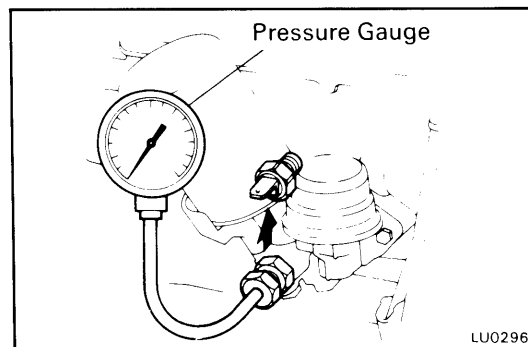
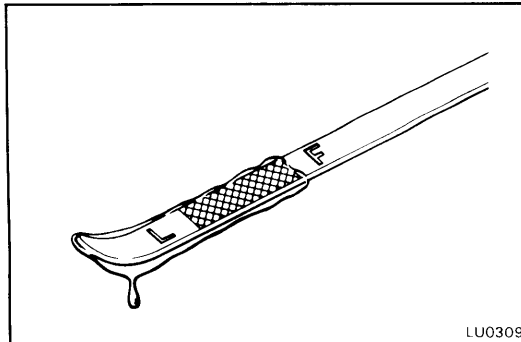
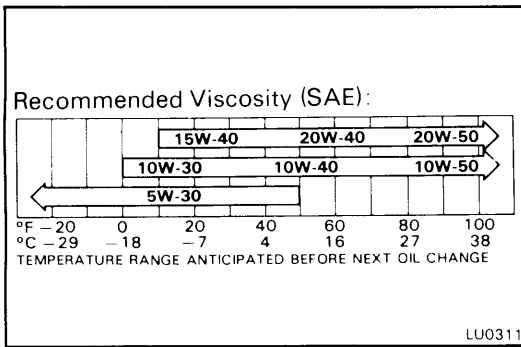

LUBRICATION SYSTEM

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TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Oil leakage	Cylinder head, cylinder block or oil pump body damaged or cracked Oil seal faulty Gasket faulty	Repair as necessary Replace oil seal Replace gasket	EM-34, 57
Low oil pressure	Oil leakage Relief valve faulty Oil pump faulty Engine oil quality poor Crankshaft bearing faulty Connecting rod bearing faulty Oil filter clogged	Repair as necessary Repair relief valve Repair oil pump Replace engine oil Replace bearing Replace bearing Replace oil filter	LU-5 LU-5 LU-4 EM-39 EM-39 LU-4
High oil pressure	Relief valve faulty	Repair relief valve	LU-5



OIL PRESSURE CHECK

1. CHECK ENGINE OIL QUALITY

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

If the quality is poor, replace the oil.

Use API grade SF or SF/CC, multigrade, fuel-efficient and recommended viscosity oil.

2. CHECK ENGINE OIL LEVEL

The oil level should be between the "L" and "F" marks on the oil dipstick.

If low, check for leakage and add oil up to the "F" mark.

3. REMOVE OIL PRESSURE SWITCH OR SENDER GAUGE

4. INSTALL OIL PRESSURE GAUGE

5. START ENGINE

Start engine and warm it up to normal operating temperature.

6. CHECK OIL PRESSURE

Oil pressure:

At idle	0.3 kg/cm ² (4.3 psi, 29 kPa) or more
At 3,000 rpm	2.5 – 5.0 kg/cm ² (36 – 71 psi, 245 – 490 kPa)

NOTE: Check for oil leakage after reinstalling the oil pressure switch or sender gauge.

REPLACEMENT OF ENGINE OIL AND OIL FILTER

1. DRAIN ENGINE OIL

- (a) Remove the oil filter cap.
- (b) Remove the oil drain plug and drain the oil into a container.

2. REPLACE OIL FILTER

- (a) Using SST, remove the oil filter.
SST 4WD A/T (w/Oil cooler) 09228-44011
Others (w/o Oil cooler) 09228-22020
- (b) Check and clean the oil filter installation surface.
- (c) Apply clean engine oil to the gasket of a new oil filter.

- (d) Lightly screw in the oil filter by hand to where you feel resistance.
- (e) Then, using SST, tighten it another 3/4 turn.

SST 4WD A/T (w/Oil cooler) 09228-44011
Others (w/o Oil cooler) 09228-22020

3. FILL WITH ENGINE OIL

- (a) Clean and install the oil drain plug with a new gasket.
- (b) Fill the engine with new oil, API grade SF or SF/CC multigrade, fuel-efficient and recommended viscosity oil.

Capacity:

Drain and refill

w/ Oil filter change

3.5 liters (3.7 US qts, 3.1 Imp. qts)

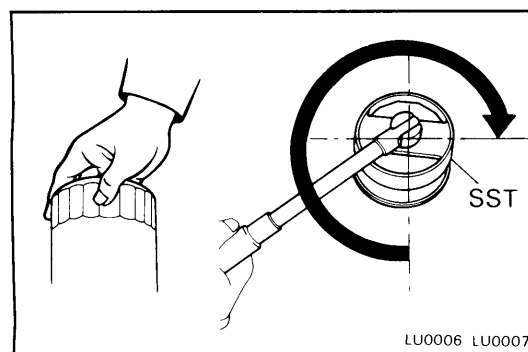
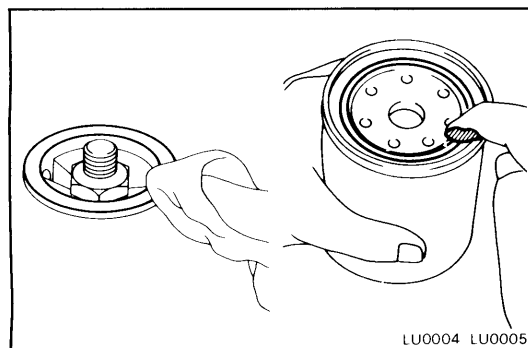
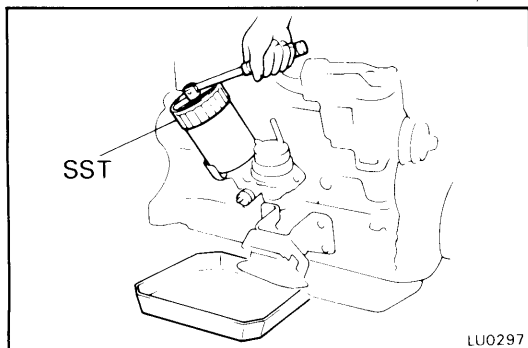
w/o Oil filter change

3.0 liters (3.2 US qts, 2.6 Imp. qts)

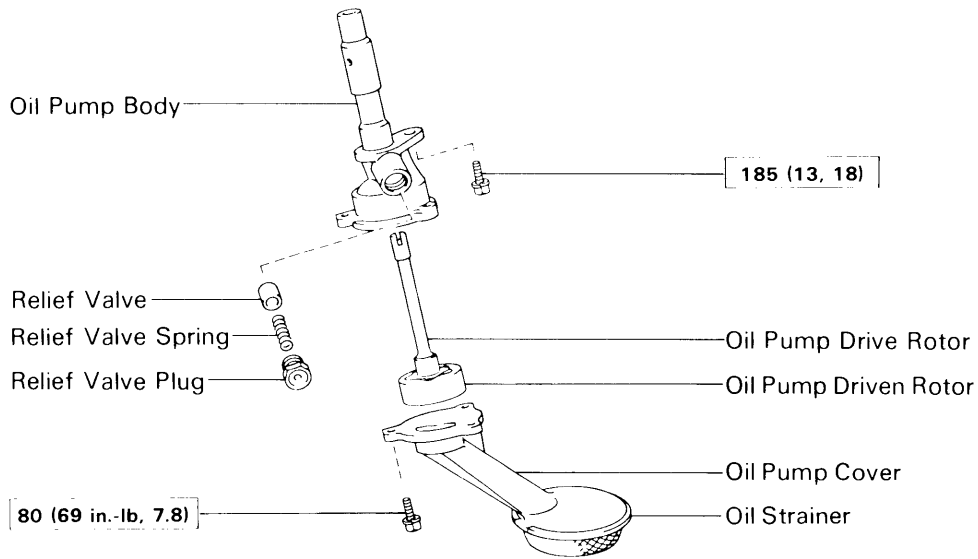
Dry fill 4.2 liters (4.4 US qts, 3.7 Imp. qts)

4. START ENGINE AND CHECK FOR LEAKS

5. RECHECK ENGINE OIL LEVEL (See page LU-3)



OIL PUMP COMPONENTS

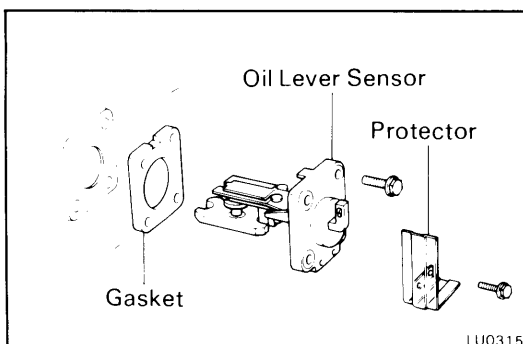


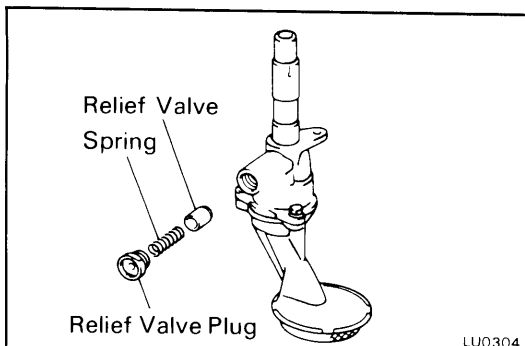
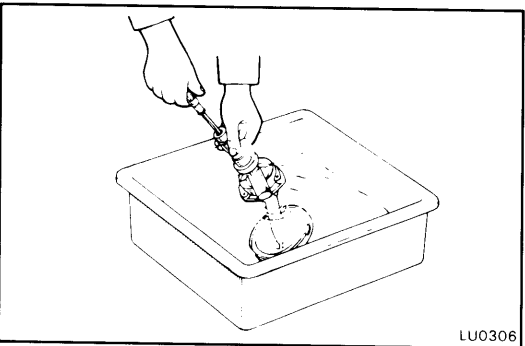
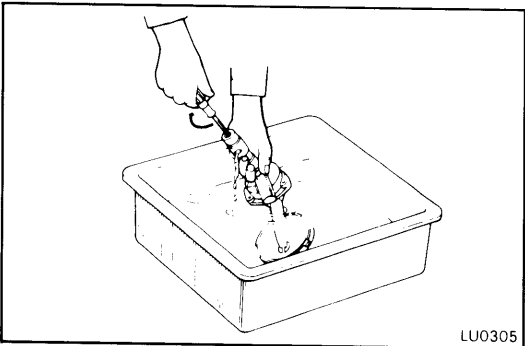
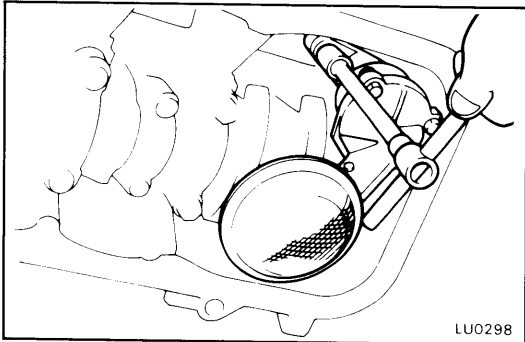
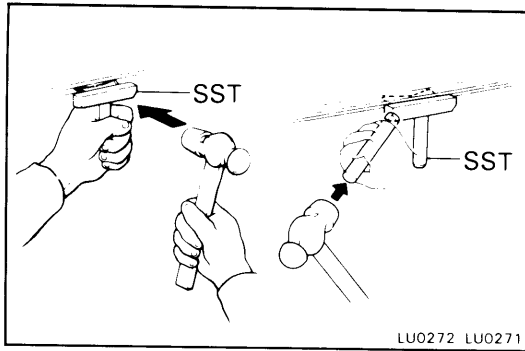
kg-cm (ft-lb, N·m) : Specified torque

LU0124

REMOVAL OF OIL PUMP

1. RAISE VEHICLE
CAUTION: Be sure the vehicle is securely supported.
2. DRAIN ENGINE OIL (See page LU-4)
3. REMOVE RIGHT AND LEFT STIFFENER PLATES
4. DISCONNECT CONNECTOR OF OIL LEVEL SENSOR
5. IF NECESSARY, REMOVE OIL LEVEL SENSOR





6. REMOVE OIL PAN

- (a) Remove the eighteen bolts.
- (b) Insert the blade of SST between the cylinder block and oil pan, cut off applied sealer and then remove the oil pan.

SST 09032-00100

NOTE:

- Do not use SST for the timing chain cover side. If necessary, use a screwdriver.
- When removing the oil pan, be careful not to damage the oil pan flange.

7. REMOVE OIL PUMP

Remove the bolt and pull out the oil pump.

DISASSEMBLY OF OIL PUMP

(See page LU-5)

1. CHECK OIL PUMP OPERATION

- (a) Using a screwdriver, immerse the oil strainer in oil and turn the oil pump shaft clockwise. Oil should come out of the oil outlet hole.
- (b) Close the oil outlet hole with your thumb and turn the oil pump shaft as before. The oil pump shaft should be difficult to turn.

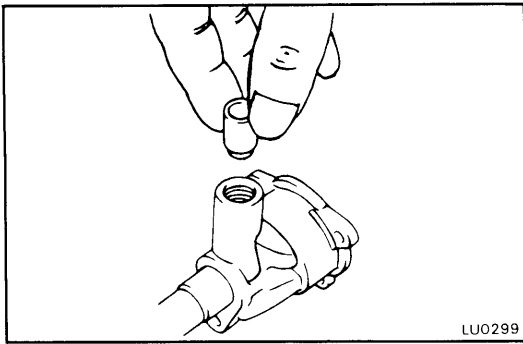
2. REMOVE RELIEF VALVE

Remove the relief valve plug, spring and valve.

3. REMOVE OIL PUMP COVER

Remove the three bolts and oil pump cover.

4. REMOVE DRIVE AND DRIVEN ROTORS

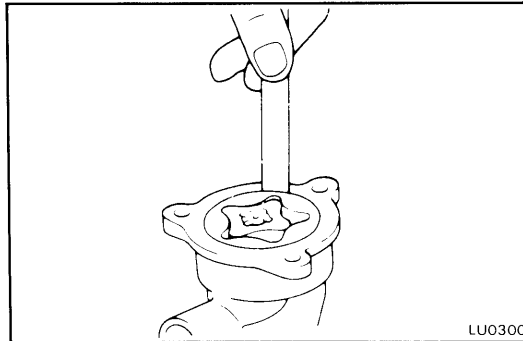


INSPECTION OF OIL PUMP

1. INSPECT RELIEF VALVE OPERATION

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

If necessary, replace the valve and/or pump assembly.



2. INSPECT DRIVE AND DRIVEN ROTORS

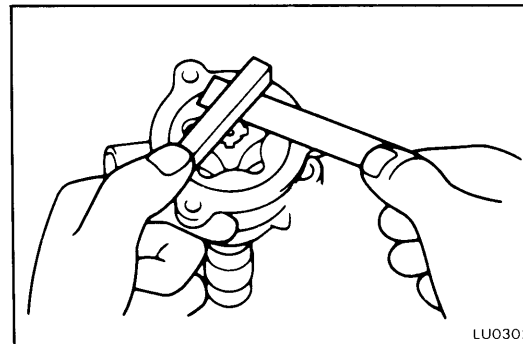
A. Inspect Rotor Body Clearance

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

Standard clearance: 0.10 – 0.15 mm
(0.0039 – 0.0059 in.)

Maximum clearance: 0.2 mm (0.008 in.)

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



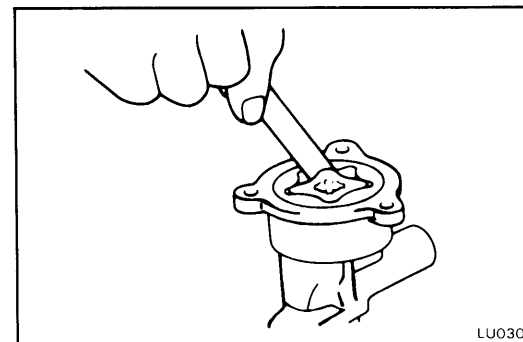
B. Inspect Rotor Body Clearance

Using a feeler gauge, measure the clearance as shown.

Standard clearance: 0.03 – 0.07 mm
(0.0012 – 0.0028 in.)

Maximum clearance: 0.15 mm (0.0059 in.)

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



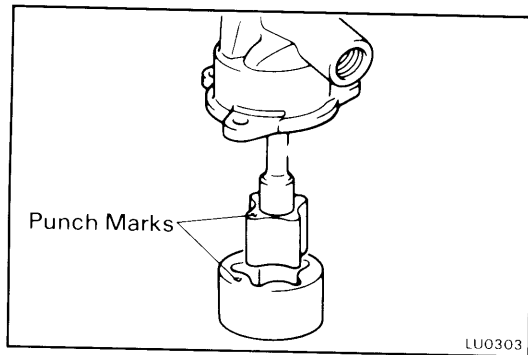
C. Inspect Rotor Tip Clearance

Using a feeler gauge, measure the clearance between the drive rotor and driven rotor.

Standard clearance: 0.07 – 0.12 mm
(0.0028 – 0.0047 in.)

Maximum clearance: 0.2 mm (0.008 in.)

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



ASSEMBLY OF OIL PUMP

(See page LU-5)

1. INSTALL DRIVE AND DRIVEN ROTORS

Install the rotors so the punch marks are facing upward toward the pump body.

2. INSTALL OIL PUMP COVER

Install the oil pump cover with the three bolts. Torque the bolts.

Torque: 80 kg-cm (69 in.-lb, 7.8 N·m)

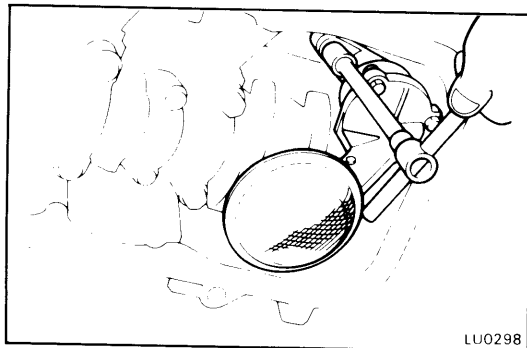
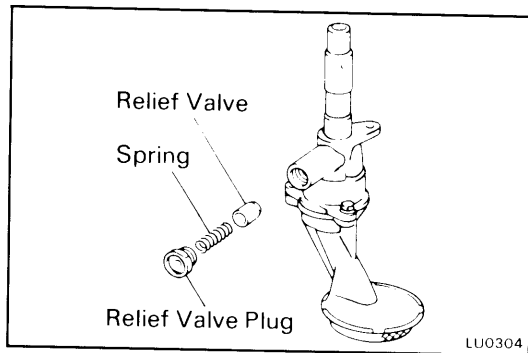
3. INSTALL RELIEF VALVE, SPRING, AND RELIEF VALVE PLUG

Insert the relief valve and spring, and install the relief valve plug.

Torque: 375 kg-cm (27 ft-lb, 37 N·m)

4. CHECK OIL PUMP OPERATION

(See page LU-6)



INSTALLATION OF OIL PUMP

1. INSTALL OIL PUMP

(a) Align the governor shaft protrusion of the IIA with the drive rotor slot of the oil pump.

(b) Install the oil pump with the bolt.

Torque the bolt.

Torque: 185 kg-cm (13 ft-lb, 18 N·m)

2. INSTALL OIL PAN

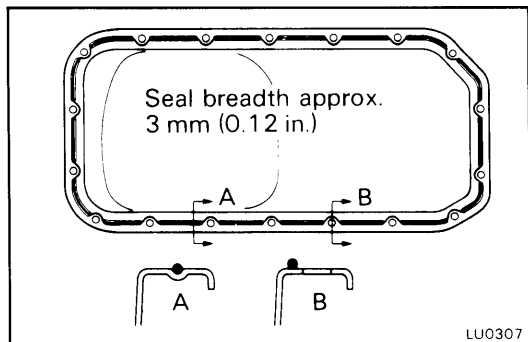
(a) Remove any oil packing material and be careful not to drop any oil on the contacting surfaces of the oil pan and cylinder block.

- 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.

- Clean both sealing surfaces with a non-residue solvent.

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



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

Seal packing: Part No. 08826-00080 or equivalent

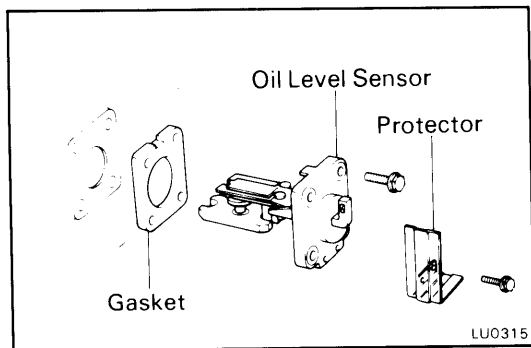
- Install a nozzle that has been cut to the 3 mm (0.12 in.) opening.

NOTE: Avoid applying an excess amount to the surface. Be especially careful near oil passages.

- Parts must be assembled within 15 minutes of application. Otherwise, the material must be removed and reapplied.
- Immediately remove nozzle from tube and reinstall cap.

(c) Install the oil pan with the eighteen bolts.

Torque: 130 kg-cm (9 ft-lb, 13N·m)



3. INSTALL OIL LEVEL SENSOR

(a) Install a new gasket and the oil level sensor with the four bolts. Torque the bolts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

(b) Install the protector of the oil level sensor with the two bolts.

CAUTION: Be careful not to drop the oil level sensor when installing it.

4. CONNECT CONNECTOR OF OIL LEVEL SENSOR

5. INSTALL RIGHT AND LEFT STIFFENER PLATES

6. LOWER VEHICLE

7. FILL WITH ENGINE OIL (See step 3 on page LU-4)

8. START ENGINE AND CHECK FOR LEAKS

9. CHECK ENGINE OIL LEVEL (See page LU-3)