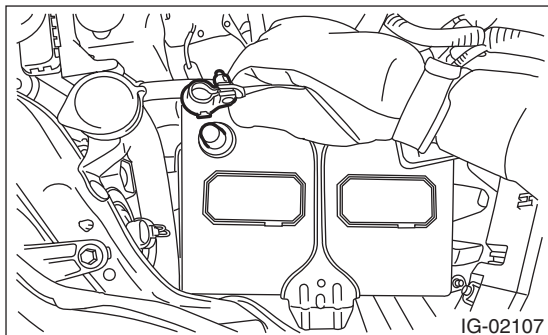


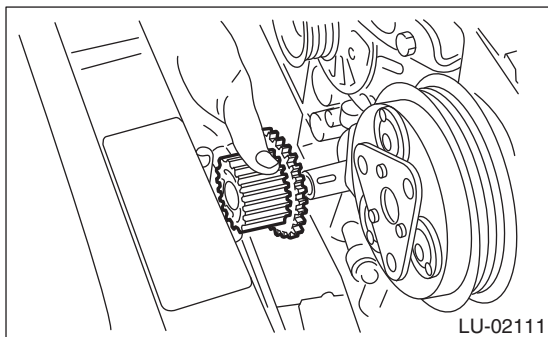
4. Oil Pump

A: REMOVAL

- 1) Remove the collector cover. (turbo model)
- 2) Disconnect the ground cable from battery.



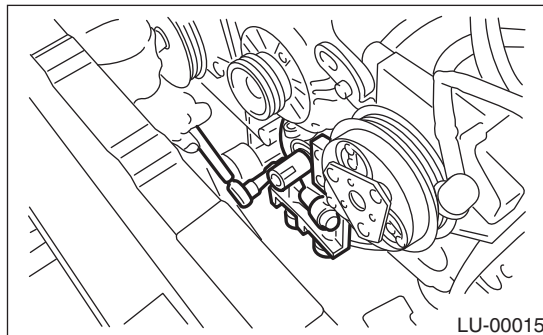
- 3) Remove the radiator. <Ref. to CO(H4SO)-20, REMOVAL, Radiator.> <Ref. to CO(H4DOTC)-21, REMOVAL, Radiator.>
- 4) Remove the crankshaft position sensor. <Ref. to FU(H4SO)-22, REMOVAL, Crankshaft Position Sensor.> <Ref. to FU(H4DOTC)-33, REMOVAL, Crankshaft Position Sensor.>
- 5) Remove the water pump. <Ref. to CO(H4SO)-16, REMOVAL, Water Pump.> <Ref. to CO(H4DOTC)-16, REMOVAL, Water Pump.>
- 6) Remove the crank sprocket. <Ref. to ME(H4SO)-53, REMOVAL, Crank Sprocket.> <Ref. to ME(H4DOTC)-61, REMOVAL, Crank Sprocket.>



- 7) Remove the bolts which install oil pump onto cylinder block.

NOTE:

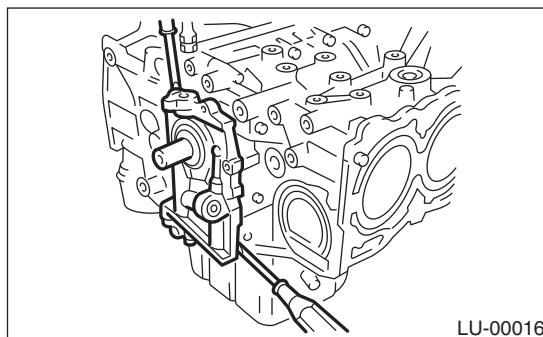
When disassembling and checking the oil pump, loosen the relief valve plug before removing the oil pump.



- 8) Remove the oil pump by using flat tip screwdriver.

CAUTION:

Be careful not to damage the mating surface of the cylinder block and oil pump.



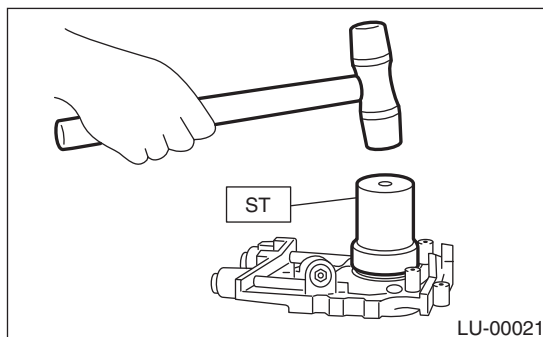
- 9) Remove the front oil seal from the oil pump.

B: INSTALLATION

- 1) Using the ST, install the front oil seal.
ST 499587100 OIL SEAL INSTALLER

NOTE:

Use a new front oil seal.



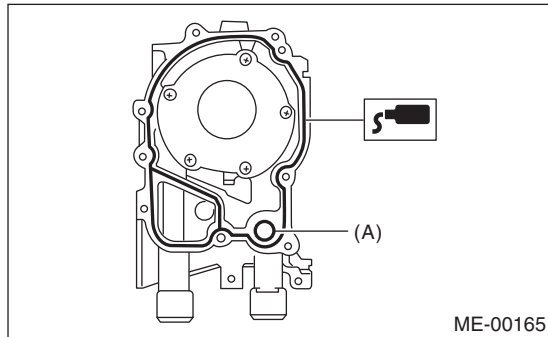
- 2) Apply liquid gasket to the mating surfaces of oil pump.

NOTE:

Install within 5 min. after applying liquid gasket.

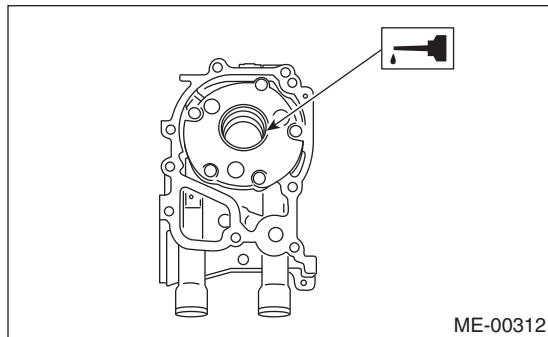
Liquid gasket:

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



(A) O-ring

3) Apply a coat of engine oil to the inside of front oil seal.



4) Install the oil pump to cylinder block.

CAUTION:

- Be careful not to damage the front oil seal during installation.
- Make sure the front oil seal lip is not folded.

NOTE:

- Align the flat surface of oil pump's inner rotor with flat surface of crankshaft before installation.
- Use new O-rings.
- Do not forget to assemble O-rings.

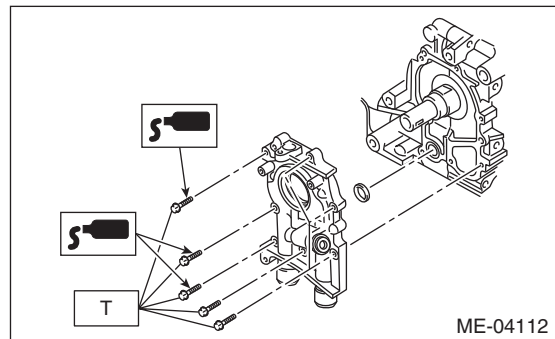
5) Apply liquid gasket to the three bolts thread shown in figure. (when reusing bolts)

Liquid gasket:

THREE BOND 1324 (Part No. 004403042) or equivalent

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



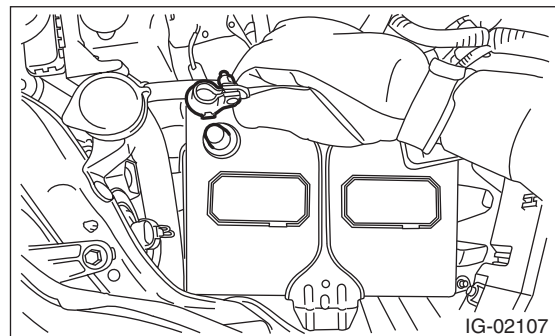
6) Install the crank sprocket. <Ref. to ME(H4SO)-53, INSTALLATION, Crank Sprocket.> <Ref. to ME(H4DOTC)-61, INSTALLATION, Crank Sprocket.>

7) Install the water pump. <Ref. to CO(H4SO)-16, INSTALLATION, Water Pump.> <Ref. to CO(H4DOTC)-16, INSTALLATION, Water Pump.>

8) Install the crankshaft position sensor. <Ref. to FU(H4SO)-22, INSTALLATION, Crankshaft Position Sensor.> <Ref. to FU(H4DOTC)-33, INSTALLATION, Crankshaft Position Sensor.>

9) Install the radiator. <Ref. to CO(H4SO)-21, INSTALLATION, Radiator.> <Ref. to CO(H4DOTC)-22, INSTALLATION, Radiator.>

10) Connect the ground cable to battery.



C: DISASSEMBLY

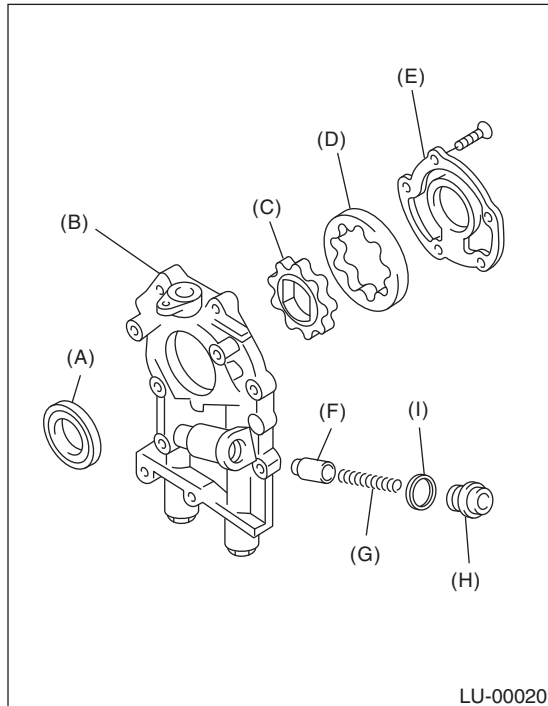
Remove the screw which secures oil pump cover and then disassemble oil pump. Inscribe alignment marks on the inner and outer rotors so that they can be replaced in their original positions during reassembly.

Oil Pump

LUBRICATION

NOTE:

Before disassembling the oil pump, remove the relief valve.



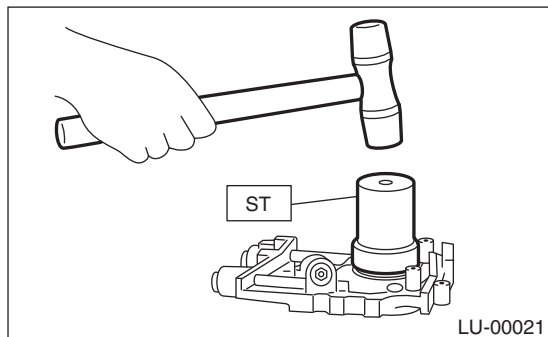
- (A) Front oil seal
- (B) Oil pump case
- (C) Inner rotor
- (D) Outer rotor
- (E) Oil pump cover
- (F) Relief valve
- (G) Relief valve spring
- (H) Plug
- (I) Gasket

D: ASSEMBLY

1) Using the ST, install the front oil seal.
ST 499587100 OIL SEAL INSTALLER

NOTE:

Use a new front oil seal.



- 2) Apply a coat of engine oil to inner and outer rotors.
- 3) Install the inner and outer rotors.

4) Install the oil relief valve and relief valve spring and plug.

NOTE:

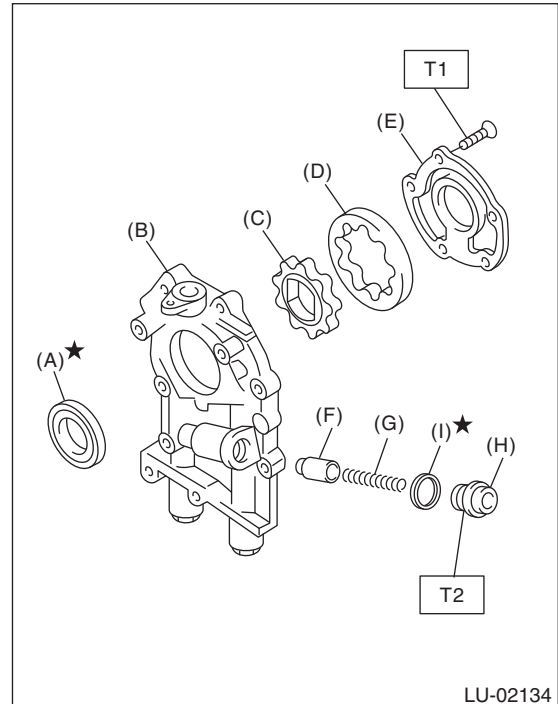
Use a new gasket.

5) Install the oil pump cover.

Tightening torque:

T1: 5.4 N·m (0.6 kgf-m, 4.0 ft-lb)

T2: 44 N·m (4.5 kgf-m, 32.5 ft-lb)



- (A) Front oil seal
- (B) Oil pump case
- (C) Inner rotor
- (D) Outer rotor
- (E) Oil pump cover
- (F) Relief valve
- (G) Relief valve spring
- (H) PLUG
- (I) Gasket

E: INSPECTION

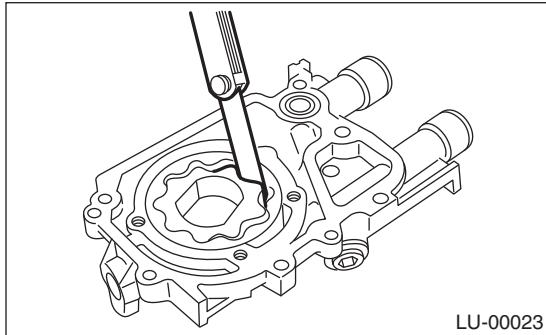
1. TIP CLEARANCE

Measure the tip clearance of rotors. If the clearance is out of standard, replace the rotors as a set.

Tip clearance between inner and outer rotors:

Standard

0.04 — 0.14 mm (0.0016 — 0.0055 in)



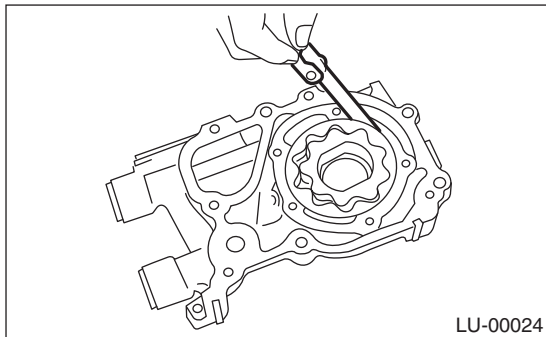
2. CASE CLEARANCE

Measure the clearance between outer rotor and oil pump case. If clearance is out of standard, replace the oil pump case.

Case clearance between outer rotor and pump case:

Standard

0.10 — 0.175 mm (0.0039 — 0.0069 in)



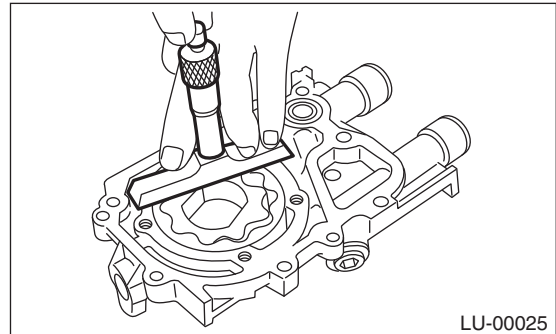
3. SIDE CLEARANCE

Measure the gap between the inner rotor and the oil pump case to measure the clearance between the inner rotor and the oil pump cover as shown in the figure. If clearance is out of standard, replace the rotor or the oil pump case.

Side clearance between inner rotor and pump case:

Standard

0.02 — 0.07 mm (0.0008 — 0.0028 in)



4. OIL RELIEF VALVE

Check the valve for assembly condition and damage, and the relief valve spring for damage and deterioration. Replace the parts if defective.

Relief valve spring:

Free length

73.7 mm (2.902 in)

Installed length

54.7 mm (2.154 in)

Load when installed

93.1 N (9.49 kgf, 20.93 lbf)

5. OIL PUMP CASE

Check for worn shaft hole, clogged oil passage, worn rotor chamber, cracks and other faults.

6. FRONT OIL SEAL

Check the front oil seal lips for deformation and hardening, wear.