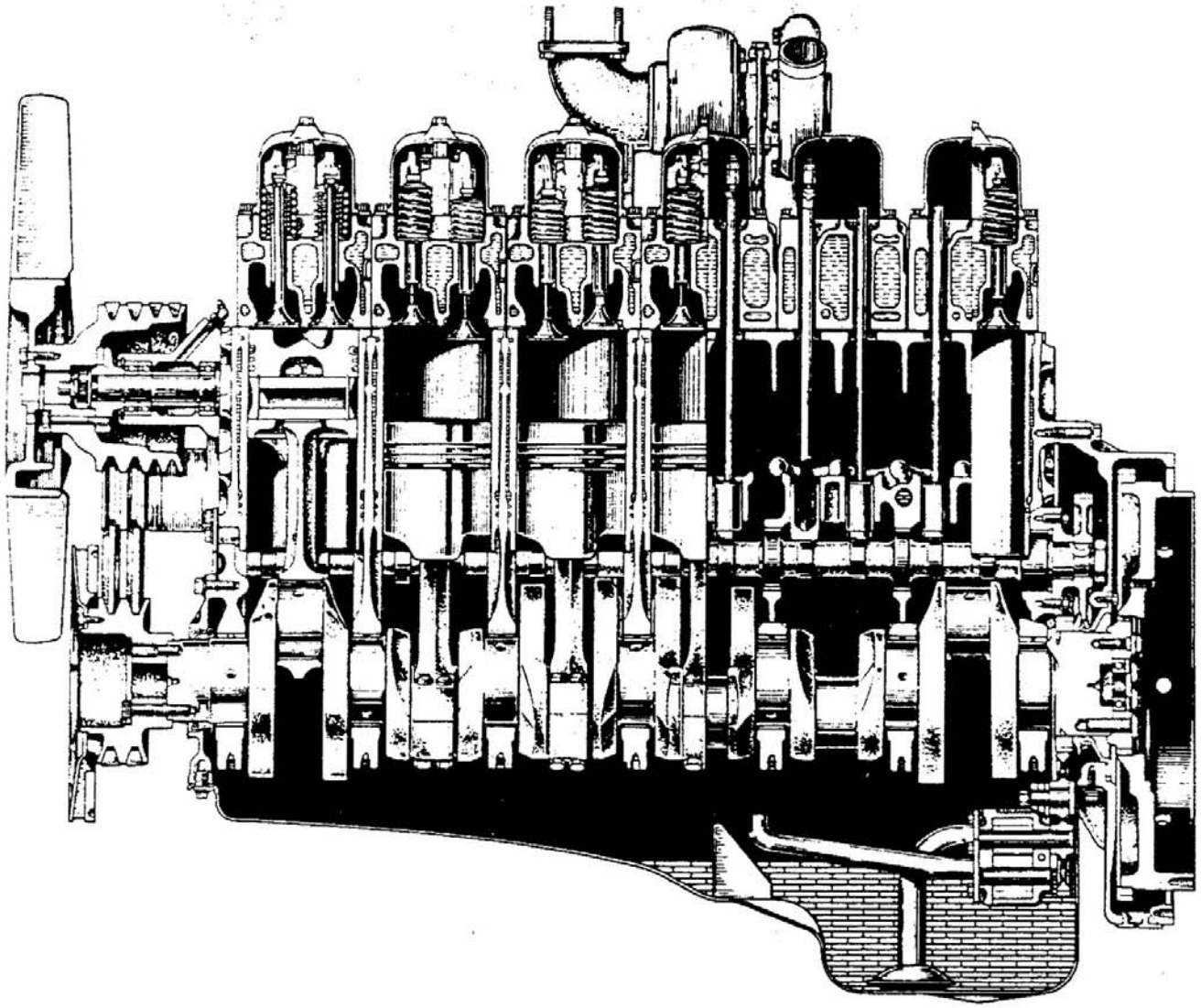
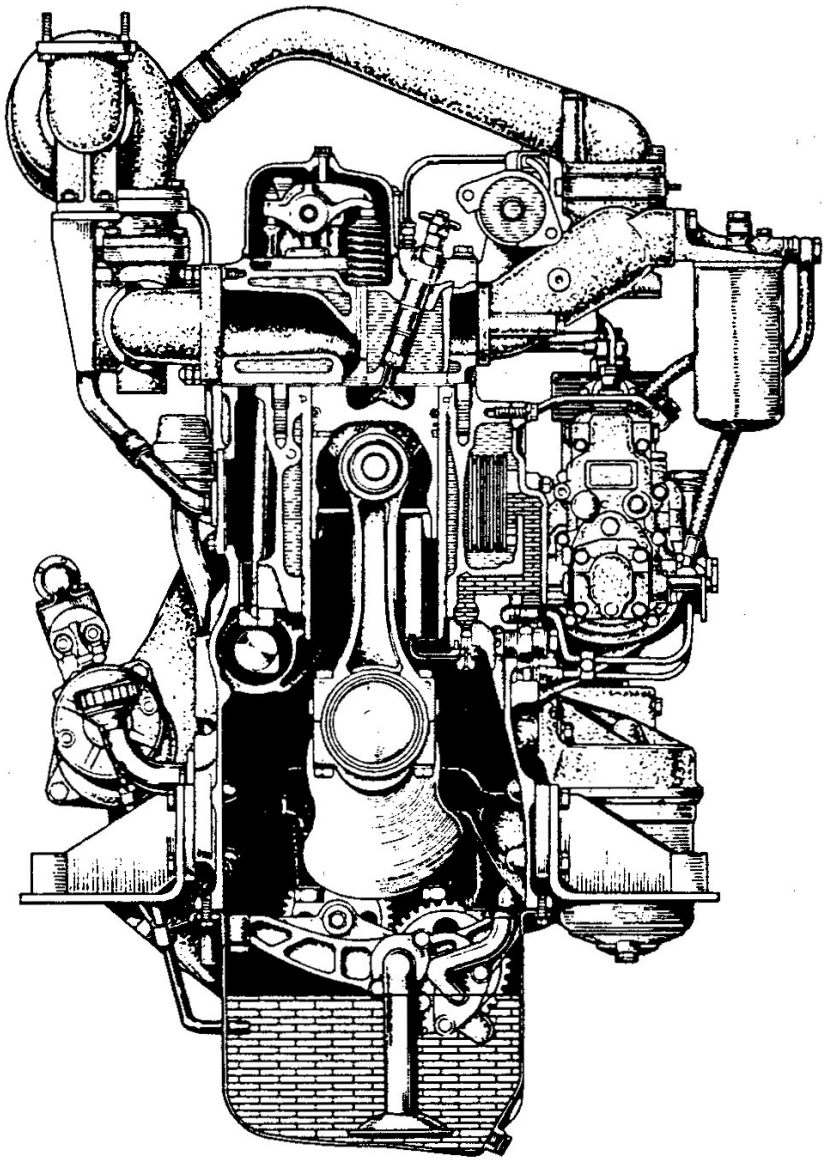
(2) D6AZ



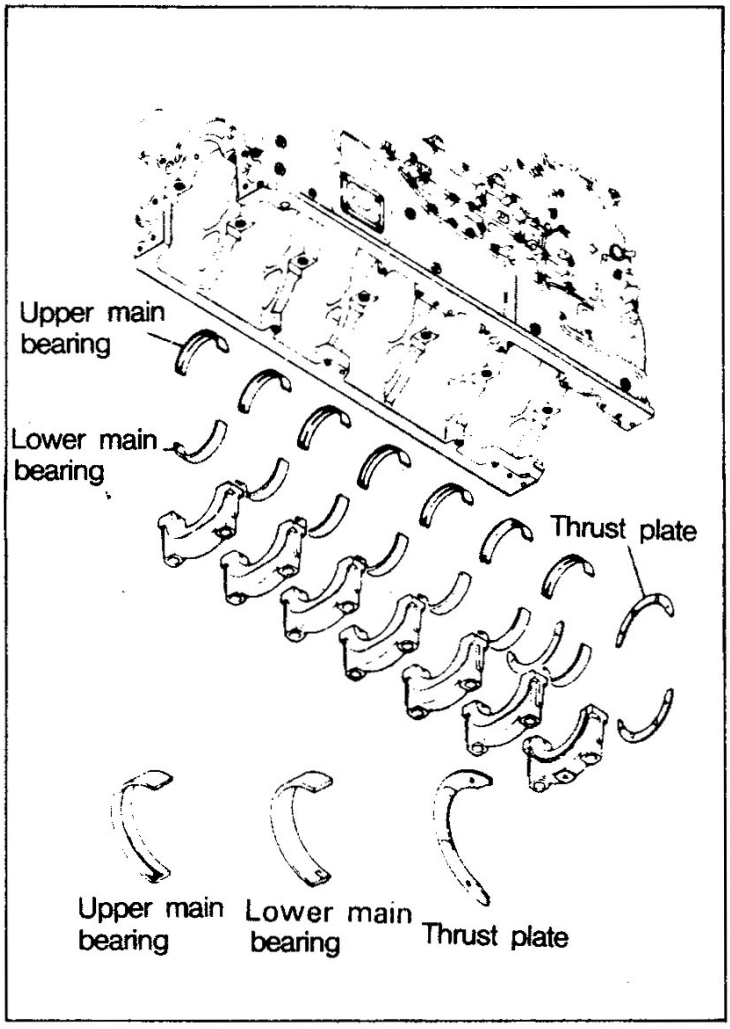


(b) Main bearing

The main bearing is a split type plain bearing consisting of special alloy plating and kelmet metal with backing metal.

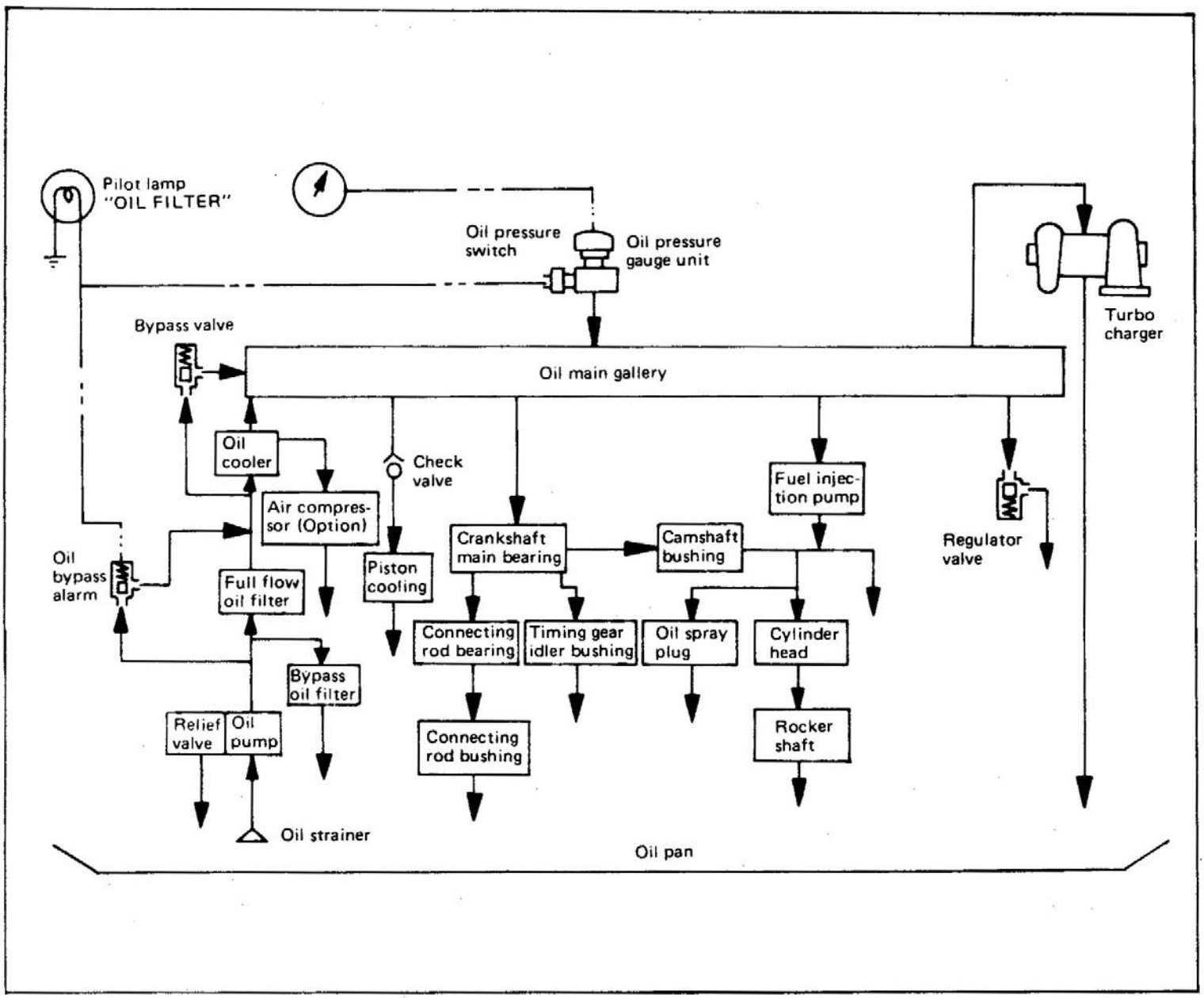
The inside surface of upper main bearing has an oil groove and oil hole which is in alignment with the oil hole in the crankshaft.

Seven pairs of main bearings are provided. Halved thrust plates are mounted at the rearmost bearing cap.



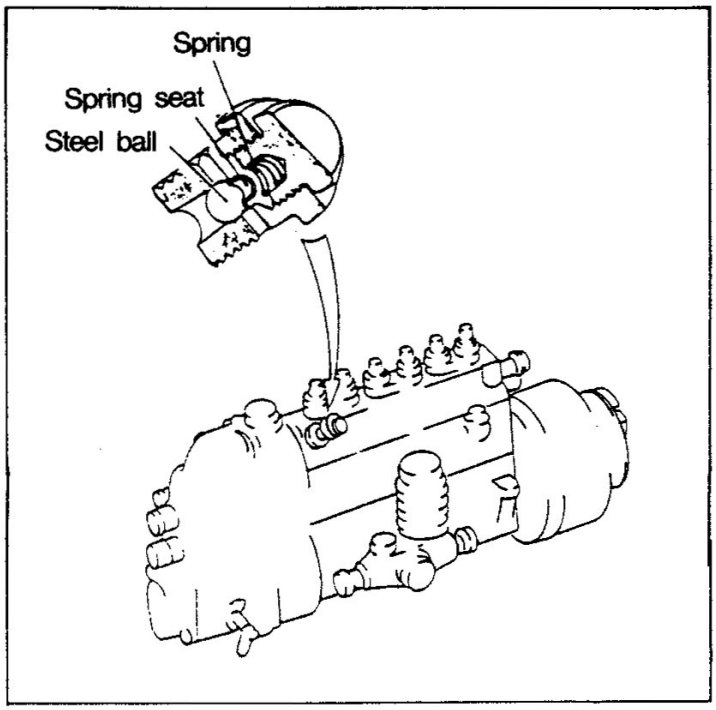
1-3-3 Lubrication

Engine lubrication is accomplished by forced lubrication system using gear pump. The engine oil in the pan is drawn up through the oil strainer by the oil pump and force-fed to the oil filter and oil cooler to lubricate all parts.



(e) Overflow valve

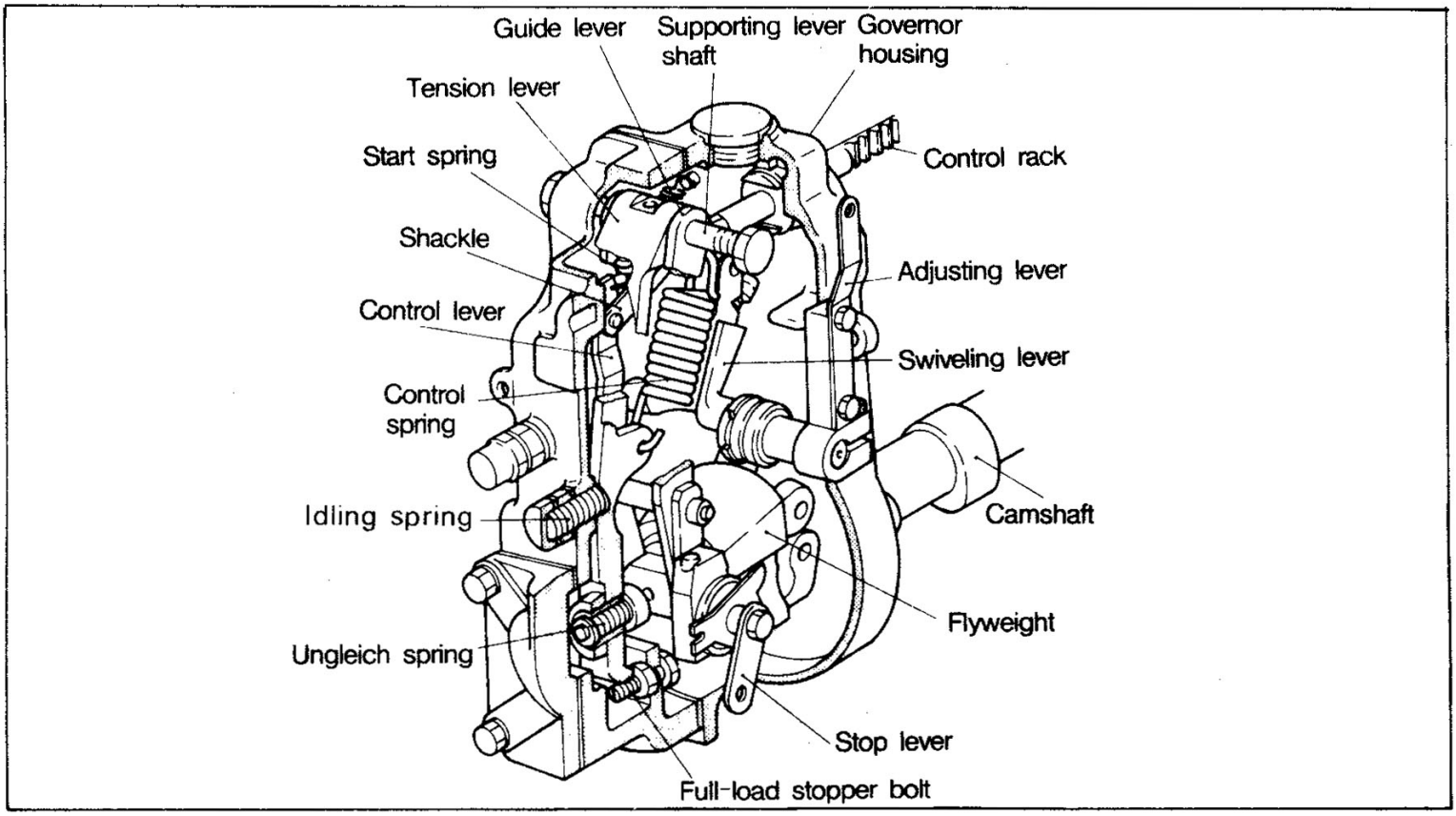
When the fuel pressure in the injection pump exceeds a predetermined pressure, the steel ball in the overflow valve is pushed up to let the fuel flow out from the injection pump and return to the fuel tank, thereby stabilizing the fuel temperature and temperature distribution in the injection pump and maintaining the injection rate into each cylinder constant.



(2) Governor

(a) RSV type governor

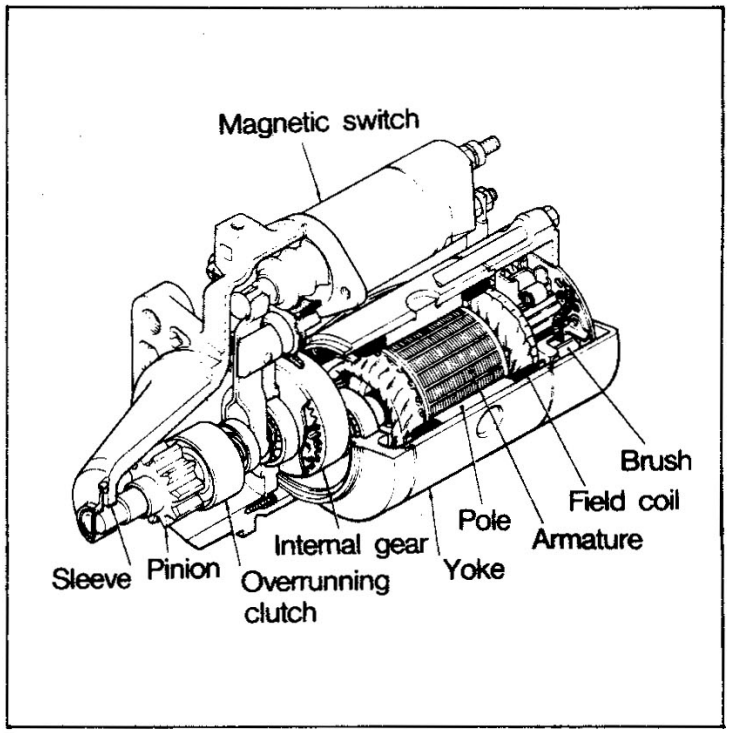
The RSV type governor is a centrifugal type all-speed governor coupled to the cam shaft of the injection pump. The governor not only controls the maximum and minimum speeds but also automatically controls the engine speed at any intermediate speed position.



(1) Starter

The starter is a reduction type starter containing a smaller-size and higher-speed motor and a reduction gear mechanism.

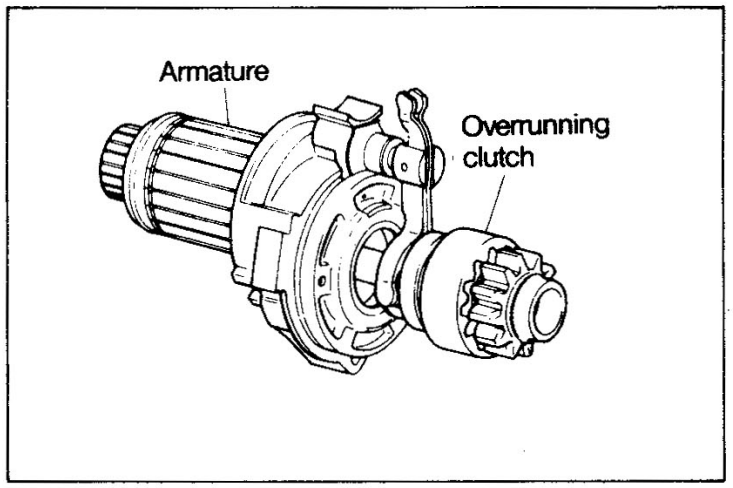
The starter may be broadly divided into the motor section which generates power, the overrunning clutch section which transmits the torque of the armature and prevents the starter from overrunning after the engine has started, the magnetic switch section which makes the pinion fit the ring gear and feeds the load current to the motor, and the reduction gear section which reduces the rotating speed of the armature and transmits the torque to the pinion.



(a) Reduction gear section

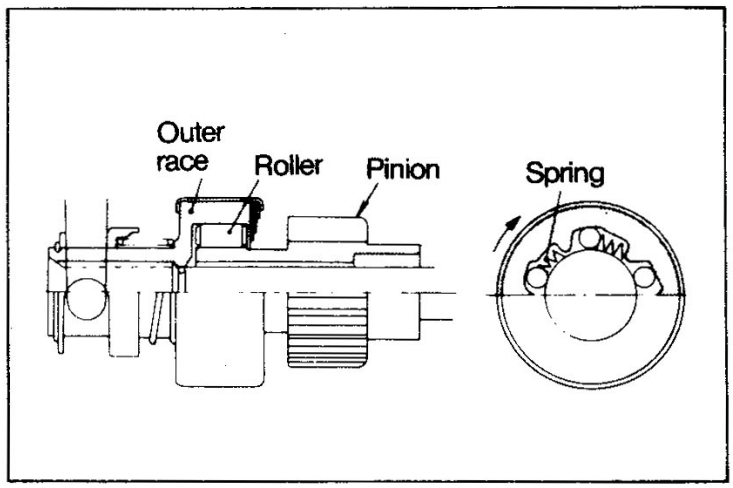
The end of the armature is shaped as a gear and is in mesh with the internal gears.

After reduction by the internal gears, the torque is multiplied several times and is transmitted to the pinion.



(b) Overrunning clutch

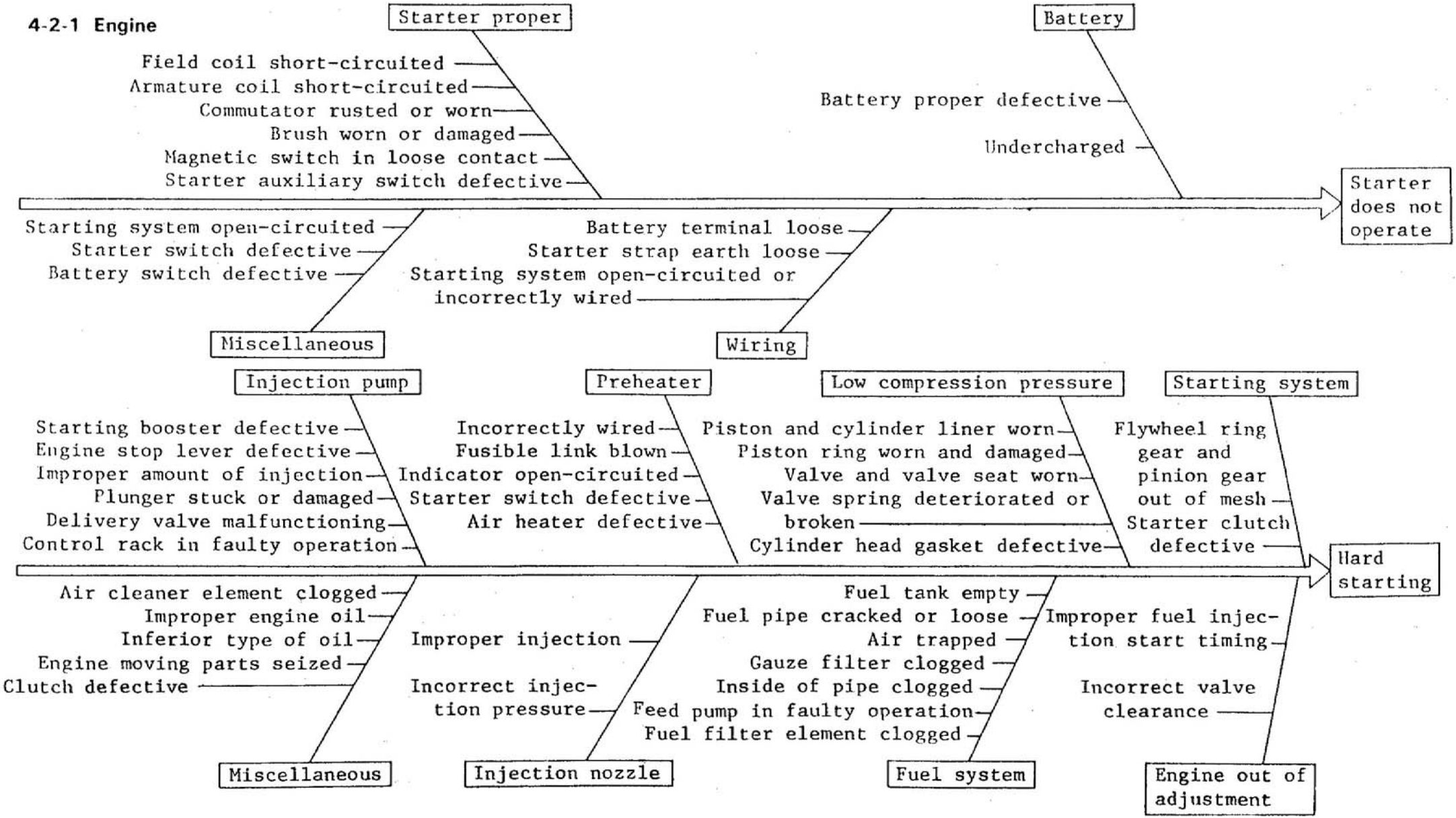
The overrunning clutch is a roller type. Each roller is set in the wedge-like groove provided between the outer and inner races(pinion) and is pressed against the narrower side of the groove by spring.



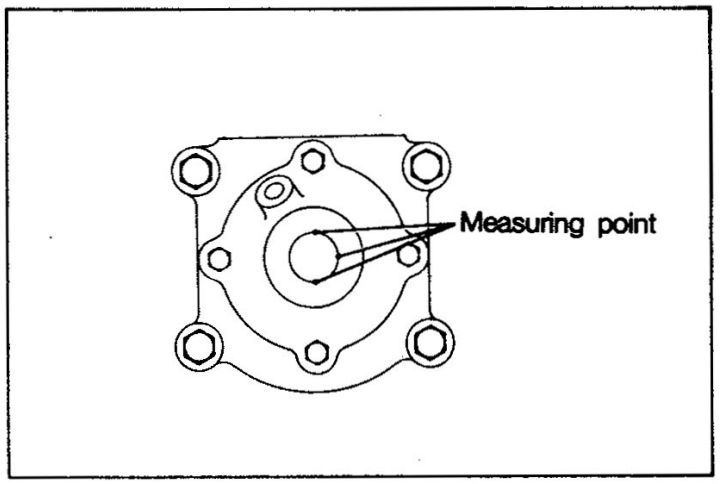
4-2 TROUBLESHOOTING

The symptoms and causes shown in this paragraph are typical examples. In actual operations, locate the causes according to the symptoms.

4-2-1 Engine



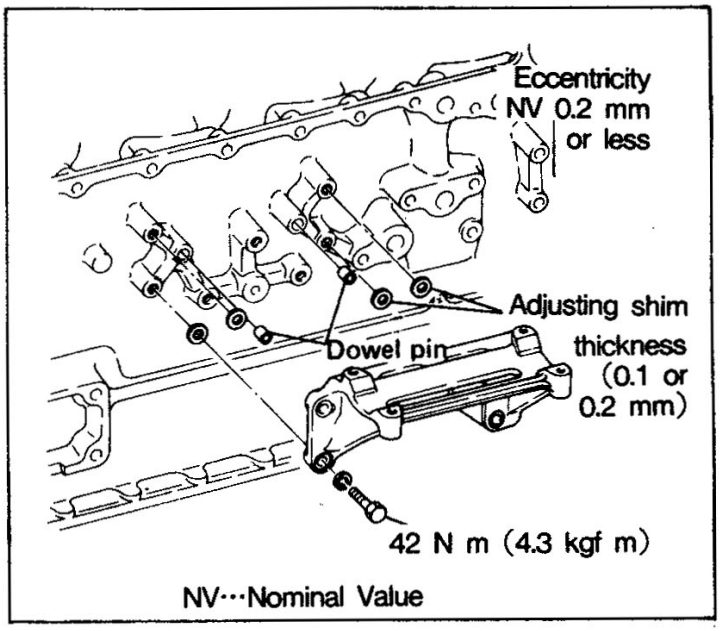
2) Slide the dial indicator of the centering tool toward the injection pump drive and measure the positions of the injection pump drive shaft shown in the illustration with the dial indicator.



3) If the eccentricity between the mandrel and injection pump drive shaft is in excess of the nominal dimension, adjust by adding or removing injection pump bracket shims.

Shim Inserting Condition

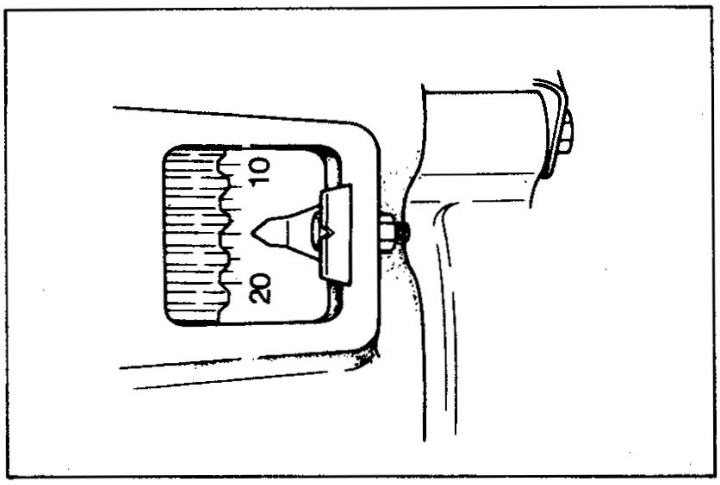
- The number of shims inserted into a single point must not exceed three.
- The front and rear shims must be equal in number.
- The difference in number between the top and bottom shims must not exceed one.



4) After adjustment, tighten the tightening bolts to the specified torque before confirmation.

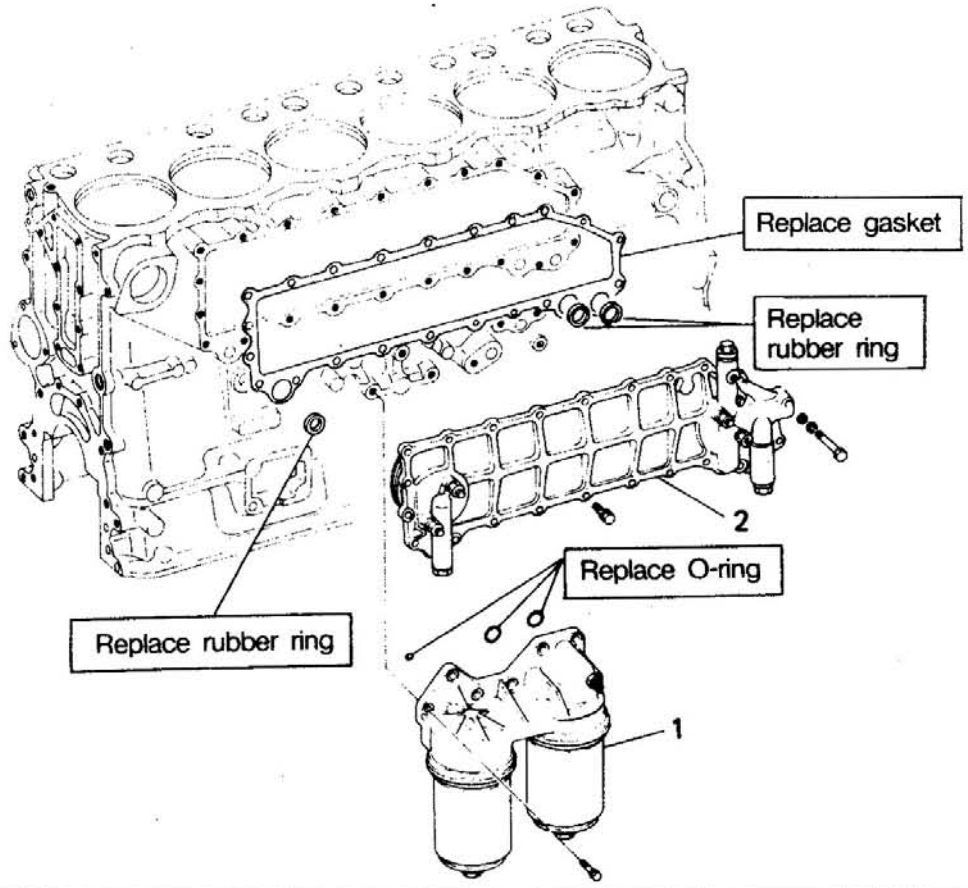
(b) Installation of injection pump

1) Crank the engine to adjust the No. 1 cylinder to the fuel injection timing. For this purpose, align the angle scale inscribed on the outer periphery of the flywheel with the pointer of the inspection window of the flywheel housing.



6-2-6 Lubrication

(1) Oil Filter and Oil Cooler



1 Oil filter
2 Oil cooler

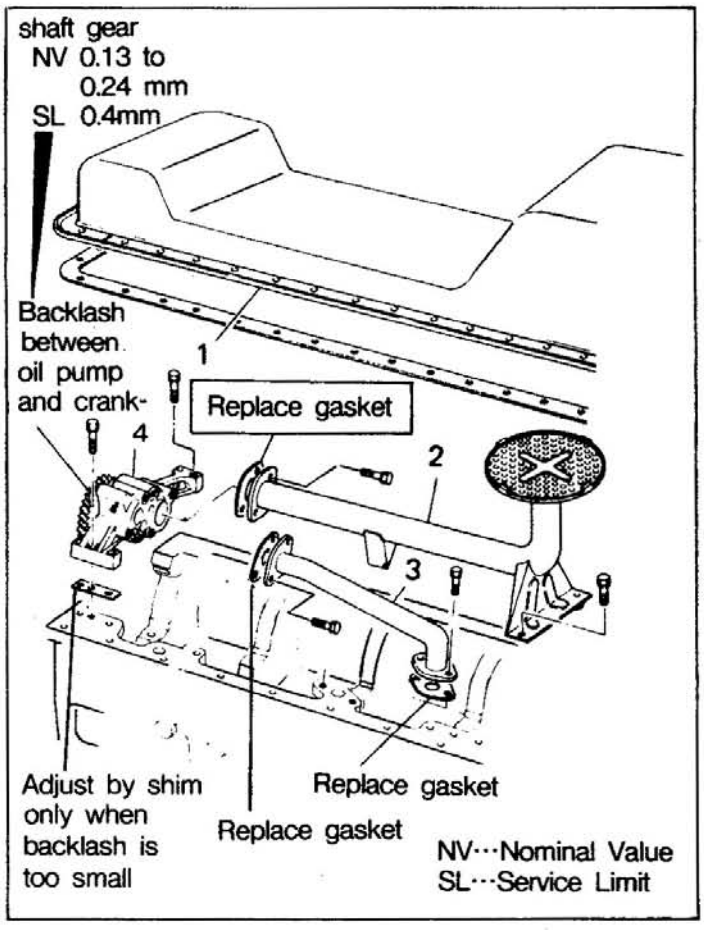
(2) Oil Pump and Oil Strainer

1 Oil pan
2 Oil strainer
3 Oil pipe
4 Oil pump

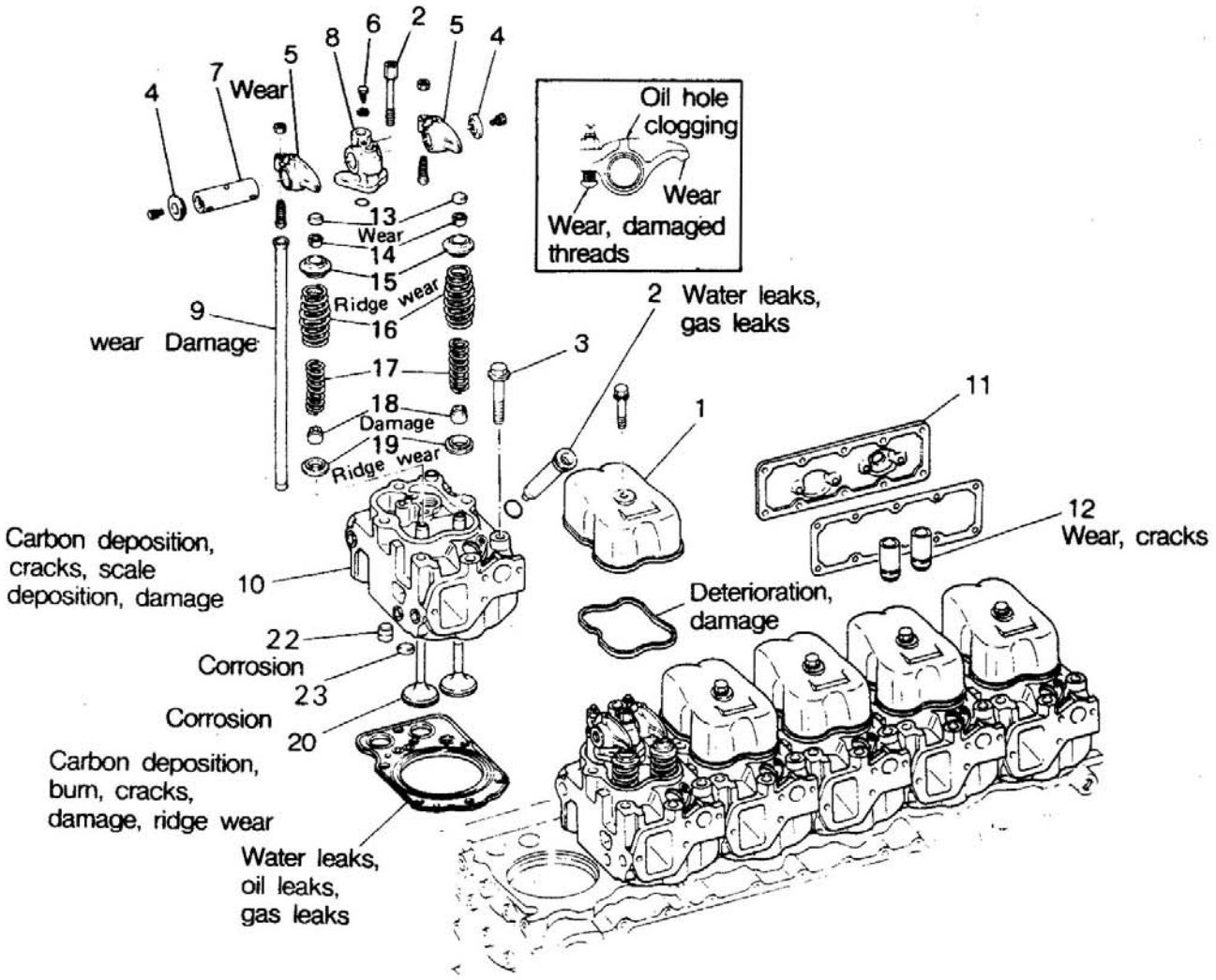
NOTE : 1. Before the oil pump is removed, measure the backlash.

2. The oil strainer and oil pipe should be removed as assembled with the oil pump, unless abnormal condition is evident.

3. After the oil pump has been installed, measure the backlash to confirm that the backlash is with in the nominal values.

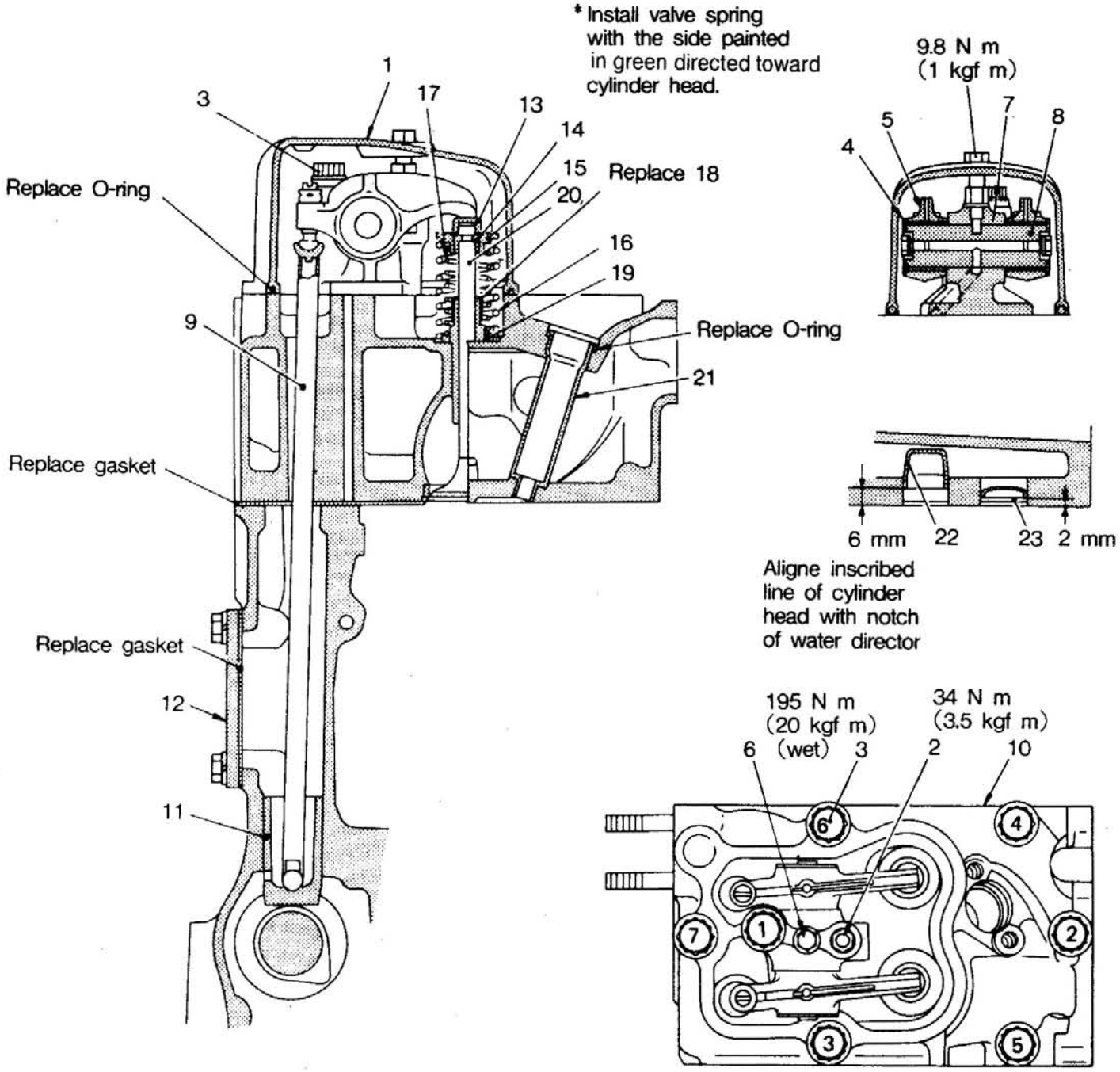


7-1-1 Cylinder Head and Valve Mechanism



1 Rocker cover
2 Rocker bracket mounting bolt
3 Cylinder head bolt
4 Thrust plate
5 Rocker
6 Set screw
7 Rocker shaft
8 Rocker shaft bracket
9 Push rod
10 Cylinder head
11 Crankcase side cover
12 Tappet
13 Valve cap
14 Valve cotter
15 Upper retainer
16 Outer valve spring
17 Inner valve spring
18 Valve stem seal
19 Lower retainer
20 Valve
21 Nozzle tube
22 Water director
23 Sealing cap

7-3-3 Cylinder Head and Valve Mechanism

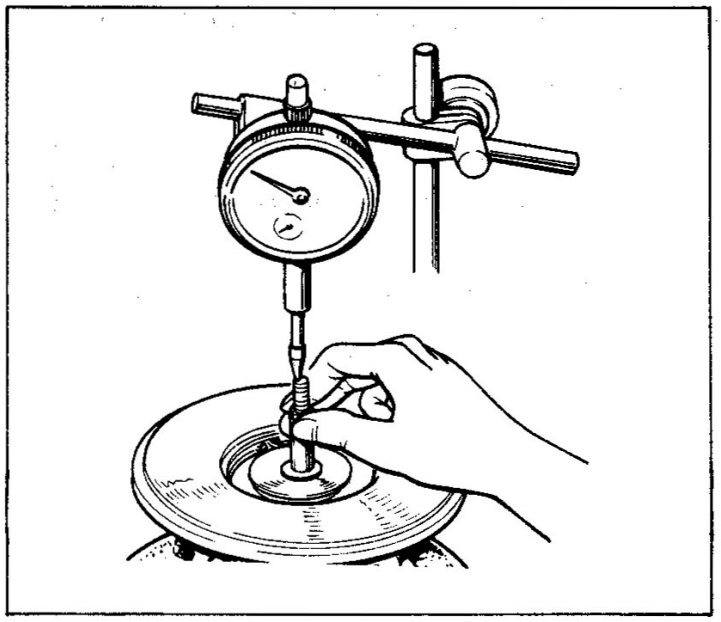


Assembling sequence

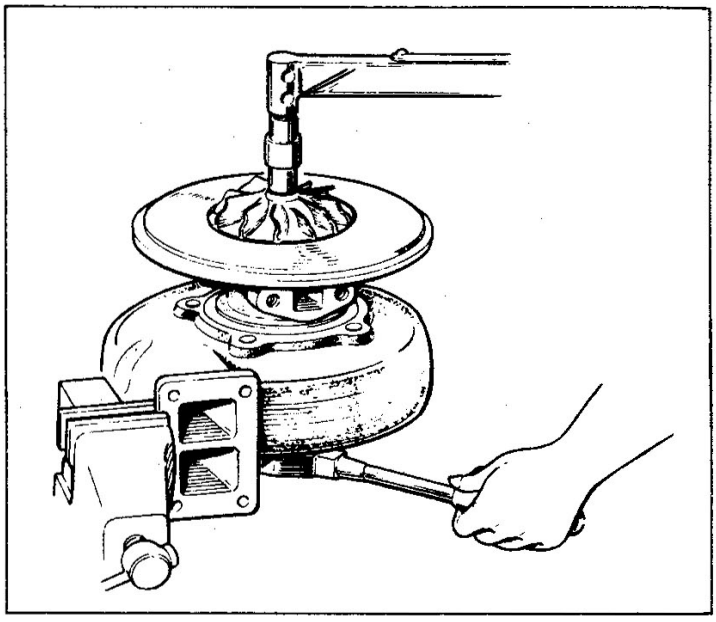
23→22→21→20→18→19→17→16→16→14→13→
12→11→10→9→8→7→6→5→4→3→2→1

(7) Set a dial indicator on the end of the turbine wheel shaft.

Move the turbine wheel shaft up and down to measure the clearance between the turbine wheel and turbine housing. If the clearance is out of specification, disassemble and check to locate the cause.

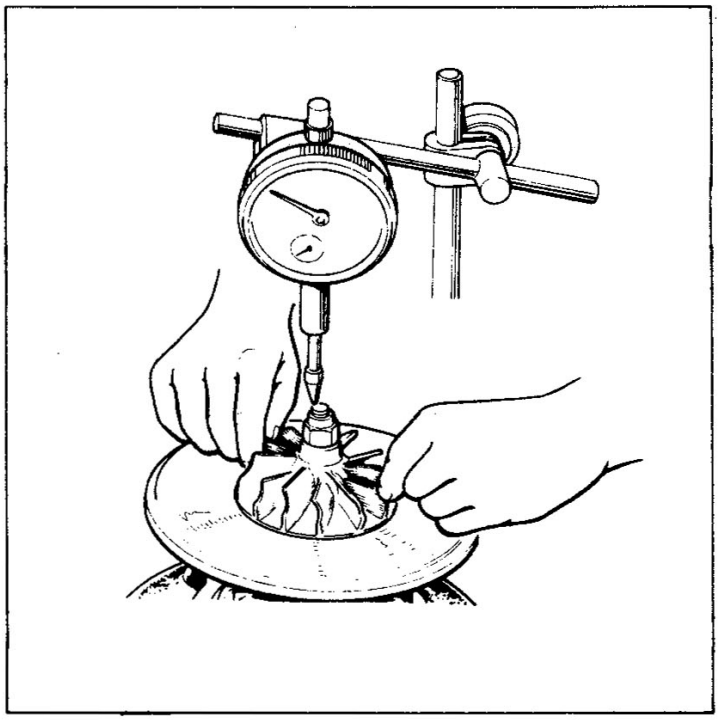


(8) Install the compressor wheel 3 on the turbine wheel shaft and tighten the lock nut to the specified torque.



(9) Set a dial indicator on the turbine wheel shaft end. Move the compressor wheel up and down to measure the end play.

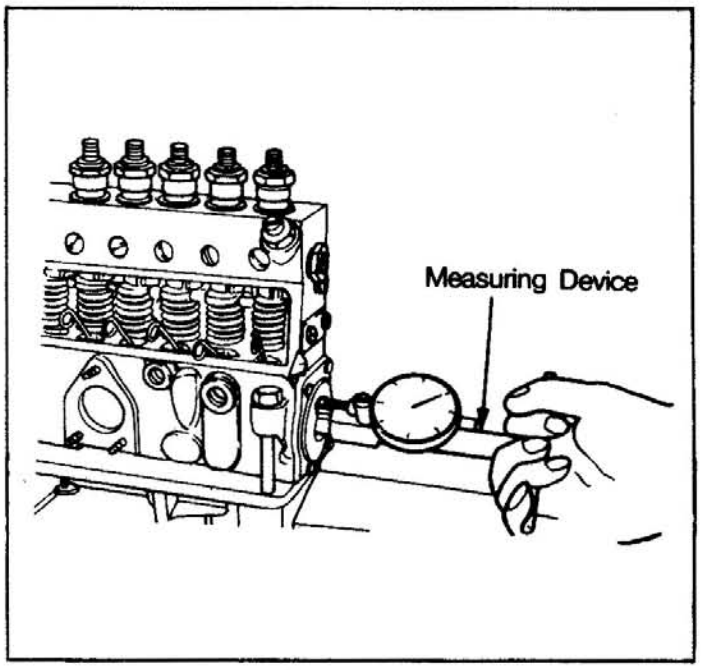
If the play is out of specification, desassemble and check to locate the cause.



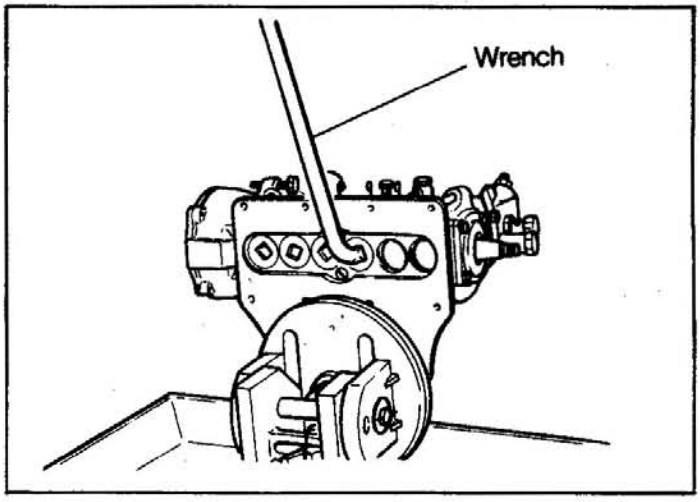
(g) Measure the end play of the camshaft with special tool(Measuring Device). If the end play is in excess of the repair limit, adjust by using shims or replace the bearing.

Shim thickness	0.10, 0.12, 0.14, 0.16, 0.18, 0.30 0.50, 1.00mm

NOTE : Select timer and governor side shims so that their thicknesses will be about equal.



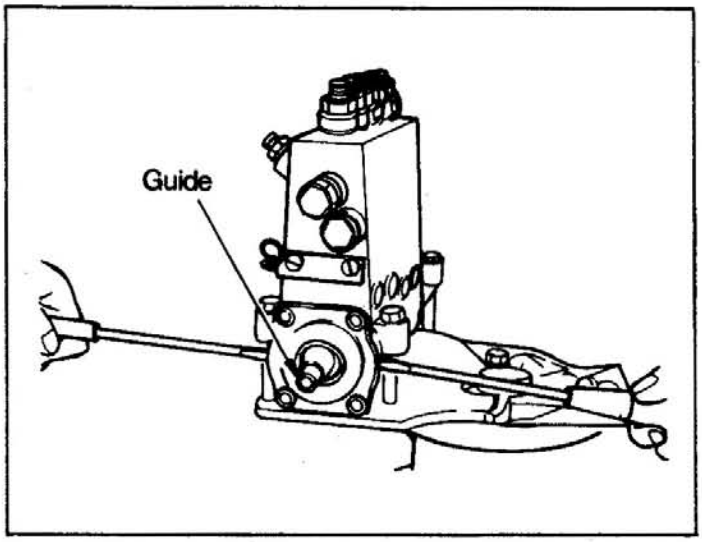
(h) Remove the screws 2 at the bottom of the injection pump with special tool (Wrench).



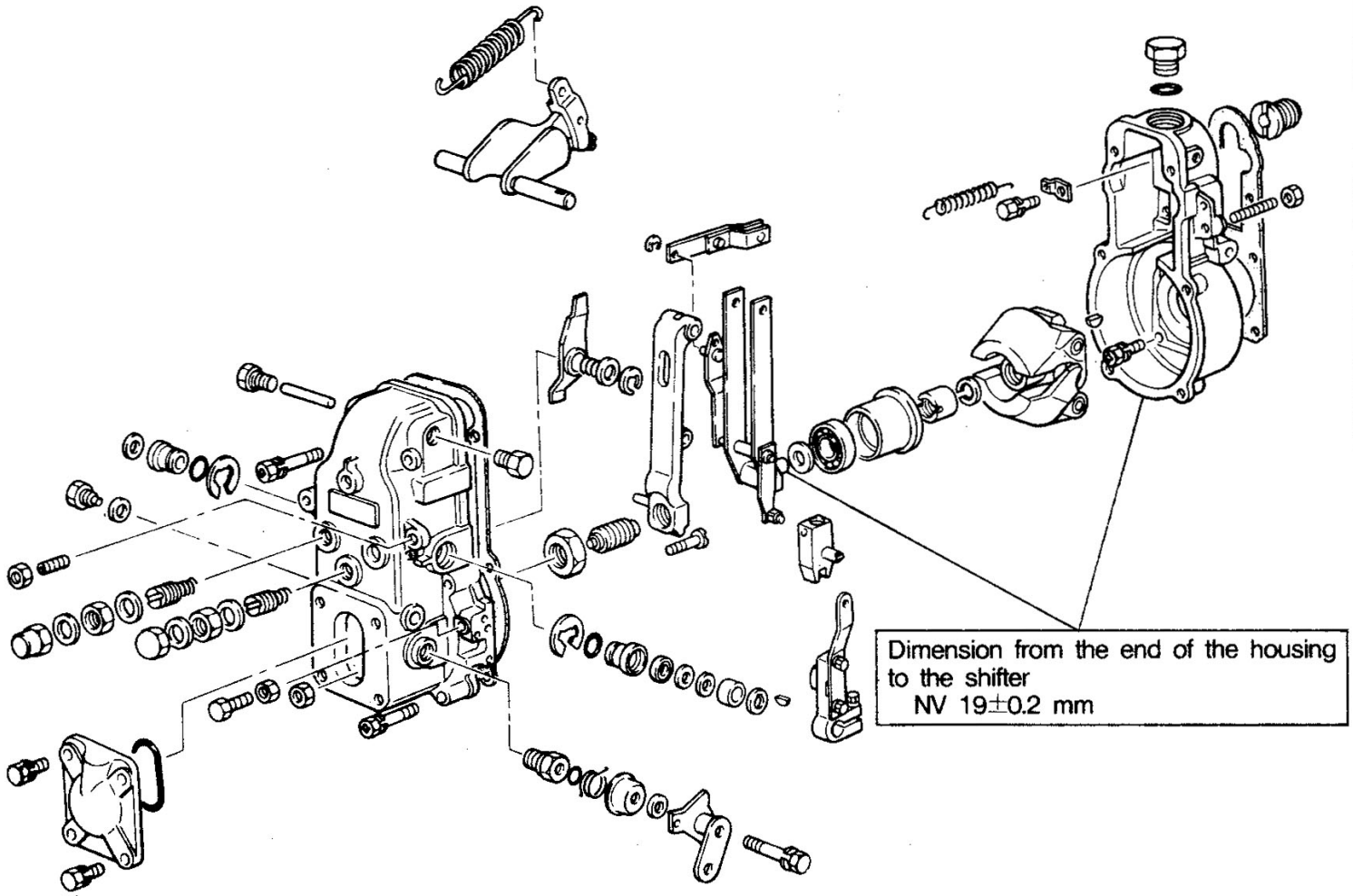
(i) Insert a screwdriver into the groove in the bearing cover to remove the bearing cover 4 and oil seal 5.

NOTE : 1. To prevent damaging the oil seal, remove the woodruff key from the camshaft and put special tool (Guide) on the threaded portion.

2. To remove the camshaft, direct the first cam lobe on the removal side of camshaft toward the top of the pump to prevent the camshaft lobe from touching the tappets, and then lightly strike.



(2) Inspection and Correction

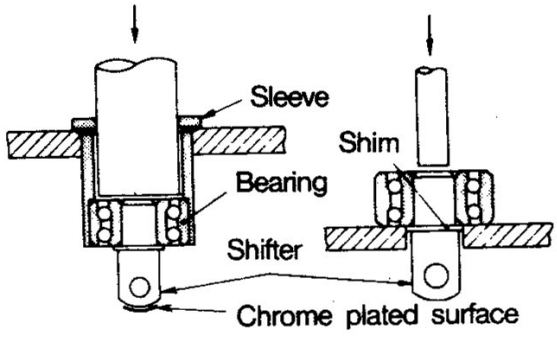


NV···Nominal Value

Replacement of sleeve or guide lever assembly

(a) Remove the bearing from inside the shifter, using a press.

(b) Using a press, remove the shifter of the guide lever assembly from the bearing.

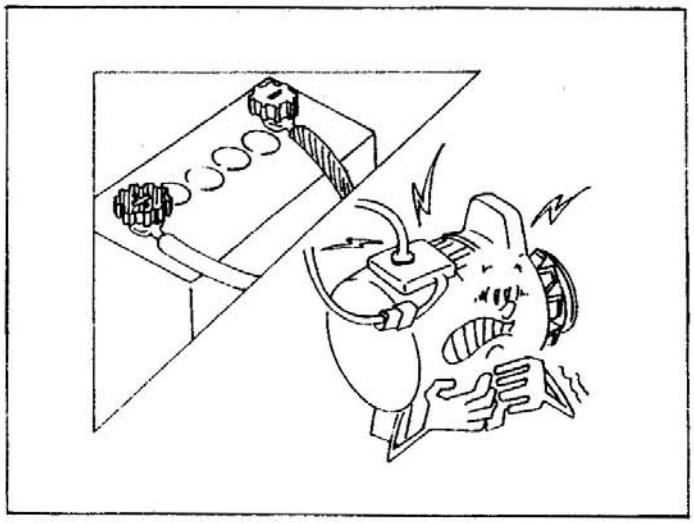


12-3 ALTERNATOR

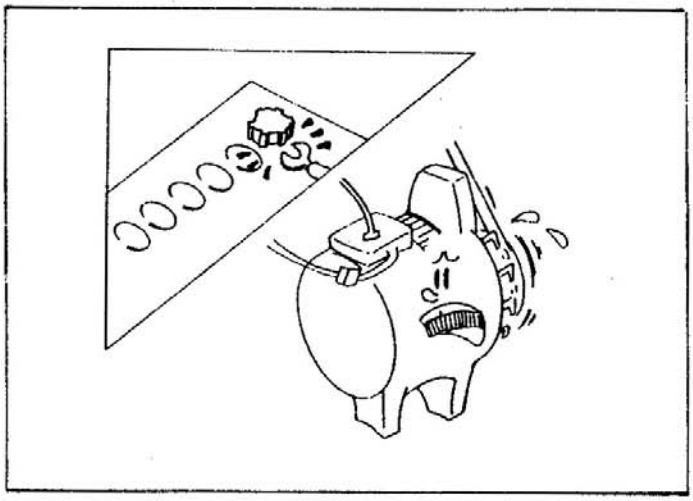
12-3-1 Alternator Handling Precautions

When servicing the alternator, pay attention to the following.

(1) If the polarity of the battery is reversed when connections are made, large current will flow from the battery to the alternator, causing damage to the diode and the IC regulator.



(2) Do not disconnect the battery terminal connections while the engine is running. Otherwise, a sure voltage will be generated, causing deterioration of the diode and the regulator.



(3) Do not use a high voltage tester such as megger to test the alternator as it could cause damage to the diode and the regulator.