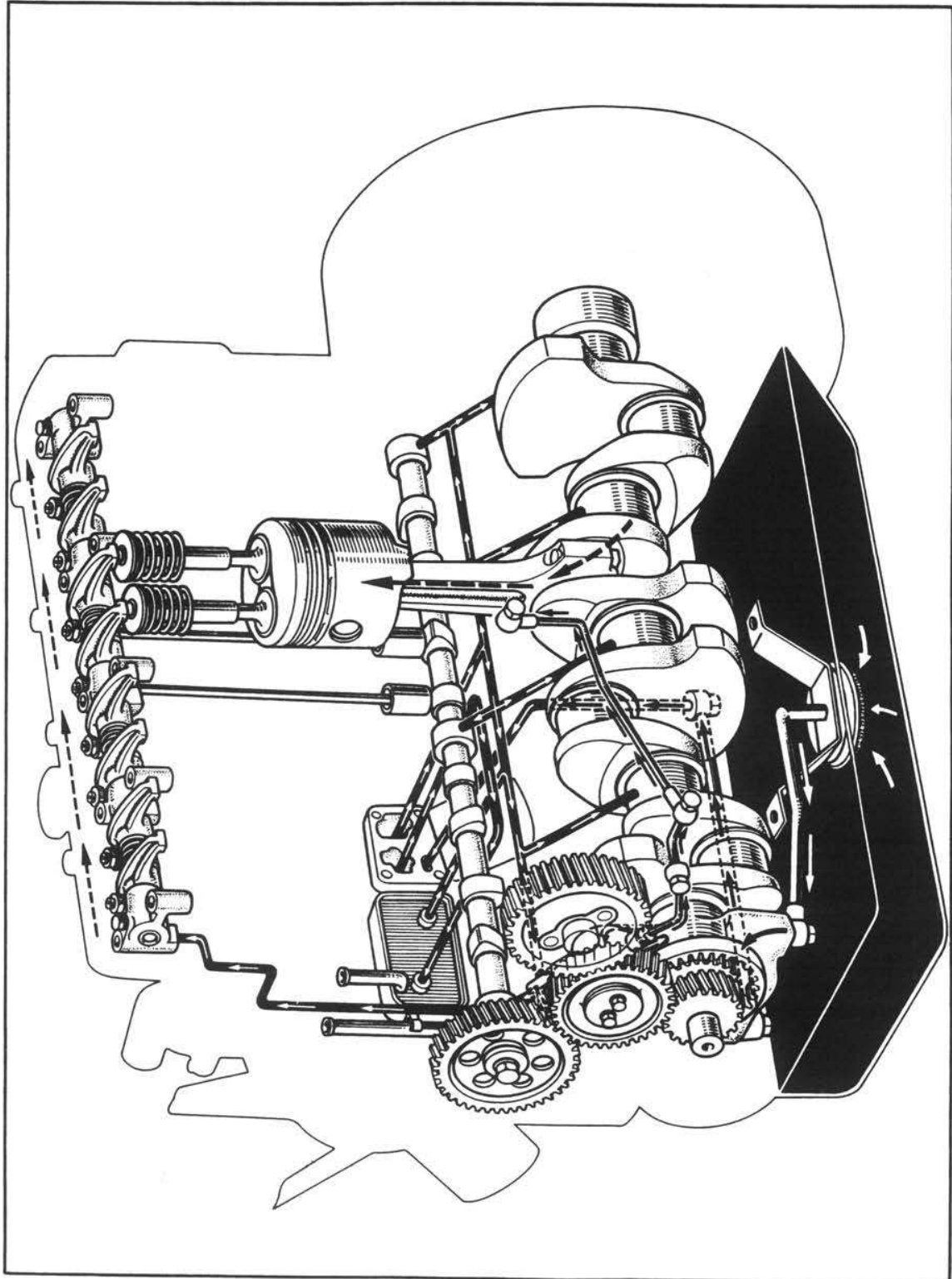


LUBRICATION SYSTEM

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LUBRICATION SYSTEM CIRCUIT	4-2
OIL FILTER	4-3
OIL PUMP	4-7

4-2

LUBRICATION SYSTEM – Lubrication System Circuit**LUBRICATION SYSTEM CIRCUIT****Fig. 4-1**

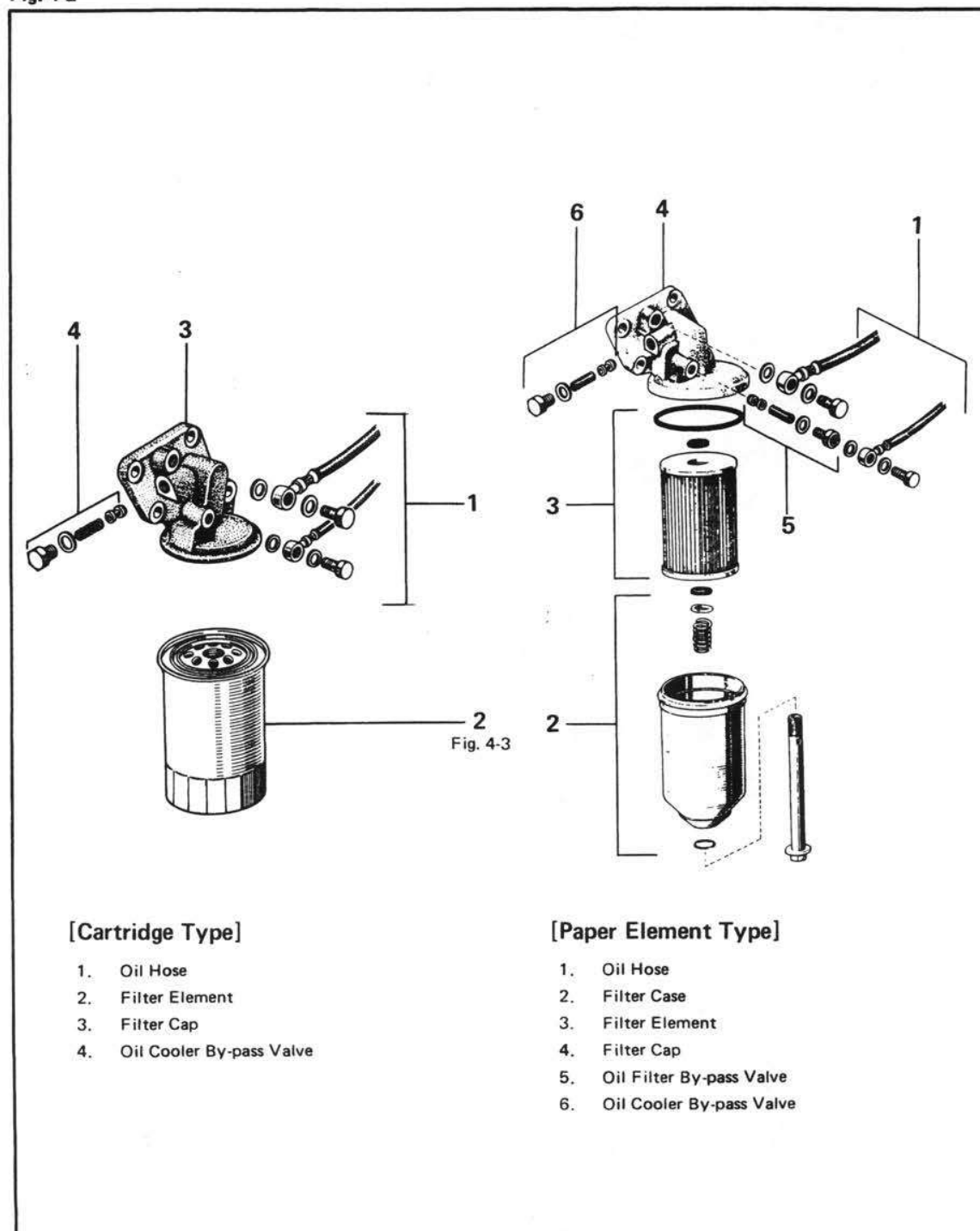
LUBRICATION SYSTEM — Oil Filter

4-3

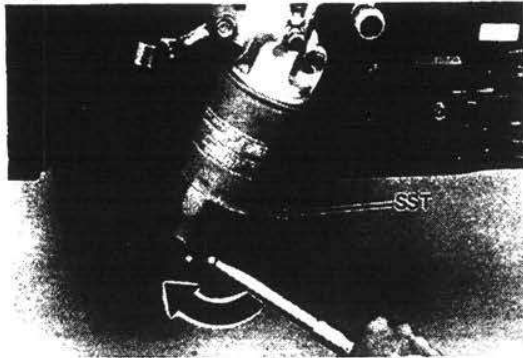
OIL FILTER**DISASSEMBLY**

Disassemble in numerical order.

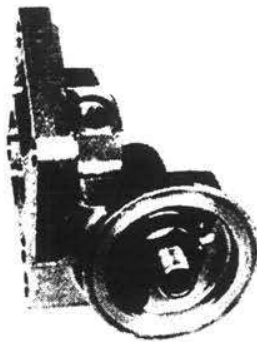
Fig. 4-2



4-4

LUBRICATION SYSTEM – Oil Filter**Fig. 4-3**

Remove oil filter by using SST[09228-44010].

Fig. 4-4**INSPECTION**

1. Check the contacting surface of the oil filter cap for scoring and cracks.

Fig. 4-5

2. Check valve for valve sliding.
 - (1) Oil filter by-pass valve

Fig. 4-6

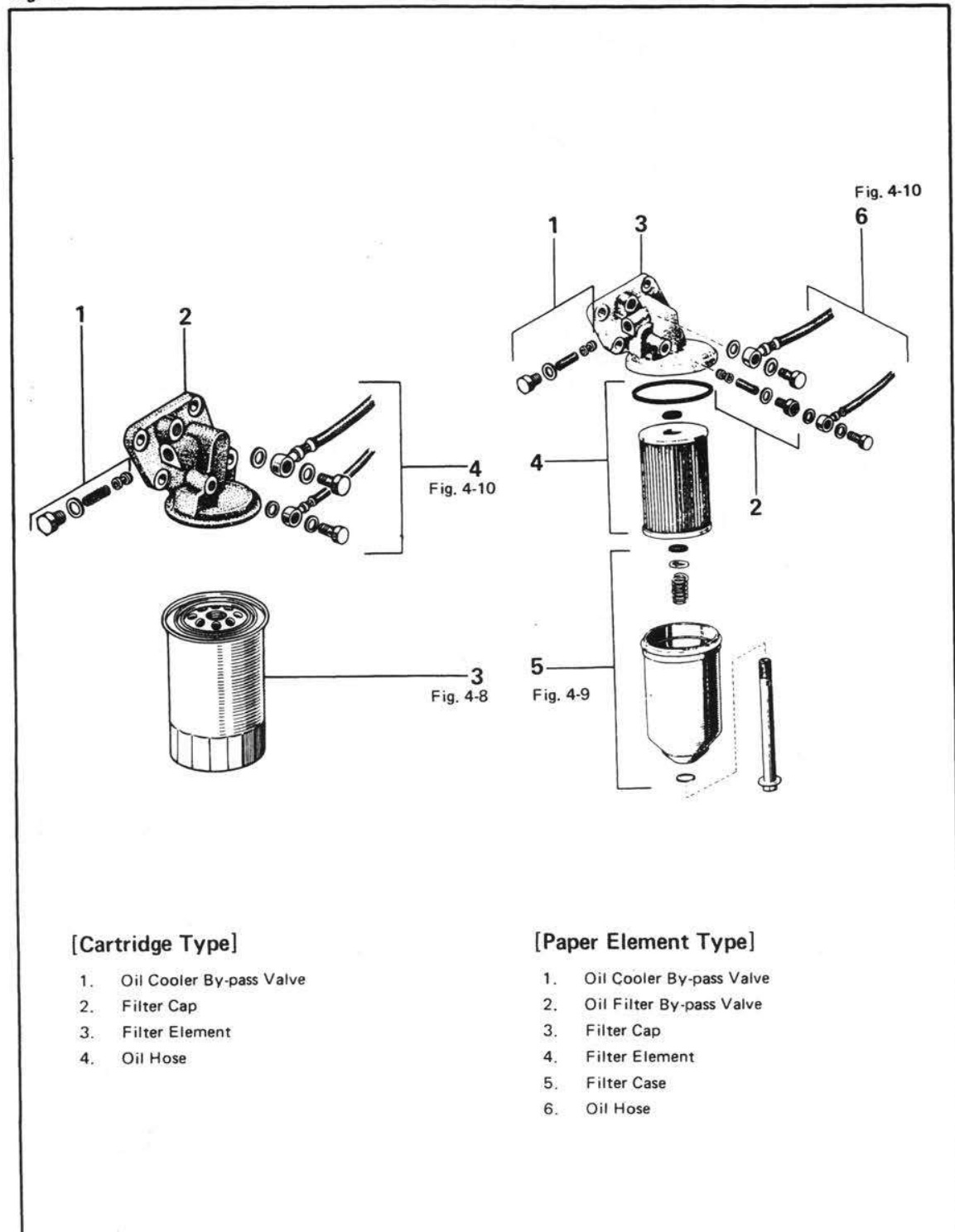
- (2) Oil cooler by-pass valve

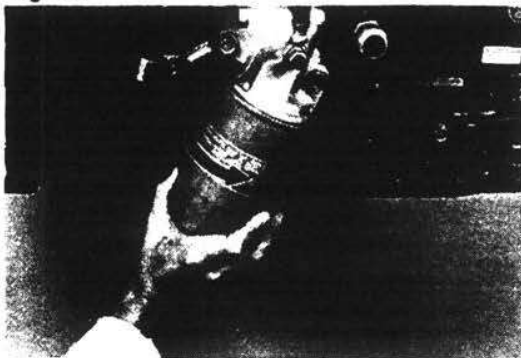
LUBRICATION SYSTEM – Oil Filter

4–5

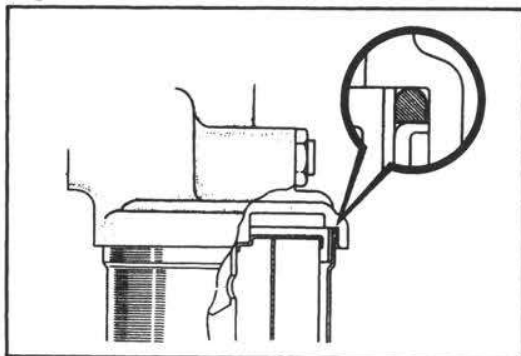
ASSEMBLY

Assemble in numerical order.

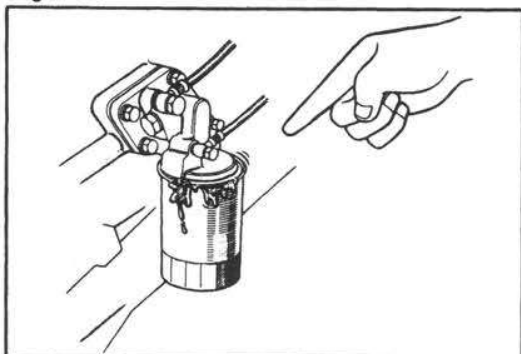
Fig. 4-7

4-6 LUBRICATION SYSTEM – Oil Filter**Fig. 4-8**

To install, hand-tighten oil filter.

Fig. 4-9

Use new gaskets and assemble the filter body gasket with the rounded side facing upward (toward cap).

Fig. 4-10

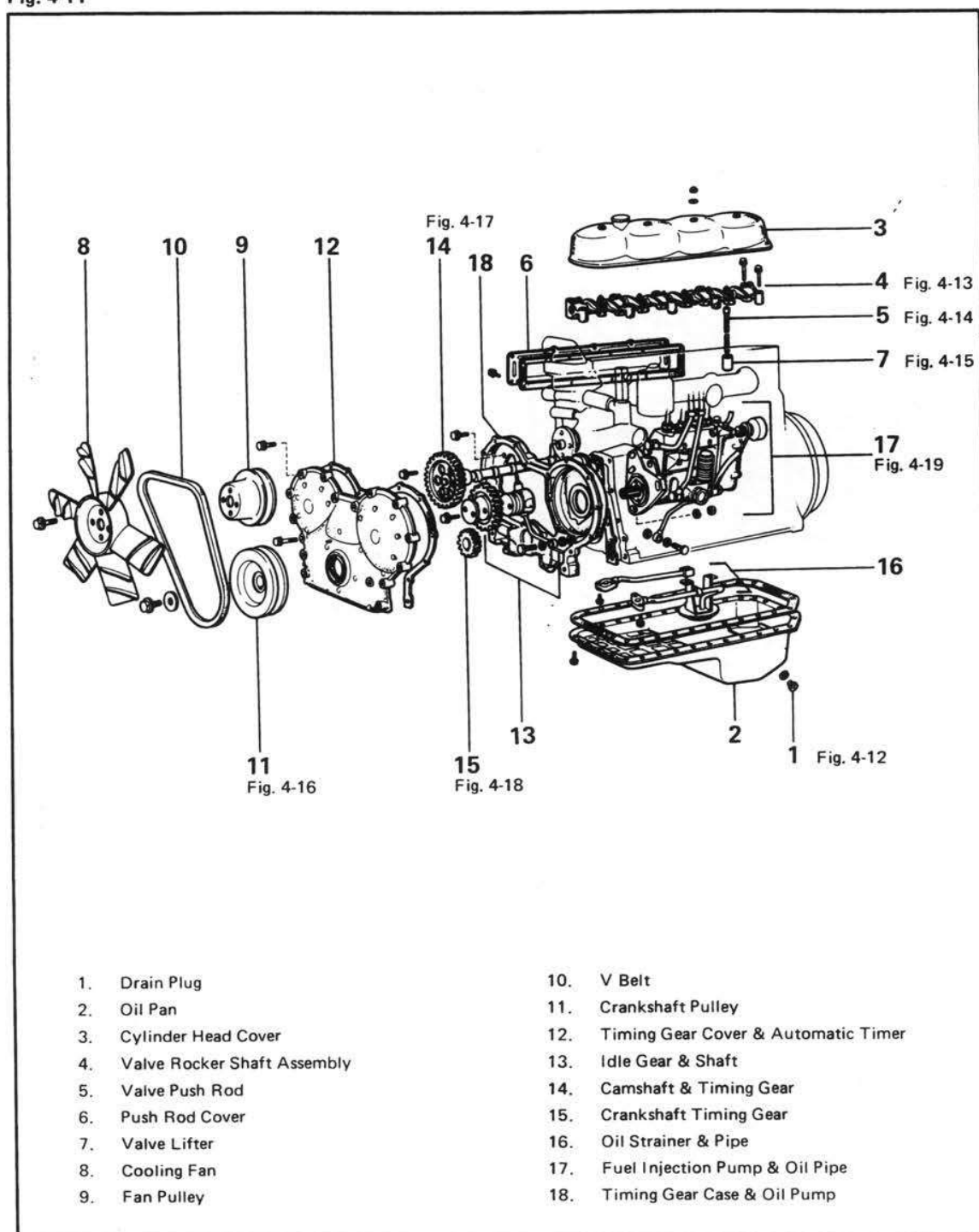
After installing, start the engine and check for oil leaks.
Stop the engine and check oil level.

LUBRICATION SYSTEM – Oil Pump

4-7

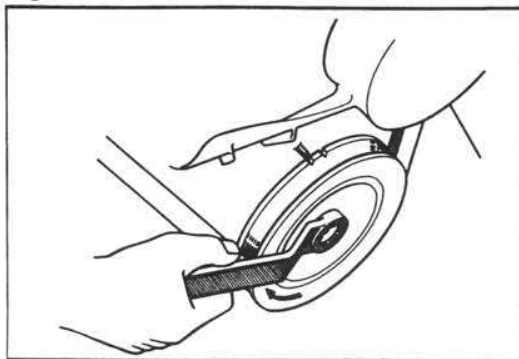
OIL PUMP**REMOVAL**

Remove in numerical order.

Fig. 4-11

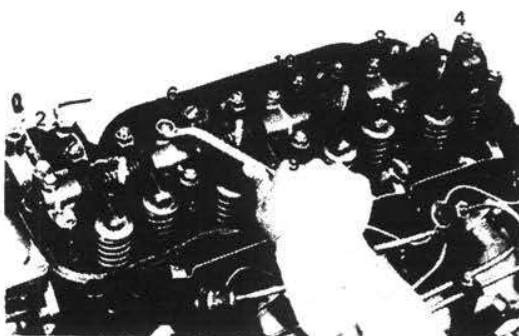
4-8 LUBRICATION SYSTEM – Oil Pump

Fig. 4-12



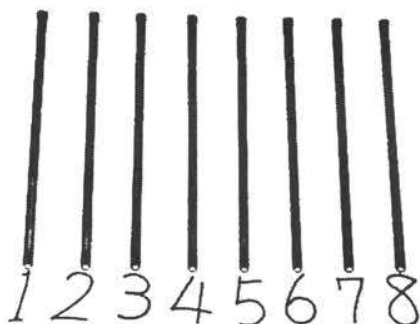
Before starting work, set No.1 cylinder piston at TDC/Compression.

Fig. 4-13



Loosen valve rocker support bolts little by little in three or four steps in the specified numerical sequence.

Fig. 4-14



Keep push rods in correct order.

Fig. 4-15



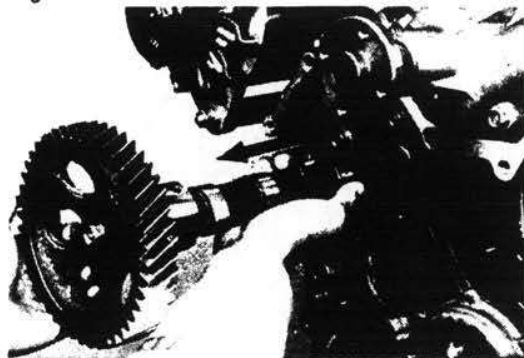
Keep valve lifters in correct order.

LUBRICATION SYSTEM – Oil Pump

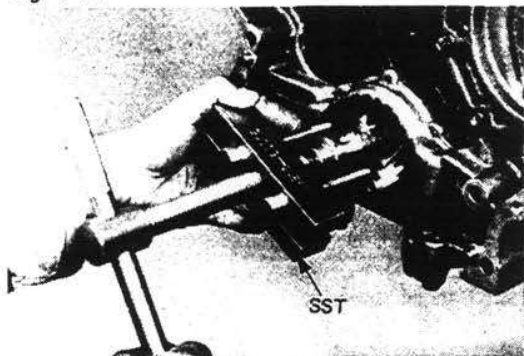
4-9

Fig. 4-16

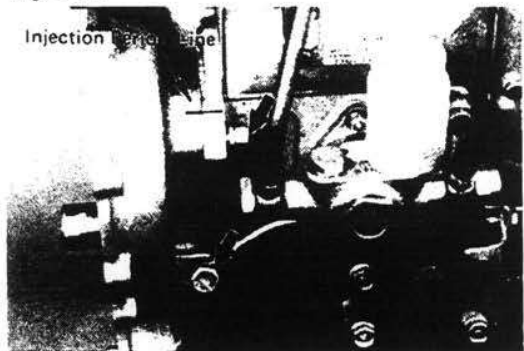
Pull out crankshaft pulley with SST[09213-31021].

Fig. 4-17

Pull out camshaft using care not to damage the camshaft bearings.

Fig. 4-18

Pull out crankshaft timing gear with SST[09213-60015].

Fig. 4-19

Check the position of the injection period line, and remove the three injection pump mounting nuts and oil pipe union bolt.

4-10 LUBRICATION SYSTEM – Oil Pump

DISASSEMBLY

Dissemble in numerical order.

Fig. 4-20

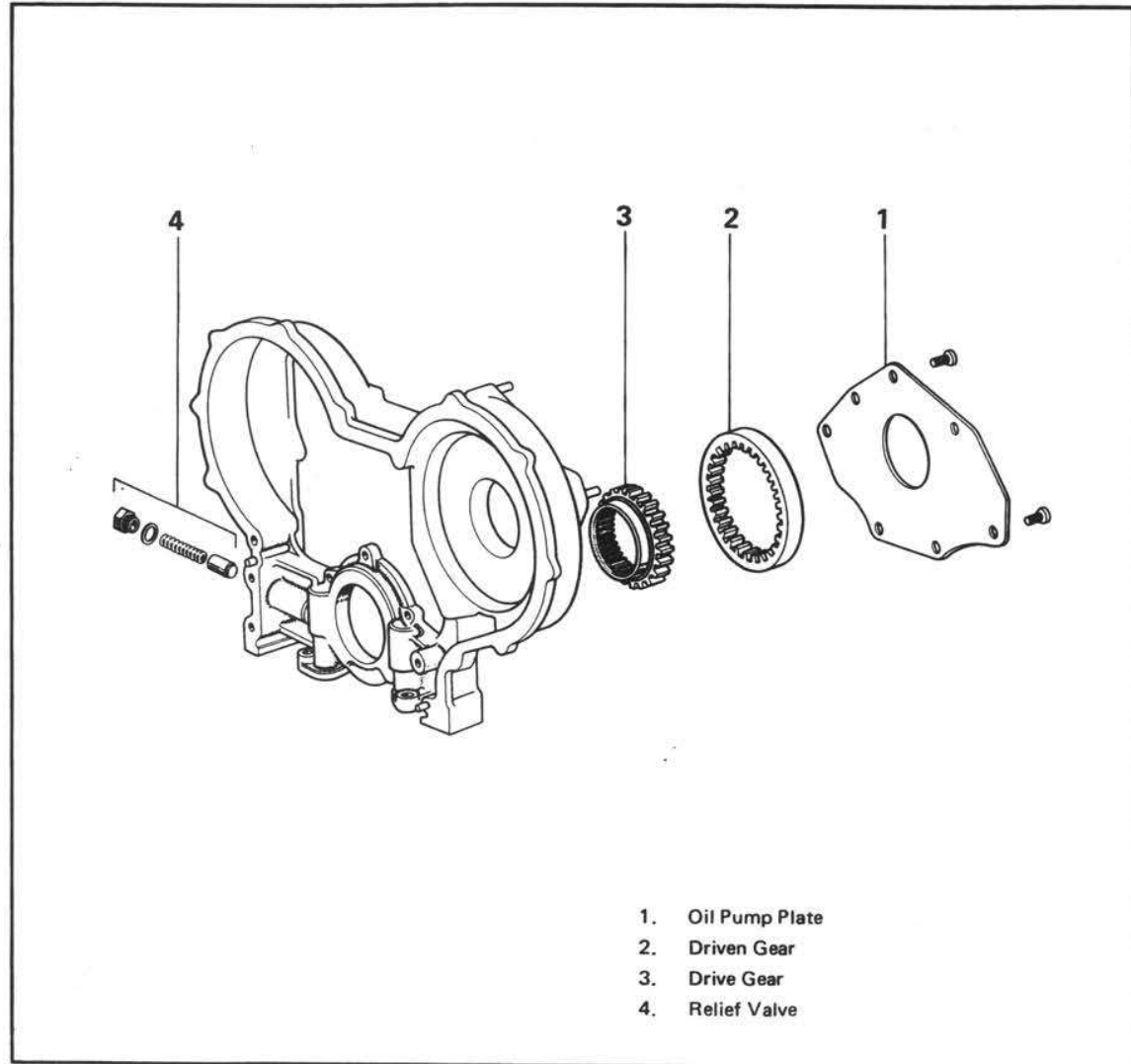
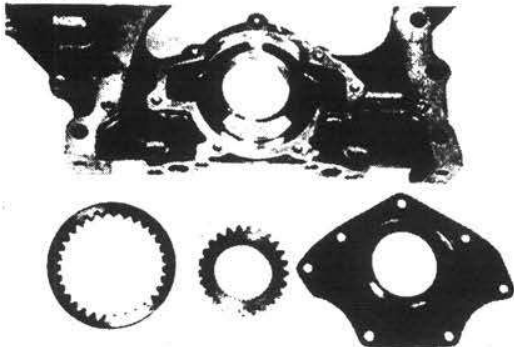


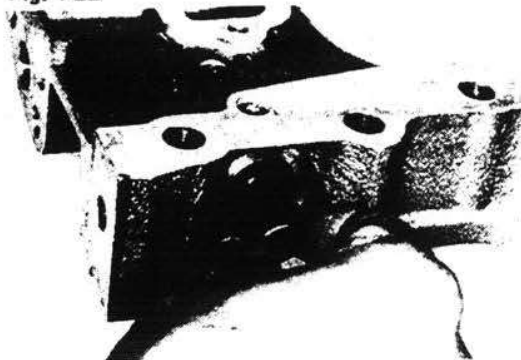
Fig. 4-21



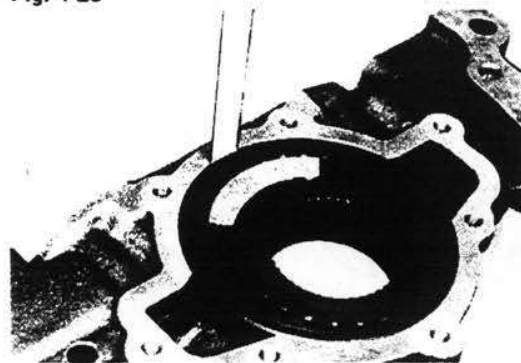
INSPECTION



1. Check disassembled parts for wear or damage.

LUBRICATION SYSTEM – Oil Pump**4–11****Fig. 4-22**

2. Check relief valve for wear or scoring, and see if it sides smoothly.

Fig. 4-23

3. Measure body clearance.

Limit	0.2 mm (0.008 in.)
STD	0.06 – 0.15 mm (0.0024 – 0.0059 in.)

Fig. 4-24

4. Measure tip clearances.

Limit	0.3 mm (0.012 in.)
STD	
Driven gear-crescent	0.15 – 0.21 mm (0.0059 – 0.0083 in.)
Drive gear-crescent	0.22 – 0.25 mm (0.0087 – 0.0098 in.)

Fig. 4-25

5. Measure side clearance.

Limit	0.15 mm (0.0059 in.)
STD	0.03 – 0.09 mm (0.0012 – 0.0034 in.)

4-12 LUBRICATION SYSTEM – Oil Pump

ASSEMBLY

Assemble in numerical order.

Fig. 4-26

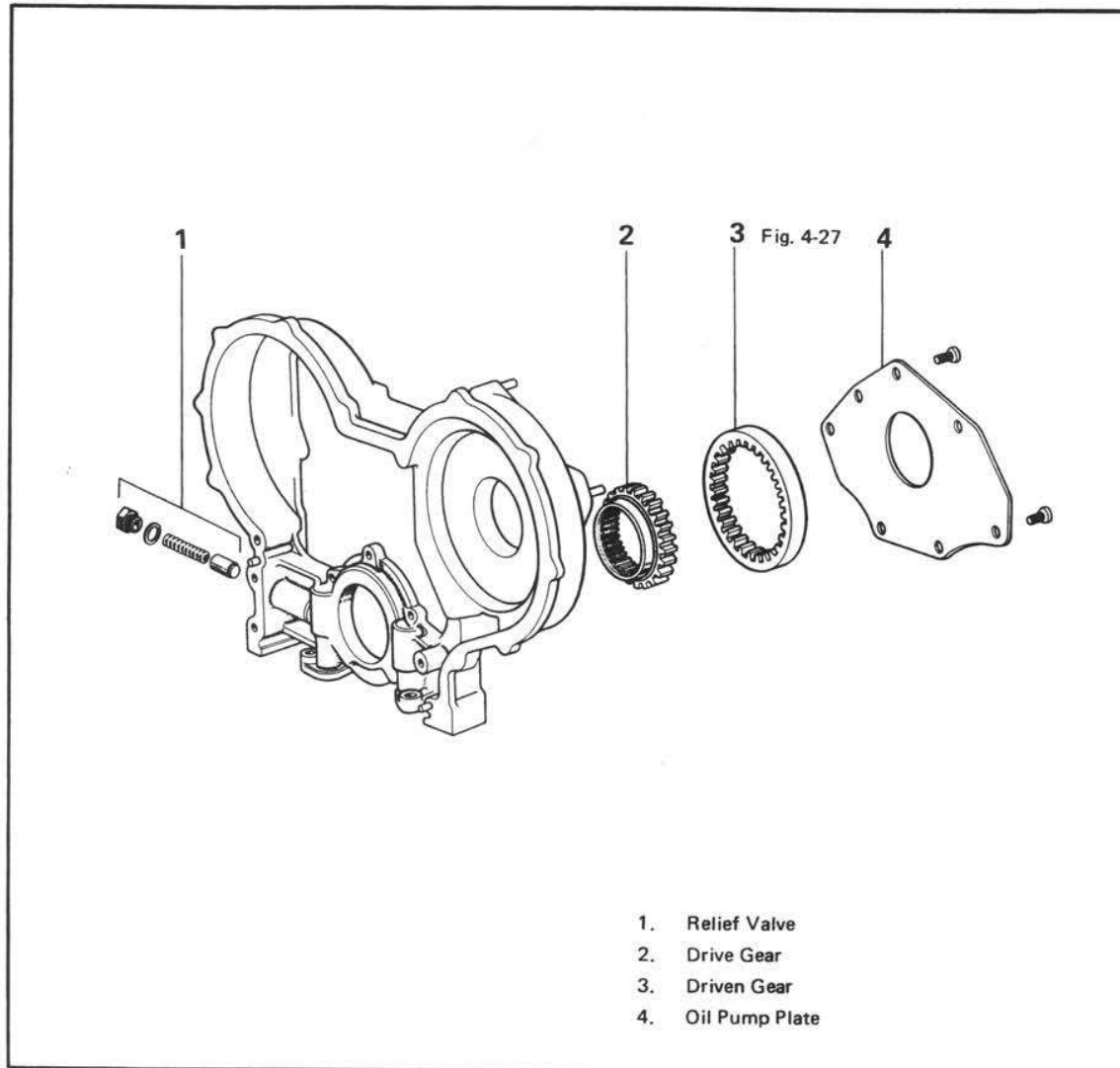
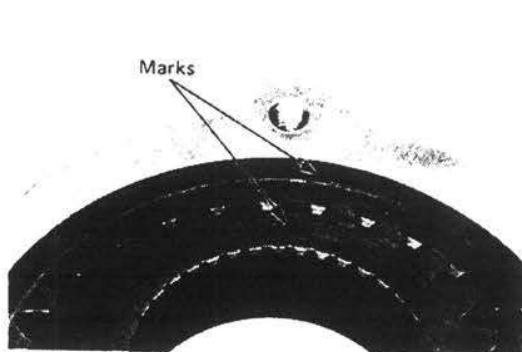


Fig. 4-27



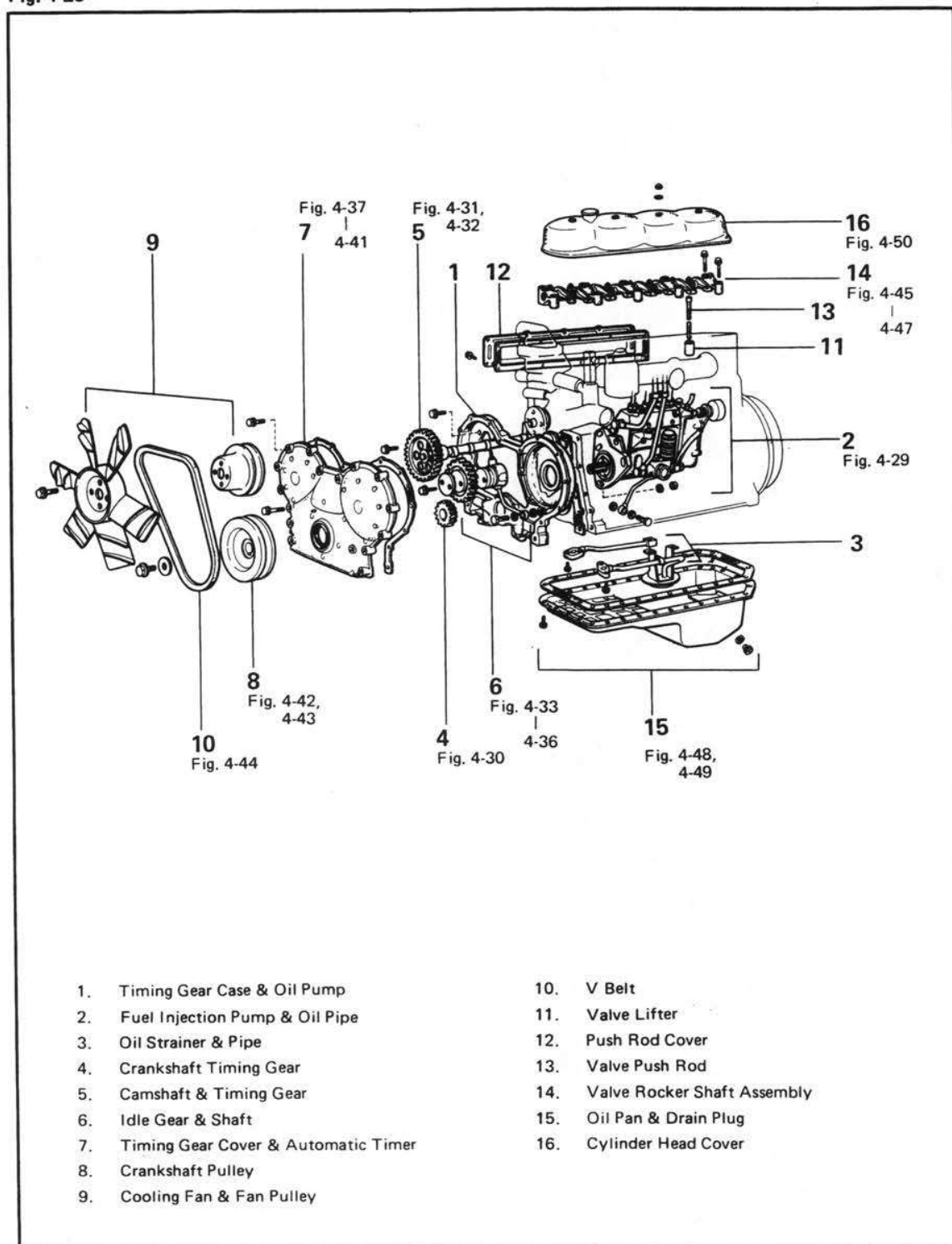
Assemble the drive and driven gears into pump body, with its triangular marks facing the pump plate side.

LUBRICATION SYSTEM – Oil Pump

4-13

INSTALLATION

Install in numerical order.

Fig. 4-28

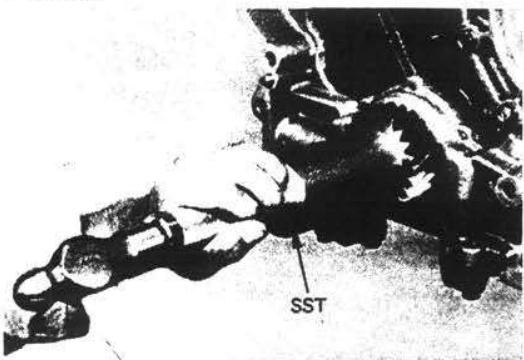
4-14 LUBRICATION SYSTEM – Oil Pump

Fig. 4-29



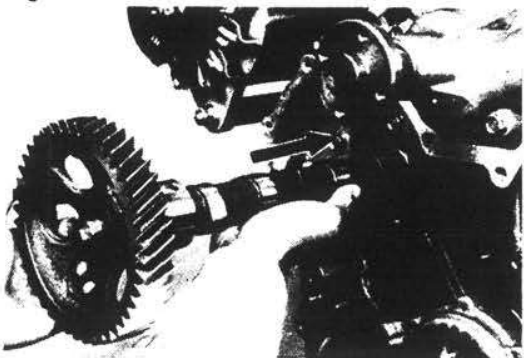
Set the injection period line back to the former position.

Fig. 4-30



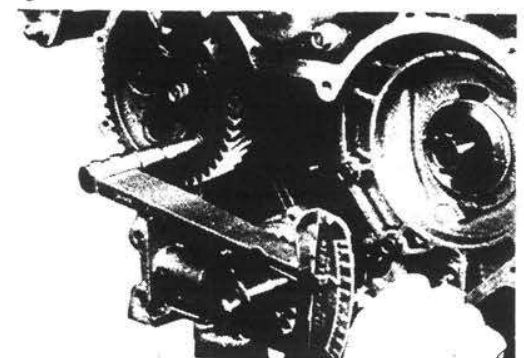
Drive in crankshaft timing gear with SST[09214-60010].

Fig. 4-31



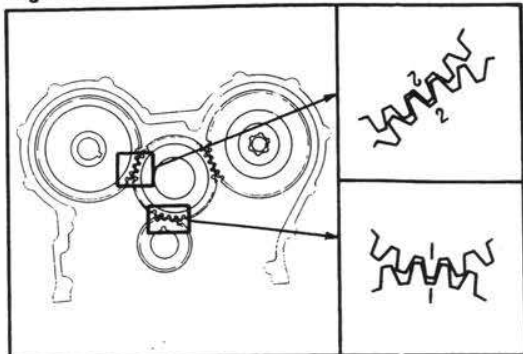
Insert camshaft using care not to damage the camshaft bearings.

Fig. 4-32

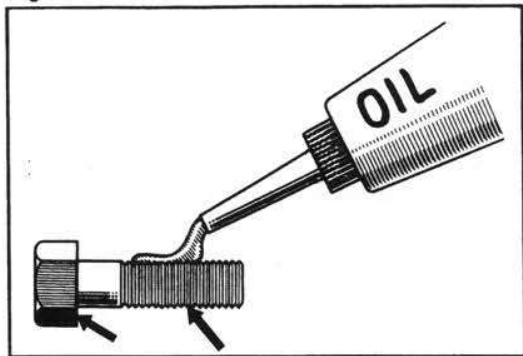


Tighten camshaft thrust plate.

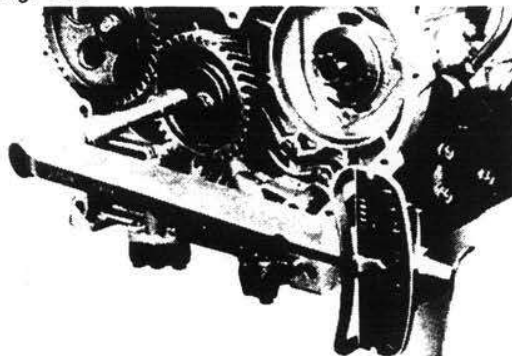
Torque **1.0 – 1.6 kg-m (8 – 11 ft-lb)**

LUBRICATION SYSTEM – Oil Pump**4-15****Fig. 4-33**

Set the idle gear aligning marks "1" and "2" respectively against crankshaft gear mark "1" and camshaft gear mark "2".

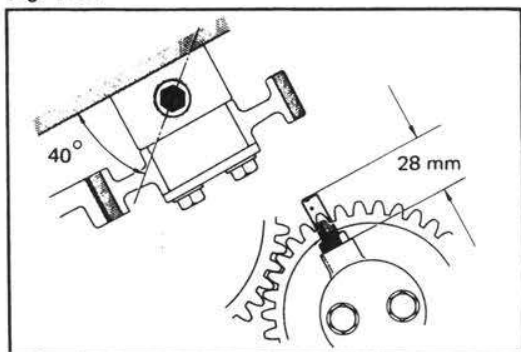
Fig. 4-34

Apply a light coating of engine oil on the bolt threads and under head (Thrust plate contacting surface) before installing the bolts.

Fig. 4-35

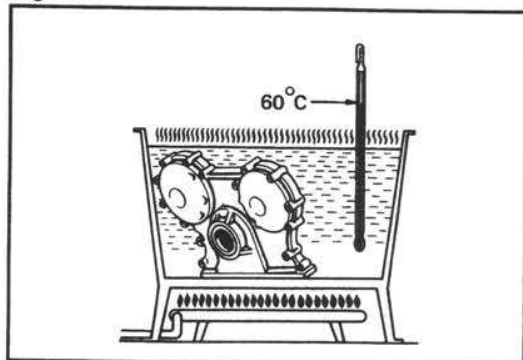
Tighten idle gear and shaft.

Torque **4.0 – 5.5 kg-m (29 – 39 ft-lb)**

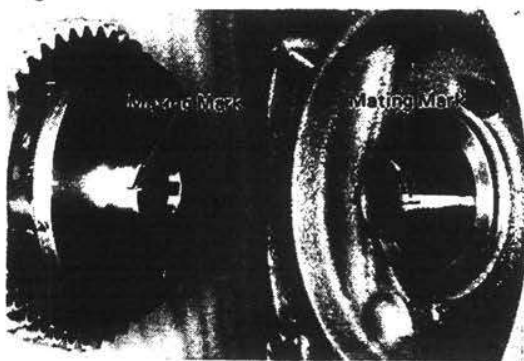
Fig. 4-36

Oil injection hole should face the side where the camshaft and idle gears are engaged.

4-16

LUBRICATION SYSTEM – Oil Pump**Fig. 4-37**

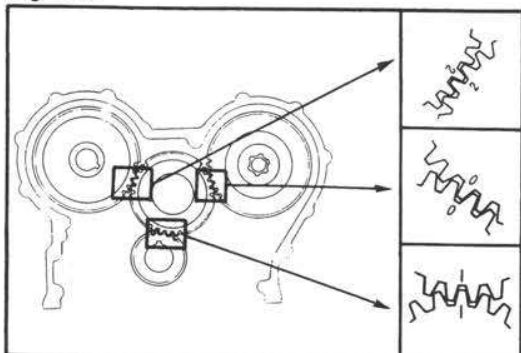
Remove the automatic timer from the timing gear cover after heating the cover to about 60°C (140°F).

Fig. 4-38

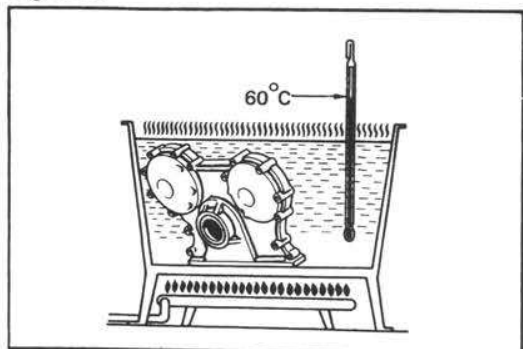
Align the mating marks on injection pump spline shaft and timer drive shaft when installing the automatic timer.

— Note —

Coat the splines and bearing with MP grease.

Fig. 4-39

Align the idle gear mark "O" against the timer drive gear mark "O".

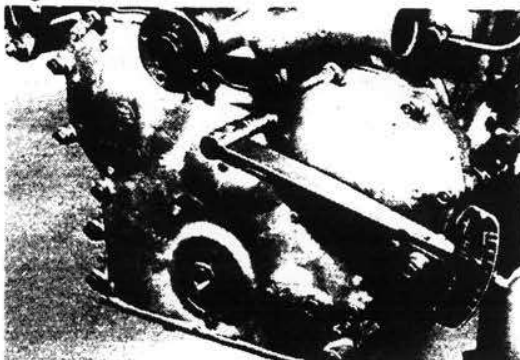
Fig. 4-40

Heat the timing gear cover to about 60°C (140°F) before installing.

LUBRICATION SYSTEM – Oil Pump

4-17

Fig. 4-41



Tighten timing gear cover.

Torque**8 mm bolt** 1.5 – 2.2 kg-m (11 – 15 ft-lb)**10 mm bolt** 3.0 – 4.5 kg-m (22 – 32 ft-lb)

Fig. 4-42



Drive in the crankshaft pulley with SST [09214-60010].

Fig. 4-43

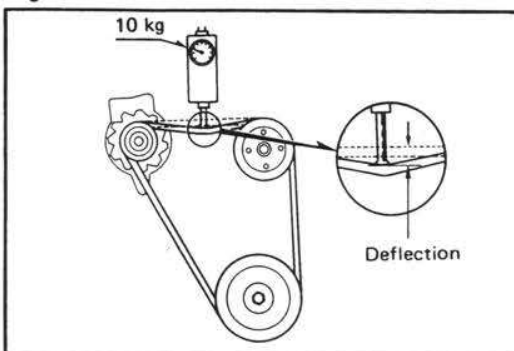


Tighten retaining bolt.

Torque 20.0 – 24.0 kg-m (145 – 173 ft-lb)**– Note –**

Apply a light coating of engine oil on the bolt threads and under head before installing.

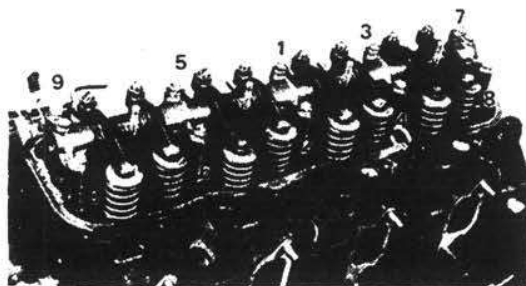
Fig. 4-44



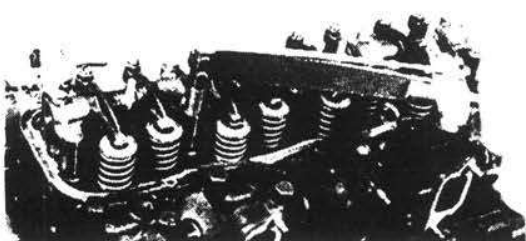
Adjust "V" belt tension.

Deflection at 10 kg (22 lb) force**B engine** 10 – 13 mm (0.4 – 0.5 in.)**2B engine** 8 – 11 mm (0.3 – 0.4 in.)

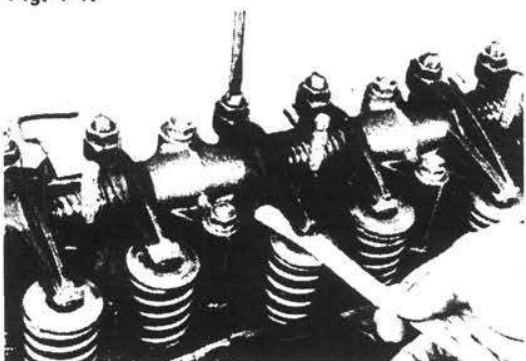
4-18

LUBRICATION SYSTEM – Oil Pump**Fig. 4-45**

Tighten valve rocker support bolts little by little in three or four steps in the specified numerical sequence.

Fig. 4-46

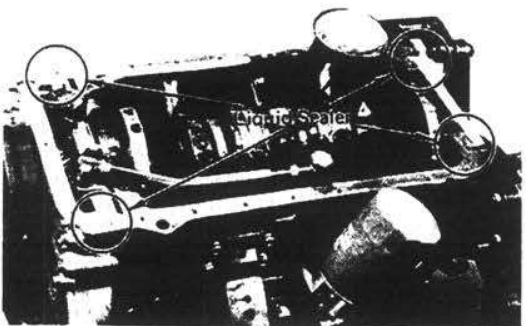
Tighten valve rocker support bolts to specified torque.

Torque**1.0 – 1.6 kg-m (8 – 11 ft-lb)****Fig. 4-47**

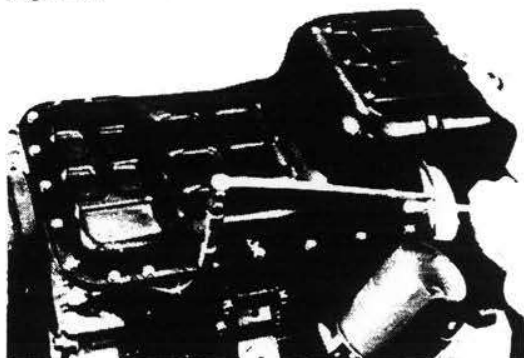
Tentatively, adjust valve clearance.

Valve clearance

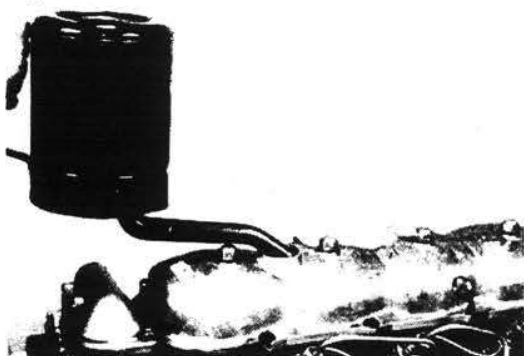
IN.	0.20 mm (0.008 in.)
EX.	0.36 mm (0.014 in.)

Fig. 4-48

Apply liquid sealer to the cylinder block and gear cover.

LUBRICATION SYSTEM – Oil Pump**4–19****Fig. 4-49**

Install the oil pan.

Torque 0.5 – 1.0 kg-m (4 – 7 ft-lb)**Fig. 4-50**

Fill the engine with engine oil.

Oil grade API service CC-CD**Oil capacity (Total)****7.3 liter, 7.7 USqt, 6.4 Imp.qt**

