

## 14.Chain Cover

### A: REMOVAL

**NOTE:**

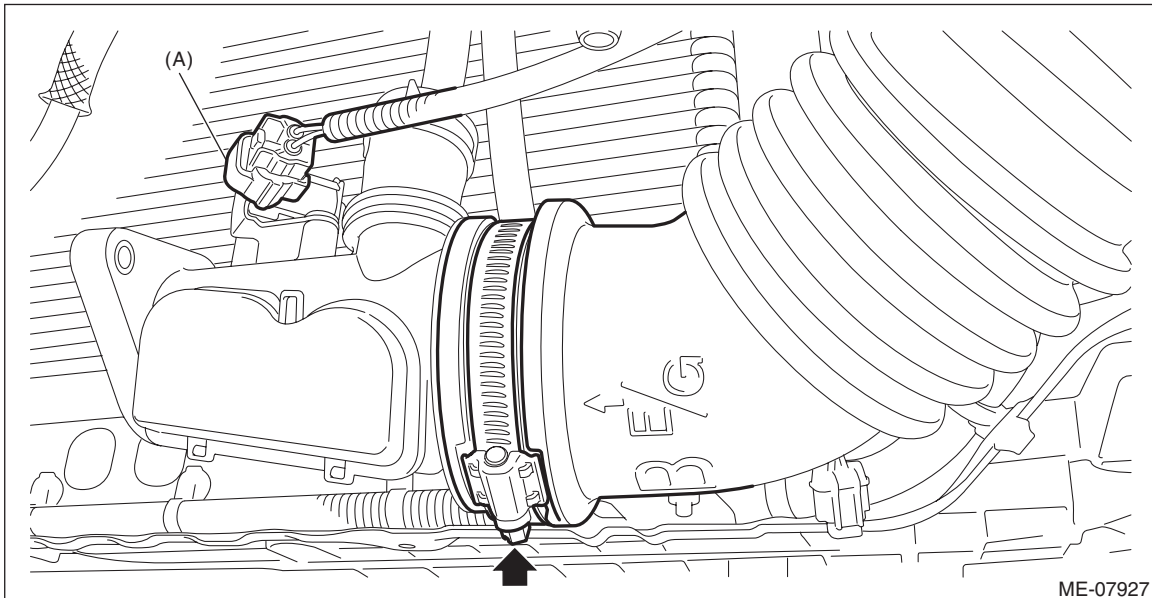
When replacing a single part, perform the work with the engine assembly installed to body.

1) When working on the vehicle

**NOTE:**

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

- (1) Remove the intercooler. <Ref. to IN(w/o STI)-38, REMOVAL, Intercooler.>
- (2) Remove the intake duct No. 2. <Ref. to IN(w/o STI)-25, INTAKE DUCT NO. 2, REMOVAL, Intake Duct.>
- (3) Remove the radiator. <Ref. to CO(w/o STI)-37, REMOVAL, Radiator.>
- (4) Remove the front exhaust pipe. <Ref. to EX(w/o STI)-9, REMOVAL, Front Exhaust Pipe.>
- (5) Disconnect the connector (A) from the wastegate control solenoid valve, and remove the air intake boot from the intake duct No. 1.



- 2) Drain the engine oil. <Ref. to LU(w/o STI)-11, REPLACEMENT, Engine Oil.>
- 3) Remove the V-belts. <Ref. to ME(w/o STI)-78, V-BELT, REMOVAL, V-belt.>
- 4) Remove the generator. <Ref. to SC(w/o STI)-31, REMOVAL, Generator.>
- 5) Remove the water pump pulley. <Ref. to CO(w/o STI)-16, WATER PUMP, REMOVAL, Water Pump.>
- 6) Remove the crank pulley. <Ref. to ME(w/o STI)-85, REMOVAL, Crank Pulley.>
- 7) Remove the engine oil cooler. <Ref. to LU(w/o STI)-35, REMOVAL, Engine Oil Cooler.>
- 8) Remove the front engine oil cooler pipe assembly. <Ref. to LU(w/o STI)-37, FRONT ENGINE OIL COOLER PIPE, REMOVAL, Engine Oil Cooler Pipe.>

## Chain Cover

### MECHANICAL

9) When working on the engine unit only

#### NOTE:

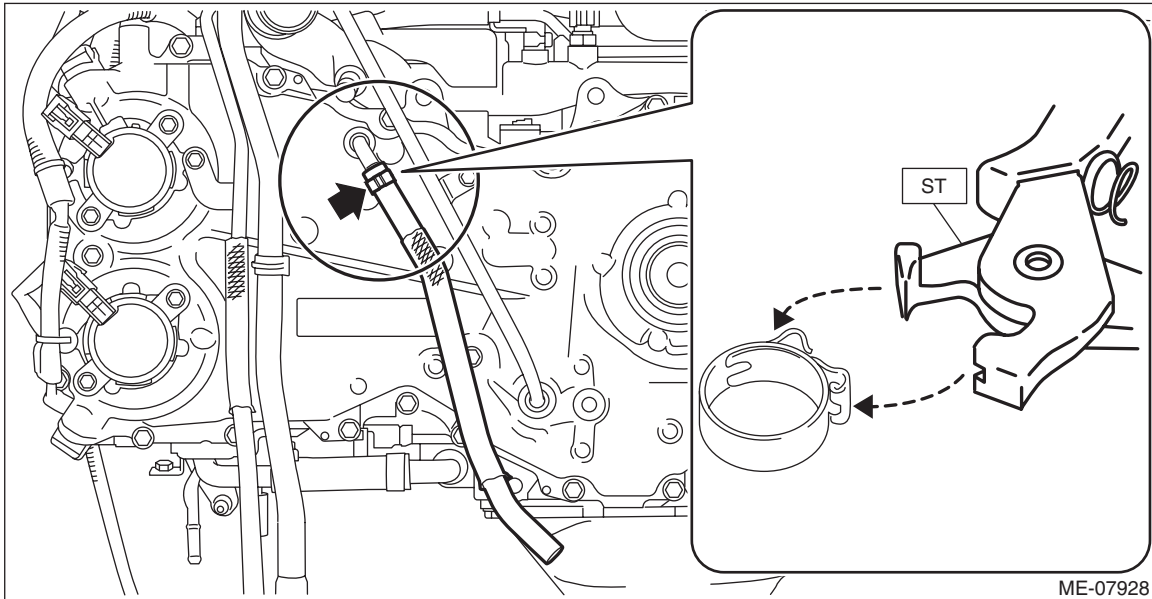
When working on the engine unit only, also perform the following steps.

(1) Remove the PCV hose assembly from the chain cover.

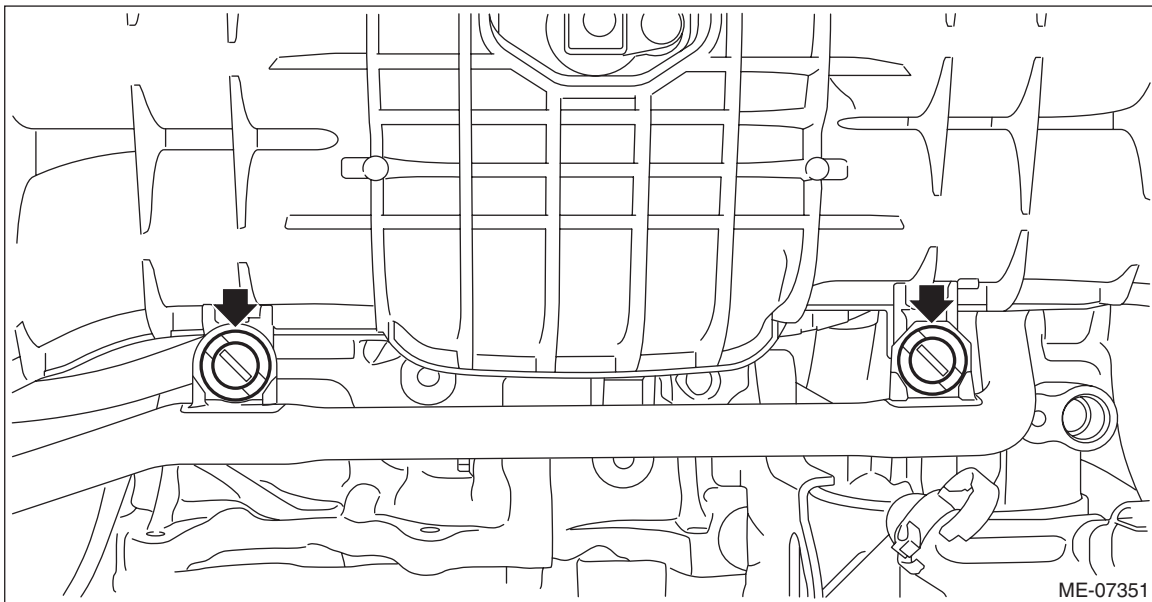
#### NOTE:

To disconnect the PCV hose assembly, fit the cut outs of the ST with the protrusions on the clamp as shown in the figure, squeeze the ST's handles together and unlock the clamp.

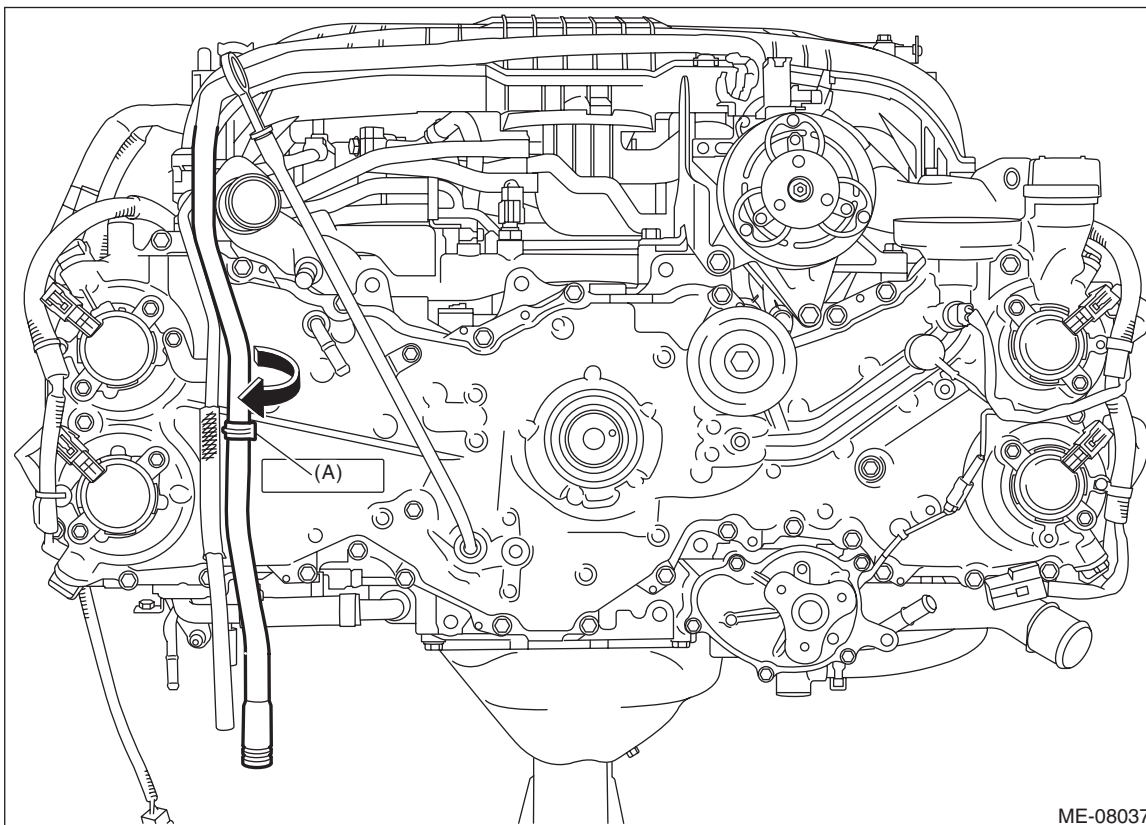
ST 18353AA000 CLAMP PLIERS



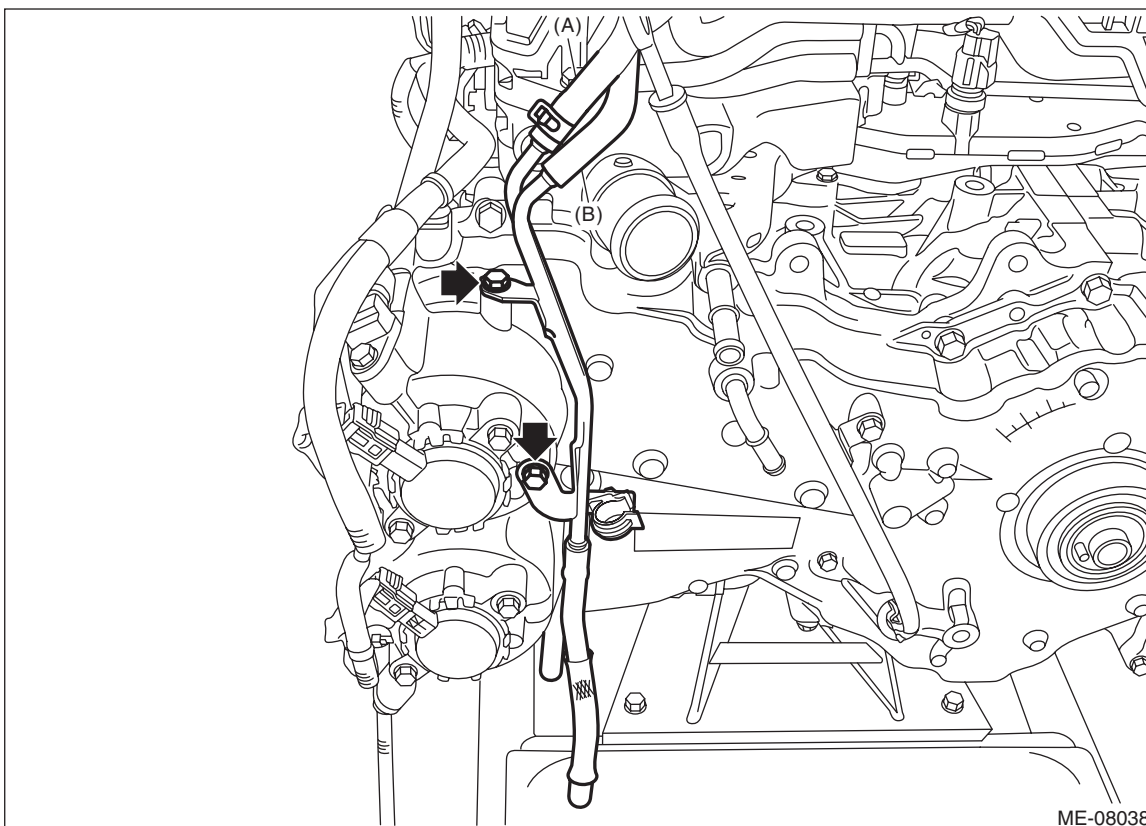
10) Remove the clip securing the PCV pipe to the intake manifold.



11) Remove the PCV pipe from the clip (A), and move the PCV pipe together with the intake duct No. 1 (when working on the vehicle) to a location that does not interfere operation.



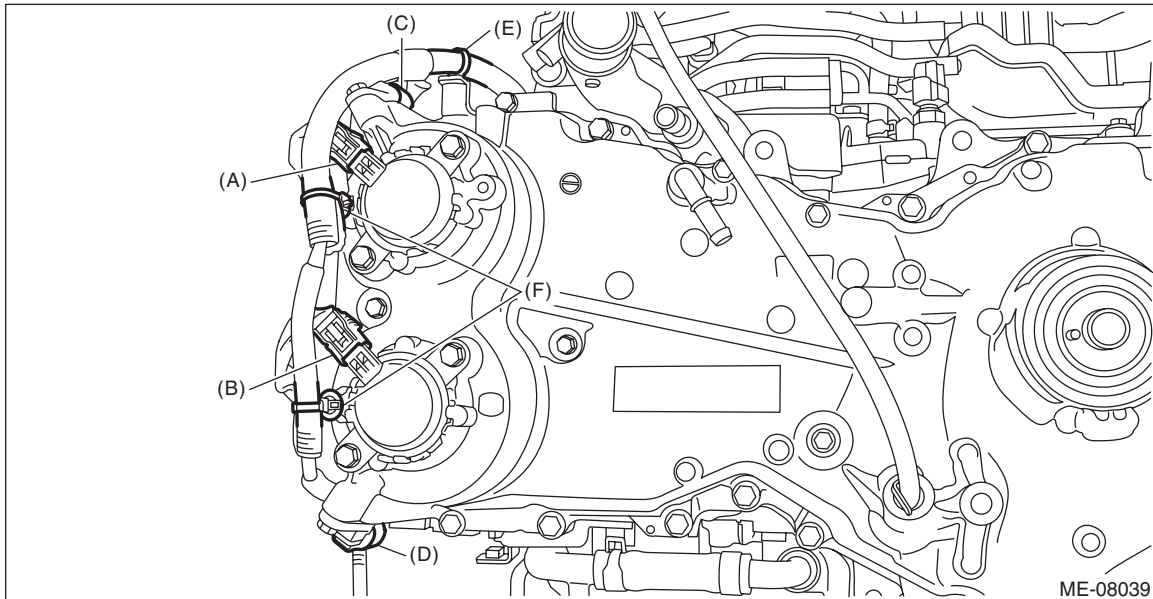
12) Disconnect the vacuum control hose (A) and vacuum hose (B) from the vacuum pipe assembly, and remove the vacuum pipe assembly from the chain cover.



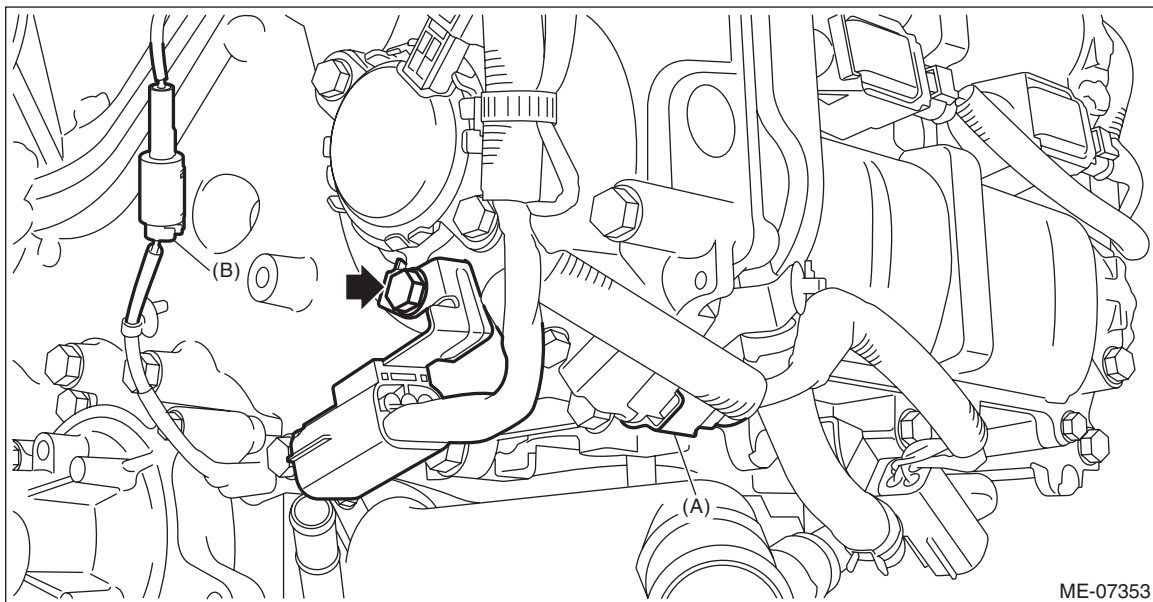
## Chain Cover

### MECHANICAL

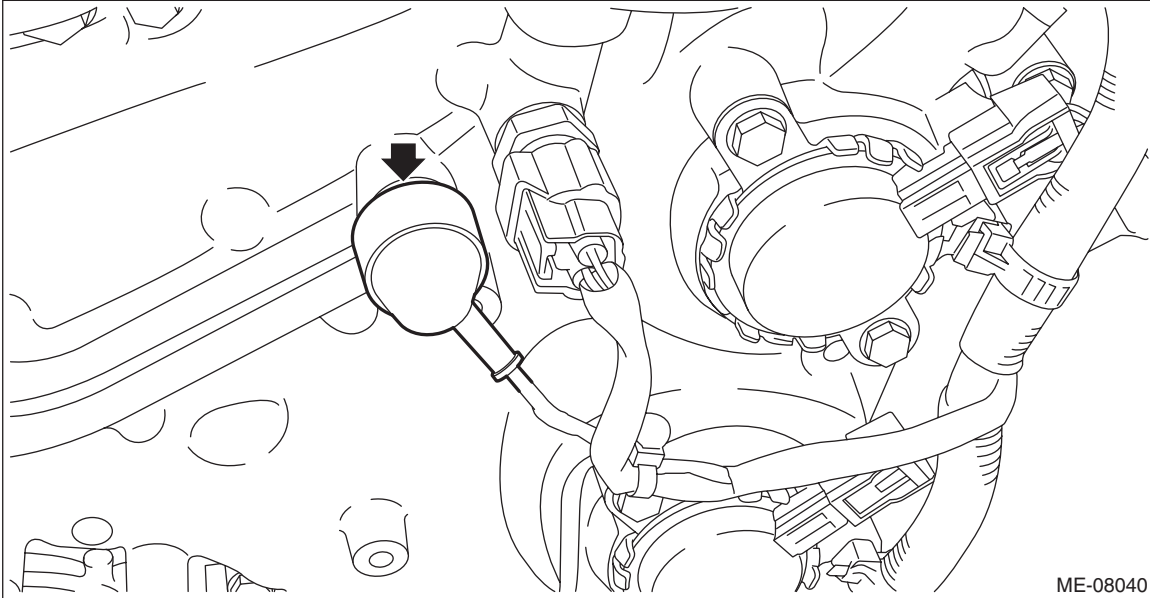
13) Disconnect the connector (A) from the intake oil control solenoid RH, connector (B) from the exhaust oil control solenoid RH, connector (C) from the intake camshaft position sensor RH, and the connector (D) from the exhaust camshaft position sensor RH, and then remove the clips (E) and (F) securing the engine harness.



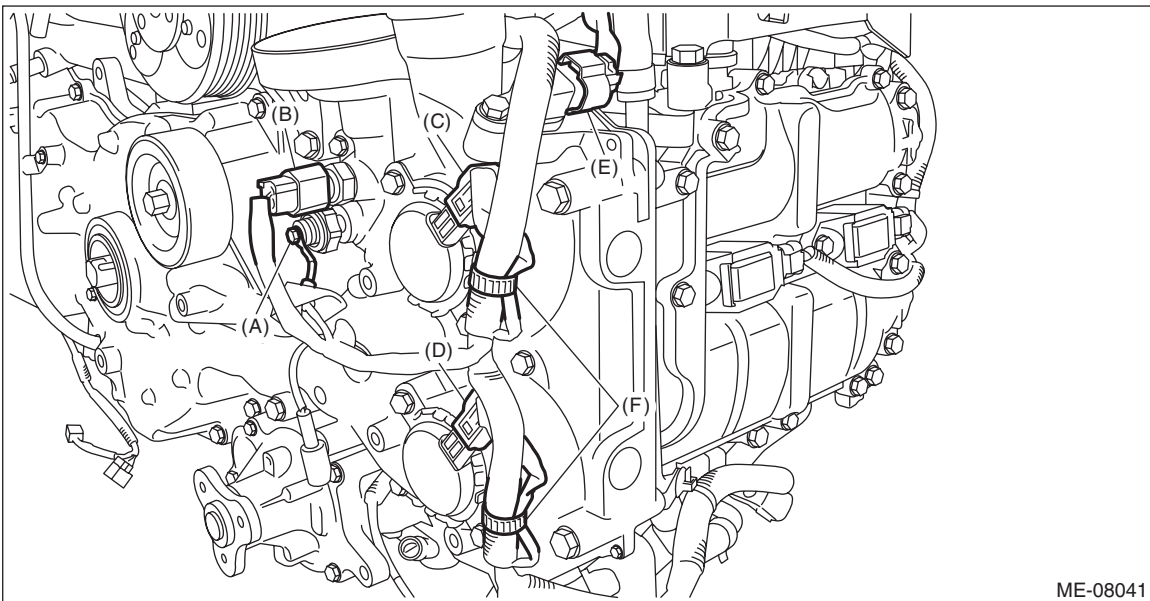
14) Disconnect the connector (A) from the exhaust camshaft position sensor LH and the connector (B) from the oil level switch, and remove the engine harness stay from the chain cover.



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



16) 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, and the connector (E) from the intake camshaft position sensor LH, and then remove the clip (F) securing the engine harness.

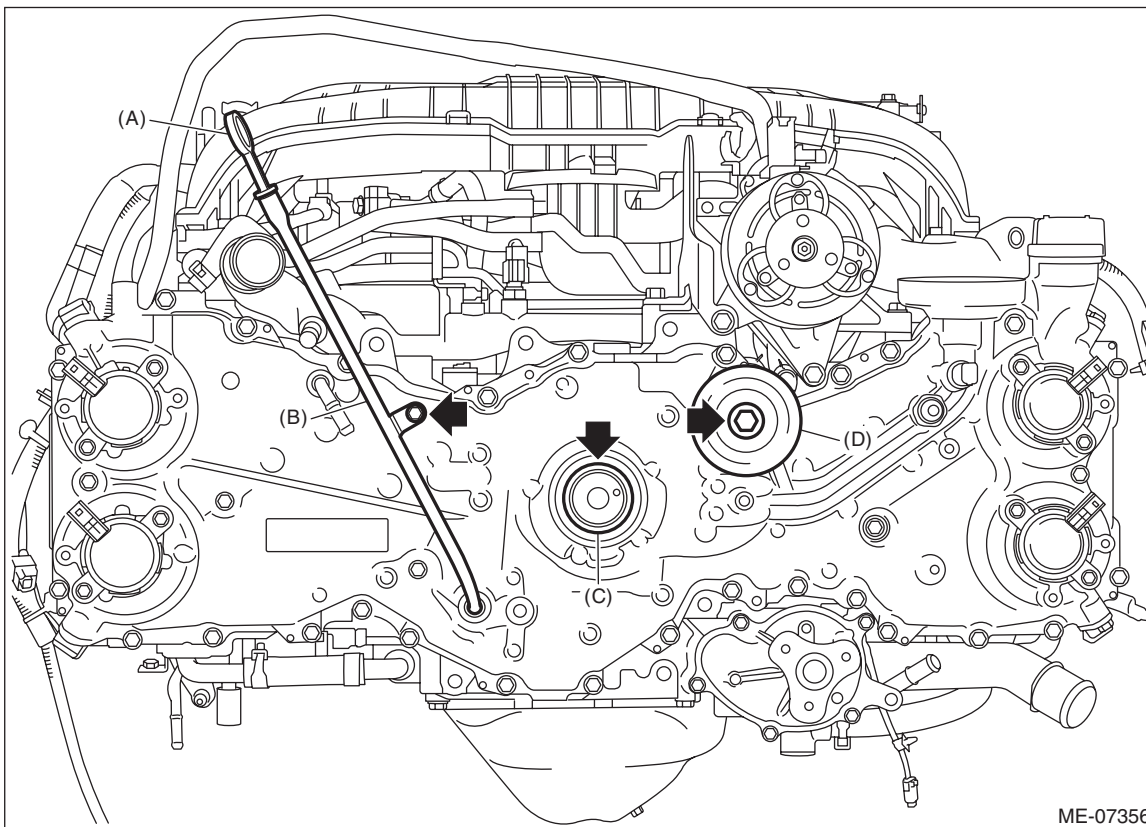




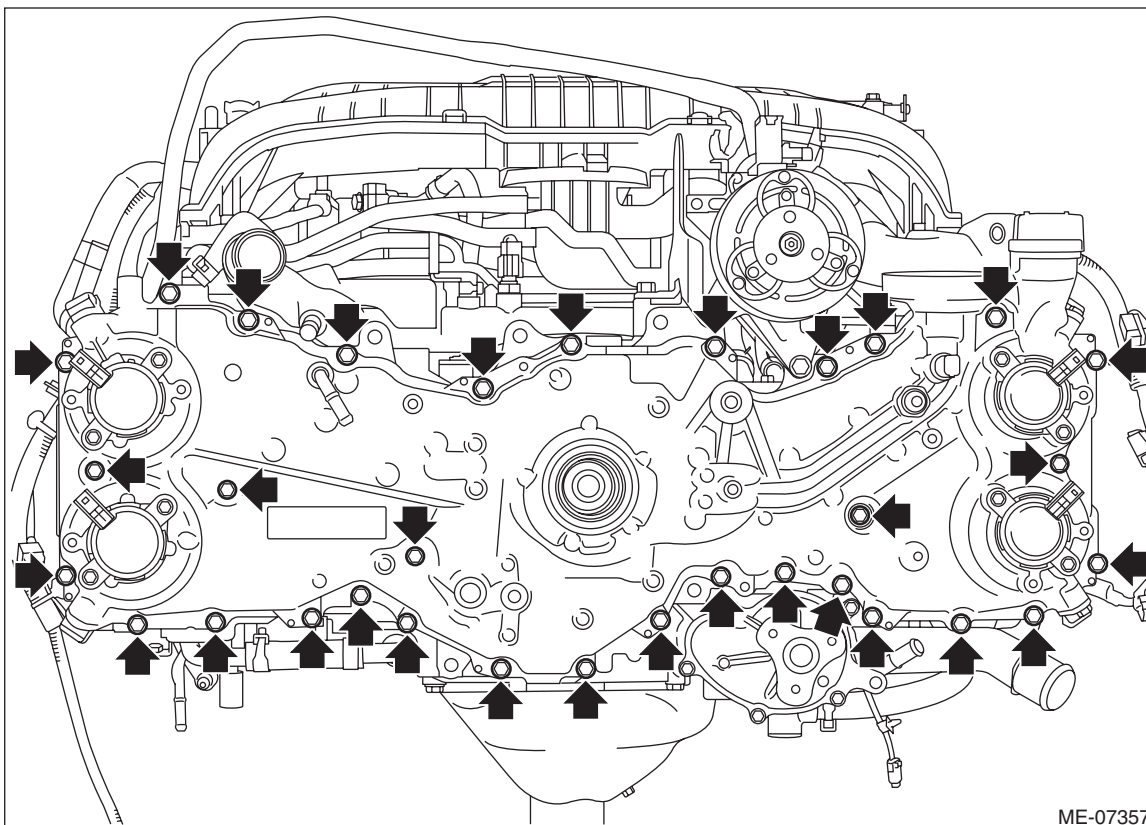
## Chain Cover

### MECHANICAL

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



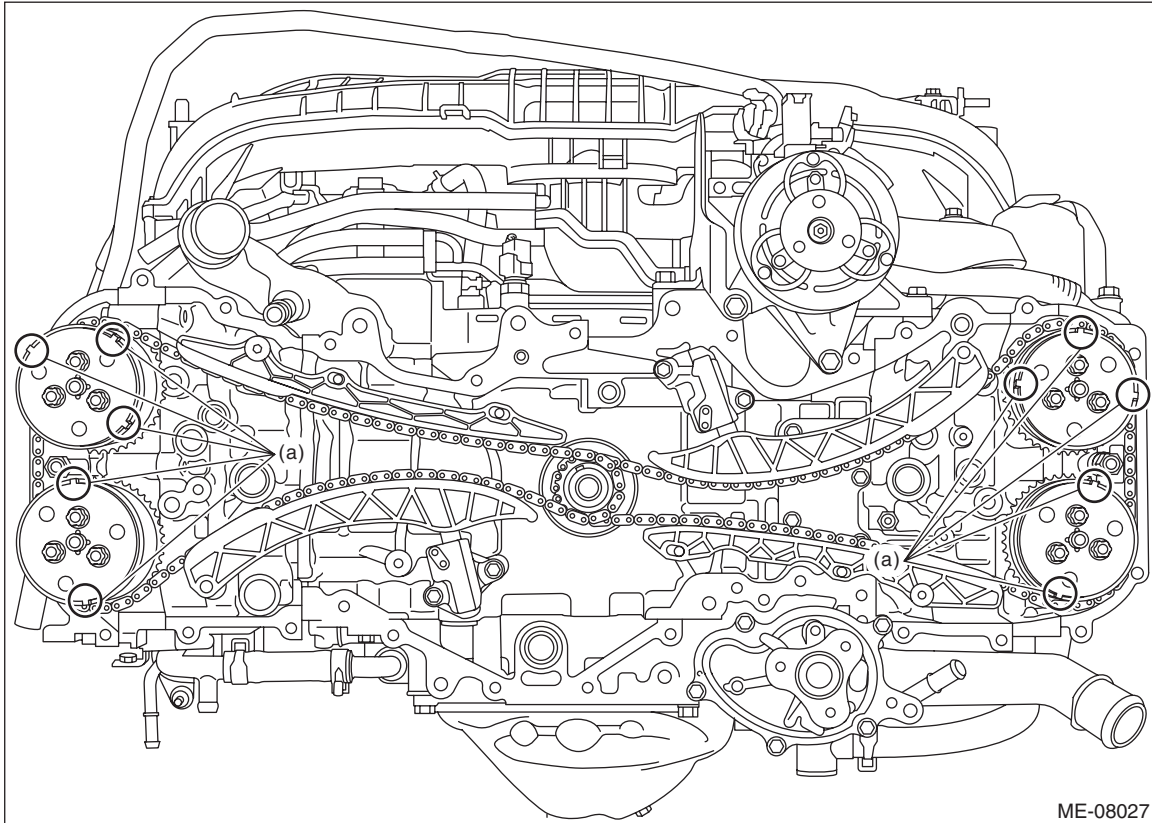
18) Remove the bolts securing the chain cover to engine.



19) Pry the points shown in the figure with a crowbar wrapped by protective tape, and then remove the chain cover from the engine.

**CAUTION:**

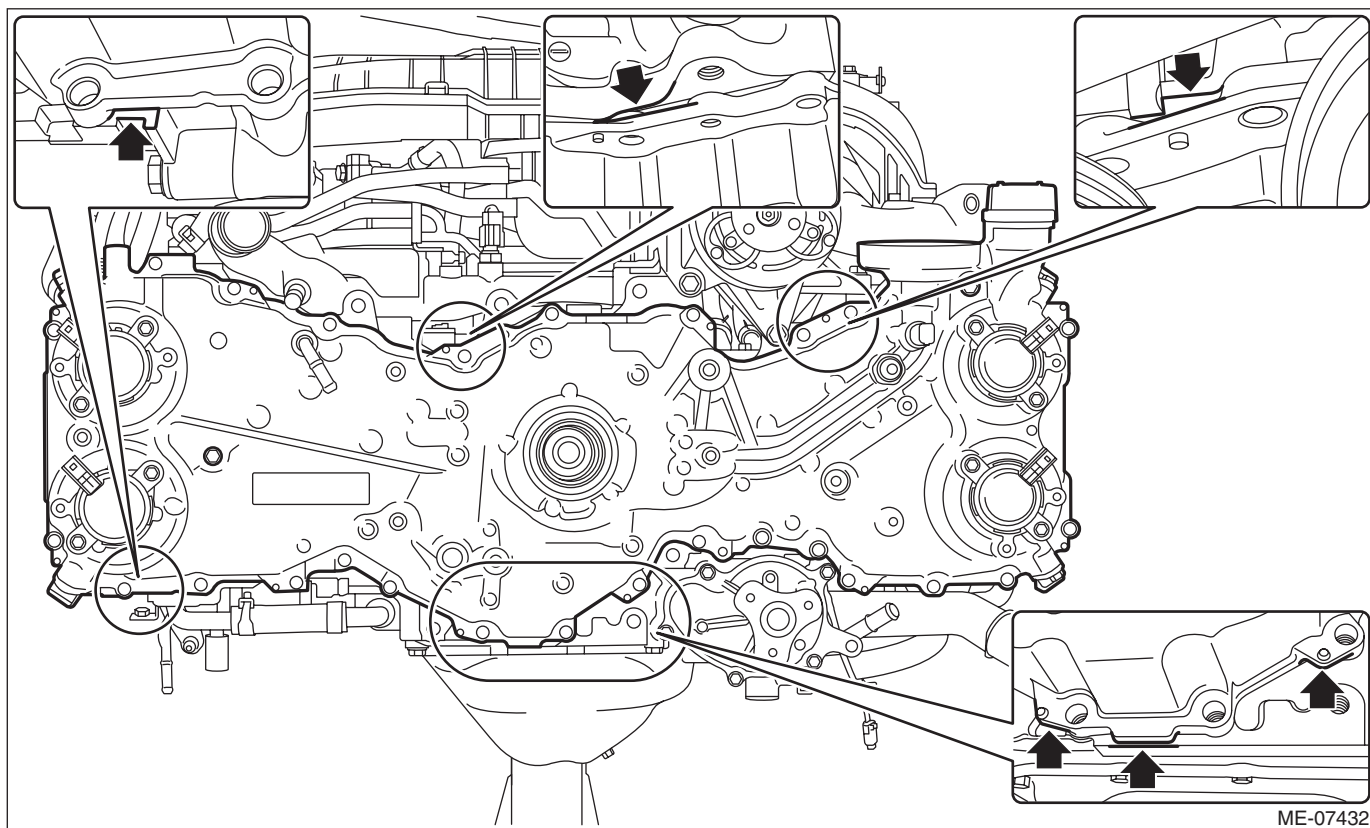
The chain cover may contact the protrusion (a) of cam sprocket sensor plate and cause damage. When removing the chain cover, move the chain cover horizontally until it cannot contact with the cam sprocket, and then remove it carefully.



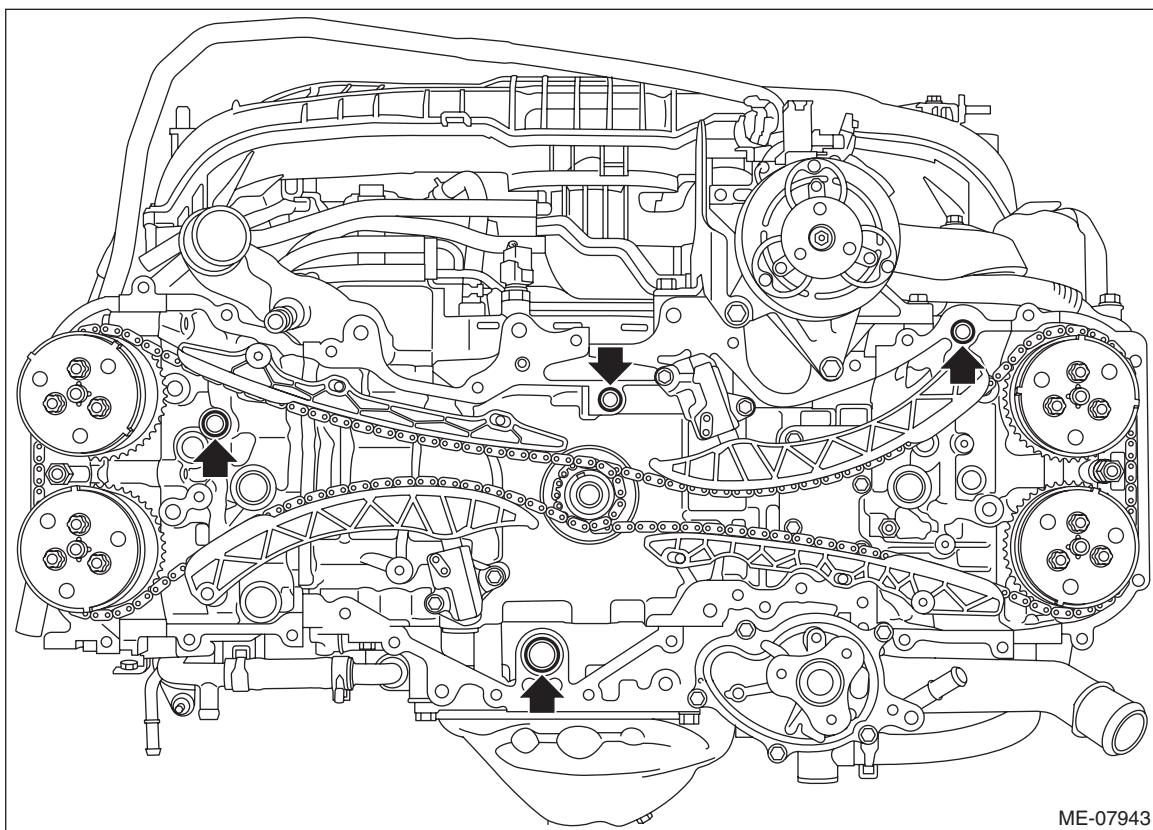
ME-08027

## Chain Cover

MECHANICAL

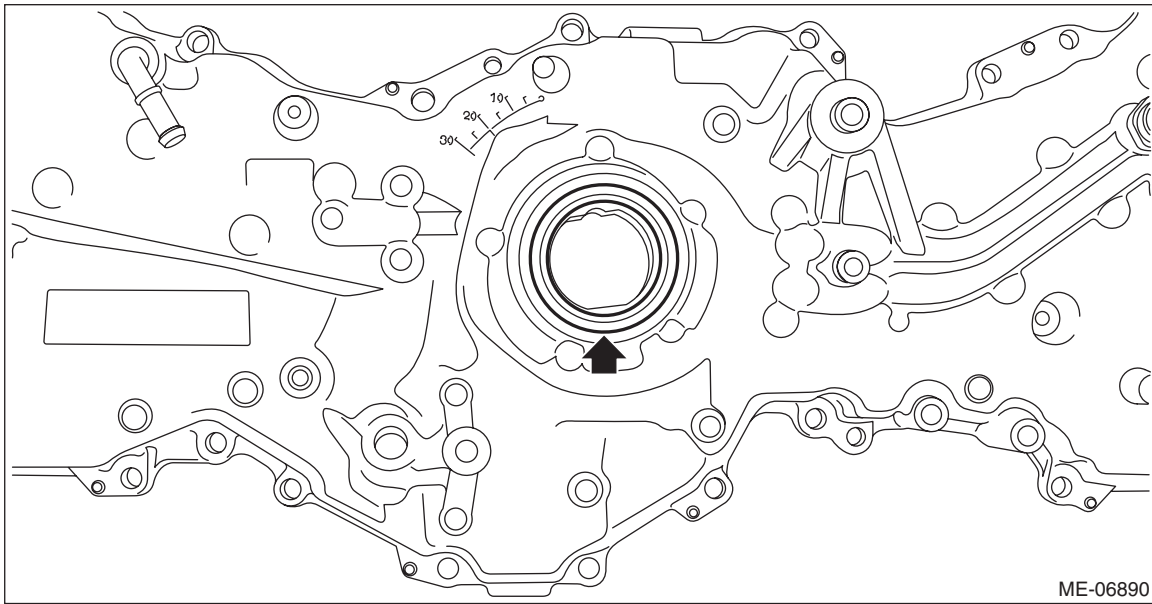


20) Remove the O-rings from cylinder head RH, cylinder head LH, cylinder block LH and oil pan upper.





- 21) Remove the liquid gasket from the chain cover and engine unit.
- 22) Remove the front oil seal from the chain cover.



## B: INSTALLATION

- 1) Apply a light coat of engine oil to the front oil seal inner periphery and outer periphery, and install the front oil seal to the chain cover using ST.

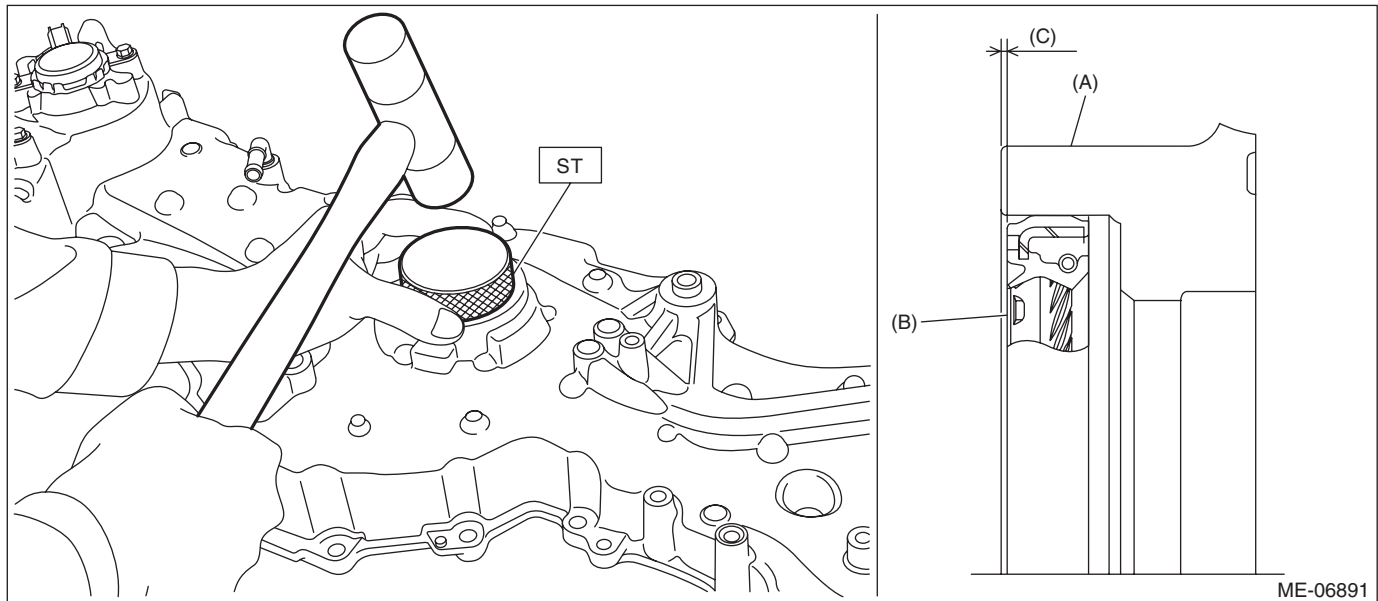
### NOTE:

Use a new front oil seal.

ST 398437700 OIL SEAL INSTALLER

### 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)

## Chain Cover

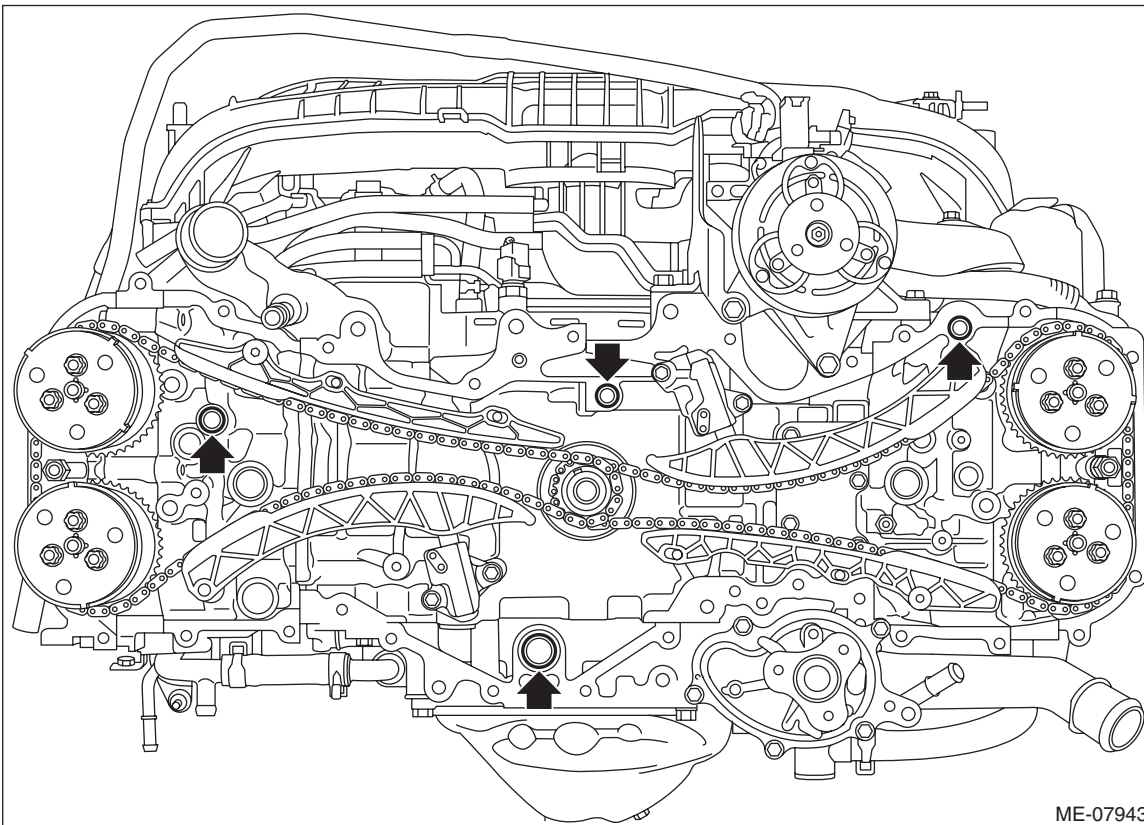
### MECHANICAL

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

**NOTE:**

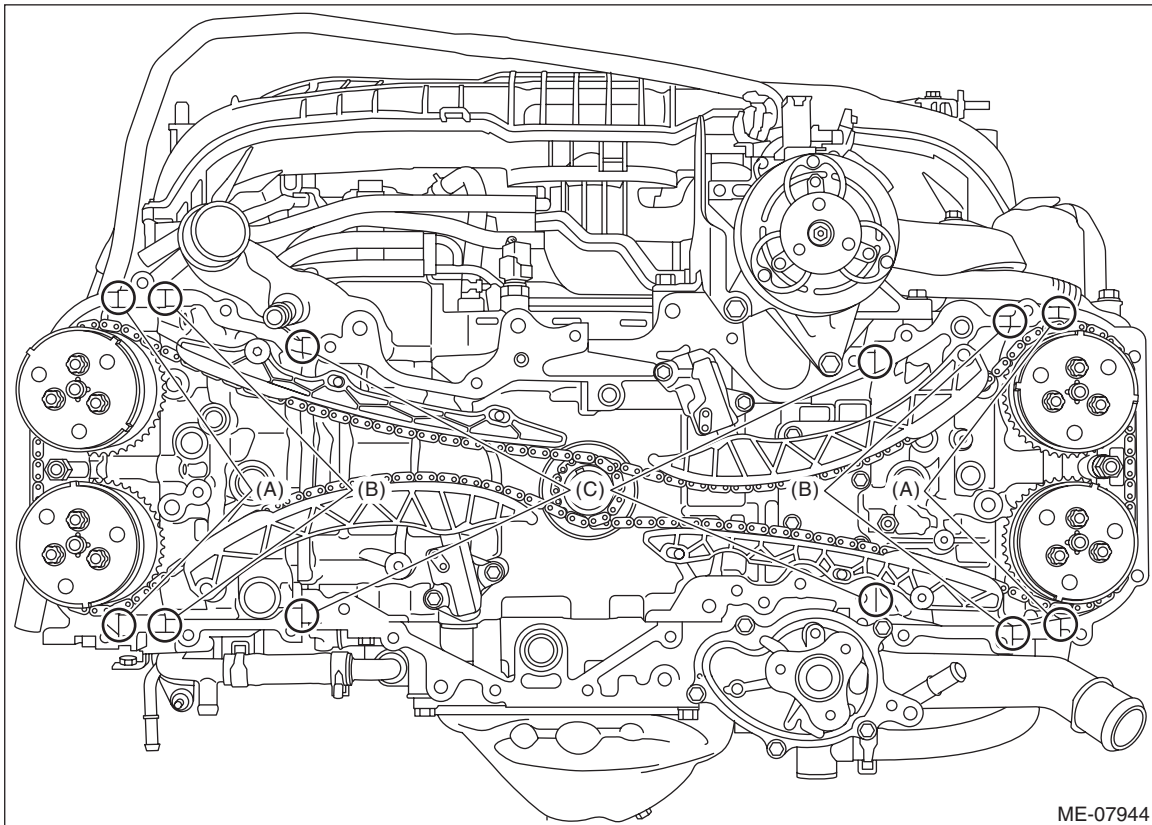
- Use new O-rings.
- Apply a coat of engine oil to the O-rings.



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) or equivalent**



# Chain Cover

## MECHANICAL

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

### NOTE:

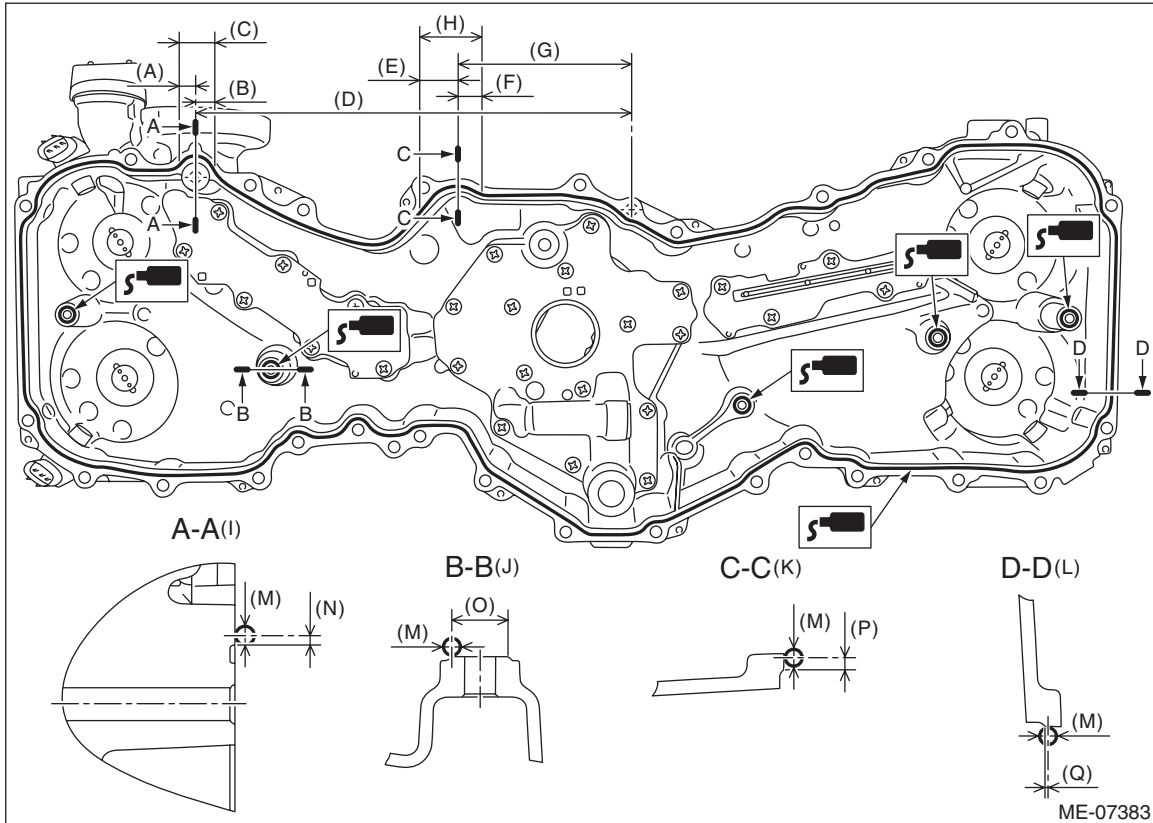
- Before applying liquid gasket, degrease the old liquid gasket seal surface of the engine and chain cover.
- Install within 5 min. after applying liquid gasket.

### Liquid gasket:

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

### Liquid gasket applying diameter:

**$4\pm0.5$  mm ( $0.1575\pm0.0197$  in)**



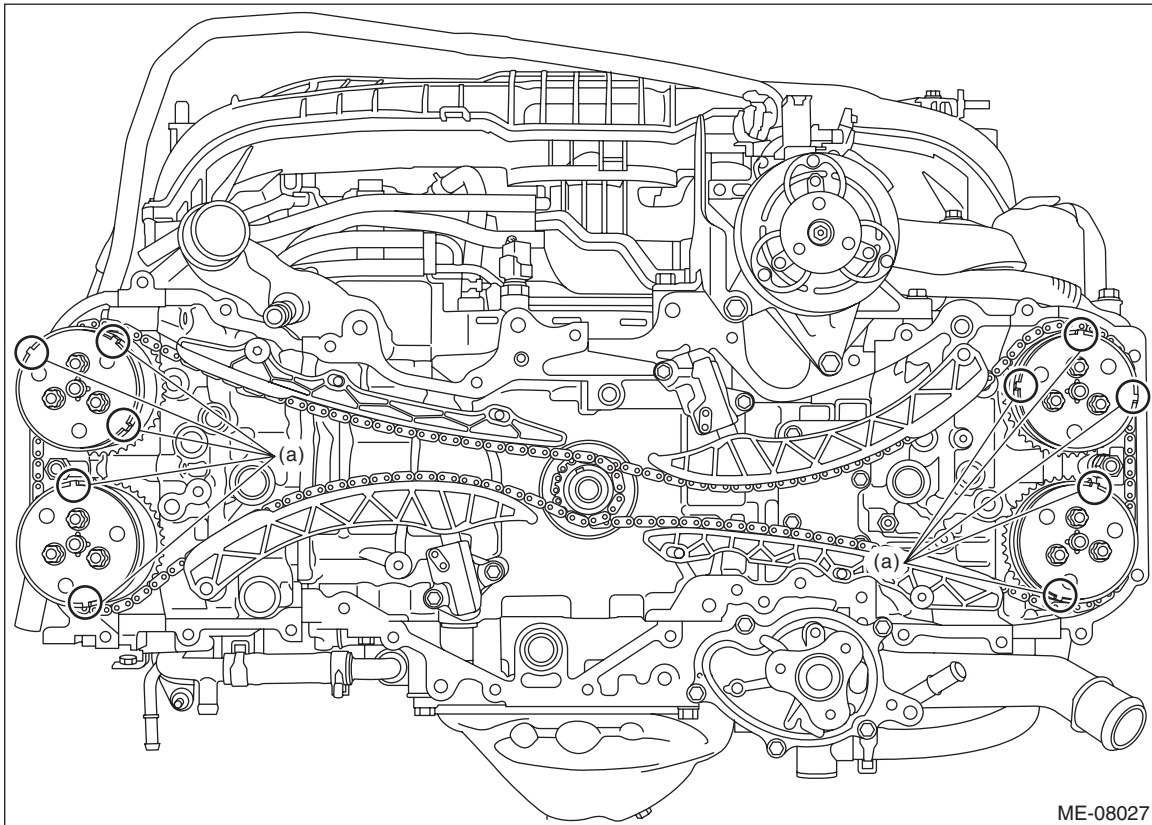
(A) 14.5 mm (0.5709 in)	(G) 127 mm (5.0000 in)	(M) $\phi 4\pm0.5$ mm ( $0.1575\pm0.0197$ in)
(B) 17.5 mm (0.6890 in)	(H) Range B	(N) 2 mm (0.0787 in)
(C) Range A	(I) Liquid gasket applying position of mating surfaces of range A	(O) $\phi 12$ mm (0.4724 in)
(D) 316.2 mm (12.4488 in)	(J) Liquid gasket 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	



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

**CAUTION:**

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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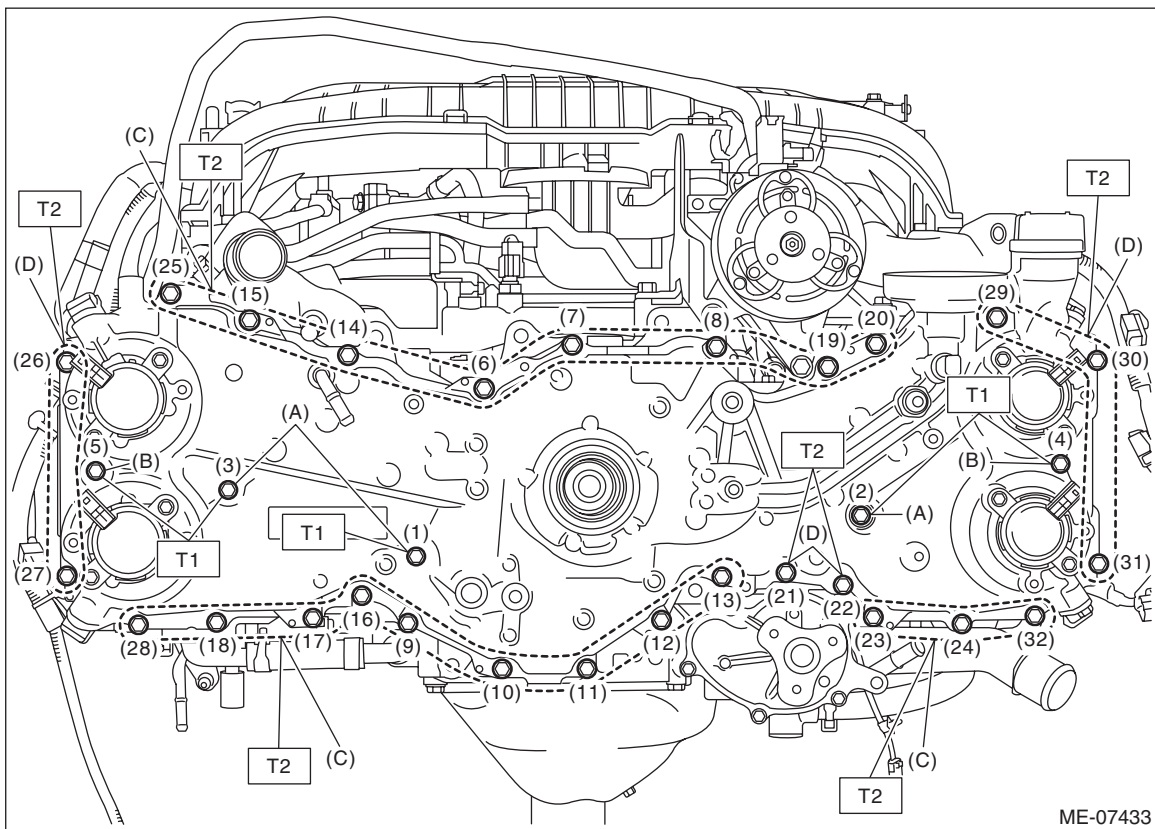
# Chain Cover

## 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

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

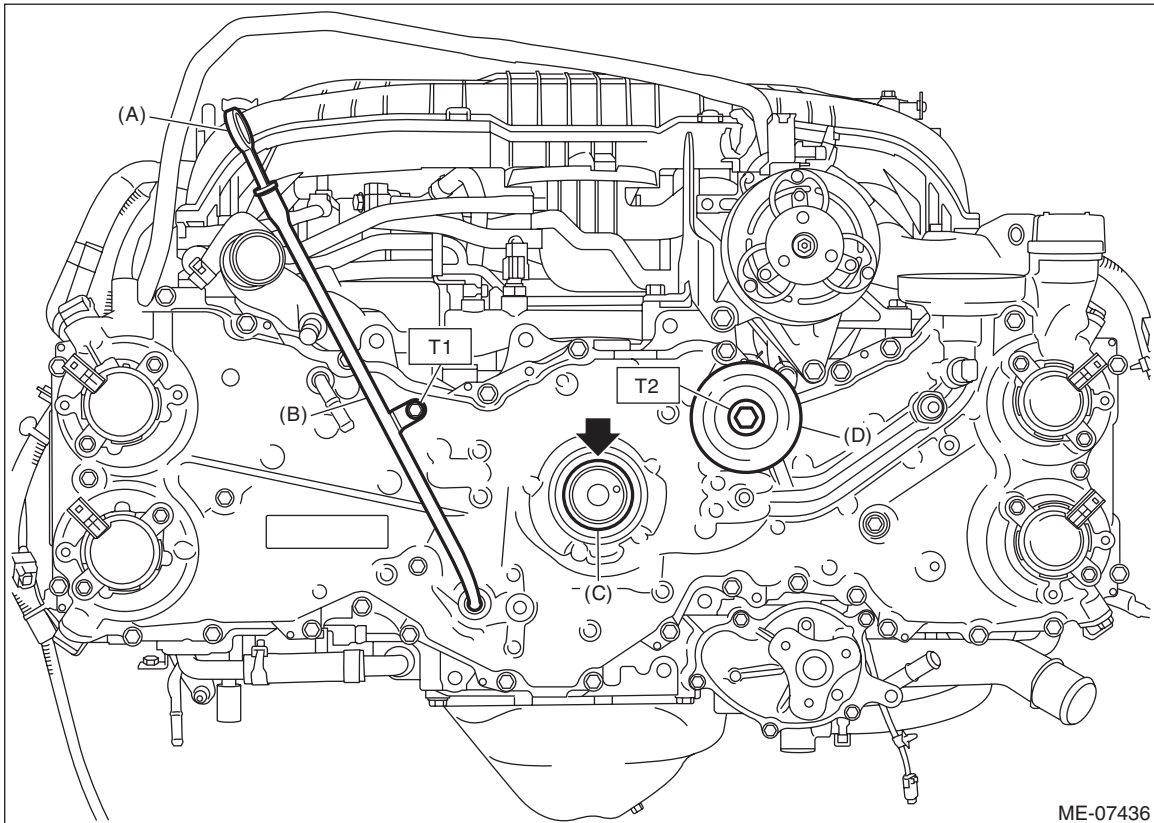
**NOTE:**

- 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)**



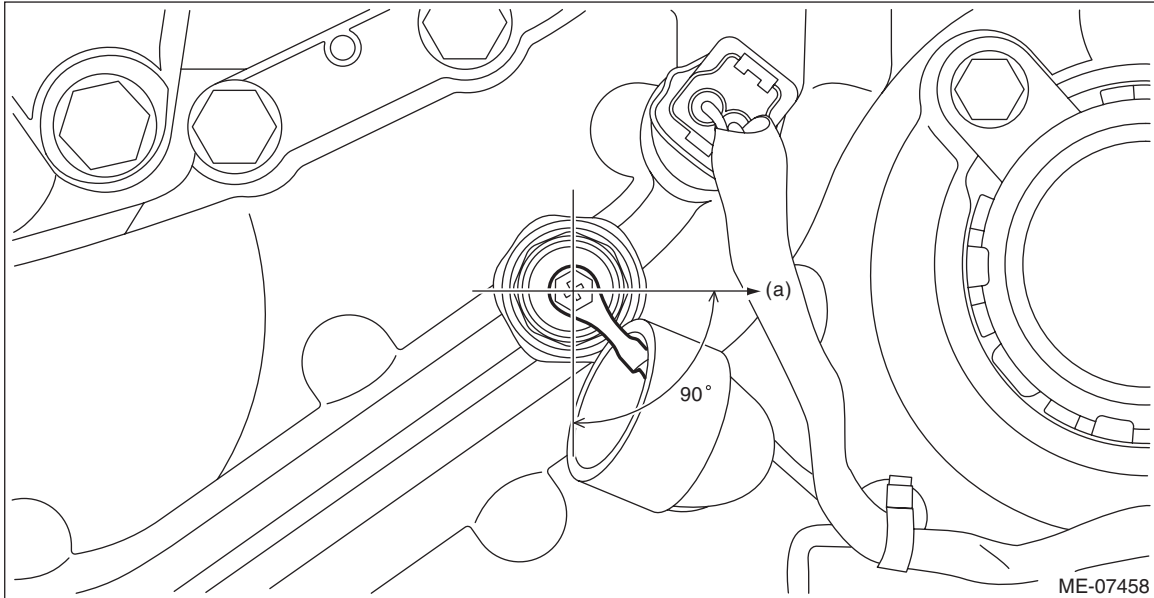
## Chain Cover

### MECHANICAL

7) 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, and the connector (E) to the intake camshaft position sensor LH, and fix the engine harness using the clip (F).

#### NOTE:

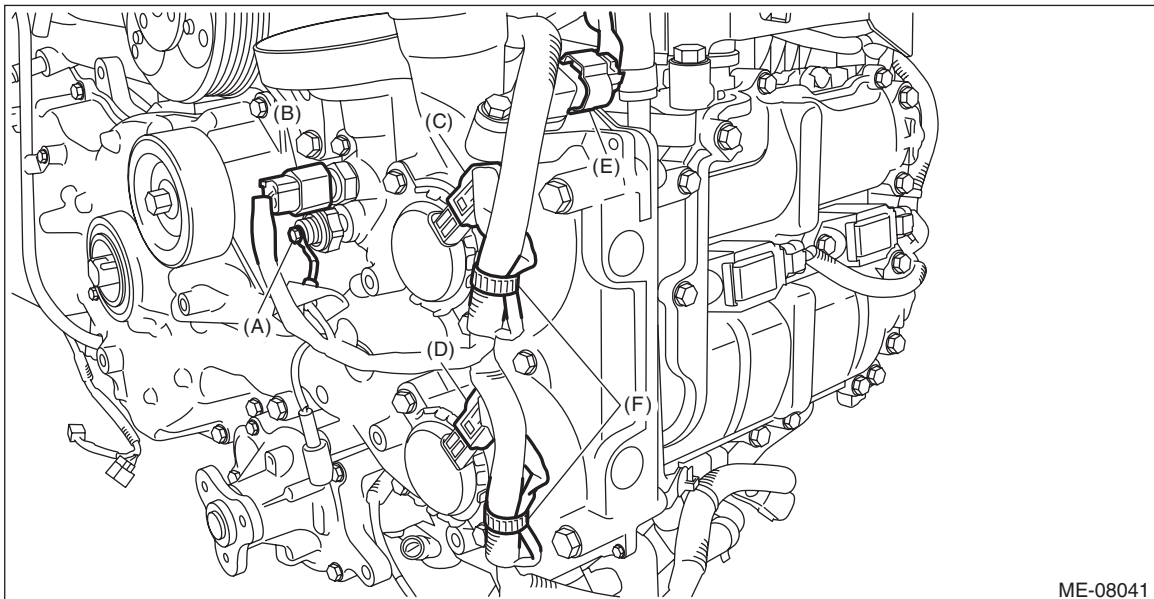
The oil pressure switch harness must be positioned toward the left lower side of the vehicle within the range of 90°.



(a) Left side of vehicle

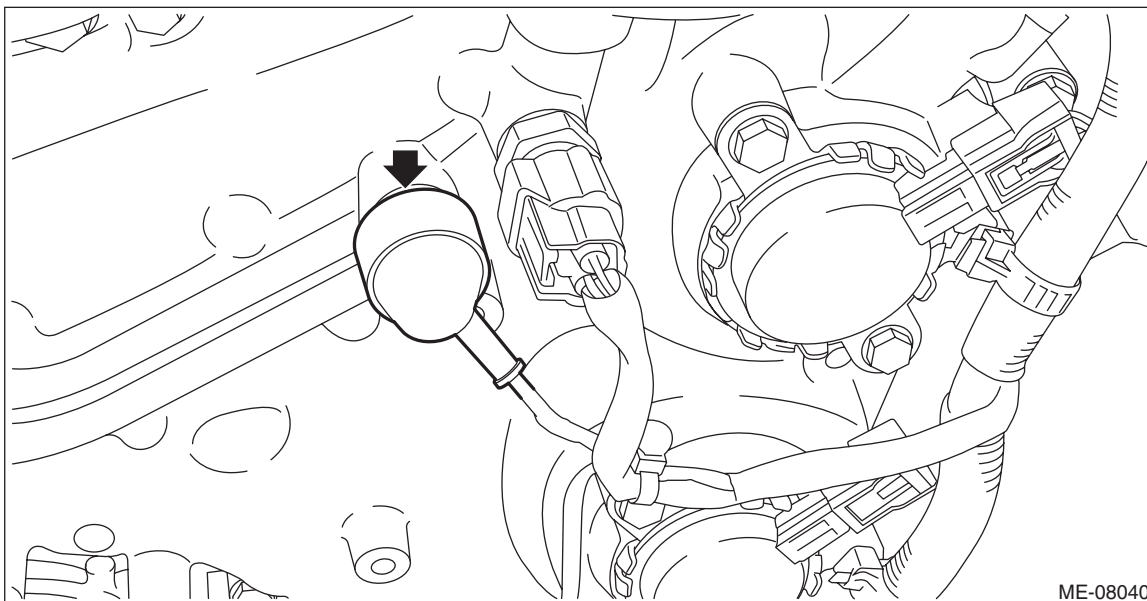
#### Tightening torque:

**1.5 N·m (0.2 kgf-m, 1.1 ft-lb)**





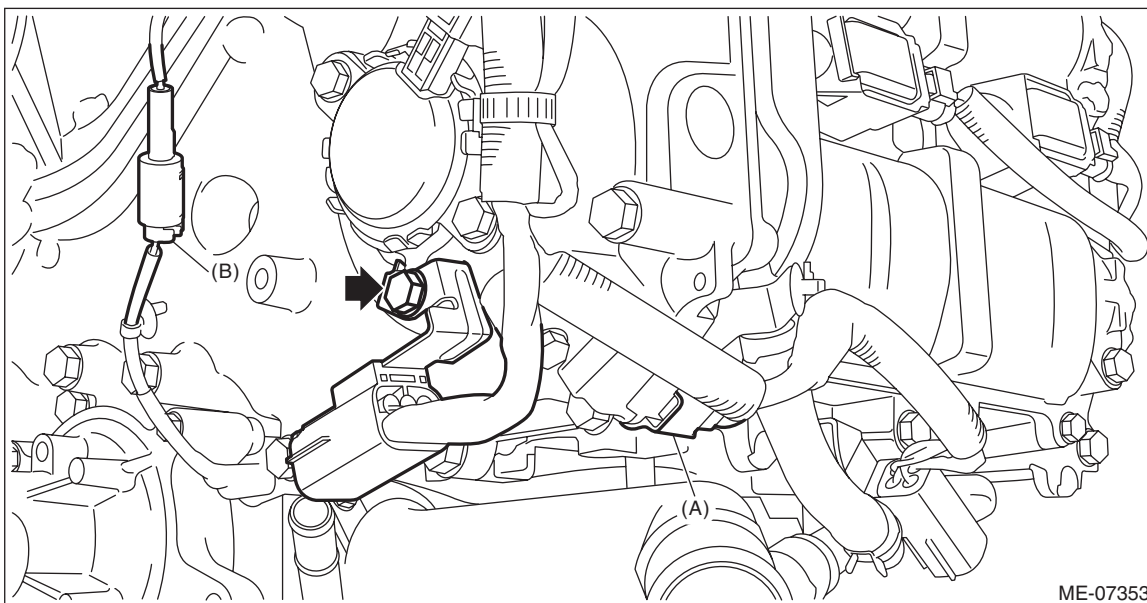
- 8) Attach the rubber cap to the oil pressure switch.



- 9) Connect the connector (A) to the exhaust camshaft position sensor LH and the connector (B) to the oil level switch, and install the engine harness stay to the chain cover.

**Tightening torque:**

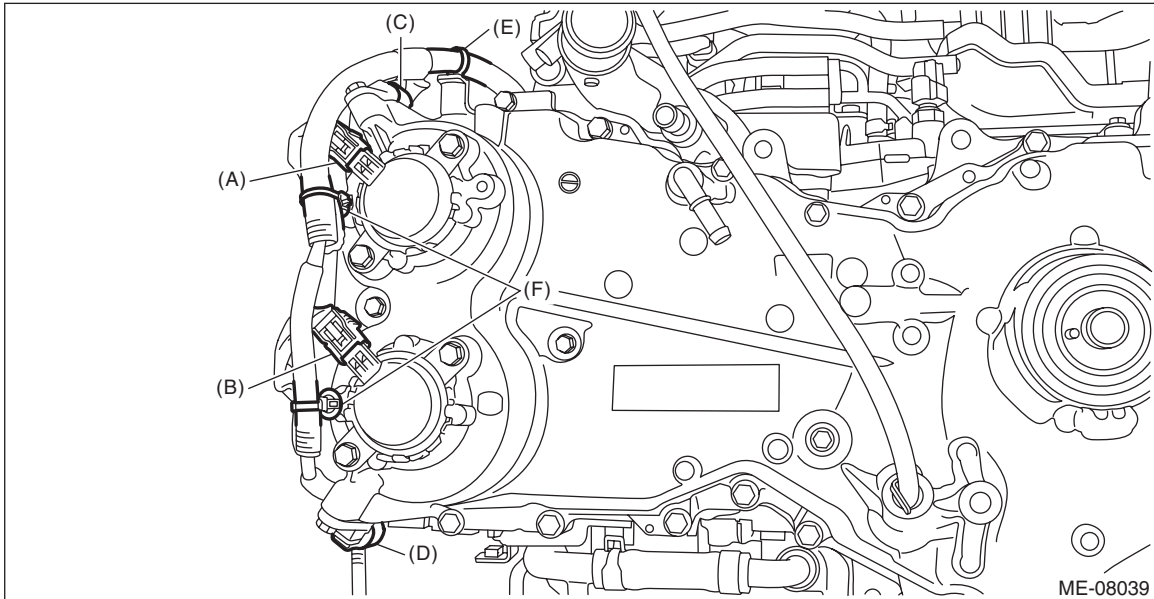
**6.4 N·m (0.7 kgf-m, 4.7 ft-lb)**



## Chain Cover

### MECHANICAL

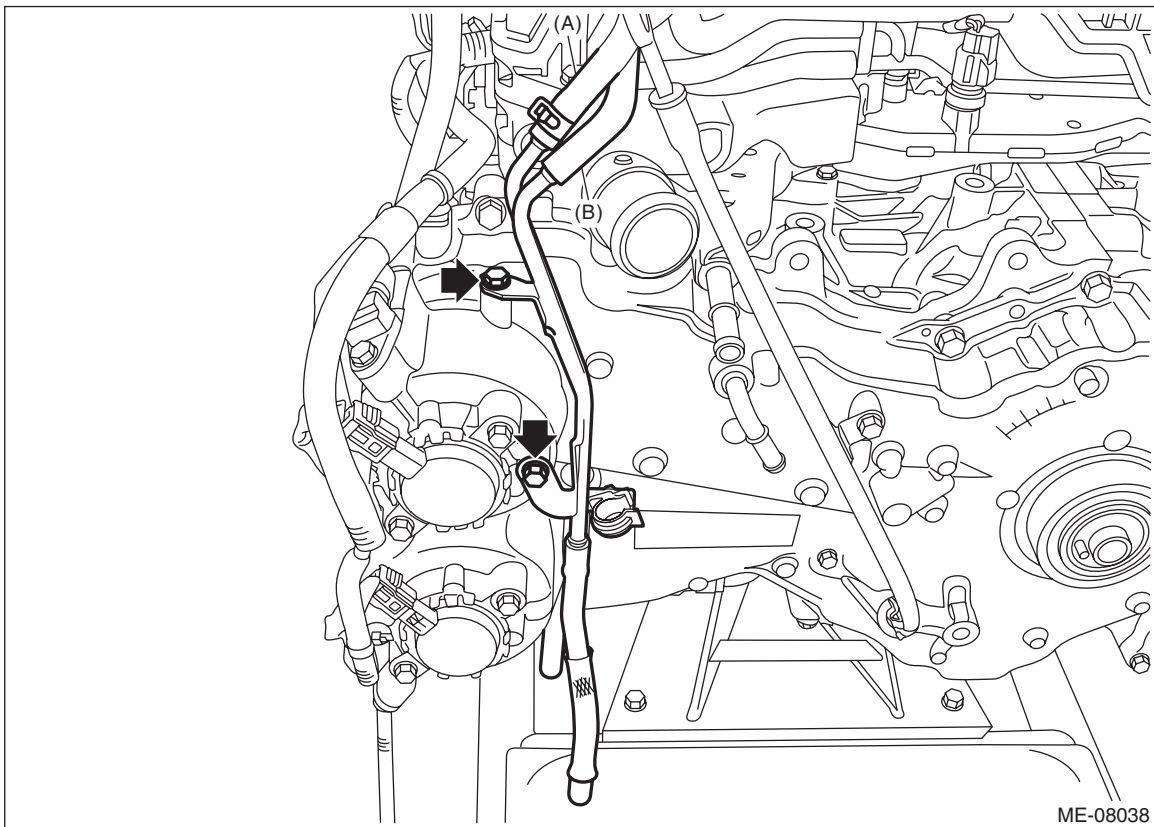
10) Connect the connector (A) to the intake oil control solenoid RH, connector (B) to the exhaust oil control solenoid RH, connector (C) to the intake camshaft position sensor RH, and the connector (D) to the exhaust camshaft position sensor RH, and then fix the engine harness using the clips (E) and (F).



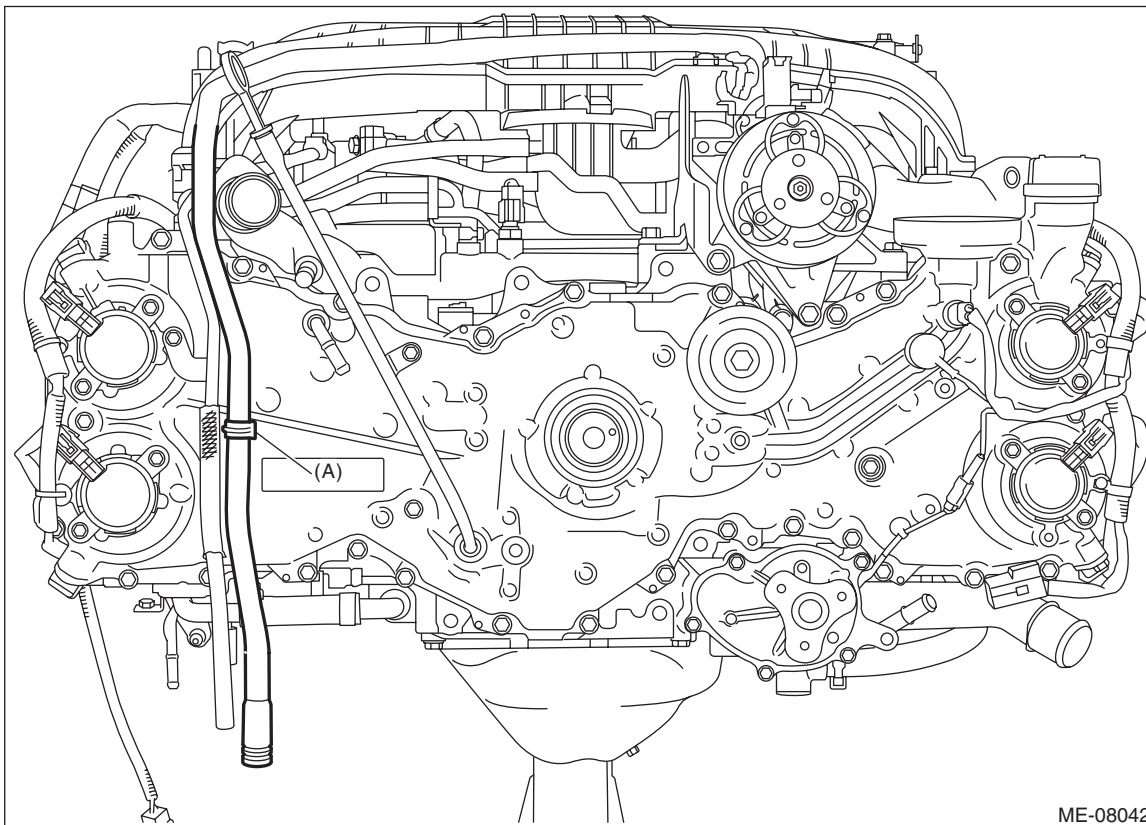
11) Install the vacuum pipe assembly to the chain cover, and connect the vacuum control hose (A) and vacuum hose (B) to the vacuum pipe assembly.

#### **Tightening torque:**

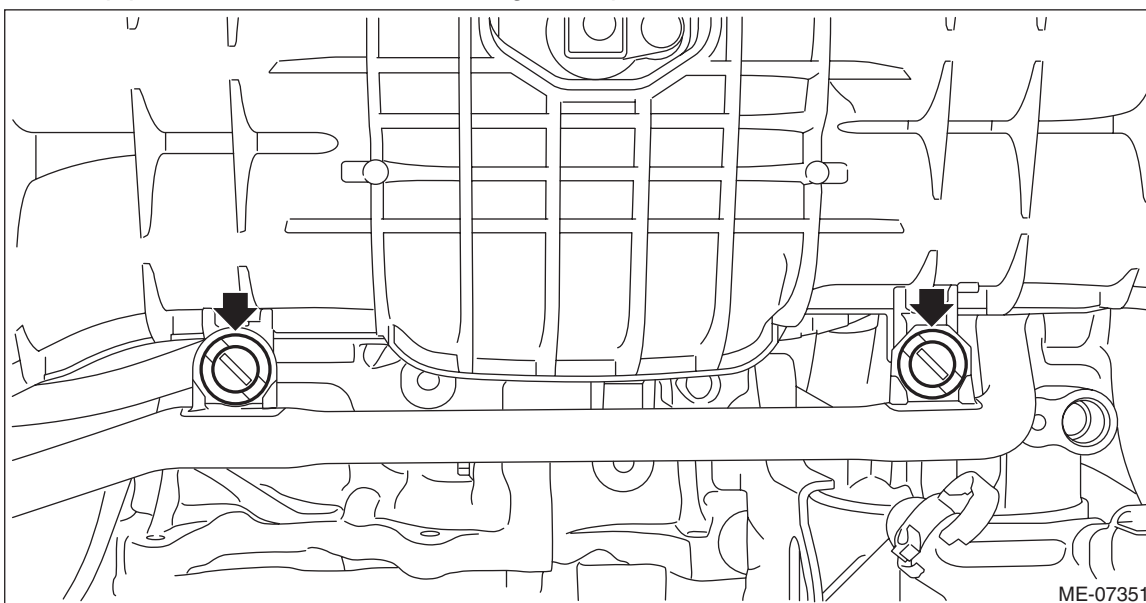
**6.4 N·m (0.7 kgf-m, 4.7 ft-lb)**



- 12) Install the PCV pipe together with the intake duct No. 1 (when working on the vehicle) to the clip (A).



- 13) Fix the PCV pipe to the intake manifold using the clip.



## Chain Cover

### MECHANICAL

14) When worked on the engine unit only

#### NOTE:

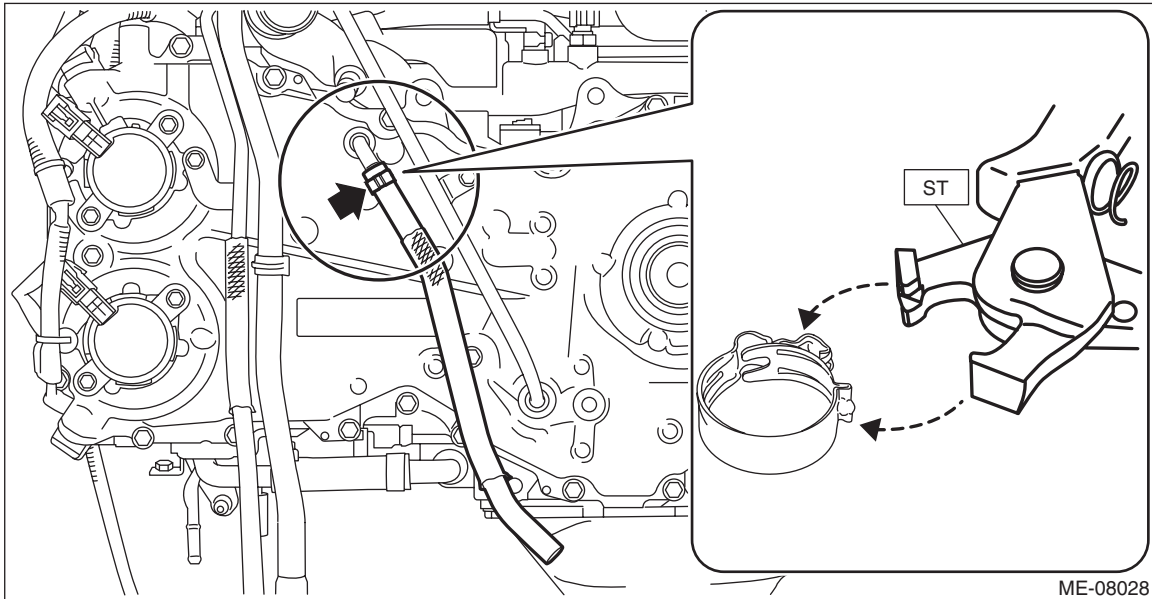
When work was done on the engine unit only, also perform the following steps.

(1) Install the PCV hose assembly to the chain cover.

#### NOTE:

Use a new clamp. To connect the PCV hose assembly, fit the cut outs of the ST with the protrusions on the clamp as shown in the figure, squeeze the ST's handles together and lock the clamp.

ST 18353AA000 CLAMP PLIERS



15) Install the front engine oil cooler pipe assembly. <Ref. to LU(w/o STI)-41, FRONT ENGINE OIL COOLER PIPE, INSTALLATION, Engine Oil Cooler Pipe.>

16) Attach the engine oil cooler. <Ref. to LU(w/o STI)-36, INSTALLATION, Engine Oil Cooler.>

17) Install the crank pulley. <Ref. to ME(w/o STI)-87, INSTALLATION, Crank Pulley.>

18) Install the water pump pulley. <Ref. to CO(w/o STI)-17, WATER PUMP, INSTALLATION, Water Pump.>

19) Install the generator. <Ref. to SC(w/o STI)-33, INSTALLATION, Generator.>

20) Install the V-belts. <Ref. to ME(w/o STI)-81, V-BELT, INSTALLATION, V-belt.>

21) Fill engine oil. <Ref. to LU(w/o STI)-11, REPLACEMENT, Engine Oil.>

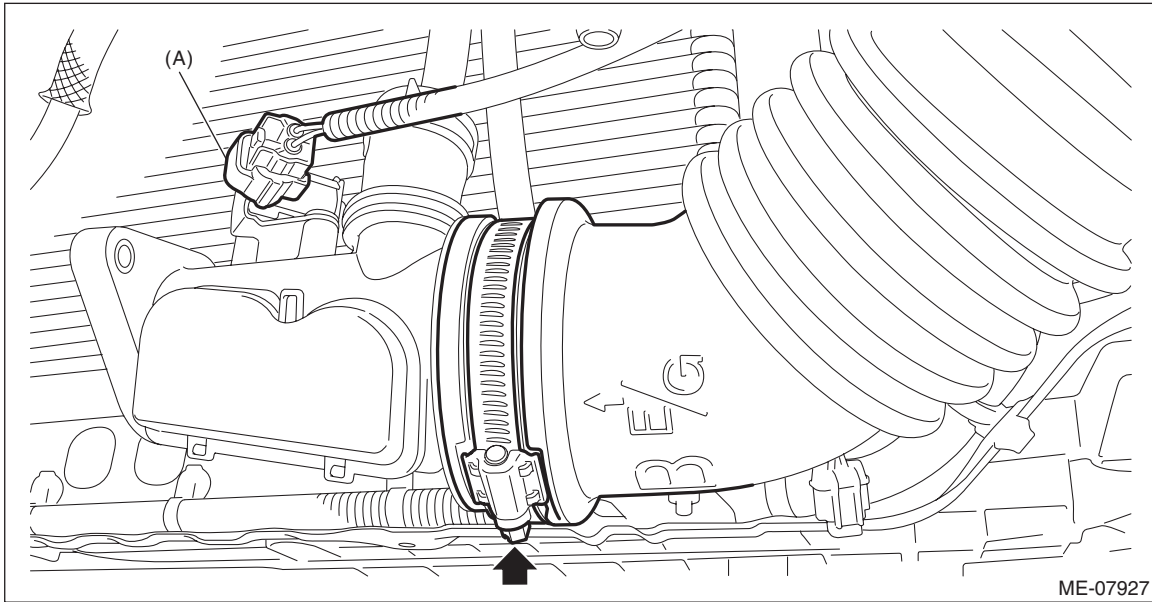
22) When working on the vehicle

#### NOTE:

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



- (1) Install the air intake boot to the intake duct No. 1, then connect the connector (A) to the wastegate control solenoid valve.



- (2) Install the front exhaust pipe. <Ref. to EX(w/o STI)-19, INSTALLATION, Front Exhaust Pipe.>
- (3) Install the intake duct No. 2. <Ref. to IN(w/o STI)-32, INTAKE DUCT NO. 2, INSTALLATION, Intake Duct.>
- (4) Install the radiator. <Ref. to CO(w/o STI)-40, INSTALLATION, Radiator.>

## C: DISASSEMBLY

- 1) When removal work was done on the vehicle

### NOTE:

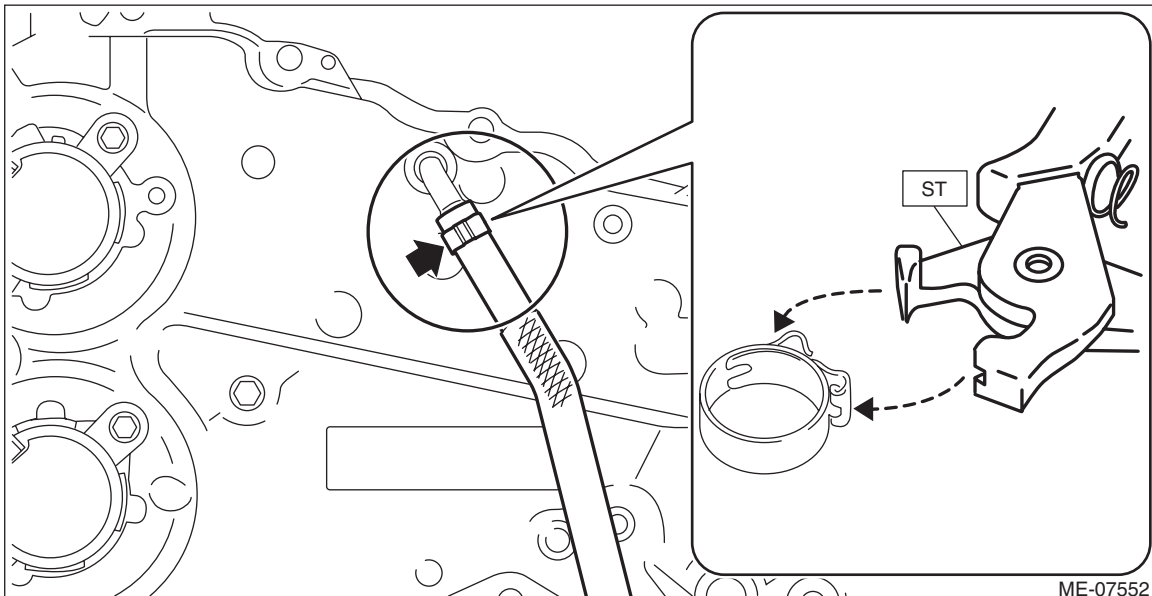
When removal work was done on the vehicle, also perform the following steps.

- (1) Remove the PCV hose assembly together with the oil catch tank from the chain cover.

### NOTE:

To disconnect the PCV hose assembly, fit the cut outs of the ST with the protrusions on the clamp as shown in the figure, squeeze the ST's handles together and unlock the clamp.

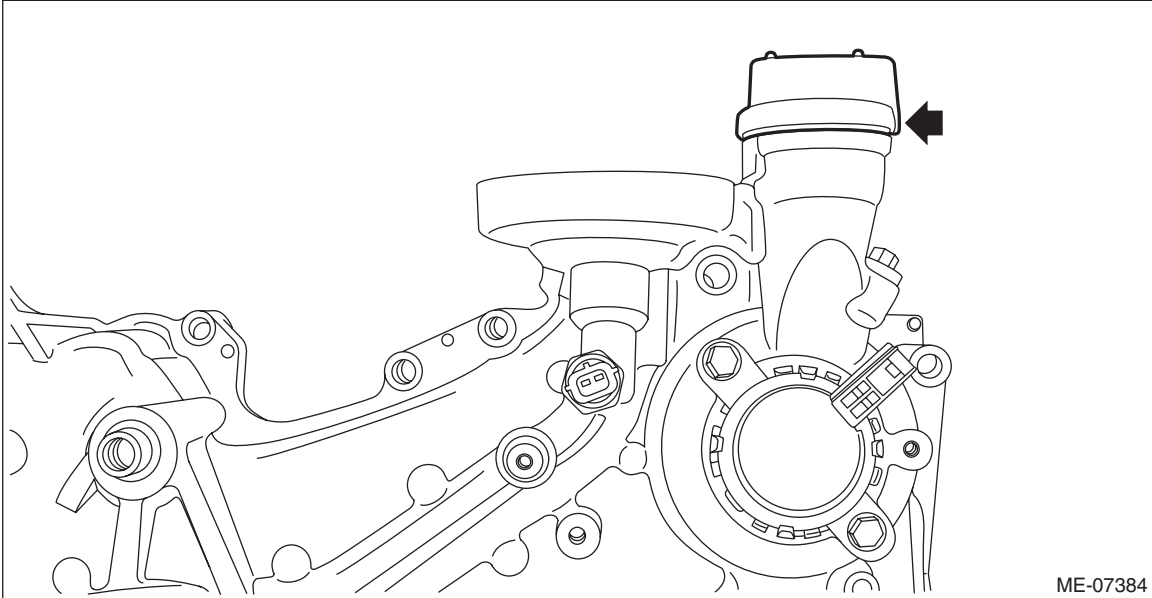
ST 18353AA000 CLAMP PLIERS



# Chain Cover

## MECHANICAL

2) Remove the oil filler cap.



3) Remove the oil pressure switch. <Ref. to LU(w/o STI)-31, REMOVAL, Oil Pressure Switch.>

4) Remove the engine oil temperature sensor. <Ref. to FU(w/o STI)-96, REMOVAL, Engine Oil Temperature Sensor.>

5) Remove the oil control solenoid. <Ref. to FU(w/o STI)-108, REMOVAL, Oil Control Solenoid.>

6) Remove the camshaft position sensor. <Ref. to FU(w/o STI)-103, REMOVAL, Camshaft Position Sensor.>

## D: ASSEMBLY

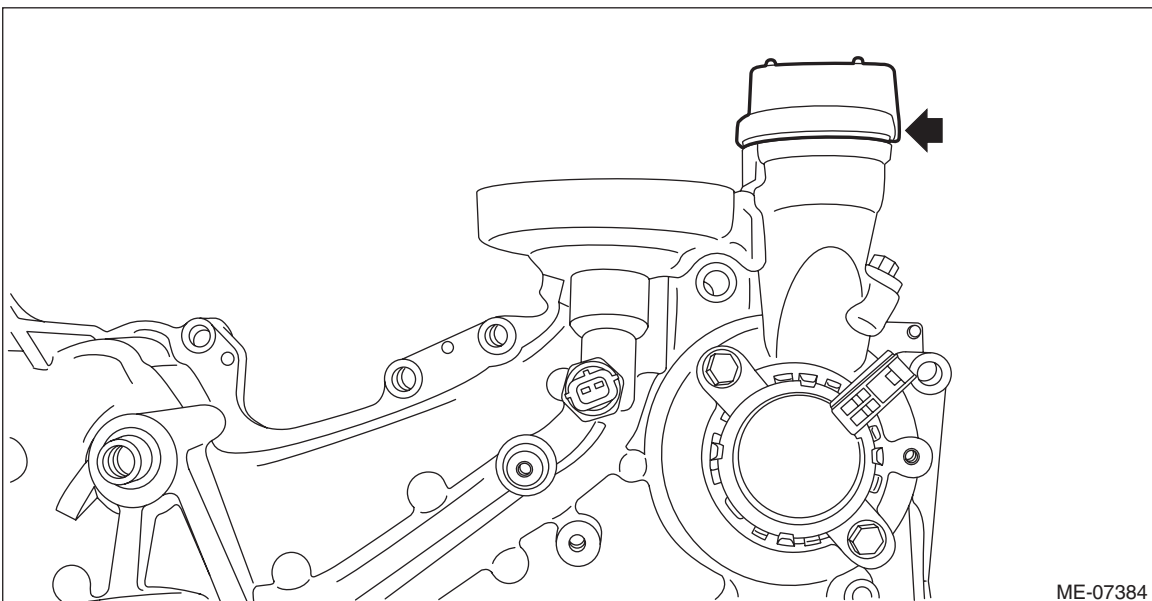
1) Install the camshaft position sensor. <Ref. to FU(w/o STI)-104, INSTALLATION, Camshaft Position Sensor.>

2) Install the oil control solenoid. <Ref. to FU(w/o STI)-109, INSTALLATION, Oil Control Solenoid.>

3) Install the engine oil temperature sensor. <Ref. to FU(w/o STI)-96, INSTALLATION, Engine Oil Temperature Sensor.>

4) Install the oil pressure switch. <Ref. to LU(w/o STI)-32, INSTALLATION, Oil Pressure Switch.>

5) Install the oil filler cap.



6) When installation work is done on the vehicle

**NOTE:**

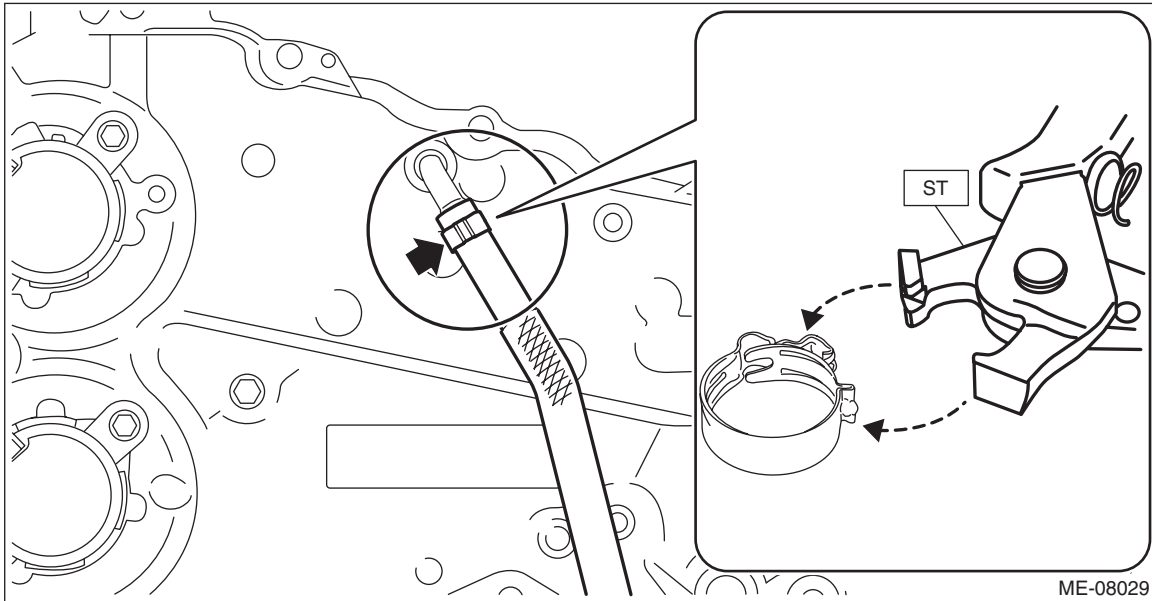
When installation work is done on the vehicle, also perform the following steps.

- (1) Install the PCV hose assembly together with the oil catch tank to the chain cover.

**NOTE:**

Use a new clamp. To connect the PCV hose assembly, fit the cut outs of the ST with the protrusions on the clamp as shown in the figure, squeeze the ST's handles together and lock the clamp.

ST 18353AA000 CLAMP PLIERS



## E: INSPECTION

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