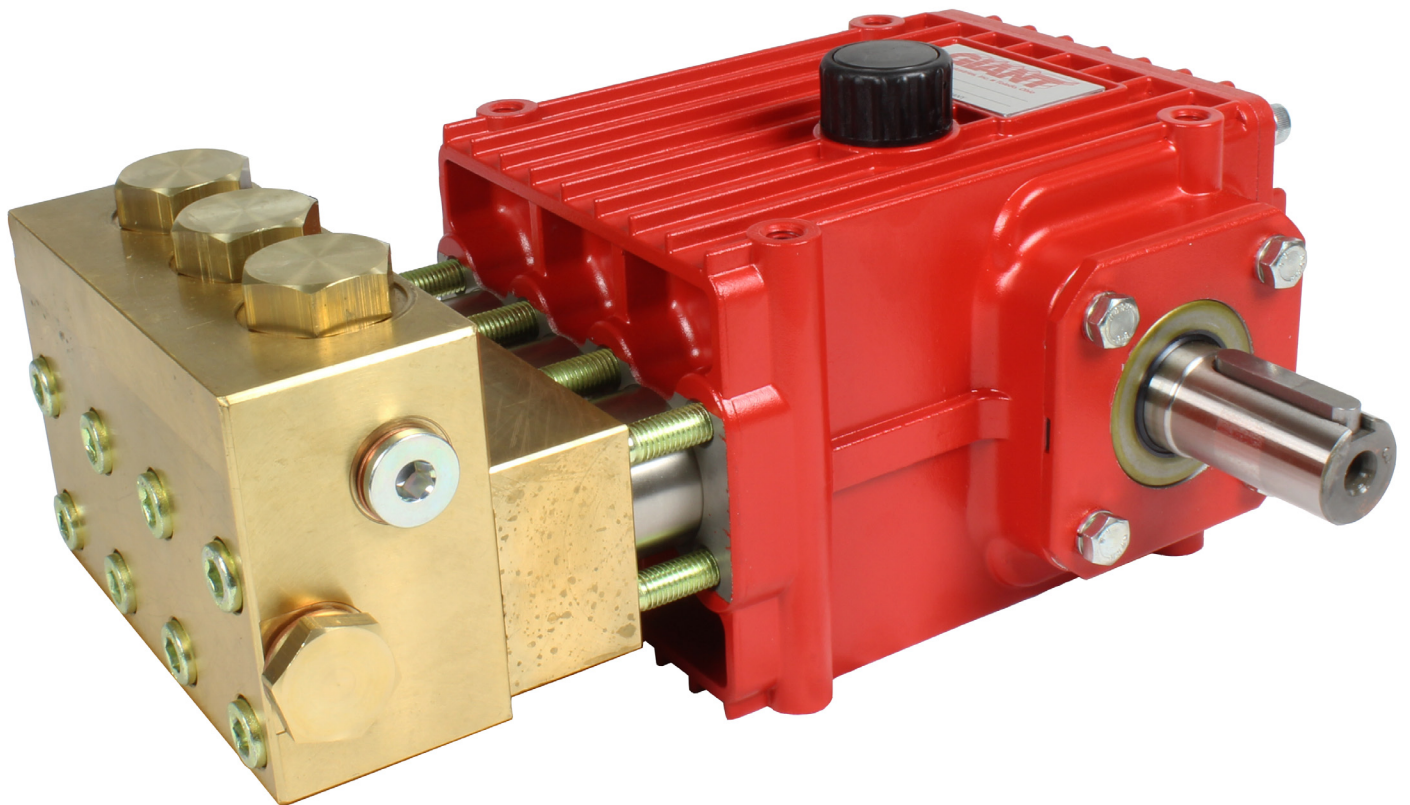


# Models P461 and P462

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# Installation Instructions

Installation of the Giant Industries, Inc., pump is not a complicated procedure, but there are some basic steps common to all pumps. The following information is to be considered as a general outline for installation. If you have unique requirements, please contact Giant Industries, Inc. or your local distributor for assistance.

1. The pump should be installed flat on a base to a maximum of a 15 degree angle of inclination to ensure optimum lubrication.
2. The inlet to the pump should be sized for the flow rate of the pump with no unnecessary restrictions that can cause cavitation. Teflon tape should be used to seal all joints. If pumps are to be operated at temperatures in excess of 104° F (40°C,) it is important to insure a positive head to the pump to prevent cavitation.
3. The discharge plumbing from the pump should be properly sized to the flow rate to prevent line pressure loss to the work area. It is essential to provide a safety bypass valve between the pump and the work area to protect the pump from pressure spikes in the event of a blockage or the use of a shut-off gun.
4. Crankshaft rotation on Giant Industries, Inc. pumps should be made in the direction designated by the arrows on the pump crankcase. Reverse rotation may be safely achieved by following a few guidelines available upon request from Giant Industries, Inc. Required horsepower for system operation can be obtained from the charts on pages 3 through 5.
5. Before beginning operation of your pumping system, remember: Check that the crankcase and seal areas have been properly lubricated per recommended schedules. Do not run the pump dry for extended periods of time. Cavitation will result in severe damage. Always remember to check that all plumbing valves are open and that pumped media can flow freely to the inlet of the pump.

Finally, remember that high pressure operation in a pump system has many advantages. But, if it is used carelessly and without regard to its potential hazard, it can cause serious injury.

## IMPORTANT OPERATING CONDITIONS

**Failure to comply with any of these conditions invalidates the warranty.**

1. Prior to initial operation, add oil to the crankcase so that oil level is between the two lines on the oil dipstick. **DO NOT OVERFILL.**
3. Acids, alkalines, or abrasive fluids cannot be pumped unless approval in writing is obtained before operation from Giant Industries, Inc.

### **Use SAE 80-90 Industrial Gear Lube Oil (Giant's P/N 01154)**

Crankcase oil should be changed after the first 50 hours of operation, then at regular intervals of 200 hours or less depending on operating conditions.

2. Pump operation must not exceed rated pressure, volume, or RPM. A pressure relief device must be installed in the discharge of the system.

4. Run the pump dry approximately 10 seconds to drain the water before exposure to freezing temperatures.

**Important!** If there is a **danger of frost**, the water in the pump and in the pump fittings (particularly the unloader valve) must be emptied. The second discharge port can also be used and the pump run "dry" for 1-2 minutes for this purpose.

**NOTE: Contact Giant Industries for Service School Information. Phone: (419)-531-4600**

# Pump Specifications

## U.S. Measurements

	Max. Flow	Max. Discharge Pressure	Max. Speed	Power Required	Plunger Diameter	Stroke	Gallons Per Revolution
Model	GPM	PSI	RPM	BHP	in	in	
P461	3.9	7250	1750	19.5	0.55	0.79	0.00223
P462	4.6	7250	1750	23.0	0.55	0.94	0.00263

## Metric Measurements

	Max. Flow	Max. Discharge Pressure	Max. Speed	Power Required	Plunger Diameter	Stroke	Liters Per Revolution
Model	l/min	Bar	RPM	kW	mm	mm	
P461	14.6	500	1750	14.5	14	20	0.00834
P462	17.5	500	1750	17.2	14	24	0.01

Consult the factory for special requirements that must be met if the pump is to operate beyond one or more of the limits specified above.

### Horsepower Ratings:

We recommend a 1.15 service factor be specified when selecting an electric motor as the power source.

To compute electric motor horsepower required, use the following formula:  $HP = (GPM \times PSI) / 1450$ .

The formula to determine the horsepower required for a gas engine is:  $HP = (GPM \times PSI) / 1150$ .

The formula to determine the horsepower required for a diesel engine is:  $HP = (GPM \times PSI) / 1250$ .

### For the Application of a Hydraulic Motor:

To Determine the Torque of a Hydraulic Motor --  $(GPM \times PSI \times 36.77) / RPM = \text{Torque (in-lbs)}$

### Calculating RPM / GPM of Pump:

A pump must be connected to an electric motor or gas or diesel engine with the correct ratio of pulleys and belts to attain the required speed and GPM. The use of a Variable Frequency Drive (VFD) may also be used to control the RPM of a properly sized electric motor when variable flows are required.

$$(\text{Max. Pump RPM} / \text{Rated Pump GPM}) \times \text{Required Pump GPM} = \text{Required Pump RPM}$$

To calculate a pulley diameter one (1) pulley diameter and the required pump RPM must be known:

$$(\text{Pump RPM} \times \text{Pump Pulley Diameter}) / \text{Motor RPM} = \text{Motor Pulley Diameter}$$

$$(\text{Motor RPM} \times \text{Motor Pulley Diameter}) / \text{Pump RPM} = \text{Pump Pulley Diameter}$$

### Common Specifications:

	US	Metric
Inlet Pressure .....	-4.35 to 145 PSI....	-0.3 to 10 Bar
Max. Temp. ....	104 °F .....	40°C
Inlet Ports .....	(2) 1/2" BSP	
Discharge Ports .....	(2) 3/8" BSP	
Shaft Rotation .....	Top of pulley towards fluid end	
Crankshaft Diameter.....	28mm	
Key Width .....	8mm	
Shaft Mounting .....	Either side <sup>1</sup>	
Weight .....	42 lbs. ....	19 kg
Crankcase Capacity .....	27 fl.oz. ....	0.8 Liters

### <sup>1</sup>NOTES:

In order to drive the pump from the side opposite the present shaft extension, simply remove the valve casing from the crankcase and rotate the pumps 180 degrees to the desired position. Be certain to rotate the seal case (item #20) as well, so that the weep holes are down at the six o'clock position. Exchange the oil fill and the oil drain plugs, also. Refer to the repair instructions as necessary for the proper assembly sequence.

# P461 and P462 PARTS LIST

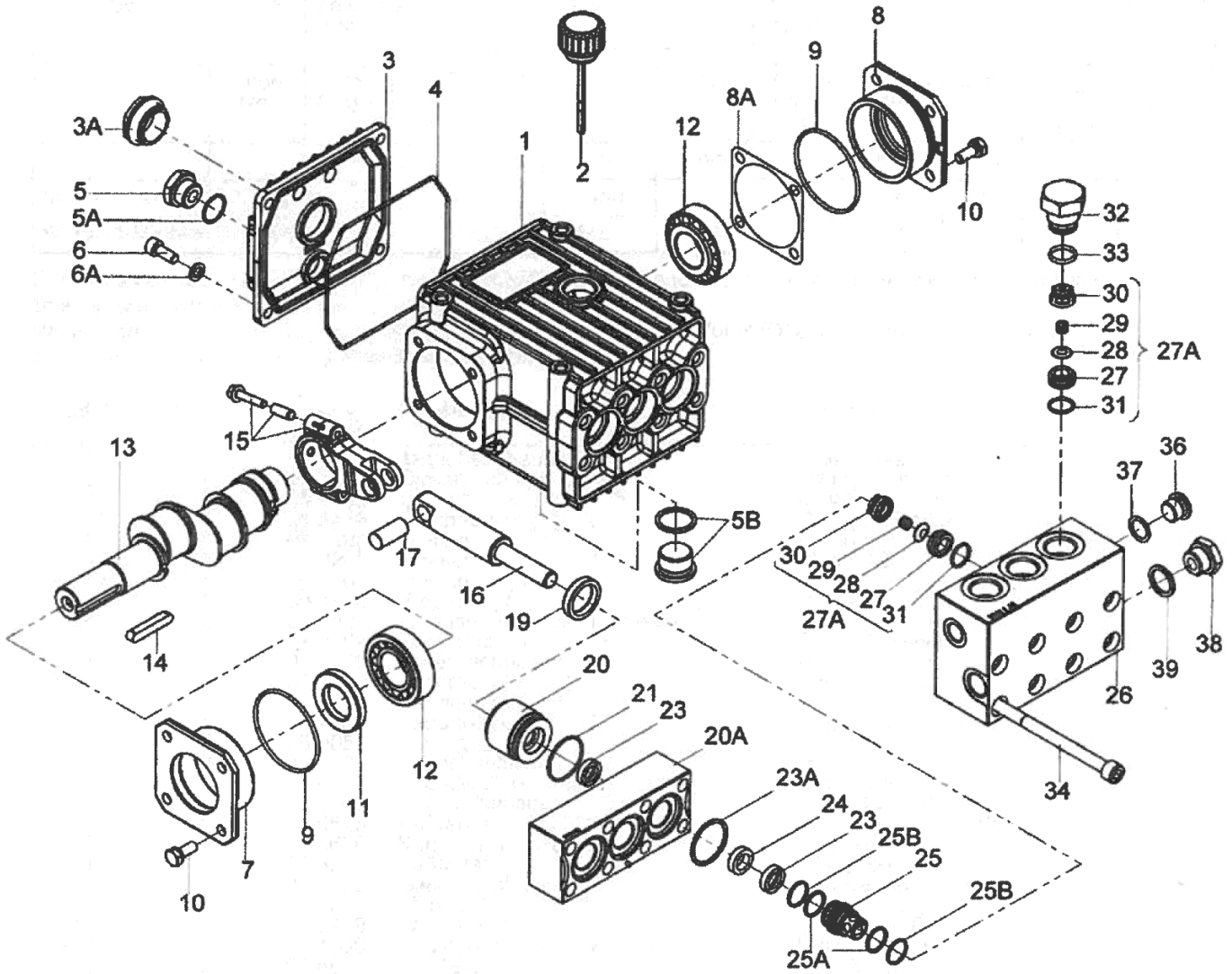
<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	08377	Crankcase	1	21	07266	O-Ring	3
2	08378	Oil Fill Plug with Gasket	1	23*	06483	Grooved Seal Packing	6
3	06479	Crankcase Cover	1	23A	13036	Support Ring	3
3A	07186	Oil Sight Glass w/Gasket	1	24	06484	Guide Ring	3
4	08380	O-Ring	1	25	04461	Seal Case	3
5	07109	Oil Drain Plug	1	25A	06492	Support Ring	6
5A	06015	O-Ring	1	25B	06487	O-Ring	6
5B	08092	Plug with Gasket	1	26	06488	Valve Casing	1
6	01010	Screw	4	27A	05543	Valve Assy.	6
6A	01011-0400	Spring Washer	4			(Includes items 27-31A)	
7	05290	Bearing Cover Open	1	27	05541	Valve Seat	6
8	05291	Bearing Cover Closed	1	28	05542	Valve Plate	6
8A	05292	Shim	1	29	07906	Valve Spring	6
8B	05293	Shim	1	30	07907	Valve Spring Retainer	6
9	01016	O-Ring	2	31	07770	O-Ring	6
10	07114	Screw with Washer	8	32	05544	Plug	3
11	07459	Radial Shaft Seal	1	33	05545	O-Ring	3
12	05350	Bearing	2	34	05546	Cap Screw	8
13	08482	Crankshaft, P461	1	36	12256	Plug, 3/8" BSP	1
13	08475	Crankshaft, P462	1	37	08486	Copper Washer	1
14	08091	Fitting Key	1	38	07109	Plug, 1/2" BSP	1
15	08390	Connecting Rod Assy.	3	39	06272	Copper Washer	1
15A	07311	Screw with Washer	6				
16	06480	Plunger Assembly	3				
17	06790	Crosshead Pin	3				
19	05444	Oil Seal	3				
20	05938	Seal Adapter	3				
20A	04460	Seal Casing	1				

\*Important! If the pump is not used for a long period of time, it is possible the seals (23) could become hard or brittle thus causing the pump to leak when put into operation. If this is the case, we recommend the seals be replaced every 4 years.

## P460A/P480/P414 TORQUE SPECIFICATIONS

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Torque Amount</u>
5	07109	Oil Drain Plug	30 ft.-lbs. (40 Nm)
15A	07311	Screw with Washer	98 in.-lbs. (11 Nm)
32	05544	Plug	111 ft.-lbs. (150 Nm)
34	05546	Cap Screw	30 ft.-lbs. (40 Nm)

# Exploded View - P461 and P462



## P461 and P462 REPAIR KITS

### Plunger Packing Kit

Part # 09779

Item	Part #	Description	Qty.
21	07266	O-Ring	3
23	06483	Grooved Seal Packing	6
23A	13036	Support Ring	3
24	06484	Guide Ring	3
25A	06492	Support Ring	6
25B	06487	O-Ring	6

### Valve Assembly Kit

Part # 09781

Item	Part #	Description	Qty.
27A	05543	Valve Assembly, Complete	6
33	05545	O-Ring	3

### Oil Seal Kit

Part # 09641

Item	Part #	Description	Qty.
19	05444	Oil Seal	3

# Repair Instructions - P461 and P462 PUMPS

## Inlet Valves

Remove inner hexagon screws (34) and pull off valve casing (26) to the front. Take out seal case (25) from valve casing (26). Remove the exposed inlet valve with a pair of flat nose pliers and the valve seat (27) with a valve puller. Disassemble parts and examine valve plate (28), valve seat (27), O-ring (31) and support ring (31A). Replace worn parts. Tighten inner hexagon screws (34) again to 30 ft-lbs. (40 Nm).

**Discharge Valves:** With a socket 32mm wrench, screw out valve plugs (32) . Remove the exposed discharge valves with a pair of flat nose pliers and the valve seat (27) with a valve seat puller. Disassemble parts and examine valve plate (28), valve seat (27), and O-rings (31, 33). Replace worn parts. Take care to reassemble in correct sequence. Tighten plugs (32) to 111 ft-lbs. (150 Nm).

## Seals

Remove oil drain plug (5) and drain oil. Remove inner hexagon screws (34) and pull off valve casing (26) frontwise over the plungers (16).

**Important!** if the seal casing (20A) does not separate from the valve casing (26), press both casings apart by placing two flat screwdrivers in the side notches on the seal casing (20A). Be careful not to damage casing surfaces.

Remove seal cases (25) situated either in valve casing (26) or seal casing (20A). Separate seal casing (20A) from seal retainers (20). Remove grooved ring (23) and guide ring (24) from the seal casing (20A). Examine O-rings (25B) and support rings (25A) attached to seal casing (26). Check seal ring (23A) situated between valve casing and seal casing, and replace if necessary. Then remove seal retainers (20) from crankcase (1). Pull grooved ring (23) out of seal retainer (20). Check O-ring (21). Grease new seals and O-rings with silicone grease before reinstallation.

**Important!** Seal casing (20A) has a notched pin to ensure correct fitting. Reassemble parts in the proper sequence.

**Important!** The grooved seal (23) on the high-pressure side is to be fitted carefully into the seal casing (20A) using a 22mm plastic rod. Under no circumstances must the surface in the seal casing or the seal lip of the grooved seal be damaged.

Check surfaces of plunger (16). Damaged surfaces cause hard wear on seals. Deposits of all kinds must be removed from the plungers.

**Important!** The plunger surfaces are not to be damaged. If there are lime deposits in the pump, care must be taken that the drip-return bore in parts (25) and (26) ensure trouble-free drip-return.

If the plunger (16) is worn, the complete plunger must be changed. The ceramic pipe alone cannot be changed due to reasons of precision. When reassembling tighten inner hexagon screw (34) to 30 ft-lbs. (40 Nm).

If the plunger (16) is worn, the complete plunger must be changed (see below). The ceramic pipe alone cannot be changed due to reasons of precision. When reassembling tighten inner hexagon screw (34) to 30 ft-lbs (40 Nm).

## Gear and Plunger

If oil leaks where the plunger (16) protrudes out of the gear, gear seals (19) and plungers have to be examined and replaced as necessary.

## Gear Seal

Remove plug (5) and drain oil. Remove valve casing as described above. Take seal adapter (20) off plunger (16) and replace gear seal (19).

## Plungers

Drain oil and remove crankcase cover (3). Take off screws on con rods (15). Be careful not to mix up the con rod halves. Push con rod shaft as far as possible into the crosshead guide. Loosen screws (10) and remove bearing covers (7&8) with the help of a screw-driver.

Take crankshaft out carefully so as not to bend the con rods. Remove and dismantle con rods and plungers (18). Replace worn parts. **Connecting rods must be installed in the same position and orientation.**

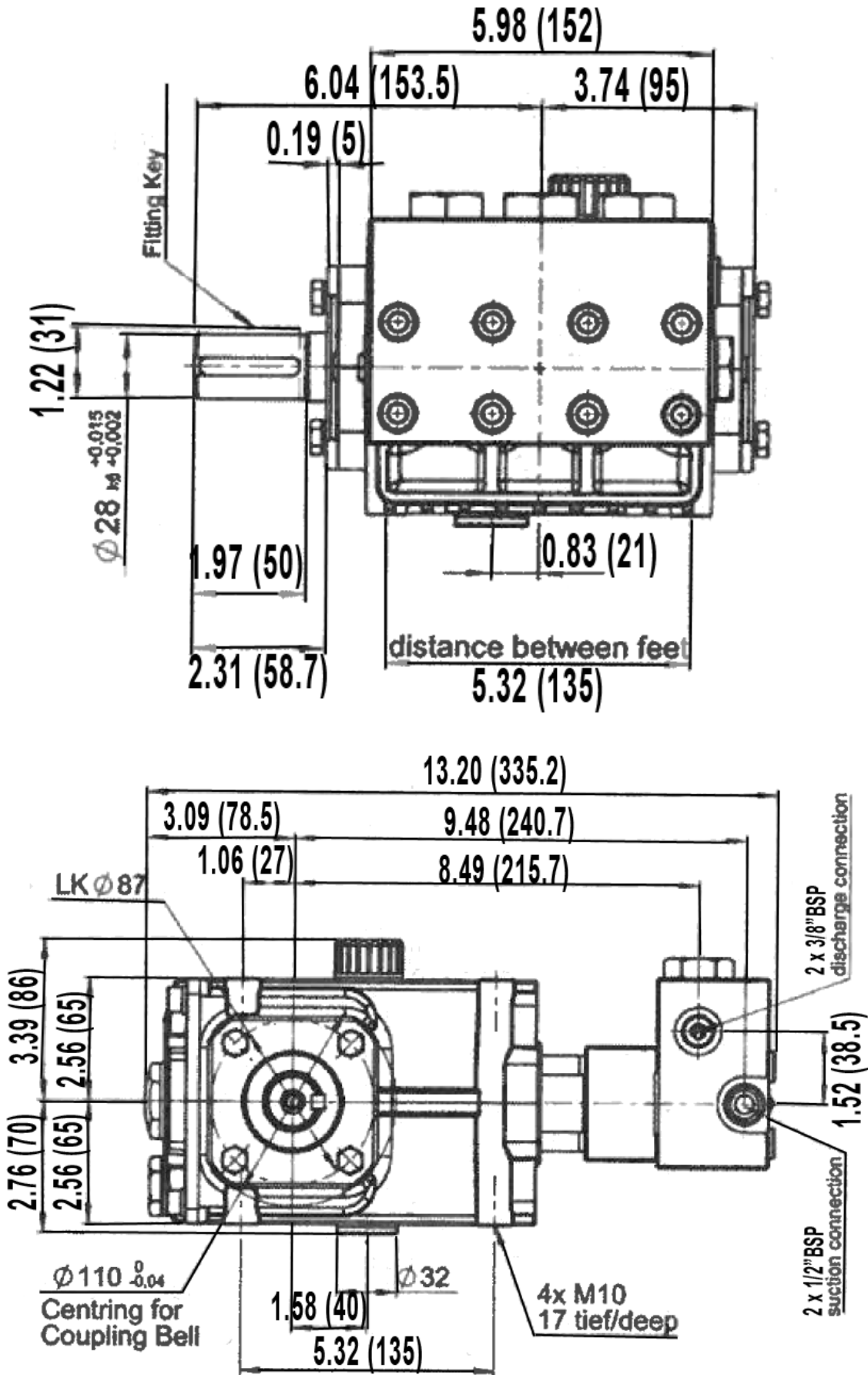
To reinstall, insert con rods and plungers, put crankshaft in carefully and then push the bearing covers (7&8) onto the ends of the crankshaft. Screw on bearing covers with screws (10). Mount con rod halves and tighten screws (15) to 98 in-lbs. (11Nm). Mount crankcase cover (3) together with O-ring (4).

## To rotate crankshaft to the opposite side.

The shaft end is on the left side of the pump looking at it from behind. If it should be on the other side, the valve casing (26) and seal casing (20A) have to be removed, turned by 180° and then put on again. Turn seal adapters (20) 180°, so that the leakage holes are underneath. Oil dipstick (2) and oil drain plug (58) have to be interchanged and crankcase cover turned by 180°.

**Contact Giant Industries for service school information. Phone: (419) 531-4600**

# Models P461 and P462 Dimensions in(mm)



# GIANT INDUSTRIES LIMITED WARRANTY

Giant Industries, Inc. pumps and accessories are warranted by the manufacturer to be free from defects in workmanship and material as follows:

1. For portable pressure washers and self-service car wash applications, the discharge manifolds will never fail, period. If they ever fail, we will replace them free of charge. Our other pump parts, used in portable pressure washers and in car wash applications, are warranted for five years from the date of shipment for all pumps used in NON-SALINE, clean water applications.
2. One (1) year from the date of shipment for all other Giant industrial and consumer pumps.
3. Six (6) months from the date of shipment for all rebuilt pumps.
4. Ninety (90) days from the date of shipment for all Giant accessories.

This warranty is limited to repair or replacement of pumps and accessories of which the manufacturer's evaluation shows were defective at the time of shipment by the manufacturer. The following items are NOT covered or will void the warranty:

1. Defects caused by negligence or fault of the buyer or third party.
2. Normal wear and tear to standard wear parts.
3. Use of repair parts other than those manufactured or authorized by Giant.
4. Improper use of the product as a component part.
5. Changes or modifications made by the customer or third party.
6. The operation of pumps and or accessories exceeding the specifications set forth in the Operations Manuals provided by Giant Industries, Inc.

Liability under this warranty is on all non-wear parts and limited to the replacement or repair of those products returned freight prepaid to Giant Industries which are deemed to be defective due to workmanship or failure of material. A Returned Goods Authorization (R.G.A.) number and completed warranty evaluation form is required prior to the return to Giant Industries of all products under warranty consideration. Call (419)-531-4600 or fax (419)-531-6836 to obtain an R.G.A. number.

Repair or replacement of defective products as provided is the sole and exclusive remedy provided hereunder and the MANUFACTURER SHALL NOT BE LIABLE FOR FURTHER LOSS, DAMAGES, OR EXPENSES, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGES DIRECTLY OR INDIRECTLY ARISING FROM THE SALE OR USE OF THIS PRODUCT.

THE LIMITED WARRANTY SET FORTH HEREIN IS IN LIEU OF ALL OTHER WARRANTIES OR REPRESENTATION, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL SUCH WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY THE MANUFACTURER.



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