

Fire Pump Models CLR, CLS and CLV Installation Instructions

Waterous Fire Pumps may be ordered with a variety of accessories.
Refer to the following separate installation instructions as necessary:

Auto Tank Fill System

Butterfly Valves

CAF System

Discharge Valves

Drain Valves

Foam System:

Foam Pump

Foam Pump Flush Kit

Foam Fill

Dual Foam Injection Kit

Dual Tank Selector

Overboard Foam Pick-up

Remote Start Kit

Overheat Protection Manager (OPM)

Pump Shift (Pneumatic)

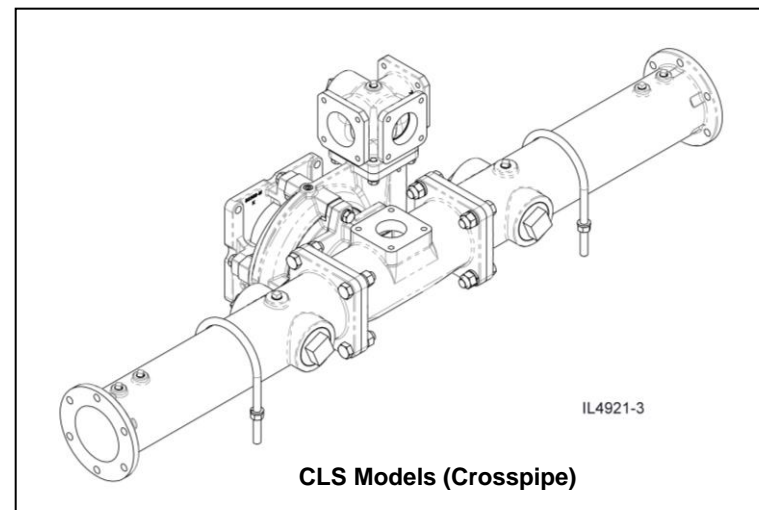
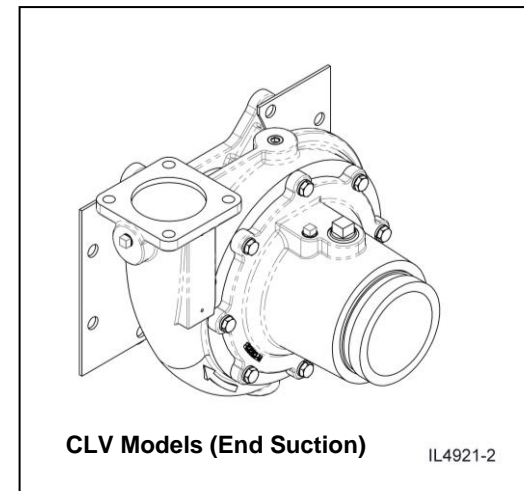
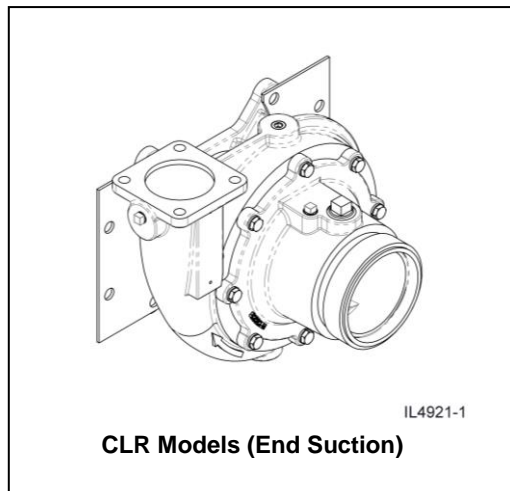
Pressure Control System:

Discharge Relief Valve

Intake Relief Valve

Pressure Governor

Priming System



**Read through safety information
and installation instructions
carefully before installing your
Waterous Fire Pump.**

Note that Instructions are subject to change
without notice.

F-1031, Section 3020
Revised: 7/18/24

Table on Contents:

| | |
|---|-----------|
| Safety Information..... | 3 |
| Pump Intake and Discharge Connections..... | 4 |
| Pump Orientation Definitions..... | 4 |
| Available Pump Drives..... | 4 |
| Pump Mounting..... | 5 |
| Mounting Locations: | |
| CLR and CLV End Suction Models: | |
| With K Model Transmission..... | 6 |
| With PA Model Transmission..... | 7 |
| With T Model Transmission..... | 8 |
| CLS Crosspipe Models: | |
| With K Model Transmission..... | 9 |
| With PA Model Transmission..... | 10 |
| Optional Suspension Pin Mounting Method: | |
| With Model K Transmissions Only..... | 11 |
| Tachometer Connection: | |
| Available on PA Transmissions Only..... | 12 |
| Optional Corrosion Protection..... | 13 |
| Final Checks: | |
| Lubrication..... | 14 |
| Testing..... | 14 |



Read through and communicate safety information to the end user of this Watrous Fire Pump.

⚠ WARNING

Death or serious personal injury might occur if proper operating procedures are not followed. The pump operator, as well as individuals connecting supply or discharge hoses to the apparatus must be familiar with these pump operating instructions as well as other operating instructions and manuals for the apparatus, water hydraulics and component limitation.

⚠ WARNING

Pressure Hazard. May result in personal injury.

Prior to connection or removal of hoses, caps or other closures with pump intake or pump discharge connections, relieve pressure by opening drains or bleeder valves. Bleeder valves should also be used while filling a hose connected to an intake with water.

⚠ WARNING

Scalding Water Hazard. May result in serious burns.

When operating the pump, be sure to open at least one discharge valve slightly to prevent the pump from overheating. If the pump runs for a few minutes completely closed, it may heat the water enough to scald someone when the valve is opened. Overheating can damage the packing, seals and other pump parts. If the apparatus builder has installed a by-pass system or other provision designed to prevent overheating, opening a discharge valve may be unnecessary.

⚠ WARNING

Rotating Parts Hazard or Unexpected Truck Movement. May result in serious personal injury or death.

Stop the engine, set parking brake and chock the wheels before going under the truck to adjust packing or to check packing gland temperature.

OEM Installation Warnings

⚠ WARNING

Unexpected Truck Movement. May result in serious personal injury or death.

Failure to properly install the pump shift control and pump shift indicator system in the apparatus or failure to incorporate in the Pump Operator's Panel Engine Speed Interlock System may result in unexpected truck movement which may result in serious personal injury or death.

⚠ WARNING

Inability to Pump Water. May result in serious personal injury or death.

Failure to properly install the pump shift control and pump shift indicator system in the apparatus or failure to incorporate in the Pump Operator's Panel Engine Speed Interlock System may result in the inability to pump water which may result in serious personal injury or death.

⚠ WARNING

Exceeding Power Train Torque Ratings. May result in inability to pump water causing serious personal injury or death.

This fire pump may have the capability under certain pumping conditions to exceed the torque rating of the power train.

A means to control the engine output to a torque level no greater than the power train's continuous-duty torque rating must be considered when specifying power train components and engine control system parameters.

Pump Orientation Definitions

Pump and Vehicle Location Definitions used in this Instruction

| Fire Pump Location | Relative to Vehicle Location (Vehicle with Left Side Driver's Controls) |
|--------------------|--|
| Front | Front (Driver's Controls) |
| Rear | Rear (Rear Wheels) |
| Left | Driver's Side |
| Right | Passenger or Curb Side |
| Top | Up |
| Bottom | Down |

Pump Intake and Discharge Connections

| Pump Model | Intake | Discharge |
|------------|--|---|
| CLR | 4 in. NH or 4 in. BSPP Thread | Various Options: Waterous 2-1/2 in. 4-Bolt Flange, Discharge Head with 2-1/2 in. 4-Bolt Flanges, 3 in. NPT (F) Tapped Flange, 3 in. Victaulic® Connection |
| CLS | Left and Right Flanges, 4 in. Flange Waterous Flange, (6) 1/2 in. Bolts on a 5-3/4 in. Bolt Circle | |
| CLV | 4 in. Victaulic® | |

Available Pump Drives

| Drive | Transmission | | | | Complete Pump and Transmission Model | | |
|-------------------------------|-----------------------------|--------|-------|--------------------------------|--------------------------------------|-------|-------|
| | Type | Series | Model | Input Shaft Rotation | CLR | CLS | CLV |
| PTO | Two Gear Speed Increaser | K | K | Clockwise or Counter Clockwise | CLRK | CLSK | CLVK |
| | Chain Drive Speed Increaser | P | PA | Clockwise | CLRPA | CLSPA | CLVPA |
| Directly Mounted to an Engine | Two Gear Speed Increaser | T | T | Clockwise or Counter Clockwise | CLRT | - | CLVT |

Pump Mounting

Select a mounting location which will make the pump and its accessories readily accessible for maintenance and which will make the pump driveshaft parallel with the output shaft of the chassis transmission or transfer case. Also, select the location so that when the apparatus is loaded, the universal joints on the propeller shaft will have a proper working angle. Be sure the propeller shaft used are of the slip-joint design. Frame deflection, temperature changes and similar factors may cause a propeller shaft without slip-joints to produce severe axial loads on the bearings and damage the pump.

Be sure to keep at least a minimum of 1° U-joint operating angle. This is the preferred method of propeller shaft installation. For additional information on this method, or for alternative methods, see drive shaft installation guidelines such as Spicer® / Driveshaft Installation Techniques.

Driveline End Yokes and Companion Flanges: Anti-seize should be applied to the shaft threads before installing end yoke or companion flange. Use self-locking nuts supplied, torque to 275-325 lb-ft. Do not re-use nuts if end yoke or companion flange is removed.

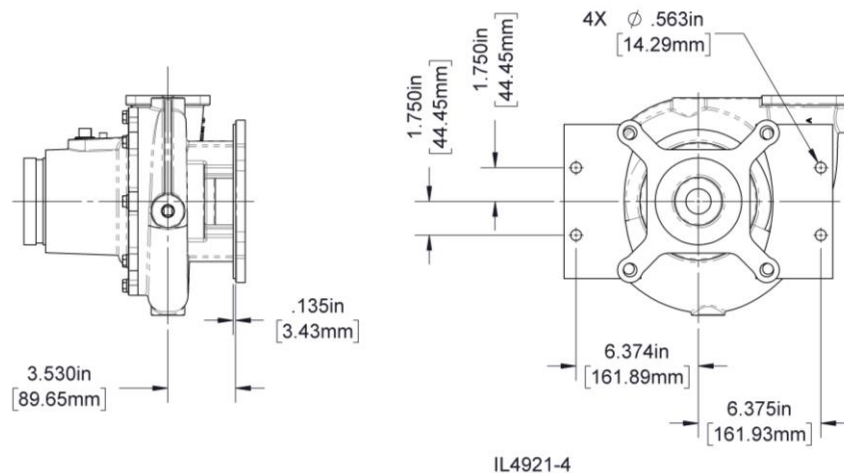
CLR and CLV End Suction Models:

Brackets must be fabricated to attach to the mounting points of the pump and the chassis frame. Tighten the mounting hardware to standard torque specifications.

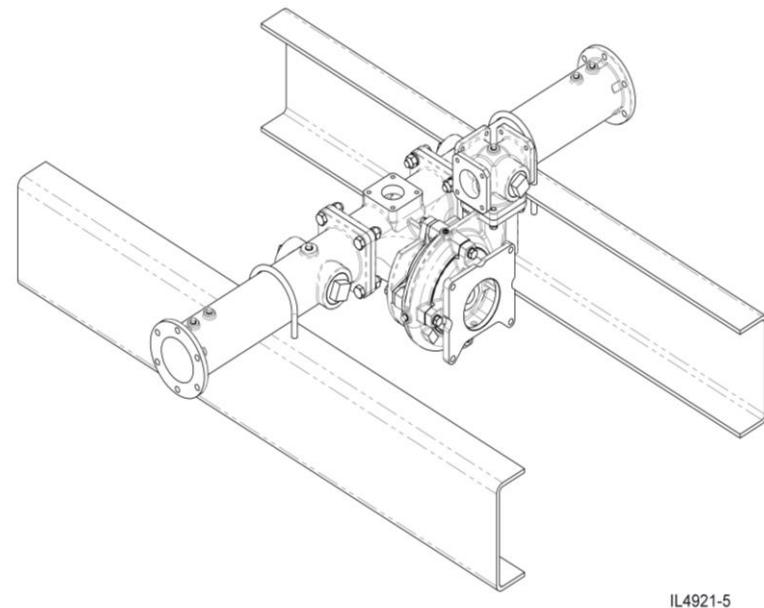
CLS Crosspipe Models:

The diagram below shows a typical installation where the pump crosspipe is attached to the chassis frame rails with U-bolts. To mount the pump, drill suitably sized holes corresponding to the u-bolts. The u-bolts are furnished with the pump along with hex nuts and washers.

CLR and CLV End Suction Models



CLS Crosspipe Models

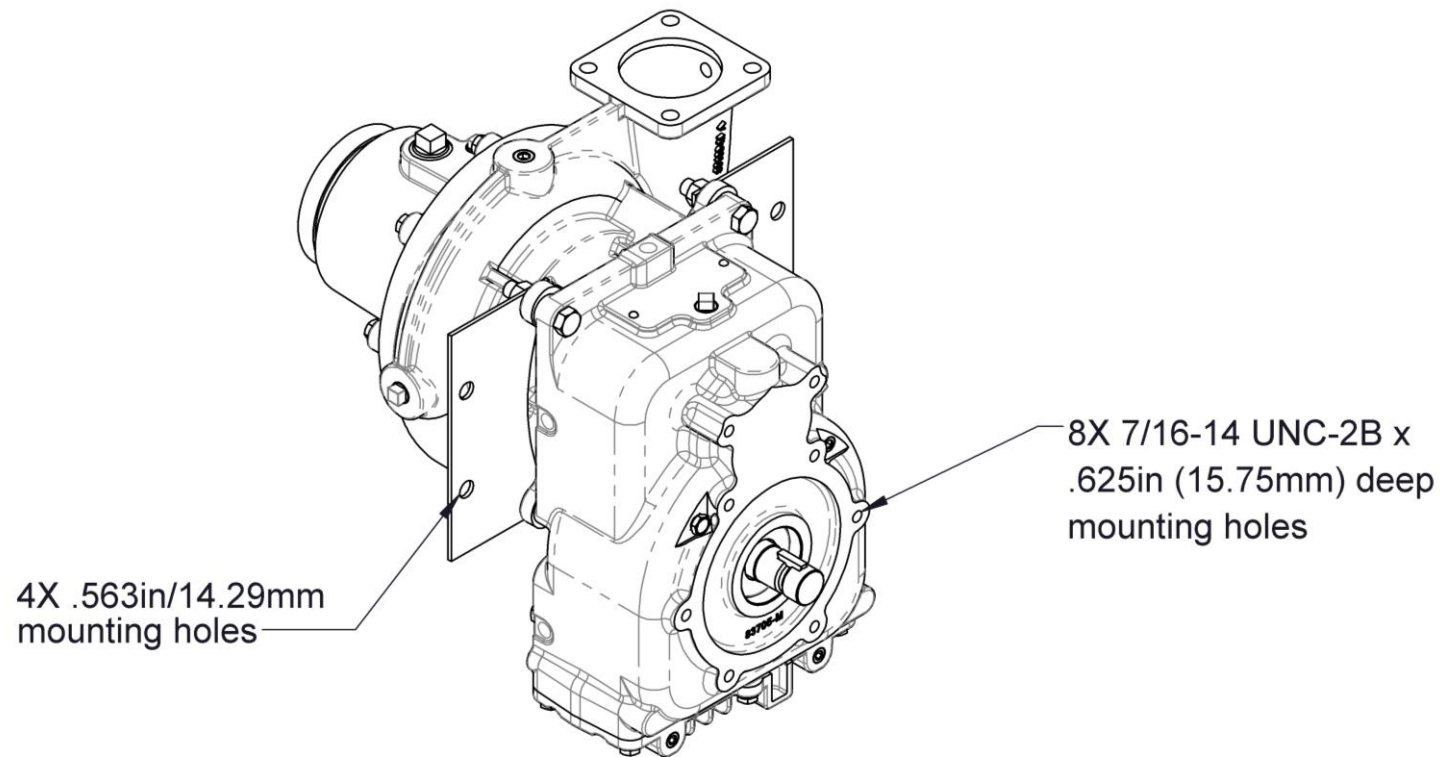


Mounting Locations

CLR and CLV End Suction with Model K Transmission

Note that the Pump Discharge only may be positioned Up, Right, Left or Down. The Transmission may be mounted Vertical, Right, Left or Inverted.

Refer to the configuration of the pump you ordered and Pump Dimensional Drawing for details specific to your pump.



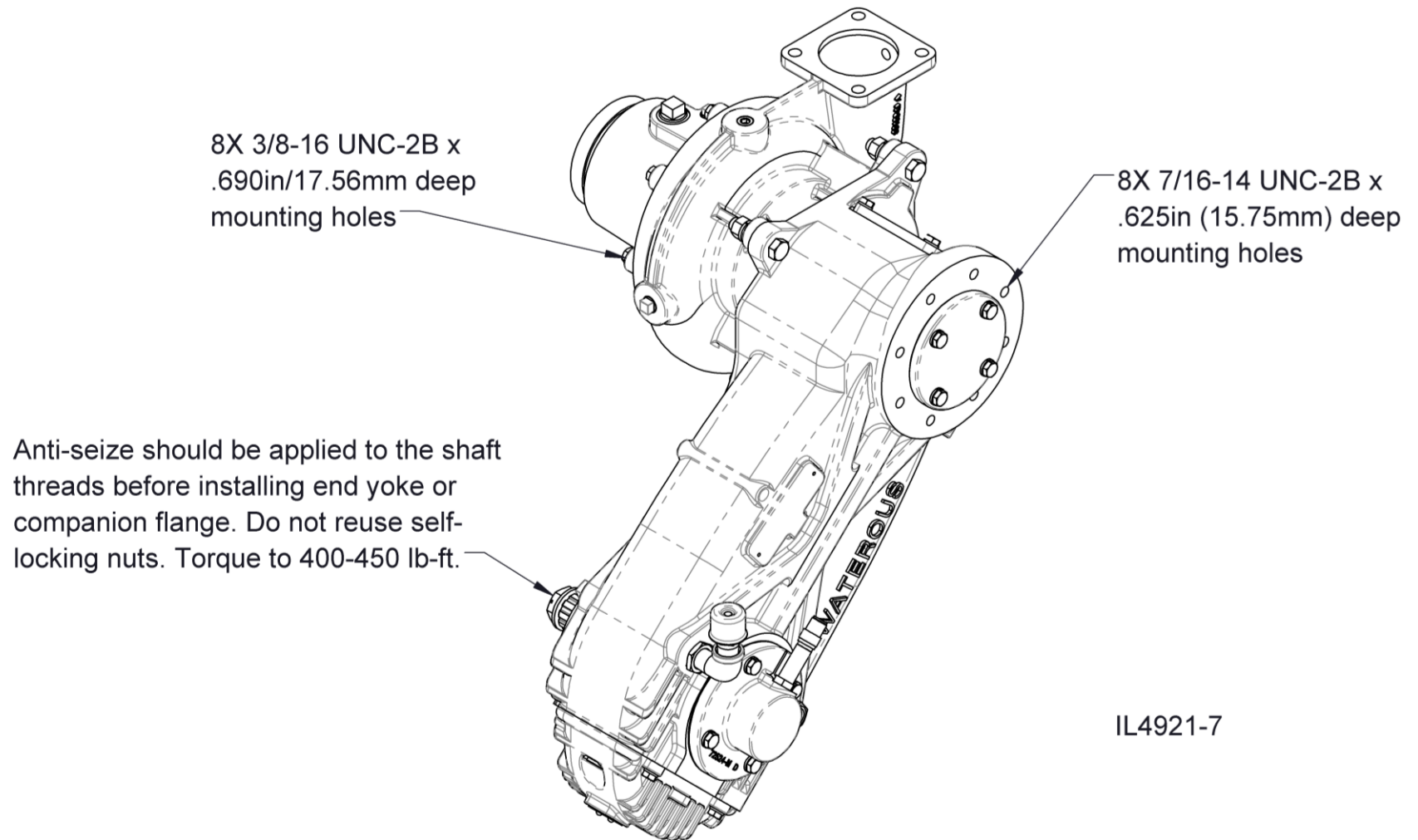
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Mounting Locations

CLR and CLV End Suction with Model PA Transmission

Refer to the Pump Dimensional Drawing for details specific to your pump.

Anti-seize should be applied to the shaft threads before installing end yoke or companion flange. Do not reuse self-locking nuts, torque to 400-450 lb-ft.

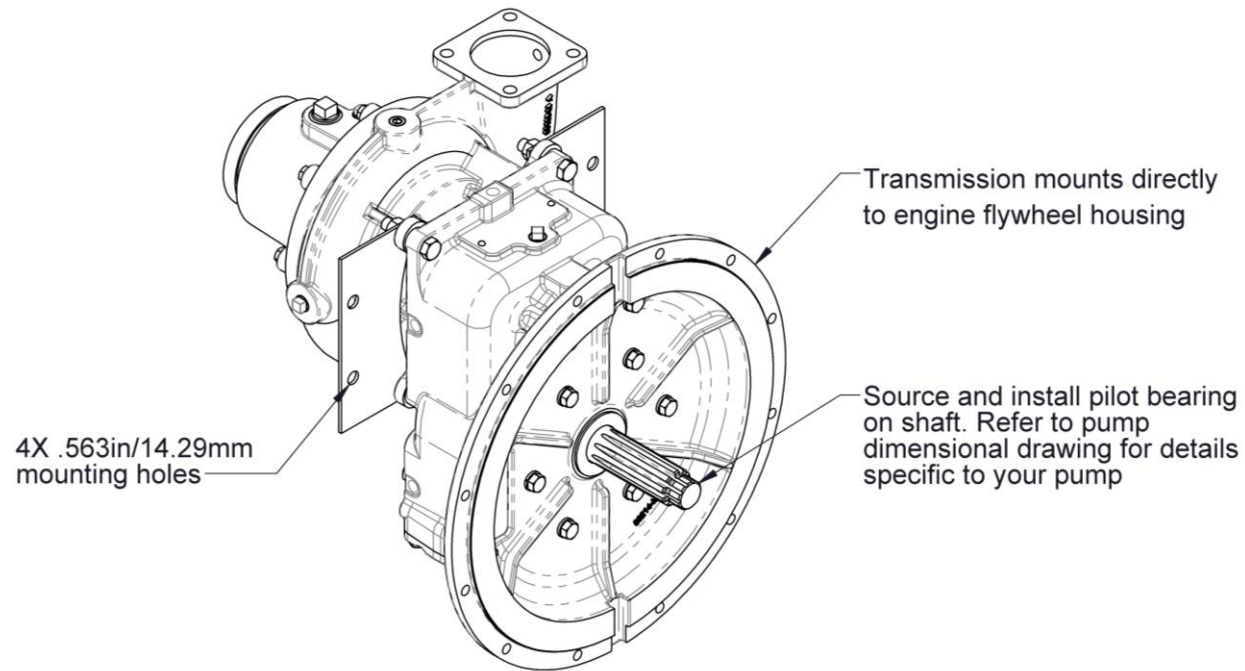


Mounting Locations

CLR and CLV End Suction with Model T Transmission

Note that the Pump Discharge only may be positioned Up, Right, Left or Down. The Transmission may be mounted Vertical, Right, Left or Inverted.

Refer to the configuration of the pump you ordered and Pump Dimensional Drawing for details specific to your pump.



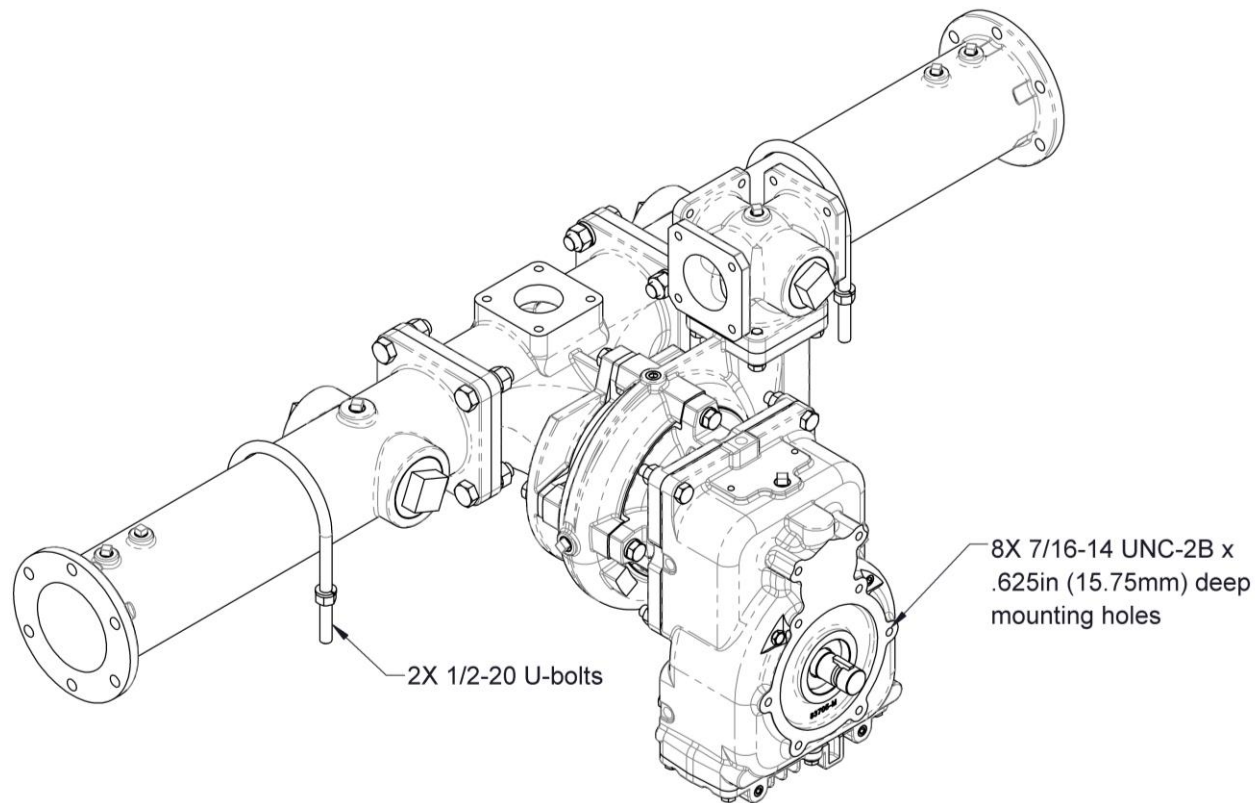
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Mounting Locations

CLS Crosspipe with Model K Transmission

Note that the Pump Discharge only may be positioned Up, Right, Left or Down, The Transmission may be mounted Vertical, Right, Left or Inverted.

Refer to the configuration of the pump you ordered and Pump Dimensional Drawing for details specific to your pump.



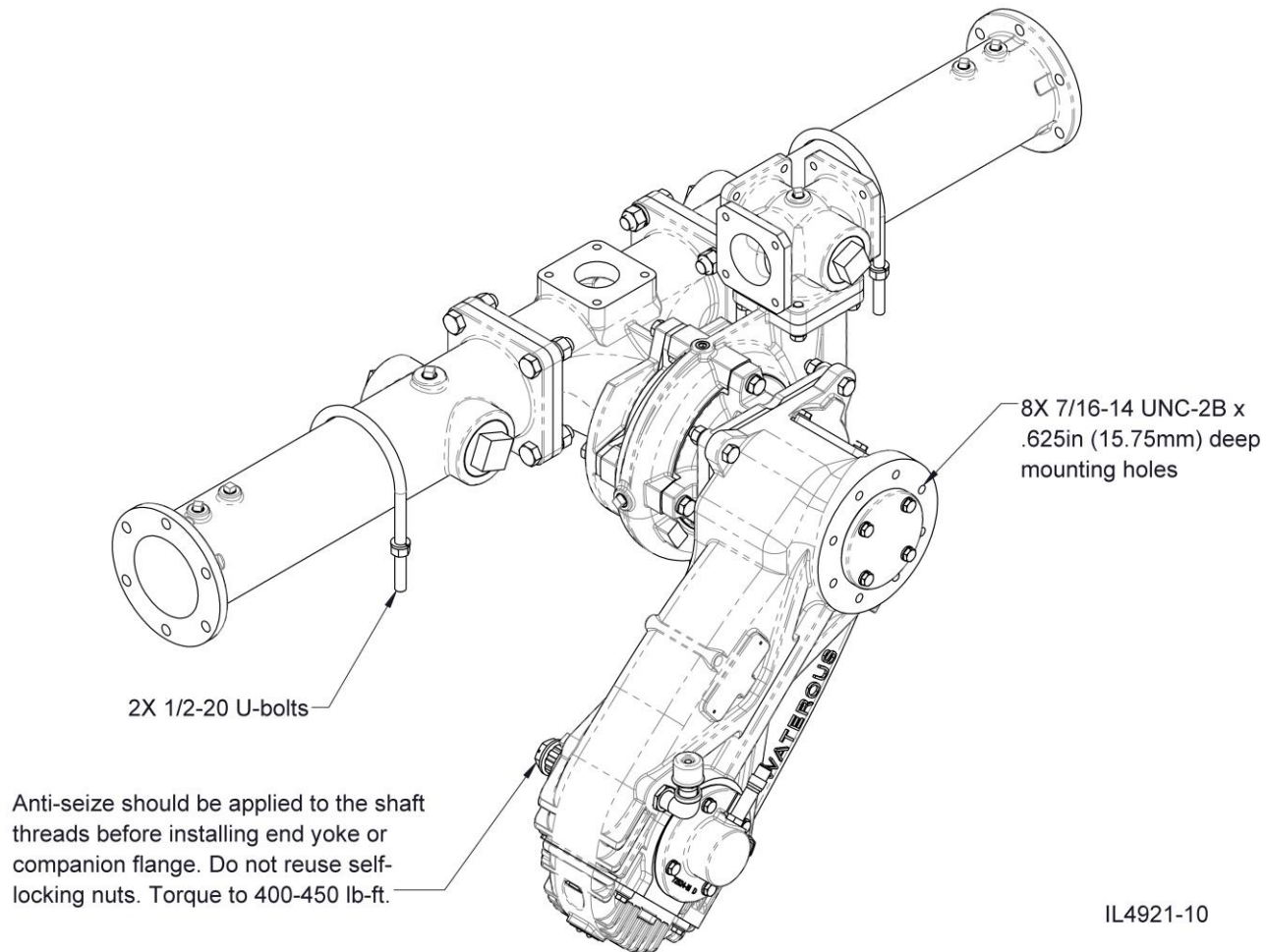
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Mounting Locations

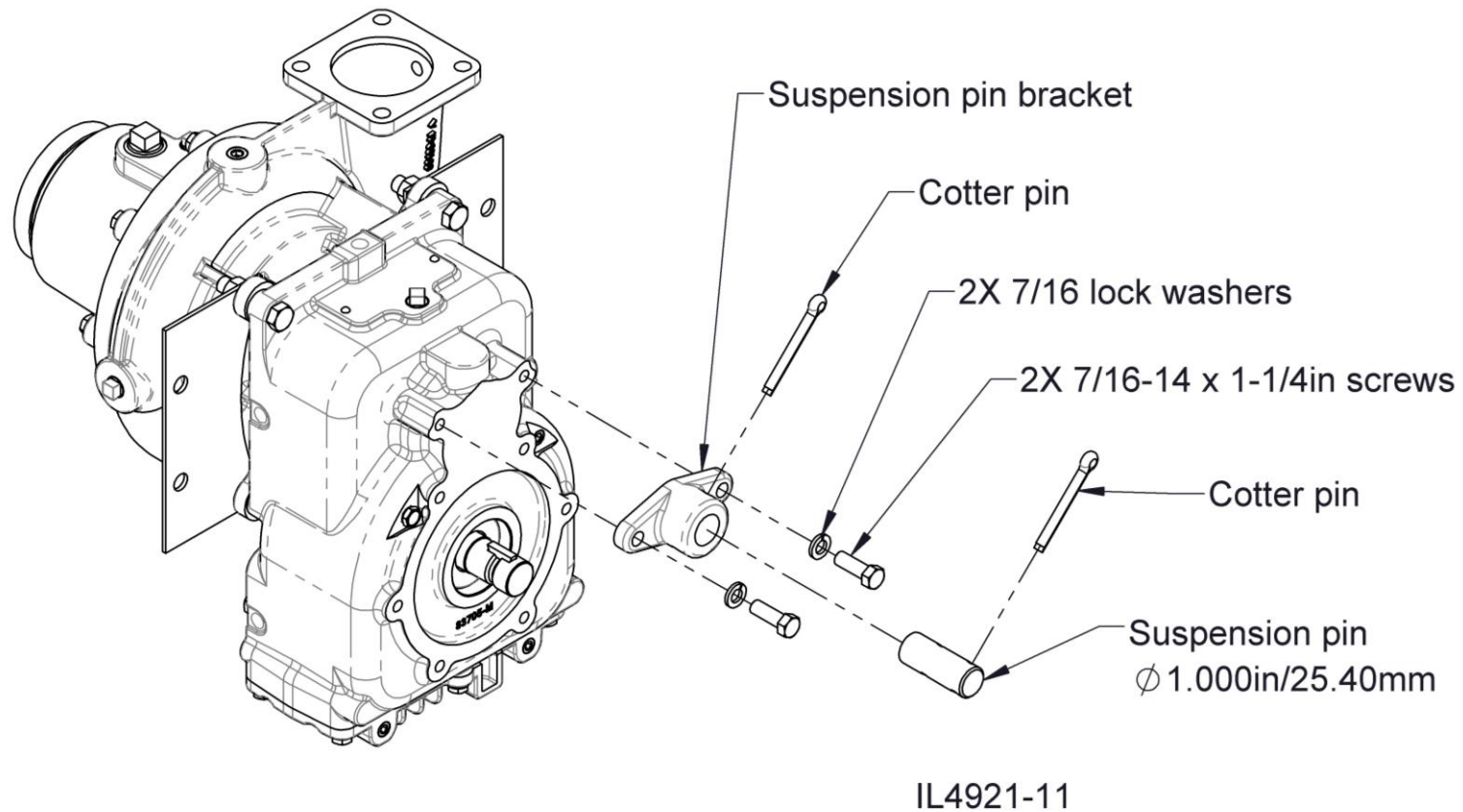
CLS Crosspipe with Model PA Transmission

Refer to the pump Dimensional Drawing for details specific to your pump.

Anti-seize should be applied to the shaft threads before installing end yoke or companion flange. Do not reuse self-locking nuts, torque to 400-425 lb-ft.



Optional Suspension Pin Mounting Method With Model K Transmissions Only



Tachometer Connection

Electronic Tachometer

Standard on PA Model Transmissions

The magnetic pick-up in the transmission mates with an Amphenol connector (P/N MS3106A-10SL-4S).

This connector should be wired to a wall mount receptacle on the operator's panel.

Cable assembly part number 63033 is available from Waterous.

To verify the rotational speed of the drive shaft, the frequency (Hz) reading from the tachometer sensor should be multiplied by 6.

$$\text{Hz} \times 6 = \text{RPM}$$

NOTE: Frequency reading can be measured with a hand-held multimeter.

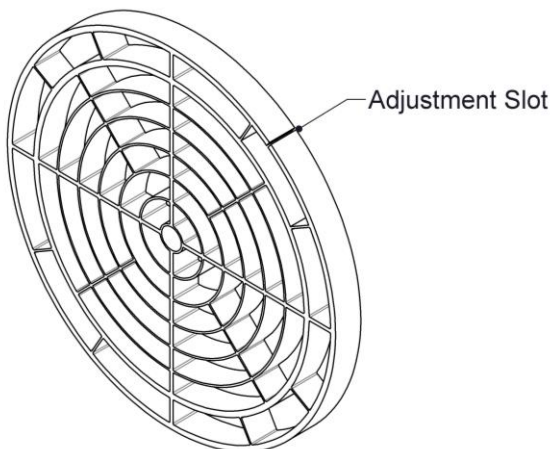
Cable connector assembly part number V 3398 is available from Waterous for connecting panel mounted receptacle to multimeter.

Optional Corrosion Protection

Intake Screens

Waterous offers intake screens that fit 4, 4-1/2, 5 and 6 inch intake fittings sizes. The screen is designed to fit in the counter bore in the inside diameter of the fittings. There must be a strong electrical contact between the screen and the intake fitting. Remove any corrosion, debris or paint from the counter bore that will insulate the screen from the intake fitting. If the screen does not fit tightly, adjust the gap of the slot on the outside diameter of the screen to ensure a tight fit.

NOTE: Intake screen are die-cast which results in a slight taper from one side to the other. Install the screen with the thinner cross-section facing out to minimize flow restriction.



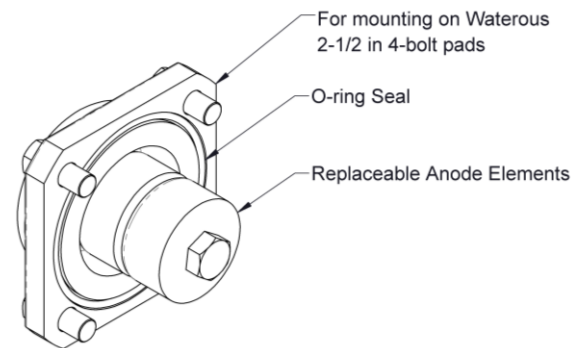
Intake Screen

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Anodes

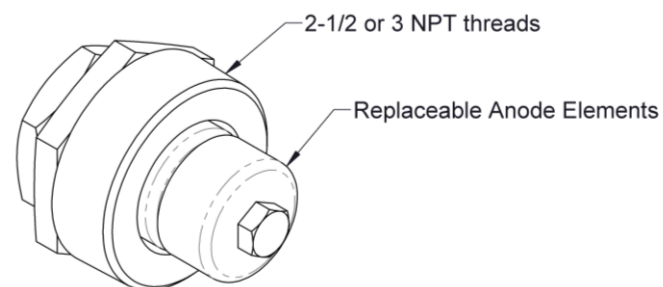
Anodes may be mounted in the intake piping or, if no intake pads are available, in the discharge piping.

NOTE: The replaceable elements must make contact with water to be effective. Do not paint or use any other coating on the replaceable elements.



4-Bolt Anode

IL4417-2



Threaded Anode

IL4417-3

Final Checks

Lubrication

Transmissions are shipped without lubricant and must be filled before the pump is operated.

NOTICE

Failure to properly lubricate the pump transmission may result in serious damage to the equipment.

The types of recommended lubricants are listed below:

| Transmission Model | Capacity (Quarts or Liters) (See Note 1) | Lubricant (See Note 2) |
|--------------------|--|--|
| PA | 1 | ATF (All Climates), or for Ambient Temperatures over 90°F/32°C: SAE 20 Oil 300 SSU @ 100°F with service classification SA, SB, SC should be used |
| K | 1 | SAE 80W-90 Gear Oil |
| T | 1 | |

Notes:

- 1) Capacities shown are approximate Quarts or Liters, always fill to the bottom of the plug labeled "Oil Level" or sight glass. Quantities listed vary based on ratio and/or mounting orientation.
- 2) Synthetic ATF and oil substitutes are acceptable.

Testing

Perform the tests listed in F-1031, Section 1000, "Centrifugal Fire Pump Principles of Operation, Inspection Tests and Troubleshooting Guide." During the running tests, monitor the smoothness of operation, listen for unusual noises and check for leaks.