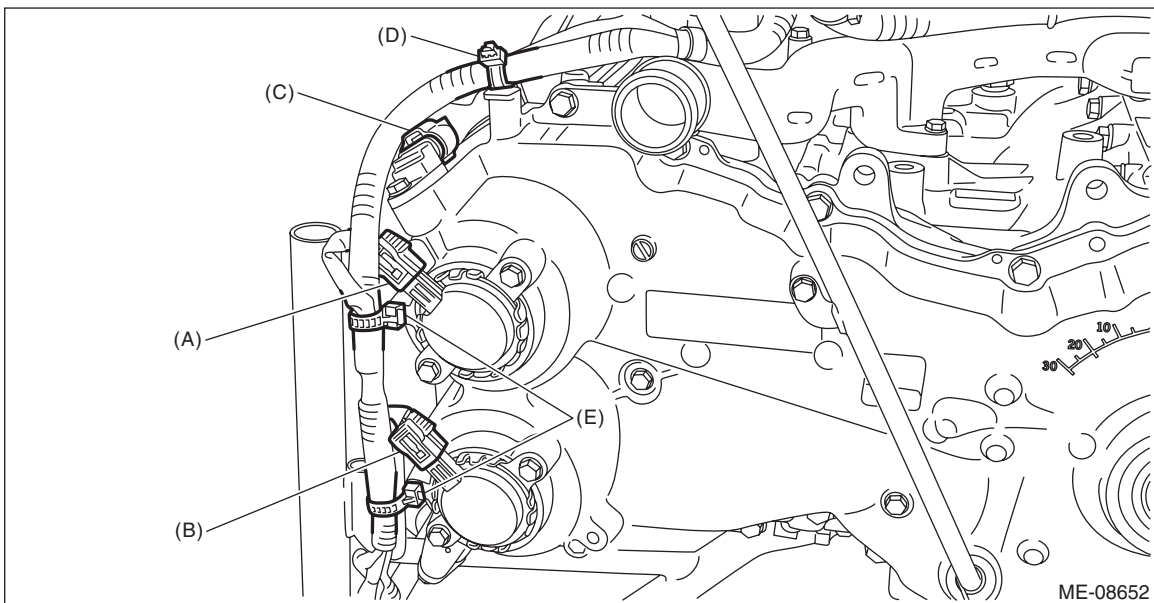
Chain Cover

MECHANICAL

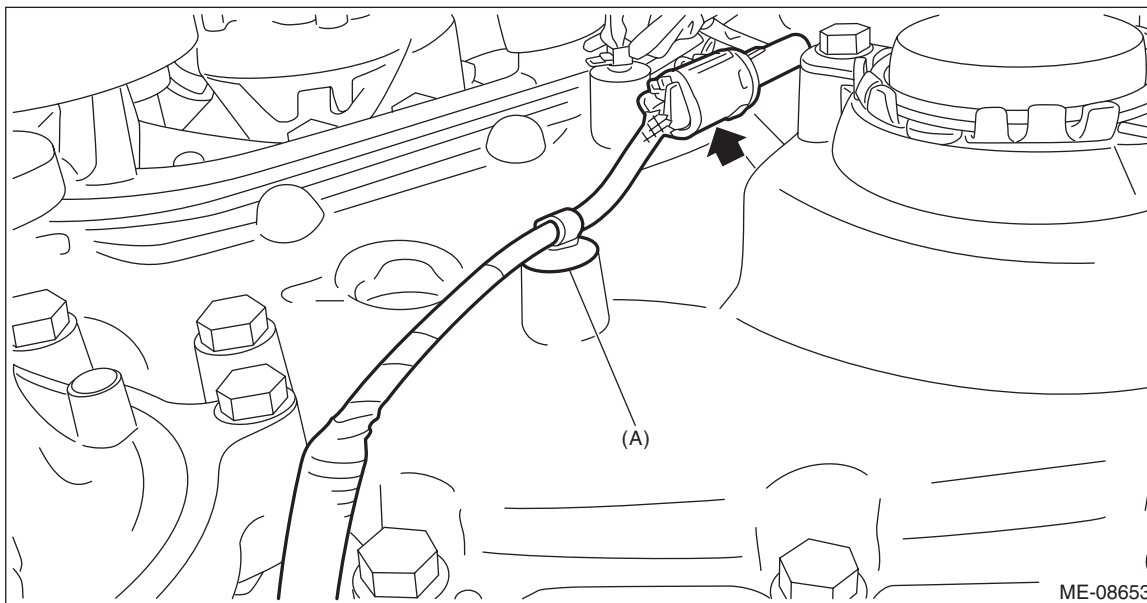
7) Disconnect the connector (A) from the exhaust camshaft position sensor RH, and remove the engine harness stay from the chain cover.



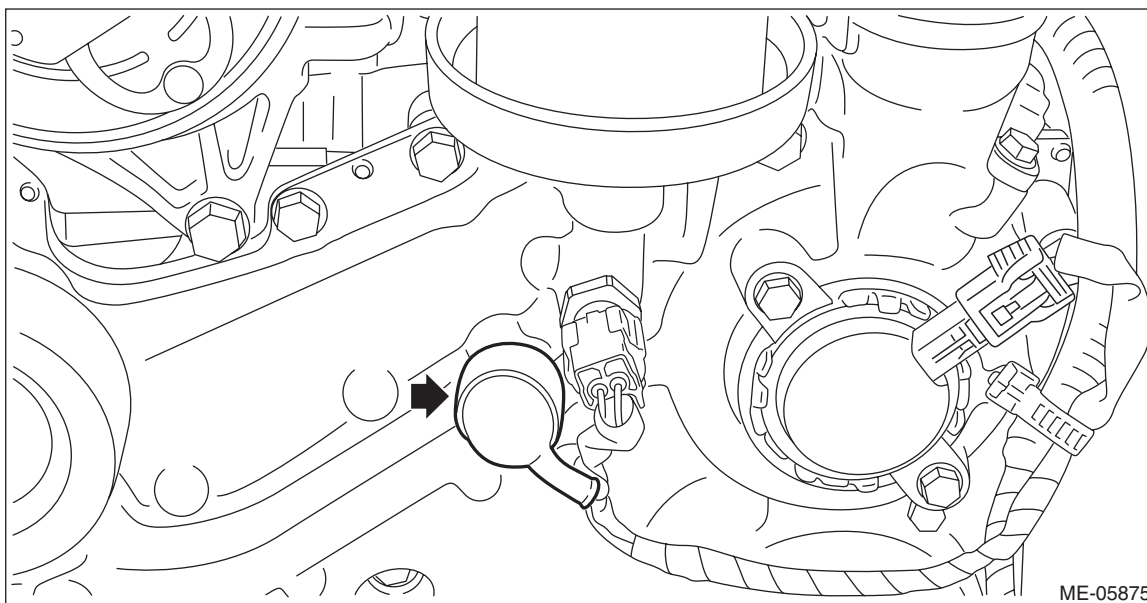
8) Disconnect the connector (A) from the intake oil control solenoid RH, connector (B) from the exhaust oil control solenoid RH, and the connector (C) from the intake camshaft position sensor RH, and then remove the clips (D) (gasoline engine model) and the clips (E) which secure the engine harness.



9) Disconnect the connectors from the oil level switch, and remove the clip (A) which secure the oil level switch harness.



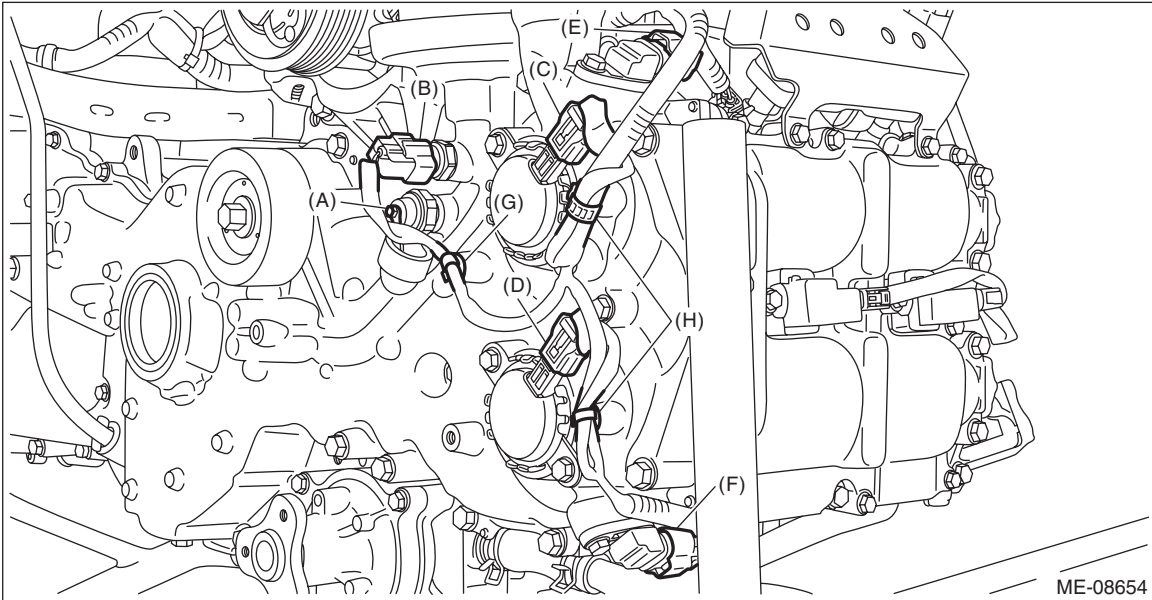
10) Remove the rubber cap from the oil pressure switch.



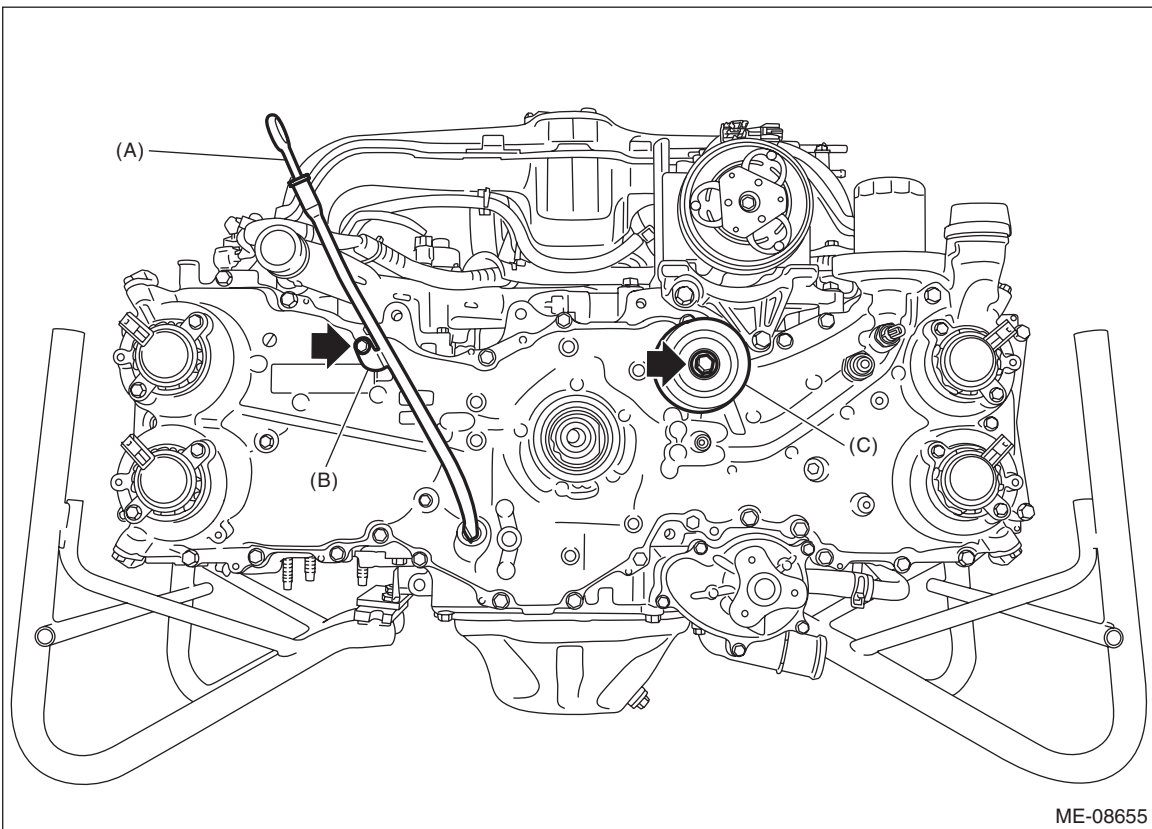
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MECHANICAL

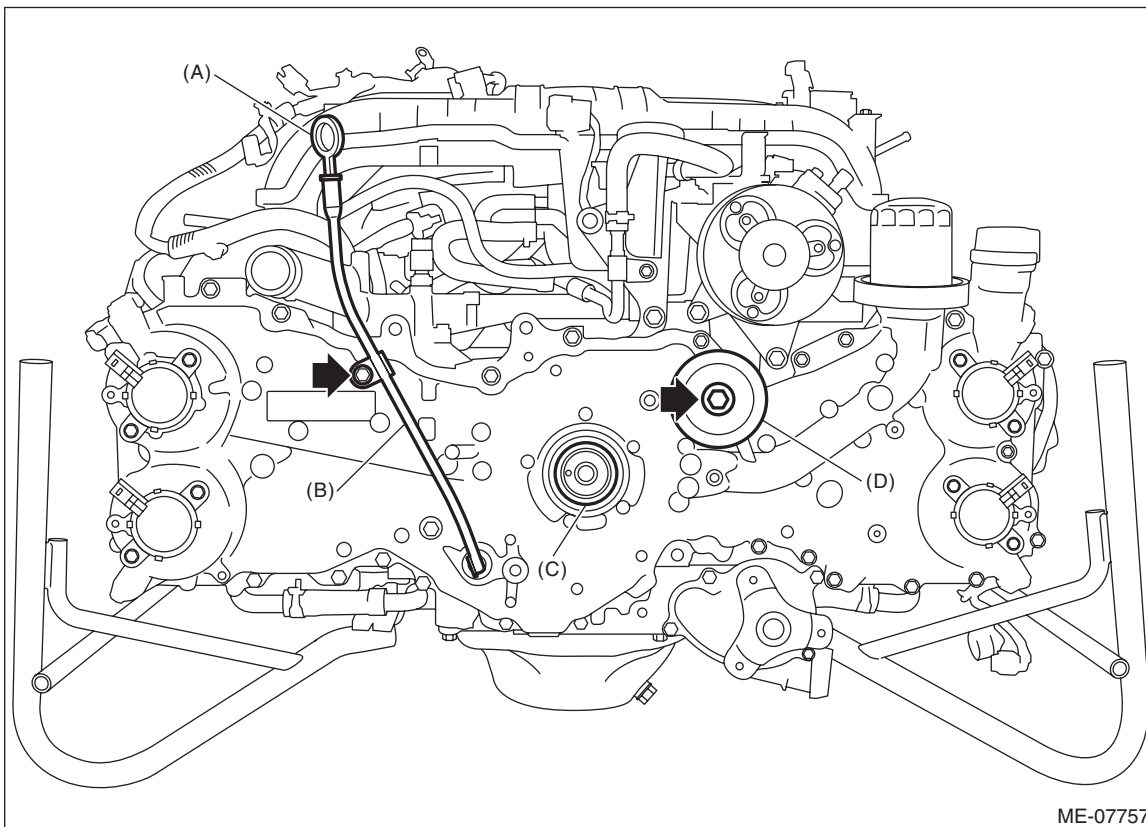
11) Disconnect the terminal (A) from the oil pressure switch, connector (B) from the engine oil temperature sensor, connector (C) from the intake oil control solenoid LH, connector (D) from the exhaust oil control solenoid LH, connector (E) from the intake camshaft position sensor LH, and connector (F) from the exhaust camshaft position sensor LH, and remove the clips (G) and (H) which secure the engine harness.



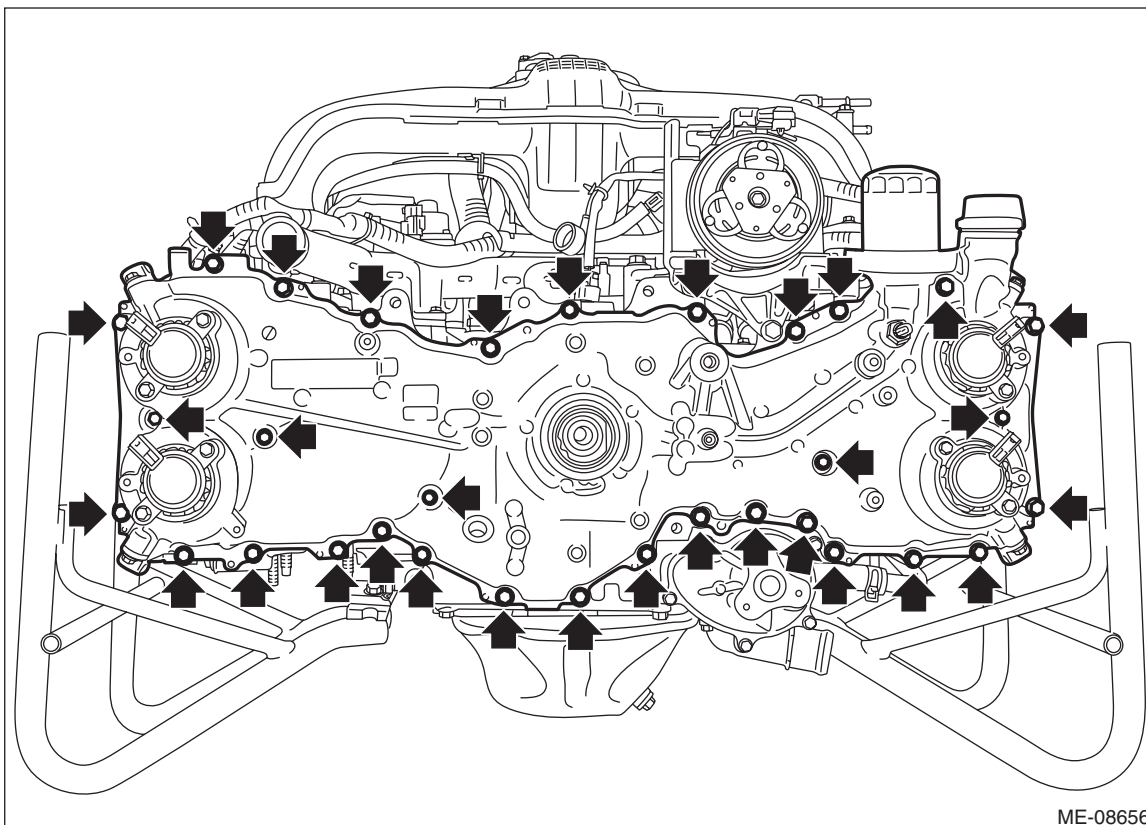
12) Pull out the oil level gauge (A), and remove the oil level gauge guide (B) and idler pulley (C). (Gasoline engine model)



13) Pull out the oil level gauge (A), and remove the oil level gauge guide (B), crank pulley boss (C), and idler pulley (D). (HEV model)



14) Remove the bolts securing the chain cover to the engine.



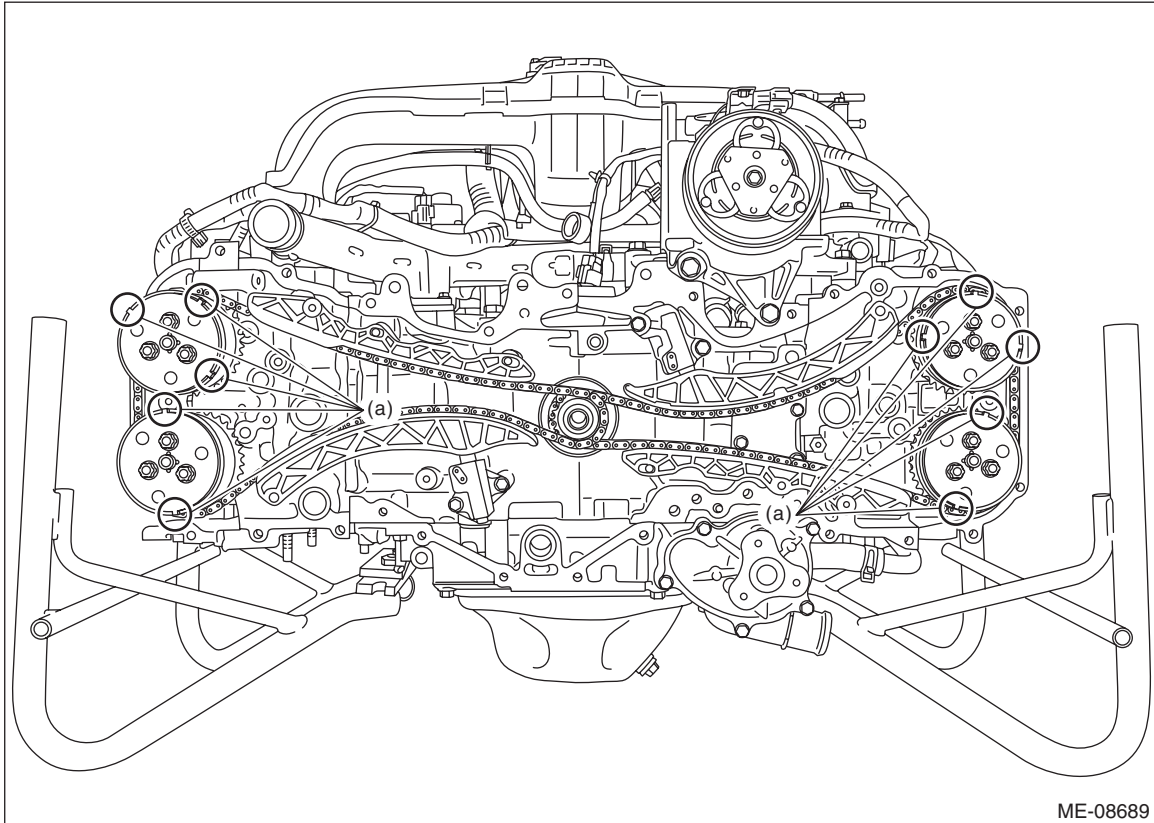
Chain Cover

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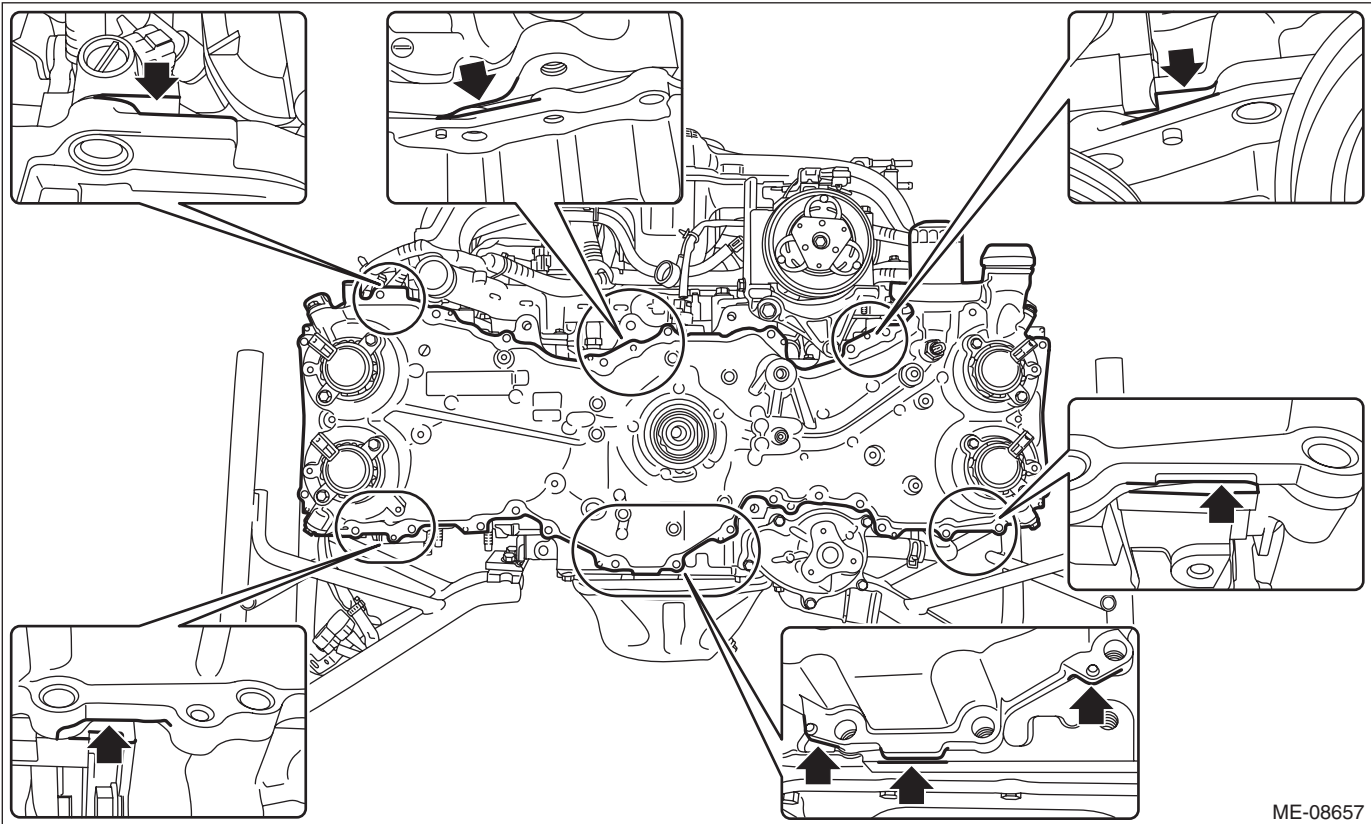
15) Expand the area shown in the figure using a crowbar or a similar tool wrapped in tape for protection, and remove the chain cover from the engine.

CAUTION:

For gasoline engine models, the chain cover may contact the protrusion (a) of cam sprocket sensor plate and cause damage. When removing the chain cover, move the chain cover horizontally until it cannot contact with the cam sprocket, and then remove it carefully.

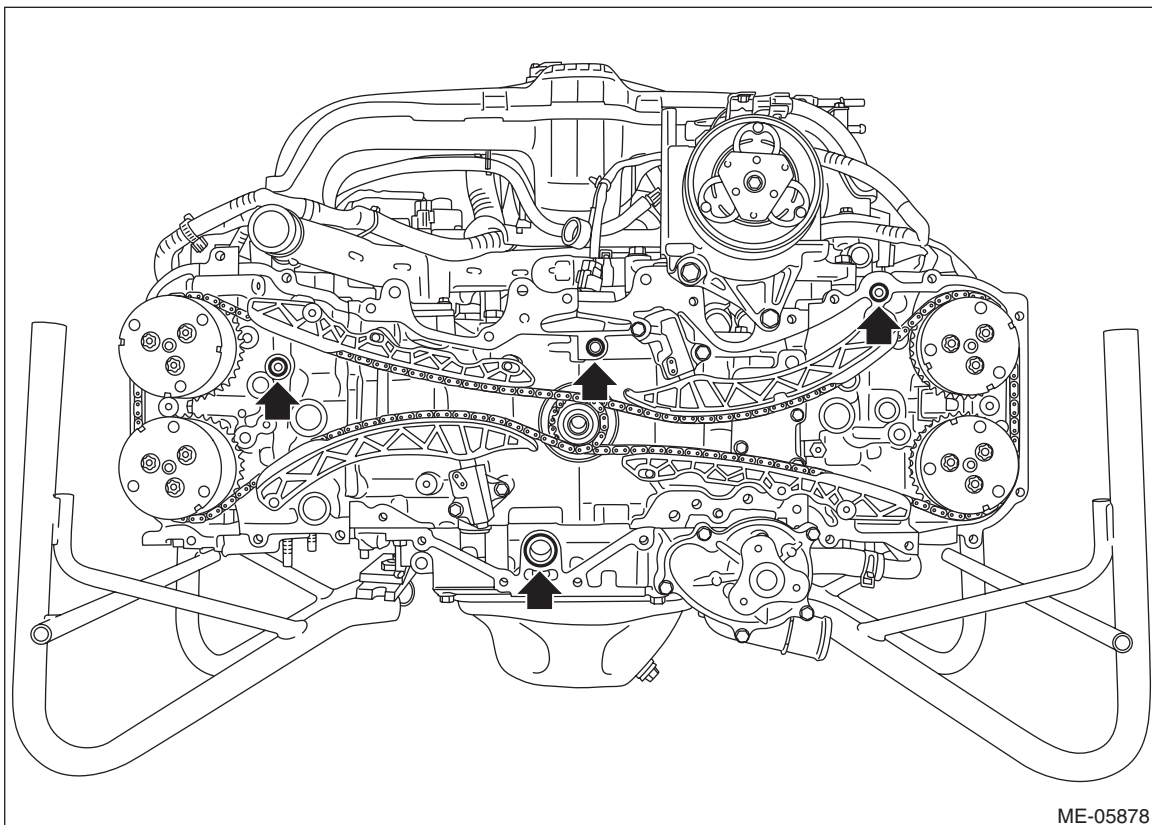


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16) Remove the O-rings from cylinder head RH, cylinder head LH, cylinder block LH and oil pan upper.



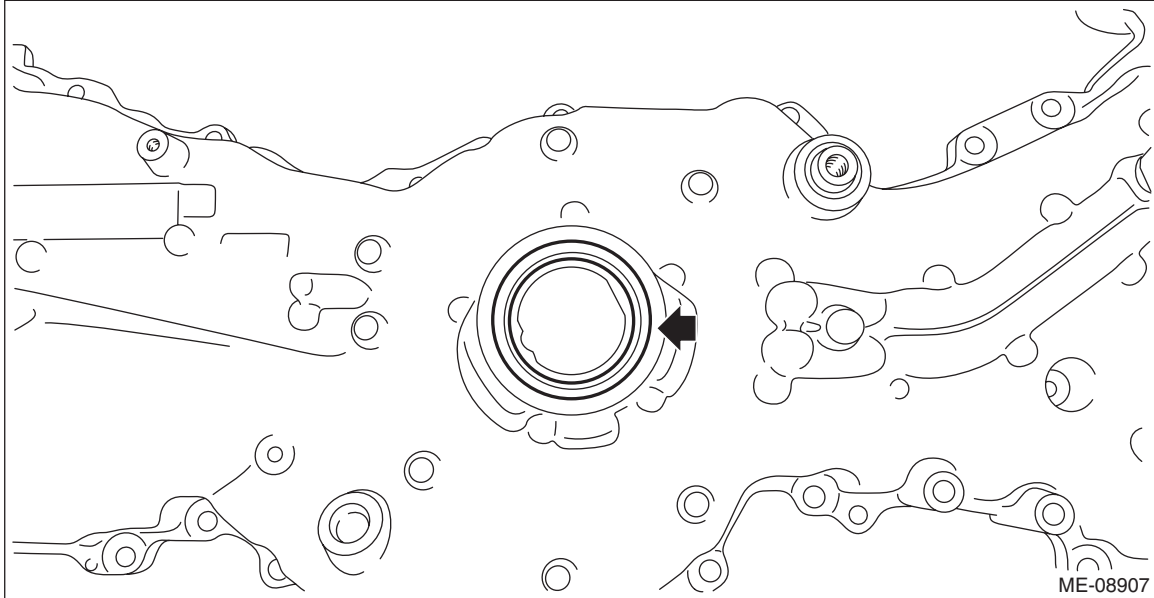
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17) Remove the liquid gasket from the chain cover and engine unit.

Chain Cover

MECHANICAL

18) Remove the front oil seal from the chain cover. (HEV model)



B: INSTALLATION

1) Degrease the press-fit section for the chain cover front oil seal, and install the front oil seal to the chain cover using ST. (HEV model)

CAUTION:

Do not apply fluid such as engine oil to the front oil seal and the chain cover; otherwise engine oil leakage may occur.

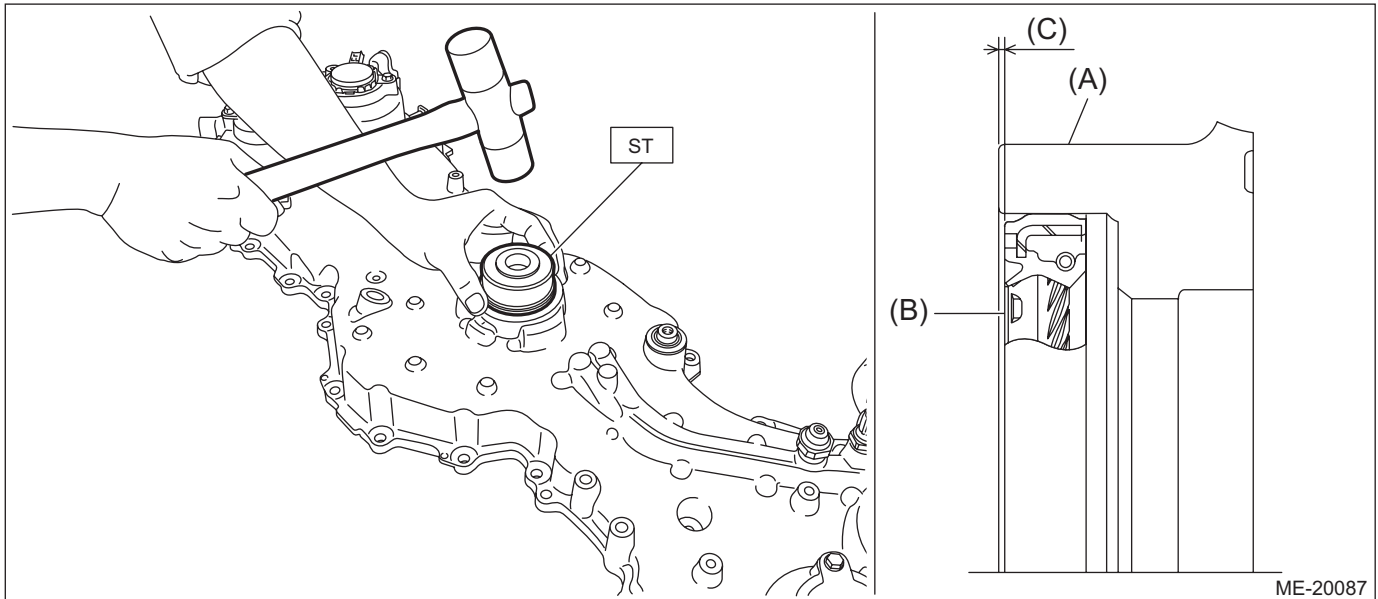
NOTE:

Use a new front oil seal.

ST 41399FG020 SPECIAL TOOL B

Front oil seal press-fit position:

1^{+0}_{-1} mm ($0.0039^{+0}_{-0.0039}$ in) position from chain cover end face



(A) Chain cover

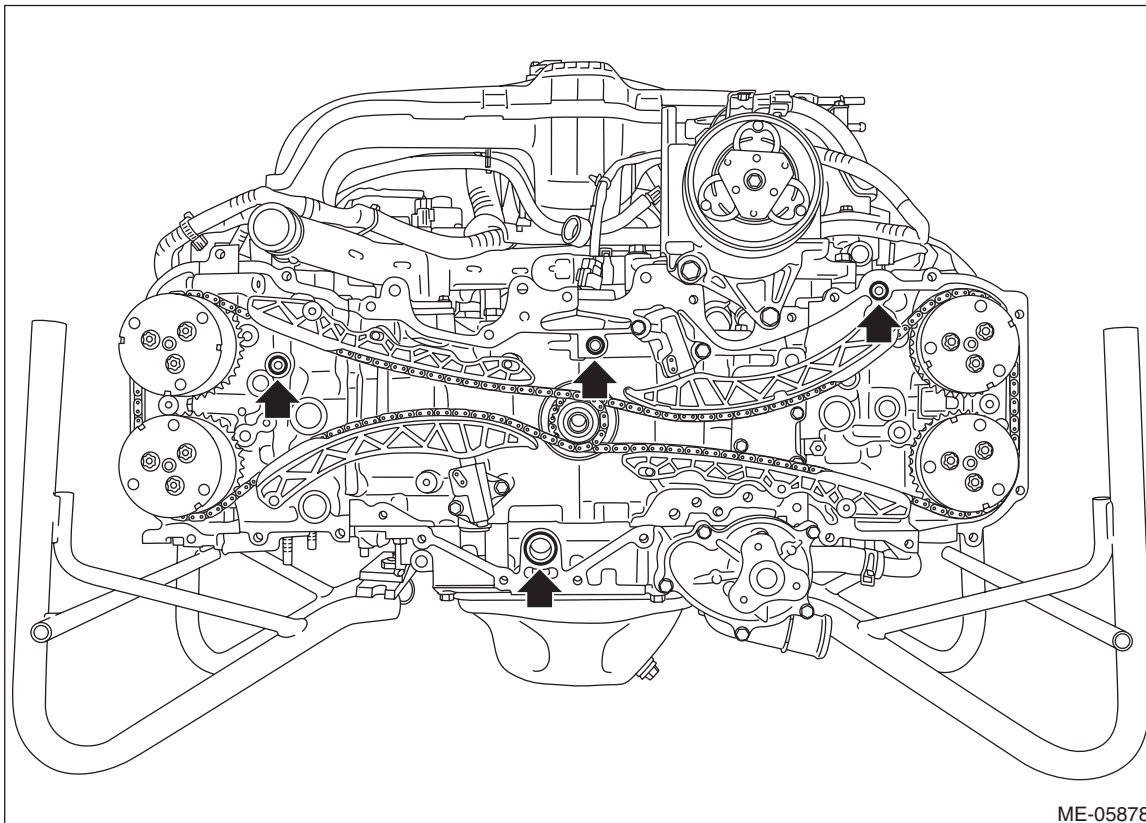
(B) Oil seal

(C) Front oil seal press-fit position
(1^{+0}_{-1} mm ($0.0039^{+0}_{-0.0039}$ in)
position from chain cover end
face)

2) Install the O-rings to cylinder head RH, cylinder head LH, cylinder block LH and oil pan upper.

NOTE:

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



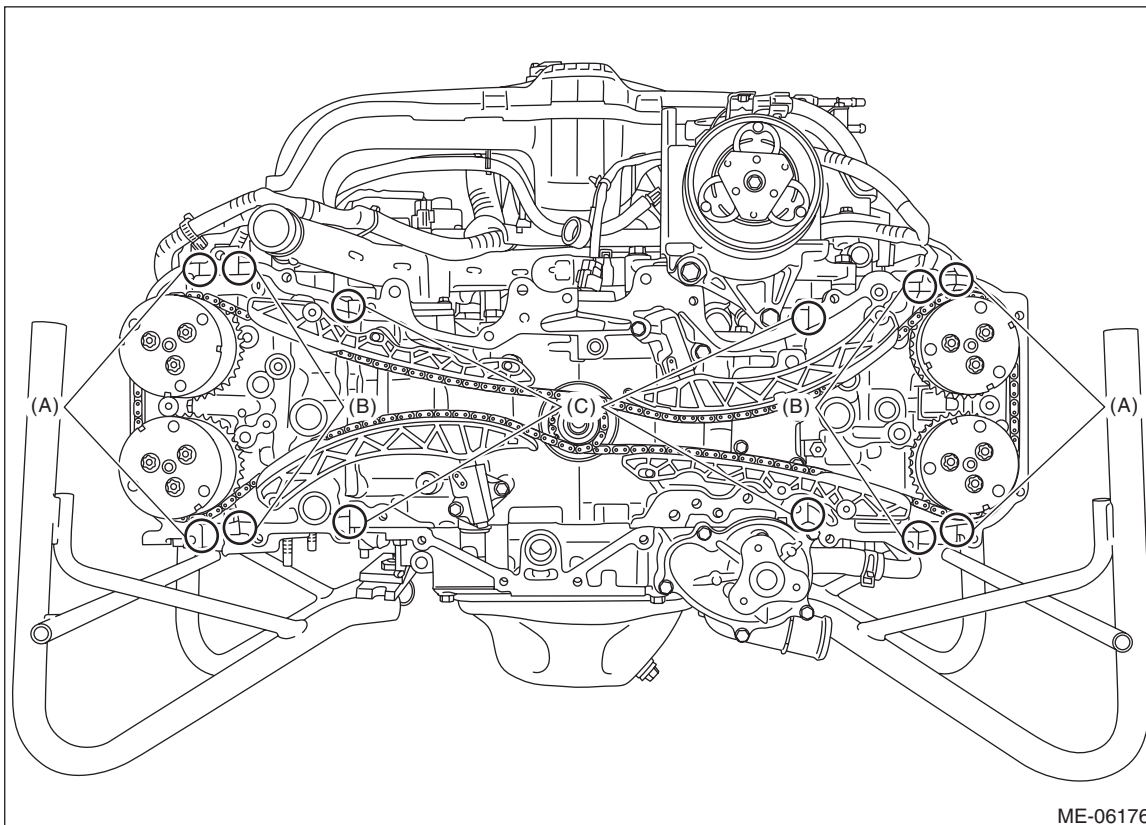
Chain Cover

MECHANICAL

3) Apply liquid gasket if there are gaps between front camshaft cap and cam carrier (A), cam carrier and cylinder head (B), and cylinder head and cylinder block (C) as shown in the figure.

Liquid gasket:

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



4) Apply liquid gasket to the chain cover mating surface and center boss (5 places) as shown in the figure.

NOTE:

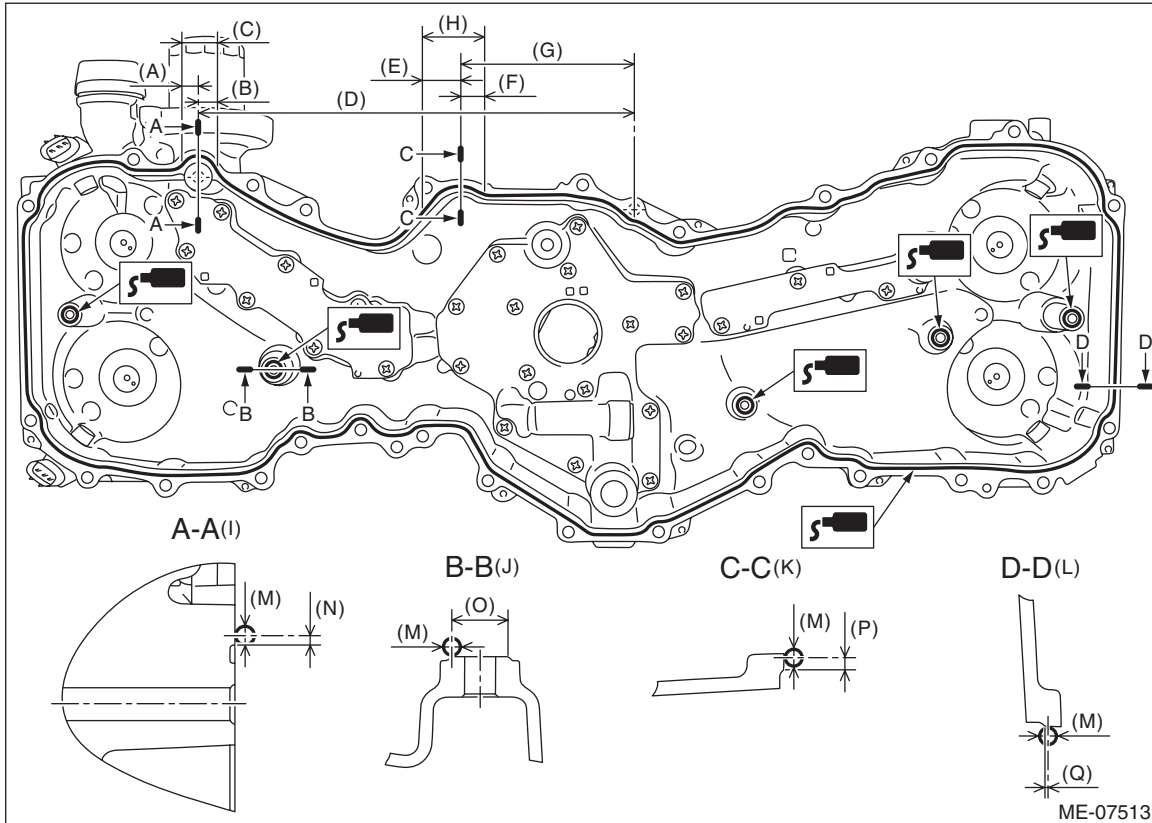
- Before applying liquid gasket, degrease the old liquid gasket seal surface of the engine and chain cover.
- Install within 5 min. after applying liquid gasket.

Liquid gasket:

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

Liquid gasket applying diameter:

4 ± 0.5 mm (0.1575 ± 0.0197 in)



(A) 14.5 mm (0.5709 in)	(G) 127 mm (5.0000 in)	(M) $\phi 4\pm0.5$ mm (0.1575 ± 0.0197 in)
(B) 17.5 mm (0.6890 in)	(H) Range B	(N) 2 mm (0.0787 in)
(C) Range A	(I) Liquid gasket applying position of mating surfaces of range A	(O) $\phi 12$ mm (0.4724 in)
(D) 316.2 mm (12.4488 in)	(J) Liquid gasket applying position of center boss (5 places)	(P) 2.5 mm (0.0984 in)
(E) 24.5 mm (0.9646 in)	(K) Liquid gasket applying position of mating surfaces of range B	(Q) 0.5 mm (0.0197 in)
(F) 18.5 mm (0.7283 in)	(L) Liquid gasket applying position of mating surfaces other than range A and range B	

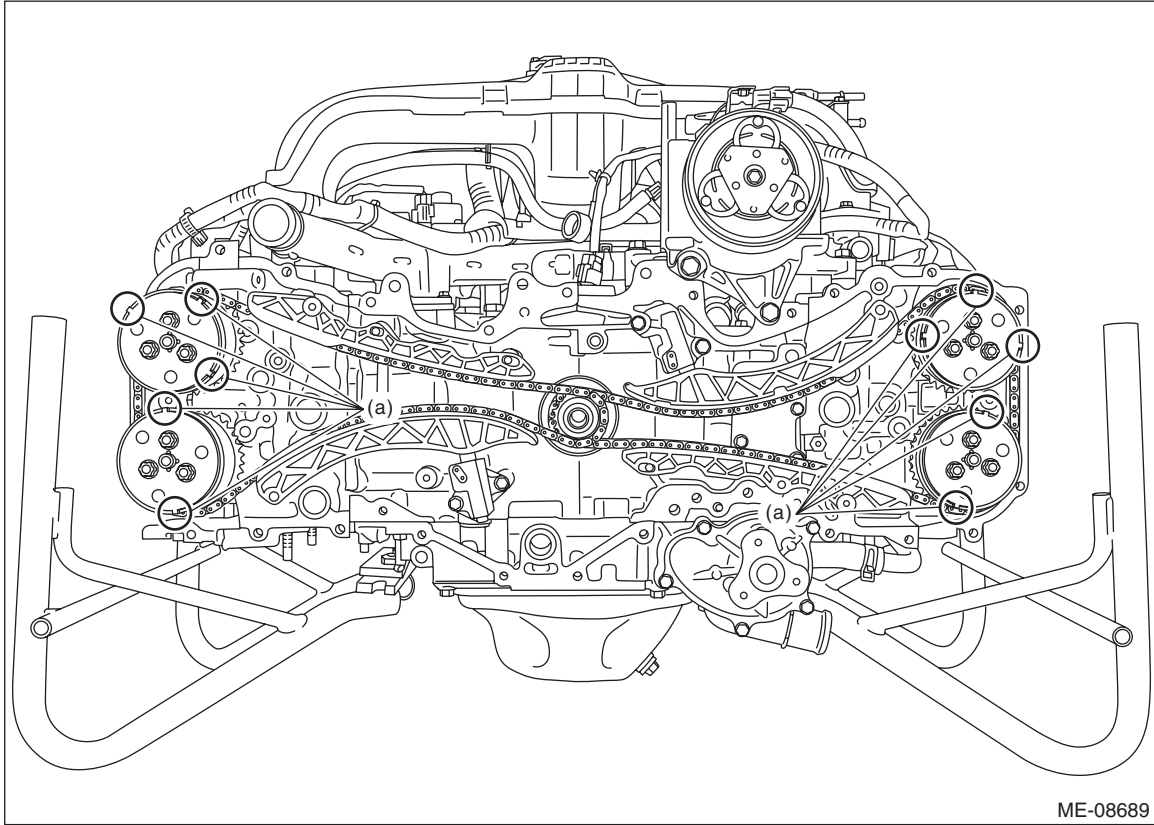
Chain Cover

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5) Set the chain cover, and tighten the bolts in numerical order as shown in the figure.

CAUTION:

For gasoline engine models, the chain cover may contact the protrusion (a) of cam sprocket sensor plate and cause damage. When setting the chain cover, move the chain cover horizontally and set it while taking care not to contact with the cam sprocket.



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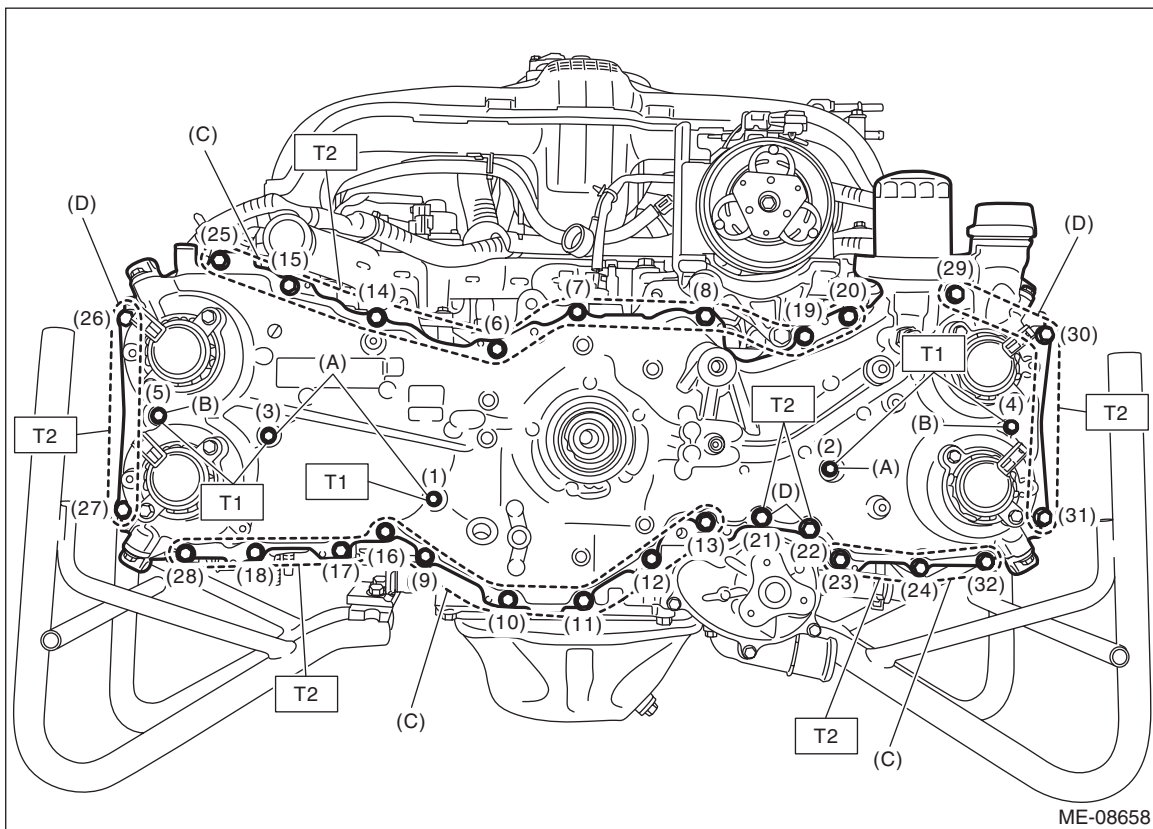
Chain Cover

MECHANICAL

Tightening torque:

T1: 10 N·m (1.0 kgf-m, 7.4 ft-lb)

T2: 25 N·m (2.5 kgf-m, 18.4 ft-lb)



- (A) M6 × 20
(B) M6 × 50

(C) M8 × 25

(D) M8 × 60

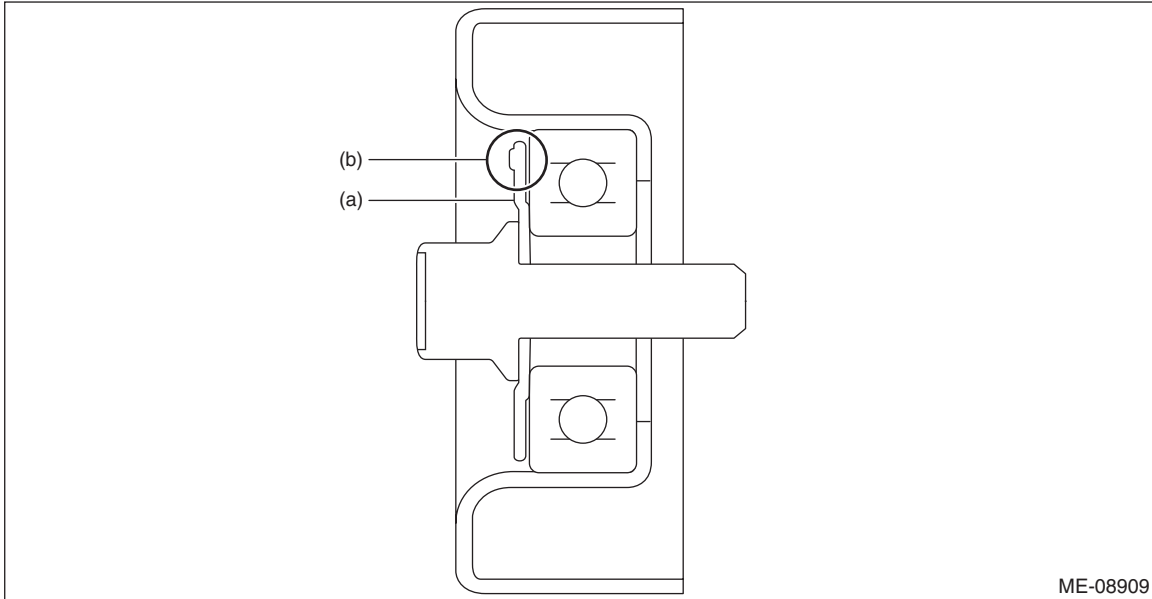
Chain Cover

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6) Install the idler pulley (C) and oil level gauge guide (B), and insert the oil level gauge (A). (Gasoline engine model)

NOTE:

- When installing the idler pulley, be careful of the idler pulley cover direction.



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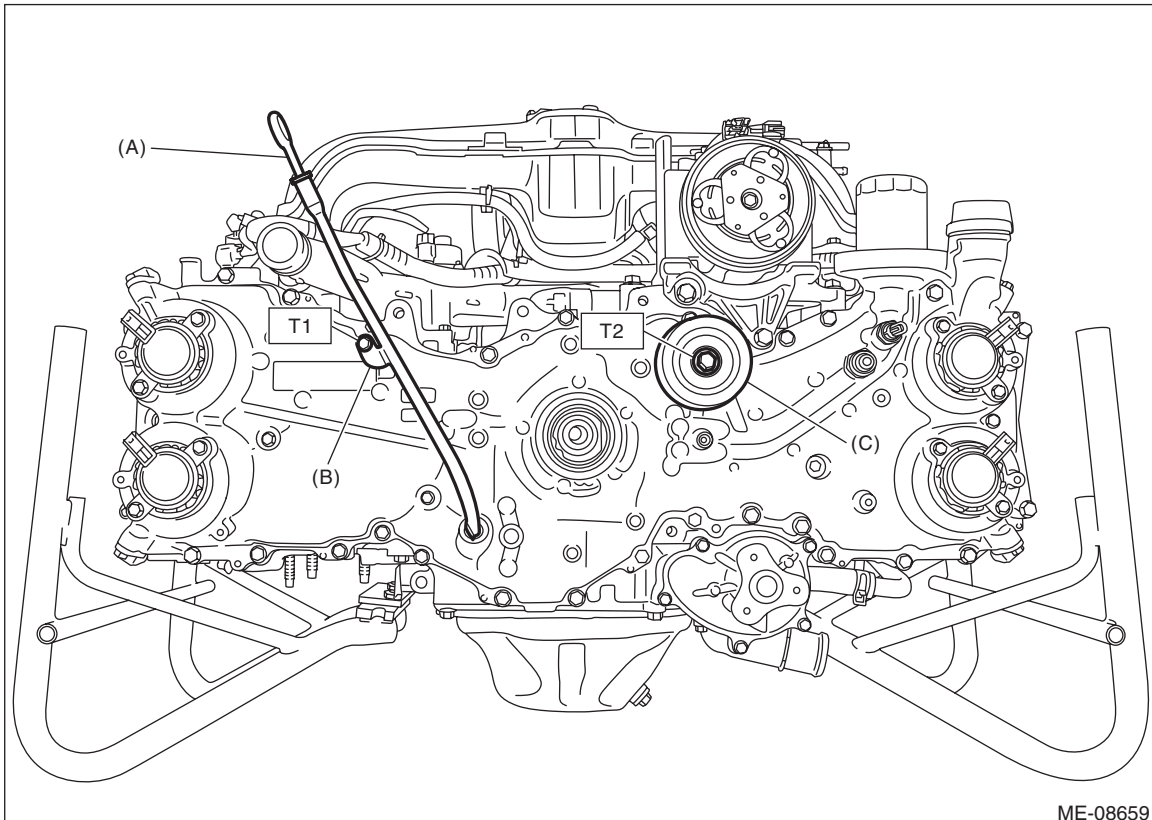
- (a) Idler pulley cover (b) Protrusion (3 places)

- Use a new O-ring to the oil level gauge guide.
- Apply a light coat of engine oil to the O-rings of the oil level gauge guide and the oil level gauge.

Tightening torque:

T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

T2: 36 N·m (3.7 kgf-m, 26.6 ft-lb)

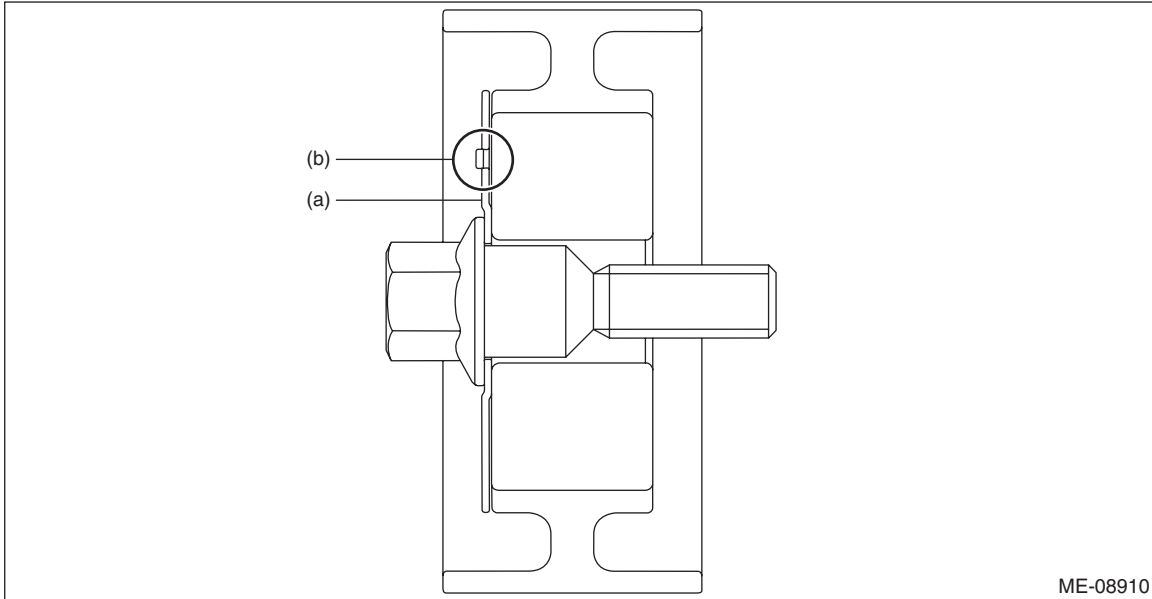


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7) Install the idler pulley (D), crank pulley boss (C) and oil level gauge guide (B), and insert the oil level gauge (A). (HEV model)

NOTE:

- When installing the idler pulley, be careful of the idler pulley cover direction.



(a) Idler pulley cover

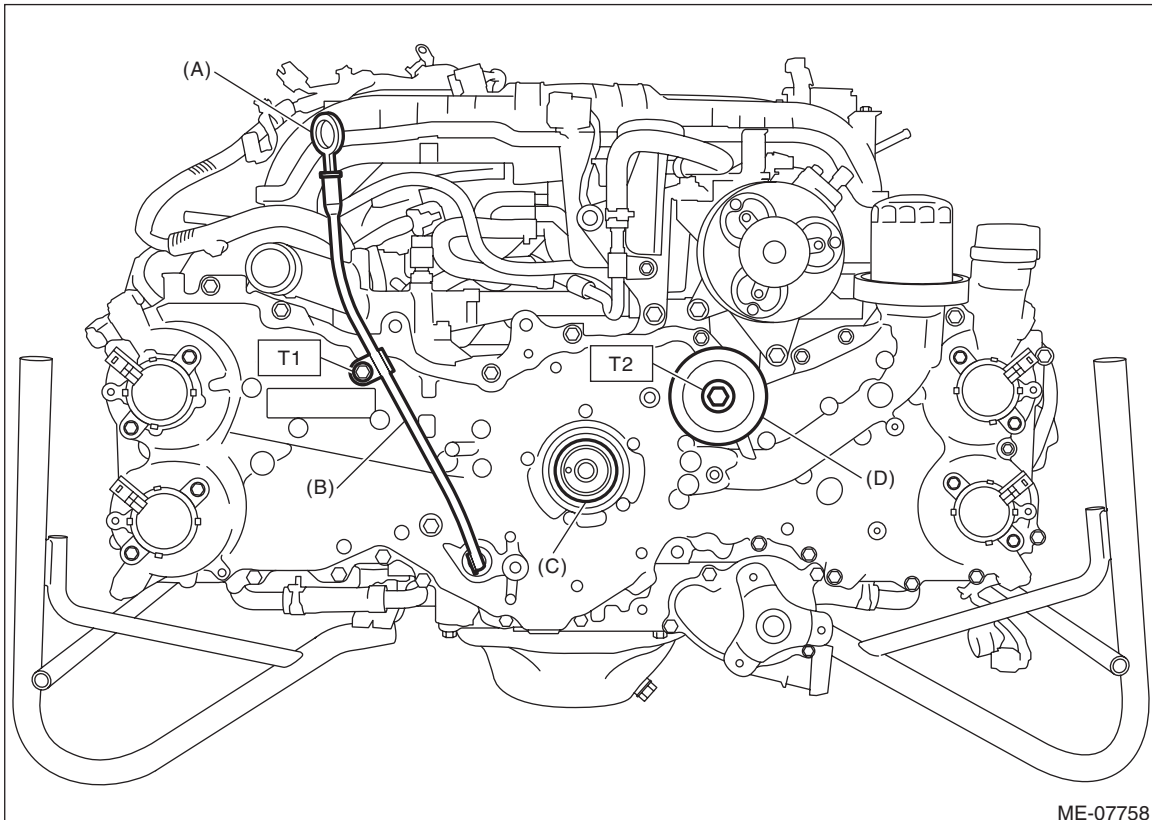
(b) Protrusion (3 places)

- Use a new O-ring to the oil level gauge guide.
- Apply a light coat of engine oil to the O-rings of the oil level gauge guide and the oil level gauge.

Tightening torque:

T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

T2: 36 N·m (3.7 kgf-m, 26.6 ft-lb)



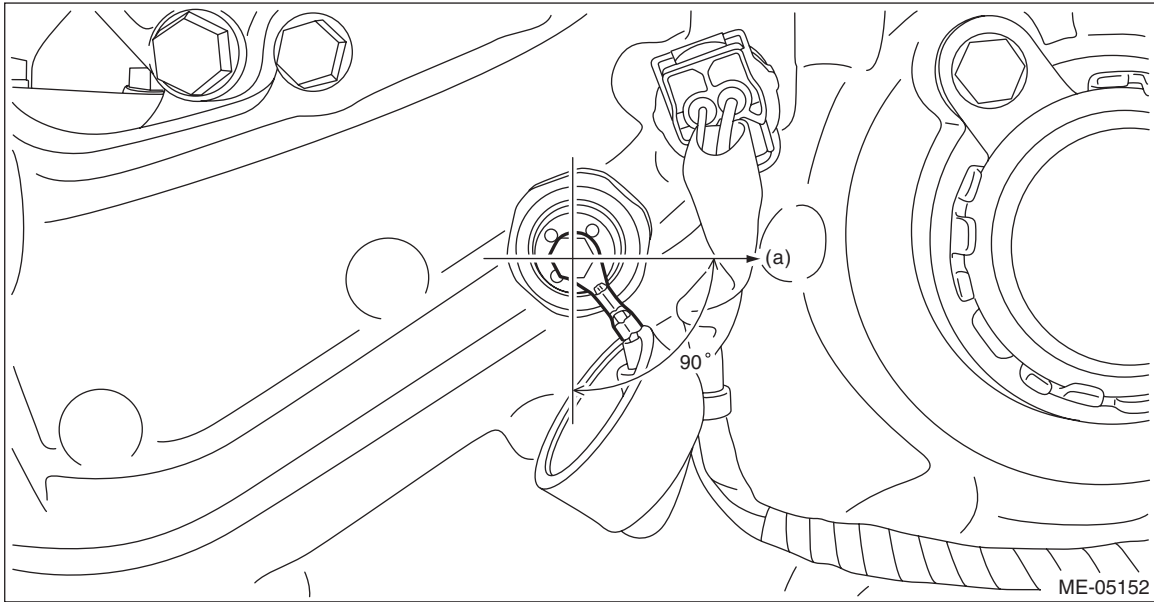
Chain Cover

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8) Connect the terminal (A) to the oil pressure switch, connector (B) to the engine oil temperature sensor, connector (C) to the intake oil control solenoid LH, connector (D) to the exhaust oil control solenoid LH, connector (E) to the intake camshaft position sensor LH, and connector (F) to the exhaust camshaft position sensor LH, and secure the engine harness with the clips (G) and (H).

NOTE:

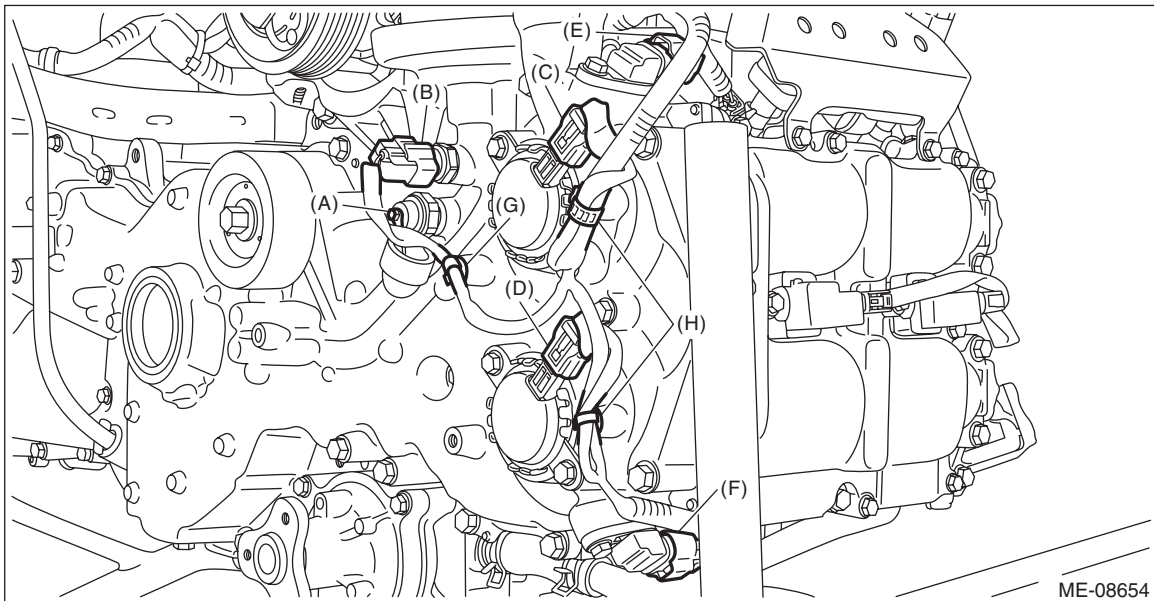
The oil pressure switch harness must be positioned toward the left lower side of the vehicle within the range of 90°.



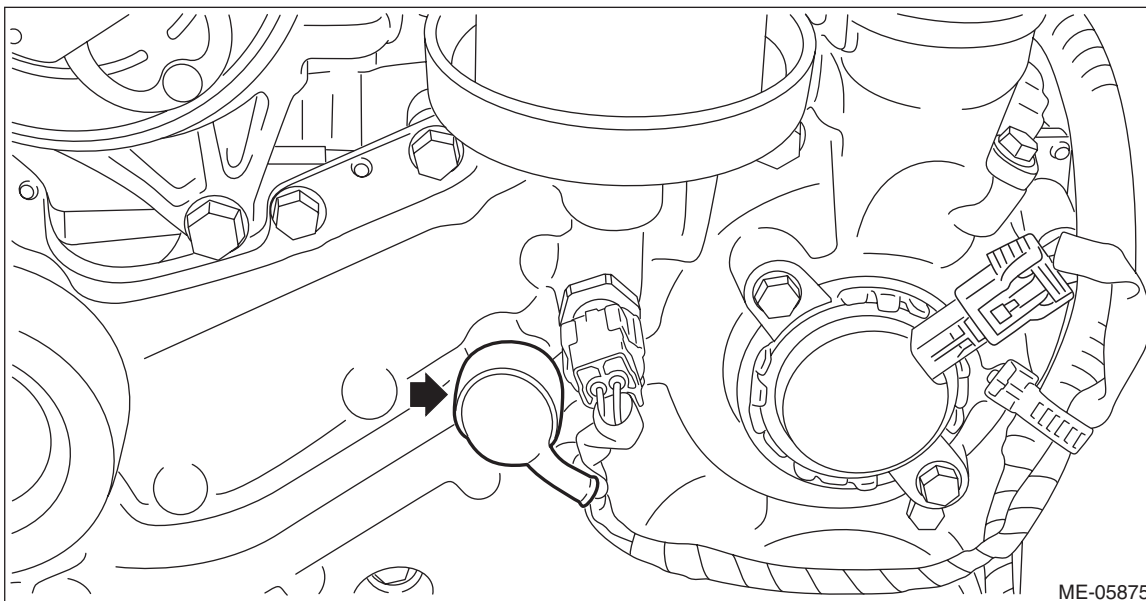
(a) Left side of vehicle

Tightening torque:

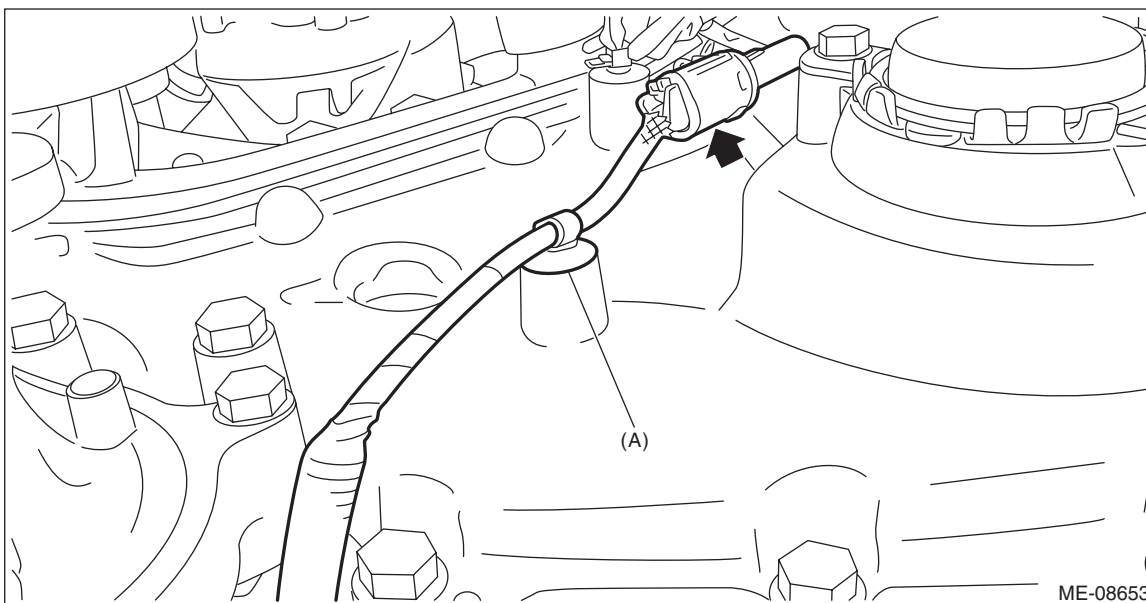
1.5 N·m (0.2 kgf-m, 1.1 ft-lb)



- 9) Attach the rubber cap to the oil pressure switch.



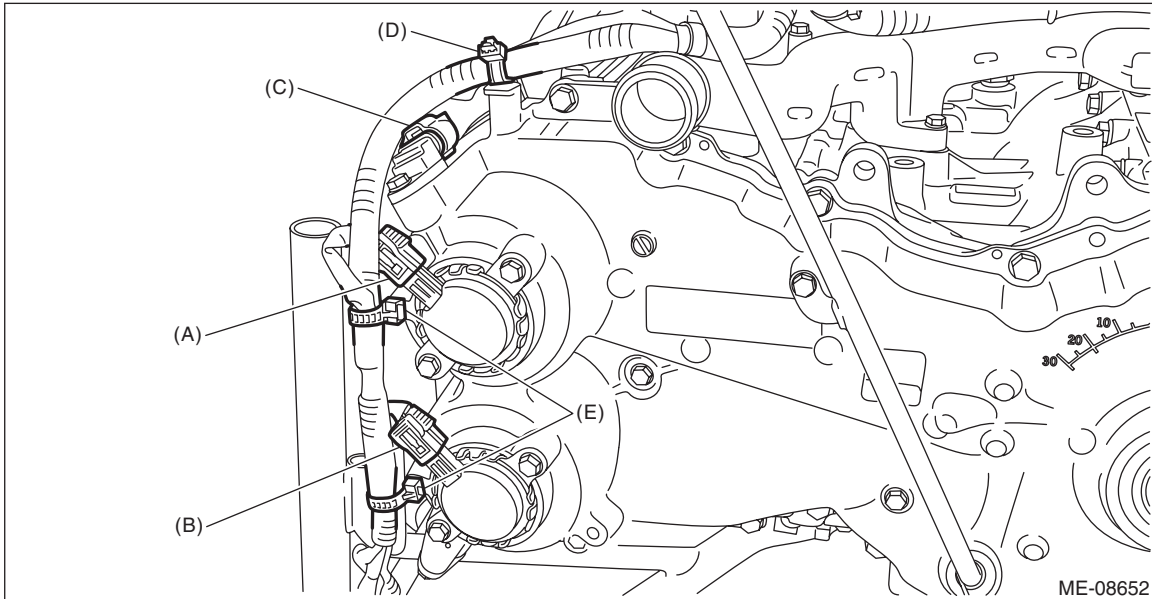
- 10) Secure the oil level switch harness with clips (A), and connect the connectors to the oil level switch.



Chain Cover

MECHANICAL

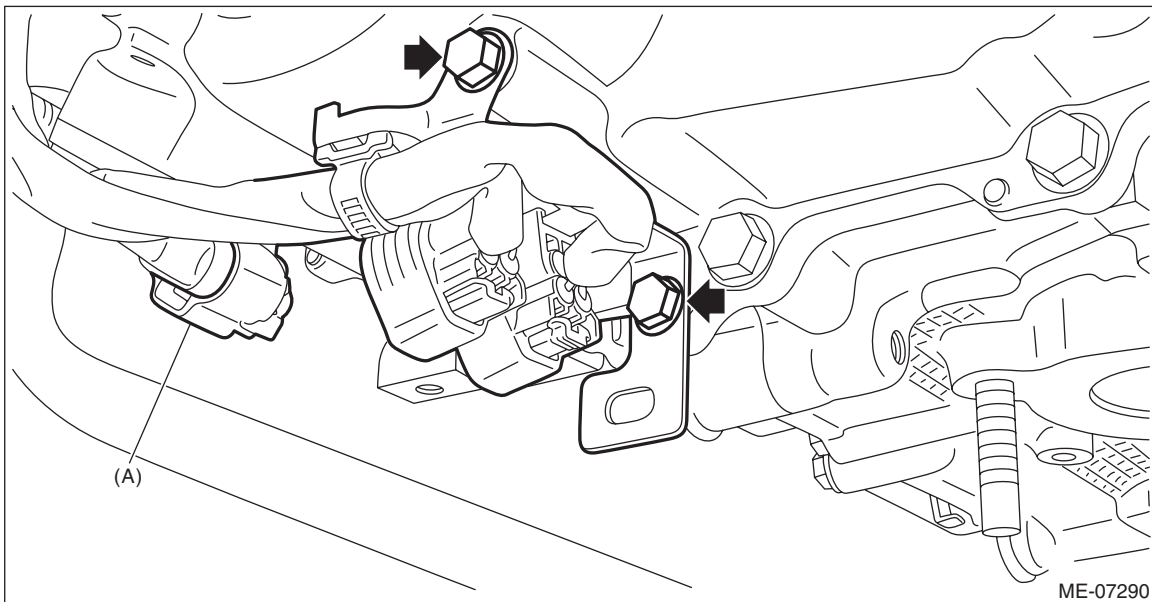
11) Connect the connector (A) to the intake oil control solenoid RH, connector (B) to the exhaust oil control solenoid RH, and connector (C) to the intake camshaft position sensor RH, and then secure the engine harness with the clips (D) (gasoline engine model) and the clips (E).



12) Connect the connector (A) to the exhaust camshaft position sensor RH, and install the engine harness stay to the chain cover.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



13) Install the crank pulley. <Ref. to ME(H4DO(w/o HEV))-142, INSTALLATION, Crank Pulley.>

14) Install the water pump pulley. <Ref. to CO(H4DO(w/o HEV))-22, WATER PUMP, INSTALLATION, Water Pump.>

15) Fill engine oil. <Ref. to LU(H4DO(w/o HEV))-13, REPLACEMENT, Engine Oil.>

16) Install the generator. (Gasoline engine model) <Ref. to SC(H4DO(w/o HEV))-34, INSTALLATION, Generator.>

17) Install the ISG. (HEV model) <Ref. to SC(H4DO(HEV))-35, INSTALLATION, Integrated Starter Generator (ISG).>

18) When working on the vehicle

NOTE:

When working on the vehicle, perform the following steps also.

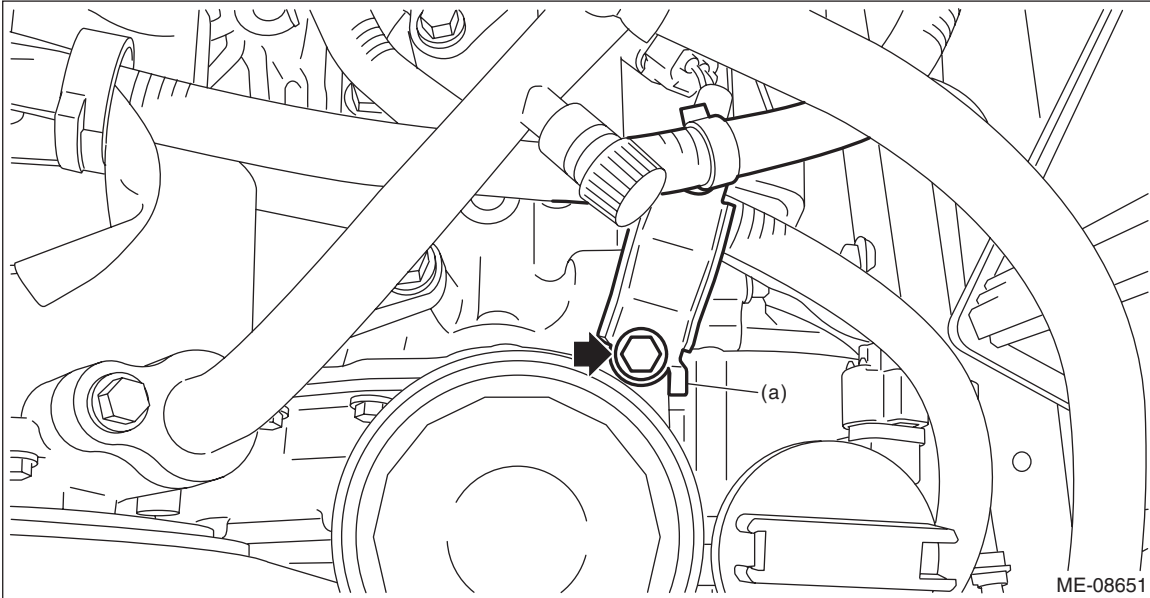
- (1) Install the radiator. <Ref. to CO(H4DO(w/o HEV))-82, INSTALLATION, Radiator.>
- (2) Install the front exhaust pipe. <Ref. to EX(H4DO(w/o HEV))-8, INSTALLATION, Front Exhaust Pipe.>
- (3) Install the generator cord stay to the chain cover. (Gasoline engine model)

NOTE:

Install the generator cord stay so that the folded end (a) touches the chain cover boss.

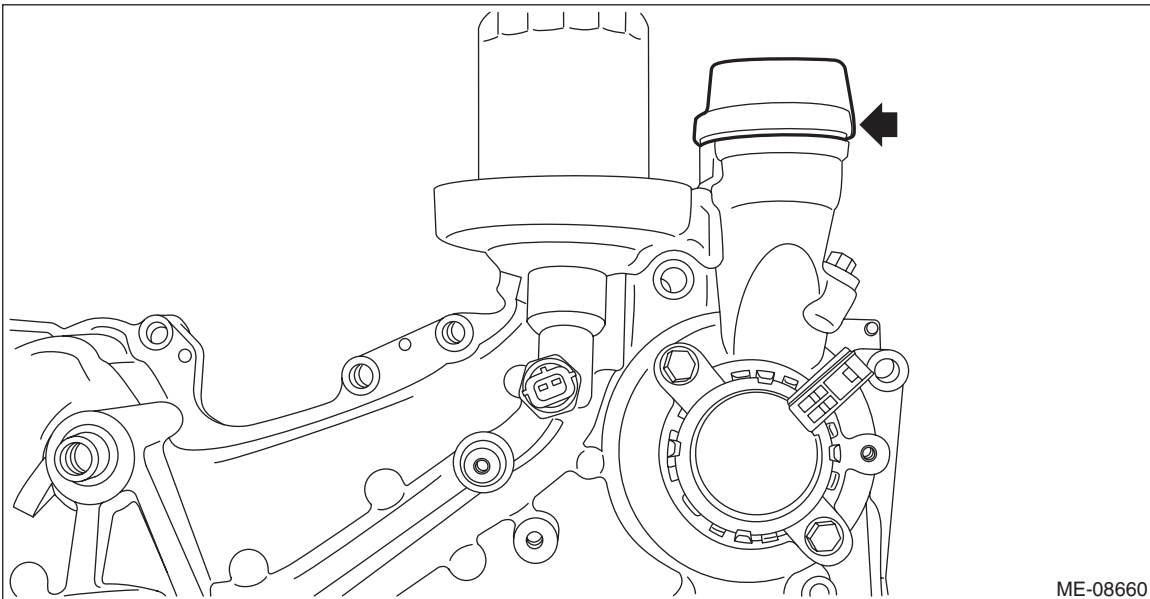
Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



C: DISASSEMBLY

1) Remove the oil filler cap.



2) Remove the engine oil filter and the oil pump union. <Ref. to LU(H4DO(w/o HEV))-29, REMOVAL, Engine Oil Filter.>

3) Remove the oil pressure switch. <Ref. to LU(H4DO(w/o HEV))-25, REMOVAL, Oil Pressure Switch.>

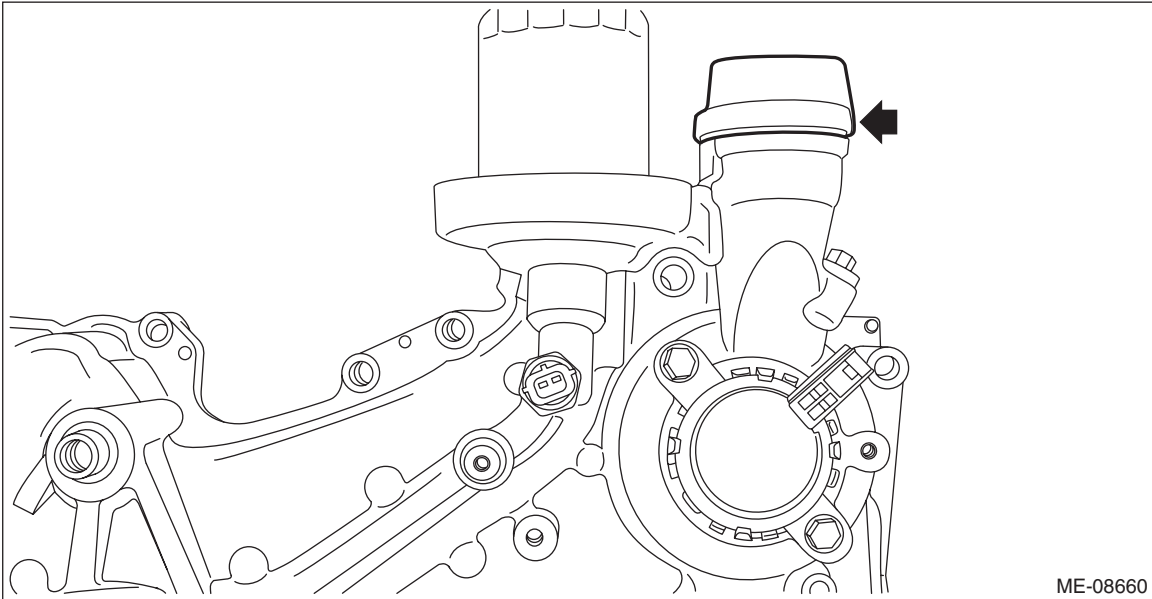
Chain Cover

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- 4) Remove the engine oil temperature sensor. <Ref. to FU(H4DO(w/o HEV))-53, REMOVAL, Engine Oil Temperature Sensor.> <Ref. to FU(H4DO(HEV))-44, REMOVAL, Engine Oil Temperature Sensor.>
- 5) Remove the oil control solenoid. <Ref. to FU(H4DO(w/o HEV))-64, REMOVAL, Oil Control Solenoid.> <Ref. to FU(H4DO(HEV))-56, REMOVAL, Oil Control Solenoid.>
- 6) Remove the camshaft position sensor. <Ref. to FU(H4DO(w/o HEV))-59, REMOVAL, Camshaft Position Sensor.> <Ref. to FU(H4DO(HEV))-52, REMOVAL, Camshaft Position Sensor.>

D: ASSEMBLY

- 1) Install the camshaft position sensor. <Ref. to FU(H4DO(w/o HEV))-61, INSTALLATION, Camshaft Position Sensor.> <Ref. to FU(H4DO(HEV))-53, INSTALLATION, Camshaft Position Sensor.>
- 2) Install the oil control solenoid. <Ref. to FU(H4DO(w/o HEV))-66, INSTALLATION, Oil Control Solenoid.> <Ref. to FU(H4DO(HEV))-58, INSTALLATION, Oil Control Solenoid.>
- 3) Install the engine oil temperature sensor. <Ref. to FU(H4DO(w/o HEV))-53, INSTALLATION, Engine Oil Temperature Sensor.> <Ref. to FU(H4DO(HEV))-44, INSTALLATION, Engine Oil Temperature Sensor.>
- 4) Install the oil pressure switch. <Ref. to LU(H4DO(w/o HEV))-27, INSTALLATION, Oil Pressure Switch.>
- 5) Install the engine oil filter and the oil pump union. <Ref. to LU(H4DO(w/o HEV))-30, INSTALLATION, Engine Oil Filter.>
- 6) Install the oil filler cap.



ME-08660

E: INSPECTION

Check that the chain cover does not have deformation, cracks and any other damage.