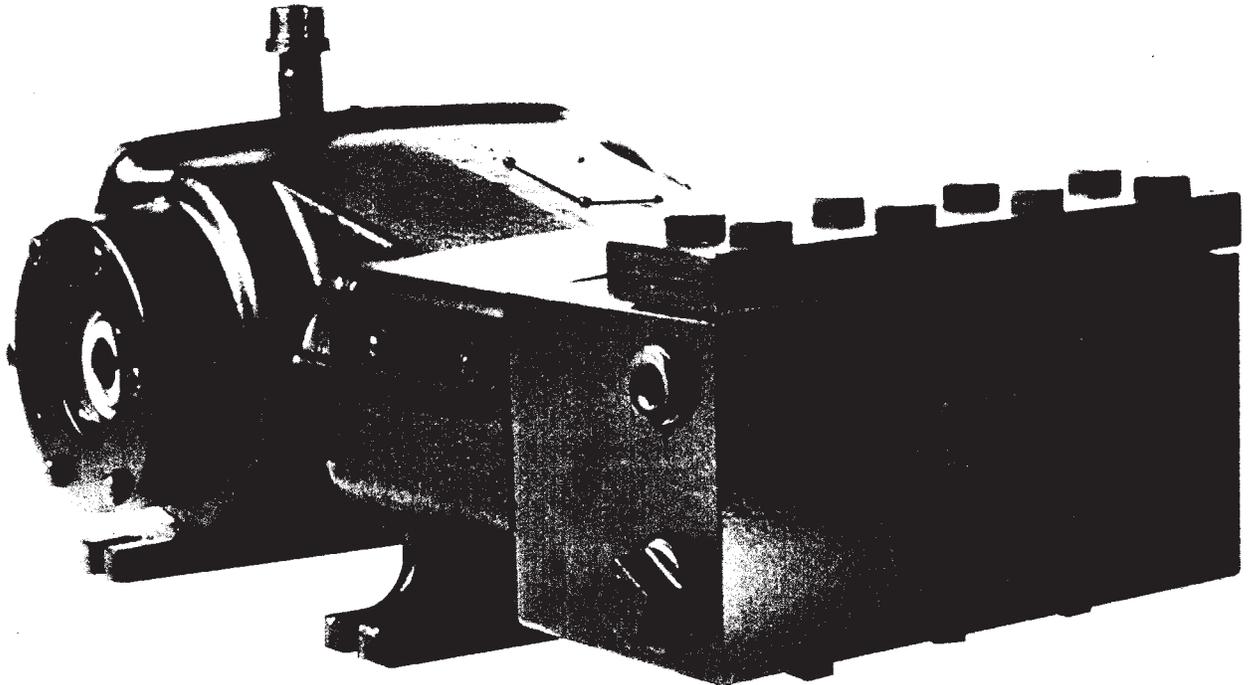




MYERS®



CMP SERIES

CPM15-15B (25905F300)

CPM15-15B-H/D (25905F301)

CPM18-15B (25905F303)

CPM18-15B-H/D (25905F304)

INDUSTRIAL PUMPS

INSTRUCTIONS AND SERVICE MANUAL WITH PARTS LIST

NOTE! To the installer: Please make sure you provide this manual to the owner of the equipment or to the responsible party who maintains the system.

SHAFT DRIVE

CPM15-15B (25905F300) 1-1/2" Dia. Plunger
 CPM18-15B (25905F303) 1-5/8" Dia. Plunger

SPECIFICATIONS

Temp. Rating F° (C°)	Size in Inches (mm)					Wgt. Lbs. (kg)
	Piston Stroke	Suction Size (NPT)	Disch. Size (NPT)	Input Shaft	Keyway	
180 (82)	1-3/4 (44.5)	1-1/2 (38.1)	1 (25.4)	1-3/8 (34.9)	5/16 x 5/32 (7.9 x 3.9)	278 (126)

Suggested Drive for 1750 RPM Motor Drive Sheave – 1-7/8 Bore, 1/2 x 1/4 Keyway, 7.8 O.D. Driven Sheave – 1-3/8 Bore, 5/16 x 5/32 Keyway, 20.05 O.D. Belt – 770XH-400 (4" wide, 77" long, 7/8" pitch) 15.38 Center Distance.

MATERIAL SPECIFICATIONS

POWER END	
Crankcase	Cast Iron, CL30
Crankshaft	4140 Heat Treated Forging
Link	Ductile Iron, ASTM A536
Crosshead	Ductile Iron, ASTM A536
Pony Rod	303 SST
Wrist Pin	CDS C1018 Carburize & Hardened
Crankshaft Main Bearing	Tapered Roller
Crankshaft Journal Bearing	Steel/Babbitt Inserts
Wrist Pin Bearing	Bronze Bushing
Bearing Cap	Cast Iron, CL30
Crankcase Cover	Cast Iron, CL30
Drain Plug	Magnetic

FLUID END	
Body Fluid End	CDS 1211
Valve Cap	CDS 1211
Valve, Ball	440C
Valve Seat	440C
Valve Spring	Inconel
Plunger	TECH 23 303 SST
Plunger Packing	Nitrile & Cotton Duck Fabric Nitrile Aramid

HORSEPOWER REQUIREMENTS

Plunger Dia.	HORSEPOWER REQUIRED FOR:								
	1-1/2 RPM	1-5/8 RPM	GPM	PSI 500	PSI 1000	PSI 1500	PSI 2000	PSI 2500	PSI 3000
83	71	3	1	3	3	4	5	6	
166	141	6	2	4	6	8	10	12	
249	212	9	3	6	9	12	15	19	
332	283	12	4	8	12	16	21	25	
415	354	15	5	10	15	21	26	31	

* Horsepower required is based upon 85% overall efficiency.
 * Formula (1) HP required = $\frac{\text{GPM} \times \text{PSI}}{1457}$ or KW = $\frac{\text{LPM} \times \text{BAR}}{511}$
 (electric brake)

(2) Expected GPM = Rated GPM x $\frac{\text{Working RPM}}{\text{Rated RPM}}$ or

Expected LPM = Rated LPM x $\frac{\text{Working RPM}}{\text{Rated RPM}}$

Motor shieve = Pump shieve x $\frac{\text{Pump RPM}}{\text{Motor RPM}}$
 O.D. size O.D. size

KILOWATT REQUIREMENTS

Plunger Dia.	KILOWATT REQUIRED FOR:								
	(38.1) RPM	(41.3) RPM	LPM	BAR 35	BAR 69	BAR 104	BAR 138	BAR 173	BAR 207
83	71	11	1	1	2	3	4	4	
166	141	23	2	3	5	6	8	9	
249	212	34	2	5	7	9	12	14	
332	283	45	3	6	9	12	15	18	
415	354	57	4	8	12	15	19	23	

NOTE: Horsepower requirements for an internal combustion engine (gas or diesel) may be obtained by multiplying the figures listed by 1.3. Do not exceed 80% of the manufacturer's advertised horsepower at operating RPM.

HYDRAULIC DRIVE

CPM15-15B-H/D (25905F301) 1-1/2" Dia. Plunger
 CPM18-15B-H/D (25905F304) 1-5/8" Dia. Plunger

SPECIFICATIONS

Temp. Rating F° (C°)	Size in Inches (mm)					Wgt. Lbs. (kg)
	Piston Stroke	Suction Size (NPT)	Disch. Size (NPT)	Input Shaft	Internal Keyway	
180 (82)	1-3/4 (44.5)	1-1/2 (38.1)	1 (25.4)	1.001/1.002 I.D. (25.43/25.45)	1/4 x 1/8 (6.35 x 3.18)	278 (126)

MATERIAL SPECIFICATIONS

POWER END	
Crankcase	Cast Iron, CL30
Crankshaft	4140 Heat Treated Forging
Link	Ductile Iron, ASTM A536
Crosshead	Ductile Iron, ASTM A536
Pony Rod	303 SST
Wrist Pin	CDS C1018 Carburize & Hardened
Crankshaft Main Bearing	Tapered Roller
Crankshaft Journal Bearing	Steel/Babbitt Inserts
Wrist Pin Bearing	Bronze Bushing
Bearing Cap	Cast Iron, CL30
Crankcase Cover	Cast Iron, CL30
Drain Plug	Magnetic

FLUID END	
Body Fluid End	CDS 1211
Valve Cap	CDS 1211
Valve, Ball	440C
Valve Seat	440C
Valve Spring	Inconel
Plunger	TECH 23 303 SST
Plunger Packing	Nitrile & Cotton Duck Fabric Nitrile Aramid

HORSEPOWER REQUIREMENTS

Plunger Dia.		HORSEPOWER REQUIRED FOR:						
1-1/2 RPM	1-5/8 RPM	GPM	PSI 500	PSI 1000	PSI 1500	PSI 2000	PSI 2500	PSI 3000
83	71	3	1	3	3	4	5	6
166	141	6	2	4	6	8	10	12
249	212	9	3	6	9	12	15	19
332	283	12	4	8	12	16	21	25
415	354	15	5	10	15	21	26	31

KILOWATT REQUIREMENTS

Plunger Dia.		KILOWATT REQUIRED FOR:						
(38.1) RPM	(41.3) RPM	LPM	BAR 35	BAR 69	BAR 104	BAR 138	BAR 173	BAR 207
83	71	11	1	1	2	3	4	4
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415	354	57	4	8	12	15	19	23

* Horsepower required is based upon 85% overall efficiency.

* Formula (1) $HP \text{ required} = \frac{GPM \times PSI}{1457}$ or $KW = \frac{LPM \times BAR}{511}$
 (electric brake)

(2) Expected GPM = Rated GPM x $\frac{\text{Working RPM}}{\text{Rated RPM}}$

Expected LPM = Rated LPM x $\frac{\text{Working RPM}}{\text{Rated RPM}}$

INSTRUCTIONS

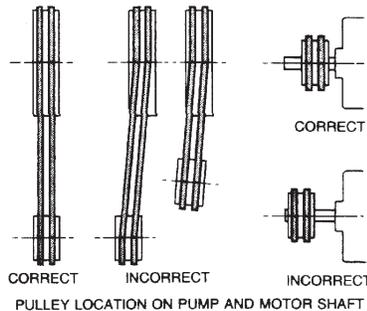
CAUTION: Positive Displacement Pumps must have a proper size and operable type of pressure regulating valve or pressure relief valve piped into the discharge line. This is mandatory to prevent damage to pump and piping or possible injury to personnel. Do not install any valves or shut-off devices in the bypass line from pressure regulator tank or supply.

CAUTION: All pumps should be installed level. For mobile applications the maximum angle of intermittent operation should be no more than 5 degrees in any one direction.

CALIFORNIA PROPOSITION 65 WARNING:

▲ WARNING This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

It is recommended to install a pulsation dampener in discharge line to smooth out pressure pulse. This can protect pump parts and piping for longer life and quiet operation.



BELT DRIVE

With belt drives, pulley on both engine and pump should be located as closely as possible to bearing to reduce bearing and shaft bending loads. Make sure that all bolts, nuts, set screws, and keys are properly tightened.

STARTING PUMP

A. Before Starting:

1. Read all instructions carefully.
2. Fill pump crankcase with recommended oil (SAE) to level mark on oil saber.
3. Replace all drain plugs in pump and piping.
4. Inspect tank to be sure that no foreign material is in tank or suction line.
5. Fill tank at least half full or connect suction to water supply. Open valve (if present) in suction line. **Avoid prolonged dry operation which may cause excessive wear on piston packing.**

Be sure that an operating pressure gauge is located in discharge line. Use heavy duty, liquid filled, pulsation free pressure gauge.

6. Make sure all valves, including spray gun or nozzles, are open in discharge line. Spray gun may be anchored to discharge back into tank.
7. Completely back off pressure adjusting device on pressure regulating valve.
8. Check pressure rating for pulsation dampener pressure regulator and pipe fitting to make sure working pressure is not over maximum pressure rating.

B. Starting the Unit:

1. After starting, close discharge valve or spray gun slowly while watching pressure gauge to make sure relief valve or unloader is operating properly.
2. Adjust relief valve or unloader to desired pressure. See regulator instructions.
3. Cycle nozzles or gun on and off to be sure that pressure adjustment and regulator operation is satisfactory.

NOTE: Nozzle capacity should not exceed 90% of pump capacity for satisfactory regulator operation. **AVOID FREEZING** by draining all water from pump and system in cold weather. There is a 3/8 NPT drain plug for each cylinder chamber.

SUGGESTED MAINTENANCE SCHEDULE

OPERATION	INTERVAL
Check oil level	Daily
Drain and change oil (SAE 30)	300 hrs. (1)
Inspect piston packing and spacer rings	500 hrs. (2)
Inspect valves and springs	500 hrs. (3)
Inspect connecting link bearing inserts	1000 hrs. (4)
Inspect crankshaft tapered roller bearings	2000 hrs.
Inspect piston stud	2000 hrs. (5)

1. Drain at operating temperature to prevent contamination from setting.
2. Inspect frequently for leakage; piston packing is allowed to drip in order to cool and lubricate packing. Replace if there is a stream leak.
3. Replace if cracks and heavy wear are present.
4. Replace at first signs of fatigue or wear to prevent damage to crankshaft.
5. Replace if any pitting or rough surface on the seal surface.

LUBRICATION

Pump – Fill crankcase with SAE 30 crankcase oil – 2 quarts. Maintain oil level between the high and the low level marks on bayonet oil gauge inserted through crankcase cover. Add extra quart for crankshaft speeds under 300 RPM.

NOTE – Drain oil from crankcase after first 30 hours of operation. Refill with proper oil as mentioned above. Change oil every 300 hours thereafter. Check oil levels regularly. Change oil immediately if water droplets are found on bayonet gauge.

SERVICE

CAUTION: Disconnect electrical leads to motor or remove spark plug leads on engine before proceeding.

PLUNGER SEAL SERVICE

- A. Remove 3 seal lubricating lines.
- B. Remove 8 nuts holding fluid end and slide head 6".
- C. Rotate crankshaft until plunger is flush with seal housing.
- D. Slide seal housing forward to clear plunger and remove.
- E. Remove seals and clean seal housing.
- F. Install new seals. Lubricate with waterproof grease.
- G. Repeat elements F - A to install plunger seal. Torque bolts 85 ft-lb, plunger 20 ft-lb.

VALVE SERVICE

When servicing valves always renew O-rings. Remove 8 bolts and valve clamp. Remove valve covers on top of fluid end for access to valve components. Suction and discharge valves will show a wear pattern on seating surface but need not be replaced unless extreme wear, cracks or erosion is present on valve. All valves and seats are interchangeable but it is recommended to put them back in the same order as taken out if not renewing the components. To replace valve components first clean bores to remove corrosion or burrs. Lubricate and replace O-ring in bottom of bore. Then the valve seat. Lubricate and replace O-ring. Place the valve in the valve seat and make sure the spring is inserted against the ball valve and fitted snug on the bottom of the valve seat. Repeat for the discharge valve. Insert valve covers and secure with valve clamp. Torque bolts 80 ft-lb.

REPLACING PISTON ROD SEALS

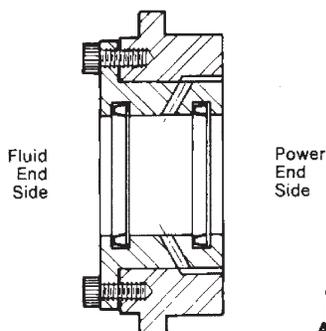


FIG. 4
OIL SEAL
HOUSING
ASSEMBLY

The rod seal assembly contains two seals, two oil seals with lips facing power end. The fluid end must be removed before the oil seal can be replaced. Unscrew two Allen screws and place into the other two tapped holes. Gradually screw them in to push oil seal housing off the retainer. After assembling new seals in oil seal housing an assembly thimble should be used on end of crosshead rod for sliding oil seal housing back into retainer. Check gasket, replace if damaged.

An assembly thimble should be used on small end of the piston rod to expand sealing edge as it is pushed on. Figure 5 shows a recommended thimble for installation of oil seals. The thimble should be machined from high carbon steel and polished on the exterior to reduce possibility of seal lip damage.

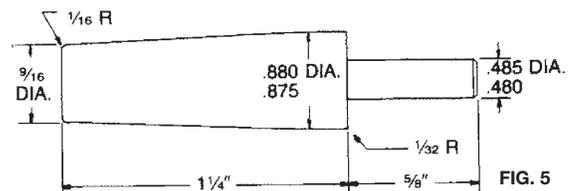


FIG. 5

SERVICING CRANKCASE PARTS

To remove the crankshaft you do not need to remove the cylinder body from the crankcase. Remove the connecting link caps from the connecting links and push the free links toward the cylinder end as far as possible. The crankshaft can then be removed by taking off the bearing caps and pulling the crankshaft through the bearing opening as shown in illustration Figure 6. During this process be sure to note the markings on the connecting links and link caps because these parts are mated to each other and should be reinstalled in the same position they were before taken apart.

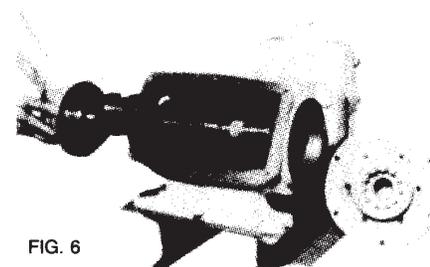


FIG. 6

REPLACING CRANKSHAFT AND SHIMMING BEARINGS

For quiet operation and long life, the crankshaft and bearings must be installed with .003" to .005" preload.

- A. Place .045" shim (3 pink shims) on the right crankshaft bearing cap. Tighten the 6 cap screws and torque to 20 ft-lb (240 in-lb). Slide crankshaft from left-hand bore. Extreme care should be exercised to avoid damage to oil seal by using tape to cover key way slot.

- B. Install the left cap without shims. Secure with 2 cap screws positioned top and bottom (180° apart), torque the 2 cap screws at 60 in-lb (5 ft-lb). **DO NOT USE TORQUE WRENCH WITH LARGE FT-LB SCALE – MAY NOT BE ACCURATE.** Do this *three times* to properly seat the tapered roller bearings.
- C. Measure (adjacent to the cap screws) the shim gap remaining between the bearing cap and the crankcase.
- D. The required shim thickness for this cap is equal to the average gap measurement, plus .005" constant.
- E. Insert correct shim thickness under left bearing cap and tighten all 6 cap screws and torque to 20 ft-lbs. (240 in-lb). Ref. – green shim is .003" thick.
- F. Rotate crankshaft to ensure no binding as result of shimming.

SERVICING CONNECTING LINKS

When the connecting link bearings are worn but the crankshaft is in good condition, standard replacement bearing inserts can be installed in the connecting links. These bearings should not be tampered with or changed in size in any way at the time of assembly. Do not attempt to change the size of the link by filing or grinding the faces of the link cap where they are clamped together. When reinstalling the links on the crankshaft be sure to place the oil holes upward for proper lubrication.

When installing new bushings for the wrist pin, these bushings should be reamed to proper size after pressing into the link. The proper size as indicated in Fig. 7.

Bushing Ream Diameter "C"	1.0000" to 1.0005"
Inside Diameter "D" of Standard Bushing	2.3741" to 2.3748"
Bushing Inside Diameter "D" of Undersize Bushing	2.3441" to 2.3448"

NOTE: "D" Bushings are NOT to be reamed after assembly

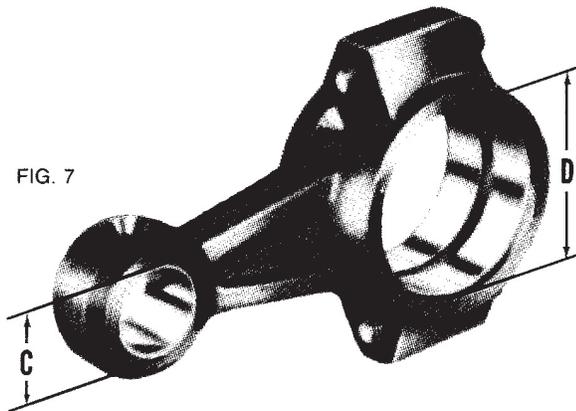


FIG. 7

RECOMMENDED TORQUE	
FASTENER LOCATION	TORQUE (FOOT-POUNDS)
Link Bearing Caps	25
Crankshaft End Caps	20
Packing Assembly to Piston Rod	20
Valve and Cylinder Cover Clamps	80
Capscrew (Fluid End to Crankcase)	1/2"-50, 5/8"-85

CROSSHEAD AND PISTON RODS

Repair parts for the crosshead and piston rod are supplied only as a complete unit. If either of these parts becomes worn it is necessary to replace both the crosshead and piston rod. Under normal conditions a crosshead will not wear nor will the bore of the crankcase wear to the extent that oversize crossheads will be required. If extreme wear does occur, it will be due to severe damage from the lack of oil or a fairly large metal object scoring the crosshead bore. A clearance of .002" to .004" is standard for the crosshead. The parts can wear until considerably more clearance than this exists before harmful operation will occur.

RECONDITIONING CRANKSHAFTS

When only a very small amount of damage has occurred on the crank pins, such as small surface grooves cut part way around the bearing surface, the crank pins can sometimes be reconditioned for further use. This can be done with emery cloth and polishing until all ridges are completely removed. The final polishing operation should be performed by using a very fine emery cloth. This procedure can only be followed where the amount of sanding does not reduce the normal diameter of the crank pin.

If the crankshaft cannot be refinished by hand in this manner, it will be necessary to regrind and polish the bearing surfaces for special undersize bearings.

The tabulation on next page shows the crankshaft with the crank pin sizes tabulated for both standard diameter and the undersize diameter that should be maintained. Worn or corroded crank pins can be ground and polished down to .030" under the size when the cranks were new. When this is done the surface should be polished to a good smooth finish. The undersize connecting links are made especially for turned down crankshafts. If the crankshaft has been reground to dimension "D" for reconditioned shafts, the undersize links can be used and will fit properly and operate as well as the original equipment.

If the surface is badly damaged, the crankshaft can often be salvaged by "metalizing" the crank pins and then regrinding and polishing to the original diameter. Consult F.E. Myers Engineering for details.

When assembling bearings on the crankshaft an oil seal expander thimble should be used at the end of the shaft as shown in Illustration No. 8. A thimble of this type will cause the lip of the oil seal to gradually expand up to the shaft diameter allowing it to slip on the shaft without turning or damaging the seal in any way. Extreme care should be taken when pushing oil seals over keyways or holes in a shaft to make sure the sealing lip is not damaged. A slight nick or cut in this lip can damage a seal enough that it will not retain the oil properly.

When re-assembling all parts make sure that all gaskets are replaced exactly as they were originally.

- Crank Pin Size "D" Standard –
Use Standard Link Bearing 2.3730" to 2.3740"
- Size "D" for Reconditioned Shaft –
Use Undersize Link Bearing 2.3430" to 2.3440"

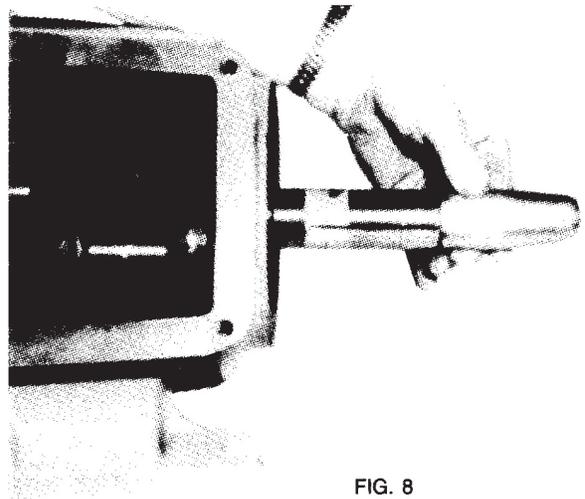


FIG. 8

TROUBLESHOOTING

SYMPTOMS	POSSIBLE CAUSE OF PROBLEM	
Failure of pump to build pressure with discharge closed. See A, B, C, D, E, F, H or I.	A. Pump not primed. B. Valve closed in suction line.	L. Need vacuum chamber in suction line.
Failure to hold pressure with discharge open. See C, D, E, F, G, H, I, J or K.	C. Suction line or sediment chamber clogged. D. Air leak in suction line. E. Pressure regulator valve badly worn.	M. Water in crankcase. N. Worn connecting link bearings. O. Lack of oil in crankcase or speed reducer case.
Pump is noisy. See L, N or P.	F. Pressure regulator not properly adjusted.	P. Foaming mixture.
Pump gets hot. See M, N, O or W.	G. Pump packing or valves badly worn.	Q. Regulator plunger sticking.
Pressure gauge shows abnormal fluctuations. See P, Q, R, T or U.	H. Pressure regulator overflow valve held open by manual control.	R. Regulator stuffing box nut too tight.
Regulator chatter. See S or U.	I. Pump cylinder body cracked. J. Holes in discs are too large (nozzle worn out). K. Small air leak in suction line.	S. Regulator stuffing box nut too loose or needs packing. T. Foreign matter under pump valve. U. Air chamber waterlogged. V. Loose piston rod. W. Main bearing lock rings out.

WARNING – THIS PUMP MUST BE INSTALLED WITH A PRESSURE RELIEF VALVE IN DISCHARGE LINE.

Explanation of the Service Chart

A. Pump priming is usually not necessary when the pump is installed correctly. However, there are certain unusual conditions which may make it necessary to prime the pump to get the pumping action started. Priming will be required under conditions where it is impossible for the piston to displace the air in the pump and replace it with water. This could be caused by a high suction lift (high from the water supply to the pump), the valves being stuck on the seat, such as after pumping a sticky fluid, or it

might be caused by valves sticking due to extreme corrosion of the valves and seats. A pump will not prime readily if someone has tampered with the valve springs causing them to exert undue pressure of the valve plates against the valve seats. When the pump appears to need priming this condition can be checked by pouring water into the cylinder body through one of the valve cap openings or into the pump discharge opening at the same time operating the pump to work the water into the cylinder and valve passages.

B. Frequently a gate valve is installed in the suction line between a tank or pressure line and pump sediment chamber. This valve is usually installed in the line to shut off the supply source for cleaning sediment chamber or for pump repairs.

If this valve is closed or even partially closed it will interfere with the flow of water to the pump suction to such an extent that the pump will not perform to full capacity. If the valve is partially closed it may cause severe knocking and vibration of the pump because the water cannot flow into the cylinder cavities fast enough.

C. A sediment chamber should be installed in the suction line between the gate valve and the pump suction.

The strainers in these sediment chambers are of more than adequate capacity to allow a free flow of the liquid to the pump. However, because of its normal function of collecting sediment, the strainer may become severely clogged and in some cases, it will completely stop the flow of liquid to the pump. The length of time the pump may operate before it is necessary to clean the strainer will depend upon the type of liquid pumped. After the pump has been used a short period the operator will soon become familiar with the amount of running time between strainer cleanings.

D. Any piston pump, when operated at high pressure will not operate satisfactorily or quietly if a mixture of air and water is allowed to enter the pump suction. For this reason, a small air leak in the suction line will cause the pump to knock and vibrate excessively. This holds true only for a small air leak which allows the pump to draw a certain amount of water mixed with air on each stroke of the piston. A large air leak will cause the pump to lose prime after which it can not be reprimed until the air leak is stopped. Air leaks may occur at the joints of the suction line piping, at the gate valve in the suction line, at the gasket sealing the cap on the sediment chamber or by a crack in the suction wall of the cylinder body, such as might be caused by freezing if the pump is not properly drained in freezing weather. There is also a remote possibility of air drawing past the piston packing on the suction stroke if the piston packings are badly worn.

E. Badly worn packing or valves and valve seats will cause a serious drop in pump capacity. This will be indicated by a drop in pressure when guns are turned on. Worn packing is very easy to detect because of the water leakage. The packing should be replaced just as soon as this excessive leakage is noticed. If it is allowed to continue some of the material may work past the piston rod seals into the pump crankcase. Water in the pump crankcase will cause severe corrosion of the bearings causing them to fail. Worn valves can only be detected by visual examination of each valve assembly. The most prevalent cause of valve wear is the use of highly abrasive liquids. This will cause the valve and valve

seat to wire cut. The cut starts as a very small groove but increases very rapidly once the valve starts to leak through this groove. Cutting will usually be much more evident on the valve plate in flat valve pumps. If the valve plates are replaced as soon as they start to show this cutting action it will prevent the valve seat from becoming cut in a similar manner and keep the cost of replacement parts to a minimum.

- F. Pump cylinder bodies must withstand an extreme amount of shock and pulsation while the pump is in operation. If the pump is allowed to freeze, due to not being drained, the freezing may crack the cylinder body walls in almost any location. If the crack should occur on the suction valve or cylinder portion of the body it may allow a small amount of air to enter on the suction stroke and cause noisy operation or a decrease in pumping capacity. If the crack develops in the walls between the cylinder cavities or discharge valve cavity it may allow the water to flow from one cavity to the adjacent cavity and rob the pump of its effective displacement. This will not cause noisy operation but will reduce the pump capacity and may show up as a drop in pressure when the discharge is open.
- G. The holes in gun or nozzle discs are continually subject to wear because of the high velocity of the liquid through the holes. Naturally they wear much faster if there is any abrasive or solid material in the liquid. If the holes become worn too much they may allow a higher rate of discharge than the pump is able to provide and a drop in pressure will be noticed. This can quickly be checked by reducing the number of nozzles or guns and at the same time watching the amount of overflow from the pressure regulator. If there is considerable overflow, even though a drop in pressure has been noticed, it is an indication that the regulator valve is worn rather than the gun or nozzle discs.
- H. Suction surge arresters should be installed on the suction line of reciprocating pumps. A rubber bag type of suction surge arrester is preferred but a suitable vacuum chamber can be made by attaching a piece of vertical pipe as close to the pump suction as possible. One and one-half or two inch pipe can be used. A standing height of 12" to 15" will be sufficient with the top end closed by an ordinary pipe cap.
- I. Water may accumulate in the pump crankcase from two sources; the most prevalent being leakage of the packing as explained in Paragraph E. The other means of accumulation being a condensation of moisture inside the crankcase due to changes in weather or the repeated heating and cooling of the pump due to its normal usage. Pumps that are used rather consistently and run for a considerable period of time to heat the oil and other working parts will not normally accumulate water by condensation. If the packing is replaced as soon as it starts to leak it will be impossible for water to enter the crankcase from

this cause. In localities or conditions where extremely abrasive liquids must be used, it is always advisable to replace the cylinder shells at the same time the worn packing is replaced. New packing will not give satisfactory service if it is placed in a badly worn and roughened cylinder liner.

- J. Worn connecting link bearings will only develop because of unusual or adverse operating conditions. They will, however, be seriously affected by corrosion if water is present in the crankcase and they will wear out from overheating if adequate oil is not provided in the crankcase. For this reason we recommend thorough draining, cleaning and refilling with new oil prior to any storage period. Replace bearings as soon as any damage is discovered to avoid possible damage to crankshaft. (See Lubrication Instructions.)
- K. Lack of sufficient oil in crankcase can quickly cause failure of pump power end and result in extensive repairs. Oil level should be checked periodically during normal operation as well as when maintenance work of any nature is performed. Insufficient oil will first be indicated by excessive heat and should be corrected immediately.
- L. A foaming mixture will sometimes have the same effect as a small air leak in the suction line. This is because various quantities of the foam is drawn through the suction line into the pump disrupting the normal flow of water.
- M. Pressure regulators that are operated by plunger action may become sluggish in action due to the plunger sticking or fitting too tightly in its cylinder. This condition may be caused by an accumulation of chemicals collecting in and around the plunger, or may be due to excessive corrosion of the plunger parts. To check this condition, remove and clean the plunger. After cleaning the plunger, parts should be covered with a waterproof grease before assembling.
- N. In some cases there is a tendency for the pressure regulator valves to chatter or vibrate excessively. This is an indication of unstable operation due to nozzling in the high or low capacity range of the regulator. On systems using pressure regulator valves, the nozzling requirements should be at least 50% and not exceed 90% of pump capacity.
Due to nozzle disc wear, the system requirements may exceed the 90% limit, resulting in cycling or hammering of the regulator. This can readily be checked by replacing the worn discs with new discs.
If chatter persists with an unloader, there is a possibility that stuffing box nut (on valve lifter stem) is too loose or that additional packing should be placed in the stuffing box gland. By repacking and drawing the stuffing box nut up to the point where it is snug, unloader chatter can be eliminated.
- O. If a large piece of foreign matter becomes lodged between a pump valve and valve seat or if something of this kind becomes wedged in so that it prevents the valve from operating normally we can expect drastic drop in capacity and considerable surge or

pulsation will be noticed in the discharge line. To correct a condition of this kind it is usually necessary to examine each valve in the pump until the offending condition is located. The use of clean liquid and seeing that the suction strainer is in proper condition will prevent trouble of this kind.

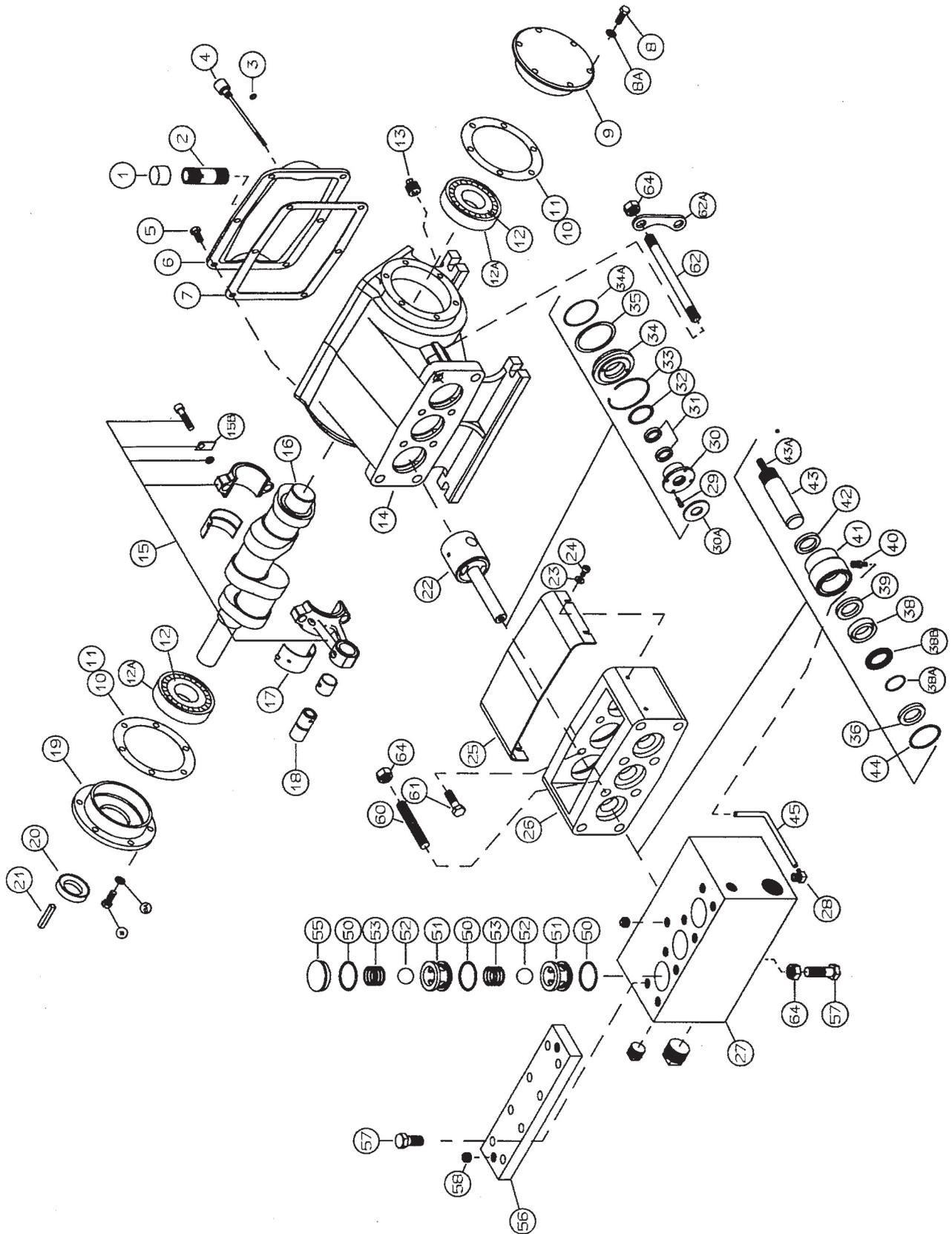
Atmospheric Air Chambers

- P. When a pump is used for a long period of time without the source of supply being completely exhausted so that air can enter the pump we sometimes encounter a waterlogged air chamber. This decreases the effectiveness of the air chamber causing undue pulsation at the discharge. If this should happen the suction should be open to atmosphere at some point to allow air to be drawn through the pump to recharge the air chamber. This should be done with the pressure release valve open so the pump operates at no pressure, otherwise it will not pump air into the air chamber.
- Q. Noisy pump operation will sometimes be caused by a piston rod being loose in the crosshead.
This will only become evident after the rod becomes so extremely loose that some end motion can be found between the piston rod and crosshead. A noise of this kind usually has a regular cadence timed with each stroke of the piston. When this condition occurs it is always necessary to replace both the piston rod and the crosshead because the two parts are threaded and pinned into a single unit.
- R. The crankshaft main bearings are held in place by the end bearing caps. If bearing cap retaining bolts should become loosened, the bearing can shift which may cause bearing to run exceptionally hot.

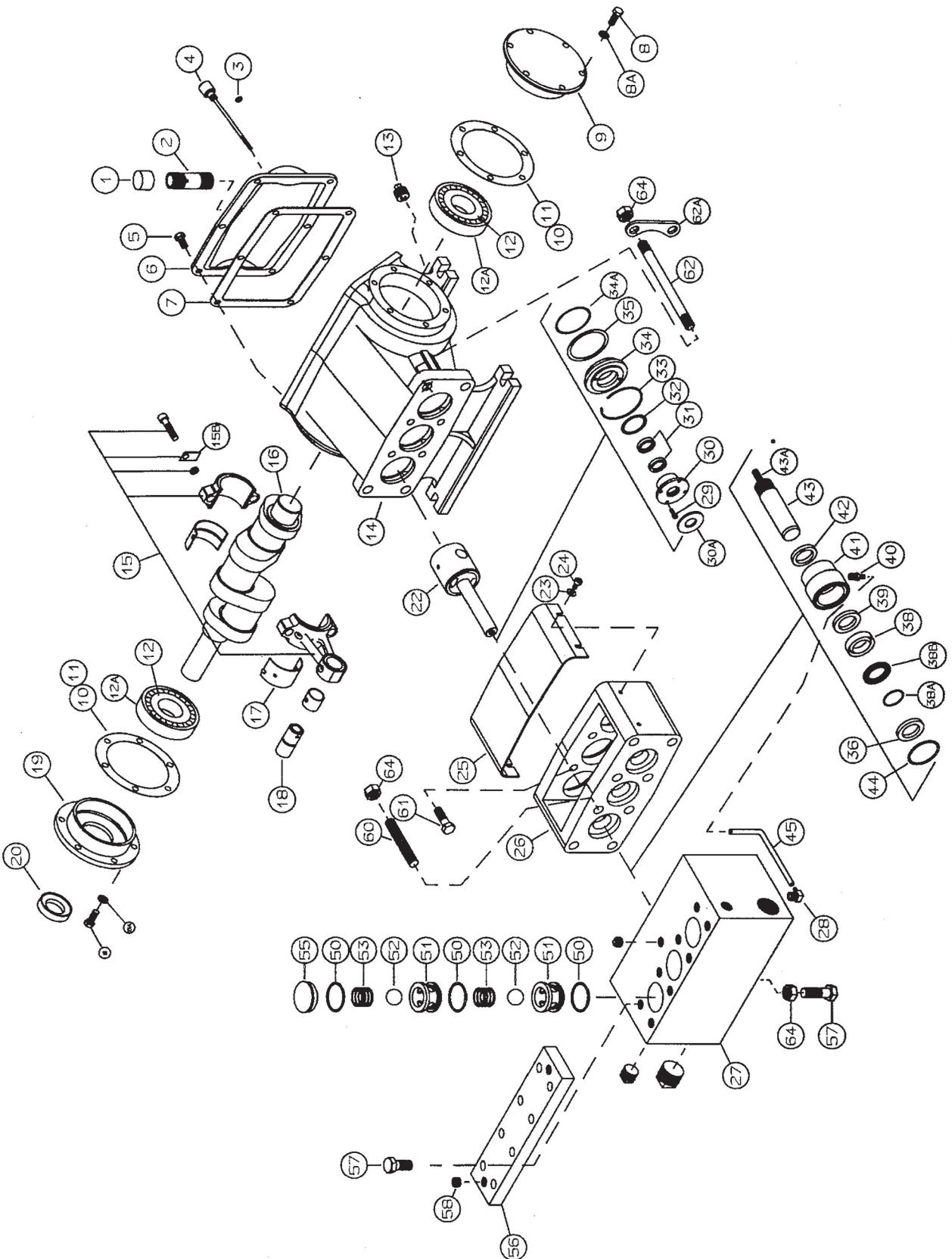
Unusual Conditions Which May Cause Trouble

- S. If the V-belts have a tendency to wear rapidly, it may be due to having the belt tightener pulley adjusted too far into the belt, throwing a reverse bend in the belt where it passes over the pulley. If very much reverse angle seems necessary to keep the belt tight, other provisions should be made for tightening, such as placing shims under the pump base or otherwise spreading the drive centers enough to take up the belt length. On multiple V-belt drives, a complete set of belts should be installed when making a replacement. Further, all the belts in one set should be checked for length and accurately matched to avoid placing an undue load on any one belt. The synchronized belt can deliver higher torque with narrower belt. The sprocket is thus narrower which results in less bending movement on main bearing and crankshaft. Also, initial tension is not required.

CPM15-15B (25905F300) & CPM18-15B (25905F303)



CPM15-15B-H/D (25905F301) & CPM18-15B-H/D (25905F304)



Parts List for Part No. 25905F300 – CPM15-15B

Ref. No.	Part No.	Description	Qty
1	05737A021	Cap, Pipe, 3/4" Galv.	1
2	17995A001	Nipple, Pipe, 3/4" Vented	1
3	05876A235	O-Ring	1
4	17360A014	Gauge, Oil Level	1
5	19101A007	Screw, Hex 3/8"-16 x 3/4"	6
6	06077C000	Lid, Cast Iron	1
7	06089B000	Gasket, Vellumoid	1
8	19101A013	Screw, Hex 3/8"-16 x 1"	12
8A	14946A003	Washer, Fast Seal	12
9	10414B001	Bearing Cap, Closed, Cast Iron	1
10	05011A027	Gasket, Shim .003 Thick, Green	6
11	05011A028	Gasket, Shim .015 Thick, Pink	4
12	05674A019	Bearing, Tapered Cone	2
12A	05675A018	Bearing, Tapered Cup	2
13	17481A001	Plug, Pipe, 1/2" NPTF, Magnetic	1
14	06076D000	Case, Gear, Ductile Iron	1
15	06110B004	Link, Ductile Iron	3
15B	26173A001	Oil Slinger	3
16	06074D011	Crankshaft	1
17	06109A000	Bearing, Steel Backed	6
18	06116A000	Pin, CRK & WR, CDS	3
19	10414B002	Bearing Cap, Open, Cast Iron	1
20	05710A004	Oil Seal, 1-3/8" Shaft Dia.	1
21	05818A077	Key, 5/16" x 5/16" x 2"	1
22	17515B001	Crosshead & Piston Rod	3
23	05030A020	Washer, Flat, Steel	4
24	05028A002	Mach. Screw, 1/4"-20 x 1/2"	4
25	25927C000	Adapter Cover	1
26	25937E000	Adapter, Water to Gear End Ductile	1
27	25934E002	Body, Cylinder, 1-1/2"	1
28	23188A002	Fitting, 1/4" NPT, 90 Male Elbow	3
29	06106A034	Screw, Skt. Hd., #10 x 1/2"	6
30	24959A002	Housing, Oil Seal	3
30A	05059A418	Gasket, Rubber Neoprene	3
31	22835A004	Cup, U Metric	6
		22 I.D. x 30 O.D. x 5.5	
32	05059A435	Gasket, Vellumoid	3

Ref. No.	Part No.	Description	Qty
33	06120A000	Spring, Wave	3
34	24958A001	Retainer, Oil Seal Housing	3
34A	06120A000	Spring, Retainer	3
35	05059A052	Gasket, Vellumoid	3
36	24894A007	Washer, Seal, 1-1/2" Dia.	3
38	18922A009	Packing, V-Ring	3
38A	05876A029	O-Ring	3
38B	24793A006	Ring, Male Adapter, 1-1/2"	3
39	24794A005	Ring, Female Adapter, 1-1/2"	3
40	10519A002	Fitting, 1/8" NPT Tube Str.	3
41	25928B004	Plate, Seal, 1-1/2" Dia.	3
42	24899A002	Seal, Low Pressure 1-1/2" Bore	3
43	25926B211	Plunger, TECH 23, 1-1/2"	3
43A	26789A000	Stud	3
44	05876A158	O-Ring	3
45	23265161275	Tube, .25 O.D. x .04 Wall	1.75 ft.
50	05876A204	O-Ring	9
51	25931A002	Seat, Valve, 440C SST	6
52	05373A013	Valve, Ball, 440C SST	6
53	06127A003	Spring, Inconel	6
55	25932A000	Cap, Valve, Steel	3
56	25933B000	Clamp, Valve	1
57	19105A042	Screw, Hex 5/8"-18 x 1-3/4"	8
57A	19105A042	Screw, Hex 5/8"-18 x 1-3/4"	1
58	25938A001	Set Screw, Skt. Drive, 5/8"-18 x 1"	2
60	05659A125	Stud, 5/8"-18 x 3-1/4"	4
61	19103A008	Screw, Hex 1/2"-13 x 1-3/4"	4
62	05659A120	Stud, 5/8"-18 x 8-1/2"	4
62A	26709A000	Washer, Wedge	2
64	19109A047	Nut, Hex 5/8"-18	8
64A	19109A047	Nut, Hex 5/8"-18	1
66	06008A322	Plate, Name	1
66A	05160A001	Screw, Drive, .138 x 5/16	4
67	05022A043	Plug, Pipe, 1 Sq. Hd., Stl. Galvanized	1
68	05022A016	Plug, Pipe, 1-1/2" Sq. Hd., Mall Galvanized	1

Bold type indicates "normal" wearing items or items replaced when rebuilding a reciprocating pump (typ.)

Parts List for Part No. 25905F301 – CPM15-15B-H/D

Ref. No.	Part No.	Description	Qty
1	05737A021	Cap, Pipe, 3/4" Galv.	1
2	17995A001	Nipple, Pipe, 3/4" Vented	1
3	05876A235	O-Ring	1
4	17360A014	Gauge, Oil Level	1
5	19101A007	Screw, Hex 3/8"-16 x 3/4"	6
6	06077C000	Lid, Cast Iron	1
7	06089B000	Gasket, Vellumoid	1
8	19101A013	Screw, Hex 3/8"-16 x 1"	12
8A	14946A003	Washer, Fast Seal	12
8B	19101A028	Screw, Hex. Hd., 3/8"-16 x 2"	6
9	10414B001	Bearing Cap, Closed, Cast Iron	1
10	05011A027	Gasket, Shim .003 Thick, Green	6
11	05011A028	Gasket, Shim .015 Thick, Pink	4
12	05674A019	Bearing, Tapered Cone	2
12A	05675A018	Bearing, Tapered Cup	2
13	17481A001	Plug, Pipe, 1/2" NPTF, Magnetic	1
14	06076D000	Case, Gear, Ductile Iron	1
15	06110B004	Link, Ductile Iron	3
15B	26173A001	Oil Slinger	3
16	06074D013	Crankshaft, Hydraulic Drive	1
17	06109A000	Bearing, Steel Backed	6
18	06116A000	Pin, CRK & WR, CDS	3
19	26367B000	Adapter, Plate, Hydr. Drive	1
20	05710A045	Oil Seal, 1-3/4" Shaft Dia.	1
22	17515B001	Crosshead & Piston Rod	3
23	05030A020	Washer, Flat, Steel	4
24	05028A002	Mach. Screw, 1/4"-20 x 1/2"	4
25	25927C000	Adapter Cover	1
26	25937E000	Adapter, Water to Gear End Ductile	1
27	25934E002	Body, Cylinder, 1-1/2"	1
28	23188A002	Fitting, 1/4" NPT, 90 Male Elbow	3
29	06106A034	Screw, Skt. Hd., #10 x 1/2"	6
30	24959A002	Housing, Oil Seal	3
30A	05059A418	Gasket, Rubber Neoprene	3
31	22835A004	Cup, U Metric 22 I.D. x 30 O.D. x 5.5	6
32	05059A435	Gasket, Vellumoid	3

Ref. No.	Part No.	Description	Qty
33	06120A000	Spring, Wave	3
34	24958A001	Retainer, Oil Seal Housing	3
34A	06120A000	Spring, Retainer	3
35	05059A052	Gasket, Vellumoid	3
36	24894A007	Washer, Seal, 1-1/2" Dia.	3
38	18922A009	Packing, V-Ring	3
38A	05876A029	O-Ring	3
38B	24793A006	Ring, Male Adapter, 1-1/2"	3
39	24794A005	Ring, Female Adapter, 1-1/2"	3
40	10519A002	Fitting, 1/8" NPT Tube Str.	3
41	25928B004	Plate, Seal, 1-1/2" Dia.	3
42	24899A002	Seal, Low Pressure 1-1/2" Bore	3
43	25926B211	Plunger, TECH 23, 1-1/2"	3
43A	26789A000	Stud	3
44	05876A158	O-Ring	3
45	23265161275	Tube, .25 O.D. x .04 Wall	1.75 ft.
50	05876A204	O-Ring	9
51	25931A002	Seat, Valve, 440C SST	6
52	05373A013	Valve, Ball, 440C SST	6
53	06127A003	Spring, Inconel	6
55	25932A000	Cap, Valve, Steel	3
56	25933B000	Clamp, Valve	1
57	19105A042	Screw, Hex 5/8"-18 x 1-3/4"	8
57A	19105A042	Screw, Hex 5/8"-18 x 1-3/4"	1
58	25938A001	Set Screw, Skt. Drive, 5/8"-18 x 1"	2
60	05659A125	Stud, 5/8"-18 x 3-1/4"	4
61	19103A008	Screw, Hex 1/2"-13 x 1-3/4"	4
62	05659A120	Stud, 5/8"-18 x 8-1/2"	4
62A	26709A000	Washer, Wedge	2
64	19109A047	Nut, Hex 5/8"-18	8
64A	19109A047	Nut, Hex 5/8"-18	1
66	06008A326	Plate, Name	1
66A	05160A001	Screw, Drive, .138 x 5/16	4
67	05022A043	Plug, Pipe, 1 Sq. Hd., Stl. Galvanized	1
68	05022A016	Plug, Pipe, 1-1/2" Sq. Hd., Mall Galvanized	1

Bold type indicates "normal" wearing items or items replaced when rebuilding a reciprocating pump (typ.)

Parts List for Part NO. 25905F303 – CPM18-15B

Ref. No.	Part No.	Description	Qty
1	05737A021	Cap, Pipe, 3/4" Galv.	1
2	17995A001	Nipple, Pipe, 3/4" Vented	1
3	05876A235	O-Ring	1
4	17360A014	Gauge, Oil Level	1
5	19101A007	Screw, Hex 3/8"-16 x 3/4"	6
6	06077C000	Lid, Cast Iron	1
7	06089B000	Gasket, Vellumoid	1
8	19101A013	Screw, Hex 3/8"-16 x 1"	12
8A	14946A003	Washer, Fast Seal	12
9	10414B001	Bearing Cap, Closed, Cast Iron	1
10	05011A027	Gasket, Shim .003 Thick, Green	6
11	05011A028	Gasket, Shim .015 Thick, Pink	4
12	05674A019	Bearing, Tapered Cone	2
12A	05675A018	Bearing, Tapered Cup	2
13	17481A001	Plug, Pipe, 1/2" NPTF, Magnetic	1
14	06076D000	Case, Gear, Ductile Iron	1
15	06110B004	Link, Ductile Iron	3
15B	26173A001	Oil Slinger	3
16	06074D011	Crankshaft	1
17	06109A000	Bearing, Steel Backed	6
18	06116A000	Pin, CRK & WR, CDS	3
19	10414B002	Bearing Cap, Open, Cast Iron	1
20	05710A004	Oil Seal, 1-3/8" Shaft Dia.	1
21	05818A077	Key, 5/16" x 5/16" x 2"	1
22	17515B001	Crosshead & Piston Rod	3
23	05030A020	Washer, Flat, Steel	4
24	05028A002	Mach. Screw, 1/4"-20 x 1/2"	4
25	25927C000	Adapter Cover	1
26	25937E000	Adapter, Water to Gear End Ductile	1
27	25934E003	Body, Cylinder, 1-3/8"	1
28	23188A002	Fitting, 1/4" NPT, 90 Male Elbow	3
29	06106A034	Screw, Skt. Hd., #10 x 1/2"	6
30	24959A002	Housing, Oil Seal	3
30A	05059A418	Gasket, Rubber Neoprene	3
31	22835A004	Cup, U Metric 22 I.D. x 30 O.D. x 5.5	6
32	05059A435	Gasket, Vellumoid	3

Ref. No.	Part No.	Description	Qty
33	06120A000	Spring, Wave	3
34	24958A001	Retainer, Oil Seal Housing	3
34A	06120A000	Spring, Retainer	3
35	05059A052	Gasket, Vellumoid	3
36	24894A008	Washer, Seal, 1-5/8" Dia.	3
38	25929A003	Packing, V-Ring	3
38A	05876A029	O-Ring	3
38B	24793A007	Ring, Male Adapter, 1-5/8"	3
39	25935A001	Ring, Female Adapter, 1-5/8"	3
40	10519A002	Fitting, 1/8" NPT Tube Str.	3
41	25928B006	Plate, Seal, 1-5/8" Dia.	3
42	24897A001	Seal, Low Pressure, 1-5/8" Bore	3
43	25926B212	Plunger, TECH 23, 1-5/8"	3
43A	26789A000	Stud	3
44	05876A217	O-Ring	3
45	23265161275	Tube, .25 O.D. x .04 Wall	1.75 ft.
50	05876A204	O-Ring	9
51	25931A002	Seat, Valve, 440C SST	6
52	05373A013	Valve, Ball, 440C SST	6
53	06127A003	Spring, Inconel	6
55	25932A000	Cap, Valve, Steel	3
56	25933B000	Clamp, Valve	1
57	19105A042	Screw, Hex 5/8"-18 x 1-3/4"	8
57A	19105A042	Screw, Hex 5/8"-18 x 1-3/4"	1
58	25938A001	Set Screw, Skt. Drive, 5/8"-18 x 1"	2
60	05659A125	Stud, 5/8"-18 x 3-1/4"	4
61	19103A008	Screw, Hex 1/2"-13 x 1-3/4"	4
62	05659A120	Stud, 5/8"-18 x 8-1/2"	4
62A	26709A000	Washer, Wedge	2
64	19109A047	Nut, Hex 5/8"-18	8
64A	19109A047	Nut, Hex 5/8"-18	1
66	06008A331	Plate, Name	1
66A	05160A001	Screw, Drive, .138 x 5/16	4
67	05022A043	Plug, Pipe, 1 Sq. Hd., Stl. Galvanized	1
68	05022A016	Plug, Pipe, 1-1/2" Sq. Hd., Mall Galvanized	1

Bold type indicates "normal" wearing items or items replaced when rebuilding a reciprocating pump (typ.)

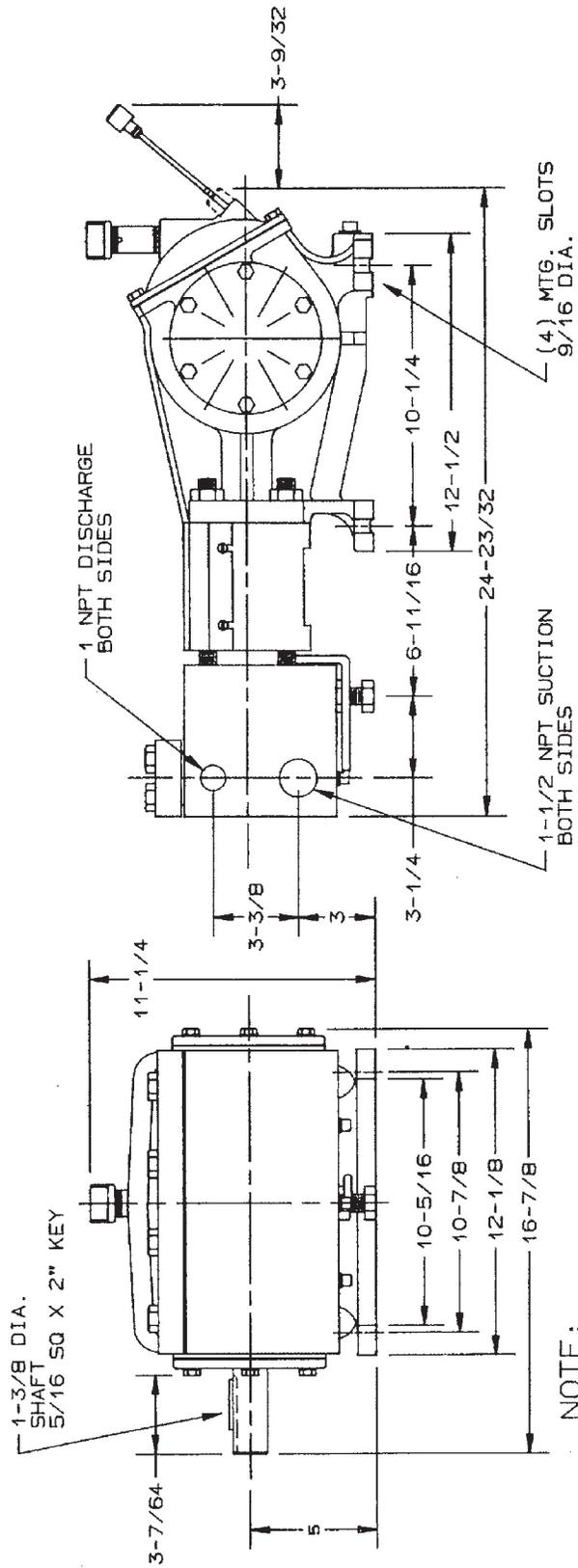
Parts List for Part No. 25905F304 – CPM18-15B-H/D

Ref. No.	Part No.	Description	Qty
1	05737A021	Cap, Pipe, 3/4" Galv.	1
2	17995A001	Nipple, Pipe, 3/4" Vented	1
3	05876A235	O-Ring	1
4	17360A014	Gauge, Oil Level	1
5	19101A007	Screw, Hex 3/8"-16 x 3/4"	6
6	06077C000	Lid, Cast Iron	1
7	06089B000	Gasket, Vellumoid	1
8	19101A013	Screw, Hex 3/8"-16 x 1"	6
8A	14946A003	Washer, Fast Seal	12
8B	19101A028	Screw, Hex Hd., 3/8"-16 x 2"	6
9	10414B001	Bearing Cap, Closed, Cast Iron	1
10	05011A027	Gasket, Shim .003 Thick, Green	6
11	05011A028	Gasket, Shim .015 Thick, Pink	4
12	05674A019	Bearing, Tapered Cone	2
12A	05675A018	Bearing, Tapered Cup	2
13	17481A001	Plug, Pipe, 1/2" NPTF, Magnetic	1
14	06076D000	Case, Gear, Ductile Iron	1
15	06110B004	Link, Ductile Iron	3
15B	26173A001	Oil Slinger	3
16	06074D013	Crankshaft, Hydraulic Drive	1
17	06109A000	Bearing, Steel Backed	6
18	06116A000	Pin, CRK & WR, CDS	3
19	26367B000	Adapter, Plate, Hydr. Drive	1
20	05710A045	Oil Seal, 1-3/4" Shaft Dia.	1
22	17515B001	Crosshead & Piston Rod	3
23	05030A020	Washer, Flat, Steel	4
24	05028A002	Mach. Screw, 1/4"-20 x 1/2"	4
25	25927C000	Adapter Cover	1
26	25937E000	Adapter, Water to Gear End Ductile	1
27	25934E003	Body, Cylinder, 1-3/8"	1
28	23188A002	Fitting, 1/4" NPT, 90 Male Elbow	3
29	06106A034	Screw, Skt. Hd., #10 x 1/2"	6
30	24959A002	Housing, Oil Seal	3
30A	05059A418	Gasket, Rubber Neoprene	3
31	22835A004	Cup, U Metric	6
		22 I.D. x 30 O.D. x 5.5	
32	05059A435	Gasket, Vellumoid	3

Ref. No.	Part No.	Description	Qty
33	06120A000	Spring, Wave	3
34	24958A001	Retainer, Oil Seal Housing	3
34A	06120A000	Spring, Retainer	3
35	05059A052	Gasket, Vellumoid	3
36	24894A008	Washer, Seal, 1-5/8" Dia.	3
38	25929A003	Packing, V-Ring	3
38A	05876A029	O-Ring	3
38B	24793A007	Ring, Male Adapter, 1-5/8"	3
39	25935A001	Ring, Female Adapter, 1-5/8"	3
40	10519A002	Fitting, 1/8" NPT Tube Str.	3
41	25928B006	Plate, Seal, 1-5/8" Dia.	3
42	24897A001	Seal, Low Pressure, 1-5/8" Bore	3
43	25926B212	Plunger, TECH 23, 1-5/8"	3
43A	26789A000	Stud	3
44	05876A217	O-Ring	3
45	23265161275	Tube, .25 O.D. x .04 Wall	1.75 ft.
50	05876A204	O-Ring	9
51	25931A002	Seat, Valve, 440C SST	6
52	05373A013	Valve, Ball, 440C SST	6
53	06127A003	Spring, Inconel	6
55	25932A000	Cap, Valve, Steel	3
56	25933B000	Clamp, Valve	1
57	19105A042	Screw, Hex 5/8"-18 x 1-3/4"	8
57A	19105A042	Screw, Hex 5/8"-18 x 1-3/4"	1
58	25938A001	Set Screw, Skt. Drive, 5/8"-18 x 1"	2
60	05659A125	Stud, 5/8"-18 x 3-1/4"	4
61	19103A008	Screw, Hex 1/2"-13 x 1-3/4"	4
62	05659A120	Stud, 5/8"-18 x 8-1/2"	4
62A	26709A000	Washer, Wedge	2
64	19109A047	Nut, Hex 5/8"-18	8
64A	19109A047	Nut, Hex 5/8"-18	1
66	06008A325	Plate, Name	1
66A	05160A001	Screw, Drive, .138 x 5/16	4
67	05022A043	Plug, Pipe, 1 Sq. Hd., Stl. Galvanized	1
68	05022A016	Plug, Pipe, 1-1/2" Sq. Hd., Mall Galvanized	1

Bold type indicates "normal" wearing items or items replaced when rebuilding a reciprocating pump (typ.)

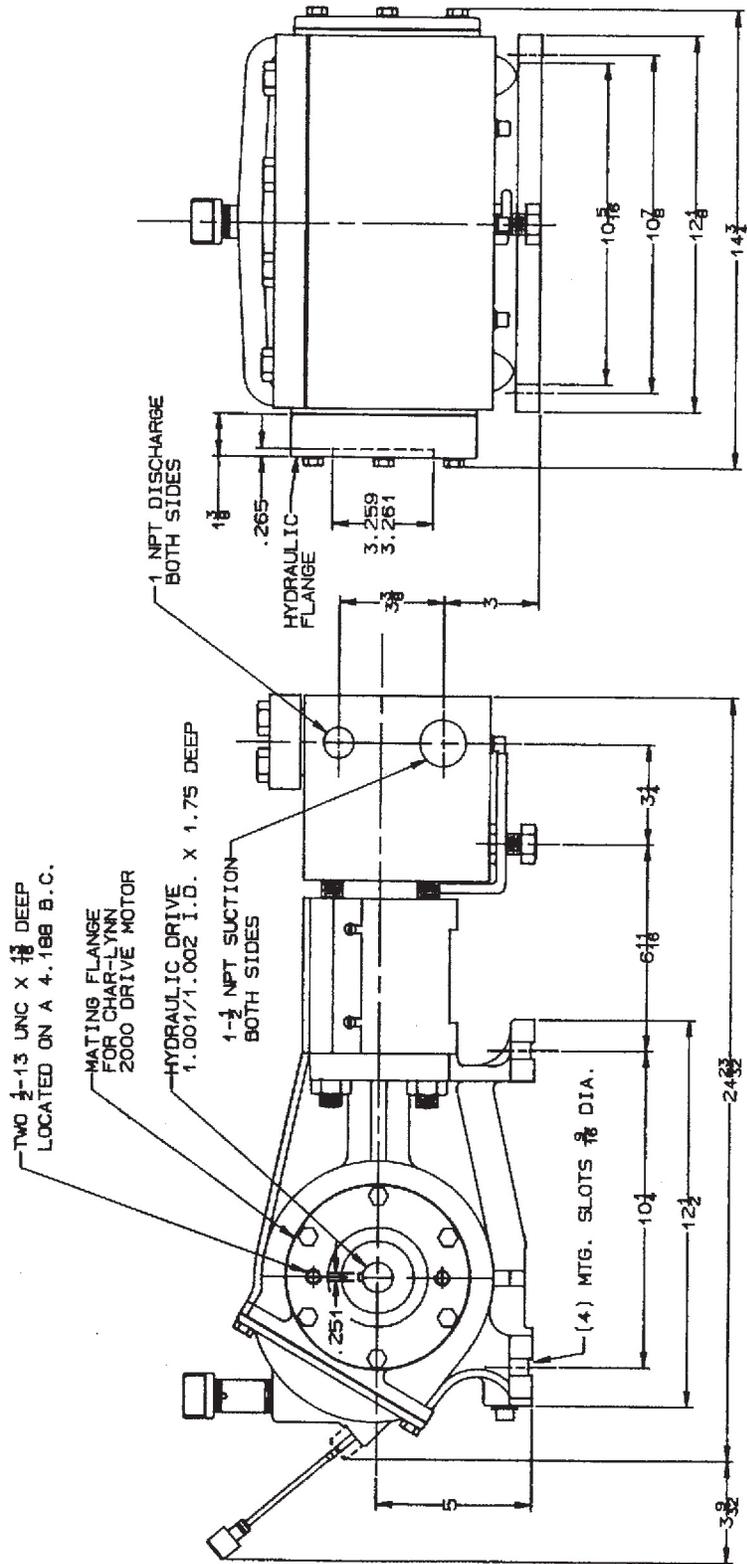
CPM15-15B & CPM18-15B



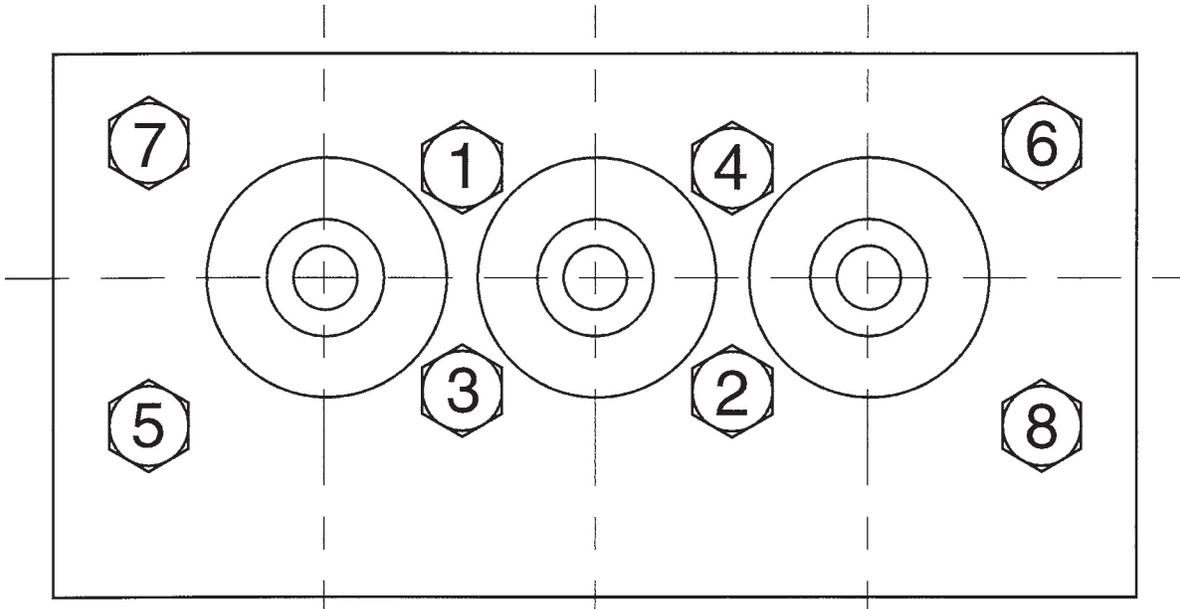
NOTE:

STANDARD SHAFT EXTENSION SHOWN (RIGHT HAND)

CPM15-15B-H/D & CPM18-15B-H/D



LIQUID END FASTENER TORQUING PROCEDURE



Torque bolts to 50 ft-lbs in sequence shown on figure.

Then retorque to 85 ft-lbs using same sequence.

CPM15-15B (25905F300) & CPM15-15B-H/D (25905F301)

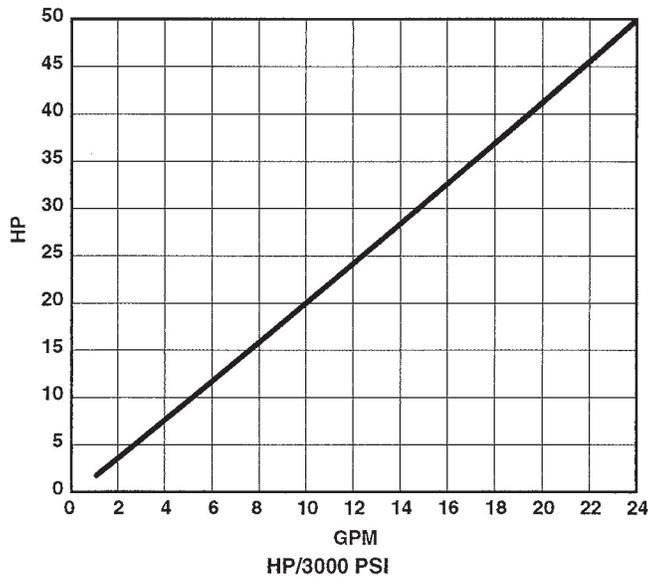
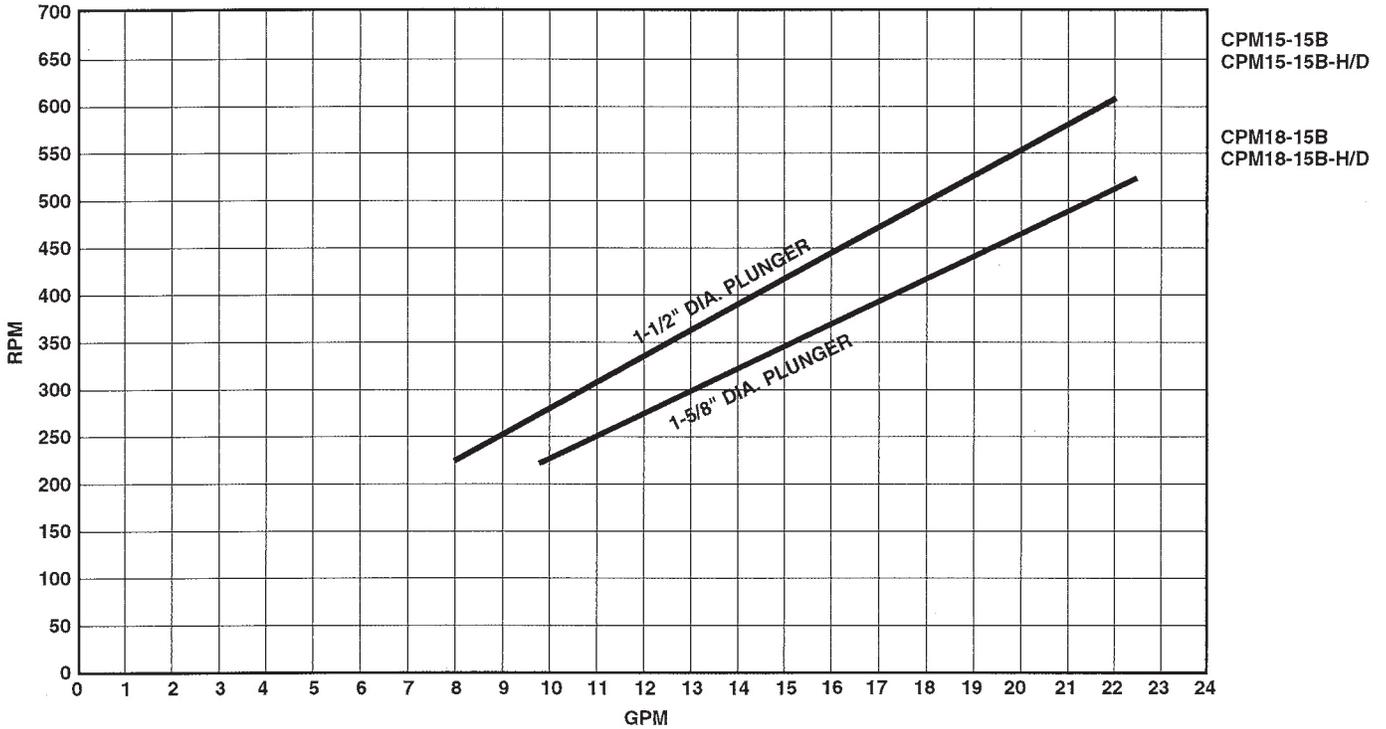
1-1/2" DIA. PLUNGER x 1-3/4" STROKE

CPM18-15B (25905F303) & CPM18-15B-H/D (25905F304)

1-5/8" DIA. PLUNGER x 1-3/4" STROKE

NOTE: Horsepower requirements for an internal combustion engine (gas or diesel) may be obtained by multiplying the figures listed by 1.3. Do not exceed 80% of the engine manufacturers advertised horsepower at operating RPM.

NOTE: Consult F.E. Myers when operating speed is less than minimum rating for lubrication recommendations.



STANDARD LIMITED WARRANTY CENTRIFUGAL & RECIPROCATING PUMPS

Pentair Myers® warrants its products against defects in material and workmanship for a period of 12 months from the date of shipment from Pentair Myers or 18 months from the manufacturing date, whichever occurs first – provided that such products are used in compliance with the requirements of the Pentair Myers catalog and technical manuals.

During the warranty period and subject to the conditions set forth, Pentair Myers, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Myers reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Seals, piston cups, packing, plungers, liners and valves used for handling clear, fresh, nonaerated water at a temperature not exceeding 120°F are warranted for ninety days from date of shipment. All other applications are subject to a thirty day warranty. Accessories such as motors, engines and auxiliary equipment are warranted by the respective manufacturer and are excluded in this standard warranty. Under no circumstance will Pentair Myers be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Myers service facility.

This limited warranty will not apply: (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and parts used in connection with such service; (d) to units that are not installed in accordance with applicable local codes, ordinances and good trade practices; (e) if the unit is moved from its original installation location; (f) if unit is used for purposes other than for what it is designed and manufactured; (g) to any unit that has been repaired or altered by anyone other than Pentair Myers or an authorized Pentair Myers service provider; (h) to any unit that has been repaired using non factory specified/OEM parts.

Warranty Exclusions: PENTAIR MYERS MAKES NO EXPRESS OR IMPLIED WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. PENTAIR MYERS SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE.

Liability Limitation: IN NO EVENT SHALL PENTAIR MYERS BE LIABLE OR RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES RESULTING FROM OR RELATED IN ANY MANNER TO ANY PENTAIR MYERS PRODUCT OR PARTS THEREOF. PERSONAL INJURY AND/OR PROPERTY DAMAGE MAY RESULT FROM IMPROPER INSTALLATION. PENTAIR MYERS DISCLAIMS ALL LIABILITY, INCLUDING LIABILITY UNDER THIS WARRANTY, FOR IMPROPER INSTALLATION. PENTAIR MYERS RECOMMENDS INSTALLATION BY PROFESSIONALS.

Some states do not permit some or all of the above warranty limitations or the exclusion or limitation of incidental or consequential damages and therefore such limitations may not apply to you. No warranties or representations at any time made by any representatives of Pentair Myers shall vary or expand the provision hereof.



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