

LUBRICATION SYSTEM

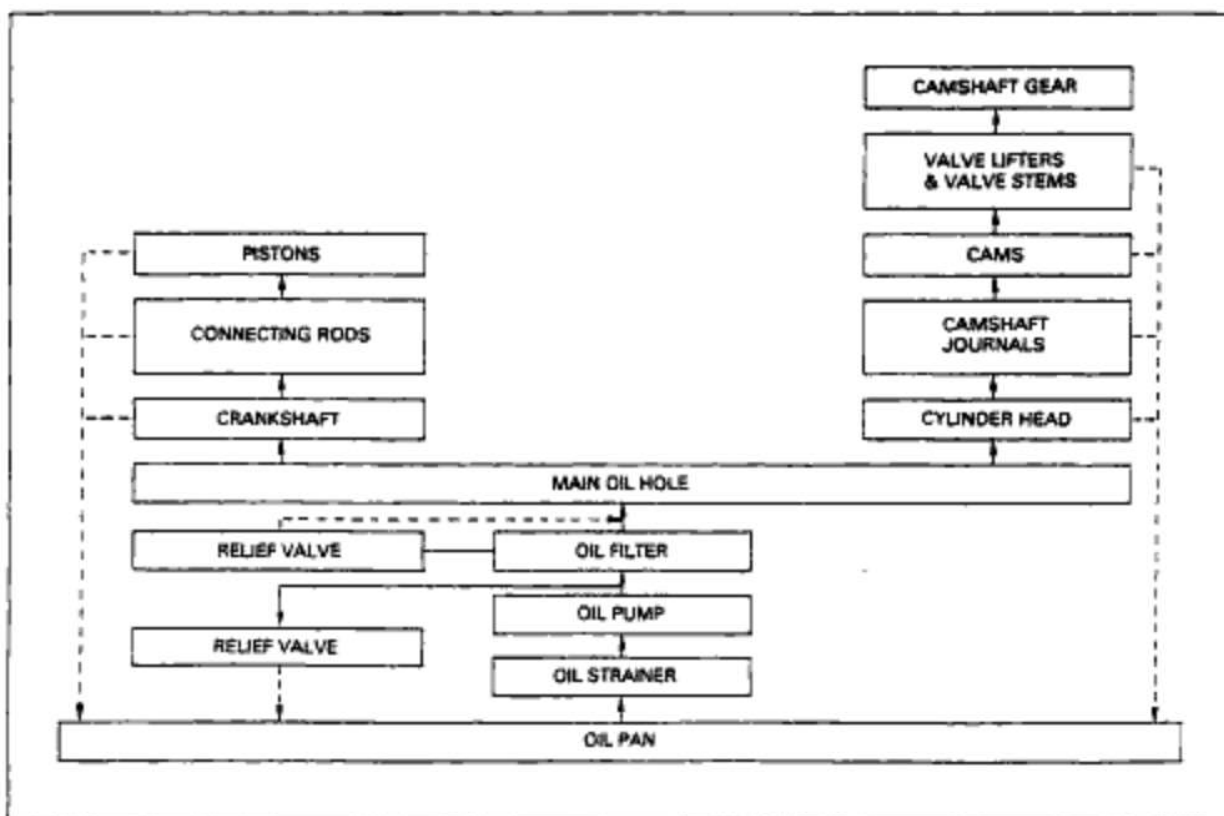
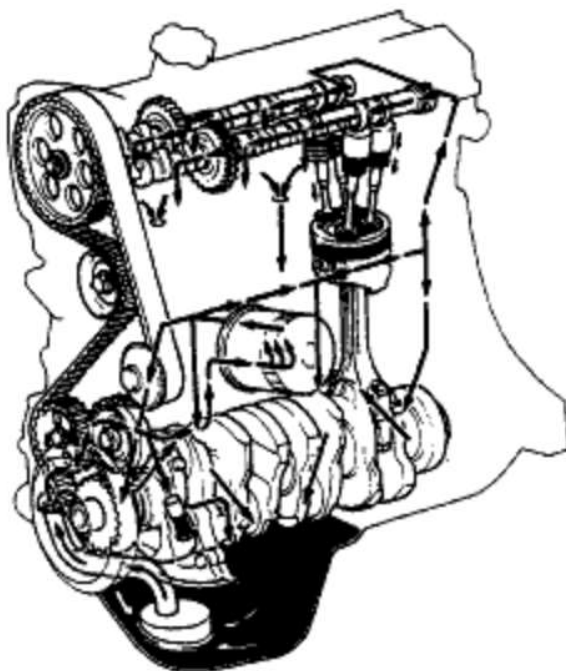
LU-2

LUBRICATION SYSTEM – Description

DESCRIPTION

A fully pressurized, fully filtered lubrication system has been adopted for this engine.

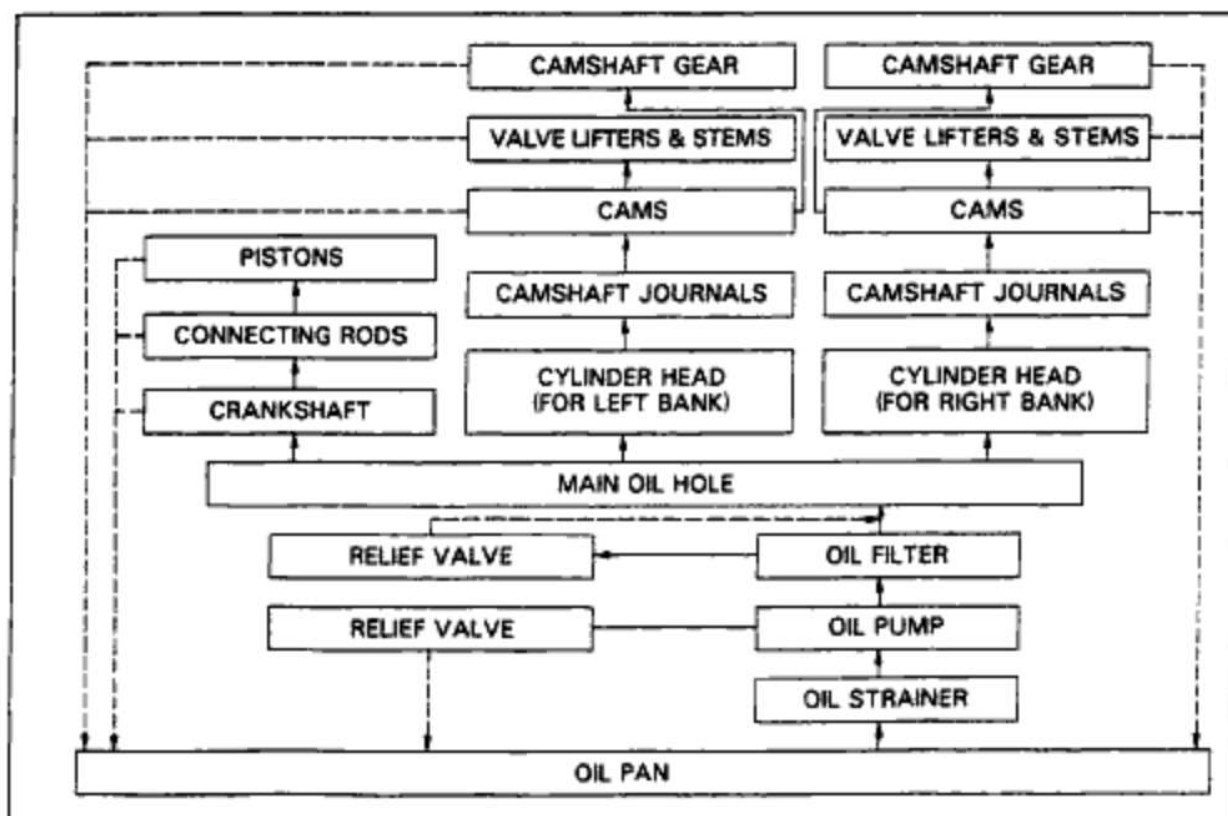
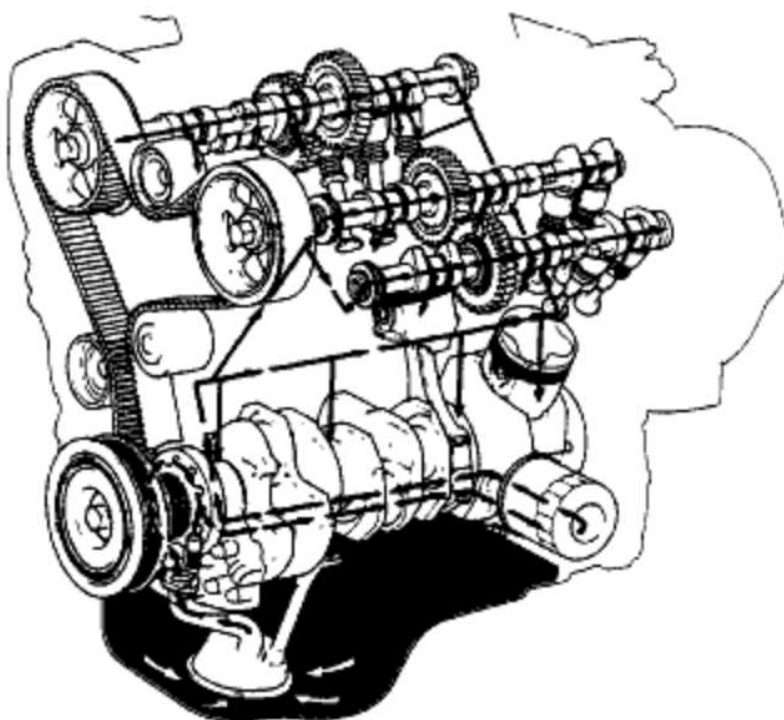
3S-FE



LU0664

LUBRICATION SYSTEM – Description

2VZ-FE



LU0645

LU-4**LUBRICATION SYSTEM** – Description

A pressure feeding lubrication system has been adopted to supply oil to the moving parts of this engine. The lubrication system consists of an oil pan, oil pump, oil filter and other external parts which supply oil to the moving parts in the engine block. The oil circuit is shown in the illustration at the top of the previous page. Oil from the oil pan is pumped up by the oil pump. After it passes through the oil filter, it is fed through the various oil holes in the crankshaft and cylinder block. After passing through the cylinder block and performing its lubricating function, the oil is returned by gravity to the oil pan. A dipstick on the center left side of the cylinder block is provided to check the oil level.

OIL PUMP

The oil pump pumps up oil from the oil pan and sends it under pressure to the various parts of the engine.

An oil strainer is mounted in front of the inlet to the oil pump. The oil pump itself is a trochoid-type pump, inside of which is a drive rotor and a driven rotor. When the drive rotor rotates, the driven rotor rotates in the same direction, and since the axis of the driven rotor shaft is different from the center of the driven rotor, the space between the two rotors is changed as they rotate. Oil is drawn in when the space is wide and is discharged when the space is narrow.

OIL PRESSURE REGULATOR (RELIEF VALVE)

At high engine speeds, the engine oil supplied by the oil pump exceeds the capacity of the engine to utilize it.

For that reason, the oil pressure regulator works to prevent an oversupply of oil. During normal oil supply, a coil spring and valve keep the by-pass closed, but when too much oil is being fed, the pressure becomes extremely high, overpowering the force of the spring and opening the valves. This allows the excess oil to flow through the valve and return to the oil pan.

OIL FILTER

The oil filter is a full flow type filter with a built-in paper filter element. Particles of metal from wear, air-born dirt, carbon and other impurities can get in the oil during use and could cause accelerated wear or seizing if allowed to circulate through the engine. The oil filter, integrated into the oil line, removes these impurities as the oil passes through it. The filter is mounted outside the engine to simplify replacement of the filter element.

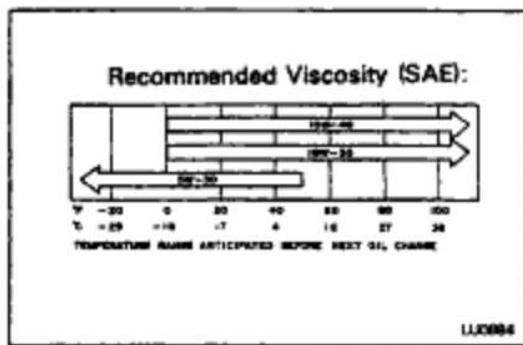
A relief valve is also included ahead of the filter element to relieve the high oil pressure in case the filter element becomes clogged with impurities. The relief valve opens when the oil pressure overpowers the force of the spring. Oil passing through the relief valve by-passes the oil filter and flows directly into the main oil hole in the engine.

TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Oil leakage	Cylinder head; cylinder block or oil pump body damaged or cracked Oil seal faulty	Repair as necessary Replace oil seal	EM-125, 160 LU-13
	Gasket faulty	Replace gasket	
Low oil pressure	Oil leakage Relief valve faulty Oil pump faulty Engine oil poor quality 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-9, 16 LU-9, 16 LU-7 EM-116, 149 EM-114, 147 LU-7
High oil pressure	Relief valve faulty	Repair relief valve	LU-9, 16

LU-6

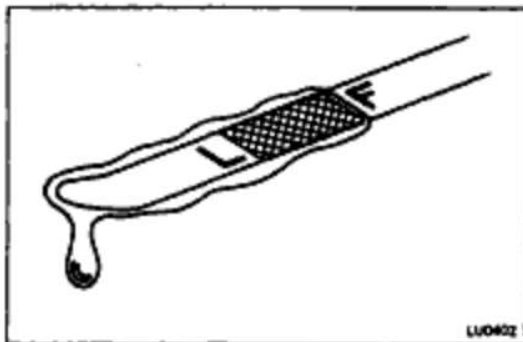
LUBRICATION SYSTEM – Oil Pressure Check

**OIL PRESSURE CHECK****1. CHECK ENGINE OIL QUALITY**

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

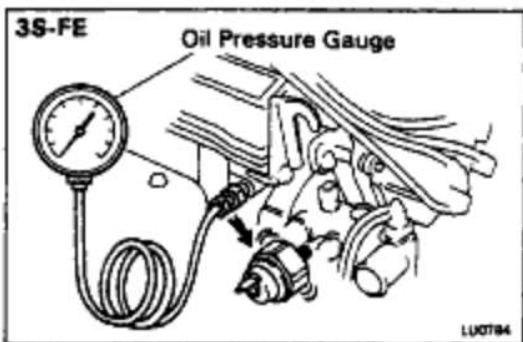
If the quality is poor, replace the oil.

Use API grade SG 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 dipstick.

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

**3. REMOVE OIL PRESSURE SWITCH****4. INSTALL OIL PRESSURE GAUGE****5. WARM UP ENGINE**

Allow the engine to normal operating temperature.

6. CHECK OIL PRESSURE

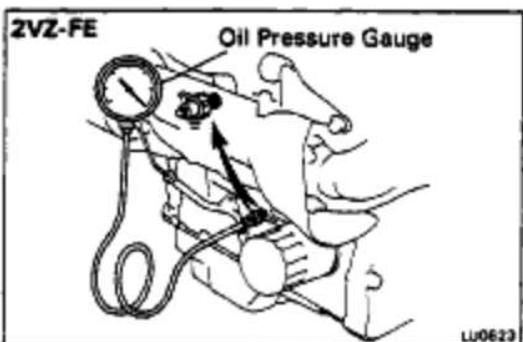
Oil pressure:

At idling 0.3 kg/cm² (4.3 psi, 29 kPa)
or more

At 3,000 rpm

3S-FE 2.5 – 5.0 kg/cm²
(36 – 71 psi, 245 – 490 kPa)

2VZ-FE 3.0 – 5.5 kg/cm²
(43 – 78 psi, 294 – 539 kPa)

**7. REINSTALL OIL PRESSURE SWITCH**

Apply adhesive to two or three threads.

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

8. START ENGINE AND CHECK FOR LEAKS

REPLACEMENT OF ENGINE OIL AND OIL FILTER

NOTICE:

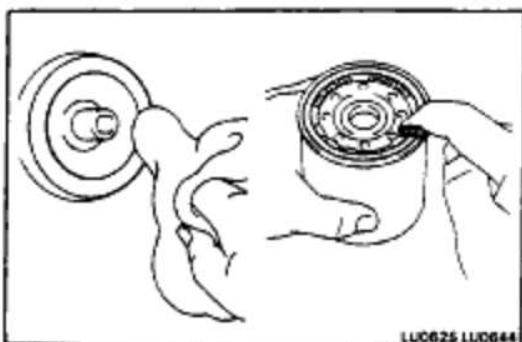
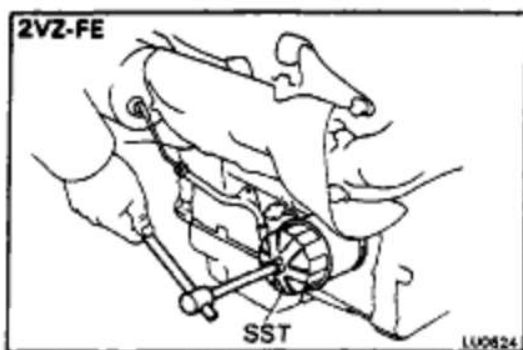
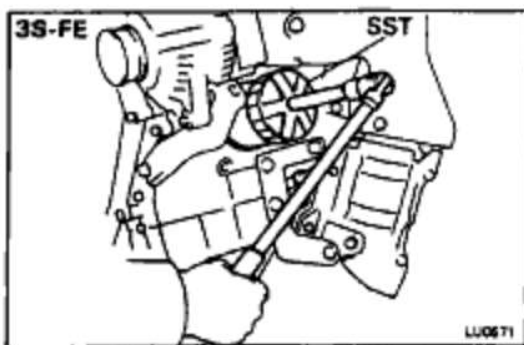
- Prolonged and repeated contact with mineral oil will result in the removal of natural oils from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.
- Care should be taken, therefore, when changing 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 waterless hand cleaner, to remove any used engine oil. Do not use gasoline, thinners, or solvents.
- In order to preserve the environment, used oil 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

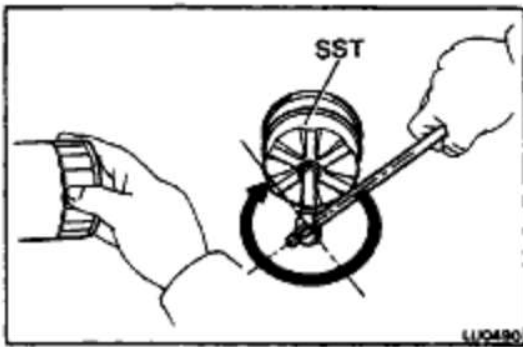
- Using SST, remove the oil filter.
SST 09228-06500 (3S-FE)
09228-07500 (2VZ-FE)



- Check and clean—the oil filter installation surface.
- Apply clean engine oil to the gasket of a new oil filter.

LU-8

LUBRICATION SYSTEM — Replacement of Engine Oil and Oil Filter



- (d) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.
- (e) Using SST, tighten it an additional 3/4 turn.
SST 09228-06500 (3S-FE)
09228-07500 (2VZ-FE)

3. FILL WITH ENGINE OIL

- (a) Clean and install the oil drain plug with a new gasket.
Torque: 2VZ-FE 3S-FE 400 kg-cm (29 ft-lb, 39 N-m)
- (b) Fill with new engine oil (API grade SG multigrade, fuel-efficient and recommended viscosity oil).

Capacity (3S-FE):**Drain and refill****w/ Oil filter change****4.1 liters (4.3 U S qts, 3.6 Imp. qts)****w/o Oil filter change****3.7 liters (3.9 US qts, 3.3 Imp. qts)****Dry fill 4.5 liters (4.8 U S qts, 4.4 Imp. qts)****Capacity (2VZ-FE):****Drain and refill****w/ Oil filter change****3.9 liters (4.1 US qts, 3.4 Imp. qts)****w/o Oil filter change****3.7 liters (3.9 US qts, 3.3 Imp. qts)****Dry fill 4.6 liters (4.8 US qts, 4.4 Imp. qts)**

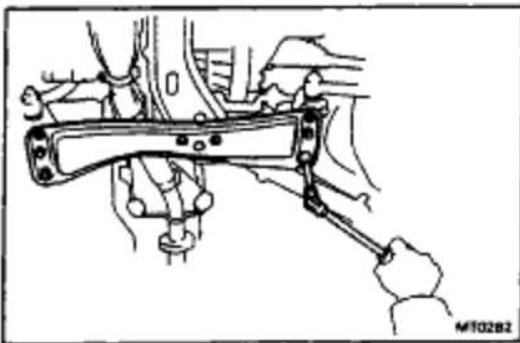
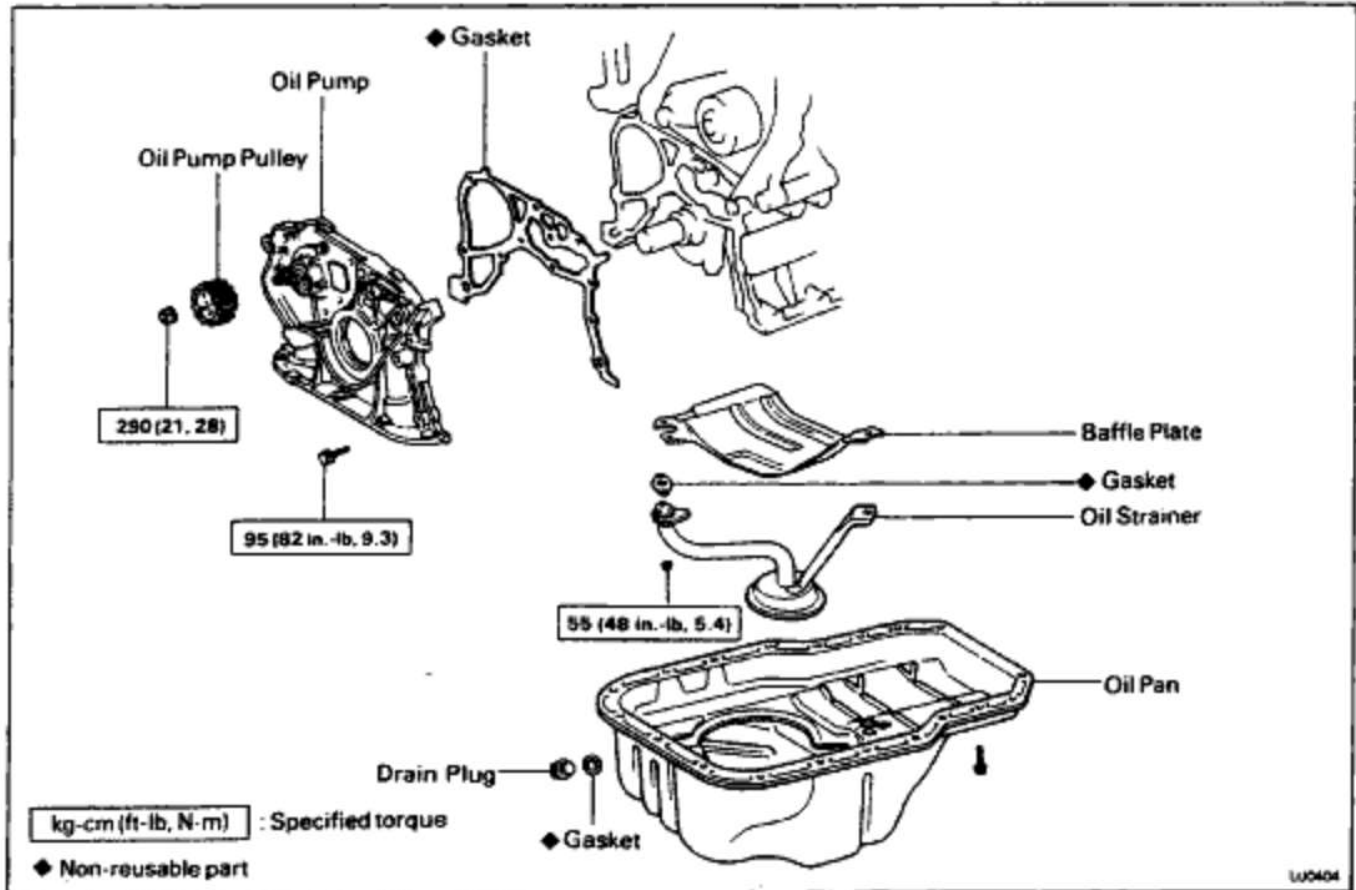
- (c) Install the oil filler cap.

4. START ENGINE AND CHECK FOR LEAKS**5. RECHECK ENGINE OIL LEVEL (See page [LU-6](#))**

OIL PUMP (3S-FE)

REMOVAL OF OIL PUMP

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



1. REMOVE HOOD

2. RAISE VEHICLE

NOTICE: Be sure the vehicle is securely supported.

3. REMOVE ENGINE UNDER COVERS

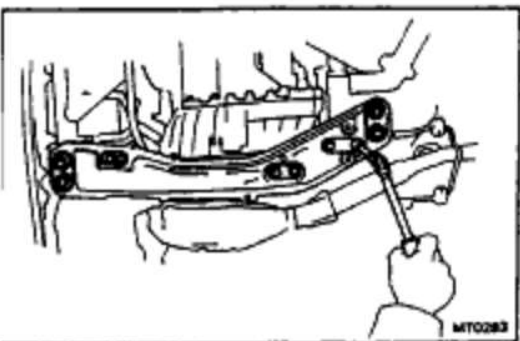
4. DRAIN ENGINE OIL (See page [LU-7](#))

5. REMOVE FRONT EXHAUST PIPE

(See step 25 on page [EM-110](#))

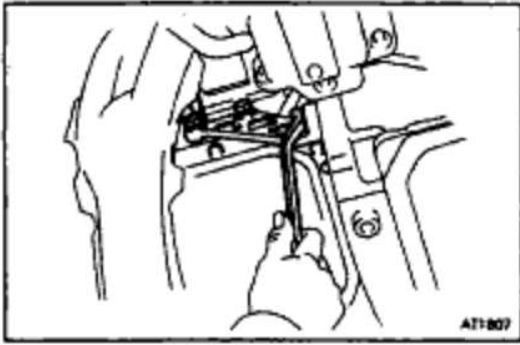
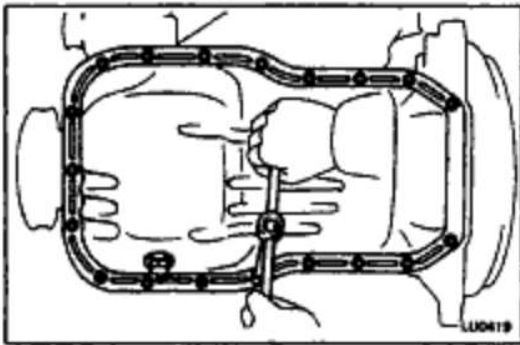
6. REMOVE SUSPENSION LOWER CROSSMEMBER

7. REMOVE ENGINE MOUNTING CENTER MEMBER

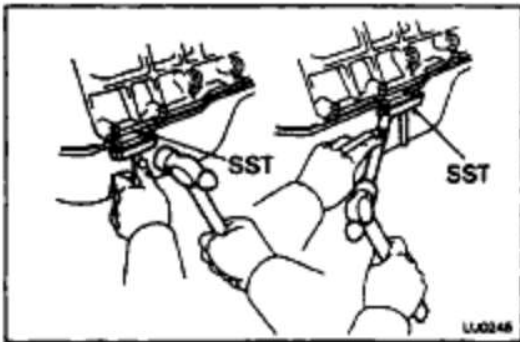


LU-10

LUBRICATION SYSTEM – Oil Pump PS-FE)

**8. REMOVE STIFFENER PLATE****9. REMOVE OIL PAN**

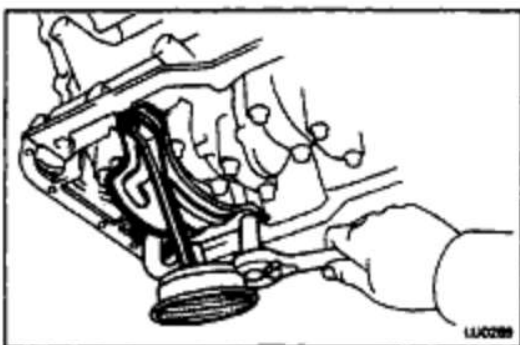
- (a) Remove the dipstick.
- (b) Remove the seventeen bolts and two nuts.



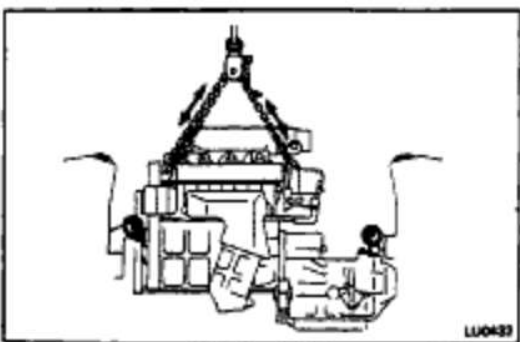
- (c) Insert the blade of SST between the cylinder block and oil pan, cut off applied sealer and remove the oil pan.
SST 09032-04100

NOTICE:

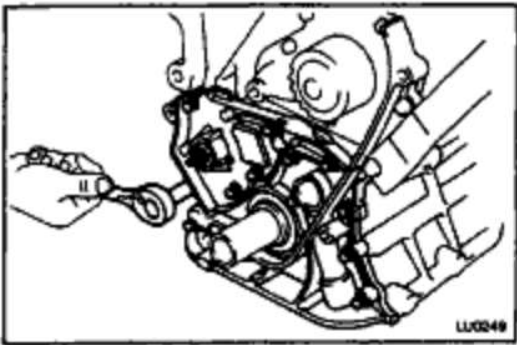
- Do not use SST for the oil pump body side and rear oil seal retainer.
- Be careful not to damage the oil pan flange.

**10. REMOVE OIL STRAINER**

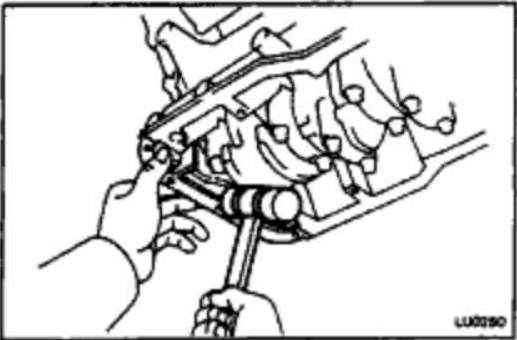
Remove the two bolts, two nuts, oil strainer, baffle plate and gasket.

**11. SUSPEND ENGINE WITH ENGINE HOIST CHAIN****12. REMOVE TIMING BELT AND PULLEYS**

(See pages [EM-23](#) to [26](#))

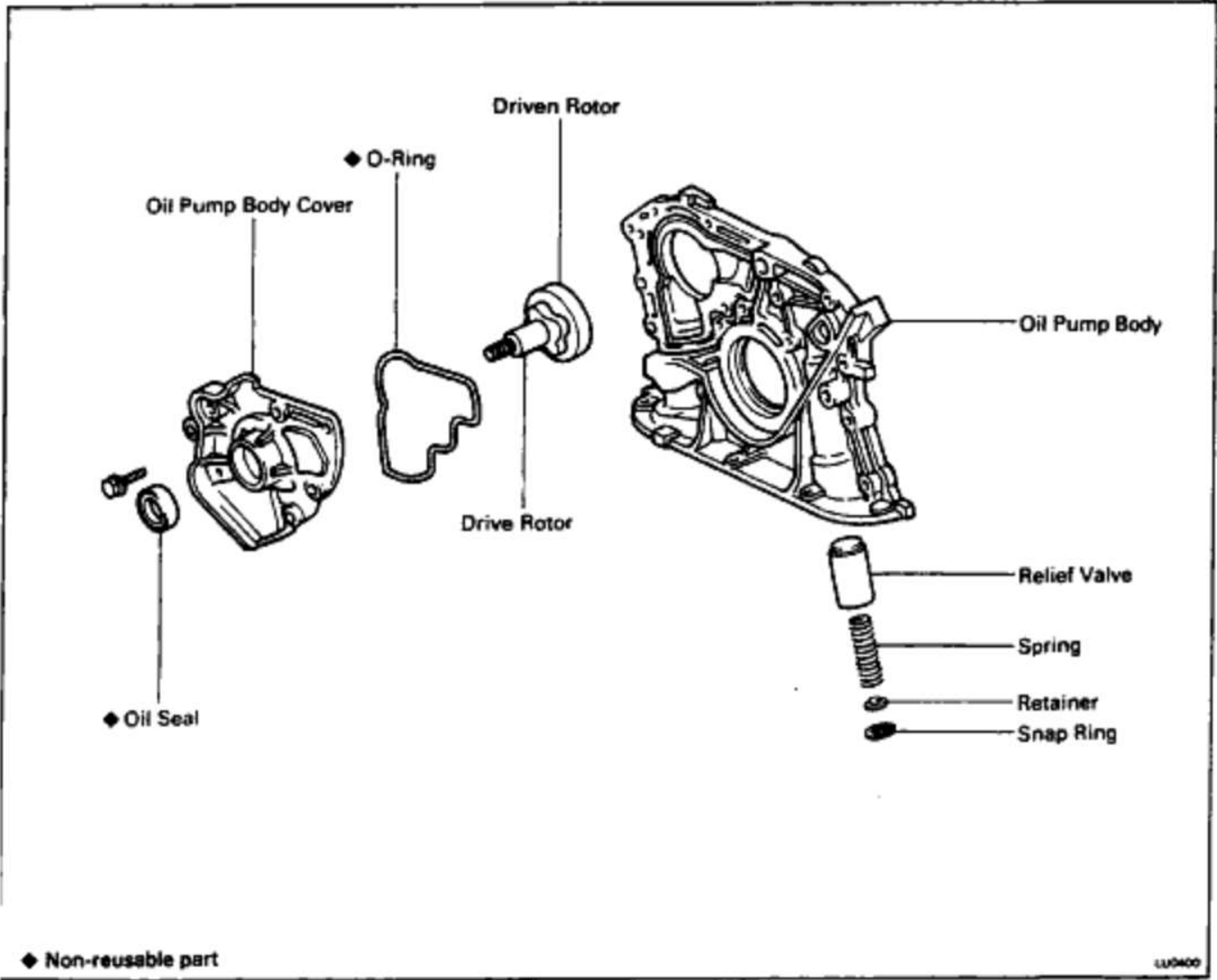


13. REMOVE OIL PUMP
(a) Remove the twelve bolts.



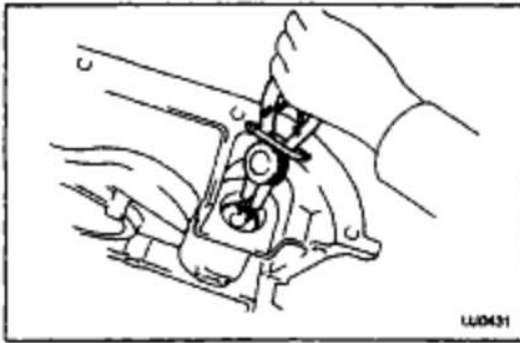
(b) Using a plastic-faced hammer, careful tap off the oil pump.

COMPONENTS



LU-12

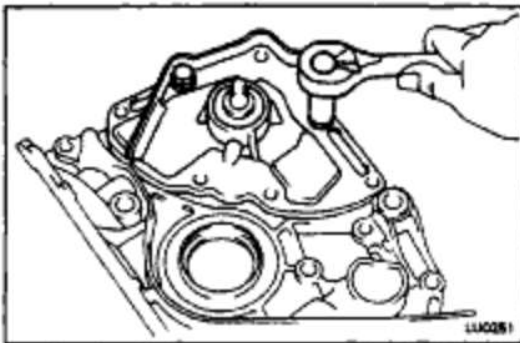
LUBRICATION SYSTEM – Oil Pump (3S-FE)

**DISASSEMBLY OF OIL PUMP**

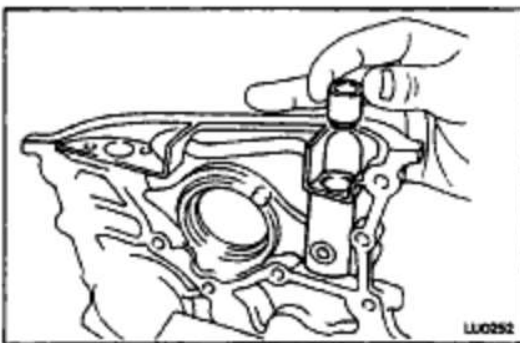
(See page LU-11)

1. REMOVE RELIEF VALVE

- (a) Using snap ring pliers, remove the snap ring.
- (b) Remove the retainer, spring and relief valve.

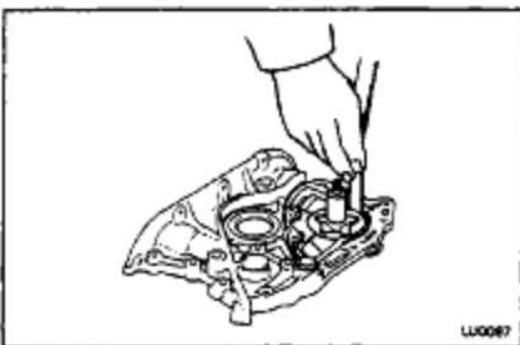
**2. REMOVE DRIVE AND DRIVEN ROTORS**

Remove the two bolts, pump body cover, O-ring, the drive and driven rotors.

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

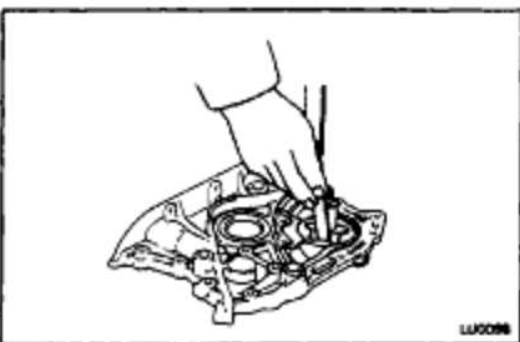
**2. INSPECT DRIVE AND DRIVEN ROTORS****A. Inspect rotor body clearance**

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

Standard body clearance: 0.10 – 0.16 mm
(0.0039 – 0.0063 in.)

Maximum body clearance: 0.20 mm (0.0079 in.)

If the body clearance is greater than maximum, replace the rotor as a set. If necessary, replace the oil pump assembly.

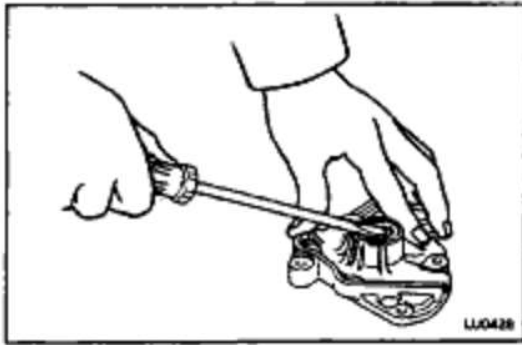
**B. Inspect rotor tip clearance**

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

Standard tip clearance: 0.04 – 0.16 mm
(0.0016 – 0.0063 in.)

Maximum tip clearance: 0.20 mm (0.0079 in.)

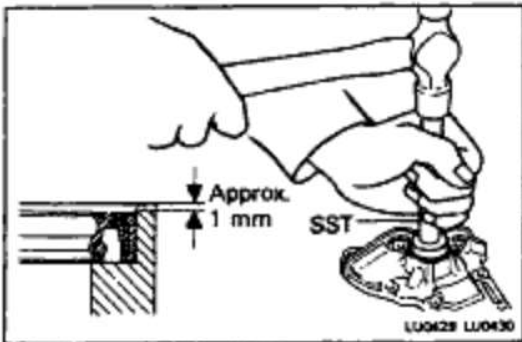
If the tip clearance is greater than maximum, replace the rotors as a set. If necessary, replace the oil pump assembly.



REPLACEMENT OF OIL SEAL

1. REMOVE OIL SEAL

Using a screwdriver, pry out the oil seal.

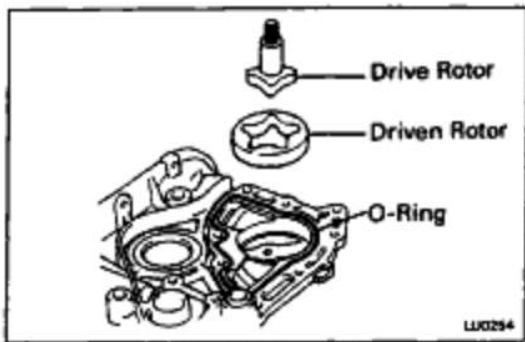


2. INSTALL OIL SEAL

(a) Using SST and a hammer, tap in a new oil seal to a depth of approx. 1 mm (0.04 in.) from the oil pump cover edge.

SST 09620-30010 (09627-30010, 09631 - 20)

(b) Apply MP grease to the oil seal lip.



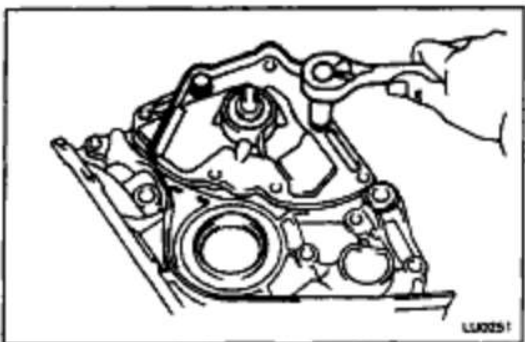
ASSEMBLY OF OIL PUMP

(See page [LU-11](#))

1. INSTALL DRIVE AND DRIVEN ROTORS

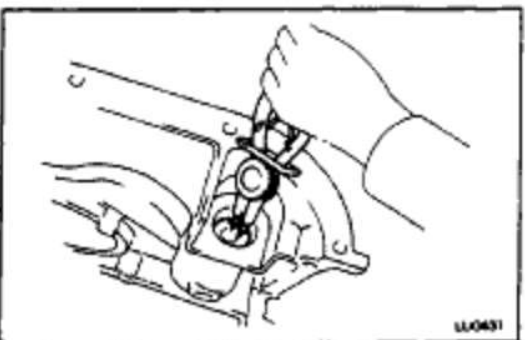
(a) Place a new O-ring into the pump body groove.

(b) Place the drive and driven rotors into pump body.



(c) Install the pump body cover with the two bolts.

Torque: 90 kg-cm (78 in.-lb. 8.8 N-m)



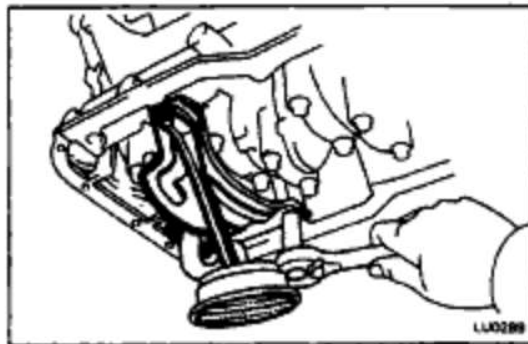
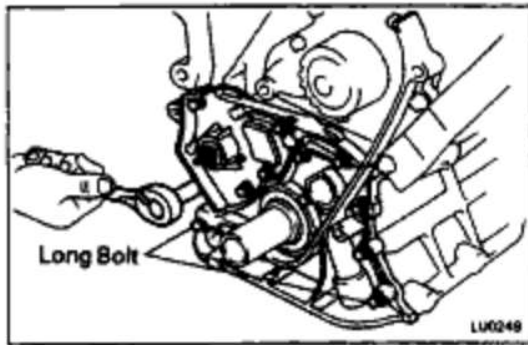
2. INSTALL RELIEF VALVE

(a) Insert the relief valve, spring and retainer into the pump body hole.

(b) Using snap ring pliers, install the snap ring.

LU-14

LUBRICATION SYSTEM – Oil Pump (3S-FE)



INSTALLATION OF OIL PUMP

(See page LU-9)

1. INSTALL OIL PUMP

Install a new gasket and the oil pump with the twelve bolts.

Torque: 95 kg-cm (82 in.-lb, 9.3 N-m)

2. INSTALL PULLEYS AND TIMING BELT (See pages EM-29 and 33)

3. REMOVE ENGINE HOIST CHAIN FROM ENGINE

4. INSTALL OIL STRAINER

Install a new gasket, the baffle plate and oil pan with the two bolts and two nuts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N-m)

5. 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 figure.

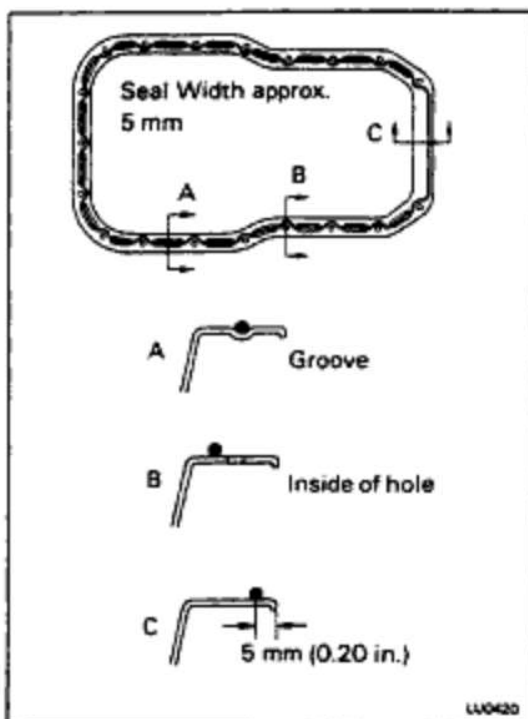
Seal packing: Part No.08828-00080 or equivalent

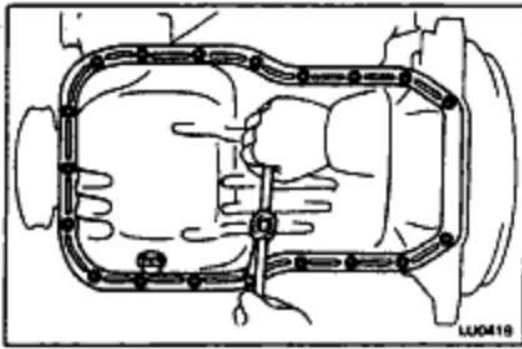
- Install a nozzle that has been cut to a 5 mm (0.20 in.) opening.

HINT: Avoid applying an excessive amount to the surface.

Be particularly careful near oil passages.

- Parts must be assembled within 3 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.

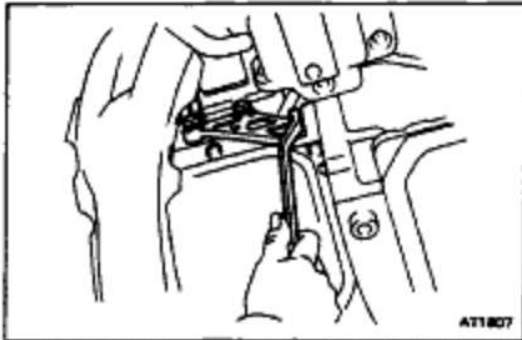




(c) Install the oil pan with the seventeen bolts and two nuts.

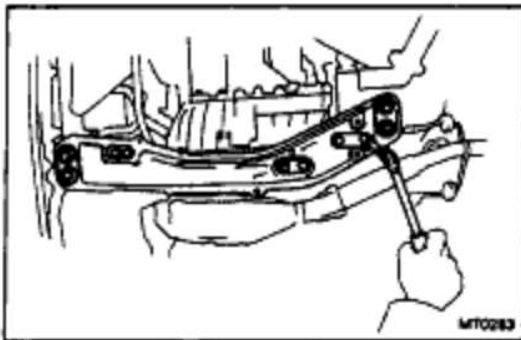
Torque: 55 kg-cm (48 in.-lb. 5.4 N-m)

(d) Install the dipstick.



6. INSTALL STIFFENER PLATE

Torque: 380 kg-cm (27-lb, 37 N-m)



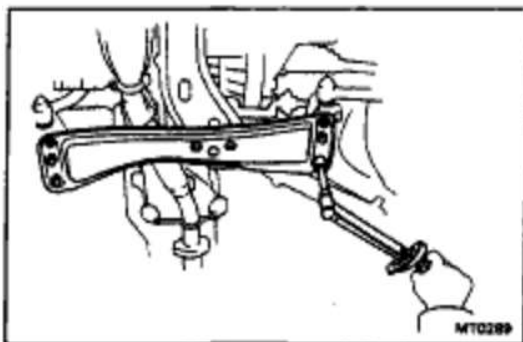
7. INSTALL ENGINE MOUNTING CENTER MEMBER

Torque:

To body 400 kg-cm (29 ft-lb, 39 N-m)

To mounting insulator

490 kg-cm (35 ft-lb, 48 N-m)



8. INSTALL SUSPENSION LOWER CROSSMEMBER

Torque:

14 mm head bolt

400 kg-cm (32 ft-lb, 43 N-m)

19 mm head bolt

2,120 kg-cm (153 ft-lb, 208 N-m)

9. INSTALL FRONT EXHAUST PIPE

(See step 12 on page [EM-134](#))

10. INSTALL ENGINE UNDER COVERS

11. LOWER VEHICLE

12. FILL WITH ENGINE OIL (See page [LU-8](#))

13. START ENGINE AND CHECK FOR LEAKS

14. RECHECK ENGINE OIL LEVEL (See page [LU-6](#))

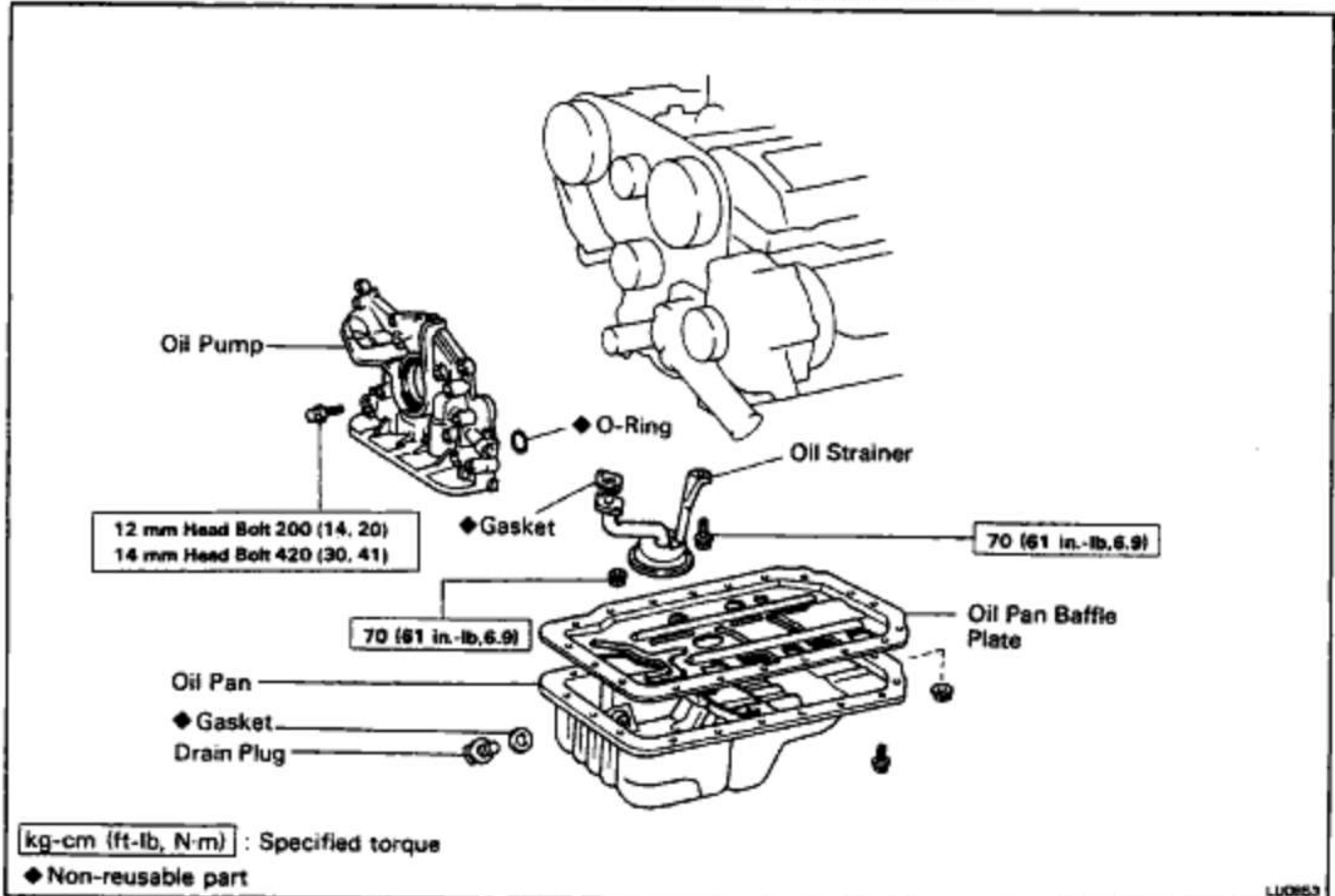
15. INSTALL HOOD

LU-16

LUBRICATION SYSTEM – Oil Pump (2VZ-FE)

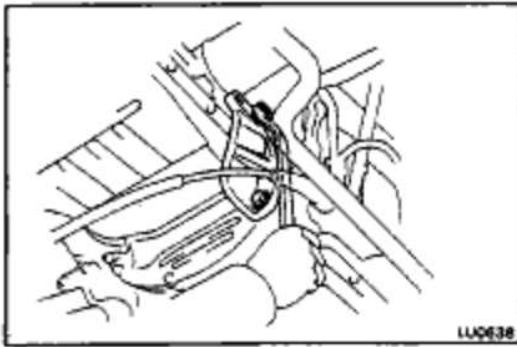
OIL PUMP (2VZ-FE)**REMOVAL OF OIL PUMP**

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

**1. REMOVE HOOD****2. RAISE VEHICLE**

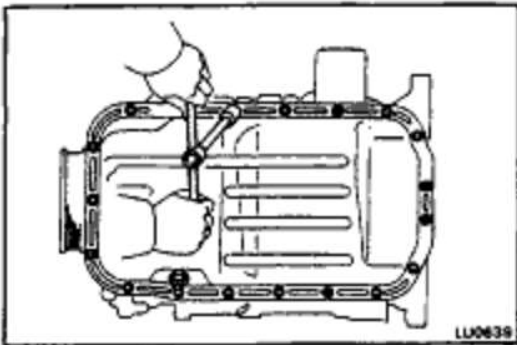
NOTICE: Be sure the vehicle is securely supported.

3. REMOVE ENGINE UNDER COVERS**4. DRAIN ENGINE OIL** (See page [LU-7](#))**5. REMOVE SUSPENSION LOWER CROSSMEMBER**
(See step 26 on page [EM-142](#))**6. REMOVE FRONT EXHAUST PIPE**
(See step 27 on page [EM-142](#))**7. REMOVE ENGINE MOUNTING CENTER MEMBER**
(See step 31 on page [EM-143](#))**8. REMOVE FRONT ENGINE MOUNTING INSULATOR
AND BRACKET**



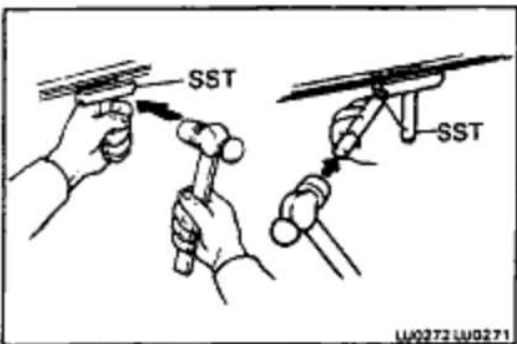
9. REMOVE STIFFENER PLATE

Remove the two bolts and stiffener plate.



10. REMOVE OIL PAN

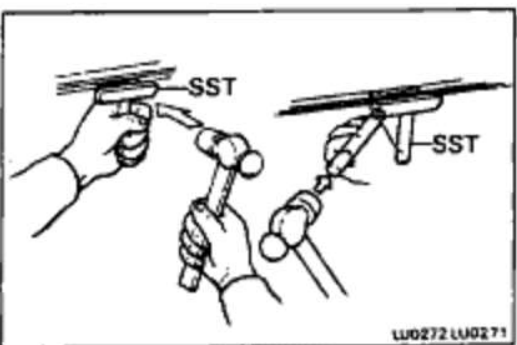
- (a) Remove the dipstick.
- (b) Remove the fifteen bolts and four nuts.



- (c) 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 oil pump body side and rear oil seal retainer.
- Be careful not to damage the oil pan flange.



11. REMOVE OIL PAN BAFFLE PLATE

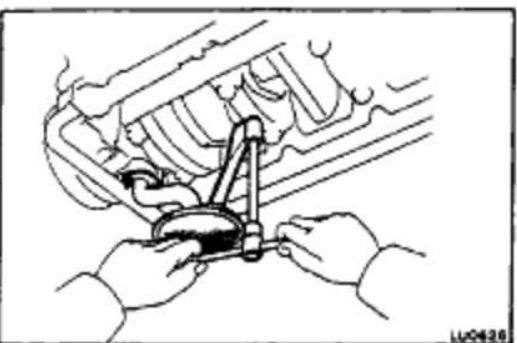
Insert the blade of SST between the cylinder block and baffle plate, cut off applied sealer and remove the baffle plate.
SST 09032-00100

NOTICE:

- Do not use SST for the oil pump body side and rear oil seal retainer.
- Be careful not to damage the baffle plate flange.

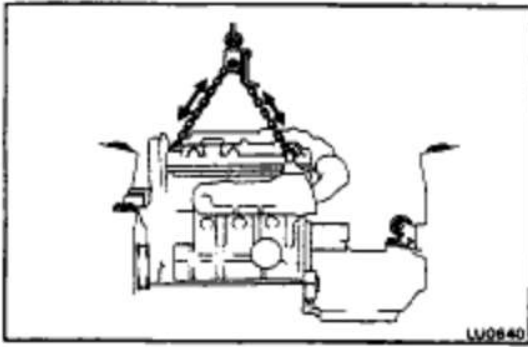
12. REMOVE OIL STRAINER

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



LU-18

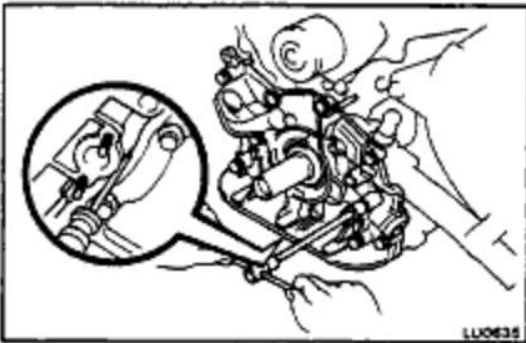
LUBRICATION SYSTEM – Oil Pump (2VZ-FE)

**13. SUSPEND ENGINE WITH ENGINE HOIST CHAIN****14. REMOVE TIMING BELT, NO.1 IDLER AND CRANKSHAFT TIMING PULLEYS**(See pages [EM-34](#) to 39)**15. (w/ A/C)****REMOVE ALTERNATOR** (See page [CH-6](#))**16. (w/ A/C)****REMOVE A/C COMPRESSOR WITHOUT DISCONNECTING HOSES**(See step 28 on page [EM-142](#))**17. (w/ A/C)****REMOVE A/C COMPRESSOR BRACKET****18. REMOVE PS BELT ADJUSTING BAR****19. REMOVE OIL PUMP**

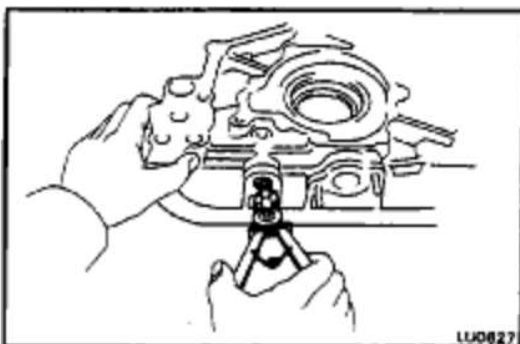
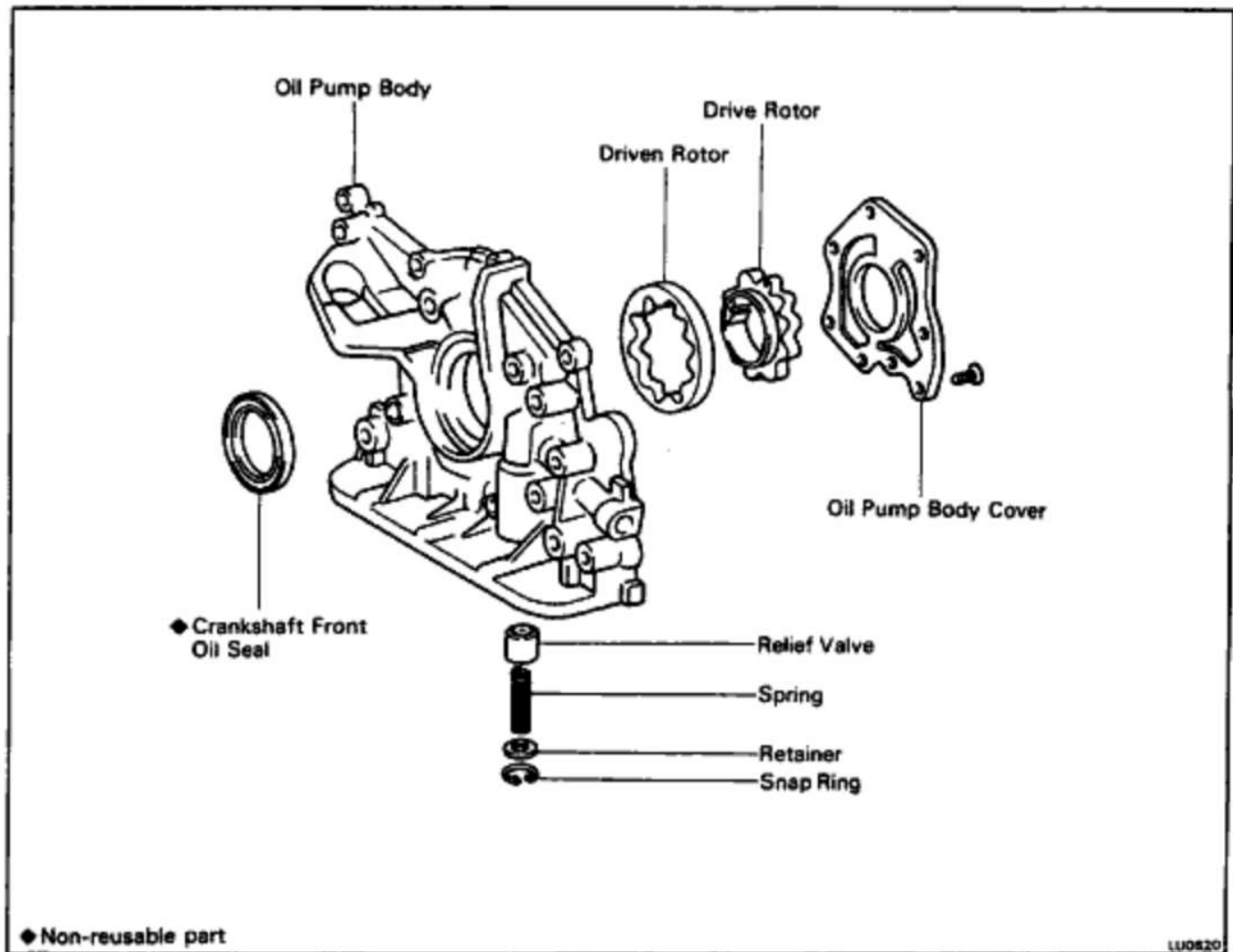
(a) Remove the nine bolts.

(b) Remove the oil pump by prying a screwdriver between the oil pump and main bearing cap.

(c) Remove the O-ring.



COMPONENTS



DISASSEMBLY OF OIL PUMP

1. REMOVE RELIEF VALVE

- Using snap ring pliers, remove the snap ring.
- Remove the retainer, spring and relief valve.

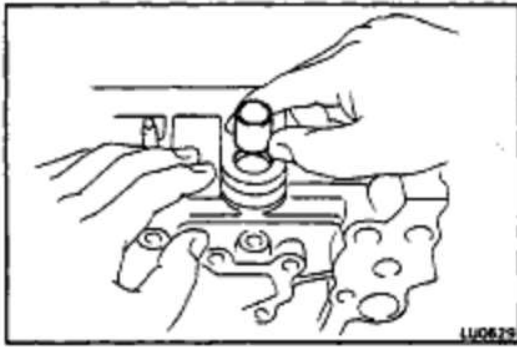


2. REMOVE DRIVE AND DRIVEN ROTORS

Remove the eight screws, pump body cover, the drive and driven rotors.

LU-20

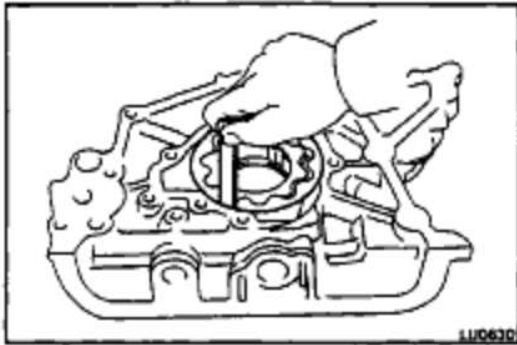
LUBRICATION SYSTEM – Oil Pump (2VZ-FE)



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

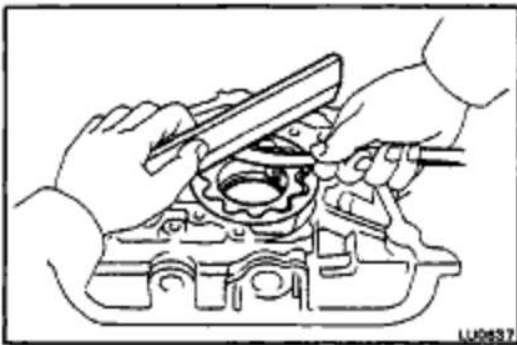
A. Inspect rotor body clearance

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

Standard body clearance: 0.100 – 0.175 mm
(0.0039 – 0.0069 in.)

Maximum body clearance: 0.30 mm (0.0118 in.)

If the body clearance is greater than maximum, replace the rotors as a set. If necessary, replace the oil pump assembly.



B. Inspect rotor side clearance

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

Standard side clearance: 0.030 – 0.090 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 rotors as a set. If necessary, replace the oil pump assembly.

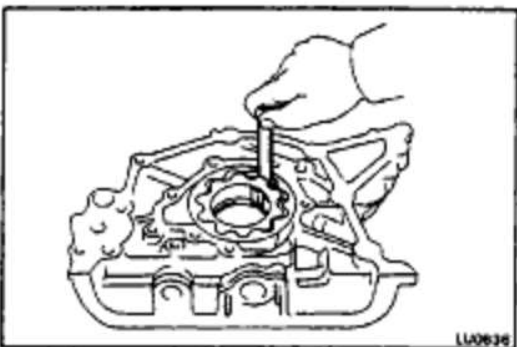
C. Inspect rotor tip clearance

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

Standard tip clearance: 0.110 – 0.240 mm
(0.0043 – 0.0094 in.)

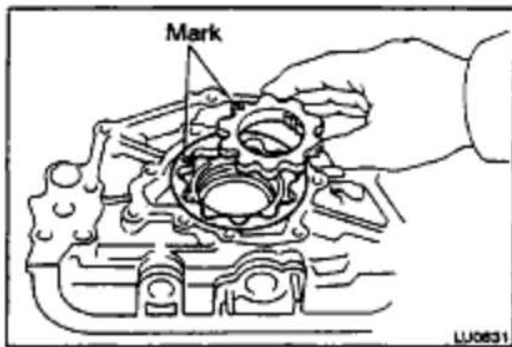
Maximum tip clearance: 0.35 mm (0.0138 in.)

If the tip clearance is greater than maximum, replace the rotors as a set.



REPLACEMENT OF CRANKSHAFT FRONT OIL SEAL

(See page [EM-160](#))

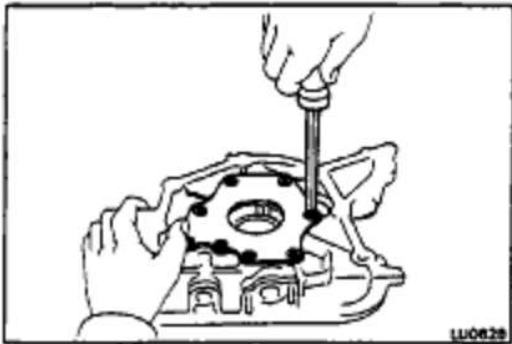


ASSEMBLY OF OIL PUMP

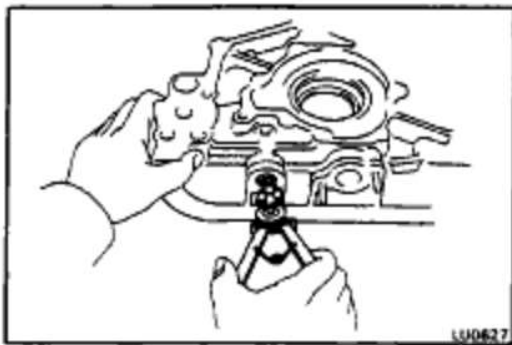
(See page [LU-19](#))

1. INSTALL DRIVE AND DRIVEN ROTORS

- (a) Place the drive and driven rotors into pump body with the marks facing the pump body cover side..



- (b) Install the pump body cover with the eight screws.



2. INSTALL RELIEF VALVE

- (a) Insert the relief valve, spring and retainer into the pump body hole.
(b) Using snap ring pliers, install the snap ring.

LU-22

LUBRICATION SYSTEM – Oil Pump (2VZ-FE)

INSTALLATION OF OIL PUMP

(See page LU-16)

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 groove.
- Thoroughly clean all components to remove all the loose material.

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

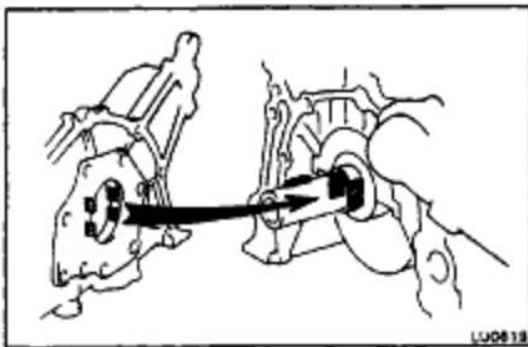
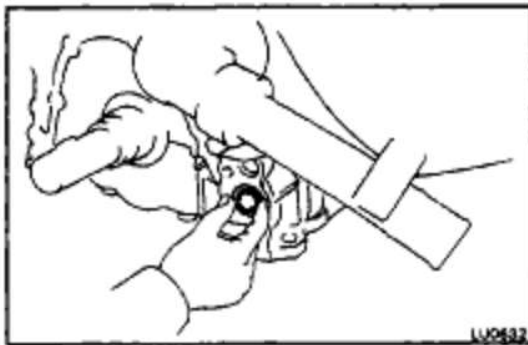
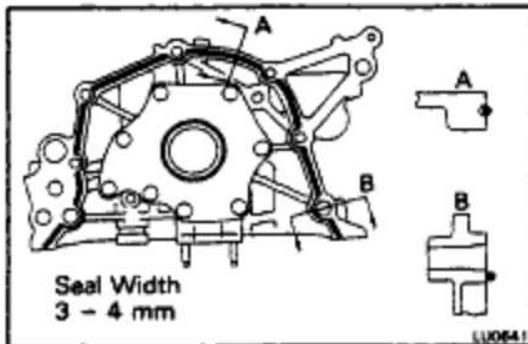
Seal packing: Part No.08826-00080 or equivalent

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

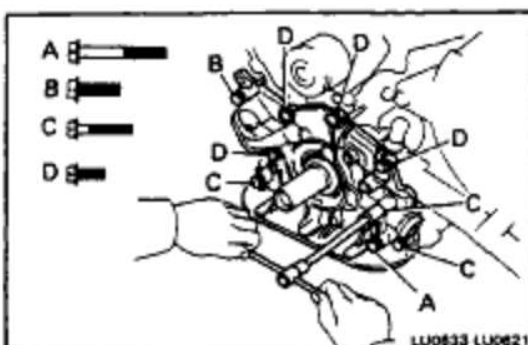
HINT: Avoid applying an excessive amount to the surface.

- 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 in position on the cylinder block.



(d) Engage the spline teeth of the oil pump drive gear with the large teeth of the crankshaft, and slide.



(e) Install the oil pump with the nine bolts.

Torque:

12 mm head bolt (C and D)

200 kg-cm (14 ft-lb, 20 N-m)

14 mm head bolt (A and B)

420 kg-cm (30 ft-lb, 41 N-m)

2. INSTALL PS BELT ADJUSTING BAR**3. (w/ A/C)****INSTALL A/C COMPRESSOR BRACKET****4. (w/ A/C)****INSTALL ALTERNATOR (See page CH-15)****5. (w/ A/C)****INSTALL A/C COMPRESSOR BRACKET****6. INSTALL CRANKSHAFT TIMING PULLEY, NO.1 IDLER PULLEY AND TIMING BELT****(See pages EM-42 to 47)****7. REMOVE ENGINE HOIST CHAIN FROM ENGINE****8. INSTALL OIL PAN BAFFLE PLATE**

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

- Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces.
- 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.

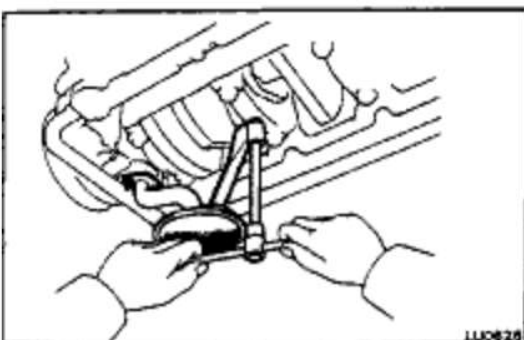
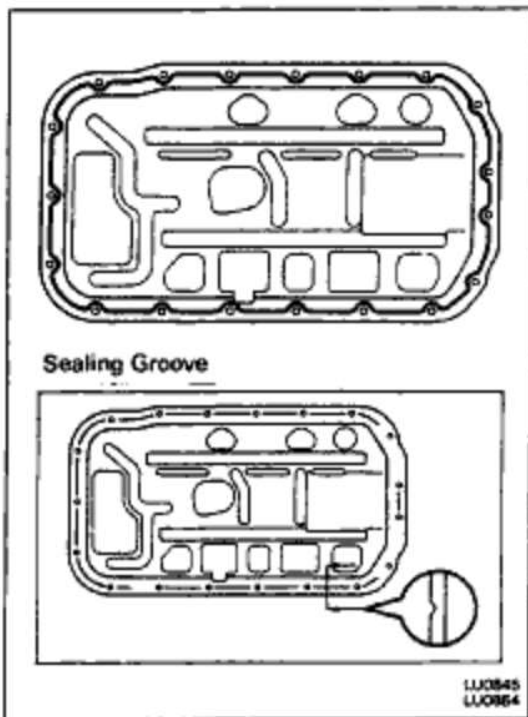
(d) Apply seal packing to the baffle plate as shown in the figure.

Seal packing: Part No. 08826-00080 or equivalent

- Install a nozzle that has been cut to a 3 – 4 mm (12 – 0.16 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) Install the baffle plate.

**9. INSTALL OIL STRAINER**

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

Torque: 70 kg-cm (61 in.-lb, 6.9 N-m)

LU-24

LUBRICATION SYSTEM – Oil Pump (2VZ-FE)

10. 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 figure.

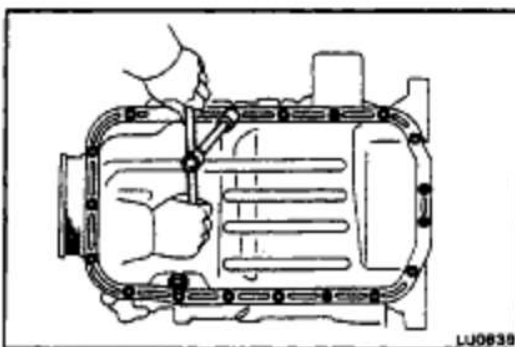
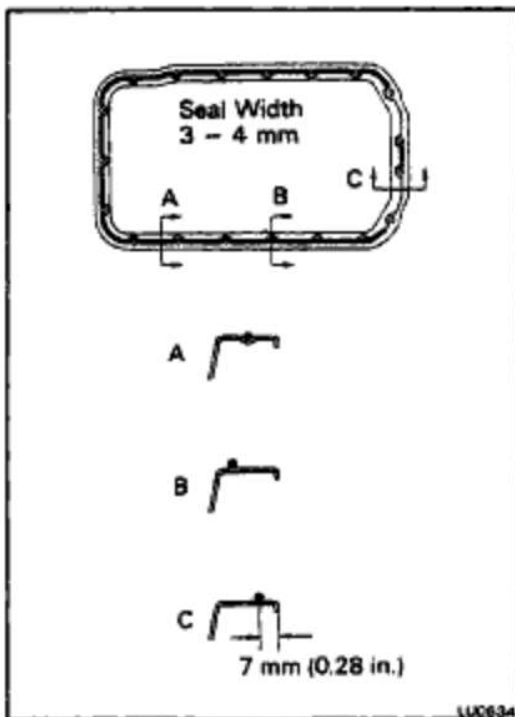
Seal packing: Part No.08826-00080 or equivalent

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

HINT: Avoid applying an excessive amount to the surface.

Be particularly careful near oil passages.

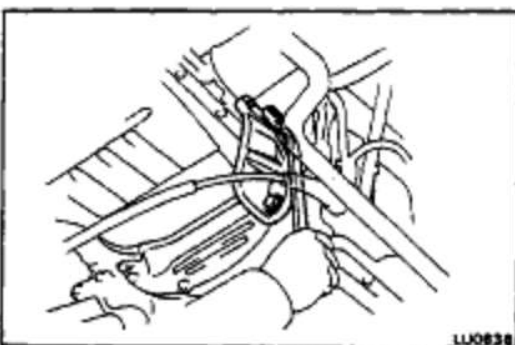
- Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.



(c) Install the oil pan with the fifteen bolts and four nuts.

Torque: 60 kg-cm (52 in.-lb, 5.9 N-m)

(d) Install the dipstick.

**10. INSTALL STIFFENER PLATE**

Install the stiffener plate with the two bolts.

Torque: 380 kg-cm (27 ft-lb, 37 N-m)

11. INSTALL FRONT ENGINE MOUNTING BRACKET AND INSULATOR

(See step 7 on page [EM-171](#))

12. INSTALL ENGINE MOUNTING CENTER MEMBER

(See step 10 on page [EM-171](#))

13. REMOVE FRONT EXHAUST PIPE

(See step 14 on page [EM-172](#))

14. INSTALL SUSPENSION LOWER CROSSMEMBER

(See step 15 on page [EM-172](#))

15. INSTALL ENGINE UNDER COVERS**16. LOWER VEHICLE****17. FILL WITH ENGINE OIL (See page [LU-8](#))****18. START ENGINE AND CHECK FOR LEAKS****19. RECHECK ENGINE OIL LEVEL (See page [LU-6](#))****20. INSTALL HOOD**