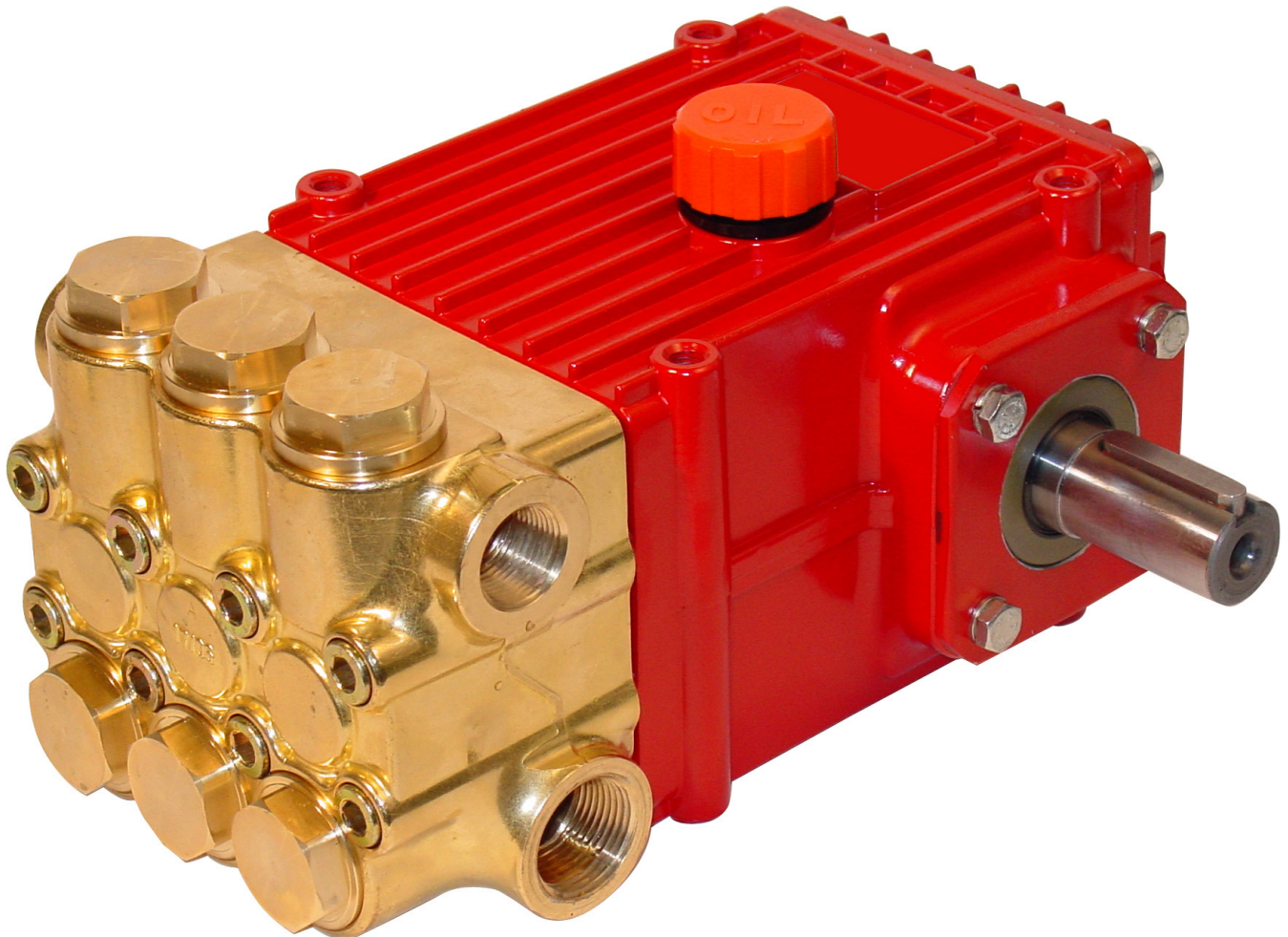


# Model CP420/CP425

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Triplex Ceramic  
Plunger Pump  
Operating Instructions/  
Repair and Service  
Manual



Updated 01/25

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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 CO<sub>2</sub> 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 (23/238) 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.**

SPECK TRIPLEX 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 & CP425 Pump Specifications

	<u>U.S.</u>	<u>Metric</u>
Volume (CP420) .....	6.4 GPM	24.3 L/min
Volume (CP425) .....	5.5 GPM	21.0 L/min
Discharge Pressure (CP420).....	1740 PSI	120 Bar
Discharge Pressure (CP425).....	2000 PSI	140 Bar
Inlet Pressure.....	14-500 PSI	1-35 Bar
Stroke (CP420).....	0.98"	24mm
Stroke (CP425).....	0.79"	20mm
Speed .....	Up to 750 RPM	
Plunger Diameter.....	1.02"	25mm
Temperature of Pumped Fluids.....	-40 °F to 32 °F	-40 °C to 0 °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"	28mm
Key Width .....	0.31"	8mm
Shaft Mounting.....	Either side <sup>1</sup>	
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.

## <sup>1</sup>NOTES:

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.

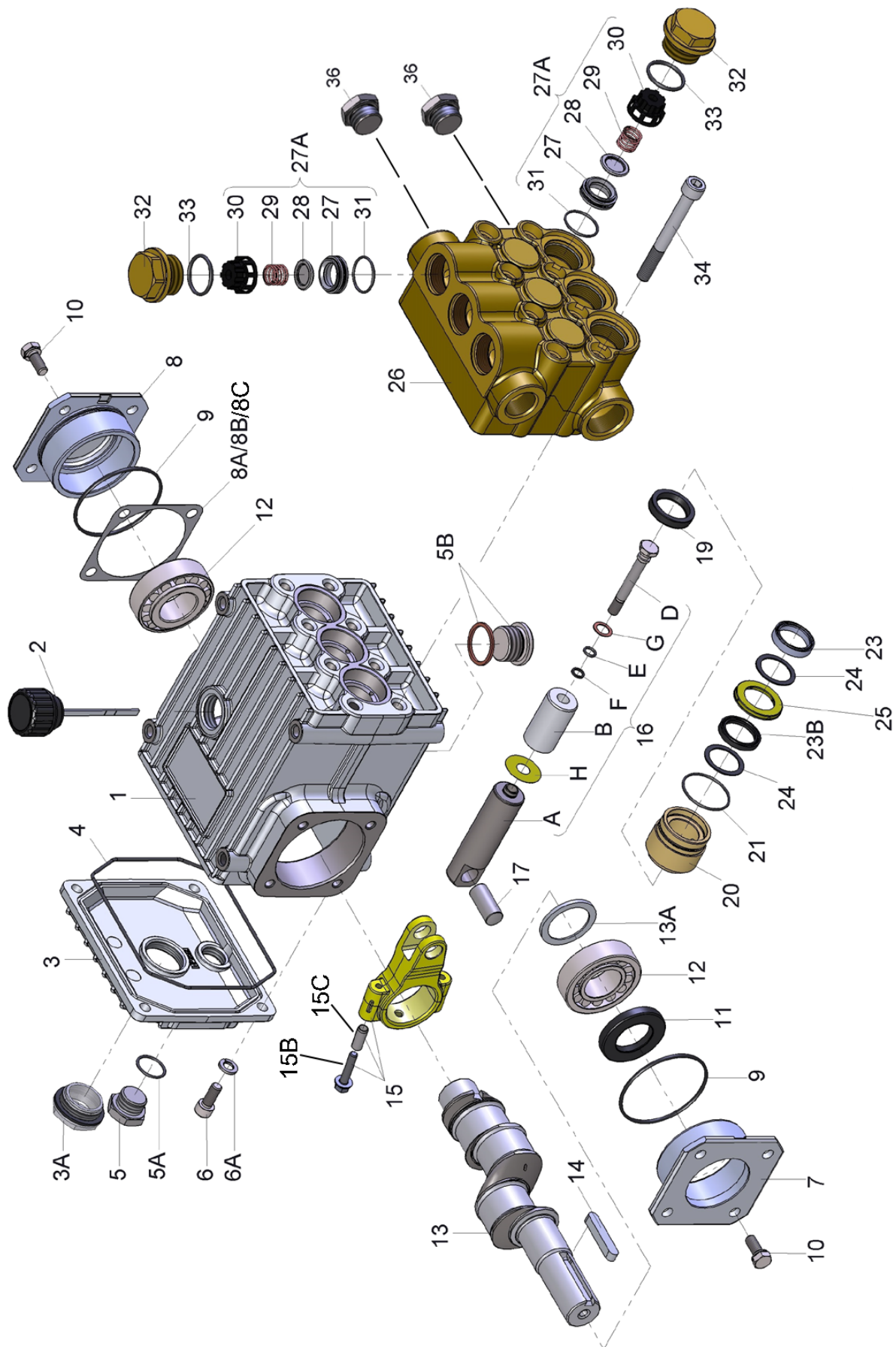
We recommend a 1.15 service factor be specified when selecting an electric motor as the power source. To compute specific pump horse power requirements, use the following formula:

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

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

# CP420 & CP425 Exploded View





## CP420 & CP425 Spare Parts List

<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	CP08377	Crankcase	1	16A	CP05352	Plunger Base	3
2	CP08378	Oil Fill Plug with Gasket	1	16B	CP05960	Plunger Pipe, 25mm	3
3	CP06479	Crankcase cover	1	16D	CP08399	Tension Screw	3
3A	CP07186	Oil Sight Glass w/ Gasket	1	16E	CP07023	O-Ring	3
4	CP08380	O-Ring	1	16F	CP07203	Backup Ring	3
5	CP07109	Oil Drain Plug	1	16G	CP07258	Copper Washer	3
5A	CP06015	Gasket for Oil Drain Plug	1	16H	CP06431	Oil Scraper	3
5B	CP08092	Plug with Gasket	1	17	CP06790	Crosshead Pin	3
6	CP01010	Screw	4	19	CP05444	Oil Seal	3
6A	CP01010-0400	Spring Washer	4	20	CP05443	Seal Adapter	3
7	CP04739	Bearing Cover, open	1	21*	CP07266-0003	O-Ring, EPDM	3
8	CP05291	Bearing Cover, closed	1	23	CP12254	Grooved Seal, Brown	3
8A	CP05292	Shim	1	23B	CP12255-0020	Grooved Seal, Teflon	3
8B	CP05293	Shim	1	24	CP08376	Pressure Ring	6
		(May not be present)	1	25	CP08394	Weep Return Ring	3
8C	CP05264	Shim	1-2	26	CP06999	Manifold, Brass	1
9	CP01016	O-Ring	2	27	CP08370	Valve Seat	6
10	CP07114	Screw with Washer	8	27A	CP04643	Valve Assembly (27-31)	6
11	CP07459	Radial Shaft Seal	1	28	CP06791-0100	Valve Plate, 316 S.S.	6
12	CP05350	Bearing	2	29	CP06377-0100	Valve Spring, 316 S.S.	6
13	CP04741	Crankshaft (CP420)	1	30	CP08372	Spring Tension Cap	6
13	CP04740	Crankshaft (CP425)	1	31*	CP07212-0003	O-Ring, EPDM	6
13A	CP04742	Spacer Ring	1	32	CP08373	Plug	6
14	CP08091	Fitting Key	1	33*	CP07214-0003	O-Ring, EPDM	6
15	CP08390	Connecting Rod	3	34	CP08396	Cap Screw	8
		Assembly	3	36	CP07703	Plug, 3/4" BSP	1
15B	CP05349	Connecting Rod Screw	3	36A	12249	Plug, 1" BSP	1
15C	CP05348	Adapting Sleeve	3	*The O-Rings must not come into contact with mineral oil or mileral grease. Use silicone grease only.			
16	CP05959	Plunger Assembly	3				
		For items 16A-16G	3				

## CP420 & CP425 Repair Kits

### Plunger Packing Kit - # CP09595

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
21	CP07266-0003	O-Ring, EPDM	3
22	CP08059	O-Ring	3
23	CP12254	Grooved Seal, Brown	3
23B	CP12255-0020	Grooved Seal, Teflon	3
24	CP08376	Pressure Ring	6

### Valve Assembly Kit - # CP09596

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
27A	CP04643	Valve Assembly	6
33	CP07214-0003	O-Ring, EPDM	6

### Oil Seal Kit - # CP09641

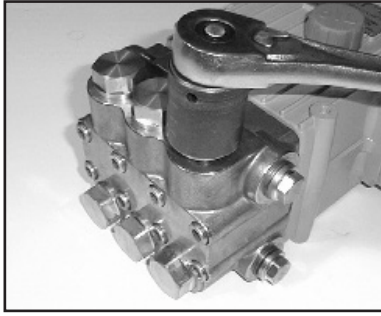
<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
19	CP05444	Oil Seal	3

## CP420 & CP425 Torque Specifications

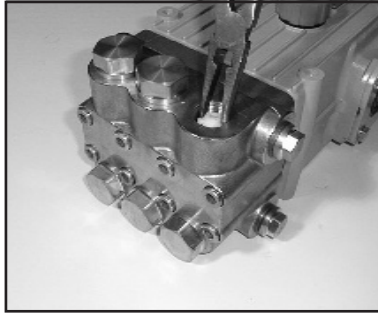
<u>Position</u>	<u>Item#</u>	<u>Description</u>	<u>U.S</u>	<u>Metric</u>
15A	CP07311	Screw with Washer	97 in.-lbs.	11 Nm
16D	CP08399	Tensioning Screw	21 ft.-lbs.	28 Nm
32	CP08373	Plug	107 ft.-lbs.	145 Nm
34	CP08396	Cap Screw	30 ft.-lbs.	40 Nm

## CP420 & CP425 PUMP REPAIR INSTRUCTIONS

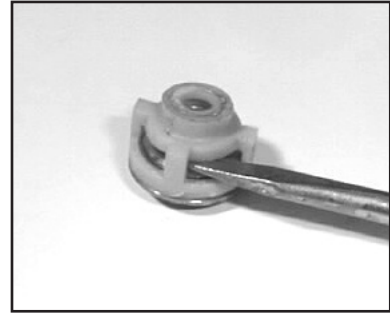
*Note: All o-rings and seals must not come into contact with mineral oil. Use silicone grease only.*



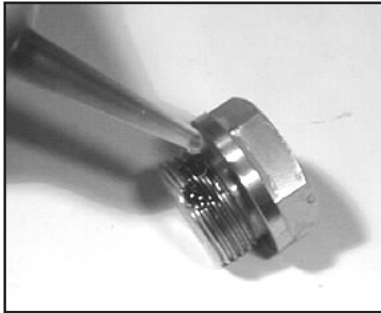
- 1) With a socket wrench, remove the three discharge valve plugs and three inlet valve plugs (32). Inspect the o-ring (33) for wear and replace if damaged.



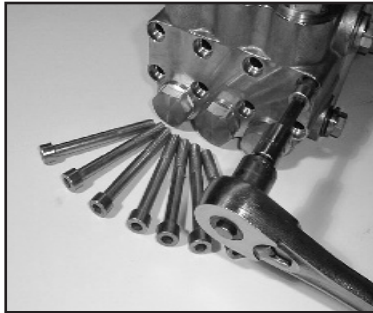
- 2) Using needle nose pliers, remove the inlet and discharge valve assemblies (27A). Note: It may become necessary to remove the valve seat (27) from the valve casing using a slidehammer.



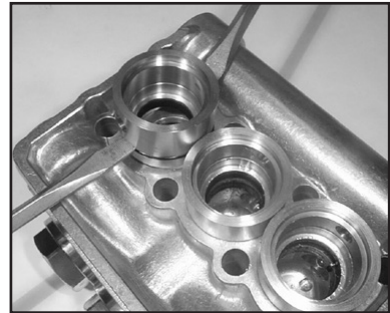
- 3) By inserting a small screw driver between the valve seat (27) and the valve spring retainer (30), the valve assembly can be separated.



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



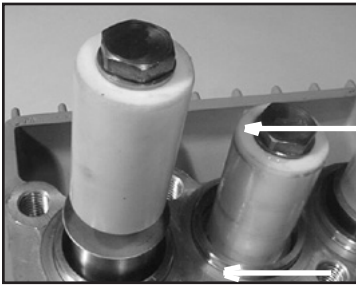
- 7) Remove the pressure rings (24) and grooved seals (23) from the valve casing (26).



- 8) Remove the weep grooved seal (23B) together with pressure ring (24) out of the seal adaptor (20). Check O-rings (21). Coat new seals and o-rings with silicone grease.

**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.

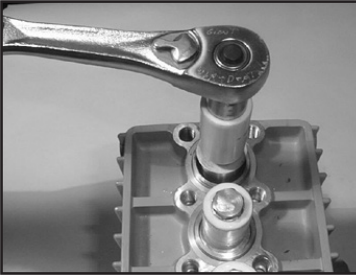
## CP420 & CP425 PUMP REASSEMBLY INSTRUCTIONS



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

**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.

**IMPORTANT!** Glue must never come between the plunger pipe (16B) and the centering support on the plunger (16A). The plunger pipe is not to be strained by excessive tightening of the tension screw or through damage to the front surface as this can lead to breakage.



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 22 ft.-lbs. (28 Nm).

11) If oil leaks under the plunger (16), the oil seals (19) need to be replaced. Remove oil plug (5) and drain oil.

12) Remove crankcase cover (3). Remove valve casing (26), seal casing (21), seal adaptors (20) as well as plunger pipes (16B) and oil scrapers (16H) as described previously.

13) Take off screws on connecting rods (15), separate the back connecting rod half from the crankshaft and front connecting rod half by screwing a screw into the center back bore on the connecting rod. **Be careful not to mix up the connecting rod halves.** Push connecting rod shaft as far as possible into the crosshead guide.

14) Take off screws (10) and remove bearing covers (7+8) with the help of a screwdriver. Take out the crankshaft carefully threading it through the connecting rods (15), making sure not to bend the connecting rods. Remove and dismantle connecting rods and plungers (16) paying attention not to damage the plungers.

15) Pry out gear seal (19) using a screwdriver.

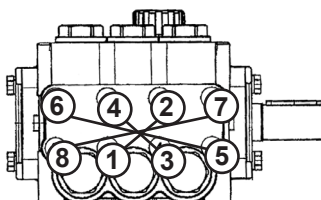
16) To reinstall, press the gear seal (19) into the drive casing first. Then insert connecting rods with plungers. Thread in the crankshaft. Mount bearing covers (7, 8) together with the roller bearing (12) and fix with screws (10).

17) Mount bearing cover (8) and adjust clearance by fitting shims (8A/8B) under the bearing cover (8) to ensure the crankshaft turns easily with very little play.

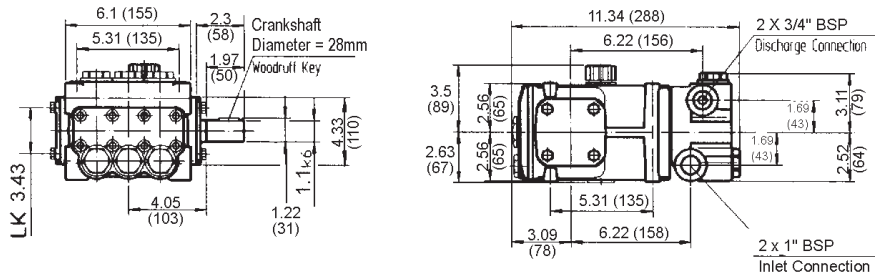
18) Fit the connecting rod halves and tighten screws (15) at 97 in.-lbs. (11 Nm). Mount crankcase cover (3) together with o-ring (4).

19) When refitting the valve casing, tighten hexagon socket screws (34) at 30 ft.-lbs (40 Nm) in the pattern shown below.

20) **Switching the orientation of the crankshaft.** Should you need to change the orientation of the crankshaft, remove the valve casing, turn seal adaptors (20) 180° around, turn valve casing 180° around and remount. Interchange plug (5B) and oil filler plug (2), and turn gear cover 180° around.



## CP420 & CP425 Pump Dimensions - Inches (mm)



### LIMITED WARRANTY

Eco<sub>2</sub>Blast pumps and accessories are warranted by the manufacturer to be free from defects in workmanship and material as follows:

1. For portable pressure washers and car wash applications, the discharge manifolds will never fail, period. If they ever fail, we will replace them free of charge. Our other pump parts, used in portable pressure washers and in car wash applications, are warranted for five years from the date of shipment for all pumps used in NON-SALINE, clean water applications.
2. One (1) year from the date of shipment for all other Eco<sub>2</sub>Blast industrial and consumer pumps.
3. Six (6) months from the date of shipment for all rebuilt pumps.
4. Ninety (90) days from the date of shipment for all Eco<sub>2</sub>Blast accessories.

This warranty is limited to repair or replacement of pumps and accessories of which the manufacturer's evaluation shows were defective at the time of shipment by the manufacturer. The following items are NOT covered or will void the warranty:

1. Defects caused by negligence or fault of the buyer or third party.
2. Normal wear and tear to standard wear parts.
3. Use of repair parts other than those manufactured or authorized by Eco<sub>2</sub>Blast.
4. Improper use of the product as a component part.
5. Changes or modifications made by the customer or third party.
6. The operation of pumps and or accessories exceeding the specifications set forth in the Operations Manuals provided by Eco<sub>2</sub>Blast.

Liability under this warranty is on all non-wear parts and limited to the replacement or repair of those products returned freight prepaid to Eco<sub>2</sub>Blast which are deemed to be defective due to workmanship or failure of material. A Returned Goods Authorization (R.G.A.) number and completed warranty evaluation form is required prior to the return to Eco<sub>2</sub>Blast of all products under warranty consideration. Call (260)728-4433 to obtain an R.G.A. number.

Repair or replacement of defective products as provided is the sole and exclusive remedy provided hereunder and the MANUFACTURER SHALL NOT BE LIABLE FOR FURTHER LOSS, DAMAGES, OR EXPENSES, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGES DIRECTLY OR INDIRECTLY ARISING FROM THE SALE OR USE OF THIS PRODUCT.

THE LIMITED WARRANTY SET FORTH HEREIN IS IN LIEU OF ALL OTHER WARRANTIES OR REPRESENTATION, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL SUCH WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY THE MANUFACTURER.



**WARNING:** This product might contain a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm.  
For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)



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Phone: (260)728-4433  
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