

Fig. VII/34 - Exploded view of hydraulic pump.

a) Detail of shaft oil assembly.

C₂. Cover and flange bolt nuts. - C₃. Pump driving shaft coupling nut. - M. Pump delivery port (of smaller diameter than the inlet port). - R. Bearing fillets, delivery end. - 1. Bearings. - 2. Cover and flange sealing rings. - 3. Body. - 4. Flange. - 5. Cover. - 6. Shaft oil seal. - 7. Circlip. - 8. Drive gear shaft. - 9. Driven gear shaft. - 10. Spacer. - 11. Seal back-up ring (to be installed also on pumps found without one).

To disassemble the external tapping, first remove the control lever locknut and then withdraw components out. Then, check tightness of the sealing ring on the valve spool and check the sliding clearance of the spool which should be within the limits of $0.015 \div 0.020$ mm ($0.0006 \div 0.0008$ in).

HYDRAULIC PUMP

The pump (P, Fig. VII/5) which feeds the hydraulic lift circuit is a gear type "sandwich construction" unit that does not require any maintenance, checking or periodical adjustments because both gear shaft lubrication and the taking-up of service wear between gears and bearings is done automatically by the pressure of the oil circulating through the pump (pressure-loaded bearing principle).

Bearing bores housing the shafts are lubricated by the same oil circulated by the pump through the recesses on inlet side of bearings. Service wear is taken up by the pressure of the oil acting upon the plane face of the bearings adjacent to the flange and cover within the area delimited by the two sealing rings.

The pump is driven from the engine timing gear (17, Fig. VII/35) through an oldham coupling.

To reach the driving gear, bushings and bearings, remove the timing gear case cover as described in the section "Engine".

The related data are tabulated on page 177.

The pump is quickly damaged when running dry, therefore, never run the engine when the transmission housing is dry.

Overhauling.

Overhaul the pump when output drops of about 25 percent with respect to that given in the specifications of page 146.

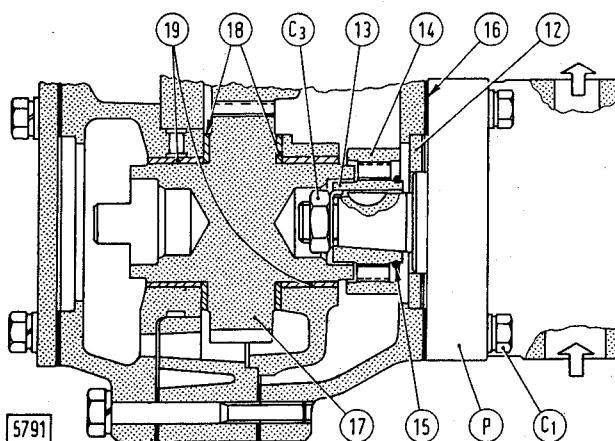


Fig. VII/35 - Pump driving unit.

C₁. Capscrews securing pump to engine timing gearcase cover. - C₂. Coupling nut. - P. Oil pump -

12. Pump alignment ring. - 13. Pump drive coupling. - 14. Coupling driving ring. - 15. Driving ring (14) circlip. - 16. Gasket. - 17. Pump driving gear. - 18. Thrust washers. - 19. Bearing bushes.

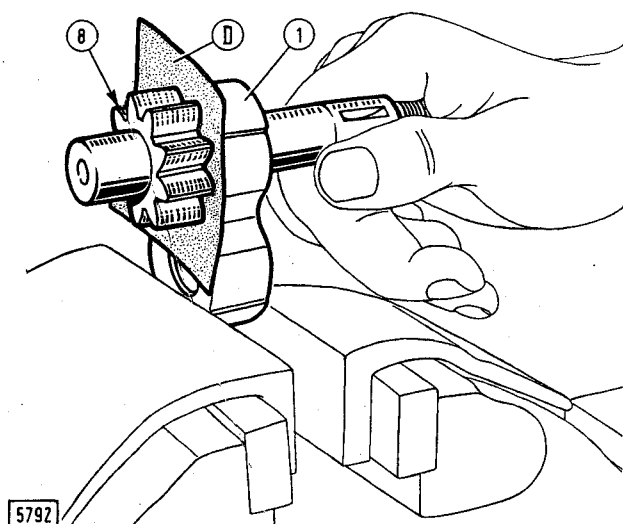


Fig. VII/36 - Polishing drive gear faces.
D. Emery paper. - 1. Bearing. - 8. Gear.

Removal.

Remove the pump from the tractor by removing the capscrews which secure it to the engine timing gear case cover and the capscrews securing the suction and delivery oil lines (21 and 20, Fig. VII/5). Withdraw it then at front and recover the alignment ring (12, Fig. VII/35), the driving ring (14) and the gasket inserted between pump and timing gear case cover.

Disassembly.

Clamp the pump in a bench vise provided with soft lead jaws, then disassemble it as follows:

- unscrew the nut (C₃, Fig. VII/34) from the drive shaft, then withdraw the drive sleeve and retaining ring;
- remove flange and cover and their sealing rings after removing the attaching bolts;
- withdraw gears and bearings, tapping the shaft ends with a plastic mallet. We recommend scribing assembly marks before disassembly to ensure correct assembly of the parts, if still usable;
- withdraw from the cover the drive shaft seals and the spacer, after removing the retaining ring;
- remove the inner and outer seals from flange and cover, the latter provided with a plastic back-up ring.

Inspection.

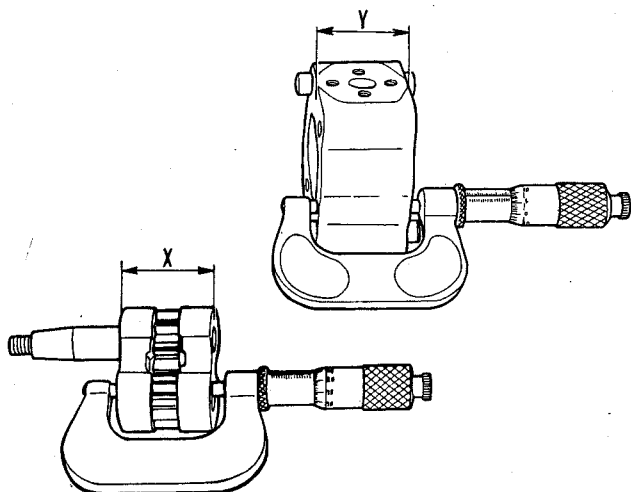
Following a thorough cleaning of the parts, but avoiding solvents which may damage the oil seals, proceed as follows.

- Check flange and cover seals and the two drive shaft seals for scored working surfaces or permanent damage, and refit them if found functionally efficient. However, it is best to replace all of them at overhauls.
- Check the making gear and bearing faces with lampblack. These surfaces must be perfectly smooth and normal to their axes. If wear is very small these faces are polished as shown in Fig. VII/36, by inserting a sheet of emery paper lubricated with paraffin and turning the shaft and gear slowly.
- Check on a surface gauge the flats on the bearing mating faces, and if wear is still small, polish them by passing them over a sheet of emery paper lubricated with paraffin and laid on a flat surface.
Then, remove burrs and polish the side surfaces so that bearings slide in under slight hand pressure.
- Measure shaft and bore wear vs. data tabulated on page 177.
- Measure the bearing clearance which should be comprised within the limits of $0.1 \div 0.2$ mm ($0.004 \div 0.008$ in) (Fig. VII/37).

Assembly.

Prior to assembly, lubricate all pump components using the hydraulic fluid, to avoid seizure or binding during the initial period of service. Assemble the pump referring to Fig. VII/34 and taking notice of the scribed assembly marks and of the following points:

- after fitting the sealing rings insert on the inside of the ring anti-extrusion plastic ring (Fig. VII/38), also on those pumps which were not provided with it;
- arrange the gear bearings inside the pump body with the relieved radii (R, Fig. VII/34) on the outer circumference facing the delivery end port (M) and with the front faces with the lubrication scrolls adjacent to the gears;
- thoroughly dry the shaft seal lands in the cover, then introduce them complete with spacer arranged as shown in detail (a) of Fig. VII/34,



5793

Fig. VII/37 - Bearing and gear end clearance measurement.

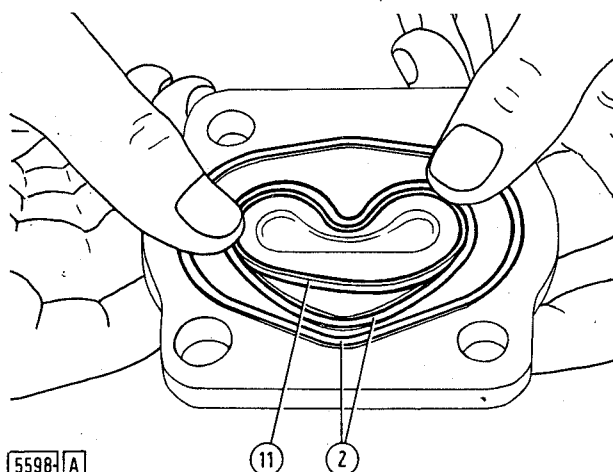
Length X less than Y by $0.1 \div 0.2$ mm ($0.004'' \div 0.008''$).

and, finally, fill the cavity between the seal lips with FIAT MR 3 grease (wheel bearing grease, NLGI no. 3).

When fitting the complete cover be sure to cover with a suitable sheet band the end thread and the key seat of the drive shaft to avoid damaging the rubber rings against sharp corners;

— tighten the pump cover bolt nuts gradually and to the specified torque value.

If, following overhauling, the pump performance is poor, entrust it to a specialized shop properly equipped for bench testing.



5598 A

Fig. VII/38 - Fitting the seal back up ring (11) to the pump cover on the inside of the inner O-ring.

2. Sealing rings.

Installation.

Assemble the drive coupling and refit the pump to the tractor inserting the alignment ring (12, Fig. VII/35) and gasket (16) between the timing gear case cover and the pump.

Fix the suction line flange (21, Fig. VII/5) and, before securing the delivery pipe (20), pour in some oil through the upper duct, in order to favour the priming of the pump avoiding the risk of seizure during the initial service period.