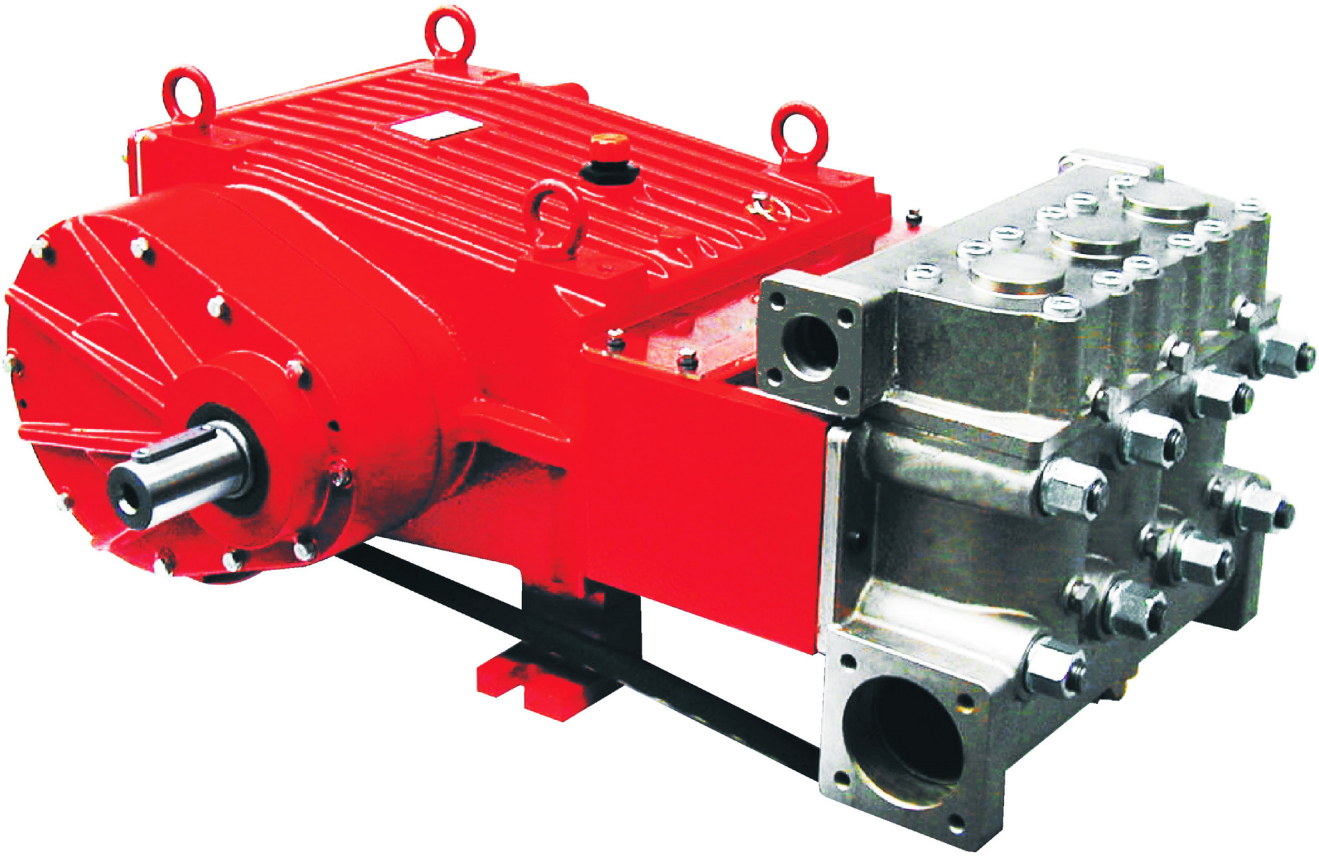
Model GP8265GB-1000

Triplex Ceramic Plunger Pump Operating Instructions Repair and Service Manual



GIANT
Performance Under Pressure

Contents:

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/dm3, 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 (Giant’s p/n 01154)**. 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 intermit-tent 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 de-livered 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 tenson 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 leckage 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 leckage 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 per-sons 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 ex-ceeded 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 carry-ing 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 accidently. 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 cavi-tation occurring, the pump-npshr, positive suction head and water tem-perature must be respected.

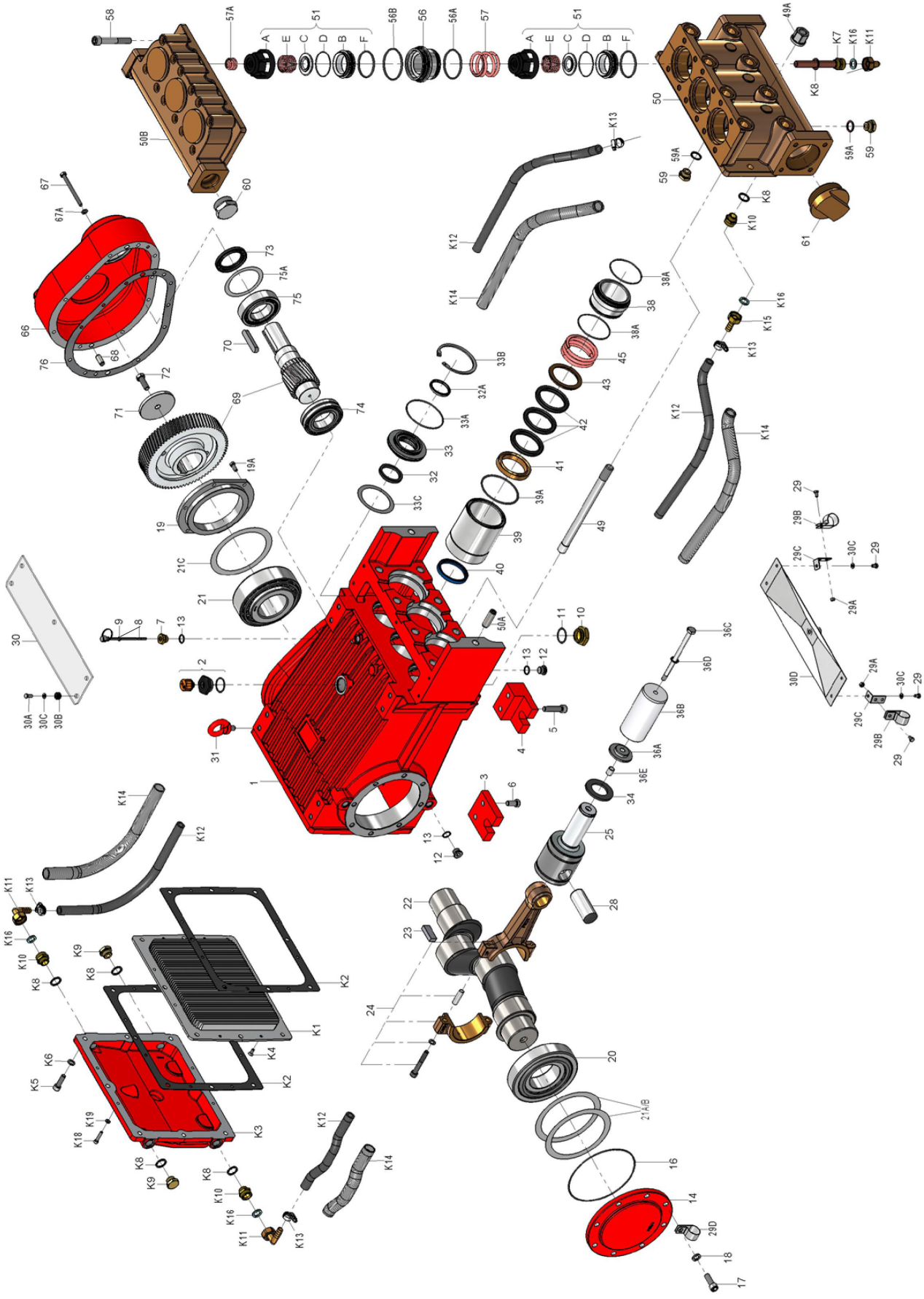
Cavitation and/or compression of gases lead to uncontrollable pressure-kicks which can ruin the pump and unit parts and also be dangerous to the operator or anyone standing nearby.

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 responsibil-ity of the equipment manufacturer and/or operator to ensure that all pertinent safety regulations are adhered to.

GP8265GB-1000 TORQUE SPECIFICATIONS AND TOOL LIST			
Item	**Description**	**Torque Ft.-lbs. (Nm)**	**Tool Needed**
17	Hexagon Socket Screw	64 (87)	10mm Allen Wrench
24	Connecting Rod Hex. Hd. Socket Screw	37 (50)	8mm Allen Wrench
33B	Clip Ring	N/A	Industrial Snap Ring Pliers
36C	Tension Screw	30 (40)	16mm Socket
49A	Hexagon Nut (Manifold)	265 (360)	30mm Socket
51 & 52	Valve Assemblies	N/A	Valve Puller (p/n 07662) included w/pump
58	Hexagon Socket Screw	13 (180)	12mm Allen Wrench
K5	Hexagon Socket Screw	N/A	8mm Allen Wrench

Exploded View - GP8265GB-1000



Parts List - GP8265GB-1000

Item	Part	Description	Qty
1	03619	Crankcase	1
2	06893	Oil Filler Plug Assy. with Vent	1
3	05652	Rear Foot for Crankcase	2
4	05653	Front Foot for Crankcase	2
5	05654	Hexagon Socket Screw	4
6	05655	Hexagon Socket Screw	4
7	05656	Plug, 3/8” for Oil Dipstick	1
8	04185	Oil Dipstick Assembly	1
9	01009	O-Ring	1
10	05657	Plug M33 X 1.5	1
11	07102	O-Ring	1
12	12256	Plug 3/8” BSP	3
13	22929	Copper Washer	4
14	05036	Bearing Cover Closed	1
16	05037	O-Ring	1
17	05038	Hexagon Socket Screw M12	8
18	05039	Spring Ring	8
19	05765	Flange	1
19A	05766	Hexagon Socket Screw	6
20	05658	Tapered Roller Bearing	1
21	05659	Tapered Roller Bearing	1
21A	05042	Fitting Disc	3
21B	05043	Fitting Disc	3
21C	05113	Fitting Disc	3
22	05741	Crankshaft For Gear	1
23	05661	Fitting Key	1
24	05047	Connecting Rod Assembly	3
25	05048	Crosshead c/w Plunger	3
28	05049	Crosshead Pin	3
29	05051	Hexagon Screw	6
29A	07408	Hexagon Nut	2
29B	05383	Bracket 2 for Cooling Hose	2
29C	05662	Support Clamp	2
29D	05382	Bracket 1 for Cooling Hose	1
30	05052	Cover Plate	1
30A	07225-0100	Hexagon Screw	5
30B	13136	Grommet	5
30C	08280	Washer	9
30D	05050	Splash Cover	1
31	07623	Eye Bolt	4
32	05058	Radial Shaft Seal	3
32A	03118	Scraper	3
33	03119	Seal Retainer	3
33A	05056	O-Ring	3
33B	05054	Clip Ring	3
33C	05059	Fitting Disc	3
34	05060	Oil Shield	3
36A	05063	Plunger Pipe Cover	3
36B	05115	Plunger	3
36C	05062	Tension Screw	3
36D	07665	Copper Washer	3
36E	06900	Centering Sleeve	3
38	03618	Seal Case	3
38A	06667	O-Ring	6
39	05116	Seal Sleeve	3
39A	05066	O-Ring	3
40	06996	Seal Ring	3
41	05117	Pressure Ring	3
42	06997	Sleeve	9
43	05118	Sleeve Support Ring	3
45	05119	Seal Tension Spring	3
49	05072	Stud Bolt	8
49A	05073	Hexagon Nut	8
50	03570-1000	Valve Casing	1
50A	13162	Centering Stud	2
50B	03571-1000	Discharge Casing	1
51	03572	Valve Assembly	6
51A	03573	Spring Tension Cap	6
51B	03574	Valve Seat	6
51C	03575	Valve Plate	6
51D	06560	O-Ring	6
51E	05080	Valve Spring	6
51F	03434	O-Ring	6
56	03576	Discharge Valve Adaptor	3
56A	04955	O-Ring	3
56B	13156	O-Ring	3
57	05086	Pressure Spring	3
57A	07210-0100	Pressure Spring	3
58	05087	Hexagon Socket Screw	12
59	07109	Plug, 1/2” BSP	2
59A	06272	Copper Seal	2
60	13322-0100	Plug, 1-1/2” BSP	1
61	05088	Plug, 3” BSP	1
66	05663	Gear Cover	1
67	05664	Hexagon Screw	10
67A	05341	Washer	10
68	05665	Cylinder Pin	2
69	04171	Gear Wheel Set (1500 RPM=2.6)	1
69	04170	Gear Wheel Set (1800 RPM=3.1)	1
69	05767	Gear Wheel Set (2200 RPM=3.8)	1
69	05666	Gear Wheel Set (2600 RPM=4.5)	1
70	07614	Fitting Key	1
71	04571	Spacer Ring	1
72	05667	Hexagon Screw	1
73	05428	Shaft Seal Ring for Gear	1
74	05668	Self-Aligning Roller Bearing	1
75	05669	Roller Bearing	1
75A	05670	Fitting Disc	1
76	05432	Gear Seal	1
78	05502	Oil Cooler (Items K1 - K19)	1
K1	05026	Cooling Vane Plate	1
K2	05027	Seal for Gear Cover	2
K3	05028	Gear Cover	1
K4	05029	Hexagon Hd Cntrsnk Screw	4
K5	07381	Hexagon Socket Screw	8
K6	08041	Washer	8
K7	05030	Connection for Oil Cooler	1
K8	06272	Copper Seal	6
K9	07109	Plug, 1/2” BSP	2
K10	05031	Connecting Branch	3
K11	05032	U-Joint Connector c/w Nut	3
K12	05033	Tube for Cooler	2
K13	05402	Hose Clamp	4
K14	05403	Hose Guard	2
K15	05404	Hose Coupling Nut	1
K16	05405	Flat Gasket	4
K18	04158	Hexagon Socket Screw	4
K19	05053	Washer	4

GP8265GB-1000 PUMP REPAIR KITS

Plunger Packing Kit - #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

Oil Seal Kit - #09584A

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

Valve Repair Kit - #09865

Item	Part #	Description	Qty.
51	03572	Inlet Valve Assembly	3
56A	04955	O-Ring	3
56B	13156	O-Ring	3

Specifications - GP8265GB-1000

	U.S.	(Metric)
Maximum Flow	127 GPM	480 L/min
Maximum Pressure	1740 PSI	120 bar
Maximum Speed		700 RPM
Power Required	147 HP	110 kW
Maxiumum 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		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
GP8265GB-1000-2.6	2.6:1	1500 RPM
GP8265GB-1000-3.1	3.1:1	1800 RPM
GP8265GB-1000-3.8	3.8:1	2200 RPM
GP8265GB-1000-4.5	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:

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

GP8265-1000 HORSEPOWER REQUIREMENTS					
RPM	GPM	500 PSI	750 PSI	1000 PSI	1740 PSI
350	63.5	21.9	32.9	43.8	76.2
400	72.6	25.0	37.6	50.1	87.1
500	90.7	31.3	46.9	62.6	108.8
580	105.2	32.3	54.4	72.6	126.2
700	127.0	43.8	65.7	87.6	152.4

Pump Repair Instructions - GP8265GB-1000

To Check Valves
Loosen screws (58), lift discharge casing (50B) up and away. Take out pressure springs (57A). Pull out assembled valves (51 and 52) with fitting tool (p/n 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.
Before refitting the valves, clean the sealing surfaces in the casing and check for any damage.
Tighten screws (58) at 133 ft.-lbs. (180 Nm); check torque tension after 8-10 operating hours.

To Check Seals and Plunger Pipe
Remove hexagon nuts (49A), remove valve casing (50) 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) 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 plunger pipe out of seal assembly and check for any damage. Pry out seal rings (40) and sleeves (42) out of the seal sleeve 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 installation.
Insert the seal unit (40, 41, 42, 43) in to the seal sleeve (39). 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 out the seal case (38) from the valve casing (50) and check O-rings (38A) (if necessary secure 2 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 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 centring positions in the crankcase, pressure and valve casing.
Coat the seal sleeve lightly with anti-corrosive grease (e.g. molycote no. Cu-7439) in its fitted area towards the crankcase. Coat the step of the plunger pipe cover (36A) lightly with silicon grease and press on to the back end of the plunger pipe. Insert 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 per 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 plunger pipe cover (36A). 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).
Mounting Valve Casing:
Put seal cases (38) in the centring holes of the valve casing, then push valve casing carefully on to centring studs (50A). Tighten hexagon screws (49A) evenly and crosswise at 265 ft.-lbs. (360 Nm).

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.

To Dismantle Crankcase Gear
Take out plungers and seal sleeves as described above.
Drain oil by taking off plug (12).
After removing the clip ring (33B), pry out 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 off bearing cover (14), remove shims (21A/B/C).

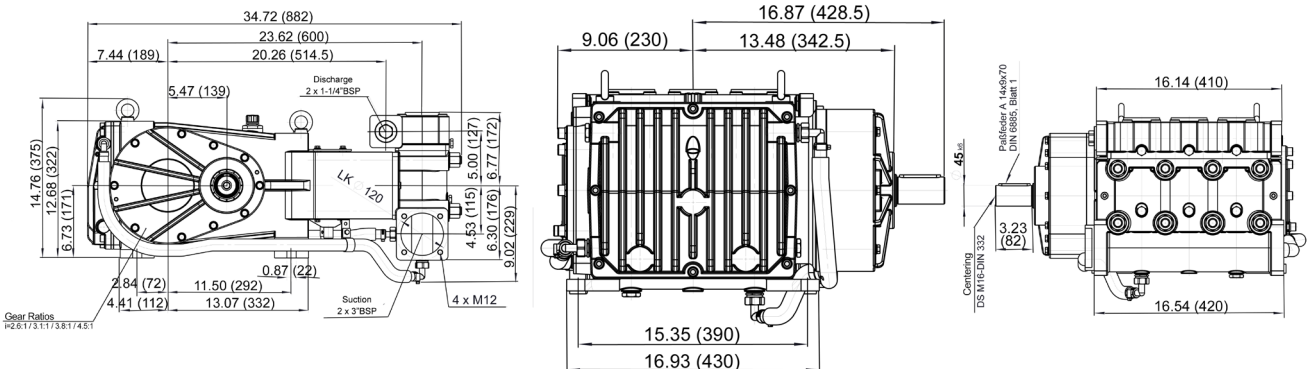
To Dismantle Reduction Gear
Remove screws (67). Press off gear cover (66) by screwing two screws into both thread bores. Remove screw (72) and remove spacer ring (71).
Remove the cogwheel (69) from the shaft with a removal tool. Using a rubber hammer, tap out the crankshaft (22) towards bearing cover (14).
Check surfaces on the connecting rods (24), crankshaft (22) and crossheads (25). Check the surfaces of the crosshead guides in the crankcase 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 later to the bearings and connecting rods due to wobble movements in the conical bearing shells.
Mount connecting rod halves in their exact original position and tighten at 37 ft.-lbs. (50 Nm).

IMPORTANT! Connecting rods must be able to move slightly side-ways on the stroke journals.

To Mount Reduction Gear
Heat ball bearings (75 and 74) first before pressing them on to the pinion shaft. Press the cogwheel slightly on to 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 on to the crankshaft and into the bearing seat.
Fit spacer ring (71), and secure screw (72) with Loctite.
Fit the seal (76) on to the cylindrical pins (68).
Push the gear cover (76) carefully on to the bearing (75). Make sure that the radial shaft seal (73) does not get damaged during fitting on to the pinion.
Mount cooling 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.

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

GP8265GB-1000 Dimensions - Inches (MM)



GIANT INDUSTRIES LIMITED WARRANTY

Giant Industries, Inc. pumps and accessories are warranted by the manufacturer to be free from defects in workmanship and material as follows:

1. Five (5) years from the date of shipment for all pumps used in portable pressure washers with NON-SALINE, clean water applications.
2. Two (2) years from the date of shipment for Giant pumps used in car wash applications.
3. One (1) year from the date of shipment for all other Giant industrial and consumer pumps.
4. Six (6) months from the date of shipment for all rebuilt pumps
5. Ninety (90) days from the date of shipment for all Giant accessories.

This warranty is limited to repair or replacement of pumps and accessories of which the manufacturer's evaluation shows were defective at the time of shipment by the manufacturer. The following items are NOT covered or will void the warranty:

1. Defects caused by negligence or fault of the buyer or third party.
2. Normal wear and tear to standard wear parts.
3. Use of repair parts other than those manufactured or authorized by Giant.
4. Improper use of the product as a component part.
5. Changes or modifications made by the customer or third party.
6. The operation of pumps and or accessories exceeding the specifications set forth in the Operations Manuals provided by Giant Industries, Inc.

Liability under this warranty is on all non-wear parts and limited to the replacement or repair of those products returned freight prepaid to Giant Industries which are deemed to be defective due to workmanship or failure of material. A Returned Goods Authorization (R.G.A.) number and completed warranty evaluation form is required prior to the return to Giant Industries of all products under warranty consideration. Call (419)-531-4600 or fax (419)-531-6836 to obtain an R.G.A. number.

Repair or replacement of defective products as provided is the sole and exclusive remedy provided hereunder and the MANUFACTURER SHALL NOT BE LIABLE FOR FURTHER LOSS, DAMAGES, OR EXPENSES, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGES DIRECTLY OR INDIRECTLY ARISING FROM THE SALE OR USE OF THIS PRODUCT.

THE LIMITED WARRANTY SET FORTH HEREIN IS IN LIEU OF ALL OTHER WARRANTIES OR REPRESENTATION, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL SUCH WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY THE MANUFACTURER.

WARNING: This product might contain a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm.
For more information go to www.P65Warnings.ca.gov

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Performance Under Pressure