

# Repair Instructions - P460A/P480/P414 PUMPS

## Inlet Valves

Remove inner hexagon screws (34) and pull off valve casing (26) to the front. Take out seal case (25) from valve casing (26). Remove the exposed inlet valve with a pair of flat nose pliers and the valve seat (27) with a valve puller. Disassemble parts and examine valve plate (28), valve seat (27), O-ring (31) and support ring (31A). Replace worn parts. Tighten inner hexagon screws (34) again to 30 ft-lbs. (40 Nm).

**Discharge Valves:** With a socket 32mm wrench, screw out valve plugs (32) . Remove the exposed discharge valves with a pair of flat nose pliers and the valve seat (27) with a valve seat puller. Disassemble parts and examine valve plate (28), valve seat (27), and O-rings (31, 33). Replace worn parts. Take care to reassemble in correct sequence. Tighten plugs (32) to 111 ft-lbs. (150 Nm).

## Seals

Remove oil drain plug (5) and drain oil. Remove inner hexagon screws (34) and pull off valve casing (26) frontwise over the plungers (16).

**Important!** if the seal casing (20A) does not separate from the valve casing (26), press both casings apart by placing two flat screwdrivers in the side notches on the seal casing (20A). Be careful not to damage casing surfaces.

Remove seal cases (25) situated either in valve casing (26) or seal casing (20A). Separate seal casing (20A) from seal retainers (20). Remove grooved ring (23) and guide ring (24) from the seal casing (20A). Examine O-rings (25B) and support rings (25A) attached to seal casing (26). Check seal ring (23A) situated between valve casing and seal casing, and replace if necessary. Then remove seal retainers (20) from crankcase (1). Pull grooved ring (23) out of seal retainer (20). Check O-ring (21). Grease new seals and O-rings with silicone grease before reinstallation.

**Important!** Seal casing (20A) has a notched pin to ensure correct fitting. Reassemble parts in the proper sequence.

**Important!** The grooved seal (23) on the high-pressure side is to be fitted carefully into the seal casing (20A) using a 22mm plastic rod. Under no circumstances must the surface in the seal casing or the seal lip of the grooved seal be damaged.

Check surfaces of plunger (16). Damaged surfaces cause hard wear on seals. Deposits of all kinds must be removed from the plungers.

**Important!** The plunger surfaces are not to be damaged. If there are lime deposits in the pump, care must be taken that the drip-return bore in parts (25) and (26) ensure trouble-free drip-return.

If the plunger (16) is worn, the complete plunger must be changed. The ceramic pipe alone cannot be changed due to reasons of precision. When reassembling tighten inner hexagon screw (34) to 30 ft-lbs. (40 Nm).

If the plunger (16) is worn, the complete plunger must be changed (see below). The ceramic pipe alone cannot be changed due to reasons of precision. When reassembling tighten inner hexagon screw (34) to 30 ft-lbs (40 Nm).

## Gear and Plunger

If oil leaks where the plunger (16) protrudes out of the gear, gear seals (19) and plungers have to be examined and replaced as necessary.

## Gear Seal

Remove plug (5) and drain oil. Remove valve casing as described above. Take seal adapter (20) off plunger (16) and replace gear seal (19).

## Plungers

Drain oil and remove crankcase cover (3). Take off screws on con rods (15). Be careful not to mix up the con rod halves. Push con rod shaft as far as possible into the crosshead guide. Loosen screws (10) and remove bearing covers (7&8) with the help of a screw-driver.

Take crankshaft out carefully so as not to bend the con rods. Remove and dismantle con rods and plungers (18). Replace worn parts. **Connecting rods must be installed in the same position and orientation.**

To reinstall, insert con rods and plungers, put crankshaft in carefully and then push the bearing covers (7&8) onto the ends of the crankshaft. Screw on bearing covers with screws (10). Mount con rod halves and tighten screws (15) to 8 in-lbs. (11Nm). Mount crankcase cover (3) together with O-ring (4).

## To rotate crankshaft to the opposite side.

The shaft end is on the left side of the pump looking at it from behind. If it should be on the other side, the valve casing (26) and seal casing (20A) have to be removed, turned by 180° and then put on again. Turn seal adapters (20) 180°, so that the leakage holes are underneath. Oil dipstick (2) and oil drain plug (58) have to be interchanged and crankcase cover turned by 180°.

**Contact Giant Industries for service school information. Phone: (419) 531-4600**