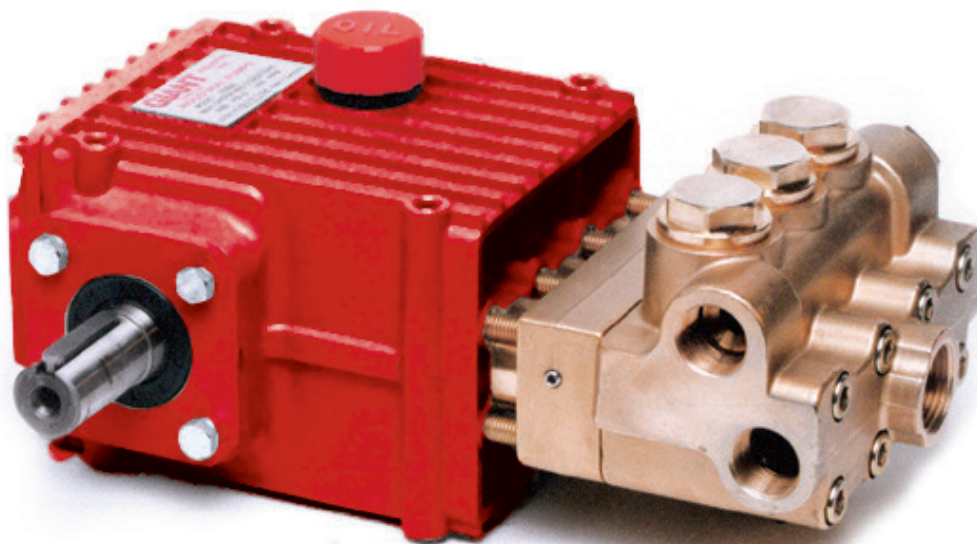


# Model CP470

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Triplex Ceramic  
Plunger Pump  
Operating Instructions/  
Repair and Service  
Manual



Updated 07/19

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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 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) 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.**

Giant 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.**

# Specifications Model CP470

	<b>U.S.</b>	<b>Metric</b>
Volume.....	9.25 GPM .....	35 L/min
Discharge Pressure.....	1740 PSI .....	120 Bar
Inlet Pressure .....	14-870 PSI.....	1-60 Bar
Stroke .....	0.94".....	24mm
Speed .....	Up to 750 RPM	
Plunger Diameter.....	1.18" .....	30mm
Temperature of Pumped Fluids .....	-40 °F to 32 °F .....	-40 °C to 0 °F
Inlet Ports .....	(1) x 1" BSP, (2) x 3/4" 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 .....	39.7 lbs. ....	18 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.

<b>CP470 HORSEPOWER REQUIREMENTS</b>					
RPM	GPM	500 PSI	1000 PSI	1500 PSI	1740 PSI
350	4.32	1.5	3.0	4.5	5.2
450	5.55	1.9	3.8	5.7	6.7
550	6.78	2.3	4.7	7.0	8.1
650	8.02	2.8	5.5	8.3	9.6
750	9.25	3.2	6.4	9.6	11.1

**HORSEPOWER RATINGS:**

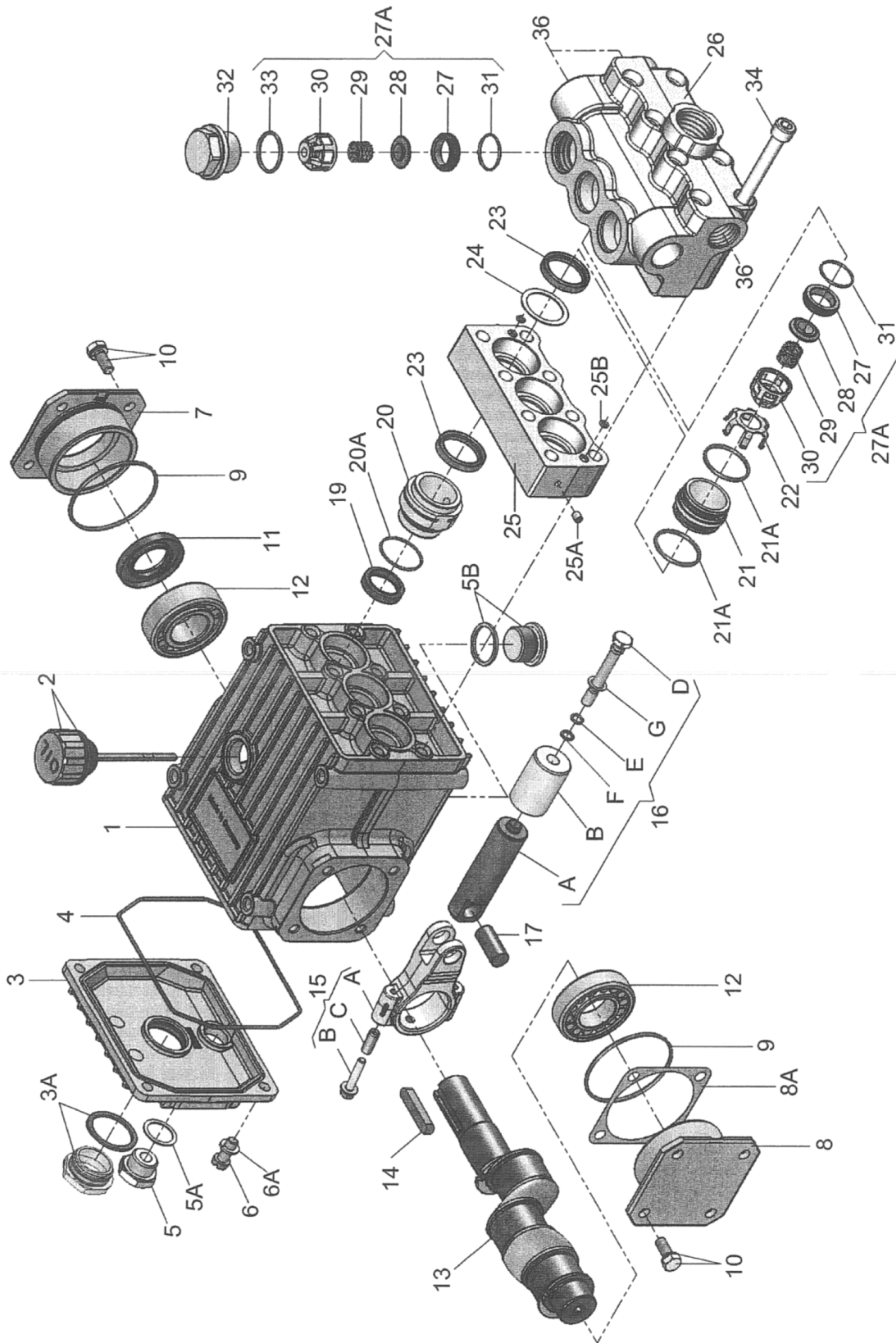
The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

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

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

# Exploded View - CP470 Pump

Note: Do not use mineral oil on seals and o-rings.  
Use silicone grease only.



## CP470 PUMP 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	16E	CP07023	O-Ring	3
2	CP08378	Oil Fill Plug with Gasket	1	16F	CP07203	Backup Ring	3
3	CP06479	Crankcase cover	1	16G	CP07258	Copper Washer	3
3A	CP07186	Oil Sight Glass w/ Gasket	1	17	CP06790	Crosshead Pin	3
4	CP08380	O-Ring	1	19	CP08366	Oil Seal	3
5	CP07109	Oil Drain Plug, 1/2" BSP	1	20	CP06928	Gear Seal Adapter	3
5A	CP06015	O-Ring for Oil Drain Plug	1	20A	CP08059	O-Ring	3
5B	CP08092	Plug with Gasket	1	21	CP06929	Seal Sleeve	3
6	CP01010	Screw	4	21A*	CP07150-0003	O-Ring, EPDM	6
6A	CP01010-0400	Spring Washer	4	22	CP06930	Valve Holder	3
7	CP04739	Bearing Cover, Open	1	23	CP06931-0020	Grooved Seal	6
8	CP05291	Bearing Cover, Closed	1	24	CP06932	Support Ring	3
8A	CP05292	Shim, 0.1 mm	1-3	25	CP06933	Intermediate Casing	1
8B	CP05293	Shim, 0.2 mm		25A	CP05934	Thread Plug	2
		(May not be present)	1	25B*	CP02009-0003	O-Ring, EPDM	2
8C	CP05964	Shim, 0.15 mm		26	CP06935	Manifold, Brass	1
		(May not be present)	2	27A	CP06936-0003	Valve Assembly	6
9	CP01016	O-Ring	2	27	CP06937	Valve Seat	6
10	CP07114	Screw with Washer	8	28	CP06938	Valve Plate	6
11	CP07459	Radial Shaft Seal	1	29	CP06377-0100	Valve Spring	6
12	CP05350	Taper Roller Bearing	2	30	CP06939	Spring Tension Cap	6
13	CP04741	Crankshaft	1	31*	CP07212-0003	O-Ring, EPDM	6
13A	CP04742	Spacer Ring	1	32	CP08373	Plug	3
14	CP08091	Fitting Key	1	33*	CP07214-0003	O-Ring, EPDM	3
15	CP08390	Connecting Rod Assembly	3	34	CP06494	Inner Cap Screw	8
15A	CP07311	Screw with Washer	6	36	CP07703	Plug, 3/4" BSP	3
16	CP05961	Plunger Assy., (16A-16G)	3				
16A	CP05352	Plunger Base	3				
16B	CP05962	Plunger Pipe	3				
16D	CP08399	Tension Screw	3				

\*The EPDM (Buna) O-Rings must not come into contact with mineral oil or mineral grease. Use silicone grease only.

## CP470 PUMP REPAIR KITS

### Plunger Packing Kit - # CP09718

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
20A	CP08059	O-Ring, EPDM	3
21A	CP07150-0003	O-Ring, EPDM	6
23	CP06931-0020	Grooved seal	6
24	CP06932	Support Ring	3
25B	CP02009-0003	O-Ring, EPDM	2

### Valve Assembly Kit - # CP09719

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
27A	CP06936-0003	Valve Assembly	6
33	CP07214-0003	O-Ring, EPDM	3

### Oil Seal Kit - # 09306

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
19	CP08366	Oil Seal	3

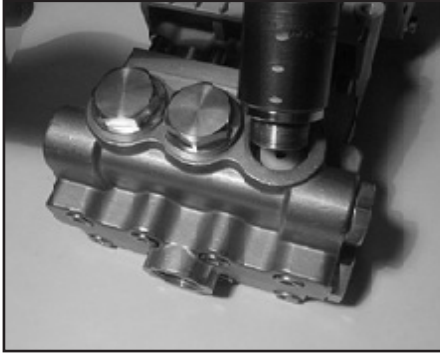
## CP470 PUMP TORQUE SPECIFICATIONS

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Torque Amount</u>
3A	CP07186	Oil Sight Glass	106 in.-lbs. (12 Nm)
5	CP07109	Oil Drain Plug	59 ft.-lbs. (80 Nm)
5B	CP08092	Plug	59 ft.-lbs. (80 Nm)
6	CP01010	Screw	110 in.-lbs. (12.5 Nm)
10	CP07114	Screw w/Washer	132 in.-lbs. (15 Nm)
15A	CP07311	Screw with Washer	97 in.-lbs. (11 Nm)
16D	CP08399	Tension Screw	247 in.-lbs. (28 Nm)
32	CP08373	Plug	132 in.-lbs. (15 Nm)
34	CP06494	Cap Screw	30 ft.-lbs. (40 Nm)

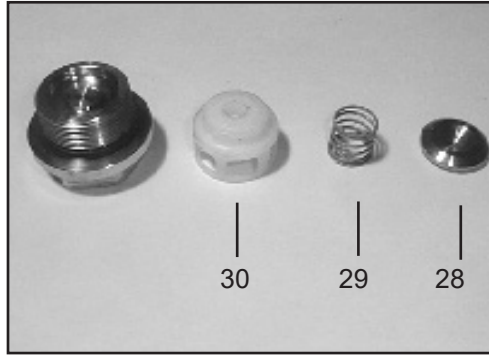
# REPAIR INSTRUCTIONS - CP470

Note: Do not use mineral oil on seals and o-rings. Use silicone grease only.

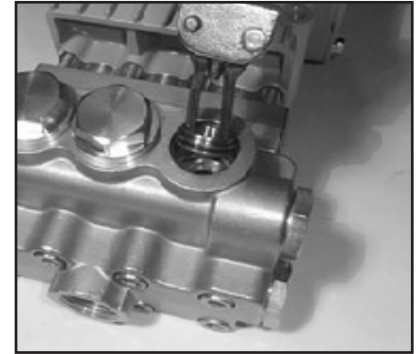
## To Check Valves



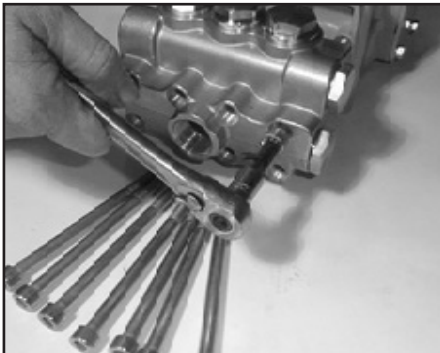
1. Remove plugs (32) with socket wrench.



2. Remove the exposed spring tension cap (30) from valve seat by pushing it sideways with a screwdriver. Remove spring tension cap (30), valve spring (29), and valve plate (28).



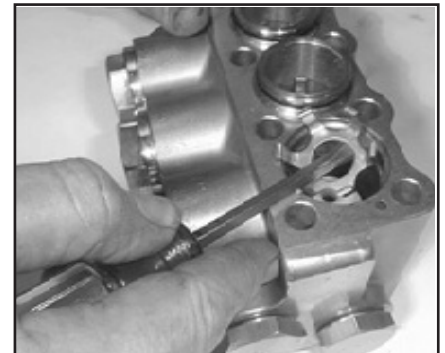
3. Pull out valve seat (27) and O-ring (31) with a valve puller. Check O-ring for wear.



4. Remove hexagon socket screws (34) and remove valve casing (26) by pulling them frontwise over the plungers (16)



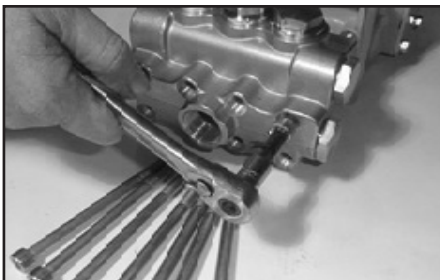
5. Using two screwdrivers, remove seal case (21)



6. The exposed suction valve parts are to be removed the same way as the discharge valves as described above. Check valve components for wear and damage. Check O-rings (21A and 31). Replace worn parts. Reassemble in same order. Coat new O-Rings with silicone grease before installation. Coat O-rings (25B) with silicon grease and place them in their recesses. Insert seal cases (21) into valve casing (26) before mounting the whole unit. Slide valve casing over plungers. Tighten hexagon socket screws (34) at 22 ft.-lbs. (40 Nm).

**Important:** When extracting the valve holders (22), make sure not to scratch the outer bore diameter as this is a sealing

## To Check To Check Seals and Plunger Pipe

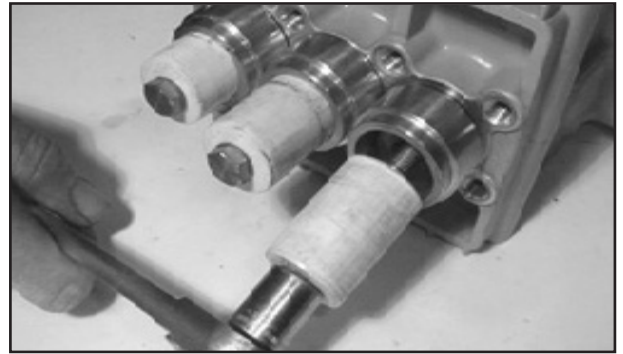
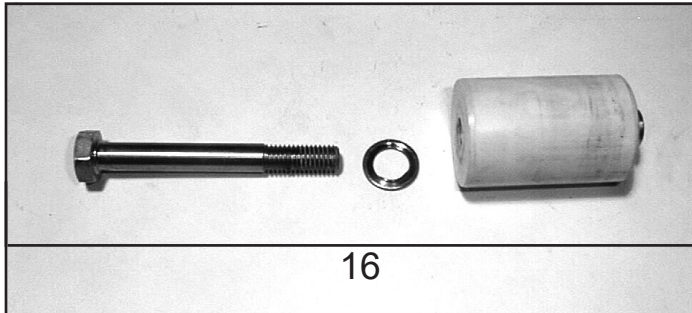


7. Remove hexagon socket screws (34).



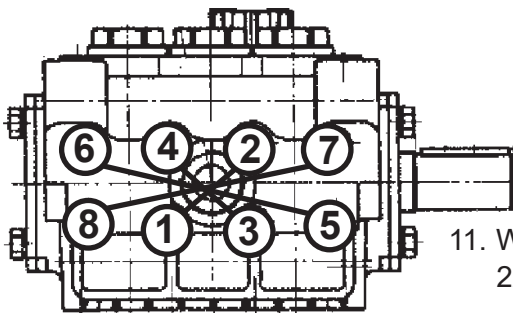
8. Using two screwdrivers, gently pry seal cases (21) out of the valve casing (26) or intermediate casing (25). Press grooved rings (23) and support rings (24) out of intermediate casing (25) using a screwdriver. Check O-rings (21A/25B). Examine seals (23). Replace worn seals.

# REPAIR INSTRUCTIONS - CP470



9. Check plunger surfaces (16). Damaged surfaces lead to 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 desposits in the pump, care must be taken that the weep-return bore in parts (25) and (26) ensure trouble-free weep-return.



10. If the plunger pipe (16B) is worn, remove tension screw (16D) and remove together with plunger pipe. Check and clean plunger (16A) surfaces and mount new plunger pipe. Cover thread of tension screw (16D) with a thin film of Loctite and tighten carefully at 247 in-lbs (28 Nm).

**Important:** Glue must never come between the plunger pipe (16B) and the centring sleeve (16C). The plunger pipe is not to be strained by eccentric tightening of the tension screw or through damage to the front surface as this can lead to breakage.

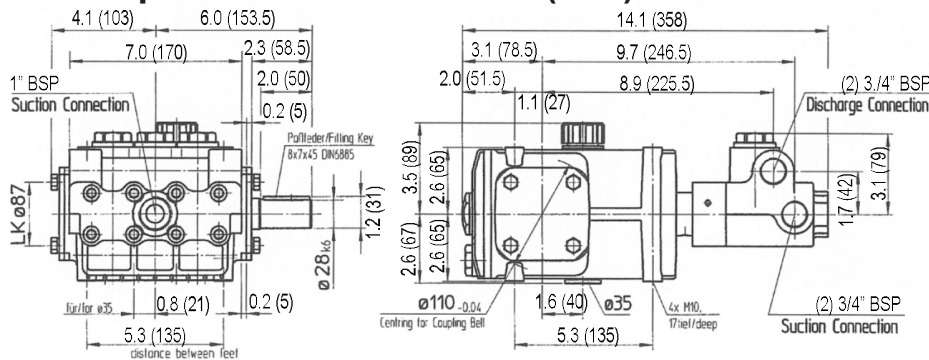
11. When reassembling, tighten inner hexagon screw (34) at 22 ft-lbs. (40 Nm) in a crossing pattern (as shown on left).

## Gear and Plunger

If oil leaks where the plungers (16) protrude out of the gear, gear seals (19) and plungers must be examined and replaced if necessary.

- a) **Gear Seal:** Remove oil plug (5) and drain oil. Remove valve casing (26) together with seal casing (25) as described above. Dismantle plunger pipe (16B). Pry gear seal adaptor (20) out of the crankcase using a screwdriver; take out gear seal (19) and replace it.
- b) **Plungers:** Remove oil plug (5) and drain oil; remove crankcase cover (3). Remove valve casing (26), seal casing (25), gear seal adaptors (20) and plunger pipes (16B) as described above. Remove screws on conn-rods (15). Be careful not to mix up the connecting rod halves. Push connecting rod shaft as far as possible into the crosshead guide. Take off screws (10) and pry out bearing covers (7 & 8) with the help of a screwdriver. Take out crankshaft carefully threading it past the conrods (15), making sure not to bend the connecting rods. Remove and dismantle connecting rods and plungers (16). Replace worn parts. Reassemble and tighten tension screws (16D) at 247 in-lbs (28 Nm). When reinstalling, first insert connecting rods together with plungers. Thread in crankshaft. Then push bearing covers (7 & 8) onto the crankshaft ends. Screw on bearing covers with screws (10). Mount connecting rod halves and tighten screws (15) at 22 ft-lbs. Mount crankcase cover (3) together with O-ring (4). Replace seal adaptors (20), seal casing (25) and valve casing (26). Replace eight (8) hexagon screws (34) and tighten to 22 ft-lbs (40 Nm).

## CP470 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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