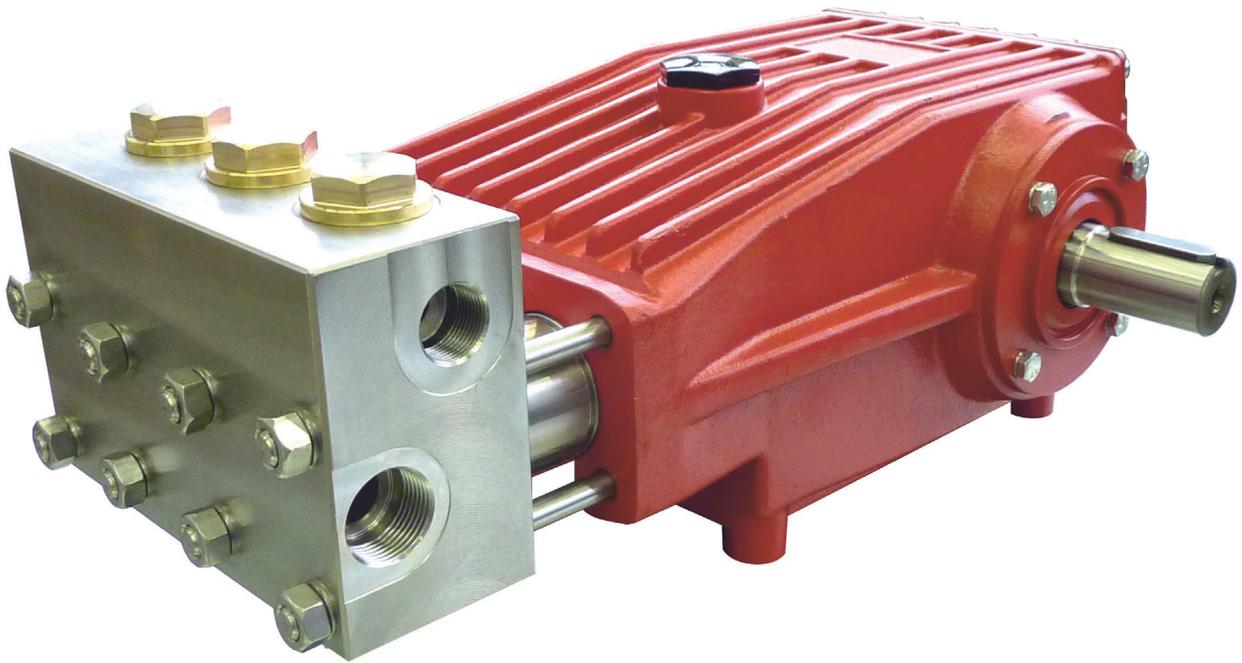


# Models

# LP305/LP605

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Triplex Ceramic  
Plunger Pump  
Operating Instructions/  
Manual



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Updated 07/20

# 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 re-filled, 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**

## Model LP305 Specifications

	<u>U.S.</u>	<u>Metric</u>
Flow .....	15.9 GPM .....	60 L/min
Maximum Pressure.....	4060 PSI .....	280 bar
Power Consumption .....	43.3 HP .....	32.3 kW
Inlet Pressure .....	-4.35 to 145 PSI .....	-0.3 to 10 Bar
Speed .....		1100 RPM
Plunger Diameter.....	0.95" .....	24 mm
Stroke .....	1.65" .....	42 mm

## Model LP605 Specifications

	<u>U.S.</u>	<u>Metric</u>
Flow .....	10.6 GPM .....	40 L/min
Discharge Pressure .....	6090 PSI .....	420 Bar
Power Consumption .....	43.3 HP .....	32.3 kW
Inlet Pressure .....	-4.35 to 145 PSI .....	0.3 to 10 Bar
Speed .....		1100 RPM
Plunger Diameter.....	0.79" .....	20 mm
Stroke .....	1.65" .....	42 mm
Crankshaft Diameter.....		35 mm

## Common Specifications

	<u>U.S.</u>	<u>Metric</u>
Crankcase Oil Capacity .....	0.8 Gallon .....	3.0 Liters
Temperature of Pumped Fluids .....	140 °F .....	60 °C
Inlet Port .....		1" NPT
Discharge Port.....		3/4" NPT
Crankshaft Mounting .....		Either Side
Shaft Rotation.....		Top of Pulley Towards Fluid End
Weight .....	125 lbs.....	56.5 kg
Crankshaft Diameter.....		35 mm
NPSHR .....	23.3 ft.-head .....	7.1 mWs
Fluide End Material.....		AISI 303

### PULLEY INFORMATION

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

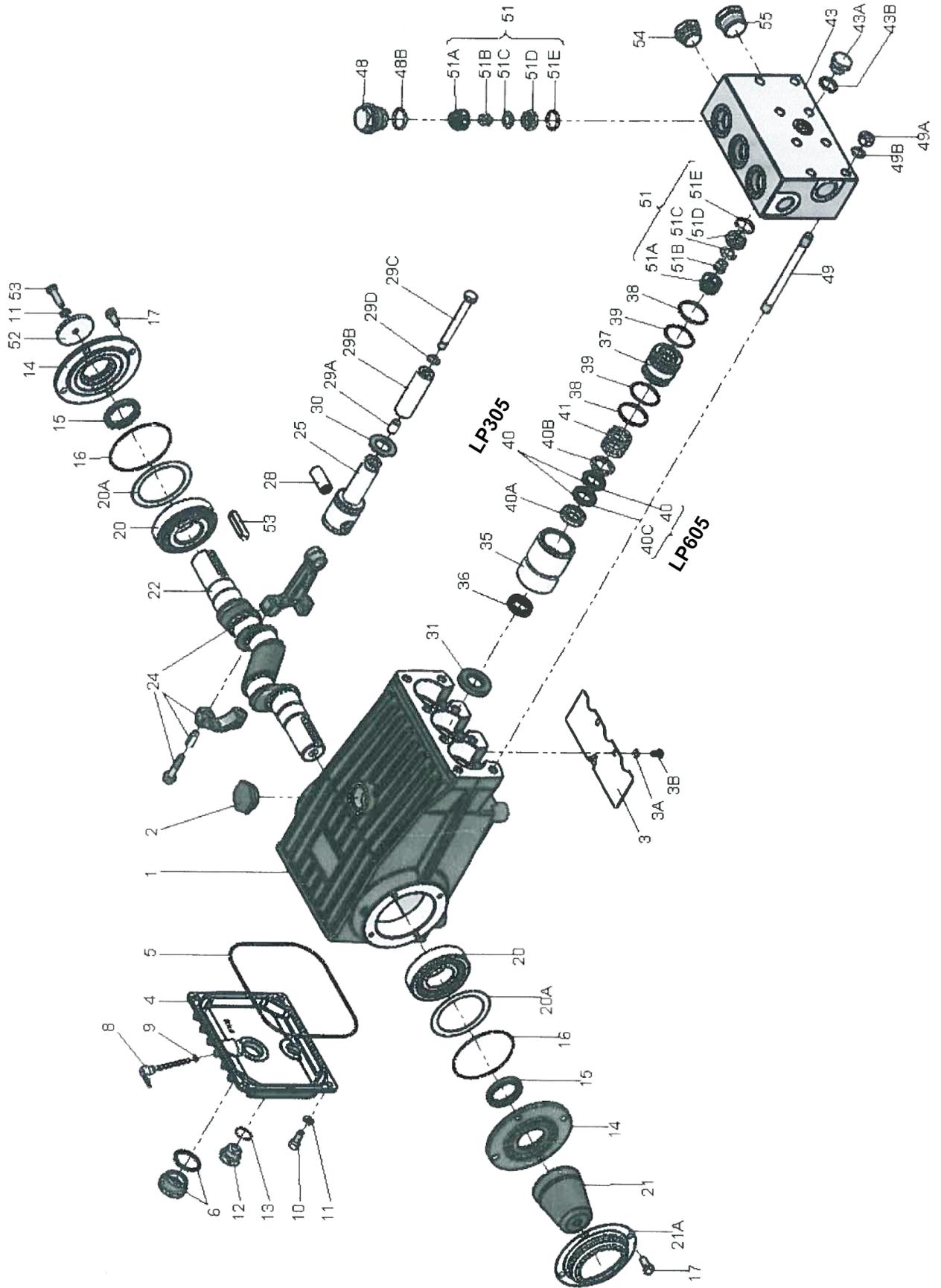
We recommend that a 1.15 service factor be specified when selecting an electric motor as the power source. To compute specific pump horsepower requirements, use the following formula:

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

LP305 Horsepower Requirements					
RPM	GPM	2500 PSI	3000 PSI	3500 PSI	4060 PSI
550	8.0	13.8	16.6	19.3	22.4
600	8.7	15.0	18.0	21.0	24.4
700	10.1	17.4	20.9	24.4	28.3
800	11.6	20.0	24.0	28.0	32.5
900	13.0	22.4	26.9	31.4	36.4
1100	15.9	27.4	32.9	38.4	44.5

LP605 Horsepower Requirements					
RPM	GPM	3000 PSI	4000 PSI	5000 PSI	6090 PSI
550	5.3	11.0	14.6	18.3	22.3
600	5.8	12.0	16.0	20.0	24.4
700	6.8	14.1	18.8	23.5	28.6
800	7.7	15.9	21.2	26.6	32.3
900	8.7	18.0	24.0	30.0	36.5
1100	10.6	21.9	29.2	36.6	44.5

# Exploded View - LP305/LP605



# Parts List - LP305/LP605

<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	36	13237	Leakage Seal (LP605)	3
2	13000	Oil Filler Plug Assembly	1	36	13238	Leakage Seal (LP305)	3
3	05940	Cover Plate	1	37	04573	Seal Case	3
3A	07223-0100	Spring Ring	2	38	12055	O-Ring, Seal Case	6
3B	05051	Hexagon Screw	2	39	07693	Support Ring	6
4	06085	Crankcase Cover	1	40	07322	V-Sleeve (LP605)	3
5	07104	O-ring, Crankcase Cover	1	40	06083	V-Sleeve (LP305)	6
6	05943	Oil Sight Glass w/Gasket	1	40A	07268	Pressure Ring (LP605)	3
8	06086	Oil Dipstick Assembly	1	40A	13366	Pressure Ring (LP305)	3
9	01009	O-Ring, (For Dipstick)	1	40B	07270	Support Ring for 40 (LP605)	3
10	01010	Cylinder Screw	4	40B	13367	Support Ring for 40 (LP305)	3
11	01011-0400	Spring Ring	5	40C	07322-0020	Sleeve, Teflon (LP605)	3
12	07109	Plug, 1/2" BSP	1	41	07338	Pressure Spring	3
13	06015	O-Ring	1	43	04574	Valve Casing	1
14	07111	Bearing Cover	2	43A	07109-0400	Plug, 1/2" BSP	1
15	07112	Radial Shaft Seal	2	43B	06272	Copper Ring	1
16	07113	O-Ring for Bearing Cover	2	48	05971	Plug	3
17	07114	Hexagon Screw	8	48B	05972	O-Ring	3
20	07116	Taper Roller Bearing	2	49	04575	Stud Bolt	8
20A	07117	Fitting Disc	1-3	49A	07158	Hexagon Nut	8
20B	13001	Fitting Disc	1-3	49B	07159	Disc	8
21	05376	Shaft Protector	1	51	04513	Valve Assembly (51A-E)	6
21A	05377	Shaft Guard Holder	1	51A	06939	Spring Tension Cap	6
22	13242	Crankshaft	1	51B	06377	Valve Spring	6
23	13243	Key	1	51C	04495	Valve Plate	6
24	13340	Connecting Rod Assembly	3	51D	04496	Valve Seat	6
25	13341	Crosshead Assembly	3	51E	04123	O-Ring	6
28	13232	Crosshead Pin	3	52	13020	Disc for Crankshaft	1
29A	07125	Centering Sleeve	3	53	04561	Hexagon Screw	1
29B	07126	Plunger Pipe (LP605)	3	54	04576	Plug, 3/4" NPT	1
29B	07127	Plunger Pipe (LP305)	3	55	07756	Plug, 1" NPT	1
29C	13031	Tensioning Screw	3		04577	Crankcase Assembly	
29D	07755	Copper Ring	3			(1-29A,30,31,49,49A-B,52,53)	
30	07779	Oil Scraper	3		04578	Plunger Replacement Kit (LP605)	
31	07133	Oil Seal	3			(29B-D,35-40B)	
35	04572	Seal Sleeve (LP605)	3		04579	Plunger Replacement Kit (LP305)	
35	13364	Seal Sleeve (LP305)	3			(29B-D,35-41)	

<b>Plunger Packing Kits</b>				<b>Valve Assembly Kit</b>			
<b>LP305 - #09789</b>				<b>#09792</b>			
<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>	<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
36	13238	Leakage Seal	3	38	12055	O-Ring	6
38	12055	O-Ring	6	39	07693	Support Ring	6
39	07693	Support Ring	6	48B	05972	O-Ring	3
40	06083	V-Sleeve	6	51	04513	Valve Assembly	6
<b>LP605 - #09791</b>				<b>Oil Seal Kit</b>			
<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>	<b># 09577</b>			
<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>	<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
36	13237	Leakage Seal	3	31	07133	Oil Seal	3
38	12055	O-Ring	6				
39	07693	Support Ring	6				
40	07322	V-Sleeve	3				
40C	07322-0020	Sleeve, Teflon	3				

<b>LP305/LP605 TORQUE SPECIFICATIONS</b>			
<u>Position</u>	<u>Item#</u>	<u>Description</u>	<u>Torque Amount</u>
24	13340	Connecting Rod Assembly	265 in.-lbs. (30 Nm)
29C	13031 (LP305)	Tension Screw, Plunger	310 in.-lbs. (35 Nm)
29C	13031 (LP605)	Tension Screw, Plunger	265 in.-lbs. (30 Nm)
49A	07158	Hexagon Nut, Stud Bolts	59 ft.-lbs. (80 Nm)
52	13020	Disc for Crankshaft	107 ft.-lbs. (145 Nm)

# REPAIR INSTRUCTIONS - LP305/LP605

## To Check Valves

Discharge Valves: remove valve plugs (48) using a socket wrench. Using a screwdriver, carefully push the exposed spring tension cap (51A) to the side to remove it from the valve seat. Take out the spring tension cap, valve spring (51B) and valve plate (51C). Pull out valve seat (51D) using a valve seat puller tool ( $\varnothing 12\text{-}\varnothing 16$ ).

To dismantle the complete valve, place a screwdriver through a gap in the spring tension cap, press on the valve plate and lever the valve apart. Tighten plugs (52) at 107 ft.-lbs. (145 Nm).

Suction Valves: unscrew the 8 nuts (49A) and pull valve casing (43) off to the front. Continue as described above under Discharge Valves. Examine valves and replace worn parts.

## To Check Seals and Plunger Pipe

Unscrew the 8 nuts (49A) and pull off valve casing to the front. Pull seal sleeves (35) out of guides in crankcase. With the help of 2 screwdrivers, pry out seal case (37) from seal sleeve (35).

Check plunger surfaces and seals (36/40/40C). Replace worn seals.

If plunger pipe is worn out, remove tension screw (29C) and pull of plunger pipe to the front. Clean front surface of plunger (25) carefully. Then place new plunger pipe carefully through the oiled seals 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 tension screw (29C). Apply a thin coat of bonding agent (Loctite) to the thread of the tension screw and to the gasket. Tighten screw on LP605 to 265 in.-lbs (30Nm) and LP305 to 310 in.-lbs. (35 Nm).

**Important!** Care must be taken that no glue gets between the plunger pipe (29B) and the centring sleeve (29A). The plunger pipe should not be strained by eccentric tightening of the tension screw or through damage to front surface of plunger, otherwise it will probably break.

Tighten the fixing nuts (49A) for the valve casing evenly at 59 ft.-lbs. (80 Nm).

## To Dismantle Gear

Remove the 8 nuts (49A) and pull off valve casing to the front. Pull seal sleeves (35) out of guides in crankcase.

Remove plunger pipe (29B).

Unscrew plug (12) and drain oil. Remove gear cover (4) and bearing cover (14).

Remove connecting rod screws (24) and push the front of the connecting rod forward as far as possible into the crosshead guide.

**Important!** Connecting rods are marked for identification. Do not twist connecting rod halves. Connecting rods should be reinstalled in the same position on shaft journals.

Turning the crankshaft slightly, hit it out carefully to the side with a rubber hammer.

**Important! Do not bend the connecting rod shanks. Check shaft and connecting rod surfaces, shaft seals and taper roller bearings.**

## To Reassemble

Using a soft tool, press in the outer bearing ring till the outer edge lines up with the outer edge of the bearing hole.

Attach bearing cover together with shaft seal and o-ring. Fit shaft through bearing hole on the opposite side.

Press in outer bearing ring and apply tension inwards with the bearing cover, keeping the shaft in vertical position and turning slowly so that the taper rollers of the bearings touch the edge of the outer bearing ring.

Adjust axial bearing clearance to at least 0.1 mm and maximum 0.15 mm by placing fitting discs (20A) under the bearing cover.

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

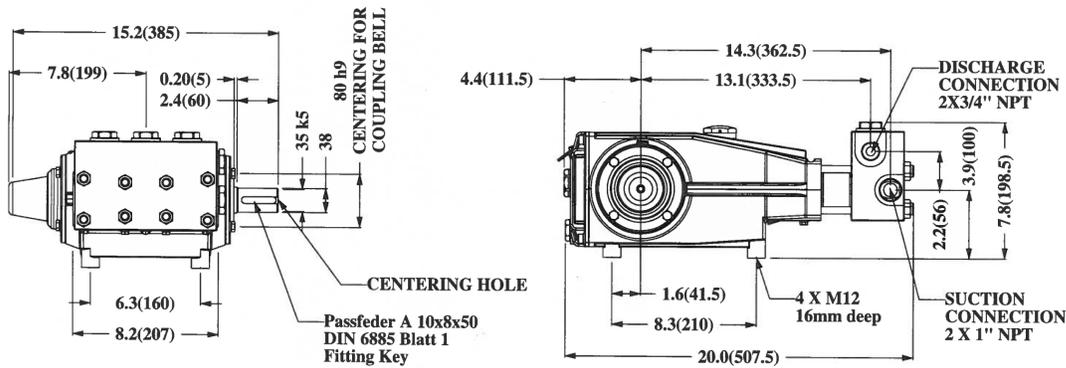
Tighten connecting rod screws to 265 in.-lbs. (30 Nm).

# Pump System Malfunction

<u>MALFUNCTION</u>	<u>CAUSE</u>	<u>REMEDY</u>
The Pressure and/or the Delivery Drops	Worn packing seals Broken valve spring Belt slippage Worn or Damaged nozzle Fouled discharge valve Fouled inlet strainer Worn or Damaged hose Worn or Plugged relief valve on pump Cavitation  Unloader	Replace packing seals Replace spring Tighten or Replace belt Replace nozzle Clean valve assembly Clean strainer Repair/Replace hose Clean, Reset, and Replace worn parts Check suction lines on inlet of pump for restrictions Check for proper operation
Water in crankcase	High humidity Worn seals	Reduce oil change interval Replace seals
Noisy Operation	Worn bearings  Cavitation	Replace bearings, Refill crankcase oil with recommended lubricant Check inlet lines for restrictions and/or proper sizing
Rough/Pulsating Operation with Pressure Drop	Worn packing Inlet restriction  Accumulator pressure Unloader Cavitation	Replace packing Check system for stoppage, air leaks, correctly sized inlet plumbing to pump Recharge/Replace accumulator Check for proper operation Check inlet lines for restrictions and/or proper size
Pressure Drop at Gun	Restricted discharge plumbing	Re-size discharge plumbing to flow rate of pump
Excessive Leakage	Worn plungers Worn packing/seals Excessive vacuum Cracked plungers Inlet pressure too high	Replace plungers Adjust or Replace packing seals Reduce suction vacuum Replace plungers Reduce inlet pressure
High Crankcase Temperature	Wrong Grade of oil Improper amount of oil in crankcase	Giant oil is recommended Adjust oil level to proper amount

<b>Preventative Maintenance Check List &amp; Recommended Spare Parts List</b>						
<b>Check</b>	<b>Daily</b>	<b>Weekly</b>	<b>50 hrs</b>	<b>Every 1000 hrs</b>	<b>Every 1500 hrs</b>	<b>Every 3000 hrs</b>
Oil Level/Quality	X					
Oil Leaks	X					
Water Leaks	X					
Belts, Pulley		X				
Plumbing		X				
<b>Recommended Spare Parts</b>						
Oil Change 0.8 Gallon p/n 01154			X	X		
Oil Seal Kit (1 kit/pump) (see page 5 for kit list)					X	
Seal Spare Parts (1 kit/pump) (see page 5 for kit list)					X	
Valve Spare Parts (1 kit/pump) (see page 5 for kit list)						X

# 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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