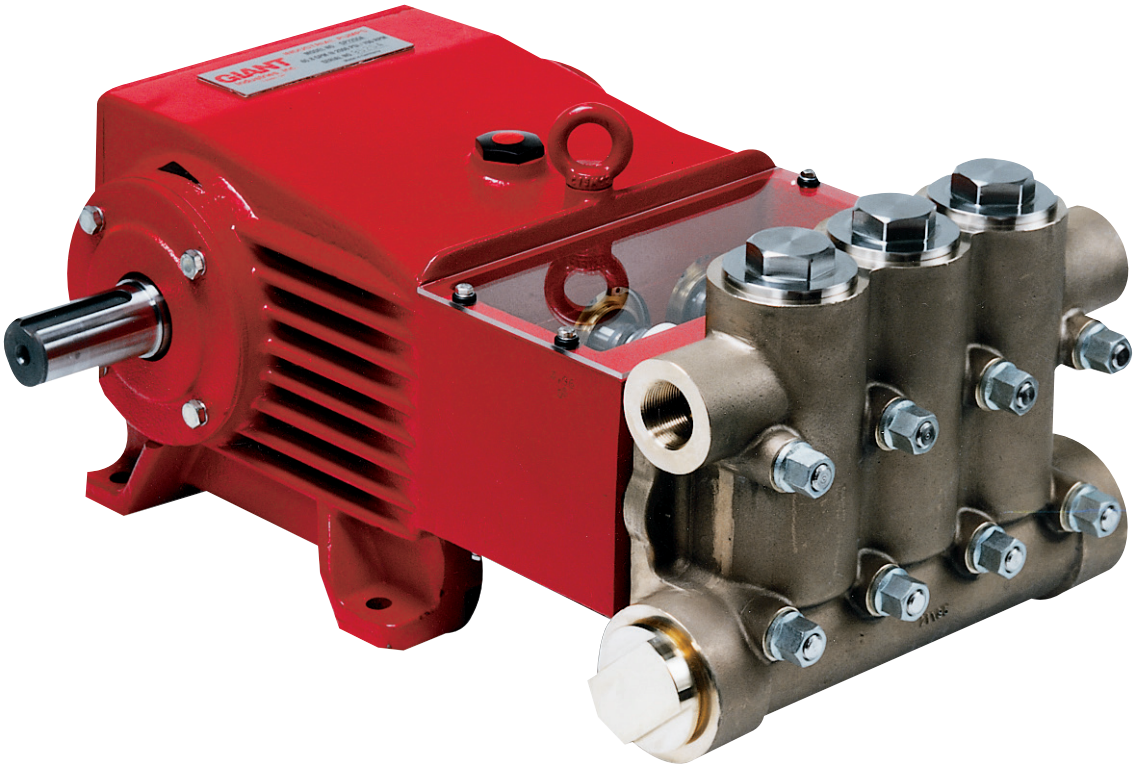
Model

GP7142HTC

Triplex Ceramic Plunger Pump Operation Manual



Coolant System not shown

GIANT
Performance Under Pressure

Contents:

INSTALLATION INSTRUCTIONS

Operation and Maintenance

Check oil level prior to starting and ensure trouble-free water supply.

Oil: Use only 1.8 gal. (7.0 L) SAE 80W-90 Industrial Gear Lube Oil (Giant's p/n 01154).

Initial oil changed after 50 operating hours and then every 500 operating hours, or after 1 year if used less.

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.

Keep NPSH under control.

Max. input pressure 145 PSI (10 bar), max. suction head -4.35 PSI (-0.3) bar.

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 shaft end must be covered by shaft protector (21), the driven shaft side and coupling by a protective
cover.

Pressure in the discharge line and in the pump must be at zero before any maintenance to the pump takes place. Close off suction line. Disconnect fuses to ensure that the driving motor cannot get switched on accidentally.

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 prevent cavitation occurring, the pump positive suction head (npshr) and water temperature must be respected.

Cavitation and/or compression of gases lead to uncontrollable pressure spikes which can ruin pump and unit parts and also be dangerous to the operator and 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 flammable, explosive and toxic media - Giant must be consulted with regard to the resistance of the pump material. It is the responsibility of the equipment manufacturer and/or operator to ensure that all pertinent safety regulations are adhered to.

Supplementary Information

The Giant Pump 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 - 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 0.13 GPM (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 vapor pressure of the medium and is never to fall short of this figure .Temperature and vapor 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
Due to its construction, the plunger pump creates pulsation in the 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
Model GP7142HTC

	U.S.	(Metric)
Volume*	25.1 GPM	(95 LPM)
Discharge Pressure*	1160 PSI	(80 bar)
Speed		460 RPM
Power Required	20.1 BHP	15.0 kW
Inlet Pressure (maximum)	-4.35 to 145 PSI	(-0.3 to 10 bar)
Plunger Diameter	1.7”	42mm
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*	221 °F	(105 °C)
Inlet Ports		(2) 2-1/2” BSP
Discharge Ports		(2) 1-1/4” BSP
Weight	375 lbs.	(170 kg)
Crankcase Oil Capacity	1.8 Gal.	(7.0 liter)
Fluid End Material		Stainless Steel

*For continuous duty and/or with fluid temperature above 104°F (40°C), reduce pressure and flow by 10%

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.

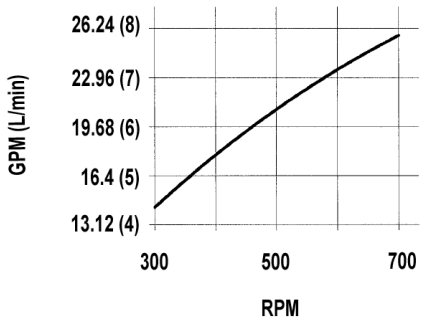
HORSEPOWER INFORMATION

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:

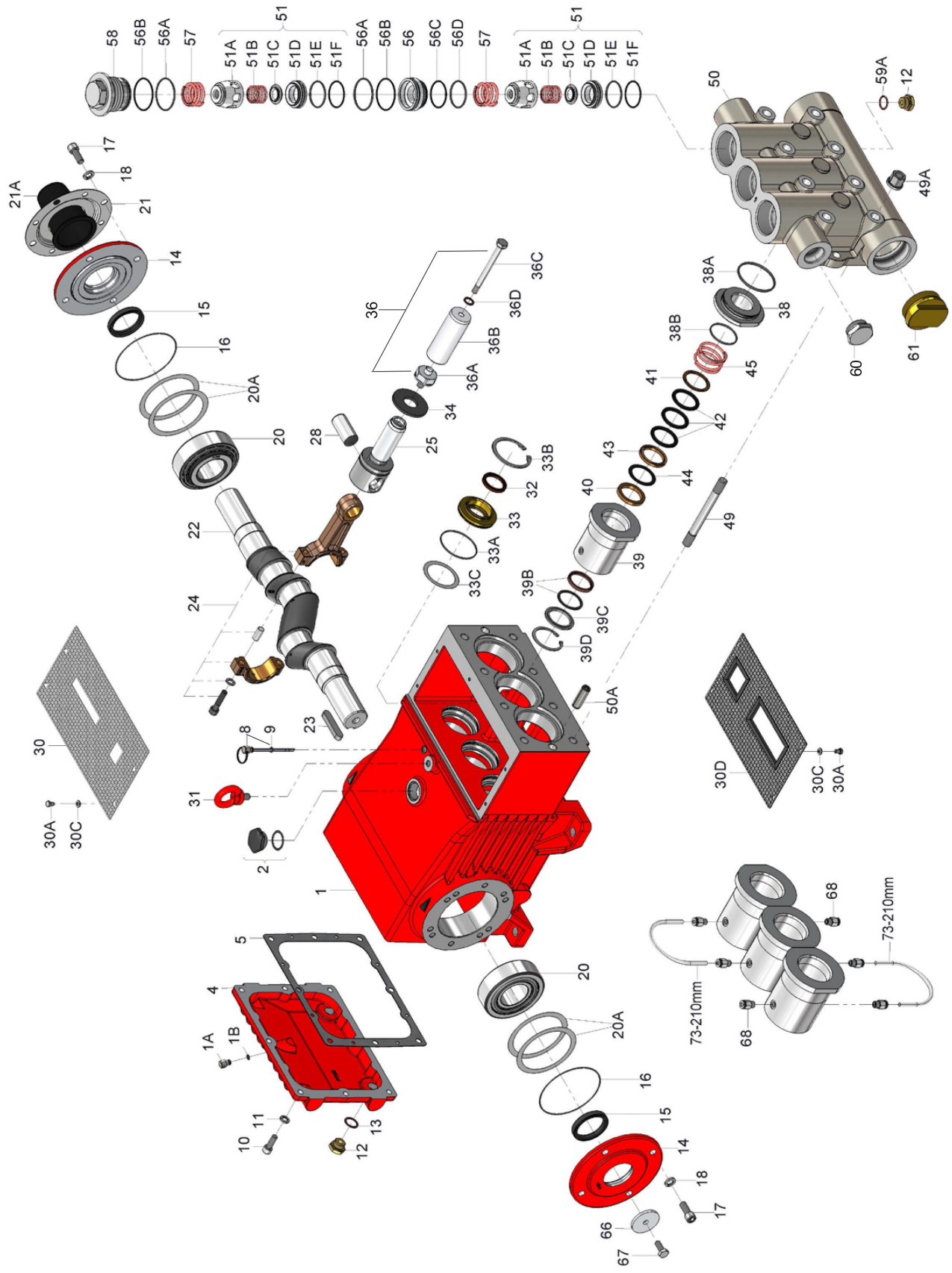
(GPM X PSI) / 1450 = HP

Required NPSH refers to water: Specific weight 1kg/dm³, viscosity 1cst.



GP7142HTC HORSEPOWER REQUIREMENTS					
RPM	GPM	250 PSI	500 PSI	750 PSI	1160 PSI
230	12.6	2.2	4.4	6.5	10.1
300	16.4	2.8	5.7	8.5	13.1
400	21.8	3.8	7.5	11.3	17.4
460	25.1	4.3	8.7	13.0	20.1

Exploded View - GP7142HTC



PARTS LIST - GP7142HTC

ITEM	PART	DESCRIPTION	QTY.
1	07600	Crankcase	1
1A	05525	Head of 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	Drain Plug	3
13	07182	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	Shaft Guard Holder	1
21A	05646	Shaft Guard	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	05053	Washer	8
30D	05714	Tin Lid	1
31	07623	Eye Bolt	1
32	07624	Radial Shaft Seal	3
33	07626	Seal Retainer	3
33A	07627	O-Ring	3
33B	07628	Circlip for 33	3
33C	07249	Shim	3
34	13137	Oil Scraper	3
36	04316	Plunger Pipe Assy., (36 A-D)	3
36A	07667	Plunger Connection	3
36B	04317	Plunger Pipe	3
36C	07664	Tension Screw	3
36D	07665	Steel Ring	3
38	04321-0100	Seal Case	3
38A	13156	O-Ring	3
38B	04779	O-Ring	3
39	04791	Seal Sleeve	3
39B	04780	Seal Pack	3
39C	04781	Support Disc	3
39D	05474	Clip Ring	3
40	04775	Guide Ring	3
41	07746	Seal Support Ring	3
42	04776	V-Sleeve	9
43	07744	Pressure Ring	3
44	03518	Support Ring	3
45	13297	Tension Spring	3
49	13159	Stud Bolt	8
49A	13160	Hexagon Nut	8
50	05758	Valve Casing	1
50A	13162	Cylinder Stud	2
51	05759	Valve Assembly	6
51A	13165A	Spacer Pipe	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	13167	Valve Adaptor	3
56A	07658-0003	O-Ring	6
56B	07635	Support Ring	6
56C	13166	Support Ring	3
56D	07653-0003	O-Ring	3
57	13173	Tension Spring	6
58	13170	Plug, M6 x 2	3
59A	07661	Copper Ring	1
60	13151	Plug, 1-1/4” BSP	1
61	13171	Plug, 2-1/2” BSP	1
66	13362	Disc For Crankshaft	1
67	13358	Hexagon Screw	1
68	04785	Push-In Connector	6
73	04786	Hose	1
	07662	Valve Removal Tool (not shown)	1

REPAIR KITS - GP7142HTC

Plunger Packing Kit

#09860

Item	Part#	Description	Qty.
38A	13156	O-Ring	3
38B	04779	O-Ring	3
39B	04780	Seal Pack	3
42	04776	V-Sleeve	9
43	07744	Pressure Ring	3

Oil Seal Kit

09221

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

Valve Repair Kit

#09806

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	6
56B	07635	Support Ring	6
56C	13166	Support Ring	3
56D	07653-0003	O-Ring	3

GP7142HTC REPAIR INSTRUCTIONS

To Check Valves

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

To Check Seals and Plunger Pipe

Loosen nuts (49A) and remove pump head. 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. Take seal case (38) out of seal sleeve (39).
Examine plunger parts (36A-36D), seals (42,39B) and o-rings (38A,38B).
When replacing plunger pipe (36B), tighten tension screws (36C) to 29.5 ft.-lbs. (40 Nm).
Replace worn parts: grease seals with Silicone before installing.

Important! Don't loosen the 3 plungers connections (36A) before the valve casing has been removed otherwise the tension screw (36C) could hit against the spacer pipe (51A) when the pump is being turned.
Seal life can be increased if the pretensioning allows for a little leakage. This assists lubrication and keeps the seals cool. It is therefore not necessary to replace seals before the leakage becomes too heavy and causes output and operating pressure to drop.
When reassembling, tighten plunger screws (36A) to 33 ft.-lbs. (45 Nm).

Mounting Valve Casing

Check o-rings on seal case (38). Clean surfaces of seal sleeves in gear box and sealing surfaces of valve casing (50). Push valve casing carefully onto 0-rings of seal case and centring studs (50A).
Tighten nuts (49A) to 103 ft.-lbs. (140 Nm).

To Dismantle Gear

Take out plunger and seal sleeves as described above. Drain oil.
After removing the circlip ring (33B), pry out seal retainer (33) with a screw driver. Check seal (32), o-rings (33A) and surfaces of crosshead. 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).

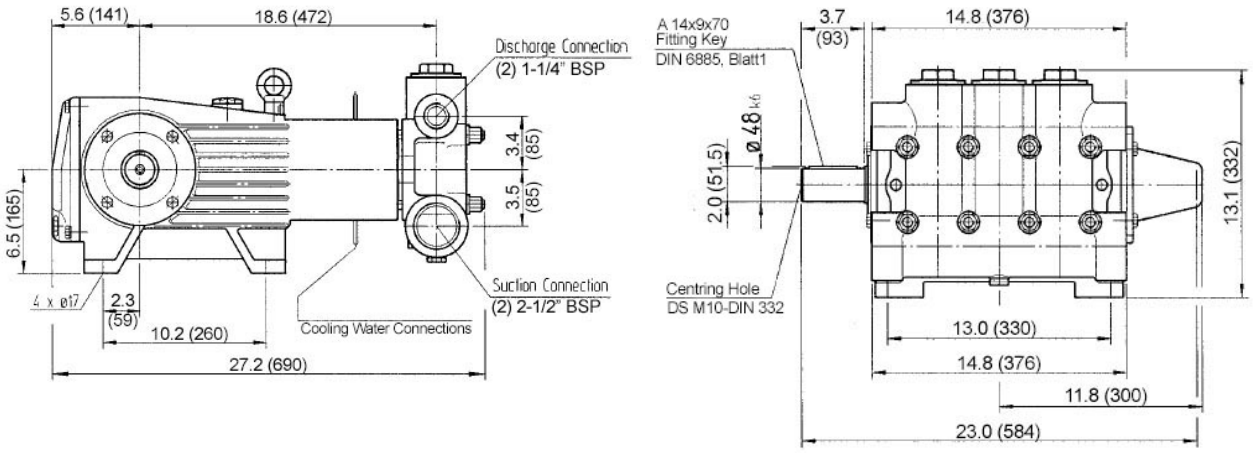
Important! Connecting rods are marked for identification. Do not twist connectin rod halves. Connecting rod is to be reinstalled in the same position on shaft journals.
Push connecting rod halves together with the crosshead as far as possible into the crosshead guide.
Take out bearing cover to one side and push out crankshaft taking particular care that the connecting rod doesn't get bent.
Check surfaces of connecting rod and crankshaft (22).
Reassemble in reverse order: Regulate axial play of the crankshaft clearance to minimum 0.1mm, maximum 0.15mm - by means of fitting disc (20A). Shaft should turn easily with little clearance.
Tighten screws (24) to 29.5 ft.-lbs. (40 Nm).

Important! Connecting rod has to be able to be slightly moved sidewise at the stroke journals.

Preventative Maintenance Check-List & Recommended Spare Part List

Check	Daily	Weekly	50hr	Every 500 hr	Every 1500 hr	Every 3000hrs
Oil Level / Quality	X					
Oil Leaks	X					
Water Leaks	X					
Belts, Pulley		X				
Plumbing		X				
		Recommended Spare Part				
Oil Change (p/n 01154)			X	X		
Plunger Packing Kits (1 kit/ Pump) See page 5 for kit list					X	
Oil Seal Kit (1 kit/Pump) See page 5 for kit list					X	
Valve Assembly Kit (1 kit/ pump)See page 5 for kit list						X

GP7142HTC PUMP DIMENSIONS - MM (INCHES)



GP7142HTC Torque Specifications				
Position	**Item#**	**Description**	**Lubrication Info**	**Torque Specifications**
1	07600	Crankcase	Molycote/Cu-Paste	
10	22706	Hexagon Screw		33 ft.-lbs. (45 Nm)
12	07109	Drain Plug		59 ft.-lbs. (80 Nm)
24	13182	Connecting Rod Assembly		30 ft.-lbs. (40 Nm)
30A	05051-0100	Hexagon Screw		89 in.-lbs. (10 Nm)
32	07624	Radial Shaft Seal	Loctite 403	
36A	07667	Plunger Connection		33 ft.-lbs. (45 Nm)
36C	07664	Tension Screw	Loctite 243	30 ft.-lbs. (40 Nm)
49	13159	Stud Bolt	Loctite 270	
49A	13160	Hexagon Nut		103 ft.-lbs. (140 Nm)
58	13170	Plug		107 ft.-lbs. (145 Nm)

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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