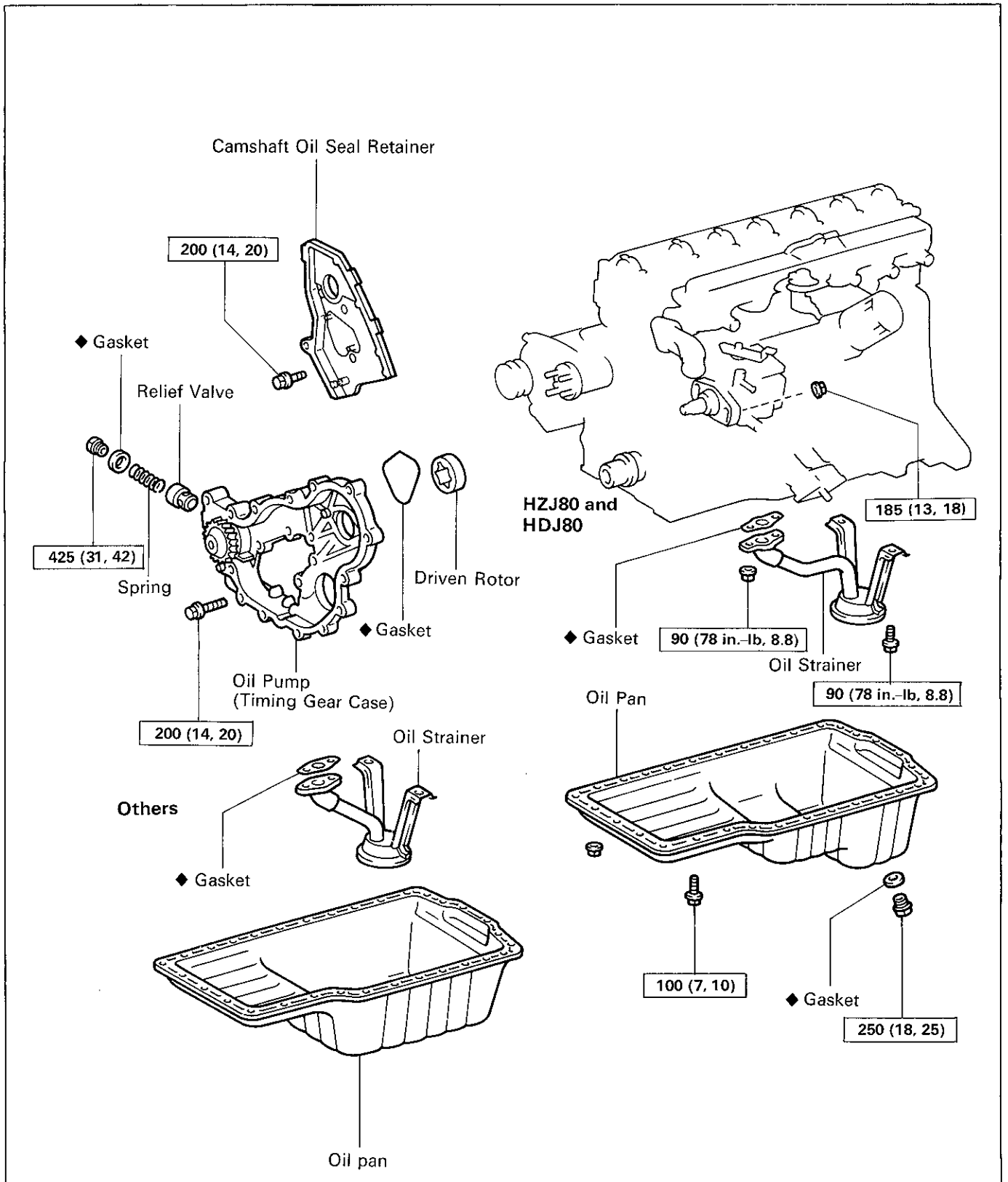
OIL PUMP

COMPONENT



kg-cm (ft-lb, N·m) : Specified torque

◆ Non-reusable part

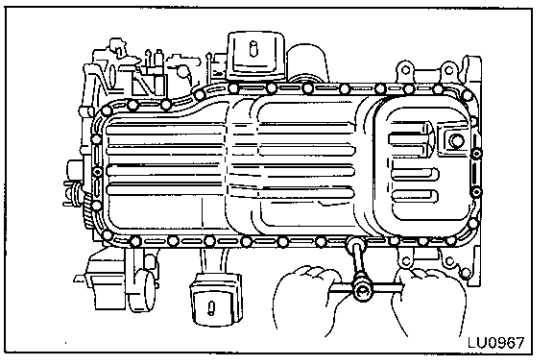
LU0991

REMOVAL OF OIL PUMP

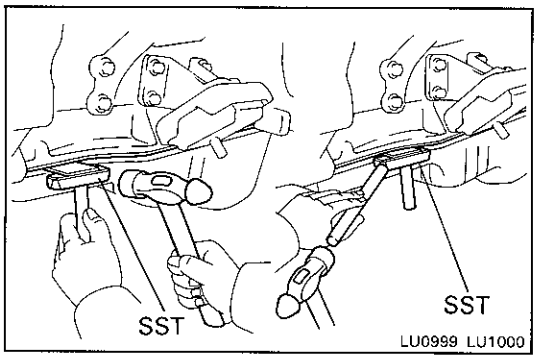
(See page LU-8)

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

1. **DRAIN ENGINE COOLANT (See page CO-4)**
2. **DRAIN ENGINE OIL (See page LU-6)**
3. **REMOVE TIMING GEARS (See steps 1 to 12 on pages EM-43 to 45)**
4. **REMOVE OIL PAN**



(a) Remove the twenty-three bolts (1PZ) or twenty-seven bolts (1HZ and IHD-T) and three nuts.



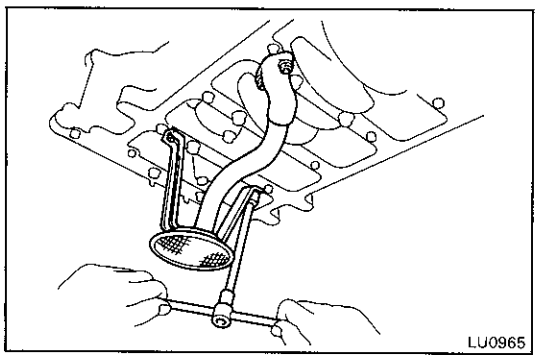
(b) Insert the blade of SST between the cylinder block and oil pan, cut off applied sealer and remove the oil pan.

SST 09032-00100

NOTICE:

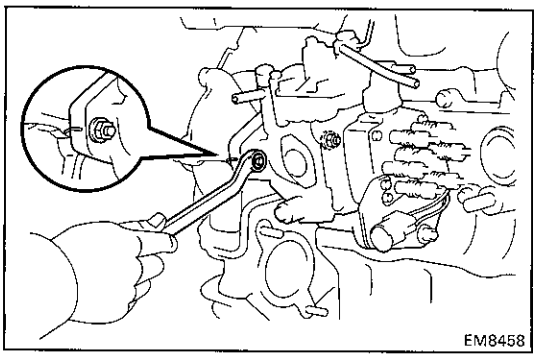
- **Do not use SST for the timing gear case side and rear oil seal retainer.**
- **Be careful not to damage the oil pan flange.**

5. **REMOVE OIL STRAINER**



Remove the two bolts, two nuts, oil strainer and gasket.

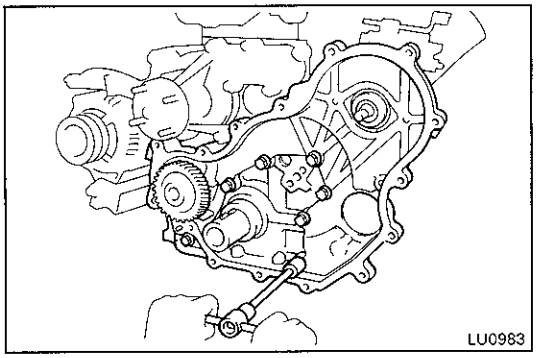
6. **REMOVE OIL PUMP (TIMING GEAR CASE)**



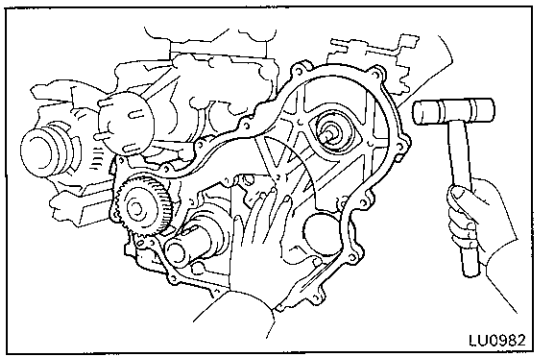
(a) Before removing the two nuts holding the timing gear case to the injection pump, check if the injection pump period lines are aligned.

If not, place new matchmarks for reinstallation.

(b) Remove the two nuts.

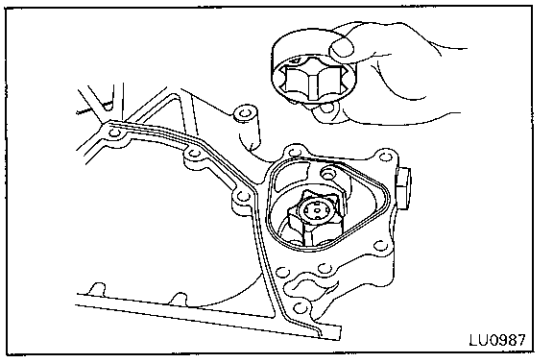


(c) Remove the seven bolts, timing gear case and gasket.



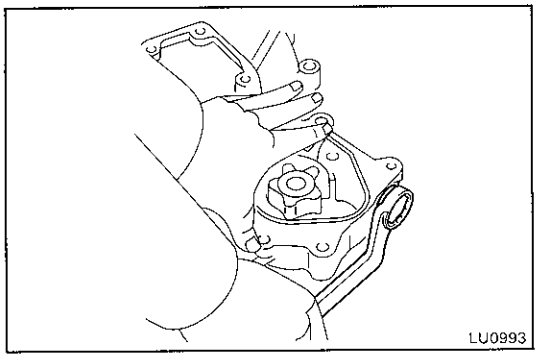
(d) Using a plastic-faced hammer, lightly tap out the timing gear case.

(e) Remove the gasket.



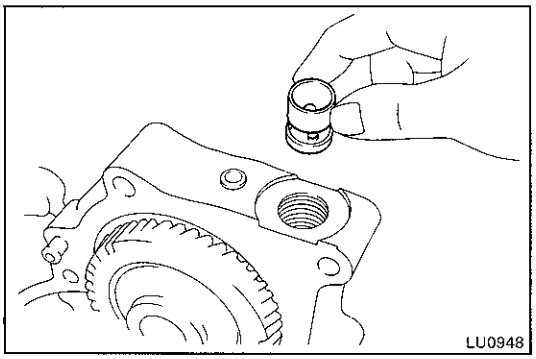
DISASSEMBLY OF OIL PUMP

1. REMOVE DRIVEN ROTOR



2. REMOVE RELIEF VALVE

Remove the plug, gasket, spring and relief valve.

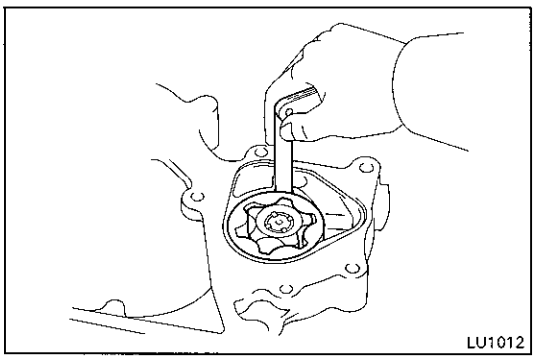


INSPECTION OF OIL PUMP

1. INSPECT RELIEF VALVE

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

If it does not, replace the relief valve. If necessary, replace the oil pump assembly.



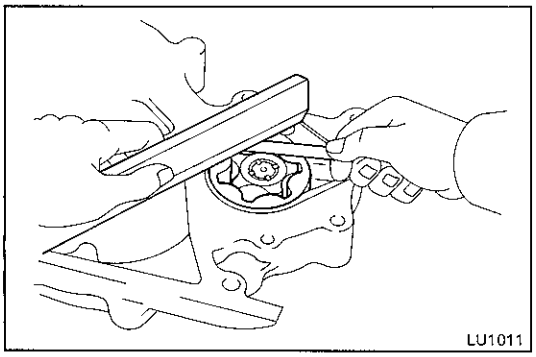
2. INSPECT DRIVE AND DRIVEN ROTORS

A. Inspect rotor body clearance

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

Standard body clearance: **0.10 – 0.17 mm (0.039 – 0.0067 in.)**
Maximum body clearance: **0.20 mm (0.0079 in.)**

If the body clearance is greater than maximum, replace the oil pump assembly.

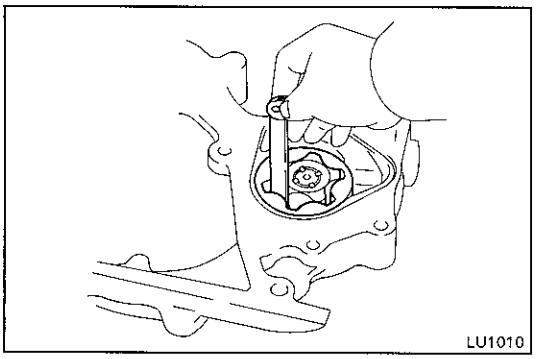


B. Inspect rotor side clearance

Using a thickness gauge and precision straight edge, measure the clearance between the rotors and precision straight edge.

Standard side clearance: **0.03 – 0.09 mm (0.0012 – 0.0035 in.)**
Maximum side clearance: **0.15 mm (0.0059 in.)**

If the side clearance is greater than maximum, replace the oil pump assembly.

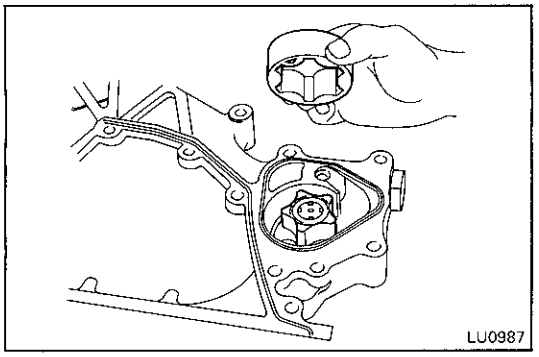


C. Inspect rotor tip clearance

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

Standard tip clearance: **0.08 — 0.16 mm (0.0031 — 0.0063 in.)**
Maximum tip clearance: **0.21 mm (0.0083 in.)**

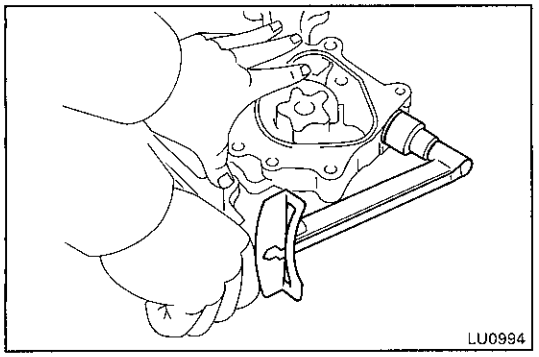
If the tip clearance is greater than maximum, replace the oil pump assembly.



ASSEMBLY OF OIL PUMP

(See page LU-8)

1. INSTALL DRIVEN ROTOR



2. INSTALL RELIEF VALVE

(a) Insert the relief valve and spring into the installation hole of the timing gear case.

(b) Install a new gasket and the plug.

Torque: 425 kg-cm (31 ft-lb, 42 N·m)

INSTALLATION OF OIL PUMP

(See page LU-8)

1. INSTALL OIL PUMP (TIMING GEAR CASE)

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the timing gear case and cylinder block.

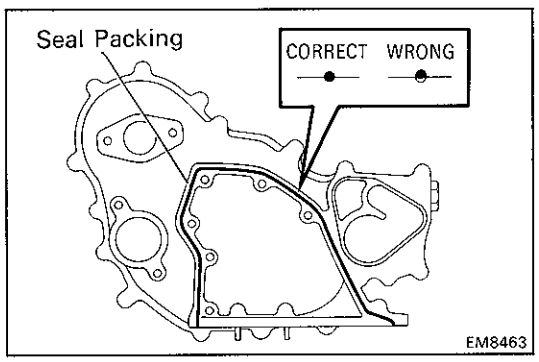
- Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces and sealing groove.
- Thoroughly clean all components to remove all the loose material.
- Using a non-residue solvent, clean both sealing surfaces.

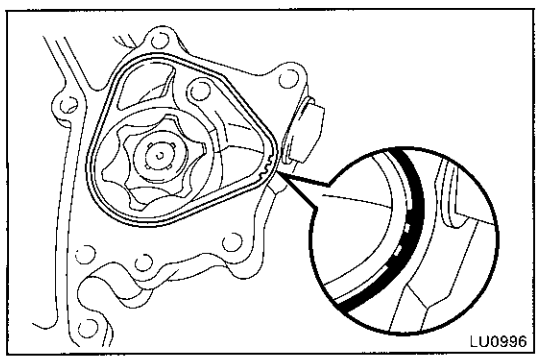
(b) Apply seal packing to the timing gear case as shown in the illustration.

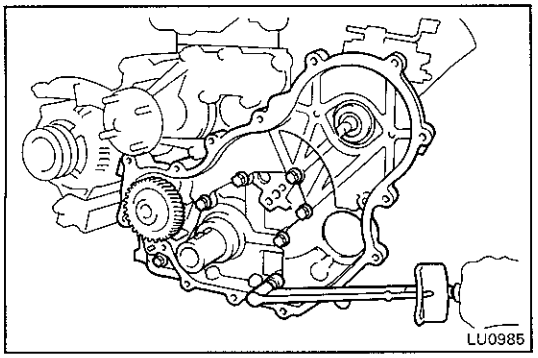
Seal packing: Part No.08826-00080 or equivalent

- Install a nozzle that has been cut to a 2 – 3 mm (0.08 – 0.12 in.) opening.
- 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 gasket into the groove of the timing gear case as shown in the illustration.

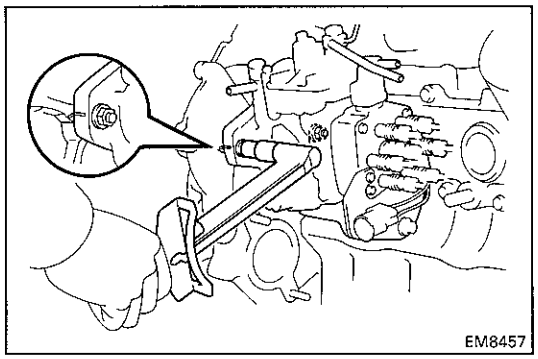






(d) Install the timing gear case with the seven bolts.

Torque: 200 kg-cm (14 ft-lb, 20 N·m)

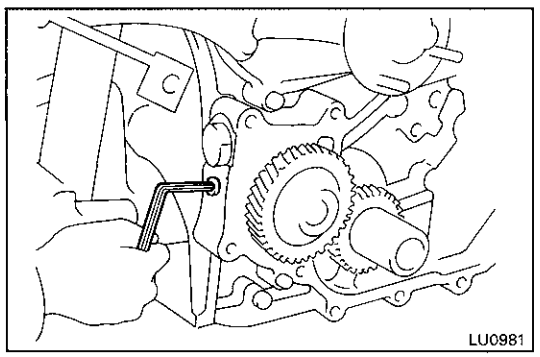


(e) Install the two nuts holding the injection pump to the timing gear case.

Torque: 185 kg-cm (13 ft-lb, 18 N·m)

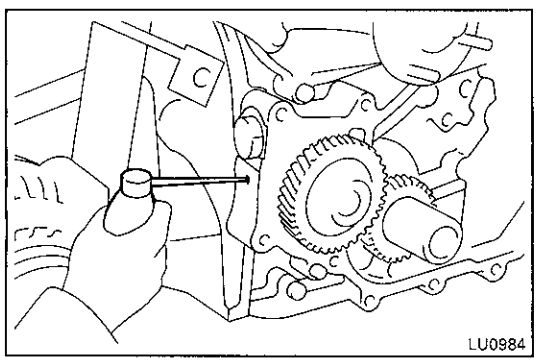
(f) Check that the injection pump period lines (or matchmarks) are aligned.

If not correct, align the period lines (or matchmarks) by tilting the injection pump.

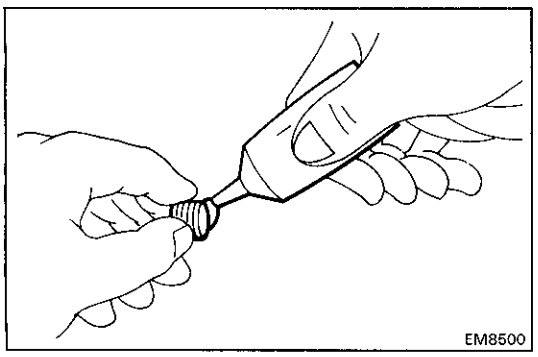


2. POUR ENGINE OIL INTO OIL PUMP

(a) Using a 5 mm hexagon wrench, remove the taper screw plug.



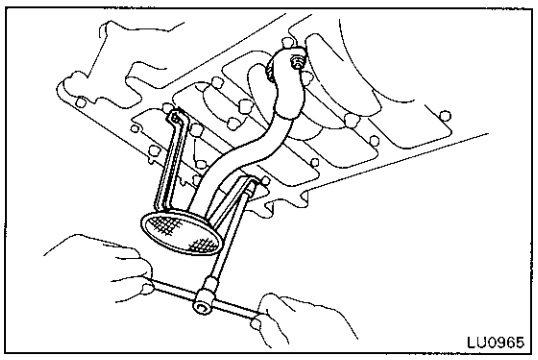
(b) Pour in approx. 10 cc (0.061 cu in.) of engine oil into the oil pump.



(c) Apply adheshive to two or three threads of the taper screw.

Adhesive: Part No. 08833-00070, THREE BOND 1324 or equivalent

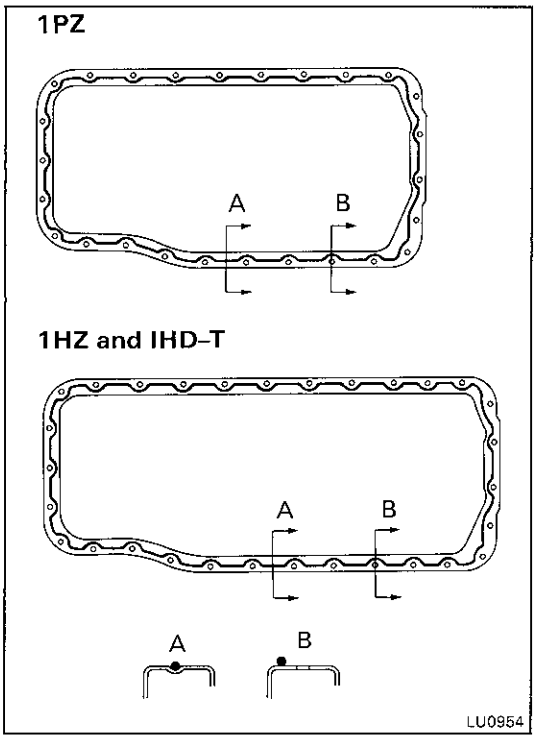
(d) Using a 5 mm hexagon wrench, install the taper screw.



3. INSTALL OIL STRAINER

Install a new gasket and the oil strainer with the two bolts and two nuts.

Torque: 90 kg-cm (78 in.-lb, 8.8 N·m)



4. INSTALL OIL PAN

(a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surfaces of the oil pan and cylinder block.

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

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

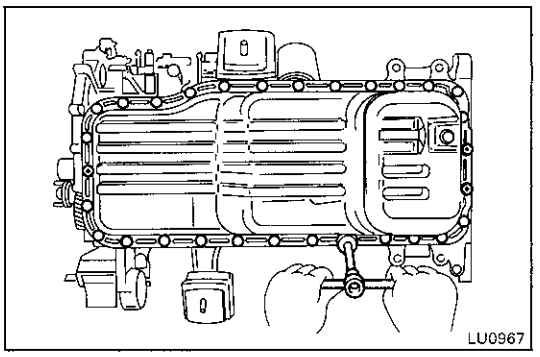
(b) Apply seal packing to the oil pan as shown in the illustration.

Seal packing: Part No.08826-00080 or equivalent

- Install a nozzle that has been cut to a 5 mm (0.20 in.) opening.
- 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) Install the oil pan with the twenty-three bolts (1PZ) or twenty-seven bolts (1HZ and 1HD-T) and three nuts.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)



5. INSTALL TIMING GEARS
(See steps 2 to 12 on pages EM-50 to 53)

6. FILL WITH ENGINE OIL (See page LU-7)

7. FILL WITH ENGINE COOLANT (See page CO-5)

8. START ENGINE AND CHECK FOR LEAKS