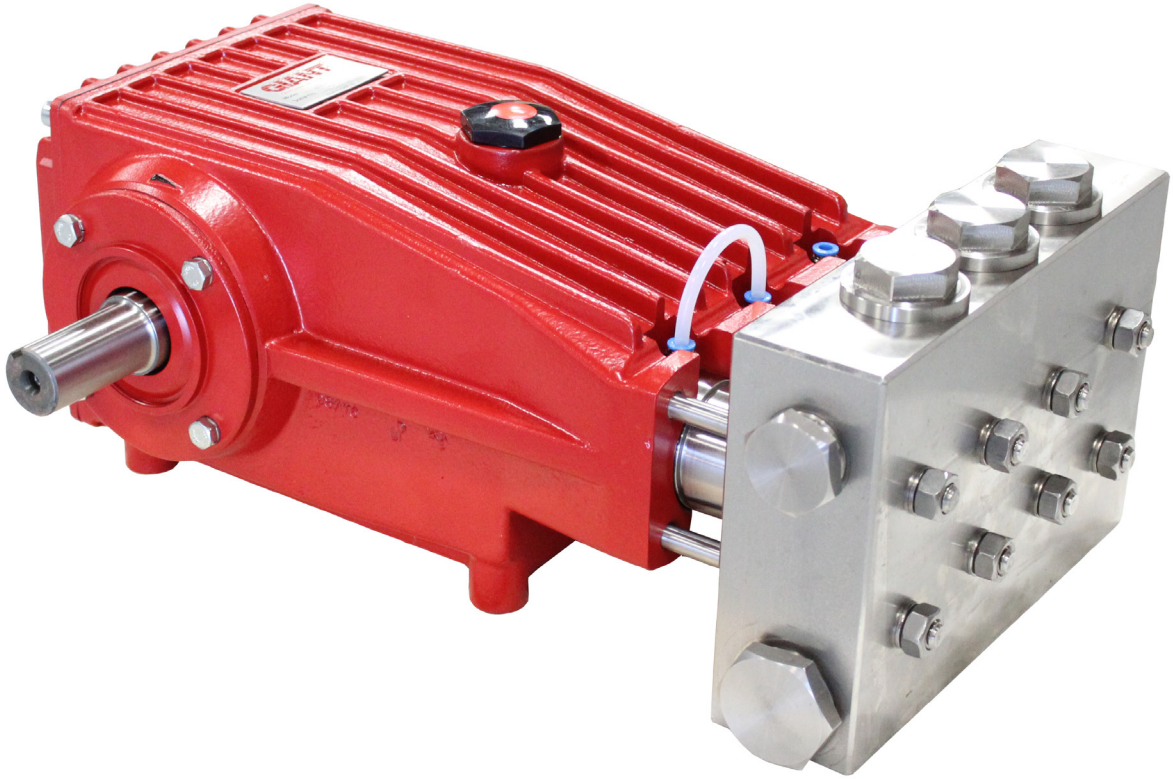
# Model LP601

**Triplex Ceramic Plunger Pump Operating Instructions/ Manual**

Pump with rinsing system and ball valve for slurry (viscous) applications



GIANT
Performance Under Pressure

**Contents:**



**Updated 07/21**

# 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 118 fluid ounces (3.5 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 maximun 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$^3$ (1kg/dm$^3$), 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 LP601 Specifications

| | U.S. | Metric |
|---|---|---|
| Volume | 9.8 GPM | 37 LPM |
| Discharge Pressure | 5800 PSI | 400 Bar |
| Inlet Pressure | -4.35 to 145 PSI | 0.3 to 10 Bar |
| Speed | 1000 RPM | |
| Plunger Diameter | 0.79” | 20 mm |
| Stroke | 1.57” | 40 mm |
| Crankcase Oil Capacity | 118 fl.oz. | 3.5 liters |
| Temperature of Pumped Fluids | 140 °F | 60 °C |
| Inlet Port | 1-1/4” BSP | |
| Discharge Port | 1” BSP | |
| Crankshaft Mounting | Either Side | |
| Shaft Rotation | Top of Pulley Towards Fluid End | |
| Weight | 119 lbs. | 54 kg |
| Crankshaft Diameter | 35 mm | |

### 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

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 X PSI) / 1450

**LP601 PULLEY SELECTION AND HORSEPOWER REQUIREMENTS**

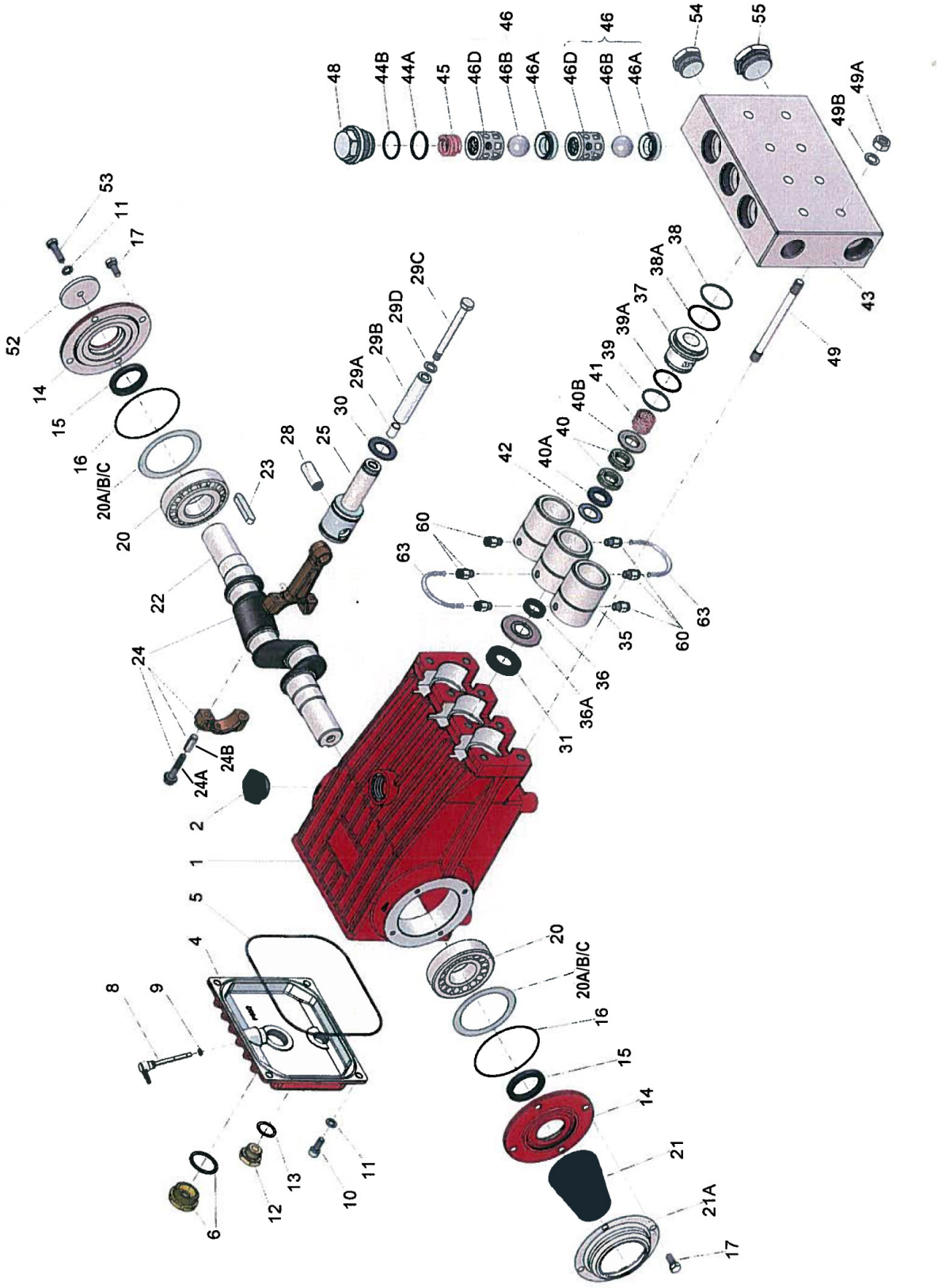
| GPM | RPM | 3000 PSI | 4000 PSI | 5000 PSI | 5800 PSI |
|---|---|---|---|---|---|
| 4.85 | 500 | 10.1 | 13.5 | 16.8 | 19.4 |
| 6.2 | 640 | 12.9 | 17.2 | 21.5 | 24.8 |
| 7.28 | 750 | 15.2 | 20.2 | 25.3 | 29.1 |
| 7.8 | 805 | 16.3 | 21.6 | 27.1 | 31.2 |
| 8.4 | 865 | 17.5 | 23.3 | 29.1 | 33.6 |
| 9.1 | 940 | 18.9 | 25.2 | 31.6 | 36.4 |
| 9.7 | 1000 | 20.2 | 26.9 | 33.7 | 38.8 |

### LP601 TORQUE SPECIFICATIONS

| Position | Item# | Description | Torque Amount |
|---|---|---|---|
| 6 | 05943 | Oil Sight Glass w/Gasket | 354 in.-lbs. (40 NM) |
| 10 | 01010 | Cylinder Screw | 221 in.-lbs. (25 NM) |
| 12 | 07109 | Plug, 1/2” BSP | 354 in.-lbs. (40 NM) |
| 17 | 07114 | Hexagon Screw | 221 in.-lbs. (25 NM) |
| 24A | 13277 | Inner Hex Screw, Connecting Rod | 265 in.-lbs. (30 NM) |
| 29C | 13031 | Tension Screw, Plunger | 265 in.-lbs. (30 NM) |
| 48 | 06077 | Plug, Discharge | 107 ft.-lbs. (145 NM) |
| 49A | 07158 | Hexagon Nut, Stud Bolts | 59 ft.-lbs. (80 NM) |

# Exploded View - LP601

**Important!** The stainless steel valve plugs (48) can seize when being screwed out of the casing. To release tension beforehand, strike the plugs 1-2 times with a steel hammer on the top before screwing them out. Coat threads with antiseize (e.g. Fel-Pro Nickel Anti-Seize 51119)



# Parts List - LP601

| ITEM | PART | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 07759A | Crankcase | 1 |
| 2 | 13000 | Oil Filler Plug Assy. | 1 |
| 4 | 06085 | Crankcase Cover | 1 |
| 5 | 07104 | O-ring, Crankcase Cover | 1 |
| 6 | 05943 | Oil Sight Glass w/Gasket | 1 |
| 8 | 06086 | Oil Dipstick Assy. | 1 |
| 9 | 01009 | O-Ring, (For Dipstick) | 1 |
| 10 | 01010 | Cylinder Screw | 4 |
| 11 | 01011-0400 | Spring Ring | 5 |
| 12 | 07109 | Plug, 1/2” BSP | 1 |
| 13 | 06015 | O-Ring | 1 |
| 14 | 07111 | Bearing Cover | 2 |
| 15 | 07112 | Radial Shaft Seal | 2 |
| 16 | 07113 | O-Ring for Bearing Cover | 2 |
| 17 | 07114 | Hexagon Screw | 8 |
| 20 | 07116 | Taper Roller Bearing | 2 |
| 20A | 07117 | Fitting Disc, 0.1 mm | 0-3 |
| 20B | 13001 | Fitting Disc, 0.15 mm | 0-3 |
| 20C | 04091 | Fitting Disc, 0.2 mm | 0-3 |
| 21 | 05376 | Shaft Protector | 1 |
| 21A | 05377 | Shaft Guard Holder | 1 |
| 22 | 04640 | Crankshaft | 1 |
| 23 | 08091 | Key | 1 |
| 24 | 13340 | Connecting Rod Assy. | 3 |
| 24A | 13277 | Inner Hex Screw | 6 |
| 24B | 13278 | Spring Washer | 6 |
| 25 | 13341 | Crosshead Assy. | 3 |
| 28 | 13232 | Crosshead Pin | 3 |
| 29A | 07125 | Centering Sleeve | 3 |
| 29B | 07126 | Plunger Pipe | 3 |
| 29C | 13031 | Tensioning Screw | 3 |
| 29D | 07161A-0100 | Crush Washer | 3 |
| 30 | 07779 | Oil Scraper | 3 |
| 31 | 07133 | Oil Seal | 3 |
| 35 | 05985 | Seal Sleeve | 3 |
| 36 | 13037 | Leakage Seal | 3 |
| 36A | 05991 | Support Disc | 3 |
| 37 | 13239A | Seal Case | 3 |
| 38 | 07140 | O-Ring, Seal Case | 3 |
| 38A | 13241 | Support Ring for 38 | 3 |
| 39 | 13012 | O-Ring | 3 |
| 39A | 13036 | Support Ring for 39 | 3 |
| 40 | 07783 | Packing | 6 |
| 40A | 07268A | Guide Ring | 3 |
| 40B | 07270A | Support Ring for 40 | 3 |
| 41 | 07210 | Pressure Spring | 3 |
| 42 | 04031 | Pressure Ring | 3 |
| 43 | 13040A | Valve Casing | 1 |
| 44A | 07150 | O-Ring | 9 |
| 44B | 06266 | Support Ring for O-Ring | 3 |
| 45 | 06078 | Compression Spring | 3 |
| 46 | 07060A | Valve Assembly,Complete | 6 |
| 46A | 06920 | Valve Seat | 6 |
| 46B | 04641* | Valve Ball | 6 |
| 46D | 07066A* | Spacer Pipe | 6 |
| 48 | 06077 | Plug | 3 |
| 49 | 07157 | Stud bolt | 8 |
| 49A | 07158 | Hexagon Nut | 8 |
| 49B | 07159 | Disc | 8 |
| 52 | 13020 | Disc for Crankshaft | 1 |
| 53 | 04561 | Hexagon Screw | 1 |
| 54 | 13044 | Plug, 1” BSP | 1 |
| 55 | 13151 | Plug, 1-1/4” BSP | 1 |
| 60 | 04583 | Connector | 6 |
| 63 | 04642 | Tube, 4 x 1, Clear, 160 mm | 2 |
| | *Not sold alone - see 07060A | | |

# Repair Kits - LP601

## Plunger Packing Kit - #09793

| Item | Part # | Description | Qty. |
|---|---|---|---|
| 36 | 13037 | Seal Ring | 3 |
| 38 | 07140 | O-Ring | 3 |
| 38A | 13241 | Support Ring | 3 |
| 39 | 13012 | O-Ring | 3 |
| 39A | 13036 | Support Ring | 3 |
| 40 | 07783 | Packing | 6 |

## Valve Repair Kit - #09794

| Item | Part # | Description | Qty. |
|---|---|---|---|
| 44A | 07150 | O-Ring | 9 |
| 44B | 06266 | Support Ring | 3 |
| 46 | 07060A | Valve Assembly | 6 |

## Oil Seal Kit - # 09577

| Item | Part # | Description | Qty. |
|---|---|---|---|
| 31 | 07133 | Oil Seal | 3 |

# Repair Instructions - LP601

### To Check Valves

Lossen and remove tension plugs (48) with a 36 mm socket wrench. Check o-ring (44A) and support ring (448). Take out spring (45).
Take out discharge valves (46), pulling them upwards out of the valve casing with snap-ring tongs or any other pull-off device. Then remove suction valves in the same way. Check sealing surface and replace worn valve assemblies.
Reassemble with new o-rings if possible and oil them before installing. Tighten tension plugs (48) at 107 ft.-lbs. (145NM).

### To Check Seals and Plunger Pipe

Unscrew the a 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 (29B) and seals (36/40).
Replace worn seals.
If plunger pipe is worn out, remove tension screw (29C) and pull out 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 prpe into the crankcase guide. Tum 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 to 265 in.-lbs. (30NM).

**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 excessive 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. (80NM).

### To Dismantle Gear

Remove the a nuts (49A) and pull off valve casing to the front. Pull seal sleeves (35) out of guides in crankcase. Remove plunger pipe (298). 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 rod is to 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. Screw on bearing cover together with shaft seal and o-ring. Fit shaft through bearing hole on the opposite side. Press in outer bearing ring and tension it 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 0.1mm and maximum 0.15mm by placing fitting discs (20A/B/C) under the bearing cover.

**Important!** After assembly has been completed, the shaft should turn easily with very little clearance. Tighten connecting rod screws at 25.8 ft.-lbs. (35NM)

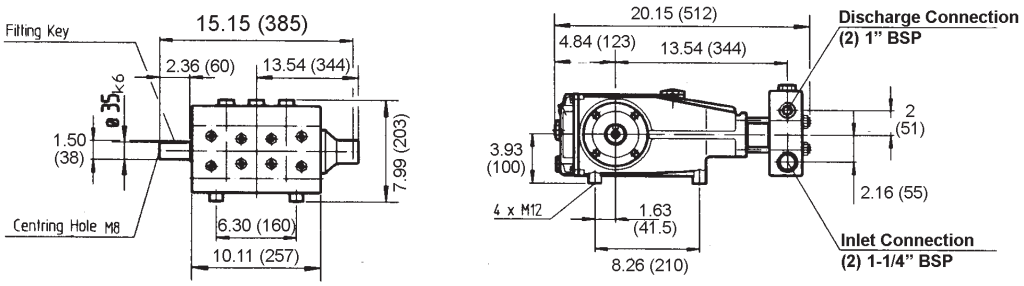
# Pump System Malfunction

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

## 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 | | | | |
| | **Recommended Spare Parts** | | | | | |
| Oil Change (1 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 (mm) - LP601




## 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

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Performance Under Pressure