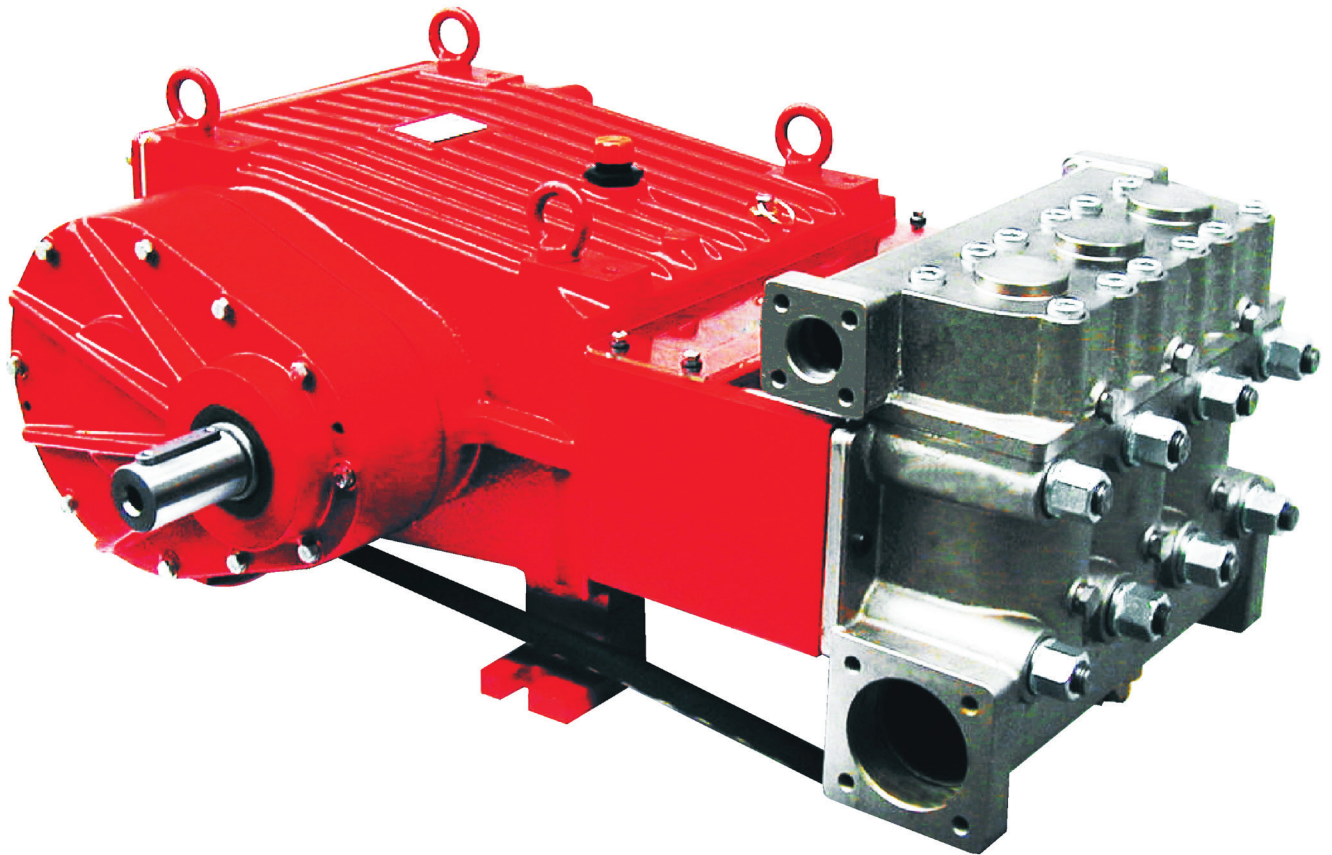


Model GP8176

Triplex Ceramic
Plunger Pump
Operating Instructions
Repair and Service Manual



GIANT
Performance Under Pressure

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Specifications - Model GP8176

1. Performance

	U.S.	(Metric)
Flow	132 GPM	(500 LPM)
Discharge Pressure	1500 PSI	(100 bar)
Power Consumption	129 BHP	96 kW
Maximum Speed		520 RPM
Inlet Pressure.....	29 PSI	(2.0 bar)
Plunger Diameter.....	2.99".....	76 mm
Plunger Stroke.....	2.83".....	72 mm
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
Temperature of Pumped Fluids.....	86° F	(30° C)*
Inlet Ports.....		(2) 3" BSP
Discharge Ports		(2) 1-1/4" BSP
Weight.....	794 lbs.	(360 kg)
Fluid End Material.....		Nickel Plated Spheroidal Cast Iron
Crankcase Oil Capacity	3.3 Gal.	(12.5 liters)
NPSHR	26.2 ft.-head.....	8.0 mWs

*higher water temperatures possible with separate crankcase cooling system; contact Giant.

<u>Gear Ratio</u>	<u>Input Speed</u>
2.6:1.....	1500 RPM
3.1:1.....	1800 RPM
3.8:1.....	2200 RPM
4.5:1.....	2600 RPM

1) Figures given for maximum pressure and maximum speed (rpm) apply to intermittent operation with cold water.

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 inbetween. For example, this can be full load operation for 5 minutes four times an hour with 10 minute breaks inbetween or continuous full load operation for 20 minutes followed by a 40 minute break.

2) Higher water temperatures are possible with a separate external crankcase cooling system. The manufacturer is to be contacted in this case.

3) The maximum pressure is to be reduced by 10% where continuous operation with a cooler (with or without gear) is involved.

NPSHR / Inlet pressure

Required NPSH refers to water at 68 °F (20 °C) at maximum permissible pump speed.



The inlet pressure on the suction side must not exceed 29 PSI (2 bar) if the integrated gear oil cooling system (standard version) is connected. 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 29 PSI (2 bar) on the suction side. Make sure that suction pulsation is sufficiently dampened - water column resonance must be avoided.

Level of noise emission

Emission sound pressure level: ≤ 70 dB(A)

2. Fields of application

The fields of application of these pump types correspond to the specifications in the assembly instructions GIANT INDUSTRIES.

Ambient conditions

Ambient temperature:

41 °F (5 °C) < T_{Amb.} < 86 °F (30 °C)

4. Oil filling

- Filling quantity: **4.2 gal (16.0 L)**
- Quality: Industrial gear oil **ISO VG 220** or automotive gear oil **SAE 90 GL4 - Giant's p/n 01154**
- Intervals: first oil change after **50 operating hours** then every **1000 operating hours**, but at the latest **12 months**



If the pump is mounted on a vehicle (possible inclined position during operation) and/or if the pump speed is between 300 rpm and 500 rpm, the required oil quantity increases by 1 liter.

5. Installation/ Putting into Operation

5.1 Shaft protector

When the pump is in operation, the driven shaft side and coupling by a bell housing and the plunger area by cover (30).

Do not step onto the protective plate (30) or put heavy objects on it.

5.2 Direction of pump rotation

The GP8176 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.

The indicated direction ensures that oil is correctly distributed on and into the crosshead guides via optimal connecting rod motion thus providing best possible lubrication particularly with regard to continuous operation.

The pump can also be run against the recommended direction of rotation if operated periodically or at reduced pressure.

If so, the pump must be run in in this direction to smoothen the bearing areas.

This is done by initially operating the pump at zero pressure for 30 minutes; thereafter, the pressure is to be slowly increased over a period of an hour to the desired maximum operating pressure.

Check the oil temperature during this process.

5.3 Suction line filter

Recommended mesh size 150 µm.

5.4 Gear oil cooling



The pumps can be run without gear oil cooling in continuous operation **up to a power rating of 95.2 HP (70 kW)** or with major intermittent operation at full performance.

If the power required **exceeds 95.2 HP (70 kW)** in continuous operation, 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 520 pump rpm. The cooling water is sucked in by one of the pumping chambers and pumped away.



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.

5.5 Valve Casing



The torque tension on the valve casing nuts (49A) is to be checked after approximately 200 operating hours.

Please see page 6 for the torque values.

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

6. Operation

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



The pump and cooling system must be emptied if there is a danger of frost. Note that travel wind, for example, can cause water in pumps fitted on open vehicles to freeze even if the outside temperature is

above freezing point.

Empty the pump through the second unused suction and discharge connection using compressed air, for example.

Bottom plugs (59) on the suction channel can be opened as well.

The pump can also be run "dry" for 1-2 minutes to aid emptying.

Empty the cooling system by removing screw joints (K11) on the pump head (50) and by blowing the hoses (K12) with compressed air on the (K11/K7) side.

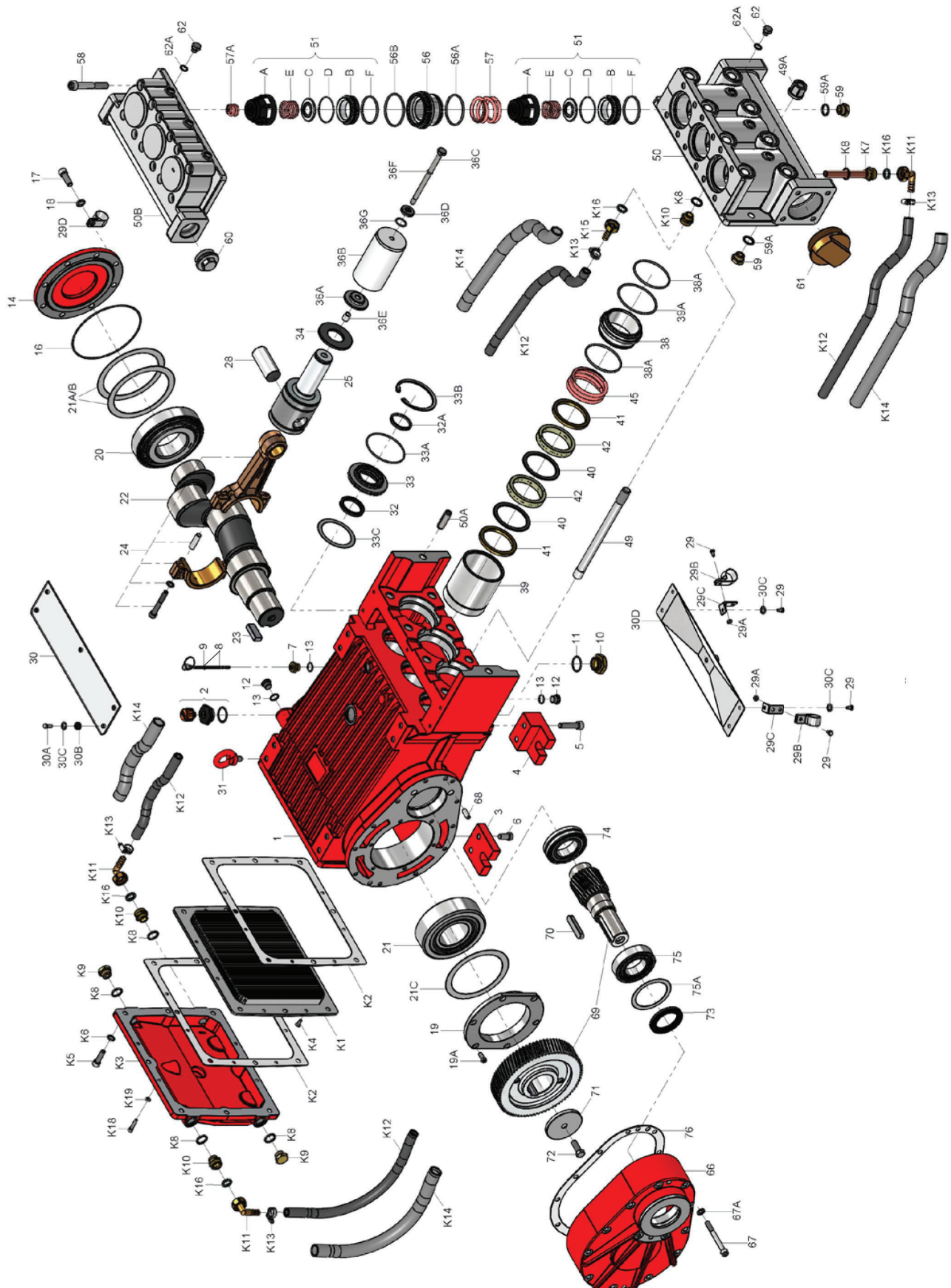
Anti-freeze is recommended to guard against frost where a separate cooling circuit is used.



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).

Exploded View - GP8176



Parts List - GP8176

<u>Item</u>	<u>Part</u>	<u>Description</u>	<u>Qty</u>	<u>Item</u>	<u>Part</u>	<u>Description</u>	<u>Qty</u>
1	05651	Crankcase	1	45	03569	Seal Tension Spring	3
2	06893	Oil Filler Plug Assy. 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	03570	Valve Casing	1
5	05654	Hexagon Socket Screw	4	50A	13162	Centering Stud	2
6	05655	Hexagon Socket Screw	4	50B	03571	Discharge Casing	1
7	05656	Plug, 3/8" for Oil Dipstick	1	51	03572	Valve Assembly	6
8	04185	Oil Dipstick Assembly	1	51A	03573	Spring Tension Cap	6
9	01009	O-Ring	1	51B	03574	Valve Seat	6
10	05657	Plug M33 X 1.5	1	51C	03575	Valve Plate	6
11	07102	O-Ring	1	51D	06560	O-Ring	6
12	12256	Plug, 1/2" BSP	3	51E	05080	Valve Spring	3
13	22929	Copper Washer	4	51F	03434	O-Ring	6
14	05036	Bearing Cover Closed	1	56	03576	Discharge Valve Adaptor	3
16	05037	O-Ring	1	56A	04955	O-Ring	3
17	05038	Hexagon Socket Screw M12	8	56B	13156	O-Ring	3
18	05039	Spring Ring	8	57	05086	Pressure Spring	3
19	05765	Flange	1	57A	07210-0100	Pressure Spring	3
19A	05766	Hexagon Socket Screw	6	58	05087	Hexagon Socket Screw	12
20	05658	Tapered Roller Bearing	1	59	07109	Plug, 1/2" BSP	2
21	05659	Tapered Roller Bearing	1	59A	06272	Copper Seal	2
21A	05042	Fitting Disc	3	60	13322	Plug, 1-1/2" BSP	1
21B	05043	Fitting Disc	3	61	05088	Plug, 3" BSP	1
21C	05113	Fitting Disc	3	62	05302	Plug, 1/4" BSP	6
22	05741	Crankshaft For Gear	1	62A	06934	Copper Gasket	6
23	05661	Fitting Key	1	66	03193	Gear Cover	1
24	05047	Connecting Rod Assembly	3	67	08484	Hexagon Screw	11
25	05048	Crosshead c/w Plunger	3	67A	08041	Washer	11
28	05049	Crosshead Pin	3	68	04445	Cylinder Pin	2
29	05051	Hexagon Screw	6	69	04171	Gear Wheel Set (1500 RPM=2.6)	1
29A	07408	Hexagon Nut	2	69	04170	Gear Wheel Set (1800 RPM=3.1)	1
29B	05383	Bracket 2 for Cooling Hose	2	69	05767	Gear Wheel Set (2200 RPM=3.8)	1
29C	05662	Support Clamp	2	69	05666	Gear Wheel Set (2600 RPM=4.5)	1
29D	05381	Bracket 1 for Cooling Hose	1	70	07614	Fitting Key	1
30	05052	Cover Plate	1	71	04571	Spacer Ring	1
30A	07225-0100	Hexagon Screw	5	72	05667	Hexagon Screw	1
30B	13136	Grommet	5	73	05608	Shaft Seal Ring for Gear	1
30C	08280	Washer	9	74	05668	Self-Aligning Roller Bearing	1
30D	05050	Splash Cover	1	75	05669	Roller Bearing	1
31	07623	Eye Bolt	4	75A	05670	Fitting Disc	1
32	05058	Radial Shaft Seal	3	76	03309	Gear Seal	1
32A	03118	Scraper	3	78	05025	Oil Cooler (Items K1 - K19)	1
33	03119	Seal Retainer	3	79	07662	Valve Puller (Not Shown)	1
33A	05056	O-Ring	3	K1	05026	Cooling Vane Plate	1
33B	05054	Clip Ring	3	K2	05027	Seal for Gear Cover	2
33C	05059	Fitting Disc	3	K3	05028	Gear Cover	1
34	03560	Oil Shield	3	K4	05029	Hexagon Hd Cntrsnsk Screw	4
36A	05063	Plunger Pipe Cover	3	K5	07381	Hexagon Socket Screw	8
36B	03561	Plunger Pipe	3	K6	08041	Washer	8
36C	03562	Tension Screw	3	K7	05030	Connection for Oil Cooler	1
36D	03577	Copper Washer	3	K8	06272	Copper Seal	6
36E	06900	Centering Sleeve	3	K9	07109	Plug, 1/2" BSP	2
36F	22704	O-Ring	3	K10	05031	Connecting Branch	3
36G	12092	O-Ring	3	K11	05032	U-Joint Connector c/w Nut	3
38	03563	Seal Case	3	K12	05033	Tube for Cooler	2
38A	03364	O-Ring	6	K13	05402	Hose Clamp	4
39	03565	Seal Sleeve	3	K14	05403	Hose Guard	2
39A	05066	O-Ring	3	K15	05404	Hose Coupling Nut	1
40	03566	Support Ring	6	K16	05405	Flat Gasket	4
41	03567	Guide Ring	6	K18	04158	Hexagon Socket Screw	4
42	03568	Coiled Packing Ring	6	K19	05053	Washer	4

Pump Repair Kits - GP8176

Plunger Packing Kit - # 09861

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
38A	03364	O-Ring	6
39A	05066	O-Ring	3
40	03566	Support Ring	6
41	03567	Guide Ring	6
42	03568	Coiled Packing Ring	6

Valve Repair Kit - #09862

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
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
56A	04955	O-Ring	6
56B	13156	O-Ring	3

Oil Seal Kit

#09584A

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

GP8176 TORQUE SPECIFICATIONS

<u>Item</u>	<u>Part #</u>	<u>Thread</u>	<u>Description</u>	<u>Lubricaion Info</u>	<u>Torque Amount</u>
12	12256	1/2" BSP	Plug, 1/2" BSP		29.5 ft.-lbs. (40 Nm)
17	05038	M12	Hexagon Socket Screw		64 ft.-lbs. (87 Nm)
24	05047	M10	Connecting Rod Assembly		36.9 ft.-lbs. (50 Nm)
32	05058		Radial Shaft Seal	Loctite 403	
39	03565		Seal Sleeve	Anti-Seize 350 Crankcase Outside	
49	05072		Stud Bolt	Loctite 648 Crankcase Side	
49A	05073	M20	Hexagon Nut		265.5 ft.-lbs. (360 Nm)
58	05087	M14	Hexagon Socket Screw	Anti-Seize 350	132.8 ft.-lbs. (180 Nm)
59	07109	1/2" BSP	Plug, 1/2" BSP		29.5 ft.-lbs. (40 Nm)
67	08484	M10	Hexagon Screw		59 ft.-lbs. (80 Nm)
K4	05029	M6	Hexagon Head Countersunk Screw		106.2 in.-lbs. (12 Nm)
K5	07381	M10	Hexagon Socket Screw		33 ft.-lbs. (45 Nm)
K9	07109	1/2" BSP	Plug, 1/2" BSP		29.5 ft.-lbs. (40 Nm)
K18	04158	M6	Hexagon Socket Screw		106.2 in.-lbs. (12 Nm)

GP8176 PUMP REPAIR INSTRUCTIONS

7. Maintenance and Servicing

Based on the thread type and the required tightening torques, observe the table on page 6.

7.1 Special tools required

The following special tools are required for assembly:

- Assembling tool (p/n 07662)

7.2 Suction and Discharge Valves

Loosen screws (58), lift discharge valve casing (50B) up and away.

Take out pressure springs (57).

Pull out assembled valves (51) using an assembly tool (p/n 07662).

To dismantle valves:

The spring tension cap (51A) is screwed together with the valve seat (51B).

Remove spring tension cap, take out springs (51E) and valve plate (51C).

Check sealing surfaces and O-rings (51D, 51F).

Replace worn parts.

Coat threads of valve seat with silicon grease or molycote anti-seize Cu-7439 when reassembling.

Before re-fitting the valves, clean the sealing surfaces in the casing and check for any damage.

Tighten screws (58) to the required torque.

Check torque tension after 8-10 operating hours.

8.3 Seals and Plunger

Remove hexagon nuts (49A) and hose coupling (K11 and K15), remove pump head together with seal case (38) from crankcase (1).

If necessary, carefully tap the valve casing (50) past the centring stud (50A) using a rubber hammer.



If necessary, support the pump head 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.

Pull out spiral rings (40) and sleeves (42) out of the seal sleeve with a screwdriver.



Be careful not to damage seal sleeve (39) and guide ring (41).

Check the inner diameter of the guide 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.

Carefully push the ceramic plunger 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.



Mounting surfaces of the crankcase, seal sleeves, intermediate casing 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, discharge (50B) and valve casing (50).

Coat the seal sleeve lightly with anti-corrosive grease (e.g. molycote no. Cu-7439) in its fitted area towards the crankcase. Lightly coat the step of the plunger pipe cover (36A) with silicon grease and press it onto the back end of the plunger pipe.

Insert seal sleeves 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.

Turn the pump by hand until the plunger (25) rests against the plunger pipe.

Tighten tension screw to the required torque.



Thread glue must never come between the plunger pipe (36B) and plunger 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) into the seal sleeve (39) and the O-rings (38A, 39A) in to the seal case (38).

Mounting Valve Casing:

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

Tighten hexagon nuts (49A) evenly and crosswise to the required torque.

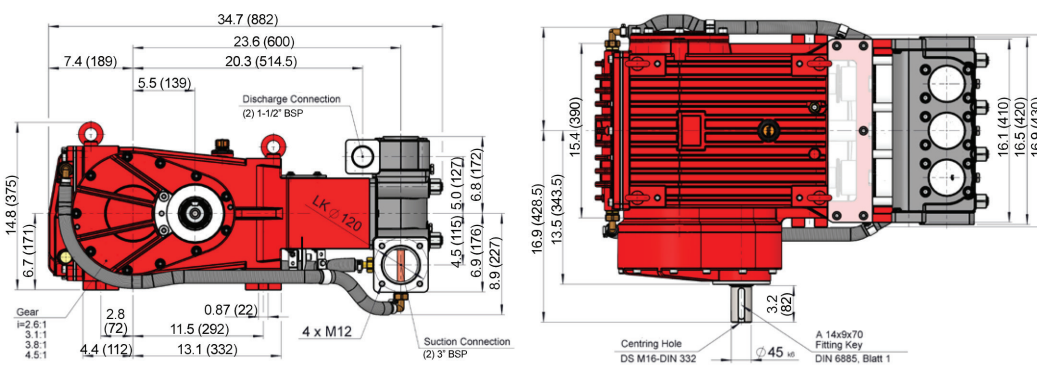


The torque tension on the screws (49A) must be checked after 8-10 operating hours; the pump must be at zero pressure.

Thereafter the tension is to be checked every 200 operating hours.

If required, supplementary assembly instructions can be requested from the manufacturer Giant Industries.

GP8176 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