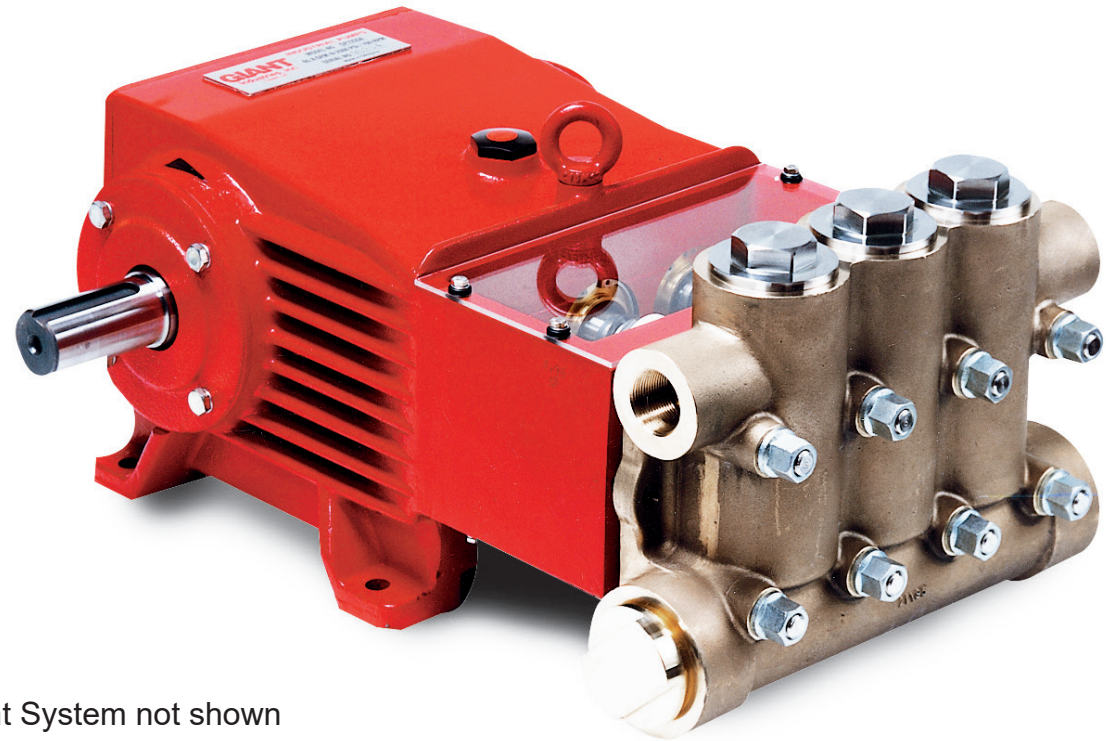
Triplex Ceramic
Plunger Pump
Operation Manual

Model
GP7155-4000HTC



Coolant System not shown

GIANT
Performance Under Pressure

Contents:

INSTALLATION INSTRUCTIONS

Required NPSH refers to water (specific weight 1kg/dm3, viscosity 1cst) at 460 rpm.

Operation and Maintenance

Check oil level prior to starting and ensure trouble-free water supply.
Oil: Use only 1.8 gallons (7.0 litres) of ISO VG 220 (e.g. Aral Degol BG220) or SAE 90 gear oil or Giant p/n 01154. We recommend ISO VG 68 (SAE80) gear oil for low ambient temperatures (+5°C and less).
Initial change after 50 operating hours and then every 1000 operating hours, or after 1 year if used less.

IMPORTANT! Should condensate (frothy oil) occur in the gear box or when operating in damp places or with high temperature fluctuations, oil must be changed immediately.
Keep NPSH under control.
Maximum input pressure 145 PSI (10 bar), maximum suction head -4.35 PSI (-0.3 bar). Make sure that suction pulsation is sufficiently dampened – water column resonance must be avoided.

⚠ Safety Rules

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 open shaft end must be covered by shaft protector (21), the driven shaft side and coupling by a protective cover.
Pressure in discharge line and in pump must be at zero before any maintenance to the pump takes place. Close up suction line. Disconnect fuses to ensure that the driving motor cannot get switched on accidently.

Make sure that 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 to avoid cavitation occurring, the pump-npshr, positive suction head and water temperature must be kept under control.

Cavitation and/or compression of gases lead to uncontrollable pressure-kicks which can ruin 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 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 manufacture and/or operator to ensure that all pertinent safety regulations are adhered to.

Supplementary Information
The Giant GP7155-4000HTC has been specially constructed for pumping hot water, to steam boilers, for example. The plunger seals (42) on the water side are made of a high temperature-resistant material. To further increase seal life, there are also rinsing chambers behind the high pressure seals through which cold water flows. The cold water connections (68) are suited to 6mm Ermeto pipe diameter. The operator can fit hose nipples instead, if wished; the threads in the seal sleeves for this purpose are 1/8” BSP.
The cold water (68 °F - 104 °F) (20°C - 40°C) can be guided into the pump from either side and flows out on the opposite side, into a drain, for example. The cold water flow rate should be at least 16.7 ounces/ min (0.5 litre/min) and must be drawn in as soon as the pump is started.If the cold water does not start flowing immediately the pump is put into operation, the ceramic plunger (36B) in particular could crack under the cold shock.

IMPORTANT! The cooling water must be delimed to avoid lime formation due to warming.

IMPORTANT! If the location of the pump does not allow for cooling, on no account are the connections in the seal sleeves (35) to be closed because this is where water from the high pressure seals has to drip out. The U-pipes (73) should be removed in this case. To ensure the seals are properly greased, the openings in the screw-in joints (68) should be used to fill the rinsing chambers with high-temperature-resistant grease by means of a grease gun.
In the case of water temperature above 194 °F (90°C), we strongly recommend the cold-water rinse.

Plant Lay-Out
For perfect functioning of the pump, the following points must be adhered to:

a) Pressure in Suction Side
The stipulated NPSHR is the minimum required pressure above the vapour pressure of the medium and is never to fall short of this figure. Temperature and vapour pressure of the medium, the geodetic height of the location, the flow rate and loss of friction in the suction line, must all be taken into consideration.It may be necessary to install a booster pump (centrifugal pump) in the suction line.

b) Pulsation
suction and discharge lines. Suction pulsation in particular must be damped in order to prevent resonance in the suction line which in turn causes cavitation. Therefore the pump is never to be connected to a rigid pipe, but instead to a flexible hose (not reinforced by steel), and if possible 1.5 to 2 times wider than the suction connection. If a booster pump is used, the hose is to be attached between the booster pump and the high pressure pump.
If several pumps are used, each pump must have its own suction line. If this cannot be done, a suction air chamber or a suction flow stabilizer must be installed in front of each pump. The bladder in the stabilizer is to be pretensioned on location.

Depending on the lay-out of the plant, a pressure accumulator may be necessary on the discharge side. This pressure accumulator must be installed directly in front of the discharge outlet of the high pressure pump. We recommend the use of only one pressure accumulator respectively in the discharge line in order to avoid irritation which could be caused by different pre-tension levels in the accumulators.

Gas tension in both the suction flow stabilizer/s and in the pressure accumulator/s should be checked regularly.

Specifications
Models GP7155-4000HTC

	U.S.	(Metric)
Volume	42.4 GPM	(160.3 LPM)
Discharge Pressure	1160 PSI	(80 bar)
Power Required	34.9 HP	26.0 kW
Speed		460 RPM
Inlet Pressure (maximum)	-4.35 to 145 PSI	(-0.3 to10 bar)
Plunger Diameter	2.17”	55mm
Plunger Stroke	2.0”	52mm
Crankshaft Diameter	1.9”	48mm
Key Width	0.6”	14mm
Crankshaft Mounting		Either side
Shaft Rotation	Top of pulley towards manifold	
Temperature of Pumped Fluids	Up to 220 °F	(105 °C)
Inlet Ports		(2) 2-1/2” BSP
Discharge Ports		(2) 1-1/4” BSP
Weight	441 lbs.	(200 kg)
Crankcase Oil Capacity	1.8 Gal.	(7.0 liter)
Fluid End Material		AISI 303 Stainless Steel
NPSHR	19.7 ft. of head	6.0 m of head

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.

PULLEY INFORMATION

Pulley selection and pump speed are based on a 1725 RPM motor and “B” section belts. When selecting desired GPM, allow for a ±5% tolerance on pumps output due to variations in pulleys, belts and motors among manufacturers.

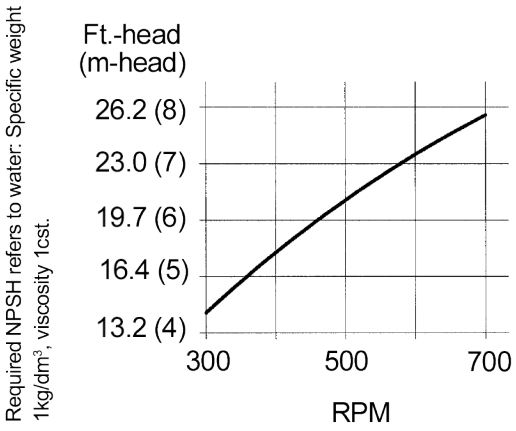
1. Select GPM required, then select appropriate motor and pump pulley from the same line.
2. The desired pressure is achieved by selecting the correct nozzle size that corresponds with the pump GPM.

HORSEPOWER INFORMATION

Horsepower ratings shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend that 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:

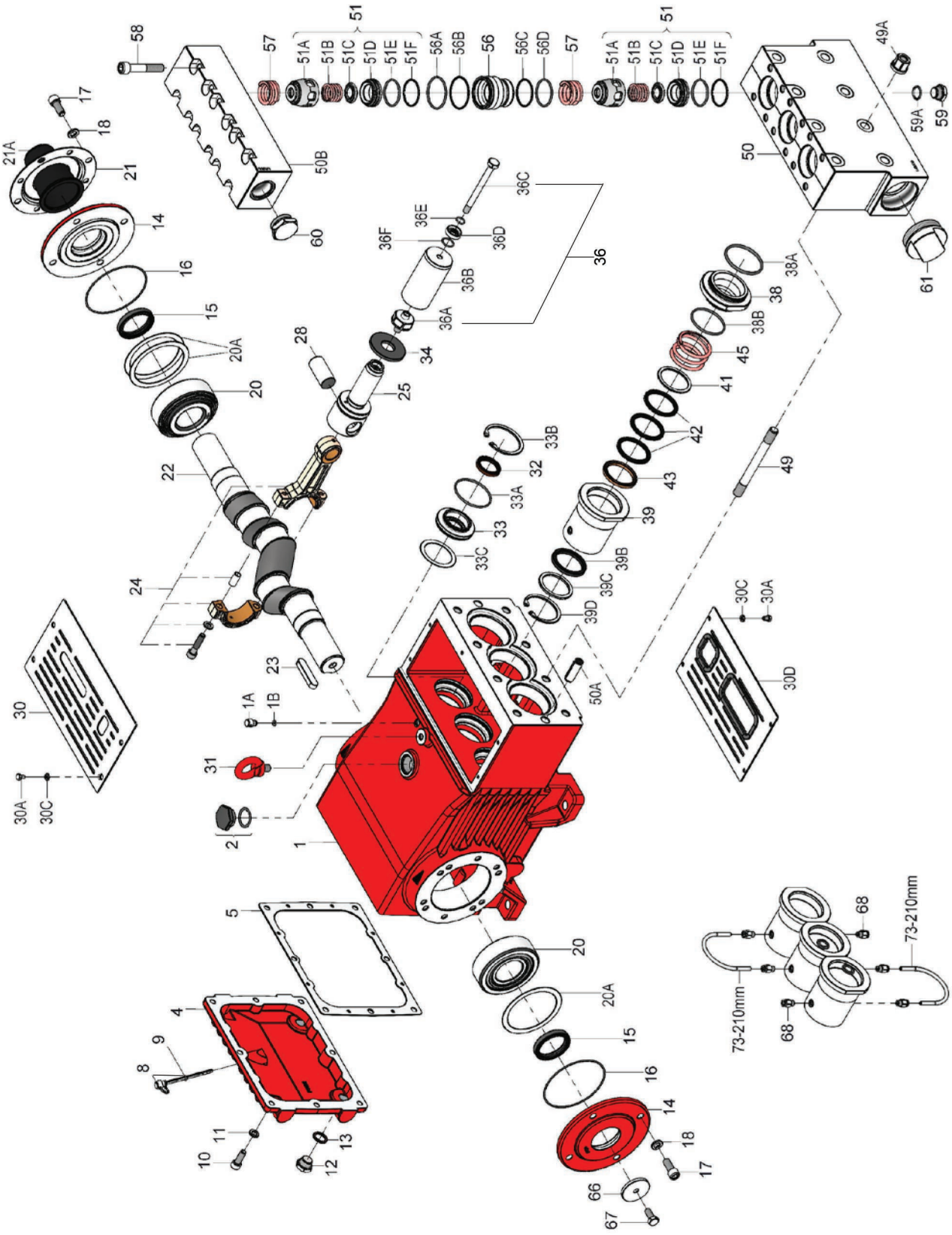
(GPM X PSI) / 1450 = HP



GP7155-4000HTC Horsepower Requirements					
RPM	**GPM**	**500 PSI**	**750 PSI**	**1000 PSI**	**1160 PSI**
200	18.4	6.3	9.5	12.7	14.7
300	27.7	9.6	14.3	19.1	22.2
400	36.9	12.7	19.1	25.4	29.5
460	42.3	14.6	21.9	29.2	33.8

Exploded View - GP7155-4000HTC

The EPDM (Buna) o-rings must not come into contact with mineral oil or mineral grease. Use silicone grease only.



PARTS LIST - GP7155-4000HTC

ITEM	PART	DESCRIPTION	QTY.
1	07600	Crankcase	1
1A	05525	Head for Oil Dipstick	1
1B	01009	O-Ring	1
2	13000	Oil Filler Plug Assembly	1
4	07601	Crankcase Cover	1
5	05798	Gasket, Crankcase Cover	1
8	07603	Oil Dip Stick Assembly	1
9	01009	O-Ring, Dip Stick	1
10	22706	Hexagon Screw	8
11	06725	Spring Washer	8
12	07109-0400	Drain Plug	2
13	06272	Gasket, Drain Plug	2
14	05644	Bearing Cover	2
15	07608	Radial Shaft Seal	2
16	07184	O-Ring	2
17	05642	Inner Hexagon Screw	8
18	05039	Spring Washer	8
20	07610	Taper Roller Bearing	2
20A	07611	Fitting Disc (Shim)	1-5
21	05645	Holder, Shaft Protector	1
21A	05646	Shaft Protector	1
22	13405	Crankshaft	1
23	07614	Key	1
24	13182	Connecting Rod Assembly	3
25	13183	Crosshead Assembly	3
28	13184	Crosshead Pin	3
30	05713	Tin Lid	1
30A	05051-0100	Hexagon Screw	8
30C	08280	Disc	8
30D	05714	Cover Plate	1
31	07623	Eye Bolt	1
32	07624	Radial Shaft Seal	3
33	06950	Seal Retainer	3
33A	07627	O-Ring	3
33B	06951	Circlip	3
33C	07249	Fitting Disc	3
34	13137	Oil Scraper	3
36	03512	Plunger Pipe Assy.(36A-D)	3
36A	07667	Plunger Connection	3
36B	07666	Plunger Pipe	3
36C	07664	Tension Screw	3
36D	03435	Steel Ring	3
36E	05871-0001	O-Ring	3
36F	06015-0001	O-Ring	3
38	05715	Seal Case	3
38A	13156-0003	O-Ring for 38	3
38B	07721-0003	O-Ring for 38	3
39	05716	Seal Sleeve	3
39B	05717	Compact Ring	3
39C	05718	Support Disc	3
39D	05719	Clip Ring	3
41	05720	Sleeve Support Ring	3
42	07711-0030	V-Sleeve	9
43	07712	Pressure Ring	3
45	05721	Pressure Spring	3
49	13159	Stud Bolt	8
49A	06958	Hexagon Nut	8
50	04782	Valve Casing	1
50A	13162	Cylinder Stud	2
50B	04783	Discharge Manifold	1
51	05759	Valve Assembly (51A-51F)	6
51A	13165	Spring Tension Cap	6
51B	07732-0100	Valve Spring	6
51C	05314	Valve Plate	6
51D	05136A	Valve Seat	6
51E	07653-0003	O-Ring	6
51F	13166	Support Ring	6
56	04784	Valve Adaptor	3
56A	07658-0003	O-Ring for 56, 58	3
56B	07635	Support Ring for 56A, 58A	3
56C	13166	Support Ring	3
56D	07653-0003	O-Ring	3
57	07173	Tension Spring	6
58	05223	Hexagon Screw	12
59	07109-0400	Plug, 1/2” BSP	2
59A	06807	Steel Ring	2
60	13151	Plug, 1-1/4” BSP	1
61	12518	Plug, 2-1/2” BSP	1
66	13362	Disc For Crankshaft	1
67	13358	Hexagon Screw	1
68	04785	Push-In Fitting	6
73	04786	Hose	1
	07662	Valve Tool (Not Shown)	1

REPAIR KITS - GP7155-4000HTC

Plunger Packing Kit - # 09700

Item	Part #	Description	Qty.
38A	13156-0003	O-Ring	3
38B	07721-0003	O-Ring	3
39B	05717	Compact Ring	3
42	07711-0030	V-Sleeve	9

Oil Seal Kit - # 09221

Item	Part #	Description	Qty.
32	07624	Radial Shaft Seal	3
33A	07627	O-Ring	3

Valve Assembly Kit - # 09604A-4000

Item	Part #	Description	Qty.
51B	07732-0100	Valve Spring	6
51C	05314	Valve Plate	6
51D	05136A	Valve Seat	6
51E	07653-0003	O-Ring	6
51F	13166	Support Ring	6
56A	07658-0003	O-Ring	3
56B	07635	Support Ring	3
56C	13166	Support Ring	3
56D	07653-0003	O-Ring	3

GP7155-4000HTC TORQUE SPECIFICATIONS					
Position	**Item**	**Description**	**Thread**	**Lubrication Info**	**Torque Amount**
10	22706	Hexagon Screw	M10		33 ft.-lbs. (45 Nm)
12	07109-4000	Drain Plug	1/2” BSP		59 ft.-lbs.(80 Nm)
15	07608	Radial Shaft Seal		Loctite 403	
17	05642	Inner Hexagon Screw	M12		33 ft.-lbs. (45 Nm)
24	13182	Connecting Rod Assembly	M10		30 ft.-lbs. (40 Nm)
32	07624	Radial Shaft Seal		Loctite 403	
36A	07667	Plunger Connection			33 ft.-lbs. (45 Nm)
36C	07664	Tension Screw	M10		30 ft.-lbs. (40 Nm)
39	05716	Seal Sleeve		Copper Paste Crankcase Side	
49	13159	Stud Bolt		Loctite 648 Crankcase Side	
49A	06958	Hexagon Nut	M16		133 ft.-lbs. (180 Nm)
58	05223	Plug	M14	Anti-Seize 350	103 ft.-lbs. (140 Nm)

Preventative Maintenance Check List & Recommended Spare Parts List

Check	Daily	Weekly	50 hrs	Every 500 hrs	Every 1500 hrs	Every 3000 hrs
Oil Level/Quality	X					
Oil Leaks	X					
Water Leaks	X					
Belts, Pulley		X				
Plumbing		X				
	Recommended Spare Parts					
Oil Change p/n 01154			X	X		
Plunger Packing Kit (1 kit/pump)					X	
Oil Seal Kit (1 kit/pump)					X	
Valve Kit (1 kit/pump)						X

GP7155-4000HTC Repair Instructions

MAINTENANCE

To Check Valves

Remove screws (58), take out tension spring (57). Remove the complete valve assemblies (51) with either a valve tool (07662) or an M16 hexagon screw. Remove valve adaptor (56) and tension spring (57) with pull-out tool size 5.
To dismantle valves: remove valve seat (51D) out of spring tension cap (51A).
Check sealing surfaces and replace worn parts. Check o-rings (51E) and support rings (51F).
Tighten screws (58) at 103 ft.-lbs. (140 Nm).

To Check Seals and Plunger Pipe

Remove U-pipes (73), take screw-in joints (68) out of seal sleeves (39).
Remove nuts (49A) and remove pump head (50). Separate plunger connection (36A) from crosshead (25) by means of an open-end wrench (size 36). Pull seal sleeves (39) out of their fittings in the crankcase.
Seal case (38) should remain in the valve casing (50); examine o-rings (38/38B).
Take seals (42) out of seal sleeves (39) and examine them. Check plunger unit (36A-36D).
Using a suitable pliers, take clip ring (39D) out of seal sleeve (39); remove and examine seal (39B).
Replace worn parts. Be careful to note sequence of installation.

IMPORTANT! Do **not** use grease when replacing high pressure plunger seals (42).
Hot water causes grease to wash off the seal which in turn can jam valves.
The new seals and O-rings should only be lightly oiled before installation.

When replacing plunger pipe (36B), tighten tension screws (36C) at 30 ft.-lbs. (40 Nm).
When reassembling, tighten plunger connection (36A) at 33 ft.-lbs. (45 Nm).

IMPORTANT! The 3 plungers connections (36A) must not be removed as long as the valve casing (50) is mounted; otherwise, the tension screw (36C) could hit against the spacer pipe (51E) (when the pump is being turned).

Mounting Valve Casing:

Check O-rings on seal case (38).
Clean the mounting surfaces of seal sleeves (39) in the drive and sealing surfaces of valve casing (50).
Push valve casing carefully onto the seal case (38), o-rings (38A/38B) and centring studs (50A). Tighten nuts (49A) at 133 ft.-lbs. (180 Nm).

To Dismantle Gear

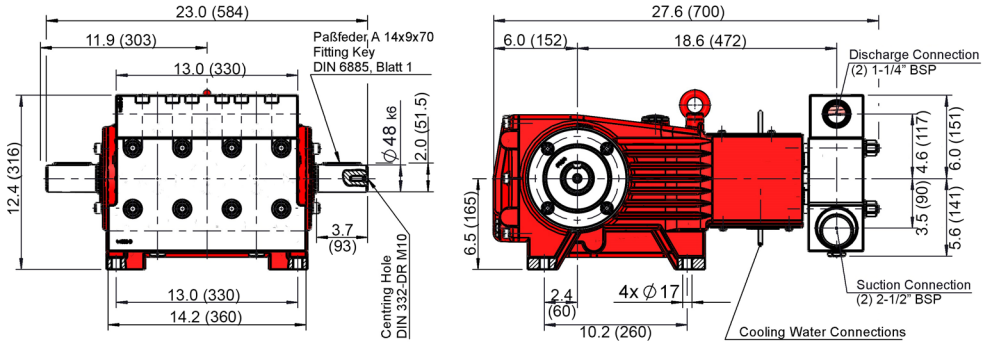
Take out plunger and seal sleeves as described above. Drain oil.
After removing the circlip ring (33B), remove out seal retainer (33) with a screwdriver. Check seals (32, 33A) and surfaces of crosshead (25).
Possible axial float of the seal adaptor (33) to be compensated with shims (33C).
Remove crankcase cover (4). Loosen screws on the connecting rods (24).

IMPORTANT! Connecting rods are marked for identification. Do not twist connecting rod halves. Connecting rods are to be reinstalled in the same position on shaft journals.

Push connecting rod halves together with the crosshead as far as possible in to the crosshead guide.
Take out bearing cover (14) on one side and push out crankshaft (22) taking particular care not to bend the connecting rods (24).
Check surfaces of connecting rods (24) and crankshaft (22).
Reassemble in reverse order. Adjust axial play (clearance) on the crankshaft to minimum 0.1mm / maximum 0.15mm by means of shims (20A). Shaft should turn easily with little clearance.
Tighten screws (24) at 30 ft.-lbs. (40 Nm).

IMPORTANT! Connecting rods must be able to be slightly moved sidewises at the stroke journals.

GP7155-4000HTC 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
Performance Under Pressure

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