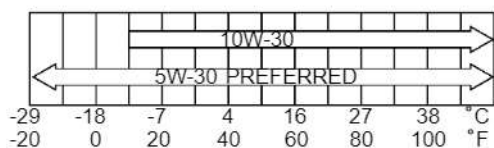


Recommended Viscosity (SAE):



TEMPERATURE RANGE ANTICIPATED BEFORE NEXT OIL CHANGE

B00319

OIL AND FILTER INSPECTION

LU00H-04

1. CHECK ENGINE OIL QUALITY

Check the oil for deterioration, entry of water, discoloring or thinning.

If the quality is visibly poor, replace the oil.

Oil grade:

API grade SJ, Energy-Conserving or ILSAC multi-grade engine oil. SAE 5W-30 is the best choice for your vehicle, for good fuel economy, and good starting in cold weather.

2. CHECK ENGINE OIL LEVEL

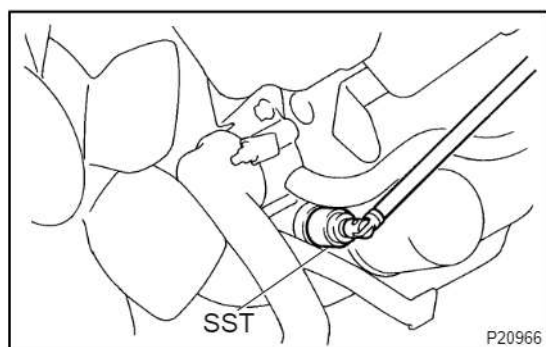
The oil level should be between the low level and full level marks on the dipstick.

3. CHECK OIL LEVEL

The oil level should be between the "L" and "F" marks on the level gauge. If low, check for leakage and add oil up to the "F" mark. If low, check for leakage and add oil up to the full level marks.

NOTICE:

- When inserting the oil dipstick, insert the curved tip of the dipstick facing the same direction as the curve of the guide.
- If the dipstick gets caught while inserting it, do not force it in. Reconfirm the direction of the dipstick.



4. REMOVE OIL PRESSURE SWITCH

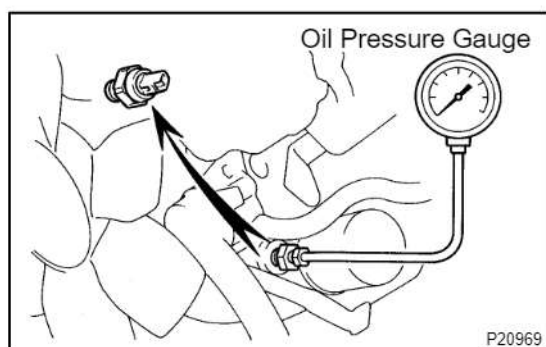
Using SST, remove the oil pressure switch.

SST 09816-30010

5. INSTALL OIL PRESSURE GAUGE

6. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.

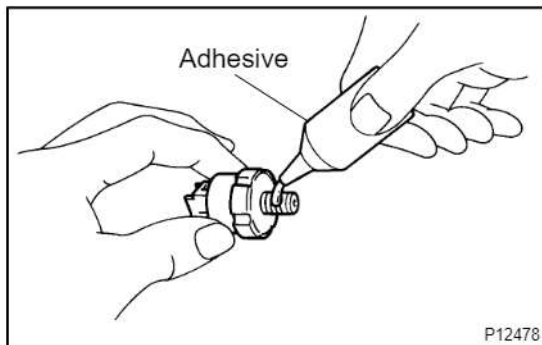


7. MEASURE OIL PRESSURE

Oil pressure:

At idle	29 kPa (0.3 kgf/cm ² , 4.3 psi) or more
At 3,000 rpm	245 - 520, kPa (2.5 - 5.3 kgf/cm ² , 36 - 75 psi)

8. REMOVE OIL PRESSURE GAUGE

**9. INSTALL OIL PRESSURE SWITCH**

- (a) Apply adhesive to 2 or 3 threads.

Adhesive:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

- (b) Using SST, install the oil pressure switch.

SST 09816-30010

Torque: 15 N·m (150 kgf·cm, 11 ft·lbf)

10. START ENGINE AND CHECK FOR LEAKS

REPLACEMENT

CAUTION:

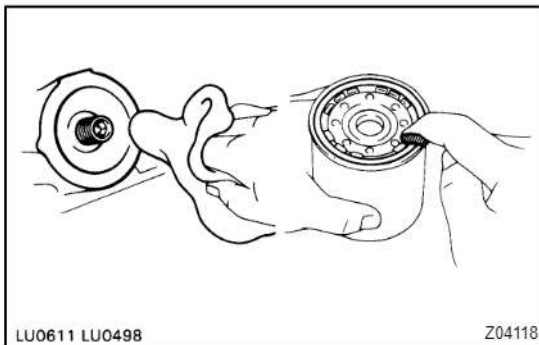
- Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.
- Care should be taken, therefore, when changing engine oil to minimize the frequency and length of time your skin is exposed to used engine oil. Protective clothing and gloves that cannot be penetrated by oil should be worn. The skin should be thoroughly washed with soap and water, or use water-less hand cleaner, to remove any used engine oil. Do not use gasoline, thinners, or solvents.
- In order to preserve the environment, used oil and used oil filters must be disposed of only at designated disposal sites.

1. DRAIN ENGINE OIL

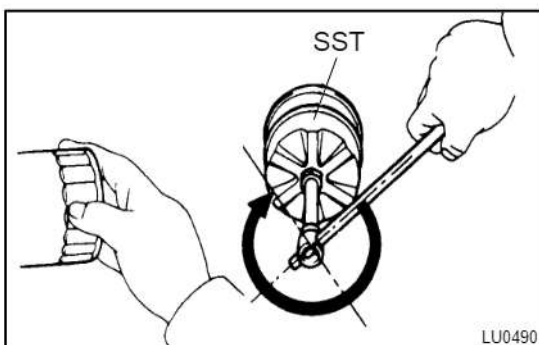
- Remove the oil filler cap.
- Remove the oil drain plug, and drain the oil into a container.

2. REPLACE OIL FILTER

- Using SST, remove the oil filter.
SST 09228-07501



- Clean the oil filter contact surface on the oil filter mounting.
- Lubricate the filter rubber gasket with clean engine oil.



- Tighten the oil filter by hand until the rubber gasket contacts the seat of the filter mounting.
- Using SST, give it an additional 3/4 turn to seat the filter.
SST 09228-07501

3. FILL WITH ENGINE OIL

- Clean and install the oil drain plug with a new gasket.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

- (b) Fill with new engine oil.

Capacity:

Drain and refill

w/ Oil filter change	5.2 liters (5.5 US qts, 4.5 Imp. qts)
w/o Oil filter change	4.9 liters (5.2 US qts, 4.3 Imp. qts)

Dry fill: 5.9 liters (6.2 US qts, 5.2 Imp. qts)

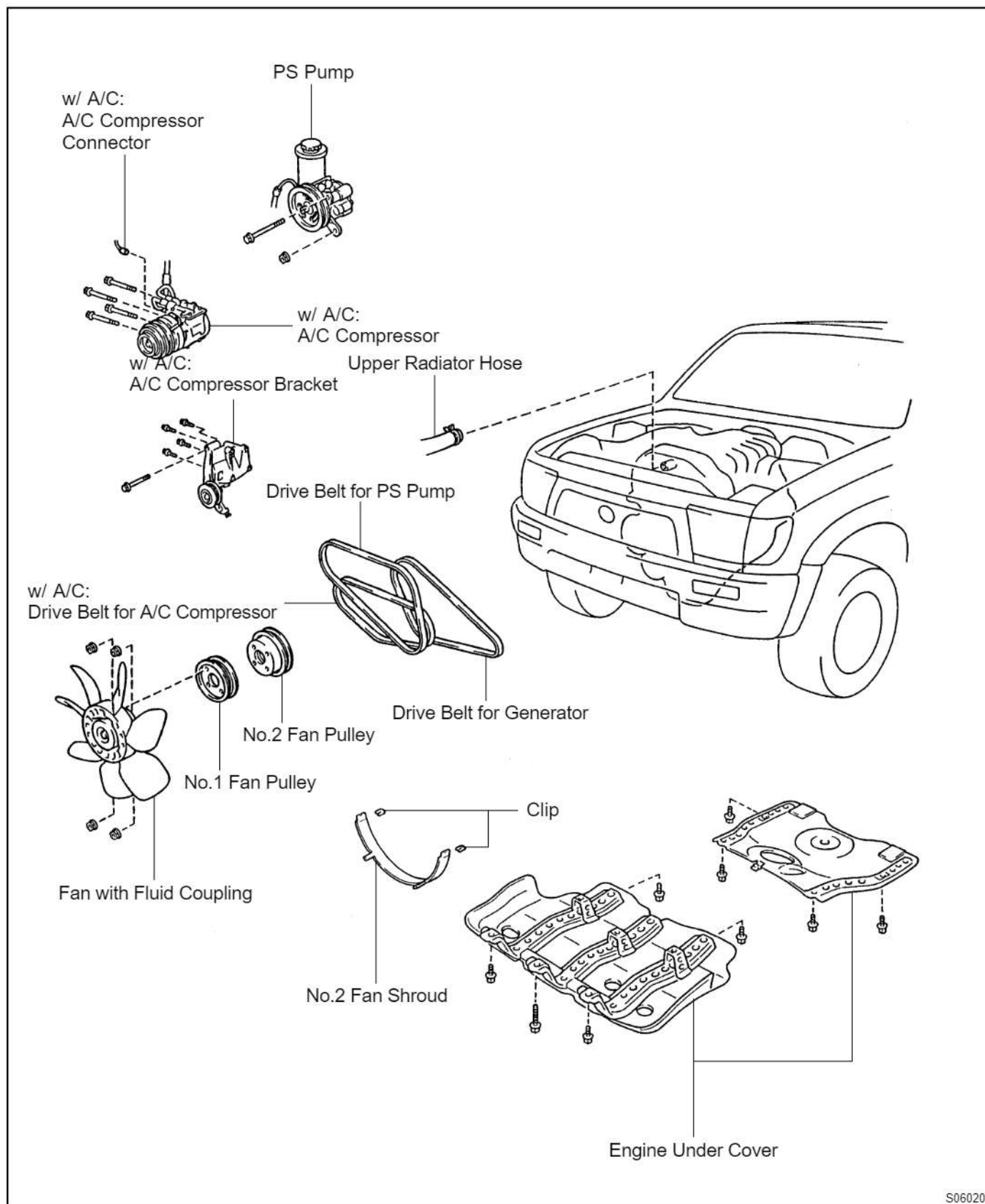
- (c) Reinstall the oil filler cap.

4. START ENGINE AND CHECK FOR OIL LEAKS

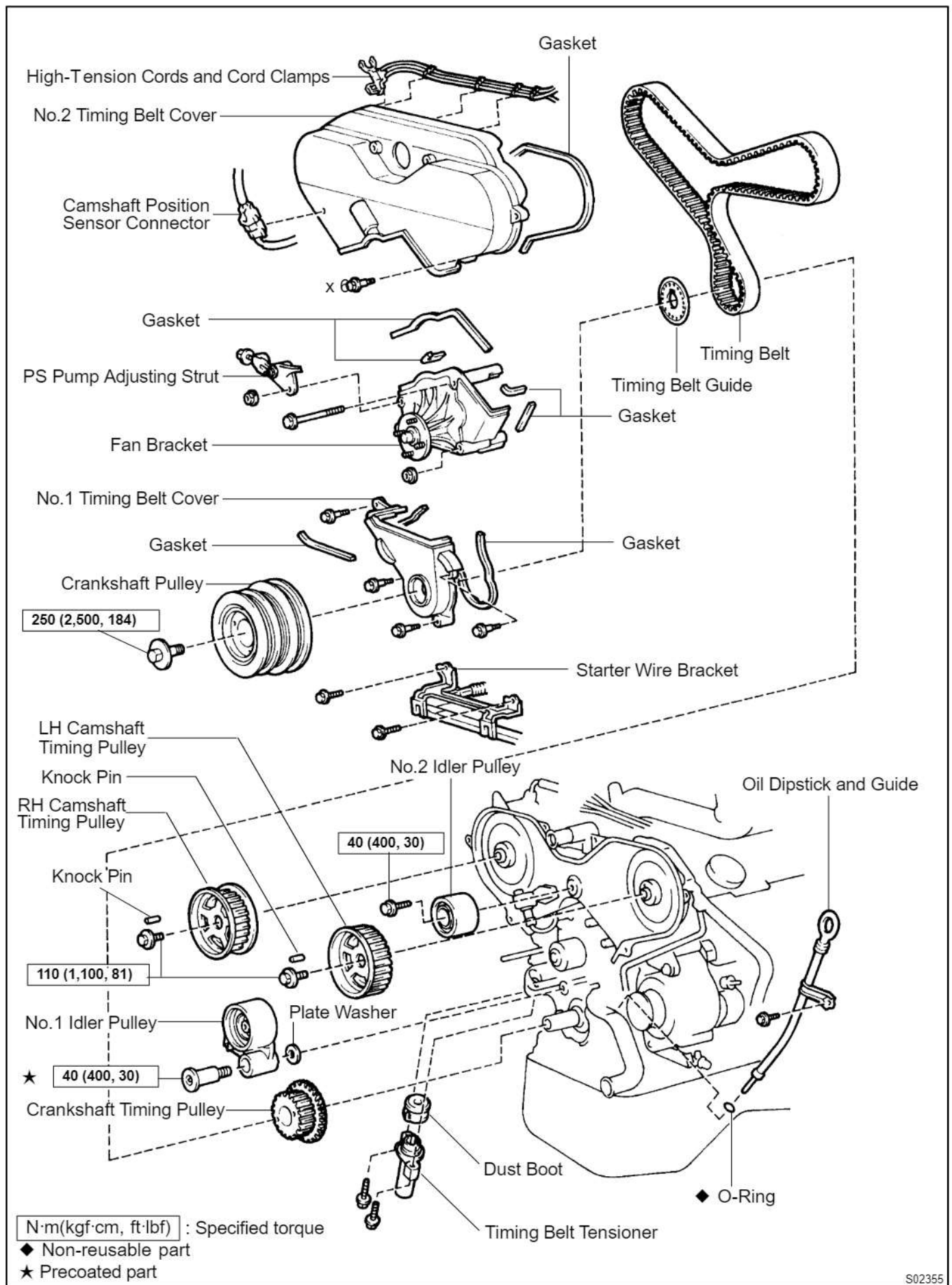
5. RECHECK ENGINE OIL LEVEL

OIL PUMP COMPONENTS

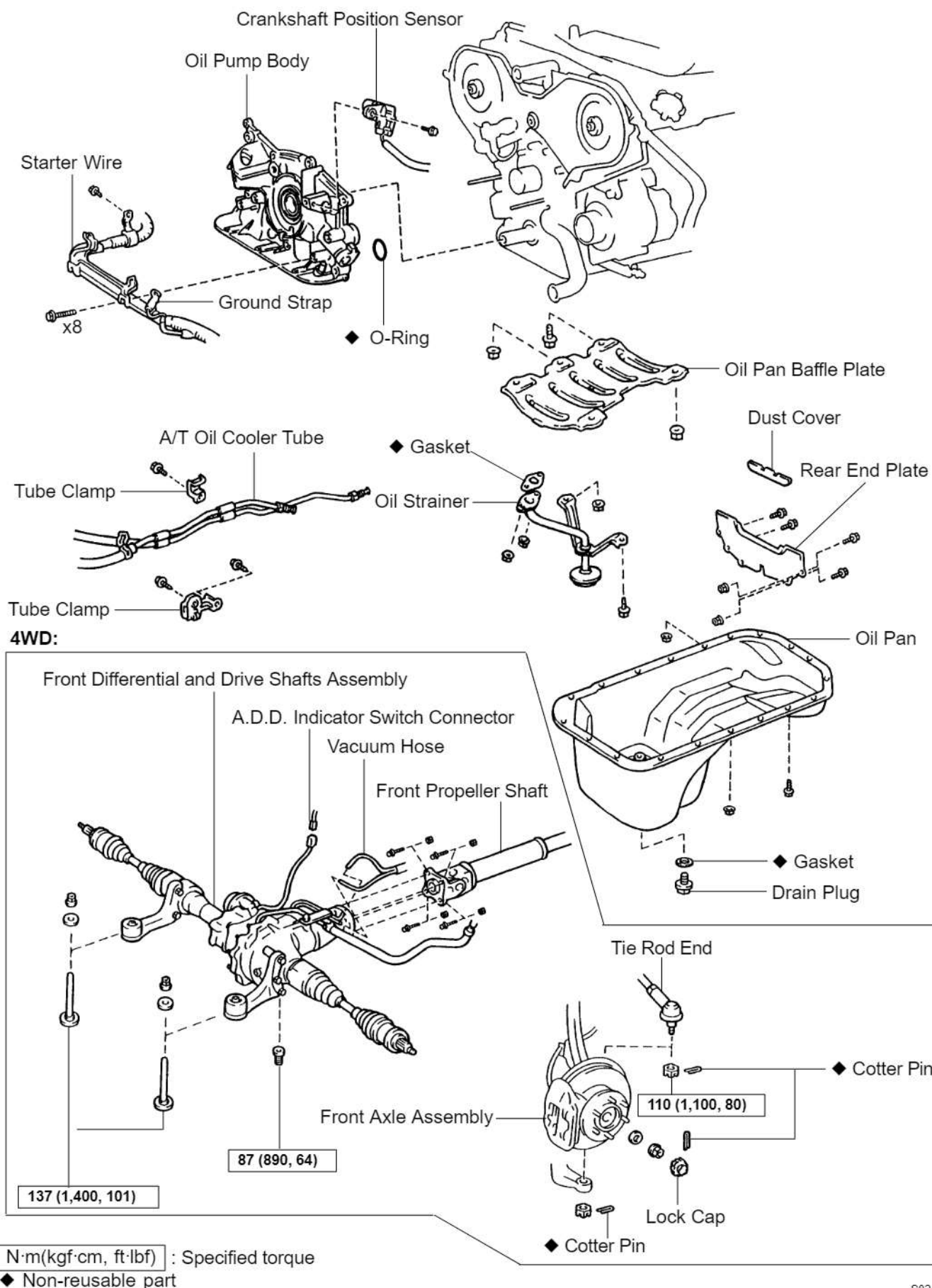
LU00J-03



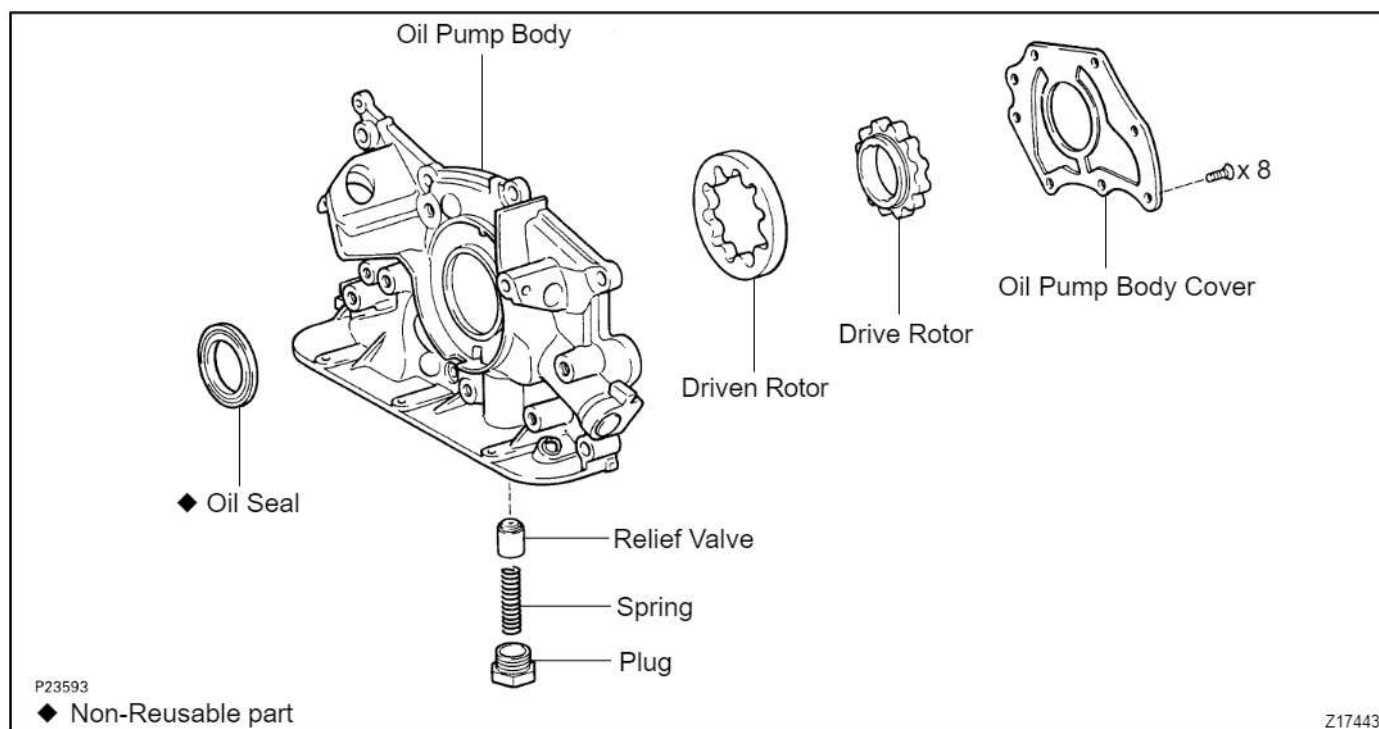
S06020



S02355



S02421

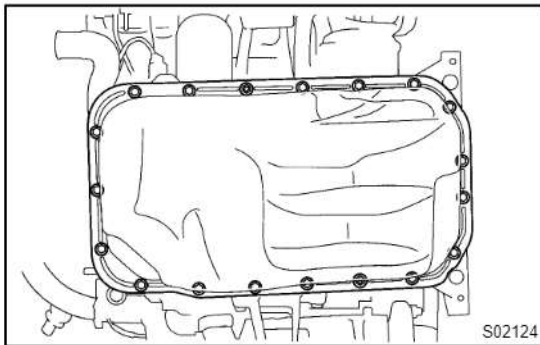


REMOVAL

HINT:

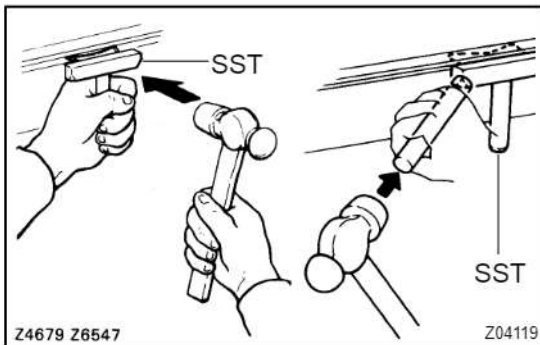
When repairing the oil pump, the oil pan and strainer should be removed and cleaned.

1. **REMOVE CRANKSHAFT TIMING PULLEY**
(See page [EM-13](#))
2. **4WD:**
REMOVE FRONT DIFFERENTIAL (See page [SA-29](#))
3. **DRAIN ENGINE OIL**
4. **A/T:**
REMOVE OIL COOLER TUBE AND CLAMP
(A340E:See page [AT-19](#))
(A340F:See page [AT-22](#))
5. **REMOVE REAR END COVER AND DUST COVER**
6. **DISCONNECT STARTER WIRE CLAMP**
7. **REMOVE CRANKSHAFT POSITION SENSOR**
(See page [IG-12](#))



8. REMOVE OIL PAN

- (a) Remove the 17 bolts and 2 nuts.

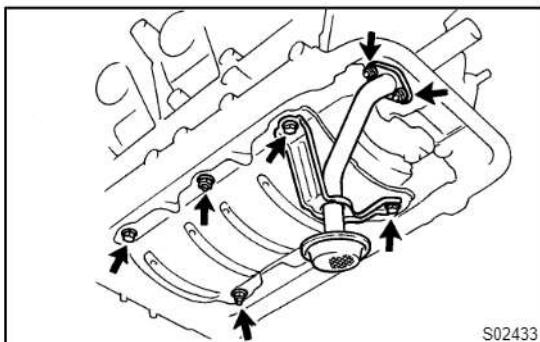


- (b) Using SST and a brass bar, separate the oil pan from the cylinder block.

SST 09032-00100

HINT:

When removing the oil pan, be careful not to damage the oil pan flange.

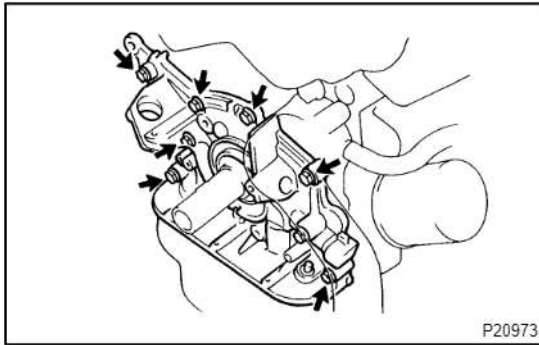


9. REMOVE OIL STRAINER

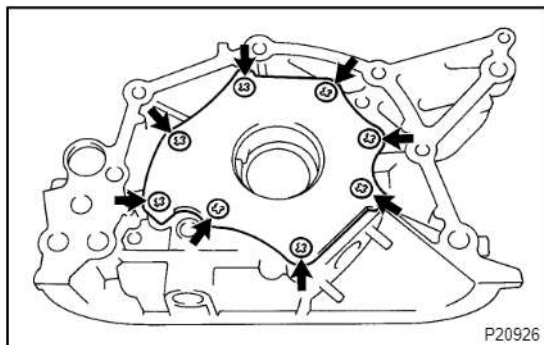
Remove the bolt, 3 nuts and oil strainer and gasket.

10. REMOVE OIL PAN BAFFLE PLATE

Remove the bolt, 2 nuts and oil pan baffle plate.

**11. REMOVE OIL PUMP**

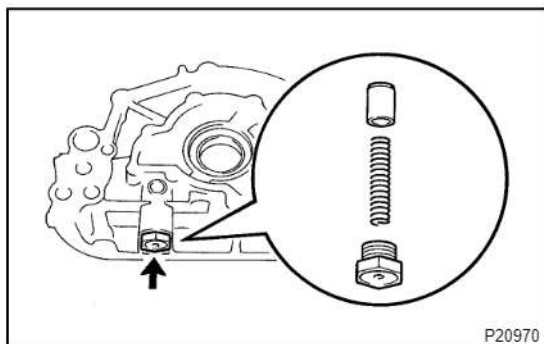
- (a) Remove the 8 bolts, ground strap and oil pump.
- (b) Using a plastic-faced hammer, carefully tap the oil pump body.
- (c) Remove the O-ring from the cylinder block.



DISASSEMBLY

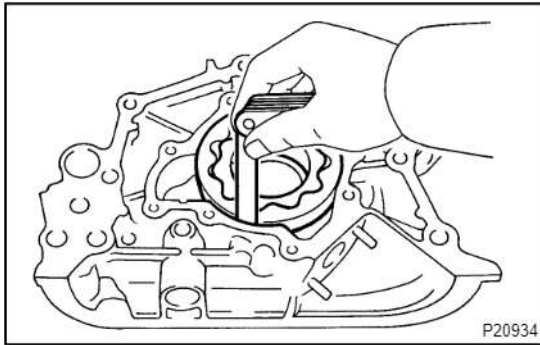
1. REMOVE DRIVEN AND DRIVE ROTORS

- Remove the 8 screws and pump body cover.
- Remove the drive and driven rotors.



2. REMOVE RELIEF VALVE

- Unscrew the relief valve plug and gasket.
- Remove the spring and relief valve.



INSPECTION

1. INSPECT BODY CLEARANCE

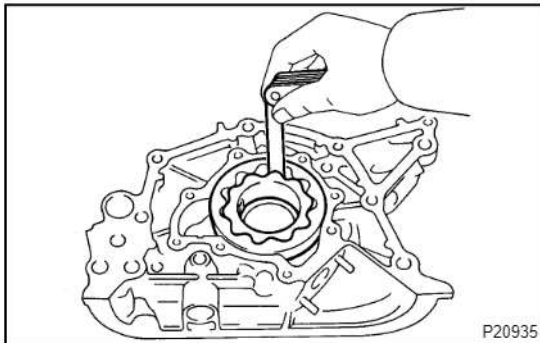
Using a thickness gauge, measure the clearance between the driven rotor and pump body.

Standard clearance:

0.10 - 0.18 mm (0.0039 - 0.0069 in.)

Maximum clearance: 0.30 mm (0.0118 in.)

If the clearance is greater than the maximum, replace the oil pump rotor set and/or pump body.



2. INSPECT TIP CLEARANCE

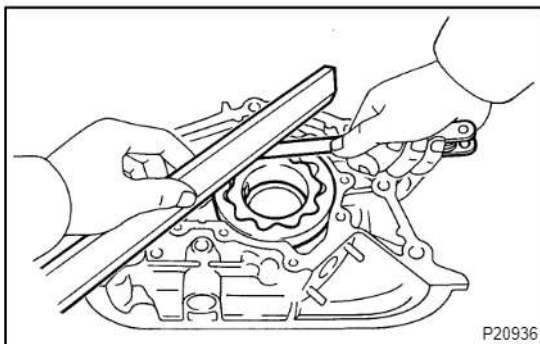
Using a thickness gauge, measure the clearance between the drive and driven rotors.

Standard clearance:

0.11 - 0.24 mm (0.0043 - 0.0094 in.)

Maximum clearance: 0.35 mm (0.0138 in.)

If the clearance is greater than the maximum, replace the oil pump rotor set.



3. INSPECT SIDE CLEARANCE

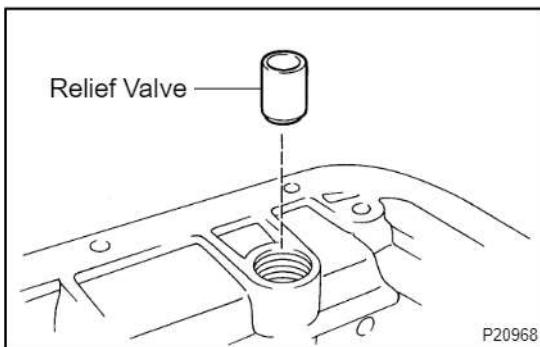
Using a thickness gauge and precision straight edge, measure the side clearance, as shown.

Standard clearance:

0.03 - 0.09 mm (0.0012 - 0.0035 in.)

Maximum clearance: 0.15 mm (0.0059 in.)

If the clearance is greater than the maximum, replace the oil pump rotor set and/or pump body.



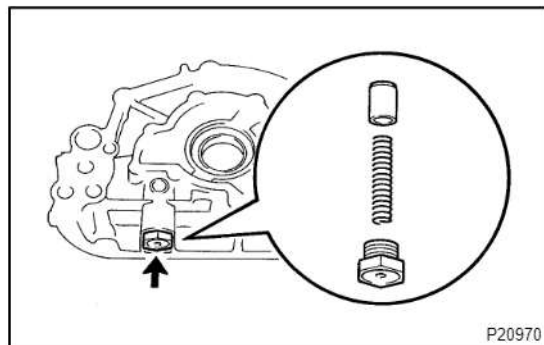
4. INSPECT RELIEF VALVE

Coat the relief valve with engine oil and check that it falls smoothly into the valve hole by its own weight.

If the valve does not fall smoothly, replace the valve and/or oil pump assembly.

REPLACEMENT

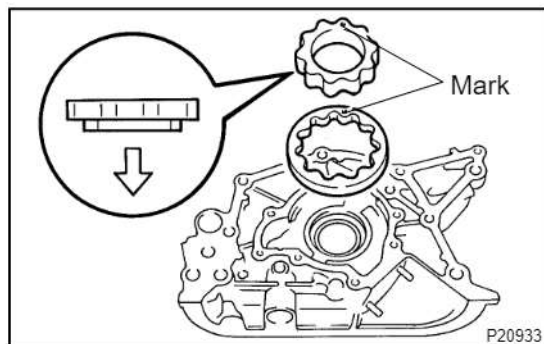
REPLACE CRANKSHAFT FRONT OIL SEAL (See page [EM-88](#))



REASSEMBLY

1. INSTALL RELIEF VALVE

Install the relief valve, compression spring, new gasket and plug.

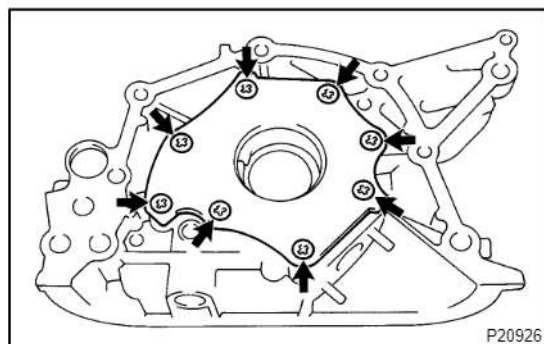


2. INSTALL DRIVEN AND DRIVE ROTORS

(a) Install the drive and driven rotor.

HINT:

Place the drive and driven rotor into pump body with the marks facing the pump body cover side.



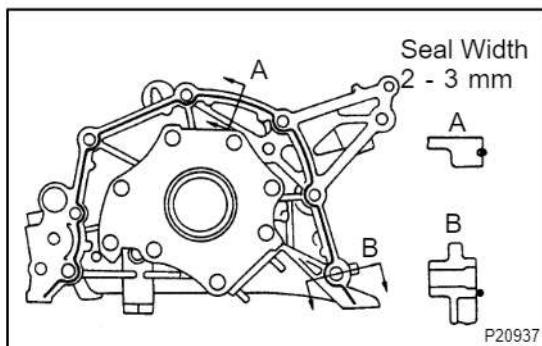
(b) Install the pump body cover with 8 screws

Torque: 10 N·m (105 kgf·cm, 8 ft·lbf)

INSTALLATION

1. INSTALL OIL PUMP

- (a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the oil pump and cylinder block.
- Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing grooves.
 - Thoroughly clean all components to remove all the loose material.
 - Using a non-residue solvent, clean both sealing surfaces.



- (b) Apply seal packing to the oil pump, as shown in the illustration.

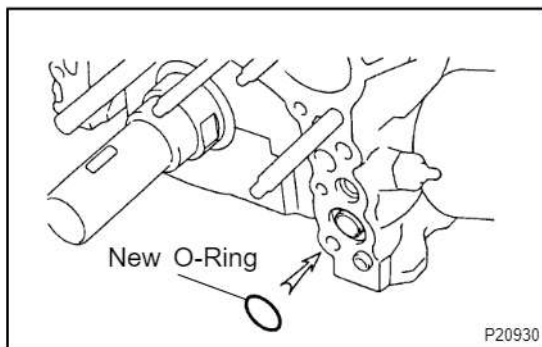
Seal packing: Part No. 08826-00080 or equivalent

- Install nozzle that has been cut out to a 2-3 mm (0.08-0.12 in.) opening.

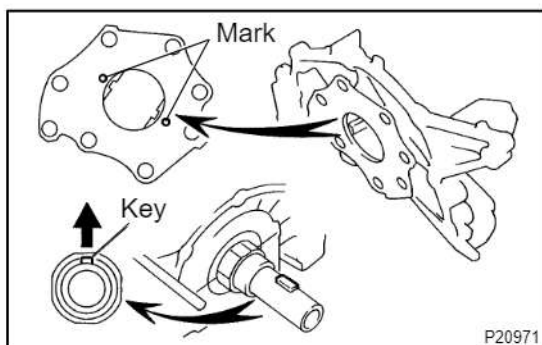
HINT:

Avoid applying an excessive amount to the surface.

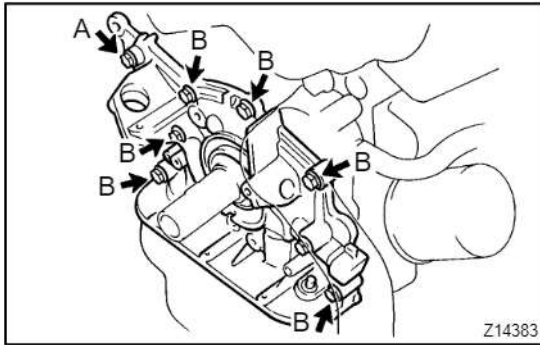
- Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.



- (c) Place a new O-ring into the groove of cylinder block.



- (d) Install the oil pump to the crankshaft with the spline teeth of the drive rotor engaged with the large teeth of the crankshaft.



- (e) Install the oil pump with the 8 bolts, and ground strap.

Torque:

Bolt A: 20 N·m (200 kgf·cm, 15 ft·lbf)

Bolt B: 42 N·m (420 kgf·cm, 31 ft·lbf)

2. INSTALL CRANK SHAFT POSITION SENSOR

(See page [IG-14](#))

3. INSTALL OIL PAN BAFFLE PLATE

4. INSTALL OIL STRAINER

Place a new gasket and install the oil strainer.

Torque: 7.5 N·m (76 kgf·cm, 66 in·lbf)

5. CLEAN OIL PAN.

Remove any old packing (FIPG) material and be careful not to drop any oil on the contacting surfaces of the, oil pan, cylinder block and sealing grooves.

- Using a razor blade and gasket scraper, remove all the remaining seal packing (FIPG) material from the gasket surfaces.
- Thoroughly clean all components to remove all the loose material.
- Clean both sealing surfaces with a non-residue solvent.

NOTICE:

Do not use a solvent which will affect the painted surfaces.

6. INSTALL OIL PAN

- (a) Apply seal packing to the oil pan, as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

- Install a nozzle that has been cut to a 3 - 4 mm (0.12 - 0.16 in.) opening.

HINT:

Avoid applying an excess amount to the surface.

- If parts are not assembled within 5 minutes of applying the seal packing, the effectiveness of the seal packing is lost and the seal packing must be removed and reapplied.
- Immediately remove the nozzle from the tube and reinstall the cap after using the seal packing.

- (b) Install the oil pan with the 2 nuts and 17 bolts.

Torque: 7.6 N·m (78 kgf·cm, 67 in·lbf)

7. INSTALL REAR END COVER AND DUST COVER

8. CONNECT STARTER WIRE CLAMP

9. A/T:

INSTALL OIL COOLER TUBE AND CLAMP

(A340E: See page [AT-21](#))

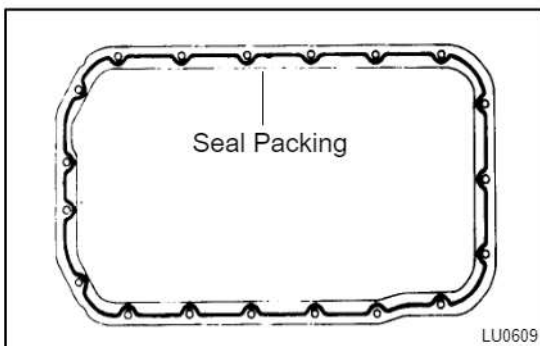
(A340F: See page [AT-27](#))

10. INSTALL CRANKSHAFT TIMING PULLEY

(See page [EM-19](#))

11. 4WD:

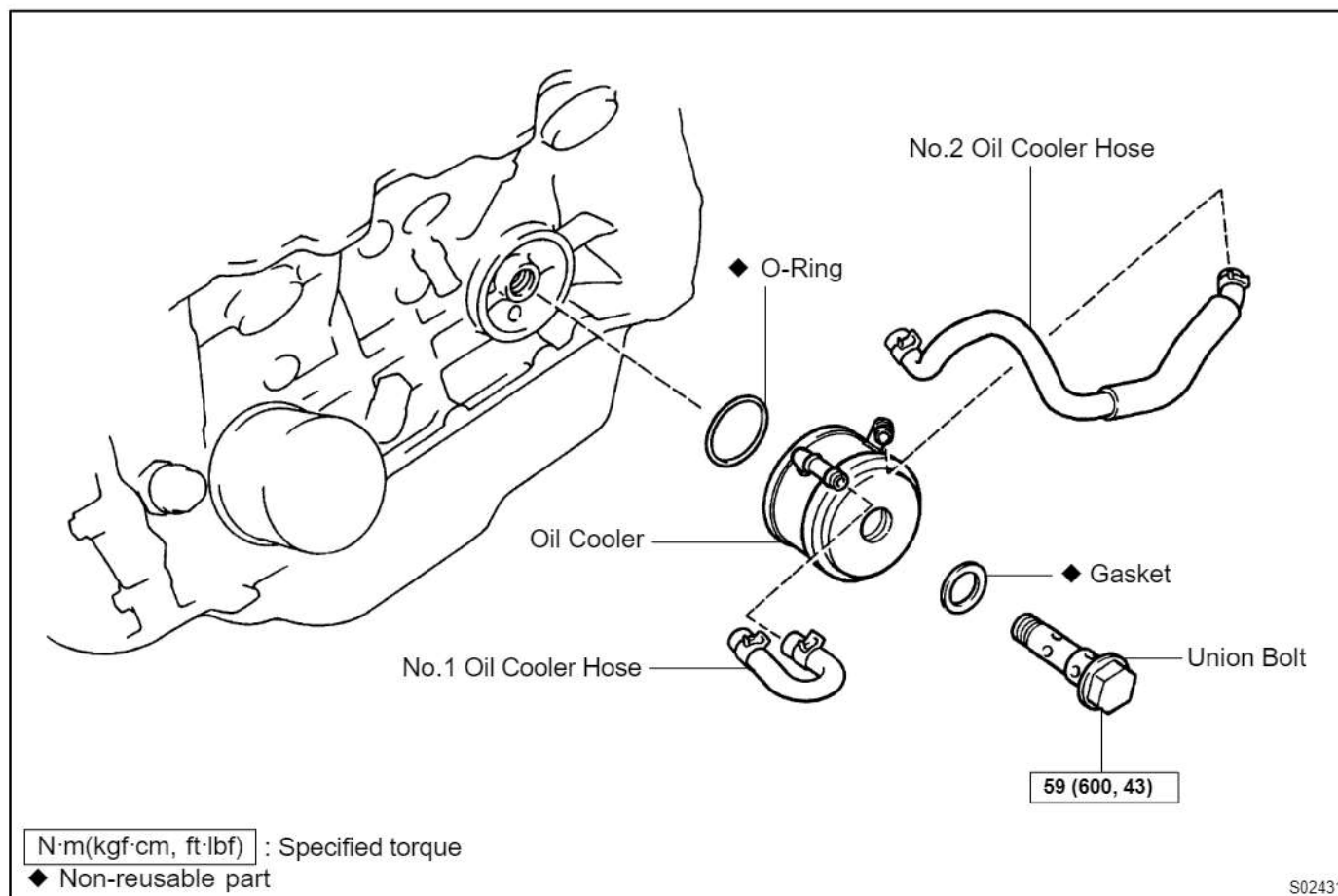
INSTALL FRONT DIFFERENTIAL (See page [SA-47](#))



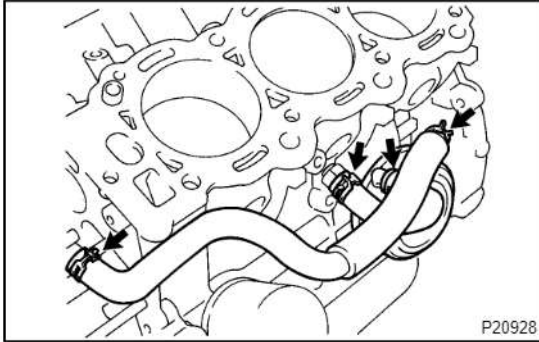
12. FILL WITH ENGINE OIL
13. START ENGINE AND CHECK FOR LEAKS
14. INSTALL ENGINE UNDER COVER
15. RECHECK ENGINE OIL LEVEL

OIL COOLER COMPONENTS

LU009-03



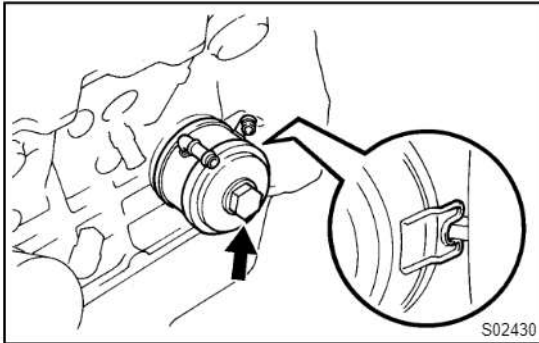
S02431



REMOVAL

1. **DRAIN ENGINE COOLANT**
2. **DISCONNECT OIL COOLER HOSES**

Disconnect the No.1 and No.2 oil cooler hoses.



3. **REMOVE OIL COOLER**

Remove the union bolt, gaskets, oil cooler and O-ring.

INSPECTION

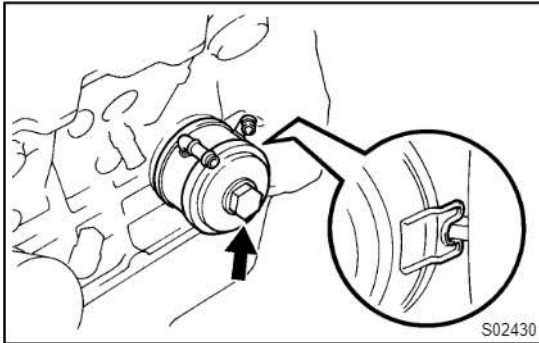
INSPECT OIL COOLER

Check the oil cooler for damage or clogging.
If necessary, replace the oil cooler.

INSTALLATION

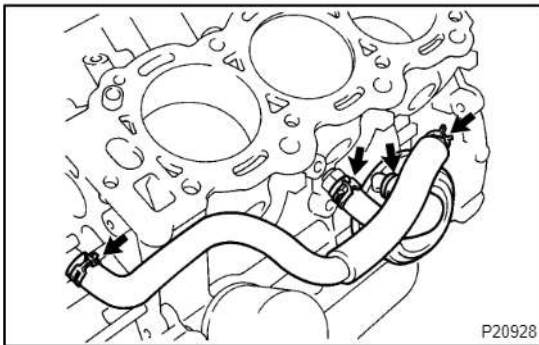
1. INSTALL OIL COOLER

- (a) Clean the oil cooler contact surface on the oil cooler mounting.
- (b) Place a new O-ring to the oil cooler.
- (c) Apply a light coat of engine oil on the threads and under the head of the union bolt.



- (d) Install the oil cooler, New gasket and union bolt.

Torque: 59 N·m (600 kgf·cm, 43 ft·lbf)



2. CONNECT OIL COOLER HOSES

Connect the No.1 and No.2 oil cooler hoses.

3. FILL WITH ENGINE COOLANT

4. START ENGINE AND CHECK FOR COOLANT AND ENGINE OIL LEAKS