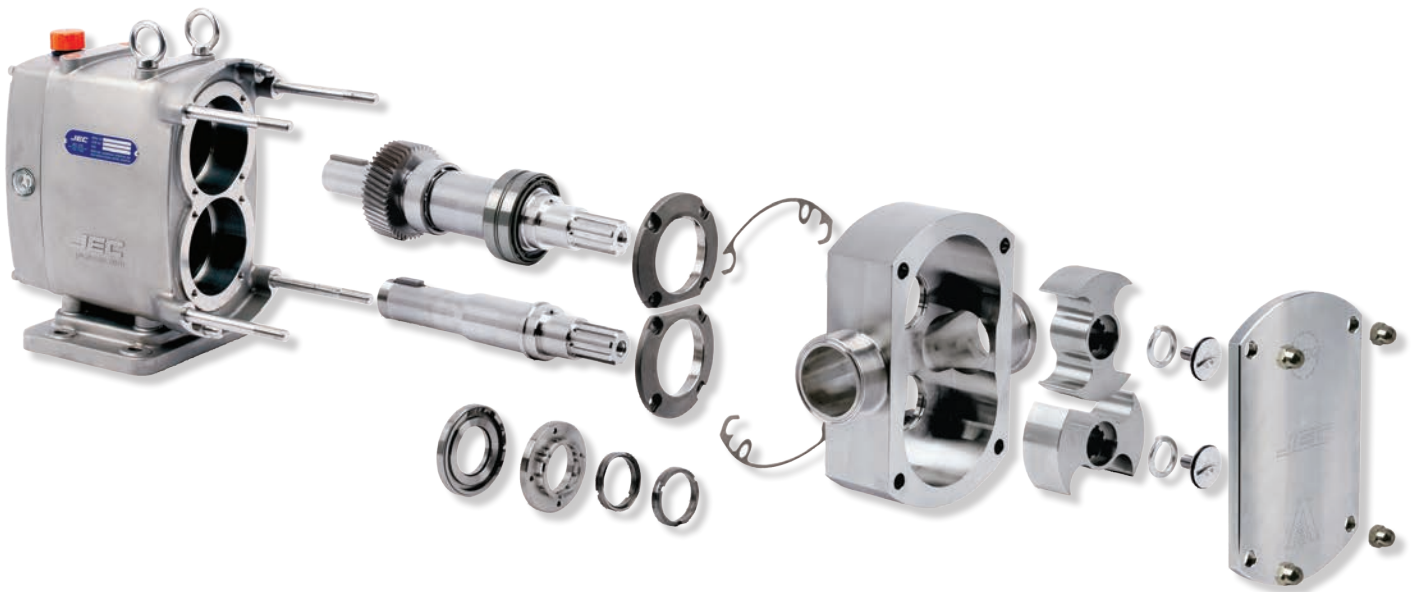


# Operating & Maintenance Manual for JRZL-400 Series Rotary Lobe Pumps



*The Right Connection®*

## **Dixon Sanitary**


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[dixonvalve.com](http://dixonvalve.com)

Thank you for purchasing a Dixon Sanitary Product!

This manual contains installation, operation, disassembly and assembly instructions, maintenance procedures, troubleshooting and a complete parts list for all JRZL-Series positive displacement pumps.

READ THIS MANUAL carefully to learn how to service these pumps. Failure to do so could result in person injury or equipment damage. 

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## Safety Information

### DO'S & DON'TS

- DO** read and understand these instructions before installing or using the pump.
- DO** use Dixon spare parts when replacing a component of the pump.
- DO NOT** service the pump while it is running.
- DO NOT** place the pump in an application where the service ratings are exceeded.
- DO NOT** modify the pump. Modifying the pump creates unsafe conditions and voids all warranties.

### SAFETY PRECAUTIONS WHEN INSTALLING PUMP

- DO** use an authorized electrician when connecting the pump.
- DO** observe the mechanical limits of the pump (refer to the pump performance sheet).
- DO** install a throttling valve in the discharge line.
- DO NOT** install a throttling valve in the suction line.

### SAFETY PRECAUTIONS WHEN OPERATING PUMP

- DO** allow only qualified personnel to operate this pump.
- DO NOT** start the pump until all personnel are clear.
- DO NOT** touch the pump or the lines when pumping hot fluids or when performing Clean In Place (CIP) procedures.
- DO NOT** run the pump with BOTH the suction inlet and discharge outlet blocked. Running the pump with the inlet blocked will cause serious damage to the pump.
- DO NOT** check pump rotation with liquid in the pump.
- DO NOT** run the pump with the front cover removed. The rotors and rotor case could be damaged or may cause severe injury.
- DO NOT** operate the pump with the safety guard removed.

### SAFETY PRECAUTIONS WHEN SERVICING PUMP

- DO** ensure the pump is cool to touch before performing service.
- DO** relieve all pressure and drain all fluids from pump and connected piping before performing service.
- DO ENSURE POWER TO THE UNIT HAS BEEN DISCONNECTED PRIOR TO PERFORMING ANY PUMP MAINTENANCE OR CLEANING.**
- DO** exercise caution and wear protective clothing when using lye or acid for cleaning.

## Care of Stainless Steel

The stainless steel components in Dixon Sanitary equipment are machined, welded and assembled by skilled craftsmen using manufacturing methods that preserve the corrosion-resistant quality of the stainless steel.

Retention of corrosion-resistant qualities under processing conditions requires regular attention to the precautions listed below.

1. Regularly check all electrical devices connected to the equipment for stray currents caused by improper grounding, damaged insulation or other defects. Corrosion: Pitting often occurs when stray currents come in contact with moist stainless steel.
2. Never leave rubber mats, fittings, wrenches, etc. in contact with stainless steel. Corrosion: Pitting or galvanic action. Objects retard complete drying, preventing air from reforming the protective oxide film. Galvanic corrosion occurs when two dissimilar metals touch when wet.
3. Immediately rinse equipment after use with warm water until the rinse water is clear. Clean the equipment (manual or CIP) as soon as possible after rinsing. Corrosion: discoloration, deposits, pitting. Product deposits often cause pitting beneath the particles.
4. Use only recommended cleaning compounds. Purchase chemicals from reputable and responsible chemical manufacturers familiar with stainless steel processing equipment, they continuously check the effects of their products on stainless steel.
5. Use cleaning chemicals exactly as specified by the manufacturer. Do not use excessive concentrations, temperatures or exposure times. Corrosion: Pitting, discoloration, stress cracks. Permanent damage often occurs from excessive chemical concentrations, temperatures or exposure times.
6. For manual cleaning, use only soft non-metallic brushes, sponges or pads. Brush with the grain on polished surfaces, avoid scratching the surface. Corrosion: Pitting, scratches. Metal brushes or sponges will scratch the surface and promote corrosion over a period of time. Metal particles allowed to remain on a stainless steel surface will cause pitting.
7. Use chemical bactericides exactly as prescribed by the chemical manufacturer in concurrence with local health authority. Use the lowest permissible concentration, temperature and exposure time possible. Flush immediately after bacterial treatment. In no case should the solution be in contact with stainless steel more than 20 minutes. Corrosion: Protective film destroyed. Chlorine and other halogen bactericides can destroy the protective film. A few degrees increase in temperature greatly increases chemical activity and accelerates corrosion.
8. Regularly inspect the joints in pipelines. Be sure all connections are tight fitting without binding. Corrosion: Crevice corrosion. Small crevices caused by improperly seated gaskets will promote crevice corrosion. Stainless steel under stress will develop stress cracking especially in the presence of bactericides containing chlorine.
9. Regularly inspect equipment for surface corrosion (i.e. pitting deposits, stress cracks, etc.). If deposit or color corrosion is detected, remove it immediately using mild scouring powder and detergents. Rinse thoroughly and allow to air dry. Review production and cleaning procedures to determine the cause. Note: If corrosion is not removed, the protective film cannot be restored and corrosion will continue at an accelerated rate.

# JRZL 400-Series Technical Data

## Specifications:

Model	Maximum Differential Pressure (PSI) <sup>1</sup>	Maximum Flow Rate (GPM)	Temperature Range	Viscosity Range	Noise Level
440	174	299	14°F to 356°F (-10°C to 180°C)	Up to 1,000,000 cPs	60 ~ 80 dB
450	116	441	above 248°F (120°C) may require Hot Clearance Rotors		

<sup>1</sup> Up to 435 PSI (30 bar) is available with Front Bearing Cover

## Materials:

- Product wetted steel part: AISI 316L Stainless Steel (standard)
- Product wetted elastomers: EPDM (standard)
- Optional seals: Buna, FKM

## Shaft Seals:

- Seal options: Single and Double Mechanical, Single and Double O-Ring and Triple Lip-seal
- Maximum flushing water pressure: 7 PSI (0.5 bar)
- Flushing water consumption: 30~60 cubic inches/min (0.25~0.5 liter/min)
  - Flush inlet at lowest port on casing
- Stationary seal ring material: Tungsten Carbide
- Rotating seal ring material: Tungsten Carbide (standard) or Silicon Carbide (optional)
- O-ring material: EPDM (standard)
- Optional O-ring material: Buna, FKM
- Triple lip seal material: PTFE(Polytetrafluoroethylene)+Glass (standard) or PTFE+Copper (optional)

## Rotor Information: Not all rotors available in all models.

- Single/bi-wing and bi-lobe/tri-lobe/heli-lobe are interchangeable
- Optional rotors: Multi-lobe, Hardened

## Optional Information:

- Ultra clean version
- High pressure version up to 435 PSI (30 bar)
- Heating jacket on rotor case and front cover
- Rectangular inlet version
- Pressure relief front cover (not 3A)
- Surface hardening

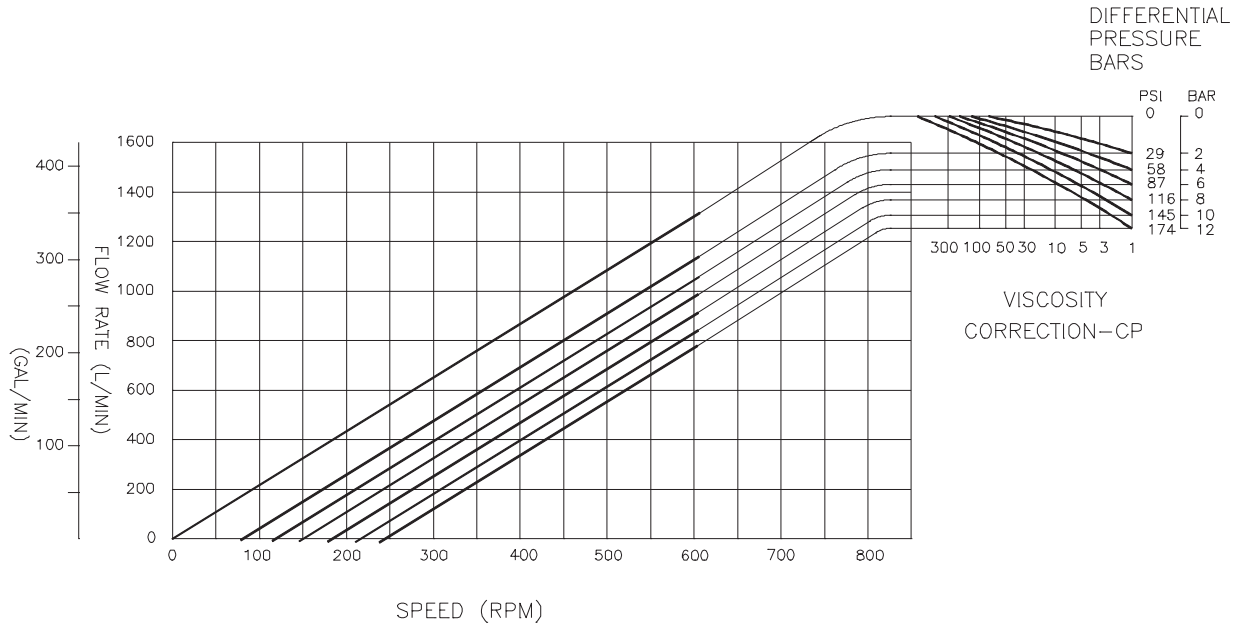
## JRZL440 Curves

# Rotary Lobe Pump JRZL440

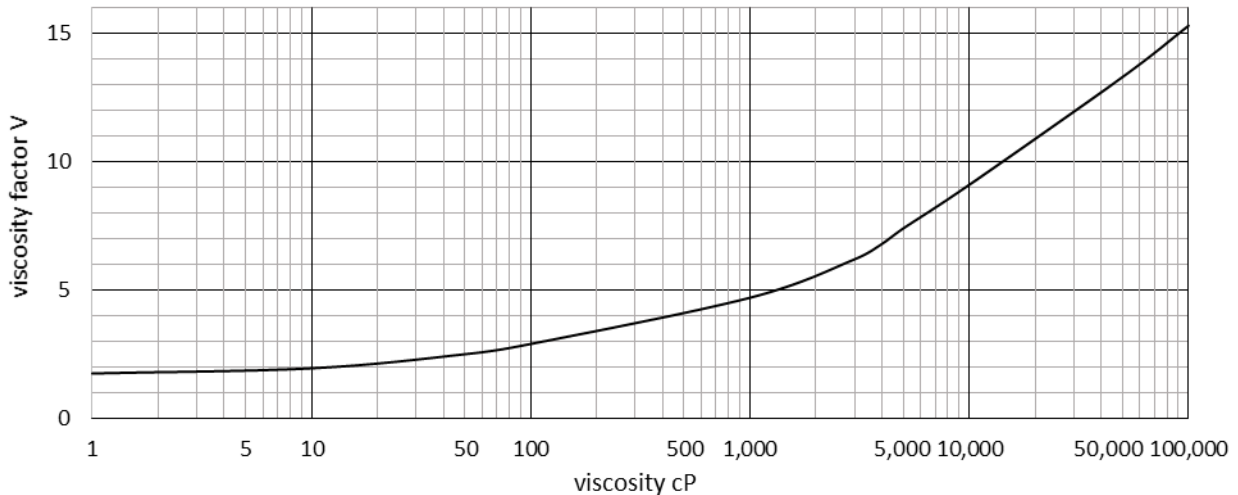
APPLIES TO BI-WING, BI-LOBE, AND SINGLE WING\* ROTORS

\* SINGLE WING ROTOR MAX 100 RPM

PORT SIZE: 4 X 4



### Power Calculation for Viscosity Liquids



$$(English\ units)\ Total\ Power\ (HP) = (0.0007 \times p + 0.0051 \times v) \times n \times c$$

$$(Metric\ units)\ Total\ Power\ (Kw) = \frac{(2 \times p + v) \times n \times c}{1000}$$

$p$  = pressure (psi or bar)

$v$  = viscosity correction factor (from graph)

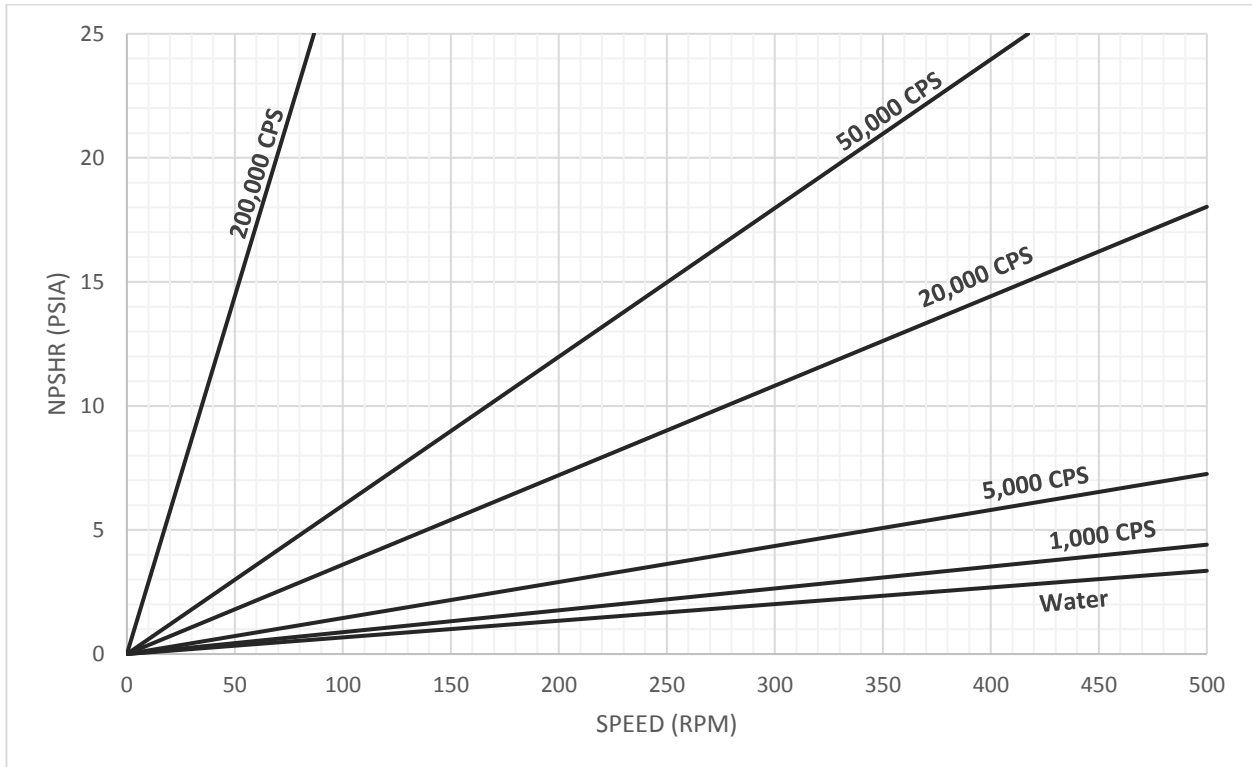
$n$  = speed (RPM)

$c$  = displacement (0.60 gal/rev or 2.27 L/rev)

## JRZL 440 NPSHR Curves

# Rotary Lobe Pump JRZL440

NET POSITIVE SUCTION HEAD REQUIRED  
PORT SIZE: 4 X 4



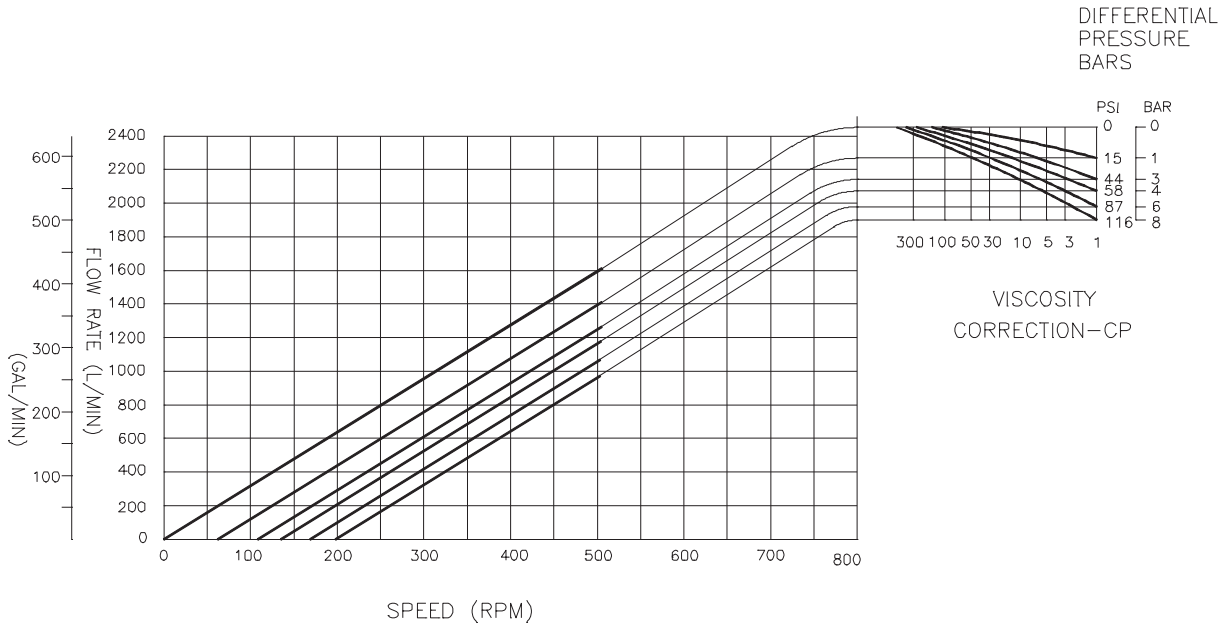
## JRZL450 Curves

# Rotary Lobe Pump JRZL450

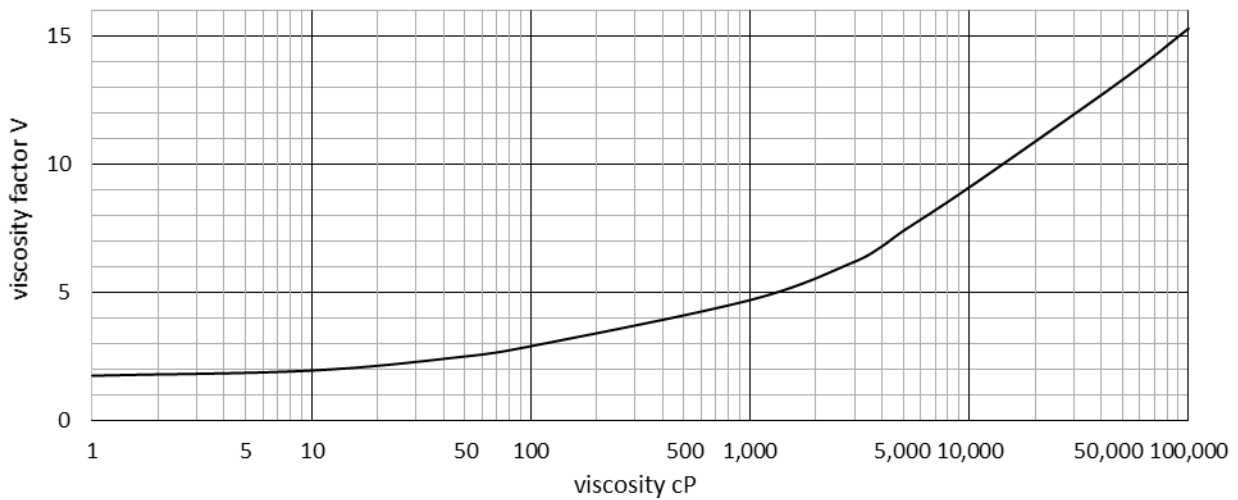
APPLIES TO BI-WING, BI-LOBE, AND SINGLE WING\* ROTORS

\* SINGLE WING ROTOR MAX 100 RPM

PORT SIZE: 5 X 5



### Power Calculation for Viscosity Liquids



$$(English\ units)\ Total\ Power\ (HP) = (0.0007 \times p + 0.0051 \times v) \times n \times c$$

$$(Metric\ units)\ Total\ Power\ (Kw) = \frac{(2 \times p + v) \times n \times c}{1000}$$

$p$  = pressure (psi or bar)

$v$  = viscosity correction factor (from graph)

$n$  = speed (RPM)

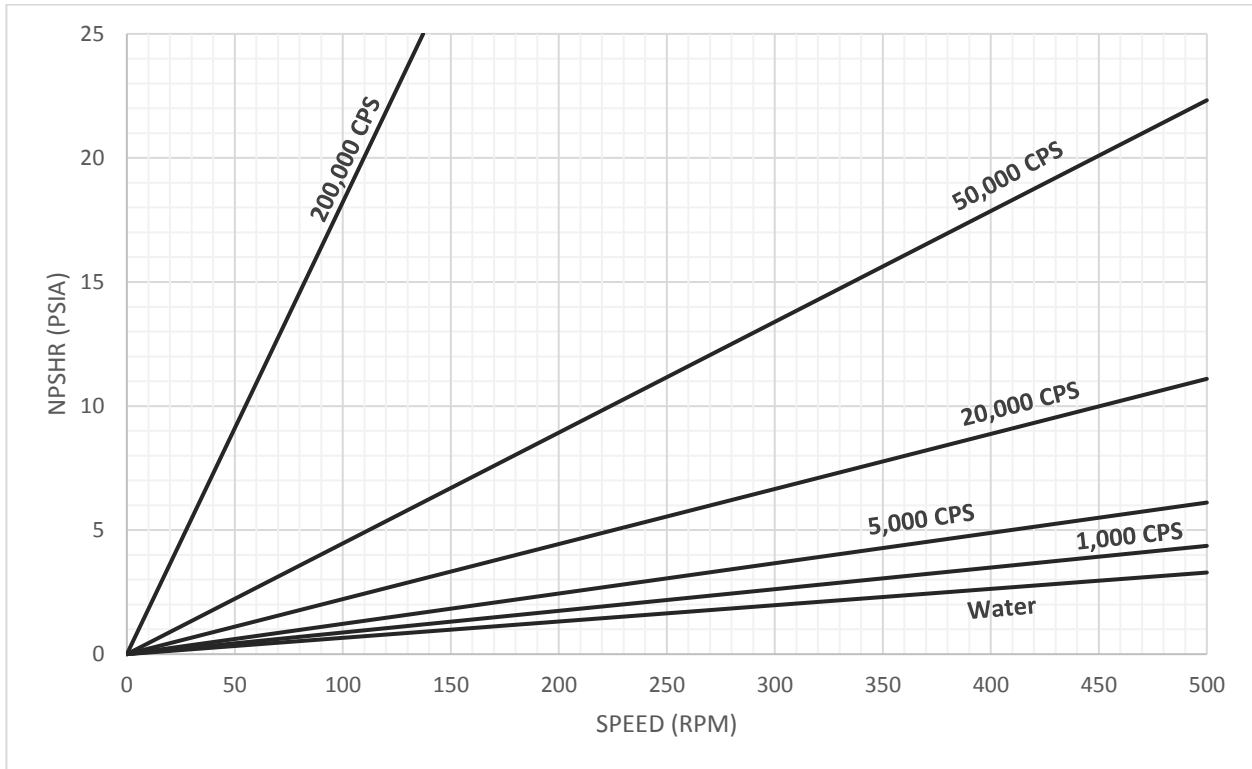
$c$  = displacement (0.88 gal/rev or 3.34 L/rev)



## JRZL 450 NPSHR Curves

# Rotary Lobe Pump JRZL450

NET POSITIVE SUCTION HEAD REQUIRED  
PORT SIZE: 5 X 5



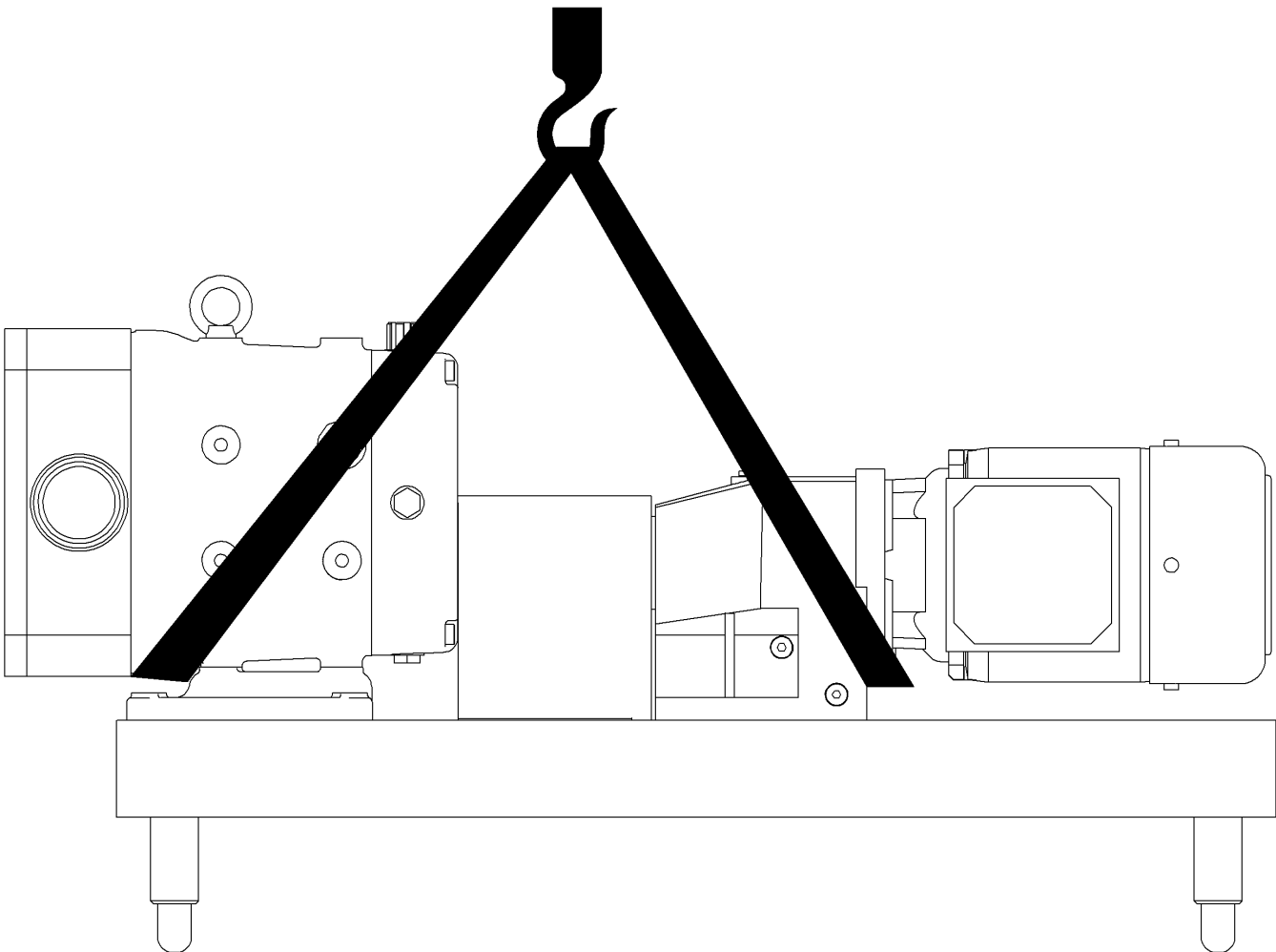
## Unpacking

Carefully unpack all parts of the pump and inspect for damage that may have occurred during shipment. Report any damages to the carrier immediately.

The ports on the pump are protected with a plastic cover. If any covers are missing or damaged, inspect the ports on the pump thoroughly for any damage.

If you are receiving a complete base mounted unit, please check shaft alignment as it may have changed during shipment.

The drawing below shows how the pump should be lifted. Ensure that the lifting equipment is correctly rated.

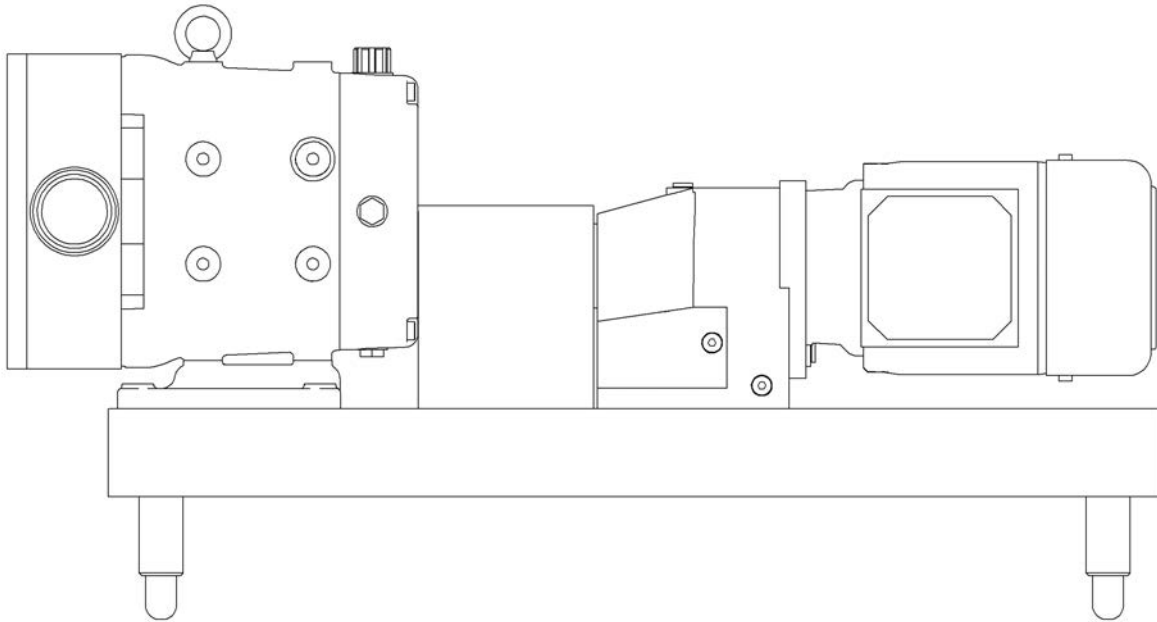


# Installation & Start Up

## Mounting Configurations

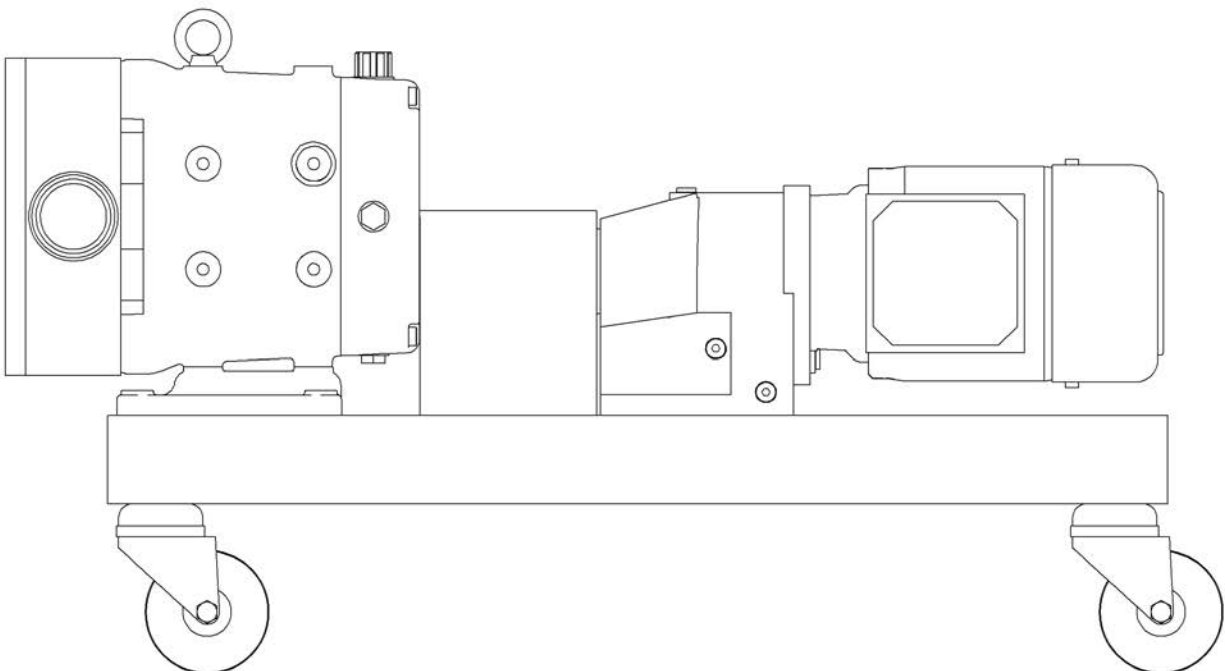
### Pump Mounting Adjustable:

- Adjustable leg base, commonly used for sanitary pumps for wash down under base. Can be easily moved or repositioned.



### Pump Mounting Casters:

- Portable bases – for movement to different locations. Can also be mounted on a cart with handles.

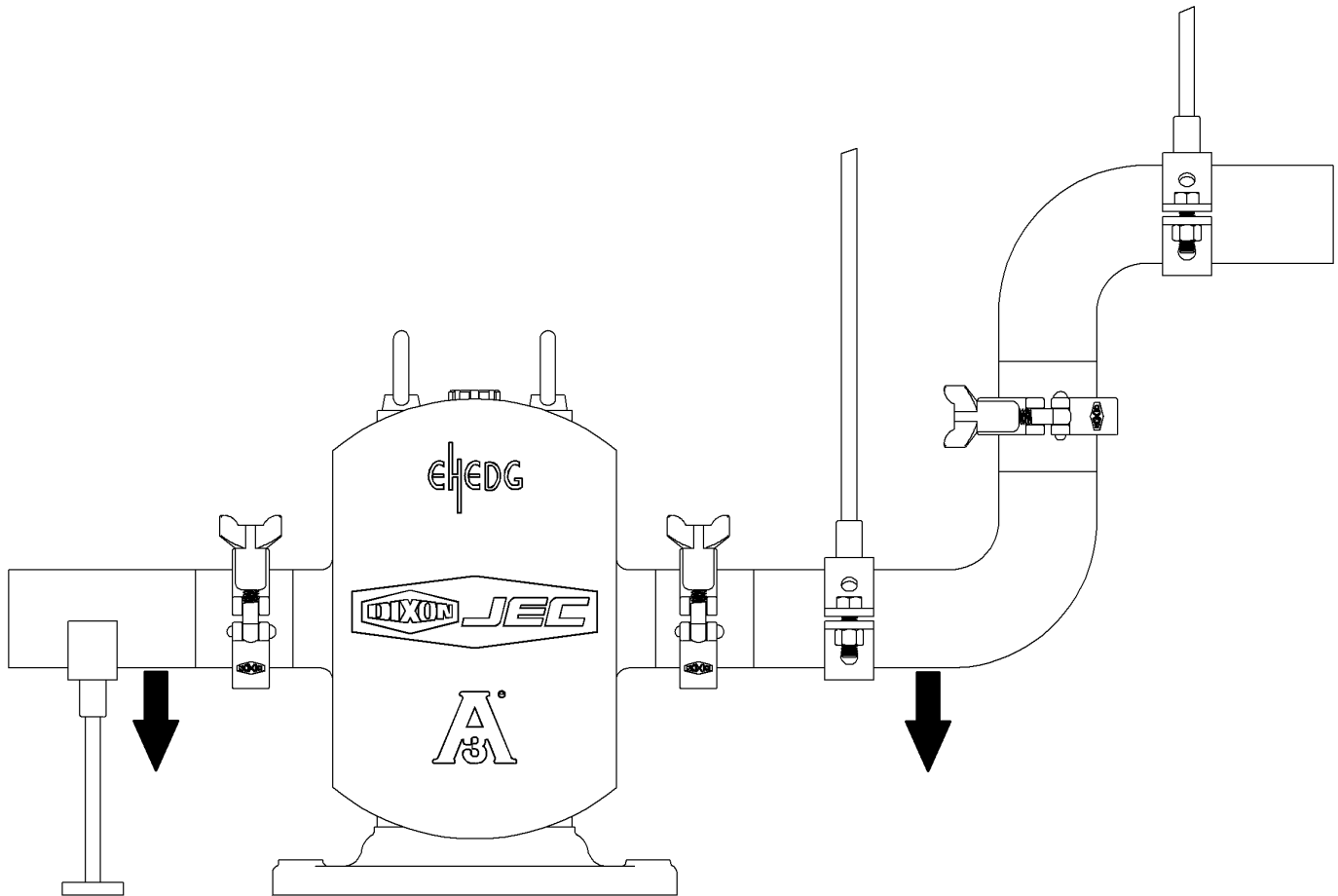


# Installation & Start Up

## Proper Installation

### Piping Support:

- Weight of piping and fluid – support piping independently with hangers or pedestals. On rectangular inlet flange pumps, hopper should also be supported independently.

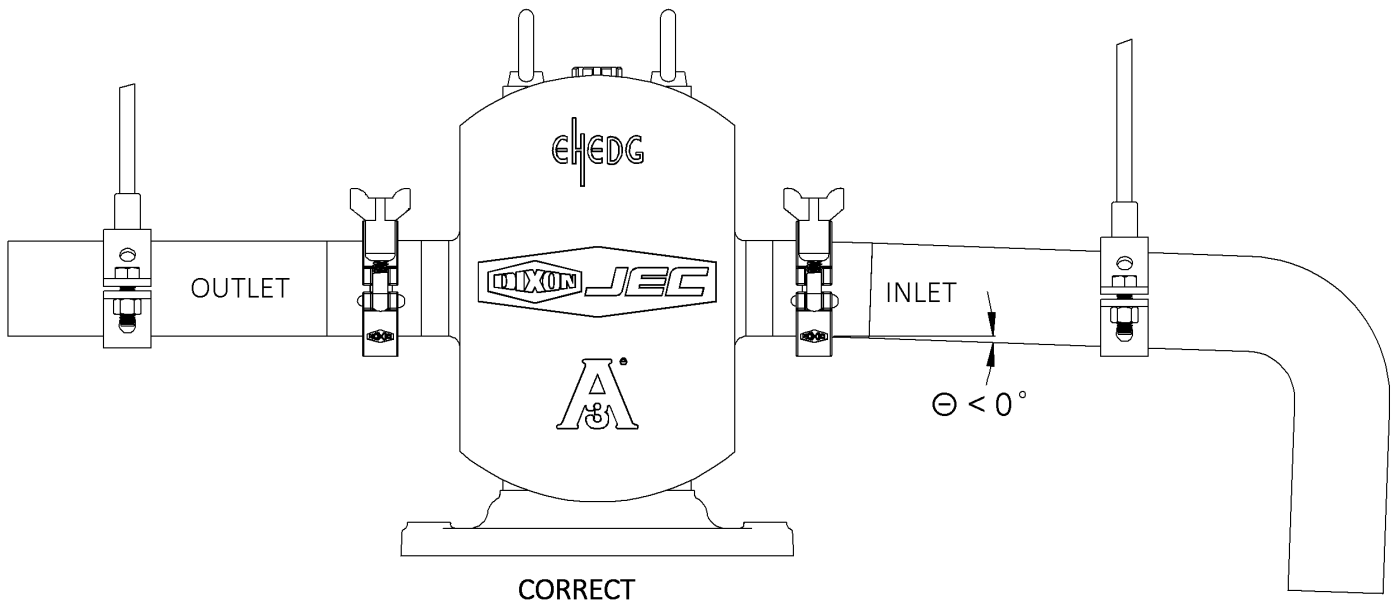
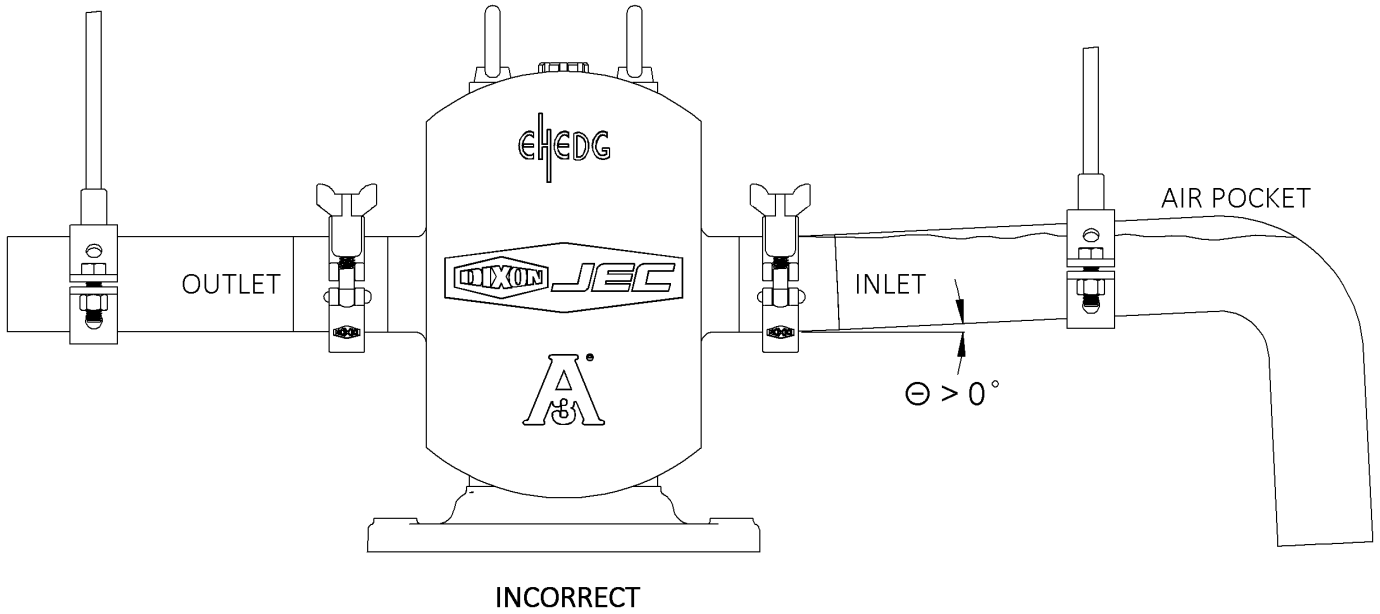


# Installation & Start Up

## Proper Installation (continued)

### Piping Slope:

- Inlet side – slope piping up to inlet to avoid air pocket.



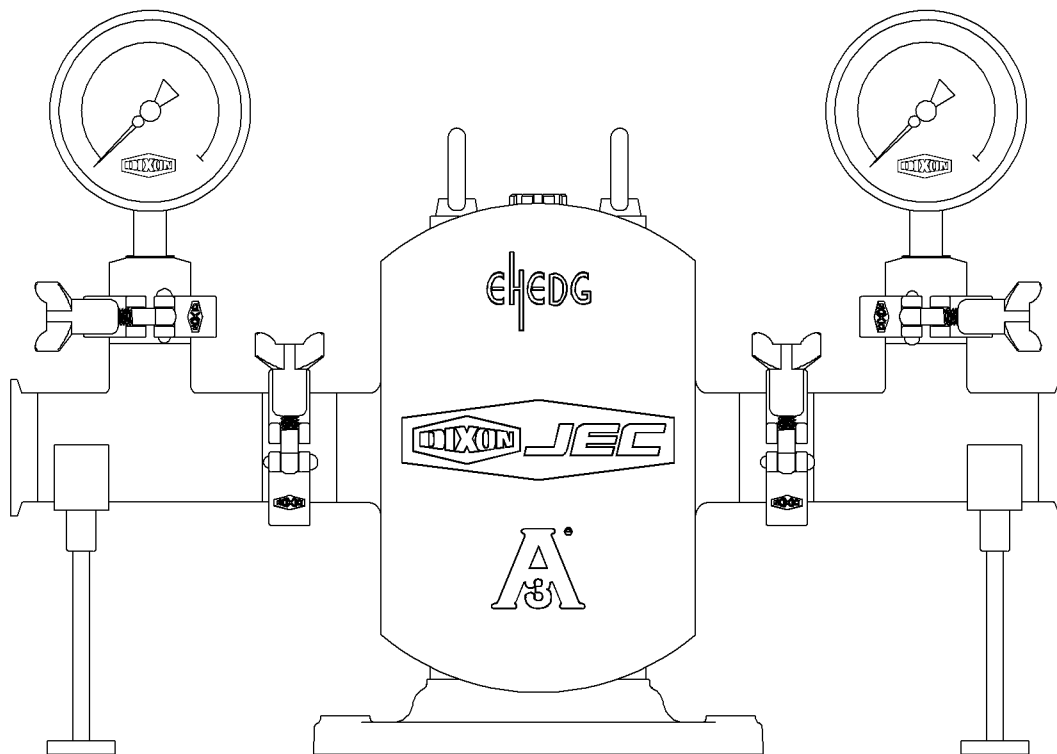
# Installation & Start Up

## Proper Installation (continued)

### Pressure Gauges:

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

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

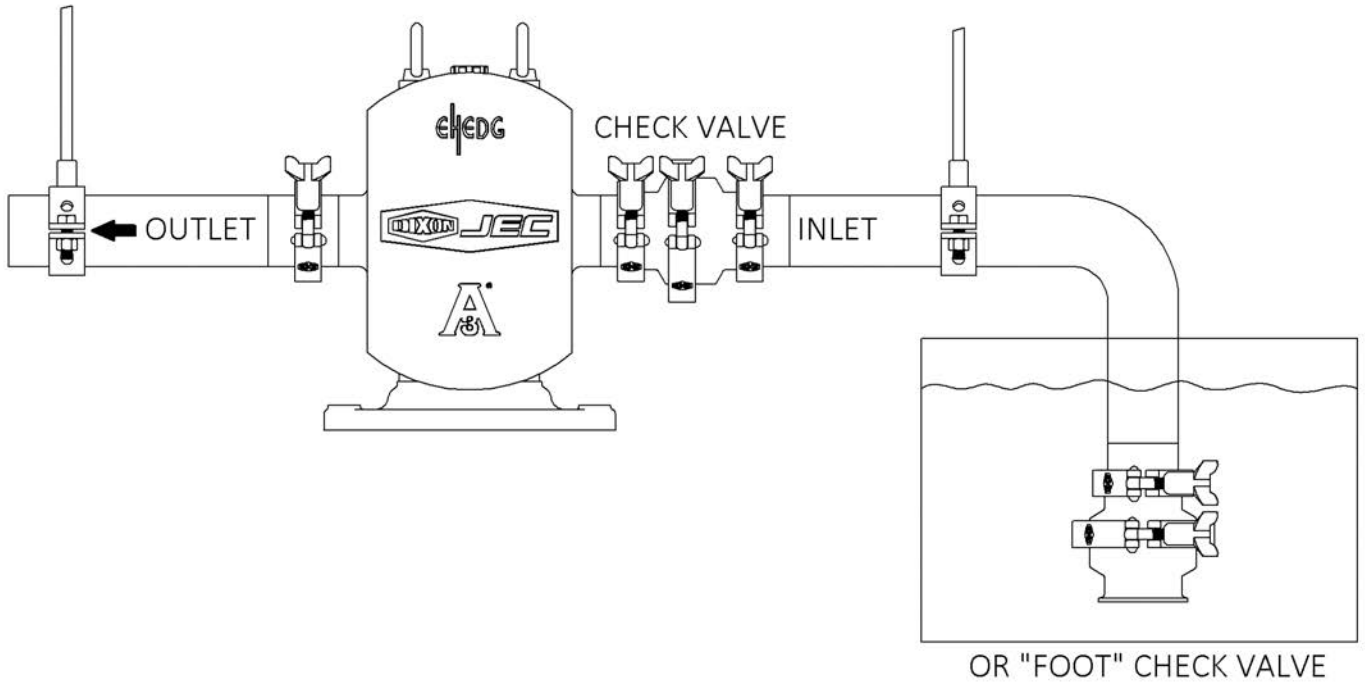


# Installation & Start Up

## Proper Installation (continued)

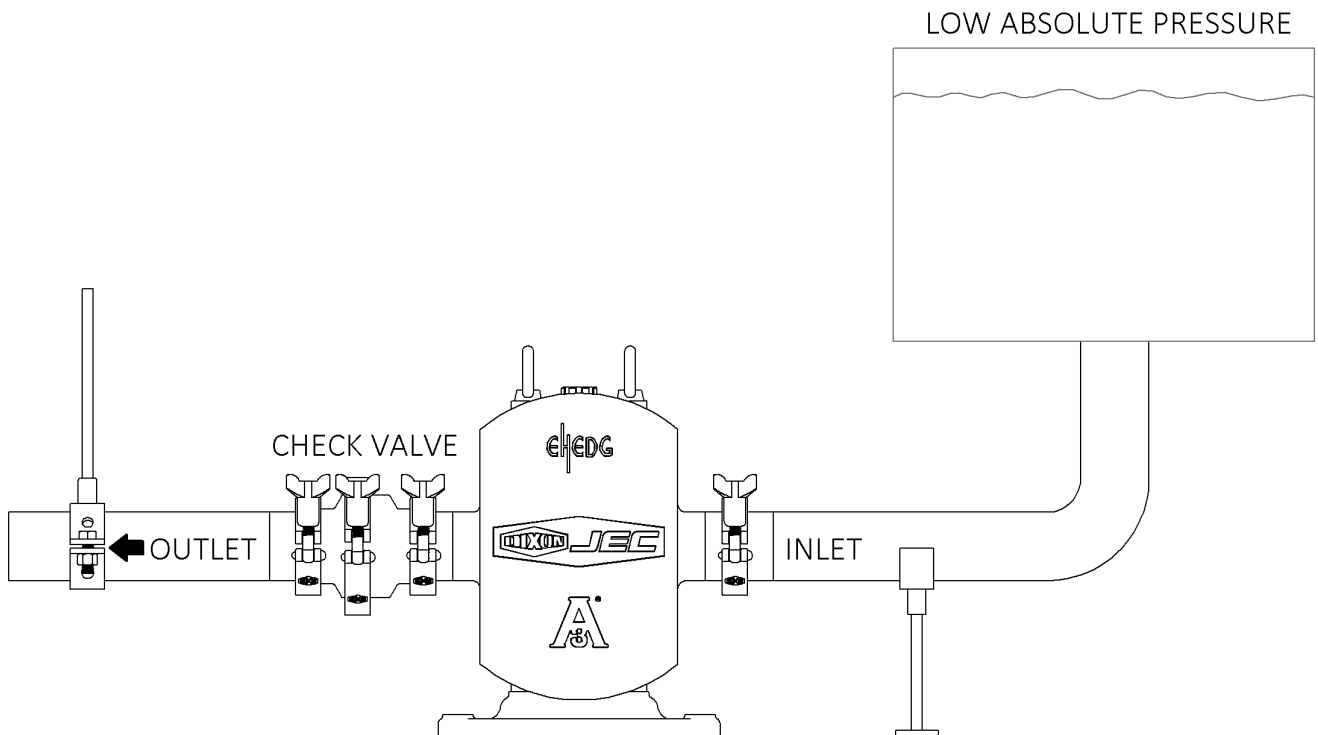
### Inlet Check Valve:

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



### Outlet Check Valve:

- 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)

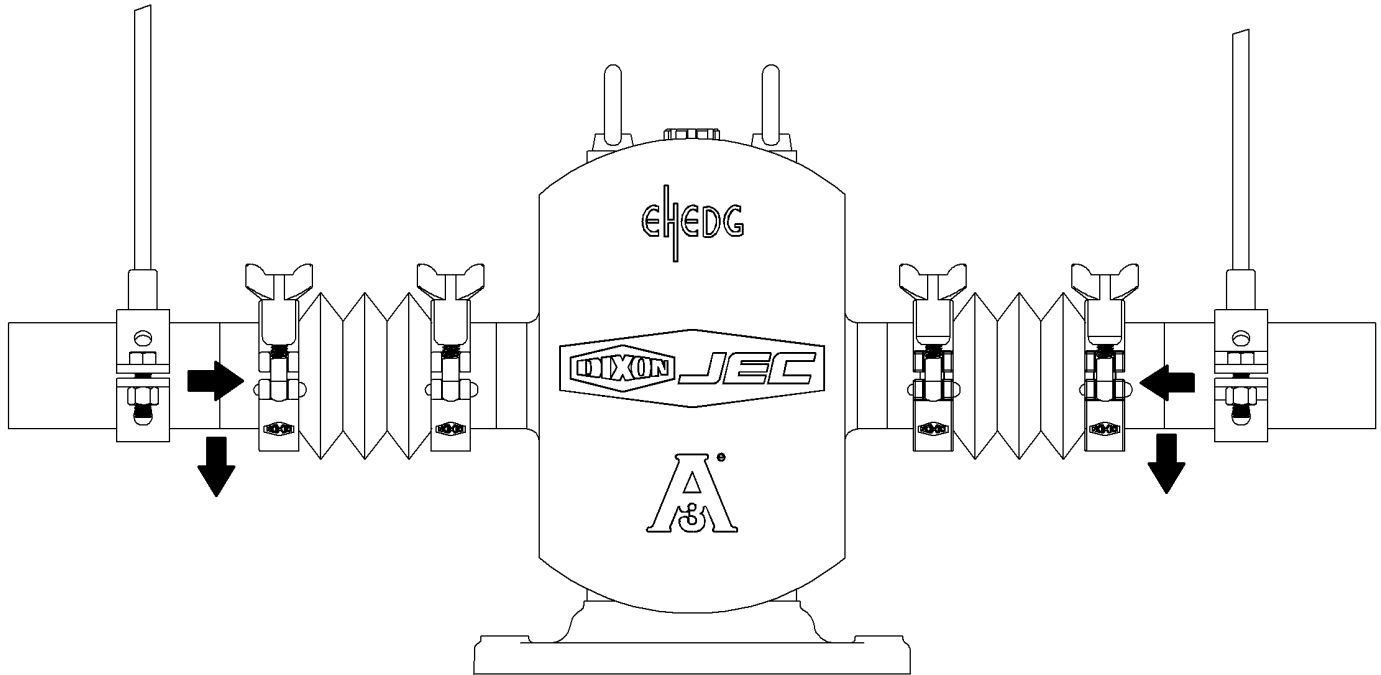


# Installation & Start Up

## Proper Installation (continued)

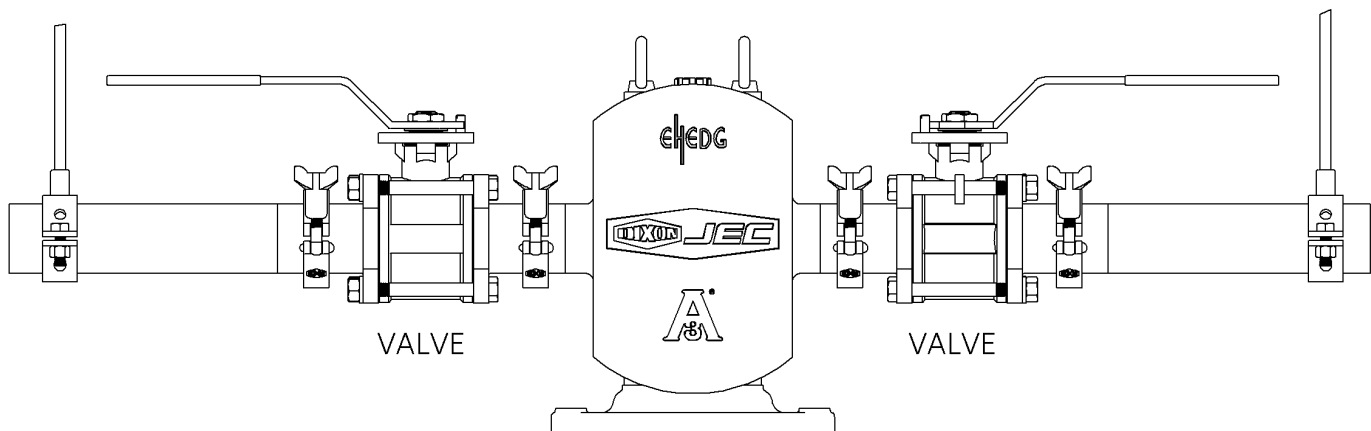
### Thermal Expansion:

- 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.



### Isolation Valves:

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



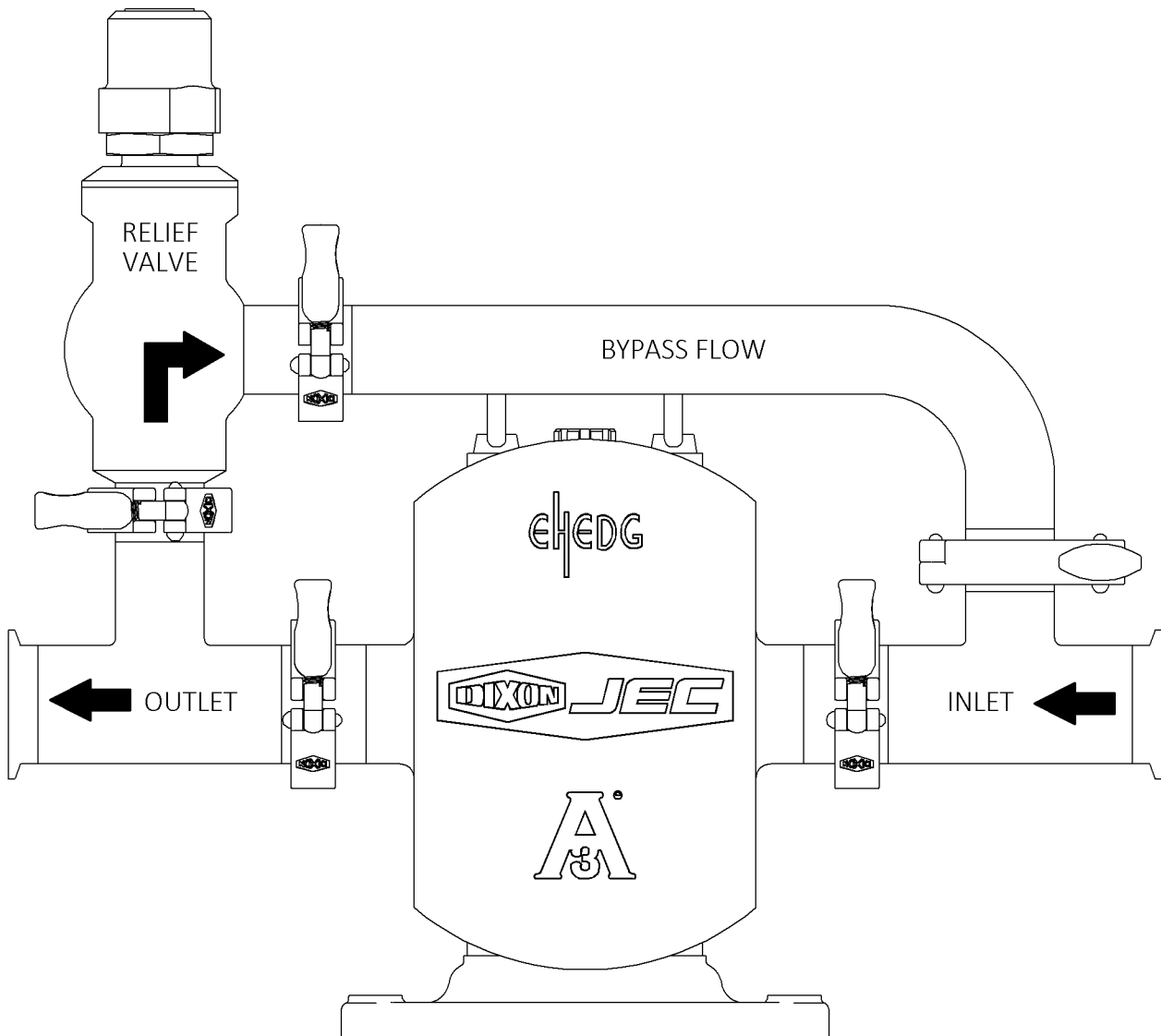


## Installation & Start Up

### Proper Installation (continued)

#### Relief Loop:

- 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.

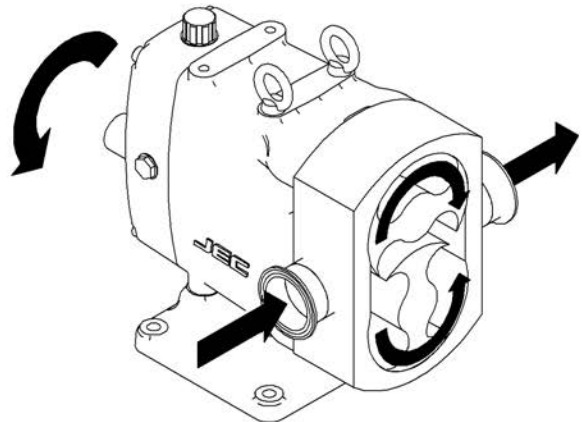
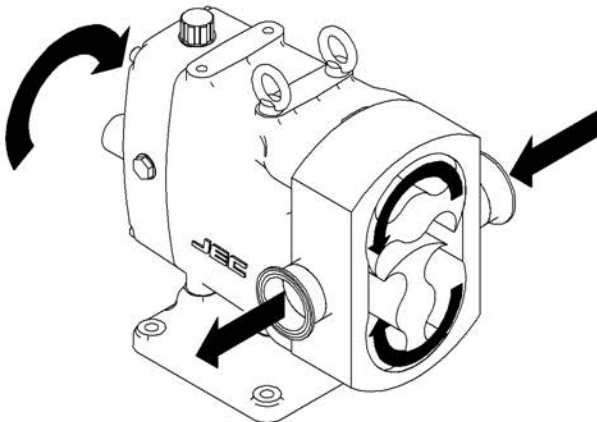
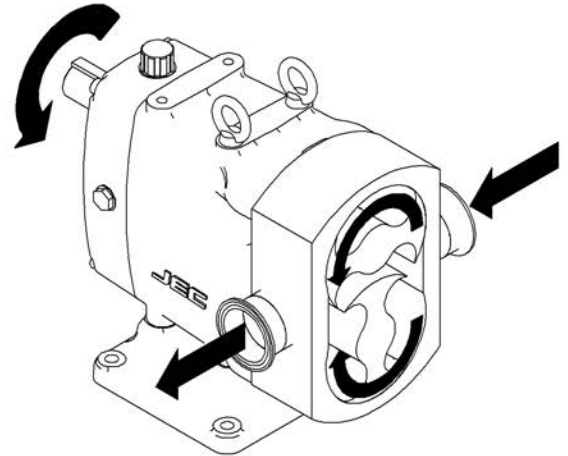
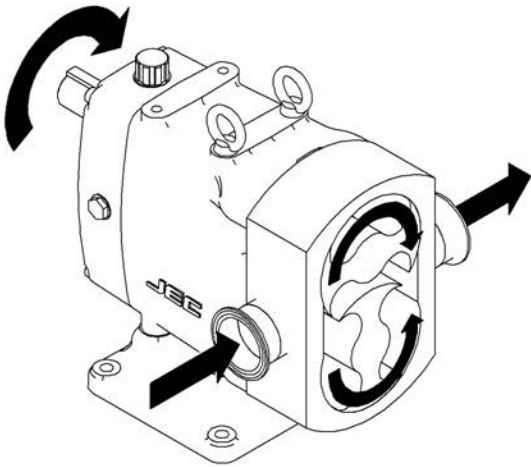


# Installation & Start Up

## At Start Up

### Pump Flow:

- All pumps are labeled with flow direction based on motor being wired for clockwise rotation. If motor is wired for counterclockwise rotation, flow direction will be opposite of what is indicated on pump head.

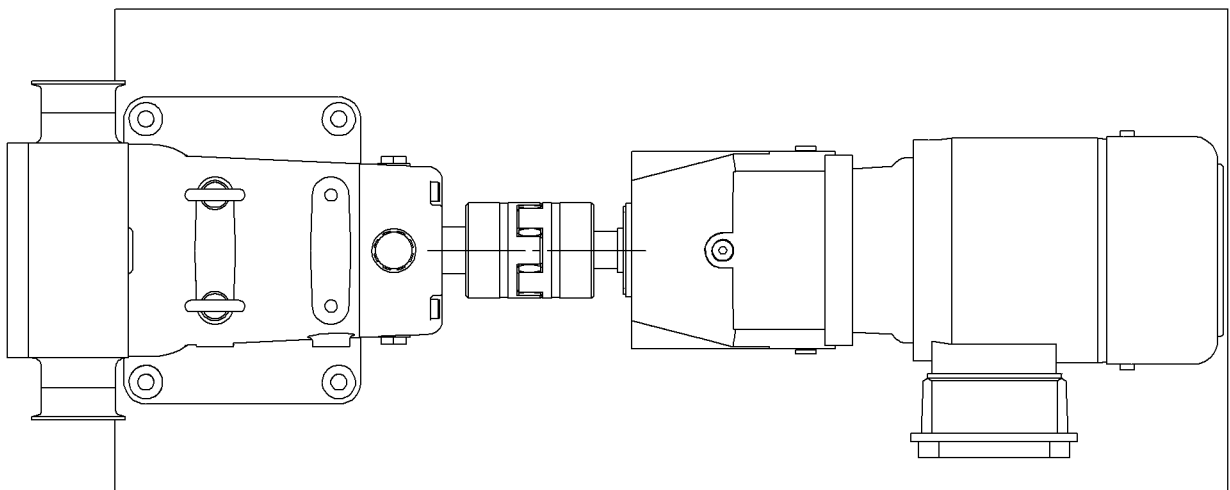
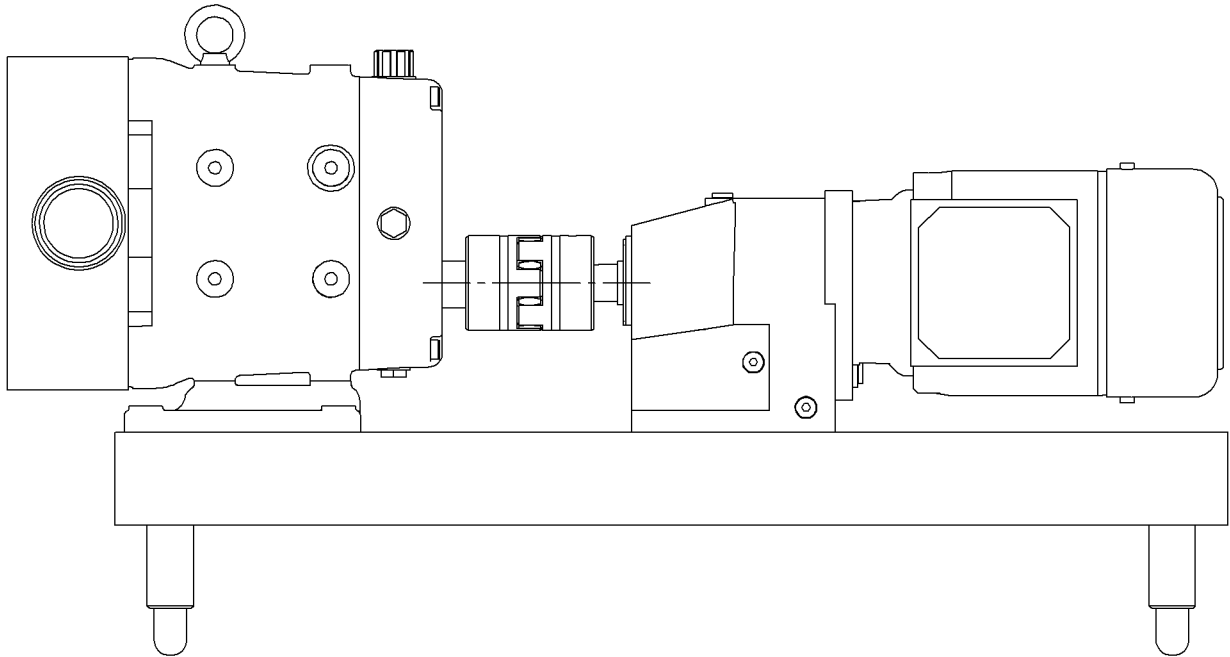


# Installation & Start Up

## At Start Up

### Pump Alignment:

- 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 possible.
- Check angular alignment using feeler or taper gauge.
- Adjust to get equal dimension at all points – at the same time, set space between coupling halves to the coupling manufacturer's recommended distance.
- Note: Pump is aligned prior to shipping, after installation verify alignment as misalignment may have occurred during shipment.



## Tools Needed

- Rotor tool
- Plastic dowel
- Open ended wrench set
- Rubber mallet
- Flat head screw driver
- Feeler gauges
- Hex keys
- O-ring pick
- Spanner wrench
- Rotor extraction tool (optional)

Additional tools needed when assembling or disassembling gear box

- Spanner wrench
- Arbor press or bearing puller

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## Maintenance

### Pump Housing Disassembly - Single Mechanical Seal

**!** Prior to removal of pump, the shut-off valves in the suction and discharge lines must be closed. If there is any risk that product may harden, crystallize or freeze in the pump it should be thoroughly drained and cleaned immediately after use. Same attention applies if there is a seal flush option. Power needs to be locked out to prevent unintended start of the pump.

Note: Reference numbers are listed in the sectional view located on pages 61-73.

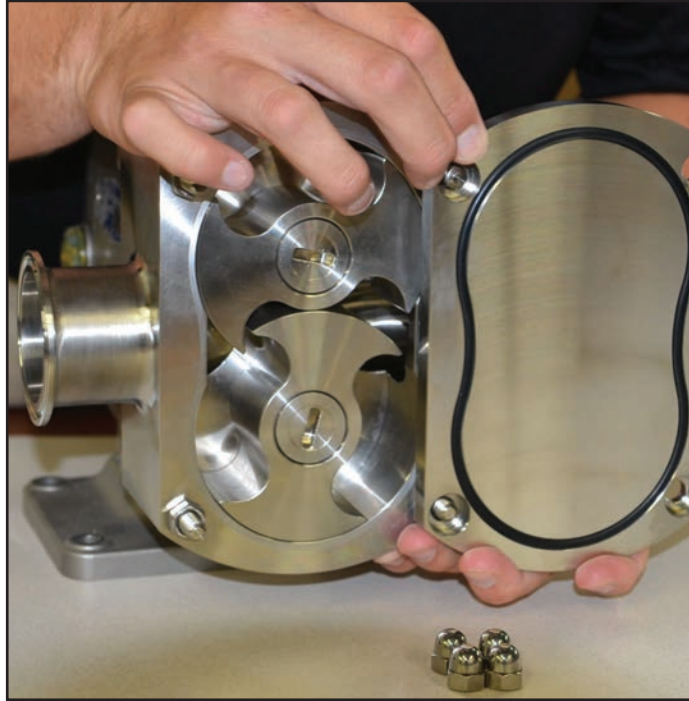
1. Loosen and remove the four hex nuts (33) from the front cover.



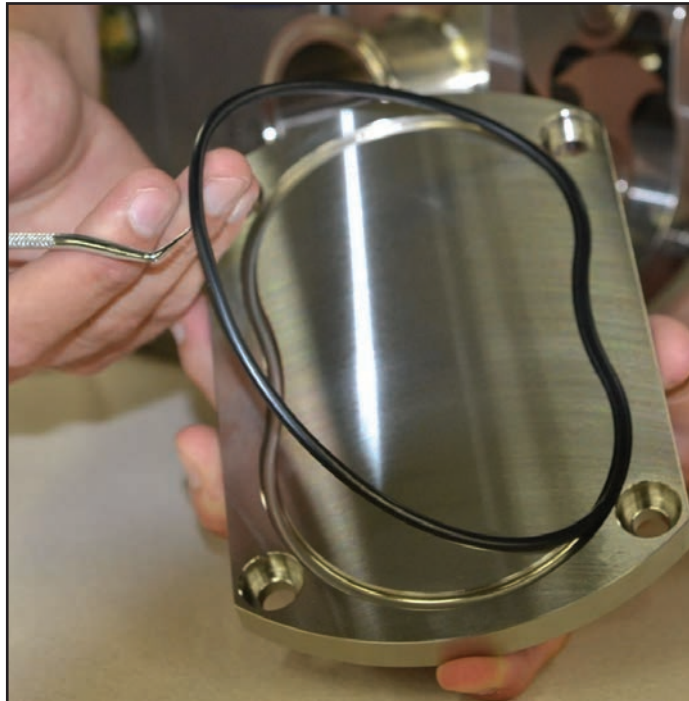
## Maintenance

### Pump Housing Disassembly - Single Mechanical Seal (continued)

2. Remove the cover (32). If it is stuck, tap the cover with a soft hammer.



3. Remove the cover O-ring (34).

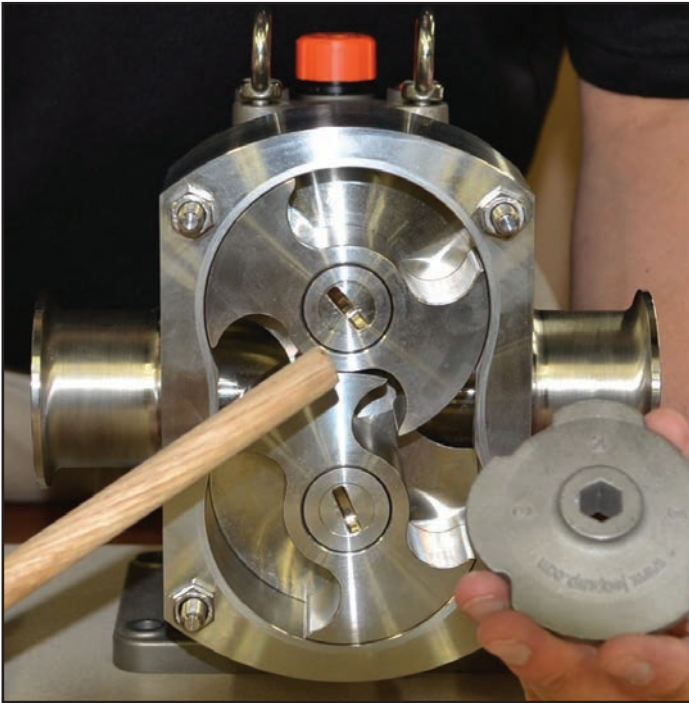




## Maintenance

### Pump Housing Disassembly - Single Mechanical Seal (continued)

4. Remove the rotor retaining bolts (35). To remove the rotor retaining bolts, place the dowel between the rotors. Turn the first rotor bolt counter-clockwise.



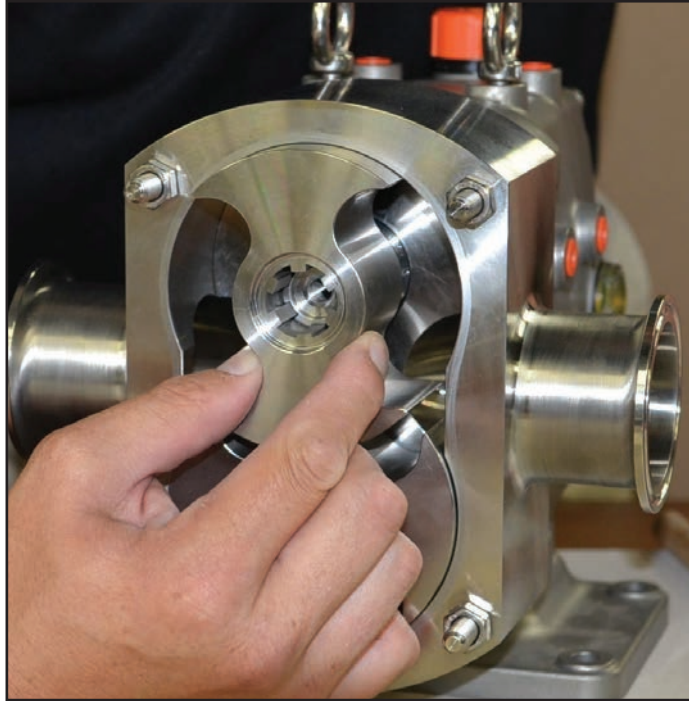
5. Remove the rotor bolts (35), spring washers (36) and O-ring (37).



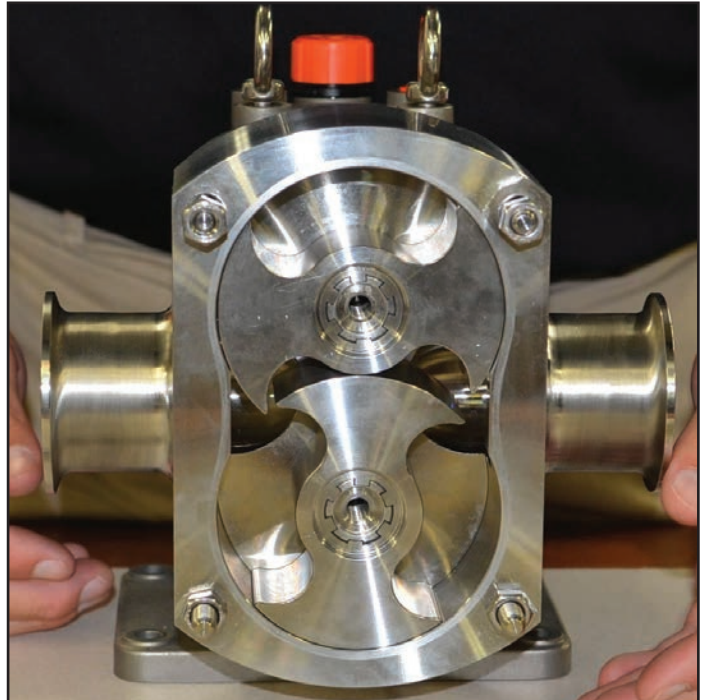
## Maintenance

### Pump Housing Disassembly - Single Mechanical Seal (continued)

6. Remove the rotors (38) from the pump housing (31) by pulling straight.



6a. If the rotors (38) will not come out freely, remove the stud bolt hex nuts (46) and then tap on the back of the inlet and outlet ports with a soft hammer. Once the rotors (38) are loose, then push the casing (31) back towards the gear box and remove the rotors.

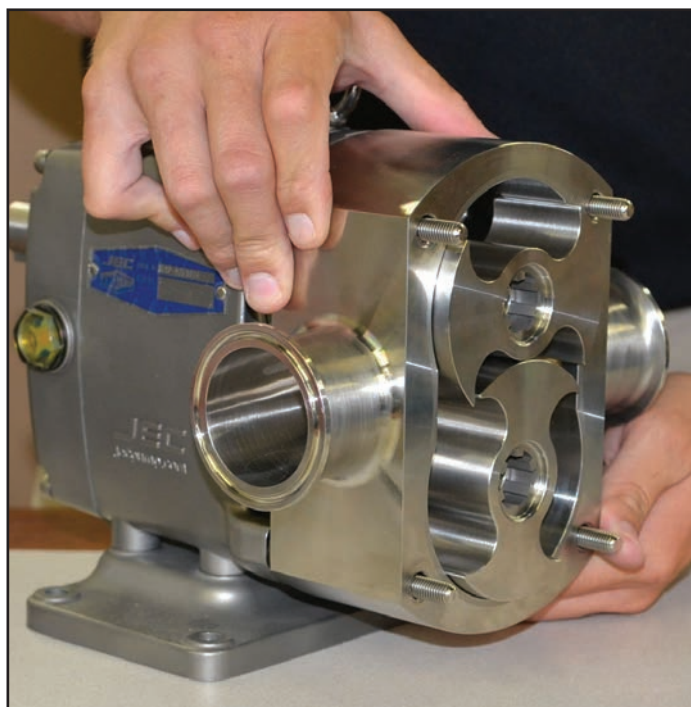
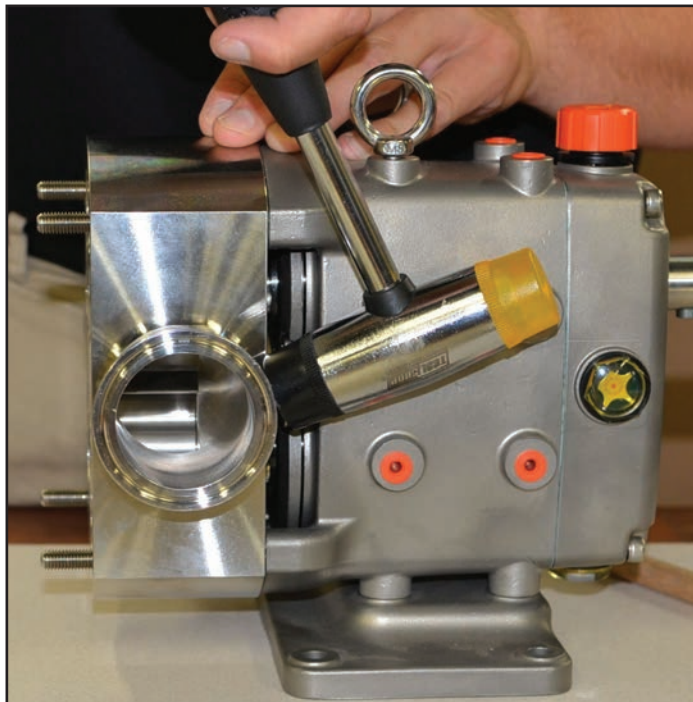




# Maintenance

## Pump Housing Disassembly - Single Mechanical Seal (continued)

6a, continued

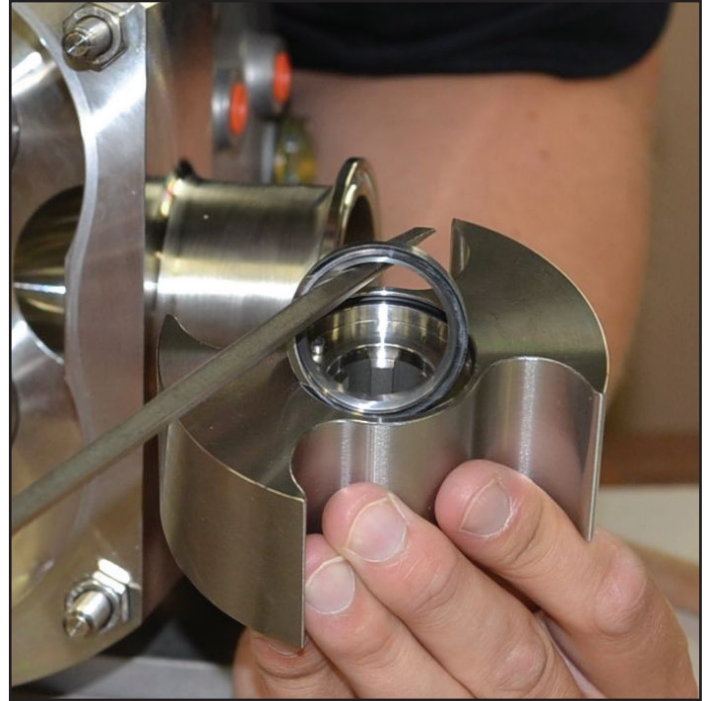




## Maintenance

### Pump Housing Disassembly - Single Mechanical Seal (continued)

7. Remove the seal ring (52) from the back of the rotor (38).



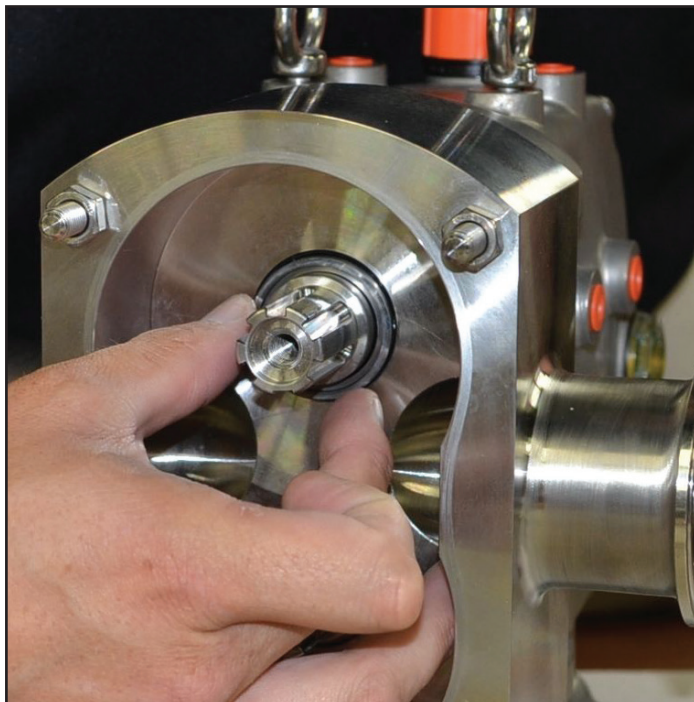
8. Remove the rotor O-rings (51).



## Maintenance

### Pump Housing Disassembly - Single Mechanical Seal (continued)

9. Remove the casing seal rings (52).



10. Remove the stud bolt hex nuts (46).

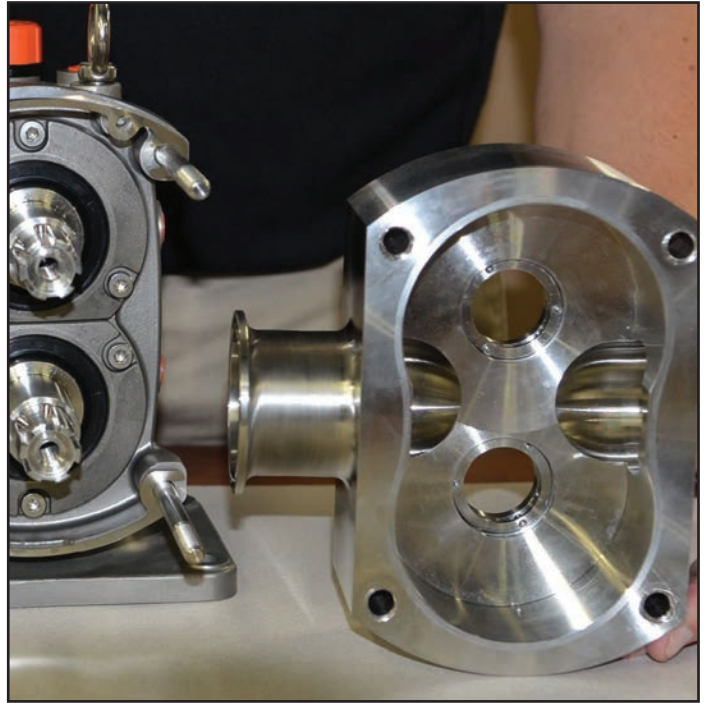
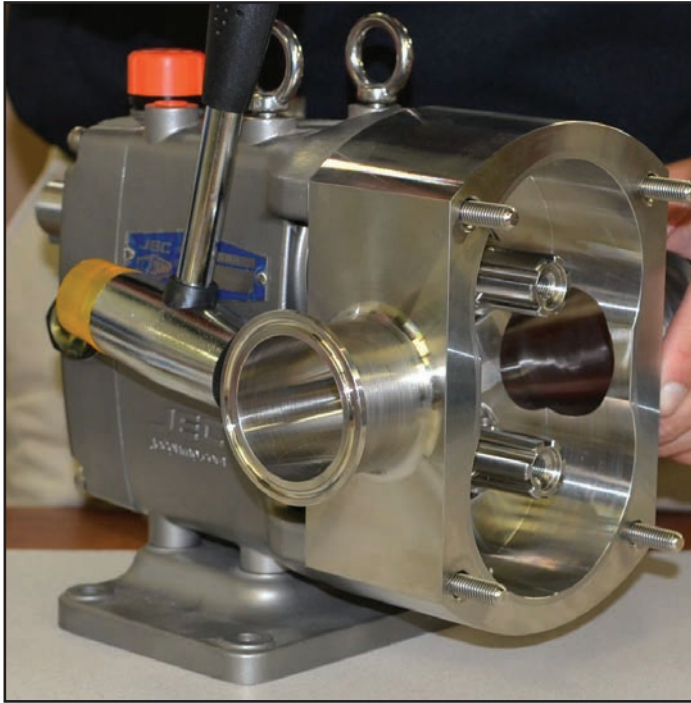




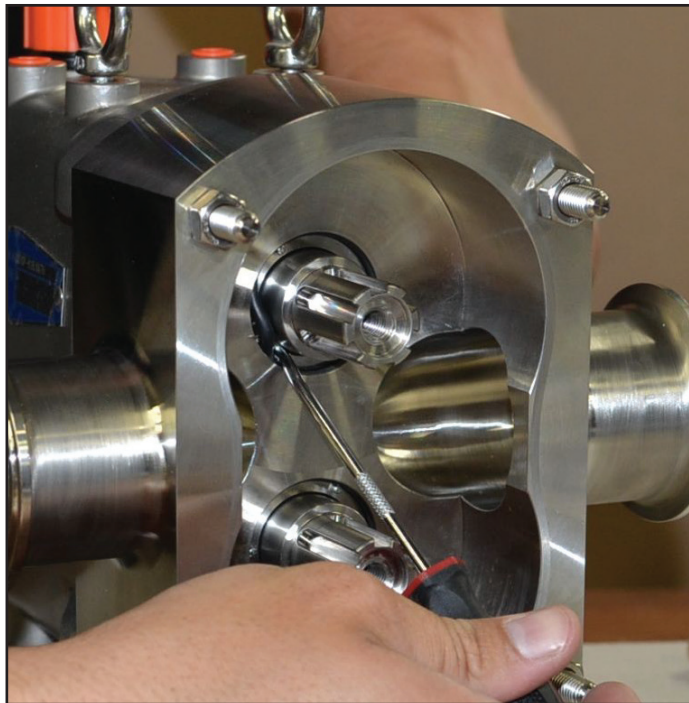
## Maintenance

### Pump Housing Disassembly - Single Mechanical Seal (continued)

11. Remove the rotor case (31).



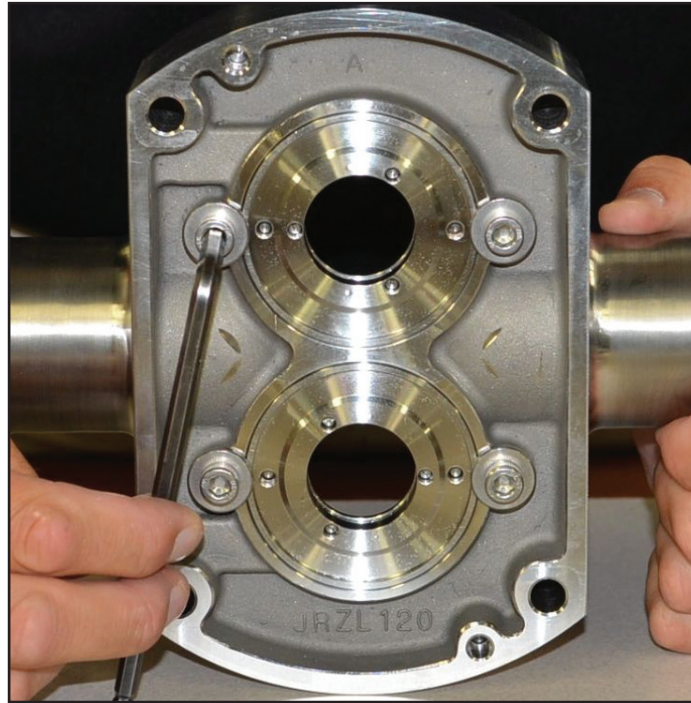
12. Remove the rotor case O-ring (53). This can be done before you remove the casing or after.



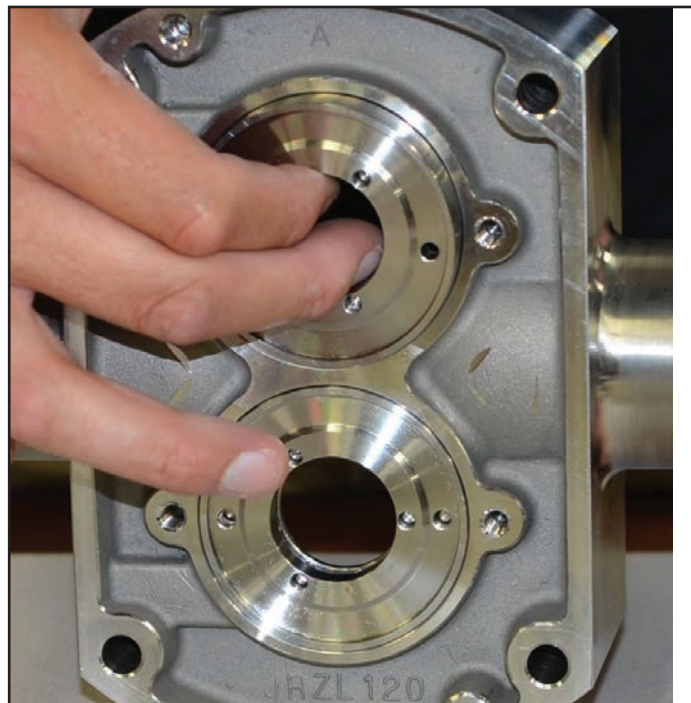
## Maintenance

### Pump Housing Disassembly - Single Mechanical Seal (continued)

13. On the back of the rotor case, remove the four mechanical seal gland wrench bolts (42 & 43).



14. Remove the single seal body cases (54).



## Maintenance

### Pump Housing Disassembly - Double Mechanical Seal

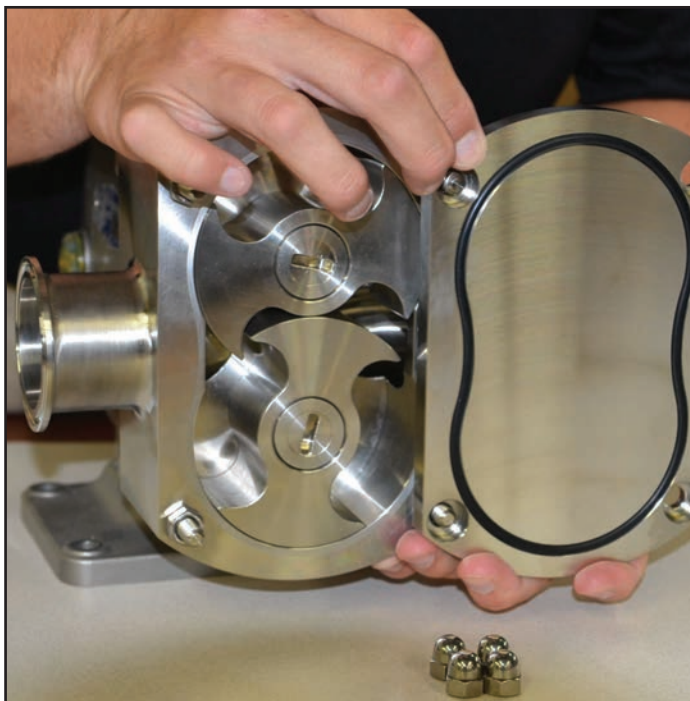
**!** Prior to removal of pump, the shut-off valves in the suction and discharge lines must be closed. If there is any risk that product may harden, crystallize or freeze in the pump it should be thoroughly drained and cleaned immediately after use. Same attention applies if there is a seal flush option. Power needs to be locked out to prevent unintended start of the pump.

Note: Reference numbers are listed in the sectional view located on pages 61-73.

1. Loosen and remove the four hex nuts (33) from the front cover.



2. Remove the cover (32). If it is stuck, tap the cover with a soft hammer.

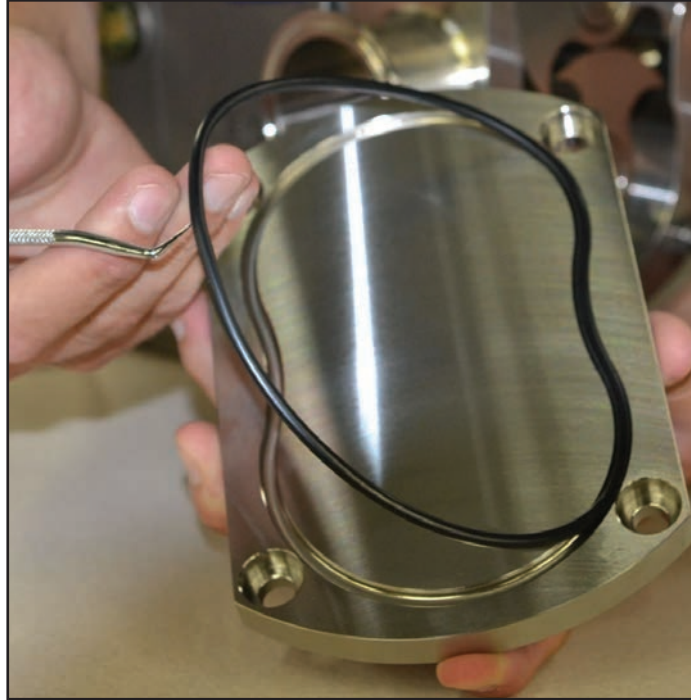




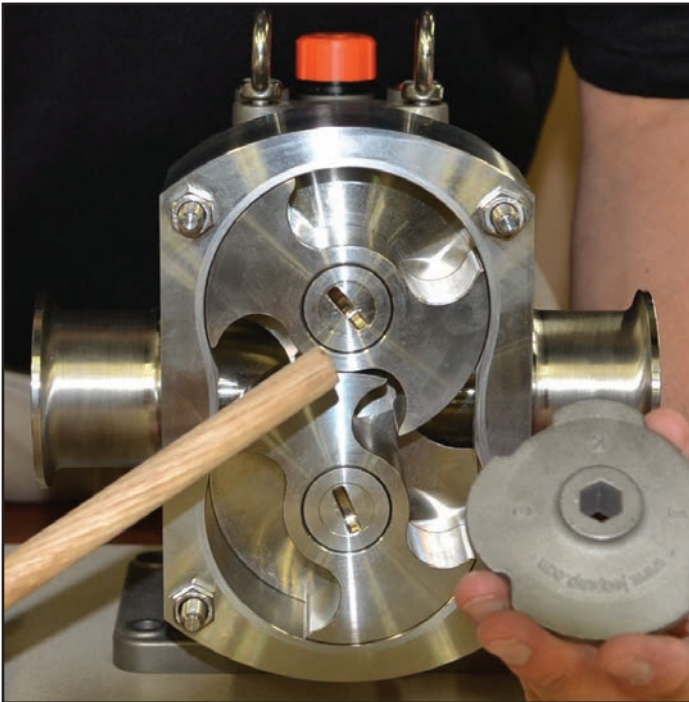
## Maintenance

### Pump Housing Disassembly - Double Mechanical Seal (continued)

3. Remove the cover O-ring (34).



4. Remove the rotor retaining bolts (35). To remove the rotor retaining bolts, place the dowel between the rotors. Turn the first rotor bolt counter-clockwise.



## Maintenance

### Pump Housing Disassembly - Double Mechanical Seal (continued)

5. Remove the rotor bolts (35), spring washers (36) and O-ring (37).



6. Remove the rotors (38) from the pump housing (31) by pulling straight.

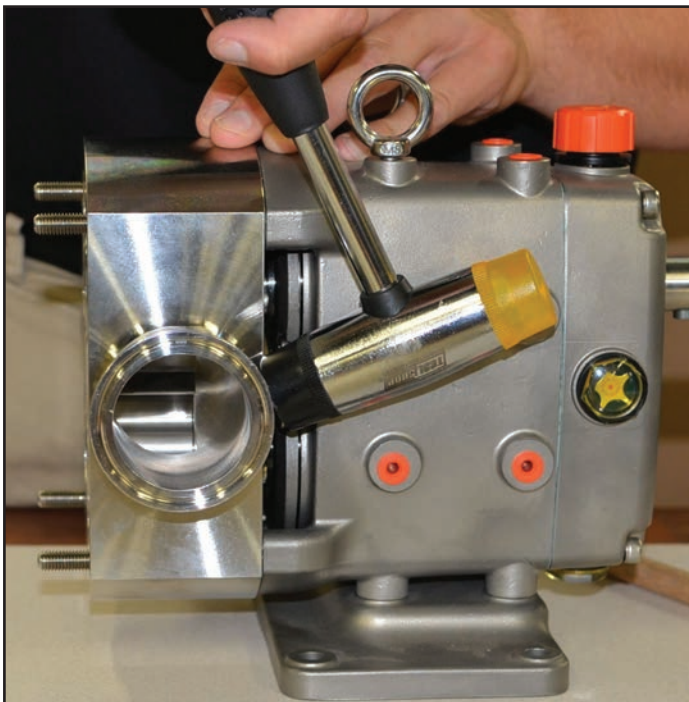
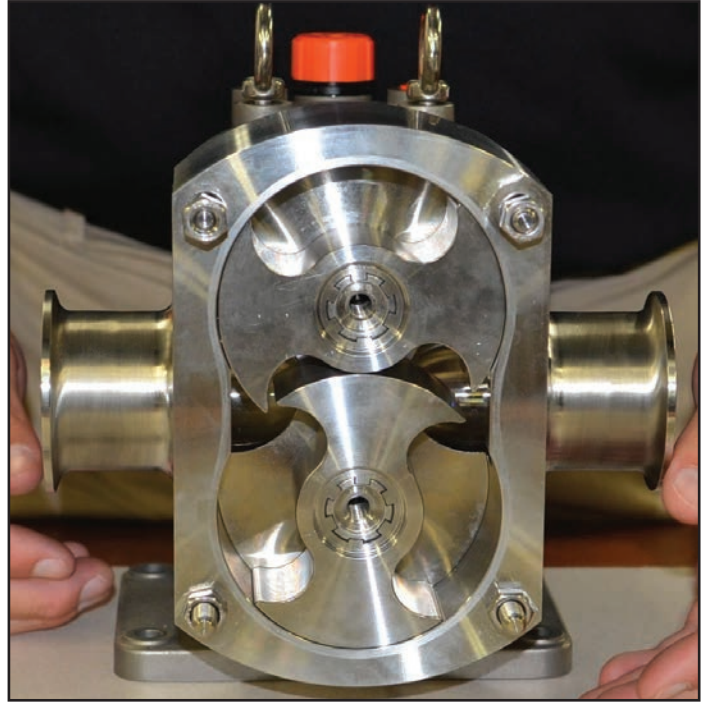




## Maintenance

### Pump Housing Disassembly - Double Mechanical Seal (continued)

**6a.** If the rotors (38) will not come out freely, remove the stud bolt hex nuts (46) and then tap on the back of the inlet and outlet ports with a soft hammer. Once the rotors (38) are loose, then push the casing (31) back towards the gear box and remove the rotors.

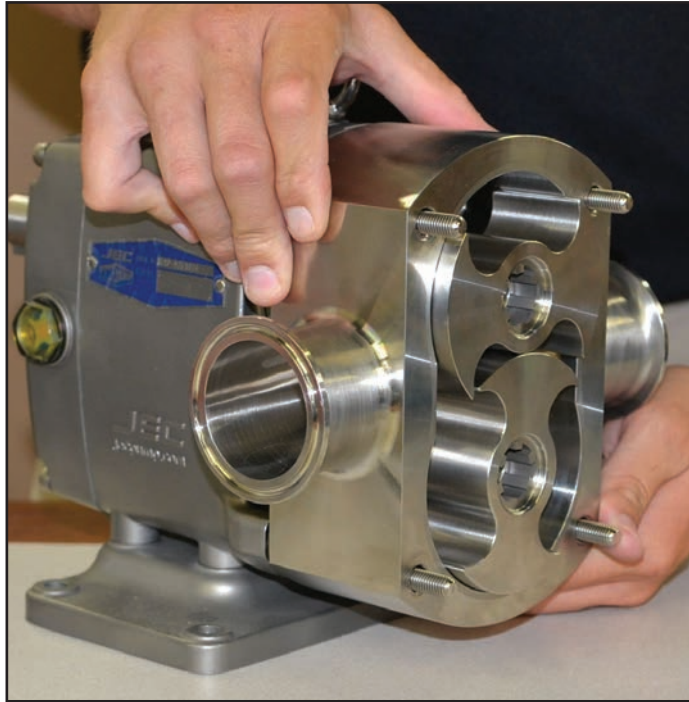




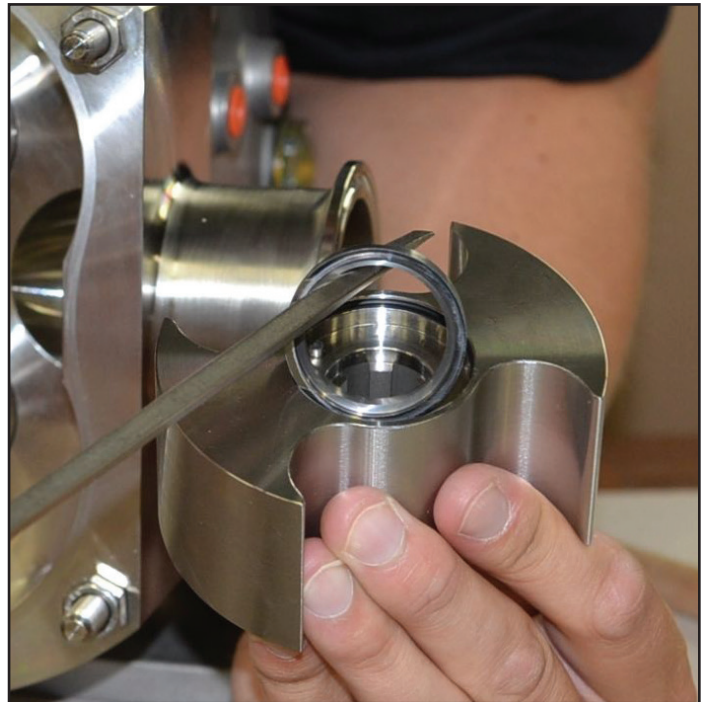
# Maintenance

## Pump Housing Disassembly - Double Mechanical Seal (continued)

6a, continued



7. Remove the seal ring (52) from the back of the rotor (38).



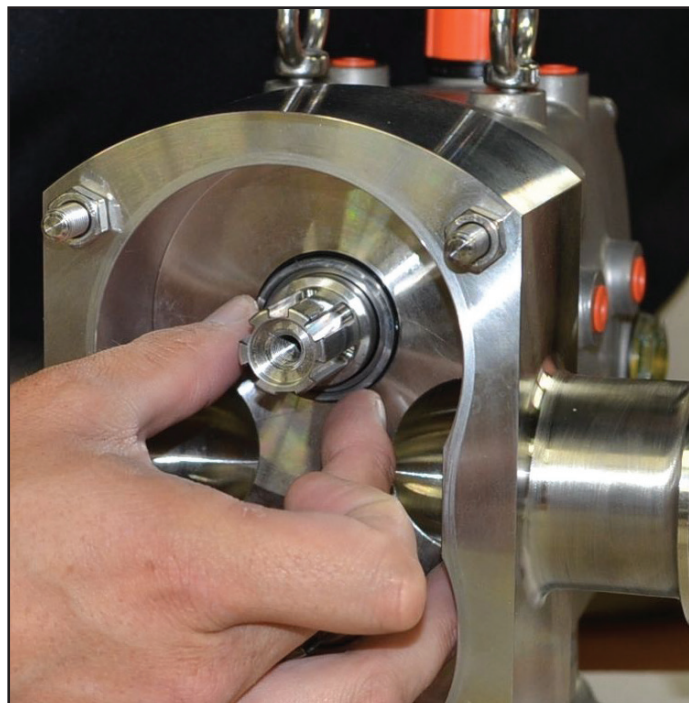
## Maintenance

### Pump Housing Disassembly - Double Mechanical Seal (continued)

8. Remove the rotor O-rings (51).



9. Remove the casing seal rings (52).





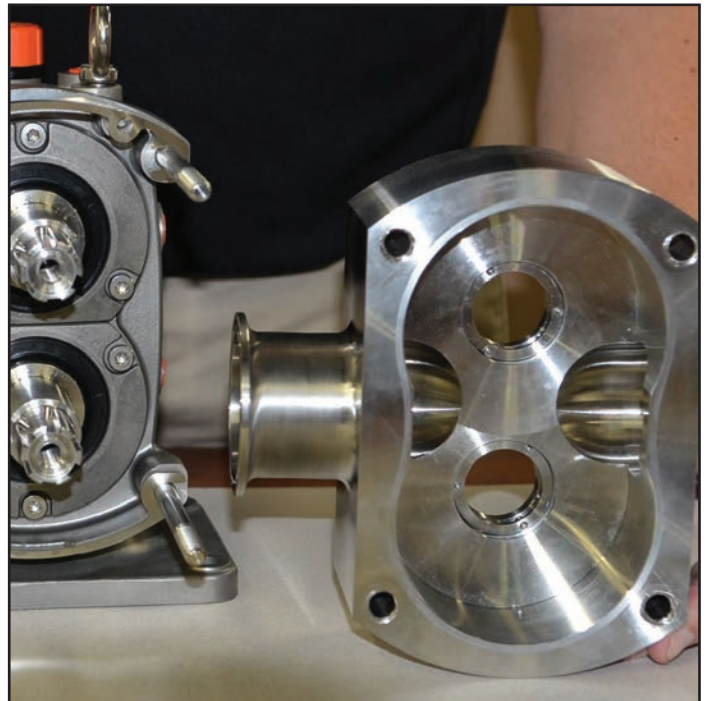
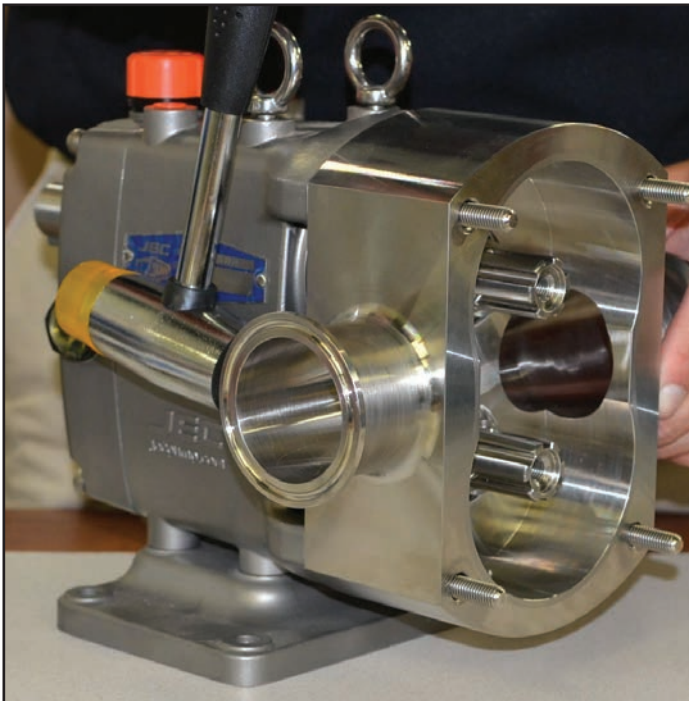
## Maintenance

### Pump Housing Disassembly - Double Mechanical Seal (continued)

10. Remove the stud bolt hex nuts (46).



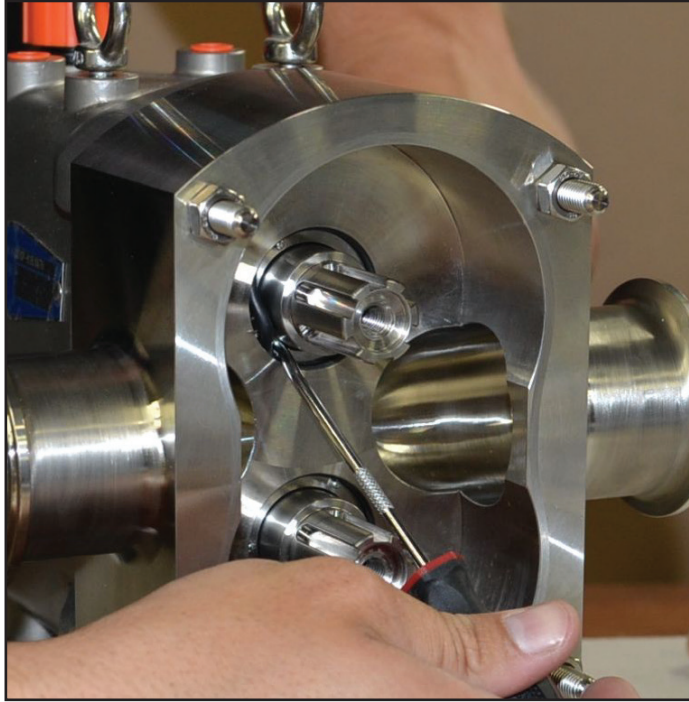
11. Remove the rotor case (31).



## Maintenance

### Pump Housing Disassembly - Double Mechanical Seal (continued)

12. Remove the rotor case O-ring (53). This can be done before you remove the casing or after.



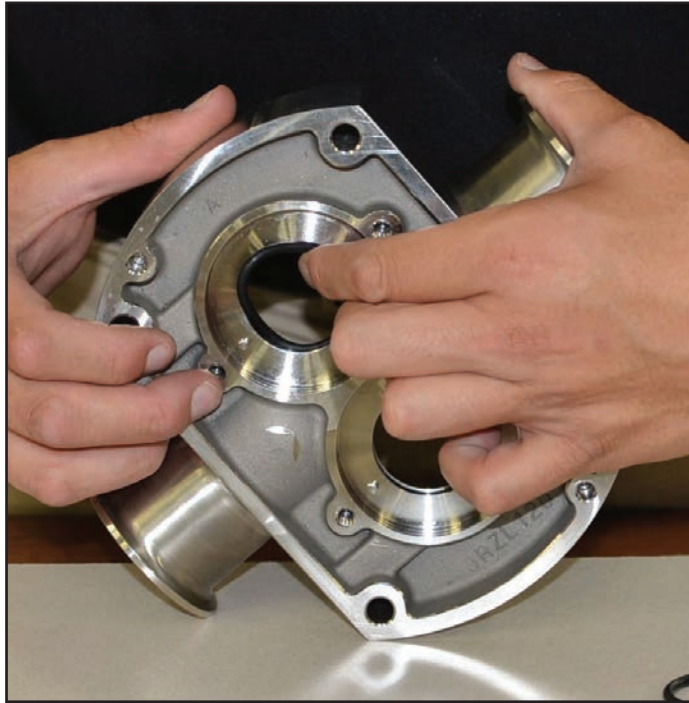
13. Remove seal body case (61) and seal O-ring (62).



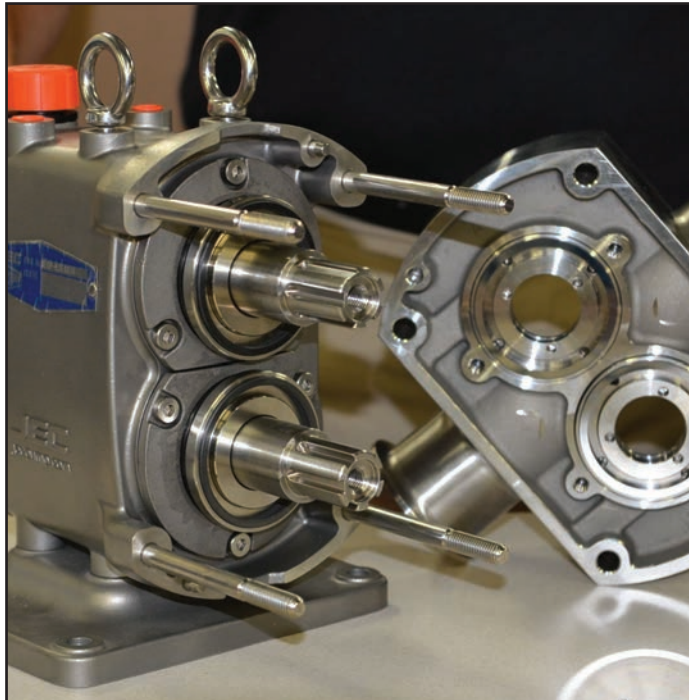
## Maintenance

### Pump Housing Disassembly - Double Mechanical Seal (continued)

14. Remove casing O-ring (53).



15. Remove shaft seal base (63).





## Maintenance

### Pump Housing Disassembly - Double Mechanical Seal (continued)

16. Remove shaft O-ring (64).



## Maintenance

### Pump Housing Disassembly - Single O-ring Seal

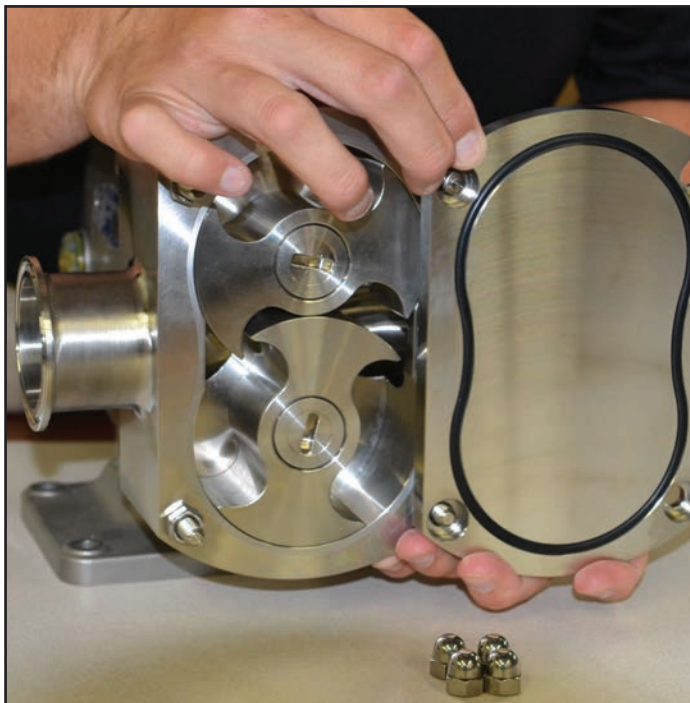
**!** Prior to removal of pump, the shut-off valves in the suction and discharge lines must be closed. If there is any risk that product may harden, crystallize or freeze in the pump it should be thoroughly drained and cleaned immediately after use. Same attention applies if there is a seal flush option. Power needs to be locked out to prevent unintended start of the pump.

Note: Reference numbers are listed in the sectional view located on pages 61-73.

1. Loosen and remove the four hex nuts (33) from the front cover.



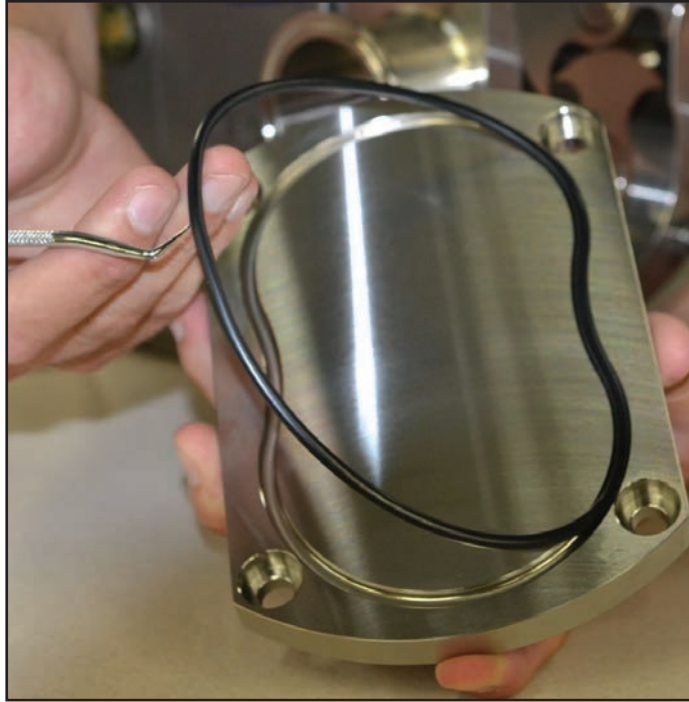
2. Remove the cover (32). If it is stuck, tap the cover with a soft hammer.



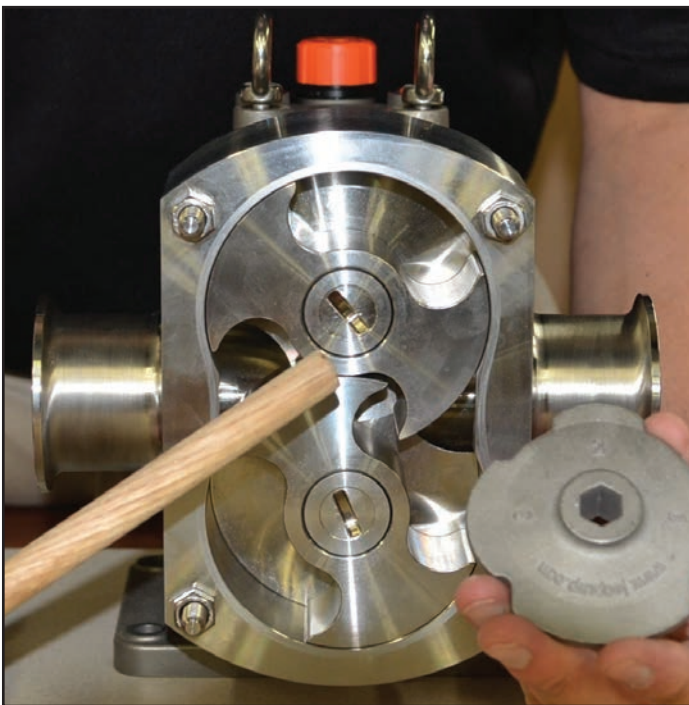
## Maintenance

### Pump Housing Disassembly - Single O-ring Seal (continued)

3. Remove the cover O-ring (34).



4. Remove the rotor retaining bolts (35). To remove the rotor retaining bolts, place the dowel between the rotors. Turn the first rotor bolt counter-clockwise.

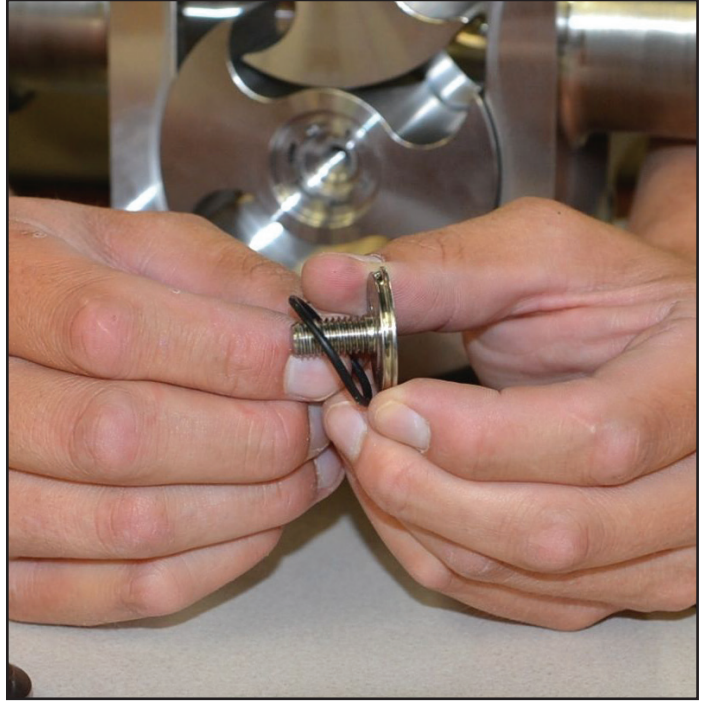




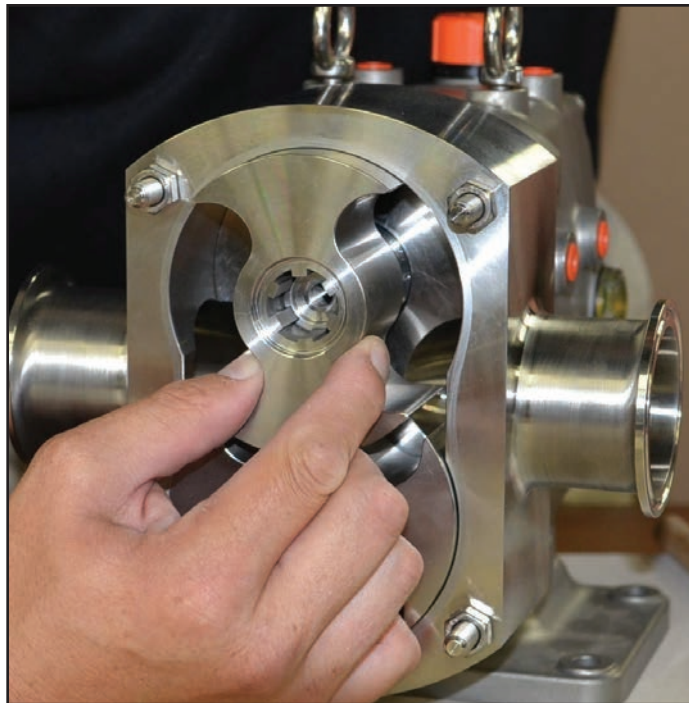
## Maintenance

### Pump Housing Disassembly - Single O-ring Seal (continued)

5. Remove the rotor bolts (35), spring washers (36) and O-ring (37).



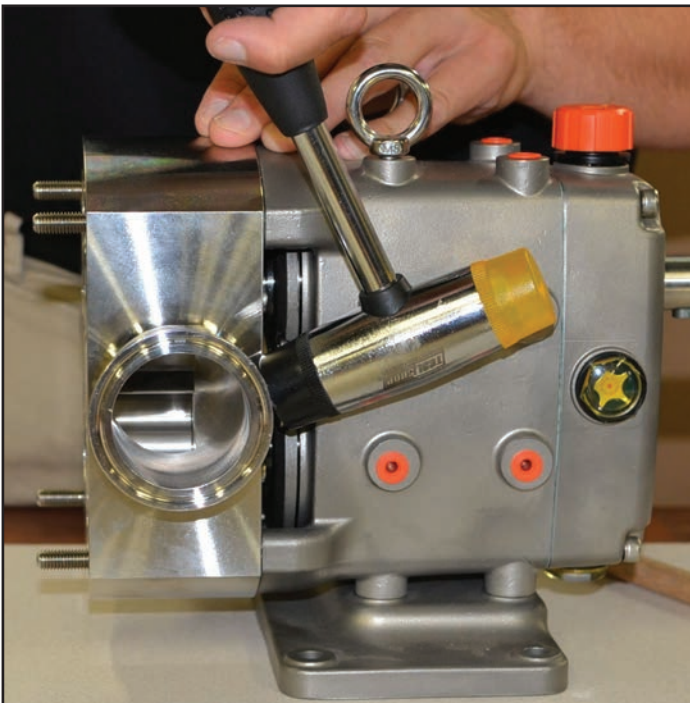
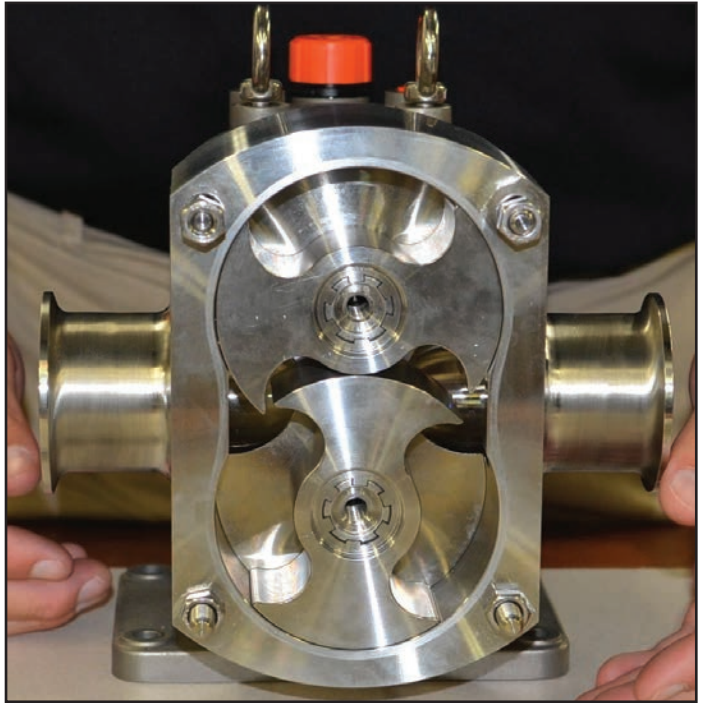
6. Remove the rotors (38) from the pump housing (31) by pulling straight.



## Maintenance

### Pump Housing Disassembly - Single O-ring Seal (continued)

6a. If the rotors (38) will not come out freely, remove the stud bolt hex nuts (46) and then tap on the back of the inlet and outlet ports with a soft hammer. Once the rotors (38) are loose, then push the casing (31) back towards the gear box and remove the rotors.





## Maintenance

### Pump Housing Disassembly - Single O-ring Seal (continued)

6a. continued



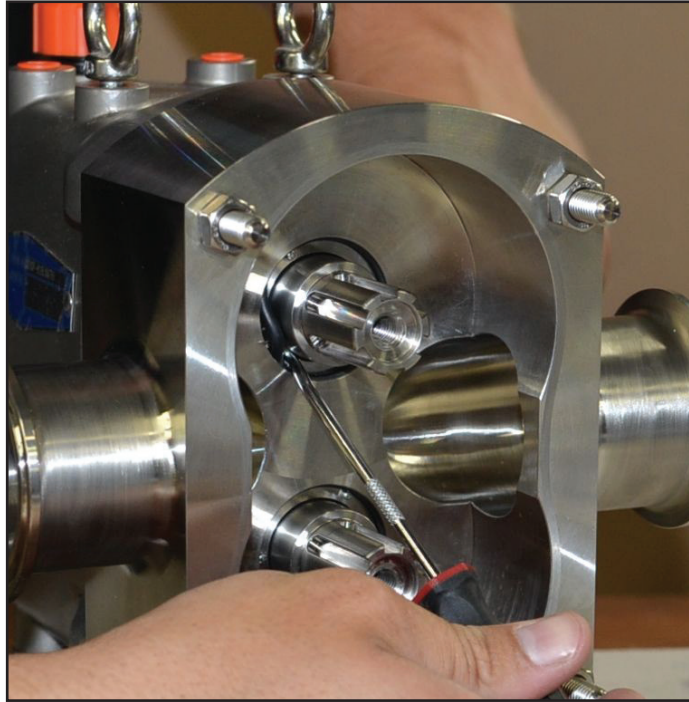
7. Remove O-ring (51) from the rotor.



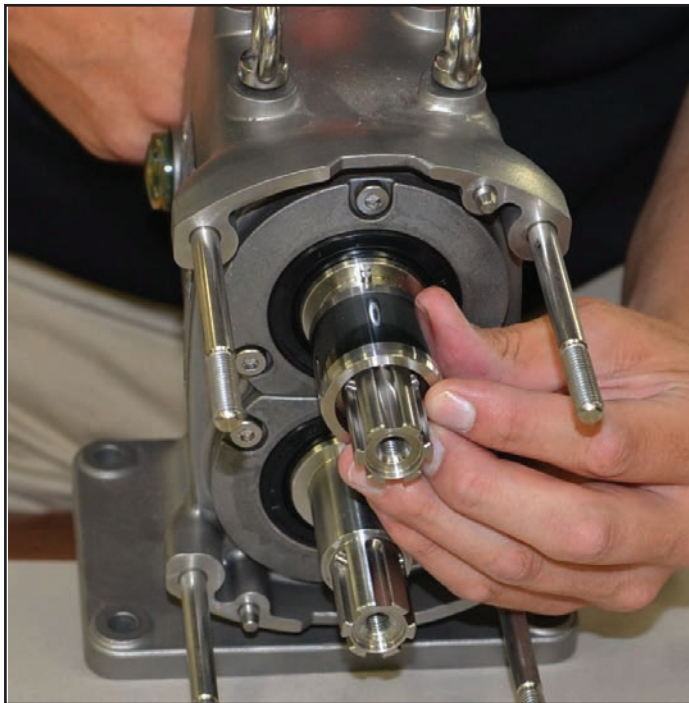
## Maintenance

### Pump Housing Disassembly - Single O-ring Seal (continued)

8. Remove the rotor case O-ring (53). This can be done before you remove the casing or after. Note: This is easier to do after you remove the casing.



9. Remove sleeve (57) from shaft.



## Maintenance

### Pump Housing Disassembly - Triple Lip Seal

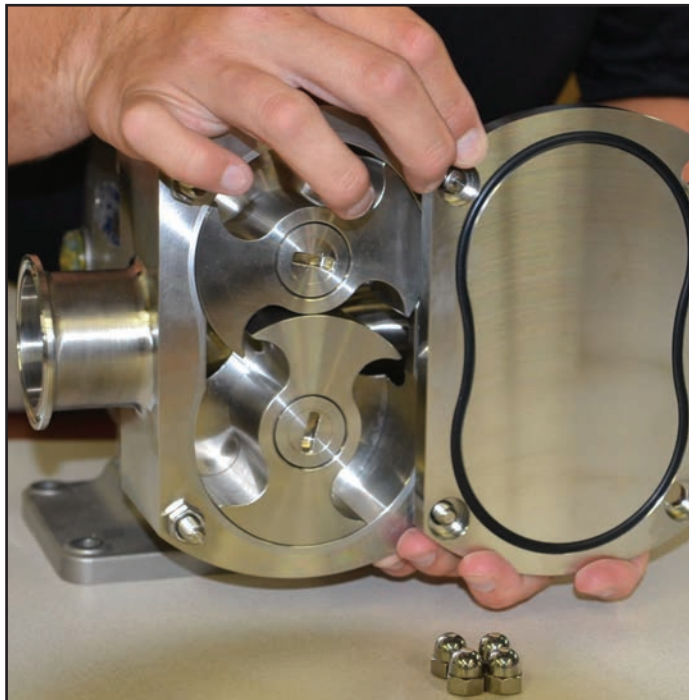
**!** Prior to removal of pump, the shut-off valves in the suction and discharge lines must be closed. If there is any risk that product may harden, crystallize or freeze in the pump it should be thoroughly drained and cleaned immediately after use. Same attention applies if there is a seal flush option. Power needs to be locked out to prevent unintended start of the pump.

Note: Reference numbers are listed in the sectional view located on pages 61-73.

1. Loosen and remove the four hex nuts (33) from the front cover.



2. Remove the cover (32). If it is stuck, tap the cover with a soft hammer.

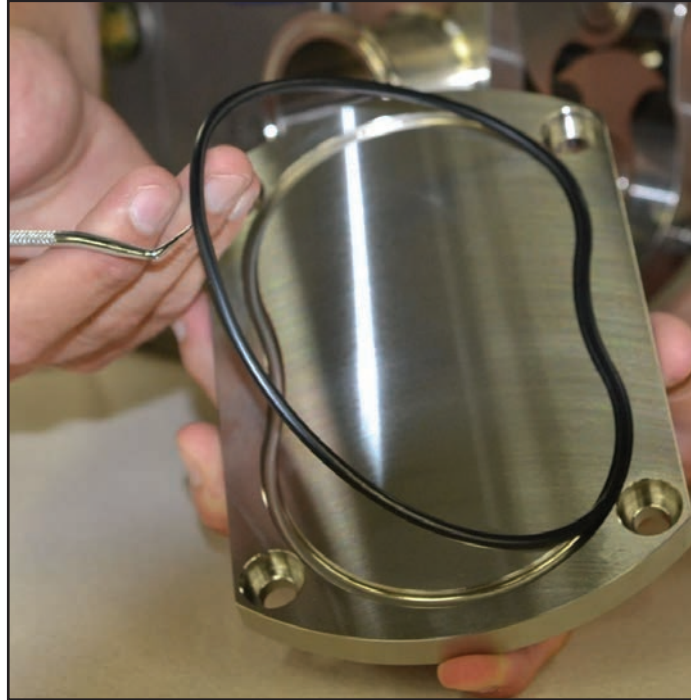




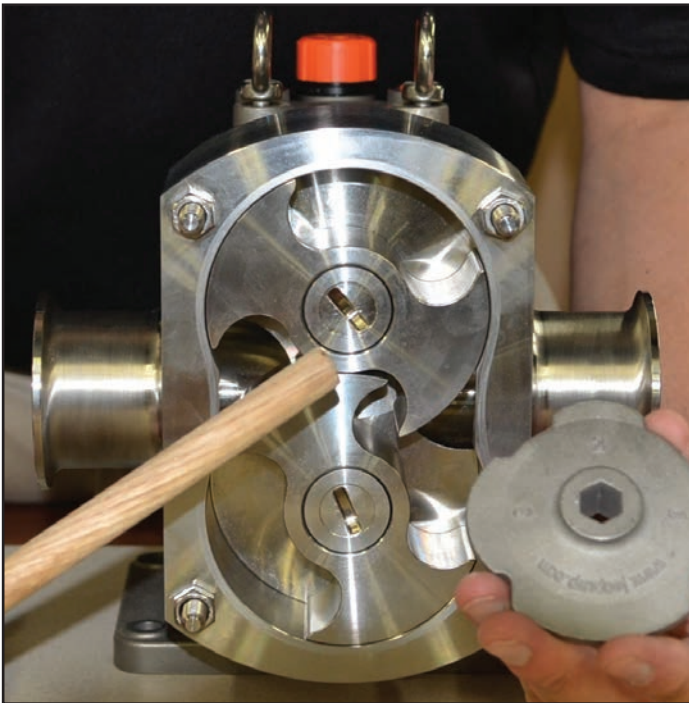
## Maintenance

### Pump Housing Disassembly - Triple Lip Seal (continued)

3. Remove the cover O-ring (34).



4. Remove the rotor retaining bolts (35). To remove the rotor retaining bolts, place the dowel between the rotors. Turn the first rotor bolt counter-clockwise.



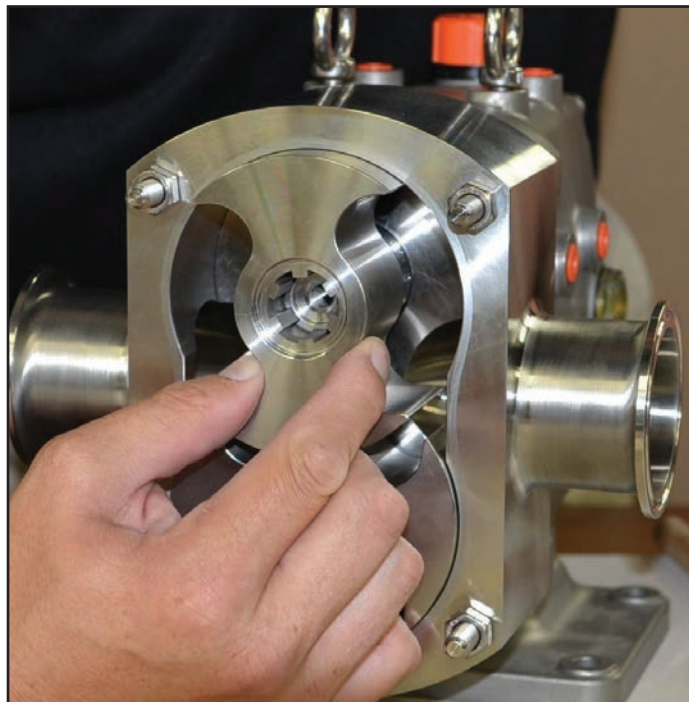
## Maintenance

### Pump Housing Disassembly - Triple Lip Seal (continued)

5. Remove the rotor bolts (35), spring washers (36) and O-ring (37).



6. Remove the rotors (38) from the pump housing (31) by pulling straight.

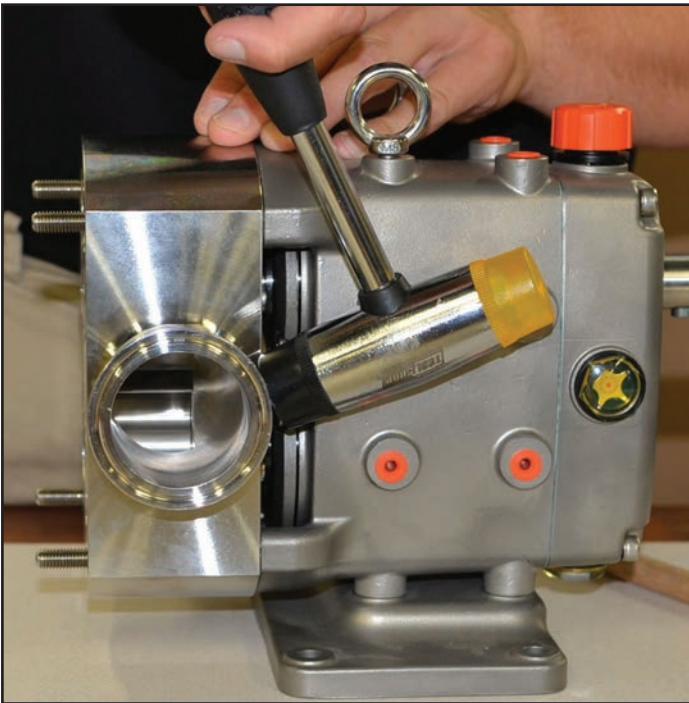
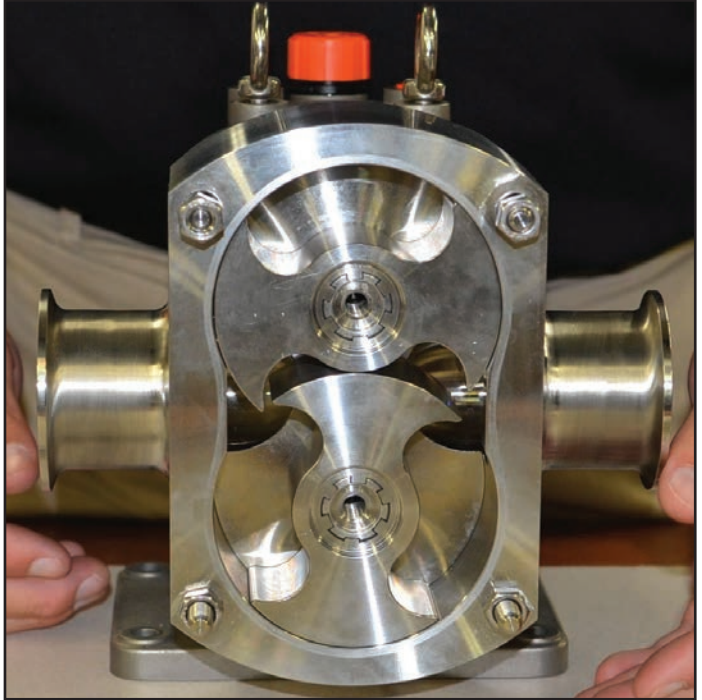




## Maintenance

### Pump Housing Disassembly - Triple Lip Seal (continued)

6a. If the rotors (38) will not come out freely, remove the stud bolt hex nuts (46) and then tap on the back of the inlet and outlet ports with a soft hammer. Once the rotors (38) are loose, then push the casing (31) back towards the gear box and remove the rotors.





# Maintenance

## Pump Housing Disassembly - Triple Lip Seal (continued)

6a. continued



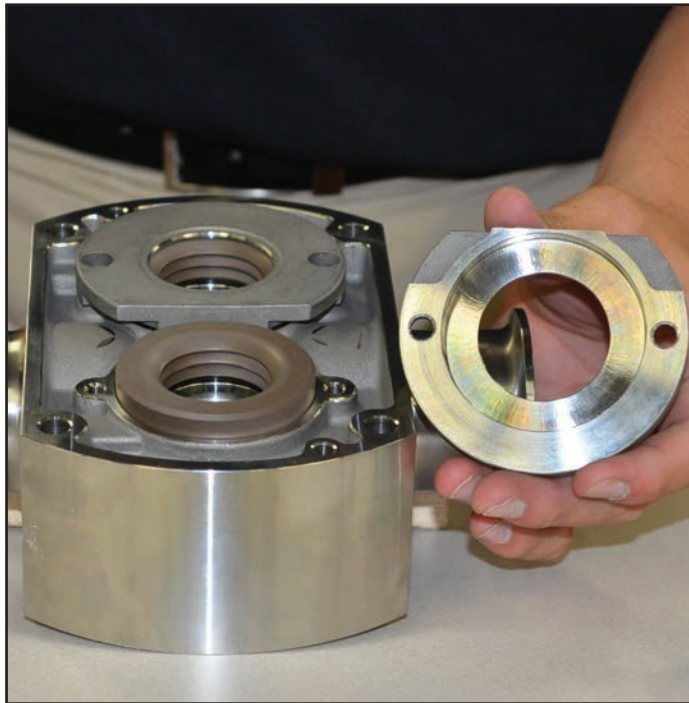
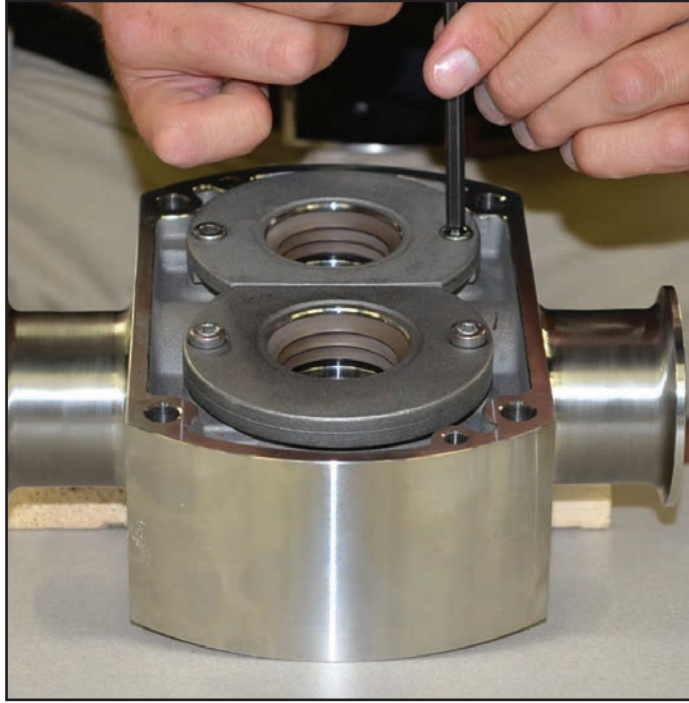
7. Remove O-ring (51) from the rotor.



## Maintenance

### Pump Housing Disassembly - Triple Lip Seal (continued)

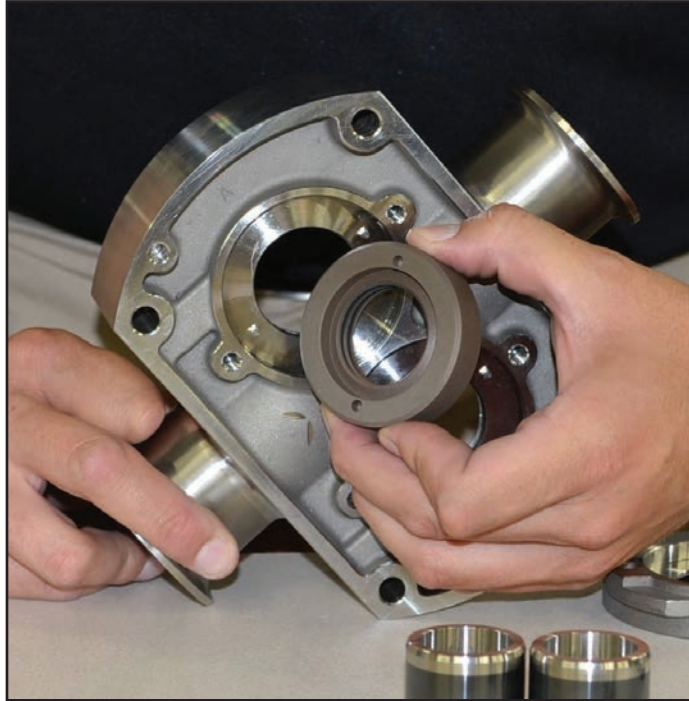
8. Remove lip seal cover (56).



# Maintenance

## Pump Housing Disassembly - Triple Lip Seal (continued)

9. Remove triple lip seal (55)



# Maintenance

## Inspection

1. Inspect O-rings and seals for reuse. Worn O-rings and seals should be replaced.
2. Inspect seal faces for scoring or cracks. Replace any seal faces that are damaged.
3. Inspect rotors for any damage or abnormal wear.
4. Inspect rotors for wear on splines and that they fit snugly on the shafts.
5. Inspect shafts for wear on splines and make sure they are not loose in the gear case.
6. Inspect rotor galling sign among the rotor housing, front cover and rotors. Must be removed or replaced.
7. Inspect burr of the rotor bolt groove. Must be removed or replaced.

## Pump Housing Assembly

Before installing the pump housing (31) to the gearbox make sure that the surface of the pump housing and gear box are clean and check the shim plate between pump housing and gear box. Install the pump housing (31) onto the gear box (1A) and secure the four housing set nuts (46).

When installing the ceramic shaft sleeve onto the pump shaft, align sleeve with fit pin.

Follow the disassembly instructions in reverse for all types of seals and rotor assembly.

Assemble a rotor onto shaft engaging the shallow groove with small spline in rotor and seal side first in to the shaft.



Place the plastic dowel between the rotors. Tighten the first rotor bolt with a special tool to the recommended torque.

Model	Rotor Nut Torque Specification
JRZL 105	116.3 in. lbs.
JRZL 110	116.3 in. lbs.
JRZL 115	116.3 in. lbs.
JRZL 120	116.3 in. lbs.
JRZL 220	277.8 in. lbs.
JRZL 225	277.8 in. lbs.
JRZL 330	434.0 in. lbs.
JRZL 340	434.0 in. lbs.
JRZL 440	651.0 in. lbs.
JRZL 450	651.0 in. lbs.

To tighten the second rotor place the plastic dowel on the opposite side of the rotor and tighten the second rotor bolt to the proper torque.



Install the cover (32) and tighten the cap nuts (33).

# Maintenance

## Rotor Clearance

**Use feeler gauges to verify the back and radial clearances between the rotors and the housing. A depth gauge should be used to verify the front clearance.**

Rotor clearance must be precisely maintained to provide maximum pumping efficiency, prevent contact between rotors, rotor housing and front cover during operation. If pumping efficiency is below expectations or if parts contact has occurred during operation (within rated differential pressure) check rotor clearances and adjust if incorrect.

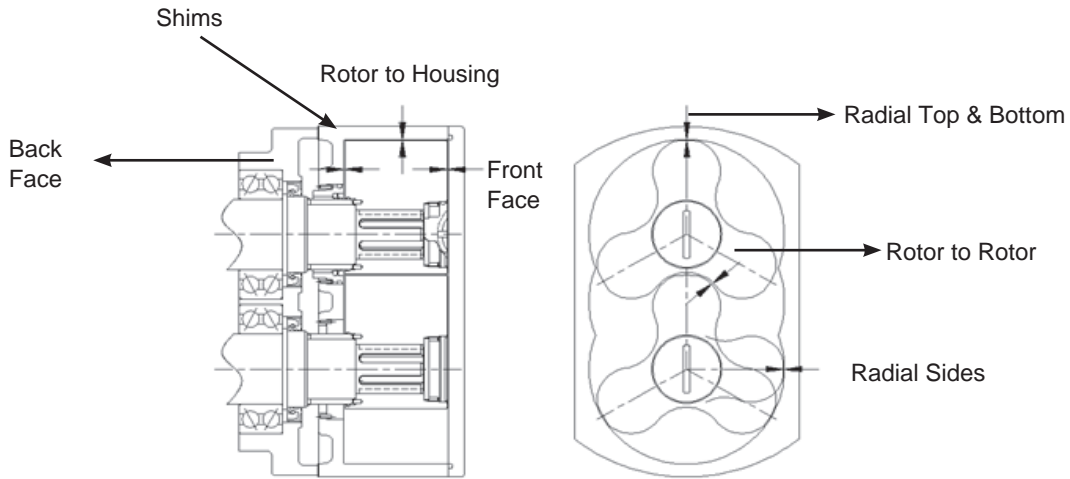


Figure 20

**Standard Rotor Clearances (mm/in)**

Model	Back Face	Front Face	Clearances for Rotor Timing		
			Radial Sides	Radial Top & Bottom	Rotor to Rotor
JRZL 105	0.05/0.002	0.05/0.002	0.07/0.003	0.07/0.003	0.1/0.004
JRZL 110	0.05/0.002	0.05/0.002	0.07/0.003	0.07/0.003	0.1/0.004
JRZL 115	0.15/0.006	0.15/0.006	0.27/0.011	0.12/0.005	0.15/0.006
JRZL 120	0.15/0.006	0.15/0.006	0.3/0.012	0.15/0.006	0.15/0.006
JRZL 220	0.2/0.008	0.2/0.008	0.3/0.012	0.15/0.006	0.2/0.008
JRZL 225	0.2/0.008	0.2/0.008	0.4/0.016	0.2/0.008	0.2/0.008
JRZL 330	0.3/0.012	0.3/0.012	0.4/0.016	0.2/0.008	0.3/0.012
JRZL 340	0.3/0.012	0.3/0.012	0.5/0.020	0.3/0.012	0.3/0.012
JRZL 440	0.45/0.018	0.45/0.018	0.55/0.022	0.3/0.012	0.4/0.016
JRZL 450	0.45/0.018	0.45/0.018	0.7/0.028	0.45/0.018	0.4/0.016

There are two areas of rotor clearances as illustrated following:

- Rotor tip clearance – not adjustable set by manufacturer
- Front and back face clearance – adjustable by shim

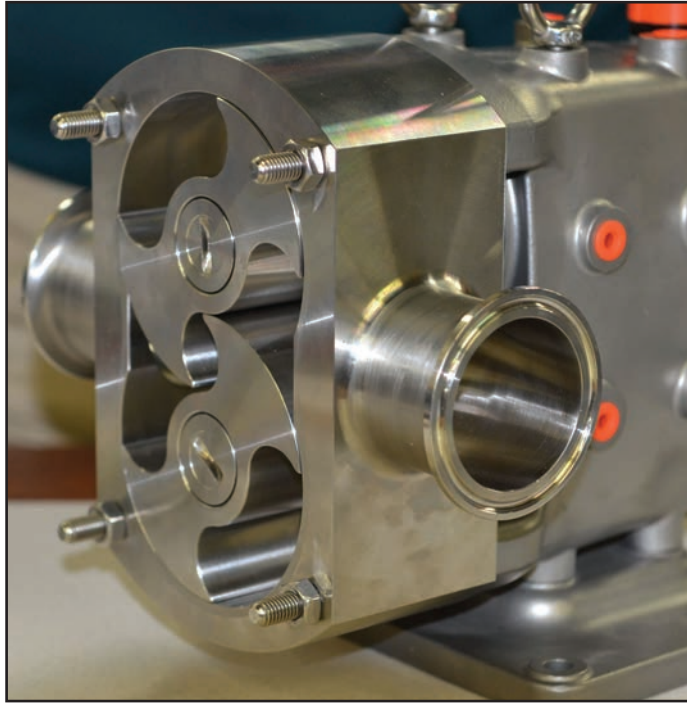


## Maintenance

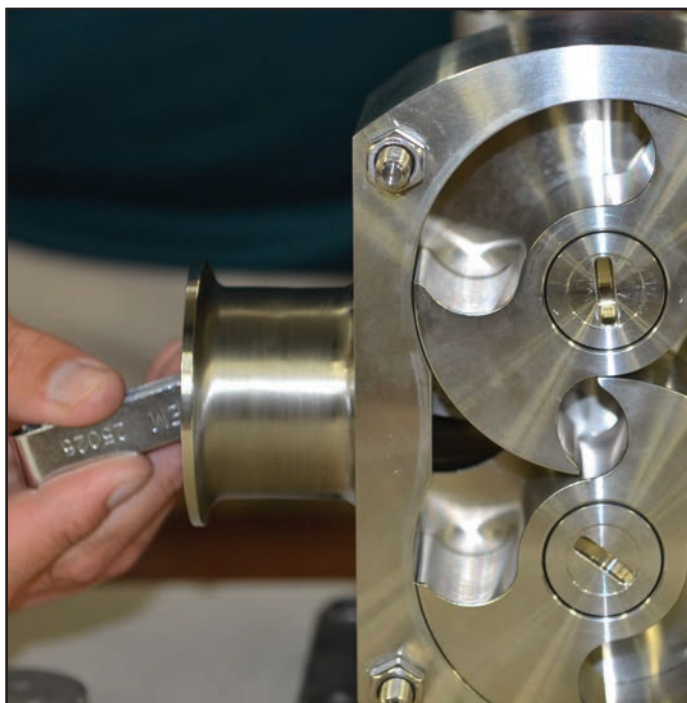
### Rotor Clearance (continued)

Rotor width and body depth are fixed at manufacturer. Therefore, with the correct rotor size selected, the only maintenance adjustment that can be made is the proportion of front and rear clearance. Measure the front clearance as follows:

1. The rotor to rotor housing back face clearance is maintained by the shim (45).
2. Check that the rotor housing (31) is tight to gearbox (1A). And check the rotor bolts (35) are tight.



3. Measure the clearance between the back face of the pump housing and the back of the rotor with a feeler gauge. Check the reading with the recommended back face clearance.



## Maintenance

### Rotor Clearance (continued)

4. If incorrect, adjust by adding or removing shim plates (45) from behind the pump housing.



5. Check each rotor and adjust as necessary.



# Maintenance

## Rotor Timing

Rotor timing must be precisely maintained to provide maximum pumping efficiency, prevent contact between rotors during operation. If pumping efficiency is below expectations or if rotors contact during operation (within rated differential pressure), check rotor timing and adjust if incorrect. Also check rotor timing after any gearbox dismantling when the gears are removed and/or replaced.

Check Rotor timing as follows:

1. Assemble each rotor in its normal location on the drive shaft and the idle shaft. Assemble each rotor bolt and tighten hand tight.
2. Rotate the shafts 30 degrees and measure gap as illustrated by arrows. Rotate the shafts 60 degrees the opposite direction and measure gap as illustrated.
3. The rotors are correctly timed when the gap measured, using a feeler gauge, at both locations are equal. If the gap is unequal, adjust the timing as follows.

4. Rotor timing is determined by the relative location of the two helical gears (14) on the shafts. Gear spacers (16) are used to adjust the location and the timing. When adjusting timing, move only one of the two gears.

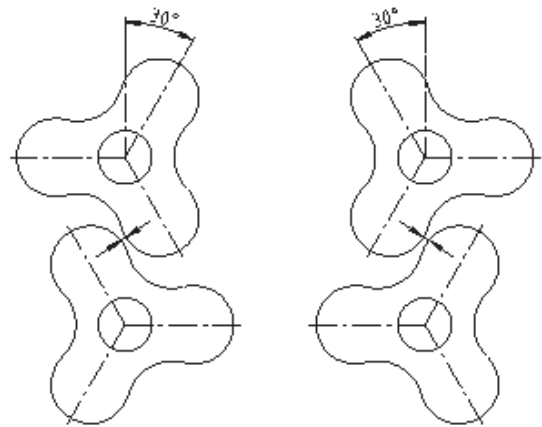
5. Place the wooden dowel between the rotors.

6. Bend away the tab of the lock washer (12) on one shaft. Loosen the lock nut and temporarily insert shim stock between the gear and gear spacer. Tighten the lock nut, reassemble the rotor in its correct location, and recheck rotor timing.

- If rotor timing is correct, remove the gear and replace added other spacer or add a shim equal in thickness to the shim stock temporarily added. Reassemble the gear and gear nut, tighten to the correct torque, and check rotor timing again to confirm that it is correct.
- If rotor timing is incorrect, but closer to equal than original measurement, repeat previous step adding additional shim stock.
- If rotor timing is incorrect and more unequal than original measurement, remove temporary shim stock from one shaft and add instead to the other shaft.

7. Repeat above procedures until the timing gap is equal after gear spacers are in place and gear nuts are tightened to correct torque.

8. Reassemble pump.



# Maintenance

## Gearbox Disassembly

1. Remove the oil drain plug (5) and drain the oil.
2. Remove the gear box cover bolts (6) from the rear cover (4).
3. Pull the rear cover off the drive shaft extension. If the cover is stuck use a soft hammer carefully to loosen it.
4. Remove the rear cover oil seal (11) from the rear cover.
5. Remove the paper gasket (26) from the rear cover or gear box.
6. Straighten the locking tab of the bearing lock washer (12). Reinstall the rotors (38) on the drive (8) and idle (9) shafts. Lock the rotor with a plastic dowel. Remove the lock nut (12-1) and lock nut washer from the drive shaft (8) and idle shaft (9).
7. Pull the two helical-gears (14) off the pump shafts. Remove the gear keys (7).
8. Remove the front bearing gland set bolts (23).
9. Place the gearbox (1), wet end (rotor side) down, on an arbor press.
10. Protect the shaft ends with a wood block and press the drive and idle shaft out of the gearbox.
11. Remove the bearings (17) and spacers (18) together by pressing them out from the shafts.
12. Or remove bearings by puller.
13. The taper roller bearings for 400 series must be keep together with in-outside spacer and separated for drive and idle shafts.

# Maintenance

## Gearbox Assembly

1. Clean and lubricate the front and rear bearing areas of the drive (8) and idle shafts (9) with oil.
2. Fit the front bearing (20), spacer (18) and rear bearing (17) on the shaft by arbor press or heat 120C (250F) up by heater.
3. Lubricate and install the front bearing oil seals (22) in to the bearing gland.
4. Position the gearbox (1) with wet end up.
5. Clean and lubricate the front and rear bearing areas with oil.
6. Insert the shaft perpendicularly to the gearbox properly. There should be a tight sliding fit between the gearbox and the bearing outer rings. Press or soft hammer could be used.
7. Place the front bearing gland set bolt (23) and washer and tighten.
8. Lubricate and install the rear oil seal cover (24) into gear box.
9. Place the gear spacer (16) over the shafts.
10. Clean and lubricate the gear area of the shaft and the face of the lock washer with oil.
11. Position both shaft gear keys (7) to the 12:00 position.
12. Place the gear, lock washer (12) and lock nut (12-1) onto the shafts and hand tighten.
13. After the gears are installed, turn the shafts to make sure they turn freely and that the rotors (38) are timed correctly. (rotor alignments are required)
14. Use a spanner wrench to tighten the gear lock nut on the drive shaft. You can install the rotors to hold the shafts in place while you tighten the nut.
15. Tighten the locknut on the idle shaft, following the previous steps.
16. Install the paper gasket to rear cover (26) and mount the rear cover assembly over the drive shaft extension onto the gearbox.
17. Set the cover bolts, oil window and pressure relieve valve.
18. Fill the oil reservoir with oil to the middle of the oil window.

---

## Scheduled Maintenance

- After initial startup – change oil after 4,000 hours.
- After, change oil annually based on 8 hrs a day, 5 days a week run time.
- Every two years, change oil seals

### Recommended Spare Parts:

- 1 Year – (2) Seal sets and (1) O-ring set
- 2 Years – (4) Seal sets and (2) O-ring sets and (1) set rotors

## JRZL Series Maximum RPM

Viscosity (cP)	Model No. JRZL								
	110	115	120	220	225	330	340	440	450
	Recommended Maximum RPM								
1 - 100	1000	800	800	700	700	600	600	500	500
100 - 1,000	667	533	533	467	467	400	400	333	333
1,000 - 5,000	417	333	333	292	292	250	250	208	208
5,000 - 10,000	250	200	200	175	175	150	150	125	125
10,000 - 20,000	167	133	133	117	117	100	100	83	83
20,000 - 50,000	117	93	93	82	82	70	70	58	58
50,000 - 100,000	83	67	67	58	58	50	50	42	42

**Note:**

1. This maximum RPM speed is calculated and estimated within the ideal operational condition.
2. Pressure, solid(particle), operation hour and other operational conditions effect on this maximum rpm.
3. High RPM is not recommended for pump durability.

## Maximum Solids with Bi-Wing Rotors

This is intended to be a guideline only, please contact Dixon Sanitary's Engineering Department to verify specific applications for the best selection of pump and rotor type.

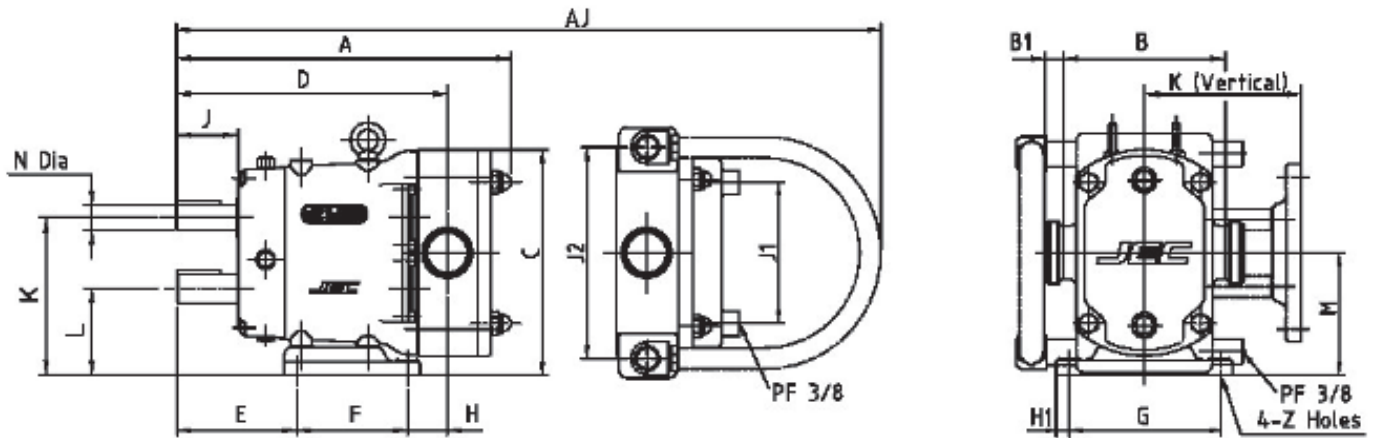
Series No.	Maximum Solid Size (in)
JRZL 100	2 x ¾
JRZL 200	2½ x 1
JRZL 300	3 x 2
JRZL 400	5 x 2

The following formulas will also help in determining the best pump and rotor type for applications involving solids in the product.

**High Discharge Pressure = Mashed Solid**

**Low RPM = Increased Possibility of Mashed Solid**

## Dimensional Drawing



Model	Dimensions (in)																
	A	B	C	D	E	F	G	H	H1 (mm)	J	K	L	M	N (mm)	X <sup>1</sup> (mm)	Y <sup>2</sup> (mm)	Z (mm)
JRZL 105	10.40	5.98	7.80	8.62	3.78	3.31	5.28	1.54	12	1.85	5.55	3.03	4.29	22	34	8	9
JRZL 110	10.40	5.98	7.68	8.35	3.78	3.31	5.28	1.54	12	1.85	5.55	3.03	4.29	22	34	8	9
JRZL 115	10.80	5.98	7.80	8.74	3.78	3.31	5.28	1.65	12	1.85	5.55	3.03	4.29	22	34	8	9
JRZL 120	11.42	5.98	7.80	9.02	3.78	3.31	5.28	1.93	12	1.85	5.55	3.03	4.29	22	34	8	9
JRZL 220	14.84	7.40	10.12	12.09	5.08	5.20	7.09	1.81	15	2.32	7.28	3.98	5.63	32	53	10	11
JRZL 225	15.75	7.40	10.12	12.60	5.08	5.20	7.09	2.13	15	2.32	7.28	3.98	5.63	32	53	10	11
JRZL 330	18.70	9.53	13.54	15.32	6.06	6.30	9.53	2.95	22	2.76	9.59	5.06	7.32	45	57	14	13
JRZL 340	19.69	9.53	13.54	15.83	6.06	6.30	9.53	3.47	22	2.76	9.59	5.06	7.32	45	57	14	13
JRZL 440	24.41	12.76	18.03	19.88	7.80	8.27	12.60	3.94	30	3.15	12.76	6.69	9.72	55	67	14	15
JRZL 450	25.79	12.76	18.03	20.55	7.80	8.27	12.60	4.61	30	3.15	12.76	6.69	9.72	55	67	14	15

<sup>1</sup> X = Key Length

<sup>2</sup> Y = Key Width

Model	Ports	Dimension B1 (in)					AJ	J1	J2	Weight LB
		Clamp	BS	DIN	SMS	FLANGE				
JRZL 105	1"	0.79	1.02	0.98	1.10	1.18	16.73	4.80	7.09	37
JRZL 110	1"	0.79	1.02	1.18	1.10	1.18	16.73	4.80	7.09	37
JRZL 115	1½"	0.87	1.02	1.18	0.79	1.18	16.93	4.80	7.09	42
JRZL 120	2"	0.87	1.02	1.18	0.87	1.18	17.32	4.80	7.09	44
JRZL 220	2"	0.87	1.02	1.18	0.87	1.18	23.82	6.77	9.25	93
JRZL 225	2½"	1.02	1.02	1.46	1.10	1.38	24.80	6.77	9.25	106
JRZL 330	3"	1.10	1.02	1.65	1.10	1.57	28.35	9.69	12.13	207
JRZL 340	4"	1.10	1.02	1.77	1.38	2.13	29.29	9.69	12.13	227
JRZL 440	4"	1.10	1.02	1.77	1.38	2.13	32.68	14.09	16.54	496
JRZL 450	5"	1.18	1.02	1.81	1.38	2.13	35.28	14.09	16.54	551



# Troubleshooting

Problem	Possible Cause	Suggested Action
<b>No Flow, Pump Rotors Are Not Turning</b>	Drive motor not running.	Check resets, fuses, circuit breakers.
	Key sheared or missing.	Replace.
	Drive belts, power transmission components slipping or broken.	Replace or adjust.
	Pump shaft, keys or gears sheared.	Inspect and replace parts as necessary.
<b>No Flow, Pump Rotors Are Turning</b>	Rotors turning in the wrong direction.	Check motor hookup to reverse motor rotation.
	Relief valve not properly adjusted or held open by foreign material.	Adjust or clear valve.
	Suction port is blocked, not allowing flow to the pump.	Check all inlet valves, strainers and tank outlet ports.
<b>No Flow, Pump Not Priming</b>	Valve closed in inlet line.	Open valve.
	Inlet line clogged or restricted.	Clear line, clean filters, etc.
	Air leaks due to bad gaskets or pipe connections.	Replace gaskets, check lines for leakage (can be done by air pressure or by filling with liquid and pressurizing with air).
	Pump speed too slow.	Increase pump speed.
	Pump speed too fast for high viscosity liquid.	Decrease pump speed.
	Liquid drains or siphons from system during off periods.	Use foot valve or check valves. Filling inlet lines with material before startup may solve startup priming problems due to no material in system.
	"Air" lock caused by fluids which "gas off" or vaporize or allow gas to come out of material during off periods.	Install and use a manual or automatic air bleed from pump or lines near pump.
	Extra clearance rotors, worn pump.	Increase pump speed within limits, use foot valve to improve priming. Replace worn rotors.
	NPSHA too low.	Check net inlet pressure available against net inlet pressure required. Change inlet system as needed.
	On "Vacuum" inlet system: On initial start-up, atmospheric "blow back" prevents pump from developing enough differential pressure to start flow.	Install check valve in discharge line.
<b>Insufficient Flow</b>	Speed too low or too high to obtain desired flow.	Check curve and adjust as necessary.
	Air leak due to bad seals, pipe connections or other equipment.	Replace seals, check inlet fittings.
<b>Insufficient Flow – Flow Being Bypassed Somewhere</b>	Flow diverted in branch line, open valve, etc.	Check system and controls.
	Relief valve not adjusted or jammed.	Clear or adjust valve.
<b>Insufficient Flow – High Slip</b>	Hot (HC) or extra clearance rotors being used on "cold" fluid and/or low viscosity fluid.	Replace with standard clearance rotors.
	Worn pump.	Increase pump speed (within limits). Replace rotors
		Replace rotors
	High pressure.	Reduce pressure by adjusting system settings or hardware.

## Troubleshooting

Problem	Possible Cause	Suggested Action
<b>Cavitation</b>	Strainers, foot valves, inlet fittings or lines clogged.	Clear lines. If problem continues, inlet system may require changing.
	Inlet line size too small, inlet line too long. Too many fittings or valves. Foot valve, strainers too small.  NPSHA too low.	Increase inlet line size. Reduce length, minimize direction and size changes, reduce number of fittings.
		Raise liquid level in source tank to increase net inlet pressure.
		Increase net inlet pressure by raising or pressurizing source tank.
	Fluid viscosity greater than expected.	Select larger pump size with lower net inlet pressure required.
		Reduce pump speed and accept lower flow or change system to reduce line losses.
	Fluid temperature higher than expected (vapor pressure higher).	Change temperature of product to reduce viscosity.
Reduce temperature, reduce speed and accept lower flow or change system to increase net inlet pressure available.		
<b>Noisy Operation</b>	Cavitation	
	High fluid viscosity High vapor pressure fluid High temperature.	Slow down pump, reduce temperature, change system setup.
	NPSHA less than NPSHR.	Increase NPSHA or decrease NPSHR.
	Air or gas in fluid .	
	Leaks in the pump or piping.	Fix leaks.
	Dissolved gas or naturally aerated products.	Minimize discharge pressure (also see "Cavitation" above).
<b>Noisy Operation Caused By Mechanical Problems</b>	Rotor to Body Contact	
	Improper assembly of pump.	Check clearances and adjust shimming.
	Distortion of pump due to improper piping installation.	Change piping installation to eliminate piping stress and distortion on body.
	Pressures required higher than the pump is rated for.	Reduce discharge pressure required.
	Worn bearings.	Rebuild with new bearings and lubricate regularly.
	Rotor to Rotor Contact	
	Loose or incorrectly-timed gears.	Rebuild with new parts. Note: This will cause severe damage.
	Sheared keys.	Rebuild with new parts. Note: This will cause severe damage.
	Worn gear splines.	Rebuild with new parts. Note: This will cause severe damage.
	Drive noise caused by gear trains, chains, couplings or bearings.	Repair or replace drive parts. Check bearings for damage and replace as necessary.

## Troubleshooting

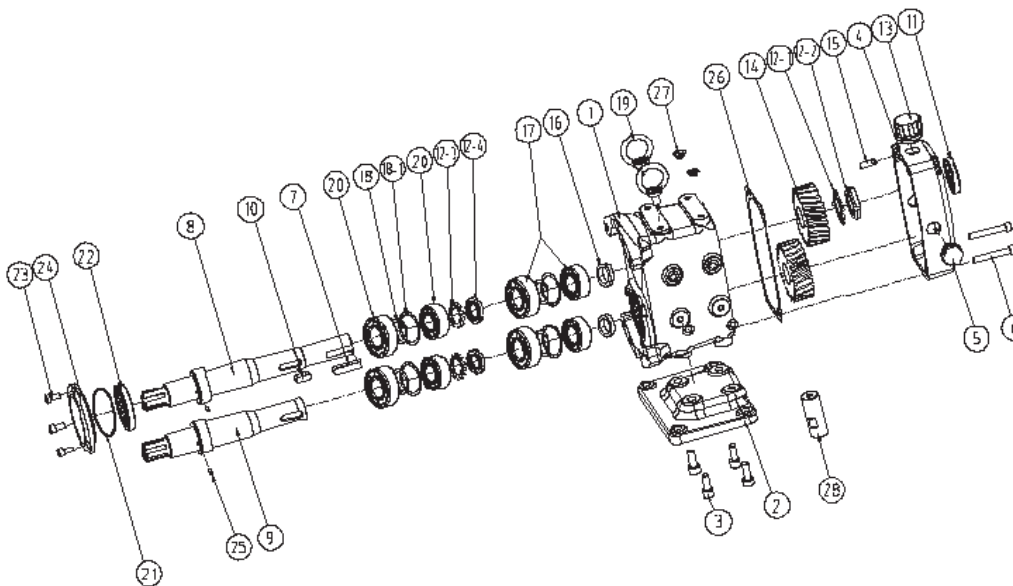
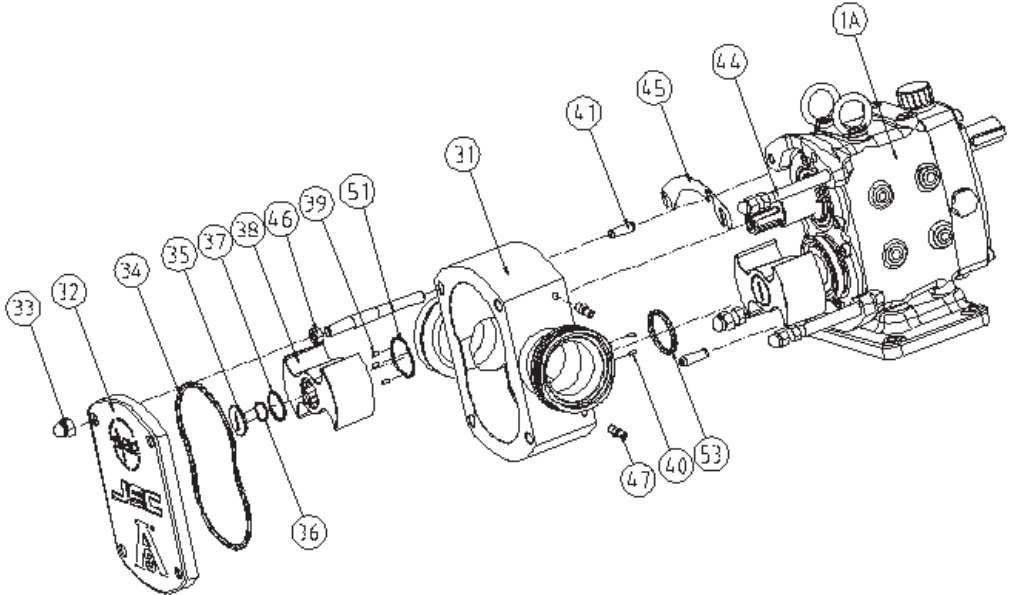
Problem	Possible Cause	Suggested Action
<b>Pump Requires Excessive Power (overheats, stalls, high current draw, breakers trip)</b>	Higher than expected viscosity losses.	If within pump rating, increase drive size
	Higher than expected pressures.	Reduce pump speed. Increase line sizes.
	Fluid is colder with a higher viscosity than expected.	Heat fluid, insulate lines or heat trace lines.
	Fluid sets in line and pump during shutdown.	Increase line sizes.
		Insulate lines or heat trace lines.
		Install a "soft start" drive.
		Install a recirculating bypass system.
Flush system with a nonsetting fluid.		
Fluid builds up on pump surfaces.	Replace the pump with more running clearances.	
<b>Short Pump Service Life</b>	Pumping abrasives.	Larger pumps at slower speeds.
	Speeds and pressures higher than rated.	Reduce speeds and pressures by making changes in the system.
		Replace pump with a larger model with higher pressure ratings.
	Worn bearings and gears due to lack of lubrication.	Check and replace bearing and gears as necessary. Adjust lubrications schedule to decrease time between lubrication.
		Modify external wash down method to reduce water entering into gear case.
Misalignment of drive and piping. (Excessive overhung load or misaligned couplings.)	Check alignment of piping and drive. Adjust as necessary.	
<b>Any Other Issue</b>		Contact: Dixon Sanitary 800-789-1718

# Repair Kits

Part Number	Description	Material
<b>Complete Replacement Seal Kits</b>		
RZL-440B-3E-KIT	Triple Lip Seal Repair Kit	EPDM
RZL-440B-3V-KIT	Triple Lip Seal Repair Kit	FKM
Repair kits include items 51, 55, 56 & 57		
RZL-440B-2E-KIT	Single Mech. Seal Repair Kit TC/TC	EPDM
RZL-440B-2V-KIT	Single Mech. Seal Repair Kit TC/TC	FKM
Repair kits include items 51, 52 & 53		
RZL-440B-4E-KIT	Double Mech. Seal Repair Kit TC/TC	EPDM
RZL-440B-4V-KIT	Double Mech. Seal Repair Kit TC/TC	FKM
Repair kits include items 51, 52, 53, 62 & 64		
RZL-440B-1E-KIT	Single O-ring Seal Repair Kit	EPDM
RZL-440B-1V-KIT	Single O-ring Seal Repair Kit	FKM
Repair kits include items 51, 53 & 57		
RZL-440B-5E-KIT	Double O-ring Seal Repair Kit	EPDM
RZL-440B-5V-KIT	Double O-ring Seal Repair Kit	FKM
Repair kits include items 51, 53, 57, 62 & 71		
<b>Pump Elastomers Only</b>		
RZL-440B-3E-EK	Triple Lip Seal EPDM Elastomers	EPDM
RZL-440B-3V-EK	Triple Lip Seal FKM Elastomers	FKM
Repair Kits include items 34, 37, 51 & 55		
RZL-440B-2E-EK	Single Mech. Seal EPDM Elastomers	EPDM
RZL-440B-2V-EK	Single Mech. Seal FKM Elastomers	FKM
Repair Kits include items 34, 37, 51 & 53		
RZL-440B-4E-EK	Double Mech. Seal EPDM Elastomer	EPDM
RZL-440B-4V-EK	Double Mech. Seal FKM Elastomers	FKM
Repair kits include items 34, 37, 51, 53, 62 & 64		
RZL-440B-1E-EK	Single O-ring Seal EPDM Elastomers	EPDM
RZL-440B-1V-EK	Single O-ring Seal FKM Elastomers	FKM
Repair Kits include items 34, 37, 51 & 53		
RZL-440B-5E-EK	Double O-ring Seal EPDM Elastomers	EPDM
RZL-440B-5V-EK	Double O-ring Seal FKM Elastomers	FKM
Repair Kits include items 34, 37, 51, 53 & 62		
<b>Set of TC Seats</b>		
RZL-440B-TC-SET	TC Seal Ring	
Includes item 52		



# Parts List for JRZL-400 Series Pumps Basic Assembly (Single M/Seal)



## Parts List for JRZL-400 Series Pumps Gear Box Assembly (Basic)

Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump
1	RZL-440B-GBCI	Gear Box	FCD40	RZL400	1
2	RZL-440B-GBCIB	Base , Gear Box	FCD40	RZL400	1
3	RZL-440B-BWB	Wrench Bolt , Base (M14x35L)	SUS304		4
4	RZL-440B-GBCCI	Cover , Gear Box	FCD40	RZL400	1
	RZL-440B-GBCSS	Cover , Gear Box	SUS304		1
5	RZL-330B-PLD	Plug , Level , Drain		RZL300/400	3
6	RZL-440B-GBWB	Wrench Bolt , Gear Box Cover (M10x90L)	SUS304	RZL440	4
7	RZL-440B-DSKEY	Key, Gear (14x9x67)	S45C		2
8	RZL-440-DSHAFT	Shaft, Drive	SUS304		1
	RZL-450-DSHAFT	Shaft, Drive	SUS304	RZL450	1
9	RZL-440-ISHAFT	Shaft, Idle	SUS304	RZL440	1
	RZL-450-ISHAFT	Shaft, Idle	SUS304	RZL450	1
10	RZL-440B-GKEY	Key, Gear (14x9x53)	S45C	RZL400	2
11	RZL-440B-OSCB	Oil Seal , Cover (55x82x12t)	NBR		1
	RZL-440B-OSCV	Oil Seal , Cover (55x82x12t)	FKM		1
12-1	RZL-440B-TGWSHD	Lock Washer, Drive Shaft	S45C	RZL400	2
12-2	RZL-440B-TGNUTD	Lock Nut, Drive Shaft	S45C		2
12-3	RZL-440B-TGWSHI	Lock Washer, Idle Shaft	S45C		2
12-4	RZL-440B-TGNUTI	Lock Nut, Idle Shaft	S45C		4
13	RZL-440B-RVLV	Breather, Gearbox	PE	RZL400	1
14	RZL-440B-TGHELG	Hellical Gear	S45C		2
15	RZL-440B-GBDOW	Dowel, Gear Box (Φ8)	SUS304		2
16	RZL-440B-GSPAC	Spacer, Gear (Φ35x5L)	S45C	RZL400	2
17	RZL-440B-RBEAR	Bearing, Rear (#E32213J)			4
18	RZL-440B-BSPCI	Spacer, Bearing (inner)	S45C		4
18-1	RZL-440B-BSPCO	Spacer, Bearing (outer)	S45C		4
19	RZL-440B-IBOLT	I-bolt / M14	SUS		2
	RZL-440B-FBEAR	Bearing , Front (#E32215J)			4
21	RZL-440B-OSGOV	O-ring, Oil Seal Gland (AN049)	FKM		2
22	RZL-440B-OSGB	Oil Seal, Gear box (85x110x13t)	NBR		2
	RZL-440B-OSGV	Oil Seal, Gear box (85x110x13t)	FKM		2
23	RZL-440B-OSGWB	Wrench Bolt , Oil Seal Gland (M12x25L)	SUS304		8
24	RZL-440B-OSGLD	Gland, Oil Seal	SUS304	2	
25	RZL-440B-DSPIN	Pin, Double Seal	SUS304	4	
26	RZL-440B-GCGP	Gasket	Paper	1	
27	RZL-440B-PLUG	Plug (M14)	PE	8	
28	RZL-440B-VADPT	Vertical adaptor	SUS304	RZL400	4
29	RZL-115B-LFP	Pad, Leg feet	SS+Rubber	RZL Series	4
30	RZL-115B-ERT	Rotor tool, Extraction	SUS304	RZL Series	1

## Parts List for JRZL-400 Series Pumps Pump Assembly

Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump	
1A	RZL-440-GBAW	Gear Box Ass'y - White	FCD40	RZL440	1	
	RZL-450-GBAW	Gear Box Ass'y - White	FCD40		1	
31	See page 65	Rotor Case	SUS316L	RZL400	1	
32	RZL-440B-FCVVR	Front Cover	SUS316L	RZL400	1	
33	RZL-440B-CNUT	Cap Nut	SUS304		4	
34	RZL-440B-FCORB	O-ring, Front Cover (AN278)	NBR		1	
	RZL-440B-FCORE	O-ring, Front Cover (AN278)	EPDM		1	
	RZL-440B-FCORV	O-ring, Front Cover (AN278)	FKM		1	
36	RZL-440B-RBW	Rotor Bolt & Spring Washer	SUS304		2	
37	RZL-440B-RBORB	O-ring, Rotor Bolt (AN228)	NBR		2	
	RZL-440B-RBORE	O-ring, Rotor Bolt (AN228)	EPDM		2	
	RZL-440B-RBORV	O-ring, Rotor Bolt (AN228)	FKM		2	
38	See page 68	Rotor	SUS304		6	
39	RZL-440B-RTSLP	Rotor, Seal Pin	SUS316L		RZL400	2
40	RZL-440B-CSSLP	Seal Pin, Case	SUS304		RZL400	4
41	RZL-440B-RCDOW	Dowel, Rotor Case(Φ15)	SUS304		RZL400	2
44	RZL-440-CSSB	Stud Bolt, Case (M20x198L)	SUS304	RZL440	4	
	RZL-450-CSSB	Stud Bolt, Case (M20x223L)	SUS304	RZL450	4	
45	RZL-440B-SHIM05	Shim (0.05mm)	SUS304	RZL400	2	
	RZL-440B-SHIM1	Shim (0.1mm)	SUS304	RZL400	2	
	RZL-440B-SHIM2	Shim (0.2mm)	SUS304	RZL400	2	
46	RZL-440B-SBHYN	Hex nut, Stud Bolt (M10,14mm)	SUS304	RZL400	4	
47	RZL-440B-FSNIP	Nipple, Flush	SUS304		2	
51	RZL-440B-RTORE	O-ring, Rotor (AN151)	EPDM		2	
	RZL-440B-RTORV	O-ring, Rotor (AN151)	FKM		2	
53	RZL-440B-RCORE	O-ring, Rotor Case (AN235)	EPDM		2	
	RZL-440B-RCORV	O-ring, Rotor Case (AN235)	FKM	2		

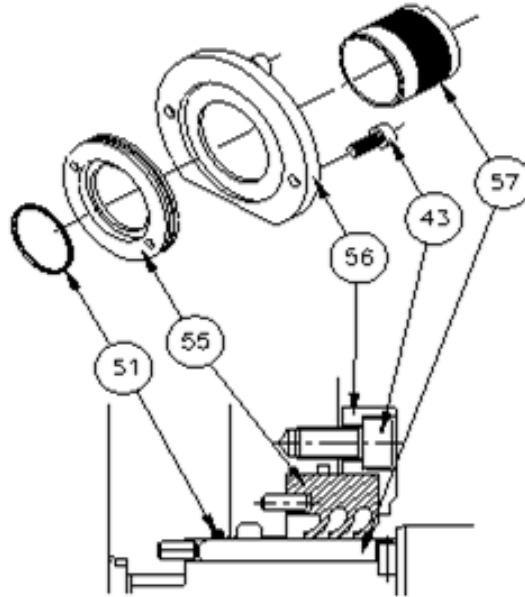
## Parts List for JRZL-400 Series Pumps Rotor Case / Rotor

Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump	
31	RZL-440-RCCLMP	Rotor Case - 4" TRICLAMP	SUS316L	RZL440	1	
31	RZL-450-RCCLMP	Rotor Case - 5" TRICLAMP / 5" TRICLAMP	SUS316L	RZL450	1	
	RZL-450-RCFLNG	Rotor Case - 5" FLANGE	SUS316L		1	
38	RZL-440-SWA	Rotor Set (2), Single-Wing	SUS316L	RZL440	2	
	RZL-440-BWA	Rotor Set (2), Bi-Wing	SUS316L		2	
	RZL-440-BWTIA	Rotor Set (2), Bi-Wing, PTFE Inserted	SUS316L/ PTFE		2	
	RZL-440-HWA	Rotor Set (2), Bi-Wing, High Temp Clearance	SUS316L		2	
	RZL-440-BLA	Rotor Set (2), Bi-Lobe	SUS316L		2	
	RZL-440-3LA	Rotor Set (2), Tri-Lobe	SUS316L		2	
	RZL-440-HTLA	Rotor Set (2), Tri-Lobe, High Temp Clearance	SUS316L		2	
	RZL-440-HELIA	Rotor Set (2), Heli-Lobe	SUS316L		2	
	RZL-450-SWA	Rotor Set (2), Single-Wing	SUS316L		RZL450	2
	RZL-450-BWA	Rotor Set (2), Bi-Wing	SUS316L			2
	RZL-450-BWTIA	Rotor Set (2), Bi-Wing, PTFE Inserted	SUS316L			2
	RZL-450-HWA	Rotor Set (2), Bi-Wing, High Temp Clearance	SUS316L			2
	RZL-450-BLA	Rotor Set (2), Bi-Lobe	SUS316L			2
	RZL-450-3LA	Rotor Set (2), Tri-Lobe	SUS316L			2
	RZL-450-HTLA	Rotor Set (2), Tri-Lobe, High Temp Clearance	SUS316L			2
	RZL-450-HELIA	Rotor Set (2), Heli-Lobe	SUS316L			2

- All standard rotor cases do not have tap holes for flushing on jacketed options.

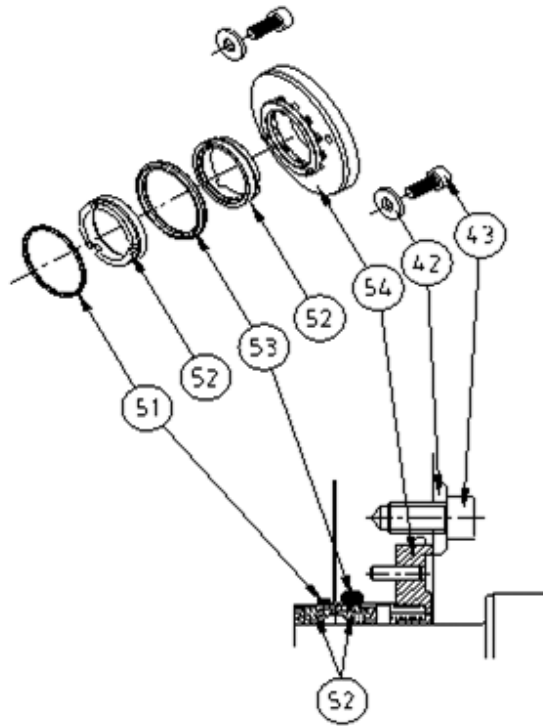


## Parts List for JRZL-400 Series Pumps Triple Lip Seal



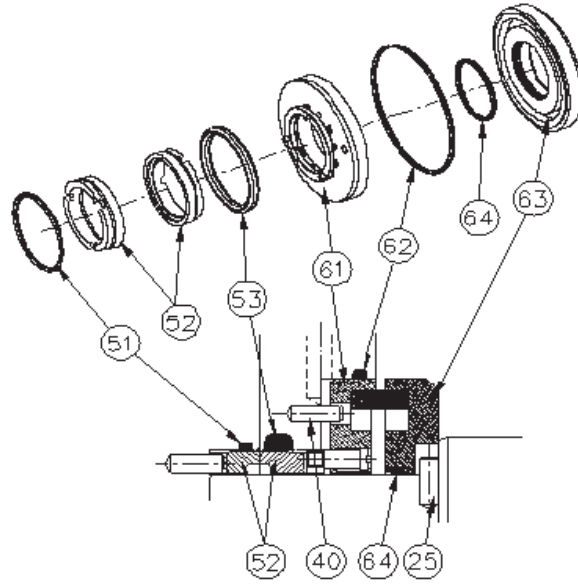
Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump
43	RZL-440B-MSGWB	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304	RZL400	4
51	RZL-440B-RTORB	O-ring, Rotor (AN151)	NBR		2
	RZL-440B-RTORE	O-ring, Rotor (AN151)	EPDM		2
	RZL-440B-RTORV	O-ring, Rotor (AN151)	FKM		2
55	RZL-440B-TRPLSC	Triple Lip Seal, Product	PTFE+Copper		2
	RZL-440B-TRPLS	Triple Lip Seal, Product	PTFE+Glass		2
56	RZL-440B-LSC	Lip Seal Cover	SUS304		2
57	RZL-440B-CERCS	Ceramic Coated Sleeve, Product	CERAMIC/ SUS304		2

## Parts List for JRZL-400 Series Pumps Single Mechanical Seal



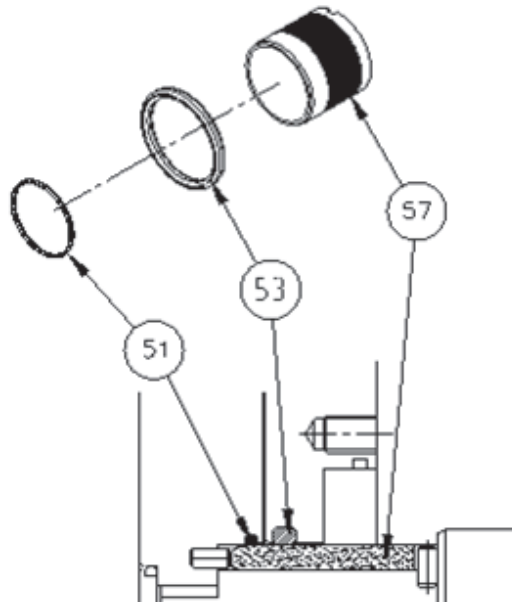
Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump
42	RZL-440B-MSGFW	Flat Washer, M/Seal Gland (Φ6)	SUS304	RZL400	4
43	RZL-440B-MSGWB	Wrench Bolt, M/Seal Gland (M6x10L)	SUS304		4
51	RZL-440B-RTORB	O-ring, Rotor (AN151)	NBR		2
	RZL-440B-RTORE	O-ring, Rotor (AN151)	EPDM		2
	RZL-440B-RTORV	O-ring, Rotor (AN151)	FKM	2	
52	RZL-440B-TCSEAL	Seal Ring	TC	RZL450	4
53	RZL-440B-RCORB	O-ring, Rotor Case (AN234)	NBR	RZL400	2
	RZL-440B-RCORE	O-ring, Rotor Case (AN234)	EPDM		2
	RZL-440B-RCORV	O-ring, Rotor Case (AN234)	FKM		2
54	RZL-440B-CSSB	Single Seal Body, Case	SUS304		2

## Parts List for JRZL-400 Series Pumps Double Mechanical Seal



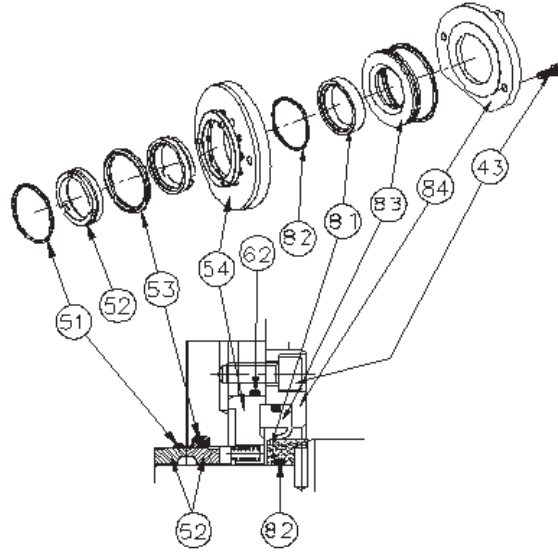
Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump
51	RZL-440B-RTORB	O-ring, Rotor (AN151)	NBR	RZL400	2
	RZL-440B-RTORE	O-ring, Rotor (AN151)	EPDM		2
	RZL-440B-RTORV	O-ring, Rotor (AN151)	FKM		2
52	RZL-440B-TCSEAL	Seal Ring	TC	RZL450	4
53	RZL-440B-RCORB	O-ring, Rotor Case (AN234)	NBR	ZL400	2
	RZL-440B-RCORE	O-ring, Rotor Case (AN234)	EPDM		2
	RZL-440B-RCORV	O-ring, Rotor Case (AN234)	FKM		2
61	RZL-440B-CDSBTC	Double Seal Body, Case	TC/SUS304	ZL400	2
	RZL-440B-CDHPTC	Double Seal Body, Case, High Pressure	TC/SUS304		2
62	RZL-440B-CORDSB	O-ring, Case, Double seal (AN045)	NBR		2
	RZL-440B-CORDSE	O-ring, Case, Double seal (AN045)	EPDM		2
	RZL-440B-CORDSV	O-ring, Case, Double seal (AN045)	FKM		2
63	RZL-440B-SDSBC	Rotation Part, Double Seal, Shaft	Carbon/SUS304		2
64	RZL-440B-SORDSB	O-ring, Shaft, Double Seal (AN038)	NBR		2
	RZL-440B-SORDSE	O-ring, Shaft, Double Seal (AN038)	EPDM		2
	RZL-440B-SORDSV	O-ring, Shaft, Double Seal (AN038)	FKM		2

## Parts List for JRZL-400 Series Pumps Single O-ring Seal



Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump
51	RZL-440B-RTORB	O-ring, Rotor (AN151)	NBR	RZL400	2
	RZL-440B-RTORE	O-ring, Rotor (AN151)	EPDM		2
	RZL-440B-RTORV	O-ring, Rotor (AN151)	FKM		2
53	RZL-440B-RCORB	O-ring, Rotor Case (AN234)	NBR		2
	RZL-440B-RCORE	O-ring, Rotor Case (AN234)	EPDM		2
	RZL-440B-RCORV	O-ring, Rotor Case (AN234)	FKM		2
57	RZL-440B-CERCS	Ceramic Coated Sleeve	CERAMIC/SS		2

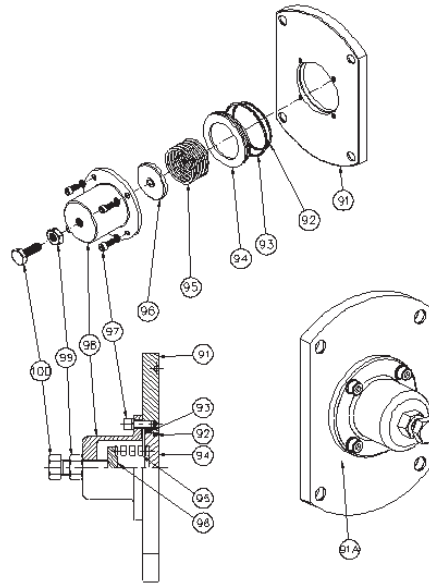
## Parts List for JRZL-400 Series Pumps Single Mechanical Seal with Flush



Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump	
43	RZL-440B-MSGWB	Wrench Bolt, Lip Seal Gland (M6x10L)	SUS304	RZL400	4	
51	RZL-440B-RTORB	O-ring, Rotor (AN151)	NBR		2	
	RZL-440B-RTORE	O-ring, Rotor (AN151)	EPDM		2	
	RZL-440B-RTORV	O-ring, Rotor (AN151)	FKM		2	
52	RZL-440B-TCSEAL	Seal Ring	TC	RZL450	4	
53	RZL-440B-RCORB	O-ring, Rotor Case (AN234)	NBR	RZL400	2	
	RZL-440B-RCORE	O-ring, Rotor Case (AN234)	EPDM		2	
	RZL-440B-RCORV	O-ring, Rotor Case (AN234)	FKM		2	
54	RZL-440B-CSSB	Seal Base, Single Mech.	SUS304		4	
62	RZL-440B-CORDSB	O-ring, Flushed Seal, Case (AN045)	NBR	RZL400	2	
	RZL-440B-CORDSE	O-ring, Flushed Seal, Case (AN045)	EPDM		2	
	RZL-440B-CORDSV	O-ring, Flushed Seal, Case (AN045)	FKM		2	
81	RZL-440B-CERFL	Ceramic Sleeve, Flushing	Ceramic		RZL400	2
	RZL-440B-ORFLB	O-ring, Ceramic Sleeve, Flushing (AN038)	NBR	2		
82	RZL-440B-ORFLE	O-ring, Ceramic Sleeve, Flushing (AN038)	EPDM	RZL400		2
	RZL-440B-ORFLV	O-ring, Ceramic Sleeve, Flushing (AN038)	FKM			2
83	RZL-440B-LSFLT	Lip seal, Flushing	PTFE	RZL400	4	
84	RZL-440B-SLPFLG	Gland, Lip Seal, Flushing	SUS304	RZL400	2	



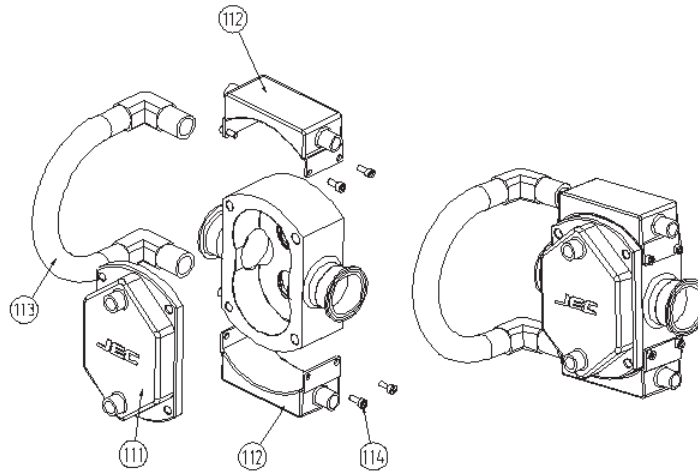
## Parts List for JRZL-400 Series Pumps Pressure Relief Front Cover



Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump
91	RZL-440B-RVFC	Front Cover, Relief Valve	SUS316L	RZL400	1
91A	RZL-440B-C	Pressure Relief Front Cover Ass'y	SUS316L		1
92	RZL-440B-OR1B	O-ring, 1 stage, plate (AN252)	NBR		1
	RZL-440B-OR1E	O-ring, 1 stage, plate (AN252)	EPDM		1
	RZL-440B-OR1V	O-ring, 1 stage, plate (AN252)	FKM		1
93	RZL-440B-OR2B	O-ring, 2 stage, plate (AN249)	NBR		1
	RZL-440B-OR2E	O-ring, 2 stage, plate (AN249)	EPDM		1
	RZL-440B-OR2V	O-ring, 2 stage, plate (AN249)	FKM		1
94	RZL-440B-VP	Plate, Valve	SUS316L		1
95	RZL-440B-RVSP	Spring	SS41 + Cr		1
96	RZL-440B-SPGP	Plate, Spring	SUS304		1
97	RZL-440B-RVWB	Wrench Bolt (M8 x 25)	SUS304		4
98	RZL-440B-RVC	Cover, Relief Valve	SUS304		1
99	RZL-440B-RVLN	Lock Nut (M20)	SUS304		1
100	RZL-440B-RVAB	Adjusting Bolt (M20 x 80)	SUS304	1	

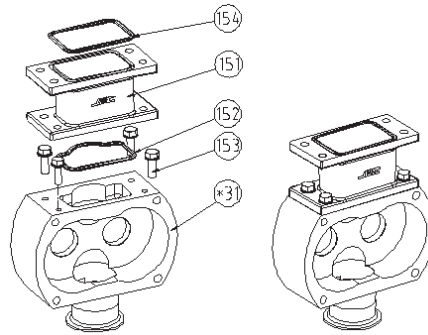
- Must supply setting pressure

## Parts List for JRZL-400 Series Pumps Jacket Front Cover and Case



Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump
111	RZL-440B-FCJ	Front Cover Jacket	SUS316	RZL400	1
112	RZL-440-CTJ	Jacket, Case Top	SUS304	RZL440	1
	RZL-440-CBJ	Jacket, Case Bottom	SUS304		1
	RZL-450-CTJ	Jacket, Case Top	SUS304	RZL450	1
	RZL-450-CBJ	Jacket, Case Bottom	SUS304		1
113	RZL-440B-JT	Tube, Jacket	SUS304	RZL400	1
	RZL-440B-JWB	Wrench Bolt, Jacket (M8 X 15L)	SUS304	RZL400	8

## Parts List for JRZL-400 Series Pumps Rectangular Inlet



Item	Dixon Sanitary Part #	Description	Material	Used	Quantity Per Pump
31	RZL-440-RCRI2C	Rotor Case - RECT / 5" Tri-clamp	SUS316L	RZL400	1
	RZL-440B-RFLG	Rotor Case - RECT / 5" FLANGE	SCS14		1
152	RZL-440B-RIORB	O-ring, Rectangular Inlet (AN262)	NBR		1
	RZL-440B-RIOR	O-ring, Rectangular Inlet (AN262)	EPDM		1
	RZL-440B-RIORV	O-ring, Rectangular Inlet (AN262)	FKM		4

# Certificates

ISSUE DATE: NOVEMBER 29, 2005

CERTIFICATE AUTHORIZATION NUMBER: 1397



THIS IS TO CERTIFY THAT

JEC Ltd.

32-8 Hwadang-Ri, Paltan-Myun Hwasung-Si, Kyunggi-do 445-914 SOUTH KOREA

is hereby authorized to continue to apply the 3-A Symbol to the models of equipment, conforming to 3-A Sanitary Standards for:

Number 02-11  
Centrifugal and Positive Rotary Pumps

set forth below

Rotary Lobes: JRZL105, JRZL110, JRZL115, JRZL120, JRZL220, JRZL225, JRZL330, JRZL340, JRZL440, & JRZL450; Centrifugal: JCP508, JCP510, JCP809, JCP812, JCP2210, JCP2214, JRZP015, JRZP030, JRZP060, JRZP130, & JRZP220; Centrifugal (WFT): JWP508, JWP510, JWP809, JWP812, JWP2210, & JWP2214.

VALID THROUGH: December 31, 2014

Timothy R. Rugh  
Executive Director  
3-A Sanitary Standards, Inc.

The issuance of this authorization for the use of the 3-A Symbol is based upon the voluntary certification, by the applicant for it, that the equipment listed above complies fully with the 3-A Sanitary Standards designated. Legal responsibility for compliance is solely that of the holder of this Certificate of Authorization, and 3-A Sanitary Standards, Inc. does not warrant that the holder of an authorization at all times complies with the provisions of the said 3-A Sanitary Standard. This in no way affects the responsibility of 3-A Sanitary Standards, Inc. to take appropriate action in such cases in which evidence of nonconformance had been established.

NEXT TPV INSPECTION/REPORT DUE: April 2017



## 1935/2004 (EC) Declaration of conformity

**Producer:** JEC Ltd. (15-26, Beodeul-ro 1362, Hwaseong-Si, Gyeonggi-Do, South Korea)  
**Product:** JEC Rotary lobe pump  
**Model:** JRZL series

We, JEC, hereby guarantee that the materials are in direct contact with food as below.

**SS316L, SIC seal ring, PTFE Glass filler and EPDM O-ring**

Complies with the following relevant regulations:

- 1935/2004 (EC)
- Annex IV of Regulation (EC) 10/2011
- BFR Recommendation XXI

This declaration of conformity has been established on the basis of the following:

No.	Parts	Test requested	Test done
1	Wetted parts (SS316L)	German Food, Articles of Daily use and Feed Code of September 1, 2005(LFGB),Section30 German Food, Articles of Daily use and Feed Code of September 1, 2005(LFGB),Section31	Extractable heavy metals Sensorial examination odor and taste
2	Seal ring (SIC)	German Food, Articles of Daily use and Feed Code of September 1, 2005(LFGB),Section30 German Food, Articles of Daily use and Feed Code of September 1, 2005(LFGB),Section31	Extractable heavy metals Sensorial examination odor and taste
3	Lip seal (PTFE With Glass Filler)	Commission Regulation(EC)No 10/2011 and Hence Article 3 of European Regulation No. 1935/2004 German Food, Articles of Daily use and Feed Code of September 1, 2005(LFGB),Section31	1.Overall Migration 2.Specific Migration of Heavy metal Sensorial examination odor and taste
4	O-ring (EPDM)	BFR Recommendation XXI European Commission Directive 93/11/EEC	1.Overall Migration 2.Specific migration of Primary Aromatic Amine 3.lead and Zinc content 4.Specific migration of Formaldehyde 5.Chloroethin content Specific migration of Nitrosamines

James Song / President

JEC LTD. 15-26, Beodeul-ro, Paltan-myun, Hwaseong-si, Gyeonggi-do, 445-914, South Korea  
Tel : 82-31-355-0316, Fax : 82-31-355-0319

# Certificates



## EC-Declaration of conformity (as per EC's Machinery Directive 2006/42/EC, Annex IIA)

**Producer**  
JEC LTD  
15-26, Beodeul-ro 1362, Hwasung-Si,  
Kyunggi-do, South Korea

We hereby guarantee that **Lotary lobe pump (Pump Head Only)**  
Type: **JRZL series**

are in conformity with the essential requirements of the EC's Machinery Directive 2006/42/CE (latest modifications included) and according to the following Council Directives and harmonized norms:  
- 2006/95/EC Directive "low voltage"  
- UNI EN ISO 12100-2:2005

## Manufacturer Declaration (as per EC's Machinery Directive 2006/42/CE, Annex IIB)

We hereby declares that the above pumps,  
Comply with the pertinent disposition, in the execution supplied by JEC LTD for the incorporation in a machine or installation, or for the assembly with other machines as a subunit of other higher order machine. Harmonized norms used, particularly:

**UNI EN ISO 12100-2:2005**

The machine above must not be put into service until the machinery into which it has been incorporated have been declared in conformity with the EC Machinery Directive. It must meet, particularly, the standards ISO 23857:2008, ISO 13732-1:2007 in its respective current editions.

James Song / President

JEC LTD, 15-26, Beodeul-ro, Paltan-myun, Hwasong-si, Gyeonggi-do, 445-843, South Korea  
Tel : 82-31-355-0316, Fax : 82-31-355-0319

## ATEX Certificate



### Konformitätserklärung EC declaration of conformity

im Sinne der EG-Maschinenrichtlinie 98 / 37 / EG, Anhang IIA  
as defined by EC machinery directive 98 / 37 / EC, Annex I A

Produkt: Produit:	Kreislaufpumpe Rotary Lobe Pump
Modell: Serial No.:	JRZL series JCEP-0000
Max. Arbeitsdruck: max. working pressure:	bis 12 bar to 12 bar
Drehzahl: Speed:	<500 min <sup>-1</sup> (+/-10%)
Kennzeichnung: Marking:	II 2G c T4

Hiermit erklären wir, dass die Pumpentypen, mit den folgenden Richtlinien übereinstimmen.  
We declares that the pump types, complies with the following relevant regulations:

**EG - Maschinenrichtlinie 98 / 37 / EG, Anhang I Nr. 1**  
**EC machinery directive 98 / 37 / EG, Annex I No. 1**

**EG - Richtlinie 94 / 9 / EC für Geräte in explosionsgefährdeten Bereichen**  
**EC directive 94 / 9 / EC for equipment for the use in potentially explosive atmospheres**

Entsprechend Artikel 8(1)(b)(i) der Richtlinie 94/9/EC ist die technische Dokumentation bei der benannten Stelle hinterlegt.  
**IBEXU, Institut für Sicherheitstechnik, Fuchsmühlenweg 7, 09599 Freiberg**

According to article 8(1)(b)(i) of guide line 94 / 9 / EC the technical documentation is deposited at the nominated location.  
**IBEXU, Institute for Safety Technology, Fuchsmuehlenweg 7, 09599 Freiberg, Germany**

Angewandte harmonisierte Normen:  
Applicable harmonized standards:

EN 292-1, EN 292-2, EN 809, EN 294, EN 663, EN 963

EN1127-1, EN 13463-1, EN 13463-5

Die Sicherheitshinweise der Betriebsanleitung sind zu beachten!  
The safety instructions of the operating manual must be followed!

July 28 2009  
Date

James Song / President

JEC LTD, 32-8, Hwadang-ri, Paltan-myun, Hwasong-si, Gyeonggi-do, 445-843, South Korea  
Tel : 82-31-355-0316, Fax : 82-31-355-0319



## Limited Warranty

DIXON VALVE AND COUPLING COMPANY (herein called "Dixon") warrants the products described herein, and manufactured by Dixon to be free from defects in material and workmanship for a period of one (1) year from date of shipment by Dixon under normal use and service. Its sole obligation under this warranty being limited to repairing or replacing, as hereinafter provided, at its option any product found to Dixon's satisfaction to be defective upon examination by it, provided that such product shall be returned for inspection to Dixon's factory within three (3) months after discovery of the defect. The repair or replacement of defective products will be made without charge for parts or labor. This warranty shall not apply to: (a) parts or products not manufactured by Dixon, the warranty of such items being limited to the actual warranty extended to Dixon by its supplier; (b) any product that has been subject to abuse, negligence, accident, or misapplication; (c) any product altered or repaired by others than Dixon; and (d) to normal maintenance services and the replacement of service items (such as washers, gaskets and lubricants) made in connection with such services. To the extent permitted by law, this limited warranty shall extend only to the buyer and any other person reasonably expected to use or consume the goods who is injured in person by any breach of the warranty. No action may be brought against Dixon for an alleged breach of warranty unless such action is instituted within one (1) year from the date the cause of action accrues. This limited warranty shall be construed and enforced to the fullest extent allowable by applicable law.

Other than the obligation of Dixon set forth herein, Dixon disclaims all warranties, express or implied, including but not limited to any implied warranties of merchantability or fitness for a particular purpose, and any other obligation or liability. The foregoing constitutes Dixon's sole obligation with respect to damages, whether direct, incidental or consequential, resulting from the use or performance of the product.

Some products and sizes may be discontinued when stock is depleted, or may require a minimum quantity for ordering.

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