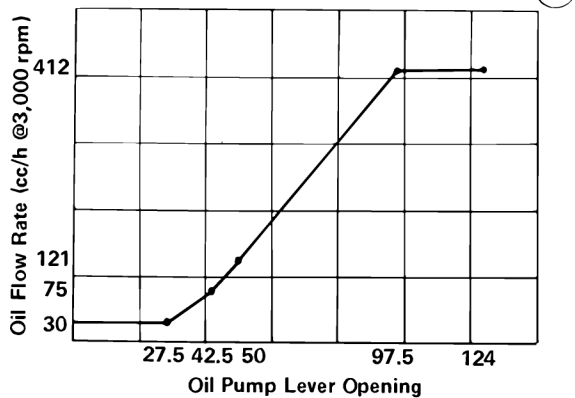


Pump operation and the path for oil flow through the pump are shown in Fig. 453, and the oil flow rate is shown in Fig. 451. The pump shaft has a worm gear at the end which meshes with the teeth cut into the center of the plunger. A spring pushes the plunger follower and plunger so that the plunger cam face rests against the camshaft. As the plunger turns, the cam on its face causes it to move back and forth according to the height of the cam.

Oil Flow Rate



Oil is drawn into the pump through inlet A, and it goes through passage B and into oil chamber C, from where it flows to passage D. When the plunger rotates and descends, the plunger follower follows it down, enlarging pump chambers F and G and starting to create a low pressure in them. But just at this point, the rotation of the plunger follower causes plunger follower inlet passage I to coincide with inlet hole E, so oil flows in through passages B and P to fill pump chambers F and G and equalize the pressure.

As the plunger and follower rotate further and start rising again, holes I and E are no longer aligned, so the decrease in the volume of chambers F and G starts to pressurize the oil. Just at this time, however, plunger follower outlet passages H and J coincide with holes K and L and so the oil is forced out these holes.

This completes 180° of plunger and follower rotation. The second 180° follows exactly the same pattern, except that at the end, outlet passages H and J coincide with holes N and M instead.

The oil pumped out of K, L, and M, goes to the left, right, and center carburetors, respectively, while the oil from N goes through a pipe to check valves at the back of the cylinders. From the three check valves the oil goes to lubricate the crankshaft main bearings and the connecting rod big end needle bearings.

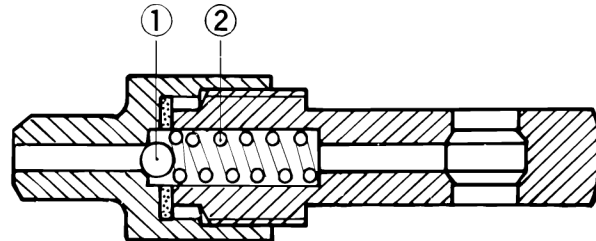
### (3) Check Valves

The check valves open when oil pressure is in the direction of the arrow, and allow oil flow in the oil direction only. When the engine is stopped — and therefore the oil pump is also stopped — the check valves stop oil flow, and any oil that has passed a check valve is prevented from returning.

As the check valves can not be disassembled, if they become clogged or if they do not function properly, replace the check valves and oil pipe together.

To clean a check valve, use a squirt can filled with solvent. Never use compressed air as this will distort the valve spring and cause the valve to malfunction.

### Check Valve



### (4) Pump repair

Pump repair is limited to replacement of the “O” rings and pump shaft oil seal, since these are the only parts that may be expected to deteriorate. Other moving parts are well lubricated by the oil in the pump, and wear very little.

If the “O” rings deteriorate or are damaged, the pump will lose compression, pump output will drop, and oil may leak from the pump. When pump trouble is suspected, inspect the “O” rings and replace any defective ones. If the trouble is with parts other than the “O” rings, replace the pump assembly.

When the pump is disassembled or if the engine oil tank runs out of oil, air will enter the pump and must be bled out. To bleed the pump, remove the two banjo bolt until oil starts coming out of the outlet, and then screw the banjo bolts back in (See Page. 46).

### (5) Oil pump performance test

If a drop in oil pump performance is suspected, check the rate that the oil is being pumped as follows.

**●USE A 20 : 1 RATIO OF GASOLINE TO OIL IN THE FUEL TANK IN PLACE OF THE GASOLINE NORMALLY USED.**

- Remove the oil pump cover.
- Detach the banjo bolt and oil hose from the right carburetor, and install a screw (6 mm) in the carburetor.
- Loosen the banjo bolt on the other end, and pull out the check valve. Retighten the banjo bolt.
- Run the output hose into a container.
- Start the engine, and keep it at 2,000 rpm.
- Pulling up on the oil pump cable, collect the oil that is being pumped for 3 minutes. If the quantity of oil collected corresponds with that shown in the table, the oil pump is operating properly.