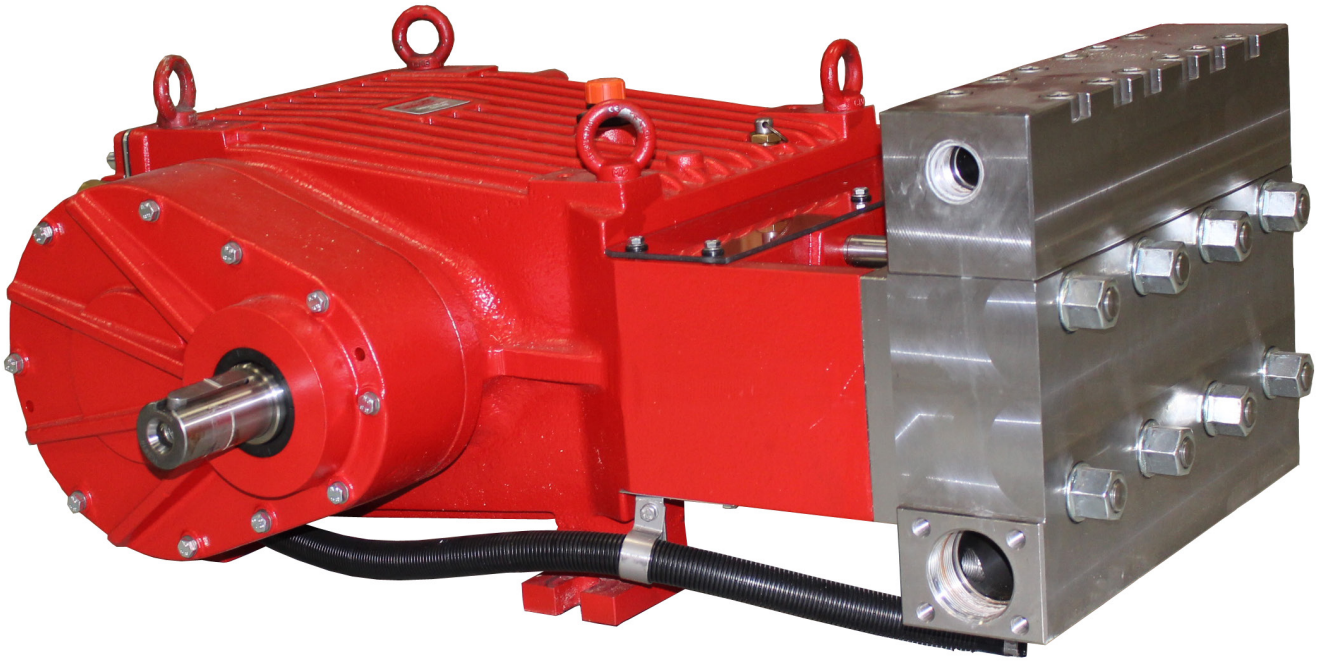
Models GP8135, GP8135A, GP8140 & GP8140A

Triplex Ceramic Plunger Pump Operating Instructions Repair and Service Manual

"A" version = NPT inlet and discharge ports



GIANT
Performance Under Pressure

Updated 09/24

Contents:

GP7645GBHS/GP7650GBHS/GP7655GBHS PUMP SPECIFICATIONS

Performance

	Power Required	Pressure	Max. Speed	Max. Flow	Max. Temp.	Plunger ø	Plunger Stroke	Weight	NPSHR
Model	**BHP (kW)**	**PSI (bar)**	**RPM**	**GPM (l/min)**	**°F (°C)**	**in (mm)**	**in (mm)**	**lbs. (kg)**	**ft. of head (mWs)**
GP8135	142 (106)	7250 (500)	580	29.1 (110)	86 (30)	1.38 (35)	2.83 (72)	800 (363)	27.9 (8.5)
GP8140	146 (109)	5510 (380)	580	39.6 (150)	86 (30)	1.57 (40)	2.83 (72)	800 (363)	24.6 (7.5)

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 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.

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 suction side input pressure 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 or 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)

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 < $T_{Amb.}$ < 86 °F

Ambient temperature: 5 °C < $T_{Amb.}$ < 30°C

Oil filling

- Filling quantity: **4.2 gal (16.0 l)**
- Quality: Industrial gear oil **ISO VG 220** oil 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 after **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 **0.26 gallons** (**1 liter)**.

Installation/ Putting into Operation

Shaft protector

When the pump is in operation, the driven shaft side and coupling by a contact-protector and the plunger room by cover (30).

Do not steop onto the protective plate (30) nor put heavy objects on it.

Direction of pump rotation

The GP8135/GP8140 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 indicated direction ensures that oil is correctly distributed on and into the crosshead guides via optimal conrod 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.

Suction line filter
Recommended mesh size 50 µm.

Gear oil cooling

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 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 1.9 GPM (7.0 l/min) at 580 pump rpm. The cooling water is sucked in by one of the pumping chambers and pumped away.


If higher medium temperatures or liquids other than water are involved or aggressive media such as seawater, demineralised water etc., pump must be fitted with a separate cooling circuit. The separate cooler must have a cooling efficiency of 1700 watts.

If there is a danger of frost, an appropriate amount of antifreeze must be mixed into the cooling circuit.

Valve Casing

The torque tension on the valve casing nuts (49A) is to be checked after approximately 200 operating hours. Please see the section ‘Maintenance and Servicing’ concerning the torque values.
The pump must be at zero pressure when checking the torque tension.

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 (K10) on the pump head (50) and by blowing the hoses (K12) with compressed air on the (K10/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).

Maintenance and Servicing
For the type of thread locker used and the required tightening torques, observe the table in the exploded view.

Special tools required
The following special tools are required for assembly:
- Assembling tool (code no. 15.0038)

Suction and Discharge Valves
Loosen screws (58), lift discharge casing (53A – GP8135), (50B – GP8140) up and away.
Take out pressure springs (57).
Pull out assembled valves (51 and 52) with fitting tool (p/n 07662).

To dismantle valves:
The spring tension cap (51A, 52A) is screwed together with the valve seat (51B or alternatively 52B).
Screw off spring tension cap, take out springs (51E, 52E) and valve plate (51C, 52C).
Check sealing surfaces and O-rings (51D/F, 52D/F, 56A).
Replace worn parts.
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.

Seals and Plunger
Screw off hexagon nuts (49A) and hose coupling (K11 and K15), remove pump head together with seal case (38) and intermediate casing (62) 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.

Take off flat leakage seal (62A/D) and check.
Screw off Plunger (36) from crosshead w. plunger (25) and take seal sleeve (39) together with all mounted parts out of the drive.
Pull plunger out of seal assembly and check for any damage. Clean centring and top-surface of crosshead with plunger (25).
Take out tension spring (45) Lever whole seal unit (41-44) carefully out of the seal sleeve with a screwdriver from the backside. Check plunger surface and seals.
Check O-rings (39).
Renew damaged parts.
Check Leakage seal (40) and O-ring (40A) after removing off clip-ring (40C) and pressure ring (40B) and renew if necessary.


Make sure that the contact surfaces on the actuator housing, the sealing sleeves, the intermediate housing and the valve housing are clean and without damage.
The components must lie absolutely flat on each other.
The same applies to all centerings in the actuator housing, intermediate housing, pressure housing and valve housing.
Apply a thin coat of anti-corrosion grease (e.g. Anti Size 350) to the sealing sleeve in the area where it fits the drive housing. Insert the sealing sleeves into the fits of the drive housing.


Make sure that the milled surfaces on the sleeves (39) are perpendicular to each other.

New parts should be lightly coated with silicon grease before installation.
Turn the pump by hand until the plunger (25) is in contact with the plunger (36). Tighten the plunger (36) (SW24) to the specified torque.
Insert the seal tension spring (45) into the seal sleeve (39).

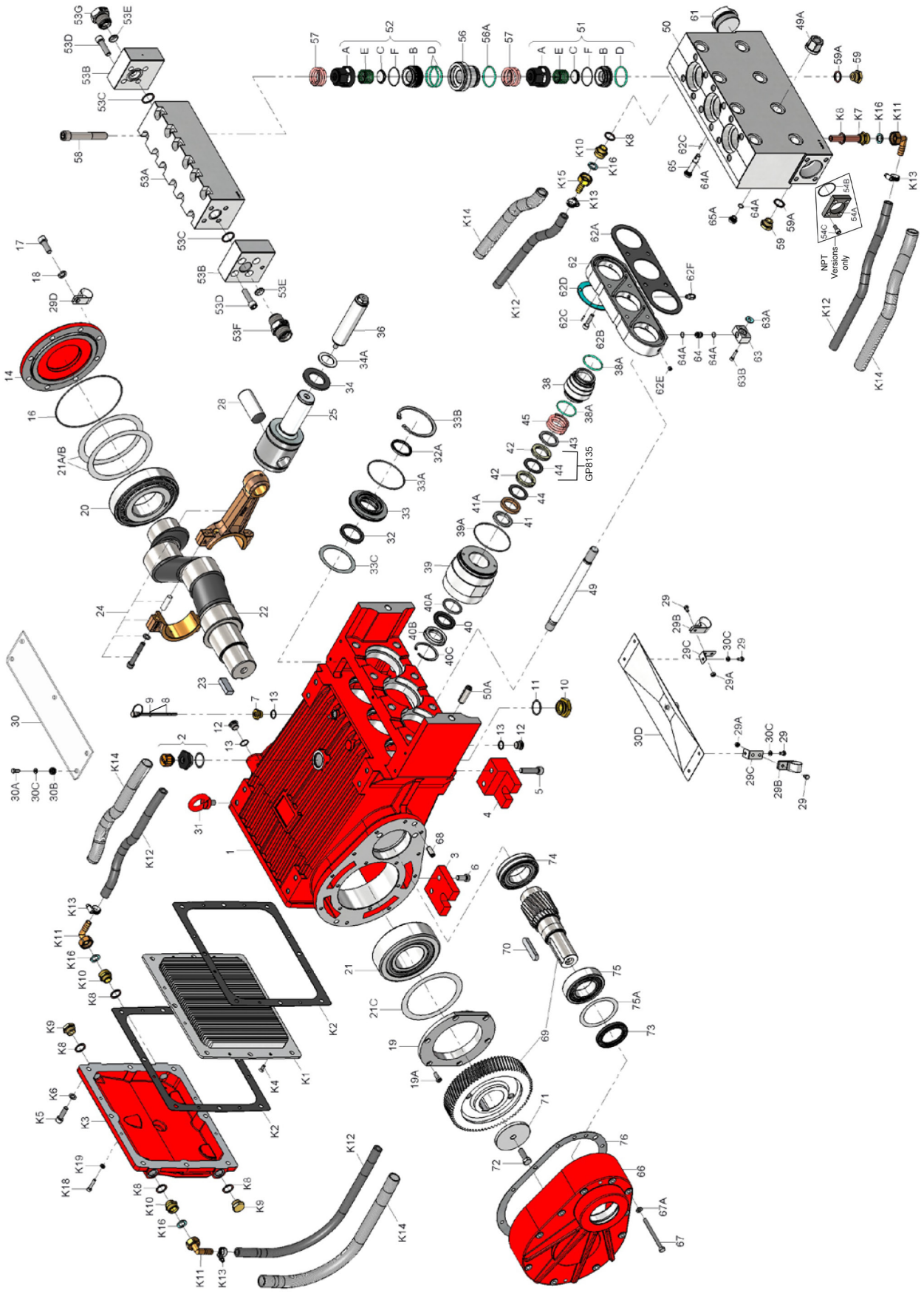
Mounting Valve Casing:
Press seal cases (38) with the stepped OD dia. 65 carefully to its stop in the centring holes of the intermediate casing. Mount flat leakage seal (62D).


The flat leakage seal (62D) must be positioned with its ø3 bore onto the notched pin (62C) on the intermediate casing.
The leakage return bores in the intermediate casing and in the seal sleeves must stay open by the cut-outs in the seal (62D).
Push valve casing (50) together with intermediate casing (62) carefully on to the 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.

EXPLODED VIEW - GP8135 & GP8140



Parts List - GP8135 and GP8140

Item	Part	Description	Qty
1	05651	Crankcase	1
2	06893	Oil Filler Plug Assembly 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” BSP 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	1-3
21B	05043	Fitting Disc	1-3
21C	05113	Fitting Disc	1-3
22	05741	Crankshaft	1
23	05661	Fitting Key	1
24	05047	Connecting Rod Assembly	3
25	05048	Crosshead with Plunger Base	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	05381	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	Oil 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
34A	05830	Locking Disc	3
36	05743	Plunger Pipe, GP8135	3
36	05816	Plunger Pipe, GP8140	3
38	05831	Seal Case, GP8135	3
38	05817	Seal Case, GP8140	3
38A	05408	O-Ring, GP8135	6
38A	05818	O-Ring, GP8140	6
39	05832	Seal Sleeve, GP8135	3
39	05819	Seal Sleeve, GP8140	3
39A	05617	O-Ring	3
40	05744	Sleeve, GP8135	3
40	05820	Sleeve, GP8140	3
40A	05745	O-Ring, GP8135	3
40A	05821	O-Ring, GP8140	3
40B	05746	Pressure Ring, GP8135	3
40B	05822	Pressure Ring, GP8140	3
40C	05474	Clip Ring, GP8135	3
40C	13217-0100	Clip Ring, GP8140	3
41	05833	Pressure Ring, GP8135	3
41	05823	Pressure Ring, GP8140	3
41A	05747	Guide Ring, GP8135	3
41A	03559	Guide Ring, GP8140	3
42	05748	Rope Packing, GP8135	6
42	05825	Rope Packing, GP8140	3
43	05749	Support Disc, GP8135	3
43	05826	Support Disc, GP8140	3
44	05751	Support Ring, GP8135	6
44	05827	Support Ring, GP8140	3
45	13297	Tension Spring, GP8135	3
45	05828	Tension Spring, GP8140	3
49	05834	Stud Bolt	8
49A	05073	Hexagon Nut	8
50	05835	Inlet Valve Casing	1
50A	13162	Centering Stud	2
51	05837	Inlet Valve Assembly	3
51A	05595	Spring Tension Cap	3
51B	05838	Inlet Valve Seat	3
51C	05752	Valve Plate	3
51D	05408	O-Ring	3
51E	05450	Valve Spring	3
51F	05596	O-Ring	3
52	05839	Discharge Valve Assembly	3
52A	05595	Spring Tension Cap	3
52B	05840	Discharge Valve Seat	3
52C	05752	Valve Plate	3
52D	05408	O-Ring	6
52E	05450	Valve Spring	3
52F	05596	O-Ring	3
53A	03585	Discharge Casing	1
53B	03586	Connection Plate	2
53C	07704	Copper Seal	2
53D	03587	Hexagon Socket Screw	8
53E	03588	Lens Gasket	2
53F	03589	Connection Nipple, 1” (MNPT versions)	1
53F	03589-BSP	Connection Nipple, 1” (MBSP versions)	1
53G	03590	Plug, 1” BSP	1
54A	03591	Adapter, 2” (FNPT versions)	1
54B	13286	O-Ring (NPT versions)	1
54C	03592	Hexagon Socket Screw (NPT versions)	4
56	05409	Discharge Valve Adaptor	3
56A	05408	O-Ring	3
57	07173	Tension Spring	6
58	05753	Inner Hexagon Screw	12
59	07109	Plug, 1/2” BSP	2
59A	06272	Copper Seal, 1/2” BSP	2
61	05841	Plug, 2” BSP	1
62	05842	Intermediate Casing	1
62A	05843	Flat Seal	1
62B	05754	Hexagon Socket Screw	4
62C	22764	Serrated Pin	4
62D	05844	Flat Leakage Seal	3
62E	06106	Allen Grub Screw	2
62F	04583	Connector	1
63	05845	Drip Return Joint	2
63A	05757	Leakage Seal	2
63B	05811	Hexagon Socket Screw	4
64	05846	Drip Return Nipple	2
64A	11507-0001	O-Ring	6
65	05847	Drip Return Connection	1
65A	05848	Drip Return Plug	1
66	05663	Gear Cover	1
67	05664	Hexagon Screw	10
67A	05341	Washer	10
68	05665	Cylinder Pin	2
69	04171	Gearwheel Set (1500 RPM=2.6)	1
69	04170	Gearwheel Set (1800 RPM=3.1)	1
69	05767	Gearwheel Set (2200 RPM=3.8)	1
69	05666	Gearwheel Set (2600 RPM=4.5)	1
70	07614	Fitting Key	1
71	04571	Fitting Disc	1
72	05667	Hexagon Screw	1
73	05608	Shaft Seal Ring for Gear	1
74	05429	Roller Bearing	1
75	05669	Roller Bearing	1
75A	05670	Fitting Disc	1
76	05432	Gear Seal	1
78	05849	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 Head Countersunk Screw	4
K5	07381	Hexagon Socket Screw	8
K6	08041	Washer	8
K7	05742	Connecting Branch	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 Set Screw	4
K19	05053	Washer	4
	04175	Plunger Replacement Kit, GP8135 (34A-45)	
	04160	Plunger Replacement Kit, GP8140 (34A-45)	

Pump Repair Kits - GP8135 and GP8140

Plunger Packing Kit - GP8135 - # 09707

Item	Part #	Description	Qty.
38A	05408	O-Ring	6
39A	05617	O-Ring	3
40	05744	Sleeve	3
40A	05745	O-Ring	3
41A	05747	Guide Ring	3
42	05748	Rope Packing	6
44	05751	Support Ring	6

Plunger Packing Kit - GP8140 - # 09708

Item	Part #	Description	Qty.
38A	05818	O-Ring	6
39A	05617	O-Ring	3
40	05820	Sleeve	3
40A	05821	O-Ring	3
41A	03559	Guide Ring	3
42	05825	Rope Packing	3
44	05827	Support Ring	3

Inlet Valve Kit - #09709

Item	Part #	Description	Qty.
51	05837	Inlet Valve Assembly	3
56A	05408	O-Ring	3

Discharge Valve Kit - #09710

Item	Part #	Description	Qty.
52	05839	Discharge Valve Assembly	3
56A	05408	O-Ring	3

Oil Seal Kit - #09584

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

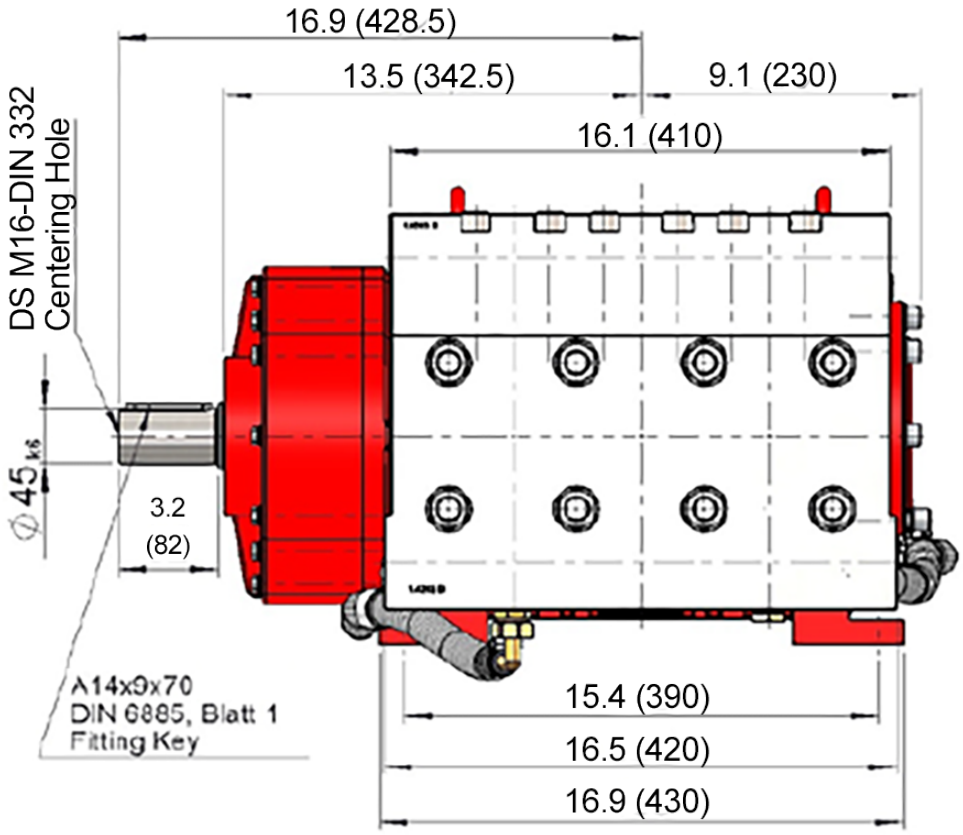
GP8135(A) & GP8140(A) TORQUE SPECIFICATIONS

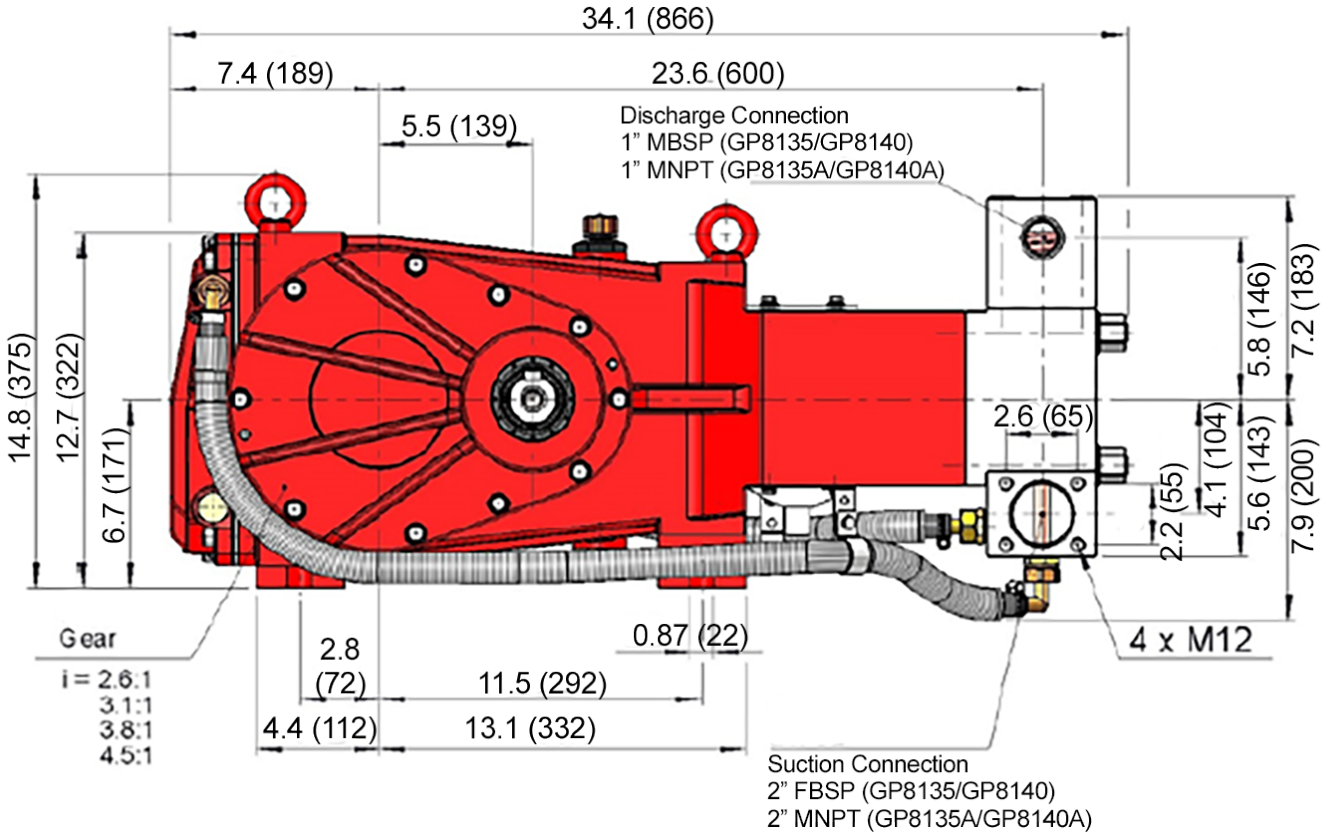
Position	Item #	Tool Needed	Description	Lubrication Info	Torque Amount
17	05038	10mm Allen Wrench	Hexagon Socket Screw		64 ft.-lbs. (87 Nm)
24	05047	8mm Allen Wrench	Connecting Rod Assembly		37 ft.-lbs. (50 Nm)
33B	05054	Industrial Snap Ring Pliers	Clip Ring		
36	05743/05816	16mm Socket	Plunger Pipe		33 ft.-lbs. (45 Nm)
49A	05073	30mm Socket	Hexagon Nut		266 ft.-lbs. (360 Nm)
51/52	05837/05839	Valve Puller - p/n 07662	Valve Assemblies		
58	05753	12mm Allen Wrench	Hexagon Socket Screw	Anti-Seize 350	132 ft.-lbs. (180 Nm)
K5	07381	8mm Alen Wrench	Hexagon Socket Screw		

GP8000 Troubleshooting

Problem	Cause	Solution
Pressure drops, water leaks	V-sleeves leak	Replace V-sleeves, examine surface of plunger
Pressure drops, pump becomes loud	Discharge or suction valve leaks	Replace valve
	Steam formation (cavitation)	Reduce suction height, reduce flow resistance in inlet line, clean inlet filter, lower water temperature
Irregular pressure	Worn valves	Examine valves
	O-Ring on the valves or inlet valve adapter leaks	Examine O-ring, examine valve casing for unevenness on the sealing surfaces
Oil leaks at visible part of plunger	Gear sealing is leaky	Examine seals and running surface of plunger
Dirty mile-colored frothy oil	Oil has mixed with water	Replace oil immediately, find and fix the cause
Oil leakage on the crankshaft	Shaft seal ring leaks	Check seal and shaft
Noise increases without loss of pressure	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

GP8135 and GP8140 Pump 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

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

Performance Under Pressure

09/24 GP8135_GP8140.INDD