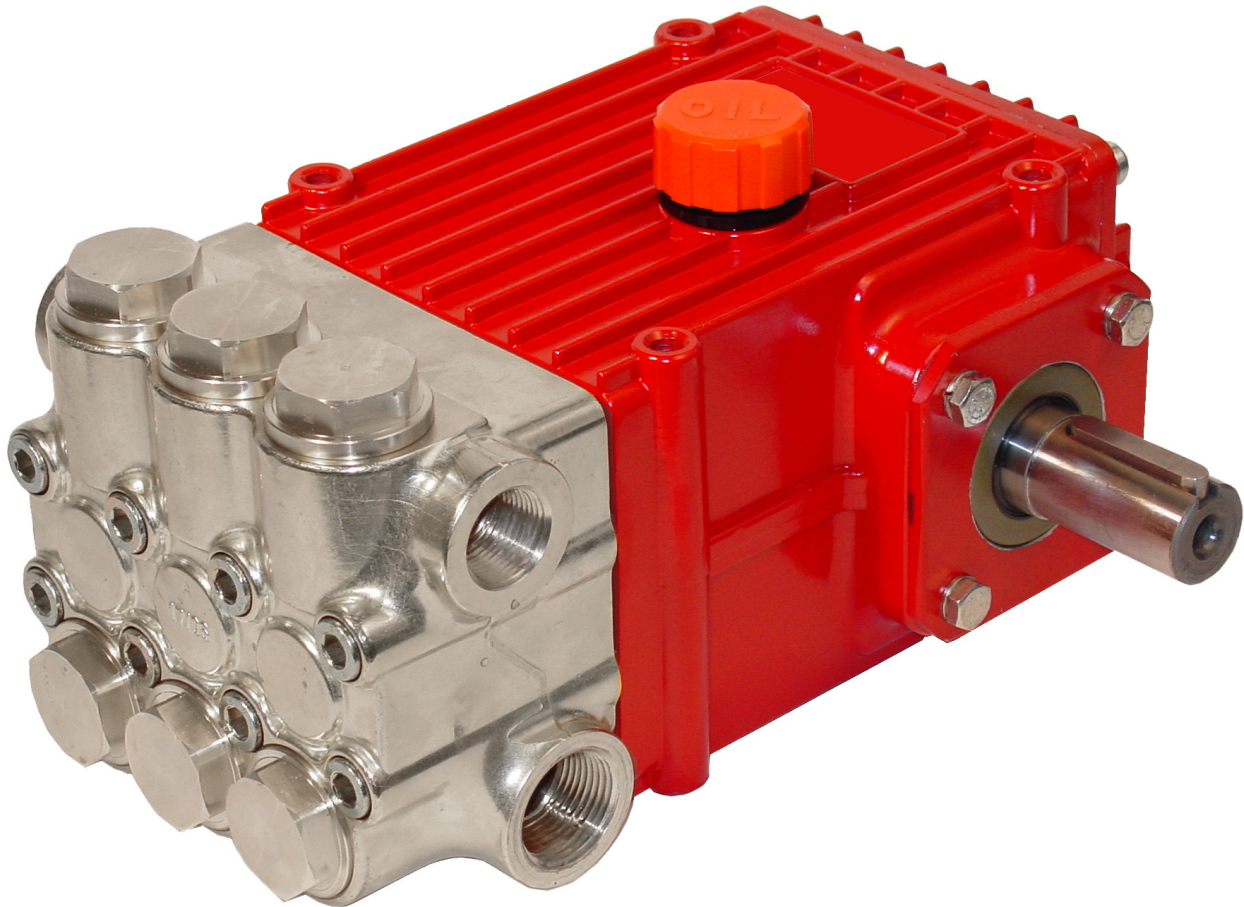


Models

CP420-5123

CP425-5123

Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service Manual
316 Stainless Steel
Corrosion Resistant
CO₂ Pump



Updated 12/19

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INSTALLATION INSTRUCTIONS

Operation

Check oil level prior to starting and ensure trouble-free water supply.

Important! The crankcase must be filled with synthetic motor oil of class SAE 0W 40 when pumping CO₂ under 0° C.

Initial oil change after 50 operating hours and then every 500 hours, after 1 year if used less. Caution when operating in damp places or with high temperature fluctuations. Oil must be changed immediately should condensate (frothy oil) occur in the gear box.

NPSH values must be observed.

Maximum input pressure is 508 PSI (35 bar). The maximum suction head is 14.5 PSI (1 bar). Make sure that suction pulsation is sufficiently dampened - water column resonance must be avoided.

Important! If the pump is not used for a long period of time, it is possible the seals (23/23B) could become hard or brittle thus causing the pump to leak when put into operation. If this is the case, we recommend these seals be replaced every 4 years.

Safety Rules

A safety valve is to be installed in accordance with the guidelines for liquid spraying units so that the admissible operating pressure cannot be exceeded by more than 10%. Pump operation without a safety valve as well as any excess in temperature or speed limits automatically voids the warranty.

When the pump is in operation, the drive shaft end and the coupling must be enclosed by a protective cover or a coupling bell.

Pressure in the discharge line and pump must be at zero before any maintenance to the pump takes place. Shut off suction line. Disconnect fuses to ensure that the driving motor does not get switched on accidentally. Make sure that all parts on the pressure side of the unit are vented before starting the pump. In order to prevent air, or an air-water mixture being absorbed and to prevent cavitation occurring, the pump NPSHR (=suction head) and water temperature must be respected.

Cavitation and/or compression of gases lead to uncontrollable pressure-kicks which can ruin pump and unit parts and also be dangerous to the operator or anyone standing nearby.

Eco₂Blast Plunger Pumps are suitable for pumping clean water and other non-aggressive or non-abrasive media with a specific weight similar to water.

Before pumping other liquids • especially Inflammable, explosive and toxic media - the pump manufacturer must be consulted with regard to the resistance of the pump material. It is the responsibility of the equipment manufacture and/or operator to ensure that all pertinent safety regulations are adhered to.

CP420-5123 and CP425-5123 Pump Specifications

	<u>U.S.</u>	<u>Metric</u>
Volume (CP425-5123)	5.5 GPM	21.0 L/min
Volume (CP420-5123)	6.4 GPM	24.3 L/min
Discharge Pressure (CP425-5123).....	2030 PSI	140 Bar
Discharge Pressure (CP420-5123).....	1740 PSI	120 Bar
Inlet Pressure.....	870 PSI	60 Bar
Stroke (CP425-5123).....	0.79"	20 mm
Stroke (CP420-5123).....	0.94"	24 mm
Speed	Up to 750 RPM	
Plunger Diameter.....	1.02"	25mm
Temperature of Pumped Fluids.....	-40 °F to 160 °F	-40 °C to 70 °C
Inlet Ports.....	(2) x 1" BSP	
Discharge Ports	(2) x 3/4" BSP	
Shaft Rotation	Top of pulley towards fluid end	
Crankshaft Diameter.....	1.10"	28 mm
Key Width	0.31"	8 mm
Shaft Mounting.....	Either side ¹	
Weight.....	38.3 lbs.	17.4 KG
Crankcase Capacity.....	30.4 fl.oz.	0.9 Liter

Consult the factory for special requirements that must be met if the pump is to operate beyond one or more of the limits specified above.

¹NOTES:

In order to drive the pump from the side opposite the present shaft extension, simply remove the valve casing from the crankcase and rotate the pumps 180 degrees to the desired position. Be certain to rotate the seal case (item #20) as well, so that the weep holes are down at the six o'clock position. Exchange the oil fill and the oil drain plugs, also. Refer to the repair instructions as necessary for the proper assembly sequence.

HORSEPOWER RATINGS:

The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

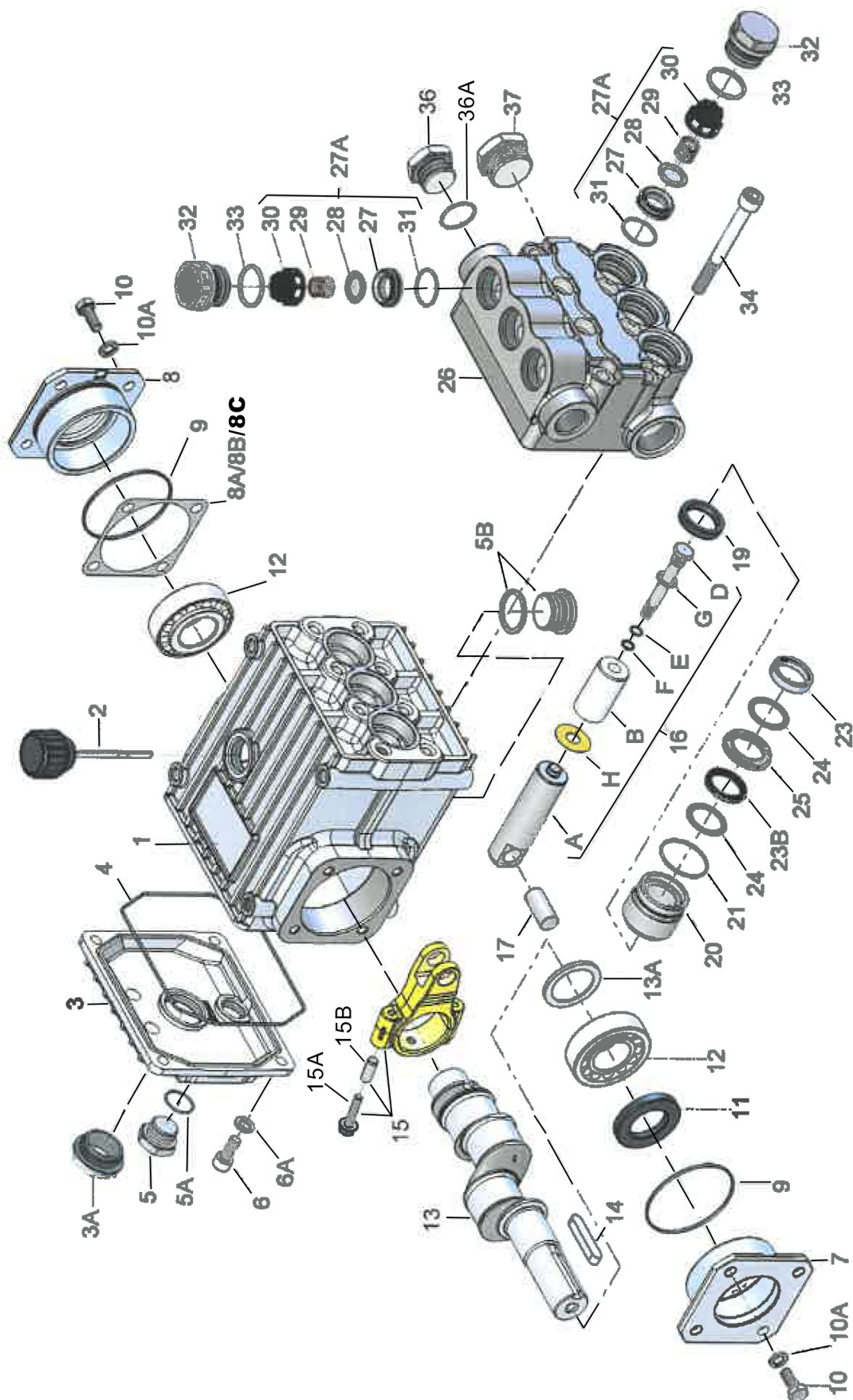
We recommend a 1.15 service factor be specified when selecting an electric motor as the power source. To compute specific pump horse power requirements, use the following formula:

$$HP = (GPM \times PSI) / 1450$$

CP420 HORSEPOWER REQUIREMENTS					
RPM	GPM	500 PSI	1000 PSI	1500 PSI	1740 PSI
350	3.00	1.0	2.1	3.1	3.6
450	3.85	1.3	2.7	4.0	4.6
550	4.71	1.6	3.2	4.9	5.6
650	5.56	1.9	3.8	5.8	6.7
750	6.42	2.2	4.4	6.6	7.7

CP425 HORSEPOWER REQUIREMENTS					
RPM	GPM	500 PSI	1000 PSI	1500 PSI	2030 PSI
350	2.59	0.9	1.8	2.7	3.6
450	3.33	1.1	2.3	3.4	4.7
550	4.07	1.4	2.8	4.2	5.7
650	4.81	1.7	3.3	5.0	6.7
750	5.55	1.9	3.8	5.7	7.8

EXPLODED VIEW - CP420-5123 and CP425-5123



CP420-5123 and CP425-5123 SPARE PARTS LIST

ITEM	PART	DESCRIPTION	QTY.	ITEM	PART	DESCRIPTION	QTY.
1	CP08377	Crankcase	1	16A	CP08384-0600	Plunger Base	3
2	CP08378	Oil Fill Plug with Gasket	1	16B	CP05960	Plunger Pipe	3
3	CP06479	Crankcase cover	1	16D	CP08399-0100	Tensioning Screw	3
3A	CP07186	Oil Sight Glass w/ Gasket	1	16E	CP07023-0001	O-Ring, EPDM	3
4	CP08380	O-Ring	1	16F	CP07203	Backup Ring	3
5	CP07109-0400	Oil Drain Plug	1	16G	CP07161-0100	Seal Ring	3
5A	CP06015	O-Ring	1	16H	CP06431	Flinger	3
5B	CP08092-0100	Plug with Gasket	1	17	CP06790	Crosshead Pin	3
6	CP08093	Screw	4	19	CP05444	Oil Seal	3
6A	CP01011-0400	Spring Washer	4	20	CP05443-0100	Seal Case	3
7	CP04739	Bearing Cover, Open	1	21	CP07266-0003	O-Ring, EPDM	3
8	CP05291	Bearing Cover, Closed	1	23	CP06144	V-Sleeve, Brown	3
8A	CP05292	Shim	1-3	23B	CP12255-0020	Weep Seal	3
8B	CP05293	Shim (May not be present)	1	24	CP08376	Pressure Ring	6
8C	CP05964	Shim (May not be present)	1-2	25	CP08394-0100	Weep Return Ring	3
9	CP01016	O-Ring	2	26	CP06255-5000	Manifold	1
10	CP07114-0100	Screw with Washer	8	27A	CP04643-0103	Valve Assembly	6
10A	CP01011-0400	Spring Washer	8	27	CP08370-0100	Valve Seat	6
11	CP07459	Radial Shaft Seal	1	28	CP06791-0100	Valve Plate	6
12	CP05350	Taper Roller Bearing	2	29	CP06377-0100	Valve Spring	6
13	CP04741	Crankshaft (CP420-5123)	1	30	CP08372	Valve Spring Retainer	6
13	CP04740	Crankshaft (CP425-5123)	1	31	CP07212-0003	O-Ring, EPDM	6
13A	CP04742	Spacer Ring	1	32	CP08373-0600	Plug	6
14	CP08091	Fitting Key	1	33	CP07214-0003	O-Ring, EPDM	6
15	CP08390	Connecting Rod Assembly	3	34	CP08396-0100	Hexagon Screw	8
15A	CP05349	Connecting Rod Screw	3	36	CP13150-0100	Plug, 3/4" BSP	1
15B	CP05348	Adapter Sleeve	3	36A	CP06808	Steel Ring	1
16	CP05351-0100C	Plunger Assembly, (items 16A-16H)	3	37	CP13321-0100	Plug, 1" BSP	1

CP420-5123 and CP425-5123 Repair Kits

Plunger Packing Kit

CP09595

Item	Part #	Description	Qty
21	CP07266-0003	O-Ring	3
23	CP06144	V-Sleeve	3
23B	CP12255-0020	Weep Seal	3
24	CP08376	Pressure Ring	6

Valve Assembly Kit

CP09596-0103

Item	Part #	Description	Qty.
27A	CP04643-0103	Valve Assembly, Complete	6
33	CP07214-0003	O-Ring	6

Oil Seal Kit

P400 Series - # CP09641

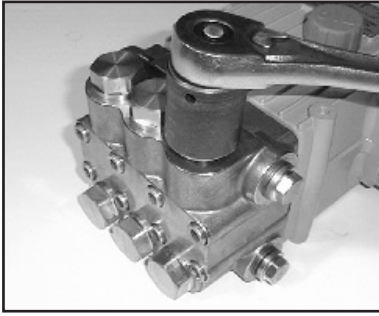
Item	Part #	Description	Qty
19	CP05444	Oil Seal	3

Preventative Maintenance Check-List & Recommended Spare Parts List

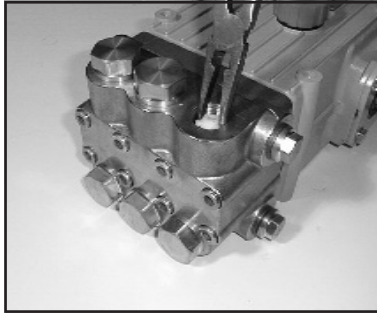
Check	Daily	Weekly	50hrs	Every 500 hrs	Every 1500 hrs	Every 3000 hrs
Oil Level/Quality	X					
Oil Leaks	X					
Water Leaks	X					
Belts, Pulley		X				
Plumbing		X				
Recommended Spare Parts						
Oil Change (p/n 1154)			X	X		
Seal Spare Parts (1 kit/pump) (See this page for kit list)					X	
Oil Seal Kit (1 kit/pump) (See this page for kit list)					X	
Valve Spare Parts (1 kit/pump) (See this page for kit list)						X

Repair Instructions - CP420-5123 and CP425-5123

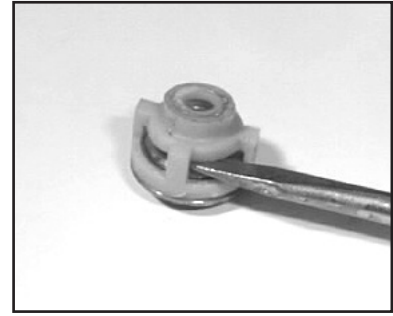
Note: Always take time to lubricate all metal and nonmetal parts with a light film of oil before reassembly. This step will ensure proper fit, at the same time protecting the pump nonmetal parts (i.e., the elastomers) from cutting and scoring.



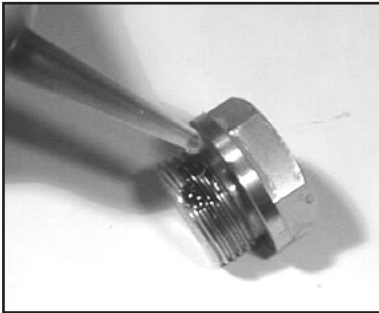
- 1) With a socket wrench, remove the three discharge valve plugs and three inlet valve plugs (32). Inspect the o-ring (33) for wear and replace if damaged.



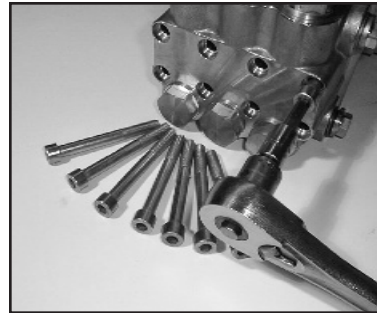
- 2) Using needle nose pliers, remove the inlet and discharge valve assemblies (27A). Note: It may become necessary to remove the valve seat (27) from the valve casing using a slidehammer.



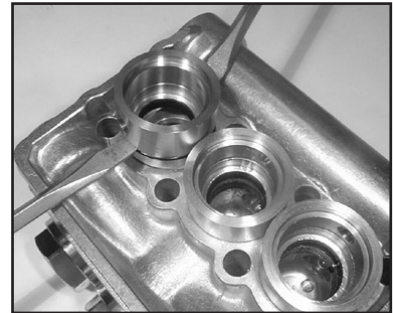
- 3) By inserting a small screw driver between the valve seat (27) and the valve spring retainer (30), the valve assembly can be separated.



- 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 adapters (20) and weep return rings (25) from the valve casing.



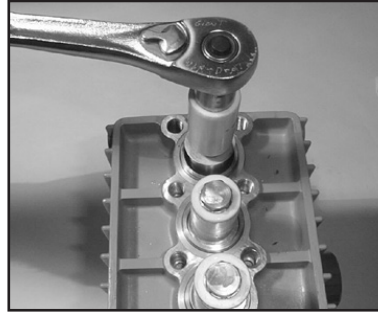
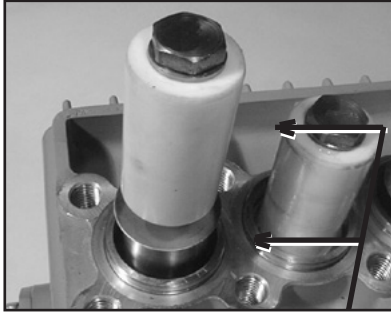
- 7) Remove the pressure rings (24) and v-sleeves (23).



- 8) Remove the weep grooved seal (23B) together with pressure ring 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.

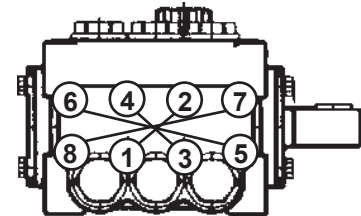
Repair Instructions - CP420-5123 and CP425-5123



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.

- 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 243 and tighten carefully to 22 ft.-lbs. (30NM).
- 11) If oil leaks 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), carefully pry out the oil seal with a flat screwdriver and replace it with a new one. 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).
- 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 22 ft.-lbs.(40 NM) in a cross-ing pattern (as shown at right).



Pump Torque Specifications/Lubrication

<u>Position</u>	<u>Item#</u>	<u>Description</u>	<u>Lubrication Info</u>	<u>U.S (Metric)</u>
3A	07186	Oil Sight Glass	Loctite 5910	106 in.-lbs. (12 Nm)
5	07109-0400	Oil Drain Plug		59 ft.-lbs. (80 Nm)
5B	08092-0100	Plug with Gasket		59 ft.-lbs. (80 Nm)
6	08093	Screw		110 in.-lbs. (12.5 Nm)
10	07114-0100	Screw with Washer		132 in.-lbs. (15 Nm)
15A	05349	Connecting Rod Screw		97 in.-lbs. (11 Nm)
16D	08399-0100	Tensioning Screw		22 ft.-lbs. (30 Nm)
32	08373-0600	Plug		107 ft.-lbs. (145 Nm)
34	08396-0100	Cap Screw		22 ft.-lbs. (40 Nm)

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