

MODEL GP8155-R WITH INTEGRAL GEARBOX 180° REVERSE

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. For portable pressure washers and self-service car wash applications, the discharge manifolds will never fail, period. If they ever fail, we will replace them free of charge. Our other pump parts, used in portable pressure washers and in car wash applications, are warranted for five years from the date of shipment for all pumps used in NON-SALINE, clean water applications.
2. One (1) year from the date of shipment for all other Giant industrial and consumer pumps.
3. Six (6) months from the date of shipment for all rebuilt pumps.
4. Ninety (90) days from the date of shipment for all Giant accessories.

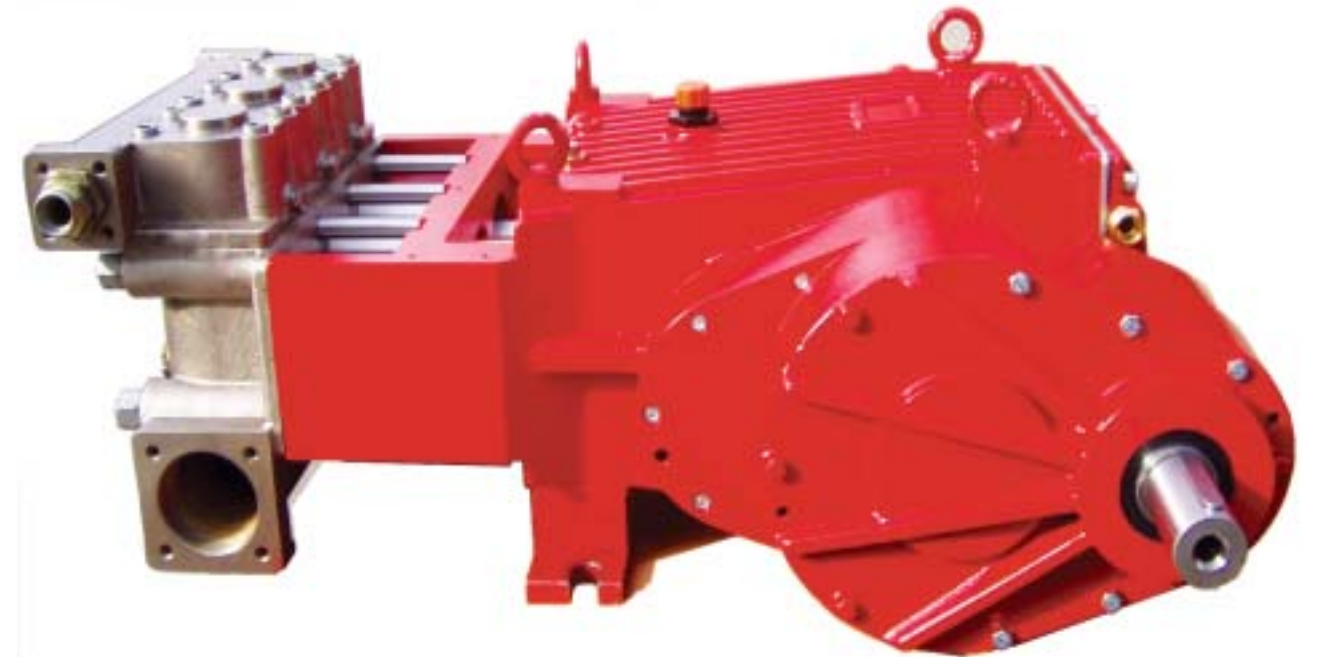
This warranty is limited to repair or replacement of pumps and accessories of which the manufacturer's evaluation shows were defective at the time of shipment by the manufacturer. The following items are NOT covered or will void the warranty:

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.



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Updated 4/08

INSTALLATION INSTRUCTIONS

Installation of the Giant Industries, Inc., pump is not a complicated procedure, but there are some basic steps common to all pumps. The following information is to be considered as a general outline for installation. If you have unique requirements, please contact Giant Industries, Inc. or your local distributor for assistance.

1. The pump should be installed flat on a base to a maximum of a 15 degree angle of inclination to ensure optimum lubrication.
2. The inlet to the pump should be sized for the flow rate of the pump with no unnecessary restrictions that can cause cavitation. Teflon tape should be used to seal all joints. If these pumps are to be operated at temperatures in excess of 86° F, it is important to insure a positive head to the pump to prevent cavitation.
3. The discharge plumbing from the pump should be properly sized to the flow rate to prevent line pressure loss to the work area. It is essential to provide a safety bypass valve between the pump and the work area to protect the pump from pressure spikes in the event of a blockage or the use of a shut-off gun.
4. Use of a dampener is necessary to minimize pulsation at drive elements, plumbing, connections, and other system areas. The use of a dampener with Giant Industries, Inc. pumps is optional, although recommended by Giant Industries, Inc. to further reduce system pulsation. Dampeners can also reduce the severity of pressure spikes that occur in systems using a shut-off gun. A dampener must be positioned downstream from the unloader.

IMPORTANT OPERATING CONDITIONS

Failure to comply with any of these conditions invalidates the warranty

1. Prior to initial operation, add oil to crankcase so that oil level is between the two lines on the oil dipstick. DO NOT OVERFILL.
Use Industrial synthetic gear lube oil (ISO VG 220), such as Mobil Gear 630, Shell Omala oil 220 or Texaco Meropa 220.
Crankcase oil should be changed after the first 50 hours of operation, then at regular intervals of 200 hours or less depending on operating conditions.
- Run pump for one (1) min at ZERO PSI before operating under pressure.
2. Pump operation must not exceed rated pressure, volume, or RPM. A pressure relief device must be installed in the discharge of the system.
3. Acids, alkalines, or abrasive fluids cannot be pumped unless approval in writing is obtained before operation from Giant Industries, Inc. Pump fluid should be filtered to 300 micron.

5. Crankshaft rotation on Giant Industries, Inc. pumps should be made in the direction designated by the arrows on the pump crankcase. Reverse rotation may be safely achieved by following a few guidelines available upon request from Giant Industries, Inc. Required horsepower for system operation can be obtained from the charts on page 3.

6. Before beginning operation of your pumping system, remember: Check that the crankcase and seal areas have been properly lubricated per recommended schedules. Do not run the pump dry for extended periods of time. Cavitation will result in severe damage. Always remember to check that all plumbing valves are open and that pumped media can flow freely to the inlet of the pump.

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).

Finally, remember that high pressure operation in a pump system has many advantages. But, if it is used carelessly and without regard to its potential hazard, it can cause serious injury.

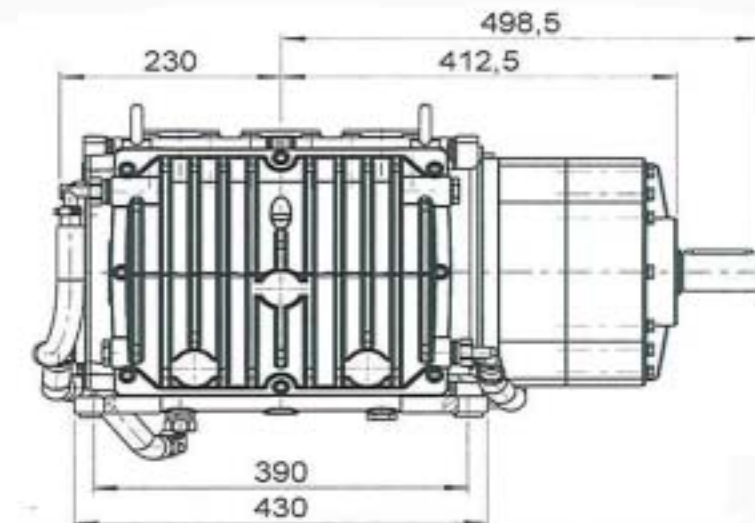
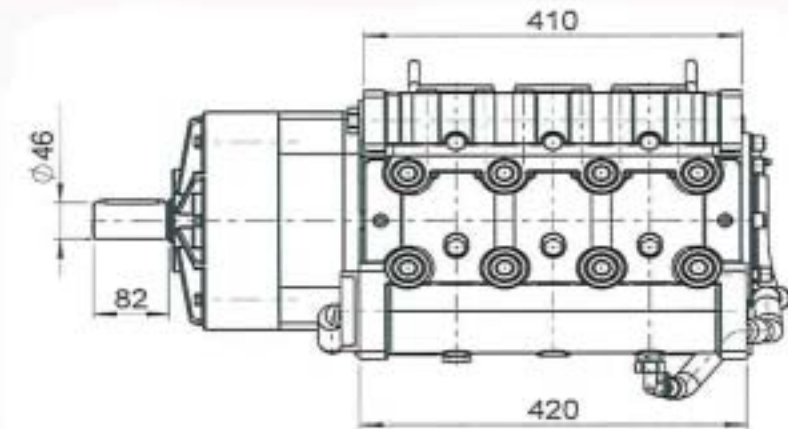
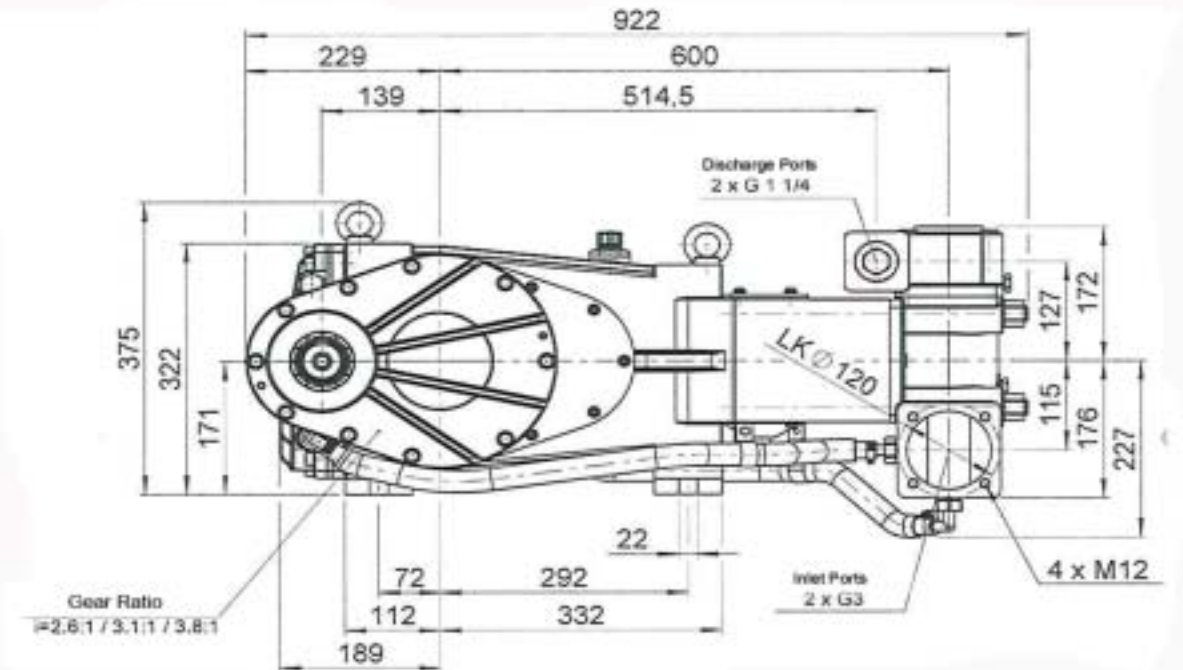
4. Run the pump dry approximately 10 seconds to drain the water before exposure to freezing temperatures.
5. **Important!** The pump and cooling system must be emptied if there is a danger of frost. Note that travel wind, for example, can cause water in pumps fitted on open vehicles to freeze even if the outside temperature is above freezing point.

6. Inlet pressure not to exceed 29 PSI when using the integrated oil cooling system. If using a separate cooling system (max. 29 PSI), the inlet pressure can be a maximum of 145 PSI.

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) should be checked after approximately 200 operating hours. Please see page 7 for torque values.

GP8155-R -- DIMENSIONS - (mm)



GP8155-R PUMP REPAIR INSTRUCTIONS

- 15) Replace seal retainer (33), seal (32) and clip ring (33B). Seal (32) must always be installed so the seal lip on the inside diameter faces the oil. Possible axial float of the seal retainer (33) to be compensated with shims (33C). Re-assemble the seal sleeves (39) and plunger pipes (36B). Tighten the tension screw (36C) to 30 Ft-lbs. Replace valve casing and tighten hexagon
- 16) 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.

Heat ball bearings (74 and 75) first before pressing them on to the pinion. Press the cogwheel slightly on to the crankshaft so that the pinion (69) together with the ebaring (74) can 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 fitting disc (69) and secure screw (72) with Loctite. Fit the seal (76) on to the cylindrical pins (68).

Push the gear cover (66) carefully onto the bearing (75). Make sure that the radial shaft seal (73) does not get damaged during fitting onto the pinion.

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.

Specifications Model GP8155-R

	U.S.	(Metric)
Volume	Up to 74.8 GPM	(283 LPM)
Discharge Pressure	Up to 2900 PSI	(200 bar)
Speed	Up to 580 RPM	580 RPM
Inlet Pressure	Up to 29 PSI	(2.0 bar)
Plunger Diameter	2.17"	55mm
Plunger Stroke	2.83"	72mm
Crankshaft Diameter	2.76"	70mm
Key Width	0.55"	14mm
Crankshaft Mounting	Either side	
Shaft Rotation	Top of pulley	
.....	Towards manifold	
Temperature of Pumped Fluids	Up to 86 °F	(30 °C)
Inlet Ports	(2) 3" BSP	
Discharge Ports	(2) 1-1/4" BSP	
Weight	794 lbs.	(360kg)
Crankcase Oil Capacity	3.7 Gal.	(14.0 liters)
Fluid End Material	Nickle plated Spheroidal Cast Iron	

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.

GP8155-R HORSEPOWER REQUIREMENTS					
RPM	GPM	500 PSI	1000 PSI	2000 PSI	3000 PSI
300	38.7	13.3	26.7	53.4	80.1
400	51.6	17.8	35.6	71.2	106.8
500	64.5	22.2	44.5	89.0	133.4
580	74.8	25.8	51.6	103.2	154.8

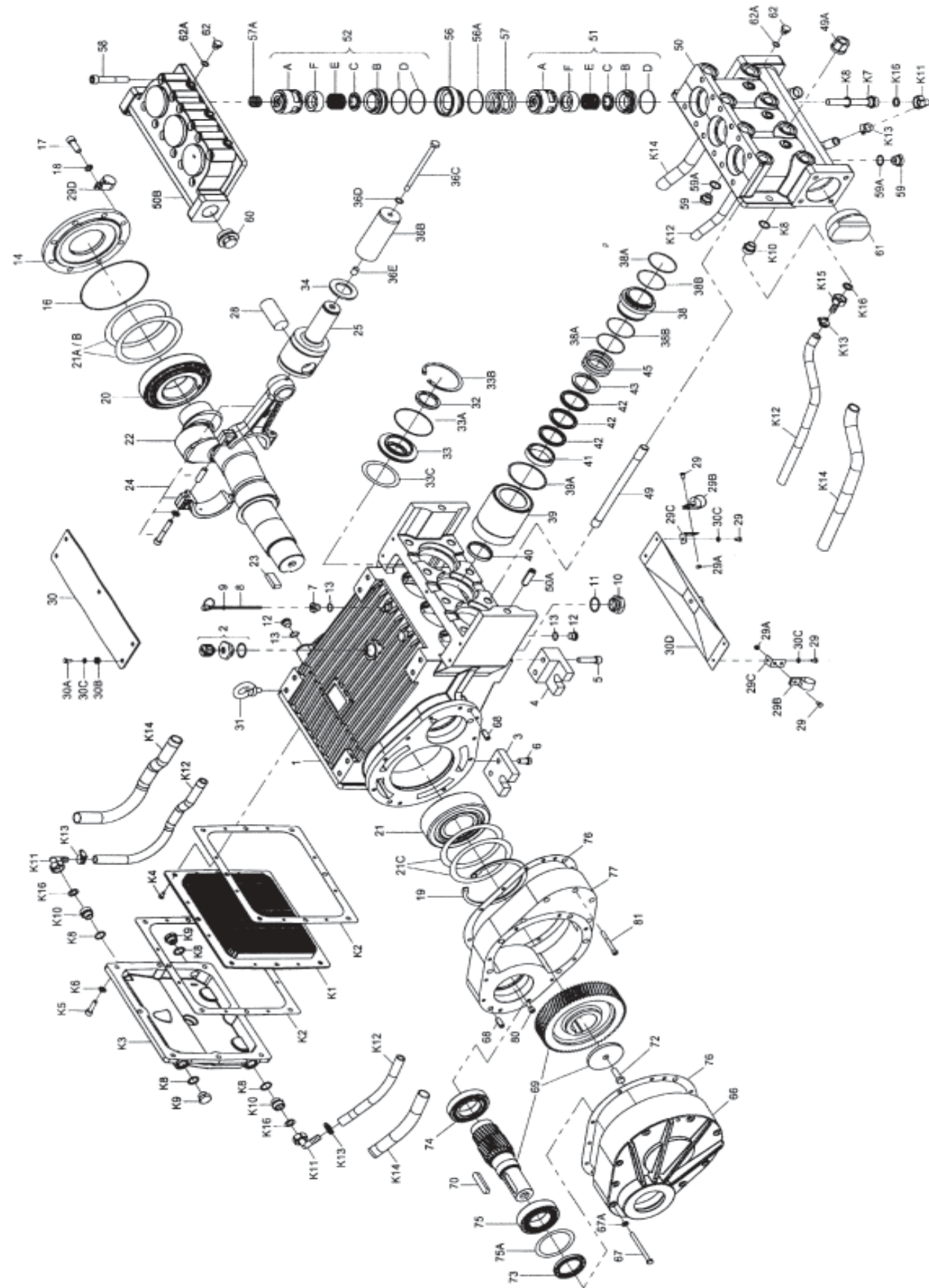
SPECIAL NOTE:
The theoretical gallons per revolution (gal/rev) is 0.129.
To find specific outputs at various RPM, use the formula:

$$\text{GPM} = 0.129 \times \text{RPM}$$

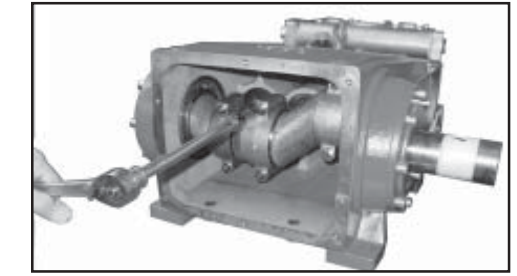
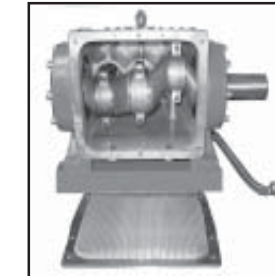
HORSEPOWER RATINGS:
The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

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:

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



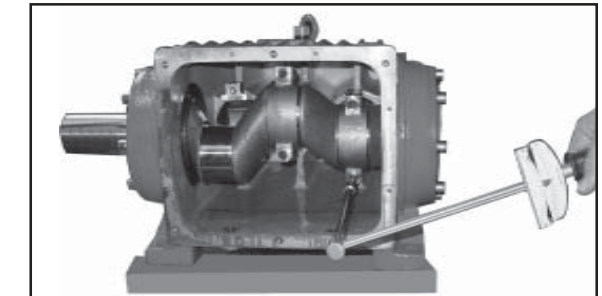
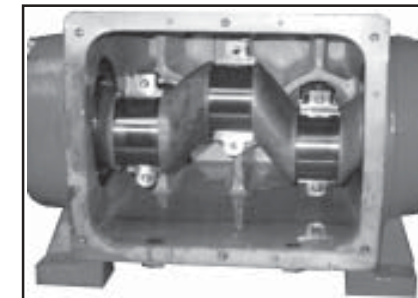
To Dismantle Crankcase Gear



11) Take out plungers and seal sleeves as described above. Drain the oil by taking off the plug (12). After removing the clip ring (33B), lever out the seal retainer (33) and seal (32) with a screwdriver. Open hose adapter (K11) and remove gear cover (K3) by removing the socket head cap screws (K5). Remove the cooling vane plate (K1) by removing the screws (K4)

12) Remove the connecting rod screws (24).

Important! Connecting rods are marked 1 to 3 for identification. Do not rotate connecting rod halves or interchange them. When re-assembling, the connecting rod must be fitted in their exact original position on the crankshaft journals.

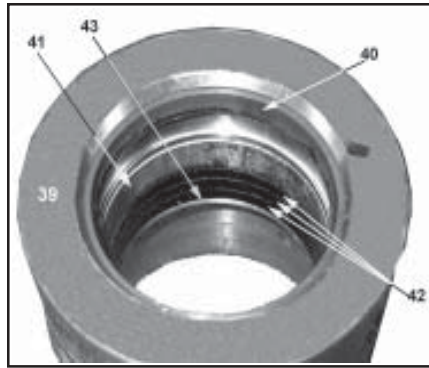


13) Push connecting rod halves together with the crosshead as far as possible into the crosshead guide. Remove bearing cover (14). Begin dismantling of the reduction gear by removing screws (67). Press off gear cover (66) by screwing two screws into both threaded bores. Remove screw (72) and take off fitting disc (69). Remove cogwheel from shaft with a removal tool and take the crankshaft out of the crankcase by gently tapping it with a rubber mallet. Remove connecting rod (24) and crosshead (25) from crankcase. Remember that this assembly must be re-assembled exactly as it was removed. Check surfaces on connecting rods (24), crankshaft (22) and crosshead (25). Check the surfaces of the crosshead guides in the crankcase for any unevenness.

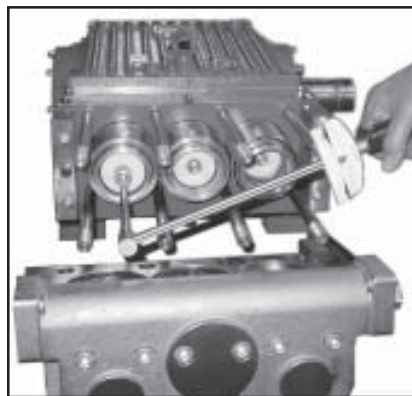
14) Reassemble in reverse order. Replace the connecting rod and crosshead exactly as they were removed. Press the bearing ring (21) past the clip ring groove. Replace the shims (21C). Snap in the clip ring (19) and insert crankshaft from other side, then press in the roller bearing (20). Mount bearing cover (14) and tighten screws (17) to 64 Ft-lbs. Adjust axial play (clearance) on the crankshaft to minimum 0.1mm / 0.15mm using shims (21A/B). Connecting rods must sit exactly in the middle of the crankshaft journal. Mount connecting rod halves in the exact, original position and tighten to 37 Ft-lbs. The shaft should turn easily.

Important! Connecting rods must be able to move slightly sideways on the stroke journals.

GP8155-R PUMP REPAIR INSTRUCTIONS

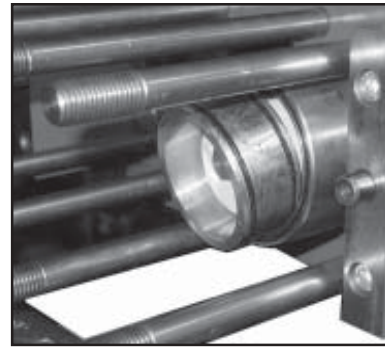


7) **Important!** Be careful not to damage the seal sleeve (39) and pressure ring (41). Check the inner diameter of the pressure ring for wear and if necessary replace together with seals (40) and (42). Clean all parts. New parts should be lightly coated with silicon grease before installation. Insert 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.



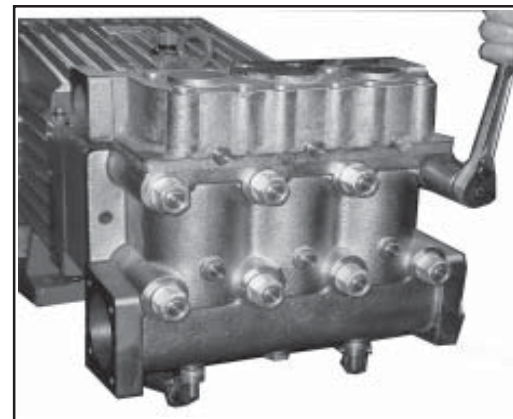
9) Coat the seal sleeve(39) lightly with anti-corrosive grease (e.g. molycote no.Cu-7439) in its fitted area towards the crankcase. Insert the seal sleeves in to their crankcase fittings. Coat the threads of the tension screw (36C) lightly with thread glue and insert it together with a new copper ring (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.

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 266 Ft.-lbs.

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.

Parts List - GP8155-R

Item	Part	Description	Qty	Item	Part	Description	Qty
1	05410	Crankcase	1	50A	13162	Centering Stud	2
2	06893	Oil Filler Plug Assy with Vent	1	50B	05075	Discharge Casing	1
3	05411	Rear Foot for Crankcase	2	51	05076	Suction Valve Assy.	3
4	05412	Front Foot for Crankcase	2	51A	05077	Spring Tension Cap	3
5	05413	Hexagon Socket Screw	4	51B	05078	Suction Valve Seat	3
6	05414	Hexagon Socket Screw	4	51C	05079	Valve Plate	3
7	05381	Plug 3/8 for Oil Dipstick	1	51D	07658	O-Ring	3
8	05035	Oil Dipstick Assy	1	51E	05080	Valve Spring	3
9	01009	O-Ring	1	51F	05081	Valve Spring Guide	3
10	05415	Plug M33*1.5	1	52	05082	Discharge Valve Assy	3
11	07102	O-Ring	1	52A	05077	Spring Tension Cap	3
12	06273	Plug G3/8	3	52B	05084	Discharge Valve Seat	3
13	22929	Copper Washer	4	52C	05079	Valve Plate	3
14	05036	Bearing Cover Closed	1	52D	06258	O-Ring	6
16	05037	O-Ring	1	52E	05080	Valve Spring	3
17	05038	Hexagon Socket Screw M12	8	52F	05081	Valve Spring Guide	3
18	05039	Spring Ring	8	56	05085	Discharge Valve Adaptor	3
19	05124	Clip Ring	1	56A	06258	O-Ring	3
20	05416	Tapered Roller Bearing	1	57	05086	Pressure Spring	3
21	05417	Tapered Roller Bearing	1	57A	07210-0100	Pressure Spring	3
21A	05042	Fitting Disc	3	58	05087	Hexagon Socket Screw	12
21B	05043	Fitting Disc	3	59	07109	Plug G1/2	2
21C	05113	Fitting Disc	3	59A	06272	Copper Seal	2
22	05418	Crankshaft For Turned Gear	1	60	06909	Plug G1 1/4	1
23	05419	Fitting Key	1	61	05088	Plug G3	1
24	05047	Conn-rod Assy	3	62	05302	Plug G1/4	6
25	05048	Crosshead c/w Plunger	3	62A	06934	Copper Gasket	6
28	05049	Crosshead Pin	3	66	05423	Gear Cover	1
29	05051	Hexagon Screw	6	67	05424	Hexagon Screw	10
29A	07408	Hexagon Nut	2	67A	07274	Washer	10
29B	05420	Bracket 2 for Cooling Hose	2	68	05425	Cylinder Pin	4
29C	05421	Support Clamp	2	69	05426	Gear Wheel Set (2200 RPM=3.8)	1
29D	05422	Bracket 1 for Cooling Hose	1	70	07614	Fitting Key	1
30	05052	Cover Plate	1	72	05427	Hexagon Screw	1
30A	07225-0100	Hexagon Screw	5	73	05428	Shaft Seal Ring for Gear	1
30B	13136	Grommet	5	74	05429	Roller Bearing	1
30C	08280	Washer	9	75	05430	Roller Bearing	1
30D	05050	Splash Cover	1	75A	05431	Fitting Disc	1
31	07623	Eye Bolt	4	76	05432	Gear Seal	2
32	05058	Radial Shaft Seal	3	77	05433	Flange c/w Gear	1
33	05055	Seal Retainer	3	78	05025	Oil Cooler	1
33A	05056	O-Ring	3	79	07662	Mounting Aid for Valve	1
33B	05054	Clip Ring	3	80	07544	Hexagon Socket Screw M8	1
33C	05059	Fitting Disc	3	81	05434	Hexagon Socket Screw	9
34	05060	Oil Shield	3	K1	05026	Cooling Vane Plate	1
36B	05280	Plunger Pipe	3	K2	05027	Seal for Gear Cover	2
36C	05062	Tension Screw	3	K3	05028	Gear Cover	1
36D	07665	Copper Washer	3	K4	05029	Hexagon Hd Cntrsnc Screw	8
36E	06900	Centering Sleeve	3	K5	07381	Hexagon Socket Screw	8
38	05283	Seal Case	3	K6	08041	Washer	8
38A	13286	O-Ring	6	K7	05030	Connection for Oil Cooler	1
38B	05281	Support Ring	6	K8	06272	Copper Seal	6
39	05275	Seal Sleeve	3	K9	07109	Plug G1/2	2
39A	05066	O-Ring	3	K10	05120	Connecting Branch	3
40	07723	Compact Ring	3	K11	05032	U-Joint Connector c/w Nut	3
41	05276	Pressure Ring	3	K12	05033	Tube for Cooler	2
42	05277	Sleeve	9	K13	05402	Hose Clamp	4
43	05278	Sleeve Support Ring	3	K14	05435	Hose Guard	2
45	05279	Seal Tension Spring	3	K15	05404	Hose Coupling Nut	1
49	05072	Stud Bolt	8	K16	05436	Flat Gasket	4
49A	05073	Hexagon Nut	8				
50	05074	Valve Casing	1				

GP8155-R PUMP REPAIR KITS

Plunger Packing Kit #09616

Item	Part #	Description	Qty.
38A	13286	O-Ring	6
39A	05066	O-Ring	6
40	07723	Seal Ring	3
42	05277	V-Sleeve	9

Oil Seal Kit - #09584

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

Inlet Valve Kit - #09587

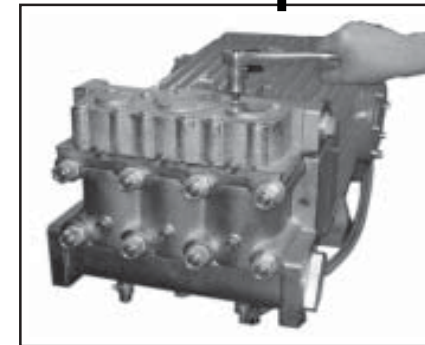
Item	Part #	Description	Qty.
51B	05078	Inlet Valve Seat	1
51C	05079	Valve Plate	1
51D	07658	O-Ring	1
51E	05080	Valve Spring	1
51F	05081	Valve Spring Guide	1
56A	06258	O-Ring	3

Discharge Valve Kit - #09588

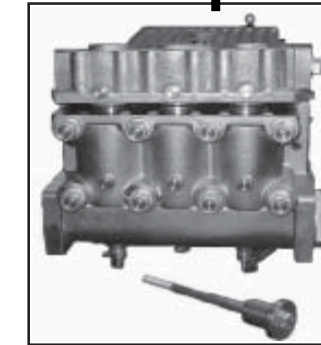
Item	Part #	Description	Qty.
52B	05084	Discharge Valve Seat	1
52C	05079	Valve Plate	1
52D/56A	06258	O-Ring	2
52E	05080	Valve Spring	1
52F	05081	Valve Spring Guide	1

GP8155-R PUMP REPAIR INSTRUCTIONS

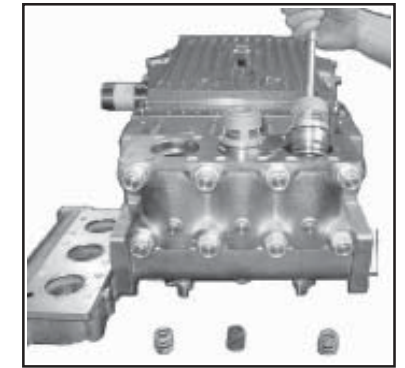
Valve Inspection and Repair



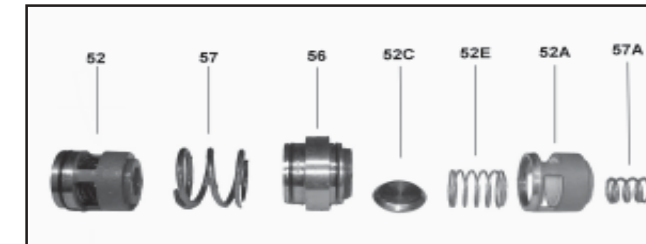
1) Remove socket head cap screws (58)



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

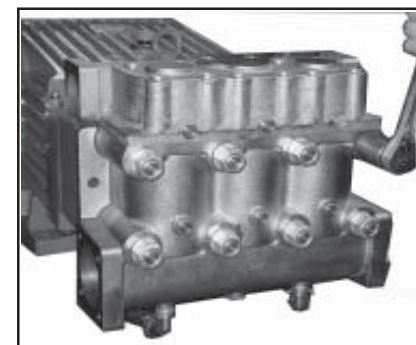


3) Take out pressure springs (57A). Pull out assembled valves (51 & 52) with valve puller.

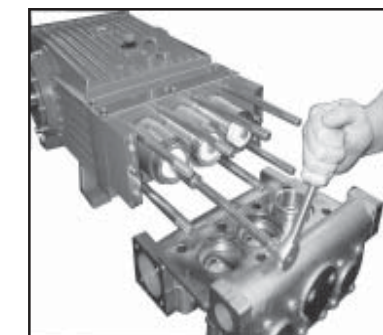


4) Remove valve assembly (52) from discharge valve adapter (56) by gently twisting apart. The spring tension cap (51A, 52A) is screwed together with the valve seat (51B or 52B). Screw off spring tension cap. Takeout springs (51E, 52E) and valve plate (51C, 52C). Check sealing surfaces and O-rings (51D, 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 133 Ft-lbs; 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.

GP8155-R 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	05076-05082	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-R 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 Steam formation (Cavitation)	Replace valve(s) 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.

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