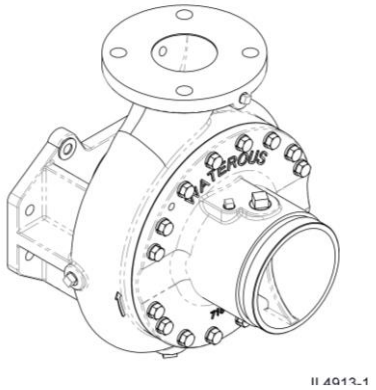
Fire Pump Models CGV, CGVG and CGVR Installation Instructions

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

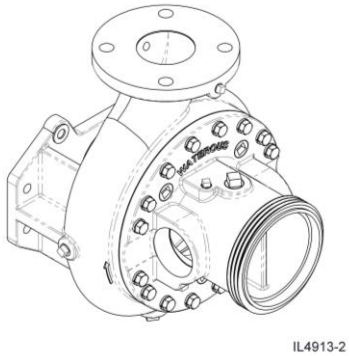
- Auto Tank Fill System
- Butterfly Valves
- CAF System
- Discharge Valves
- Drain Valves
- Foam System:
  - Foam Pump
  - Foam Pump Flush Kit
  - Foam Fill
  - Dual Foam Injection Kit
  - Dual Tank Selector
  - Overboard Foam Pick-up
  - Remote Start Kit
- Overheat Protection Manager (OPM)
- Pump Shift (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.

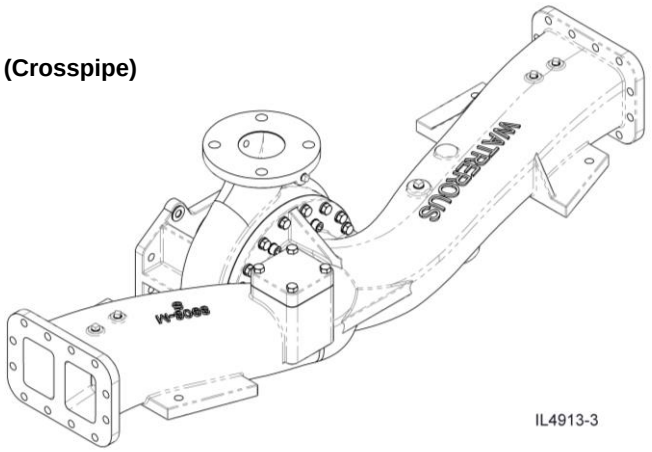


CGV Models (End Suction)



CGVR Models (End Suction)

CGVG Models (Crosspipe)



F-1031, Section 3019
Revised: 8/13/20

Waterous Company 125 Hardman Avenue South, South St. Paul, Minnesota 55075 (651) 450-5000

www.waterousco.com

Table on Contents:

Read through and communicate safety information to the end user of this Waterous 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	Pump Intake	Pump Discharge
CGV	5 in. Victaulic ®	Waterous 3 in. Flange with (4) 5/8 in. Bolts on a 6 in. Bolt Circle or an Optional 4 in. Victaulic ® Connection
CGVG	Left and Right Flanges for Standard Waterous Intake Fittings	
CGVR	4 in., 4-1/2 in. or 5 in. NH Thread	

Available Pump Drives

Drive	Transmission			Input Shaft Rotation	Complete Pump and Transmission Model		
	Type	Series	Model		CGV	CGVR	CGVG
PTO	Two Gear Speed Increaser	K	K	Clockwise or Counter Clockwise	CGVK	CGVRK	CGVGK
	Chain Drive Speed Increaser	P	PA	Clockwise	CGVPA	CGVRPA	CGVGPA
Directly Mounted to an Engine	Two Gear Speed Increaser	T	T	Clockwise or Counter Clockwise	CGVT	CGVRT	-
Split Shaft	Chain Drive Speed Increaser	C20	C20B C20C C20D C20E C20F	Clockwise	CGVC20B CGVC20C CGVC20D CGVC20E CGVC20F	-	CGVGC20B CGVGC20C CGVGC20D CGVGC20E CGVGC20F

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.

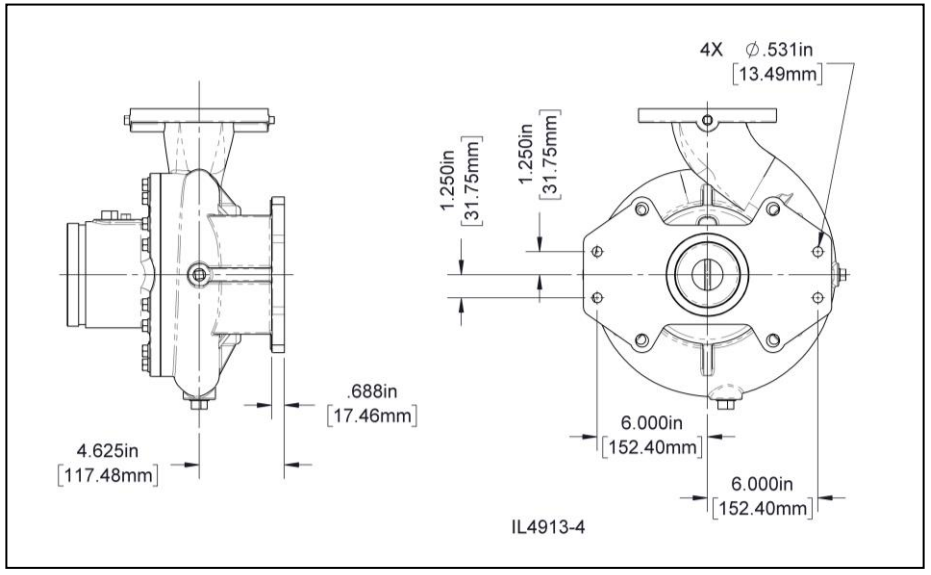
Driveline End Yokes and Companion Flanges: Anti seize should be applied to the shaft threads before installing end yoke or companion flange. Use self-locking nuts supplied, torque to 275-325 lb-ft. Do not re-use nuts if end yoke or companion flange is removed.

CGV and CGVR End Suction Models:

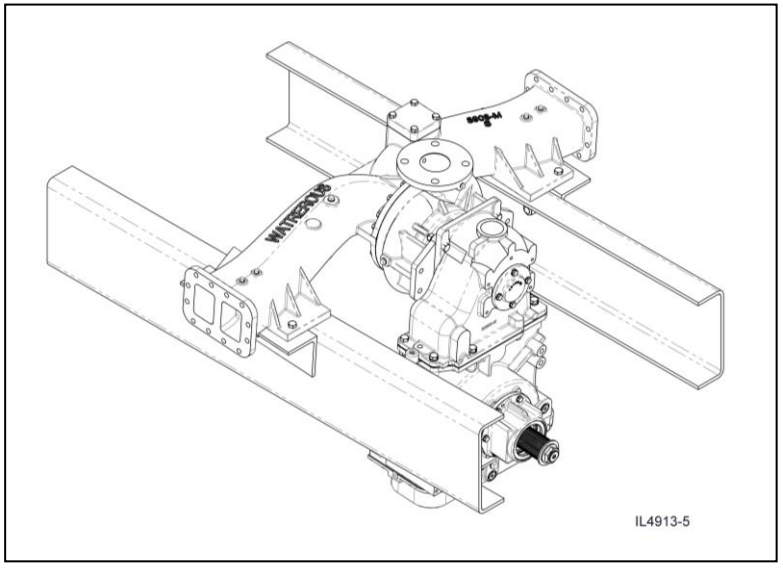
Brackets must be fabricated to attach to the mounting points of the pump body and transmission and the chassis frame. Tighten the mounting hardware to standard torque specifications.

CGVG Crosspipe Models:

The diagram below shows a typical installation where the pump is mounted on angle brackets attached to the outside of the chassis frame rails. To mount the pump, create angle brackets that will attach the pump to the vehicle's chassis. The pump has four holes in the crosspipe, see page 13 for hole layout dimensions. Drill suitably sized holes in the angle bracket corresponding to the holes in the pump intake adapters. Fasten the angle brackets to the pump intake crosspipe on each side of the adapter. Attach the angle brackets to the vehicle frame rails in a manner which will compensate for vehicle frame twist, see page 14 for recommended method. Tighten the mounting hardware to standard torque specifications.



CGV and CGVR End Suction Models



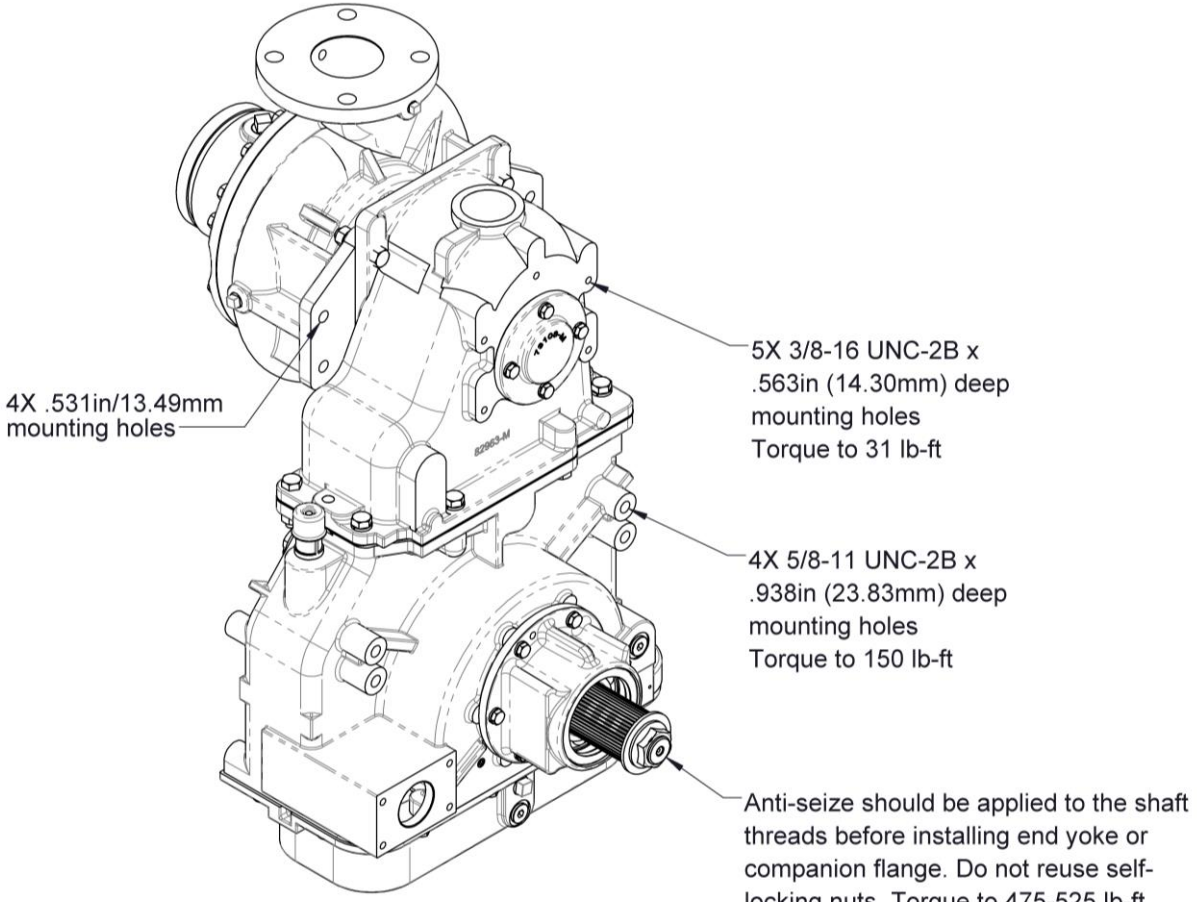
CGVG Crosspipe Models

Mounting Locations

CGV and CGVR End Suction with C20 Series Transmission

Note that the Pump Discharge only may be positioned Up and the Transmission mounted Vertical.

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

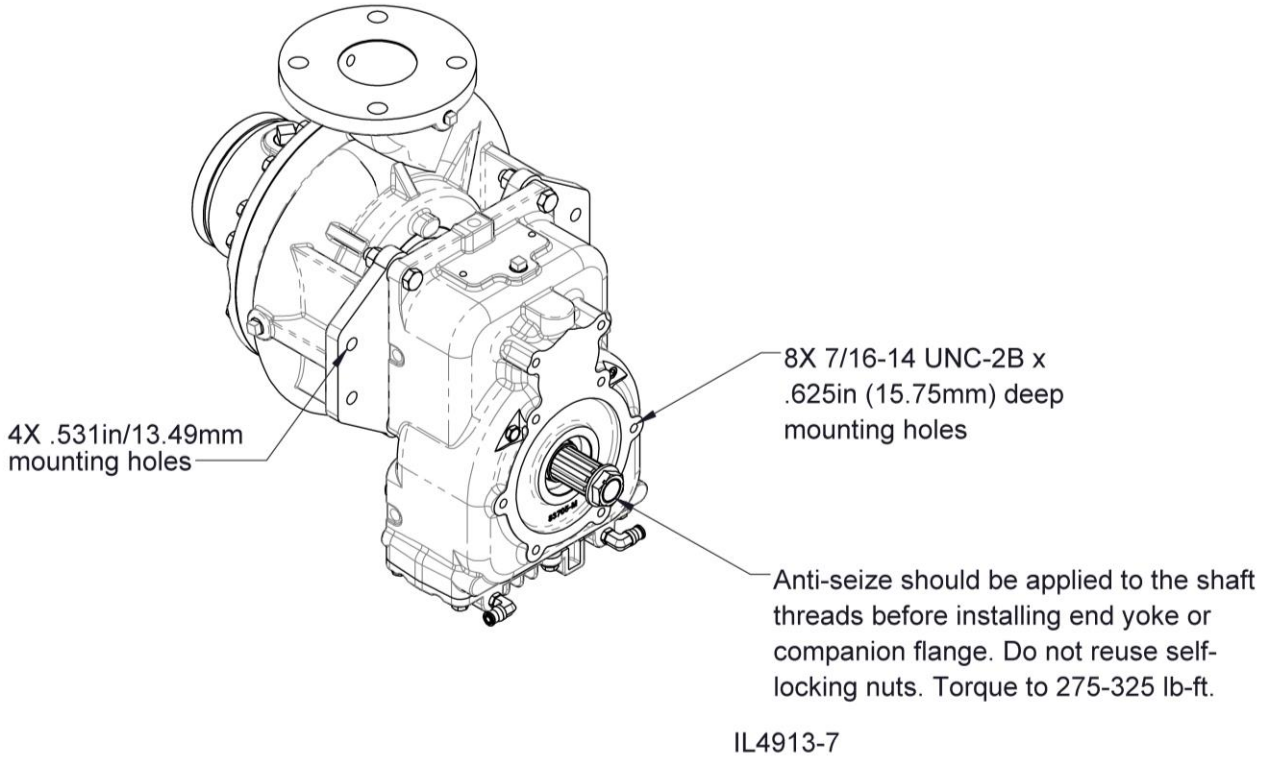


Mounting Locations

CGV and CGVR End Suction with Model K Transmission

Note that the Pump Discharge only may be positioned Up, Right, 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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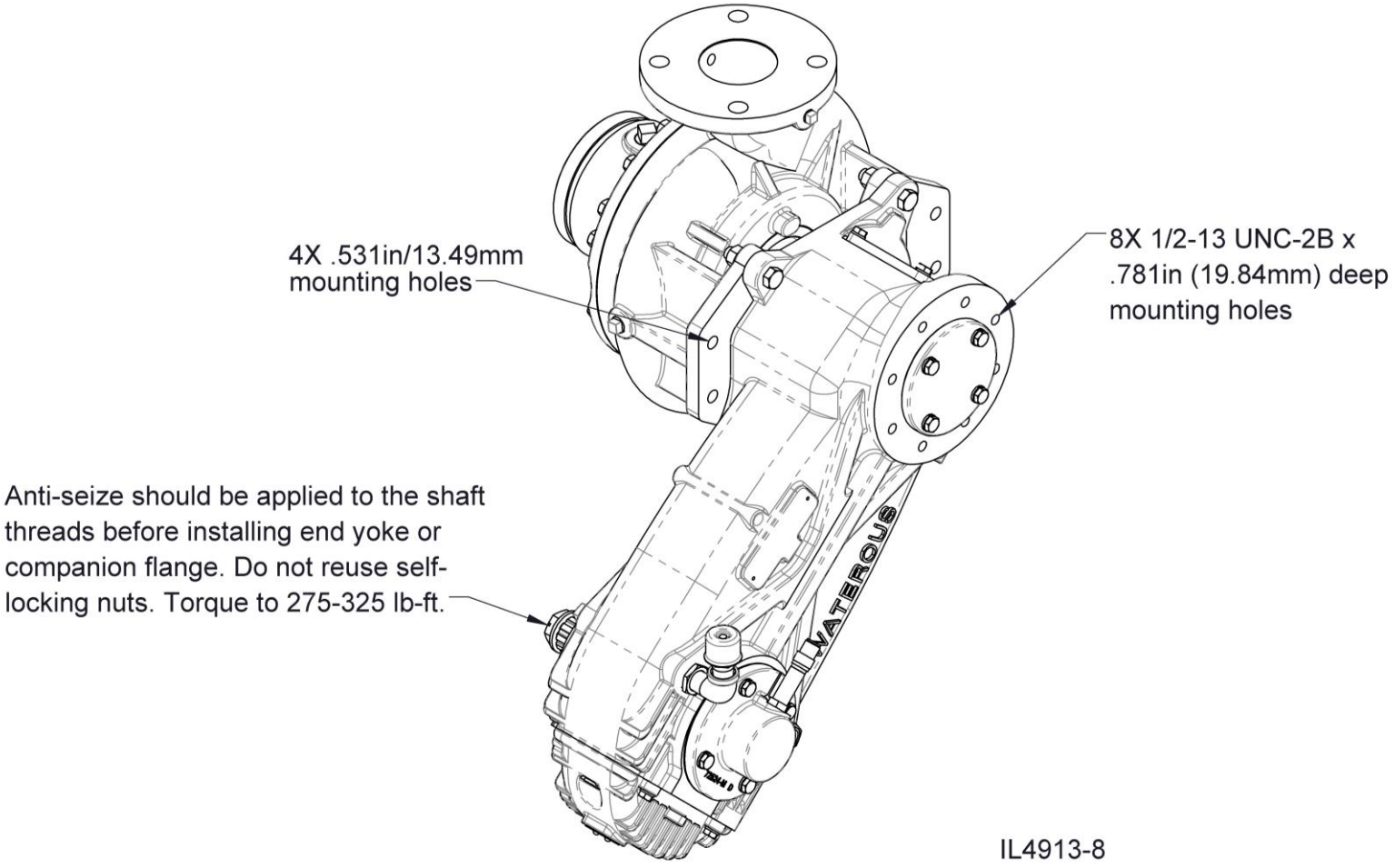
Mounting Locations

CGV and CGVR End Suction with Model PA Transmission

Note that the Pump Discharge only may be positioned Up and the Transmission mounted Vertical.

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

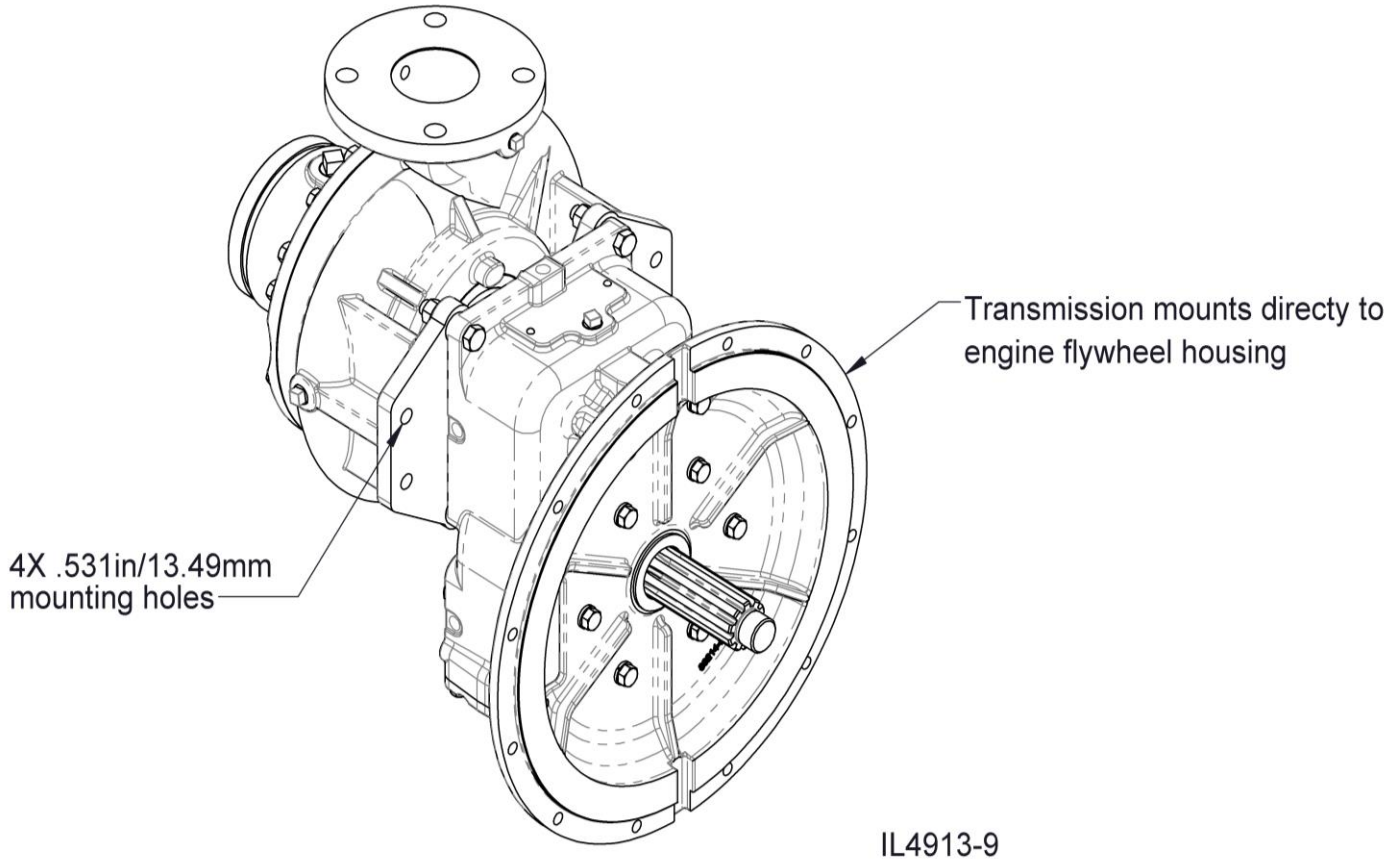


Mounting Locations

CGV and CGVR End Suction with Model T Transmission

Note that the Pump Discharge only may be positioned Up, Right, 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.

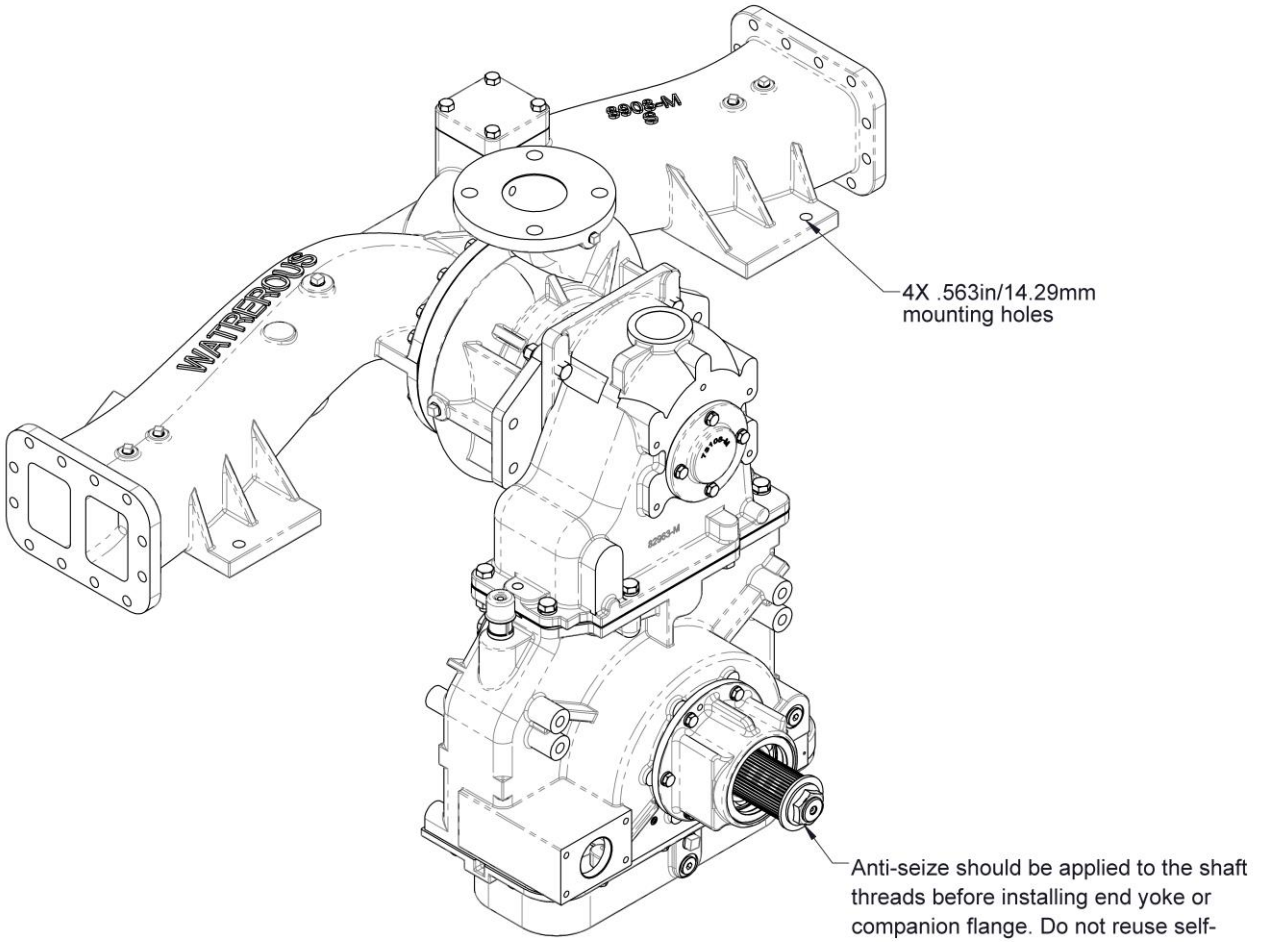


Mounting Locations

CGVG Crosspipe with C20 Series Transmission

Note that the Pump Discharge only may be positioned Up and the Transmission mounted Vertical.

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



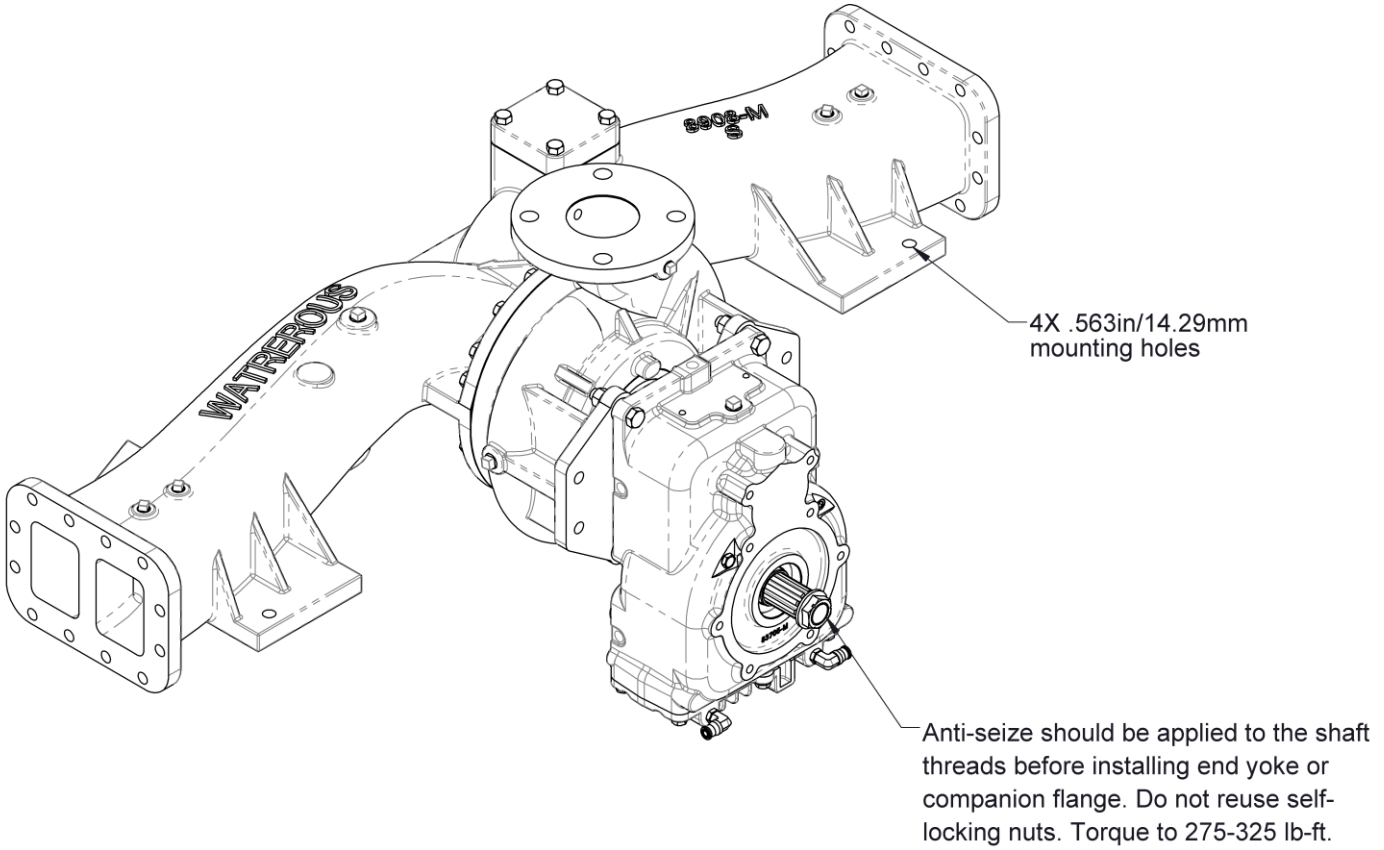
IL4913-10

Mounting Locations

CGVG Crosspipe with Model K Transmission

Note that the Pump Discharge only may be positioned Up and the Transmission mounted Vertical.

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



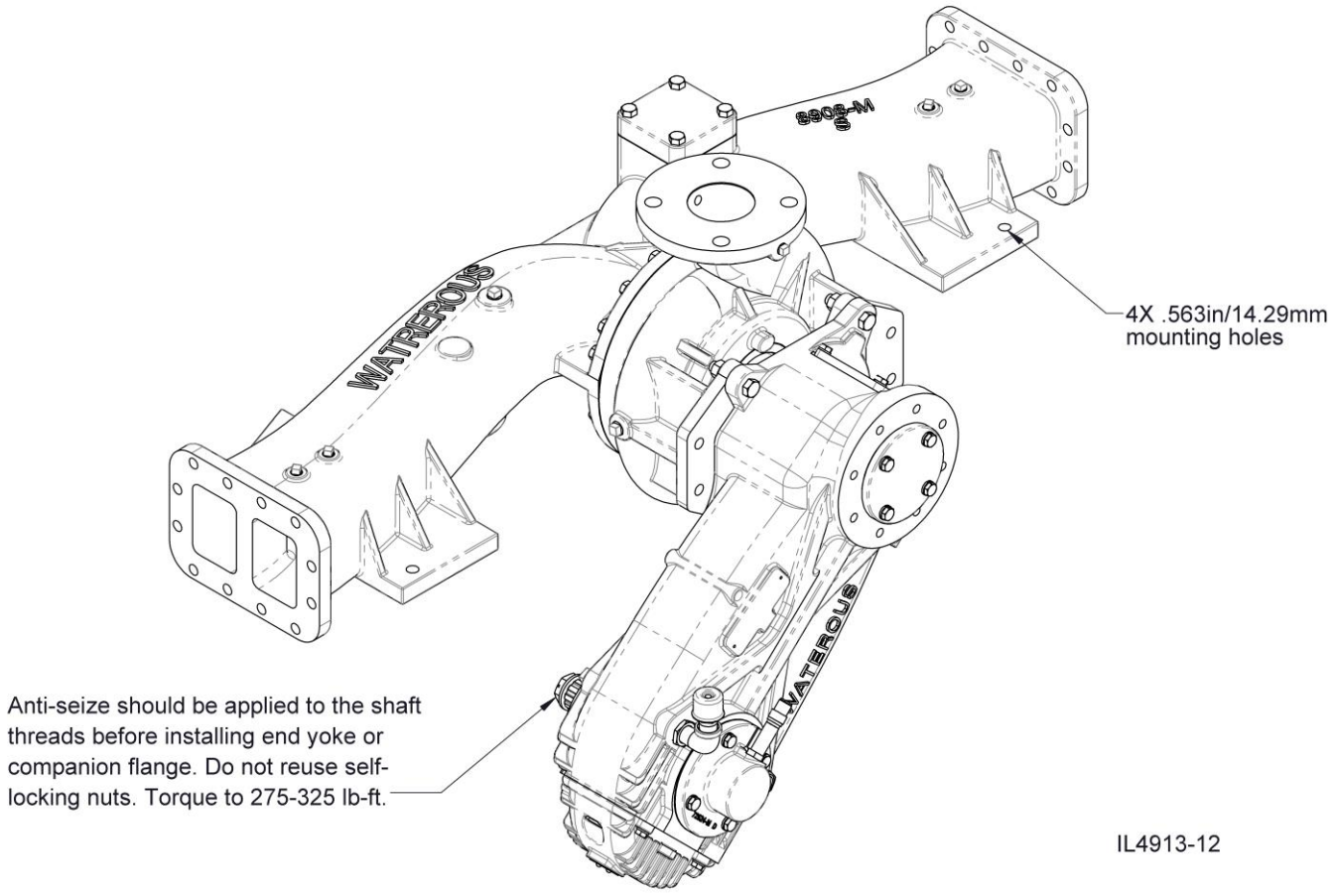
IL4913-11

Mounting Locations

CGVG Crosspipe with Model PA Transmission

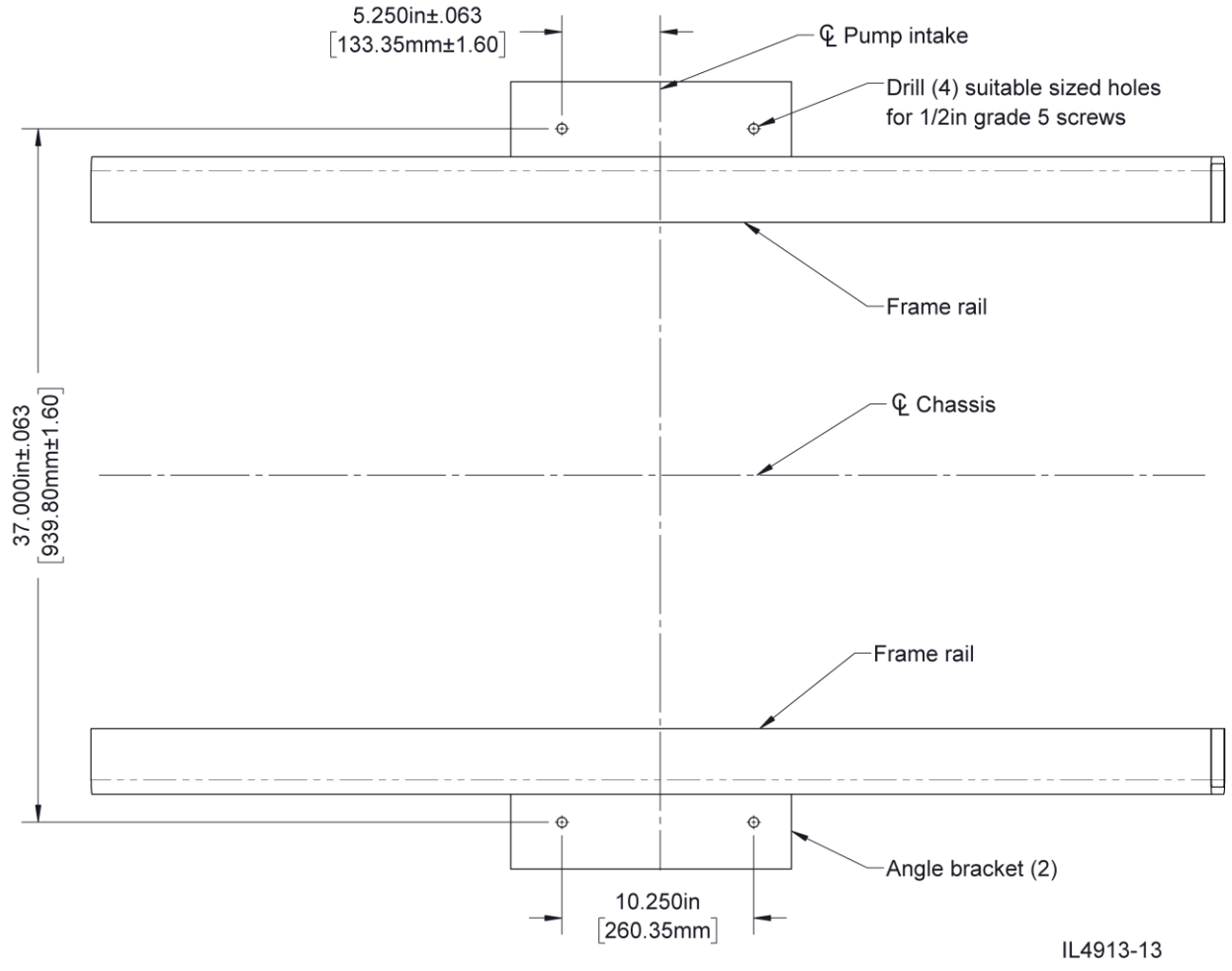
Note that the Pump Discharge only may be positioned Up and the Transmission mounted Vertical.

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



CGVG Angle Bracket Mounting Method

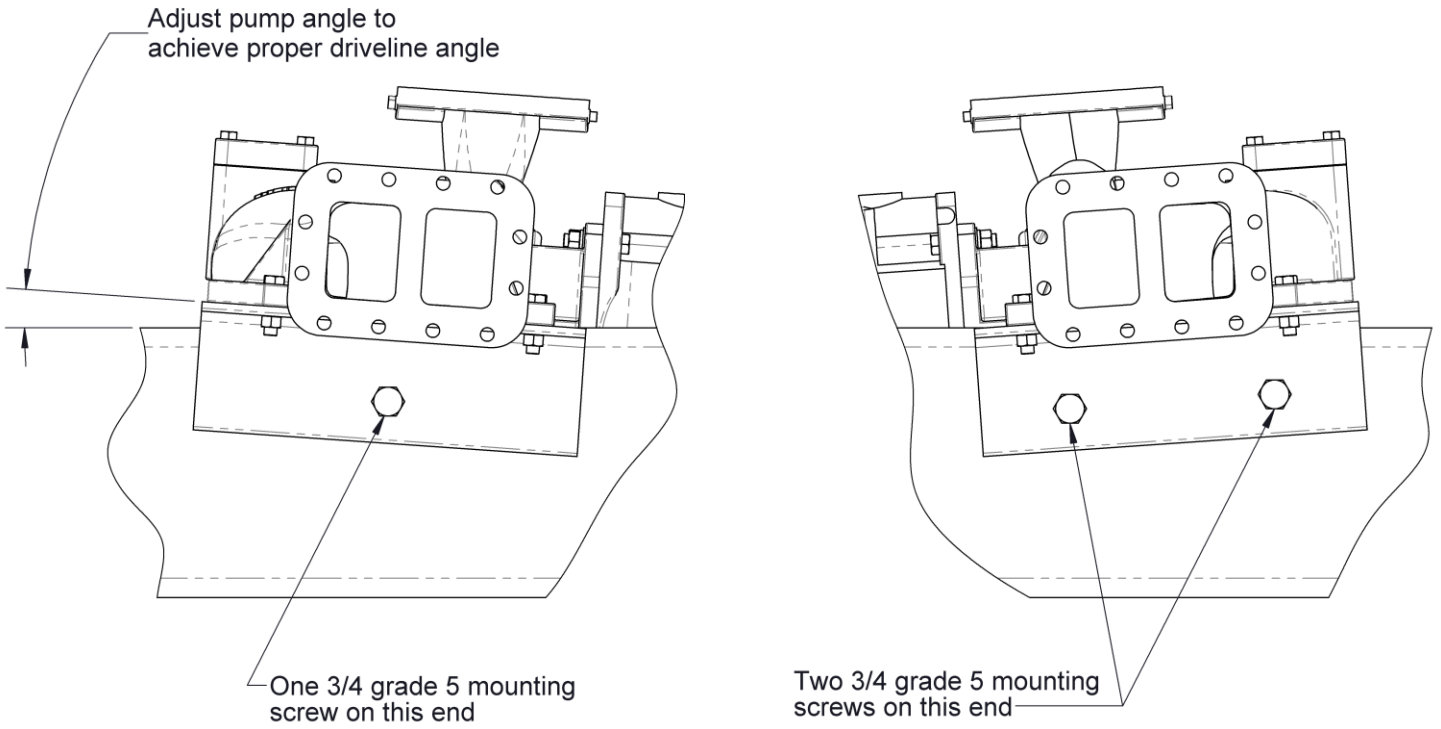
Chassis Frame Rail Hole Pattern



CGVG Angle Bracket Mounting Method

Recommended Arrangements to Compensate for Frame Twist

Three Point Bolted Design



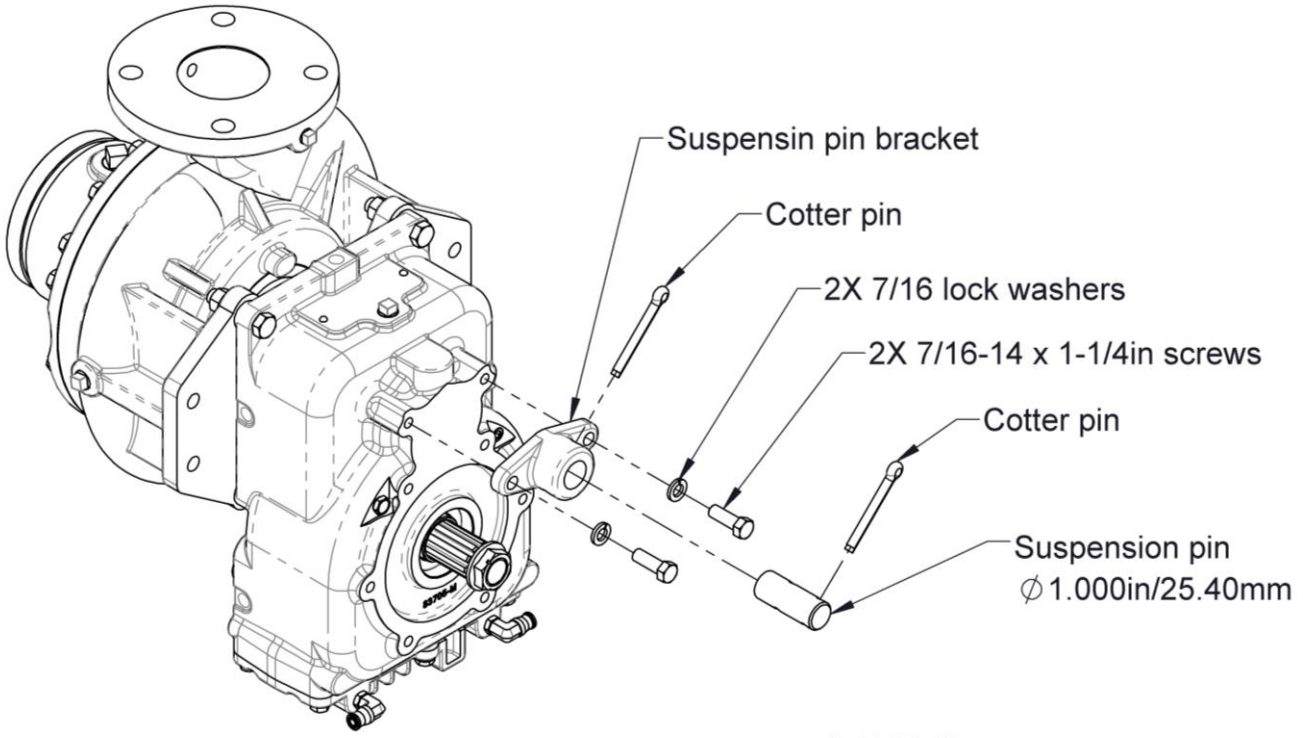
Left (Drivers) Side

Right (Passenger) Side

IL4913-14

Optional Suspension Pin Mounting Method

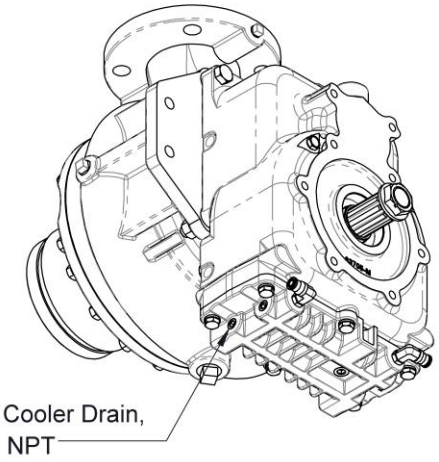
Model CGVK, CGVGK and CGVRK Only



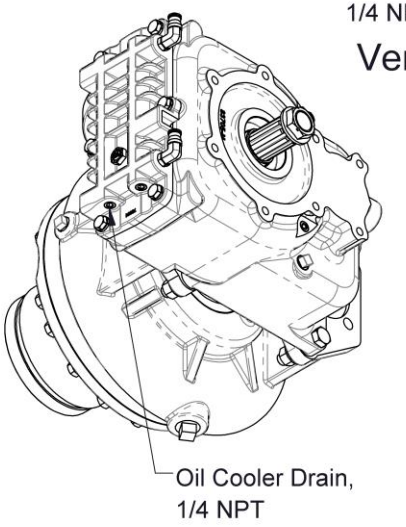
IL4913-15

Transmission Oil Cooler Drain

K and T Model Transmissions

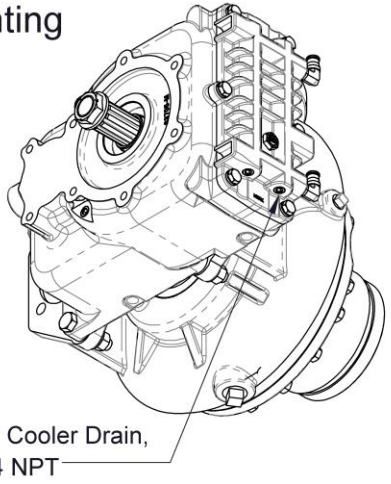


Vertical Transmission Mounting



Left Transmission Mounting

IL4913-16



Right Transmission Mounting

Note:
Inverted transmission mounting does not require an oil cooler drain as the water will drain through the pump.

Tachometer Connection

Electronic Tachometer

Optional on C20 Series Transmissions

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.

C20 Series Transmissions

To verify the rotational speed of the drive shaft, the frequency (Hz) reading from the tachometer sensor should be multiplied by 10.

Hz x 10 = RPM

PA Model Transmissions

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

Hz x 6 = RPM

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

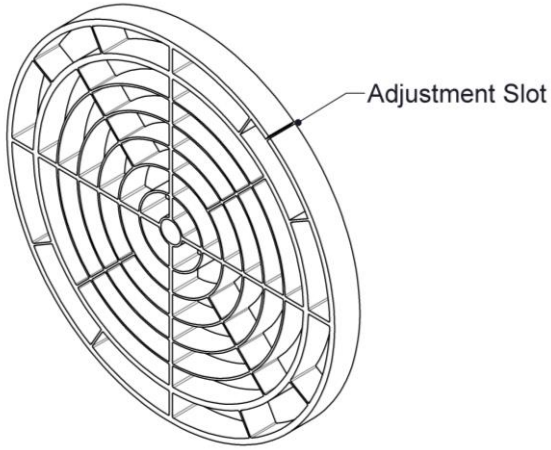
Cable connector assembly part number V 3398 is available from Waterous for connecting panel mounted receptacle to multimeter.

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.



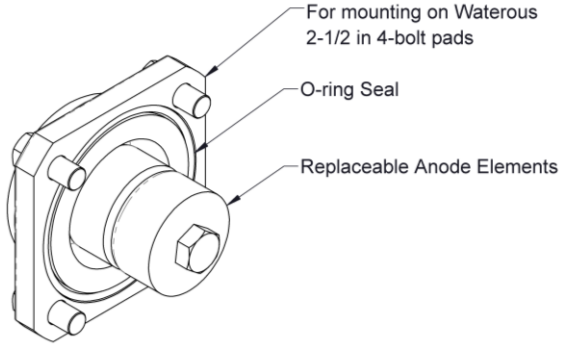
Intake Screen

IL4417-1

Anodes

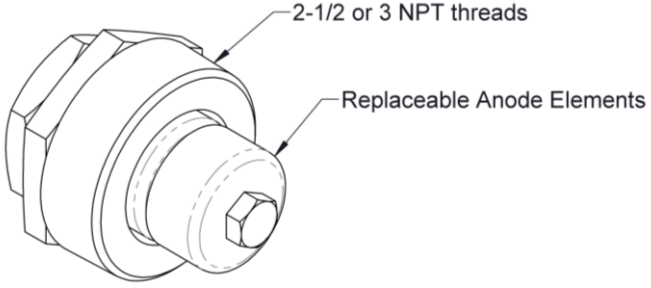
Anodes may be mounted in the intake piping or, if no intake pads are available, in the discharge piping.

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



IL4417-2

4-Bolt Anode



IL4417-3

Threaded Anode

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)*
C20B, C20C, C20D C20E, C20F	6	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
PA	1	
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 preferred.

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.

C20 Series Transmission Temperature Specifications

The maximum temperature permitted at transmission external surfaces is 250°F (121°C).