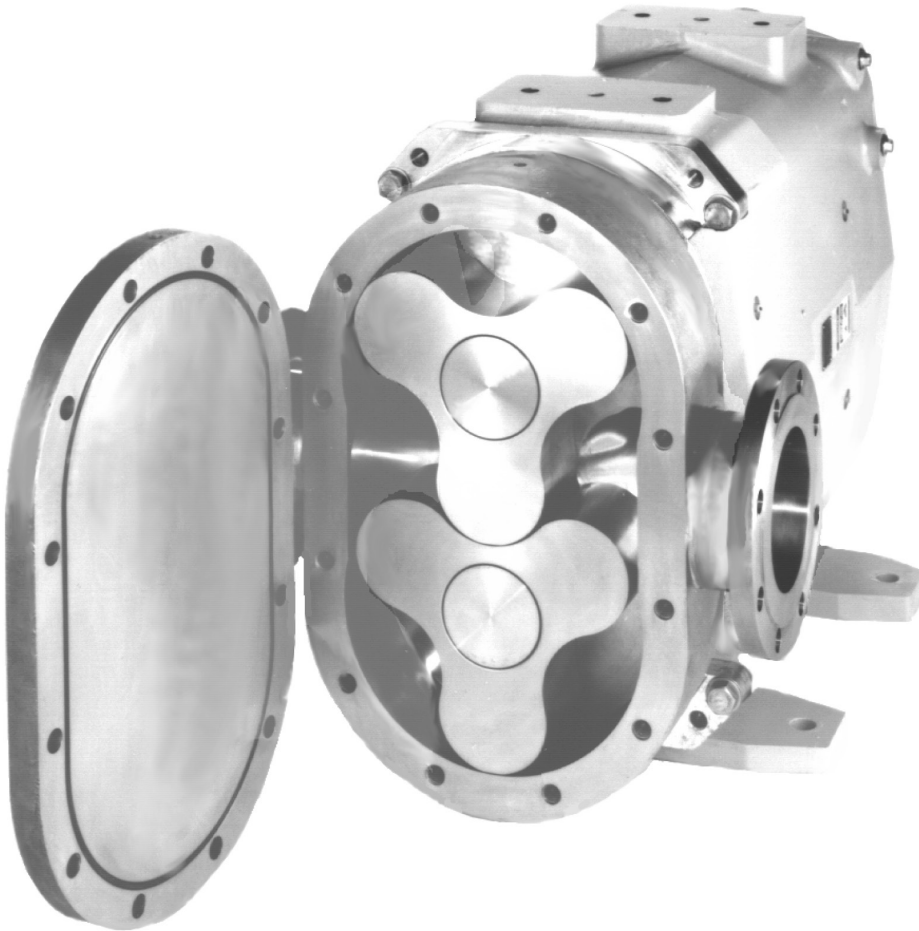


Universal Lobe 420/520UL Series

ROTARY POSITIVE DISPLACEMENT PUMP

FORM NO.: 95-03034 REVISION: 03/1998

READ AND UNDERSTAND THIS MANUAL PRIOR TO OPERATING OR SERVICING THIS PRODUCT.



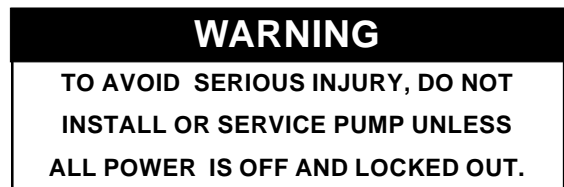
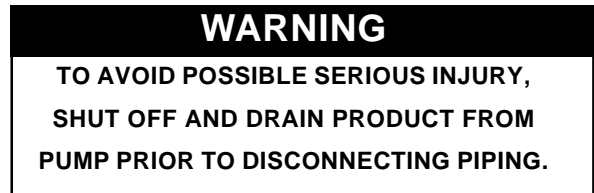
SAFETY

Warnings, cautions and notes are contained in this manual. To avoid serious injury and/or possible damage to equipment, pay attention to these messages.

WARNING Hazards or unsafe practices which COULD result in severe personal injury or death and how to avoid it.

CAUTION Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

NOTE Important information pertaining directly to the subject.
(Information to be aware of when completing the task.)



REPLACEMENT LABEL



REPLACEMENT LABEL

Read and understand this manual prior to installing, operating or maintaining this pump.

TABLE OF CONTENTS

Safety	3	Assembly Procedures	
		Shaft Sub Assembly	26
		Bearings	26
Receiving and Warranty	5	Shaft Installation in Gear Case Assembly 27-28	
Inspection		Timing Gear Installation	28
Loss or Damage		Adjusting Rotor to Body Backface	29
Introduction	6	Shims - All Models	29
Installation		Fluid Head Assembly	
Basic Dimensions	7	Seal Assembly	30
Capacity ratings	7	Body Installation	31
Pump and Drive Unit	8	Rotor Installation	31
Piping Layout	9	Timing rotors	32
Valves	9	Cover Installation	32
Strainers/Gages	10	420/520 Gearcase Subassembly	33
Alignment	10-11	Universal 420 Parts Listing	34
Pump Rotation	11	Torque Specifications	34
Low Pressure Flush	12	Universal 520 Parts Listing	35
High Pressure Flush	12	Torque Specifications	35
Start-up Check List	13	Seals	
Operation	14	Double Mechanical Seal	36
Lubrication	14	Single Inner Mechanical Seal	37
Cleaning	14	Single Outer Mechanical Seal	38
Troubleshooting a Pump System ..	15-18	Parts Ordering	39
Maintenance			
Safety Precautions	19		
Special Tools	19		
Disassembly Procedures			
Fluid Head Removal	20		
Cover Removal	20		
Rotor Removal	21		
Body Removal	22		
Mechanical Seal Removal	23		
Gearcase Disassembly			
... Timing Gears	24		
... Shaft and Bearing Removal	25		

RECEIVING AND WARRANTY

WAUKESHA CHERRY-BURRELL WARRANTY

Seller warrants its products to be free from defects in materials and workmanship for a period of one (1) year from the date of shipment. This warranty shall not apply to products which require repair or replacement due to normal wear and tear or to products which are subjected to accident, misuse or improper maintenance. This warranty extends only to the original Buyer. Products manufactured by others but furnished by Seller are exempted from this warranty and are limited to the original manufacturer's warranty.

Seller's sole obligation under this warranty shall be to repair or replace any products that Seller determines, in its discretion, to be defective. Seller reserves the right either to inspect the products in the field or to request their prepaid return to Seller. Seller shall not be responsible for any transportation charges, duty, taxes, freight, labor or other costs. The cost of removing and/or installing products which have been repaired or replaced shall be at Buyer's expense.

Seller expressly disclaims all other warranties, express or implied, including without limitation any warranty of merchantability of fitness for a particular purpose. The foregoing sets forth Seller's entire and exclusive liability, and Buyer's exclusive and sole remedy, for any claim of damages in connection with the sale of products. In no event shall Seller be liable for any special consequential incidental or indirect damages (including without limitation attorneys' fees and expenses), nor shall Seller be liable for any loss of profit or material arising out of or relating to the sale or operation of the products based on contract, tort (including negligence), strict liability or otherwise.

FACTORY INSPECTION

Each WAUKESHA pump is shipped completely assembled, lubricated and ready for use.

The WAUKESHA pump is a precision product, designed to provide long, trouble-free service in a properly designed system with normal maintenance.

RECEIVING INSPECTION

Ports are rubber capped at the factory to keep out foreign objects. If covers are missing or damaged, a thorough inspection of fluid head, by removing pump cover, is recommended. Be sure pumping head is clean and free of foreign material before rotating shaft.

LOSS OR DAMAGE

If your pump has been lost or damaged in transit, file a claim at once with the delivering carrier and ask for an Inspector to call. The carrier has signed the Bill of Lading acknowledging that the shipment has been received from us in good condition.

We will of course assist you in every way in collecting claims for loss, or damage, however, we are not responsible for the collection of claims or replacement of material.

WARRANTY

Please read the Warranty statement to correctly determine if you have a claim. In warranty claims you must have a "Returned Goods Authorization" (RGA) from the manufacturer before any returns will be accepted. Your Distributor will help you in a warranty problem. (See back pages for Information required)

INTRODUCTION

The Models 420 & 520 provide reliable and accurate pumping at high-volume capacities.

Sanitation Features

- Rotor/shaft connection sealed from product zone.
- Sidemount capability for better draining.
- 316L pump body standard.
- Exclusive, non-galling Waukesha “88” alloy rotors standard; permits running at tighter clearances and higher efficiencies; 316L stainless also available.
- Mechanical seals standard.

Long-life features

- Large diameter shafts in seal area for greater strength and stiffness.
- Heavy duty bearing frame (Gearcase)
- Double tapered roller bearings contribute further to precise rotor movement and longer seal life.
- No bearing in product zone - accommodates severe operating conditions.
- Greater flow capacity than conventional high-volume PD pumps.
- High pressure capability for more demanding jobs.

- Longer service life resulting from fresh engineering approach and high capacity components.

- The right seal for every application, plus interchangeability when needed.

- Metal rotor. exclusive Waukesha “88 “ non-galling alloy, for close running clearance.

*Mechanical seal material options.

- Carbon
- Ceramic
- Silicon Carbide

Installation/Maintenance Flexibility

- Bi-directional flow. No flow direction specification needed.

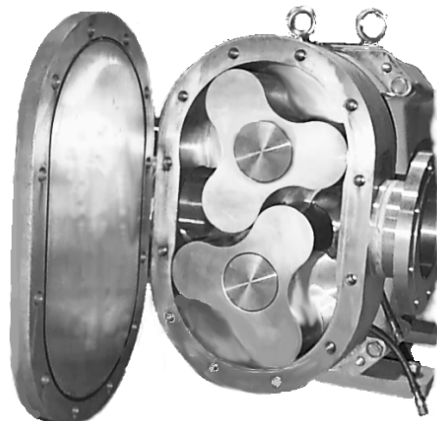
- 4-Way mounting of gearcase, including vertical alignment of ports.

- External shimming simplifies shaft height adjustments; reduces downtime.

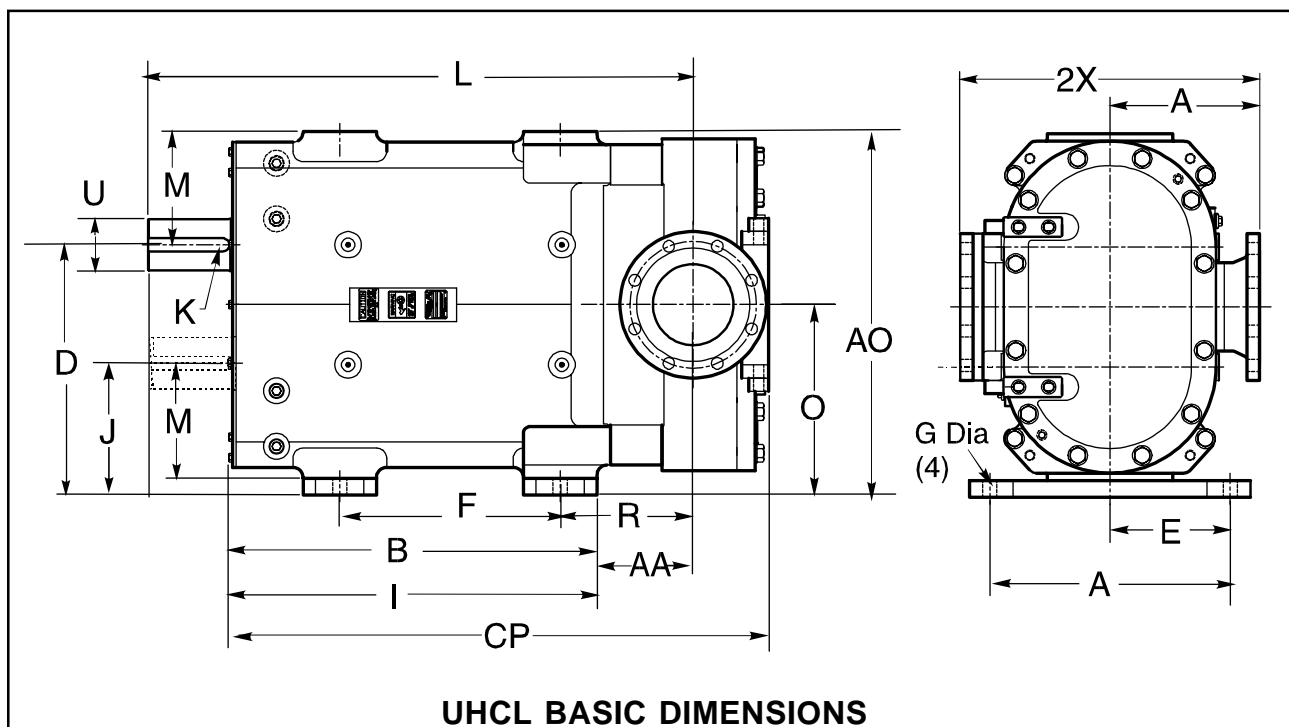
- Upper or Lower shaft position.

- High-volume capacity with the reliability of a Waukesha

Model	Displacement Per Revolution	Nominal Capacity	Inlet/Outlet	Maximum Pressure	Maximum RPM	Temperature Range
420-UHCL	1.83 Gal. (6.93 Liter)	730 GPM (166 m3/hr.)	6" (154.4 mm)	300 PSI (20.7 bar)	400	-40° F/C to 300°F/149° C.
520-UHCL	2.60 Gal (9.84 Liter)	1040 GPM (262 m3/hr.)	8" (203.2mm)	250 PSI (17.25 bar)	400	-40° F/C to 300° F/149° C.



INSTALLATION



MODEL	DIM.	A	AA	AO	B	CP	D	E	F
420	inch	21.00	7.22	27.25	22.00	46.47	18.75	9.00	16.50
	mm	533.4	183.4	692.2	558.8	1180.3	476.2	228.6	419.1
520	inch	21.00	7.57	27.25	22.00	48.79	18.75	9.00	16.50
	mm	533.4	192.3	692.2	558.8	1239.3	476.2	228.6	419.1

MODEL	DIM	G	I	J	K	L	M	N	O	R
420	inch	1.06	33.60	9.75	1.00	40.81	8.50	6.04	14.25	9.97
	mm	26.92	853.4	247.6	25.4	1036.6	215.9	153.4	362	253.2
520	inch	1.06	33.60	9.75	1.00	41.17	8.50	6.04	14.25	10.32
	mm	26.92	853.4	247.6	25.4	1045.7	215.9	153.4	362	262.1

MODEL	DIM	U	X	2X	FLANGE SIZE
420	inch	3.875	11.25	22.50	ANSI 6"
	mm	98.42	285.7	571.5	154.4mm
520	inch	3.875	11.25	22.50	ANSI 8 "
	mm	98.42	285.7	571.5	203.2mm

INSTALLATION

PUMP INSTALLATION

The installation of your Waukesha pump and its piping system should follow the practices described to give optimum performance, and be in accordance with local codes and restrictions.

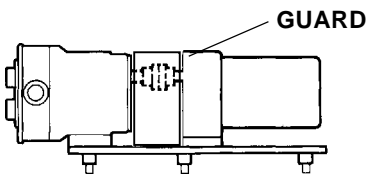
All system equipment, such as motors, sheaves, drive couplings, speed reducers, etc., must be properly sized to insure satisfactory operation of your Waukesha pump within its limits.

CAUTION: Waukesha pumps are positive displacement, low slip design and will be severely damaged if operated with closed valves in discharge or inlet lines. Pump warranty is not valid for damages caused by a hydraulic overload from operation or start-up with a closed valve in the system.

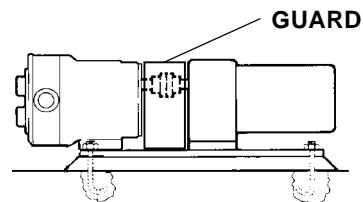
WARNING

Full coupling guards must be installed to isolate operators and maintenance personnel from rotating components. Coupling guards are provided with Waukesha pumps as a part of a complete pump and drive package.

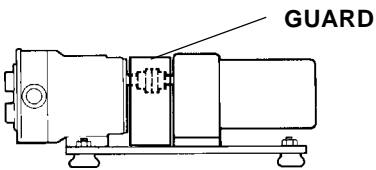
1. Installing the Pump and Drive Unit. Pumps of this type can be mounted on a common base plate with the drive. The unit can be installed in several ways:



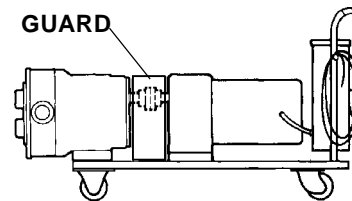
Adjustable leg base, commonly used for sanitary pumps. For washdown under base. Can be easily moved or repositioned.



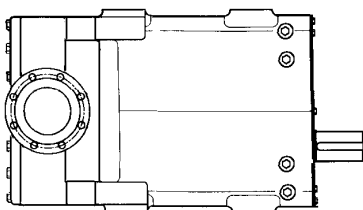
Permanent installation on foundation with bolts and grout. (Level unit before grouting.)



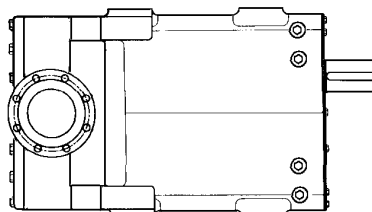
Leveling and/or vibration **isolation pads**.



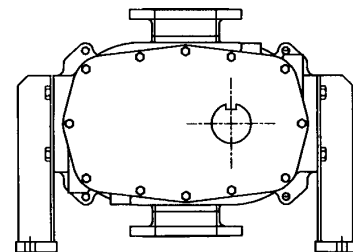
Portable bases-for movement to different locations. Many Commercial types are available.



Bottom Shaft Mount



Top Shaft Mount



Sidemount Vertical Fluid Entry

INSTALLATION

WARNING

TO AVOID SERIOUS INJURY, DO NOT INSTALL OR SERVICE PUMP UNLESS ALL POWER IS OFF AND LOCKED OUT.

2. Good Piping Practice.

All piping to the pump should be supported independently, to minimize the forces exerted on the pump. Such forces can cause misalignment of pump parts and lead to excessive wear of rotors, bearings and shafts.

NOTE: Pump dimensions and pump weights are on page 7.

A. Piping support:

Weight of piping and fluid-support piping independently with hangers or pedestals.



Thermal expansion of piping-can cause tremendous forces. Use thermal expansion joints to minimize forces on pump.

B. Flexible joints can also be used to limit the transmission of mechanical vibration. Anchor free ends of any flexible hose in system.

Piping Layout

C. Inlet side: Slope piping up to inlet to avoid air pocket.

D. Inlet side-use check valves to keep inlet line full, particularly with low viscosity fluids, and in start-stop operation.

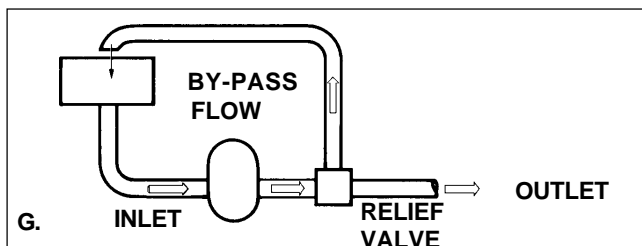
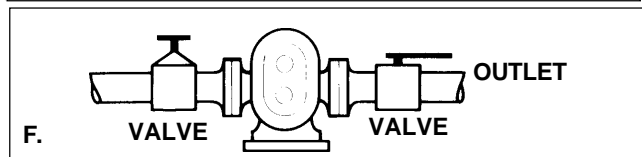
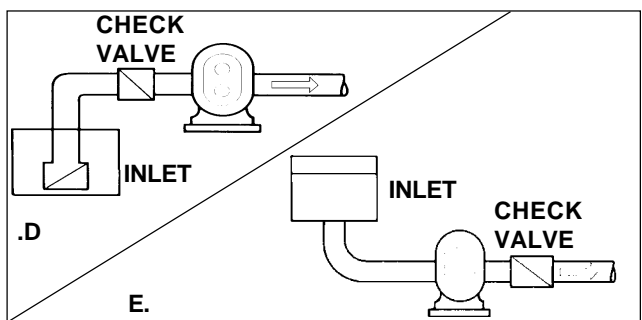
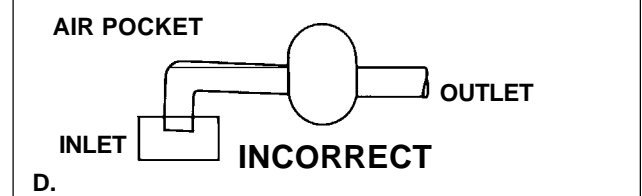
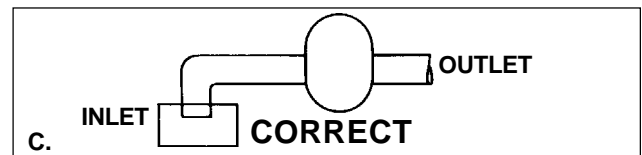
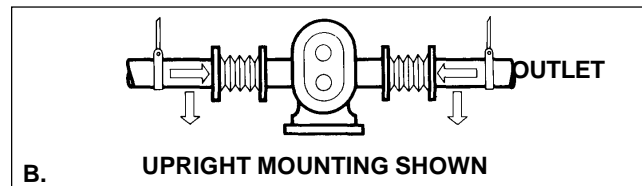
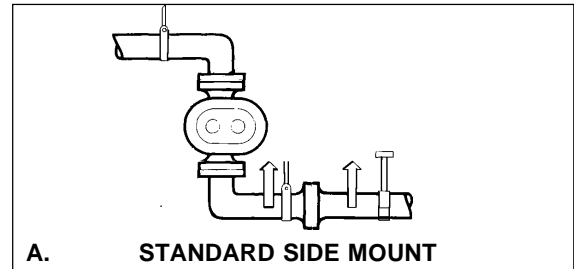
E. Inlet Vacuum Service-use check valve on outlet side.

- Prevents backflow (air or fluid).
- Facilitates initial start-up (minimizes differential pressure pump must supply to start flow).

F. "Isolation" Valves-permit pump maintenance and removal safely and without emptying entire system.

G. Relief Valve

To protect the pump and piping system against excessive pressure, a relief valve should be installed. An integral relief valve, designed to bypass the fluid internally from the pump outlet to the inlet, should not be used on applications where the discharge must be closed for more than a few minutes. Prolonged operation of the pump with closed discharge will cause heating of the fluid circulating through the relief valve. When such operation is necessary, the relief valve, whether integral, attachable, or line-mounted, should discharge externally through piping connected to the fluid source, or if that is not practical, into the inlet piping near the source.



INSTALLATION

Inlet Side-Strainers and Traps.

Inlet side strainers and traps can be used to prevent pump damage from foreign matter. Selection must be carefully made as clogging can easily occur, restricting the inlet, causing cavitation and flow stoppage.

Pressure Gauges

Pressure and Vacuum gauges provide the easiest way to tell you something about the pump operation.

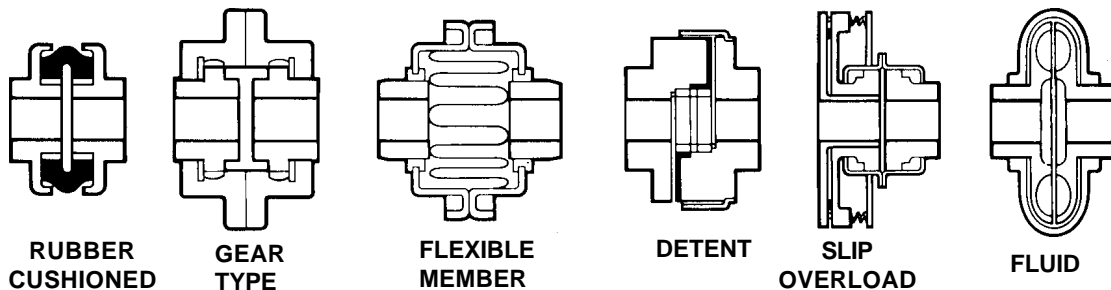
- Normal or abnormal pressures
- Overload conditions
- Indication of flow
- Changes in pump condition
- Changes in system conditions
- Changes in fluid viscosity

3. Alignment of Pump to Drive.

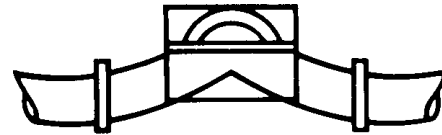
Pumps and drives which are ordered from the factory and mounted on a common base plate are accurately aligned before shipment. The alignment should be rechecked after the complete unit has been installed and the piping completed. Periodic rechecking is advisable during the pump service life.

In-line Drives. For initial pump installation, and for rechecking alignment, the following steps are advised:

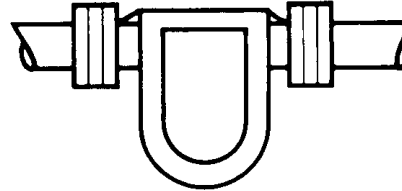
Use a flexible coupling to connect the drive to the pump. Many different types are available, including couplings with slip or overload provision.



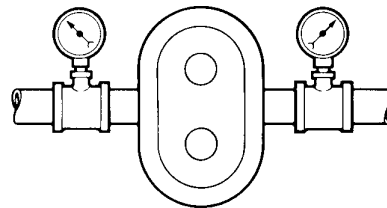
A flexible coupling is used to compensate for end play and small differences in alignment. The pump and drive shaft should be aligned as closely as is possible.



MAGNETIC TRAP



STRAINER



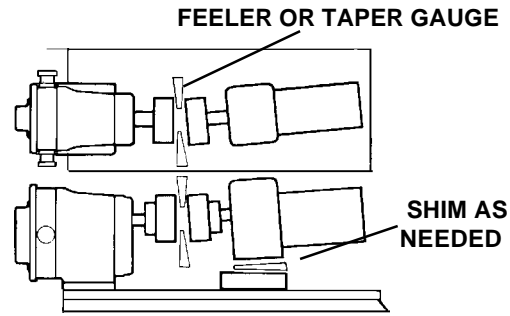
WARNING

TO AVOID SERIOUS INJURY, DO NOT
INSTALL OR SERVICE PUMP UNLESS
ALL POWER IS OFF AND LOCKED OUT.

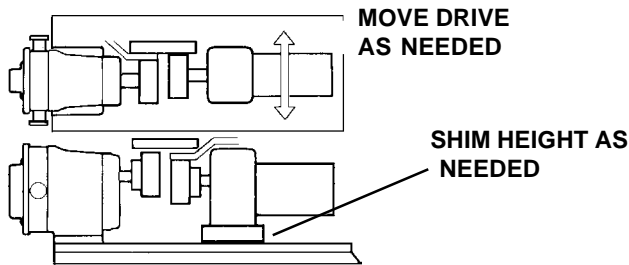
INSTALLATION

Check angular alignment:

Using feeler gauges, or taper gauges, adjust to get equal dimension at all points. At the same time set space between coupling halves to manufacturer's recommended distance.



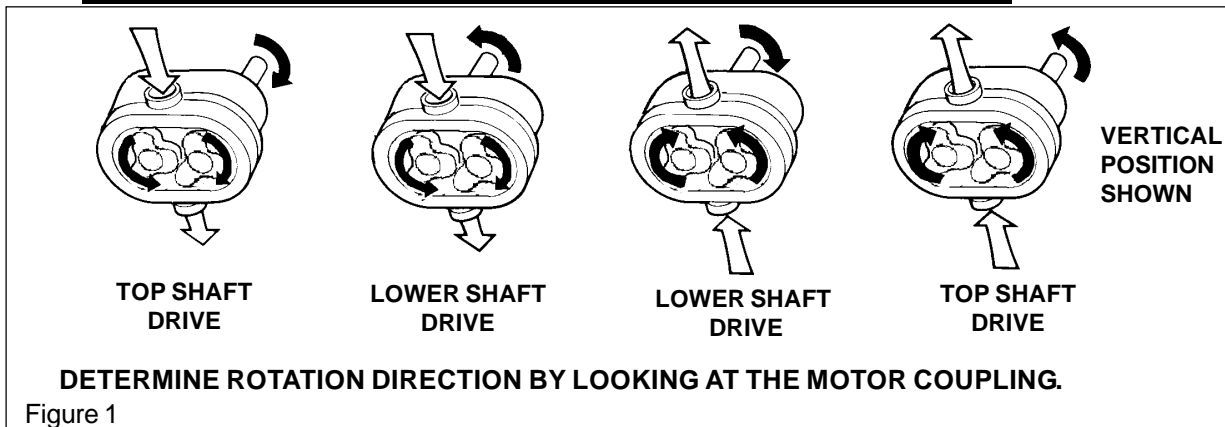
Check parallel misalignment: Use straight edges and shims:



After piping is complete, and drive and couplings are aligned, turn pump shaft manually to see if it turns freely without binding.

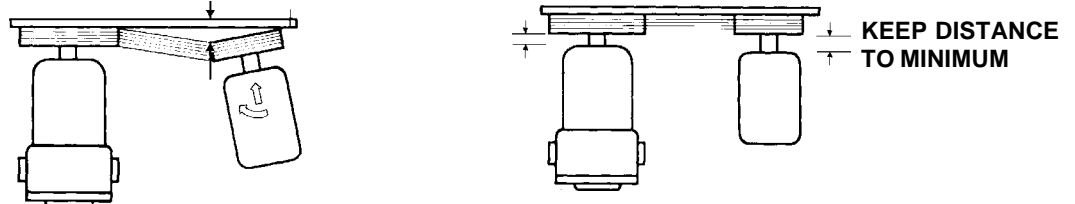
Check rotation direction of drive to see that pump will rotate in proper direction.
("Liquid End" of pump is shown below.)

Warning Note: Covers have been removed for illustration purposes only.
The pump *cannot* be operated with the cover removed.



Aligning belt and chain drives. Using straight-edges and visual check:

MOVE DRIVE TO CORRECT ANGULAR AND PARALLEL MISALIGNMENT.

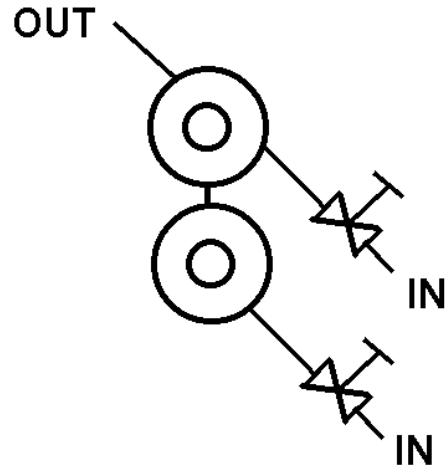


After piping is complete and before belts are installed, **turn pump shaft manually** to see that it turns freely. Check rotation direction of pump to see that pump will rotate in proper direction (see figure 1) Install belts and tension them correctly. Install belt guard.

INSTALLATION

LOW PRESSURE FLUSH (STANDARD RECOMMENDATION)

- a. Set flow rate of approximately 1/4 GPM for most applications. For high temperature applications, increase flow.
- b. Flushing media is restricted on inlet side and has free flow to drain on outlet side.

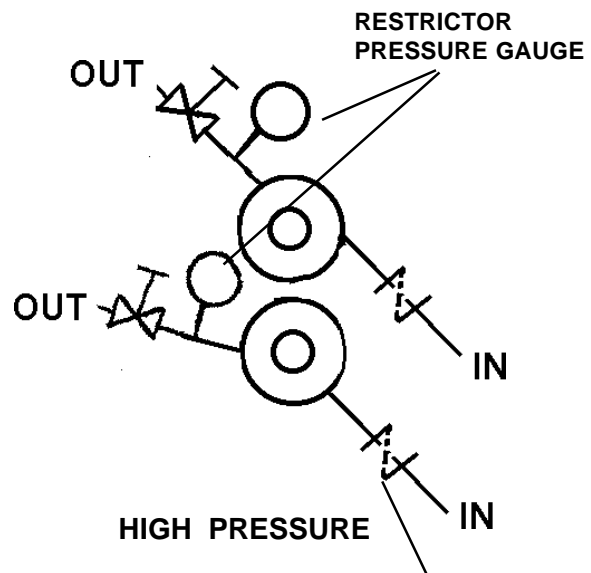


LOW PRESSURE

HIGH PRESSURE FLUSH

This method is good for abrasive applications and products that tend to "set" on seal faces.

- a. Set flow rate of approximately 1/4 GPM for most applications.
- Solenoid is recommended to stop flushing when pump is stopped. Restriction and pressure gauge is at discharge end. **Do not exceed 30 PSI with standard seals.**



START-UP CHECK LIST

The Waukesha Pump is a positive displacement pump and thus can develop very high pressures. To protect lines, equipment and personnel, certain precautions must be taken.

- 1. Review page 9, particularly "Relief Valves". Install relief valves if needed.
- 2. Check that piping and pump are clean and free of foreign material, such as welding slag, gaskets, etc. **Do not use pump to flush system.**
- 3. See that all piping connections are tight and leak-free. Where possible, check system with "non-hazardous" fluid.
- 4. Check to see that pump and drive are lubricated. See page 14. Check Drive Lubrication Instruction.
- 5. Check that all guards are in place and secure.
- 6 Seals: Double mechanical and double O-ring seals with flushing require adequate supply and flow of clean flushing fluids.
- 7. See that all valves are open on discharge system, and that free flow path is open to destination.
- 8. See that all valves are open on inlet side, and that fluid can reach pump.
- 9. Check direction of pump and drive rotation. (See page 11)
- 10. Start pump drive. Where possible, start at slow speed, or jog.

Check to see that liquid is reaching pump within several minutes. If pumping does not begin and stabilize, check items under "No Flow" or "Insufficient Flow" on (Page 15)

Troubleshooting a Pumping System.

OPERATION

Normal operation covers a speed range of 0-600 RPM and pressure range of 0-200 PSI. Temperature range with standard rotors is -40° to 200° F. and with hot clearance rotors, 180° to 300° F. (For operation at higher temperatures, consult Waukesha Cherry-Burrell.)

See START-UP CHECK LIST (Page 13) and TROUBLESHOOTING (Page 15-18) for additional operation information.

LUBRICATION

The gears are factory lubricated with Micro-Plate No. 140 oil at the quantity shown for top or bottom shaft mounts. If you mount your pump other than top or bottom shaft drive, check oil level.

The bearings are factory greased with Micro-Plate #555 grease.

Change oil every 500 hours. If pump is installed where moisture and condensation are heavy, change oil more frequently.

Bearings must be greased every 250 hours or less depending on moisture and condensation conditions.

NOTE: For hot or cold extremes use appropriate lubricant as shown in the following tables.

OIL
Micro-Plate #140 -10° to 350° F. (-23° to 177° C.)

GREASE
Silicone -20° to 5° F. (-29° to 15° C.) Micro-Plate #555 (5° to 350° F. (-15° to 177° C.)

DRIVE LUBRICATION

Refer to drive manufacturer's manual shipped with unit.

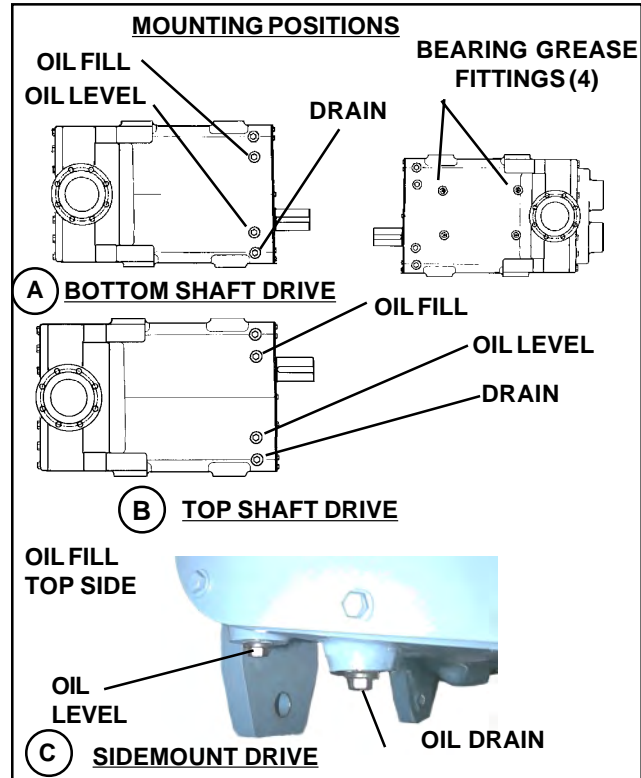
CLEANING

The standard Waukesha pumps without CIP properties, are designed to be completely disassembled for thorough and easy cleaning.

Clean the pump every day or at the end of a process. Disassemble the fluid head as outlined. Remove and clean the cover O-ring, pump seals and rotor nut assembly. **Inspect and replace O-rings if required.**

CAUTION

To avoid possible injury;
SHUT OFF and LOCK OUT
all power; relieve system
pressure before servicing.



MODEL	OIL CAPACITY (GEARS)	
	SHAFT	
	TOP OR BOTTOM	SIDE MOUNT
420/520	3.0 Quart (3.4 Liter)	4.7 Quart (4.5 Liter)

NOTE:

Where possibility of material "setting up" during shut down exists, flushing with solvent or dis-assembly of fluid head and manual cleaning are required.

TROUBLESHOOTING A PUMPING SYSTEM

Once a pump is properly selected and installed in a system, operation should be trouble free. However, in existing systems, or as pump and system conditions change, problems may develop. Following are some troubleshooting hints to help identify and solve problems.

WARNING

TO AVOID SERIOUS INJURY, DO NOT INSTALL OR SERVICE PUMP UNLESS ALL POWER IS OFF AND LOCKED OUT.

WARNING

TO AVOID POSSIBLE SERIOUS INJURY, SHUT OFF AND DRAIN PRODUCT FROM PUMP PRIOR TO DISCONNECTING PIPING.

Problem	Probable Causes	Solutions
No flow, pump not turning	Drive motor not running	Check resets, fuses, circuit breakers
	Keys sheared or missing	Replace
	Drive belts, power transmission components slipping or broken	Replace or adjust
	Pump shaft, keys, or gears sheared	Inspect: replace parts
No flow, pump not priming	Valve closed in inlet line	Open valve
	Inlet line clogged or restricted	Clear line, clean filters, etc.
	Air leaks due to bad seals or pipe connections	Replace seals; check lines for leakage (can be done by air pressure or by filling with liquid and pressurizing with air)
	Pump speed too slow	Increase speed. Filling inlet lines with fluid may allow initial start-up. Foot valve may solve start-up problems permanently.
	Liquid drains or siphons from system during off periods	Use foot valve or check valves

TROUBLESHOOTING

Problem	Probable Causes	Solutions
No flow, pump not priming	"Air" lock. Fluids which "gas off", or vaporize, or allow gas to come out of solution during off periods	Manual or automatic air bleed from pump or lines near pump
	Extra clearance rotors, worn pump	Increase pump speed, use foot valve to improve priming
	Net inlet pressure available too low	Check NIPA, NIPR~, recalculate system. Change inlet system as needed.
	On "Vacuum" inlet system: On initial start-up, atmospheric "blow back" prevents pump from developing enough differential pressure to start flow.	Install check valve in discharge line
Insufficient flow	Speed too low to obtain desired flow	Check flow-speed curve
	Air leak due to bad seals or pipe connections	Replace seals, check inlet fittings.
Fluid vaporization ("starved" pump inlet)	Strainers, foot valves, inlet fittings or lines clogged	Clear lines. If problem continues, inlet system may require change
	Inlet line size too small, inlet line too long. Too many fittings or valves. Foot valve, strainers too small .	Increase inlet line size. Reduce length, minimize direction and size changes, reduce number of fittings.
	NIPA too low	Raise liquid level in source tank
	NIPA too low	Increase by raising or pressurizing source tank

NIPA - Net Inlet Pressure Available at Pump
NIPR - Net Inlet Pressure Required by Pump

TROUBLESHOOTING

Problem	Probable Causes	Solutions
Fluid vaporization ("starved" pump inlet)	NIPA too Low	Select larger pump size with smaller NIPR
	Fluid viscosity greater than expected	Reduce pump speed and accept lower flow, or change system to reduce line losses.
	Fluid temperature higher than expected (vapor pressure higher)	Reduce temperature, reduce speed and accept lower flow or change system to increase NIPA
Insufficient flow. Fluid being bypassed somewhere	Flow diverted in branch line, open valve, etc.	Check system and controls
Insufficient flow. High slip	Hot (HC) or extra clearance rotors on "cold" fluid, and/or low viscosity fluid	Replace with standard clearance rotors
	Worn pump	Increase pump speed (within limits). Replace rotors, recondition pump.
	High pressure	Reduce pressure by system changes
Noisy operation	Cavitation	
	High fluid viscosity, High vapor pressure fluids, High temperature	Slow down pump, reduce temperature, change system
	NIPA less than NIPR see Engineering Manual	To increase NIPA or reduce NIPR,
	Air or gas in fluid	
	Leaks in pump or piping	Correct leaks
	Dissolved gas or naturally aerated products	Minimize discharge pressure. Also see "Cavitation" above.
	•Mechanical noises Rotor to body contact	
	Improper assembly	Check clearance with shims. See page 29.

TROUBLESHOOTING

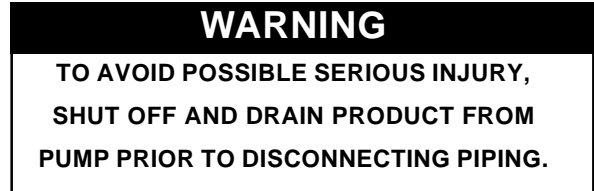
Problem	Probable Causes	Solutions
Noisy operation	<ul style="list-style-type: none"> • Rotor to body contact Distortion of pump due to improper piping installation. Pressure higher than rated Worn bearing Worn gears • Rotor to rotor contact Loose or mis-timed gears. twisted shaft, sheared keys. worn splines • Drive component noise-gear trains, chains, couplings, bearings. 	<p>Reassemble pump or reinstall piping to assure free running</p> <p>Reduce pressure if possible</p> <p>Rebuild with new bearings. Lubricate regularly</p> <p>Rebuild with new gears. Lubricate regularly</p> <p>Rebuild with new parts</p> <p>Repair or replace drive train</p>
Pump requires excessive power (overheats, stalls. high current draw, breakers trip)	<ul style="list-style-type: none"> • Higher viscous losses than expected • Higher pressure than expected • Fluid characteristics Fluid colder than expected. viscosity high Fluid sets up in line and pump during shut down Fluid builds up on pump surfaces (example. latex, chocolate. fondants) 	<p>If within pump rating, increase drive size</p> <p>Reduce pump speed, increase line sizes</p> <p>Heat fluid. insulate or heat trace lines. Use pump with more running clearances.</p> <p>Insulate or heat trace line. Install "soft start" drive. Install recirculating bypass system. Flush with other fluid.</p> <p>Use pump with more running clearance</p>
"Short" pump service life	<ul style="list-style-type: none"> High corrosion rate Pumping abrasives Speeds and pressures higher than rated Worn bearings and gears due to lack of lubrication Misalignment of drive and piping. Excessive overhung load or misaligned couplings. 	<p>Upgrade material of pump</p> <p>Larger pumps at slower speeds, can help</p> <p>Reduce speeds and pressures by changes in system</p> <p>Set up and follow regular lubrication schedule</p> <p>Check alignment of piping. Check drive alignment and loads. (Page 11)</p>

MAINTENANCE

FLUID HEAD DISASSEMBLY

RECOMMENDED SAFETY PRECAUTIONS

- Completely flush all product and cleaning solutions from the pump fluid head before any component removal is started.
- Lock out, or disconnect all power sources to the pump drive motor before starting any work.
- Drain and (or) close off all inlet and discharge piping before disconnecting piping from fluid head.



SPECIAL TOOLS

Special tools are required to aid in the disassembly and reassembly of the fluid head.. These tools are as follows:

420/520UL TOOL KIT #107361

Part No.	Description	Qty
30-360	Eyebolt 1/2-13 x .75" ZP	2
103985	Guide Bolt 3/4-10 X 11"	2
107364	Seal Preload Tool	1
107362	Torque Wrench Kit	1

(Contents of Torque Wrench Kit)

420/520UL TORQUE WRENCH KIT #107362

Part No.	Description	Qty
101640	1/2" Drive Torque Wrench	1
101645	1/2" Drive Socket, 1-1/8"	1
101643	1/2" Drive Socket, 3/4"	1
107363	Drive Bit 12mm	1

- 1000 pound capacity hoist and suitable lifting straps or chains.
- Two (2) 1/2-13x1" long bolts.

MAINTENANCE

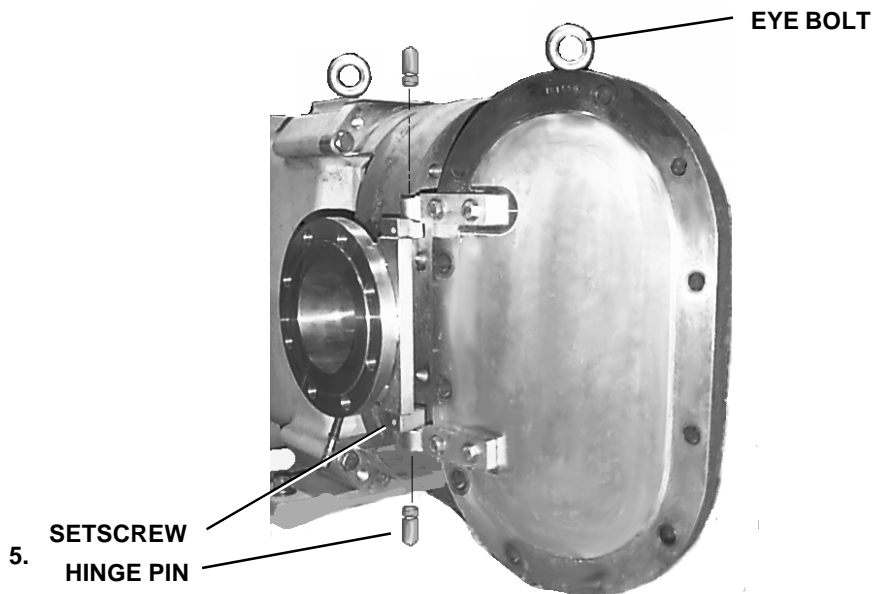
FLUID HEAD COVER REMOVAL

WARNING

Because all pump parts are extremely heavy, appropriate lifting equipment is required.

NOTE: THE FLUID HEAD COVER WEIGHS APPROXIMATELY 200 POUNDS. LIFTING EQUIPMENT IS REQUIRED.

1. Install an eye bolt into the tapped hole at the top of the cover (or at both ends if the pump is side mounted.).
2. Position the hoist over the fluid head and attach it to the eye bolt(s) on the cover. Apply light lifting load to the cover.
3. Remove the cover bolts.
4. Swiing the cover partially open.
5. Remove the hinge pin setscrews and hinge pins.
6. Supporting the cover with the hoist, remove the cover from the fluid head.
7. Clean and inspect the cover, O-ring, and all bolts for signs of wear or damage. Repair or replace any questionable component.



COVER REMOVAL

MAINTENANCE

FLUID HEAD DISASSEMBLY ROTOR REMOVAL

NOTE: THE MODEL 420 ROTOR WEIGHS APPROXIMATELY 80 POUNDS. MODEL 520 ROTOR WEIGHS APPROXIMATELY 100 POUNDS. LIFTING EQUIPMENT IS RECOMMENDED.

1. Remove fluid head cover as described by the fluid head cover removal procedure in the previous section.
2. Remove the rotor nut retaining caps using an O-ring tool or small flat blade screwdriver.
3. Use a block that will not mark the rotors to limit the rotation of the rotors during rotor retaining bolt removal. *This may be a 2"x 2"x8" long piece of wood (or equal).*



2. REMOVE ROTOR CAPS



ROTOR CAP



ROTOR RETAINING PLATE



3. REMOVE ROTOR RETAINING BOLTS

4. Carefully remove the rotors and keys from the shaft.
5. Mark all components so that they can be reinstalled on the same shafts they were removed from.
8. Clean and inspect the components for wear or damage and repair or replace any questionable components.



4. REMOVE ROTORS AND ROTOR KEYS

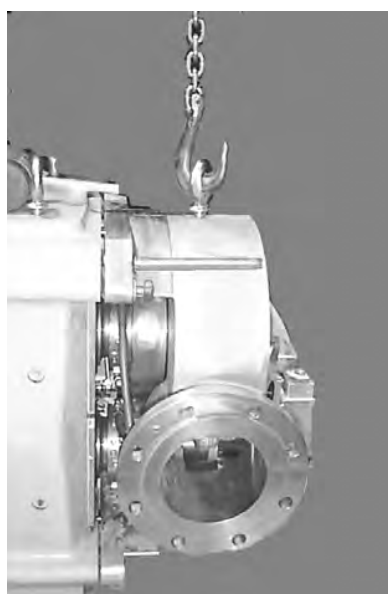
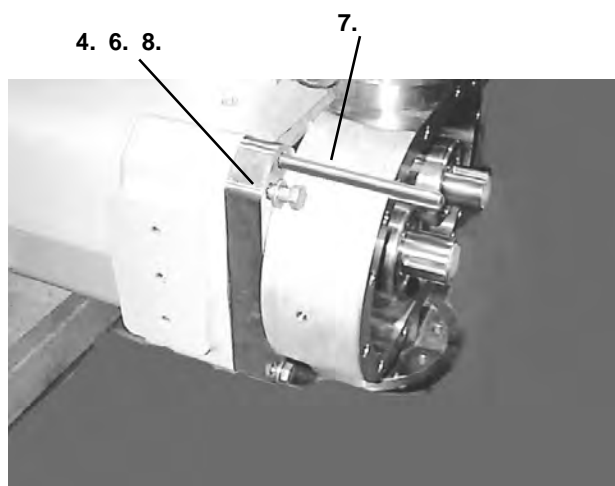
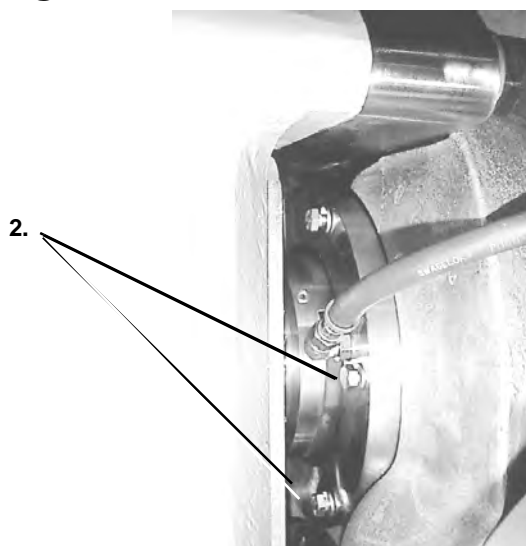
MAINTENANCE

FLUID HEAD DISASSEMBLY

BODY REMOVAL

NOTE: THE MODEL 420 BODY WEIGTHS APPROXIMATELY 650 POUNDS. THE MODEL 520 BODY WEIGTHS APPROXIMATELY 720 POUNDS. LIFTING EQUIPMENT IS REQUIRED.

1. Remove the fluid head cover and rotors as described in the preceding procedures.
2. Disconnect the inlet and discharge piping from the pump body.
3. Remove the twelve (12) 5/16" seal seat retaining bolts from the back side of the pump body.
4. Loosen, but do not remove, the four (4) 3/4" body mounting plate retaining bolts.
5. Position the hoist over the fluid head and secure it to the pump body and apply lifting tension to the body. Two 1/2-13 tapped holes are provided at the top and bottom (depending on mounting position) for use with eye bolts to aid in lifting
6. Remove the four (4) 3/4" retaining bolts and loosely install them into the tapped holes in the fluid head mounting plate.
7. Install two (2) 3/4-10 x 11" long guide bolts (103985) into the two retaining bolt holes.
8. Alternately tighten the body retaining bolts to disengage the body dowel pins from the gearcase and **carefully** slide the body away from the shaft mounted mechanical seals.
9. Remove the body from the gearcase with the hoist, after clearing the mechanical seals.
10. Clean and Inspect the components for wear or damage and repair or replace questionable parts.



8. 9.

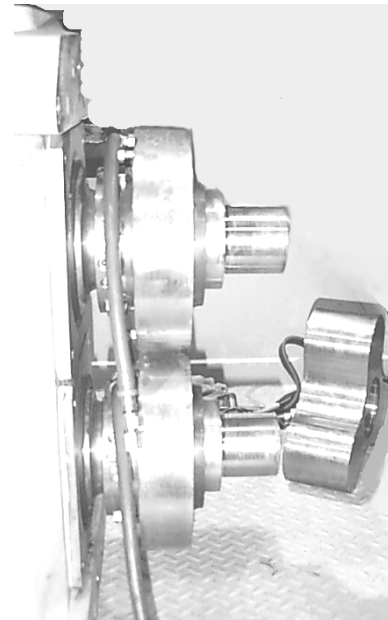
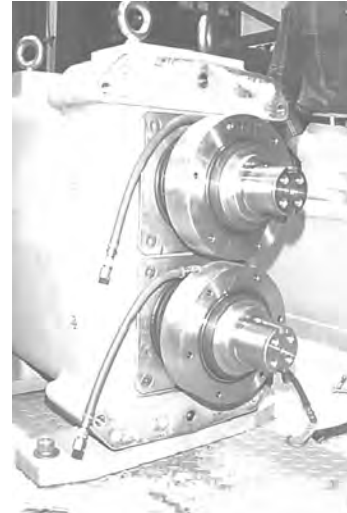
MAINTENANCE

FLUID HEAD DISASSEMBLY

MECHANICAL SEAL REMOVAL

NOTE: THE MECHANICAL SEALS ARE NOT HEAVY; HOWEVER, THEY ARE EXPENSIVE, AND ARE SOMEWHAT FRAGILE.

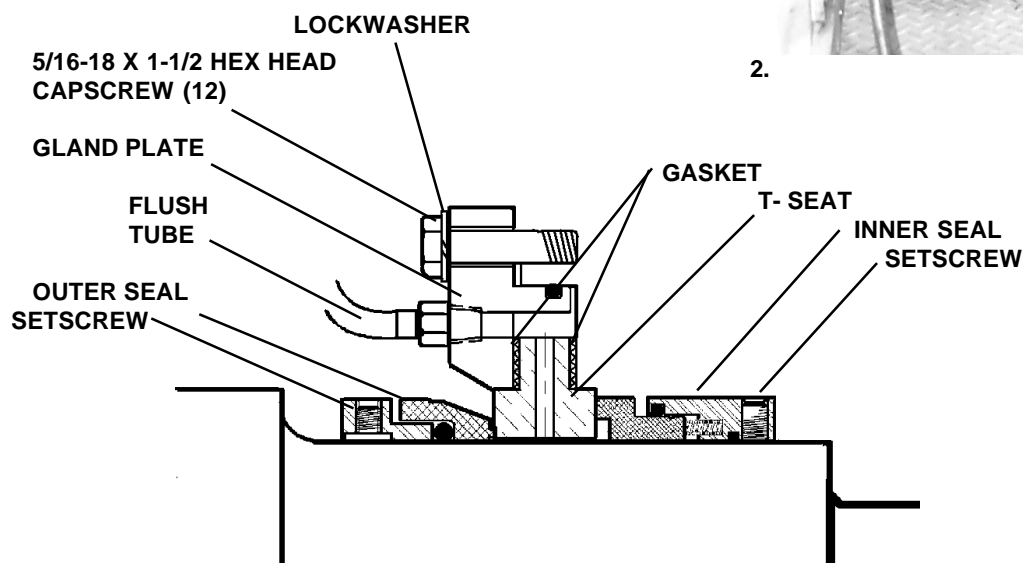
1. Remove the cover, rotors, and body as described in the previous procedures.
2. Disconnect the flush tubes from the seal seat gland plate if this has not already been done.
3. Remove the setscrews in the inner seal seat retainer.
4. Remove the inner seal seat retainer.
5. Inspect the shaft and remove burrs caused by the setscrews before removing the inner seal and inner seal O-ring to avoid causing damage to either component.
6. Remove the T-seal and gland plate.
7. Remove the inner seal.



Double Mechanical Seal

8. Remove the outer seal setscrews and slide the outer seal assembly off the shaft

Inspect all components for wear or damage and repair or replace any questionable parts.



MAINTENANCE

GEARCASE DISASSEMBLY

CAUTION NOTE: THIS PROCEDURE IS BEST PERFORMED AT A PROPERLY EQUIPPED SERVICE FACILITY. THE COMPONENTS ARE LARGE, HEAVY, AND IN MOST CASES REQUIRE SPECIAL TOOLS AND LIFTING EQUIPMENT.

TIMING GEARS

1. Drain the gear lubricant from the drive end of the gearcase.
2. Remove the twelve (12) hex head cap screws from the timing gear cover, and remove the cover.

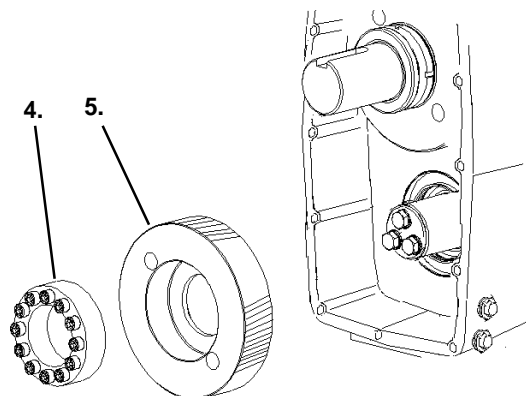
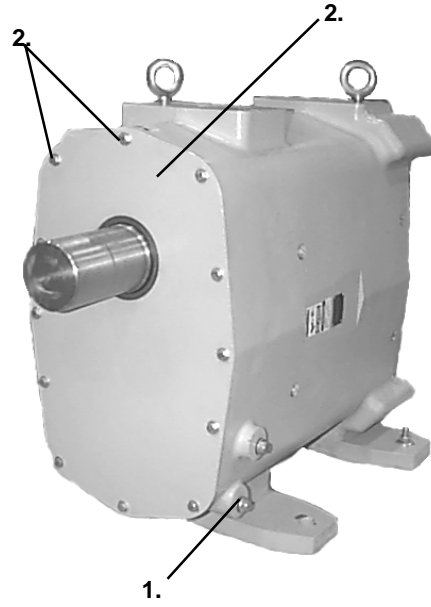
3. The top timing gear is retained with a locknut and lockwasher. Using a hammer and punch, disengage the lockwasher tabs from the mating notches in the locknut.

(Note: The locknut was installed with a minimum of 600 foot-pounds of torque using a special spanner type socket. A shaft locking device was also used to keep the shafts from rotating during the tightening operation.)

The locknut and lockwasher may now be removed.

4. Loosen the feder retaining screws on the locking assembly (use 12mm drive bit #107363) and tap lightly with mallet to loosen gear. This will allow removal of the gear and the locking assembly.

(The shaft can be removed with the gear sleeve on it.)



5. Remove the timing gears and the timing gear key. The gears should slide off the shafts. If a gear puller is required, three tapped holes are provided in each gear for that purpose.

6. With the gears removed, install a spacer (same length as the gear width (3")) and reinstall the bearing nut on the drive shaft only. Fully engage the nut on the shaft threads and hand tighten.. This prevents the shaft assembly from prematurely disassembling during the removal from the gearcase.

MAINTENANCE

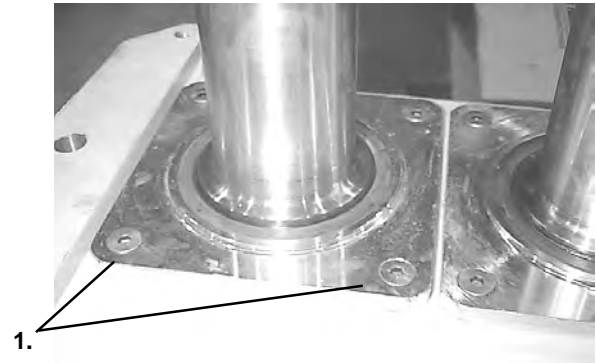
GEARCASE DISASSEMBLY

BEARING REMOVAL

The recommended position for the gearcase would have shafts up .

Bearing Retainer

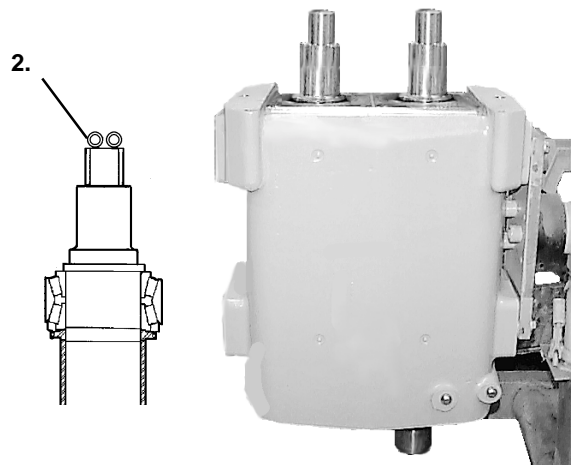
1. Remove the four front bearing retainer screws from each front bearing retainer, and remove the front bearing retainers.



Shaft Assemblies

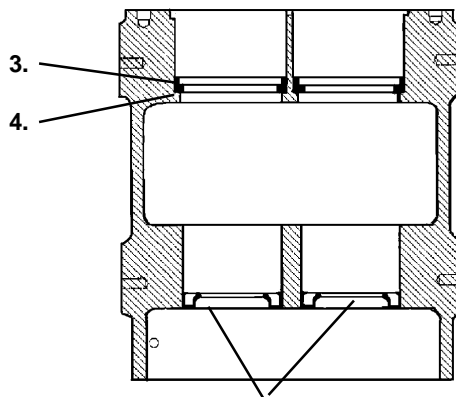
2. The shafts may now be removed from the gearcase. Screw two eye bolts into shaft end. Use a proper size hoist to lift.

WARNING
Shaft assemblies weight approximately 350 pounds each.



BEARING SEATS, SHIMS AND SEALS

3. Remove the front bearing seats and any shims from the front bearing bores.
4. Remove the rear bearing seals from the rear bearing bores of the gearcase.
5. Clean and inspect all components for wear or damage.



Bearings

Removal of the bearings from the shafts will require a large bearing press and a knowledgeable operator.

6. The bearings are fitted to the shaft with a .0015" to .0025" interference fit, and must be pressed off. *This is only required if the bearings are defective and the shaft is to be saved.*

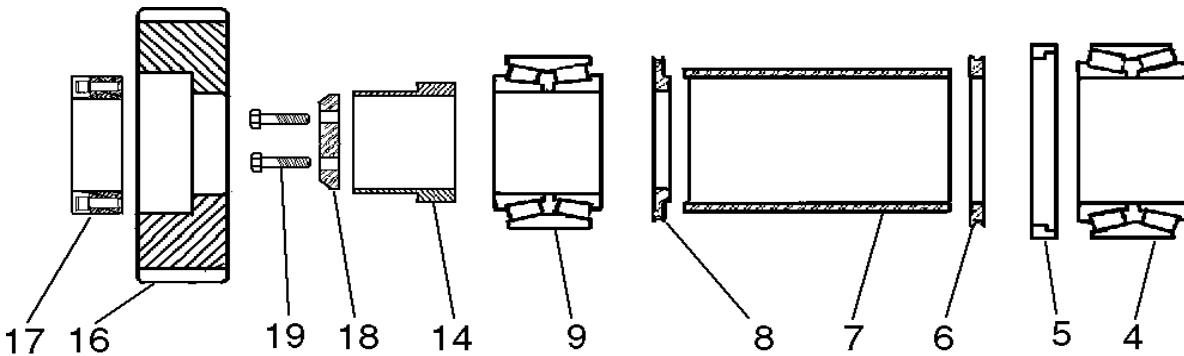
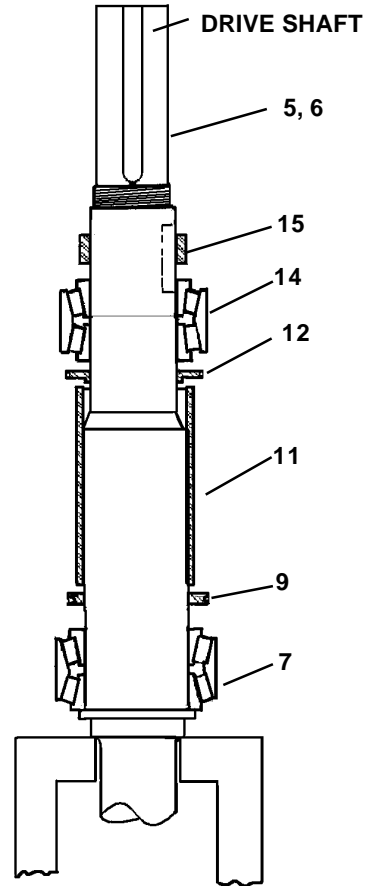
(Note: If the shaft is defective, the bearings will be lost during removal; therefore, this entire operation should be avoided.)

MAINTENANCE

GEARCASE ASSEMBLY

SHAFT SUBASSEMBLY PROCEDURE

1. Position the shaft in a fixture with the drive end down.
2. Use a bearing heater to heat a front and rear bearing to 300° F. (Do not exceed this temperature.)
3. Install the front bearing (14) on the shaft. Make sure that it is fully seated against the shaft shoulder.
4. Install the front bearing rear seal (12) on the shaft. This component is symmetrical; Therefore, it can be mounted either way.
5. Install the bearing spacer (11) on the shaft. This component is symmetrical; Therefore, it can be mounted either way.
6. Install the rear bearing inner seal (9) on the shaft. Make sure that the turned hub on the inner seal engages the bearing spacer.
7. Install the rear bearing (14) on the shaft.
8. Install the gear spacer on the shaft.
9. Using a timing gear, seat all components, and allow the bearings to cool.
10. Remove the timing gear, and install a spacer and the bearing nut. This will secure all components during assembly into the gearcase. (Several gear spacers may be used if a designated gear spacer is not available.)
11. Repeat steps 1 through 9 for the other shaft.



SHORT SHAFT ASSEMBLY

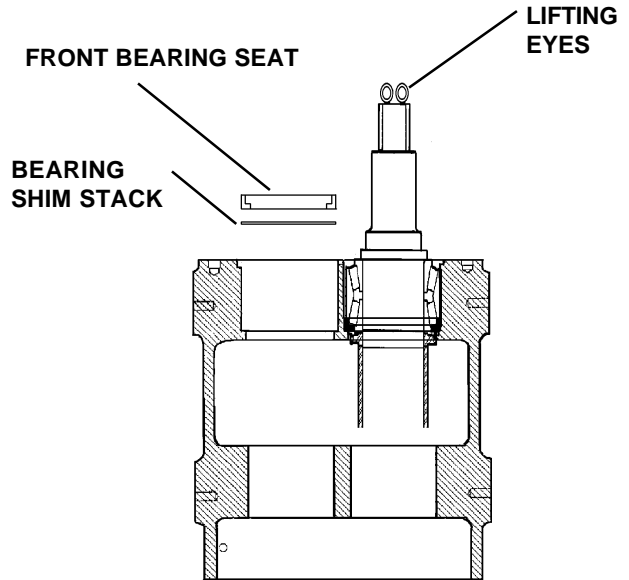
ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
4	100425	FRONT BEARING	14	105022	GEAR SPACER
5	100435	FRONT BEARING SEAT	15	100434	GEAR KEY 1X1X2.5" LG.
6	100426	FRONT BEARING INNER SEAL	16	105024	TIMING GEAR, SHORT SHAFT
7	100427	BEARING SPACER	17	105025	LOCKING ASSEMBLY
8	100428	REAR BEARING INNER SEAL	18	105023	RETAINER, GEAR SPACER
9	100429	REAR BEARING	19	30-292	HEX HD CAPSCREW, 1/2-13X2" LG

MAINTENANCE

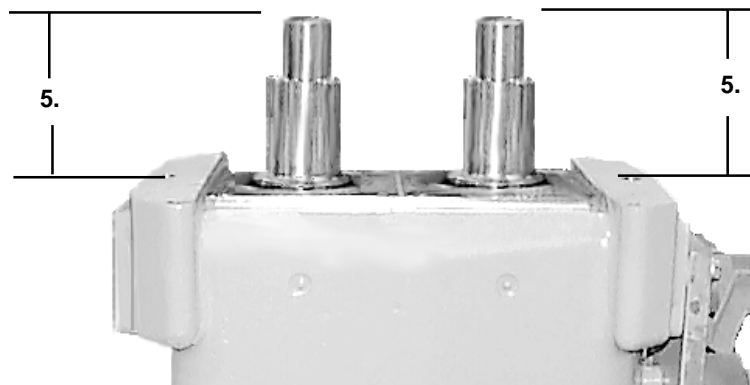
GEARCASE ASSEMBLY

INSTALLATION OF SHAFTS INTO THE GEARCASE.

1. Mount the gearcase vertically with the fluid head mounting surfaces up.
2. Install a front bearing seat (Item 22, page 33 & 35) in each of the front bearing bores of the gearcase.
3. Screw the eye bolts into the end of the shaft. Use a hoist to lift shaft and carefully slide it into the gearcase.
4. Repeat this step for the other shaft. *Locate the drive shaft according to your drive need.*



5. Before continuing, a critical measurement must be taken to determine the need for a bearing shim. Measure the distance between the fluid head mounting surface and the rotor seat surface on the corresponding shaft. Do this for both shafts. If both dimensions are the same, then no shims are needed. If there is a difference, then a shim must be added to the shaft assembly with the shortest dimension. The thickness of the shim is equal to the difference between the two measurements.
6. If a shim is required, it must be added at this time. Remove the appropriate shaft and the front bearing seat, and place the required shim(s) in the front bearing bore. Then reinstall the front bearing seat and shaft assembly.
7. Recheck the measurement made in step 5. Allowable differences between the two shafts will be $\pm .001$ ".

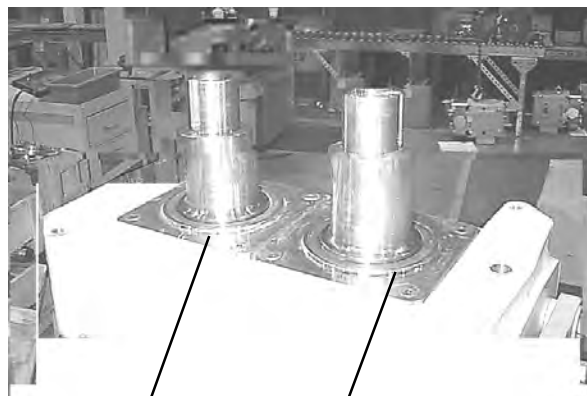


MAINTENANCE

GEARCASE ASSEMBLY

INSTALLATION OF SHAFTS INTO THE GEARCASE.

8. Apply bearing lubricant to the shafts at the front seal location to aid in installation of the seal. Apply silicone sealant to the front bearing retainers. Install the front bearing retainers (P/N 100441) and seals (P/N 100442).



FRONT BEARING RETAINER

FRONT BEARING RETAINER SEAL

TIMING GEARS

9. Turn the gearcase over to expose the timing gear end of the housing and remove the locknuts and temporary spacers from the drive shaft.

10. Install the gear spacer (P/N 100430) on the shaft.

11. Install the rear bearing seals (P/N 100431) in the gearcase.

DRIVE SHAFT GEAR

12. Install the timing gear key in the drive shaft.

13. Install the timing gear on the drive shaft.

14. Install the lockwasher and locknut on the shaft and torque the nuts to 600 ft-lbs. Lock in place by bending a tab on the lockwasher, using a hammer and drift punch.



LOCKING TAB

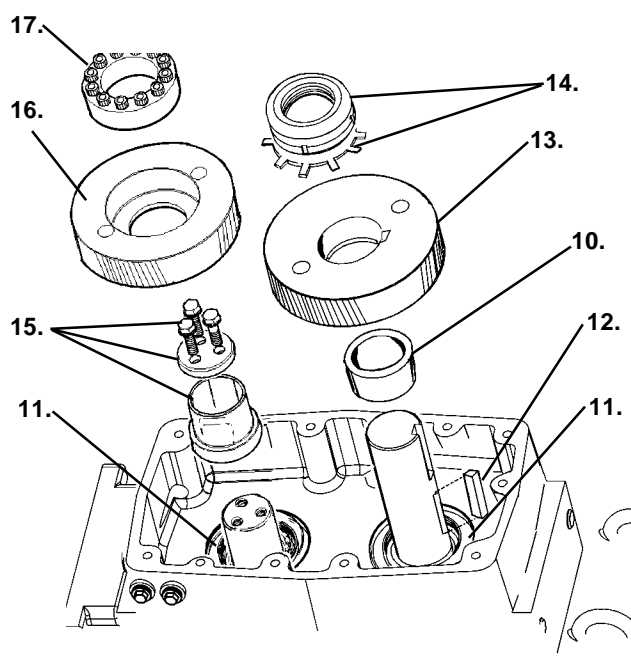
TOP TIMING GEAR

SHORT SHAFT GEAR

15. Place the gear sleeve on the shaft and fasten clamp washer in place with the three capscrews and washers. *(Omit this operation if these were left in place during disassembly.)*

16. Place the short shaft gear onto the shaft.

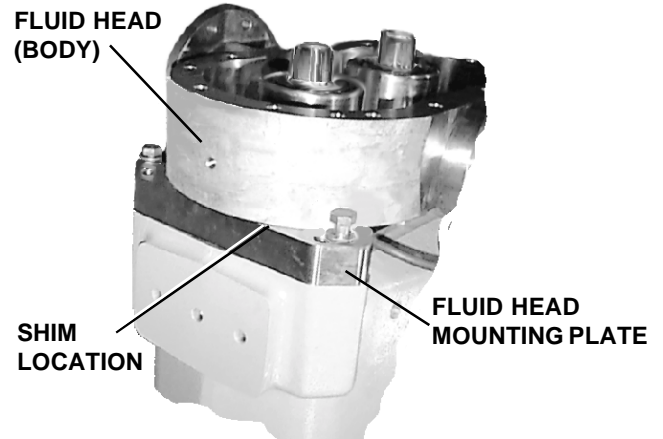
17. Place the feder assembly onto the shaft. *(The screws should be loose to allow for a full fit.)* Tighten the locking assembly screws in an alternating pattern to firmly lock the gear to the shaft. *(Do not torque at this time.)*



MAINTENANCE

GEARCASE ASSEMBLY ADJUSTING ROTOR TO BODY BACKFACE CLEARANCE.

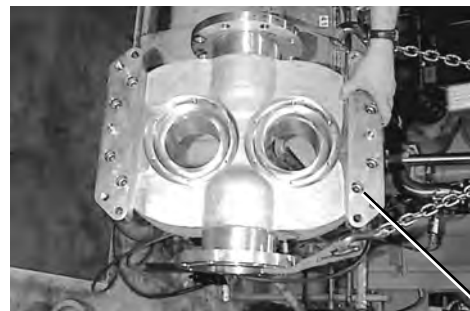
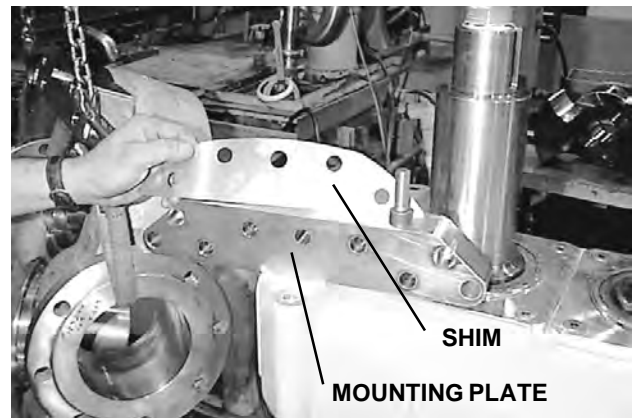
If the shafts and bearings or just the shafts were replaced, in all probability, the fluid head will probably need to be reshimmed to achieve the proper rotor to body backface clearance. The Model 420 and 520 pumps are designed to accomplish this without removing the shafts from the gearcase. All fluid head shimming is done between the fluid head (body) and the fluid head mounting plate as described in the following procedure.



1. Install the pump fluid head on the gearcase. Make sure that all mating surfaces between the fluid head mounting plate and the gearcase mounting surface are clean and free of all burrs. The shaft seals need not be installed for this operation, and it is much simpler if they are not.
2. Measure the height difference between the rotor seat surface on the shaft and the end of the body shaft hub. The rotor seat surface on the shaft should protrude above the hub by $.009" \pm .001"$. Measure both of the shafts and record each.
3. If the measurement differs from the dimension stated in step 2 shims will have to be added or removed from between the fluid head and the fluid head mounting plate. If the measurement is OK, then go to step 8.
4. Remove the fluid head from the gearcase.
5. Remove the four retaining bolts from each fluid head mounting plate. One at a time, remove each mounting plate and add or subtract shims (P/N 100472-100476) until the desired height is reached. (Example: If step 2 yielded a measurement of $.005"$, then $.004"$ of shim would need to be added to the existing shim stack.)
6. Reinstall the fluid head mounting plates over the new shim stack and secure with the socket head retaining bolts. Torque the bolts to 70 ft-lbs.
7. Repeat steps 1,2 and 3 above.
8. Remove the fluid head from the gearcase.



MEASURE DISTANCE BETWEEN HUB SHAFT SHOULDER AND ROTOR SHOULDER



Refer to the section on fluid head assembly for the complete the reassembly process.

MAINTENANCE

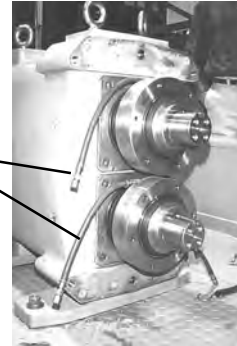
FLUID HEAD ASSEMBLY

WAUKESHA MECHANICAL SEAL INSTALLATION

DOUBLE SEAL

1. Slide the outer seal assembly onto the shaft
Care must be taken when assembling the outer seal into the outer seal retainer. All compression springs must be fully seated in the retainer. The drive notches in the outer seal must be properly aligned with the seal drive pins in the outer seal retainer.
2. The leading edge of the outer seal should be .610-inches from the shaft shoulder. Fasten seal in place by tightening the *two setscrews.
4. Install the gland plate.
5. Install the gaskets on both sides of the T-seat. Lubricate the faces on the T-seat with a food grade lubricant or other approved fluid and install the T-seat.
6. The inner seal may be assembled prior to installing on shaft. Care should be taken to make sure that all springs are properly seated and that the seal face drive pins are properly aligned with the notches in the inner seal face. *Use food grade lubricants on all O-rings during seal assembly to enhance performance.*
7. Install the inner seal.
8. Slip the inner seal preload tool over the end of the shaft. Install the rotor and rotor retainer. Hand tighten the retainer against the rotor.

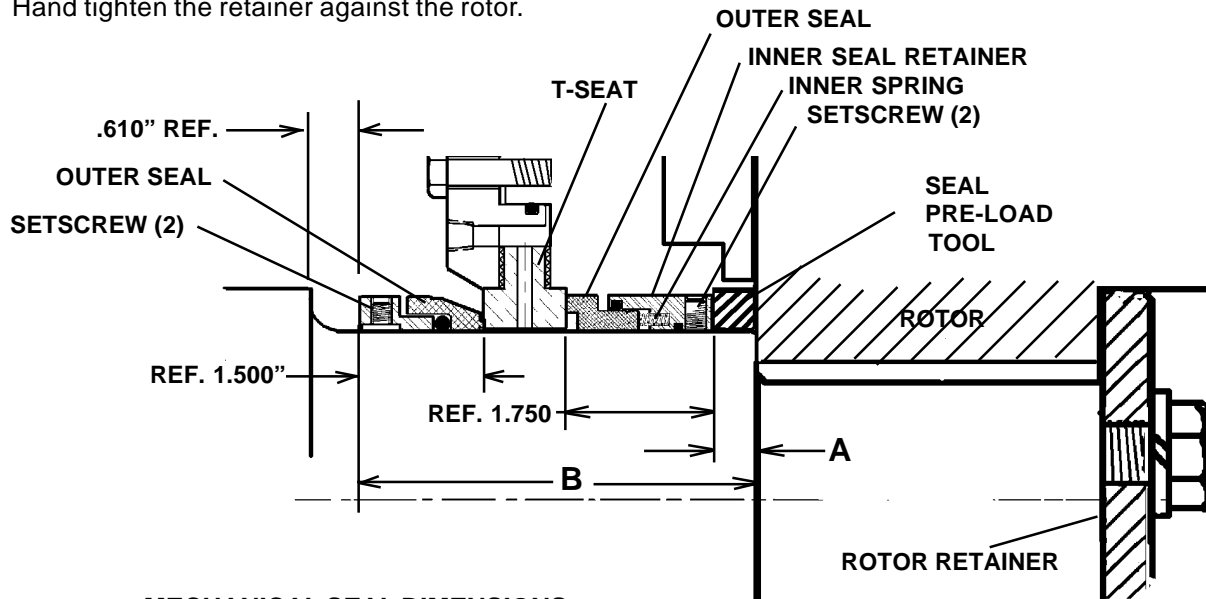
9. *Tighten the setscrews in the inner seal seat retainer.
10. Remove the rotor retainer and preload tool.
11. Connect all flush lines.



At this point, connect a water line to the flush lines and test the seals for leakage. Do not exceed 30 PSI pressure!

NOTE Omit flush step if unit has a single mechanical seal

*TO AVOID SLIPPAGE, REPLACE SETSCREWS EACH TIME THE SEAL IS REMOVED FROM THE SHAFT.



MECHANICAL SEAL DIMENSIONS

PUMP MODEL	A	B
420UL	.563"	4.813"
520UL	.563"	4.813"

MAINTENANCE

FLUID HEAD ASSEMBLY BODY INSTALLATION

The installation of the body is the reverse of the removal procedure.

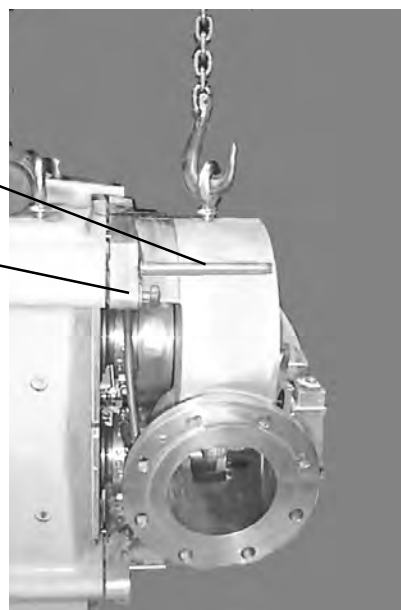
1. Use the guide bolts to align the body with the gearcase. This is very helpful in preventing damage to the mechanical seals.
2. Install retaining bolts and washers and torque to 85-90 ft. lbs,

WARNING

420 body weighs approximately 650 lbs. 520 body weighs 720 lbs.

GUIDE
BOLT

RETAINING
BOLTS (4)



ROTOR INSTALLATION

The installation of the rotors is the reverse of the removal procedure with the following suggestions:

1. Replace all rotor O-rings with new ones.
The rotor drive keys may be installed after the rotor is fully seated against the shaft shoulder.

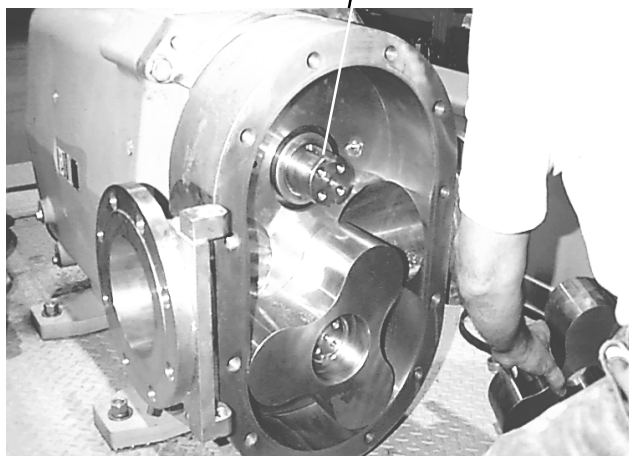
WARNING

420 rotor weighs approximately 80 lbs.
520 rotor weighs 100 lbs.

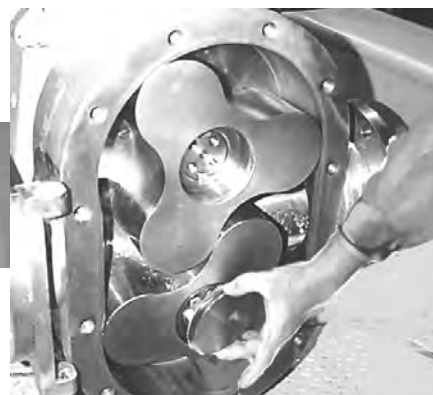
3. Install both rotors and all four rotor keys.



ROTOR KEYS



4. Place a wood or plastic rod into one of the ports to keep rotors from turning. Install each rotor retaining cap with four bolts. Torque each to 35-40 lbs.



5. Lubricate O-ring; install on rotor cap and press cap into rotor opening

MAINTENANCE

TIMING ROTORS

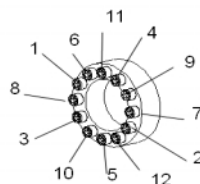
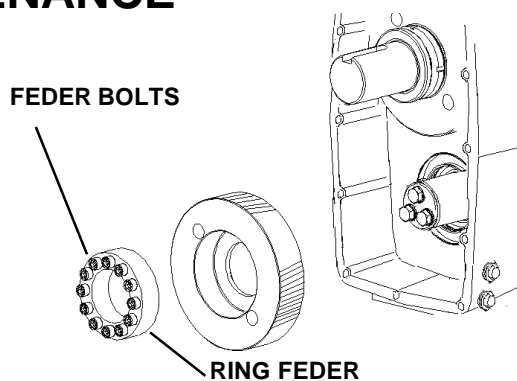
Loosen the ring feder assembly bolts to allow a slight slippage of the gear.

1. Align rotors in the vertical position (as shown).
2. Visually center the rotors or use a feeler gauge.
3. Begin tightening the feder bolts in an alternating pattern while maintaining rotor clearance.
(Use 12mm drive bit #107363)
4. When gear is tight, slowly rotate the drive shaft and check the rotor to rotor clearance. Adjust as required. Tighten the ring feder bolts in an alternating pattern. (First to 10-12 lbs of torque) Torque bolts in a star pattern. Several cycles may be required to reach specified torque.

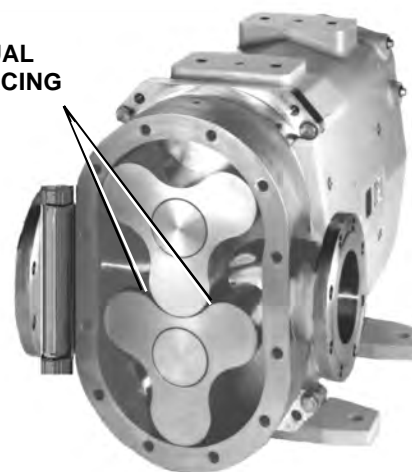
*Second torque should be 25- 30 lbs.
Thrid torque should be 55-60 lbs.
The final torque value is 91 lbs*

COVER INSTALLATION

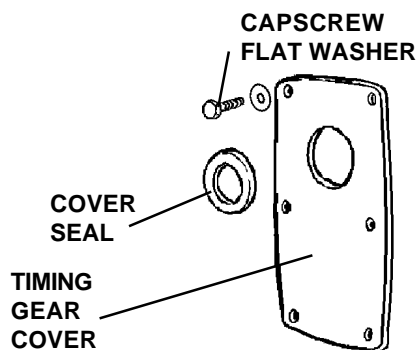
5. Press a new oil seal into gear cover with lip facing in.
6. Place silicone sealant on back of gear cover and mount cover assembly onto gear case. (*Tape shaft end to prevent cutting seal on keyway.*) Secure with cap screws and washers to 4-5 lbs torque. *Use anti-seize compound on all cover bolt threads.*
7. Install oil drain plug. Fill gear case with Micro-Plate #140 oil to proper level. (See OPERATION on page 14)



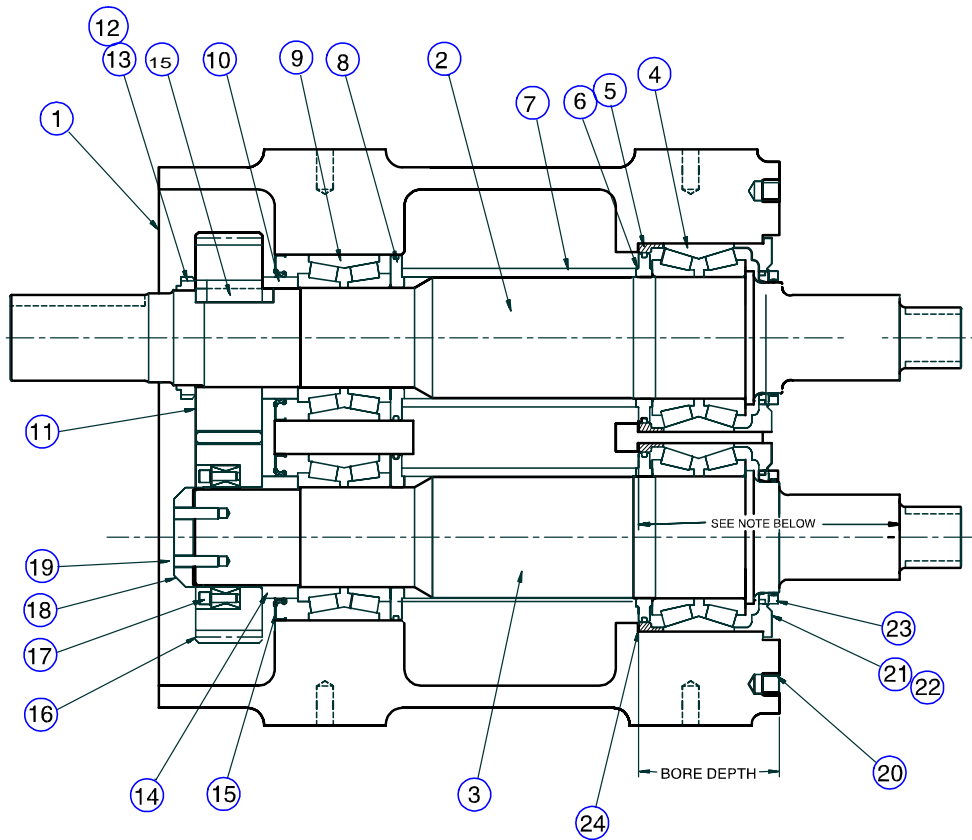
EQUAL SPACING



ROTOR POSITIONS



PARTS LIST



GEARCASE SUBASSEMBLY Model 420/520 Lobe

ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
1	100336	GEARCASE ASSEMBLY	1	14	105022	GEAR SPACER	1
2	SEE CHART	DRIVE SHAFT	1	15	100434	GEAR KEY 1 x 1 x 2.5" LG	1
3	SEE CHART	SHORT SHAFT	1	16	105024	TIMING GEAR, SHORT SHAFT	1
4	100425	BEARING, FRONT	2	17	105025	LOCKING ASSEMBLY	1
5	100435	SEAL, FRONT BEARING	2	18	105023	RETAINER, GEAR SPACER	1
6	100426	INNER SEAL, FRONT BEARING	2	19	30-292	HEX HD CAPSCREW, 1/2- 13 x 2	4
7	100427	SPACER, BEARING	2	20	100334	BUSHING, GEARCASE	2
8	100428	INNER SEAL, BEARING	2	21	105033	RETAINER, FRONT BEARING	2
9	100429	REAR BEARING	2	22	3-478	1/2-13 x 1" LG	8
10	100430	SPACER, GEAR	2	23	105048	BEARING ISOLATOR	2
11	100432	TIMING GEAR, DRIVE SHAFT	1				
12	STD 236 022	BEARING LOCKNUT	1				
13	STD 136 022	LOCKWASHER W—22	1				

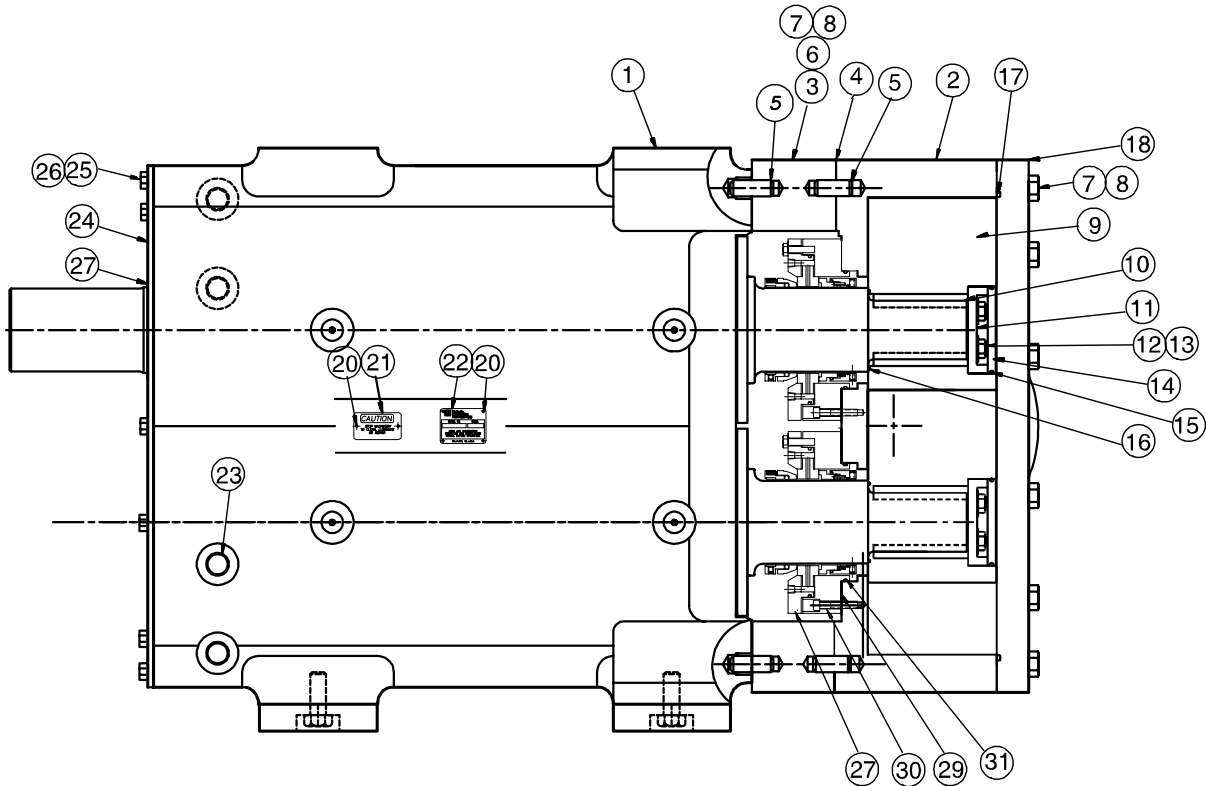
BOLT TORQUE SPECIFICATIONS

ITEM	SIZE/DESCRIPTION	TORQUE (FT-LBS)
13	BEARING LOCKNUT	560-600
19	1/2-13 X 2 CAPSCREW	20-25
22	1/2-13 X 1 CAPSCREW	20-25

SHAFT SECTION CHART

ASSEMBLY PARTNUMBER	PUMP MODEL	FLUID HEAD SEAL SIZE	B/M ITEM NO.	DRIVE SHAFT PARTNUMBER	B/M ITEM NO.	SHORTSHAFT PARTNUMBER
105042	420 LOBE	100mm	2	105029	3	105027
105619	420 LOBE	4.000"	2	105601	3	105600
105613	520 LOBE	100mm	2	105607	3	105605
105616	520 LOBE	4.000"	2	105605	3	105604

PARTS LIST



Model 420 Lobe Rotor with Standard HD Shaft Seals

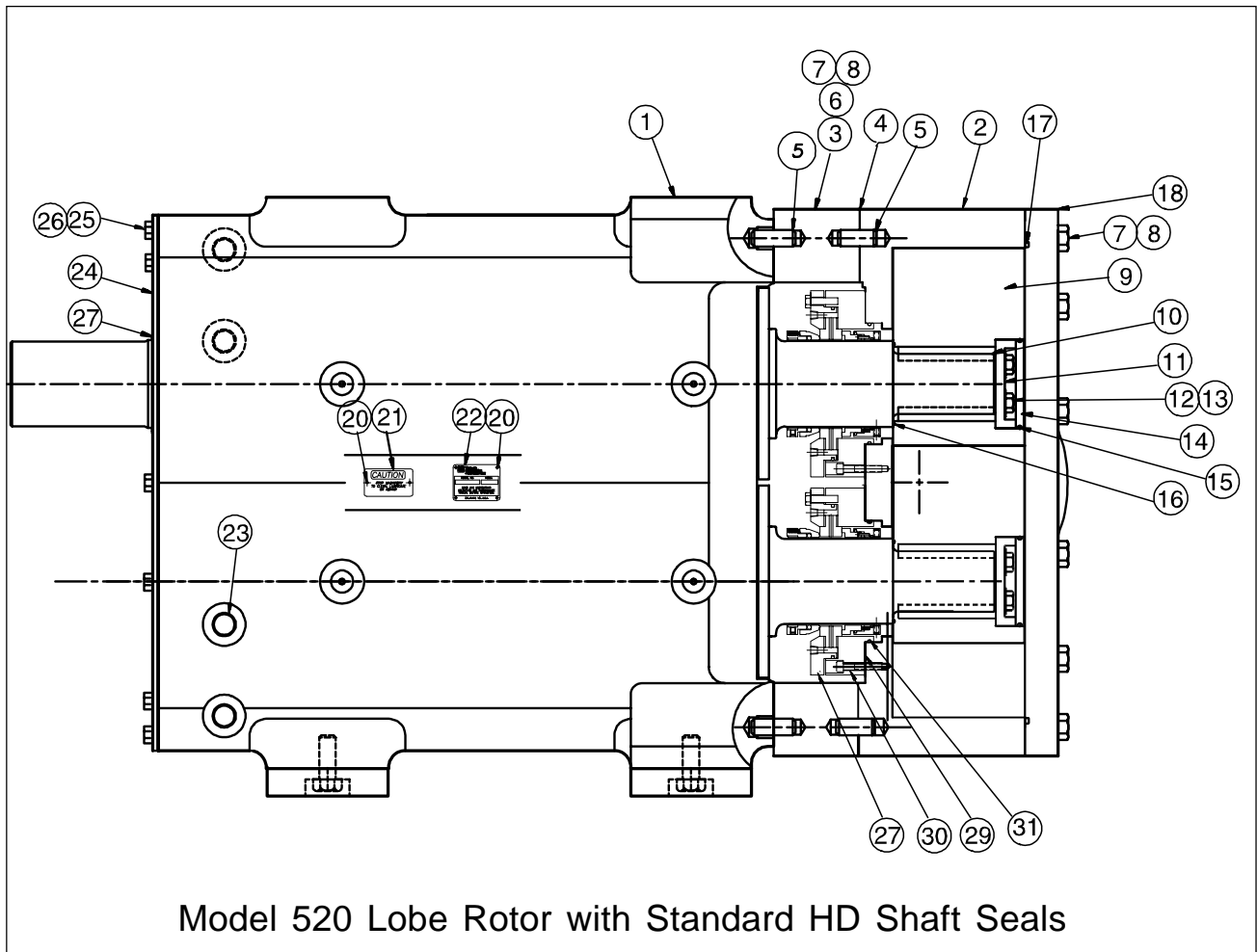
ITEM	PART NO.	DESCRIPTION	QTY
1	PAGE 33	GEARCASE SUBASSEMBLY	1
2	103993	FLUID HEAD	1
3	105043	MOUNTING PLATE	2
4	100472	BODY SHIMS	AR
	100473	BODY SHIMS	AR
	100474	BODY SHIMS	AR
	100475	BODY SHIMS	AR
	100476	BODY SHIMS	AR
5	105046	DOWEL PIN	4
6	30-564	SOC HD CAPSCREW	
	5/8-11 X 2-1/2" LG		8
7	30-444	HEX HD CAPSCREW	
	3/4-10 X 2-1/2" LG		16
8	43-55	FLAT WASHER, 3/4"	16
9	105021	ROTOR, TRI-LOBE	2
10	109057	ROTOR DRIVE KEY	4
11	105031	ROTOR RETAINING PLATE	2
12	30-127X	HEX HD CAPSCREW	
	1/2-13 X 1-1/4" LG		8
13	43-31X	WASHER, 1/2"	8
14	105032	ROTOR RETAINING CAP	2
15	N70240	O-RING OUTER ROTOR SEAL	2
16	N70152	O-RING, INNER ROTOR SEAL	2
17	N70387	O-RING, COVER	1
18	105036	FLUID HEAD COVER	1
20	30-355	PK DRIVE SCR	12

ITEM	PART NO.	DESCRIPTION	QTY
21	33-22	CAUTION NAME PLATE	2
22	001 061 002	SERIAL NUMBER PLATE	2
23	000 046 004	OIL PLUG	4
24	100530	GEARCASE COVER	1
25	30-30	HEX HD CAPSCREW	12
26	43-154	FLAT WASHER 3/8"	12
27	100402	SEAL ASSEMBLY	2
28	105040	HINGE ASSEMBLY	1
29	103992	STUFFING BOX	2
30	30-577	SOCKET HD CAPSCREW	
	5/16- 18 X 1- 3/4" LG		6
31	N70260	O-RING	2

BOLT TORQUE SPECIFICATIONS

ITEM	SIZE	TORQUE (FT-LBS)
25	3/8-16 x 1"	4-5
6	5/8-11 x 1/3/4"	65-70
7	3/4- 10 x 2-1/2"	85-90
12	1/2-13 x 1-1/4"	35-40
27	5/16-18 x 2-1/2"	5-6
30	5/16-18 x 1-3/4"	5-6
33	M12	88-93

PARTS LIST

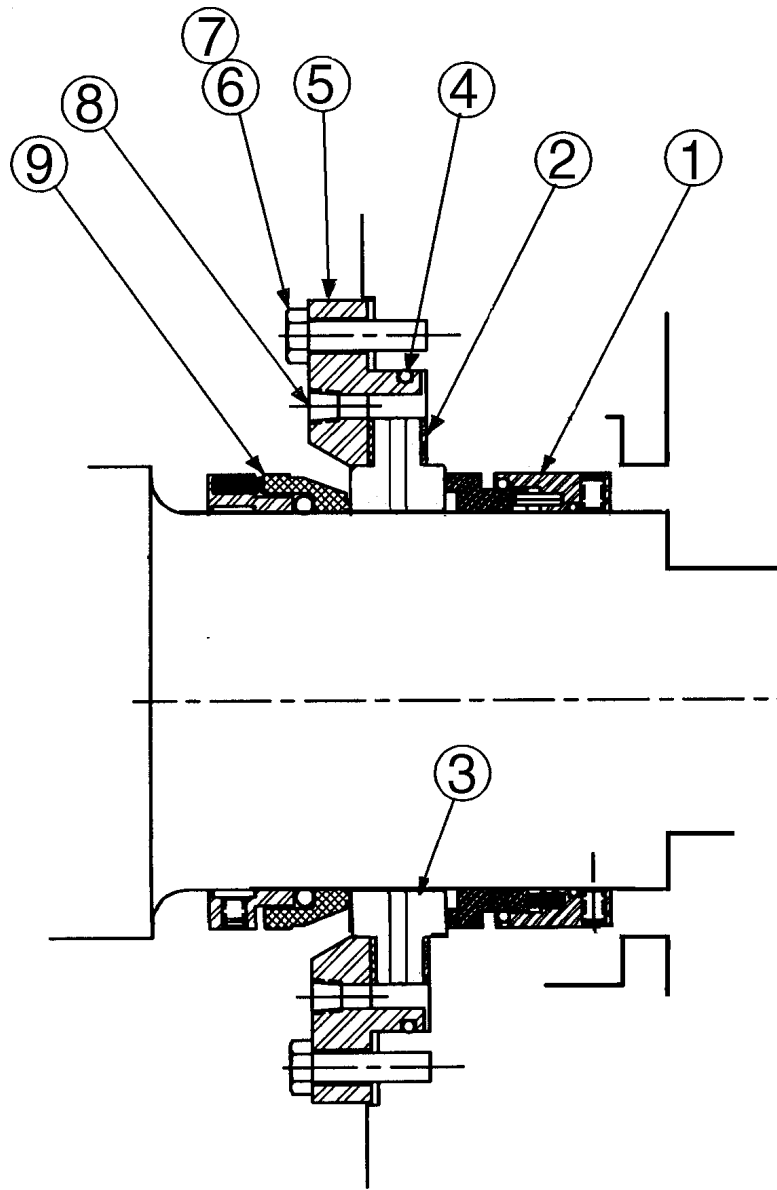


ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
1	PAGE 33	GEARCASE SUBASSEMBLY	1	21	33-22	CAUTION NAME PLATE	2
2	105610	FLUID HEAD	1	22	001 061 002	SERIAL NUM8ER PLATE	2
3	105043	MOUNTING PLATE	2	23	000 046 004	OIL PLUG	4
4	100472	BODY SHIMS	AR	24	100530	GEARCASE COVER	1
	100473	BODY SHIMS	AR	25	30-30	HEX HD CAPSCREW	12
	100474	BODY SHIMS	AR	26	43-154	FLAT WASHER 3/8"	12
	100475	BODY SHIMS	AR	27	100402	SEAL ASSEMBLY	2
	100476	BODY SHIMS	AR	28	105612	HINGE ASSEMBLY	1
5	105046	DOWEL PIN	4	29	105049	STUFFING BOX	2
6	30-564	SOC HD CAPSCREW 5/8-11 X 2-1/2" LG	8	30	30-577	SOCKET HD CAPSCREW 5/16-18 X 1-3/4" LG	6
7	30-444	HEX HD CAPSCREW 3/4-10 X 2 -1/2" LG	16	31	N70252	O-RING	2
8	43-55	FLAT WASHER, 3/4"	16	*33	105025	LOCKING ASSEMBLY	1
9	105609	ROTOR, TRI-LOBE	2				
10	109057	ROTOR DRIVE KEY	4				
11	105031	ROTOR RETAINING PLATE	2				
12	30-127X	HEX HD CAPSCREW 1/2-13 X 1-1/4"LG	8				
13	43-31X	WASHER, 1/2"	8				
14	105032	ROTOR RETAINING CAP	2				
15	N70240	O-RING OUTER ROTOR	2				
16	N70153	O-RING, INNER ROTOR	2				
17	N70357	O-RING, COVER	1				
18	105036	FLUID HEAD COVER	1				
20	30-355	PK DRIVE SCREW	12				

BOLT TORQUE SPECIFICATIONS

ITEM	SIZE	TORQUE (FT-LBS)
25	3/8-16 x 1"	4-5
6	5/8-11 x 1/3/4"	65-70
7	3/4- 1 0x 2-1/2"	85-90
12	1/2-13 x 1-1/4"	35-40
27	5/16-18 x 2-1/2"	5-6
30	5/1618 x 1-3/4"	5-6
33	M12	88-93

DOUBLE MECHANICAL SEAL

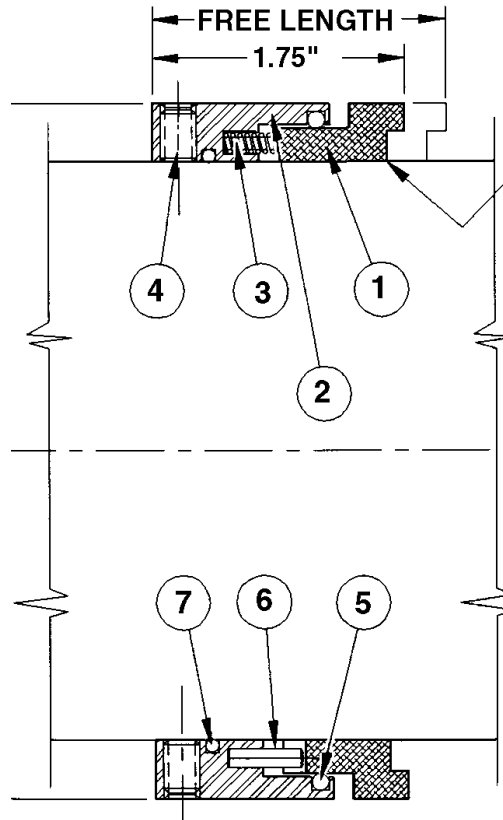


DOUBLE MECHANICAL SEAL

		PART NUMBER						
ITEM	DESCRIPTION	*100402 SCSC-CSCS	102516 SCSC-CSCV	102517 SCSC-CSC E	102518 SCSC-TN SCS	102519 SCSC-TN S CV	102520 SCSC-TN SCE	107000 SCSC-C SCE
1	INBOARD SEAL	105152	102503	102504	100512	102503	102504	102504
2	GASKET	105124	102524	102525	100515	102524	102525	107001
3	SEAT	420-014-031	420-014-031	420-014-031	420-014-031	420-014-031	420-014-031	420-014-031
4	O-RING	S75260	V70260	E70260	S75260	V70260	E70260	E70260
5	GLAND	100514	100514	100514	100514	100514	100514	100514
6	5/16-18X1¼ HHCS	30-353	30-353	30-363	30-353	30-353	30-353	30-353
7	5/16 LOCKWASHER	43-15	43-15	43-15	43-15	43-15	43-15	43-15
8	FLUSH KIT	35897	35897	35897	35897	35897	35897	35897
9	OUTBOARD SEAL	100513	102508	102509	102513	102514	102515	102509

*WAUKESHA HEAVY DUTY STANDARD SEAL

SINGLE INNER MECHANICAL SEAL



SINGLE MECHANICAL SEAL ASSEMBLIES TYPE "MP" (INNER)

ROTATING FACE	O-RING	PART NUMBER	O-RING	SEAL ASSEMBLY
SILICONE	SILICONE	100512	S75246	102150
CARBIDE	VITON	100503	V70246	102150
	EDP	100504	E70246	102150

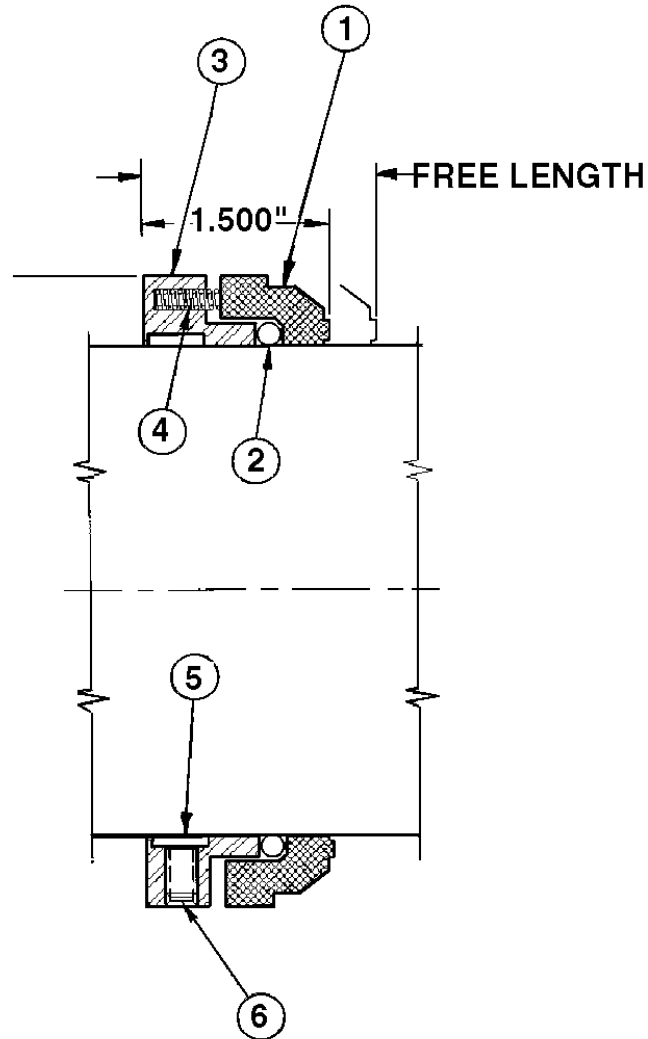
420 - 520 INNER SEAL ASSEMBLY 102150 *AS SUPPLIED BY VENDOR

ITEM	REQ'D	PART NUMBER	DESCRIPTION
*1	1	102526	FACE, SILICONE/CARBIDE ROTOR
*2	1	102527	RETAINER
*3	24	102528	SPRING
*4	4	102529	SETSCREW
5	1	SEE TABLE	RETAINER O-RING
*6	3	WITH ITEM 2	DRIVE PIN
7	1	SEE TABLE	SHAFT O-RING

O-RING ITEM 5 ITEM 7 MATERIAL

S75345	S75242	SILICONE RUBBER
V70345	V70242	FLUOROELASTOMER
E70345	E70345	EDP

SINGLE OUTER MECHANICAL SEAL



SINGLE MECHANICAL SEAL ASSEMBLIES TYPE "CO" (OUTER)

ROTATING FACE	O-RING	PART NUMBER	O-RING	SEAL ASSEMBLY
CARBON	SILICONE	100513	S75345	102138
	VITON	100508	V70345	102138
	EDP	100509	E70345	102138

420 - 520 INNER SEAL ASSEMBLY 102138 *AS SUPPLIED BY VENDOR

ITEM	REQ'D	PART NUMBER	DESCRIPTION
*1	1	102659	FACE, CARBON ROTOR
2	1	SEE TABLE	O-RING
*3	1	102661	RETAINER
*4	9	102693	SPRING
*5	1	102552	SPLIT RING
*6	34	102663	SETSCREW

ITEM 2 O-RING MATERIAL

S75345	SILICONE RUBBER
V70345	FLUOROELASTOMER
E70345	EDP

PARTS ORDERING

Any correspondence concerning valves will require the following information be documented:

PRODUCT NAME/MODEL: _____

PRODUCT SERIAL NUMBER: _____

DATE OF PURCHASE: _____

INVOICE NUMBER: _____

INVOICE DATE: _____

HOW TO ORDER PARTS

By Phone

Telephone your repair parts or fittings order to your Distributor.

To speed your order and avoid delays, please have your **equipment model** and **serial number** and the **part numbers** from the parts list before you call your Distributor.

If you do not know your Distributors number, call Waukesha Cherry-Burrell Customer Service at:

Phone: **800-252-5200 or 262-728-4900**

Fax: **800-252-5045 or 262-728-4904**

Your call will be directed to a specialist who can provide you with Distributor information for your area.

How to Return Parts

Parts may be returned for credit, subject to the conditions of our return goods policy. To obtain authorization to return a part, contact the your Distributor.

Please give the following information:

Invoice number and date

Quantity

Part Number (from parts list)

Exact reason for return

Your Distributor will provide a Return Goods Authorization. (Returns will not be accepted without advance authorization.)

DISTRIBUTOR: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

CONTACT: _____

PHONE: _____

FAX: _____

Universal Lobe 420/520UL Series

ROTARY POSITIVE DISPLACEMENT
PUMP



SPX FLOW TECHNOLOGY

611 Sugar Creek Road

Delavan, WI 53115

P: (262) 728-1900 or (800) 252-5200

F: (262) 728-4904 or (800) 252-5012

E: wcb@spx.com

SPX reserves the right to incorporate our latest design and material changes without notice or obligation.

Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing.

Please contact your local sales representative for product availability in your region. For more information visit www.spx.com.

The green ">" is a trademark of SPX Corporation, Inc.

ISSUED 03/1998

COPYRIGHT ©2015 SPX Corporation