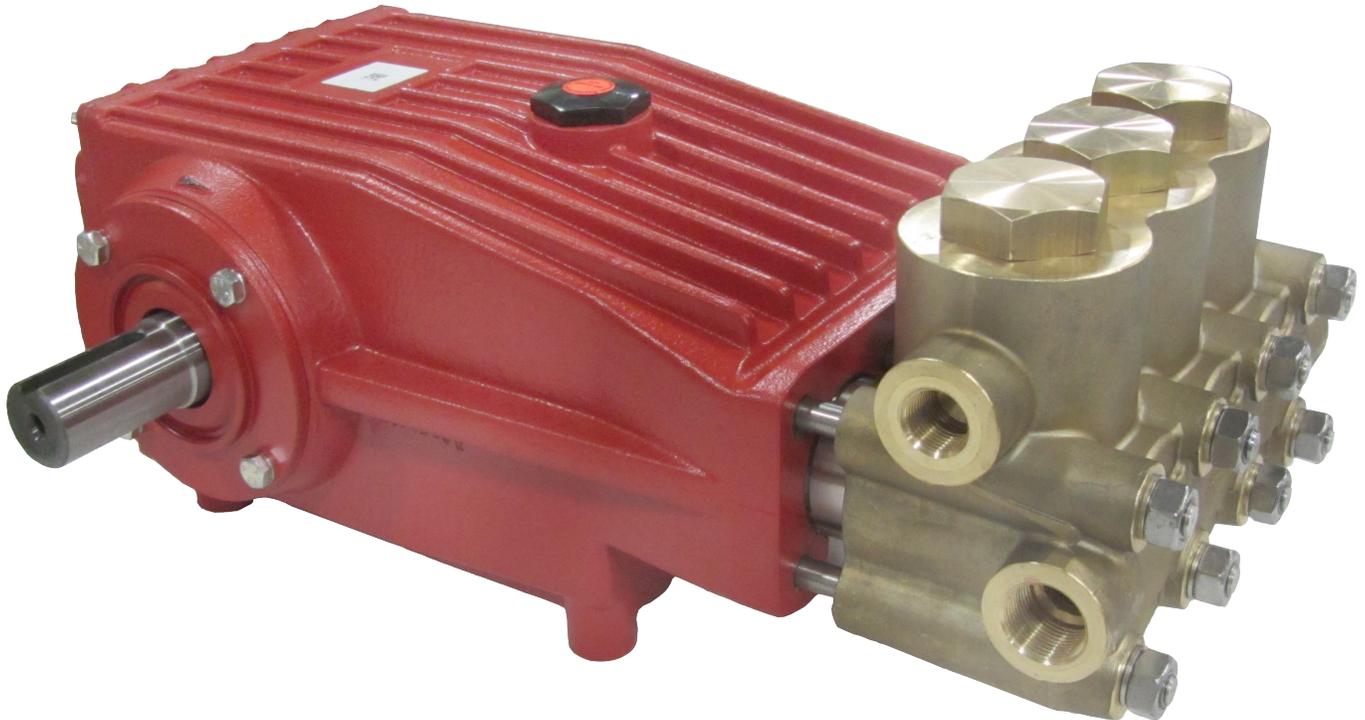


# Model LP460

Triplex Ceramic  
Plunger Pump  
Operating Instructions/  
Repair and Service  
Manual



**GIANT**  
Performance Under Pressure

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Updated 11/20

# INSTALLATION INSTRUCTIONS

## Operation and Maintenance

**Check oil level prior to starting and ensure trouble free water supply.**

**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.

Oil: Use only 0.8 gallons (3.0 L) of SAE 90 Industrial gear lube oil. (Giant's p/n 01154)

Initial change after 50 operating hours and then every 1000 operating hours, or after one year if used less.

**Caution!** When operating in damp places or with high temperature fluctuations, condensate (frothy oil) might occur in the gear box. In this situation, change the oil immediately. **Keep NPSH under control.**

Maximum input pressure is 145 PSI (10 bar), the maximum suction head is -4.35 PSI (-0.3 bar). Make sure that suction pulsation is sufficiently dampened. Water column resonance must be avoided.



### Safety Rules

Pump operation without safety valve as well as any excess in temperature or speed limits automatically voids the warranty. The safety valve must be regulated in accordance with the guidelines for liquid spraying units so that the admissible operating pressure can not be exceeded by more than 10%.

When the pump is in operation, the open shaft end must be covered up by a shaft protector (21). For direct drive operations, the driven shaft side and coupling must have a guard over the connected area.

Pressure in discharge line and in pump must be at zero before any maintenance to the pump takes place. Close the fluid supply to the inlet port(s). Disconnect fuses to ensure that the driving motor does not accidentally get switched on. Make sure that all parts on the pressure side of the unit are vented and refilled, with pressure at zero, before starting the pump.

In order to prevent air, or air/water mixture being absorbed and to prevent cavitation occurring, the pump-npshr, positive suction head and water temperature must be kept under control.

Required NPSH refers to water: Specific weight 0.0624 lb/ft<sup>3</sup> (1kg/dm<sup>3</sup>), viscosity 1°E at maximum permissible revolutions.

**Cavitation and/or compression of gases lead to uncontrollable pressure kicks which can ruin pump and unit parts and also be dangerous to the operator or anyone standing nearby.**

Giant pumps are suitable for pumping clean water and other non-aggressive or abrasive media with a specific weight similar to water.

**Before pumping other liquids - especially inflammable, explosive and toxic media - the pump manufacturer must under all circumstances be consulted with regard to the resistance of the pump material. It is the responsibility of the equipment manufacturer and/or operator to ensure that all pertinent safety regulations are adhered to.**

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

# LP460 Pump Specifications

	<u>U.S.</u>	<u>Metric</u>
Volume.....	9.8 GPM.....	37.0 L/min
Discharge Pressure.....	5800 PSI.....	400 Bar
Power Consumption.....	40.5 BHP.....	30.2 kW
Inlet Pressure.....	-4.35 to 145 PSI.....	-0.3 to 10 Bar
Maximum Crankshaft Speed.....		1000 RPM
Plunger Diameter.....	0.79".....	20mm
Stroke.....	1.65".....	42mm
Crankcase Oil Capacity.....	101 fl.oz.....	3.0 L
Temperature of Pumped Fluids.....	104° F.....	40° C
Inlet Port.....		2 x 1-1/4" BSP
Discharge Port.....		2 x 1" BSP
Shaft Mounting.....		Either side
Shaft Rotation.....		Top of pulley towards manifold
Weight.....	128 lbs.....	58 kg
Crankshaft Diameter.....		35mm
Manifold Material.....		Special Brass

### PULLEY INFORMATION

Pulley selection and pump speed are based on a 1725 RPM motor and "B" section belts. When selecting desired GPM, allow for a ±5% tolerance on pumps output due to variations in pulleys, belts and motors among manufacturers.

1. Select GPM required, then select appropriate motor and pump pulley from the same line.
2. The desired pressure is achieved by selecting the correct nozzle size that corresponds with the pump GPM.

### HORSEPOWER INFORMATION

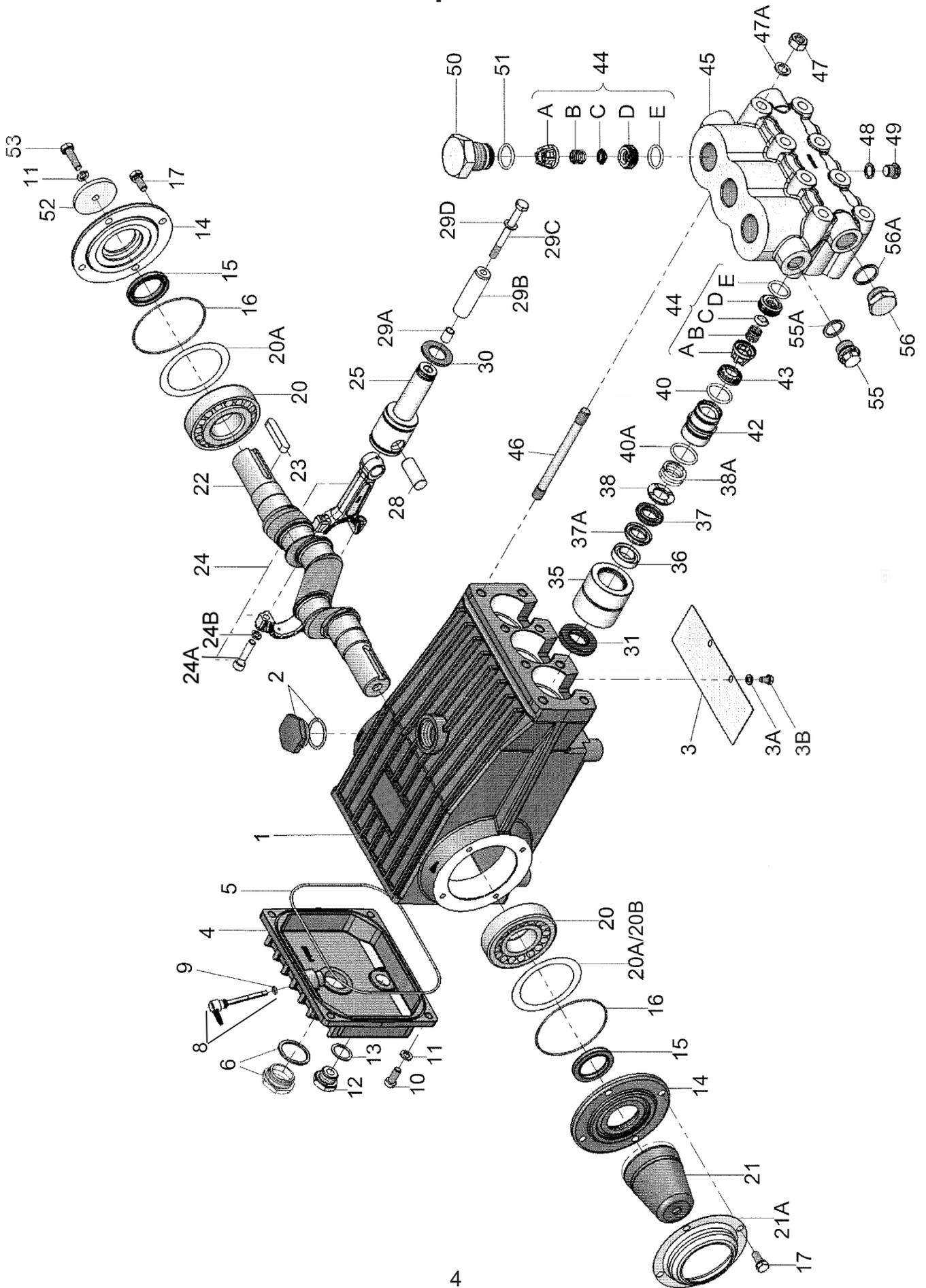
Horsepower ratings shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend that a 1.1 service factor be specified when selecting an electric motor as the power source. To compute specific pump horsepower requirements, use the following formula:

$$HP = (GPM \times PSI) / 1450$$

<b>LP460 Horsepower Requirements</b>					
RPM	GPM	3000 PSI	4000 PSI	5000 PSI	5800 PSI
600	5.9	12.1	16.2	20.2	23.4
700	6.8	14.1	18.9	23.6	27.4
800	7.8	16.2	21.6	27.0	31.3
900	8.8	18.2	24.3	30.3	35.2
1000	9.8	20.2	27.0	33.7	39.1

# LP460 Exploded View



## LP460 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	07759	Crankcase	1	29D	07258	Copper Ring	3
2	13000	Oil Filler Plug Assembly	1	30	07779	O-Ring	3
3	05940	Cover Plate	1	31	07133	Oil Seal	3
3A	07223-0100	Spring Ring	2	35	03213	Seal Sleeve	3
3B	05051	Hexagon Screw	2	36	03214	Pressure Ring	3
4	06085	Crankcase Cover	1	37	07322	Sleeve	3
5	07104	O-Ring, Crankcase Cover	1	37A	07322-0020	Sleeve, Teflon	3
6	05943	Oil Sightglass with Gasket	1	38	07270	Sleeve Support Ring	3
8	06086	Oil Dipstick Assembly	1	38A	13423	Spring	3
9	01009	O-Ring, Dipstick	1	40	04118	O-Ring	3
10	01010	Cylinder Screw	4	40A	05523	O-Ring	3
11	01011-0400	Spring Ring	5	42	04146	Seal Case	3
12	07109	Plug	1	43	13426	Valve Retainer	3
13	06015	O-Ring	1	44	04394	Valve Assembly (44A-44E)	6
14	07111	Bearing Cover	2	44A	04395	Spring Tension Cap	6
15	07112	Radial Shaft Seal	2	44B	04396	Valve Spring	6
16	07113	O-Ring	2	44C	04147	Valve Plate	6
17	07114	Hexagon Screw	8	44D	04121	Valve Seat	6
20	07116	Taper Roller Bearing	2	44E	04123	O-Ring	6
20A	07117	Fitting Disc	1-3	45	04148	Valve Casing	1
20B	13001	Fitting Disc	1-3	46	07157	Stud Bolt	8
21	05376	Shaft Protector	1	47	07158	Hexagon Nut	8
21A	05377	Shaft Guard Holder	1	47A	07159	Disc	8
22	13242	Crankshaft	1	48	07161	Copper Washer	1
23	13243	Fitting Key	1	49	07423	Plug, 1/4" BSP	1
24	13340	Connecting Rod Assembly	3	50	04122	Valve Plug	3
24A	13277	Inner Hexagon Screw	6	51	05972	O-Ring	3
24B	13278	Spring Washer	6	52	13020	Disc for Crankshaft	1
25	13244	Crosshead and Plunger Assembly	3	53	04561	Hexagon Screw	1
28	13232	Crosshead Pin	3	55	13434	Plug, 1/2" BSP	1
29A	07256	Centering Sleeve	3	55A	06272	Copper Washer	1
29B	07262	Plunger Pipe	3	56	07703	Plug, 3/4" BSP	1
29C	13007	Tensioning Screw	3	56A	07704	Copper Washer	1

## LP460 Repair Kits

### Plunger Packing Kit - # 09743

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
37	07322	Sleeve	3
37A	07322-0020	Sleeve, Teflon	3

### Valve Assembly Kit - # 09744

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
40	04118	O-Ring	3
40A	05523	O-Ring	3
44	04394	Valve Assembly	6

### Oil Seal Kit - # 09577

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
31	07133	Oil Seal	3

# LP460 REPAIR INSTRUCTIONS

## To Check Valves

Discharge Valves: screw off tension plugs (50). Take the spring tension cap (44A) out of the exposed discharge valve with flat nose pliers.

Remove the valve seat (44D), if necessary with an M12 screw (screwing it into the M12 thread). If the valve is extracted as a complete unity, position a screwdriver through the recess in the spring tension cap and press down on the valve plate to gently lever the valve apart.

Check parts and replace if worn. Tighten plugs (50) at 107 ft.-lbs. (145 Nm).

Suction Valves: unscrew the 8 nuts (47) and remove the valve casing (45) from seal sleeves (35). Using two screwdrivers, lever the seal case (42) out of the valve casing. Remove spring tension cap with flat nose pliers. Remove the valve seat (44D), if necessary with an M12 screw. Replace worn parts.

Tighten nuts (47) evenly at 59 ft.-lbs. (80 Nm) to secure the valve casing.

## To Check Seals and Plunger Pipe

Unscrew the 8 nuts (47) and remove the valve casing by pulling it off to the front. Take the seal sleeves (35) out of their guides in the crankcase. If necessary, remove the seal case (42) from the seal sleeve (35). Remove tension spring (38A) and seal parts (36-38) from the seal sleeve (35).

Check plunger surfaces and seals (37/37A). Replace worn parts.

If plunger pipe (29B) is worn out, loosen tension screws (29C) and pull plunger pipe off to the front. Clean front surface of plunger (25) thoroughly.

Then place the new plunger pipe through the oiled seals (37/37A) and push seal sleeve with plunger pipe into the crankcase guide. Turn gear until the plunger (25) comes up against the plunger pipe.

Put a new copper gasket (29D) onto the tension screw (29C), cover the thread of the tension screw and gasket with glue (Loctite) and tighten to 22 ft.-lbs. (30 Nm).

**Important!** Make sure that no glue gets between the plunger pipe (29B) and the centering sleeve (29A). The plunger pipe should not be strained by improper tightening of the tension screw or it may break.

Tighten nuts (47) evenly at 59 ft.-lbs. (80 Nm) to secure the valve casing.

## To Dismantle Gear

After removing the valve casing and plunger pipes, drain the oil. Screw off gear cover (4) and bearing cover (14).

Take off the connecting rod screws and push the front of the connecting rods as far as possible into the crosshead guide.

**Important!** Connecting rods are marked for identification. Do not twist conrod halves. The conrods must be remounted on to the shaft journals in their exact original position.

Turning the crankshaft slightly, hit it out carefully using a rubber hammer.

**Important!** Do not bend the conrod shanks. Check shaft and conrod mounting surfaces as well as the shaft seal rings and roller bearings.

## Reassembling

Using a soft tool, press in the outer bearing ring on one side until the outer edge lines up with the outer edge of the bearing bore. Screw on the bearing cover together with the shaft seal and O-ring.

Insert the shaft through the bearing bore on the opposite side. Press in the outer bearing ring and fix this with the bearing cover, keeping the shaft in a vertical position and turning it slowly so that the taper rollers of the bearings touch the edge of the outer bearing ring.

Adjust axial bearing clearance to at least 0.1mm, but less than 0.15mm by placing fitting discs (20A) under the bearing cover.

**Important!** After assembly has been completed, the shaft should turn easily with very little clearance.

Tighten conrod screws at 22 ft.-lbs. (30 Nm).

## LP460 TORQUE SPECIFICATIONS

Pos.	Item #	Description	Lubrication Info	Torque Amount
1	07759	Crankcase	Molycote Cu-Paste	
6	05943	Oil Sight Glass	Loctite 572	29 ft.-lbs. (40 Nm)
10	01010	Cylinder Screw		221 in.-lbs. (25 Nm)
12	07109	Plug		29 ft.-lbs. (40 Nm)
17	07114	Hexagon Screw		221 in.-lbs. (25 Nm)
24	13340	Connecting Rod Assembly		21 ft.-lbs. (28 Nm)
29C	13007	Tension Screw	Loctite 243	26 ft.-lbs. (35 Nm)
31	07133	Oil Seal	Loctite 403	
46	07157	Stud Bolt	Loctite 648	
47	07158	Hexagon Nut		59 ft.-lbs. (80 Nm)
50	04122	Plug		107 ft.-lbs. (145 Nm)

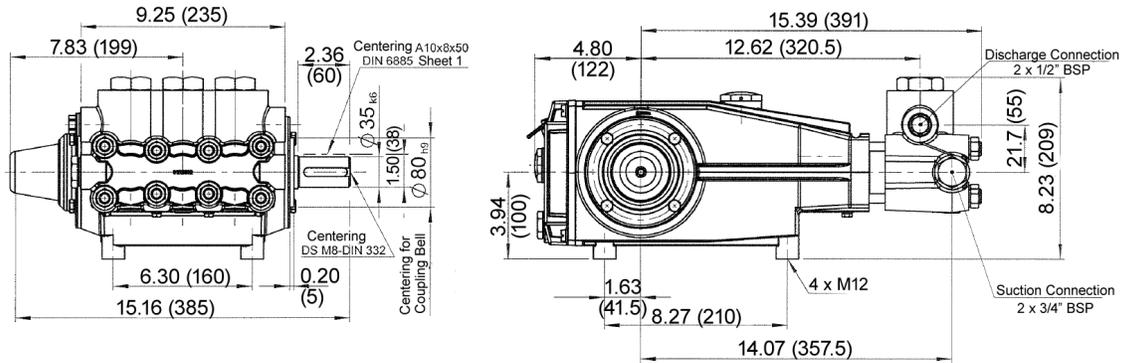
### Pump Mounting Selection Guide

<p><b>Bushings</b>  <b>06496</b> - 35 mm H Bushing</p>
<p><b>Pulley &amp; Sheaves</b>  <b>07165</b> - 12.75" Cast Iron - 4 gr.                      AB Section</p>
<p><b>Rails</b>  <b>07357</b> - Plated Steel Channel Rails                      (L=11.75"x W=1.88"x H=3.00")</p>

### Preventative Maintenance Check List & Recommended Spare Parts List

Check	Daily	Weekly	50 hrs	Every 500 hrs	Every 1500 hrs	Every 3000 hrs
Oil Level/Quality	X					
Oil Leaks	X					
Water Leaks	X					
Belts, Pulley		X				
Plumbing		X				
<b>Recommended Spare Parts</b>						
Oil Change p/n 01154			X	X		
Seal Spare Parts (1 kit/pump)					X	
Oil Seal Kit (1 kit/pump)					X	
Valve Spare Parts (1 kit/pump)						X

## LP460 Dimensions - inches (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. Five (5) years from the date of shipment for all pumps used in portable pressure washers with NON-SALINE, clean water applications.
2. Two (2) years from the date of shipment for Giant pumps used in car wash applications.
3. One (1) year from the date of shipment for all other Giant industrial and consumer pumps.
4. Six (6) months from the date of shipment for all rebuilt pumps
5. 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.



**WARNING:** This product might contain a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm.

For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

# GIANT

Performance Under Pressure

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