

# Series

## GP8155(-1000)

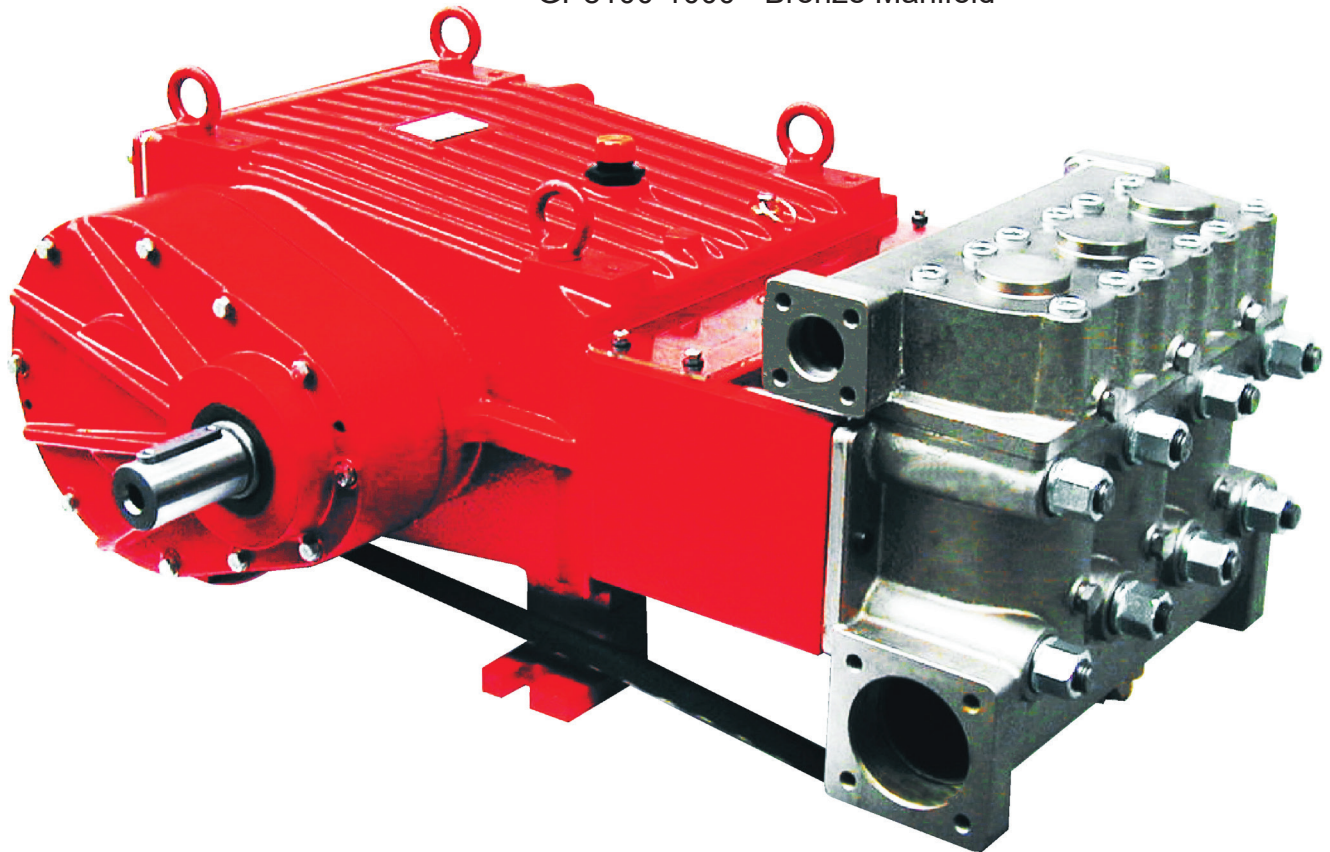
## GP8160(-1000)

## GP8165(-1000)

### GEARBOX SERIES

Triplex Ceramic  
Plunger Pump  
Operating Instructions  
Repair and Service Manual

GP8100 - Spheroidal Nickel-Plated Cast Iron Manifold  
GP8100-1000 - Bronze Manifold



**GIANT**  
Performance Under Pressure

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Updated 10/23

# INSTALLATION INSTRUCTIONS

The stated figures are for maximum pressure and maximum speed (rpm) and apply for interval operation with cold water.

Required NPSH refers to water (specific weight 1kg/dm<sup>3</sup>, viscosity 1°E) at maximum permissible pump revolutions.

Fluid medium: Clean water filtered with 200µm.  
\*higher temperatures possible with separate crankcase cooling system; the manufacturer is to be contacted in this case.

## 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 amount:** 4.2 gallons (16.0 litres). Only use **ISO VG 220 industrial gear oil** (e.g. Aral Degol BG220) or **automobile gear oil SAE 90 GL4**. Initial change after 50 operating hours and then every 1000 operating hours after one year latest.

**IMPORTANT!** When operating in damp places or with high temperature fluctuations. Oil must be changed immediately should condensate (frothy oil) occur in the gear box.

**NPSH values must be observed.**

## Cooling the Gear Oil

**IMPORTANT!** The water input pressure must not exceed 29 PSI (2 bar) when using the integrated system for cooling the gear oil (standard version). If a **separate** cooling circuit (maximum 29 PSI [2 bar]) is installed, it is then possible to have an input pressure of up to maximum 145 PSI (10 bar) on the **suction side** of the pump.

Make sure that suction pulsation is sufficiently dampened – water column resonance must be avoided.

**IMPORTANT!** The pumps can be run without gear oil cooling in continuous operation **up to** a power rating of **93.9 HP (70 kW)** or with major intermittent operation at full performance. If operational power **exceeds 93.9 HP (70 kW)** or if continuous operation is the case, the pump must be run with the integrated oil cooling system. The max. temperature of the water being pumped and which is also fed through the cooling system must not exceed 86 °F (30 °C). The water amount which is fed into the cooling system depends on the pump speed and is approximately 1.9 GPM (7.0 L/min) at 580 pump rpm. The cooling water is sucked in by one of the pumping chambers and pumped away.

**Definition of intermittent operation:** operation at full performance for not more than altogether

20 minutes an hour, with the pump running with-out pressure or turned off in between. For example, this can be full load operation for 5 minutes four times an hour with 10 minute breaks in between or continuous full load operation for 20 minutes followed by a 40 minute break.

**IMPORTANT!** If higher medium temperatures or liquids other than water are involved or aggressive media such as seawater, demineralised water etc., the pump must be fitted with a separate cooling circuit. The separate cooler must have a cooling efficiency of 1700 watt. If there is a danger of frost, an appropriate amount of antifreeze must be mixed into the cooling circuit.

When starting up for work, the pump must run first at zero pressure for approximately 1 minute.

**IMPORTANT!** The GP8100 series has a black arrow on the reduction gear which shows the preferred direction of rotation. The pumps can be delivered either with the gear on the left side or right side which eases the planning of assembling units with regard to rotational direction.

Gear on right side from behind pump = optimal rotation: to the left

Gear on left side from behind pump = optimal rotation: to the right

The preferred/optimal direction of rotation ensures the motion of the connecting rods correctly shovels the oil on to the crosshead guides – which is a particular advantage where continuous operation is involved.

The pump can also be run against the recommended direction of rotation if operated periodically or at reduced pressure. If so, the pump has to be run in in this direction to smoothen the bearing areas. This is done by a one-time operation at zero pressure for at least 30 minutes; thereafter the pressure must be slowly increased over the next hour to the desired maximum operating pressure; the pump is then run in. Check the oil temperature during this process.

**IMPORTANT!** The pump and cooling system must be emptied if there is a danger of frost. Travel wind can cause water in pumps fitted on open vehicles to freeze even if the outside temperature is above freezing point. To empty the cooling circuit, remove the L-joints (K11) on the pump head (50). Blow out the circuit liquid at the joint connection (K11/K7) using compressed air.

The torque tension on the valve casing nuts (49A) is to be checked after approximately 200 operating hours. Please see the section 'Maintenance' concerning the torque values.

The pump must be at zero pressure when checking the torque tension.

**IMPORTANT!** The service life of the seals is maximized if a minimal amount of leakage is present. A few drops of water can drip from each plunger every minute. Leakage has to be examined every day; the plunger seals must be changed should leakage become excessive (=constant dripping).

# OPERATING INSTRUCTIONS

## Safety Rules

**The operating instructions must be read and adhered to before performing any work on the pump or complete assembled unit. No responsibility will be carried by us for damage to materials or persons caused by improper handling of our pumps.**

Access to the pump is not allowed for unauthorized personnel. A safety valve is to be installed in accordance with the guidelines for liquid spraying units so that the admissible operating pressure cannot be exceeded by more than 10%. Pump operation without a safety valve as well as any excess in temperature or speed limits automatically voids the warranty.

When the pump is in operation, the driven shaft side and its coupling must be covered by a protective guard. The plunger area must also be covered by the protective plate (30).

Do not step onto the protective plate (30) nor put weight on it.

Pressure in the discharge line and pump must be at zero before carrying out any maintenance work to the pump or unit. Close off suction line. Disconnect fuses to ensure that the driving motor cannot get switched on accidentally. Make sure that the pump, the cooling system and 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 an air/water-mixture being absorbed and cavitation occurring, the pump-npshr, positive suction head and water temperature must be respected.

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

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

**Before pumping other liquids - especially inflammable, explosive and toxic media - the pump manufacturer must 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.**

# Specifications

## U.S. Measurements

|        | Maximum Flow | Maximum Pressure | Maximum Speed | Power Required | Plunger Diameter | NPSHR        |
|--------|--------------|------------------|---------------|----------------|------------------|--------------|
| Model  | GPM          | PSI              | RPM           | HP             | in               | foot of head |
| GP8155 | 75.3         | 3000             | 580           | 145            | 2.17             | 23           |
| GP8160 | 90           | 2500             | 580           | 147            | 2.36             | 23.6         |
| GP8165 | 105.6/120*   | 2000             | 580/658       | 142/166        | 2.55             | 26.2         |

## Metric Measurements

|        | Max. Flow | Maximum Pressure | Maximum Speed | Power Required | Plunger Diameter | NPSHR |
|--------|-----------|------------------|---------------|----------------|------------------|-------|
| Model  | L/min     | Bar              | RPM           | kW             | mm               | mWs   |
| GP8155 | 285       | 200              | 580           | 108            | 55               | 7.0   |
| GP8160 | 337       | 170              | 580           | 110            | 60               | 7.2   |
| GP8165 | 400/455*  | 140              | 580/658       | 106/123        | 65               | 8.0   |

|   | U.S.          | (Metric)                           |
|---|---------------|------------------------------------|
| Maximum Inlet Pressure .....                    | Up to 29 PSI* | (2.0 bar)*                         |
| Plunger Stroke .....                            | 2.83"         | 72mm                               |
| Maximum Temperature of Pumped Fluids .....      | Up to 86 °F*  | (30 °C)*                           |
| Pinion Shaft Diameter .....                     | 1.77"         | 45 mm                              |
| Key Width .....                                 |               | 14 mm x 9 mm x 70 mm               |
| Crankshaft Mounting .....                       |               | Either side                        |
| Shaft Rotation .....                            |               | See Page 2                         |
| Inlet Ports .....                               |               | (2) 3" BSP                         |
| Discharge Ports .....                           |               | (2) 1-1/4" BSP                     |
| Crankcase Oil Capacity .....                    | 4.2 Gal.      | (16.0 liters)                      |
| Weight .....                                    | 794 lbs.      | (360 kg)                           |
| Fluid End Material (GP8155/GP8160/GP8165) ..... |               | Nickle plated Spheroidal Cast Iron |
| Fluid End Material (-1000 versions) .....       |               | Bronze                             |

\*The specifications above are based on maximum pressure and RPM for intermittent duty using cold water.

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.

| Model .....      | Gear Ratio ..... | Input Speed ..... |
|------------------|------------------|-------------------|
| GP8100-2.6 ..... | 2.6:1 .....      | 1500 RPM          |
| GP8100-3.1 ..... | 3.1:1 .....      | 1800 RPM          |
| GP8100-3.8 ..... | 3.8:1 .....      | 2200 RPM          |
| GP8100-4.5 ..... | 4.5:1 .....      | 2600 RPM          |

**HORSEPOWER RATINGS:** The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend 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:

$$\frac{\text{GPM} \times \text{PSI}}{1450} = \text{HP}$$

## Pump Repair Kits - GP8155/GP8160/GP8165

### **Plunger Packing Kits**

#### **GP8155 - # 09616**

| <b><u>Item</u></b> | <b><u>Part #</u></b> | <b><u>Description</u></b> | <b><u>Qty.</u></b> |
|--------------------|----------------------|---------------------------|--------------------|
| 38A                | 13286                | O-Ring                    | 6                  |
| 38B                | 05281                | Support Ring              | 6                  |
| 39A                | 05066                | O-Ring                    | 3                  |
| 40                 | 07723                | Seal Ring                 | 3                  |
| 42                 | 05277                | Sleeve                    | 9                  |

#### **GP8160 - # 09617**

| <b><u>Item</u></b> | <b><u>Part #</u></b> | <b><u>Description</u></b> | <b><u>Qty.</u></b> |
|--------------------|----------------------|---------------------------|--------------------|
| 38A                | 06667                | O-Ring                    | 6                  |
| 39A                | 05066                | O-Ring                    | 3                  |
| 40                 | 05067                | Seal Ring                 | 3                  |
| 42                 | 05069                | Sleeve                    | 9                  |

#### **GP8165 - # 09586**

| <b><u>Item</u></b> | <b><u>Part #</u></b> | <b><u>Description</u></b> | <b><u>Qty.</u></b> |
|--------------------|----------------------|---------------------------|--------------------|
| 38A                | 06667                | O-Ring                    | 6                  |
| 39A                | 05066                | O-Ring                    | 3                  |
| 40                 | 06996                | Seal Ring                 | 3                  |
| 42                 | 06997                | V-Sleeve                  | 9                  |

### **Valve Assembly Kits**

#### **Inlet Valve Kit - #09587**

| <b><u>Item</u></b> | <b><u>Part #</u></b> | <b><u>Description</u></b> | <b><u>Qty.</u></b> |
|--------------------|----------------------|---------------------------|--------------------|
| 51                 | 04186                | Inlet Valve Assembly      | 3                  |
| 56A                | 06258                | O-Ring                    | 3                  |

#### **Discharge Valve Kit - #09588**

| <b><u>Item</u></b> | <b><u>Part #</u></b> | <b><u>Description</u></b> | <b><u>Qty.</u></b> |
|--------------------|----------------------|---------------------------|--------------------|
| 52                 | 04188                | Discharge Valve Assembly  | 3                  |
| 56A                | 06258                | O-Ring                    | 3                  |

### **Oil Seal Kits**

#### **#09584A (From 06/19)**

| <b><u>Item</u></b> | <b><u>Part #</u></b> | <b><u>Description</u></b> | <b><u>Qty.</u></b> |
|--------------------|----------------------|---------------------------|--------------------|
| 32                 | 05058                | Radial Shaft Seal         | 3                  |
| 32A                | 03118                | Scraper                   | 3                  |
| 33A                | 05056                | O-Ring                    | 3                  |

#### **#09584 (Prior to 06/19)**

| <b><u>Item</u></b> | <b><u>Part #</u></b> | <b><u>Description</u></b> | <b><u>Qty.</u></b> |
|--------------------|----------------------|---------------------------|--------------------|
| 32                 | 05058                | Radial Shaft Seal         | 3                  |
| 33A                | 05056                | O-Ring                    | 3                  |

#### **#09584-R (Retrofit Oil Seal Kit -**

#### **To retrofit pumps made before 06/19)**

| <b><u>Item</u></b> | <b><u>Part #</u></b> | <b><u>Description</u></b> | <b><u>Qty.</u></b> |
|--------------------|----------------------|---------------------------|--------------------|
| 32                 | 05058                | Radial Shaft Seal         | 3                  |
| 32A                | 03118                | Scraper                   | 3                  |
| 33                 | 03119                | Seal Retainer             | 3                  |
| 33A                | 05056                | O-Ring                    | 3                  |



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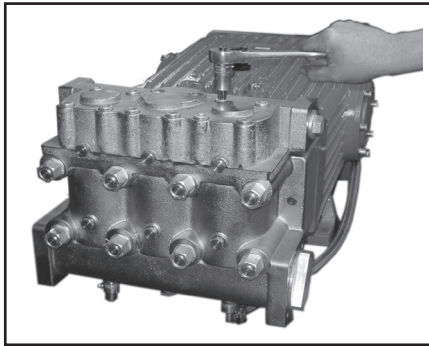


## Parts List - GP8155/GP8160/GP8165

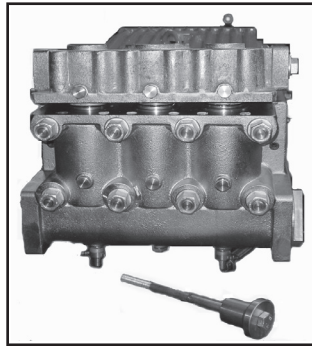
| Item | Part       | Description                     | Qty | Item | Part       | Description                        | Qty    |
|------|------------|---------------------------------|-----|------|------------|------------------------------------|--------|
| 1    | 05651      | Crankcase                       | 1   | 45   | 05279      | Seal Tension Spring, GP8155        | 3      |
| 2    | 06893      | Oil Filler Plug Assy. with Vent | 1   | 45   | 05071      | Seal Tension Spring, GP8160        | 3      |
| 3    | 05652      | Rear Foot for Crankcase         | 2   | 45   | 05119      | Seal Tension Spring, GP8165        | 3      |
| 4    | 05653      | Front Foot for Crankcase        | 2   | 49   | 05072      | Stud Bolt                          | 8      |
| 5    | 05654      | Hexagon Socket Screw            | 4   | 49A  | 05073      | Hexagon Nut                        | 8      |
| 6    | 05655      | Hexagon Socket Screw            | 4   | 50   | 05074      | Valve Casing,                      |        |
| 7    | 05656      | Plug, 3/8" for Oil Dipstick     | 1   |      |            | GP8155/GP8160/GP8165               | 1      |
| 8    | 04185      | Oil Dipstick Assembly           | 1   | 50   | 05074-3000 | Valve Casing, -1000 Versions       | 1      |
| 9    | 01009      | O-Ring                          | 1   | 50A  | 13162      | Centering Stud                     | 2      |
| 10   | 05657      | Plug M33 X 1.5                  | 1   | 50B  | 05075      | Discharge Casing,                  |        |
| 11   | 07102      | O-Ring                          | 1   |      |            | GP8155/GP8160/GP8165               | 1      |
| 12   | 12256      | Plug 3/8" BSP                   | 3   | 50B  | 05075-3000 | Discharge Valve Casing,            |        |
| 13   | 22929      | Copper Washer                   | 4   |      |            | -1000 Versions                     | 1      |
| 14   | 05036      | Bearing Cover Closed            | 1   | 51   | 04186      | Suction Valve Assembly             | 3      |
| 16   | 05037      | O-Ring                          | 1   | 51A  | 04166      | Spring Tension Cap                 | 3      |
| 17   | 05038      | Hexagon Socket Screw M12        | 8   | 51B  | 05078      | Suction Valve Seat                 | 3      |
| 18   | 05039      | Spring Ring                     | 8   | 51C  | 05079      | Valve Plate                        | 3      |
| 19   | 05765      | Flange                          | 1   | 51D  | 07658      | O-Ring                             | 3      |
| 19A  | 05766      | Hexagon Socket Screw            | 6   | 51E  | 05080      | Valve Spring                       | 3      |
| 20   | 05658      | Tapered Roller Bearing          | 1   | 52   | 04188      | Discharge Valve Assembly           | 3      |
| 21   | 05659      | Tapered Roller Bearing          | 1   | 52A  | 04166      | Spring Tension Cap                 | 3      |
| 21A  | 05042      | Fitting Disc                    | 3   | 52B  | 05084      | Discharge Valve Seat               | 3      |
| 21B  | 05043      | Fitting Disc                    | 3   | 52C  | 05079      | Valve Plate                        | 3      |
| 21C  | 05113      | Fitting Disc                    | 3   | 52D  | 06258      | O-Ring                             | 6      |
| 22   | 05741      | Crankshaft For Gear             | 1   | 52E  | 05080      | Valve Spring                       | 3      |
| 23   | 05661      | Fitting Key                     | 1   | 56   | 05085      | Discharge Valve Adaptor            | 3      |
| 24   | 05047      | Conn-rod Assembly               | 3   | 56A  | 06258      | O-Ring                             | 3      |
| 25   | 05048      | Crosshead c/w Plunger           | 3   | 57   | 05086      | Pressure Spring                    | 3      |
| 28   | 05049      | Crosshead Pin                   | 3   | 57A  | 07210-0100 | Pressure Spring                    | 3      |
| 29   | 05051      | Hexagon Screw                   | 6   | 58   | 05087      | Hexagon Socket Screw               | 12     |
| 29A  | 07408      | Hexagon Nut                     | 2   | 59   | 07109      | Plug, 1/2" BSP                     | 2 (3*) |
| 29B  | 05383      | Bracket 2 for Cooling Hose      | 2   | 59A  | 06272      | Copper Seal                        | 2 (3*) |
| 29C  | 05662      | Support Clamp                   | 2   | 60   | 06909      | Plug, 1-1/4" BSP,                  |        |
| 29D  | 05381      | Bracket 1 for Cooling Hose      | 1   |      |            | GP8155/GP8160/GP8165               | 1      |
| 30   | 05052      | Cover Plate                     | 1   | 60   | 13151      | Plug, 1-1/4" BSP, -1000 Versions   | 1      |
| 30A  | 07225-0100 | Hexagon Screw                   | 5   | 61   | 05088      | Plug, 3" BSP                       | 1      |
| 30B  | 13136      | Grommet                         | 5   | 62   | 05302      | Plug, 1/4" BSP                     | 6      |
| 30C  | 08280      | Washer                          | 9   | 62A  | 06934      | Copper Gasket                      | 6      |
| 30D  | 05050      | Splash Cover                    | 1   | 66   | 03193      | Gear Cover                         | 1      |
| 31   | 07623      | Eye Bolt                        | 4   | 67   | 08484      | Hexagon Screw                      | 11     |
| 32   | 05058      | Radial Shaft Seal               | 3   | 67A  | 08041      | Washer                             | 11     |
| 32A  | 03118      | Scraper                         | 3   | 68   | 04445      | Cylinder Pin                       | 2      |
| 33   | 03119      | Seal Retainer                   | 3   | 69   | 04171      | Gear Wheel Set (1500 RPM=2.6)      | 1      |
| 33A  | 05056      | O-Ring                          | 3   | 69   | 04170      | Gear Wheel Set (1800 RPM=3.1)      | 1      |
| 33B  | 05054      | Clip Ring                       | 3   | 69   | 05767      | Gear Wheel Set (2200 RPM=3.8)      | 1      |
| 33C  | 05059      | Fitting Disc                    | 3   | 69   | 05666      | Gear Wheel Set (2600 RPM=4.5)      | 1      |
| 34   | 05060      | Oil Shield                      | 3   | 70   | 07614      | Fitting Key                        | 1      |
| 36A  | 05063      | Plunger Pipe Cover,             |     | 71   | 04571      | Spacer Ring                        | 1      |
|      |            | GP8160/GP8165                   | 3   | 72   | 05667      | Hexagon Screw                      | 1      |
| 36B  | 05280      | Plunger, GP8155                 | 3   | 73   | 05608      | Shaft Seal Ring for Gear           | 1      |
| 36B  | 05061      | Plunger, GP8160                 | 3   | 74   | 05668      | Self-Aligning Roller Bearing       | 1      |
| 36B  | 05115      | Plunger, GP8165                 | 3   | 75   | 05669      | Roller Bearing                     | 1      |
| 36C  | 05062      | Tension Screw                   | 3   | 75A  | 05670      | Fitting Disc                       | 1      |
| 36D  | 07665      | Copper Washer                   | 3   | 76   | 03309      | Gear Seal                          | 1      |
| 36E  | 06900      | Centering Sleeve                | 3   | 78   | 05025      | Oil Cooler (Items K1 - K19)        | 1      |
| 38   | 05283      | Seal Case, GP8155               | 3   | 79   | 07662      | Valve Puller (Not Shown)           | 1      |
| 38   | 05064      | Seal Case, GP8160/GP8165        | 3   | K1   | 05026      | Cooling Vane Plate                 | 1      |
| 38A  | 13286      | O-Ring, GP8155                  | 6   | K2   | 05027      | Seal for Gear Cover                | 2      |
| 38A  | 06667      | O-Ring, GP8160/GP8165           | 6   | K3   | 05028      | Gear Cover                         | 1      |
| 38B  | 05281      | Support Ring, GP8155 Only       | 6   | K4   | 05029      | Hexagon Hd Cntrsnsk Screw          | 4      |
| 39   | 05275      | Seal Sleeve, GP8155             | 3   | K5   | 07381      | Hexagon Socket Screw               | 8      |
| 39   | 05065      | Seal Sleeve, GP8160             | 3   | K6   | 08041      | Washer                             | 8      |
| 39   | 05116      | Seal Sleeve, GP8165             | 3   | K7   | 05030      | Connection for Oil Cooler          | 1      |
| 39A  | 05066      | O-Ring                          | 3   | K8   | 06272      | Copper Seal                        | 6      |
| 40   | 07723      | Seal Ring, GP8155               | 3   | K9   | 07109      | Plug, 1/2" BSP                     | 2      |
| 40   | 05067      | Seal Ring, GP8160               | 3   | K10  | 05031      | Connecting Branch                  | 3      |
| 40   | 06996      | Seal Ring, GP8165               | 3   | K11  | 05032      | U-Joint Connector c/w Nut          | 3      |
| 41   | 05276      | Pressure Ring, GP8155           | 3   | K12  | 05033      | Tube for Cooler                    | 2      |
| 41   | 05068      | Pressure Ring, GP8160           | 3   | K13  | 05402      | Hose Clamp                         | 4      |
| 41   | 05117      | Pressure Ring, GP8165           | 3   | K14  | 05403      | Hose Guard                         | 2      |
| 42   | 05277      | Sleeve, GP8155                  | 9   | K15  | 05404      | Hose Coupling Nut                  | 1      |
| 42   | 05069      | Sleeve, GP8160                  | 9   | K16  | 05405      | Flat Gasket                        | 4      |
| 42   | 06997      | Sleeve, GP8165                  | 9   | K18  | 04158      | Hexagon Socket Screw               | 4      |
| 43   | 05278      | Sleeve Support Ring, GP8155     | 3   | K19  | 05053      | Washer                             | 4      |
| 43   | 05070      | Sleeve Support Ring, GP8160     | 3   |      |            | *3 pieces for GP8155/GP8160/GP8165 |        |
| 43   | 05118      | Sleeve Support Ring, GP8165     | 3   |      |            |                                    |        |

## Pump Repair Instructions - GP8155/GP8160/GP8165

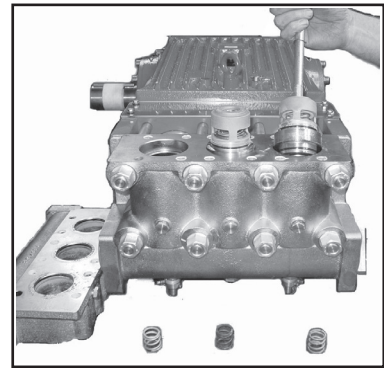
### Valve Inspection and Repair



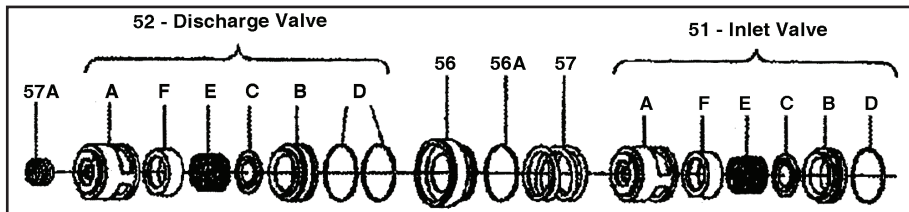
1) Remove socket head cap screws (58)



2) Lift discharge casing (50B) up and away.

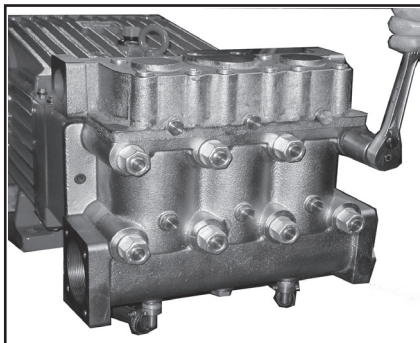


3) Take out pressure springs (57A). Pull out assembled valves (51 & 52) with valve puller.



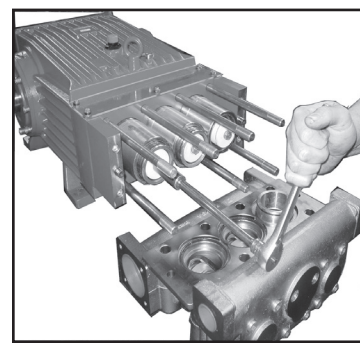
4) Remove valve assembly (52) from discharge valve adapter (56) by gently twisting apart. The spring tension cap (51A, 52A) is screwed together with the valve seat (51B or 52B). Remove spring tension cap. Takeout springs (51E, 52E) and valve plate (51C, 52C). Check sealing surfaces of valve plates (51C & 52C) and valve seats (51B & 52B) and O-rings (51D, 52D). Replace worn parts. Coat threads of valve seat with silicon grease or molycote anti-seize Cu-7439 when reassembling. Before refitting the valves, clean the sealing surfaces in the casing and check for any damage. Coat o-rings (51D, 52D & 56A) with silicone grease to help with re-assembly. Replace valve assembly (51) and pressure spring (57). Assemble valve assembly (52) to discharge valve adapter (56) by tapping together lightly with rubber mallet. While replacing the valve assemblies use a rubber mallet to tap the top of the valve puller lightly. This insures proper seating. Replace pressure spring (57A) and the discharge casing (50B). Tighten caps (58) at 132 Ft-lbs. (180 Nm); check torque tension after 8-10 operating hours.

### To Check Seals and Plunger Pipe



5) Remove hexagon nuts (49A) and valve casing together with seal case (38) from crankcase (1). If necessary, carefully tap the valve casing (50) past the centering stud (50A) using a rubber hammer.

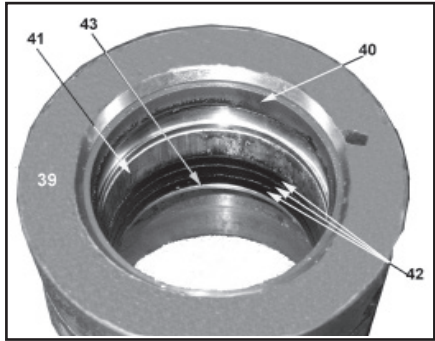
**IMPORTANT!** If necessary, support the valve casing by resting it on wooden blocks or by using a pulley.



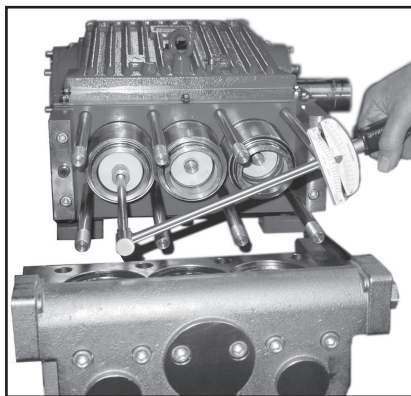
6) Remove tension screw (36C) and take seal sleeve (39) together with all mounted parts out of the drive. Pull plunger pipe (36B) out of the seal assembly and check for any damage. Carefully, remove seal rings (40) and sleeves (42) with a screwdriver.



## Pump Repair Instructions - GP8155/GP8160/GP8165

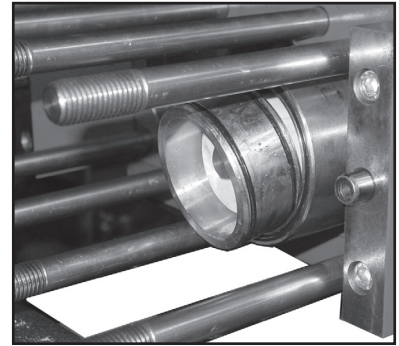


7) **Important!** Be careful not to damage the seal sleeve (39) and pressure ring (41). Check the inner diameter of the pressure ring for wear and if necessary replace together with seals (40) and (42). Clean all parts. New parts should be lightly coated with silicon grease before installation. Insert the seal unit (40, 41, 42 43) into the sleeve. Push the ceramic plunger carefully through the seals from the crankcase side. If necessary, the seals can be held tightly using a suitable pipe support held on the other side of the seal sleeve.



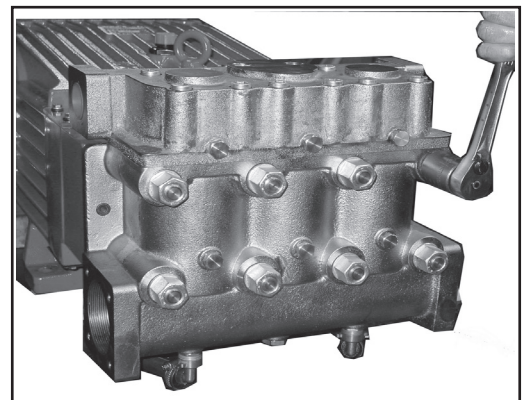
9) Coat the seal sleeve (39) lightly with anti-corrosive grease (e.g. molycode no. Cu-7439) in its fitted area towards the crankcase. Insert the seal sleeves in to their crankcase fittings. Coat the threads of the tension screw (36C) lightly with thread glue and insert it together with a new copper ring (36D) through the ceramic pipe. Turn the pump by hand until the plunger (25) rests against the plunger pipe. Tighten the tension screw at 30 Ft-lbs. (40 NM)

**Important!** Thread glue must never come between the plunger pipe (36B) and centering sleeve (36E). Overtensioning of the plunger pipe by excessive tightening of the tension screw and/or dirt or damage on the mounting surfaces can lead to plunger pipe breakage. Insert the seal tension spring (45) and o-ring (39A) in to the seal sleeve (39).



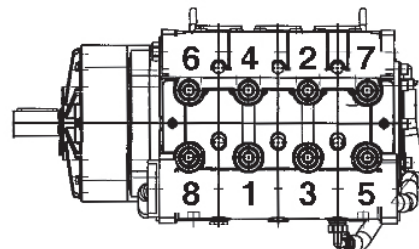
8) Take out the seal case (38) from the valve casing (50) and check o-rings (38A) (if necessary secure two screwdrivers in the front o-ring groove to extract seal casing from valve casing). Coat seals with silicon grease before installing.

**Important!** Mounting surfaces of the crankcase and the valve casing must be clean and free of damage. The components must lie exactly and evenly on one another. The same exactness applies for all centering positions in the crankcase, pressure and valve casing.



### Replacing Valve Casing:

10) Put seal cases (38) in the centering holes of the valve casing, then push valve casing carefully on to centering studs (50A). Tighten hexagon screws (49A) evenly and crosswise at 265 Ft.-lbs. (360 NM). Follow pattern below.



**Important!** The torque tension on the screws (49A) must be checked after 8-10 operating hours; the pump must be at zero pressure. Thereafter, the tension is to be checked every 200 operating hours.

## Pump Repair Instructions - GP8155/GP8160/GP8165

### To Dismantle Gear

Take out plungers and seal sleeves as described above.

Drain oil by taking off plug (12).

After removing the clip ring (33B), remove the seal retainer (33) with a screwdriver. Open hose adaptor (K11).

Remove gear cover (K3) and remove the cooling vane plate (K1) by unscrewing the screws (K4). Remove connecting rod screws (24).

**IMPORTANT!** Connecting rods are marked for identification. Do not twist connecting rod halves or interchange them. When reassembling, the connecting rods must be fitted in their exact original position on the crankshaft journals.

Push connecting rod halves together with the crosshead as far as possible into the crosshead guide.

Remove bearing cover (14), remove shims (21A/B).

### To Dismantle Gearbox

Remove screws (67). Press off gear cover (66) by screwing two screws into both thread bores. Remove screw (72) and take off plate (71). Remove the gearwheel (69) from the shaft with a bearing removal tool.

Using a rubber hammer, tap out the crankshaft towards bearing cover (14).

Check surfaces on the connecting rods (24), crankshaft (22) and crossheads (25). Check the surfaces of the crosshead guides in the crankcase (1) for any unevenness.

Reassemble in reverse order. Thread the crankshaft in from the bearing cover side until the bearing rests cleanly in the outer ring on flange (19).

Press in the outer ring from bearing (20) and using shims (21A/B/C), adjust the bearing to be free of play. To achieve this, add shims, screw on cover (14) and turn the crankshaft until it can no longer be turned by hand.

Then remove a shim and establish whether the crankshaft can now be turned. A crankshaft that can be too easily turned may cause damage to the bearings (20/21) and connecting rods (24) due to the wobble movements in the conical bearing shells.

If bearings (20 & 21) have been replaced, the flange (19) must be taken off and a new bearing outer ring pressed in until the surfaces are even. Then mount the holding flange to push the bearing outer ring in deeper.

Mount connecting rod halves in their exact original position and tighten at 37 ft.-lbs. (50 Nm).

**IMPORTANT!** A little clearance must exist to enable slight sideward movement of the connecting rod on its journal.

Mount cooler plate (K1) and gear cover (K3) with their respective seals (K2). When assembling the cooling circuit line, make sure that the oil cooler connection (K7) is always joined to the upper connection (K3) of the gear cover.

### To Reassemble Gearbox

Heat ball bearings (74 & 75) first before pressing them onto the pinion. Press the cogwheel slightly onto the crankshaft (22) so that the pinion shaft (69) together with the bearing (74) can still be inserted.

Move the pinion shaft against the cogwheel and make them mate perfectly when mounting. Carefully tap the cogwheel and the pinion shaft simultaneously onto the crankshaft and into the bearing seat.

Fit fitting disc (69), and secure screw (72) with Loctite.

Fit the seal (76) onto the cylindrical pins (68).

Push the gear cover (66) carefully onto the bearing (75). Make sure that no damage to the radial shaft seal (73) occurs during the fitting onto the pinion shaft.

**IMPORTANT!** Before putting into operation again, turn the reduction gear shaft by hand at least four full turns to make sure the gear is correctly aligned.

## Troubleshooting

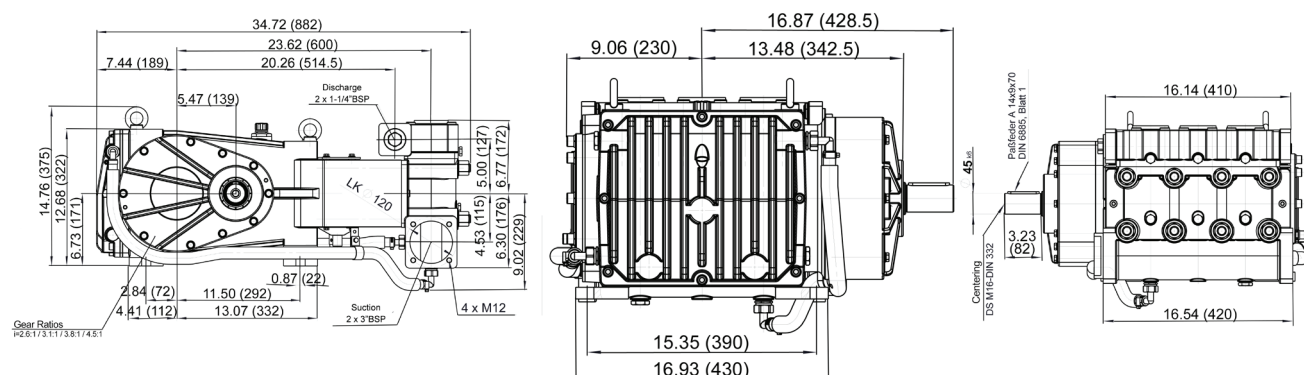
### GP8155/GP8355/GP8160/GP8360/GP8165/GP8365

| TROUBLESHOOTING                      |  |  |
|--------------------------------------|--|--|
| Problem                              | Cause  | Solution   |
| Pressure Drops, water leaks          | V-sleeves leak   | Replace V-sleeves, check surface of plunger  |
| Pressure drops, pump gets loud       | Discharge or suction valve leaks<br>Steam formation (Cavitation) | Replace valve(s)<br>Reduce suction height, reduce flow resistance in inlet line, clean inlet filter, lower water temperature.  |
| Irregular pressure                   | Worn Valves  | Examine valves   |
|                                      | O-ring on valves or inlet valve adapter leaks                    | Examine O-rings, check valve casing for unevenness on the sealing surfaces   |
| Oil leaks at visible part of plunger | Gear sealing is leaking  | Examine seals and running surface of plunger   |
| Dirty, milk-colored or frothy oil    | Water has mixed with oil   | Replace oil immediately, find & fix the cause  |
| Oil leakage on the crankshaft        | Shaft seal ring leaks  | Check seal and shaft   |
| Noise increases without the loss     | Worn bearing   | Dismantle gear, examine all parts, replace worn parts, check oil level. If service life was too short, check for excess strain or whether lubrication intervals were too long. Only specified lubricants are to be used. |

## Torque Specifications - GP8155/GP8160/GP8165

| TOOL LIST AND TORQUE SPECIFICATIONS |               |                                      |                    |  |
|-------------------------------------|---------------|--------------------------------------|--------------------|--|
| Item                                | Part #        | Description                          | Torque Ft-Lbs (NM) | Tool Needed                              |
| 17                                  | 05038         | Hexagon Socket Screw                 | 64 (87)            | 10mm Allen Wrench                        |
| 24                                  | 05047         | Connecting Rod Hex. Hd. Socket Screw | 37 (50)            | 8mm Allen Wrench                         |
| 33B                                 | 05054         | Clip Ring                            | N/A                | Industrial Snap Ring Pliers              |
| 36C                                 | 05062         | Tension Screw                        | 30 (40)            | 16mm Socket                              |
| 49A                                 | 05073         | Hexagon Nut (Manifold)               | 265 (360)          | 30mm Socket                              |
| 51 & 52                             | 04188 & 04186 | Valve Assemblies                     | N/A                | Valve Puller (p/n 07662) included w/pump |
| 58                                  | 05087         | Hexagon Socket Screw                 | 132 (180)          | 12mm Allen Wrench                        |
| K5                                  | 07381         | Hexagon Socket Screw                 | N/A                | 8mm Allen Wrench                         |

## GP8155/GP8160/GP8165 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.

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

**GIANT**  
Performance Under Pressure

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