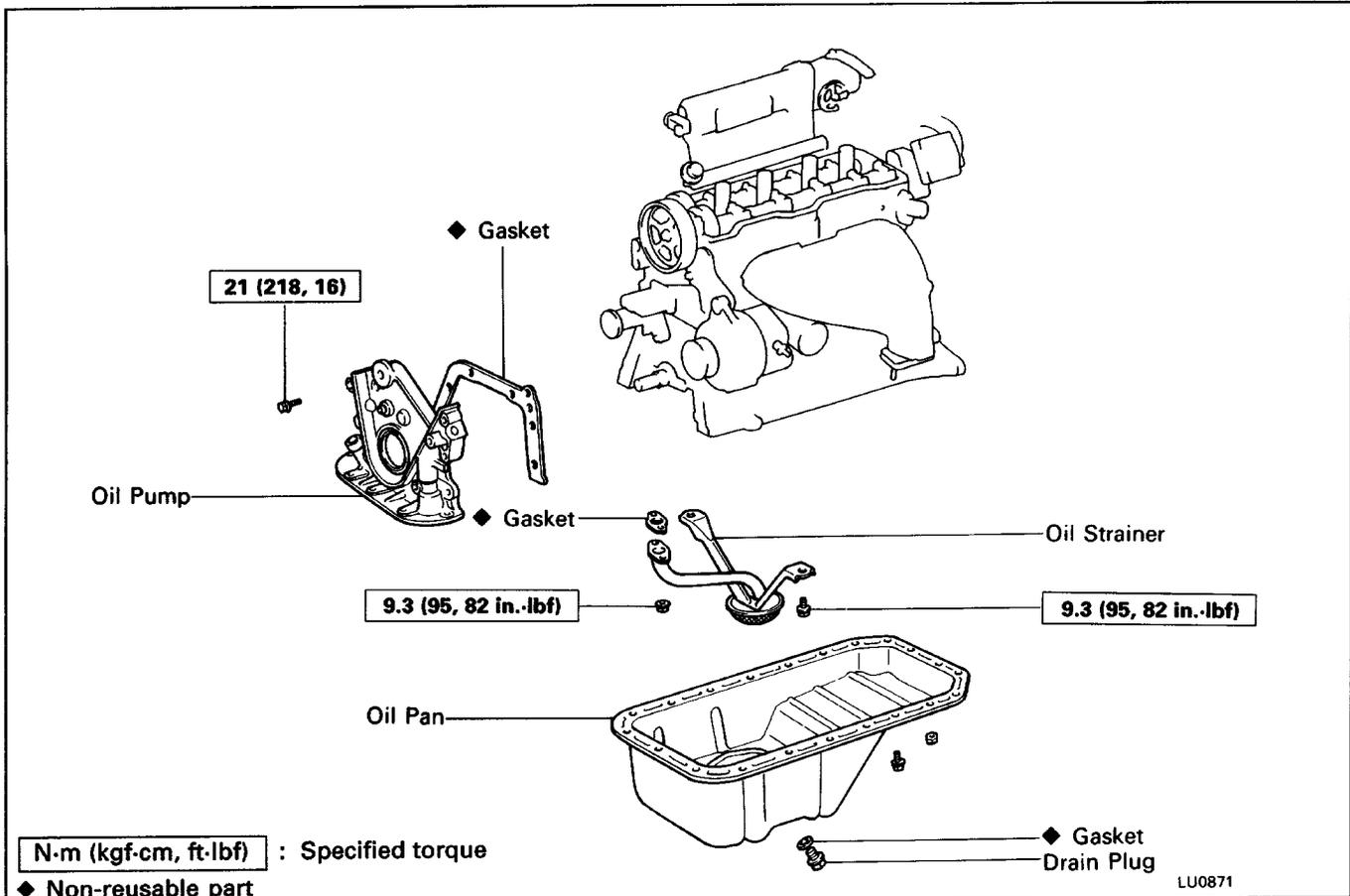


## OIL PUMP (4A-FE)

### REMOVAL OF OIL PUMP

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



#### 1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY

**CAUTION:** Work must be started after approx. 20 seconds or longer from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

#### 2. REMOVE HOOD

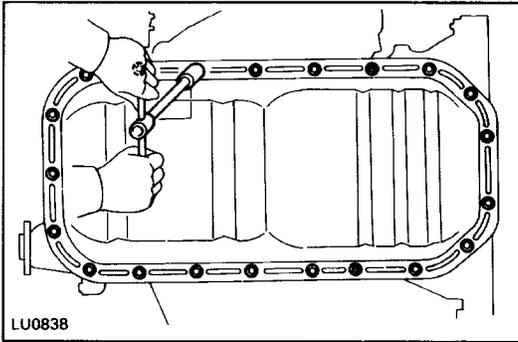
#### 3. REMOVE ENGINE UNDER COVERS

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

#### 5. REMOVE SUSPENSION LOWER CROSSMEMBER (See step 24 on page EM-189)

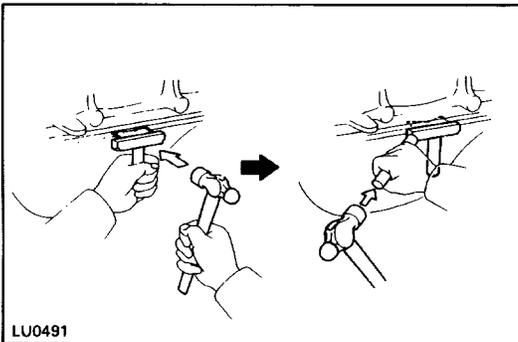
#### 6. REMOVE FRONT EXHAUST PIPE (See step 25 on page EM-189)

#### 7. REMOVE ENGINE MOUNTING CENTER MEMBER (See step 31 on page EM-190)



## 8. REMOVE OIL PAN

- (a) Remove the nineteen bolts and two nuts.

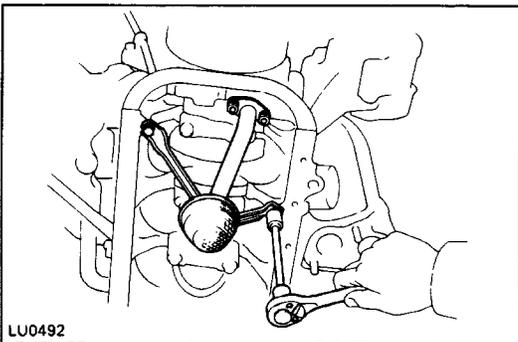


- (b) Insert the blade of SST between the cylinder block and oil pan, cut off applied sealer and remove the oil pan.

SST 09032-00100

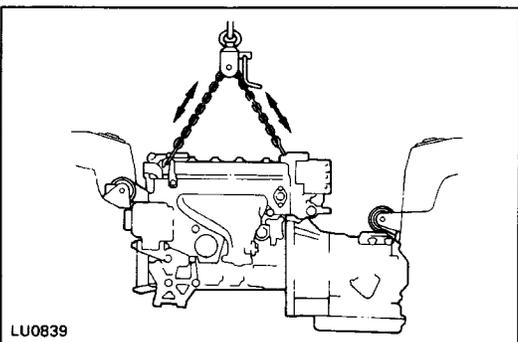
### NOTICE:

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



## 9. REMOVE OIL STRAINER

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

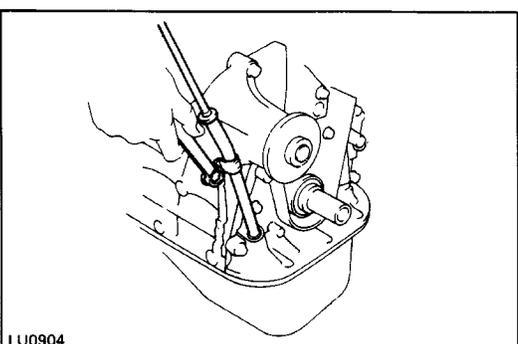


## 10. SUSPEND ENGINE WITH ENGINE CHAIN HOIST

## 11. REMOVE TIMING BELT

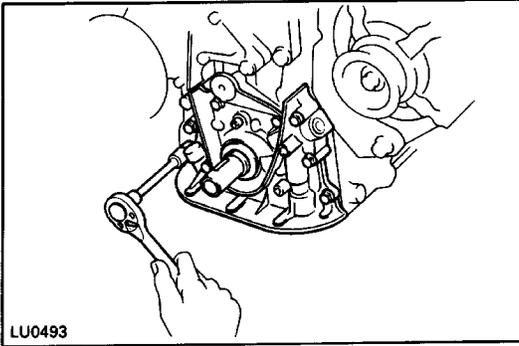
(See steps 2 to 15 and 17 to 20 on pages [EM-33](#) to 37)

## 12. REMOVE IDLER PULLEY AND CRANKSHAFT TIMING PULLEY (See steps 21 and 22 on page [EM-38](#))



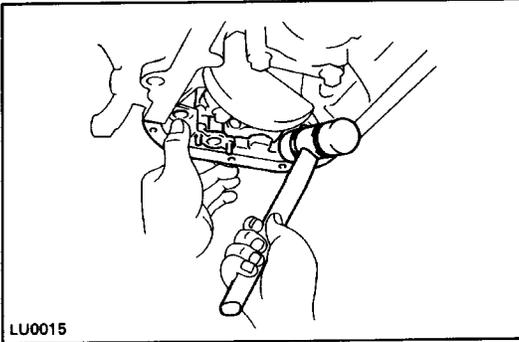
## 13. REMOVE OIL DIPSTICK AND DIPSTICK GUIDE

- (a) Remove the dipstick.  
 (b) Remove the bolt, and pull out the dipstick guide.  
 (c) Remove the O-ring from the dipstick guide.



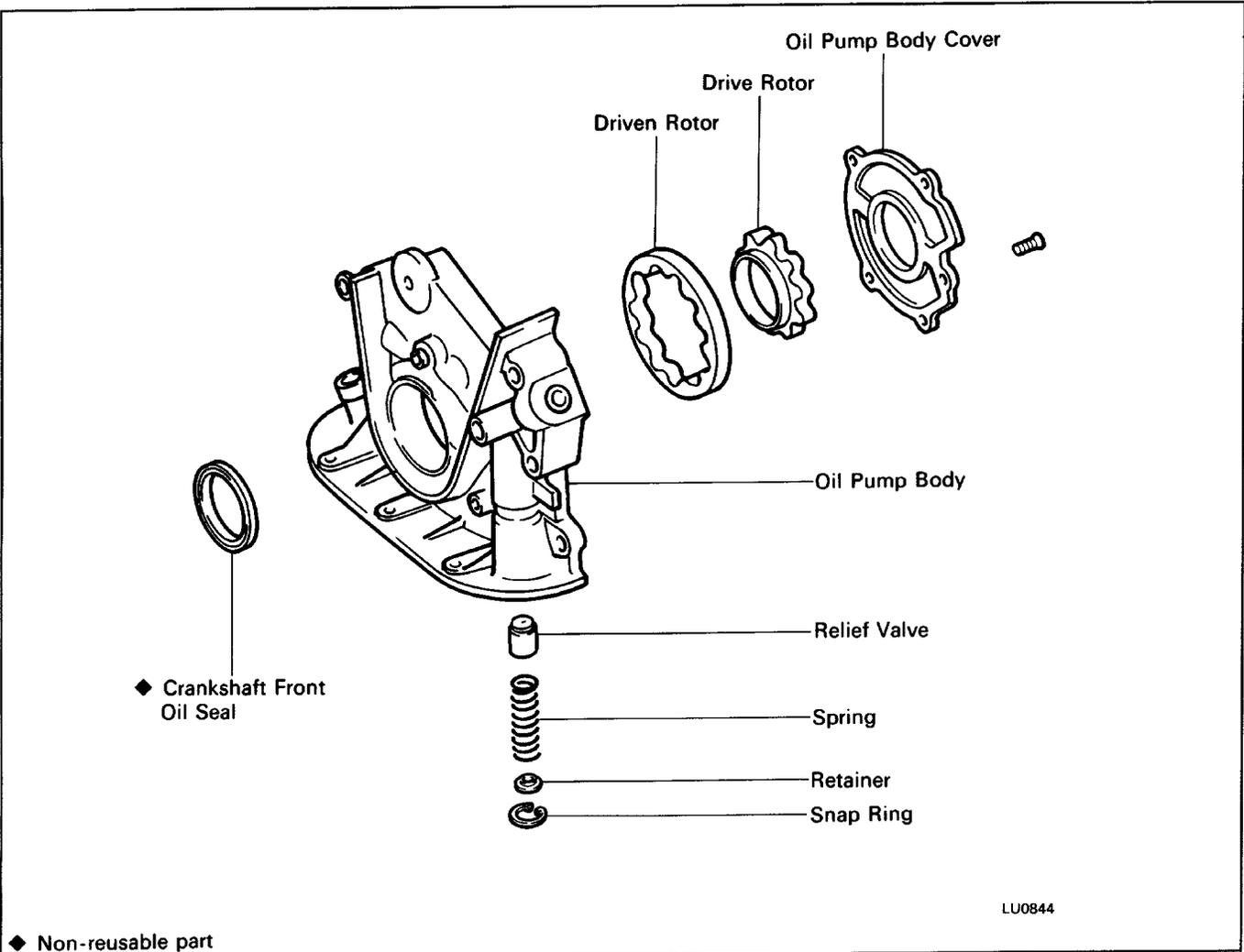
### 14. REMOVE OIL PUMP

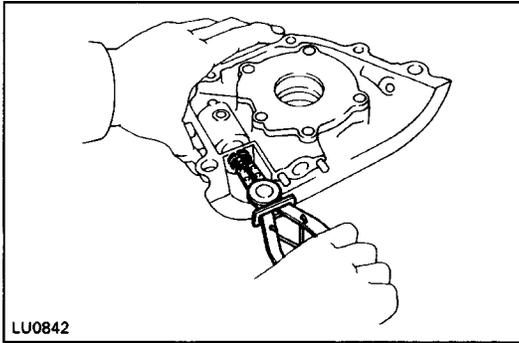
(a) Remove the seven bolts.



(b) Using a plastic-faced hammer, remove the oil pump by carefully tapping the oil pump body.

### COMPONENTS





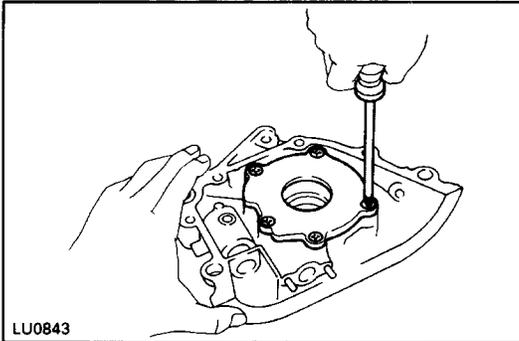
LU0842

## DISASSEMBLY OF OIL PUMP

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

### 1. REMOVE RELIEF VALVE

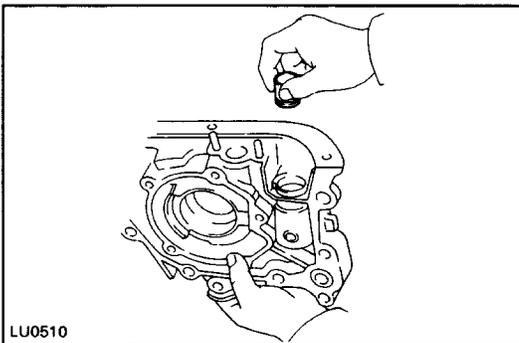
- (a) Using snap ring pliers, remove the snap ring.
- (b) Remove the retainer, spring and relief valve.



LU0843

### 2. REMOVE DRIVE AND DRIVEN ROTORS

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

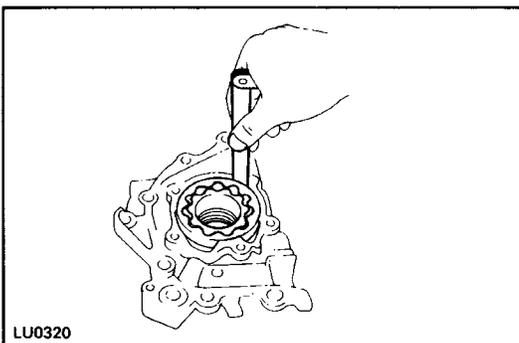


LU0510

## 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 doesn't, replace the relief valve. If necessary, replace the oil pump assembly.



LU0320

### 2. INSPECT DRIVE AND DRIVEN ROTORS

#### A. Inspect rotor body clearance

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

**Standard body clearance: 0.080 – 0.180 mm (0.0031 – 0.0071 in.)**

**Maximum body clearance: 0.20 mm (0.0079 in.)**

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

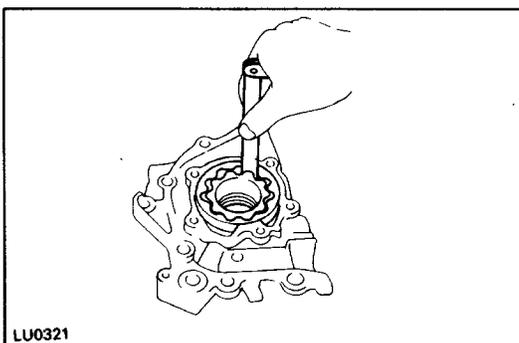
#### B. Inspect rotor tip clearance

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

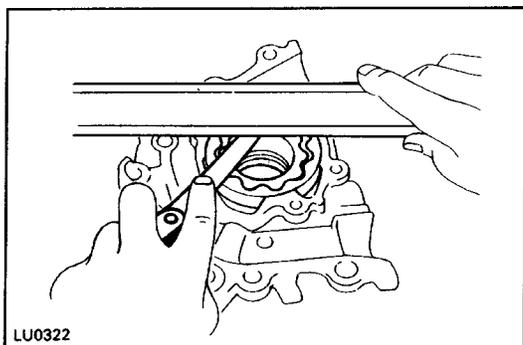
**Standard tip clearance: 0.025 – 0.085 mm (0.0010 – 0.0033 in.)**

**Maximum tip clearance: 0.35 mm (0.0138 in.)**

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



LU0321



### C. Inspect rotor side clearance

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

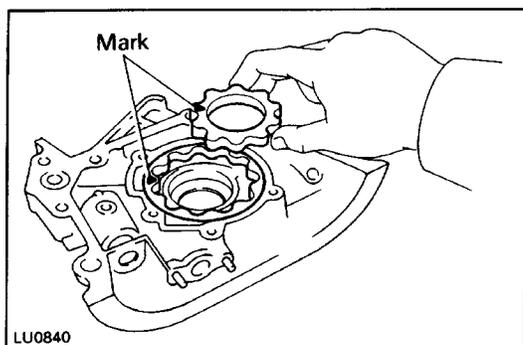
**Standard side clearance: 0.025 – 0.085 mm  
(0.0010 – 0.0033 in.)**

**Maximum side clearance: 0.10 mm (0.0039 in.)**

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

## REPLACEMENT OF CRANKSHAFT FRONT OIL SEAL

(See page [EM-207](#))

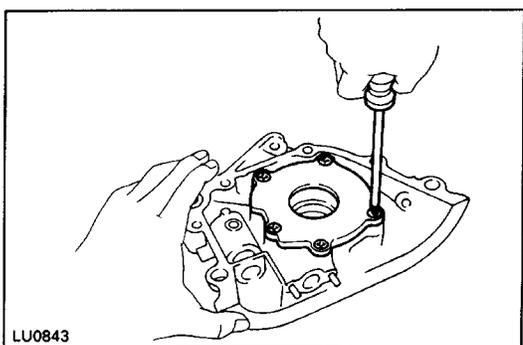


## ASSEMBLY OF OIL PUMP

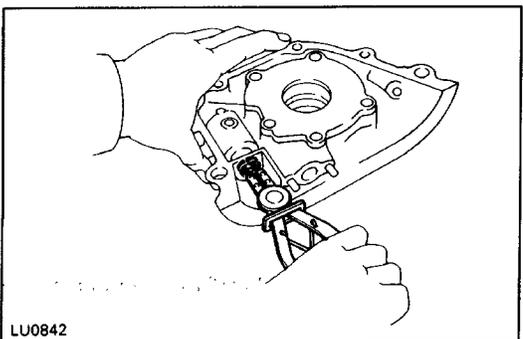
(See page [LU-11](#))

### 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.

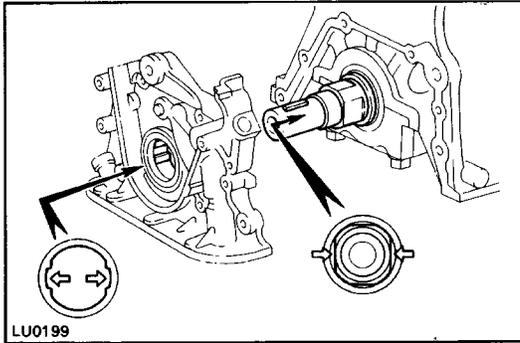


- (b) Install the pump body cover with the five screws.  
**Torque: 10 N-m (105 kgf-cm, 8 ft-lbf)**



### 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.

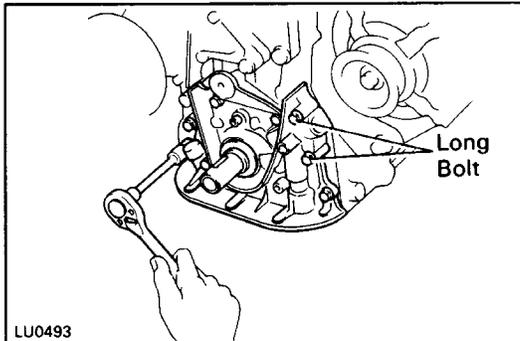


## INSTALLATION OF OIL PUMP

(See page [LU-9](#))

### 1. INSTALL OIL PUMP

- Place a new gasket in position on the cylinder block.
- Engage the spline teeth of the oil pump drive rotor with the large teeth of the crankshaft, and slide the oil pump.



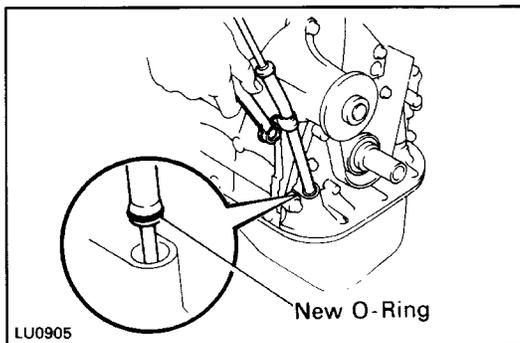
- Install the oil pump with the seven bolts.

**Torque: 21 N-m (218 kgf-cm, 16 ft-lbf)**

HINT: Each bolt length is indicated in the illustration.

Bolt length: Long bolt 35 mm (1.38 in.)

Others 25 mm (0.98 in.)



### 2. INSTALL OIL DIPSTICK GUIDE AND DIPSTICK

- Install a new O-ring to the dipstick guide.
- Apply soapy water to the O-ring.
- Push in the dipstick guide, and install it with the bolt.

**Torque: 9.3 N-m (95 kgf-cm, 82 in.-lbf)**

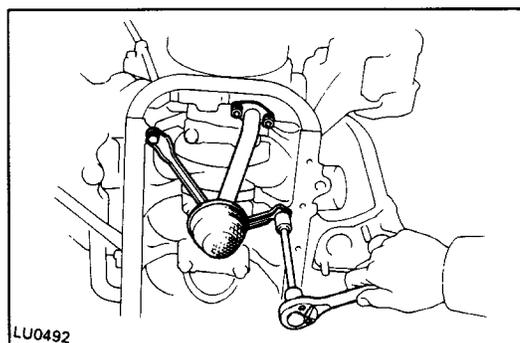
- Install the dipstick.

### 3. INSTALL CRANKSHAFT TIMING PULLEY AND IDLER PULLEY (See steps 1 and 2 on page [EM-40](#))

### 4. INSTALL TIMING BELT

(See steps 3 to 6 and 8 to 21 on pages [EM-40](#) to 45)

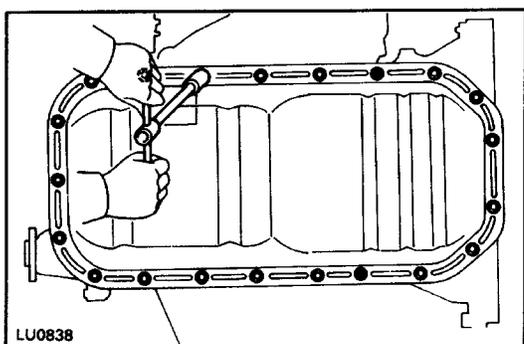
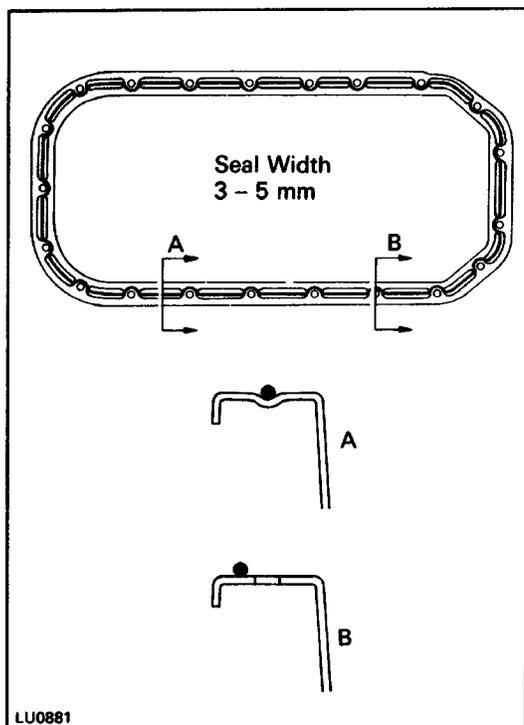
### 5. REMOVE ENGINE CHAIN HOIST FROM ENGINE



### 6. INSTALL OIL STRAINER

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

**Torque: 9.3 N-m (95 kgf-cm, 82 in.-lbf)**



## 7. 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 3 - 5 mm (0.12 - 0.20 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 re-install cap.

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

**Torque:** 4.9 N·m (50 kgf·cm, 43in.-lbf)

## 8. INSTALL ENGINE MOUNTING CENTER MEMBER

(See step 10 on page [EM-216](#))

## 9. INSTALL FRONT EXHAUST PIPE

(See step 17 on page [EM-217](#))

## 10. INSTALL SUSPENSION LOWER CROSSMEMBER

(See step 18 on page [EM-218](#))

## 11. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

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

13. START ENGINE AND CHECK FOR LEAKS

14. RECHECK ENGINE OIL LEVEL (See page [LU-5](#))

15. INSTALL HOOD

16. INSTALL ENGINE UNDER COVERS