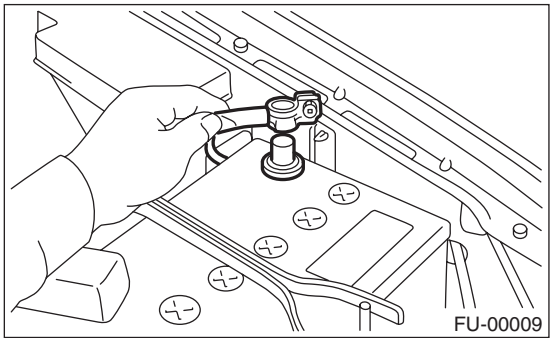
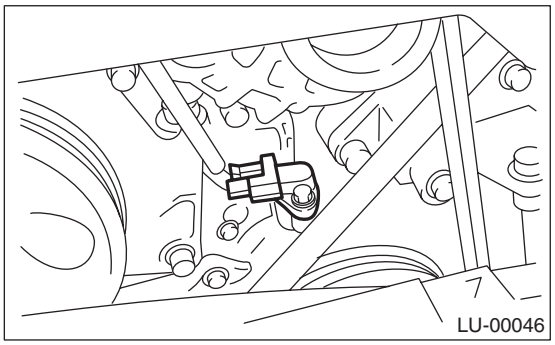
4. Oil Pump

A: REMOVAL

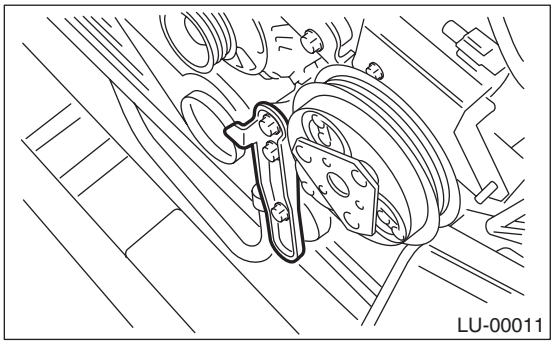
1) Set the vehicle on a lift.
2) Remove the collector cover. (Turbo model)
3) Disconnect the ground cable from the battery.



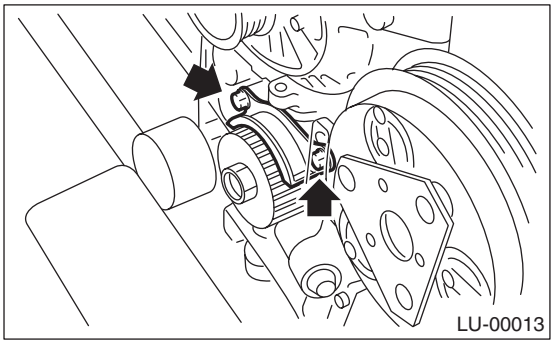
4) Lift up the vehicle.
5) Remove the under cover.
6) Lower the vehicle.
7) Remove the radiator. <Ref. to CO(H4SO)-25, REMOVAL, Radiator.>
8) Remove the crankshaft position sensor.



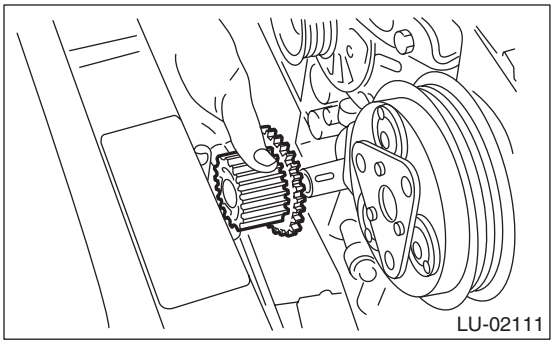
9) Remove the V-belts. (Non-turbo model) <Ref. to ME(H4SO)-41, REMOVAL, V-belt.> (Turbo model) <Ref. to ME(H4DOTC)-39, REMOVAL, V-belt.>
10) Remove the V-belt tensioner.



11) Remove the crank pulley using ST. <Ref. to ME(H4SO)-43, REMOVAL, Crank Pulley.> <Ref. to ME(H4DOTC)-41, REMOVAL, Crank Pulley.>
12) Remove the water pump. <Ref. to CO(H4SO)-19, REMOVAL, Water Pump.>
13) Remove the timing belt guide. (MT model)

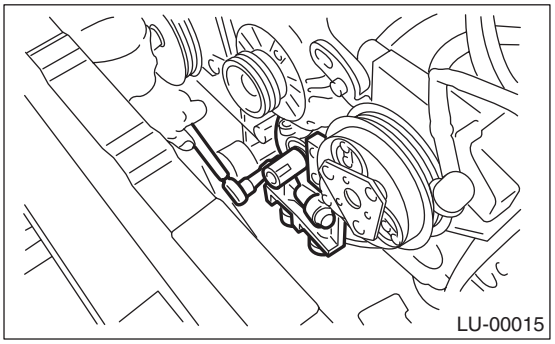


14) Remove the crank sprocket.



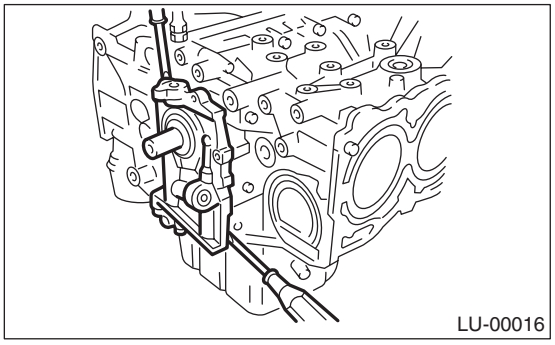
15) Remove the bolts which install oil pump onto cylinder block.

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



16) Remove the oil pump by using flat tip screwdriver.

CAUTION:
Be careful not to scratch mating surfaces of cylinder block and oil pump.

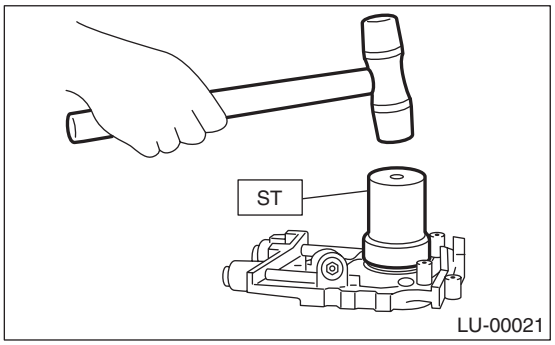


17) Remove the front oil seal from the oil pump.

B: INSTALLATION

Install in the reverse order of removal.
Perform the following.
1) Using the ST, install the front oil seal.
ST 499587100 OIL SEAL INSTALLER

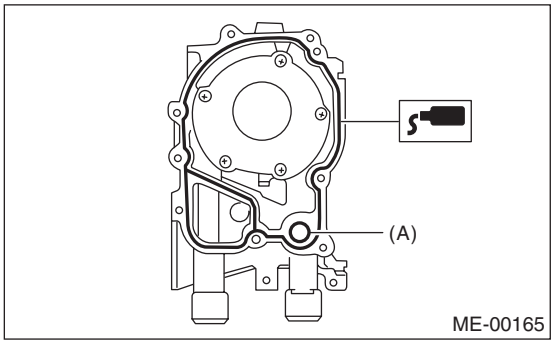
NOTE:
Use a new front oil seal.



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

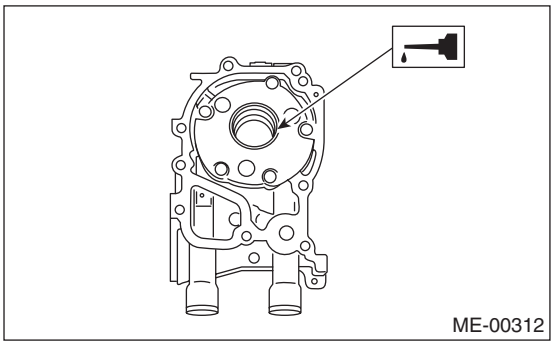
NOTE:
Install within 5 min. after applying liquid gasket.

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.



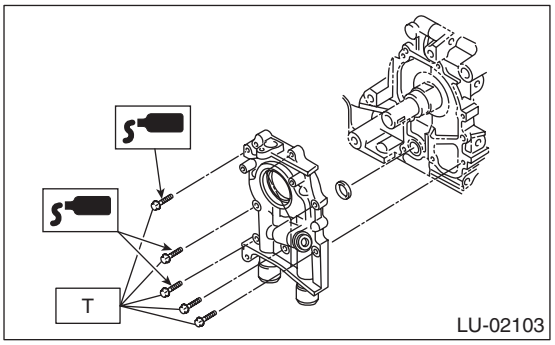
4) Install the oil pump to cylinder block. Be careful not to damage the front oil seal during installation.

NOTE:
- Make sure the front oil seal lip is not folded.
- Align the flat surface of oil pump's inner rotor with crankshaft before installation.
- Use new O-rings when installing the oil pump.

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

Liquid gasket:
THREE BOND 1324 (Part No. 004403042) or equivalent

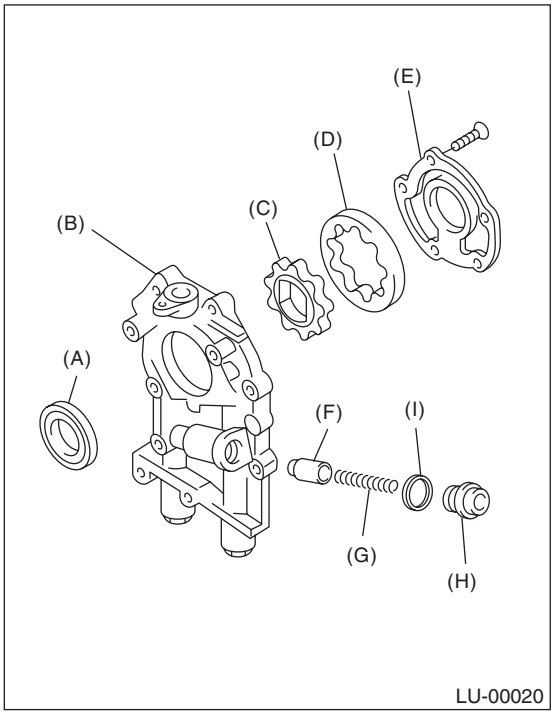
Tightening torque:
6.4 N·m (0.65 kgf-m, 4.7 ft-lb)



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.

NOTE:
Before disassembling the oil pump, remove the relief valve.

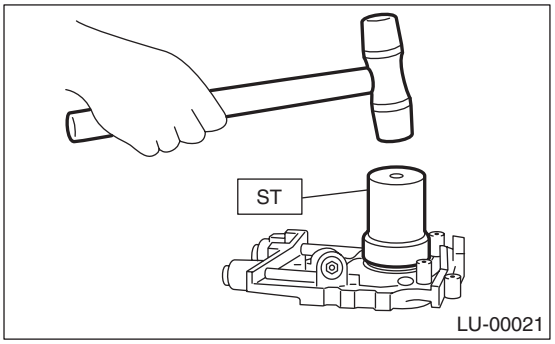


(A) Front oil seal
(B) Oil pump case
(C) Inner rotor
(D) Outer rotor
(E) Oil pump cover
(F) Relief valve
(G) Relief valve spring
(H) Plug
(I) Gasket

D: ASSEMBLY

1) Assemble the front oil seal by using ST.
ST 499587100 OIL SEAL INSTALLER

NOTE:
Use a new front oil seal.

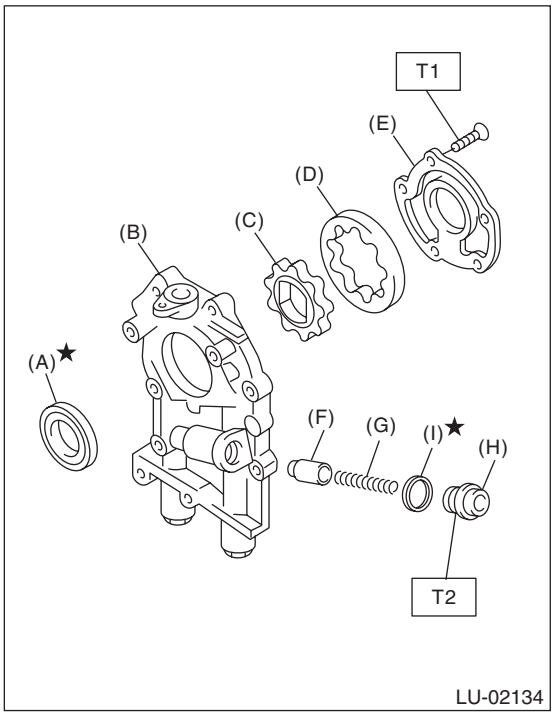


2) Apply a coat of engine oil to inner and outer rotors.
3) Assemble the inner and outer rotors in their original positions.
4) Assemble the oil relief valve and install relief valve spring and plug.

NOTE:
Use a new gasket.

5) Assemble the oil pump cover.

Tightening torque:
T1: 5.4 N·m (0.55 kgf-m, 4.0 ft-lb)
T2: 44 N·m (4.5 kgf-m, 32.5 ft-lb)



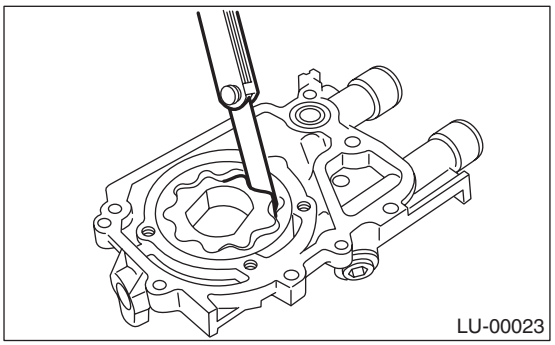
(A) Front oil seal
(B) Oil pump case
(C) Inner rotor
(D) Outer rotor
(E) Oil pump cover
(F) Relief valve
(G) Relief valve spring
(H) Plug
(I) Gasket

E: INSPECTION

1. TIP CLEARANCE

Measure the tip clearance of rotors. If the clearance exceeds the limit, replace rotors as a matched set.

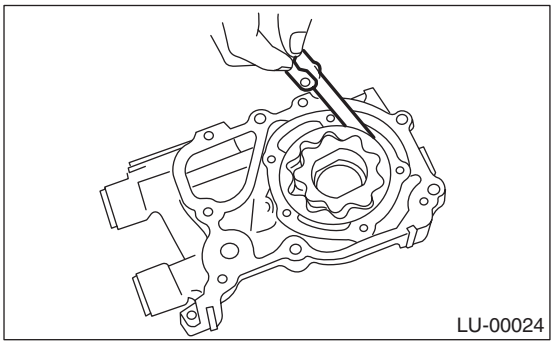
Tip clearance:
Specification:
0.04 — 0.14 mm (0.0016 — 0.0055 in)
Service limit:
0.18 mm (0.0071 in)



2. CASE CLEARANCE

Measure the clearance between outer rotor and oil pump case. If the clearance exceeds the limit, replace the oil pump case.

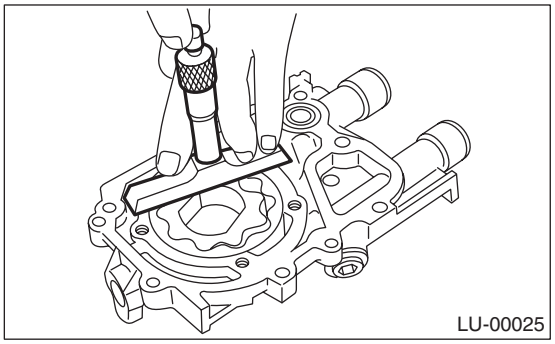
Case clearance:
Specification:
0.10 — 0.175 mm (0.0039 — 0.0069 in)
Service limit:
0.20 mm (0.0079 in)



3. SIDE CLEARANCE

Measure the gap between the inner rotor and the oil pump case to measure the clearance between the oil pump inner rotor and the oil pump cover as shown in the figure. If the clearance exceeds the limit, replace rotor or oil pump case.

Side clearance:
Specification:
0.02 — 0.07 mm (0.0008 — 0.0028 in)
Service limit:
0.12 mm (0.0047 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, 20.88 lb)

5. OIL PUMP CASE

Check the oil pump case 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, hardening, wear, etc. and replace if defective.