

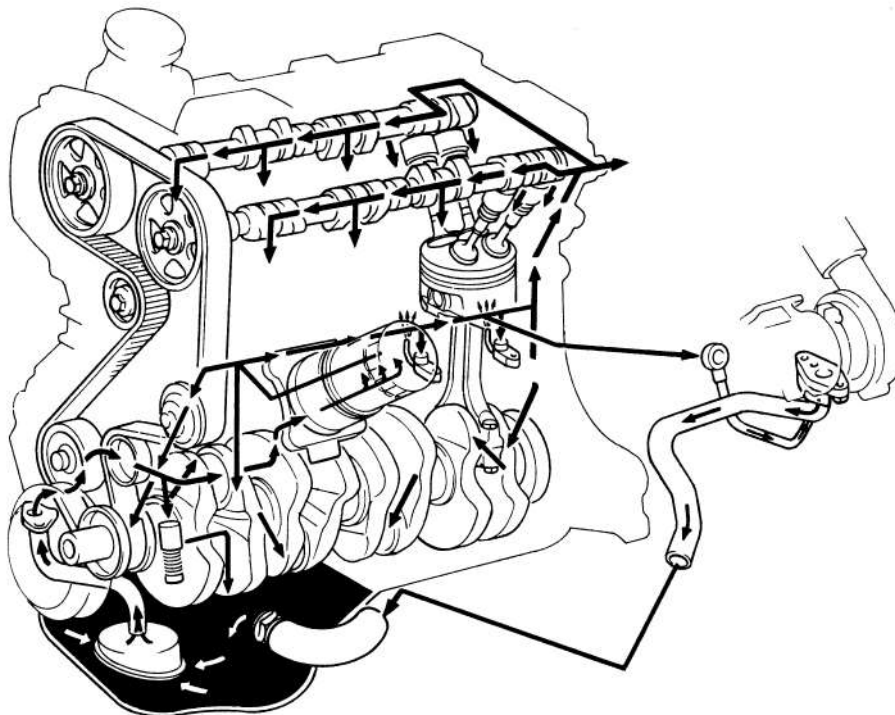
LUBRICATION SYSTEM

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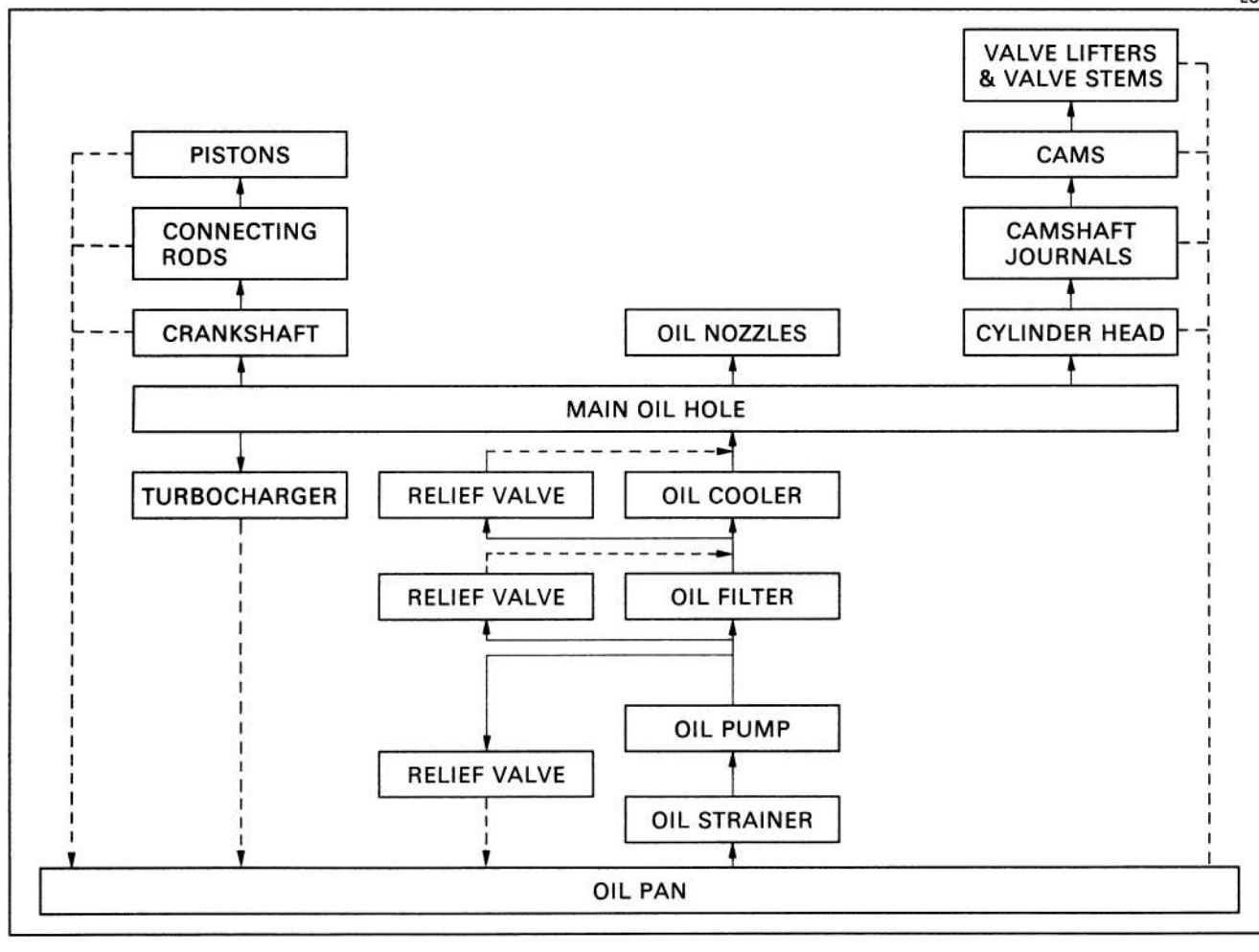
DESCRIPTION

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

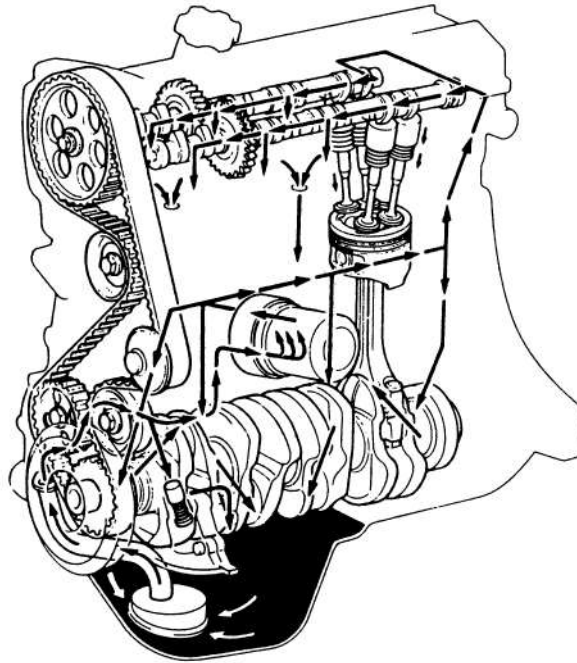
3S-GTE



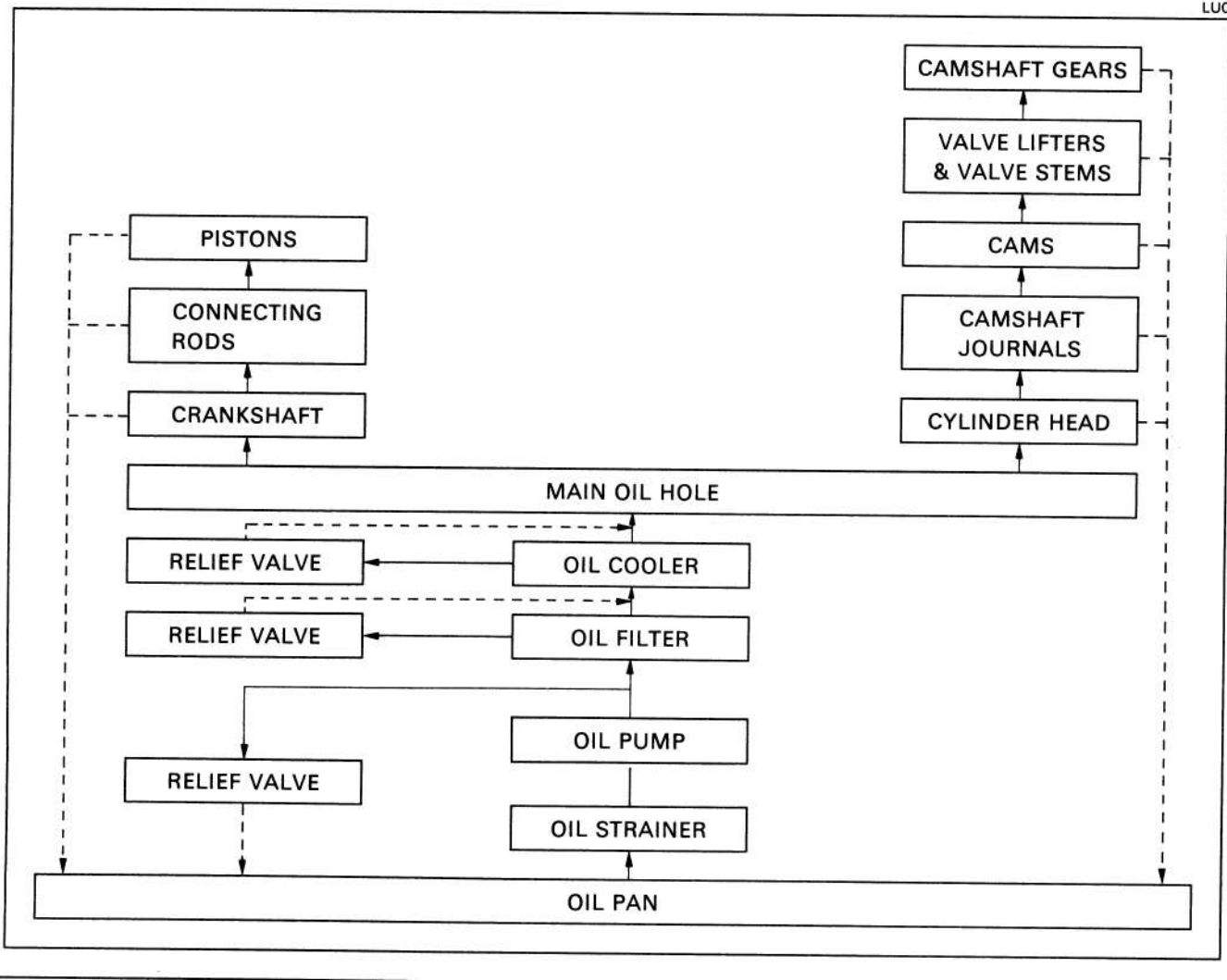
LU0932



5S-FE



LU0910



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 there 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

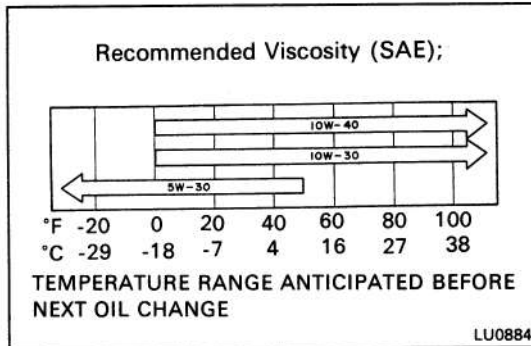
At high engine speeds, the engine oil supplied by the oil pump exceeds the capacity of the engine to utilize it. For that reason, the oil pressure regulator works to prevent an oversupply of oil. During normal oil supply, a coil spring and valve keep the bypass closed, but when too much oil is being 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, airborne dirt, carbon and other impurities can get into the oil during use and could cause accelerated wear or sizing 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 Gasket faulty	Repair as necessary Replace oil seal Replace gasket	EM-160, 161 LU-10
Low oil pressure	Oil leakage Relief valve faulty Oil pump faulty Engine oil poor quality Crankshaft bearing faulty Connecting rod bearing faulty Oil filler clogged	Repair as necessary Repair relief valve Repair oil pump Replace engine oil Replace bearing Replace bearing Replace oil filler	LU-10 LU-10 LU-7 EM-134, 182 EM-134, 182 LU-7
High oil pressure	Relief valve faulty	Repair relief valve	LU-10



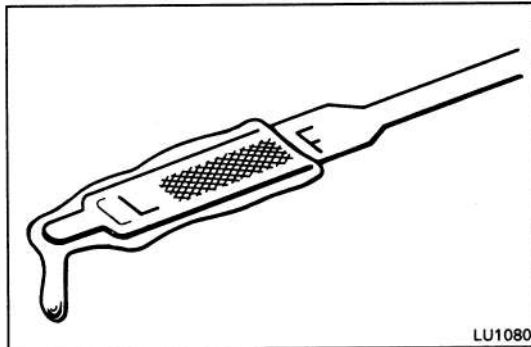
OIL PRESSURE CHECK

1. CHECK ENGINE OIL QUALITY

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

If the quality is poor, replace the oil.

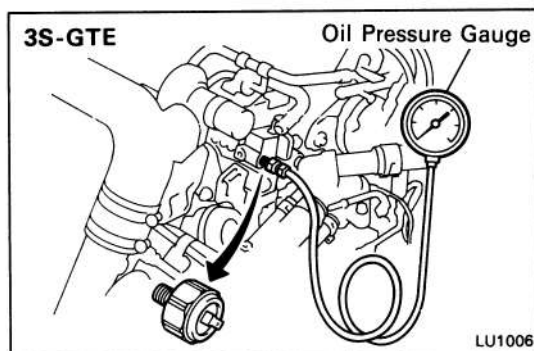
Oil grade: API grade SG, multigrade, fuelefficient and recommended viscosity oil



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

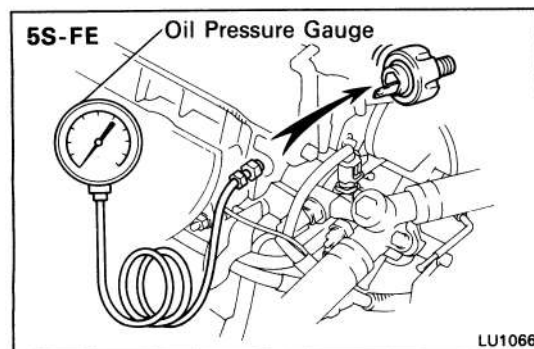
Allow the engine to warm up to normal operating temperature.

6. CHECK OIL PRESSURE

Oil pressure:

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

At 3,000 rpm 2.5 – 5.0 kg/cm² (36 – 71 psi, 245 – 490 kPa)



7. REMOVE OIL PRESSURE GAUGE, AND REINSTALL OIL PRESSURE SWITCH

Apply adhesive to two or three threads of the oil pressure switch.

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

8. START ENGINE AND CHECK FOR LEAKS

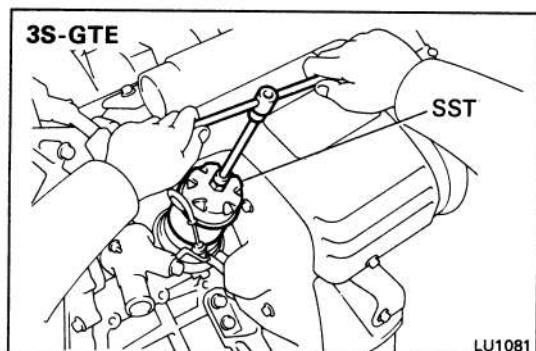
REPLACEMENT OF ENGINE OIL AND OIL FILTER

NOTICE:

- Prolonged and repeated contact with mineral oil will result in the removal of natural 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 waterless 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 filter must be disposed of only at designated disposal sites.

1. DRAIN ENGINE OIL

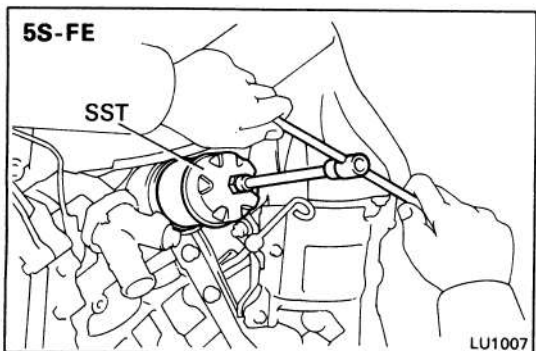
- (a) Remove the oil filler cap.
- (b) Remove the oil drain plug, and drain the oil into a container.



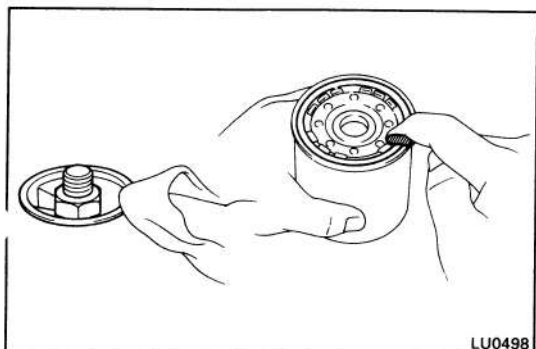
2. REPLACE OIL FILTER

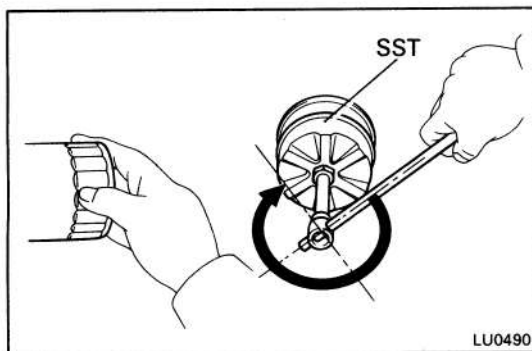
- (a) Remove the air duct from the alternator.
- (b) Using SST, remove the oil filter.

SST 09228-06500



- (c) Check and clean the oil filter installation surface.
- (d) Apply clean engine oil to the gasket of a new oil filter.





- (e) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.
- (f) Using SST, tighten it an additional $3/4$ turn.
SST 09228-06500
- (g) Reinstall the air duct to the alternator.

3. FILL WITH ENGINE OIL

- (a) Clean and install the oil drain plug with a new gasket.

Torque:

3S-GE	200 kg-cm (14 ft-lb, 20 N·m)
5S-FE	400 kg-cm (29 ft-lb, 39 N·m)

- (b) Fill with new engine oil.

Oil grade: See page LU-4

Capacity (3S-GTE):

Drain and refill

w/ Oil filter change

3.9 liters (4.1 US qts, 3.4 Imp. qts)

w/o Oil filter change

3.6 liters (3.8 US qts, 3.2 Imp. qts)

Dry fill 4.3 liters (4.5 US qts, 3.8 Imp. qts)

Capacity (5S-FE):

Drain and refill

w/ Oil filter change

4.0 liters (4.2 US qts, 3.5 Imp. qts)

w/o Oil filter change

3.8 liters (4.0 US qts, 3.3 Imp. qts)

Dry fill 4.4 liters (4.7 US qts, 3.9 Imp. qts)

- (c) Reinstall the oil filler cap.

4. START ENGINE AND CHECK FOR LEAKS

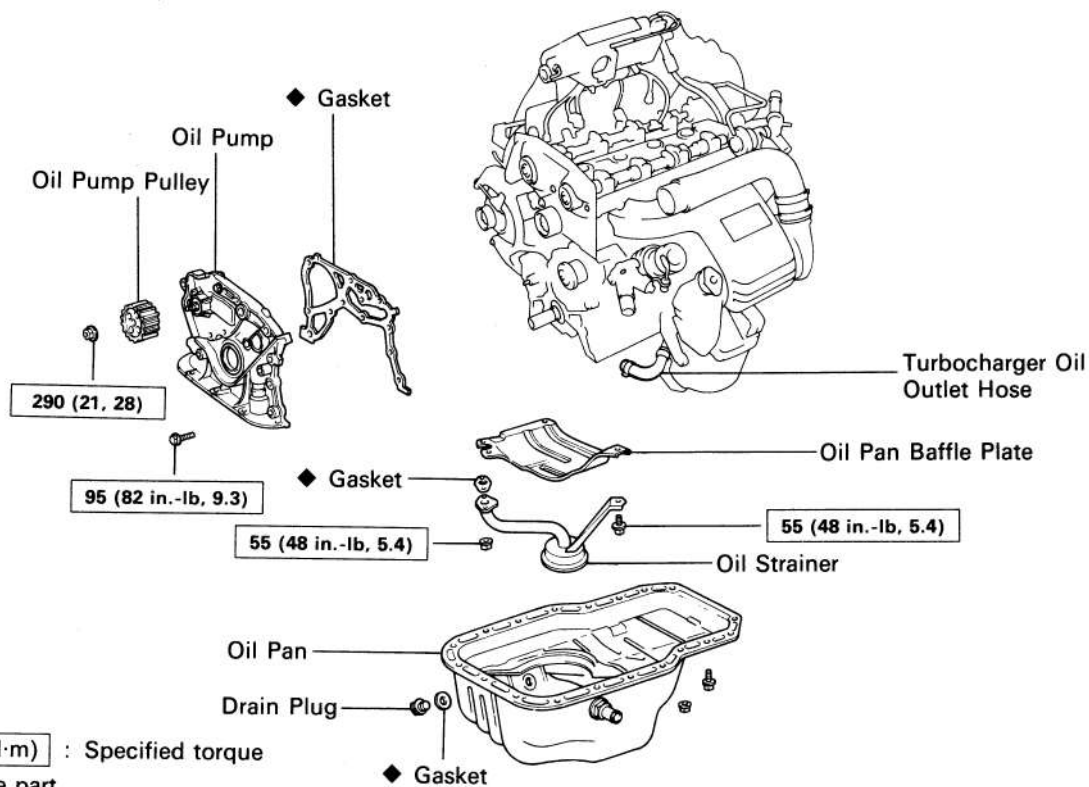
5. RECHECK ENGINE OIL LEVEL (See page LU-6)

OIL PUMP

REMOVAL OF OIL PUMP

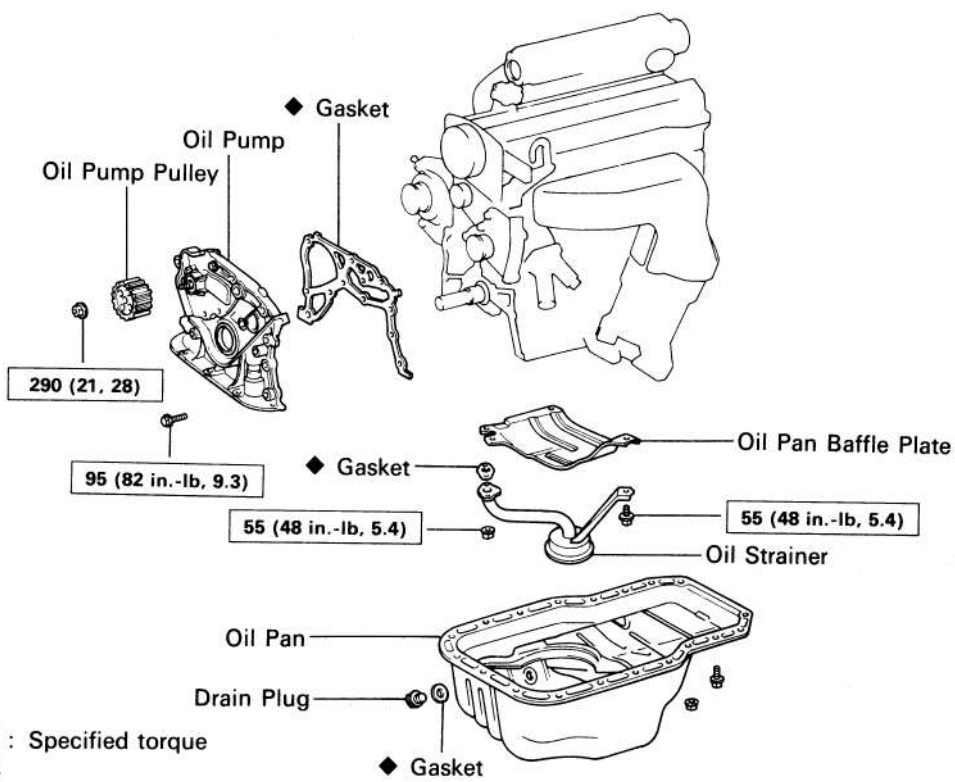
HINT: When repairing the oil pump, the oil pan and strainer should be removed and cleaned.

3S-GTE



LU1074

5S-FE

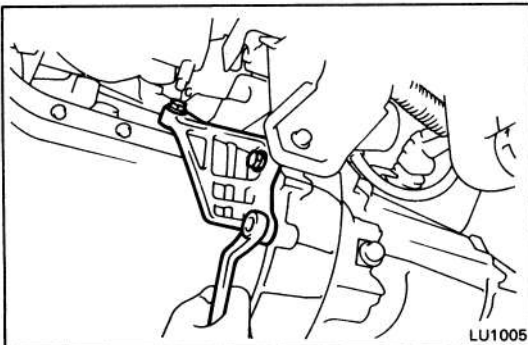


LU1083

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

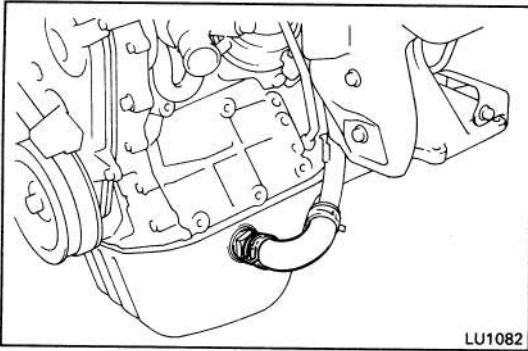
CAUTION: Work must be started after approx. 20 seconds or longer from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

2. **DRAIN ENGINE OIL** (See page LU-6)
3. **REMOVE ENGINE UNDER COVERS**
4. **REMOVE RH ENGINE HOOD SIDE PANEL**
5. **REMOVE SUSPENSION UPPER BRACE**
3S-GTE (See step 8 on page EM-134)
5S-FE (See step 8 on page EM-182)
6. **REMOVE CRUISE CONTROL ACTUATOR (w/ CRUISE CONTROL SYSTEM) AND ACCELERATOR LINKAGE**
3S-GTE (See step 13 on page EM-135)
5S-FE (See step 11 on page EM-182)
7. **REMOVE FRONT EXHAUST PIPE**
3S-GTE (See steps 30 and 31 on pages EM-138 and 139)
5S-FE (See step 29 on page EM-187)
8. (3S-GTE)
REMOVE A/C COMPRESSOR WITHOUT DISCONNECTING HOSES
(See step 12 on page TC-21)
9. (5S-FE)
REMOVE A/C BELT IDLER PULLEY
(See step 31 on page EM-187)
10. (3S-GTE)
REMOVE CATALYTIC CONVERTER
(See step 14 on page EM-64)
11. (3S-GTE)
REMOVE INTERCOOLER
(See steps 4, 5, 7 to 13 on pages TC-20 to 22)

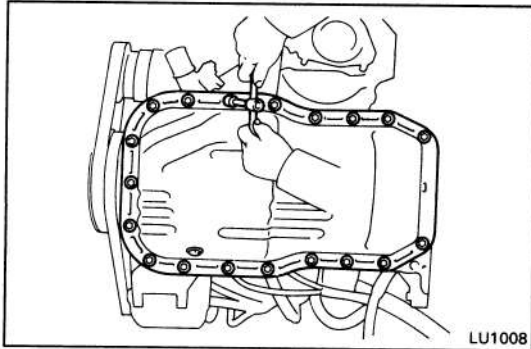


12. **REMOVE STIFFENER PLATE**

Remove the three bolts and stiffener plate.

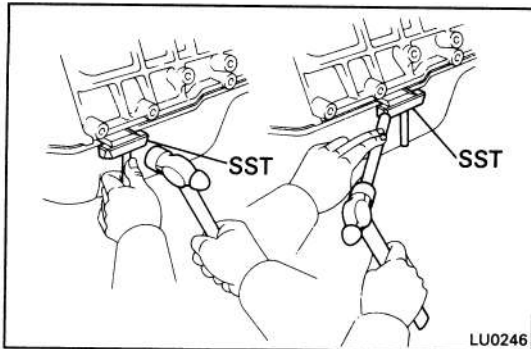


13. DISCONNECT TURBOCHARGER OIL OUTLET HOSE FROM OIL PAN



14. REMOVE OIL PAN

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

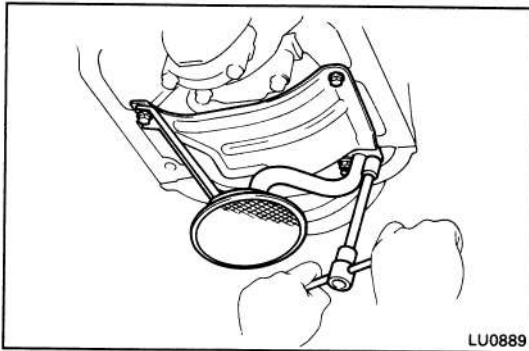


- (c) Insert the blade of SST between the cylinder block and oil pan, cut off applied sealer and remove the oil pan.

SST 09032-00100

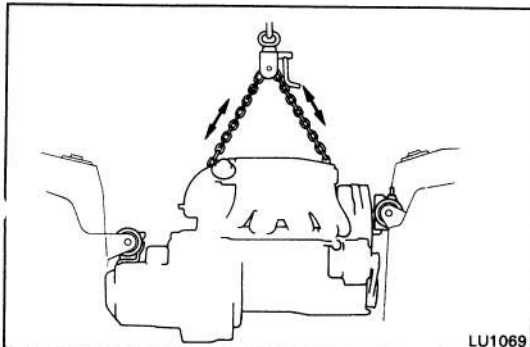
NOTICE:

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



15. REMOVE OIL STRAINER AND BAFFLE PLATE

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



16. SUSPEND ENGINE WITH ENGINE CHAIN HOIST

17. REMOVE TIMING BELT

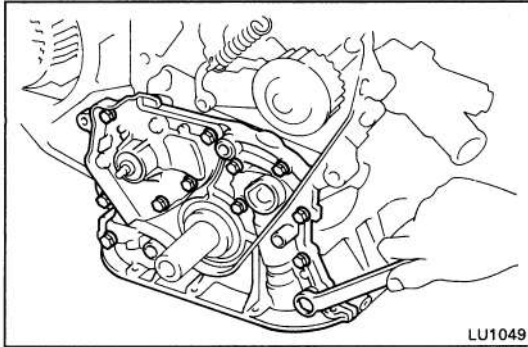
3S-GTE (See steps 7, 8 and 10 to 22 on pages EM-26 to 31)

5S-FE (See steps 6 to 8 and 10 to 21 on pages EM-47 to 52)

18. REMOVE NO.2 IDLER PULLEY, CRANKSHAFT TIMING PULLEY AND OIL PUMP PULLEY

3S-GTE (See steps 24 and 24 on pages EM-42 and 43)

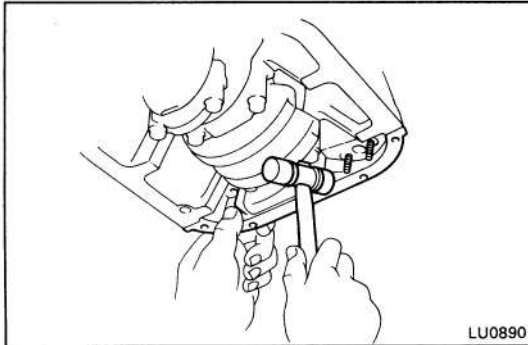
5S-FE (See steps 24 and 24 on pages EM-42 and 43)



LU1049

19. REMOVE OIL PUMP

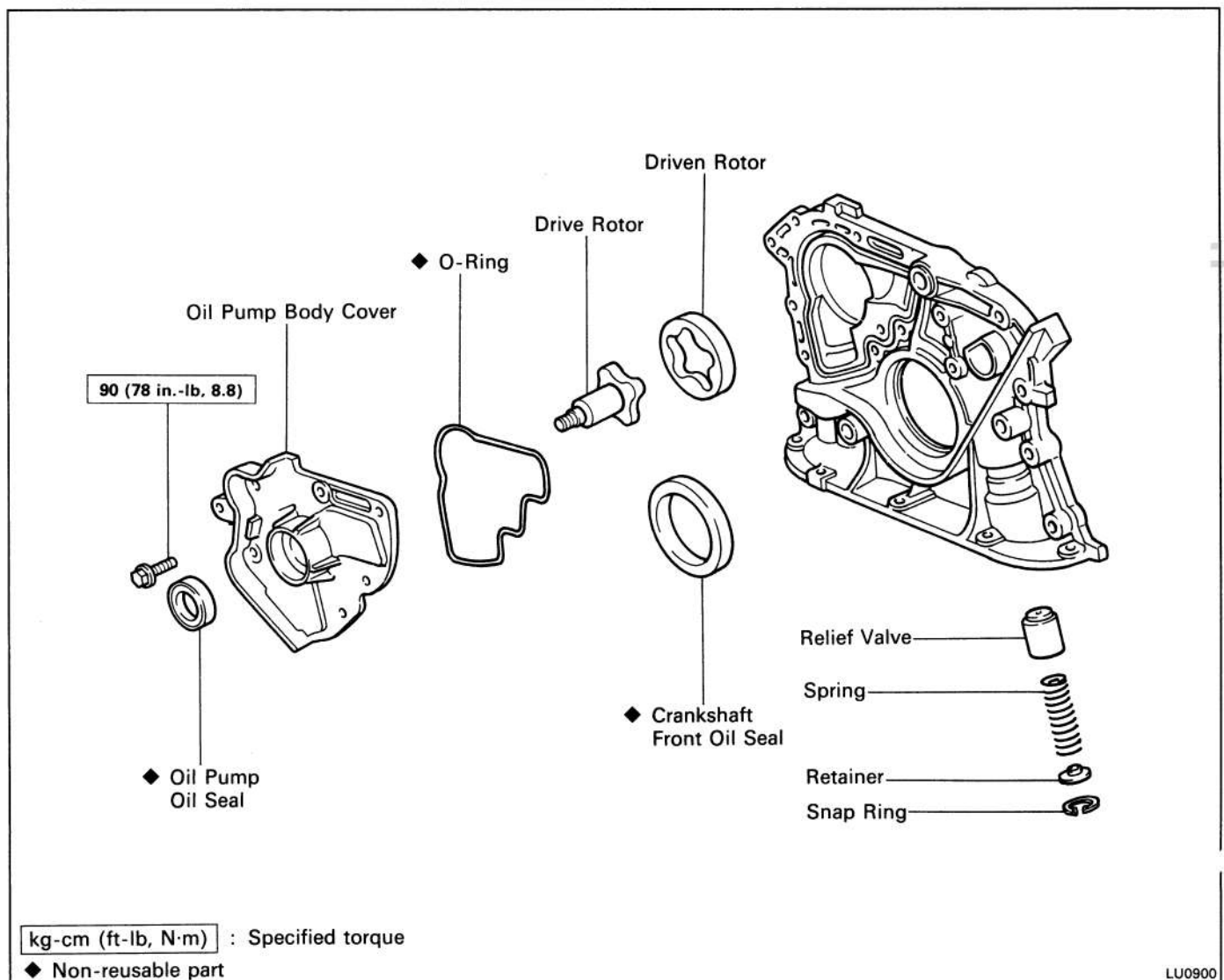
(a) Remove the twelve bolts.

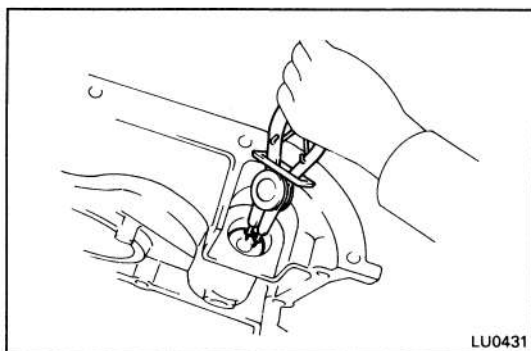


LU0890

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

(c) Remove the gasket.

COMPONENTS

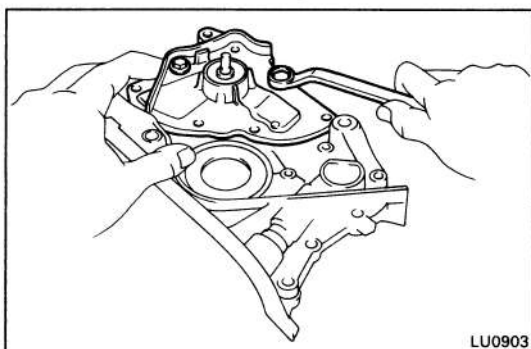


DISASSEMBLY OF OIL PUMP

(See page LU-12)

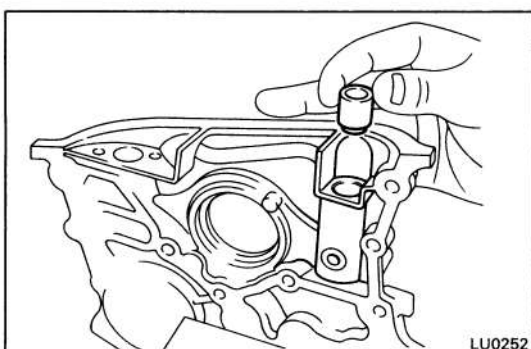
1. REMOVE RELIEF VALVE

- (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.

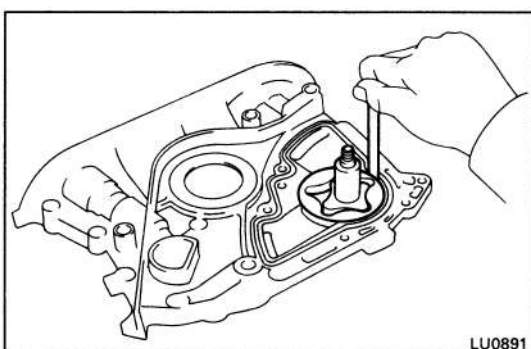


INSPECTION OF OIL PUMP

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 it doesn't, 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 – 0.160 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 rotors as a set. If necessary, replace the oil pump assembly.

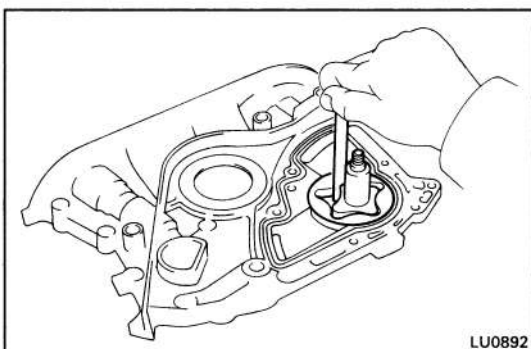
B. Inspect rotor tip clearance

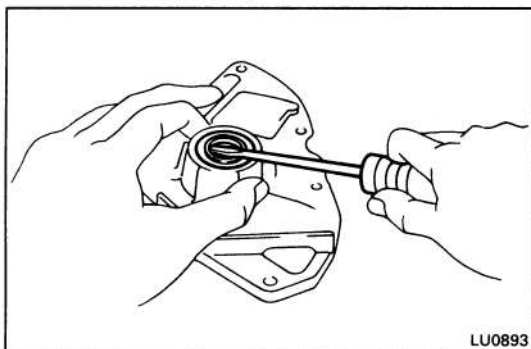
Using a feeler gauge, measure the clearance between the drive and driven rotors.

Standard tip clearance: 0.040 – 0.160 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.

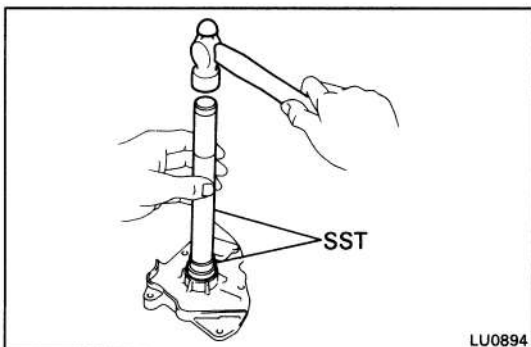




REPLACEMENT OF OIL PUMP OIL SEAL

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 until its surface is flush with the oil pump cover edge.

SST 09620-30010 (09627-30010, 09631-00020)

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

REPLACEMENT OF CRANKSHAFT FRONT OIL SEAL

(See page EM-160)

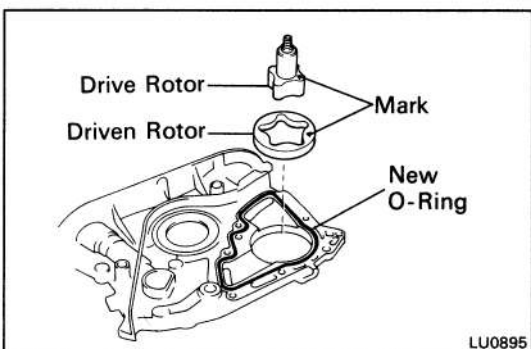
ASSEMBLY OF OIL PUMP

(See page LU-12)

1. INSTALL DRIVE AND DRIVEN ROTORS

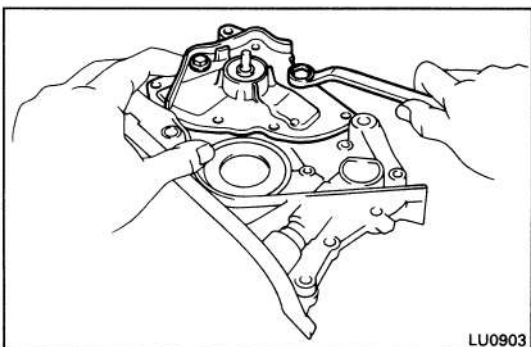
(a) Place the drive and driven rotors into pump body with the marks facing the pump body cover side.

(b) Install a new O-ring to the pump body.



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

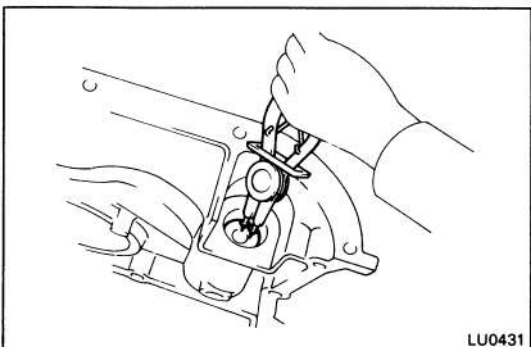
Torque: 90 kg-cm (78 in.-lb, 8.8 N·m)

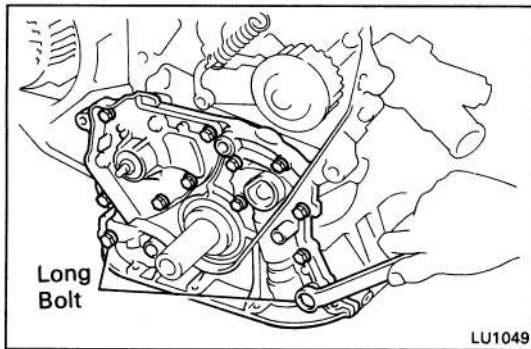


2. INSTALL RELIEF VALVE

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

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





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:

3S-GTE 80 kg-cm (69 in.-lb, 7.8 N·m)

5S-FE 95 kg-cm (82 in.-lb, 9.3 N·m)

HINT: Each bolt length is indicated in the figure.

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

Others 25 mm (0.98 in.)

2. INSTALL OIL PUMP PULLEY, CRANKSHAFT TIMING PULLEY AND NO.2 IDLER PULLEY

3S-GTE (See steps 1 to 3 on page EM-35)

5S-FE (See steps 1 to 3 on page EM-55)

3. INSTALL TIMING BELT

3S-GTE (See steps 5 to 8 and 10 to 25 on pages EM-35 to 41)

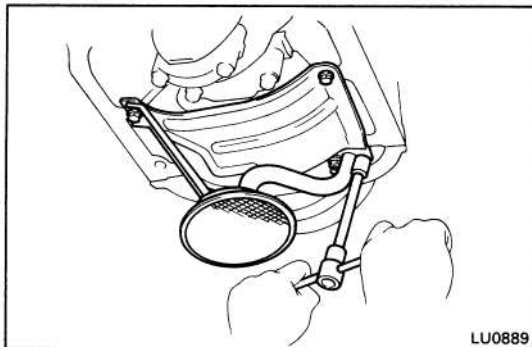
5S-FE (See steps 5 to 8 and 10 to 20 on pages EM-55 to 60)

4. REMOVE ENGINE CHAIN HOIST FROM ENGINE

5. INSTALL BAFFLE PLATE AND OIL STRAINER

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

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

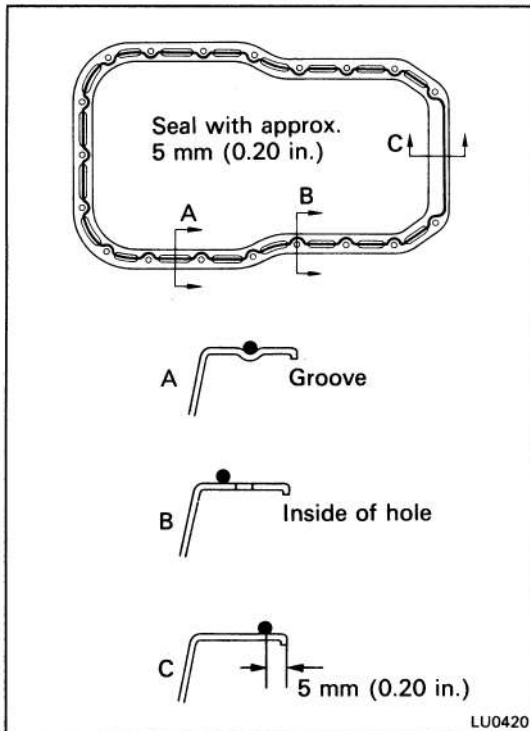


6. INSTALL OIL PAN

(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.



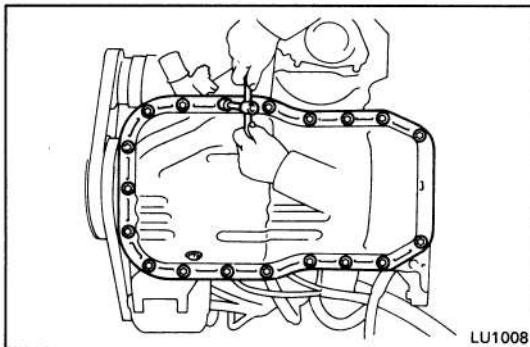
(b) Apply seal packing to the oil pan as shown in the figure.

Seal packing: Part No.08826-00080 or equivalent

- Install a nozzle that has been cut to a 3 – 5 mm (0.12 – 0.20 in.) opening.

HINT: Avoid applying an excessive amount to the surface. Be particularly careful near oil passages.

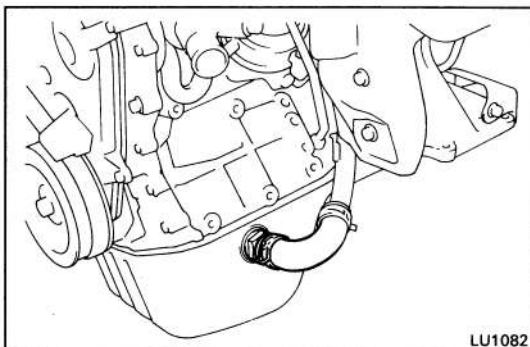
- Parts must be assembled within 5 minutes of application. Otherwise the material must be removed and reapplied.
- Immediately remove nozzle from the tube and reinstall cap.



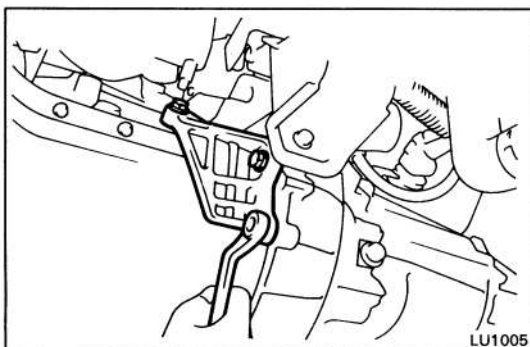
(c) Install the oil pan with the seventeen bolts and four nuts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

(d) Install the dipstick.



7. CONNECT TURBOCHARGER OIL OUTLET HOSE TO OIL PAN



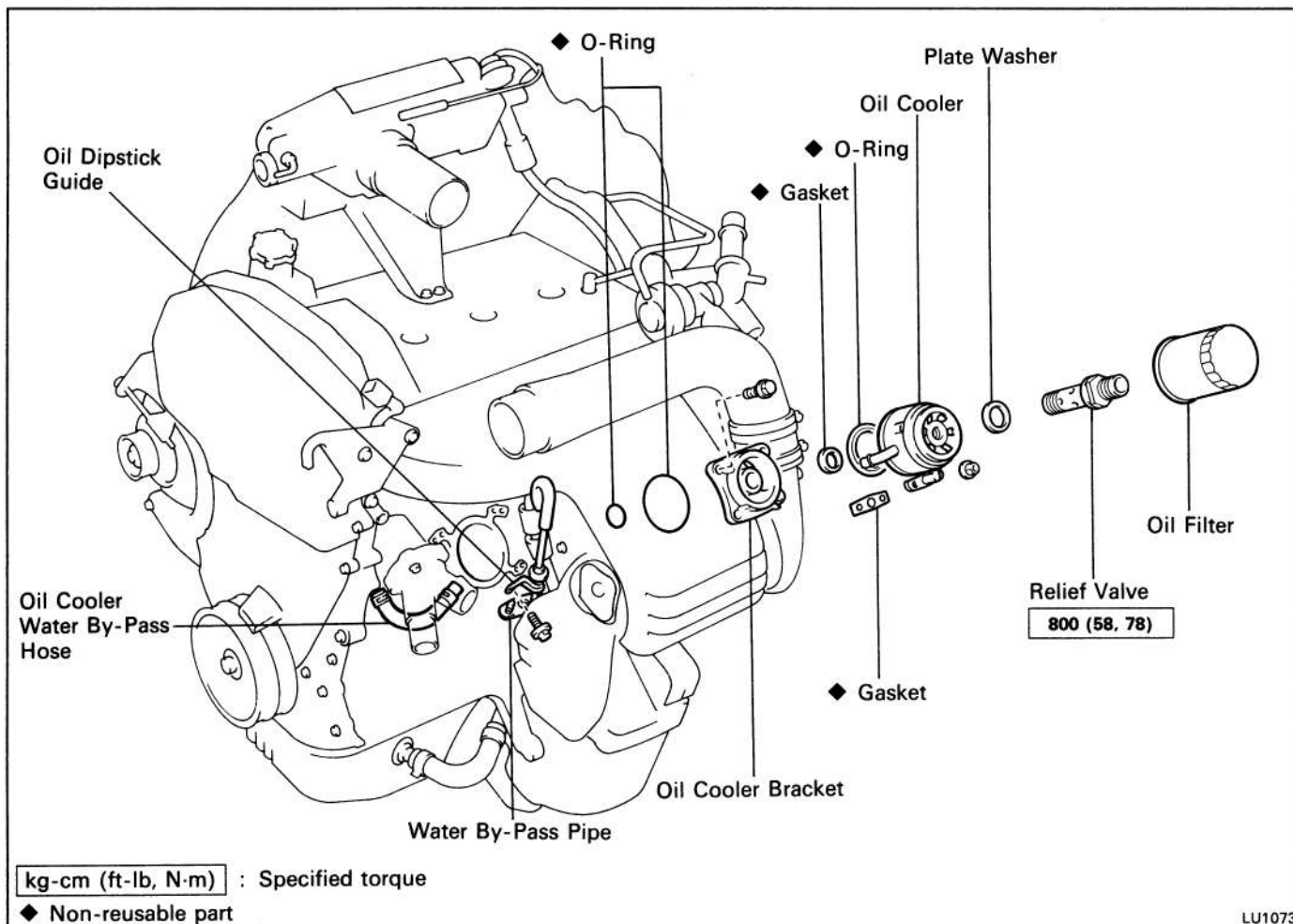
8. INSTALL STIFFENER PLATE

Install the stiffener plate with the two bolts.

Torque: 380 kg-cm (27 ft-lb, 37 N·m)

9. (3S-GTE)
INSTALL INTERCOOLER
(See steps 2 to 8, 10 and 11 on pages TC-23 to 25)
10. (3S-GTE)
INSTALL CATALYTIC CONVERTER
(See step 28 on pages EM-94 and 95)
11. (3S-GTE)
INSTALL A/C COMPRESSOR
(See step 3 on page TC-23)
12. (5S-FE)
INSTALL A/C BELT IDLER PULLEY
(See step 13 on page EM-221)
13. **INSTALL FRONT EXHAUST PIPE**
3S-GTE (See steps 18 and 19 on pages EM-174 and 175)
5S-FE (See step 15 on pages EM-221 and 222)
14. **INSTALL CRUISE CONTROL ACTUATOR (w/ CRUISE CONTROL SYSTEM) AND ACCELERATOR LINKAGE**
3S-GTE (See step 36 on page EM-178)
5S-FE (See step 33 on page EM-226)
15. **INSTALL SUSPENSION UPPER BRACE**
3S-GTE (See step 41 on page EM-179)
5S-FE (See step 36 on page EM-226)
16. **CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY**
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 RH ENGINE HOOD SIDE PANEL**

OIL COOLER (3S-GTE) COMPONENTS

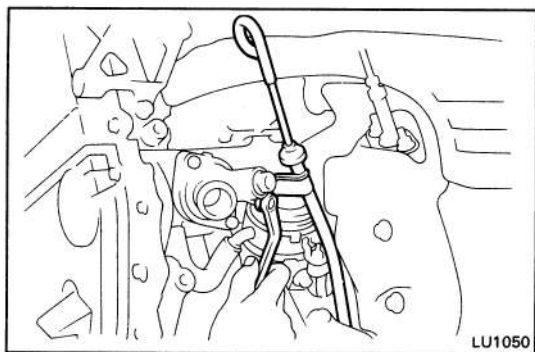


REMOVAL OF OIL COOLER

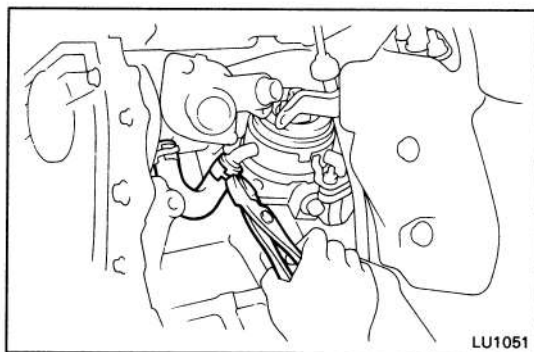
1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY

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.

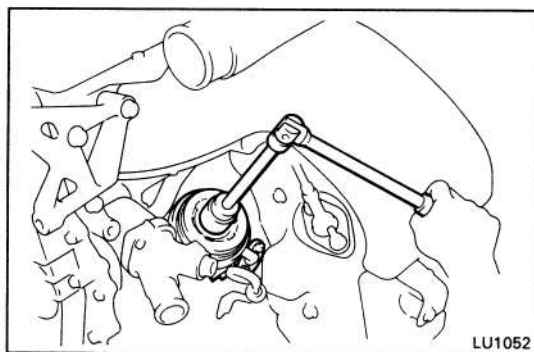
2. DRAIN ENGINE COOLANT (See page CO-6)
3. REMOVE ENGINE UNDER COVERS
4. REMOVE RH ENGINE HOOD SIDE PANEL
5. REMOVE NO.1 AIR INTAKE CONNECTOR (See step 4 on page TC-20)
6. REMOVE A/C COMPRESSOR WITHOUT DISCONNECTING HOSES (See steps 10 to 12 on pages TC-21 and 22)
7. REMOVE OIL FILTER (See page LU-7)



- 8. DISCONNECT OIL DIPSTICK GUIDE FROM WATER INLET**

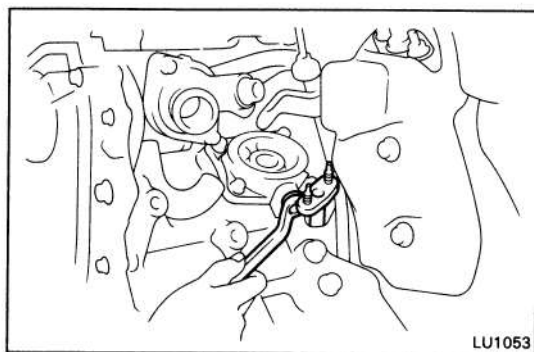


- 9. DISCONNECT WATER BY-PASS HOSE FROM OIL COOLER**

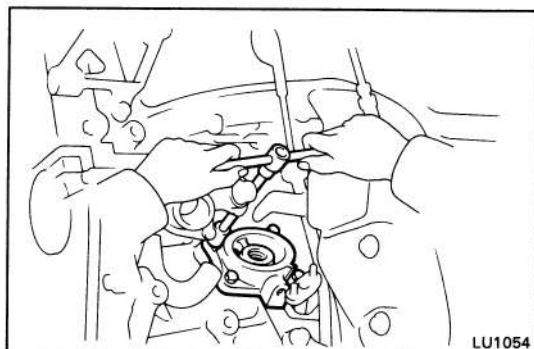


- 10. REMOVE OIL COOLER**

- (a) Remove the relief valve and plate washer.
- (b) Remove the two nuts, oil cooler and gasket.
- (c) Remove the O-ring and gasket from the oil cooler.

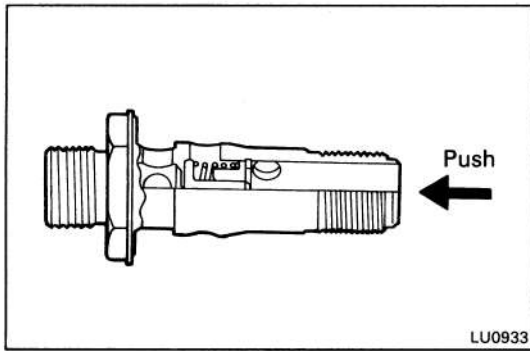


- (d) Remove the bolt, and disconnect the water by-pass pipe from the oil cooler bracket.



- 11. REMOVE OIL COOLER BRACKET**

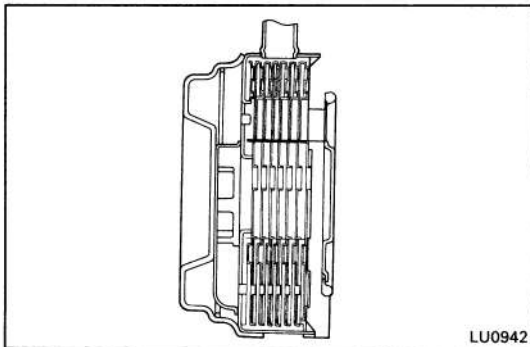
- (a) Remove the four bolts and oil cooler bracket.
- (b) Remove the two O-rings from the oil cooler.



INSPECTION OF OIL COOLER

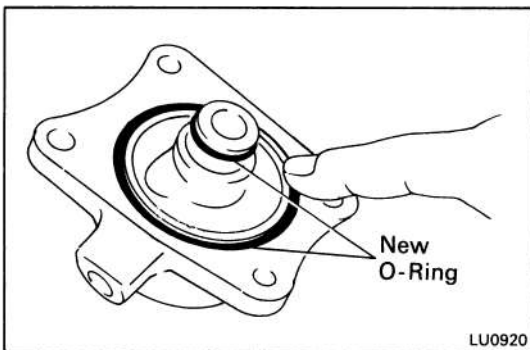
1. INSPECT RELIEF VALVE

Push the valve with a wooden stick to check if it is stuck.
If stuck, replace the relief valve.



2. INSPECT OIL COOLER

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

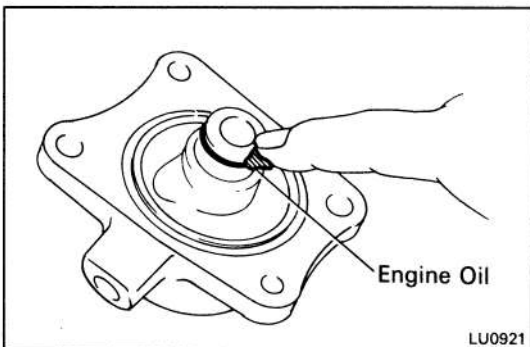


INSTALLATION OF OIL COOLER

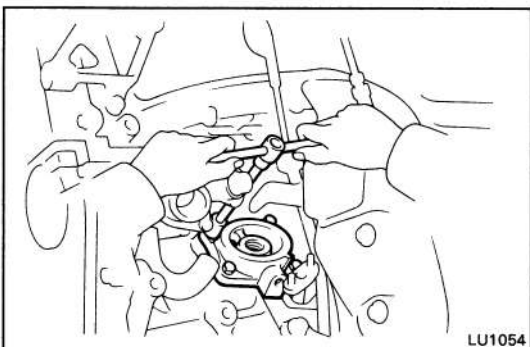
(See page LU-18)

1. INSTALL OIL COOLER BRACKET

(a) Install two new O-rings to the oil cooler bracket.

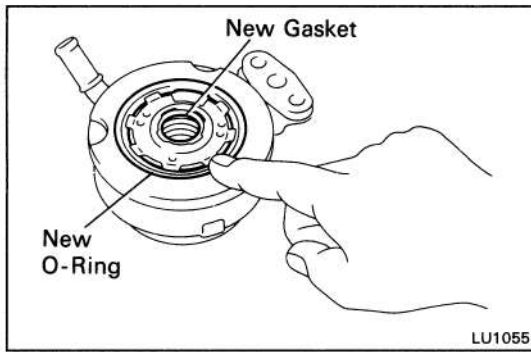


(b) Apply a light coat of engine oil on the small O-ring.



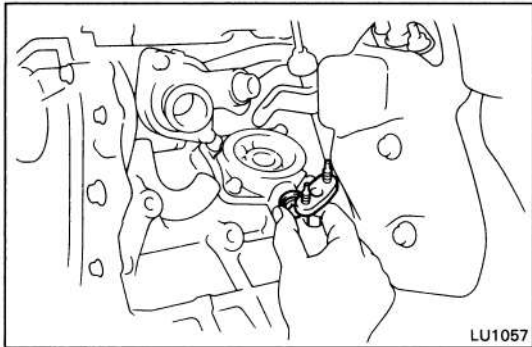
(c) Install the oil cooler bracket with the four bolts.

Torque: 80 kg-cm (69 in.-lb, 7.8 N·m)

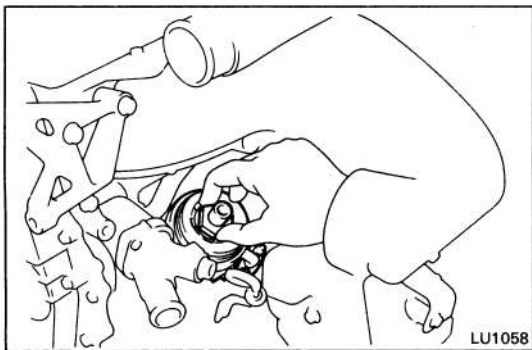


2. INSTALL OIL COOLER

(a) Install new O-ring and gasket to the oil cooler.



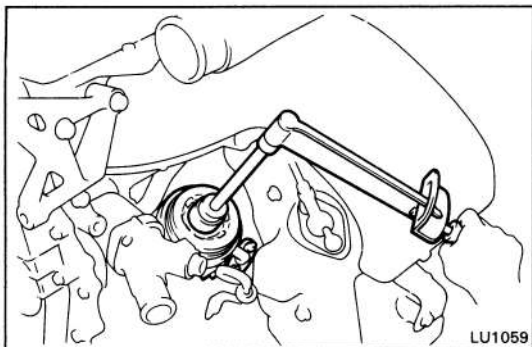
(b) Temporarily install the water by-pass pipe with the bolt.



(c) Apply a light coat of engine oil on the threads and under the head of the relief valve.

(d) Place a new gasket on the water by-pass pipe.

(e) Temporarily install the oil cooler with the plate washer, relief valve and two nuts.

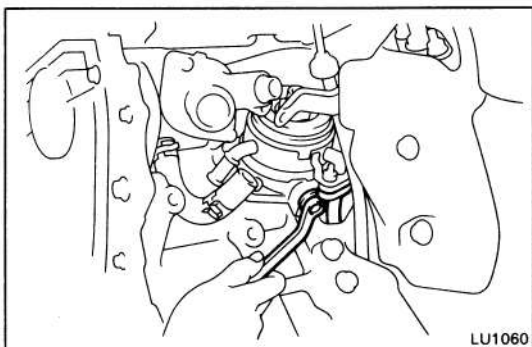


(f) Tighten the relief valve.

Torque: 800 kg-cm (58 ft-lb, 78 N·m)

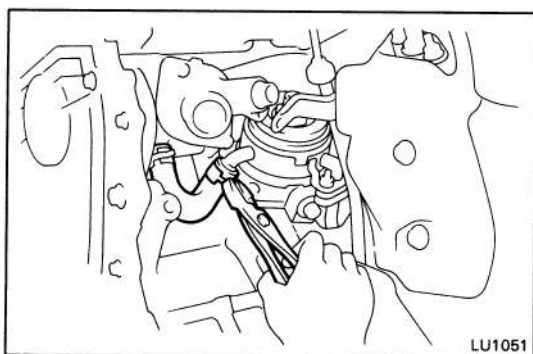
(g) Tighten the two nuts holding the oil cooler to the water by-pass pipe.

Torque: 120 kg-cm (9 ft-lb, 12 N·m)

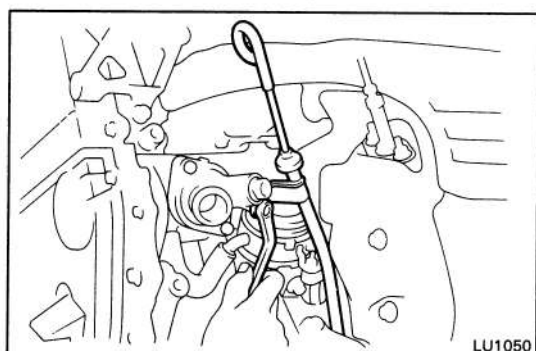


(h) Tighten the bolt holding the water by-pass pipe to oil cooler bracket.

Torque: 180 kg-cm (13 ft-lb, 18 N·m)



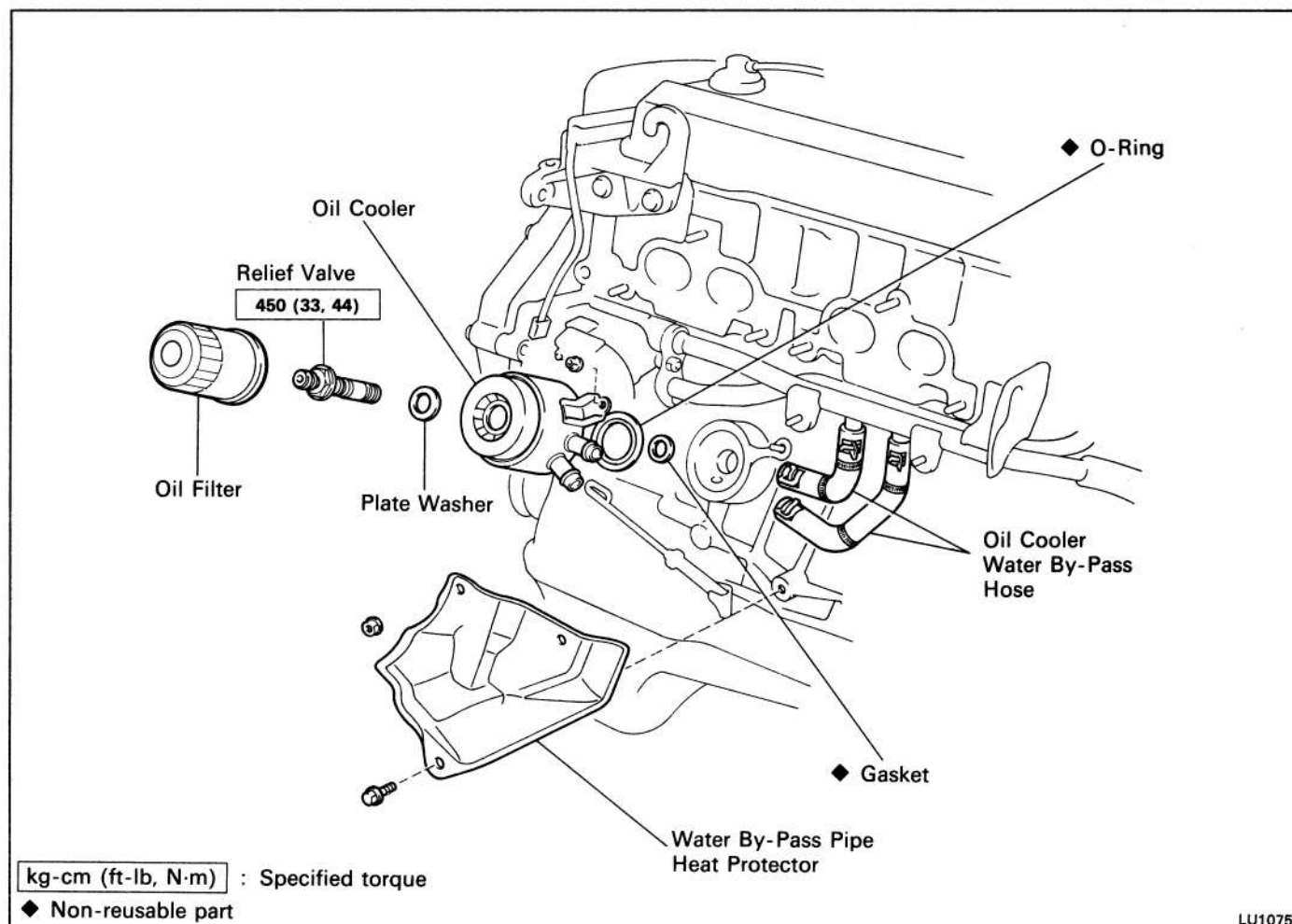
3. CONNECT WATER BY-PASS HOSE TO OIL COOLER



4. INSTALL OIL DIPSTICK GUIDE TO WATER INLET

5. INSTALL OIL FILTER (See page LU-7)
6. INSTALL A/C COMPRESSOR
(See steps 3 to 5 on pages TC-23 and 24)
7. INSTALL NO.1 AIR INTAKE CONNECTOR
(See step 10 on page TC-25)
8. INSTALL RH ENGINE HOOD SIDE PANEL
9. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY
10. FILL WITH ENGINE COOLANT (See page CO-7)
11. START ENGINE AND CHECK FOR LEAKS
12. CHECK ENGINE OIL LEVEL (See page LU-6)
13. INSTALL ENGINE UNDER COVERS

OIL COOLER (5S-FE) COMPONENTS

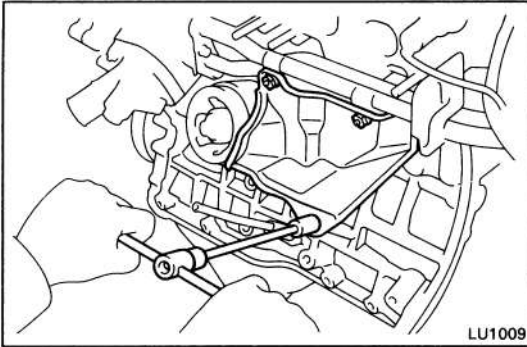


REMOVAL OF OIL COOLER

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY

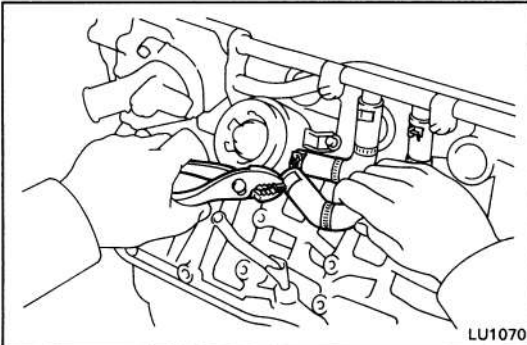
CAUTION: Work must be started after approx. 20 seconds or longer from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

2. DRAIN ENGINE COOLANT (See page CO-6)
3. REMOVE ENGINE UNDER COVERS
4. REMOVE FRONT EXHAUST PIPE
(See step 29 on page EM-187)
5. REMOVE EXHAUST MANIFOLD AND CATALYTIC CONVERTER ASSEMBLY
(See step 14 on page EM-99)
6. REMOVE OIL FILTER (See page LU-7)



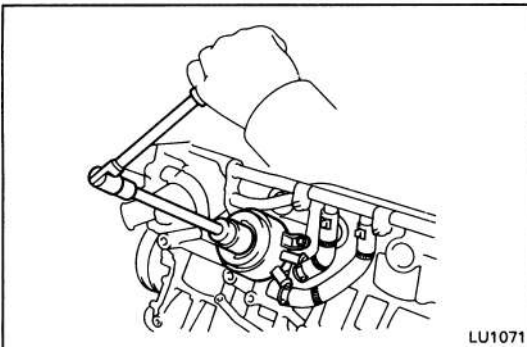
7. REMOVE WATER BY-PASS HOSE HEAT PROTECTOR

Remove the bolt, two nuts and heat protector.



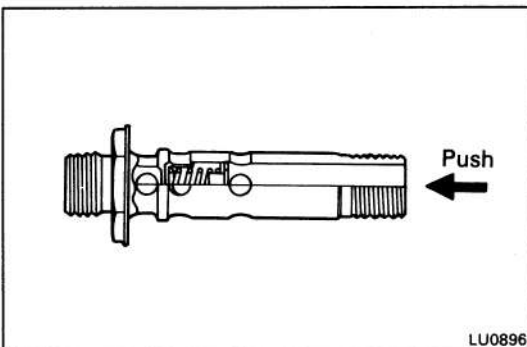
8. DISCONNECT WATER BY-PASS HOSES FROM OIL COOLER

Disconnect the two water by-pass hoses.



9. REMOVE OIL COOLER

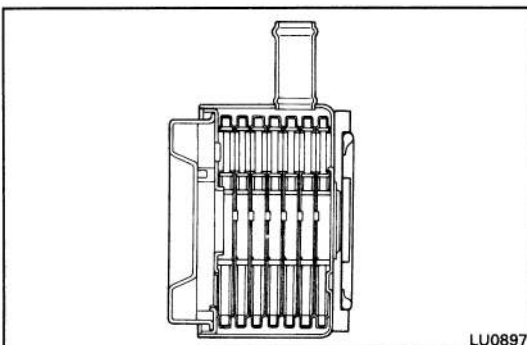
- Remove the relief valve and plate washer.
- Remove the nut and oil cooler.
- Remove the O-ring and gasket from the oil cooler.



INSPECTION OF OIL COOLER

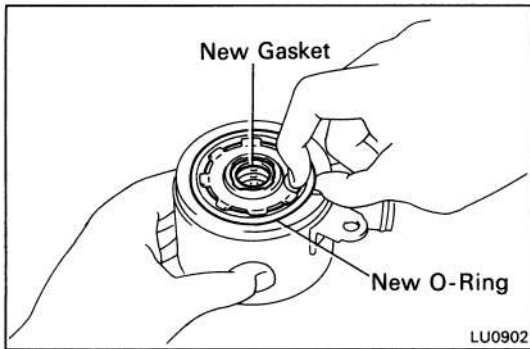
1. INSPECT RELIEF VALVE

Push the valve with a wooden stick to check if it is stuck. If stuck, replace the relief valve.



2. INSPECT OIL COOLER

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

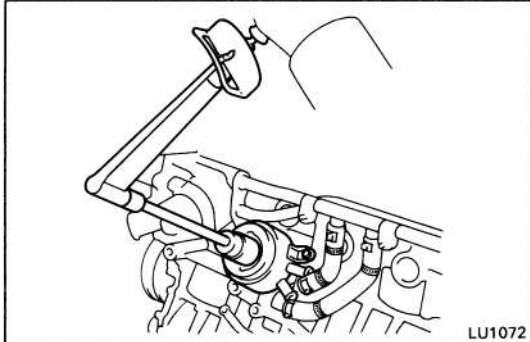


INSTALLATION OF OIL COOLER

(See page LU-23)

1. INSTALL OIL COOLER

(a) Install new O-ring and gasket to the oil cooler.



(b) Apply a light coat of engine oil on the threads and under the head of the relief valve.

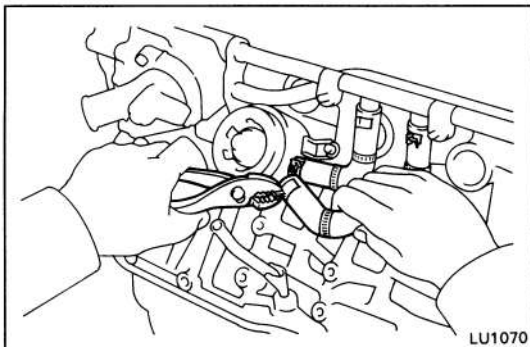
(c) Temporarily install the nut.

(d) Install the oil cooler with the plate washer and relief valve.

Torque: 450 kg-cm (33 ft-lb, 44 N·m)

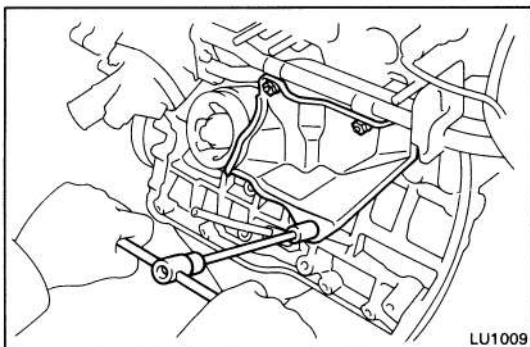
(e) Tighten the nut.

Torque: 80 kg-cm (69 in.-lb, 7.8 N·m)



2. CONNECT WATER BY-PASS HOSES

Connect the two water by-pass hoses.



3. INSTALL WATER BY-PASS HOSE HEAT PROTECTOR

Install the heat protector with the bolt and two nuts.

4. INSTALL OIL FILTER (See page LU-7)

5. INSTALL EXHAUST MANIFOLD AND CATALYTIC CONVERTER ASSEMBLY

(See step 25 on pages EM-130 and 131)

6. INSTALL FRONT EXHAUST PIPE

(See step 15 on pages EM-221 and 222)

7. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY

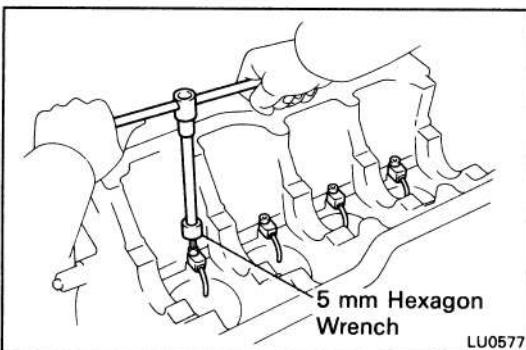
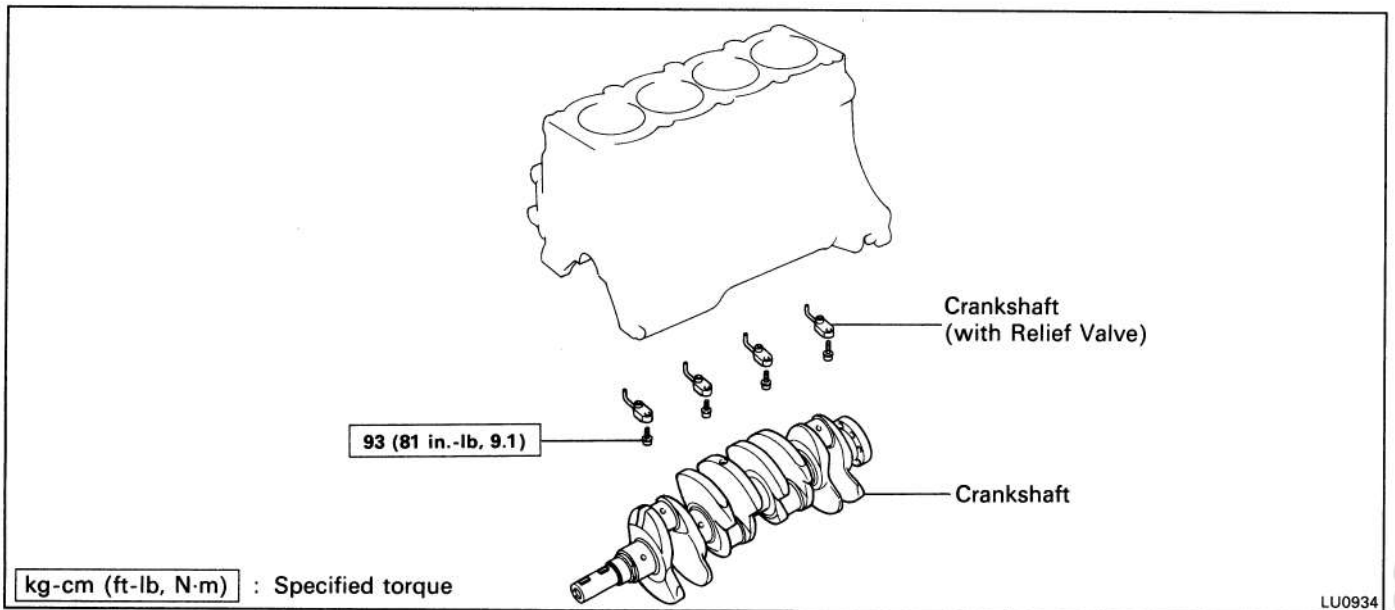
8. FILL WITH ENGINE COOLANT (See page CO-7)

9. START ENGINE AND CHECK FOR LEAKS

10. CHECK ENGINE OIL LEVEL (See page LU-6)

11. INSTALL ENGINE UNDER COVERS

OIL NOZZLES (3S-GTE) COMPONENTS

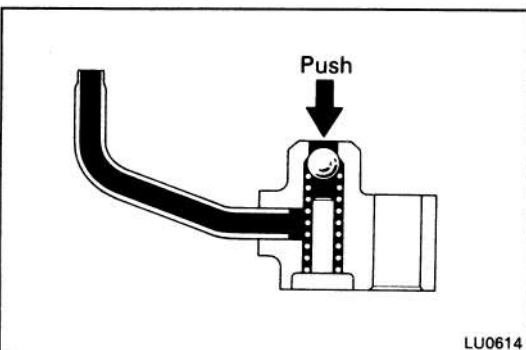


REMOVAL OF OIL NOZZLES

1. REMOVE CRANKSHAFT (See pages EM-134 to 150)

2. REMOVE OIL NOZZLES (WITH RELIEF VALVES)

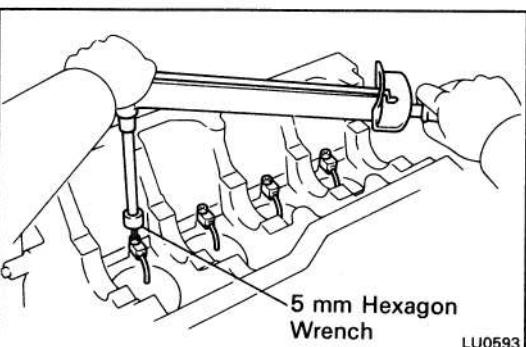
Using a 5 mm hexagon wrench, remove the bolt and oil nozzle. Remove the four oil nozzles.



INSPECTION OF OIL NOZZLES

INSPECT RELIEF VALVES (OIL NOZZLES)

Push the valve with a wooden stick to check if it is stuck. If stuck, replace the relief valve.



INSTALLATION OF OIL NOZZLES

1. INSTALL OIL NOZZLES (WITH RELIEF VALVES)

Using a 5 mm hexagon wrench, install the oil nozzle with the bolt. Install the four oil nozzles.

Torque: 93 kg-cm (81 in.-lb, 9.1 N·m)

2. INSTALL CRANKSHAFT (See pages EM-164 to 180)