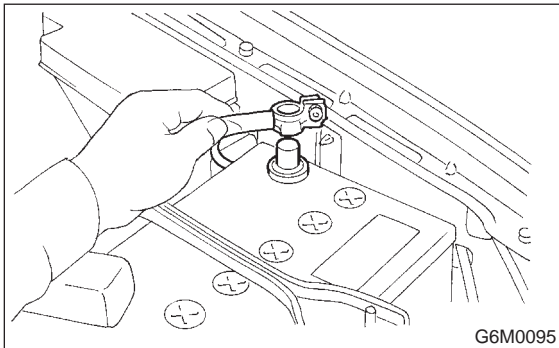


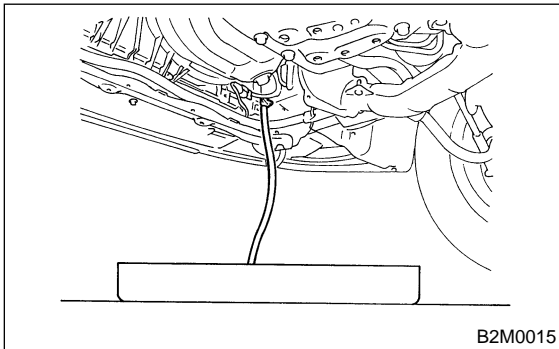
1. Oil Pump

A: REMOVAL

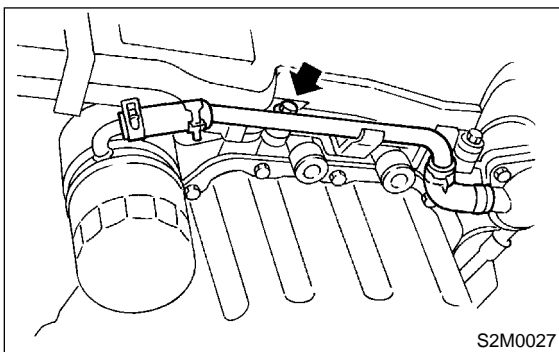
- 1) Set the vehicle on the lift.
- 2) Disconnect battery ground cable.



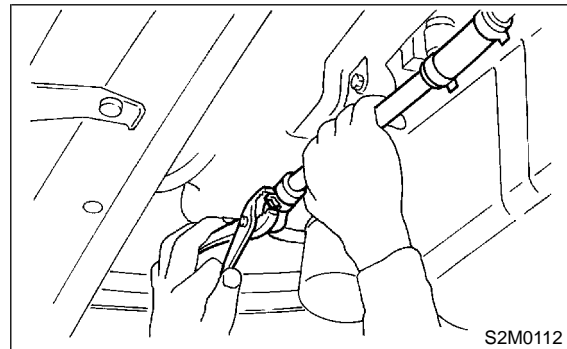
- 3) Lift-up the vehicle.
- 4) Remove under cover.
- 5) Drain coolant. <Ref. to 2-5 [W1A0].>



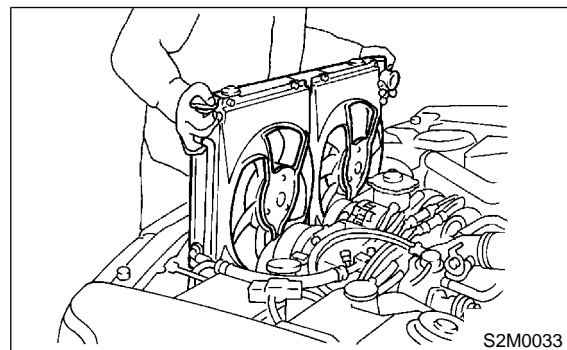
- 6) Remove bolts which install water pipe of oil cooler to oil pump. (AT vehicles only)



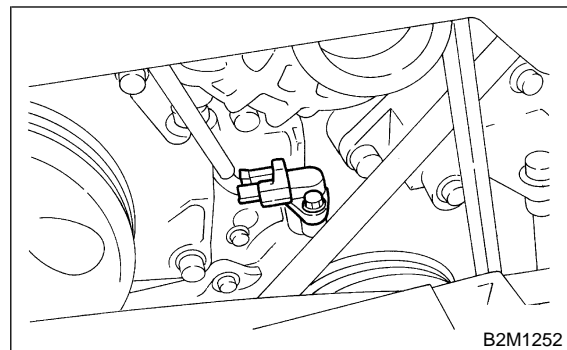
- 7) Remove water pipe and hoses between oil cooler and water pump. (AT vehicles only)



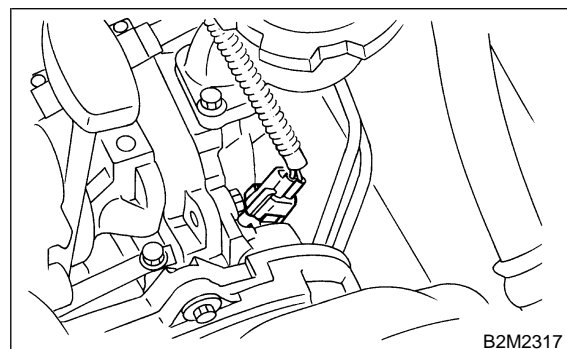
- 8) Lower the vehicle.
- 9) Remove radiator. <Ref. to 2-5 [W3A0].>



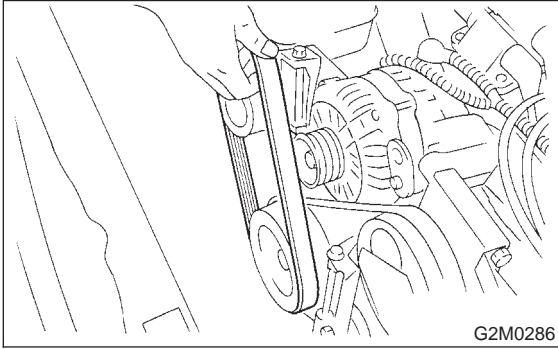
- 10) Remove crankshaft position sensor.



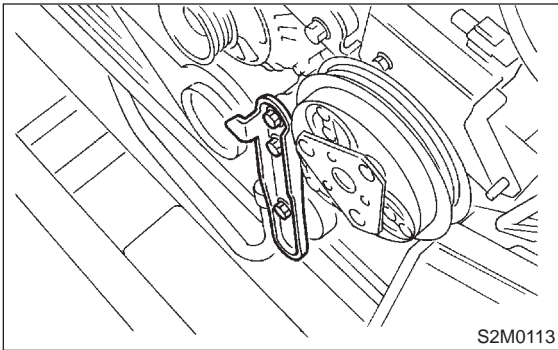
- 11) Remove camshaft position sensor. <Ref. to 2-7 [W10A0].>



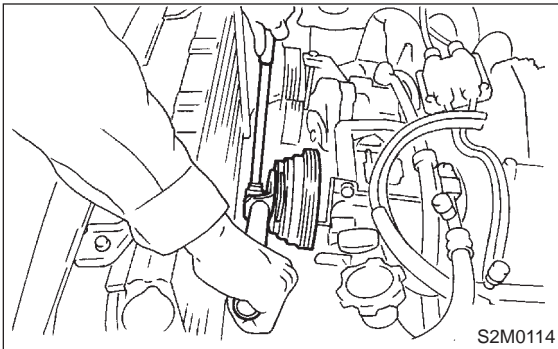
12) Remove V-belts. <Ref. to 1-5 [G2A0].>



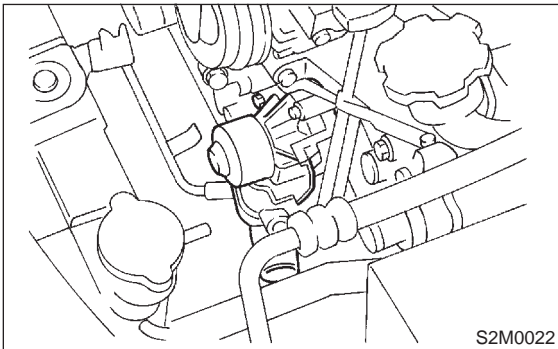
13) Remove rear side V-belt tensioner.



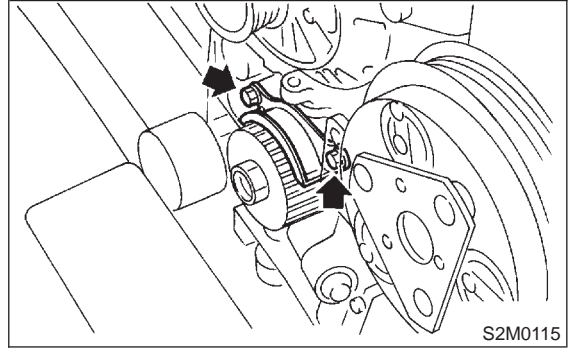
14) Remove crankshaft pulley using ST.
ST 499977100 CRANKSHAFT PULLEY
WRENCH



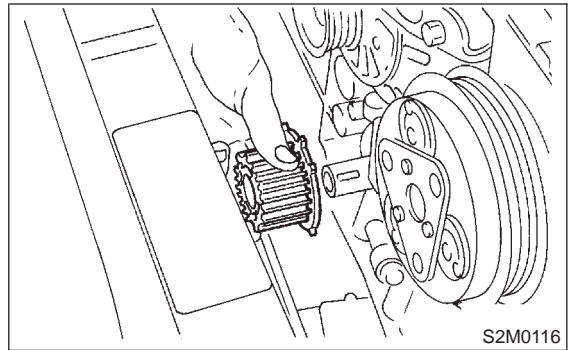
15) Remove water pump. <Ref. to 2-5 [W1A0].>



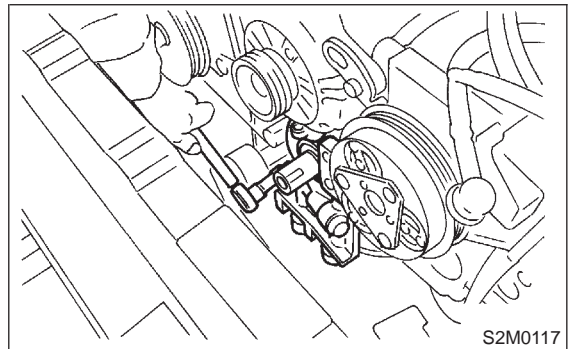
16) Remove timing belt guide. (MT vehicles only)



17) Remove crankshaft sprocket.

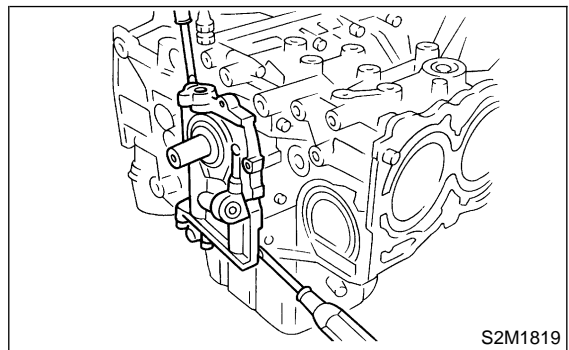


18) Remove bolts which install oil pump onto cylinder block.



19) Remove oil pump using flat bladed screwdriver.

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



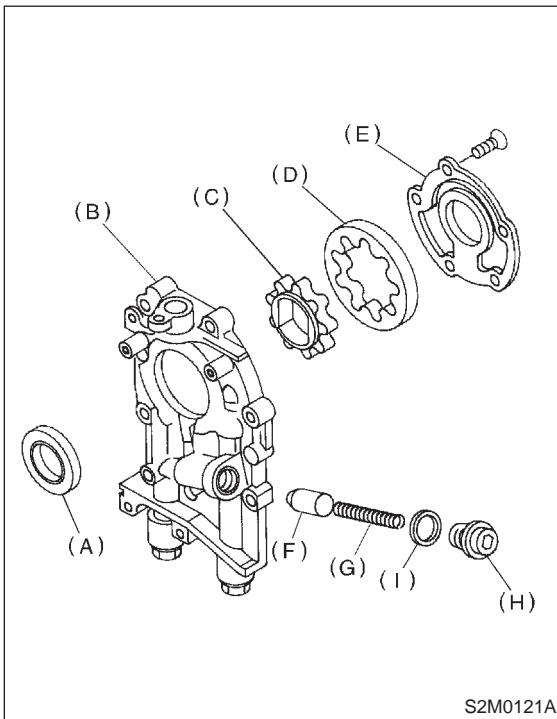
B: DISASSEMBLY

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.

CAUTION:

Before removing relief valve, loosen plug when removing oil pump from cylinder block.



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

C: INSPECTION

1. TIP CLEARANCE

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

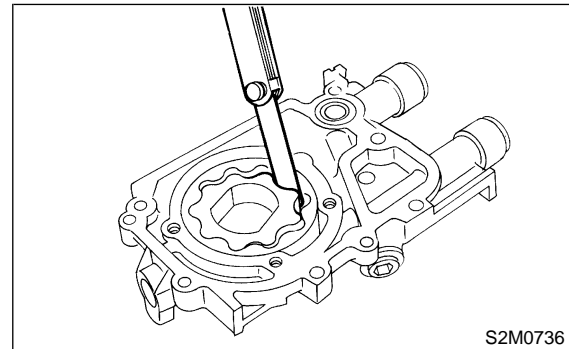
Tip clearance:

Standard

0.04 — 0.14 mm (0.0016 — 0.0055 in)

Limit

0.18 mm (0.0071 in)



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.

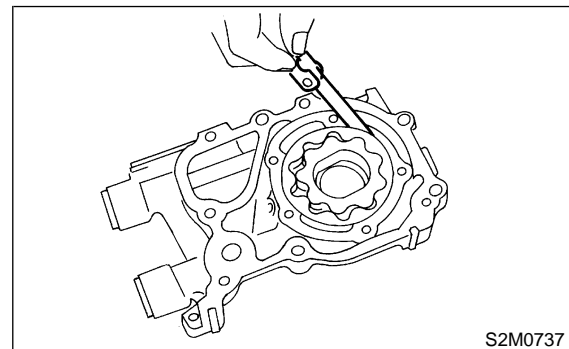
Case clearance:

Standard

0.10 — 0.175 mm (0.0039 — 0.0069 in)

Limit

0.20 mm (0.0079 in)



1. Oil Pump

3. SIDE CLEARANCE

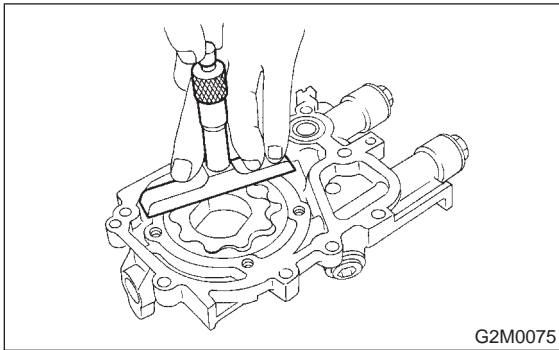
Measure clearance between oil pump inner rotor and pump cover. If the clearance exceeds the limit, replace rotor or pump body.

Side clearance:**Standard**

0.02 — 0.07 mm (0.0008 — 0.0028 in)

Limit

0.15 mm (0.0059 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; 71.8 mm (2.827 in)

Installed length; 54.7 mm (2.154 in)

Load when installed; 77.08 N (7.86 kg, 17.33 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

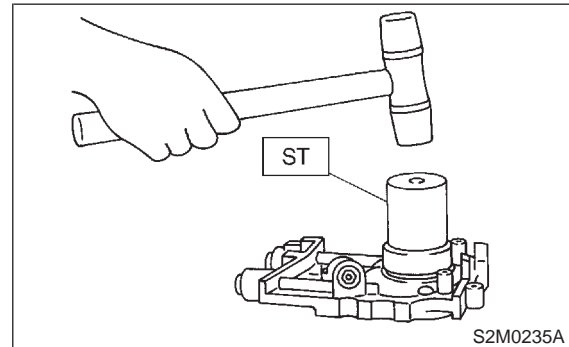
Check the oil seal lips for deformation, hardening, wear, etc. and replace if defective.

D: ASSEMBLY

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

CAUTION:

Use a new oil seal.

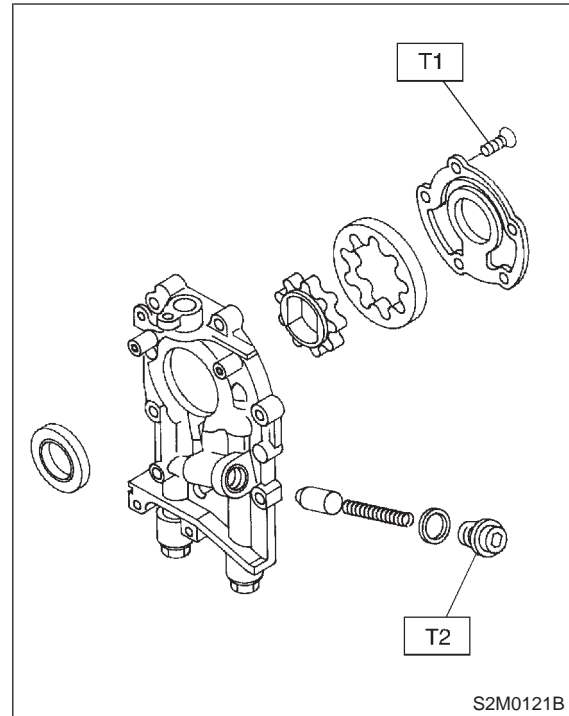


- 2) Install inner and outer rotors in their original positions.
- 3) Install oil relief valve and relief spring.
- 4) Install oil pump cover.

Tightening torque:

T1: 5 — 6 N·m (0.5 — 0.6 kg·m, 3.6 — 4.3 ft·lb)

T2: 40.7 — 47.5 N·m (4.15 — 4.84 kg·m, 30.0 — 35.0 ft·lb)



E: INSTALLATION

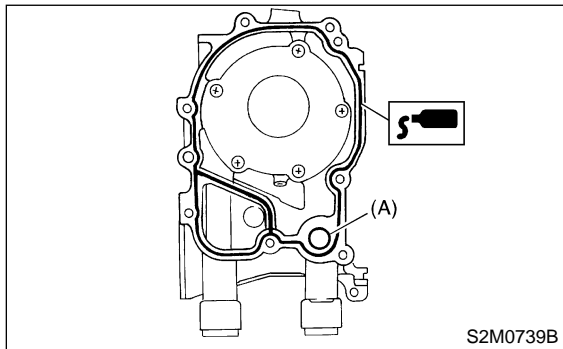
Install in the reverse order of removal.
Observe the following:

- 1) Apply fluid packing to matching surfaces of oil pump.

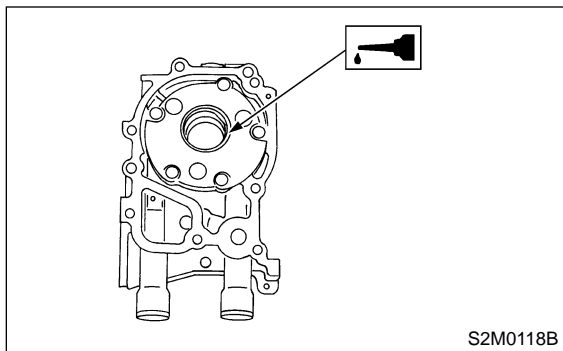
Fluid packing:

THREE BOND 1215 or equivalent

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



- 3) Apply a coat of 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.

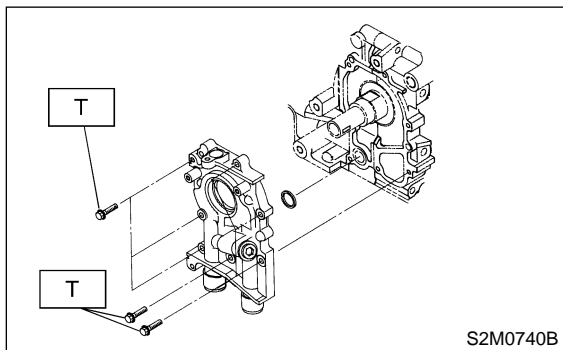
CAUTION:

Make sure the oil seal lip is not folded.

- 6) Install oil pump.

Tightening torque:

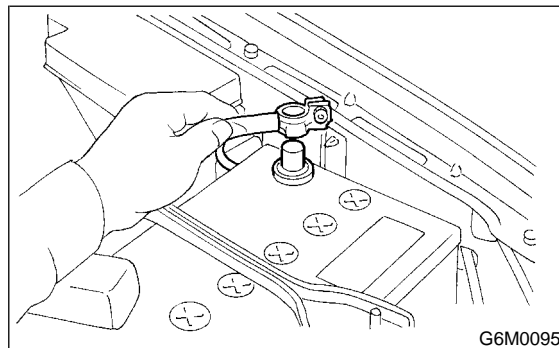
T: 6.4 N·m (0.65 kg·m, 4.7 ft·lb)



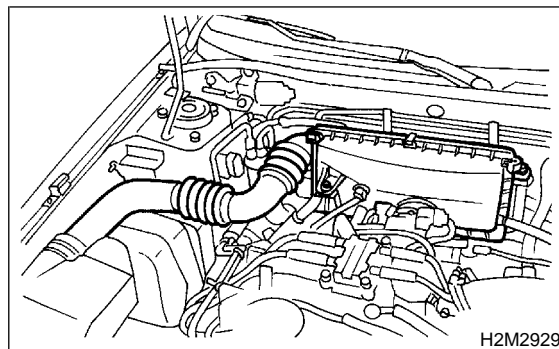
2. Oil Pan and Oil Strainer

A: REMOVAL

- 1) Set the vehicle on the lift.
- 2) Disconnect battery ground cable.



- 3) Remove air intake duct and air cleaner assembly. <Ref. to 2-7 [W1A0].>



- 4) Disconnect front oxygen (A/F) sensor connector.

