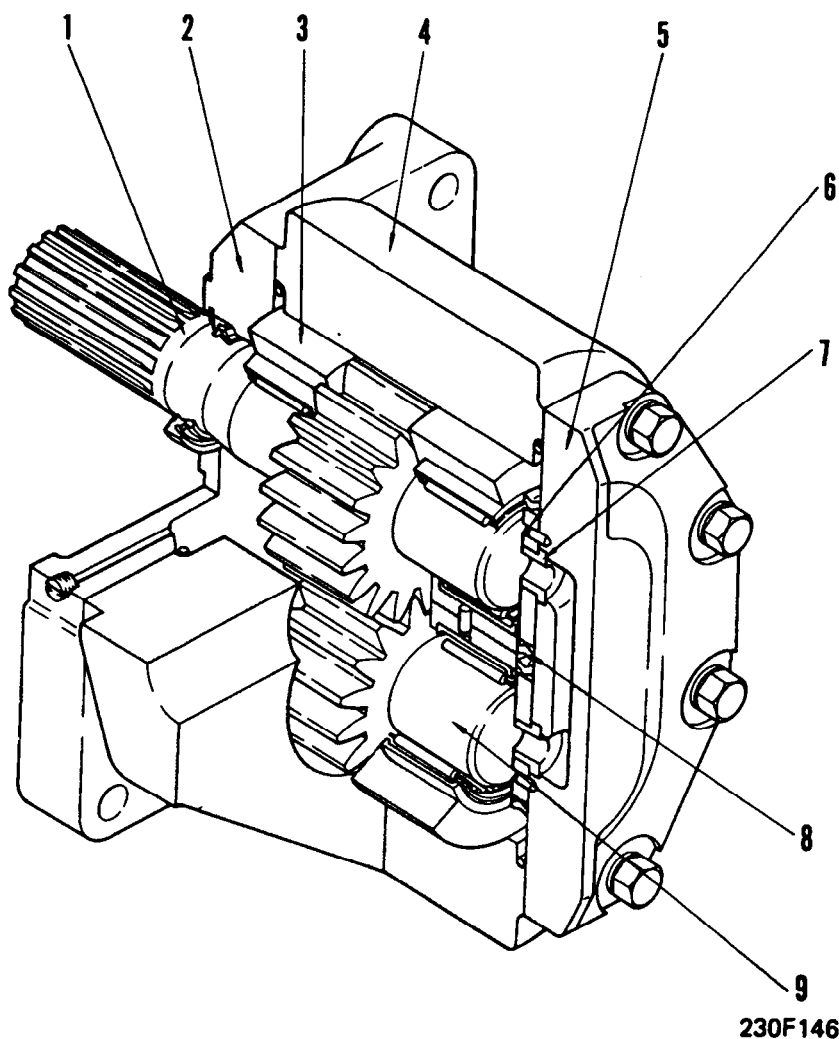


PRESSURE LOADED TYPE GEAR PUMP**GENERAL DESCRIPTION**

Hydraulic pumps used for the work equipment hydraulic units on construction machinery are pressure loaded type gear pumps. Some gear pumps of this type have a maximum delivery pressure of 210 kg/cm² or higher.

The pressure loaded type gear pump is designed so that the clearance between the gear and the side plate can be automatically adjusted according to the delivery pressure. Therefore, the oil leakage from the side plate is less than in the case of the fixed side plate type under a high discharge pressure. Consequently, no significant reduction of the pump delivery occurs, even when the pump is operated under high pressure.

1. Drive gear
2. Bracket
3. Bushing
4. Gear case
5. Cover
6. Seal plate
7. Collar
8. Back-up ring
9. Driven gear

STRUCTURE AND OPERATION

In a pressure loaded type pump, two bushings acting as side plates are inserted into the pump case, and are pressed toward the sides of the gears. The oil leakage from the gear sides is thus minimized.

Since the bushings are constantly pressed toward the gears by the oil pressure, there is no fear of an increase on oil leakage, even when the bushings are worn out and the clearances are expanded many hours of operation.

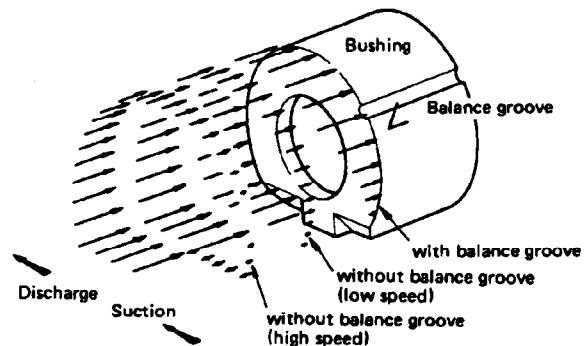
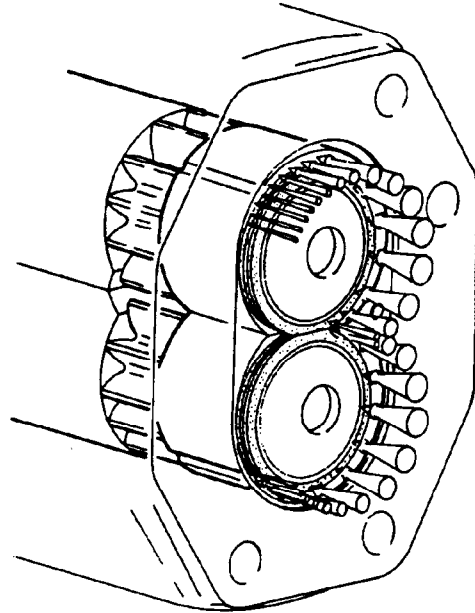
The bushings are pushed towards the gears from the cover side by the oil pressure, and they are pushed from the gear side by the pressure of oil trapped between the gear teeth and that which has leaked out from the clearance between the gear and the bushing.

Since the oil pressure in the gears is higher on the pump delivery side and is lower on the suction side, provisions are made so that the pressing force acting on the bushings from the cover side is regulated in such a way that the delivery side is pressed harder and the suction side weaker to match the counter pressure.

More specifically, the area of the bushing on the discharge side is made larger than that on the suction side by partitioning the area of the bushing subjected to pressure on the cover side, with a back-up ring installed to the seal plate as shown in the drawing at right.

When the pump is operated at high speed, the pressure on the suction side is lowered and the distribution of pressure around the periphery of the gear will change into the state shown in the drawing at right below.

Pressure balance grooves are therefore provided on the bushings to keep the balance of the force on the cover side against the pressure acting on the bushing from the gear side that varies with the pump rotation and the pressure distribution. Thus the delivery pressure is led as shown in the drawing and the pressure distribution is stabilized at any rotational speed.



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