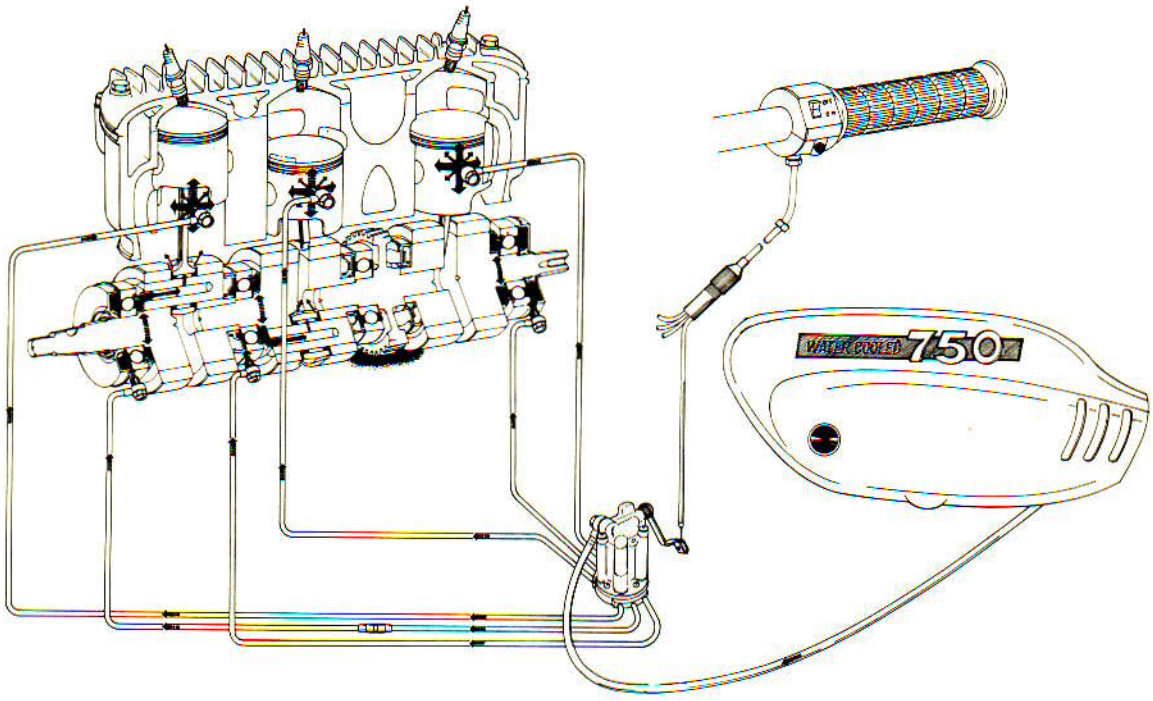


Fig. 6–1 GT750 engine lubricating system

The lubricating system of this engine uses "SUZUKI C.C.I (Cylinder & Crankshaft Injection) System", whereby a required amount of oil is pumped into both the seating or moving portions of each inner part and the stressed points by an oil pump direct from the reservoir of fresh oil with the regulation of this oil flow rate.

The oil pump is of a 6-outlet plunger type which is the original design of SUZUKI. Oil from the pump is distributed to cylinders and crankshaft, and all the inner parts such as a cylinder wall, a crank bearing and connecting rod bearings are equally lubricated.

Fresh oil is always supplied to each inner part without being diluted with gasoline. We see then that wearing of each part can be minimized and its durability is improved.

After lubricating the inside of the engine inside oil is drained into the crankcase. There a new system SRIS (Suzuki Recycle Injection System) is adopted for the recirculation of that oil. This new system has resolved a problem of smoky exhaust gases emission into atmosphere. This is usually due to incomplete combustion of oil in the crank chamber which leak suddenly into the combustion chamber during quick engine acceleration. We have now completed a two-cycle engine free from smoky exhaust gases.

SPECIFICATION

Oil Pump:	Plunger type
Delivery quantity (at full throttle opening):	
For cylinder side:	48.3 cc (0.13/0.11 pt. US/Imp) per Hr. at 2,166 rpm
For crank bearing side:	7.21 cc (0.09/0.07 pt. US/Imp) per Hr. at 2,166 rpm
Oil pump reduction ratio with crankshaft:	63.72 : 1

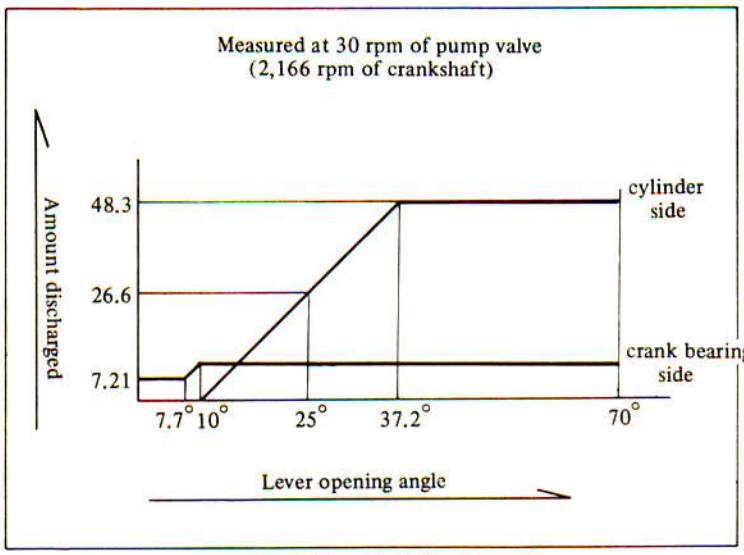
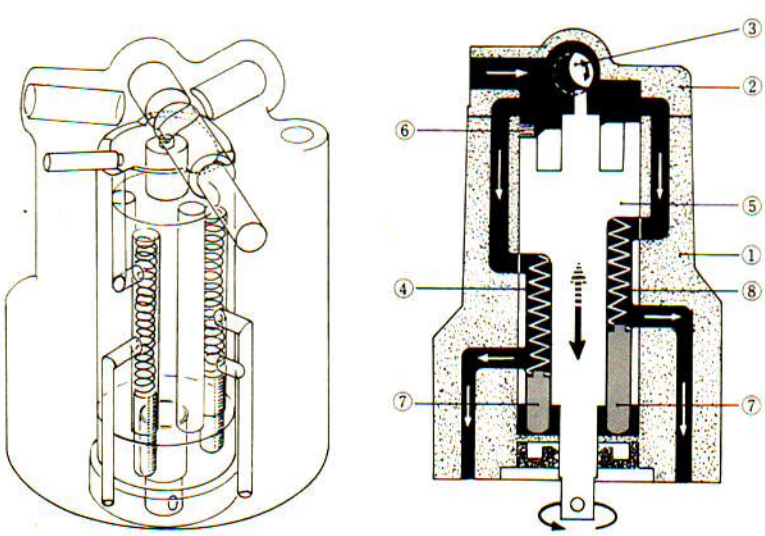


Fig. 6–2 Oil delivering curve

CONSTRUCTION & OPERATION

Oil Pump



① Oil pump body
② Pump control body
③ Control cam
④ Plunger hole
⑤ Pump valve
⑥ Cam guide
⑦ Plunger
⑧ Spring

Fig. 6–3 Oil pump construction

Construction

As shown in Fig. 6–3, the oil pump consists of the following components:

1) Oil pump body:
Oil inlet and delivery ports are provided on both upper and lower sides, and on the inner bore parts.

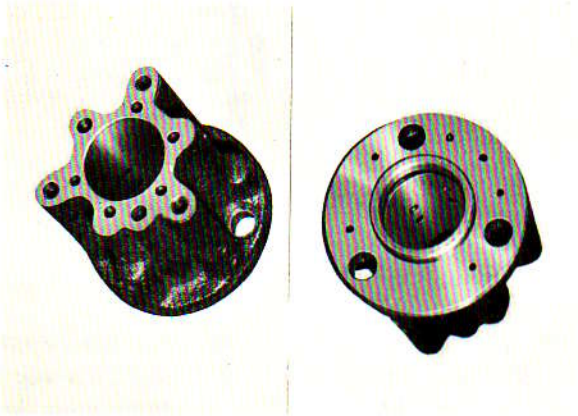


Fig. 6–4 Oil pump body

2) Oil pump valve:
Three(3) kinds of cam ① are provided on upper stems of valves symmetrical to the valve center, for the total of six(6) different elevations.

These cams are provided for three(3) different functions; first for oil suction, second for delivering oil to the cylinder and third for delivering oil to the crankshaft.

On the outer side of the valve, four ports ②, two each on the two row, are provided. The upper two ports are used for oil suction and the lower ones for oil delivery.

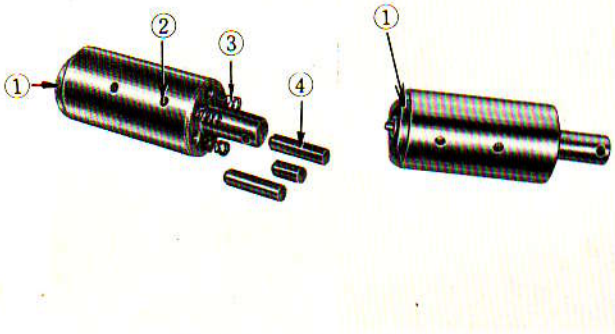


Fig. 6–5 Oil pump valve & plunger

3) Oil pump plunger:
Six(6) openings are arranged vertically inside of the valve. Three(3) of them are through-hole while a spring ③ and plunger ④ are inserted in the remaining three as shown in Fig. 6–5.

This plunger, in fact moves in the opposite direction to the vertical motion of the valve and sucks in and delivers oil.
Two types of plunger are available.

4) Control cam and shaft:
The vertical motion of the valve, which is subjected to rotating motion is effectively controlled by the cams right above it and by a cam guide ① on the pump body. In this case, the delivery amount of oil can only be controlled by the rotating valve, namely by the engine speed.

The control cam ② is capable of limiting the vertical valve motion and consequently changes the amount of oil delivery depending upon engine loads. This control cam is driven by a camshaft lever ③ connected to the carburetor throttle cable.

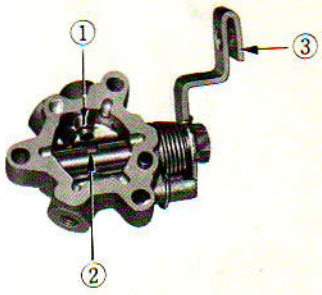


Fig. 6–6 Control cam & shaft

Operation

When the oil pump valve functions and moves upwards being regulated by the valve guide and the control cam, the plunger moves downwards relative to the valve. Oil is, therefore drawn into the valve, when a port on the valve side and the port on the pump body are matched.

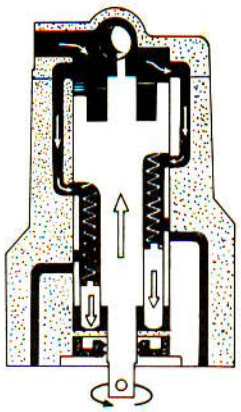


Fig. 6–7 Sucking oil

Then, during the downward strokes of the valve, the plunger moves upwards relative to the valve and oil already sucked into the plunger is discharged. It is to be noted, however, that the oil pump body has separate ports for oiling the cylinder and the crankshaft respectively to deliver the oil.

Oil quantity can be regulated by timing the overlapping period of the outlet ports of the valve and the pump body.

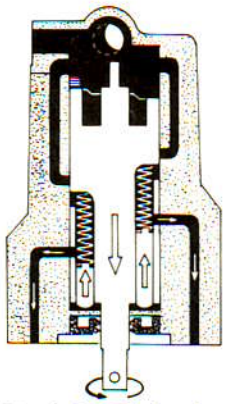


Fig. 6–8 Discharging oil

As mentioned above, four(4) ports two each for each of the two rows are provided on the valve. Corresponding ports are provided on the pump body for delivering oil to the cylinder and the crankshaft. Because it completes a return stroke twice during one rotation, eights discharges of oil will be obtained for with one(1) rotation of the valve. Actually, however, the total of six(6) oil discharges are required for the cylinder and the crankshaft lubrication because the engine has only three(3) cylinders. In order to meet this requirement, oil for each one delivery to the crankshaft and the cylinder is returned to the original place within one(1) rotation, and the total delivery time is kept at six(6). See Fig. 6–9.

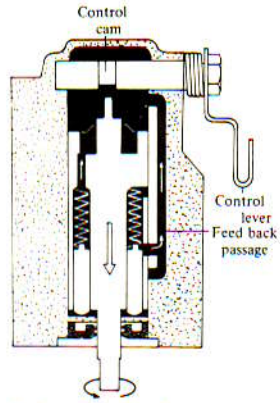


Fig. 6–9 Feed-back passage

For the vertical motion of the valve, the volume formed by the plunger and body (under the plunger) is always changing. In order to facilitate oiling into that portion, an oil circulating passage is provided on the valve body, as shown in Fig. 6–10.

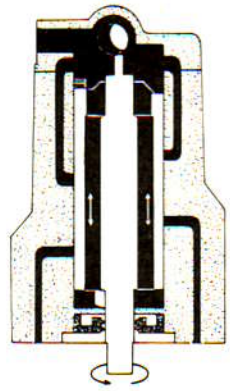


Fig. 6–10 Oil circulating passage

An overall construction and the arrangement under operating conditions are illustrated in the following diagram.

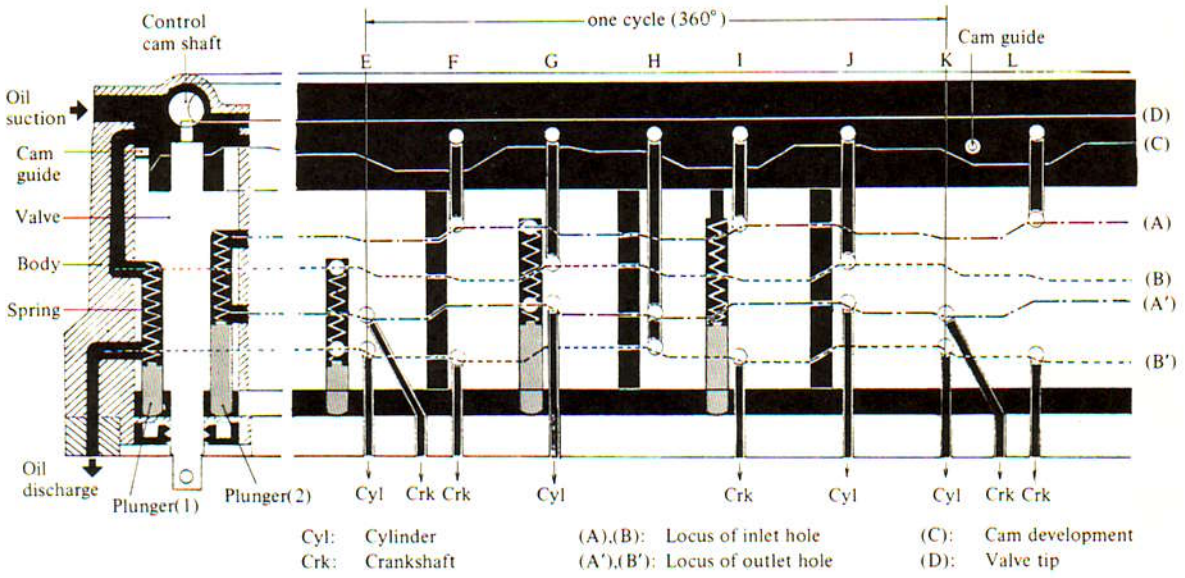


Fig. 6–11 Overall construction and arrangement under operating conditions

(A), (A'), (B) and (B') show the loci of each oil inlet and outlet on the outside of the valve traced when the valve moves up and down as rotating, with its cam traveled along the cam guide on the inside of the pump body.

These loci will be varied in accordance with the movement of the control cam shaft which is shown as a line(D) in the figure, because the reciprocating movement of the valve is regulated by both the control cam and the cam guide.

To take the plunger ② for example, oil is drawn into the valve at the position "F" and discharge it once to cylinder side to a certain extent at "G" and feed back the remaining oil to the control chamber at "H", then suck oil again from the control chamber at "I" and discharge it into cylinder and crankshaft (at "J" and "L") respectively.

Thus each plunger discharges the specified amount of oil into the cylinder and crankshaft totally 6 times within one cycle.

SRIS

Construction

The construction of SRIS (Suzuki Recycle Injection System) is so made that oil accumulating in the crankcase bottom is forced into the scavenging ports of adjacent cylinders through the rubber pipes with the help of positive and negative pressures induced by each cylinder. A check valve is fitted to the outlet of the crankcase lower part in order to prevent the reversion of oil flow. There are two piping forms for this SRIS, the one shown in Fig. 6–12 has been equipped on the machines from the first production, and the other shown in Fig. 6–13 is modified type for later model.

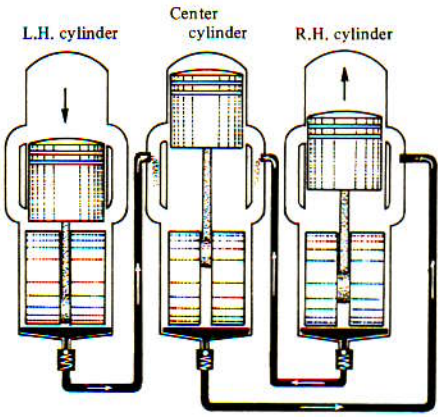


Fig. 6–12 SRIS type 1

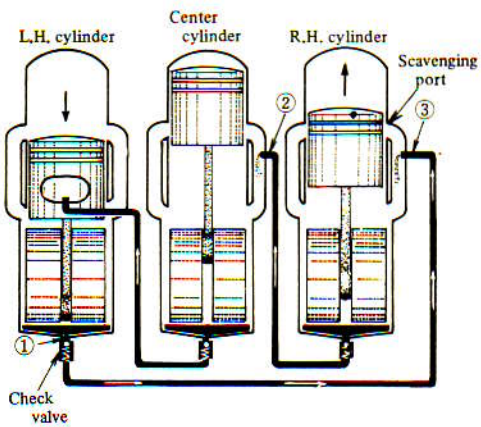


Fig. 6–13 SRIS type 2

Operation

To take the later type (Fig. 6–13) for example, it is understood that when the piston on the left hand cylinder moves downwards, its crank chamber is subjected to a positive pressure, moving the oil outside of its outlet port ①.
Simultaneously with that, the piston on the center cylinder is near the top dead center and its crank chamber has a negative pressure, taking suction of fresh gases from the carburetor and oil from the SRIS hose ②.

On the other hand, a negative pressure is induced in the crank chamber of the center cylinder as mentioned above and the piston of the right hand cylinder is in the upward stroke from the bottom dead center, reducing the positive pressure in the crank chamber.
Therefore, a pressure at the scavenging port of the center cylinder cannot attain a sufficiently high value of pressure needed for drawing oil from SRIS hose and oil as stopped at the check valve does not enter into the SRIS hose.

In the cylinder on the left hand side, the crank chamber has a positive pressure, while fresh gases are still flowing into the crankcase of the cylinders on the right hand. Therefore, oil is drawn into the crank chamber from the SRIS hose ③ and though oil is being delivered as a whole, it will no longer be delivered if the pressure is changed from positive to negative as the piston moves upward.