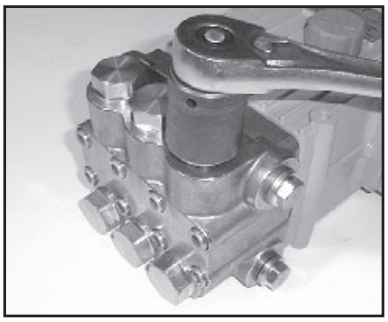
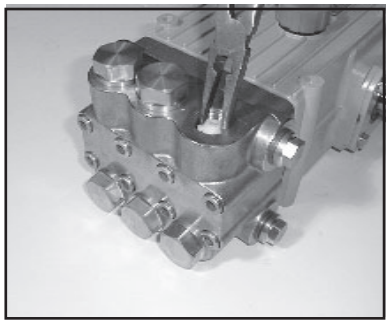
Repair Instructions P420H and P422H

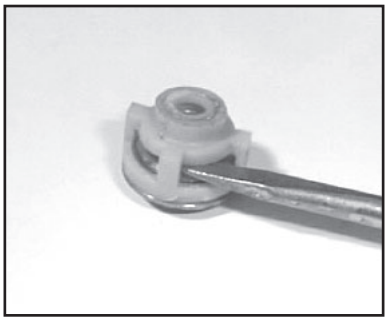
Note: Always take time to lubricate all metal and nonmetal parts with a light film of oil before reassembly. This step will ensure proper fit, at the same time protecting the pump nonmetal parts (i.e., the elastomers) from cutting and scoring.



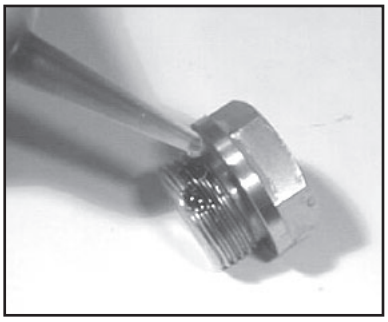
1) With a socket wrench, remove the three discharge valve plugs and three inlet valve plugs (32). Inspect the o-ring (33) for wear and replace if damaged.



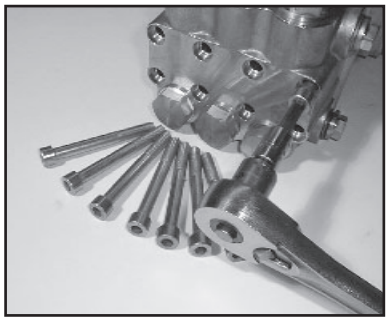
2) Using needle nose pliers, remove the inlet and discharge valve assemblies (27A). Note: It may become neccesary to remove the valve seat (27) from the valve casing using a slidehammer.



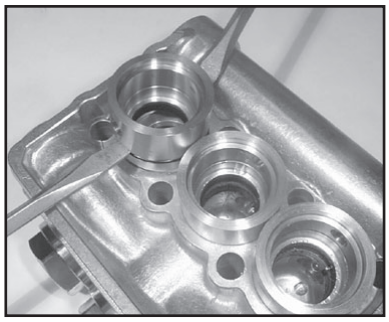
3) By inserting a small screw driver between the valve seat (27) and the valve spring retainer (30), the valve assembly can be separated.



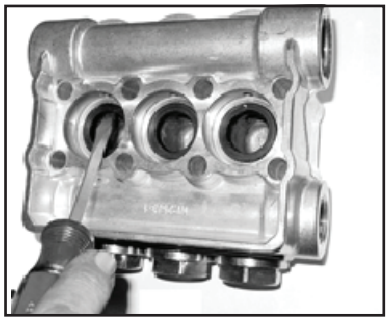
4) Remove the o-ring (31). Inspect all parts for wear and replace as necessary. Apply one drop of loctite 243 to the valve plugs (32) and tighten to 107 ft.-lbs. (145 NM).



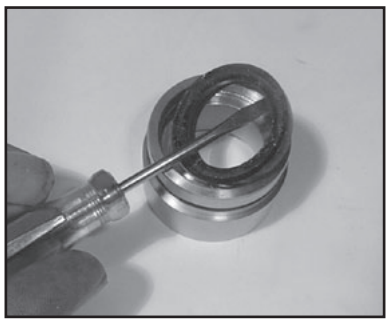
5) Use a 8mm allen wrench to remove the 8 socket head cap screws (34). Carefully slide the valve casing (26) out over the plungers.



6) Remove seal case (20) and weep return rings (25) from the valve casing.

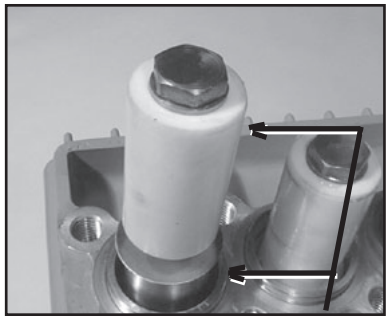


7) Remove the pressure rings (24) and v-sleeves (23 - Note: P422 & P423 pumps have a spacer ring) from the valve casing (26).

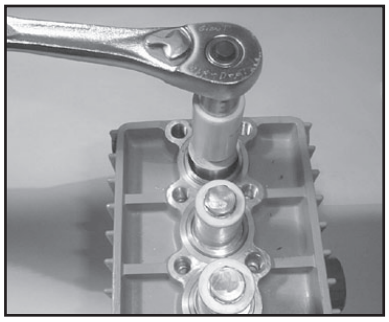


8) Remove the weep grooved seal (23 or 23B) together with pressure ring (24) P420 and P425 only) out of the seal case (20). Check O-rings (21).

IMPORTANT! The grooved seal (23) on the high-pressure side is to be fitted carefully into the valve casing (26) using a screwdriver. Under no circumstances must the seal surface in the valve casing or the seal lip be damaged.

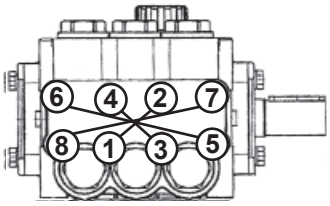


9) Check surfaces of plunger (16). Damaged surfaces cause accelerated seal wear. Deposits of all kinds must be removed from the plungers.



10) If the plunger pipe (16B), is damaged or worn, remove tension screw (16D) and plunger pipe (16B). Check and clean plunger surface (16A) and check flinger (16H). Cover thread of tension screw (16D) with a thin film of Loctite and tighten carefully to 20.7 ft.-lbs. (28 Nm).

IMPORTANT!
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.



11) If oil leaks under under the plunger (16), the oil seals (19) need to be replaced. Remove oil plug (5) and drain oil. With the valve casing (26) and seal case (20) removed (ref. instructions #5 & 6), and plunger disassembled (ref. #10). Remove crankcase cover(3).

12) After installation of high pressure seals (23), place seal case (20) with weep seals & pressure ring installed, weep return ring (25) and high pressure weep return ring (24) over plungers. Slide valve casing over plungers and seat firmly. Replace the 8 socket head cap screws (34) and tighten to 30 ft.-lbs.(40 Nm) in a crossing pattern (as shown above right).

Gear End

13) Remove screws (15B) on connecting rods (15), separate the back connecting rod half from the crankshaft (13) and front connecting rod half by threading a screw into the center back bore on the connecting rod. **Be careful not to mix up the connecing rod halves.** Push connecting rod shaft as far as possible into the crosshead guide.
14) Remove screws (10) and remove bearing covers (7 & 8) with the help of a screwdriver.
15) Remove the crankshaft (13) by carefully threading it through the connecting rods (15); make sure not to bend the connecting rods. Remove and dismantle connecting rods and plungers (16); pay attention to avoid damaging the plunger bases (16A).
16) Remove the oil seal (19) using a screwdriver.
17) To reinstall, press the oil seal (19) into the crankcase (1). Make sure that the oil seal groove faces inward towards the oil.
NOTE: Be careful not to score the crankcase guides where the oil seal sits and where the plunger base (16A) moves through the crankcase (1).
18) Insert connecting rods (25) with plunger bases (16A). Install the crankshaft (13). Mount bearing covers (7 & 8) together with the roller bearing (12) and tighten with screws (10) to 132 in.-lbs (15 Nm) and adjust clearance by fitting shims (8A/8B/8C) under the bearing cover (8) to ensure the crankshaft (13) turns easily with very little play.
19) Fit the connecting rod halves and tighten screws (15) at 97 in.-lbs. (11 Nm). Install crankcase cover (3) together with o-ring (4).
20) Install fluid end components (ref. instruction #12). When refitting the valve casing assembly, tighten hexagon socket screws (34) at 30 ft.-lbs. (40 Nm).