

LUBRICATION SYSTEM (1AZ-FE)

1700F-09

ON-VEHICLE INSPECTION

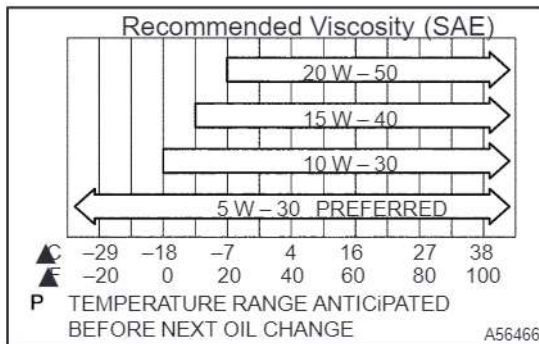
1. CHECK ENGINE OIL LEVEL

- (a) After warm up the engine and then 5 minutes after the engine stop, oil level should be between the low level and full level marks of the dipstick.

If low, check for leakage and add oil up to the full level mark.

NOTICE:

Do not fill with engine oil above the full level mark.



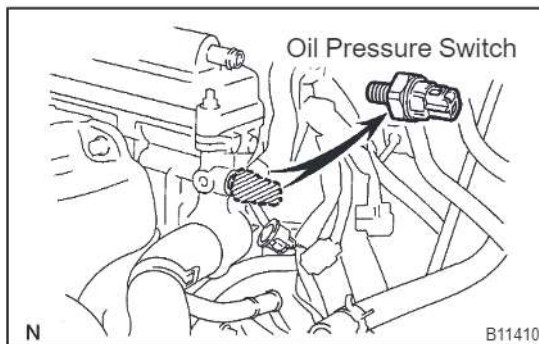
2. CHECK ENGINE OIL QUALITY

- (a) Check the oil for deterioration, entry of water, discoloring or thinning.

If the quality is visibly poor, replace the oil.

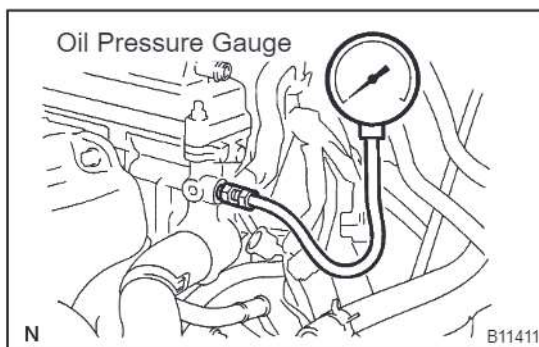
Oil grade:

API grade "SJ" Energy-Conserving, "SL" Energy-Conserving or ILSAC multi grade engine oil. Recommended viscosity is as shown in the illustration.



3. REMOVE OIL PRESSURE SWITCH ASSY

- (a) Disconnect the oil pressure switch connector.
- (b) Using a deep socket wrench 24mm, remove the oil pressure switch.



4. INSTALL OIL PRESSURE GAUGE

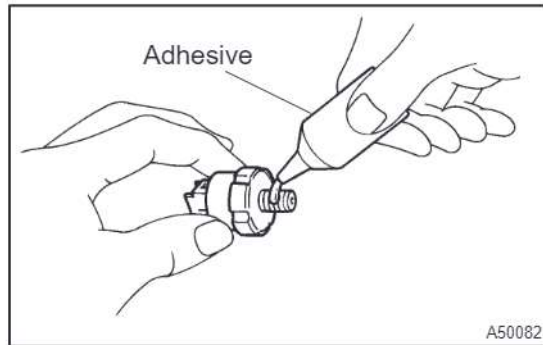
- (a) Install the oil pressure gauge.

5. WARM UP ENGINE

6. CHECK OIL PRESSURE

Oil pressure:

At idle	29 kPa (0.3 kgf/cm ² , 4.3 psi) or more
At 3,000 rpm	245 to 539 kPa (2.5 to 5.5 kgf/cm ² , 36 to 78 psi) or more

7. REMOVE OIL PRESSURE GAUGE**8. INSTALL OIL PRESSURE SWITCH ASSY**

- (a) Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:

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

- (b) Using a deep socket wrench 24mm, install the oil pressure switch.

Torque: 15 N m (153 kgf cm, 11 ft lbf)

NOTICE:

Do not start the engine within 1 hour after the installation.

- (c) Connect the oil pressure switch connector.

9. START ENGINE AND CHECK FOR LEAKS

LUBRICATION SYSTEM (1AZ-FSE)

ON-VEHICLE INSPECTION

1700E-07

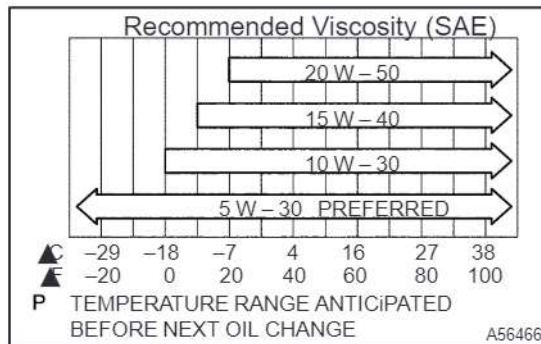
1. CHECK ENGINE OIL LEVEL

- (a) After warm up the engine and then 5 minutes after the engine stop, oil level should be between the low level and full level marks of the dipstick.

If low, check for leakage and add oil up to the full level mark.

NOTICE:

Do not fill with engine oil above the full level mark.



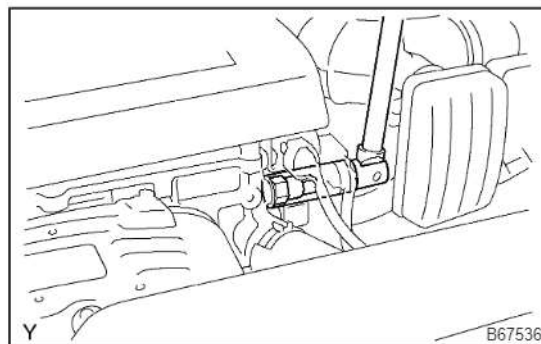
2. CHECK ENGINE OIL QUALITY

- (a) Check the oil for deterioration, entry of water, discoloring or thinning.

If the quality is visibly poor, replace the oil.

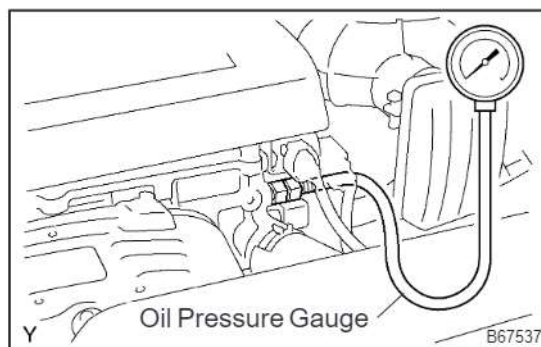
Oil grade:

API grade "SJ" Energy-Conserving, "SL" Energy-Conserving or ILSAC multi grade engine oil. Recommended viscosity is as shown in the illustration.



3. REMOVE OIL PRESSURE SWITCH ASSY

- (a) Disconnect the oil pressure switch connector.
 (b) Using a deep socket wrench 24mm, remove the oil pressure switch.



4. INSTALL OIL PRESSURE GAUGE

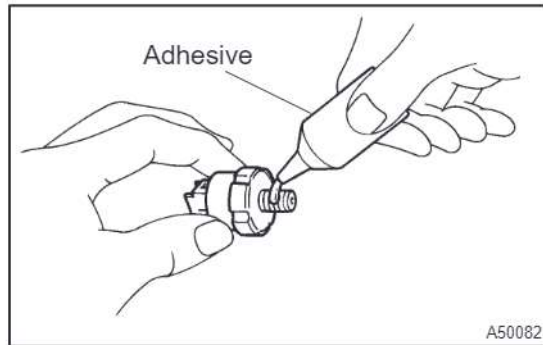
- (a) Install the oil pressure gauge.

5. WARM UP ENGINE

6. CHECK OIL PRESSURE

Oil pressure:

At idle	29 kPa (0.3 kgf/cm ² , 4.3 psi) or more
At 3,000 rpm	245 to 539 kPa (2.5 to 5.5 kgf/cm ² , 36 to 78 psi) or more

7. REMOVE OIL PRESSURE GAUGE**8. INSTALL OIL PRESSURE SWITCH ASSY**

- (a) Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:

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

- (b) Using a deep socket wrench 24mm, install the oil pressure switch.

Torque: 15 N m (153 kgf cm, 11 ft lbf)

NOTICE:

Do not start the engine within 1 hour after the installation.

- (c) Connect the oil pressure switch connector.

9. START ENGINE AND CHECK FOR LEAKS

LUBRICATION SYSTEM (1CD–FTV)

ON-VEHICLE INSPECTION

17045-03

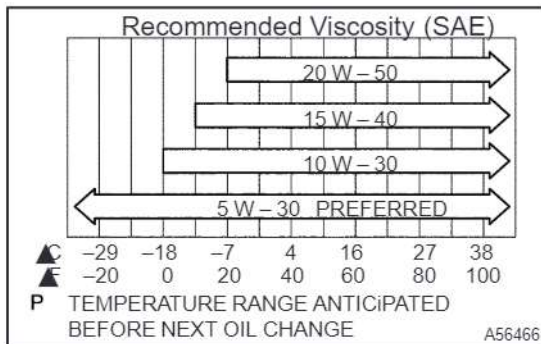
1. CHECK ENGINE OIL LEVEL

- (a) After warm up the engine and then 5 minutes after the engine stop, oil level should be between the low level and full level marks of the dipstick.

If low, check for leakage and add oil up to the full level mark.

NOTICE:

Do not fill with engine oil above the full level mark.



2. CHECK ENGINE OIL QUALITY

- (a) Check the oil for deterioration, entry of water, discoloring or thinning.

If the quality is visibly poor, replace the oil.

Oil grade:

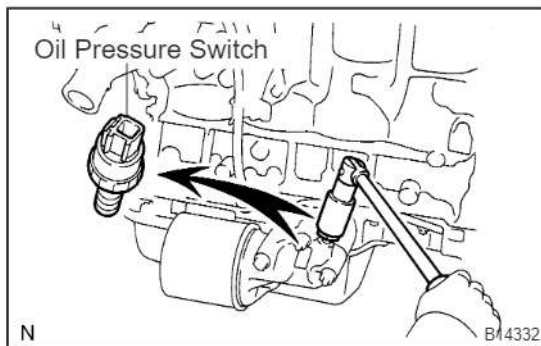
Use ACEA B1, API grade CF – 4 or CF

(You may also use API CE or CD)

SAE 5W – 30 is the best choice for your vehicle, for good fuel economy, and good starting in cold weather.

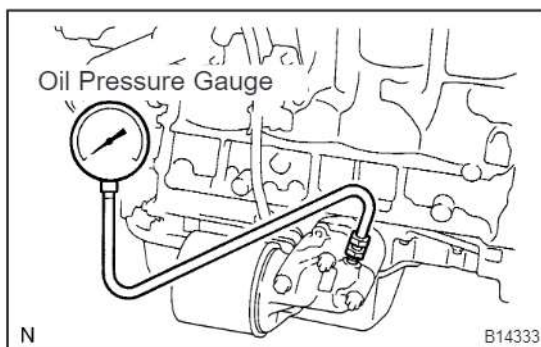
3. REMOVE OIL PRESSURE SWITCH ASSY

- (a) Disconnect the oil pressure switch connector.
- (b) Using a deep socket wrench 24mm, remove the oil pressure switch.



4. INSTALL OIL PRESSURE GAUGE

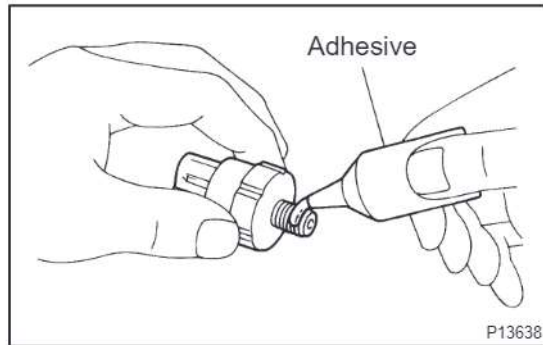
- (a) Install the oil pressure gauge.



5. WARM UP ENGINE

6. CHECK OIL PRESSURE**Oil pressure:**

At idle	29 kPa (0.3 kgf/cm ² , 4.3 psi) or more
At 4,500 rpm	245 to 588 kPa (2.5 to 6.0 kgf/cm ² , 36 to 85 psi) or more

7. REMOVE OIL PRESSURE GAUGE**8. INSTALL OIL PRESSURE SWITCH ASSY**

- (a) Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:

**Part No. 08833 – 00080, THREE BOND 1344,
LOCTITE 242 or equivalent**

- (b) Using a deep socket wrench 24mm, install the oil pressure switch.

Torque: 15 N m (153 kgf cm, 11 ft lbf)

NOTICE:

Do not start the engine within 1 hour after the installation.

- (c) Connect the oil pressure switch connector.

9. START ENGINE AND CHECK FOR LEAKS

LUBRICATION SYSTEM (1ZZ-FE/3ZZ-FE)

1700F-10

ON-VEHICLE INSPECTION

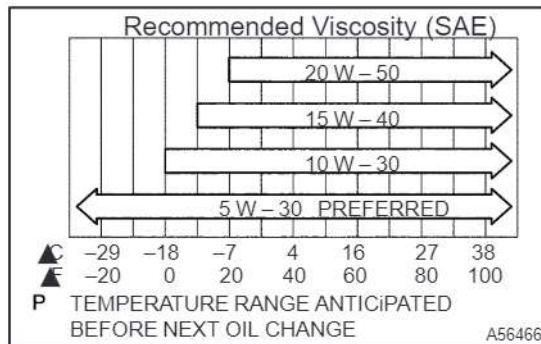
1. CHECK ENGINE OIL LEVEL

- (a) After warm up the engine and then 5 minutes after the engine stop, oil level should be between the low level and full level marks of the dipstick.

If low, check for leakage and add oil up to the full level mark.

NOTICE:

Do not fill with engine oil above the full level mark.



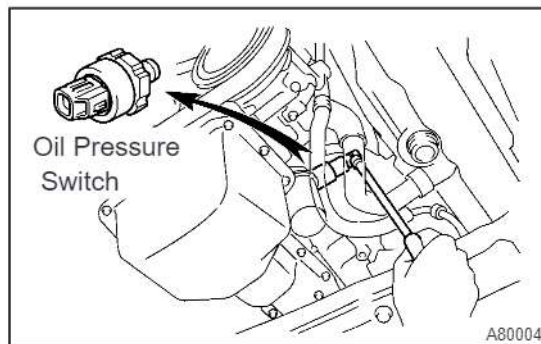
2. CHECK ENGINE OIL QUALITY

- (a) Check the oil for deterioration, entry of water, discoloring or thinning.

If the quality is visibly poor, replace the oil.

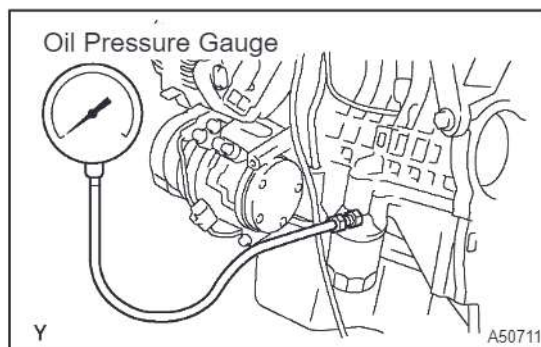
Oil grade:

API grade "SJ" Energy-Conserving, "SL" Energy-Conserving or ILSAC multi grade engine oil. Recommended viscosity is as shown in the illustration.



3. REMOVE OIL PRESSURE SWITCH ASSY

- (a) Disconnect the oil pressure switch connector.
- (b) Using a 24mm deep socket wrench, remove the oil pressure switch.



4. INSTALL OIL PRESSURE GAUGE

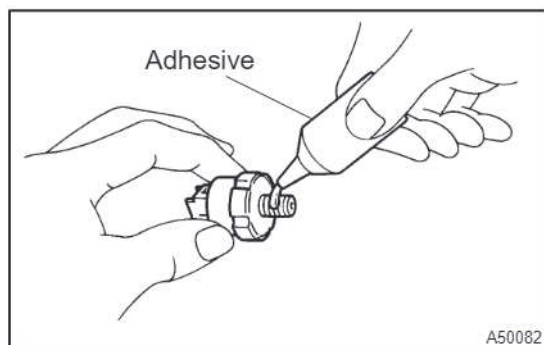
- (a) Install the oil pressure gauge.

5. WARM UP ENGINE

6. CHECK OIL PRESSURE

Oil pressure:

At idle	29 kPa (0.3 kgf/cm ² , 4.3 psi) or more
At 3,000 rpm	294 to 539 kPa (3.0 to 5.5 kgf/cm ² , 43 to 78 psi) or more

7. REMOVE OIL PRESSURE GAUGE**8. INSTALL OIL PRESSURE SWITCH ASSY**

- (a) Apply adhesive to 2 or 3 threads of the oil pressure switch.

Adhesive:

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

- (b) Using a 24mm deep socket wrench, install the oil pressure switch.

Torque: 15 N m (153 kgf cm, 11 ft lbf)

NOTICE:

Do not start the engine within 1 hour of installation.

- (c) Connect the oil pressure switch connector.

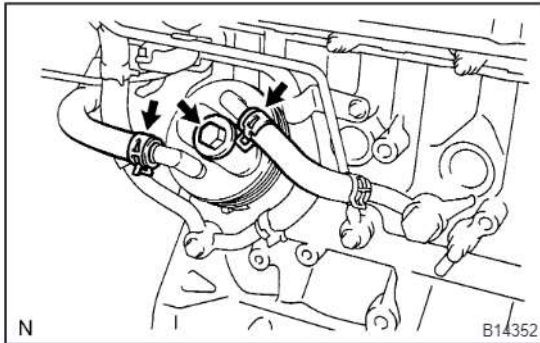
9. START ENGINE AND CHECK FOR LEAKS

OIL COOLER ASSY (1CD–FTV)

REPLACEMENT

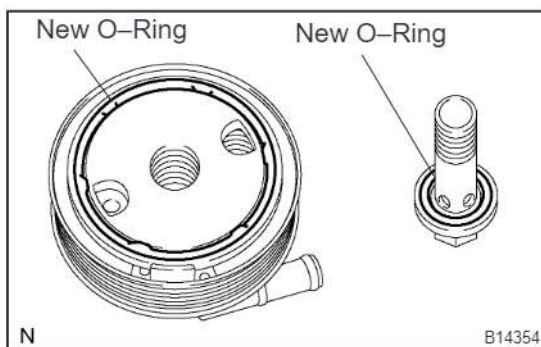
170FQ-01

1. DRAIN ENGINE COOLANT (See page 16–44)
2. DRAIN ENGINE OIL (See page 17–30)
3. REMOVE ENGINE UNDER COVER LH



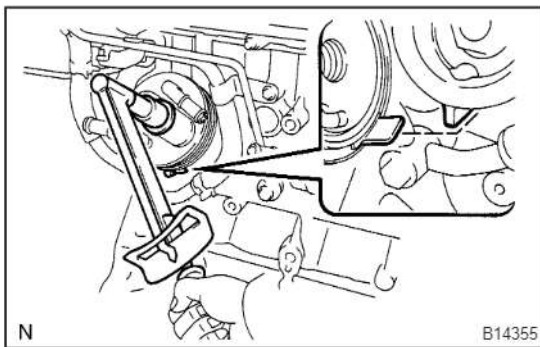
4. REMOVE OIL COOLER ASSY

- (a) Disconnect the 2 cooler hoses from the oil cooler.
- (b) Remove the union bolt and the oil cooler.
- (c) Remove the O-ring from the oil cooler.
- (d) Remove the O-ring from the union bolt.



5. INSTALL OIL COOLER ASSY

- (a) Clean the oil cooler mounting surface.
- (b) Install a new O-ring to the union bolt.
- (c) Install a new O-ring to the oil cooler.



- (d) Apply a light coat of engine oil on the threads of the union bolt.
- (e) Align the tab of the oil cooler with the tab located on the cylinder block.
- (f) Install the oil cooler with the union bolt.
Torque: 45 N m (454 kgf cm, 33 ft lbf)
- (g) Connect the 2 cooler hoses to the oil cooler.

6. ADD ENGINE OIL (See page 17–30)
7. ADD ENGINE COOLANT (See page 16–44)
8. CHECK FOR ENGINE OIL LEAKS (See page 16–44)
9. CHECK FOR ENGINE COOLANT LEAKS

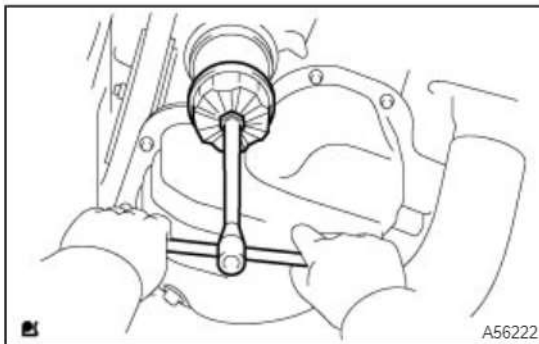
OIL FILTER SUB-ASSY (1AZ-FE)

17DFW-01

REPLACEMENT

CAUTION:

- ▲ 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.
 - ▲ Exercise caution in order to minimize the length and frequency of contact of your skin to used oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use water-less 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. **REMOVE ENGINE UNDER COVER RH**
 2. **DRAIN ENGINE OIL**
 - (a) Install a new gasket and drain plug after draining engine oil.
Torque: 25 N m (250 kgf cm, 18 ft lbf)

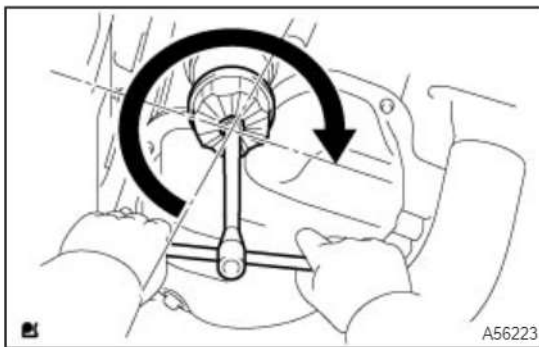


3. REMOVE OIL FILTER SUB-ASSY

- (a) Using SST, remove the oil filter.
SST 09228-06501

4. INSTALL OIL FILTER SUB-ASSY

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



- (c) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.
- (d) Using SST, tighten it an additional 3/4 turn.
SST 09228-06501

5. ADD ENGINE OIL

- (a) Fill with fresh engine oil.

Capacity:

Drain and refill w/ Oil filter change 4.2 liters (4.4 US qts, 3.7 Imp. qts)

Drain and refill w/o Oil filter change 4.0 liters (4.2 US qts, 3.5 Imp. qts)

Dry fill 4.9 liters (5.2 US qts, 4.3 Imp. qts)

- (b) Install the oil filler cap.

6. INSPECT OIL LEAK

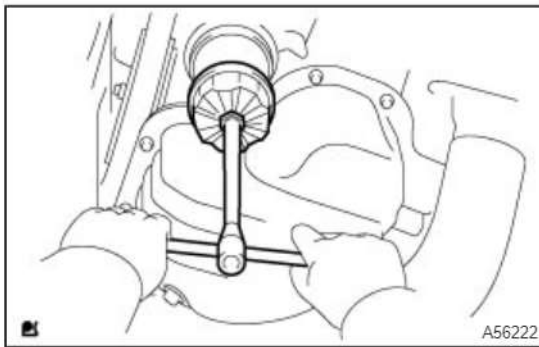
OIL FILTER SUB-ASSY (1AZ-FSE)

REPLACEMENT

170FV-01

CAUTION:

- ▲ 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.
 - ▲ Exercise caution in order to minimize the length and frequency of contact of your skin to used oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use water-less 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. **REMOVE ENGINE UNDER COVER RH**
 2. **DRAIN ENGINE OIL**
 - (a) Install a new gasket and drain plug after draining engine oil.
Torque: 25 N m (250 kgf cm, 18 ft lbf)

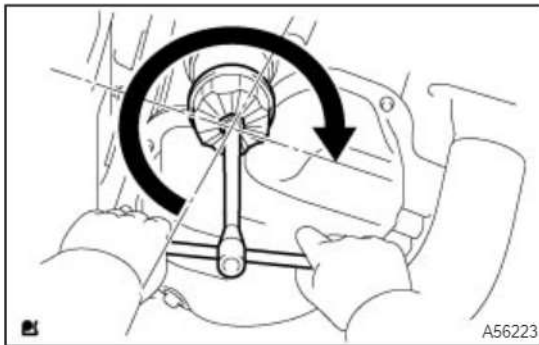


3. REMOVE OIL FILTER SUB-ASSY

- (a) Using SST, remove the oil filter.
SST 09228-06501

4. INSTALL OIL FILTER SUB-ASSY

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



- (c) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.
- (d) Using SST, tighten it an additional 3/4 turn.
SST 09228-06501

5. ADD ENGINE OIL

- (a) Fill with fresh engine oil.

Capacity:

Drain and refill w/ Oil filter change 4.2 liters (4.4 US qts, 3.7 Imp. qts)

Drain and refill w/o Oil filter change 4.0 liters (4.2 US qts, 3.5 Imp. qts)

Dry fill 4.9 liters (5.2 US qts, 4.3 Imp. qts)

- (b) Install the oil filler cap.

6. INSPECT OIL LEAK

OIL FILTER SUB-ASSY (1CD-FTV)

170FO-01

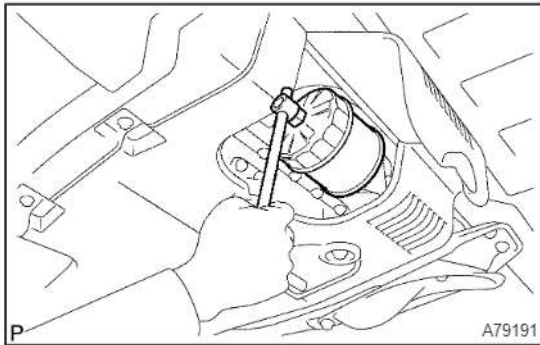
REPLACEMENT

NOTICE:

- ▲ Prolonged and repeated contact with engine 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.
- ▲ Precautions should be taken when replacing engine oil to minimize the risk of your skin making contact with used engine oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use water-less hand cleaner to remove any used engine oil. Do not use gasoline, thinners, or solvents.
- ▲ In order to preserve the environment, used oil and oil filter must be disposed of 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.

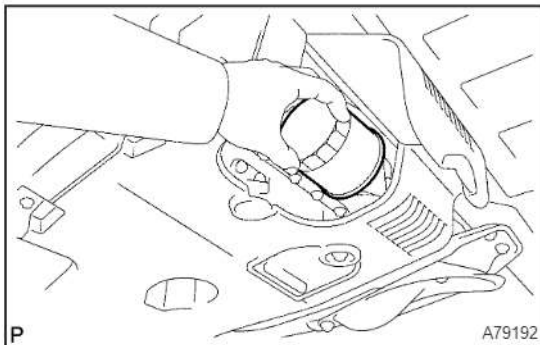


2. REMOVE OIL FILTER SUB-ASSY

- (a) Remove the clip and open the engine under cover.
- (b) Using SST, remove the oil filter.
SST 09228-10002

3. INSTALL OIL FILTER SUB-ASSY

- (a) Check and clean the oil filter installation surface.
- (b) Apply clean engine oil to the gasket of a new oil filter.
- (c) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.
- (d) Using SST, tighten it an additional 3/4 turn.
SST 09228-10002



4. ADD ENGINE OIL

- (a) Clean and install the oil drain plug with a new gasket.
Torque: 34 N m (350 kgf cm, 25 ft lbf)

- (b) Fill with fresh engine oil.

Capacity:

With the oil filter replacement: 5.9 liters (6.2 US qts, 5.2 Imp. qts)

Without the oil filter replacement: 5.3 liters (5.6 US qts, 4.7 Imp. qts)

Dry fill: 6.7 liters (7.1 US qts, 5.9 Imp. qts)

- (c) Install the oil filler cap.

5. CHECK FOR ENGINE OIL LEAKS

OIL FILTER SUB-ASSY (1ZZ-FE/3ZZ-FE)

170FS-01

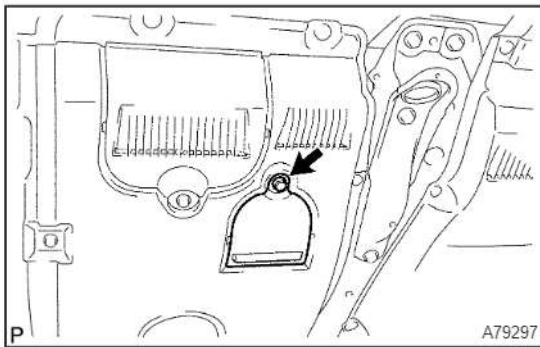
REPLACEMENT

CAUTION:

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- ▲ Precautions should be taken when replacing engine oil to minimize the risk of your skin making contact with used engine oil. Wear protective clothes and gloves. Wash your skin thoroughly with soap and water, or use water-less 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.

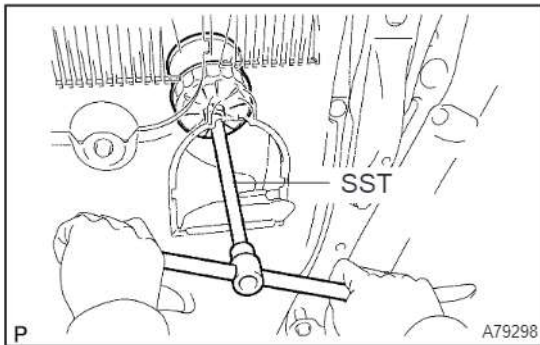
1. DRAIN ENGINE OIL

- (a) Remove the oil pan drain plug and drain engine oil.

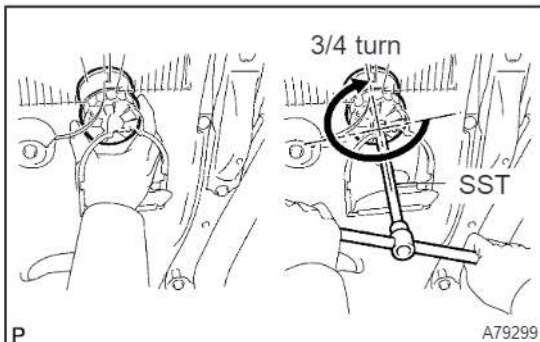


2. REMOVE OIL FILTER SUB-ASSY

- (a) Remove the screw and open the under cover.



- (b) Using SST, remove the oil filter
SST 09228-06501



3. INSTALL OIL FILTER SUB-ASSY

- (a) Check and clean the oil filter mounting surface.
- (b) Apply clean engine oil to the gasket of a new oil filter.
- (c) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.
- (d) Using SST, tighten it an additional 3/4 turn as shown in the illustration.
SST 09228-06501

4. INSTALL OIL PAN DRAIN PLUG

- (a) Clean and install the oil pan drain plug with a new gasket.
Torque: 37 N m (377 kgf cm, 27 in. lbf)

5. ADD ENGINE OIL

Capacity:

With oil filler replacement: 3.7 liters (3.9 US qts, 3.3 Imp. qts)

Without oil filler replacement: 3.5 liters (3.7 US qts, 3.1 Imp. qts)

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

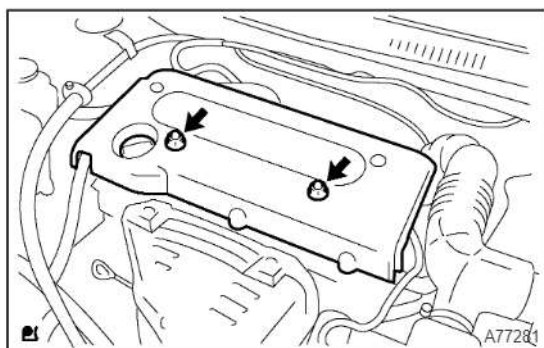
6. CHECK FOR ENGINE OIL LEAKS

OIL PUMP ASSY (1AZ-FE)

170FU-01

REPLACEMENT

1. DISCHARGE FUEL SYSTEM PRESSURE ([See page 11-15](#))
2. REMOVE FRONT WHEEL RH
3. REMOVE RADIATOR SUPPORT OPENING COVER
4. REMOVE ENGINE ROOM COVER SIDE
5. REMOVE ENGINE UNDER COVER RH
6. REMOVE ENGINE UNDER COVER LH
7. DRAIN ENGINE OIL
- (a) Install a new gasket and drain plug after draining engine oil.
Torque: 25 N m (250 kgf cm, 18 ft lbf)

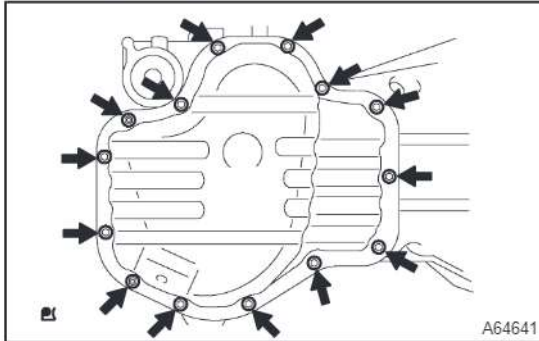


8. REMOVE ENGINE COVER SUB-ASSY NO.1
- (a) Remove 2 nuts and the engine cover No. 1.

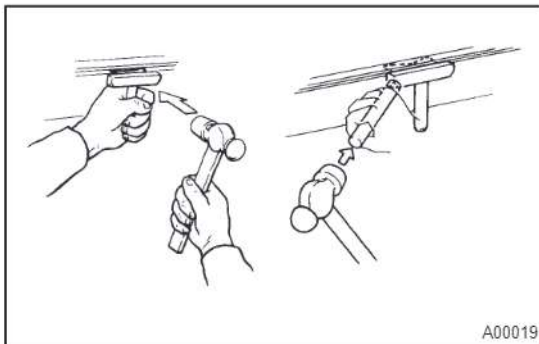
9. REMOVE FAN AND GENERATOR V BELT ([See page 14-105](#))
SST 09249-63010
10. REMOVE GENERATOR ASSY ([See page 19-20](#))
11. REMOVE EXHAUST PIPE ASSY FRONT ([See page 15-7](#))
12. SEPARATE VANE PUMP ASSY ([See page 14-139](#))
13. SEPARATE RETURN TUBE SUB-ASSY ([See page 14-139](#))
14. SEPARATE COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD(W/ AIR CONDITIONER) STEERING POSITION TYPE) ([See page 14-139](#))
15. SEPARATE VANE PUMP OIL RESERVOIR ASSY
16. REMOVE OIL RESERVOIR BRACKET NO.1 ([See page 14-139](#))
17. SEPARATE ENGINE WIRE
18. REMOVE ENGINE SERVICE COVER BRACKET RH (W/O AIR CONDITIONING)
- (a) Remove a bolt and the engine service cover bracket RH.
19. REMOVE COOLER BRACKET (LHD(W/ AIR CONDITIONER) STEERING POSITION TYPE) ([See page 14-139](#))
20. REMOVE ENGINE SERVICE COVER BRACKET RH (RHD(W/ AIR CONDITIONER) STEERING POSITION TYPE)
- (a) Remove a bolt and the engine service cover bracket RH.
21. REMOVE IGNITION COIL ASSY
- (a) Remove 4 bolts and the ignition coils.
22. REMOVE CYLINDER HEAD COVER SUB-ASSY ([See page 14-139](#))
23. SET NO. 1 CYLINDER TO TDC/COMPRESSION ([See page 14-139](#))
24. REMOVE ENGINE MOUNTING BRACKET NO.2 RH ([See page 14-139](#))
25. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR ([See page 14-139](#))

26. REMOVE CRANKSHAFT PULLEY (See page 14-139)

SST 09213-54015 (91651-60855), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

27. REMOVE CHAIN TENSIONER ASSY NO.1 (See page 14-139)**28. REMOVE CRANKSHAFT POSITION SENSOR (See page 18-16)****29. REMOVE OIL PAN SUB-ASSY**

(a) Remove 12 bolts and 2 nuts.

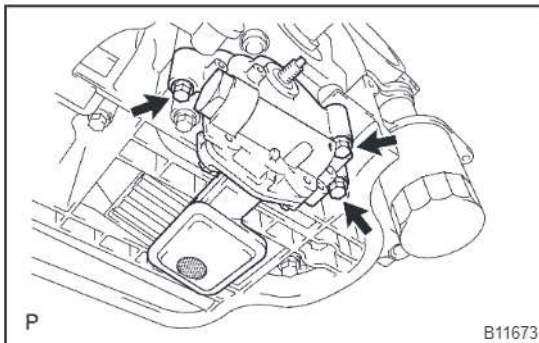


(b) Insert the blade of SST between the crank case, timing chain cover and oil pan, cut off applied sealer and remove the oil pan.

SST 09032-00100

NOTICE:

Be careful not to damage the contact surface of timing chain cover, crank case and oil pan.

30. REMOVE V-RIBBED BELT TENSIONER ASSY (See page 14-139)**31. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSY (See page 14-139)****32. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1****33. REMOVE CHAIN TENSIONER SLIPPER****34. REMOVE CHAIN VIBRATION DAMPER NO.1****35. REMOVE TIMING CHAIN GUIDE (See page 14-139)****36. REMOVE CHAIN SUB-ASSY****37. REMOVE CRANKSHAFT TIMING GEAR OR SPROCKET****38. REMOVE NO.2 CHAIN SUB-ASSY (See page 14-139)****39. REMOVE OIL PUMP ASSY**

(a) Remove 3 bolts, the oil pump and gasket.

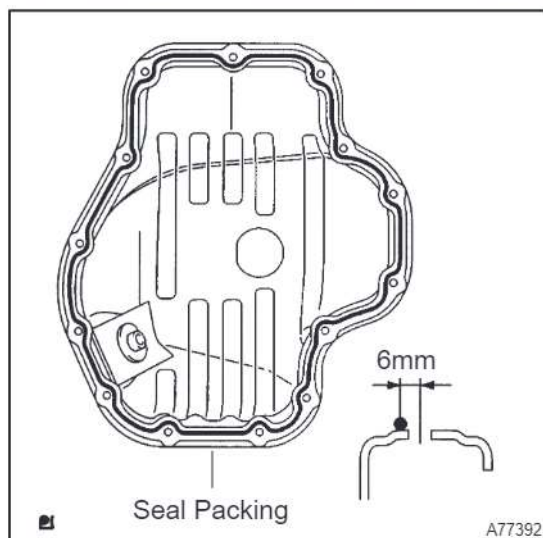
40. INSTALL OIL PUMP ASSY

(a) Install a new gasket and oil pump with 3 bolts.

Torque: 19 N m (195 kgf cm, 15 ft lbf)

41. INSTALL NO.2 CHAIN SUB-ASSY (See page 14-139)**42. INSTALL CRANKSHAFT TIMING GEAR OR SPROCKET**

43. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14-139)
44. INSTALL CHAIN VIBRATION DAMPER NO.1
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
45. INSTALL CHAIN SUB-ASSY (See page 14-139)
46. INSTALL TIMING CHAIN GUIDE
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
47. INSTALL CHAIN TENSIONER SLIPPER (See page 14-139)
48. INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1 (See page 14-139)
49. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSY (See page 14-139)
50. INSTALL V-RIBBED BELT TENSIONER ASSY (See page 14-139)

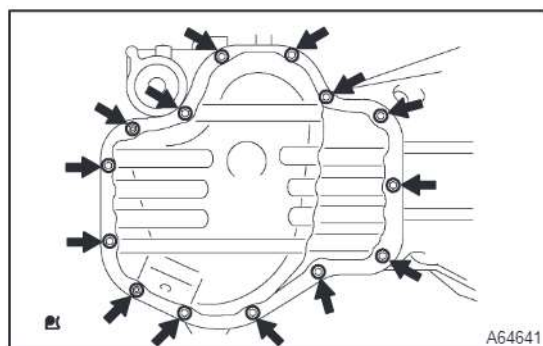


51. INSTALL OIL PAN SUB-ASSY

NOTICE:

- ▲ Remove any oil from the contact surface.
 - ▲ Install the oil pan within 3 minutes after applying seal packing.
 - ▲ Do not start the engine within 2 hours after installing.
- (a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surface of the cylinder block and oil pan.
 - (b) Apply seal packing in the shape of bead (Diameter 3 to 4 mm (0.157 in.)) as shown in the illustration, and install the oil pan.

Seal Packing: Part No. 08826 – 00080 or equivalent



- (c) Insert the oil pan with 12 bolts and 2 nuts.
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)

52. INSTALL CRANKSHAFT POSITION SENSOR (See page 14-139)
53. INSTALL CRANKSHAFT PULLEY (See page 14-139)
SST 09213-54015 (91651-60855), 09330-00021
54. INSTALL CHAIN TENSIONER ASSY NO.1 (See page 14-139)
55. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR
Torque: 52 N m (530 kgf cm, 38 ft lbf)
56. INSTALL ENGINE MOUNTING BRACKET NO.2 RH (See page 14-139)
57. INSTALL CYLINDER HEAD COVER SUB-ASSY (See page 14-139)
58. INSTALL ENGINE SERVICE COVER BRACKET RH (W/O AIR CONDITIONING)
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
59. INSTALL COOLER BRACKET (LHD(W/ AIR CONDITIONER) STEERING POSITION TYPE)
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
60. INSTALL ENGINE SERVICE COVER BRACKET RH (RHD(W/ AIR CONDITIONER) STEERING POSITION TYPE)
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)

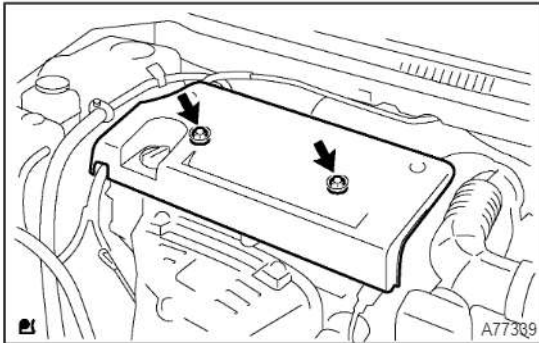
61. **INSTALL ENGINE WIRE**
Torque: 7.0 N m (71 kgf cm, 62 in. lbf)
62. **INSTALL OIL RESERVOIR BRACKET NO.1**
Torque: 8.0 N m (82 kgf cm, 71 in. lbf)
63. **INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD(W/ AIR CONDITIONER) STEERING POSITION TYPE)**
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
64. **INSTALL RETURN TUBE SUB-ASSY**
Torque: 8.0 N m (82 kgf cm, 71 in. lbf)
65. **INSTALL IGNITION COIL ASSY**
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
66. **INSTALL VANE PUMP ASSY**
Torque: 37 N m (377 kgf cm, 27 ft lbf)
67. **INSTALL EXHAUST PIPE ASSY FRONT** ([See page 15-7](#))
68. **INSTALL GENERATOR ASSY** ([See page 19-20](#))
69. **INSTALL FAN AND GENERATOR V BELT** ([See page 14-105](#))
SST 09249-63010
70. **ADD ENGINE OIL**
71. **CHECK FOR ENGINE OIL LEAKS**
72. **INSTALL ENGINE COVER SUB-ASSY NO.1**
Torque: 7.0 N m (71 kgf cm, 62 in. lbf)
73. **INSTALL FRONT WHEEL RH**
Torque: 103 N m (1,050 kgf cm, 76 ft lbf)

OIL PUMP ASSY (1AZ-FSE)

REPLACEMENT

17DFX-01

1. DISCHARGE FUEL SYSTEM PRESSURE ([See page 11-30](#))
2. REMOVE FRONT WHEEL RH
3. REMOVE RADIATOR SUPPORT OPENING COVER
4. REMOVE ENGINE ROOM COVER SIDE
5. REMOVE ENGINE UNDER COVER RH
6. REMOVE ENGINE UNDER COVER LH
7. DRAIN ENGINE OIL
- (a) Install a new gasket and drain plug after draining engine oil.
Torque: 25 N m (250 kgf cm, 18 ft lbf)

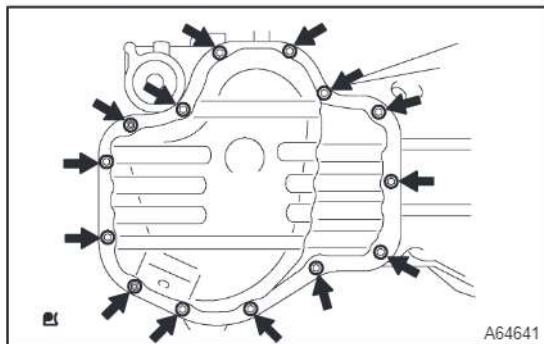


8. REMOVE ENGINE COVER SUB-ASSY NO.1
- (a) Remove 2 nuts and the engine cover No. 1.

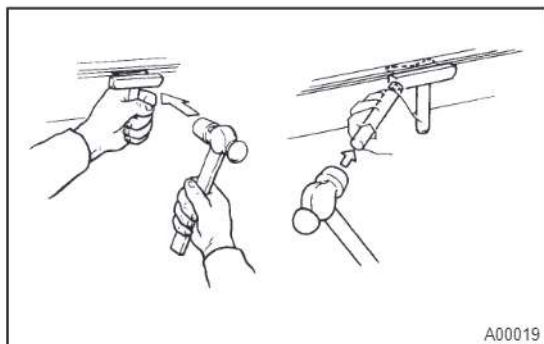
9. REMOVE FUEL PRESSURE PULSATION DAMPER ASSY
10. DISCONNECT FUEL TUBE SUB-ASSY ([See page 11-33](#))
11. SEPARATE FUEL PIPE SUB-ASSY NO.1 ([See page 11-52](#))
SST 09023-12900
12. REMOVE FUEL PUMP ASSY ([See page 11-52](#))
13. REMOVE FAN AND GENERATOR V BELT ([See page 14-185](#))
SST 09249-63010
14. REMOVE GENERATOR ASSY ([See page 19-20](#))
15. REMOVE EXHAUST PIPE ASSY FRONT ([See page 15-7](#))
16. SEPARATE VANE PUMP ASSY ([See page 14-222](#))
17. SEPARATE RETURN TUBE SUB-ASSY ([See page 14-222](#))
18. SEPARATE COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD STEERING POSITION TYPE) ([See page 14-222](#))
19. SEPARATE VANE PUMP OIL RESERVOIR ASSY
20. REMOVE OIL RESERVOIR BRACKET NO.1 ([See page 14-222](#))
21. SEPARATE ENGINE WIRE
22. REMOVE COOLER BRACKET (LHD STEERING POSITION TYPE) ([See page 14-222](#))
23. REMOVE ENGINE SERVICE COVER BRACKET RH (RHD STEERING POSITION TYPE)
- (a) Remove a bolt and the engine service cover bracket RH.
24. REMOVE IGNITION COIL ASSY
- (a) Remove 4 bolts and the ignition coils.
25. REMOVE CYLINDER HEAD COVER SUB-ASSY ([See page 14-222](#))
26. SET NO. 1 CYLINDER TO TDC/COMPRESSION ([See page 14-222](#))
27. REMOVE ENGINE MOUNTING BRACKET NO.2 RH ([See page 14-222](#))
28. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR ([See page 14-222](#))

29. REMOVE CRANKSHAFT PULLEY (See page 14-222)

SST 09213-54015 (91651-60855), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

30. REMOVE CHAIN TENSIONER ASSY NO.1 (See page 14-139)**31. REMOVE CRANKSHAFT POSITION SENSOR (See page 18-17)****32. REMOVE OIL PAN SUB-ASSY**

(a) Remove 12 bolts and 2 nuts.

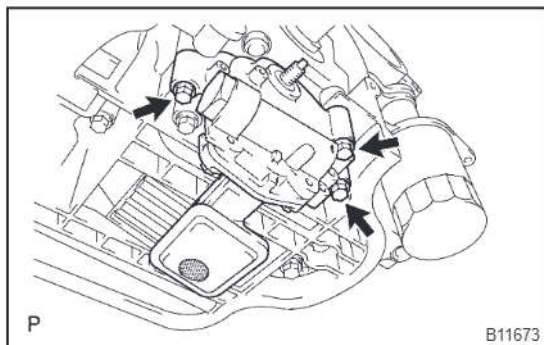


(b) Insert the blade of SST between the crank case, timing chain cover and oil pan, cut off applied sealer and remove the oil pan.

SST 09032-00100

NOTICE:

Be careful not to damage the contact surface of timing chain cover, crank case and oil pan.

33. REMOVE V-RIBBED BELT TENSIONER ASSY (See page 14-139)**34. REMOVE TIMING CHAIN OR BELT COVER SUB-ASSY (See page 14-139)****35. REMOVE CRANKSHAFT POSITION SENSOR PLATE NO.1****36. REMOVE CHAIN TENSIONER SLIPPER****37. REMOVE CHAIN VIBRATION DAMPER NO.1****38. REMOVE TIMING CHAIN GUIDE (See page 14-139)****39. REMOVE CHAIN SUB-ASSY****40. REMOVE CRANKSHAFT TIMING GEAR OR SPROCKET****41. REMOVE NO.2 CHAIN SUB-ASSY (See page 14-139)****42. REMOVE OIL PUMP ASSY**

(a) Remove 3 bolts, the oil pump and gasket.

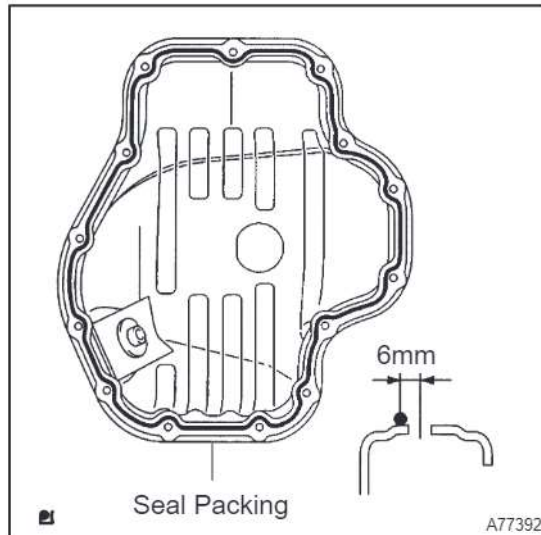
43. INSTALL OIL PUMP ASSY

(a) Install a new gasket and oil pump with 3 bolts.

Torque: 19 N m (195 kgf cm, 15 ft lbf)

44. INSTALL NO.2 CHAIN SUB-ASSY (See page 14-139)**45. INSTALL CRANKSHAFT TIMING GEAR OR SPROCKET**

46. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14-139)
47. INSTALL CHAIN VIBRATION DAMPER NO.1
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
48. INSTALL CHAIN SUB-ASSY (See page 14-139)
49. INSTALL TIMING CHAIN GUIDE
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
50. INSTALL CHAIN TENSIONER SLIPPER (See page 14-139)
51. INSTALL CRANKSHAFT POSITION SENSOR PLATE NO.1 (See page 14-139)
52. INSTALL TIMING CHAIN OR BELT COVER SUB-ASSY (See page 14-139)
53. INSTALL V-RIBBED BELT TENSIONER ASSY (See page 14-139)

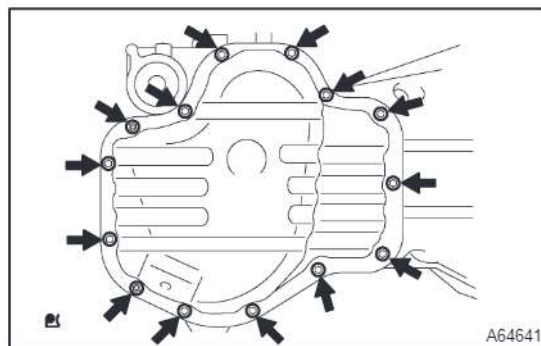


54. INSTALL OIL PAN SUB-ASSY

NOTICE:

- ▲ Remove any oil from the contact surface.
 - ▲ Install the oil pan within 3 minutes after applying seal packing.
 - ▲ Do not start the engine within 2 hours after installing.
- (a) Remove any old packing (FIPG) material and be careful not to drop any oil on the contact surface of the cylinder block and oil pan.
 - (b) Apply seal packing in the shape of bead (Diameter 3 to 4 mm (0.157 in.)) as shown in the illustration, and install the oil pan.

Seal Packing: Part No. 08826 – 00080 or equivalent



- (c) Insert the oil pan with 12 bolts and 2 nuts.
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)

55. INSTALL CRANKSHAFT POSITION SENSOR (See page 18-17)
56. INSTALL CRANKSHAFT PULLEY (See page 14-139)
SST 09213-54015 (91651-60855), 09330-00021
57. INSTALL CHAIN TENSIONER ASSY NO.1
58. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING INSULATOR
Torque: 52 N m (530 kgf cm, 38 ft lbf)
59. INSTALL ENGINE MOUNTING BRACKET NO.2 RH (See page 14-139)
60. INSTALL CYLINDER HEAD COVER SUB-ASSY (See page 14-139)
61. INSTALL COOLER BRACKET (LHD STEERING POSITION TYPE)
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
62. INSTALL ENGINE SERVICE COVER BRACKET RH (RHD STEERING POSITION TYPE)
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
63. INSTALL ENGINE WIRE
Torque: 7.0 N m (71 kgf cm, 62 in. lbf)

64. INSTALL OIL RESERVOIR BRACKET NO.1
Torque: 8.0 N m (82 kgf cm, 71 in. lbf)
65. INSTALL COOLER REFRIGERANT SUCTION HOSE NO.1 (LHD STEERING POSITION TYPE)
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
66. INSTALL RETURN TUBE SUB-ASSY
Torque: 8.0 N m (82 kgf cm, 71 in. lbf)
67. INSTALL IGNITION COIL ASSY
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)
68. INSTALL VANE PUMP ASSY
Torque: 37 N m (377 kgf cm, 27 ft lbf)
69. INSTALL EXHAUST PIPE ASSY FRONT ([See page 15-7](#))
70. INSTALL GENERATOR ASSY ([See page 19-20](#))
71. INSTALL FAN AND GENERATOR V BELT ([See page 14-185](#))
SST 09249-63010
72. INSTALL FUEL PUMP ASSY ([See page 11-52](#))
73. INSTALL FUEL PIPE SUB-ASSY NO.1 ([See page 11-52](#))
SST 09023-12900
74. INSTALL FUEL TUBE SUB-ASSY ([See page 11-33](#))
75. INSTALL FUEL PRESSURE PULSATION DAMPER ASSY ([See page 11-52](#))
76. ADD ENGINE OIL
77. CHECK FOR ENGINE OIL LEAKS
78. CHECK FUEL LEAK
79. INSTALL ENGINE COVER SUB-ASSY NO.1
Torque: 7.0 N m (71 kgf cm, 62 in. lbf)
80. INSTALL FRONT WHEEL RH
Torque: 103 N m (1,050 kgf cm, 76 ft lbf)

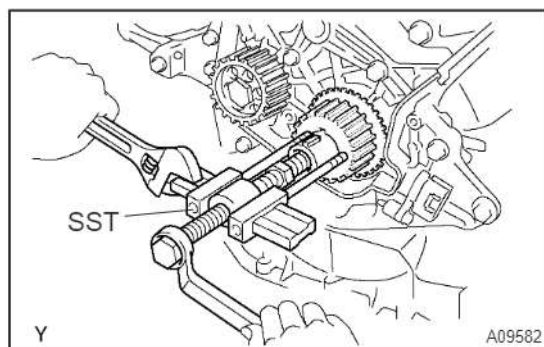
OIL PUMP ASSY (1CD–FTV)

17DFP-01

REPLACEMENT

1. DRAIN ENGINE OIL (See page 17-30)
2. REMOVE RADIATOR SUPPORT OPENING COVER
3. REMOVE ENGINE ROOM COVER SIDE
4. REMOVE FRONT WHEEL RH
5. REMOVE ENGINE UNDER COVER RH
6. REMOVE ENGINE UNDER COVER SUB-ASSY NO.1
7. REMOVE ENGINE COVER NO.1
 - (a) Remove the 5 nuts and the engine cover.
8. REMOVE INJECTOR DRIVER (See page 14-307)
9. REMOVE V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See page 14-269)
10. REMOVE GENERATOR V BELT (See page 14-269)
11. SEPARATE POWER STEERING IDLE PULLEY BRACKET (See page 14-286)
12. REMOVE ENGINE MOUNTING INSULATOR SUB-ASSY RH (See page 14-307)
13. REMOVE CRANKSHAFT PULLEY (See page 14-307)

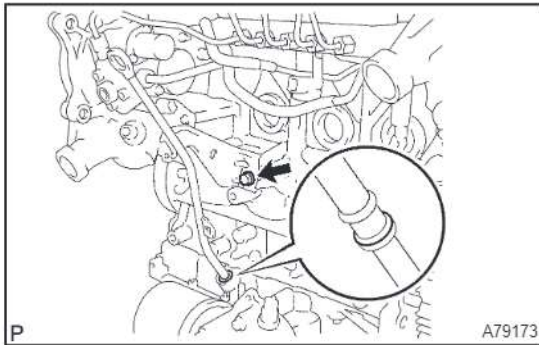
SST 09213-54015 (90105-08076), 09330-00021, 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05031)
14. REMOVE IDLER PULLEY SUB-ASSY (See page 14-307)
15. REMOVE TIMING BELT NO.2 COVER (See page 14-307)
16. REMOVE TIMING BELT NO.1 COVER (See page 14-307)
17. REMOVE TIMING BELT GUIDE
18. REMOVE TRANSVERSE ENGINE ENGINE MOUNTING BRACKET (See page 14-307)
19. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14-307)
20. REMOVE TIMING CHAIN COVER PLATE (See page 14-307)
21. REMOVE TIMING BELT (See page 14-307)
22. REMOVE TIMING BELT IDLER SUB-ASSY NO.2 (See page 14-307)



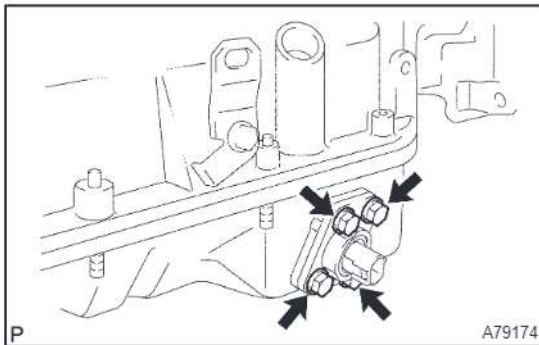
23. REMOVE CRANKSHAFT TIMING PULLEY
 - (a) If the timing pulley can not be removed by hand, use SST to remove the pulley.

SST 09950-50013 (09951-05010, 09952-05010, 09953-05010, 09953-05020, 09954-05021)

24. REMOVE GENERATOR ASSY (See page 19-29)
25. REMOVE TIMING BELT IDLER SUB-ASSY NO.1
26. REMOVE V-RIBBED BELT TENSIONER ASSY
 - (a) Remove the 2 bolts and the V-ribbed belt tensioner.

**27. REMOVE OIL LEVEL GAGE GUIDE**

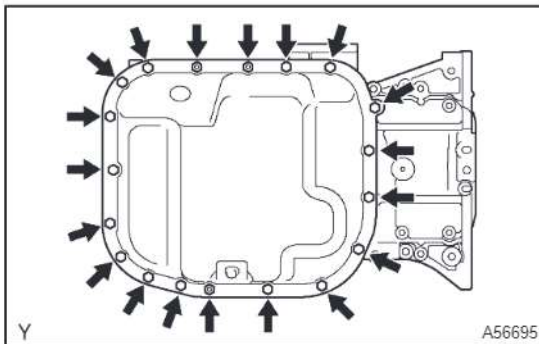
- (a) Remove the bolt which is used to secure the oil level gage guide to the cylinder block.
- (b) Pull out the oil level gage guide together with the oil level gage from the No. 1 oil pan.
- (c) Remove the O-ring from the oil level gage guide.

**28. REMOVE ENGINE OIL LEVEL SENSOR**

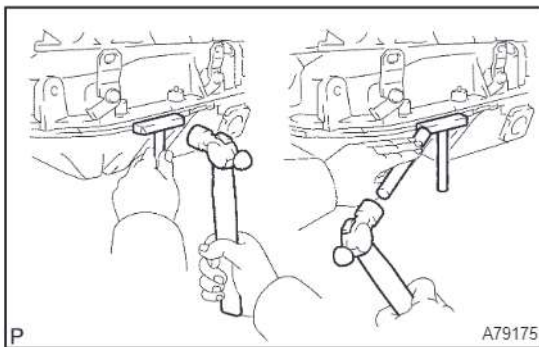
- (a) Remove the 4 bolts and the level sensor.

NOTICE:

Be careful not to drop the oil level sensor when removing.

**29. REMOVE OIL PAN SUB-ASSY NO.2**

- (a) Remove the 17 bolts and 2 nuts.

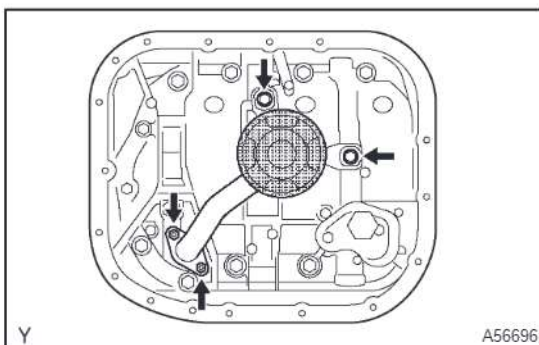


- (b) Insert the blade of SST between the No. 1 and No. 2 oil pans, and cut off applied sealer and remove the No. 2 oil pan.

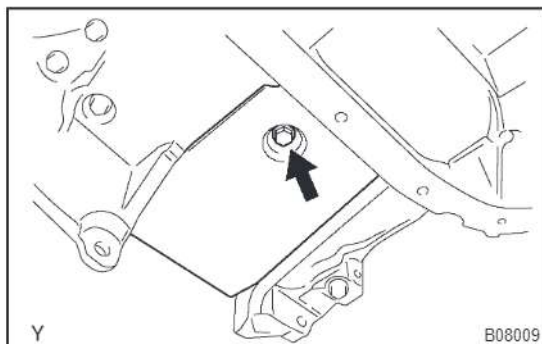
SST 09032-00100

NOTICE:

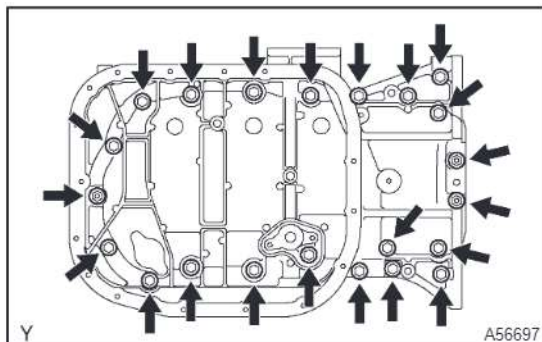
Be careful not to damage the No. 1 and No. 2 oil pans.

**30. REMOVE OIL STRAINER SUB-ASSY**

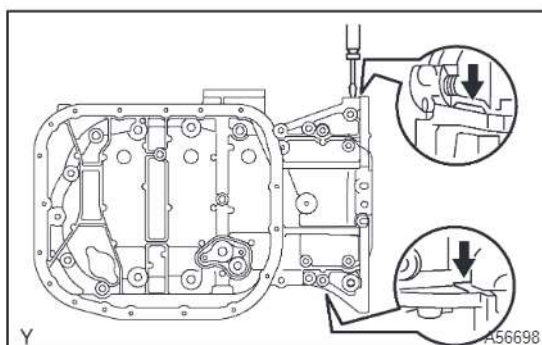
- (a) Remove the 2 bolts and 2 nuts, then remove the oil strainer and the gasket.

**31. REMOVE OIL PAN INSULATOR**

- (a) Remove the bolt and the oil pan insulator.

**32. REMOVE OIL PAN SUB-ASSY**

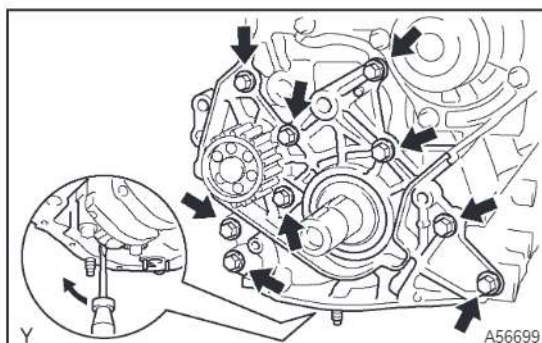
- (a) Remove the 19 bolts and 3 nuts.



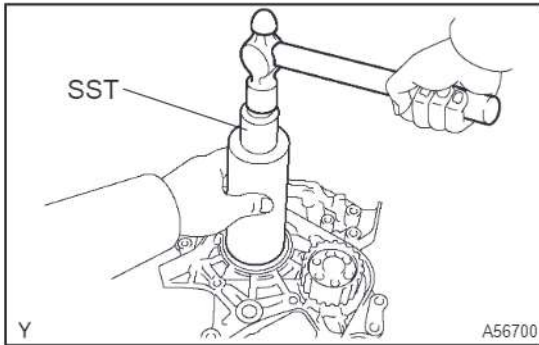
- (b) Using a screwdriver, remove the oil pan by prying between the cylinder block and the No. 1 oil pan.

NOTICE:

Be careful not to damage the cylinder block and No. 1 oil pan.

33. REMOVE CRANKSHAFT POSITION SENSOR**34. REMOVE OIL PUMP ASSY**

- (a) Remove the 9 bolts.
 (b) Remove the oil pump by prying between the oil pump and the main bearing cap with a screwdriver.
 (c) Remove the gasket.

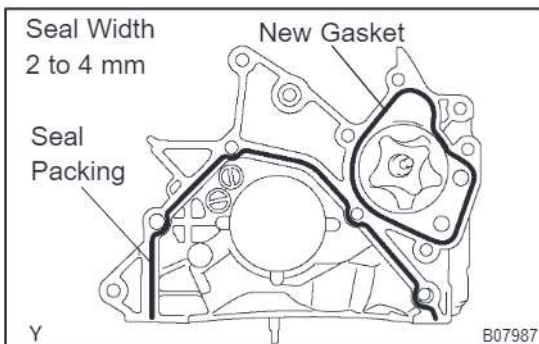


35. INSTALL CRANKSHAFT SEAL

- (a) Using SST and a hammer, tap in a new oil seal until its surface is flush with the oil pump edge.
SST 09316-60011 (09316-00011, 09316-00021)

36. INSTALL OIL PUMP ASSY

- (a) Remove any old packing (FIPG) and be careful not to drop any oil on the contact surfaces of the oil pump and the cylinder block.
- (1) Using a razor blade and a gasket scraper, remove all the old packing from the gasket surfaces and the sealing groove.
 - (2) Thoroughly clean all components to remove all the loose material.
 - (3) Using a non-residue solvent, clean both the sealing surfaces.



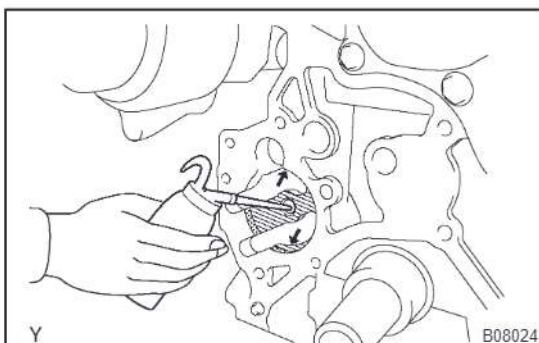
- (b) Apply seal packing to the oil pump as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

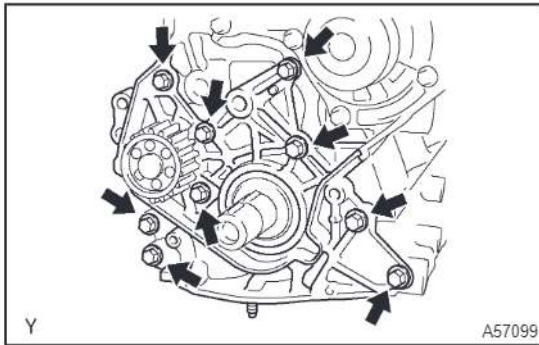
NOTICE:

Avoid applying an excessive amount to the surface.

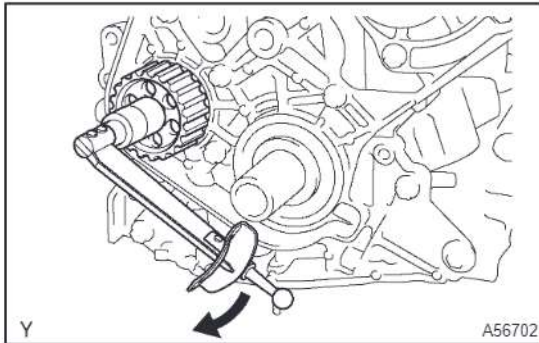
- (1) Install a nozzle that has been cut to a 2 to 4 mm (0.08 to 0.16 in.) opening.
 - (2) Parts must be set within 3 minutes and assembled within 15 minutes of application. Otherwise the material must be removed and reapplied.
 - (3) Immediately remove nozzle from the tube and reinstall the cap.
- (c) Install a new gasket to the oil pump.



- (d) Pour in 0.5 cm³ (0.03 cu in.) or more of engine oil into the bushing of the cylinder block.
- (e) Apply engine oil to the cylinder block side where it contacts with the oil pump driven rotor.



- (f) Install the oil pump with the 9 bolts.
Torque: 31 N m (320 kgf cm, 23 ft lbf)



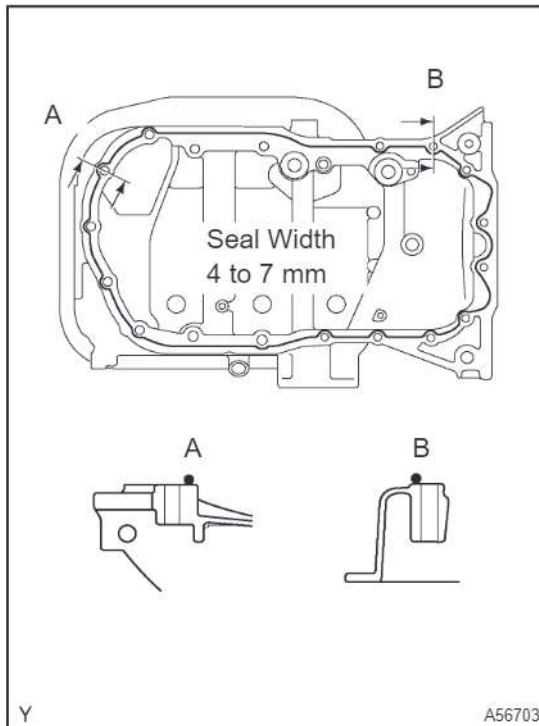
- (g) Measure the oil pump rotating torque.
 (1) Check that the pump rotates smoothly without noise.
 (2) Using a torque wrench, check the pump rotating torque.
Rotating torque: 3.0 N m (31 kgf cm, 27 in. lbf) or less

37. INSTALL CRANKSHAFT POSITION SENSOR

Torque: 8.8 N m (90 kgf cm, 78 in. lbf)

38. INSTALL OIL PAN SUB-ASSY

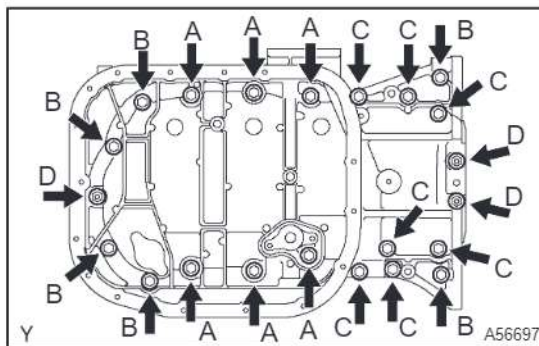
- (a) Remove any old packing (FIPG) and be careful not to drop any oil on the contact surfaces of the No. 1 oil pan, the cylinder block and the oil pump and the rear oil seal retainer.
- (1) Using a razor blade and gasket scraper, remove all the old packing from the gasket surfaces.
 - (2) Thoroughly clean all components to remove all the loose material.
 - (3) Using a non-residue solvent, clean both the sealing surfaces.



- (b) Apply a seal packing to the No. 1 oil pan as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

- (1) Install a nozzle that has been cut to a 4 to 7 mm (0.16 to 0.28 in.) opening.
- (2) Parts must be set within 3 minutes and assembled within 15 minutes of application. Otherwise the material must be removed and reapplied.
- (3) Immediately remove nozzle from the tube and reinstall the cap.



- (c) Install the oil pan with the 19 bolts and 3 nuts.

Torque:

42 N m (428 kgf cm, 31 ft lbf) for bolt A

21 N m (214 kgf cm, 15 ft lbf) for bolt B

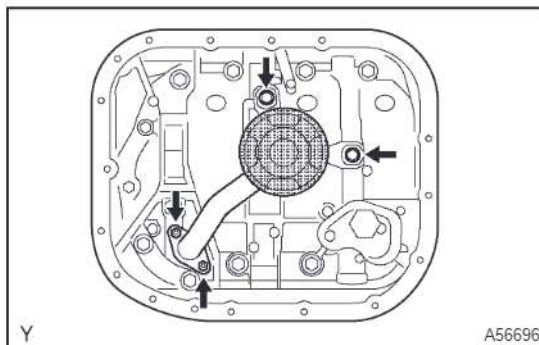
11 N m (112 kgf cm, 8 ft lbf) for bolt C

12 N m (122 kgf cm, 9 ft lbf) for nut D

39. INSTALL OIL PAN INSULATOR

- (a) Install the oil pan insulator with the bolt.

Torque: 7.5 N m (76 kgf cm, 66 in. lbf)



40. INSTALL OIL STRAINER SUB-ASSY

- (a) Install a new gasket and the oil strainer with the 2 bolts and 2 nuts.

Torque:

21 N m (209 kgf cm, 15 ft lbf) for bolt

13 N m (135 kgf cm, 10 ft lbf) for nut

41. INSTALL OIL PAN SUB-ASSY NO.2

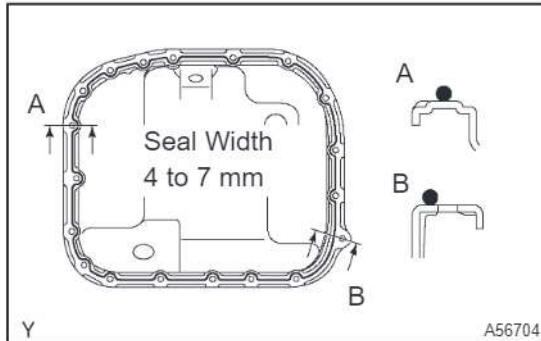
- (a) Remove any old packing and be careful not to drop any oil on the contact surfaces of the No. 1 and No. 2 oil pans.

- (1) Using a razor blade and gasket scraper, remove all the old packing from the gasket surfaces.
- (2) Thoroughly clean all components to remove all the loose material.

- (3) Using a non-residue solvent, clean both the sealing surfaces.

NOTICE:

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



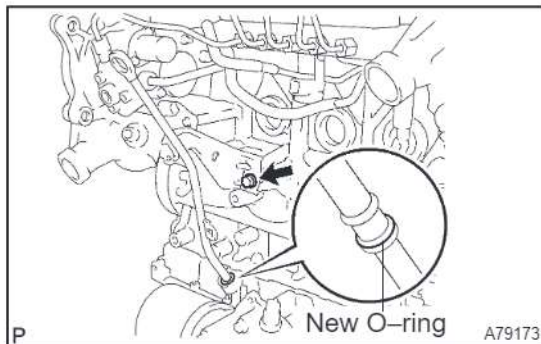
- (b) Apply a seal packing to the oil pan as shown in the illustration.

Seal packing: Part No. 08826-00080 or equivalent

- (1) Install a nozzle that has been cut to a 4 to 7 mm (0.16 to 0.28 in.) opening.
 - (2) Parts must be set within 3 minutes and assembled within 15 minutes of application. Otherwise the material must be removed and reapplied.
 - (3) Immediately remove nozzle from the tube and reinstall the cap.
- (c) Install the oil pan with the 17 bolts and 2 nuts. Tighten the bolts and nuts uniformly in several steps.
- Torque: 12 N·m (119 kgf·cm, 9 ft·lbf)**

42. INSTALL ENGINE OIL LEVEL SENSOR

Torque: 7.0 N·m (71 kgf·cm, 62 in·lbf)



43. INSTALL OIL LEVEL GAGE GUIDE

- (a) Install a new O-ring to the oil level gage guide.
 - (b) Apply engine oil to the O-ring.
 - (c) Push in the oil level gage guide end into the guide hole of the No. 1 oil pan.
 - (d) Install the oil level gage guide with the bolt.
- Torque: 18 N·m (184 kgf·cm, 13 ft·lbf)**
- (e) Apply engine oil to the O-ring on the oil level gage.
 - (f) Install the oil level gage.

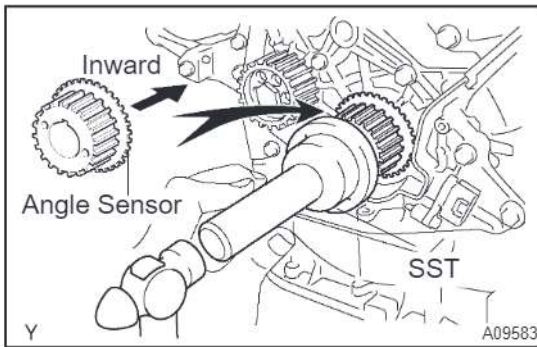
44. INSTALL V-RIBBED BELT TENSIONER ASSY

Torque: 31 N·m (320 kgf·cm, 23 ft·lbf)

45. INSTALL TIMING BELT IDLER SUB-ASSY NO.1

Torque: 35 N·m (357 kgf·cm, 26 ft·lbf)

46. INSTALL GENERATOR ASSY (See page 19-29)

**47. INSTALL CRANKSHAFT TIMING PULLEY**

- (a) Align the keyway of the timing pulley with the key located on the camshaft, slide the pulley into place.
- (b) Using SST and a hammer, tap in the timing pulley with the angle sensor facing inward.
SST 09223-46011

48. INSTALL TIMING BELT IDLER SUB-ASSY NO.2

Torque: 47 N m (479 kgf cm, 35 ft lbf)

49. SET NO. 1 CYLINDER TO TDC/COMPRESSION (See page 14-307)

SST 09960-10010 (09962-01000, 09963-01000)

50. INSTALL TIMING BELT (See page 14-307)**51. CHECK VALVE TIMING (See page 14-307)****52. INSTALL TIMING CHAIN COVER PLATE (See page 14-307)****53. INSTALL TRANSVERSE ENGINE ENGINE MOUNTING BRACKET (See page 14-307)****54. INSTALL TIMING BELT GUIDE (See page 14-307)****55. INSTALL TIMING BELT NO.1 COVER (See page 14-307)****56. INSTALL TIMING BELT NO.2 COVER (See page 14-307)****57. INSTALL CRANKSHAFT PULLEY (See page 14-307)**

SST 09213-54015 (90105-08076), 09330-00021

58. INSTALL ENGINE MOUNTING INSULATOR SUB-ASSY RH

Torque: 52 N m (530 kgf cm, 38 ft lbf)

59. INSTALL IDLER PULLEY SUB-ASSY**60. INSTALL POWER STEERING IDLE PULLEY BRACKET (See page 14-286)****61. ADJUST V (COOLER COMPRESSOR TO CRANKSHAFT PULLEY) BELT NO.1 (See page 14-269)****62. INSTALL INJECTOR DRIVER (See page 14-307)****63. INSTALL ENGINE COVER NO.1**

Torque: 8.0 N m (82 kgf cm, 71 in. lbf)

64. INSTALL FRONT WHEEL RH

Torque: 103 N m (1,050 kgf cm, 76 ft lbf)

65. ADD ENGINE OIL (See page 17-30)**66. CHECK FOR ENGINE OIL LEAKS**

OIL PUMP ASSY (1ZZ-FE/3ZZ-FE)

170FR-01

REPLACEMENT

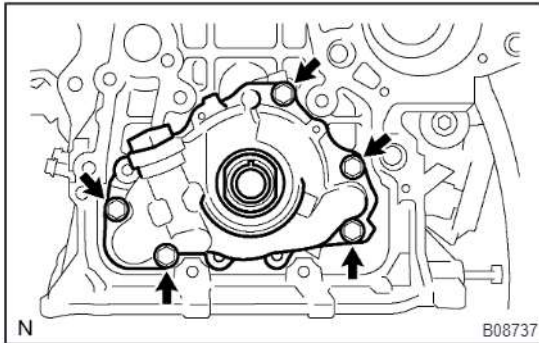
1. DRAIN ENGINE OIL

- (a) Remove the oil pan drain plug and drain engine oil.

2. REMOVAL & INSTALLATION CHAIN SUB-ASSY (See page 14-49)

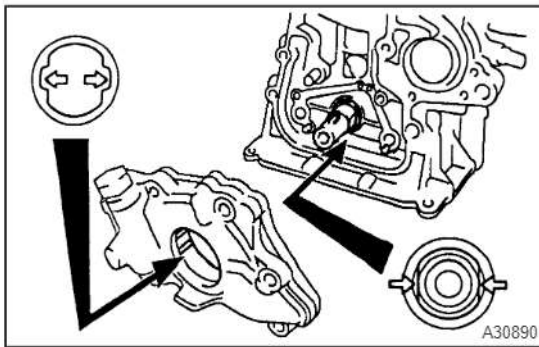
3. REMOVE CHAIN VIBRATION DAMPER NO.1

- (a) Remove the 2 bolts and the chain vibration damper No. 1.



4. REMOVE OIL PUMP ASSY

- (a) Remove the 5 bolts.
(b) Remove the oil pump assy and the gasket.



5. INSTALL OIL PUMP ASSY

- (a) Place a new gasket on the cylinder block.
(b) Align the keyway of the oil pump drive rotor with the rectangular portion of the crankshaft and slide the oil pump into place.
(c) Install the oil pump with the 5 bolts.
Torque: 9.0 N m (92 kgf cm, 80 in. lbf)

6. INSTALL CHAIN VIBRATION DAMPER NO.1

- (a) Install the chain vibration damper No. 1 with 2 bolts.
Torque: 9.0 N m (92 kgf cm, 8.0 in. lbf)

7. INSTALL OIL PAN DRAIN PLUG

- (a) Clean and install the oil pan drain plug with a new gasket.
Torque: 37 N m (377 kgf cm, 27 ft lbf)

8. ADD ENGINE OIL (See page 17-4)

9. ADD ENGINE COOLANT (See page 16-7)

10. CHECK FOR ENGINE OIL LEAKS

11. CHECK FOR ENGINE COOLANT LEAKS (See page 16-1)