

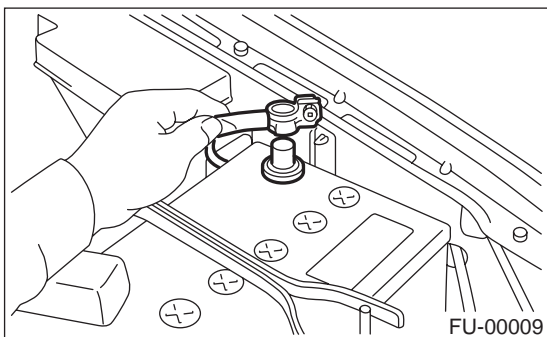
## OIL PUMP

LUBRICATION

### 4. Oil Pump

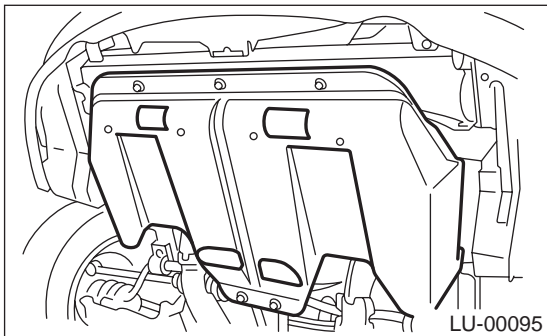
#### A: REMOVAL

1) Disconnect battery ground cable.



2) Lift-up the vehicle.

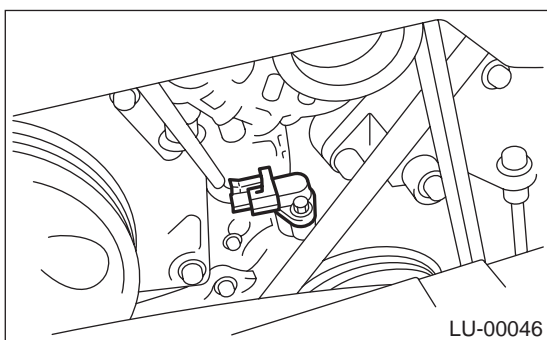
3) Remove under cover.



4) Lower the vehicle.

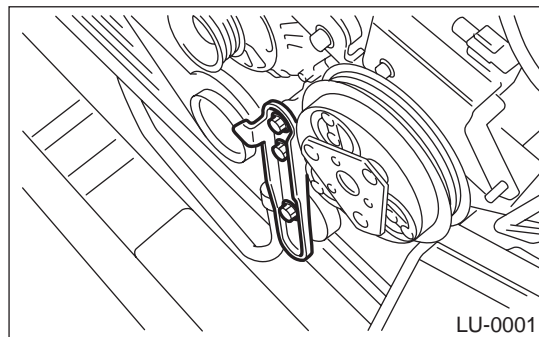
5) Remove radiator. <Ref. to CO(H4SO)-22, REMOVAL, Radiator.>

6) Remove crankshaft position sensor.

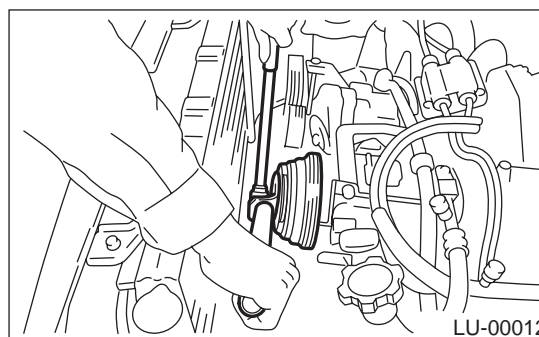


7) Remove V-belts. <Ref. to ME(H4SO)-42, REMOVAL, V-belt.>

8) Remove rear side V-belt tensioner.



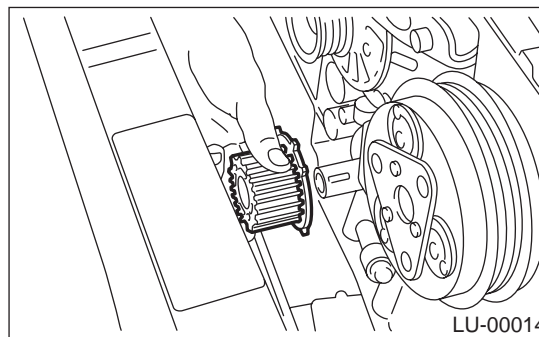
9) Remove crankshaft pulley by using ST.  
ST 499977100 CRANKSHAFT PULLEY  
WRENCH



10) Remove water pump. <Ref. to CO(H4SO)-16, REMOVAL, Water Pump.>

11) Remove timing belt guide. (MT vehicle)

12) Remove crankshaft sprocket.



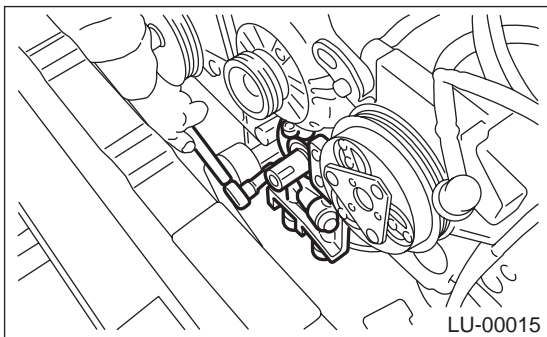
## OIL PUMP

### LUBRICATION

13) Remove bolts which install oil pump onto cylinder block.

**NOTE:**

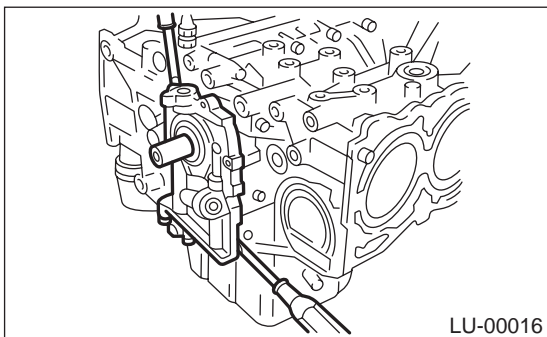
To disassemble and check oil pump, loosen relief valve plug before removing the pump.



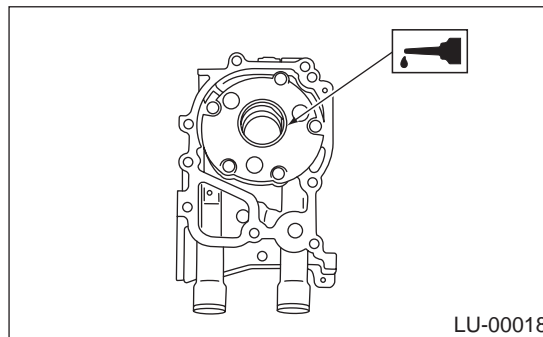
14) Remove oil pump by using flat bladed screwdriver.

**CAUTION:**

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



3) Apply engine oil to the inside of the oil seal.



4) Be careful not to scratch oil seal when installing oil pump on cylinder block.

5) Position the oil pump, aligning the notched area with the crankshaft, and push the oil pump straight.

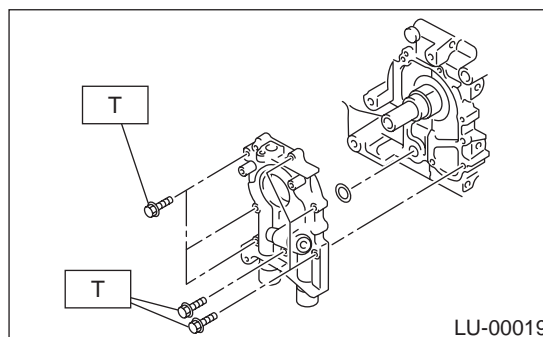
**CAUTION:**

Make sure the oil seal lip is not folded.

6) Install oil pump.

**Tightening torque:**

**6.4 N·m (0.65 kgf-m, 4.7 ft-lb)**



## B: INSTALLATION

Install in the reverse order of removal.

Do the following:

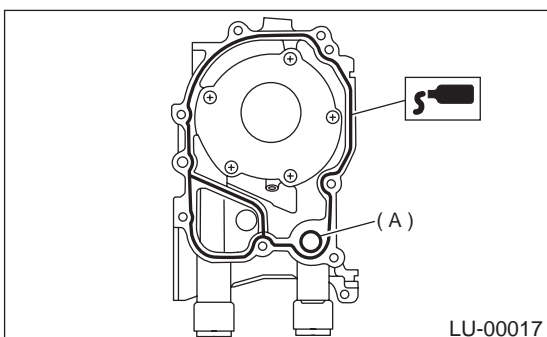
1) Apply fluid gasket to matching surfaces of oil pump.

**Fluid gasket:**

**Part No. 004403007**

**THREE BOND 1215 or equivalent**

2) Replace O-ring (A) with a new one.

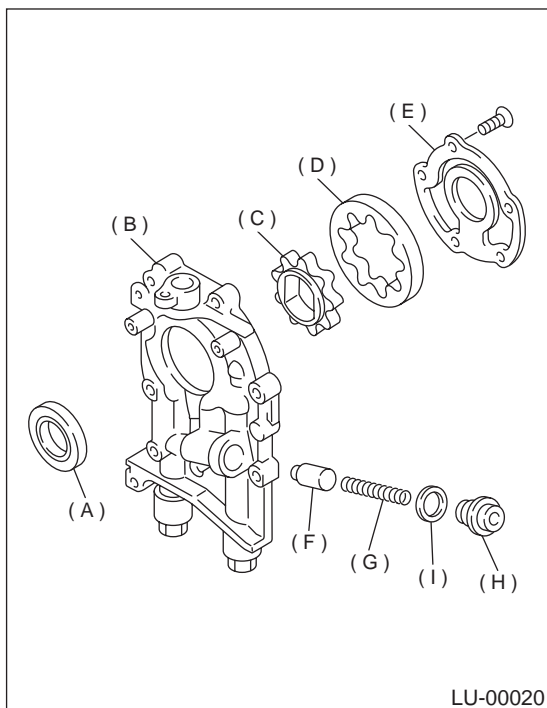


## OIL PUMP

LUBRICATION

### C: DISASSEMBLY

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

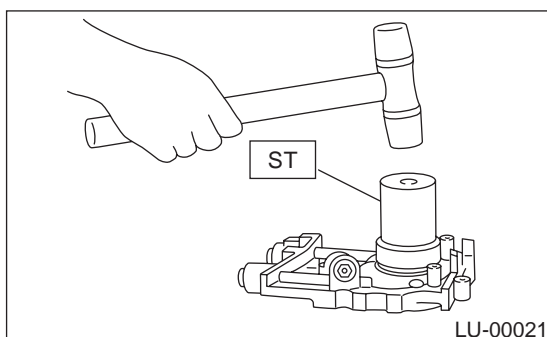


- (A) Oil seal
- (B) Pump case
- (C) Inner rotor
- (D) Outer rotor
- (E) Pump cover
- (F) Relief valve
- (G) Relief valve spring
- (H) Plug
- (I) Gasket

### D: ASSEMBLY

- 1) Install front oil seal by using ST.  
ST 499587100 OIL SEAL INSTALLER

NOTE:  
Use a new oil seal.

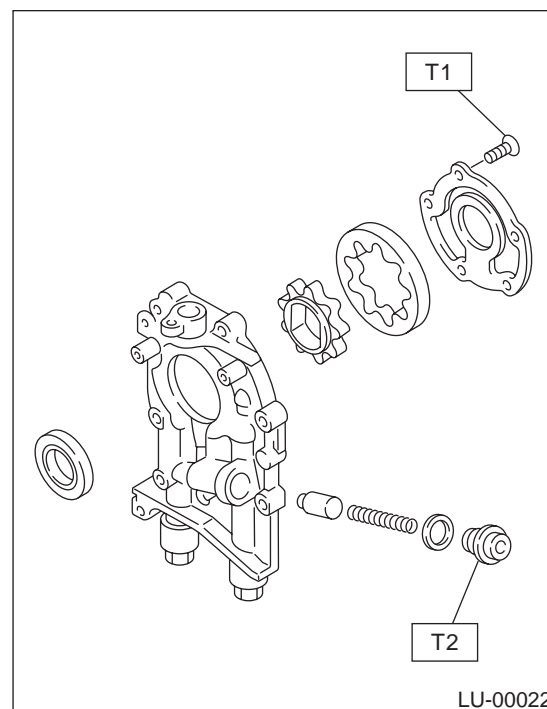


- 2) Apply engine oil to inner and outer rotors.
- 3) Install inner and outer rotors in their original positions.
- 4) Install oil relief valve and relief valve spring.
- 5) Install oil pump cover.

### Tightening torque:

**T1: 5 N·m (0.5 kgf-m, 3.6 ft-lb)**

**T2: 44 N·m (4.5 kgf-m, 33 ft-lb)**



### E: INSPECTION

#### 1. TIP CLEARANCE

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

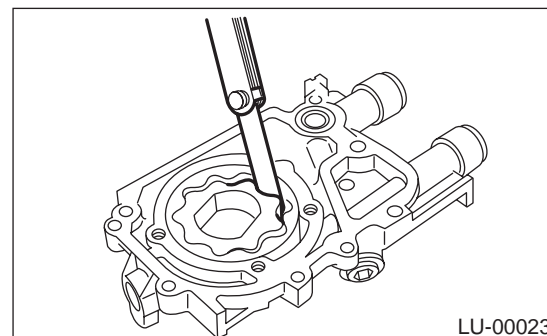
#### Tip clearance:

##### Standard

**0.04 — 0.14 mm (0.0016 — 0.0055 in)**

##### Limit

**0.18 mm (0.0071 in)**



## OIL PUMP

### LUBRICATION

#### 2. CASE CLEARANCE

Measure the clearance between the outer rotor and the cylinder block rotor housing. If the clearance exceeds the limit, replace the rotor.

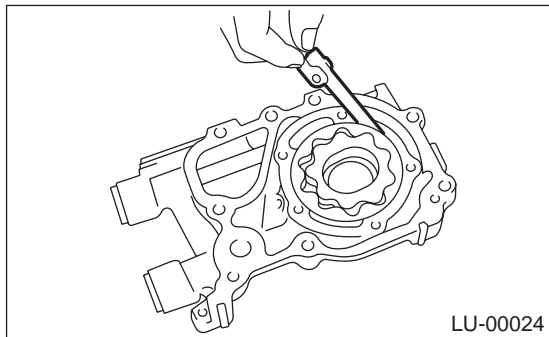
**Case clearance:**

**Standard**

**0.10 — 0.175 mm (0.0039 — 0.0069 in)**

**Limit**

**0.20 mm (0.0079 in)**



#### 3. SIDE CLEARANCE

Measure clearance between oil pump inner rotor and pump cover. If the clearance exceeds the limit, replace rotor or pump body.

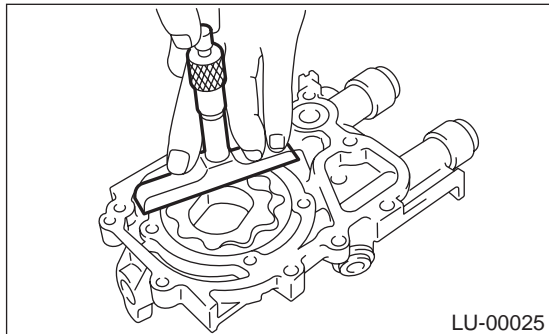
**Side clearance:**

**Standard**

**0.02 — 0.07 mm (0.0008 — 0.0028 in)**

**Limit**

**0.12 mm (0.0047 in)**



#### 4. OIL RELIEF VALVE

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

**Relief valve spring:**

**Free length**

**72.8 mm (2.866 in)**

**Installed length**

**54.7 mm (2.154 in)**

**Load when installed**

**81.3 N (8.29 kgf, 18.28 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. OIL SEAL

Check the oil seal lips for deformation, hardening, wear, etc. and replace if defective.