OIL PUMP (3S–GTE and 5S–FE)

REMOVAL OF OIL PUMP

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

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3S–GTE

- Oil Pump
- Oil Pump Pulley
- Gasket

Oil Pan
- Drain Plug
- Gasket

Turbo Oil Pipe Hose

5.4 (55, 48 in.-lbf)

6.4 (55, 48 in.-lbf)

- N·m (kgf·cm, ft-lbf): Specified torque
- Non-reusable part

5S–FE

- Oil Pump
- Oil Pump Pulley
- Gasket

Oil Pan
- Drain Plug
- Gasket

Turbo Oil Pipe Hose

5.4 (55, 48 in.-lbf)

- N·m (kgf·cm, ft-lbf): Specified torque
- Non-reusable part
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
   3S–GTE (See step 33 on page EM–228)
   5S–FE (See step 28 on page EM–274)
6. REMOVE FRONT EXHAUST PIPE
   3S–GTE (See step 34 on page EM–229)
   5S–FE (See step 29 on page EM–274)
7. REMOVE ENGINE MOUNTING CENTER MEMBER
   3S–GTE (See step 42 on page EM–229)
   5S–FE (See step 34 on page EM–275)
8. REMOVE STIFFENER PLATE
   Remove the three bolts and stiffener plate.

9. (3S–GTE)
   DISCONNECT TURBO OIL PIPE HOSE FROM OIL–PAN

10. REMOVE OIL PAN
    (a) Remove the dipstick.
    (b) Remove the seventeen bolts and two nuts.
12. SUSPEND ENGINE WITH ENGINE CHAIN HOIST

13. REMOVE TIMING BELT
   3S–GTE (See steps 2 to 18 and 20 to 23 on pages EM–46 to 51)
   5S–FE (See steps 2 to 17 and 19 to 22 on pages EM–67 to 72)

14. REMOVE NO.21 IDLER PULLEY, CRANKSHAFT TIMING PULLEY AND OIL PUMP PULLEY
   3S–GTE (See steps 25 to 27 on page EM–52)
   5S–FE (See steps 24 to 26 on pages EM–72 and 73)

15. REMOVE OIL PUMP
   (a) Remove the twelve bolts.
   (b) Using a plastic–faced hammer, remove the oil pump by carefully tapping the oil pump body.
   (c) Remove the gasket.

(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 STRAINER AND BAFFLE PLATE
Remove the two bolts, two nuts, oil strainer, baffle plate and gasket.

LUBRICATION SYSTEM
Oil Pump (3S–GTE and 5S–FE)
DISASSEMBLY OF OIL PUMP

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 thickness 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 thickness gauge, measure the clearance between the drive and driven rotor tips.
   
   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–249)
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 two bolts.
   Torque: 8.8 N–m (90 kgf–cm, 78 in–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–16)
1. INSTALL OIL PUMP
Install a new gasket and the oil pump with the twelve bolts.
   Torque: 3S–GTE 7.8 N–m (80 kgf–cm, 69 in–lbf)
   5S–FE 8.8 N–m (90 kgf–cm, 78 in–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 PUMP PULLEY, CRANKSHAFT TIMING PULLEY AND NO.2 IDLER PULLEY
   3S–GTE (See steps 1 to 3 on page EM–55)
   5S–FE (See steps 1 to 3 on page EM–75)

3. INSTALL TIMING BELT
   3S–GTE (See steps 5 to 8, 10 to 26 and 30 on pages EM–55 to 61)
   5S–FE (See steps 5 to 8 and 10 to 24 on pages EM–75 to 80)
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: 5.4 N·m (55 kgf·cm, 48 in.–lbf)

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 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 reinstall cap.
   (c) Install the oil pan with the seventeen bolts and four nuts.
     Torque: 5.4 N·m (55 kgf·cm, 48 in.–lbf)
   (d) Install the dipstick.
9. INSTALL ENGINE MOUNTING CENTER MEMBER
   3S–GTE (See step 9 on page EM–260)
   5S–FE (See step 9 on page EM–304)
10. INSTALL FRONT EXHAUST PIPE
    3S–GTE (See step 18 on page EM–261)
    5S–FE (See step 15 on page EM–305)
11. INSTALL SUSPENSION LOWER CROSSMEMBER
    3S–GTE (See step 19 on page EM–262)
    5S–FE (See step 16 on page EM–306)
12. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY
13. FILL WITH ENGINE OIL (See page LU–8)
14. START ENGINE AND CHECK FOR LEAKS
15. RECHECK ENGINE OIL LEVEL (See page LU–5)
16. INSTALL HOOD
17. INSTALL ENGINE UNDER COVERS

7. (3S–GTE)
   CONNECT TURBO OIL PIPE HOSE TO OIL Pan

8. INSTALL STIFFENER PLATE
   Install the stiffener plate with the three bolts.
   Torque: 37 N–m (380 kgf–cm, 27 ft–lbf)