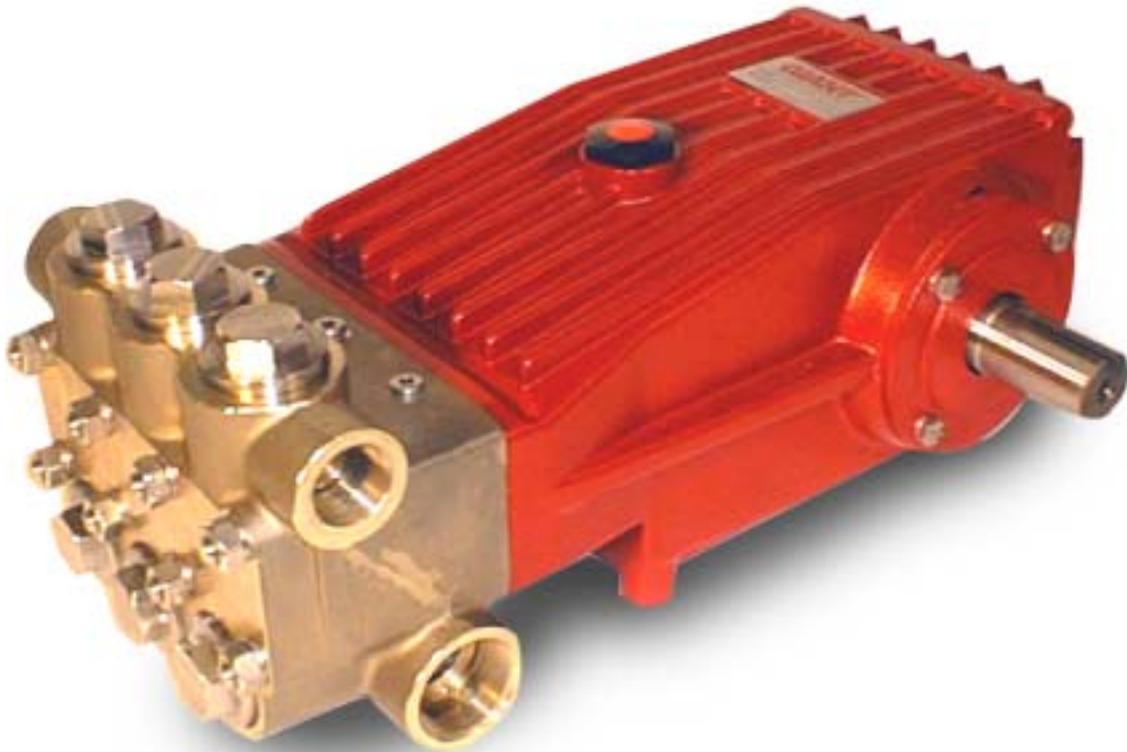


Model LP122A-3100

Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service
Manual



GIANT

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Updated 11/06

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 160^o F, 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. Use of a dampener is necessary to minimize pulsation at drive elements, plumbing, connections, and other system areas. The use of a dampener with Giant Industries, Inc. pumps is optional, although recommended by Giant Industries, Inc. to further reduce system pulsation. Dampeners can also reduce the severity of pressure spikes that occur in systems using a shut-off gun. A dampener must be positioned downstream from the unloader.

5. 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.

6. 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.

Use SAE 80-90W Industrial Gear Lube Oil (p/n 01154)

Crankcase oil should be changed after the first 50 hours of operation, then at regular intervals of 500 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.

3. Acids, alkalines, or abrasive fluids cannot be pumped unless approval in writing is obtained before operation from Giant Industries, Inc.

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

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

Specifications

Model LP122A-3100

| | U.S. | Metric |
|---------------------------------------|---------------------------------|-------------|
| Volume | 35.6 GPM | 134.7 l/m |
| Discharge Pressure | 1300 PSI | 90 Bar |
| Inlet Pressure | 90 PSI | 6.2 Bar |
| Speed | Up to 800 RPM | |
| Plunger Diameter | 1.65" | 42 mm |
| Stroke | 1.65" | 42 mm |
| Crankcase Oil Capacity | 116 fl.oz. | 3.43 liters |
| Temperature of Pumped Fluids | 160°F | 71°C |
| Inlet Port | 1-1/2" BSP | |
| Discharge Port | 1" BSP | |
| Crankshaft Mounting | Either Side | |
| Shaft Rotation | Top of Pulley Towards Fluid End | |
| Weight | 116 lbs. | 52.6 kg |
| Crankshaft Diameter | 1.38 | 35 mm |
| Valve Casing - LP122A-3100 | Aluminum Bronze-Nickle | |
| Volumetric Efficiency @ 800 RPM | 0.96 | |
| Mechanical Efficiency @ 800 RPM | 0.85 | |

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

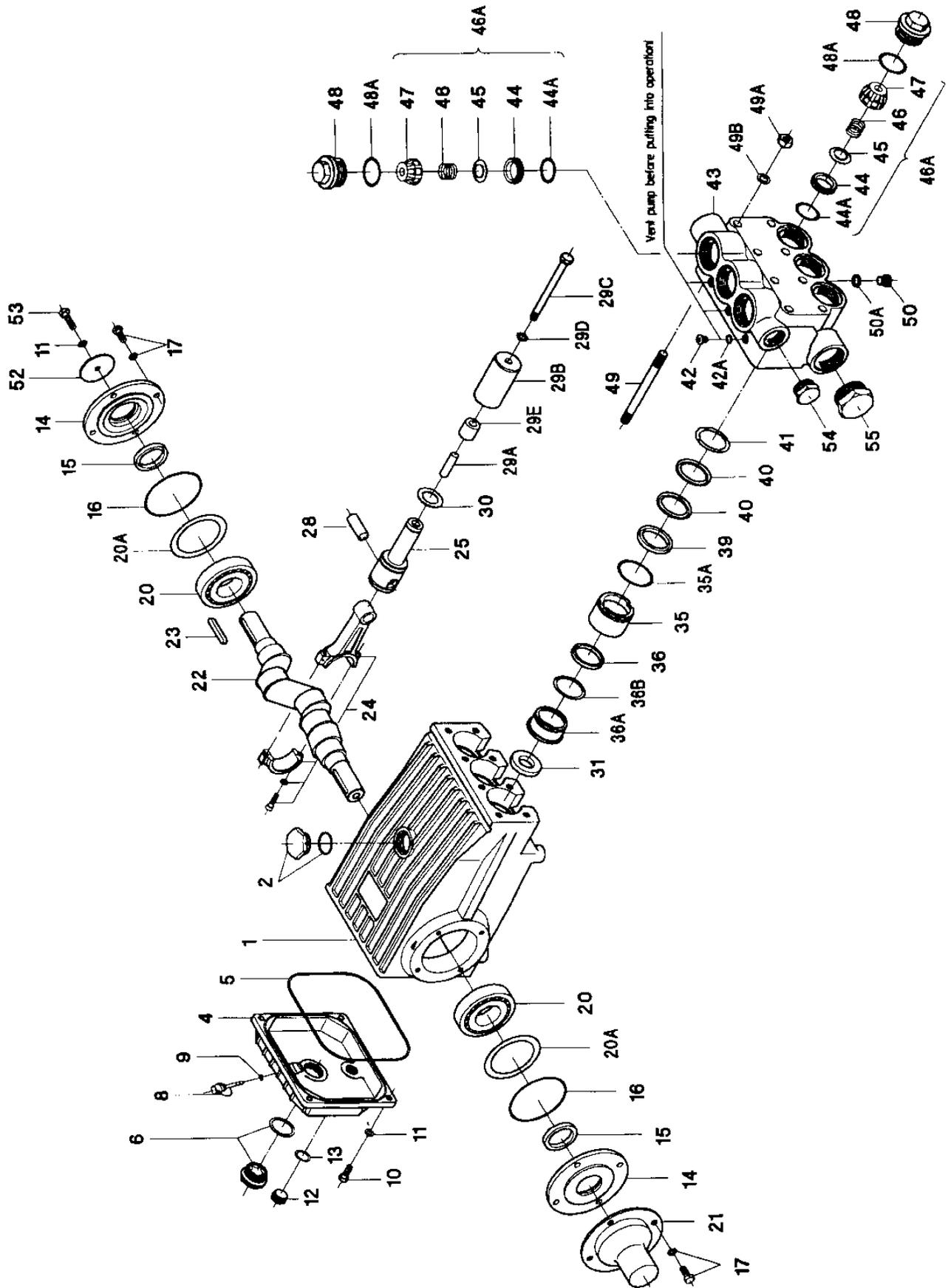
We recommend that a 1.1 service factor be specified when selecting an electric motor as the power source. To compute specific pump horsepower requirements, use the following formula:

$$HP = (GPM \times PSI) / 1440$$

Pump speeds of 640 RPM and above require a minimum inlet pressure of 12 psig.

| LP122A-3100 PULLEY SELECTION AND HORSEPOWER REQUIREMENTS | | | | | | | | |
|---|---------------------|------------|------------|----------------|----------------|-----------------|-----------------|------------------|
| PUMP PULLEY | MOTOR PULLEY | GPM | RPM | 600 PSI | 800 PSI | 1000 PSI | 1300 PSI | 2000 PSI* |
| 12.75" | 3.95" | 22.3 | 500 | 9.6 | 12.7 | 15.9 | 20.7 | 31.9 |
| 12.75" | 4.35" | 24.7 | 555 | 10.6 | 14.1 | 17.6 | 22.9 | 35.3 |
| 12.75" | 4.95" | 28.5 | 640 | 12.2 | 16.3 | 20.4 | 26.5 | 40.7 |
| 12.75" | 5.35" | 30.9 | 695 | 13.2 | 17.7 | 22.1 | 28.7 | 44.1 |
| 12.75" | 5.75" | 33.4 | 750 | 14.3 | 19.1 | 23.9 | 31.0 | 47.7 |
| 12.75" | 6.15" | 35.6 | 800 | 15.3 | 20.3 | 25.4 | 33.1 | 50.9 |

Exploded View - LP122A-3100



SPARE PARTS LIST - LP122A-3100 PUMP

| ITEM | PARTNO. | DESCRIPTION | QTY. | ITEM | PARTNO. | DESCRIPTION | QTY. |
|------|-------------|------------------------------|------|------|-------------|----------------------|------|
| 1 | 07759 | Crankcase | 1 | 29E | 06618 | Spacer Pipe | 3 |
| 2 | 13000 | Oil Filler Plug | 1 | 30 | 07779 | Flinger | 3 |
| 4 | 06085 | Crankcase Cover | 1 | 31 | 07133 | Radial Shaft Seal | 3 |
| 5 | 07104 | O-Ring | 1 | 35 | 13342-0100 | Seal Sleeve | 3 |
| 6 | 07186 | Oil Sight Glass W/Gasket | 1 | 35A | 06619 | O-Ring | 3 |
| 8 | 06086 | Oil Dipstick | 1 | 36 | 13415 | Grooved Ring | 3 |
| 9 | 01009 | O-Ring | 1 | 36A | 13416A-0100 | Pressure Ring | 3 |
| 10 | 01010-0400 | Screw | 4 | 36B | 06174 | Drip Shield | 3 |
| 11 | 08094 | Spring Washer | 5 | 39 | 07744-0100 | Pressure Ring | 3 |
| 12 | 07109-0400 | Oil Drain Plug | 1 | 40 | 07745 | Sleeve | 6 |
| 13 | 07182 | Gasket | 1 | 41 | 07746-0100 | Support Ring | 3 |
| 14 | 07111 | Bearing Cover | 2 | 43 | 13018-3000 | Valve Casing | 1 |
| 15 | 07112 | Crankshaft Seal | 2 | 44 | 07748-0300 | Valve Seat | 6 |
| 16 | 07113 | O-Ring | 2 | 44A | 06620 | O-Ring | 6 |
| 17 | 07114-0100 | Hex Screw | 8 | 45 | 07749-0300 | Valve Plate | 6 |
| 20 | 07116 | Taper Roller Bearing | 2 | 46 | 07750 | Valve Spring | 6 |
| 20A | 07117 | Fitting Disc, 0.1mm | 1-3 | 46A | 07751-0100 | Valve Assy. Complete | 6 |
| 20B | 13001 | Fitting Disc, 0.15mm | 1-3 | 47 | 07752 | Spring Tension Cap | 6 |
| 21 | 07118 | Shaft Protector | 1 | 48 | 06089 | Plug | 6 |
| 22 | 13242 | Crankshaft | 1 | 48A | 06577 | O-Ring | 6 |
| 23 | 13243 | Key | 1 | 49 | 07157 | Stud Bolt | 8 |
| 24 | 13340 | Connecting Rod Assy. | 3 | 49A | 07158 | Nut | 8 |
| 25 | 13341 | Crosshead Plunger Base Assy. | 3 | 49B | 07159 | Washer | 8 |
| 28 | 13232 | Crosshead Pin | 3 | 50 | 07423-0100 | Plug | 1 |
| 29A | 07735 | Centering Sleeve | 3 | 50A | 07755-0100 | Gasket | 1 |
| 29B | 07736 | Plunger Pipe | 3 | 52 | 13020 | Disk for Crankshaft | 1 |
| 29C | 07737-0100 | Plunger Bolt | 3 | 53 | 06607 | Hexagon Screw | 1 |
| 29D | 07161A-0100 | Gasket for Bolt | 3 | 54 | 13321-0300 | Plug 1" BSP | 1 |
| | | | | 55 | 13322-0300 | Plug, 1" BSP | 1 |

LP122A-3100 Repair Kits

Plunger Kit

09575

| Item | Qty. | Part# | Description |
|------|------|------------|---------------|
| 35A | 3 | 06619 | O-Ring |
| 36 | 3 | 13145 | Grooved Ring |
| 39 | 3 | 07744-0100 | Pressure Ring |
| 40 | 6 | 07745 | Sleeve |

Oil Seal Kit

09577

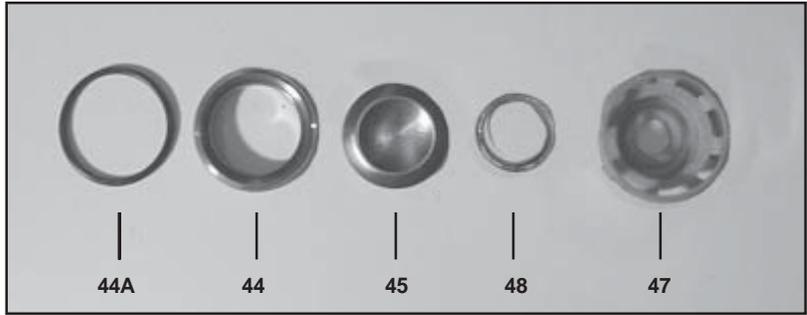
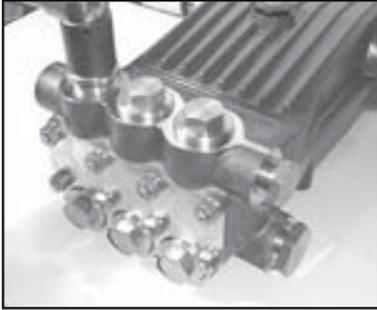
| Item | Qty. | Part# | Description |
|------|------|-------|-------------------|
| 31 | 3 | 07133 | Radial Shaft Seal |

Valve Assembly Kit

#09576

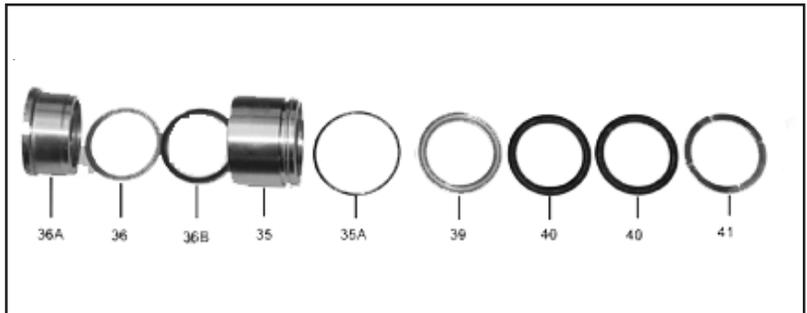
| Item | Qty. | Part # | Description |
|------|------|------------|--------------------|
| 44 | 6 | 07748-0300 | Valve Seat |
| 44A | 6 | 06620 | O-Ring |
| 45 | 6 | 07749-0300 | Valve Plate |
| 46 | 6 | 07750 | Valve Spring |
| 47 | 6 | 07752 | Spring Tension Cap |
| 48A | 6 | 06736 | O-Ring |

LP122A-3100 - Repair Instructions



1. With a 30mm wrench, remove the six (6) plugs (48) from the valve casing (43). Inspect the o-rings (48A) and replace if necessary. Remove the complete valve assembly (46A) by threading a 12mm bolt into the spring retainer and pulling straight out.

2. To disassemble the valve, screw the bolt into the retainer until the valve plate (45) presses the valve seat (44) out of the spring retainer. Examine all parts and replace if necessary. If the seat doesn't come out, use a valve puller to remove.

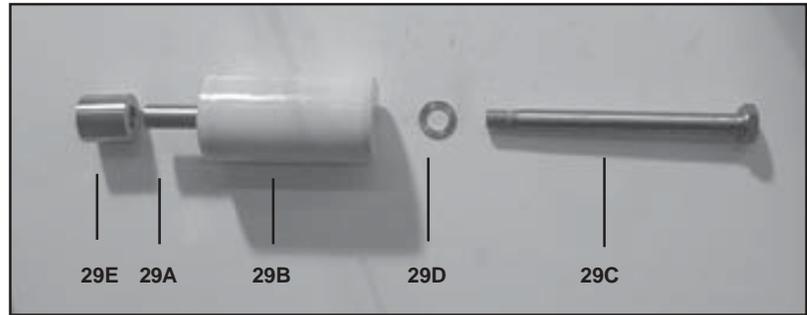


3. Remove the eight (8) hex nuts (49A) with a 19mm wrench. Tap the back of the manifold (43) with a rubber mallet to dislodge and slide off the studs.

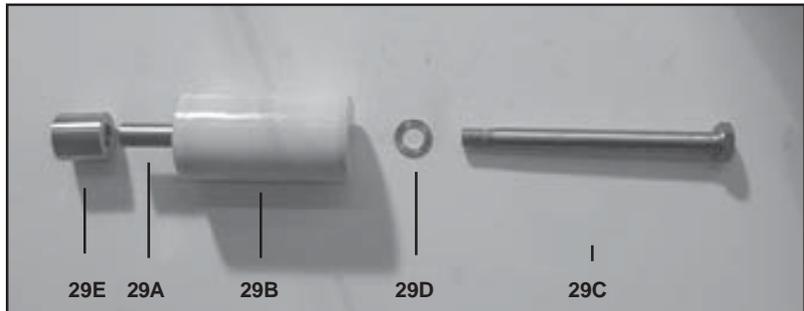
4. Remove the seal sleeve (35) from the manifold and/or crankcase. Remove the pressure rings (39&36A), v-sleeves (40&36), support ring (41) and o-rings (35A) from the manifold and seal sleeve, respectively. Examine seals carefully and replace if worn. Clean all parts.

LP122A-3100 - Repair Instructions

5. If there are signs of oil leaking through the plunger oil seals, then replacement is necessary. Remove the plunger pipe (29B) before inspecting oil seals (31A & 33). Disassemble the gear end and push out the seals from the back of the pump.

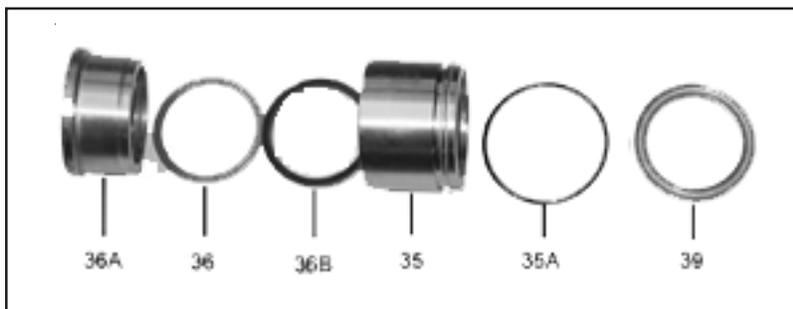


6. Inspect surface of plunger pipe (29B) carefully. Remove any chemical or mineral deposits taking care not to damage the surface of the plunger. If plunger pipe is worn, remove the plunger bolt (29C), plunger pipe (29B) and spacer (29E). Replace worn parts necessary. **Note: *Always use a new copper gasket (29) when repairing the plunger assembly.***



7. Oil seal replacement can be accomplished by pulling the retainer forward out of the crankcase. The o-ring around the outside of the retainer should be replaced and lubricated with a light film of oil.

8. If previously disassembled thoroughly clean all exposed surfaces on the spacer (29E) and all exposed threads on the plunger bolt (29C) and the steel plunger base (25). Threads **MUST** be free of old loc-tite and any other material such as oil, grease, etc. This is necessary to ensure proper curing of new loc-tite. Giant recommends cleaning the threads with acetone or other suitable cleaner. Reassemble plunger assembly parts (29A, 29B, & 29E) using a new copper gasket (29D) and the cleaned plunger bolt (29C). Slide the bolt through the center of the four (4) pieces so that the threaded end is exposed. Apply several drops of loc-tite 243 (or equivalent) adhesive to the threads. Thread into steel plunger base and tighten to 26 ft.-lbs. **BE CERTAIN ALL PARTS ARE CENTERED WITH THE BOLT!**



9. Lubricate weep seal (36). Place, weep seal (36), and pressure ring (36A) into the seal sleeve (35). Assemble the o-ring (35A) onto seal sleeve and lubricate.

10. Place support ring (41) and v-sleeves (40) into valve casing.

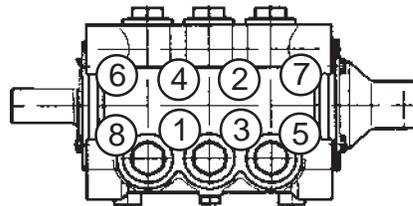
LP122A-3100 - Repair Instructions



11. Press seal sleeve assembly into the manifold and seat firmly. Put the support ring (41) on plunger with v-side facing the manifold.



12. Place entire manifold/seal sleeve assembly over the studs and push firmly until seated against the crankcase.



13. Tighten hex nuts (49A) in a crosswise pattern (shown above) to 60 ft.-lbs.



14. Next, place valve assemblies (46A) into manifold after first lubricating the o-ring (44A). Seat firmly into manifold.



15. Replace plug with o-ring (48, & 48A) and tighten to 160 ft.-lbs.

16. Fill crankcase with approximately 116 fluid ounces of Giant oil or equivalent SAE 90 industrial gear oil and check oil level of the crankcase with the dipstick. Proper level is center of two lines. Reinstall your Giant LP pump into your system.

Contact Giant Industries or your local distributor for maintenance of the gear end of your pump. Phone: 419/531-4600

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

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 pump for restrictions 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 Check for proper operation |
| Water in crankcase | High humidity Worn seals | Reduce oil change interval Replace seals |
| Noisy Operation | Worn bearings oil with Cavitation | Replace bearings, Refill crankcase 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 |
| Pump Pressure as Rated, 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 |

| Preventative Maintenance Check-List & Recommended Spare Parts List | | | | | | |
|---|--------------|---------------|--------------|--------------------------|---------------------------|---------------------------|
| Check | Daily | Weekly | 50hrs | 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 p/n 1154 | | | X | X | | |
| Seal Spare Parts (1 kit/pump) (See page 5 for kit list) | | | | | X | |
| Oil Seal Kit (1 kit/pump) (See page 5 for kit list) | | | | | X | |
| Valve Spare Parts (1 kit/pump) (See page 5 for kit list) | | | | | | X |

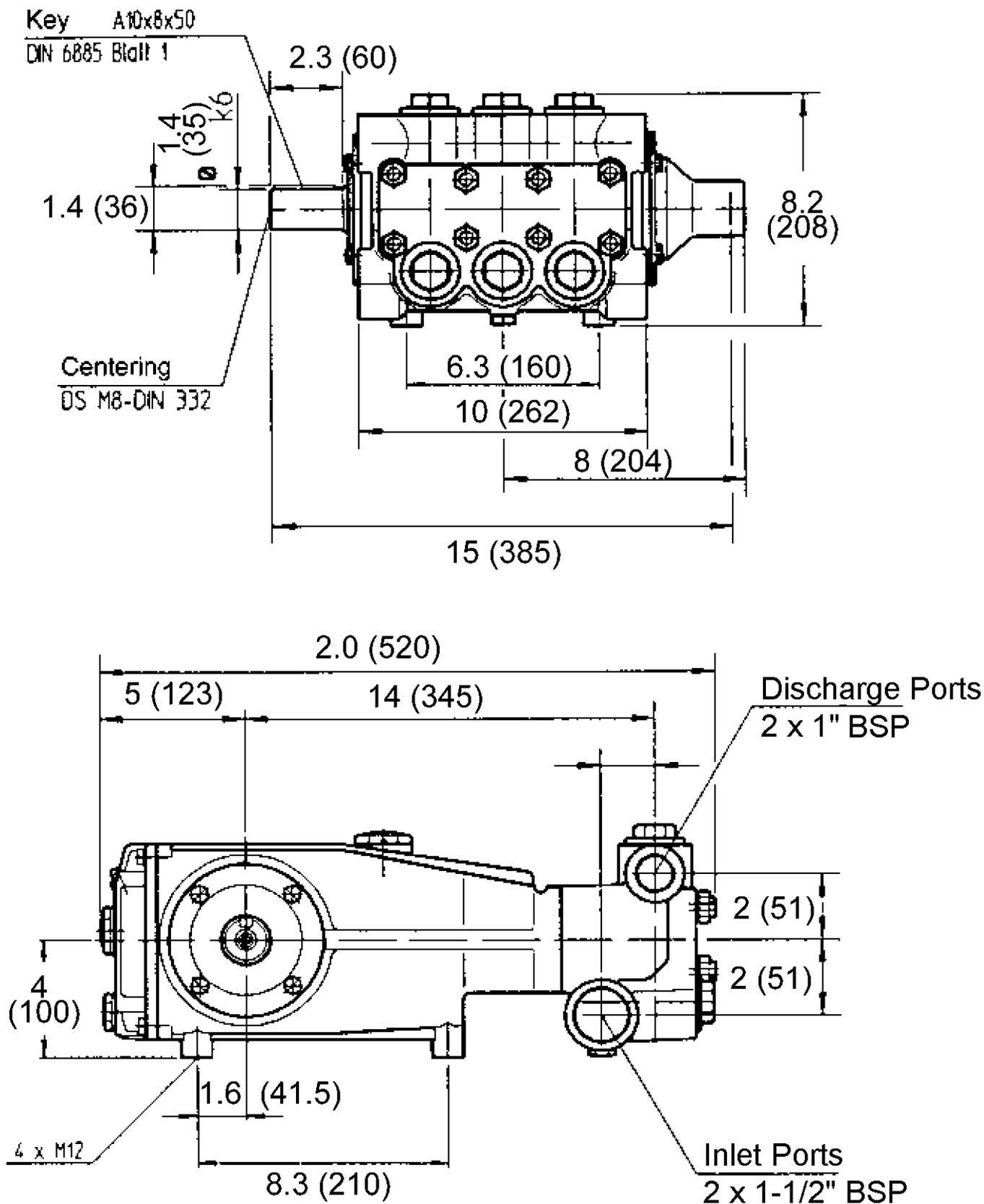
LP122A-3100 TORQUE SPECIFICATIONS

| <u>Position</u> | <u>Item#</u> | <u>Description</u> | <u>Torque Amount</u> |
|------------------------|---------------------|---------------------------|-----------------------------|
| 10 | 08093 | Screw, Cover | 125 in.-lbs. |
| 17 | 08095 | Hex Screw, Bearing Cover | 125 in.-lbs. |
| 24A | 13277 | Hex Screw, Connecting Rod | 250 in.-lbs. |
| 29C | 07131-0100 | Plunger Bolt | 26 ft.-lbs. |
| 48 | 06077-0100 | Plug, Valve | 160 ft.-lbs. |
| 49A | 07158 | Nut, Stud Bolt | 60 ft.-lbs. |

Pump Mounting Selection Guide

| |
|---|
| <p>Bushings 06496 - 35mm H Bushing</p> |
| <p>Pulley & Sheaves 07165 - 12.75" Cast Iron - 4 gr. - AB Section</p> |
| <p>Rails 07357 - Plated Steel Channel Rails (L=11.75"xW1.88"xH=3.00")</p> |

LP122A-3100 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. 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.



GIANT INDUSTRIES, INC., 900 N. Westwood Avenue, P.O. Box 3187, Toledo, OH 43607
PHONE: (419) 531-4600, FAX: (419) 531-6836, www.giantpumps.com
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