

Operation and Maintenance Manual Universal I Series Positive Displacement Pumps



Read and understand this manual prior to installing, operating or servicing this equipment.



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NOTE: Waukesha Pump CIP Series require use of the CIP Addendum 95-03039 in conjunction with this manual.

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.







READ AND UNDERSTAND THIS MANUAL PRIOR TO INSTALLING, OPERATING, OR MAINTAINING THIS PUMP.

Section 1 - Warranty and Receiving

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 Sellers entire and exclusive liability, and Buyer' 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. (See OPERATION on page 17). The WAUKESHA pump is a precision product, designed to provide long, trouble-free service in a properly designed system with normal maintenance.
RECEIVING INSPECTON	Ports are covered 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 " <i>Returned Goods Authorization</i> " (RGA) from the manufacturer before any returns will be accepted. Your Distributor will help you in a warranty problem.

Section 2 - Installation

The installation of your Waukesha pump and its piping system should follow good practice to give optimum performance, and to 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 ensure 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.

PUMP & DRIVE INSTALLATION

The installation of your Waukesha pump and its piping system should follow good practice to give optimum performance.

Pumps of this type and size are generally mounted on a common base plate with the drive.



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.

NOTE: Pump can be mounted in any of three positions without removing shafts. However, unless it is an RF pump (14, 34, 64, 134, 224 or 324), mounting it on its side will require more lubrication before operating (see OPERATION on page 16).



Coupling Guard



The unit can be installed in the plant location in several ways:

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

Leveling and/or vibration isolation pads.

Coupling Guard



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

Portable bases, for movement to different locations.



WARNING: To avoid serious injury, do not install or service pump unless all power is off and locked out.

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.

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.

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





Piping Layout

Inlet side — slope piping up to inlet to avoid air pocket.



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



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).



"Isolation" valves — permit pump maintenance and removal safely and without emptying entire system.

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.



A particular relief valve design will have a characteristic curve such as shown. The "cracking pressure" can usually be set by spring adjustment, or by adjustable pneumatic pressure, etc. Flow will begin to bypass when this "cracking pressure" is reached. As flow increases through the bypass, the system pressure will also increase.

The pressure increase for a given valve design depends on the valve setting, the flow rate, and the viscosity of the fluid being pumped. If the full-flow bypass pressure exceeds the maximum allowable for the particular pump and piping system, an oversize attachable relief valve may sometimes be used to limit the full-flow bypass pressure to an acceptable value.





Inlet Side — Strainers and Traps Inlet side strainers and traps can be

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 — Install gauges whenever possible!

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

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.



WARNING: To avoid serious injury, do not install or service pump unless all power is off and locked out.

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.



Feeler or Taper Gauge



Check at 4 points around coupling - every 90°

Move drive as needed



Shim height as needed

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.

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.



WARNING: Keep fingers out of ports.

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

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



Figure 1

Determine rotation direction by looking at the motor coupling. Connect coupling halves and install coupling guard.

Aligning belt and chain drives

Using straight-edges and visual check. Move drive to correct any angular and parallel misalignment



Figure 2

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 before operation.

Section 3 - Start-up Check List

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

- 1. Review Section 2, particularly "Relief Valves". Install relief valves if needed in system.
- 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 Section 5. 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 10)
- 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" in Section 4 - Troubleshooting a Pumping System (page 12).

Section 4 - 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	Problem Probable Causes		Solutions	
No flow, pump not turning	1.	1. Drive motor not running.		Check resets, fuses, circuit breakers.
	2.	Keys sheared or missing.	2.	Replace.
	3.	Drive belts, power transmission components slipping or broken.	3.	Replace or adjust.
	4.	4. Pump shaft, keys, or gears sheared.		Inspect: replace parts.
No flow, pump turning	Wrong direction of rotation		Re	verse
No flow, pump not priming	1.	Valve closed in inlet line.	1.	Open valve.
	2.	Inlet line clogged or restricted.	2.	Clear line, clean filters, etc.
	3.	Air leaks due to bad seals or pipe connections.	3.	Replace seals; check lines for leakage (can be done by air pressure or by filling with liquid and pressurizing with air).
	4.	Pump speed too slow.	4.	Increase speed. Filling inlet lines with fluid may allow initial start- up. Foot valve may solve start-up problems permanently.
	5.	Liquid drains or siphons from system during off periods.	5.	Use foot valve or check valves.

Problem		Probable Causes		Solutions	
No flow, pump not priming	1.	"Air" lock. Fluids which "gas off", or vaporize, or allow gas to come out of solution during off periods.	1.	Manual or automatic air bleed from pump or lines near pump.	
	2.	Extra clearance rotors, worn pump.	2.	Increase pump speed, use foot valve to improve priming.	
	3.	Net inlet pressure available too low.	3.	Check net inlet pressure available, net inlet pressure required, recalculate system. Change inlet system as needed.	
	4.	On "Vacuum" inlet system: On initial start-up, atmospheric "blow back" prevents pump from developing enough differential pressure to start flow.	4.	Install check valve in discharge line.	
No flow	1.	Relief valve not properly adjusted, or held off seat by foreign material (flow is being recirculated to inlet).	1.	Adjust or clear valve.	
Insufficient flow	1.	Speed too low to obtain desired flow.	1.	Check flow-speed curve.	
	2.	Air leak due to bad seals or pipe connections.	2.	Replace seals, check inlet fittings.	
Fluid vaporization ("starved" pump inlet)	1.	Strainers, foot valves, inlet fittings or lines clogged.	1.	Clear lines. If problem continues, inlet system may require change.	
	2.	 Inlet line size too small, inlet line too long. Too many fittings or valves. Foot valve, strainers too 	2.	Increase inlet line size. Reduce length, minimize direction and size changes, reduce number of fittings.	
	3.	Net inlet pressure available at	3.	Raise liquid level in source tank.	
	4.	pump too low.4. Net inlet pressure required by	4.	Increase by raising or pressurizing source tank.	
	5.	Net inlet pressure available too low.	5.	Select larger pump size with smaller net inlet pressure required.	
	6.	Fluid viscosity greater than expected.	6.	Reduce pump speed and accept lower flow, or change system to reduce line losses.	
	7.	Fluid temperature higher than expected (vapor pressure higher).	7.	Reduce temperature, reduce speed and accept lower flow or change system to increase net inlet pressure available.	

Problem	Probable Causes	Solutions	
Insufficient flow. Fluid being bypassed somewhere	 Relief valve not adjusted or jammed. 	1. Adjust or clear.	
	2. Flow diverted in branch line, open valve, etc.	2. Check system and controls.	
Insufficient flow. High slip	 Hot (HC) or extra clearance rotors on "cold" fluid, and/or low viscosity fluid. 	1. Replace with standard clearance rotors.	
	2. Worn pump.	 Increase pump speed (within limits). Replace rotors, recondition pump. 	
	3. High pressure.	3. Reduce pressure by system changes.	
Noisy operation	Cavitation		
	 High fluid viscosity, High vapor pressure fluids, High temperature 	 Slow down pump, reduce temperature, change system. 	
2. Net inlet pressure available than net inlet pressure requ see Engineering Manual		2. To increase net inlet pressure available or reduce net inlet pressure required.	
	Air or gas in fluid		
	1. Leaks in pump or piping	1. Correct leaks.	
	2. Dissolved gas or naturally aerated products	2. Minimize discharge pressure. Also see "Cavitation" above.	
	Mechanical noises - Rotor to body contact.		
	1. Improper assembly	1. Check clearance with shims.	

Problem	Probable Causes	Solutions
Noisy operation	Rotor to body contact1. Distortion of pump due to improper piping installation.	 Reassemble pump or re-install piping to assure free running.
	2. Pressure higher than rated.	2. Reduce pressure if possible.
	3. Worn bearing.	 Rebuild with new bearings. Lubricate regularly.
	4. Worn gears.	 Rebuild with new gears. Lubricate regularly.
	 Rotor to rotor contact 1. Loose or mis-timed gears, twisted shaft, sheared keys, worn splines. 	1. Rebuild with new parts.
	Relief valve chattering	Re-adjust, repair or replace.
	Drive component noise-gear trains, chains, couplings, bearings.	Repair or replace drive train.
Pump requires excessive power (overheats, stalls,	 Higher viscous losses than expected. 	1. If within pump rating, increase drive size.
high current draw, breakers trip)	2. Higher pressure than expected.	2. Reduce pump speed. Increase line sizes.
	Fluid characteristics.	
	 Fluid colder than expected, viscosity high. 	 Heat fluid. Insulate or heat trace lines. Use pump with more running clearances.
	2. Fluid sets up in line and pump during shut down.	 Insulate or heat trace line. Install "soft start" drive. Install recirculating bypass system. Flush with other fluid.
	3. Fluid builds up on pump surfaces (example, latex, chocolate, fondants).	3. Use pump with more running clearance.

Problem	Probable Causes	Solutions	
"Short" pump service life	1. High corrosion rate.	1. Upgrade material of pump.	
	2. Pumping abrasives.	2. Larger pumps at slower speeds, can help.	
	 Speeds and pressures higher than rated. 	3. Reduce speeds and pressures by changes in system.	
	4. Worn bearings and gears due to lack of lubrication.	4. Set up and follow regular lubrication schedule.	
	5. Misalignment of drive and piping. Excessive overhung load or misaligned couplings.	 Check alignment of piping. Check drive alignment and loads. (page 10) 	

Section 5 - Operation

NORMAL OPERATION

Normal operation covers a speed range of 0 to 600 RPM and pressure range of 0 to 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 factory.)



WARNING: Stop pump and lock out all power prior to servicing.

LUBRICATION

The gears are factory lubricated with ISO Grade 320, SAE 140, or AGMA Number 6EP oil at the quantity shown for top or bottom shaft mounts. (14, 34, 64, 134, 224 and 324 are filled for side mount). If you mount your pump other than top or bottom shaft drive, check oil level.

The bearings are factory greased with NLGI grade 2 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. Excess grease will accumulate in the gear case and can be removed through the cleanout hole covered with plastic plug.



Figure 3 Upper Shaft Drive Position of Pump Shown

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NOTE: For hot or cold extremes use appropriate lubricant as shown in Table 1.

Table 1

	Туре	Temperature Range
Oil	ISO Grade 320, SAE 140, or AGMA Number 6EP	-10° to 350°F (-23.3° to 176.6 °C)
Graaca	Silicone	-20° to 5°F (-28.8° to -15°C)
Grease	NLGI grade 2	5° to 350°F (-15° to 176.6 °C)

Table 2 - Oil Capacity (Gears)

Model	Top or Bottom Shaft oz (ml)	Side Mount oz (ml)
6, 12, 14, 15, 18, 22	1.3 (40)	3.3 (100)
30, 32, 33A, 34	2 (60)	4 (120)
60, 62, 64	6 (170)	9.5 (280)
130, 132, 133A, 134	6 (170)	9.5 (280)
220, 222, 223, 224	11 (320)	20 (600)
320, 324, 323A	17 (500)	44 (1300)

DRIVE LUBRICATION

Refer to drive manufacturer's manual shipped with unit.

CLEANING

The Waukesha pump is 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 O-rings, sleeves and pump seals.

FLUID HEAD DISASSEMBLY - ALL MODELS



- 1. Shut off power, close isolation valves, and disconnect inlet and discharge lines.
- 2. Remove wing nuts using soft hammer to loosen them.
- 3. Remove cover, if it is stuck, loosen it with a soft hammer. Remove and discard cover O-ring.



O-Ring





Apply gear puller here



scratches. If it is stuck tight, use a gear puller or hardwood lever behind rotor hub to force it off spline.

5. Orient rotors perpendicular to each other and remove rotor with both wings exposed first. Handle rotors with care to avoid knicks and

- 6. Remove pump body by pulling it straight off studs. Use a soft hammer to assist if body is stuck tight.
- 7. See Section 4 for seal disassembly procedure.
- 8. Clean and inspect body thoroughly.



CAUTION: Body must be reassembled on bearing housing from which it was removed. Both are identified with same serial number.

MODEL 320 AND 324 BODY DISASSEMBLY

After removing the cover and rotors, remove the four bolts from each seal gland and slide the gland toward the gear case. Loosen the two socket head cap screws from the front of the body. Tap the body with a soft hammer to drive body loose from gear case and dowel pins.

MODEL 323 ASEPTIC BODY DISASSEMBLY



- 1. Disconnect flushing lines.
- 2. Remove cap screws from seal flush glands and slide glands back against gear case.



- 3. Loosen two socket head cap screws in front of body. Tap body with a soft hammer to drive body loose from gear case and dowel pins.
- File flared end
- 4. Thoroughly clean the shafts. Remove "flared end" to aid in seal removal.

CLEANING PROCEDURE

Use a basket or wash tank having the bottom covered with a rubber mat. Wash parts thoroughly with cleaning compound using brushes and plenty of fresh warm water at about 125°F. Rinse the parts thoroughly with 170°F water and store them to permit free draining and natural drying. Reassemble pump and sterilize it in accordance with accepted sterilizing practices. If chlorine solution (200 ppm available chlorine) is used, it should leave no residual deposits which would remain in the pump.

NOTE: Acid cleaners have a much higher metal corrosion rate andpump parts should remain in acid cleaning solutions no longer than necessary. Any strong inorganic mineral base acids that are harmful to your hands would be harmful to pump parts. Due to the high circulation required, Waukesha Fluid Handling recommends that its pumps not be used to recirculate cleaning solutions.

FLUID HEAD ASSEMBLY - MOST MODELS

Seal Assembly See SEAL MAINTENANCE for assembly procedure on all models.



Gear Case

Socket Head

Cap Screw

Head

-20

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Body Assembly

- 1. Slide body over shafts and studs being careful seal components are not knicked or knocked out of place. Press body firmly against gear case engaging dowels.
- 2. **Model 320, 324 and 323A** bodies are secured to the gearcase with 2 socket head cap screws thru the head. (For seals see page 31 thru 33).



Rotor Assembly

Assemble a rotor onto shaft engaging the large spline tooth with the large groove in rotor. Rotate shaft until rotor wings are on vertical centerline. Install the second rotor and secure both with rotor retaining nuts (clockwise). Lock the nuts. (See torque table on page 49).

NOTE: CIP pumps have right hand and left hand nuts (12, 22, 32, 62, 132 and 222).



Cover Assembly

- 1. Install O-ring in cover groove.
- 2. Mount cover on studs and push it against body being sure O-ring remains in the groove.
- 3. Attach wing nuts (clockwise) and tighten by hitting them sharply with a soft hammer.

Flushing Connection



Flushing Connection - Aseptic Series

All connections are 1/8" female pipe taps. The pump has double "barriers" or seals at every opening to the pump chamber. Live steam or a sterile fluid is circulated between these double seals at the ports, in the cover and at the shaft seals.





Section 6- Maintenance

GENERAL

In the maintenance of pumps it is important to recognize when parts are wearing excessively. Detecting wear in the early stages will let you repair your pump at minimum cost and get it back into operation at the earliest date.

Periodic cleaning and a simple "look-feel" inspection of your pump are recommended as good operating procedures and as a means of detecting signs of trouble at an early stage. They require only a few minutes and may save you an appreciable amount of money.

A more detailed maintenance inspection should be scheduled annually. See ANNUAL MAINTENANCE, page 34.

The following routine "look-feel" checks are to be made by the system operator during shut-down periods.

VISUAL CHECKS

must be equal

Clearance on both sides

1. Check rotor wing tips for indications of metal-to-metal contact between rotor wings. If this condition exists, the pump should be repaired or replaced.

Table 3

Cause	Corrective Measure	
Worn shaft spline	Replace shaft.	
Worn rotor spline	Replace rotor.	
Note: Usually both parts will wear. The usual cause is a rotor which has been loose for extended running periods.		
Loose gears	Remove gear and inspect key, keyway and shaft. If all are in good condition, reassemble and retighten gear retainer nuts to specified torque. (See Table 2, page 49)	
Worn gears	Replace gears.	
Twisted shaft	Replace shaft.	

2. Check rotor hub end which locks against the shaft shoulder for signs of wear.







Cause	Corrective Measure
Extended running with loose rotor retaining nuts	Replace rotor or reshim shaft to maintain back face clearance (See Section 10, Table 1).

3. Shaft shoulder against which rotor hub locates and locks for deterioration.



"FEEL" CHECKS



Cause	Corrective Measure
"Steps" worn into locating face by loose rotor	Reshim or replace shaft to maintain correct running clearances. (See Section 10, Table 1)

1. Gear Back Lash-If there is any free movement when rotating either shaft without transmitting motion to other shaft, the back lash is excessive.

Cause	Corrective Measure
Worn gear teeth	Replace gear.
Gear loose on shaft	Remove gear and inspect key, keyway and shaft. If all are in good condition, reassemble and retighten gear retaining nuts to specified torque. (See Section 10, Table 2)

2. Bearing Condition-If movement of either shaft can be detected when hand loading the rotor end of the shaft (approximately 30 lbs. force applied as illustrated), bearing may be failing.



Cause	Corrective Measure
Lack of lubricant or high overload	Replace bearings and review lubrication schedule. Check for means to reduce hydraulic loads.

SEAL MAINTENANCE



Double O-Ring Service

- 1. Remove O-ring carriers.
- 2. Remove and discard O-rings from both body and carriers, using O-ring removal tool furnished with pump.



- 3. Remove shaft sleeves and shaft O-rings.
- 4. Thoroughly clean and inspect body, carrier and shaft grooves, and sleeves.

DO NOT re-use sleeves that are grooved or scratched.



Assembly

- 1. Apply an approved O-ring lubricant to NEW O-rings and insert them into body, carriers and shaft grooves. Shaft O-rings should be installed into the front shaft groove (closest to the shaft spline) when using O-ring seals.
- 2. Assemble carriers into body so notch in carrier engages pin in body.
- 3. Assemble shaft sleeves against shaft shoulder being sure the sleeve prongs DO NOT line up with the drive pin on shaft.
- 4. See Section 5 for fluid head assembly procedure.



Mechanical Seal

Service - Single Inside



- 1. Remove seal from body, then clean and inspect thoroughly. DO NOT reuse if seal face is scratched, chipped or cracked.
- 2. Remove O-rings from body and discard. Use O-ring removal tool supplied with pump.
- 3. Dress off shaft shoulder against which rotor bottoms with file to remove "flared end" and to aid in disassembly of seal seat.
- 4. Remove seal seats and shaft O-rings. Clean and inspect thoroughly. DO NOT re-use seats that are cracked, chipped, scratched or grooved.

Assembly - Single Inside

- 1. Install NEW O-rings on shafts. Lubricate O-rings to aid in assembly of seal seat.
- 2. Install seal seats being sure to line up groove on rear face with drive pin on shaft. Lubricate face of seat.
- 3. Lubricate and insert NEW O-rings in body grooves.
- 4. Assemble wave spring on seal and install into body with notch engaging pin in body.
- 5. Lubricate seal faces.
 - 6. See Section 5 for fluid head assembly procedure.



Wave Spring

NOTE: Handle all seal components with extreme care



Seal Seat Drive Pin

31-57 Shaft O-Ring Body O-Ring

Service - Single Outer





- 1. Remove seals from body and discard O-rings. Inspect seal face thoroughly. DO NOT re-use seals that are cracked, chipped or scratched.
- 2. Dress off shaft shoulder against which rotor bottoms with file to remove "flared end" and to aid in disassembly of seal seat.
- 3. Remove seal seats and shaft O-rings. Clean and inspect thoroughly. DO NOT re-use seats that are cracked, chipped, scratched, or grooved.

Assembly - Single Outer

1. Install NEW O-rings on shafts an lubricate to aid in assembly of seal seat.



- 2. Install seal seats being sure to line up groove on rear face with drive pin on shaft. Lubricate face of seat.
- 3. Apply lubricant to NEW O-rings for seal and assemble on seals.



- 4. Insert seal assembly into body engaging notch with pin and pushing from opposite side, over and in, to seat O-ring.
- 5. Apply lubricant to seal face.
- 6. See Section 5 for fluid head assembly procedure.

DOUBLE CONCENTRIC SEALS AND ASEPTIC **MODEL SEALS**

Service - Outer Seal

Remove seals from body and discard O-rings. Inspect seas face thoroughly. DO NOT re-use seals that are cracked, chipped or scratched.



Service - Inner Seal

- 1. Remove seal from body, then clean and inspect thoroughly. DO NOT reuse if seal face is scratched, chipped or cracked.
- 2. Remove O-rings from body and discard. Use O-ring removal tool supplied with pump.
- 3. Dress off shaft shoulder against which rotor bottoms with file to remove "flared end" and to aid in disassembly of seal seat.
- 4. Remove seal seats and shaft O-rings. Clean and inspect thoroughly. DO NOT re-use seats that are cracked, chipped, scratched or grooved.



File

23-30

Assembly - Outer Seal

1. Install new O-rings on shafts and lubricate to aid in assembly of seal seat. NOTE: On aseptic models, there are 2 O-rings per shaft.



- 2. Install seal seats being sure to line up groove on rear face with drive pin on shaft. Lubricate face of seat.
- 3. Apply lubricant to NEW O-rings for seal and assemble on seals.
- 4. Insert seal assembly into body engaging notch with pin and pushing from opposite side, over and in, to seat O-ring.
- 5. Apply lubricant to seal face.



Assembly - Inside Seal



Lubricate and insert NEW O-rings in body grooves.

- 2. Assemble wave spring on seal and install into body with notch engaging pin in body.
- 3. Lubricate seal faces.
- 4. See Section 5 for fluid head assembly procedure, seals with a cracked, chipped or scratched seal face.

MOTE: damage	Handle all seal components with extreme care to avoid
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Mechanical Seals - Model 320.

Seal File Off Flared Edges

Shaft / Seal Service

- 1. Remove seal from shaft by loosening set screws and sliding off. Dress off shaft shoulder against which rotor bottoms with file to remove "flared end" and to aid in disassembly.
- 2. Clean and inspect seal thoroughly. DO NOT re-use seals with a cracked, chipped or scratched seal face.
- 3. Remove seal seat retainer cap screws, lock washers and retainers from body.
- 4. Remove seal seat from body. Clean inspect thoroughly. DO NOT re-use a seal seat that is cracked, chipped, scratched or grooved.

NOTE: If one face of seat is worn, the seat can be turned over to use the other face







Assembly

- 1. Place seal rotating assembly onto shaft with seal face out. Position seal on shaft (see seal assembly drawing for correct dimension) and lock it with the set screws.
- 2. Install seal seat gasket, seal seat, retainer gasket, and seal seat retainer and secure them with wing nuts.
- 3. See Section 5 for fluid head assembly procedure.



Mechanical Seals - Model 323 Aseptic



Seal 1. Remove inner seal by disengaging set screws in seal collar.



- 2. Slide inner seal, seal seat and gaskets off shaft.
- 3. Loosen outer seal set screws and pull seals off shafts. Remove burrs on shafts where set screws locked to aid in reassembly.
- 4. Clean and inspect thoroughly all seal components. DO NOT re-use a seal or seal seat that is cracked, scratched or grooved.



Assembly

- 1. Slip outer seals onto shafts and secure them in position with set screws. See seal drawing for mounting dimension.
- 2. Slide seal seat retainer, retainer gasket, seal seat, and seat gasket, in that order, onto shafts and place seal seat against the seat face of outer seal.
- 3. Install inner seal with seal face against seal seat and lock in position with set screws. See seal drawing for mounting dimension.
- 4. Mount pump body onto bearing housing and be sure seal seats are located in body counterbores. Secure body with 4 bolts.



5. Place seal seat retainer and retainer gaskets in position and secure with cap screws.

ANNUAL MAINTENANCE





The same general procedures and corrective measures outlined should be followed and in addition the following preventive maintenance operations should be carried out at this annual check out period.

- 1. Check bearing with a dial indicator for shaft radial play. If deflection is equal to or greater than rotor to body diametrical clearance (see Section 10, Table 1), replace bearings.
- 2. Remove gear cover and inspect gears for wear, back lash and looseness. Re-torque gear retaining nuts to proper torque. (See Section 10, Table 2)
- 3. Thoroughly inspect rotors for worn splines, bearing shoulder wear, and stress cracks. Use dye check method to detect any fatigue type cracks that may develop into serious trouble.
- 4. Review performance record on pump and check radial and back face clearances to determine wear and its effect on desired performance. (SeeSection 10, Table 1)

An adjustment on operating speed can compensate for wear in some applications. When wear and subsequent performance is objectionable, we suggest you take advantage of our reconditioning program. (See Section 7)



NOTE: If bearings or shafts are replaced "in the field" extreme care should be exercised to position the shaft, by shimming, to maintain sufficient running clearances between the rotor wing faces and the pump body faces (back face and cover face).

See Section 10, Table 1 and BACK FACE CLEARANCE. If rotors are slightly out of time, they can be retimed by shimming the gears.

It is important to hold the same back face dimension for both rotors to avoid crossover interference.

Section 7 - Factory Reconditioning

Waukesha pumps are designed so that they may be factory reconditioned twice and backed with a new pump warranty each time.

Factory reconditioning involves replacement of all worn parts such as shafts, bearings, oil seals, gears, etc.

The pump body and cover are re-machined and new rotors are installed. The pumps are stamped R-1 or R-2, after the serial number, designating that they have been reconditioned once or twice.



Section 8 - Disassembly Procedures

2.

3.

4.

5.

6.

FLUID HEAD - ALL Follow the instructions under FLUID HEAD DISASSEMBLY - ALL MODELS in MODELS Section 5.

SEALS - ALL MODELS

Follow the instructions under SEAL MAINTENANCE in Section 6.

SHAFT BEARING AND **GEARS - ALL MODELS**

1. Remove oil drain plug and drain oil.



Remove cap screws from gear case cover.

Scrape silicone sealant from gear case and cover.

Lockwasher

Lockwasher

SHAFT REMOVAL



Straighten locking tab of lockwashers.

Remove oil seal from cover with an arbor press and discard.

Prevent shafts from turning by wedging a wooden block between the 7. gears.

Pull cover off shaft extension. If cover sticks, use soft hammer to loosen it.

NOTE: Protect liquid end of shafts by wrapping them with tape.



Use spanner wrench or drift to remove gear lock nuts. Gears will be 8. removed later. See step 10 below.
9. Remove front bearing retainer bolts and pull off retainers. Scrape silicone sealant from retainer and case. (If retainer is stuck, leave it in place; it will press out when shaft is removed.)







- Place housing on an arbor press with liquid end down. Protect shaft ends with wood or plastic block and press shafts out of housing. (See Section 10, Table 4)
- 11. Scrape silicone sealant; press out and discard grease seal from front bearing retainers.
- 12. Remove shims. If they are to be re-used, identify them with the shaft on which they were used.
- 13. Press out and discard both rear grease seals in housing.



ALL MODELS EXCEPT 320, 323A AND 324 1. Use hydraulic press and V-blocks to remove bearings and spacer. (See Section 10, Table 4)



MODELS 320, 323A AND 324



- 2. Remove rear bearing by using V-blocks and a hydraulic press. (See Section 10, Table 4)
- 3. Secure shaft assembly in a soft jawed vise as shown. Open tab in lock washer. Remove front bearing lock nut using a spanner wrench or drift punch.
- 4. Remove front bearings using V-Blocks and a hydraulic press. (See Section 10, Table 4)
- 5. Clean and inspect all parts thoroughly if they are to be re-used.



Section 9 - Assembly Procedures

Press Against

Inner Race Only

Front

Bearing



Shield



Front Bearing Assembly

- Coat front bearing area of shaft with NLGI grade 2 grease. Place upright 1. in hydraulic press with spline end down.
- 2. Unwrap front bearing assembly.



- 3. Place front bearing over shaft with shield side up. Press onto shaft until sealed against shaft shoulder. (See Section 10, Table 4)
- FrontBearing Inner Race Only k 46-96 Bearing
- Place spacer over shaft onto bearing.
- Coat shaft rear bearing area with NLGI grade 2 grease. 5.
- 6. Slip rear bearing over shaft with shield side down. Press bearing onto shaft until it seals against spacer and front bearing.

Gear Case Assembly

Shaft Installation

1. Place gear case on arbor press.



2. To determine the shim thickness required for the front bearing, measure dimension "A" in the gear case and dimension "B" on the shaft to three decimal places (1.000, for example). Also refer to the following table for the shim deduct factor to use with each pump.



Press Against 4.

45-94

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Pump Model	Deduct Factor
6, 12, 14, 15, 18, 22	.482
30, 32, 33A, 34	.372



Using these values calculate the shim thickness as follows:

Dimension "A" minus dimension "B" minus shim deduct factor = required shim thickness.

Front Bearing Shim

- 3. Use standard shim packs to equal the required shim thickness. Place against shoulder in front bearing bore. (Also see Section 10)
- 4. Install shaft assemblies in gear case with spline end up and drive shaft in proper location to give top or bottom drive as required. Press shafts into housing until sealed against shim pack. (See Section 10, Table 4)
- 5. Place body on gear case and seat it firmly. Install rotors on shafts and lock them in place with rotor nuts.

Check back face clearance (Dimensions in Section 10, Table 1). Remove shafts to adjust shim thickness to achieve required back face dimension.

6. Secure shaft assemblies in gear case with bearing retainers. No silicone sealant at this time.

NOTE: Retainer must seat firmly against bearing and leave .040 - .050" clearance with gear case. Use shims between bearing and

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Silicone Sealant Seal

Fill with NLGI grade 2

- 7. Check back face clearance again. See Section 10, Table 4 and BACK FACE CLEARANCE.
- 8. Remove bearing retainers.

retainer if required.

- 9. Grease front and rear bearing through grease fittings until grease is visible around ball assemblies.
- 10. Install grease seals in bearing retainers and coat seal lips with NLGI grade 2 grease. Coat retainer flanges with silicone sealant.
- 11. Install bearing retainers.

Rear Seal Assembly

- 1. Install spacer seals and gear spacers.
- 2. Coat lip of seals with NLGI grade 2 grease.
- 3. Press in rear seals with lip facing out.



MODELS 320, 323A AND 324



Shaft Assembly

Front Bearing Assembly

- 1. Coat front bearing area of shaft with NLGI grade 2 grease. Place upright in hydraulic press with spline and down.
- 2. Unwrap front bearing assembly. Do not interchange parts of one bearing assembly with another. These parts are precisely matched in manufacture and must be installed as a matched assembly.



- 3. Lift cone and roller assembly out of bearing stack and place on shaft with radius down as shown. Press onto shaft until seated against shaft shoulder. (See Section 10, Table 4)
- 4. Place spacer over shaft onto bearing cone.
- 5. Place bearing cup over cone and roller assembly, keeping the cup oriented with proper roller assembly.
- 6. Coat remaining bearing cone and roller I.D. with NLGI grade 2 grease and slip them over shaft with roller radius up. Press onto shaft and into cup to complete assembly of front bearing on shaft. (See Section 10, Table 4)
- 7. Apply NLGI grade 2 grease to threaded area on shaft and face of lock nut.
- 8. Install spacer, lock washer and lock nut. Tighten nut finger tight.





Cone and Roller

51-112

Grease Retainer

Spacer (320 & 323)

51-113

Cup Spacers

Cup

9. Clamp shaft behind lock nut in soft jawed vise and drive lock nut tight using a spanner wrench or drift. (See Section 10, Table 2.)



10. Bend lock washer tab into groove on nut to secure assembly.

Rear Bearing Assembly

- 1. Unwrap rear bearing assembly. Do not interchange parts of the bearing assembly with another. These parts are precisely matched in manufacture and must be installed as a matched assembly.
- 2. Place shaft upright in an arbor press with gear end up. Slip on grease retainer with flange up.



NOTE: On 320 and 323 install spacer before grease seal.



3. Coat shaft bearing area with Molykote grease. Slip bearing cone and roller assembly with radius down onto shaft and press on. (See Section 10, Table 4.)

 Cup
 Install both inner and outer/spacers. Place remaining cup onto outer spacer and press on the remaining cone and roller assembly. (See Section 10, Table 4.)

 Image: Section 10, Table 4.)
</tr

Bearing Housing Assembly

Shaft Installation

1. Place bearing housing on arbor press. Install front bearing grease seals, with lip towards center of cavity, flush with back face of bore.





- 2. Coat lip seals with NLGI grade 2 grease
- 3. Place standard shim packs into place against shoulder in front bearing bore.
- 4. Install shaft assemblies in bearing housing with spline end up and drive shaft in proper location to give top or bottom drive as required. Press shaft into housing until seated against shim pack. (See Section 10, Table 4.)
- 5. Install grease in bearing retainers and coat seal lip with NLGI grade 2 grease, and apply silicone sealant.







See Note

Retainer

Shim Here if Required

- 6. Grease front and rear bearing through grease fittings until grease is visible around roller assemblies.
- 7. Secure shaft assemblies in housing with bearing retainers.
- 8. Check back face clearance. See Section 10, Table 1 and BACK FACE CLEARANCE.



Gear Spacer

Spacer Seal

49-104

NOTE: Retainer must bottom out against bearing and leave .015 - .040" clearance with housing. Use shims between bearing and retainer if required.

Rear Seal Assembly

- 1. Install spacer seals and gear spacers.
- 2. Coat lip of seals with ISO GradeNLGI grade 2 grease



3. Press in rear seals with lip facing out.

NOTE: On Model 60, 130 and 320 pumps rear seal is pressed in flush with housing. On Model 220 pumps the rear seal must not be flush. It must be 1/8 inch outside of housing.

GEAR AND GEAR COVER ASSEMBLY -ALL MODELS

1. Place keys into shaft key slots. Then slide gear with single punch mark onto drive shaft. Slide gear with two punch marks onto the short shaft with punch marks straddling single mark of drive gear.



BACK FACE CLEARANCE

- 1. Waukesha Pumps are designed with close running clearances. The rotors are secured against a shaft shoulder with rotor jam nuts. The shaft is position is controlled with shims behind the front bearing. The front bearing is secured in the gear case with the bearing retainers. The resultant clearance between body back face and rotor wing is the back face clearance A. (See Section 10, Table 1 for required clearance.)
- 2. To check back face clearance mount body, less seals, onto housing. Assemble rotors and secure with rotor jam nuts. Measure clearance between body back face and rotor wing with feeler gauges. Check readings against recommended back face clearance A in Table 1. Make note of corrections required and follow examples to determine exact adjustment to make and avoid unnecessary assembly/disassembly.
- To make shim adjustments remove rotors, body and shafts. (See Section 8). Make required shim adjustment and reassemble. Recheck back face clearances. Be sure both rotors have the same clearance to avoid crossover interference. Examples:



Too Much Back Face Clearance A Condition 1

("A" is more than specified in Table 1)

Correction: A (measured) minus A (Table 1) = shims to remove from rear outer race of front bearing.

Condition 2

(Rotor wing face projects past body front face.)

Correction: C (measured with depth micrometer) plus C (Table 1) = shims to remove from rear of front bearing.

Not Enough Back Face Clearance A

(A is less than specified in Table 1.)

Correction: A (Table 1) minus A (measured) = shims to add to rear outer race of front bearing.

NOTE: It is generally best to keep back face clearance to a minimum.

The back face clearance for both rotors must be equal to avoid rotor crossover interference with adjacent rotor hub.

Notes

Section 10 - Reference Tables and Repair Parts List

Series	Model
15	12, 14, 15, 18, 22
30	30, 32, 33A, 34
60	60, 62, 64,
130	130, 132, 133A, 134
220	220, 222, 223A, 224
320	320, 323A, 324

Table 1 Clearances^a

Model	Application	A Back Face	B Rotor to Body	C Front Face
6	Standard	.002	.003	.005
12	Standard	.002	.003	.008
14 15	Standard	.002	.003	.005
18	Standard	.002	.003	.005
22	Standard	.002	.003	.008
30 34	Standard	.002	.003	.005
32	Standard	.002	.003	.008
33A	Standard	.002	.003	.007
60 64	Standard	.003	.005	.007
62	Standard	.003	.005	.010
130 134	Standard	.003	.005	.006
132	Standard	.003	.005	.011
133A	Standard	.003	.005	.007
220 224	Standard	.005	.006	.007
222	Standard	.005	.006	.013
223A	Standard	.005	.005	.006
320 324	Standard	.006	.007	.010
323A	Standard	.006	.007	.010

a. For non-standard rotor clearance, contact Application Engineering at Wauksha Cherry-Burell

Table 2 Torque Values-Ft-Lbs

Sorioo		Lock Nuts	
Series	Bearing	Gear	Rotor
15		75	30
30		100	60
60, 130	150	140	75
220	240	230	150
320	360	320	190

Table 3 Suggested Shims

Series	STD. Pump	New Shaft	
15	.113	.110	
30	.113	.110	
60, 130	.125	.120	
220	.125	.120	
320	.125	.120	

Table 4 Arbor or Hydraulic Press Required - Tons

	Sh	oft	Front Bearing		Rear Bearings			
Series	Snan		Tont Dearing		Housing		Shaft	
	In	Out	On	Off	In	Out	On	Off
15	.25	.5	.5	1	.5	1		
30 60, 130 220 320	.25 .5 .5 .5	.5 1 1 1	.5 2 5 5	1 5 15 20	.5	1	3 5 5	5 15 20

Relief Cover Option (Vented Cover)

The optional Relief Cover Feature (also called Vented Cover) is an adjustable, internal by-pass arrangement which can be used for control of pressure and/ or flow. It is bidirectional; that is the pump flow or rotation can be in either direction.

This option doesn't provide fill flow relief for all pumping situations. The pressure down stream of the pump may increase with increasing amount of by-pass through the Relief Cover. Actual down stream pressure will depend on pump speed, product viscosity, and the relief set point (spring adjustment or air pressure). Avoid high flow rates through the cover with high viscosity products. The resulting pressure may be greater than the maximum rating of the pump or other system components. Install a pressure gauge and measure pressure under worst conditions of maximum flow and maximum viscosity to determine the maximum pressure for your process. **Under any conditions, if there is a complete flow shut off down stream, stop the pump as soon as possible.** Continued pump operation with the entire flow by-passing will rapidly build heat within the pump body. Contact Waukesha Application Engineering for assistance.

Three types of Relief Covers are available:

Manual

By-pass pressure is adjusted by a threaded adjusting screw (2) which compresses a spring (5). Several spring sizes are available, to cover a range of operating pressures.

Pneumatic

By-pass pressure is adjusted by regulated air or gas pressure, operating on the side of a diaphragm (9) opposite the pumped fluid. Most sensitive control of the three types.

Piston

By-pass pressure is adjusted by regulated air or gas pressure, operating on the side of a metal piston (12), opposite the pumped fluid. Extended pressure range possible.

\ل	NOTE: On all types of relief covers, the temperature and chemical resistance of the elastomer diaphragms and O-rings determine the useful range.
ل	Buna-N
	Silicone Rubber. Optional material upon request

Installation Adjustment

Manual

Adjusting Screw

1. Manual: Turn adjusting screw counterclockwise to its farthest position, then clockwise until light spring pressure is felt.

2. Pneumatic and Piston:

- A. Set air/gas pressure to 2-5 PSIG
- B. Turn on pump.
- C. With pressure gauge and valve in discharge line:
 - 1. Close discharge valve.
 - 2. Turn adjusting screw clockwise until desired relief pressure registers on gauge. Lock adjusting screw with lock nut.
 - 3. Open valve in discharge line. Relief cover is set and will open if system pressure exceeds preset limit.
- D. Without pressure gauge in discharge line:
 - 1. Turn adjusting screw clockwise and observe product flow at discharge of system.
 - 2. When product flow reaches maximum or desired flow rate, lock adjusting screw with lock nut.

3. Pneumatic and Piston:

- A. With pressure gauge and valve in discharge line:
 - 1. Close discharge valve slowly and observe gauge pressure. DO NOT ALLOW PRESSURE TO EXCEED 200 PSI.
 - Increase air/gas pressure, until desired relief pressure registers on gauge. Lock air/gas pressure regulator adjusting screw with lock nut.
 - 3. Open valve in discharge line. Relief cover is set and will open if system pressure exceeds preset limit.
- B. Without pressure gauge in discharge line:
 - 1. Increase air/gas pressure to relief valve, with regulator, and observe product flow at discharge of system.
 - 2. When product flow reaches maximum or desired flow rate, lock regulator adjusting screw with lock nut.

Jacketed Cover

Available on Models 6, 15, 18, 30, 60, and 130

The jacketed cover is designed to allow circulation of a heating or cooling medium. The purpose is to help preheat or cool the pumping head and sustain operating temperature during short shut down periods. It should not be used as a heat exchanger to control pumping temperature during operation

Model Number			
6, 15, 18 and 30	60 and 130		
3/4" Pipe Tap	1" Pipe Tap		

Pump Jackets

Split cast aluminum jackets with cast in pipe passages are available for higher pressures and temperatures. Consult factory for recommendations.

NOTE: Jacketed pumps require longer mounting studs in the gearcase. Use a special offset rotor wrench to remove rotors from 006 through 060 models to avoid hitting studs.

Model	Part Number
006-018	AD0 019 001
030	CD0 019 001
060-130	060 019 001

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
	006-U1 Pump Body	1	See Note 1	1
	006-U1 Pump Body with Flush	1	See Note 1	1
	015-U1 Pump Body	1	See Note 1	1
	015-U1 Pump Body with Flush	1	See Note 1	1
4	014-U1 Rectangular Flange Inlet Body	1	See Note 1	1
	014-U1 Rect. Flange Inlet Body with Flush	1	See Note 1	1
	018-U1 Pump Body	1	See Note 1	1
	018-U1 Pump Body with Flush	1	See Note 1	1
	024-U1 Rectangular Flange Inlet Body	1	See Note 1	1
	024-U1 Rect. Flange Inlet Body with Flush	1	See Note 1	1
	006-014-015-U1 Drive Shaft	1	015 008 000	3
7	006-014-015-U1 Drive Shaft	1	114642	4
	018-024-U1 Drive Shaft	1	018 008 000	3
	018-024-U1 Drive Shaft	1	114644	4
8	006-014-015-U1 Short Shaft	1	015 009 000	3
	006-014-015-U1 Short Shaft	1	114643	4
	018-024-U1 Short Shaft	1	018 009 000	3
	018-024-U1 Short Shaft	1	114645	4
	006-U1 Rotor, Twin Wing, Alloy 88	2	006 010 000	2
	006-U1 Rotor, Twin Wing, 316SS	2	006 010 200	2
	006-U1 Rotor, Single Wing, Alloy 88	2	117238	2, 12
	014-015-U1 Rotor, Twin Wing, Alloy 88	2	015 010 000	2
9	014-015-U1 Rotor, Twin Wing, 316SS	2	015 010 200	2
	015-U1 Rotor , Single Wing, Alloy 88	2	117255	2, 12A, 13
	018-024-U1 Rotor, Twin Wing, Alloy 88	2	018 010 000	2
	018-024-U1 Rotor, Twin Wing, 316SS	2	018 010 200	2
	018-U1 Rotor, Single Wing, Alloy 88	2	117273	2, 12B, 13
10A	006-015-U1 Stud	8	AD0 011 000	
10B	006-015-U1 Stud, Jacketed Cover	8	AD0 011 J00	
100	014-U1 Stud	6	AD0 011 000	
100	014-U1 Stud	2	35547	
100	014-U1 Stud, Jacketed Cover	6	AD0 011 J00	
100	014-U1 Stud, Jacketed Cover	2	35548	
10E	018-U1 Stud	8	018 011 000	
10F	018-U1 Stud, Jacketed Cover	8	AD0 011 100	
100	024-U1 Stud	6	018 011 000	
100	024-U1 Stud	2	35547	
104	024-U1 Stud, Jacketed Cover	6	AD0 011 100	
	024-U1 Stud, Jacketed Cover	2	35548	
	Stud Retainer Assembly	1	020 064 000	5

006 - 014 - 015 - 018 - 024-UI Pump Parts List

- 1. Contact Factory with Serial Number of pump for Part Number.
- 2. Standard clearances and finishes for Rotor Part Numbers shown. Contact Factory for optional clearances and finishes.
- 3. Pumps shipped prior to July 30, 2001.
- 4. Pumps shipped starting July 30, 2001.
- 5. No longer manufactured, consult factory for upgrade of gear case subassembly.
- 12. Replaces 006 010 010 straight and 006 010 090 90° (degree) rotors.
- 12A.Replaces 015 010 010 straight and 015 010 090 90° (degree) rotors.
- 12B.Replaces 018 010 010 straight and 018 010 090 90° (degree) rotors.
- 13. Single wing rotors can not be used in Rectangular Flange Inlet pumps.

006 - 014 - 015 - 018 - 024-UI Pump Parts Diagram

006 - 014 - 015 - 018 - 024-UI Common Parts List

ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
	Pump Cover	1	AD0 002 S00	
	Jacketed Cover	1	AD0 002 J10	
	Pump Cover Vented - Complete Assembly			
2	Manual (over 150 PSI)	1	CVR00027	
	Manual (under 150 PSI)	1	CVR00006	
	Pneumatic	1	CVR00004	
	Piston	1	CVR00005	
	Gear Case, Cl	1	020 005 000	3, 5
2	Gear Case, SS; Optional	1	101830	3, 5
3	Gear Case, Cl	1	102276	4
	Gear Case, SS; Optional	1	101831	4
4	Gear Case Cover, Steel	1	020 106 000	
4	Gear Case Cover, SS; Optional	1	102280	
5	Gear, Drive Shaft, Spur	1	107997	
6	Gear, Short Shaft, Spur	1	107997	
44	Wing Nut	8	105850	
	Hex Nut, optional	8	108369	
12	Oil Seal, Gear Case Cover	1	000 030 016	
13	Oil Seal, Gear Case Rear	2	000 030 017	
14	Grease Seal, Bearing Retainer	2	000 030 018	3
	Grease Seal, Bearing Retainer	2	121679	4
14	Bearing Isolator Kit, includes Bearing Retainer	2	X06636-1	3
	Bearing Isolator Kit, includes Bearing Retainer	2	X06638-1	4
15	Bearing, Rear	2	015 035 000	
16	Bearing, Front	2	015 036 000	3
10	Bearing, Front	2	101714	4
17	Key, Gear	2	015 037 000	
19	Drive Pin, Seal Seat and Sleeve	2	CD0 126 000	
20	Dowel Pin, Upper Cover Side	1	AD0 040 000	
21	Dowel Pin, Upper Gear Case Side	1	AD0 040 R00	
22	Dowel Pin, Lower Cover Side	1	AD0 040 100	
23	Dowel Pin, Lower Gear Case Side	1	AD0 040 R10	
24	Fill, Drain, Level Plug	6	000 046 002	
25	Silicone Sealant	1	000 142 301	
26	Jam Nut, Rotor	4	AD0 052 001	
27	Shim, Front Bearing	AR	015-054-XXX	3
	Shim Kit	2	117889	4
29	Spacer, Gear to Rear Bearing	2	015 055 000	
30	Bearing Spacer	2	015 055 001	3
30	Bearing Spacer	2	101814	4

- 3. Pumps shipped prior to July 30, 2001.
- 4. Pumps shipped starting July 30, 2001
- 5. No longer manufactured, consult factory for upgrade of gear case subassembly.

006 - 014 - 015 - 018 - 024-UI Common Parts List

ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
32	Bearing Retainer, Front	2	015 080 000	3
52	Bearing Retainer, Front	2	101810	4
33A 33B	1/4-20 x .75" HHCS, Standard	14	30-287	
00A, 00D	1/4-20 x .75" HHCS, SS	14	30-58	
33C	1/4" Flat Washer, Gear Case Cover	6	43-108	
34	Dowel Bushing, Upper	1	AD0 116 000	
35	Dowel Bushing, Lower	1	AD0 116 100	
r	O-Ring, Pump Cover, Buna N	1	N70252	
36	O-Ring, Pump Cover, EPDM	1	E70252	
. 30	O-Ring, Pump Cover, FKM	1	V70252	
r	O-Ring, Pump Cover, Silicone	1	S75251	
ł	014-U1 O-Ring, Rectangular Flange	1	N70241	
* 36B	024-U1 O-Ring, Rectangular Flange	1	N70241	14
ł	024-U1 O-Ring, Rectangular Flange	1	N70245	14
37	Stop Pin, Seal	2	015 126 000	
39	Lockwasher, Gear	2	STD 136 005	
41	Locknut, Gear	2	STD 236 005	
	Gear Case Shim, Cl	1	020 110 000	
42	Gear Case Shim, SS; Optional	1	102284	
	Pump Pedestal, 6.75"; Optional	1	014 110 675	
43	Plastic Cap Plug	8	000 121 003	
44	5/16-18 x 1" SHCS, Standard	4	30-343	
44	5/16-18 x 1" SHCS, SS	4	30-525	
45	006-014-015-U1 Body Retaining Screw, Opt.	2	30-523	15
45	018-024-U1 Body Retaining Screw, Optional	2	30-211	15
47	Key, Coupling - 3/16 x 3/16 x 1-1/8"	1	000 037 001	
48	Cleanout Plug	2	35824	
61	Name Plate, Sanitary	1	001 061 002	
62	#2 x .125" RHDS	4	30-355	
63	O-Ring Removal Tool	1	AD0 096 001	
64	Rotor Nut Wrench, SS	1	109895	
04	Rotor Nut Wrench, Jacketed Cover	1	AD0 019 001	
65	Caution Plate	2	33-62	
66	Warning Label	2	33-63	
67	006, 015, 018 - U1 Grease Fitting, 1/8"	4	BD0 092 000	
6/	014-024-U1 Grease Fitting, 1/8"	4	BD0 092 100	
68	Plastic Cap, Grease Fitting	4	BD0 093 000	

- 3. Pumps shipped prior to July 30, 2001.
- 4. Pumps shipped starting July 30, 2001.
- 14. New O-Rings N70245 (024) introduced in 2001. Fits close to inlet opening.
- 15. New standard for Rectangular Flange Inlet pumps. Optional for standard inlet pumps. Body must be drilled at factory to use.
- * Recommended Spare Parts

006 - 014 - 015 - 018 - 024-UI Common Parts Diagram

006 - 014 -	- 015 - 018 -	024-UI Seal	Parts List
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	item No.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
		O-RING AND MECHANICAL SEAL PARTS			
*		O-Ring, Body, Buna N	2	AD0 079 000	6, 25
*	01	O-Ring, Body, EPDM	2	AD0 079 002	6, 25
*	01	O-Ring, Body, FKM	2	AD0 079 V00	6
*		O-Ring, Body, Silicone	2	AD0 079 SC0	6
*		O-Ring, Shaft, Buna N	2	N70022	25
*	റ	O-Ring, Shaft, EPDM	2	E70022	25
*	02	O-Ring, Shaft, FKM	2	V70022	25
*		O-Ring, Shaft, Silicone	2	S75022	25
*		Sleeve, SS	2	015 098 000	
*	83	Sleeve, Zirconia	2	015 098 004	
*		Sleeve, Chrome Oxide	2	015 098 002	
	84	O-Ring Seal Carrier	2	015 034 000	7
*	85	O-Ring, Outer, Buna N - Seal Carrier	2	N50228	7, 8
*		Seal Seat, Ceramic	2	015 014 002	
*	86	Seal Seat, Chrome Oxide	2	015 014 001	
*		Seal Seat, Silicon Carbide	2	015 014 009	
*		Seal Inner, Carbon (2 piece)	2	015 306 001	
*		Seal Inner, Carbon (1 piece)	2	015 306 007	
*	87	Seal Inner, Ceramic	2	40635	
*		Seal Inner, Chrome Oxide	2	015 306 002	
*		Seal Inner, Silicon Carbide	2	015 306 009	
ſ	88	Wave Spring	2	015 304 000	
*	89	Outer Seal, Carbon (1 piece)	2	015 206 007	8

NOTES:

6. (4) needed per pump with double O-ring Seal.

7. Used with double O-Ring Seal.

8. Used with double Mechanical Seal.

25. Sold in Packages of 25 only.

* Recommended Spare Parts

006 - 014 - 015 - 018 - 024-UI Vented Cover Parts List

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
	MANUAL VENTED COVER			
101	Vented Cover	1	AD0 002 VS0	
102	Adjusting Screw	1	AD0 072 000	
103	Spring Plunger	1	AD0 073 000	
104	Locknut	1	AD0 074 000	
105	Spring, Medium (less than 150 PSI)	1	AD0 076 000	
105	Spring, High (more than 150 PSI)	1	ABB 076 100	
106	Diaphragm Bushing	1	AD0 077 000	
107	Cover Nut	1	AD0 075 000	
108	Rubber Diaphragm, Buna N	1	AD0 078 000	
	PNEUMATIC VENTED COVER			
101	Vented Cover	1	AD0 002 VS0	
108	Rubber Diaphragm, Buna N	1	AD0 078 000	
110	Diaphragm Bushing	1	AD0 077 P00	
111	Cover Nut	1	AD0 075 P00	
	PISTON VENTED COVER			
101	Vented Cover	1	AD0 002 VS0	
112	Piston	1	AD0 073 P10	
113	O-Ring, Bushing Seal, Buna N	1	N70223	
114	Diaphragm Bushing	1	AD0 077 P10	
115	O-Ring, Nut Seal, Buna N	1	N70224	
116	Cover Nut	1	AD0 075 P10	
117	Piston Seal, Quad Ring	1	AD0 133 000	9
· · · · ·	Piston Seal, O-Ring	1	N70218	9

NOTES:

9. Quad Ring and O-ring can be interchanged.

* Recommended Spare Parts

006 - 014 - 015 - 018 - 024-UI Vented Cover Diagrams

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
	030-U1 Pump Body	1	See Note 1	1
	030-U1 Pump Body with Flush	1	See Note 1	1
1	034-U1 Rectangular Flange Inlet Body	1	See Note 1	1
	034-U1 Rect. Flange Inlet Body with Flush	1	See Note 1	1
	033-U1 Pump Aseptic Body	1	033 001 020	
	030-034-U1 Drive Shaft, Std.	1	030 008 000	3
	030-034-U1 Drive Shaft, Optional 17-4PH	1	35341	3
7	030-034-U1 Drive Shaft, Std.	1	114646	4
'	030-034-U1 Drive Shaft, Optional 17-4PH	1	114779	4
	033-U1 Drive Shaft, Std.	1	033 008 000	3
	033-U1 Drive Shaft, Std.	1	114648	4
	030-034-U1 Short Shaft, Std.	1	030 009 000	3
	030-034-U1 Short Shaft, Optional 17-4PH	1	35342	3
8	030-034-U1 Short Shaft, Std.	1	114647	4
Ŭ	030-034-U1 Short Shaft, Optional 17-4PH	1	114780	4
	033-U1 Short Shaft, Std.	1	033 009 000	3
	033-U1 Short Shaft, Std.	1	114649	4
	030-034-U1 Rotor, Twin Wing, Alloy 88	2	030 010 000	2
	030-034-U1 Rotor, Twin Wing, 316SS	2	030 010 200	2
9	030-U1 Rotor, Single Wing, Alloy 88	2	117291	2, 12, 13
	033-U1 Rotor, Twin Wing, Alloy 88	2	33A 010 000	2
	033-U1 Rotor, Single Wing, Alloy 88	2	117326	2, 12A
10A	030-033-U1 Stud	8	108842	
10B	030-033-U1 Stud, Jacketed Cover	8	108845	
10C	034-U1 Stud	6	108842	
	034-U1 Stud	2	35555	
10D	034-U1 Stud, Jacketed Cover	6	108845	
108	034-U1 Stud, Jacketed Cover	2	35549	
	Stud Retainer Assembly	1	040 064 000	5

030 - 034 - 033-UI Pump Parts List

- 1. Contact Factory with Serial Number of pump for Part Number.
- 2. Standard clearances and finishes for Rotor Part Numbers shown. Contact Factory for optional clearances and finishes.
- 3. Pumps shipped prior to July 30, 2001.
- 4. Pumps shipped starting July 30, 2001.
- 5. No longer manufactured, consult factory for upgrade of gear case subassembly.
- 12. Replaces 030 010 010 straight and 030 010 090 90° (degree) rotors.
- 12A. Replaces 33A 010 010 straight and 33A 010 090 90° (degree) rotors.
- 13. Single wing rotors can not be used in Rectangular Flange Inlet pumps.

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
	030-034-U1 Pump Cover	1	BD0 002 S00	
	030-034-U1 Jacketed Cover	1	BD0 002 J10	
	033-U1 Pump Cover	1	33A 002 020	
•	Pump Cover Vented - Complete Assembly	/		
2	030-034-U1 Manual (over 150 PSI)	1	CVR00007	
	030-034-U1 Manual (under 150 PSI)	1	CVR00014	
	030-034-U1 Pneumatic	1	CVR00010	
	030-034-U1 Piston	1	CVR00022	
	Gear Case, Cl	1	040 005 000	3, 5
2	Gear Case, SS; Optional	1	101832	3, 5
3	Gear Case, Cl	1	102277	4
	Gear Case, SS; Optional	1	101833	4
л	Gear Case Cover, Steel	1	040 106 000	
4	Gear Case Cover, SS; Optional	1	102281	
5	Gear, Drive Shaft, Spur	1	107999	
6	Gear, Short Shaft, Spur	1	107999	
11	Wing Nut	8	105851	
	Hex Nut, optional	8	108370	
12	Oil Seal, Gear Case Cover	1	000 030 013	
13	Oil Seal, Gear Case Rear	2	000 030 014	
	Grease Seal, Bearing Retainer	2	000 030 015	3
1/	Grease Seal, Bearing Retainer	2	101717	4
14	Bearing Isolator, includes Bearing Retainer	2	X06558-1	3
	Bearing Isolator, includes Bearing Retainer	2	X06639-1	4
15	Bearing, Rear	2	030 035 000	
16	Bearing, Front	2	030 036 000	3
10	Bearing, Front	2	101715	4
17	Key, Gear	2	BD0 037 000	
19	Drive Pin, Seal Seat and Sleeve	2	CD0 126 000	
20	Dowel Pin, Upper Cover Side	1	BD0 040 000	
21	Dowel Pin, Upper Gear Case Side	1	BD0 040 200	
22	Dowel Pin, Lower Cover Side	1	BD0 040 100	
23	Dowel Pin, Lower Gear Case Side	1	BD0 040 300	
24	Hex Capscrew; Fill, Drain, Level	6	000 046 003	
25	Silicone Sealant	1	000 142 301	
26	Jam Nut, Rotor	4	BD0 052 001	
27	Shim Kit	2	117890	
29	Spacer, Gear to Rear Bearing	2	030 055 000	
30	Bearing Spacer	2	030 055 001	3
	Bearing Spacer	2	101815	4
32	Bearing Retainer, Front	2	030 080 000	3
32	Bearing Retainer, Front	2	101811	4

030 - 034 - 033-UI Common Parts List

- 3. Pumps shipped prior to July 30, 2001.
- 4. Pumps shipped starting July 30, 2001.
- 5. No longer manufactured, consult Factory for upgrade of gear case assembly.

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
334	5/16-18 x .75" HHCS, Std gear case	6	30-283	
- J JA	1/2-20 x .50" HHCS, SS Gear case	6	30-526	
33B	5/16-18 x .75" SHCS, Brg Ret. Std gear case	8	30-296	
000	5/16-18 x .75" SHCS, Brg Ret., SS Gear case	8	30-29	
33C	5/16" Flat Washer, Std gear case	6	43-194	
34	Dowel Bushing, Upper	1	BD0 116 000	
35	Dowel Bushing, Lower	1	BD0 116 100	
	030-034-U1 O-Ring, Pump Cover, Buna N	1	N70261	
	030-034-U1 O-Ring, Pump Cover, EPDM	1	E70261	
	030-034-U1 O-Ring, Pump Cover, FKM	1	V70261	
36	030-034-U1 O-Ring, Pump Cover, Silicone	1	S75261	
	033-U1 O-Ring, Pump Cover, Outer, EPDM	1	033 117 012	11
	033-U1 O-Ring, Pump Cover, Outer, FKM	1	033 117 014	11
	033-U1 O-Ring, Pump Cover, Outer, Silicone	1	033 117 013	11
	033-U1 O-Ring, Pump Cover, Inner, EPDM	1	033 117 002	11
36A	033-U1 O-Ring, Pump Cover, Inner, FKM	1	033 117 004	11
	033-U1 O-Ring, Pump Cover, Inner, Silicone	1	033 117 003	11
26 D	034-U1 O-Ring, Rectangular Flange	1	N70260	14
300	034-U1 O-Ring, Rectangular Flange	1	N70357	14
37	Stop Pin, Seal	2	030 126 000	
39	Lockwasher, Gear	2	CD0 036 W00	
41	Locknut, Gear	2	CD0 036 N00	
	Gear Case Shim, Cl	1	040 110 000	
42	Gear Case Shim, SS	1	102285	
	Pump Pedestal, 6.25"	1	BD0 110 SM0	
43	Plastic Cap Plug	8	000 121 002	
44	3/8-16 x 1" SHCS, Std gear case	4	30-344	
44	3/8-16 x 1" SHCS, SS gear case	4	30-189	
45	Body Retaining Screw, Optional	2	30-211	15
47	Key, Coupling - 1/4 x 1/4 x 1"	1	000 037 002	
48	Cleanout Plug	2	41013	
57	033-U1 O-Ring, Port, Inner	2	S75223	11
58	033-U1 O-Ring, Port, Outer	2	V70232	11
59	033-U1 2-1/2" 131 "I" Line Clamp	2	0344223	11
60	033-U1 Aseptic Ferrule , 2-1/2"	2	BD0 267 230	11

030 - 034 - 033-UI Common Parts List

- 11. Used on 033-U1 only.
- 14. New O-Ring N70357 introduced in 2001. Fits close to inlet opening.
- 15. New standard for Rectangular Flange Inlet pumps. Optional for standard inlet pumps. Body must be drilled at Factory to use.
- * Recommended Spare Parts

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
61	Name Plate, Sanitary	1	001 061 002	
62	#2 x .125" RHDS	4	30-355	
63	O-ring Removal Tool	1	AD0 096 001	
64	Rotor Nut Wrench, SS	1	109896	
04	030-034-U1 Wrench, Jacketed Cover	1	CD0 019 001	
65	Caution Plate	2	33-62	
66	Warning Label	2	33-63	
67	030-033-U1 Grease Fitting, 1/8"	4	BD0 092 000	
07	034-U1 Grease Fitting, 1/8"	4	BD0 092 100	
68	Plastic Cap, Grease Fitting	4	BD0 093 000	

030 - 034 - 033-UI Common Parts List

ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
	O-RING AND MECHANICAL SEAL PAR	TS		
*	O-Ring, Body, Buna N	2	N70327	6, 25
* 01	O-Ring, Body, EPDM	2	E70327	6, 25
* 01	O-Ring, Body, FKM	2	V70327	6
k	O-Ring, Body, Silicone	2	S75327	6
*	O-Ring, Shaft, Buna N	2	N70028	16, 25
* 00	O-Ring, Shaft, EPDM	2	E70028	16, 25
* 02	O-Ring, Shaft, FKM	2	V70028	16
*	O-Ring, Shaft, Silicone	2	S75028	16, 25
k	Sleeve, SS	2	030 098 000	
* 83	Sleeve, Zirconia	2	030 098 004	
k	Sleeve, Chrome Oxide	2	030 098 002	
84	O-Ring Seal Carrier	2	030 034 000	7
k	O-Ring, Outer, Buna N - Seal Carrier	2	N50335	7, 8
* 95	O-Ring, Outer, EPDM - Seal Carrier	2	E50335	7, 8
* 05	O-Ring, Outer, FKM - Seal Carrier	2	V50335	7, 8
k	O-Ring, Outer, Silicone - Seal Carrier	2	S50335	7, 8
*	030-034-U1 Seal Seat, Ceramic	2	030 014 002	
k	030-034-U1 Seal Seat, Chrome Oxide	2	030 014 001	
* 96	030-034-U1 Seal Seat, Silicon Carbide	2	030 014 009	
* 00	033-U1 Seal Seat, Ceramic	2	033 014 002	11
k	033-U1 Seal Seat, Chrome Oxide	2	033 014 001	11
*	033-U1 Seal Seat, Silicon Carbide	2	033 014 009	11
k	Seal Inner, Carbon (2 piece)	2	030 306 001	
*	Seal Inner, Carbon (1 piece)	2	030 306 007	
* 87	Seal Inner, Ceramic	2	40821	
*	Seal Inner, Chrome Oxide	2	030 306 002	
*	Seal Inner, Silicon Carbide	2	030 306 009	
88	Wave Spring	2	030 304 000	
* 80	Outer Seal, Carbon (1 piece)	2	030 206 007	8
89	Outer Seal, Chrome Oxide	2	030 206 002	8

030 - 034 - 033-UI Seal Parts List

- 6. (4) needed per pump with Double O-ring Seal.
- 7. Used with Double O-Ring Seal.
- 8. Used with Double Mechanical Seal.
- 11. Used on 033-U1 only.
- 16. (4) needed per pump on 033-U1.
- 25. Sold in packages of 25 only.
- * Recommended Spare Parts


033-U1 Aseptic Seal

PD100-304

88

89

82

ITEM NO.	DESCRIPTION	QTY. Per Pump	PART NO.	NOTES
	MANUAL VENTED COVER			
101	Vented Cover	1	BD0 002 VS0	
102	Adjusting Screw	1	AD0 072 000	
103	Spring Plunger	1	AD0 073 000	
104	Locknut	1	AD0 074 000	
105	Spring, Medium (less than 150 PSI)	1	AD0 076 000	
105	Spring, High (more than 150 PSI)	1	ABB 076 100	
106	Diaphragm Bushing	1	AD0 077 000	
107	Cover Nut	1	AD0 075 000	
108	Rubber Diaphragm, Buna N	1	AD0 078 000	
	PNEUMATIC VENTED COVER			
101	Vented Cover	1	BD0 002 VS0	
108	Diaphragm, Buna N	1	AD0 078 000	
110	Diaphragm Bushing	1	AD0 077 P00	
111	Cover Nut	1	AD0 075 P00	
	PISTON VENTED COVER			
101	Vented Cover	1	BD0 002 VS0	
112	Piston	1	AD0 073 P10	
113	O-Ring, Bushing Seal, Buna N	1	N70223	
114	Diaphragm Bushing	1	AD0 077 P10	
115	O-Ring, Nut Seal, Buna N	1	N70224	
116	Cover Nut	1	AD0 075 P10	
117	Piston Seal, Quad Ring	1	AD0 133 000	9
, 117	Piston Seal, O-Ring	1	N70218	9

030 - 034-UI Vented Cover Parts List

NOTES:

9. Quad Ring and O-Ring can be interchanged.

* Recommended Spare Parts



040-UI Pump Parts List

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
1	040-U1 Pump Body	1	See Note 1	1
	040-U1 Pump Body with Flush	1	See Note 1	1
7	040-U1 Drive Shaft, Std.	1	118718	
'	040-U1 Drive Shaft, Optional 17-4PH	1	118812	
Q	040-U1 Short Shaft, Std.	1	118719	
0	040-U1 Short Shaft, Optional 17-4PH	1	118813	
٥	040-U1 Rotor, Twin Wing, Alloy 88	2	118728	2
9	040-U1 Rotor, Twin Wing, 316SS	2	118753	2
10	040-U1 Stud	8	118897	
10	040-U1 Stud, Jacketed Cover	8	118898	

NOTES:

1. Contact Factory with Serial Number of pump for Part Number.

2. Standard clearances and finishes for Rotor Part Numbers shown. Contact Factory for optional clearances and finishes.



040-UI Common Parts Diagram

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
	040-U1 Pump Cover	1	BD0 002 S00	
	040-U1 Jacketed Cover	1	BD0 002 J10	
	Pump Cover Vented - Complete Assembly	1		
2	040-U1 Manual (over 150 PSI)	1	CVR00007	
	040-U1 Manual	1	CVR00014	
	040-U1 Pneumatic	1	CVR00010	
	040-U1 Piston	1	CVR00022	
2	Gear Case, Cl	1	102277	
5	Gear Case, SS; Optional	1	101833	
1	Gear Case Cover, Steel	1	040 106 000	
7	Gear Case Cover, SS; Optional	1	102281	
5	Gear, Drive Shaft, Spur	1	107999	
6	Gear, Short Shaft, Spur	1	107999	
11	Wing Nut	8	105851	
	Hex Nut, optional	8	108370	
12	Oil Seal, Gear Case Cover	1	000 030 013	
13	Oil Seal, Gear Case Rear	2	000 030 014	
14	Grease Seal, Bearing Retainer	2	101717	
14	Bearing Isolator, includes Bearing Retainer	2	X06639-1	
15	Bearing, Rear	2	030 035 000	
16	Bearing, Front	2	101715	
17	Key, Gear	2	BD0 037 000	
19	Drive Pin, Seal Seat and Sleeve	2	CD0 126 000	
20	Dowel Pin, Upper Cover Side	1	BD0 040 000	
21	Dowel Pin, Upper Gear Case Side	1	BD0 040 200	
22	Dowel Pin, Lower Cover Side	1	BD0 040 100	
23	Dowel Pin, Lower Gear Case Side	1	BD0 040 300	
24	Hex Capscrew; Fill, Drain, Level	6	000 046 003	
25	Silicone Sealant	1	000 142 301	
26	Jam Nut, Rotor	4	BD0 052 001	
27	Shim Kit	2	117890	
29	Spacer, Gear to Rear Bearing	2	030 055 000	
30	Bearing Spacer	2	101815	
32	Bearing Retainer, Front	2	101811	

040-UI Common Parts List

040-UI Common Parts Diagram



ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
22 4	5/16-18 x .75" HHCS, Std gear case	6	30-283	
33A	1/2-20 x .50" HHCS, SS Gear case	6	30-526	
220	5/16-18 x .75" SHCS, Brg Ret. Std gear case	8	30-296	
330	5/16-18 x .75" SHCS, Brg Ret., SS Gear case	8	30-29	
33C	5/16 Flat Washer, Std gear case	6	43-194	
34	Dowel Bushing, Upper	1	BD0 116 000	
35	Dowel Bushing, Lower	1	BD0 116 100	
*	040-U1 O-Ring, Pump Cover, Buna N	1	N70261	
* 26	040-U1 O-Ring, Pump Cover, EPDM	1	E70261	
* 30	040-U1 O-Ring, Pump Cover, FKM	1	V70261	
*	040-U1 O-Ring, Pump Cover, Silicone	1	S75261	
37	Stop Pin, Seal	2	030 126 000	
39	Lockwasher, Gear	2	CD0 036 W00	
41	Locknut, Gear	2	CD0 036 N00	
	Gear Case Shim, Cl	1	040 110 000	
42	Gear Case Shim, SS	1	102285	
	Pump Pedestal, 6.25"	1	BD0 110 SM0	
43	Plastic Cap Plug	8	000 121 002	
14	3/8-16 x 1" SHCS, Std gear case	4	30-344	
44	3/8-16 x 1" SHCS, SS gear case	4	30-189	
47	Key, Coupling - 1/4 x 1/4 x 1"	1	000 037 002	
48	Cleanout Plug	2	41013	

040-UI Common Parts List

NOTES:

* Recommended Spare Parts

040-UI Common Parts Diagram





040-UI Common Parts List

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
61	Name Plate, Sanitary	1	001 061 002	
62	#2 x .125" RHDS	4	30-355	
63	O-ring Removal Tool	1	AD0 096 001	
64	Rotor Nut Wrench, SS	1	109896	
04	040-U1 Wrench, Jacketed Cover	1	CD0 019 001	
65	Caution Plate	2	33-62	
66	Warning Label	2	33-63	
67	Grease Fitting, 1/8"	4	BD0 092 000	
68	Plastic Cap, Grease Fitting	4	BD0 093 000	

040-UI Common Parts Diagram



ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
	O-RING AND MECHANICAL SEAL PARTS			
k	O-Ring, Body, Buna N	2	N70327	6, 25
• 01	O-Ring, Body, EPDM	2	E70327	6, 25
, 01	O-Ring, Body, FKM	2	V70327	6
ł	O-Ring, Body, Silicone	2	S75327	6
ł	O-Ring, Shaft, Buna N	2	N70028	16, 25
. 00	O-Ring, Shaft, EPDM	2	E70028	16, 25
, 02	O-Ring, Shaft, FKM	2	V70028	16
ł	O-Ring, Shaft, Silicone	2	S75028	16, 25
ł	Sleeve, SS	2	030 098 000	
83	Sleeve, Zirconia	2	030 098 004	
ł	Sleeve, Chrome Oxide	2	030 098 002	
84	O-Ring Seal Carrier	2	030 034 000	7
ł	O-Ring, Outer, Buna N - Seal Carrier	2	N50335	7, 8
95	O-Ring, Outer, EPDM - Seal Carrier	2	E50335	7, 8
, 00	O-Ring, Outer, FKM - Seal Carrier	2	V50335	7, 8
ł	O-Ring, Outer, Silicone - Seal Carrier	2	S50335	7, 8
ł	040-U1 Seal Seat, Ceramic	2	030 014 002	
* 86	040-U1 Seal Seat, Chrome Oxide	2	030 014 001	
ł	040-U1 Seal Seat, Silicon Carbide	2	030 014 009	
ł	Seal Inner, Carbon (2 piece)	2	030 306 001	
ł	Seal Inner, Carbon (1 piece)	2	030 306 007	
* 87	Seal Inner, Ceramic	2	40821	
ł	Seal Inner, Chrome Oxide	2	030 306 002	
*	Seal Inner, Silicon Carbide	2	030 306 009	
88	Wave Spring	2	030 304 000	
80	Outer Seal, Carbon (1 piece)	2	030 206 007	8
89	Outer Seal, Chrome Oxide	2	030 206 002	8

040-UI Seal Parts List

- 6. (4) needed per pump with Double O-ring Seal.
- 7. Used with Double O-Ring Seal.
- 8. Used with Double Mechanical Seal.
- 16. (4) needed per pump on 033-U1.
- 25. Sold in packages of 25 only.
- * Recommended Spare Parts

040-UI Seal Parts Diagram





January 2006 95-03002

040-UI Vented Cover Parts List

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
	MANUAL VENTED COVER			
101	Vented Cover	1	BD0 002 VS0	
102	Adjusting Screw	1	AD0 072 000	
103	Spring Plunger	1	AD0 073 000	
104	Locknut	1	AD0 074 000	
105	Spring, Medium (less than 150 PSI)	1	AD0 076 000	
105	Spring, High (more than 150 PSI)	1	ABB 076 100	
106	Diaphragm Bushing	1	AD0 077 000	
107	Cover Nut	1	AD0 075 000	
* 108	Rubber Diaphragm, Buna N	1	AD0 078 000	
	PNEUMATIC VENTED COVER			
101	Vented Cover	1	BD0 002 VS0	
108	Diaphragm, Buna N	1	AD0 078 000	
110	Diaphragm Bushing	1	AD0 077 P00	
111	Cover Nut	1	AD0 075 P00	
	PISTON VENTED COVER			
101	Vented Cover	1	BD0 002 VS0	
112	Piston	1	AD0 073 P10	
113	O-Ring, Bushing Seal, Buna N	1	N70223	
114	Diaphragm Bushing	1	AD0 077 P10	
115	O-Ring, Nut Seal, Buna N	1	N70224	
116	Cover Nut	1	AD0 075 P10	
117	Piston Seal, Quad Ring	1	AD0 133 000	9
* 117	Piston Seal, O-Ring	1	N70218	9

NOTES:

9. Quad Ring and O-Ring can be interchanged. * Recommended Spare Parts



ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
	060-U1 Pump Body	1	See Note 1	1
	060-U1 Pump Body with Flush	1	See Note 1	1
	064-U1 Rectangular Flange Inlet Body	1	See Note 1	1
	064-U1 Rect. Flange Inlet Body with Flush	1	See Note 1	1
1	130-U1 Pump Body	1	See Note 1	1
	130-U1 Pump Body with Flush	1	See Note 1	1
	134-U1 Rectangular Flange Inlet Body	1	See Note 1	1
	134-U1 Rect. Flange Inlet Body with Flush	1	See Note 1	1
	133-U1 Pump Body with Flush	1	133 001 020	
	060-064-U1 Drive Shaft	1	060 008 001	
	060-064-U1 Drive Shaft, Optional 17-4PH	1	35145	
7	130-134-U1 Drive Shaft	1	130 008 001	
'	130-134-U1 Drive Shaft, Optional 17-4PH	1	35394	
	133-U1 Drive Shaft	1	133 008 001	
	133-U1 Drive Shaft, Optional 17-4PH	1	34470	
	060-064-U1 Short Shaft	1	060 009 001	
	060-064-U1 Short Shaft, Optional 17-4PH	1	35146	
Q	130-134-U1 Short Shaft	1	130 009 001	
0	130-134-U1 Short Shaft, Optional 17-4PH	1	35392	
	133-U1 Short Shaft	1	133 009 001	
	133-U1 Short Shaft, Optional 17-4PH	1	34471	
	060-064-U1 Rotor, Twin Wing, Alloy 88	2	060 010 000	2
	060-064-U1 Rotor, Twin Wing, 316SS	2	060 010 200	2
	060-U1 Rotor, Single Wing, Alloy 88	2	117343	2, 12, 13
٥	130-134-U1 Rotor, Twin Wing, Alloy 88	2	130 010 000	2
5	130-134-U1 Rotor, Twin Wing, 316SS	2	130 010 200	2
	130-U1 Rotor, Single Wing, Alloy 88	2	117360	2, 12A, 13
	133-U1 Rotor, Twin Wing, Alloy 88	2	133 010 020	2
	133-U1 Rotor, Single Wing, Alloy 88	2	117377	2, 12B
10A	060-U1 Stud	8	108843	
10B	060-U1 Stud, Jacketed Cover	8	108846	
10C	060-U1 Stud Retainer Assembly	1	070 064 000	5
10D	064-U1 Stud	6	108843	
100	064-U1 Stud	2	0C1 050 000	
10E	064-U1 Stud, Jacketed Cover	6	108846	
	064-U1 Stud, Jacketed Cover	2	35556	
10F	130-133-U1 Stud	8	130 011 000	
10G	130-U1 Stud, Jacketed Cover	8	130 011 001	
10H	130-133-U1 Stud Retainer Assembly	1	140 064 000	5
101	134-U1 Stud	6	130 011 000	
	134-U1 Stud	2	0C1 050 000	
10.1	134-U1 Stud, Jacketed Cover	6	130 011 001	
100	134-U1 Stud, Jacketed Cover	2	35556	

060 - 064 - 130 - 134 - 133-UI Pump Parts List

- 1. Contact Factory with Serial Number of pump for Part Number.
- 2. Standard clearances and finishes for Rotor Part Numbers shown. Contact Factory for optional clearances and finishes.
- 5. No longer manufactured, consult factory for upgrade of gear case subassembly.
- 12. Replaces 060 010 010 straight and 060 010 090 90° (degree) rotors.
- 12A. Replaces 130 010 010 straight and 130 010 090 90° (degree) rotors.
- 12B. Replaces 133 010 010 straight and 133 010 090 90° (degree) rotors.
 - 13. Single wing rotors can not be used in Rectangular Flange Inlet pumps.





060 - 064 -130 - 134 - 133-UI Common Parts List

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
	060-064-130-134-U1 Pump Cover	1	CD0 002 S00	
	060-064-130-134-U1 Jacketed Cover	1	CD0 002 J10	
	133-U1 Pump Cover	1	133 002 020	
2	Pump Cover Vented - Complete Assembly			
2	060-064-130-134-U1 Manual (over 150 PSI)	1	CVR00036	
	060-064-130-134-U1 Manual (under 150 PSI)	1	CVR00024	
	060-064-130-134-U1 Pneumatic	1	CVR00053	
	060-064-130-134-U1 Piston	1	CVR00054	
2	Gear Case, Cl	1	070 005 000	
3	Gear Case, SS; Optional	1	101834	
4	Gear Case Cover, Steel	1	070 106 000	
4	Gear Case Cover, SS; Optional	1	102282	
5	Gear, Drive Shaft, Spur	1	107404	
6	Gear, Short Shaft, Spur	1	107404	
	Wing Nut	8	105852	
	Hex Nut, Optional	8	108371	
12	Oil Seal, Gear Case Cover	1	000 030 012	
13	Oil Seal, Gear Case Rear	2	000 030 011	
	Grease Seal, Bearing Retainer	2	000 030 009	
14	Bearing Isolator Kit, Incl. STD Bearing Retainer	2	X06614-1	
	Bearing Isolator Kit, Incl. SS Bearing Retainer	2	X06614-2	
15	Bearing, Rear	2	107186	
16	Bearing, Front	2	060 036 000	
17	Key, Gear	2	060 037 000	
19	Drive Pin, Seal Seat and Sleeve	2	CD0 126 000	
20	Dowel Pin, Upper Cover Side	1	CD0 040 000	
21	Dowel Pin, Upper Gear Case Side	1	CD0 040 R00	
22	Dowel Pin, Lower Cover Side	1	CD0 040 100	
23	Dowel Pin, Lower Gear Case Side	1	CD0 040 R10	
	Plug w/ washer, 3/4-16	6	000 046 004	40
24	Oil Plug, M20 x 1.5"	5	115798	41
	Oil Level Indicator, M20 x 1.5	1	115799	41
25	Silicone Sealant	1	000 142 301	
26	Jam Nut, Rotor	4	060 052 001	
27	Shim Kit	2	117891	
29	Spacer, Gear to Rear Bearing	2	107187	
30	Bearing Spacer	2	060 055 003	
31	Grease Retainer, Rear Bearing	2	STD 091 002	
20	Bearing Retainer, Front	2	060 080 000	
32	Bearing Retainer, SS	2	101812	
22.4	3/8-16 x .75" HHCS, STD Gear Case Cover	6	30-314	
33A	3/8-16 x .75" HHCS, SS Gear Case	6	30-50	
005	3/8-16 x 1.25" HHCS, Brg. Ret., Std. Gear Case	8	30-351	
33B	3/8-16 x 1.25" HHCS, Brg. Ret. SS Gear Case	8	30-60	
33C	3/8" Flat Washer	6	43-189	

NOTES:

40. For pumps prior to 5/15/03

41. For pumps after 5/15/03



	item No.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
	34	Dowel Bushing, Upper	1	CD0 116 000	
	35	Dowel Bushing, Lower	1	CD0 116 100	
*		O-Ring, Pump Cover, Buna N	1	N70272	
*	36	O-Ring, Pump Cover, EPDM	1	E70272	
*	50	O-Ring, Pump Cover, FKM	1	V70272	
*		O-Ring, Pump Cover, Silicone	1	S75272	
*		133-U1 O-Ring, Pump Cover, Inner, EPDM	1	133 117 002	11
*	36A	133-U1 O-Ring, Pump Cover, Inner, FKM	1	133 117 004	11
*		133-U1 O-Ring, Pump Cover, Inner, Silicone	1	133 117 003	11
*		064-U1 O-Ring, Rectangular Flange, Buna N	1	35360	14
*	26B	064-U1 O-Ring, Rectangular Flange, Buna N	1	N70366	14
*	300	134-U1 O-Ring, Rectangular Flange, Buna N	1	N70272	14
*		134-U1 O-Ring, Rectangular Flange, Buna N	1	N70369	14
	37	Stop Pin, Seal	2	223 126 000	
	39	Lockwasher, Gear	2	STD 136 009	
	41	Locknut, Gear	2	STD 236 009	
		Gear Case Shim, Cl	1	070 110 000	
	42	Gear Case Shim, SS; Optional	1	102286	
		Pump Pedestal, 5.5", Optional	1	CD0 110 SM5	
		Pump Pedestal, 10", Optional	1	CD0 110 SM1	
	43	Plastic Cap Plug	8	000 121 001	
	44	5/16-18 x 1" SHCS	4	30-275	
	45	060-064-U1 Body Retaining Screw, Optional	2	30-319	15
	40	130-133-134-U1 Body Retaining Screw, Optional	2	30-423	15
	46	Eye Bolt	2	30-360	
	47	Key, Coupling - 3/8 x 3/8 x 1-5/8"	1	000 037 003	
	48	Cleanout Plug	2	41013	
*	57	133-U1 O-Ring, Port, Inner, Silicone	2	S75041	11
*	57	133-U1 O-Ring, Port, Inner, EPDM	2	E70041	11
*	50	133-U1 O-Ring, Port, Outer, Silicone	2	S75043	11
*	30	133-U1 O-Ring, Port, Outer, EPDM	2	E70043	11
*	59	133-U1 3" 13I "I" Line Clamp	2	0345223	11
*	60	133-U1 Aseptic Ferrule, 3"	2	133 267 000	11
	61	Name Plate, Sanitary	1	001 061 002	
	62	#2 x .125" RHDS	4	30-355	
ſ	63	O-Ring Removal Tool	1	AD0 096 001	
ſ	64	Rotor Nut Wrench, SS	1	109897	
	04	060-064-130-134-U1 Wrench, Jacketed Cover	1	060 019 001	
ſ	65	Caution Plate	2	33-62	
ſ	66	Warning Label	2	33-60	
ľ	67	060, 130, 133-U1 Grease Fitting, 1/8"	4	BD0 092 000	
ŀ		U64-134-U1 Grease Fitting, 1/8"	4	BD0 092 100	
l	68	Plastic Cap, Grease Hitting	4	BD0 093 000	

060 - 064 - 130 - 134 - 133-UI Common Parts List

- 11. Used on 133-U1 only.
- 14. New O-Rings N70366 (064) and N70369 (134) introduced in 2001. Fits close to inlet opening.
- 15. New standard for Rectangular Flange Inlet pumps. Optional for standard inlet pumps. Body must be drilled at Factory to use.
- * Recommended Spare Parts



060 - 064 - 130 - 134 - 133-UI Common Parts Diagram

	ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
		O-RING AND MECHANICAL SEAL PARTS			
*		O-Ring, Body, Buna N	2	N70331	6, 25
*	01	O-Ring, Body, EPDM	2	E70331	6
*	01	O-Ring, Body, FKM	2	V70331	6
*		O-Ring, Body, Silicone	2	S75331	6
*		O-Ring, Shaft, Buna N	2	N70131	16, 25
*	80	O-Ring, Shaft, EPDM	2	E70131	16, 25
*	02	O-Ring, Shaft, FKM	2	V70131	16
*		O-Ring, Shaft, Silicone	2	S75131	16
*		Sleeve, SS	2	060 098 000	
*	83	Sleeve, Zirconia	2	060 098 004	
*		Sleeve, Chrome Oxide	2	060 098 002	
	84	O-Ring Seal Carrier	2	060 034 000	7
*		O-Ring, Outer, Buna N - Seal Carrier	2	N50338	7, 8
*	85	O-Ring, Outer, EPDM - Seal Carrier	2	E50338	7, 8
*		O-Ring, Outer, FKM - Seal Carrier	2	V50338	7, 8
*		060-064-130-134-U1 Seal Seat, Ceramic	2	060 014 002	
*		060-064-130-134-U1 Seal Seat, Chrome Oxide	2	060 014 001	
*	86	060-064-130-134-U1 Seal Seat, Silicon Carbide	2	060 014 009	
*	00	133-U1 Seal Seat, Ceramic	2	133 014 002	11
*		133-U1 Seal Seat, Chrome Oxide	2	133 014 001	11
*		133-U1 Seal Seat, Silicon Carbide	2	133 014 009	11
*		Seal Inner, Carbon (2 Piece)	2	060 306 001	
*		Seal Inner, Carbon (1 Piece)	2	060 306 007	
*	87	Seal Inner, Ceramic	2	40642	
*		Seal Inner, Chrome Oxide	2	060 306 002	
*		Seal Inner, Silicon Carbide	2	060 306 009	
	88	Wave Spring	2	060 304 000	
*	80	Outer Seal, Carbon (1 Piece)	2	060 206 007	8
*	09	Outer Seal, Chrome Oxide	2	060 206 002	8

060 - 064 - 130 - 134 - 133-UI Seal Parts List

- 6. (4) needed per pump with double O-ring Seal.
- 7. Used with double O-Ring Seal.
- 8. Used with double Mechanical Seal.
- 11. Used on 133-U1 only.
- 16. (4) needed per pump on 133-U1.
- 25. Sold in packages of 25 only.
- * Recommended Spare Parts



O-Ring Seal

Mechanical Seal



ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
	MANUAL VENTED COVER			
101	Vented Cover	1	CD0 002 VS0	
102	Adjusting Screw	1	113657	
103	Spring Plunger	1	113397	
104	Locknut	1	GD0 074 000	
105	Spring, Medium (less than 150 PSI)	1	113523	
105	Spring, High (more than 150 PSI)	1	113400	
106	Diaphragm Bushing	1	CD0 077 000	
107	Cover Nut	1	113398	
108	Rubber Diaphragm, Buna N	1	CD0 078 000	
	PNEUMATIC VENTED COVER			
101	Vented Cover	1	CD0 002 VS0	
108	Diaphragm, Buna N	1	CD0 078 000	
110	Diaphragm Bushing	1	CD0 077 P00	
111	Cover Nut	1	CD0 075 P00	
	PISTON VENTED COVER			
101	Vented Cover	1	CD0 002 VS0	
112	Piston	1	CD0 073 P10	
113	O-Ring, Bushing Seal, Buna N	1	N70239	
114	Diaphragm Bushing	1	CD0 077 P10	
115	O-Ring, Nut Seal, Buna N	1	N70240	
116	Cover Nut	1	CD0 075 P10	
417	Piston Seal, Quad Ring	1	CD0 133 000	9
	Piston Seal, O-Ring	1	N70236	9

060 - 064 - 130 - 134-UI Vented Cover Parts List

NOTES:

9. Quad Ring and O-Ring can be interchanged.

* Recommended Spare Parts



ITEM NO.	DESCRIPTION	QTY. Per Pump	PART NO.	NOTES
	220-U1 Pump Body	1	See Note 1	1
	220-U1 Pump Body with Flush	1	See Note 1	1
1	224-U1 Rectangular Flange Inlet Body	1	See Note 1	1
	224-U1 Rect. Flange Inlet Body with Flush	1	See Note 1	1
	223-U1 Pump Body	1	223 001 020	
	220-224-U1 Drive Shaft, Std.	1	220 008 001	
7	220-224-U1 Drive Shaft, Optional 17-4PH	1	35349	
'	223-U1 Drive Shaft	1	223 008 001	
	223-U1 Drive Shaft, Optional 17-4PH	1	35726	
	220-224-U1 Short Shaft, Std.	1	220 009 001	
o	220-224-U1 Short Shaft, Optional 17-4PH	1	35350	
0	223-U1 Short Shaft	1	223 009 001	
	223-U1 Short Shaft, Optional 17-4PH	1	35727	
	220-224-U1 Rotor, Twin Wing, Alloy 88	2	220 010 000	2
٥	220-224-U1 Rotor, Twin Wing, 316SS	2	220 010 200	2
5	220-224-U1 Rotor, Single Wing, Alloy 88	2	117391	2, 12, 13
	223-U1 Rotor, Twin Wing, Alloy 88	2	223 010 020	2
10A	220-U1 Stud	8	108844	
10B	220-U1 Stud, Jacketed Cover	8	108847	
100	224-U1 Stud	6	108844	
100	224-U1 Stud	2	35550	
10D	224-U1 Stud, Jacketed Cover	6	108847	
	224-U1 Stud, Jacketed Cover	2	36144	
	Stud Retainer Assembly	1	230 064 000	5

220 - 224 - 223-UI Pump Parts List

- 1. Contact Factory with Serial Number of pump for Part Number.
- 2. Standard clearance and finish Par Number shown. Contact Factory for optional clearances and finishes.
- 5. No longer manufactured, consult factory for upgrade of gear case subassembly.
- 12. Replaces 220 010 010 straight and 220 010 090 90° (degree) rotors.
- 13. Single wing rotors can not be used in Rectangular Flange Inlet pumps.



220 - 224 - 223-UI Common Parts Diagram

ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
	220-224-U1 Pump Cover	1	GD0 002 S00	
	220-224-U1 Jacketed Cover	1	GD0 002 J10	
	223-U1 Pump Cover	1	223 002 020	
2	Pump Cover Vented - Complete Assembly			
	220-224-U1 Manual (over 150 PSI)	1	CVR00106	
	220-224-U1 Manual (under 150 PSI)	1	CVR00009	
	220-224-U1 Piston	1	CVR00008	
3	Gear Case, Cl	1	230 005 000	
5	Gear Case, SS; Optional	1	101836	
л	Gear Case Cover, Steel	1	230 106 000	
-	Gear Case Cover, SS; Optional	1	102283	
5	Gear, Drive Shaft, Spur	1	110932	
6	Gear, Short Shaft, Spur	1	110932	
11	Wing Nut	8	105853	
	Hex Nut, optional	8	108372	
12	Oil Seal, Gear Case Cover	1	STD 030 006	
13	Oil Seal, Gear Case Rear	2	STD 119 002	
	Grease Seal, Bearing Retainer	2	STD 030 002	
14	Bearing Isolator, includes STD. Bearing Retainer	2	X06634-1	
	Bearing Isolator, includes SS Bearing Retainer	2	X06634-2	
15	Bearing, Rear	2	200 035 000	
16	Bearing, Front	2	200 036 000	
17	Key, Gear	2	200 037 000	
19	Drive Pin, Seal Seat and Sleeve	2	CD0 126 000	
20	Dowel Pin, Upper Cover Side	1	GD0 040 000	
21	Dowel Pin, Upper Gear Case Side	1	CD0 040 R00	
22	Dowel Pin, Lower Cover Side	1	GD0 040 100	
23	Dowel Pin, Lower Gear Case Side	1	CD0 040 R10	
	Plug w/ washer, 3/4-16	6	000 046 004	40
24	Oil Plug, M20 x 1.5"	5	115798	41
	Oil Level Indicator, M20 x 1.5"	1	115799	41
25	Silicone Sealant	1	000 142 301	
26	Jam Nut, Rotor	4	GD0 052 001	
27	Shim Kit	2	117892	
29	Spacer, Gear to Rear Bearing	2	40878	
30	Bearing Spacer	2	40752	

220 - 224 - 223-UI Common Parts List

- 40. Pumps shipped prior to 5/15/03
- 41. Pumps shipped after 5/15/03



item No.	DESCRIPTION	qty. Per Pump	Part No.	NOTES
32	Bearing Retainer, Front; STD.	2	220 080 000	
	Bearing Retainer, Front; SS	2	101813	
334	3/8-16 x .75" HHCS, Std gear case	6	30-314	
	3/8-16 x .75" HHCS, SS Gear case	6	30-50	
33B	3/8-16 x 1.25" SHCS, Brg Ret. Std gear case	8	30-351	
	3/8-16 x 1.25" SHCS, Brg Ret., SS Gear case	8	30-60	
33C	3/8" Flat Washer, Std gear case	6	43-189	
34	Dowel Bushing, Upper	1	CD0 116 000	
35	Dowel Bushing, Lower	1	CD0 116 100	
*	O-Ring, Pump Cover, Buna N	1	GD0 117 000	
* 36	O-Ring, Pump Cover, EPDM	1	GD0 117 002	
* 00	O-Ring, Pump Cover, FKM	1	GD0 117 V00	
*	O-Ring, Pump Cover, Silicone	1	GD0 117 SC0	
*	223-U1 O-Ring, Pump Cover, Inner, EPDM	1	223 117 002	11
* 36A	223-U1 O-Ring, Pump Cover, Inner, FKM	1	V70278	11
*	223-U1 O-Ring, Pump Cover, Inner, Silicone	1	223 117 003	11
36B	224-U1 O-Ring, Rectangular Flange	1	GD0 117 000	12
	224-U1 O-Ring, Rectangular Flange	1	N70376	12
37	Stop Pin, Seal	2	223 126 000	
39	Lockwasher, Gear	2	STD 136 011	
41	Locknut, Gear	2	STD 236 011	
	Gear Case Shim, Cl	1	230 110 000	
12	Gear Case Shim, SS	1	102287	
	Pump Pedestal, 9"	1	GD0 110 SM9	
	Pump Pedestal, 13"	1	GD0 110 SM1	
43	Plastic Cap Plug	8	000 121 001	
44	1/2-13 x 2" SHCS, Std gear case	4	30-111	
	1/2-13 x 2" SHCS, SS gear case	4	30-44	
45	Body Retaining Screw, Optional	2	30-499	15
46	1/2-13 Eye Bolt	2	30-360	
47	Key, Coupling - 1/2 x 1/2 x 1"	1	000 037 004	
48	Cleanout Plug	2	41013	
* 57	223-U1 O-Ring, Port, Inner	2	E70154	11
* 58	223-U1 O-Ring, Port, Outer	2	E70158	11
* 59	223-U1 4" 13MHHMV "S" Clamp	2	119-87	
* 60	223-U1 Aseptic Ferrule, 4"	2	GGA 267 000	

220 - 224 - 223-UI Common Parts List

- 11. Used on 223-U1 only.
- 12. New O-Ring N70376 introduced in 2001. Fits close to inlet opening.
- 15. New standard for Rectangular Flange inlet pumps. Optional for standard inlet pumps. Body must be drilled at Factory.
- * Recommended Spare Parts



220 - 224 - 223-UI Common Parts Diagram

ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
61	Name Plate, Sanitary	1	001 061 002	
62	#2 x .125" RHDS	4	30-355	
63	O-ring Removal Tool	1	AD0 096 001	
64	Rotor Nut Wrench, SS	1	109898	
	220-224-U1 Wrench, Jacketed Cover	1	AD0 019 001	
65	Caution Plate	2	33-62	
66	Warning Label	2	33-60	
67	220-223-U1 Grease Fitting, 1/8"	4	BD0 092 000	
	224-U1 Grease Fitting, 1/8"	4	BD0 092 100	
68	Plastic Cap, Grease Fitting	4	BD0 093 000	

220 - 224 - 223-UI Common Parts List



ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES	
O-RING AND MECHANICAL SEAL PARTS					
ł	O-Ring, Body, Buna N	2	N70338	6, 25	
81	O-Ring, Body, EPDM	2	E70338	6	
	O-Ring, Body, FKM	2	V70338	6	
ł	O-Ring, Body, Silicone	2	S75338	6	
ł	O-Ring, Shaft, Buna N	2	N70144	16, 25	
• •	O-Ring, Shaft, EPDM	2	E70144	16	
, 02	O-Ring, Shaft, FKM	2	V70144	16	
t	O-Ring, Shaft, Silicone	2	S75144	16	
ł	Sleeve, SS	2	220 098 000		
83	Sleeve, Zirconia	2	220 098 004		
ł	Sleeve, Chrome Oxide	2	220 098 002		
84	O-Ring Seal Carrier	2	220 034 000	7	
ł	O-Ring, Outer, Buna N - Seal Carrier	2	N50344	7, 8	
85	O-Ring, Outer, EPDM - Seal Carrier	2	E50344	7, 8	
. 00	O-Ring, Outer, FKM - Seal Carrier	2	V50344	7, 8	
*	O-Ring, Outer, Silicone - Seal Carrier	2	S50344	7, 8	
k	220-224-U1 Seal Seat, Ceramic	2	220 014 002		
ł	220-224-U1 Seal Seat, Chrome Oxide	2	220 014 001		
- 28	220-224-U1 Seal Seat, Silicon Carbide	2	220 014 009		
. 00	223-U1 Seal Seat, Ceramic	2	223 014 002	11	
ł	223-U1 Seal Seat, Chrome Oxide	2	223 014 001	11	
k	223-U1 Seal Seat, Silicon Carbide	2	223 014 009	11	
k	Seal Inner, Carbon (2 piece)	2	220 306 001		
ł	Seal Inner, Carbon (1 piece)	2	220 306 007		
* 87	Seal Inner, Ceramic	2	40830		
ł	Seal Inner, Chrome Oxide	2	220 306 002		
*	Seal Inner, Silicon Carbide	2	220 306 009		
88	Wave Spring	2	220 304 000		
80	Outer Seal, Carbon (1 piece)	2	220 206 007	8	
, 09	Outer Seal, Chrome Oxide	2	220 206 002	8	

220 - 224 - 223-UI Seal Parts List

- 6. (4) needed per pump with double O-ring Seal.
- 7. Used with double O-Ring Seal.
- 8. Used with double Mechanical Seal.
- 11. Used on 223-U1 only.
- 16. (4) needed on pump on 223-U1.
- 25. Sold in packages of 25 only.
- * Recommended Spare Parts



O-Ring Seal

Mechanical Seal

223-U1 Aseptic Seal



ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES		
	MANUAL VENTED COVER					
101	Vented Cover	1	GD0 002 VS0			
102	Adjusting Screw	1	113657			
103	Spring Plunger	1	GD0 073 000			
104	Locknut	1	GD0 074 000			
105	Spring, Medium (less than 150 PSI)	1	113400			
105	Spring, High (more than 150 PSI)	1	113524			
106	Diaphragm Bushing	1	GD0 077 000			
107	Cover Nut	1	GD0 075 000			
108	Rubber Diaphragm, Buna N	1	GD0 078 000			
	PISTON VENTED COVER					
101	Vented Cover	1	GD0 002 VS0			
112	Piston	1	GD0 073 P10			
113	O-Ring, Bushing Seal, Buna N	1	N70261			
114	Diaphragm Bushing	1	GD0 077 P10			
115	O-Ring, Nut Seal, Buna N	1	N70261			
116	Cover Nut	1	GD0 075 P10			
117	Piston Seal, Quad Ring	1	GD0 133 000	9		
	Piston Seal, O-Ring	1	N70258	9		

220 - 224-UI Vented Cover Parts List

NOTES:

9. Quad Ring and O-Ring can be interchanged. * Recommended Spare Parts
(Not Used on 223-U1 Pump)



220 - 224-U1 Vented Cover Diagram (Not Used on 223-U1 Pump)

ITEM NO.	DESCRIPTION	QTY. PER PUMP	PART NO.	NOTES
	320-U1 Pump Body	1	See Note 1	1
1	324-U1 Rectangular Flange Inlet Body	1	See Note 1	1
	323-U1 Pump Body	1	323 001 020	
	Drive Shaft, Std.		OH1 008 002	3, 5
	Drive Shaft, Optional 17-4PH		33081	3, 5
7	Drive Shaft Kit, Std.	1	113611	5A
	Drive Shaft Kit, Optional 17-4PH	1	113613	5A
	Drive Shaft, Std.	1	113518	4
	Drive Shaft, Optional 17-4PH	1	113520	4
	Short Shaft, Std.		OH1 009 002	3, 5
	Short Shaft, Optional 17-4PH		33204	3, 5
Q	Short Shaft Kit, Std.	1	113612	5A
0	Short Shaft Kit, Optional 17-4PH	1	113614	5A
	Short Shaft, Std.	1	113519	4
	Short Shaft, Optional 17-4PH	1	113521	4
	320-324-U1 Rotor, Twin Wing, Alloy 88	2	320 010 000	2
9	320-324-U1 Rotor, Twin Wing, 316SS	2	320 010 200	2
	323-U1 Rotor, Twin Wing, Alloy 88	2	323 010 000	2
	320-323-U1 Stud, Cover, Long	4	111291	4
10				
10	324-U1 Stud, Long	4	111291	
	324-U1 Stud, Short	4	40699	
10A	Stud, Cover, Short	4	111292	

320 - 324 - 323-UI Pump Parts List

NOTES:

- 1. Contact Factory with Serial Number of pump for Part Number.
- 2. Standard clearance and finish Par Number shown. Contact Factory for optional clearances and finishes.
- 3. Pumps shipped prior to July 30, 2001
- 4. Pumps shipped starting July 30, 2001.
- 5. No longer manufactured, See shaft kits 113611 and 113613, 113612 and 113614.
- 5A. Kits replace obsolete shafts OH1 008 002, 33081, OH1 009 002, and 33204 used in obsolete gear case OH1 005 000, which was supplied for pumps shipped prior to July 30, 2001.

Kits 113611, 113612, 113613, and 113614 Include:

Item no.	Description	Item no.	Description
5,6	Gears P/N 102470	17	Key, Gear P/N OH1 037 000
7	Drive Shaft P/N 113518 or 113520	29	Spacer, Gear P/N 117691
8	Short Shaft P/N 113519 or 113521	30	Spacer Front Bearing P/N 102473
13	Oil Seal, Case Rear P/N STD 119 000	30A	Bearing Spacer P/N 102472
15	Bearing, Rear P/N OH1 036 000	31	Grease Retainer P/N STD 091 000
16	Bearing, Front P/N OH1 036 003	41	Locknut, Gear P/N 105697



320 - 324 - 323-UI Common Parts Diagram

ITEM NO.	DESCRIPTION	qty. Per Pump	PART NO.	NOTES
2	320-324-U1 Pump Cover	1	OH1 002 002	
2	323-U1 Pump Cover	1	323 002 020	
3	Gear Case, Cl	1	OH1 005 000	3, 5
5	Gear Case, Cl	1	40616	4
4	Gear Case Cover, Steel	1	40669	
5	Gear, Drive Shaft, Spur	1	102470	
6	Gear, Short Shaft, Spur	1	102470	
11	Wing Nut	8	110858	
• •	Hex Nut, optional	8	108373	
12	Oil Seal, Gear Case Cover	1	STD 030 004	
13	Oil Seal, Gear Case Rear	2	STD 119 000	3
15	Oil Seal, Gear Case Rear	2	102475	4
1/	Grease Seal, Bearing Retainer	2	STD 030 002	
14	Bearing Isolator, includes STD. Bearing Retainer	2	X06634-3	
15	Bearing, Rear	2	OH1 036 000	
16	Bearing, Front	2	OH1 036 003	
17	Key, Gear	2	OH1 037 000	
20	Dowel Pins	4	OH1 040 000	
	Plug w/ washer, 3/4-16	6	000 046 004	40
24	Oil Plug, M20 x 1.5"	5	115798	41
	Oil Level Indicator, M20 x 1.5"	1	115799	41
25	Silicone Sealant	1	000 142 301	
26	Jam Nut, Rotor	4	OH1 052 003	
27	Shim Kit	2	117893	
20	Spacer, Gear to Rear Bearing	2	117691	3
23	Spacer, Gear to Rear Bearing	2	102474	4
30	Bearing Spacer	2	102473	4
30A	Spacer Front Bearing	2	102472	4
31	Grease Retainer, Rear Bearing	2	STD 091 000	
32	Bearing Retainer, Front	2	OH1 080 000	
33A	3/8-16 x .75" HHCS, Gear Case cover	6	30-314	
33B	5/16-18 x 1" SHCS, Bearing Retainer	8	30-343	
33C	3/8" Washer, Plain	6	43-189	
34	Dowel Bushings	2	OH1 116 000	

320 - 324 - 323-UI Common Parts List

NOTES:

- 3. Pumps shipped prior to July 30, 2001
- 4. Pumps shipped starting July 30, 2001.
- 5. No longer manufactured, consult factory for upgrade of gear case subassembly.
- 40. Pumps shipped prior to 5/15/03
- 41. Pumps shipped after 5/15/03





ITEM NO.	DESCRIPTION	QTY. Per Pump	PART NO.	NOTES
*	O-Ring, Pump Cover, Buna N	1	N70280	
* 36	O-Ring, Pump Cover, EPDM	1	E70280	
* 30	O-Ring, Pump Cover, FKM	1	V70280	
*	O-Ring, Pump Cover, Silicone	1	323 117 013	
*	323-U1 O-Ring, Pump Cover, Inner, EPDM	1	323 117 002	11
* 36A	323-U1 O-Ring, Pump Cover, Inner, FKM	1	323 117 004	11
*	323-U1 O-Ring, Pump Cover, Inner, Silicone	1	323 117 003	11
36B	324-U1 O-Ring, Rectangular Flange	1	N70382	
41	Locknut, Gear	2	105697	
12	Gear Case Shim, Cl	1	40288	
42	Pump Pedestal, 22"	1	324 110 226	
43	Plastic Cap Plug	6	000 121 001	
44	1/2-13 x 1.75" SHCS	4	30-250	
44A	Lockwasher, 1/2"	4	43-177	
45	Body Retaining, 3/8-16 x 4" SHCS	2	30-323	
46	1/2-13 Eye Bolt	3	30-360	
47	Key, Coupling - 5/8 x 5/8 x 2"	1	000 037 005	
48	Cleanout Plug	2	41013	
50	Grease Retainer, Gear Case, Front Bearing	2	STD 030 003	3
52	Spacer, Rear Bearing	2	OH1 055 002	3
53	Locknut, Front Bearing	2	OH1 236 001	3
54	Lockwasher, Front Bearing	2	OH1 136 001	3
55	Spacer, Front Bearing	2	OH1 055 001	3
56	Guard, Seal	2	113505	
*	O-Ring, Port, Inner, Silicone	2	S75261	11
* 57	O-Ring, Port, Inner, EPDM	2	E70261	11
*	O-Ring, Port, Inner, FKM	2	V70261	11
*	O-Ring, Port, Outer, Silicone	2	S75265	11
* 58	O-Ring, Port, Outer, EPDM	2	E70265	11
*	O-Ring, Port, Outer, FKM	2	V70265	11
61	Name Plate	1	001 061 015	
62	#2 x .125" RHDS	4	30-355	
63	O-ring Removal Tool	1	AD0 096 001	
64	Rotor Nut Wrench, SS	1	112829	
65	Caution Plate	2	33-62	
66	Warning Label	2	33-60	
67	320-323-U1 Grease Fitting, 1/8"	4	BD0 092 000	
0/	324-U1 Grease Fitting, 1/8"	4	BD0 092 100	
68	Plastic Cap, Grease Fitting	4	BD0 093 000	

320 - 324 - 323-UI Common Parts List

NOTES:

- 3. Pumps shipped prior to July 30, 2001
- 4. Pumps shipped starting July 30, 2001.
- 11. Used on 323-U1 only.
- * Recommended Spare Parts





ITEM NO.	DESCRIPTION	QTY. Per Pump	PART NO.	NOTES
	MECHANICAL SEAL PARTS	•		
	OUTER SEAL			
70	Crane #8B2 Outer Seal, Carbon	2	323 114 003	30
	O-Ring, Outer Seal, Shaft, EPDM	2	E70234	
70B	O-Ring, Outer Seal, Shaft, FKM	2	V70234	
	O-Ring, Outer Seal, Shaft, Silicone	2	S75234	
	"T" Seat, Plain, Ceramic	2	300 014 012	
72	"T" Seat, Plain, Tungsten Carbide	2	300 014 013	
	"T" Seat, Plain, Silicon Carbide	2	300 014 016	
72B, 72C	Gasket, Inner and Outer	4	300 042 001	
73	Gland, Plain	2	300 034 001	
73B	3/8-16 x 1-1/4" HHCS	8	30-60	
73C	Lockwasher, 3/8"	8	43-28	
	INNER SEAL			
	Waukesha HD Inner Seal, Silicon Carbide	2	40572	16
71	Waukesha HD Inner Seal, Ceramic	2	40573	16
	Waukesha HD Inner Seal, Chrome Oxide	2	40574	16
	Seal Face, Silicon Carbide	2	40754	
	Seal Face, Ceramic	2	40755	
71A	Seal Face, Chrome Oxide	2	40756	
	Seal Face, Tungsten Carbide	2	109347	
	Seal Face, Carbon	2	36027	
	O-Ring, Inner Seal, Shaft, EPDM	2	E70234	
71B	O-Ring, Inner Seal, Shaft, FKM	2	V70234	
	O-Ring, Inner Seal, Shaft, Silicone	2	S75234	
71D	Spring	12	40875	
71F	Set Screw	8	110038	
	O-Ring, Inner Seal, Seal Face, EPDM	2	E70238	
71H	O-Ring, Inner Seal, Seal Face, FKM	2	V70238	
	O-Ring, Inner Seal, Seal Face, Silicone	2	S75238	
	INNER - OUTER SEAL			
71C	Carrier Inner Sub-Assembly	1	35284	
	"T" Seat, Flushed, Ceramic	2	300 014 027	
70 1	"T" Seat, Flushed, Tungsten Carbide	2	300 014 028	
124	"T" Seat, Flushed, Chrome Oxide	2	300 014 029	
	"T" Seat, Flushed, Silicon Carbide	2	300 014 031	
72B	Gasket, Inner	2	300 042 001	
72C	Gasket, Flushed Gland, Outer	2	300 042 002	
73A	Gland, Flushed	2	300 034 001	
73B	3/8-16 x 1-1/4" HHCS	8	30-60	
73C	3/8" Lockwasher	8	43-28	

320 - 324 - 323-UI Seal Parts List

NOTES:

- 16. Complete Inner Seal with FKM O-Rings.
- 30. Alternate materials available. Standard is listed. Contact factory for information.
- * Recommended Spare Parts

320 - 324 - 323-UI Seals Parts Diagram



320 - 324-U1 Outer Seal

320 - 324 - 323-U1 Inner-Outer Seal



Universal I PD Pump Dimensions - Rectangular Flange with Pedestal

SIZE PUMP		A	АА	ло _н	AO	лок	AO _L	в	С	CA	СВ	СС	СР	CP1	CP2	СРЗ	CP4	D _H	D	Dĸ	DL	Ε	F	FA	FB	н
014	IN	6 .75	1.95	-	-	-	12.50	4.13	.50	1.62	6.50	.50	12.04	13.47	13.53	13.62	15.25	-	-	-	8.88	.38	2.31	2.63	7.50	.41
014	ΜМ	171	50	-	-	-	318	105	13	41	165	13	306	342	344	346	387	-	-	-	226	10	59	67	191	10
0.04	IN	6.75	2.18	-	-	-	12.50	4.13	.50	2.00	7.00	.50	12.46	13.90	13.95	14.04	15.67	-	-	-	8.88	.38	2.31	3.00	8.00	.41
024	ΜМ	171	55	-	-	-	318	105	13	51	178	13	316	353	354	357	398	-	-	-	226	10	59	76	203	10
074	IN	8.00	2.88	14.25	13.75	13.25	12.75	4.25	.62	1.88	10.75	.62	14.58	16.42	15.98	16.07	17.67	10. 30	9.88	9.38	8.88	.38	3.00	3.12	12.00	.44
034	ΜМ	203	73	362	349	337	324	108	16	48	273	16	370	417	406	408	449	264	251	238	226	10	76	79	305	11
064	IN	11.75	4.35	18.44	-	-	13.94	7.00	.50	4.00	12.20	.52	18.91	20.69	20.47	20.76	22.07	13.50	-	-	9.00	.50	5.50	5.00	13.23	.56
004	ΜМ	298	110	468	-	-	354	178	13	102	310	13	480	526	520	527	561	343	-	-	229	13	140	127	336	14
174	IN	11.75	5.00	18.44	-	-	13.94	7.00	.78	3.00	14.00	.63	19.85	21.63	21.42	21.70	23.01	13.50	-	-	9.00	.50	5.50	4.55	15.25	.56
154	ΜМ	298	127	468	-	-	354	178	20	76	356	16	504	549	544	551	584	343	-	-	229	13	140	116	387	14
224	IN	15.00	4.75	23.75	-	-	19.75	9.50	.63	4.37	16.75	.63	23.37	-	26.07	-	27.87	17.50	-	-	13.50	.63	8.25	5.62	18.00	.56
224	ΜМ	381	121	603	-	-	502	241	16	111	425	16	594	-	662	-	708	445	-	-	343	16	210	143	457	14
704	IN	18.00	6.56	-	-	-	36.00	12.00	.63	8.25	18.50	.69	30.17	-	-	-	-	-	-	-	27.1J	.75	9.50	9.50	19.88	.69
324	ΜМ	457	167	-	-	-	914	305	16	210	470	18	766	-	-	-	-	-	-	-	689	19	241	241	505	18

NOTE: MODEL 324 HAS B BOLT HOLES IN RECTANGULAR FLANGE, & OUTLET PORT IS A ROUND FLANGE.

STANDARD COVER-W/ STD. UNIVERSAL FOOT

																											<u> </u>	
SIZE PUMP		НА	HÐ	HB1	1	J	K +.002 000	L	ш	N	Р	PA	PB	PC	PD	Q	R	s	51	SS	т	T1	U +.000 001	x	2X	z	` w	π
014	IN	.41	2.50	2.50	7.66	2.12	. 1875	9.61	9.61	2.00	1.5	1.44	4.94	.59	1.28	2.81	2.79	1.00	1.00	1.00	2.51	2.51	.875	3.63	7.11	1.28	47	LBS
014	ΜМ	10	64	64	195	54	.4.763	244	244	51	-	37	125	15	33	71	71	25	25	25	64	64	22.23	92	181	33	21	KG
0.24	IN	.41	2.50	2.50	7.66	2.12	.1875	9.84	9.84	2.00	1.5	1.75	5.13	.63	1.44	2.81	3.02	1.00	1.00	1.00	2.74	2.74	.875	3.63	7.11	1.28	49	LBS
024	ΜМ	10	64	64	195	54	.4.763	250	250	51	-	44	130	16	37	71	77	25	25	25	70	70	22.23	92	181	33	22	KG
074	IN	.53	2.75	1.81	8.49	2.62	.25	11.36	11.37	2.32	2.0	1.81	6.84	.66	2.58	3.38	3.51	1.12	1.12	1.12	3.35	3.76	1.250	3.88	8.12	1.65	100	LBS
034	ΜМ	13	70	46	216	67	6.35	289	289	59	-	46	174	17	66	86	89	28	28	28	8 5	96	31.75	99	206	42	45	KG
064	IN	.53	4.13	3.00	10.77	3.50	.375	15.16	15.12	2.25	2.5	2.44	9.00	1.28	2.11	5.25	5.23	2.00	1.75	1.75	5.01	5.60	1.625	4.94	10.31	2.25	255	LBS
004	ΜМ	13	105	76	274	89	9.525	385	384	57	-	62	229	33	54	133	133	51	44	44	127	142	41.28	125	262	57	116	KG
174	IN	.53	4.13	3.00	10.77	3.50	.375	15.78	15.76	2.25	3.0	3.19	9.38	.68	2.94	5.25	5.87	2.00	1.75	1.75	5.65	6.25	1.625	4.94	10.31	2.25	280	LBS
134	ΜМ	13	105	76	274	89	9.525	401	400	57	-	81	238	17	75	133	149	51	44	44	144	159	41.28	125	262	57	127	KG
0.04	IN	.53	5.38	5.38	13.74	4.50	.50	18.49	18.49	2.75	4.0	4.06	11.25	.78	3.38	6.88	5.37	2.69	2.69	2.69	6.00	6.00	2.000	6.25	12.87	3.00	505	LBS
224	ΜМ	13	137	137	349	114	12.70	470	470	70	-	103	286	20	86	175	136	68	68	68	152	152	50.80	159	327	76	229	KG
704	IN	.66	5.38	5.38	16.86	5.06	.625	23.42	23.42	4.06	6.0	5.00	17.38	2.25	1.25	7.75	7.81	2.69	2.69	2.69	9.87	9.87	2.375	8.87	17.88	3.50	775	LBS
524	ΜМ	17	137	137	428	129	15.875	595	595	103	-	127	441	57	32	197	198	68	68	68	251	251	60.33	225	454	89	352	KG

Universal I PD Pump Dimensions - Rectangular Flange with Pedestal



Tru-Fit [™] Universal I Pump Size		A	В	B/2	С	D ²	E	F	G	н	J	к
006	inch	12.0	10.0	5.0	9.15	6.97	7.87	13.25	2.01	18.0	2.43	10.08
000	mm	305	254	127	232	177	200	337	51	457	62	256
015	inch	12.0	10.0	5.0	9.15	6.97	7.87	13.25	2.01	18.0	2.43	10.08
015	mm	304	254	127	232	177	200	337	51	457	62	256
018	inch	12.0	10.0	5.0	9.15	7.10	7.87	13.25	2.25	18.0	2.62	10.3 ⁻
010	mm	304	254	127	232	180	200	337	57	457	67	262
030	inch	14.0	12.0	6.0	10.02	8.51	8.37	15.11	2.59	20.0	2.97	12.4
030	mm	356	304	152	255	216	213	384	66	508	75	317
040	inch	14.0	12.0	6.0	10.02	8.62	8.37	15.11	2.97	20.0	2.97	12.84
040	mm	356	305	152	255	219	213	384	75	508	75	326
060	inch	18.0	16.0	8.0	12.0	10.74	9.75	20.0	3.01	28.0	3.77	17.39
000	mm	457	406	203	305	273	248	508	76	711	96	442
120	inch	18.0	16.0	8.0	12.0	10.74	9.75	20.0	3.64	28.0	4.08	18.02
130	mm	457	406	203	305	273	248	508	92	711	104	458
220	inch	20.0	18.0	9.0	14.5	13.25	11.5	23.25	3.51	36.0	4.99	19.76
220	mm	508	457	229	368	337	292	591	89	914	127	502
T . F . M												
Universal I			1	N 1	- 1	Б		-			v	
		L	M ¹	N ¹	P ¹	R	S	т	l	J	v	
Pump Size		L	M	N ¹	P ¹	R	S	т	l	J	v	
Pump Size	inch	L 12.51	M ¹ 27.60	N ¹ 15.56	P ¹ 10.92	R 2.79	S 5.44	T 2.12	J 5/16-1	J 8 x .62	V 2.00	
006	inch mm	L 12.51 318	M ¹ 27.60 701	N ¹ 15.56 395	P ¹ 10.92 227	R 2.79 71	S 5.44 138	T 2.12 54	5/16-1 N	J 8 x .62 /A	V 2.00 51	
006 015	inch mm inch	L 12.51 318 12.51	M ¹ 27.60 701 27.60	N ¹ 15.56 395 15.56	P ¹ 10.92 227 10.92	R 2.79 71 2.79	S 5.44 138 5.44	T 2.12 54 2.12	5/16-1 5/16-1	J 8 x .62 /A 8 x .62	V 2.00 51 2.00	
006 015	inch mm inch mm	L 12.51 318 12.51 318	M ¹ 27.60 701 27.60 701	N ¹ 15.56 395 15.56 395	P ¹ 10.92 227 10.92 227	R 2.79 71 2.79 71	S 5.44 138 5.44 138	T 2.12 54 2.12 54	5/16-1 N 5/16-1 N	J 8 x .62 /A 8 x .62 /A	V 2.00 51 2.00 51	
006 015 018	inch mm inch mm inch	L 12.51 318 12.51 318 12.93	M ¹ 27.60 701 27.60 701 28.02	N ¹ 15.56 395 15.56 395 15.56	P ¹ 10.92 227 10.92 227 10.92	R 2.79 71 2.79 71 3.02	S 5.44 138 5.44 138 5.44	T 2.12 54 2.12 54 2.12	5/16-1 5/16-1 5/16-1 5/16-1	J 8 x .62 /A 8 x .62 /A 8 x .62	V 2.00 51 2.00 51 2.00	
006 015 018	inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328	M ¹ 27.60 701 27.60 701 28.02 712	N ¹ 15.56 395 15.56 395 15.56 395	P ¹ 10.92 227 10.92 227 10.92 227	R 2.79 71 2.79 71 3.02 77	S 5.44 138 5.44 138 5.44 138	T 2.12 54 2.12 54 2.12 54 54	5/16-1 N 5/16-1 N 5/16-1 N	J 8 x .62 /A 8 x .62 /A 8 x .62 /A	V 2.00 51 2.00 51 2.00 51	
006 015 018 030	inch mm inch inch mm inch	L 12.51 318 12.51 318 12.93 328 15.44	M ¹ 27.60 701 27.60 701 28.02 712 33.67	N ¹ 15.56 395 15.56 395 15.56 395 18.65	P ¹ 10.92 227 10.92 227 10.92 227 13.74	R 2.79 71 2.79 71 3.02 77 3.84	S 5.44 138 5.44 138 5.44 138 5.81	T 2.12 54 2.12 54 2.12 54 2.62	5/16-1 N 5/16-1 N 5/16-1 N 3/8-16	J 8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62	V 2.00 51 2.00 51 2.00 51 2.25	
006 015 018 030	inch mm inch inch mm inch mm	L 12.51 318 12.51 318 12.93 328 15.44 392	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474	P ¹ 10.92 227 10.92 227 10.92 227 13.74 349	R 2.79 71 2.79 71 3.02 77 3.84 98	S 5.44 138 5.44 138 5.44 138 5.81 148	T 2.12 54 2.12 54 2.12 54 2.62 67	5/16-1 N 5/16-1 N 5/16-1 N 3/8-10	J 8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62 /A	V 2.00 51 2.00 51 2.20 51 2.25 57	
006 015 018 030 040	inch mm inch inch mm inch mm inch	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65	P ¹ 10.92 227 10.92 227 10.92 227 13.74 349 13.74	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81	T 2.12 54 2.12 54 2.12 54 2.62 67 2.62	5/16-1 N 5/16-1 5/16-1 N 3/8-10 N 3/8-10	J 8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62 /A 5 x .62	2.00 51 2.00 51 2.00 51 2.25 57 2.25	
006 015 018 030 040	inch mm inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65 474	P ¹ 10.92 227 10.92 227 13.74 349 13.74 349	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148	T 2.12 54 2.12 54 2.12 54 2.62 67 2.62 67	5/16-1 N 5/16-1 N 5/16-1 N 3/8-10 N 3/8-10 N	J 8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62 /A 5 x .62 /A 5 x .62 /A	2.00 51 2.00 51 2.00 51 2.25 57 2.25 57	
Pump Size 006 015 018 030 040 060	inch mm inch inch inch mm inch mm inch	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65 474 22.02	P ¹ 10.92 227 10.92 227 13.74 349 13.74 349 13.74	R 2.79 71 3.02 77 3.84 98 4.22 107 5.01	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148 8.13	T 2.12 54 2.12 54 2.12 54 2.62 67 2.62 67 3.50	5/16-1 N 5/16-1 N 5/16-1 N 3/8-10 N 3/8-10 N 1/2-13	J 8 x .62 /A 8 x .62 /A 6 x .62 /A 6 x .62 /A 6 x .62 /A 6 x .62 /A 6 x .62 /A	V 2.00 51 2.00 51 2.25 57 2.25 57 3.50	
Pump Size 006 015 018 030 040 060	inch mm inch mm inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16 537	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77 1112	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65 474 22.02 559	P ¹ 10.92 227 10.92 227 10.92 227 13.74 349 13.74 349 13.74 349	R 2.79 71 3.02 77 3.84 98 4.22 107 5.01 127	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148 8.13 207 2.15	T 2.12 54 2.12 54 2.12 54 2.62 67 2.62 67 3.50 89	5/16-1 N 5/16-1 N 5/16-1 N 3/8-10 N 3/8-10 N 1/2-13 N 1/2-13	J 8 x .62 /A 8 x .62 /A 6 x .62 /A 6 x .62 /A 6 x .62 /A 3 x .88 /A 3 x .88	 2.00 51 2.00 51 2.25 57 2.25 57 3.50 89 2.55 	
Pump Size 006 015 018 030 040 060 130	inch mm inch mm inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16 537 22.10	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77 1112 44.71	N ¹ 15.56 395 15.56 395 18.65 474 18.65 474 22.02 559 22.02	P ¹ 10.92 227 10.92 227 13.74 349 13.74 349 13.74 349 17.16 436 17.16	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107 5.01 127 5.01	S 5.44 138 5.44 138 5.81 148 5.81 148 8.13 207 8.13	T 2.12 54 2.12 54 2.62 67 2.62 67 3.50 89 3.50	5/16-1 N 5/16-1 N 5/16-1 N 3/8-16 N 3/8-16 N 3/8-16 N 1/2-13 N 1/2-13	8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62 /A 5 x .62 /A 5 x .62 /A 5 x .88 /A 3 x .88 /A	 2.00 51 2.00 51 2.25 57 2.25 57 3.50 89 3.50 	
Pump Size 006 015 018 030 040 060 130	inch mm inch mm inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16 537 22.10 561	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77 1112 44.71 1136	N ¹ 15.56 395 15.56 395 18.65 474 18.65 474 22.02 559 22.02 559	P ¹ 10.92 227 10.92 227 13.74 349 13.74 349 13.74 349 17.16 436 17.16	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107 5.01 127 5.65 144	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148 8.13 207 8.13 207	T 2.12 54 2.12 54 2.62 67 2.62 67 3.50 89 3.50 89	5/16-1 N 5/16-1 N 5/16-1 N 3/8-16 N 3/8-16 N 1/2-13 N 1/2-13 N 1/2-13	8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .88 /A 3 x .88 /A 3 x .88 /A	 2.00 51 2.00 51 2.00 51 2.25 57 3.50 89 3.50 89 3.50 	
Pump Size 006 015 018 030 040 060 130 220	inch mm inch mm inch mm inch mm inch mm inch	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16 537 22.10 561 24.51	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77 1112 44.71 1136 52.23	N ¹ 15.56 395 15.56 395 18.65 474 18.65 474 22.02 559 22.02 559 25.91	P ¹ 10.92 227 10.92 227 13.74 349 13.74 349 17.16 436 17.16 436 17.16 436	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107 5.01 127 5.65 144 4.73	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148 8.13 207 8.13 207 10.00	T 2.12 54 2.12 54 2.12 54 2.62 67 3.50 89 3.50 89 4.50	5/16-1 N 5/16-1 N 5/16-1 N 3/8-10 N 3/8-10 N 1/2-13 N 1/2-13 N 1/2-13	8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62 /A 5 x .62 /A 5 x .62 /A 3 x .88 /A 3 x .88 /A 3 x .10	2.00 51 2.00 51 2.25 57 2.25 57 3.50 89 3.50 89 5.38	

Tru-Fit[™] Universal I PD Pump Dimensions

PD100-437

¹ Dimensions affected by Motor Frame Size. ² Dimensions affected by Connection Type.



Tru-Fit [™] Universal I Pump Size		Α	в	B/2	с	D ²	E	F	G	Н	J	к
900	inch	12.0	10.0	5.0	9.15	6.97	7.87	13.25	2.01	18.0	2.43	10.08
000	mm	305	254	127	232	177	200	337	51	457	62	256
015	inch	12.0	10.0	5.0	9.15	6.97	7.87	13.25	2.01	18.0	2.43	10.08
015	mm	304	254	127	232	177	200	337	51	457	62	256
018	inch	12.0	10.0	5.0	9.15	7.10	7.87	13.25	2.25	18.0	2.62	10.31
010	mm	304	254	127	232	180	200	337	57	457	67	262
030	inch	14.0	12.0	6.0	10.02	8.51	8.37	15.11	2.59	20.0	2.97	12.47
030	mm	356	304	152	255	216	213	384	66	508	75	317
040	inch	14.0	12.0	6.0	10.02	8.62	8.37	15.11	2.97	20.0	2.97	12.84
040	mm	356	305	152	255	219	213	384	75	508	75	326
060	inch	18.0	16.0	8.0	12.0	10.74	9.75	20.0	3.01	28.0	3.77	17.39
000	mm	457	406	203	305	273	248	508	76	711	96	442
120	inch	18.0	16.0	8.0	12.0	10.74	9.75	20.0	3.64	28.0	4.08	18.02
130	mm	457	406	203	305	273	248	508	92	711	104	458
220	inch	20.0	18.0	9.0	14.5	13.25	11.5	23.25	3.51	36.0	4.99	19.76
220	mm	508	457	229	368	337	292	591	89	914	127	502
Tru-Fit [™] Universal I Pump Size		L	M ¹	N ¹	P ¹	R	S	т	l	J	v	
Tru-Fit [™] Universal I Pump Size	inch	L 12.51	M ¹ 27.60	N ¹ 15.56	P ¹ 10.92	R 2.79	S 5.44	T 2.12	J 5/16-1	J 8 x .62	V 2.00	
Tru-Fit [™] Universal I Pump Size 006	inch	L 12.51 318	M ¹ 27.60 701	N ¹ 15.56 395	P ¹ 10.92 227	R 2.79 71	S 5.44 138	T 2.12 54	5/16-1 N	J 8 x .62 /A	V 2.00 51	
Tru-Fit [™] Universal I Pump Size 006	inch mm inch	L 12.51 318 12.51	M ¹ 27.60 701 27.60	N ¹ 15.56 395 15.56	P ¹ 10.92 227 10.92	R 2.79 71 2.79	S 5.44 138 5.44	T 2.12 54 2.12	5/16-1 N 5/16-1	J 8 x .62 /A 8 x .62	V 2.00 51 2.00	
Tru-Fit [™] Universal I Pump Size 006 015	inch mm inch mm	L 12.51 318 12.51 318	M ¹ 27.60 701 27.60 701	N ¹ 15.56 395 15.56 395	P ¹ 10.92 227 10.92 227	R 2.79 71 2.79 71	S 5.44 138 5.44 138	T 2.12 54 2.12 54	5/16-1 5/16-1 5/16-1 N	J 8 x .62 /A 8 x .62 /A	V 2.00 51 2.00 51	
Tru-Fit [™] Universal I Pump Size 006 015	inch mm inch mm	L 12.51 318 12.51 318 12.93	M ¹ 27.60 701 27.60 701 28.02	N ¹ 15.56 395 15.56 395 15.56	P ¹ 10.92 227 10.92 227 10.92	R 2.79 71 2.79 71 3.02	S 5.44 138 5.44 138 5.44	T 2.12 54 2.12 54 2.12	5/16-1 N 5/16-1 N 5/16-1	J 8 x .62 /A 8 x .62 /A 8 x .62	V 2.00 51 2.00 51 2.00	
Tru-Fit [™] Universal I Pump Size 006 015 018	inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328	M ¹ 27.60 701 27.60 701 28.02 712	N ¹ 15.56 395 15.56 395 15.56 395	P ¹ 10.92 227 10.92 227 10.92 227	R 2.79 71 2.79 71 3.02 77	S 5.44 138 5.44 138 5.44 138	T 2.12 54 2.12 54 2.12 54	5/16-1 N 5/16-1 N 5/16-1 N	J 8 x .62 /A 8 x .62 /A 8 x .62 /A	V 2.00 51 2.00 51 2.00 51	
Tru-Fit [™] Universal I Pump Size 006 015 018	inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328 15.44	M ¹ 27.60 701 27.60 701 28.02 712 33.67	N ¹ 15.56 395 15.56 395 15.56 395 18.65	P ¹ 10.92 227 10.92 227 10.92 227 13.74	R 2.79 71 2.79 71 3.02 77 3.84	S 5.44 138 5.44 138 5.44 138 5.81	T 2.12 54 2.12 54 2.12 54 2.62	5/16-1 N 5/16-1 N 5/16-1 N 3/8-10	J 8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62	V 2.00 51 2.00 51 2.00 51 2.25	
Tru-Fit [™] Universal I Pump Size 006 015 018 030	inch mm inch mm inch inch mm	L 12.51 318 12.51 318 12.93 328 15.44 392	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474	P ¹ 10.92 227 10.92 227 10.92 227 13.74 349	R 2.79 71 2.79 71 3.02 77 3.84 98	S 5.44 138 5.44 138 5.44 138 5.81 148	T 2.12 54 2.12 54 2.12 54 2.62 67	5/16-1 N 5/16-1 N 5/16-1 N 3/8-16 N	J 8 x .62 /A 8 x .62 /A 6 x .62 /A	V 2.00 51 2.00 51 2.25 57	
Tru-Fit [™] Universal I Pump Size 006 015 018 030 040	inch mm inch mm inch mm inch	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65	P ¹ 10.92 227 10.92 227 10.92 227 13.74 349 13.74	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81	T 2.12 54 2.12 54 2.12 54 2.62 67 2.62	5/16-1 N 5/16-1 N 5/16-1 N 3/8-16 N 3/8-16	J 8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62 /A 5 x .62	V 2.00 51 2.00 51 2.25 57 2.25	
Tru-Fit [™] Universal I Pump Size 006 015 018 030 040	inch mm inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65 474	P ¹ 10.92 227 10.92 227 10.92 227 13.74 349 13.74 349	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148	T 2.12 54 2.12 54 2.62 67 2.62 67	5/16-1 N 5/16-1 N 5/16-1 N 3/8-10 N 3/8-10 N	J 8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62 /A 5 x .62 /A	V 2.00 51 2.00 51 2.25 57 2.25 57	
Tru-Fit [™] Universal I Pump Size 006 015 018 030 040 060	inch mm inch mm inch mm inch mm inch	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65 474 22.02	P ¹ 10.92 227 10.92 227 10.92 227 13.74 349 13.74 349 17.16	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107 5.01	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148 8.13	T 2.12 54 2.12 54 2.12 54 2.62 67 2.62 67 3.50	5/16-1 N 5/16-1 N 5/16-1 N 3/8-16 N 3/8-16 N 3/8-16 N 1/2-13	J 8 x .62 /A 8 x .62 /A 5 x .62 /A 5 x .62 /A 5 x .62 /A 3 x .88	V 2.00 51 2.00 51 2.25 57 2.25 57 3.50	
Tru-Fit [™] Universal I Pump Size 006 015 018 030 040 060	inch mm inch mm inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16 537	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77 1112	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65 474 18.65 474 22.02 559	P ¹ 10.92 227 10.92 227 13.74 349 13.74 349 17.16 436	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107 5.01 127	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148 8.13 207	T 2.12 54 2.12 54 2.62 67 2.62 67 3.50 89	5/16-1 N 5/16-1 N 5/16-1 N 3/8-10 N 3/8-10 N 1/2-11 N	J 8 x .62 /A 8 x .62 /A 6 x .62 /A 6 x .62 /A 6 x .62 /A 3 x .88 /A	V 2.00 51 2.00 51 2.25 57 2.25 57 3.50 89	
Tru-Fit [™] Universal I Pump Size 006 015 018 030 040 060 130	inch mm inch mm inch mm inch mm inch mm inch	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16 537 22.10	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77 1112 44.71	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65 474 18.65 474 22.02 559 22.02	P ¹ 10.92 227 10.92 227 13.74 349 13.74 349 13.74 349 17.16 436 17.16	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107 5.01 127 5.65	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148 8.13 207 8.13	T 2.12 54 2.12 54 2.62 67 2.62 67 3.50 89 3.50	5/16-1 N 5/16-1 N 5/16-1 N 3/8-16 N 3/8-16 N 1/2-13 N 1/2-13	J 8 x .62 /A 8 x .62 /A 6 x .62 /A 6 x .62 /A 6 x .62 /A 3 x .88 /A 3 x .88	V 2.00 51 2.00 51 2.25 57 2.25 57 3.50 89 3.50	
Tru-Fit [™] Universal I Pump Size 006 015 018 030 040 060 130	inch mm inch mm inch mm inch mm inch mm	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16 537 22.10 561	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77 1112 44.71 1136	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65 474 18.65 474 22.02 559 22.02 559	P ¹ 10.92 227 10.92 227 13.74 349 13.74 349 13.74 349 17.16 436 17.16 436	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107 5.01 127 5.65 144	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148 5.81 148 8.13 207 8.13 207	T 2.12 54 2.12 54 2.62 67 2.62 67 3.50 89 3.50 89	5/16-1 N 5/16-1 N 3/8-16 N 3/8-16 N 3/8-17 N 1/2-13 N 1/2-13 N	J 8 x .62 /A 8 x .62 /A 6 x .62 /A 6 x .62 /A 6 x .62 /A 3 x .88 /A 3 x .88 /A	V 2.00 51 2.00 51 2.25 57 2.25 57 3.50 89 3.50 89	
Tru-Fit [™] Universal I Pump Size 006 015 018 030 040 060 130 220	inch mm inch mm inch mm inch mm inch mm inch	L 12.51 318 12.51 318 12.93 328 15.44 392 15.81 402 21.16 537 22.10 561 24.51	M ¹ 27.60 701 27.60 701 28.02 712 33.67 855 34.04 865 43.77 1112 44.71 1136 52.23	N ¹ 15.56 395 15.56 395 15.56 395 18.65 474 18.65 474 22.02 559 22.02 559 22.02	P ¹ 10.92 227 10.92 227 10.92 227 13.74 349 13.74 349 13.74 349 17.16 436 17.16 436 17.16 436	R 2.79 71 2.79 71 3.02 77 3.84 98 4.22 107 5.01 127 5.65 144 4.73	S 5.44 138 5.44 138 5.44 138 5.81 148 5.81 148 8.13 207 8.13 207 10.00	T 2.12 54 2.12 54 2.62 67 2.62 67 3.50 89 3.50 89 4.50	5/16-1 N 5/16-1 N 5/16-1 N 3/8-16 N 3/8-16 N 3/8-16 N 1/2-13 N 1/2-13	J 8 x .62 /A 8 x .62 /A 8 x .62 /A 5 x .62 /A 5 x .62 /A 5 x .62 /A 3 x .88 /A 3 x .88 /A 3 x .88 /A	V 2.00 51 2.00 51 2.25 57 2.25 57 3.50 89 3.50 89 5.38	

Tru-Fit[™] Universal I PD Pump Dimensions

PD100-437

¹ Dimensions affected by Motor Frame Size. ² Dimensions affected by Connection Type.

Tru-Fit[™] Universal I PD Pump Dimensions - Stainless Steel Base



Tru-Fit[™] Universal I PD Pumps Parts List

ltom #	Dout Description	Universal I Pump Size								
item#	Part Description	006, 014, 015	018, 024	030, 034	040					
3	Gear Case, Cl	118986	118986	121687	121687					
4A	Gear Case Cover, Adapter	118982	118982	118678	118678					
7	Drive Shaft	119174	119175	119176	119177					
33D	1/4-20 x 1" HHCS	30-93	30-93							
330	5/16-18 x 1-1/8" HHCS			30-237	30-237					
33E	5/16" x 3/4" lg. SHSB	30-690	30-690							
33L	3/8" x 3/4" lg. SHSB			30-691	30-691					
444	Flat Washer, 5/16"	43-246	43-246							
744	Flat Washer, 3/8"			43-30	43-30					

Itom #	Part Description	Universal I Pump Size								
nem #	Fait Description	060, 064	130, 134	220, 224	320, 324					
3	Gear Case, Cl	118987	118987	118988	118989					
4A	Gear Case Cover, Adapter	(Serial # Req'd)	(Serial # Req'd)	(Serial # Req'd)	(Serial # Req'd)					
7	Drive Shaft	119178	119179	119180	119181					
33D	3/8-16 x 1-1/2" HHCS	30-50	30-50	30-50						
555	1/2-13 x 1-1/2" HHCS		-	-	30-103					
33⊑	1/2" x 1" lg. SHSB	30-692	30-692	30-692						
55L	5/8" x 1" lg. SHSB				30-693					
44A	Flat Washer, 1/2"	43-31	43-31	43-31	43-31					

PD100-434a

Tru-Fit[™] Universal I PD Pumps Diagram



New Part Numbers for Pumps Sold After 7/12/04

		Part # before	Part # after
UI Model Number	Description	7/12/04 (OLD)	7/12/04 (NEW)
006, 014, 015, 018, 024	-		
	Grease Seal, Bearing Retainer	101716	121679
	Bearing Retainer, Front	101810	120332
	O-Ring Seal Carrier	015034000	015034001
030, 034, 040			
	Grease Seal, Bearing Retainer	101717	121680
	Bearing Retainer, Front	101811	120333
	O-Ring Seal Carrier	030034000	030034001
060, 064, 130, 134			
	Bearing Retainer, Front STD	060080000	123531
	Bearing Retainer, Front SS	101812	121828
	O-Ring Seal Carrier	060034000	060034001
220, 224			
	Grease Seal, Bearing Retainer	STD030002	121681
	Bearing Retainer, Front STD	220080000	123532
	Bearing Retainer, Front SS	101813	121829
	O-Ring Seal Carrier	220034000	220034001
320, 324			
	Grease Seal, Bearing Retainer	STD030002	121681
	Bearing Retainer, Front STD	0H1080000	123533
	Bearing Retainer, Front SS	118365	123533

PD100-441



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