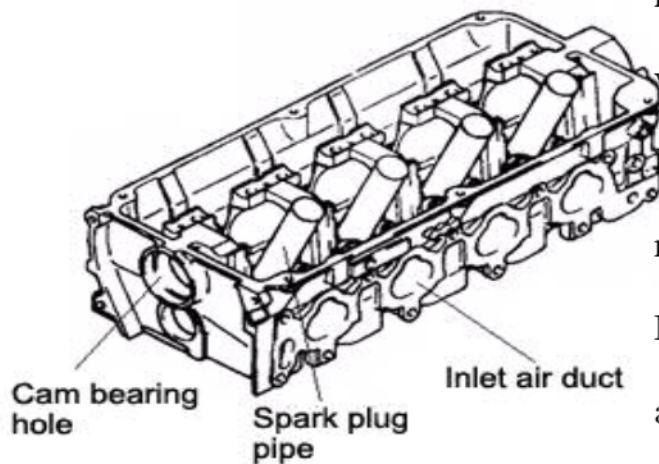


Chapter 2 Engine Structure Features

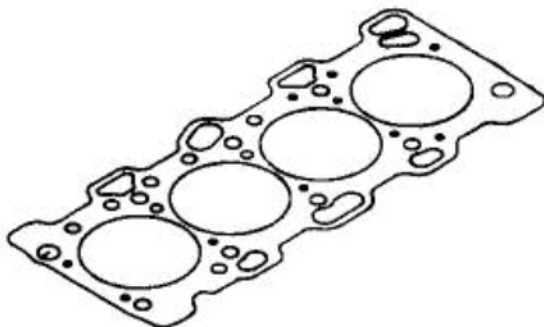
1.Cylinder Cover Structure Features



Cylinder cover is made of horniness aluminium alloy, which is firstly low-pressure-molten and then machining.

Four-valve structure is applied and its advantage is increasing emission channel area and decreasing valve movement inertia.

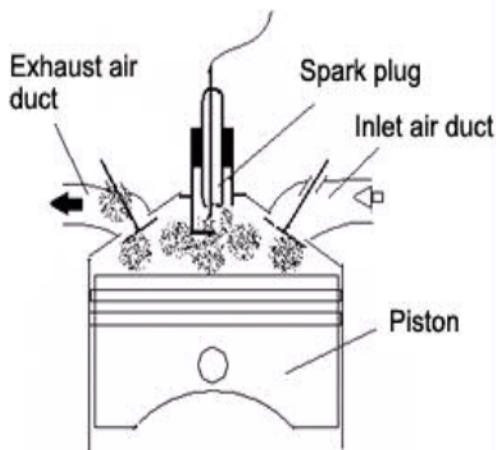
2.Cylinder Cushion Structure



Agile fiberboard structure is applied. Many

1.5mm-diameter through holes are pressed in the steel board and fiber liquid mixture is filtered through steel board. And then sealant is sprayed on both sides of agile broad and the important part is additionally sprayed

3.Spark Plug Position

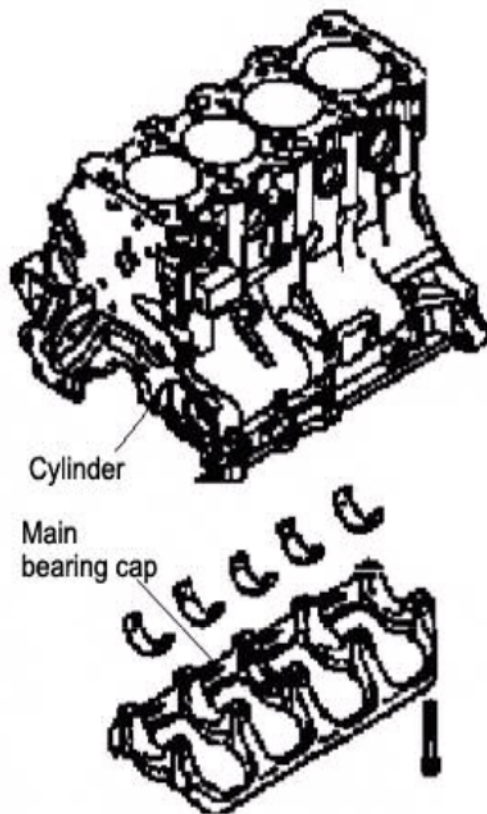




with seal thread.

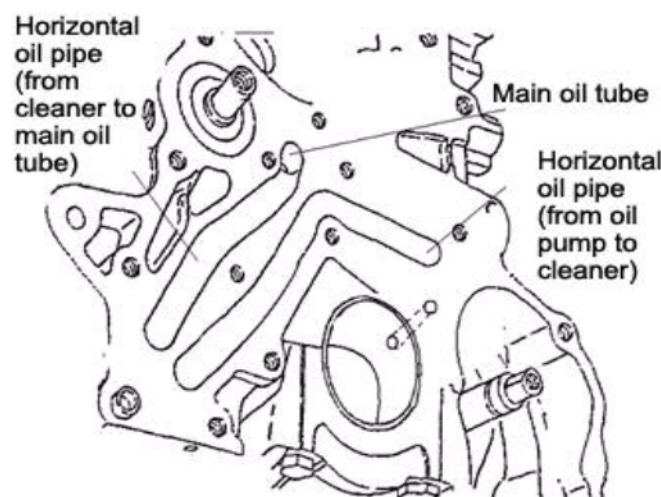
Spark plug is located in the center of chamber, which may let flame reach each chamber corner at almost the same time.

4.Cylinder Main Bearing Cap



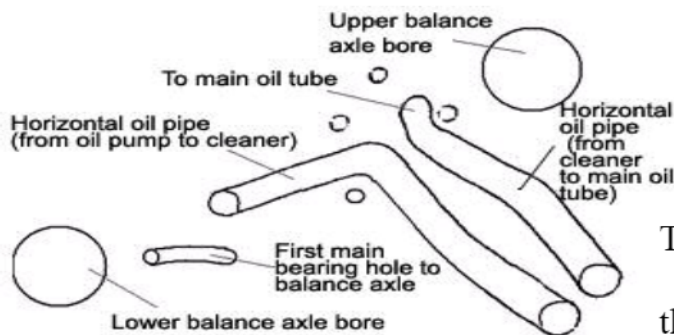
Integrated main bearing cap is applied, which may increase engine operation rigidity, observe and distribute efficiently periodic viable force generated by crank running, and ensure engine stable and smooth running at high speed, large load or large torque.

5.Oil Tube Features

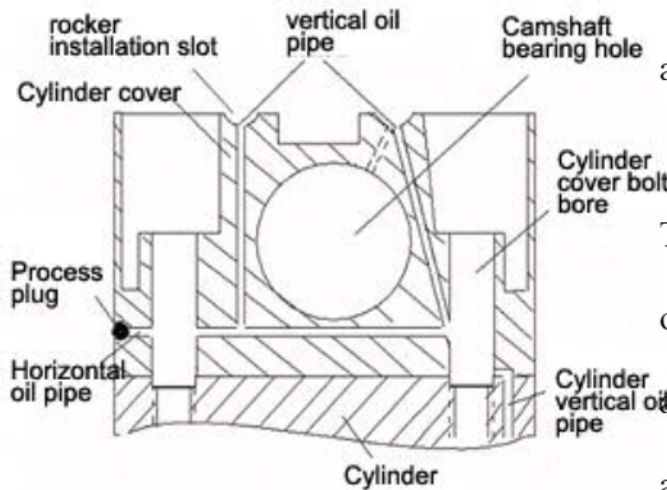


1、Modular oil pipe is applied.

(The whole oil pipe consists of the half oil pipe cast on cylinder body and the other half on front end cover)



There is a vertical oil pipe in the rear end of cylinder cover, which provides lubricant to air distribution mechanism.

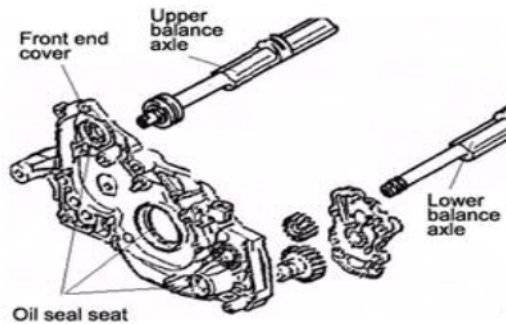


The front end cover is made of molten horniness aluminum metal. Oil pump and cleaner system are located on the front end cover's board. The cover board itself is front housing

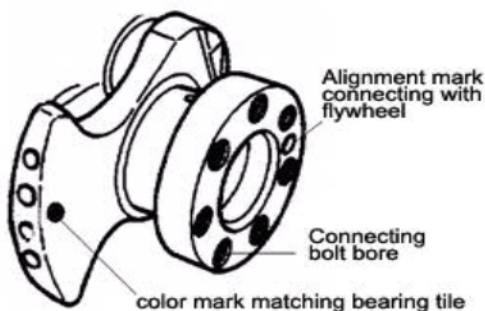
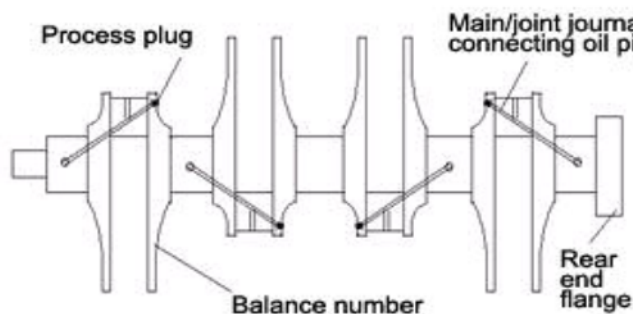
6. Front End Cover Features



of oil pump.



7. Crank Connecting Rod Mechanism



Front crank oil seal, oil pump seal and upper balance axle oil seal are pressed and fixed on front cover board.

The cylinder front end is combined as

horizontal oil pipe and there is an oil pipe to lubricate the rear bearing of lower balance axle.

Both upper and lower balance axles are supported by front end cover board. Lower balance axle is also driven axle of oil pump.

Crankshaft is made of forged carbon steel, which surface is machining processed

The location of crankshaft oil pipe is as shown.

Crankshaft is full-balance type, that is Balance Number = Number of Cylinders × 2.

The rotary radius of

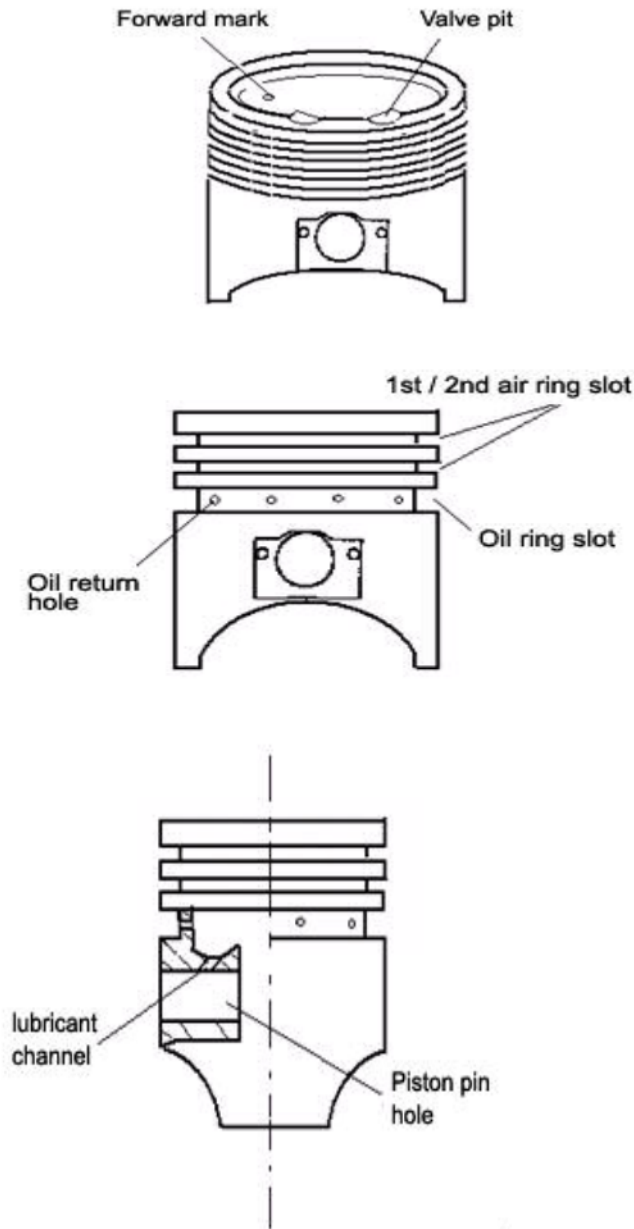


crankshaft main axle center and
crankshaft pin center is separately 88/2
(4G63), 100/2 (4G64) .

Main axle diameter/57mm、Connecting
rod diameter/45mm (The diameter of
4G63 and 64 is same) ;

The rear end flange is thickened as oil
seal top and don't impact it. Seven
flywheel bolts are part distributed and
there is a flywheel locking pin.

8. Piston Structure Features



which makes chamber compacted, decreases F/V value, reduces nocuousness emission, increases power and decreases oil consumption. There is valve pit on the right side of piston, which makes chamber structure more impacted.

There are two air ring slots and one oil ring slot. A oil return hole is drilled in the oil ring slot, which lubricate piston pin mating and reduce dynamic pressure of oil ring.

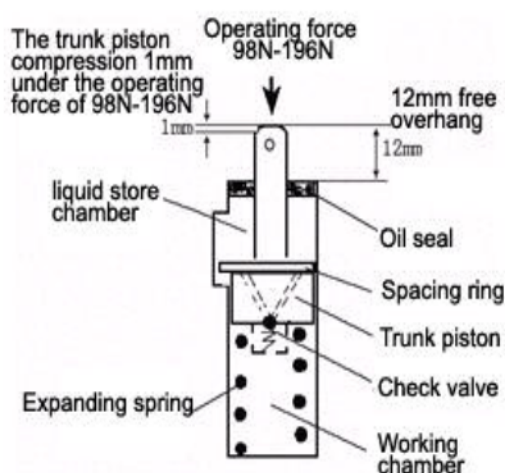
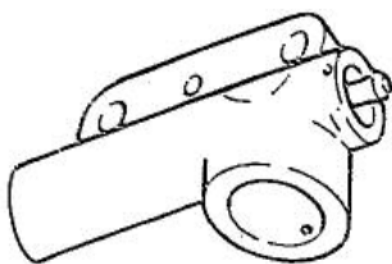
It is made of molten horniness aluminum, which has been surface processed.

There is a roundness concave on the top,

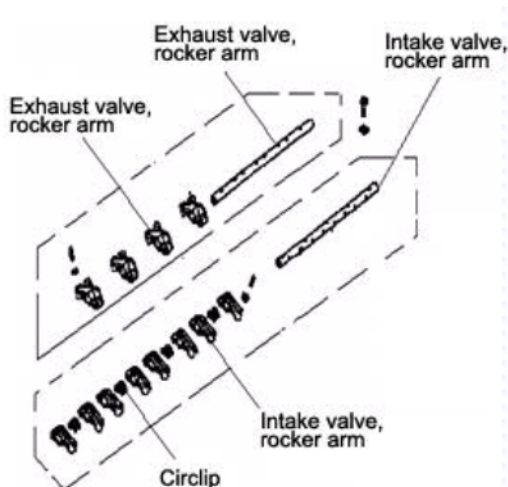


There is oil slot in the inside upper of piston pin seating, which collect splash oil to lubricate piston pin mating

9. Automatic Tensioner



10. Air Distribution Mechanism



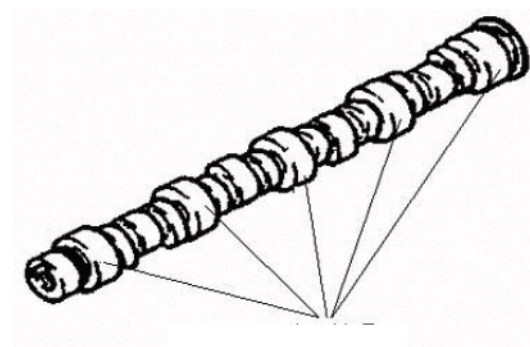
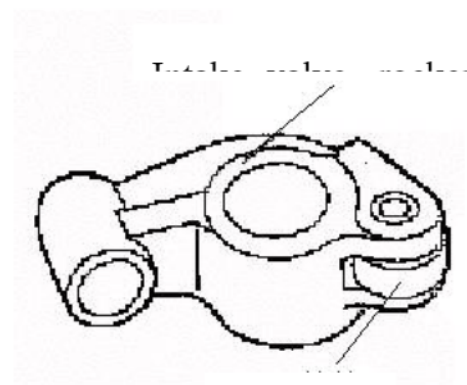
Automatic tensioner is to make timing belt tensioned. In an operation cycle, the belt tension is not constant and changing periodically. With usage time increasing and belt aging, tensioner may be tensioned automatically to prevent belt sliding and affect engine air distribution

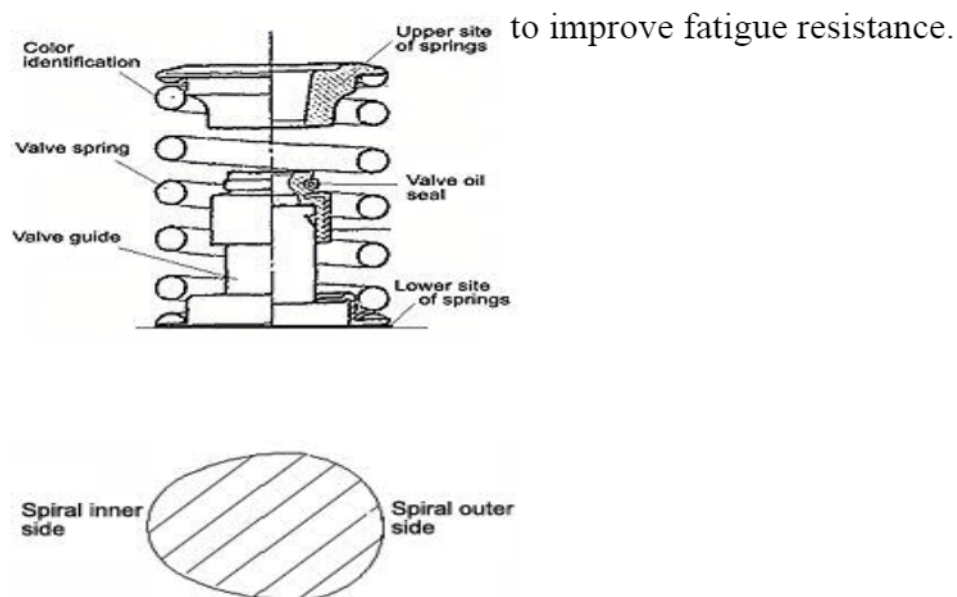
phase.

hole, which are supported by hydraulic pole in intake/exhaust valve, rocker arms. The latter will inject incoming oil from rocker to lubricate air distribution mechanism.

The two hollow rocker of oil hole can neither be exchanged nor be reversely installed.

Eight intake valve, rocker arms are divided into group A and B without exchange. Four exhaust valve, rocker arms are exchangeable. The intake/exhaust valve, rocker arms are made of aluminum metal, which may decrease weight, reduce crankshaft cam load, extend its life time and improve engine performance and fuel economics. There are oil pipe and oil injection

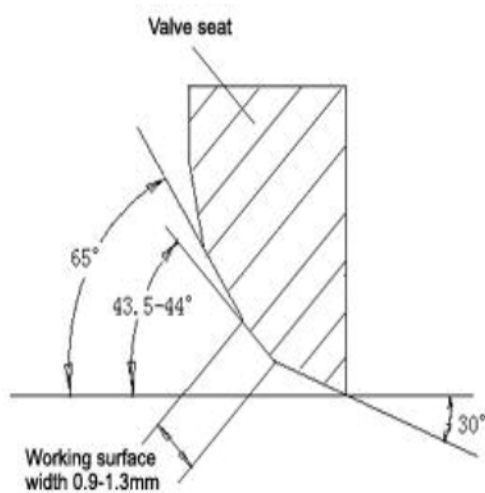
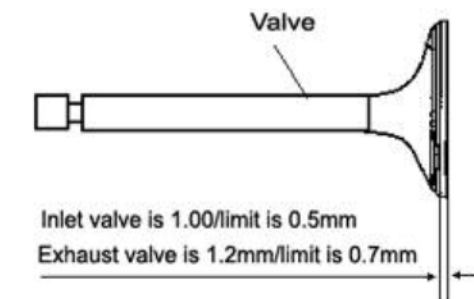




Idler wheel rocker arm is adopted in the rocker arm so as to reduce the abrasion between camshaft cam and rocker arm

Camshaft is made of spheroidal graphite iron, of 5-point bearing and no special bearing.

The valve spring is non-isometry structure, which may prevent sympathetic vibration and rupture. Please notice that the color-marked should be upwards and the larger-distant is upwards. Spring section is elliptoid, which surface is shot blasting processed



The valve is of umbrella structure. The intake valve is similar to the exhaust valve, but the size of the former

is a little bigger than the later.

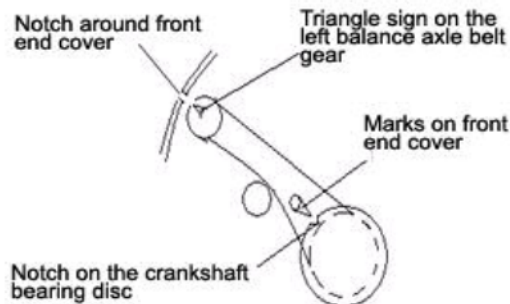
Each cylinder is of four-valve structure, which may improve emission efficiency, decrease weight and inertia resistance and extend the life time of valve and valve seat. Besides it, it is of benefit for spark plug allocation, which improve burning efficiency and reduce injurant emission and fuel consumption.

Valve oil seal is of steel-shelf and rubber-ring-spring tension structure. The duct is made of

high-temperature-pressure-processing powder metallurgy.

Upper Balance Axle Belt Fitting

Mark



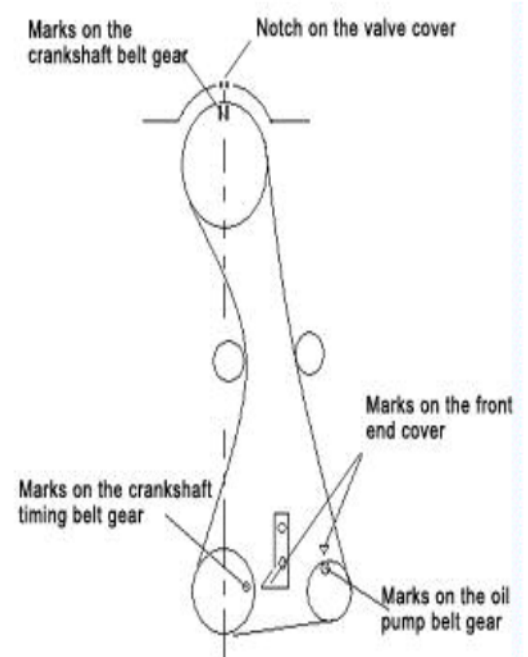
There is an independent transmission belt on the upper-left balance axle. Tension wheel B is located on the loosened side, which is to adjust belt tension manually. The teeth number of drive gear is 38 teeth and the teeth number of driven gear is 19.

Please note that align the marks of crankshaft B belt gear and front end cover and the marks of

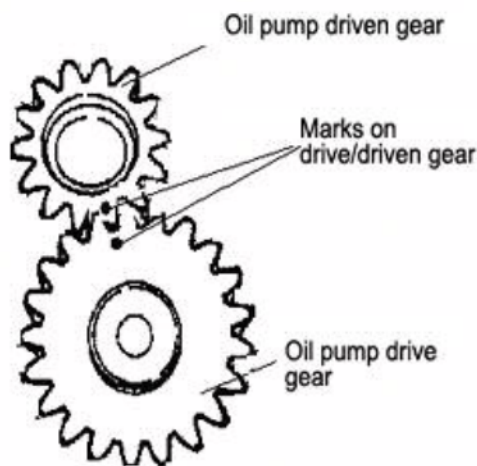
upper-left balance axle belt gear and front end cover when installing left balance axle belt gear, which is as shown.

Timing Belt Fitting

Mark



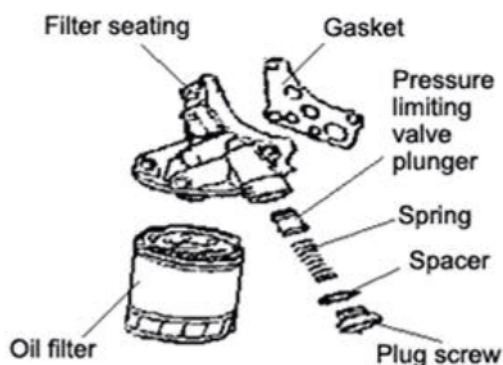
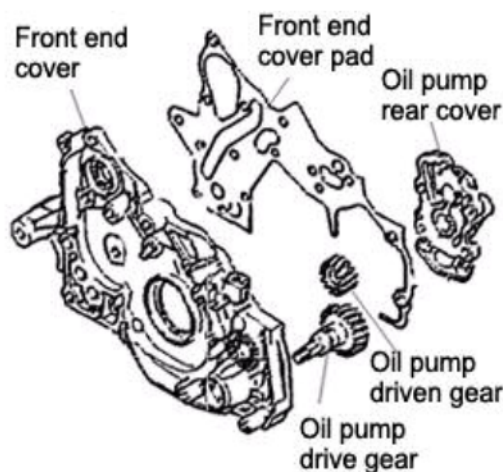
Oil Pump Gears Mark



Please note that align the marks of camshaft belt gear and valve cover, the marks of crankshaft timing belt gear and front end cover and the marks of oil pump belt gear and front end cover when installing timing belt. (The 60mm-length screw drive must be inserted into the lower balance test hole, otherwise turn around oil pump belt gear and then align timing mark.) Please align the marks of drive/driven gears when installing oil pump gears as shown.

12. Lubrication System

Structure Features



External gear oil pump is

applied and its oil supply performance is better than current rotor pump. The efficiency of external gear pump is high, that is, the efficiency of oil supply is proportional to the speed, which may satisfy large-load oil supply requirement. However, if rotor pump speed increase, the oil pump efficiency will increase at low speed, but it will drop gradually when the speed reach mid-speed as shown, which will cause lack of large-load oil supply. Therefore, large load should be considered when designing rotor pump, but it will consume power during low loading.

Oil filter seating and pressure limiting valve – Pressure limiting valve is of plunger spring structure.

Valve seat working surface angle (43.5° – 44°) is a little less than valve working surface.