

Series

GP8155AGB-180

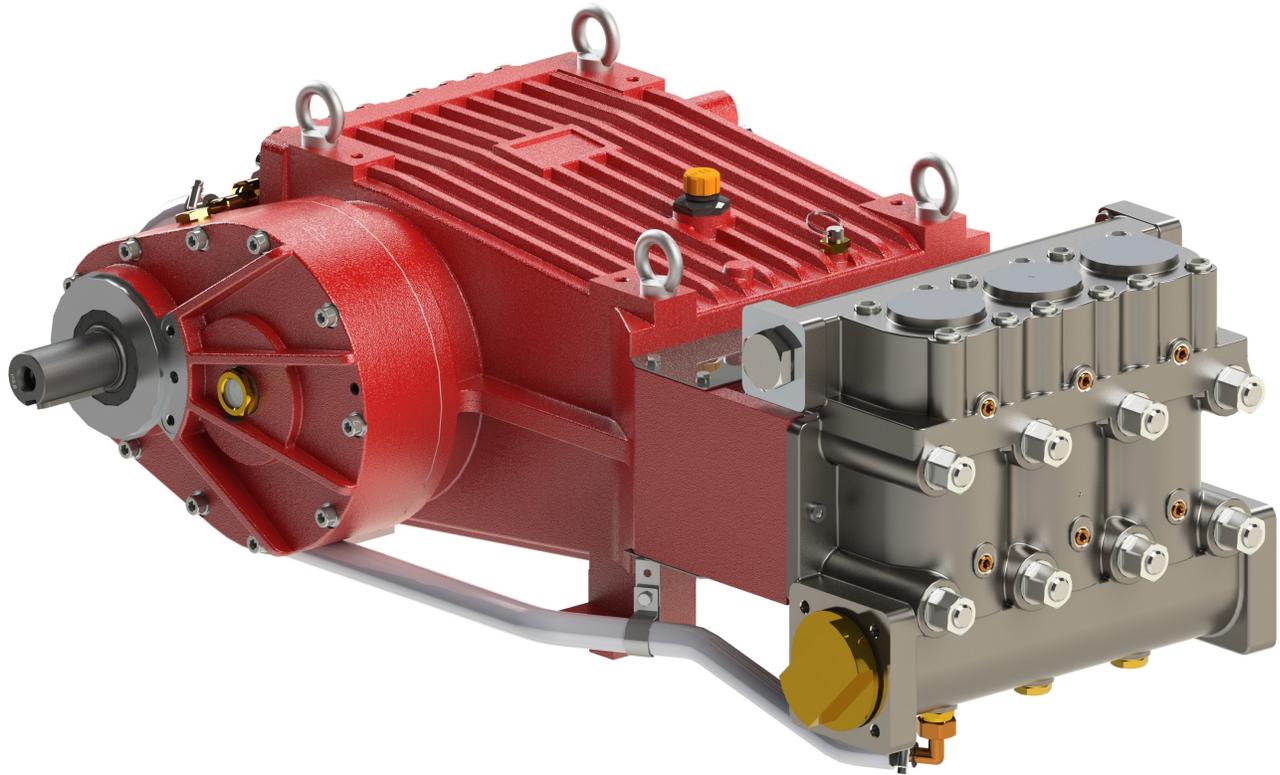
GP8160AGB-180

GP8165AGB-180

REVERSE GEARBOX SERIES

Triplex Ceramic
Plunger Pump
Operating Instructions
Repair and Service Manual

Optimal Rotation: Reverse



GIANT
Performance Under Pressure

Update 02/26

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Specifications

| | Max. Flow* | Max. Flow* | Pressure* | Pressure* | Max. Speed | Max. Inlet Pressure | Max. Inlet Pressure | Plunger Diameter | Plunger Diameter | Power Req'd | Power Req'd |
|-------------|------------|------------|-----------|-----------|------------|---------------------|---------------------|------------------|------------------|-------------|-------------|
| Model | GPM | l/min | PSI | bar | RPM | PSI | bar | in | mm | BHP | kW |
| GP8155A-180 | 75.3 | 285 | 3000 | 200 | 580 | 29 | 2.0 | 2.17 | 55 | 150 | 112 |
| GP8160A-180 | 90.0 | 340 | 2500 | 170 | 580 | 29 | 2.0 | 2.36 | 60 | 155 | 116 |
| GP8165A-180 | 105.7 | 400 | 2000 | 140 | 580 | 29 | 2.0 | 2.55 | 65 | 153 | 114 |

| | <u>U.S.</u> | <u>Metric</u> |
|------------------------------------|-------------|------------------------------------|
| Stroke | 2.83" | 72 mm |
| Crankshaft Diameter..... | 2.76" | 70 mm |
| Key Width | 0.55" | 14 mm |
| Crankshaft Mounting | | Either Side |
| Shaft Rotation | | See Page 2 |
| Temperature of Pumped Fluids | Up to 86 °F | 30 °C |
| Inlet Port | | (2) 3" BSP |
| Discharge Port | | (2) 1-1/4" BSP |
| Weight (approximate) | 775 lbs. | 352 kg |
| Crankcase Oil Capacity | 4.8 Gal. | 18.0 L |
| Fluid End Material..... | | Nickel Plated Spheroidal Cast Iron |

***Note:** The specifications above are based on maximum pressure and maximum RPM for intermittent duty using cold water. Fluid medium: Clean water filled with 200µm. Higher temperatures possible with separate crankcase cooling system; the manufacturer is to be contacted in this case.

| Model | Gear Ratio | Input Speed |
|-----------------|------------|-------------|
| GP8100-1.28-180 | 1.28:1 | 740 RPM |
| GP8100-2.6-180 | 2.6:1 | 1500 RPM |
| GP8155-3.1-180 | 3.1:1 | 1800 RPM |
| GP8100-3.8-180 | 3.8:1 | 2200 RPM |
| GP8100-4.5-180 | 4.5:1 | 2600 RPM |

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.

SPECIAL NOTE:
 The theoretical gallons per revolution (gal/rev) is 0.155.
 To find specific outputs at various RPM, use the formula:

$$\text{GPM} = 0.155 \times \text{RPM}$$

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:

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

INSTALLATION INSTRUCTIONS

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

Oil: Use only 4.8 gallons (18 liters) of ISO VG 220 GL4 (e.g. Aral Dego BG220) or SAE 90 GL4 gear oil (Giant's p/n 01154). Initial change after 50 operating hours and then every 1000 operating, or after one year if used less.

IMPORTANT! Caution 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.

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 or 2 bar) is installed, it is then possible to have an input pressure of maximum 145 PSI (10 bar) on the **suction side**. Make sure that suction pulsation is sufficiently dampened - water column resonance must be avoided.

Before beginning work for the first time, the pump must run at zero pressure for approximately one minute.

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

Gear on right side (from front of pump) = optimal rotation : counterclockwise

Gear on left side (from front of pump) = optimal rotation: clockwise

The preferred/optimal direction of rotation ensures the motion of the connecting rods correctly distributes the oil onto 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 a reduced pressure. If so, the pump has to be run 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 after which the pump is then run in. The oil temperature is to be checked during this procedure.

IMPORTANT! If operational power exceeds 80 HP (60 kW) or if continuous operation is the case, the pump must be run with the integrated oil cooling system. The maximum 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 1.8 GPM (7.0 l/min) at 580 pump rpm. The cooling water is sucked in by one of the pumping chambers and pumped away. The pumps can be run without gear oil cooling in continuous operation up to a power rating of 107 HP (80 kW) or with major intermittent operation at full performance. If this is your case, please request an extra spare parts list.

Definition of intermittent operation: operation at full performance for not more than altogether 20 minutes an hour, with the pump running without 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! 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.

The torque tension on the valve casing nuts (49A) is to be checked after approximately 200 operating hours. Please see page 6 for values. When checking the torque tension, the pump must be at zero pressure.

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).



Safety Rules

The operating instructions must be read and adhered to before performing any work on the pump or complete assembled unit. Not 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.

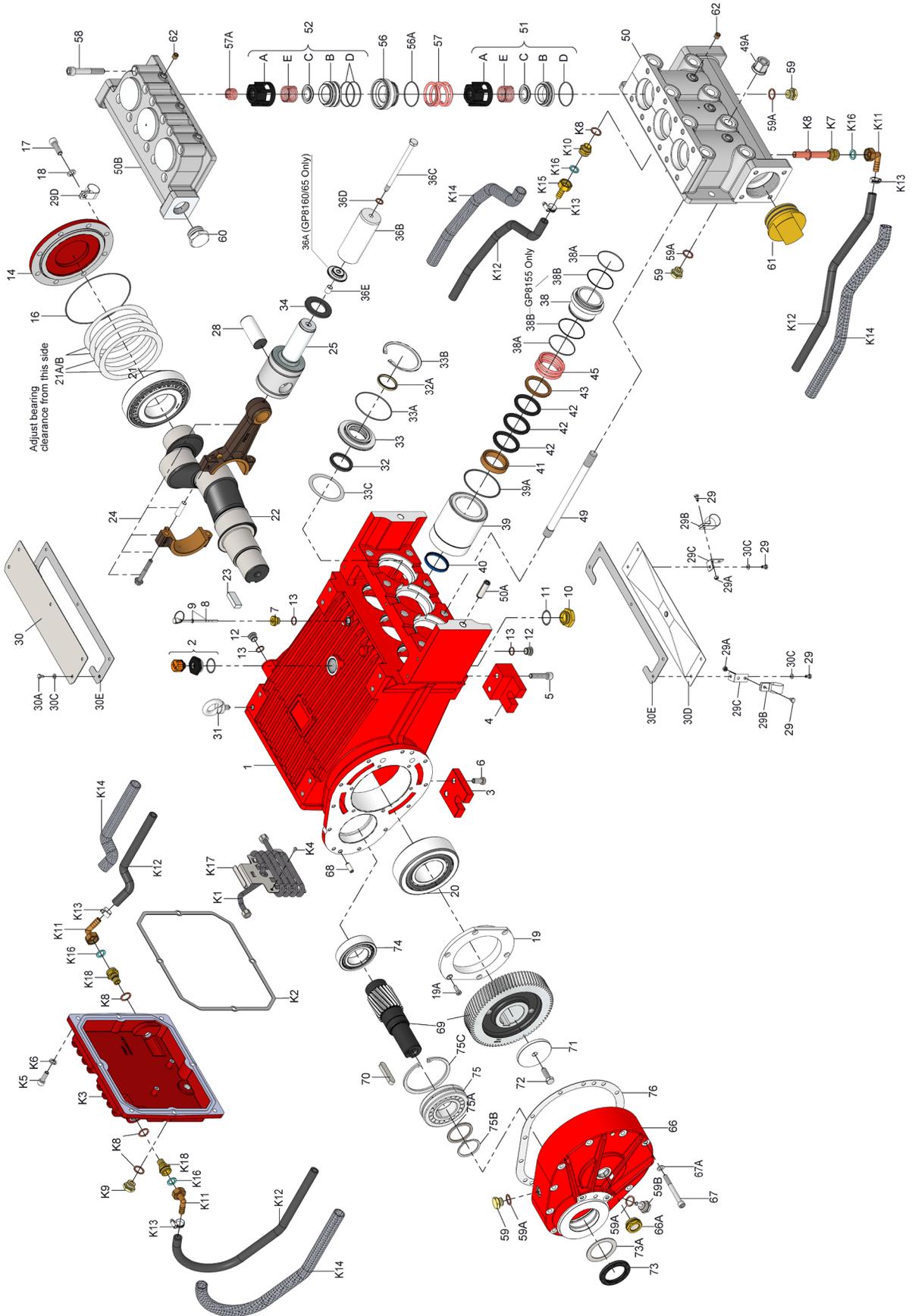
Close off the suction line. Disconnect fuses to ensure that the driving motor cannot get switched on accidentally. Make sure that the pump, the cooling system and all parts on the pressure side of the unit are vented and refilled with pressure at zero, before starting the pump. In order to prevent air on an air/water mixture being absorbed and cavitation occurring, the pump npshr, (net positive suction head required) 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.

EXPLODED VIEW - GP8155A-180, GP8160A-180, GP8165A-180



Parts List - GP8155A-180, GP8160A-180 & GP8165A-180

| Item | Part | Description | Qty | Item | Part | Description | Qty |
|------|-----------|------------------------------------|-----|--------|------------|--|-----|
| 1 | 05651-180 | Crankcase for Reverse Gear | 1 | 45 | 05119 | Seal Tension Spring, GP8165 | 3 |
| 2 | 06893 | Oil Filler Plug Assembly with Vent | 1 | 49 | 05072 | Stud Bolt | 8 |
| 3 | 05652 | Rear Foot for Crankcase | 2 | 49A | 05073 | Hexagon Nut | 8 |
| 4 | 05653 | Front Foot for Crankcase | 2 | 50 | 05074 | Valve Casing | 1 |
| 5 | 05654 | Hexagon Socket Screw | 4 | 50A | 13162 | Centering Stud | 2 |
| 6 | 05655 | Hexagon Socket Screw | 4 | 50B | 05075 | Discharge Casing | 1 |
| 7 | 05381 | Plug, 3/8" for Oil Dipstick | 1 | 51 | 04186 | Suction Valve Assembly | 3 |
| 8 | 04185 | Oil Dipstick Assembly | 1 | 51A | 04166 | Spring Tension Cap | 3 |
| 9 | 01009 | O-Ring | 1 | 51B | 05078 | Suction Valve Seat | 3 |
| 10 | 05657 | Plug, M33 X 1.5 | 1 | 51C | 05079 | Valve Plate | 3 |
| 11 | 07102 | O-Ring | 1 | 51D | 07658 | O-Ring | 3 |
| 12 | 12256 | Plug, 3/8" BSP | 3 | 51E | 05080 | Valve Spring | 3 |
| 13 | 22929 | Copper Washer | 4 | 52 | 04188 | Discharge Valve Assembly | 3 |
| 14 | 05036 | Bearing Cover Closed | 1 | 52A | 04166 | Spring Tension Cap | 3 |
| 16 | 05037 | O-Ring | 1 | 52B | 05084 | Discharge Valve Seat | 3 |
| 17 | 05038 | Hexagon Socket Screw, M12 | 8 | 52C | 05079 | Valve Plate | 3 |
| 18 | 05039 | Spring Ring | 8 | 52D | 06258 | O-Ring | 6 |
| 19 | 05765 | Flange | 1 | 52E | 05080 | Valve Spring | 3 |
| 19A | 05766 | Hexagon Socket Screw | 6 | 56 | 05085 | Discharge Valve Adaptor | 3 |
| 20 | 05659 | Tapered Roller Bearing | 1 | 56A | 06258 | O-Ring | 3 |
| 21 | 05658 | Tapered Roller Bearing | 1 | 57 | 05086 | Pressure Spring | 3 |
| 21A | 05042 | Shim, 0.1 mm | 1-3 | 57A | 07210-0100 | Pressure Spring | 3 |
| 21B | 05043 | Shim, 0.5 mm | 1-3 | 58 | 05087 | Hexagon Socket Screw | 12 |
| 22 | 05741 | Crankshaft For Turned Gear | 1 | 59 | 07109 | Plug, 1/2" BSP | 4 |
| 23 | 05661 | Fitting Key | 1 | 59A | 06272 | Copper Seal | 5 |
| 24 | 05047 | Connecting Rod Assembly | 3 | 59B | 03696 | Magnetic Plug, 1/2" BSP | 1 |
| 25 | 05048 | Crosshead c/w Plunger | 3 | 60 | 06909 | Plug, 1-1/4" BSP | 1 |
| 28 | 05049 | Crosshead Pin | 3 | 61 | 05088 | Plug, 3" BSP | 1 |
| 29 | 05051 | Hexagon Screw | 6 | 62 | 05302 | Plug, 1/4" BSP | 6 |
| 29A | 07408 | Hexagon Nut | 2 | 62A | 06934 | Copper Gasket | 6 |
| 29B | 05383 | Bracket 2 for Cooling Hose | 2 | 66 | 03697 | Gear Cover | 1 |
| 29C | 05662 | Support Clamp | 2 | 66A | 05943 | Oil Sight Glass Assembly | 1 |
| 29D | 05381 | Bracket 1 for Cooling Hose | 1 | 67 | 08484 | Hexagon Screw | 11 |
| 30 | 03802 | Cover Plate | 1 | 67A | 08041 | Washer | 11 |
| 30A | 05051 | Hexagon Screw | 5 | 68 | 03304 | Cylinder Pin | 2 |
| 30C | 08280 | Washer | 9 | 69 | 04171A | Gear Wheel Set (1500 RPM=2.6) | 1 |
| 30D | 05050 | Splash Cover | 1 | 69 | 04170A | Gear Wheel Set (1800 RPM=3.1) | 1 |
| 30E | 03803 | Cover Seal | 2 | 69 | 05767A | Gear Wheel Set (2200 RPM=3.8) | 1 |
| 31 | 07623 | Eye Bolt | 4 | 69 | 05666A | Gear Wheel Set (2600 RPM=4.5) | 1 |
| 32 | 05058 | Radial Shaft Seal | 3 | 70 | 07614 | Fitting Key | 1 |
| 32A | 03118 | Oil Scraper | 3 | 71 | 04571 | Shim | 1 |
| 33 | 03119 | Seal Retainer | 3 | 72 | 05667 | Hexagon Screw | 1 |
| 33A | 05056 | O-Ring | 3 | 73 | 05428 | Shaft Seal Ring for Gear | 1 |
| 33B | 05054 | Clip Ring | 3 | 73A | 03698 | Washer | 1 |
| 33C | 05059 | Fitting Disc | 3 | 74 | 05669 | Self-Aligning Roller Bearing | 1 |
| 34 | 05060 | Oil Shield | 3 | 75 | 03699 | Roller Bearing | 1 |
| 36A | 05063 | Plunger Pipe Cover GP8160/65 | 3 | 75A | 03670 | Fitting Disc | 1 |
| 36B | 05280 | Plunger, GP8155 | 3 | 75B | 03700 | Clip Ring | 1 |
| 36B | 05061 | Plunger, GP8160 | 3 | 75C | 03701 | Clip Ring | 1 |
| 36B | 05115 | Plunger, GP8165 | 3 | 76 | 03309 | Gear Seal | 1 |
| 36C | 05062 | Tension Screw | 3 | 79 | 07662 | Valve Puller (Not Shown) | 1 |
| 36D | 07665 | Copper Washer | 3 | 78 | 03790 | Oil Cooler Assembly (K1 - K18) | 1 |
| 36E | 06900 | Centering Sleeve | 3 | K1 | 03705 | Stainless Steel Tubing | 1 |
| 38 | 05283 | Seal Case, GP8155 | 3 | K2 | 03791 | Seal for Gear Cover | 1 |
| 38 | 05064 | Seal Case, GP8160, GP8165 | 3 | K3 | 03792 | Gear Cover | 1 |
| 38A | 13286 | O-Ring, GP8155 | 6 | K4 | 03710 | Clamping Screw | 2 |
| 38A | 06667 | O-Ring, GP8160, GP8165 | 6 | K5 | 22706 | Hexagon Socket Screw | 8 |
| 38B | 05281 | Support Ring, GP8155 Only | 6 | K6 | 06725 | Spring Washer | 8 |
| 39 | 05275 | Seal Sleeve, GP8155 | 3 | K7 | 05030 | Connection for Oil Cooler | 1 |
| 39 | 05065 | Seal Sleeve, GP8160 | 3 | K8 | 06272 | Copper Seal | 5 |
| 39 | 05116 | Seal Sleeve, GP8165 | 3 | K9 | 07109 | Plug, 1/2" BSP | 1 |
| 39A | 05066 | O-Ring | 3 | K10 | 05031 | Connecting Branch | 1 |
| 40 | 07723 | Seal Ring, GP8155 | 3 | K11 | 05032 | U-Joint Connector c/w Nut | 3 |
| 40 | 05067 | Seal Ring, GP8160 | 3 | K12 | 05033 | Hose for Cooler | 2 m |
| 40 | 06996 | Seal Ring, GP8165 | 3 | K13 | 05402 | Hose Clamp | 4 |
| 41 | 05276 | Pressure Ring, GP8155 | 3 | K14 | 05403 | Hose Guard | 2 m |
| 41 | 05068 | Pressure Ring, GP8160 | 3 | K15 | 05404 | Hose Coupling Nut | 1 |
| 41 | 05117 | Pressure Ring, GP8165 | 3 | K16 | 05405 | Flat Gasket | 4 |
| 42 | 05277 | Sleeve, GP8155 | 9 | K17 | 03706 | Hose Plate for Cooler | 1 |
| 42 | 05069 | Sleeve, GP8160 | 9 | K18 | 03707 | Reduction Nipple | 2 |
| 42 | 06997 | Sleeve, GP8165 | 9 | 05760B | | Gearend Assembly (2200 RPM) (1-34, 66-81) | |
| 43 | 05278 | Sleeve Support Ring, GP8155 | 3 | 05606 | | Manifold Assembly (50-62A w/o 52A) | |
| 43 | 05070 | Sleeve Support Ring, GP8160 | 3 | 05208 | | Plunger Replacement Kit, GP8155 (34A-45) | |
| 43 | 05118 | Sleeve Support Ring, GP8165 | 3 | 05207 | | Plunger Replacement Kit, GP8160 (34A-45) | |
| 45 | 05279 | Seal Tension Spring, GP8155 | 3 | 05209 | | Plunger Replacement Kit, GP8165 (34A-45) | |
| 45 | 05071 | Seal Tension Spring, GP8160 | 3 | | | | |

| Torque Specifications GP8155A-180, GP8160A-180, GP8165A-180 | | | |
|--|--------------------------------------|--------------------------------|------------------------------|
| Item | Description | Tool Needed/Lubrication | Torque - Ft.-lbs (Nm) |
| 1 | Crankcase | Molycote Cu-Paste | |
| 17 | Hexagon Socket Screw | 10mm Allen Wrench | 64 (87) |
| 24 | Connecting Rod Hex. Hd. Socket Screw | 8mm Allen Wrench | 37 (50) |
| 32 | Radial Shaft Seal | Loctite 403 | |
| 33B | Clip Ring | Industrial Snap Ring Pliers | |
| 36C | Tension Screw | 19mm Socket/Loctite 243 | 30 (40) |
| 49 | Stud Bolt | Loctite 243 | |
| 49A | Hexagon Nut (Manifold) | 30mm Socket | 265 (360) |
| 51 | Suction Valve Assembly | Valve Puller (p/n 07662) | |
| 51B | Suction Valve Seat | Molycote Cu-Paste | |
| 52 | Discharge Valve Assembly | Valve Puller (p/n 07662) | |
| 52B | Discharge Valve Seat | Molycote Cu-Paste | |
| 58 | Hexagon Socket Screw | 12mm Allen Wrench/Loctite 243 | 132 (180) |
| 67 | Hexagon Screw | | 18.4 (25) |
| 72 | Hexagon Screw | | 30 (40) |
| K4 | Hexagon Hd Cntrsnc Screw | | 11 (15) |
| K5 | Hexagon Socket Screw | 8mm Allen Wrench | 33 (45) |
| K9 | Plug, 1/2" SP | | 59 (80) |

Pump Repair Kits - GP8155A-180, GP8160A-180, GP8165A-180

Plunger Packing Kits

GP8155 - # 09616

| Item | Part # | Description | Qty. |
|-------------|---------------|--------------------|-------------|
| 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

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

GP8165 - # 09586

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

Valve Kits

Inlet Valve Kit - #09587

| Item | Part # | Description | Qty. |
|-------------|---------------|----------------------|-------------|
| 51 | 04186 | Inlet Valve Assembly | 3 |
| 56A | 06258 | O-Ring | 3 |

Discharge Valve Kit - #09588

| Item | Part # | Description | Qty. |
|-------------|---------------|--------------------------|-------------|
| 52 | 04188 | Discharge Valve Assembly | 3 |
| 56A | 06258 | O-Ring | 3 |

Oil Seal Kit

#09584A

| Item | Part # | Description | Qty. |
|-------------|---------------|--------------------|-------------|
| 32 | 05058 | Radial Shaft Seal | 3 |
| 32A | 03118 | Oil Scraper | 3 |
| 33 | 03119 | Seal Retainer | 3 |
| 33A | 05056 | O-Ring | 3 |

MAINTENANCE INSTRUCTIONS

To Check Valves

Remove hexagon socket screws (58), lift discharge casing (50B) up and away. Take out pressure springs (57A). Pull out assembled valves (51 and 52) with fitting tool (07662).

Dismantling valves: the spring tension cap (51A, 52A) is screwed together with the valve seat (51B/52B). Remove spring tension cap, take out springs (51E/52E) and valve plate (51C/52C). Check sealing surfaces and O-rings (51D/52D).

Replace worn parts.

Coat threads of the 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.

Tighten screws (58) at 132 ft.-lbs. (180 Nm); check torque tension after 8-10 operating hours.

To Check Seals and Plunger Pipe

Remove hexagon nuts (49A). Remove the pump head (50/50B) together with seal case (38) from crankcase (1). If necessary, carefully tap the valve casing past the centring stud (50A) using a rubber hammer.

IMPORTANT! If necessary, support the pump head (50/50B) by resting it on wooden blocks or by using a pulley.

Remove tension screw (36C) and take seal sleeve (39) together with all mounted parts out of the drive.

Pull the plunger pipe (36B) out of the seal assembly (40-43) and check for any damage. Pry seal rings (40) and sleeves (42) out of the seal sleeve (39) with a screwdriver.

IMPORTANT! Be careful not to damage 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 fitting.

Insert the seal unit (40-43) into the sleeve. Push the ceramic plunger (36B) 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.

Take the seal case (38) out of the valve casing (50) and check O-rings (38A). If necessary secure two screwdrivers in the front O-ring groove to remove the seal casing from the valve casing. Coat seals with silicon grease before fitting.

IMPORTANT! Mounting surfaces of the crankcase (1) and valve casings (50-50B) must be clean and free of damage. The components must lie exactly and evenly on one another. The same exactness applies for all centring positions in the crankcase and valve casings.

Coat the seal sleeve lightly with anti-corrosive grease (e.g. molycote no. Cu-7439) in its fitted area towards the crankcase. Insert seal sleeves (39) into 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 (36B). Turn the pump by hand until the plunger (25) rests against the plunger pipe. Tighten tension screw at 30 ft.-lbs. (40 Nm).

IMPORTANT! Thread glue must never come between the plunger pipe (36B) and centring 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 the plunger pipe to fracture. Insert the seal tension spring (45) and O-ring (39A) into the seal sleeve (39).

Mounting the Valve Casing:

Put seal cases (38) in the centring holes of the valve casing (50), then carefully push the valve casing onto the centring studs (50A).

Tighten hexagon screws (49A) evenly and crosswise at 265 ft.-lbs. (360 Nm).

IMPORTANT! With no pressure in the pump, the torque tension on the screws (49A) must be checked after 8-10 operating hours. Thereafter the tension is to be checked every 200 operating hours.

To Dismantle the Reduction Gear

Remove screws (67). Press off gear cover (66) by screwing two screws into both thread bores. Remove screw (72) and take off plate (69). Remove the cogwheel from the shaft with a removal tool. Using a rubber hammer, tap out the crankshaft towards bearing cover (14).

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

Reassemble in reverse order. Thread the crankshaft (22) 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), 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 later to the bearings and connecting rods due to wobble movements in the conical bearing shells.

If bearings (20 and 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 Mount Reduction Gear

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

Move the pinion (69) against the cogwheel and make them mate perfectly when mounting. Then, carefully tap the cogwheel and the pinion simultaneously onto the crankshaft and into the bearing seat.

Fit fitting disc (75A), and secure screw (72) with Loctite.

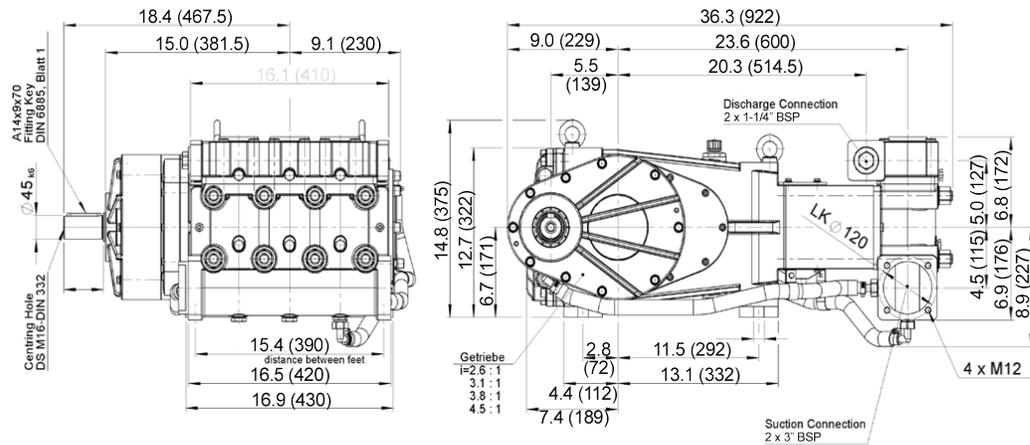
Fit the seal (76) onto the cylindrical pins (68).

Push the gear cover (66) carefully onto the bearing (75).

Make sure that the radial shaft seal (73) is not get damaged (during fitting onto the pinion).

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

GP8155A-180, GP8160A-180 and GP8165A-180 Dimensions - in (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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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

GIANT
Performance Under Pressure

GIANT INDUSTRIES, INC., 900 N. Westwood Ave., Toledo, Ohio 43607
PHONE (419) 531-4600, FAX (419) 531-6836, www.giantpumps.com
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