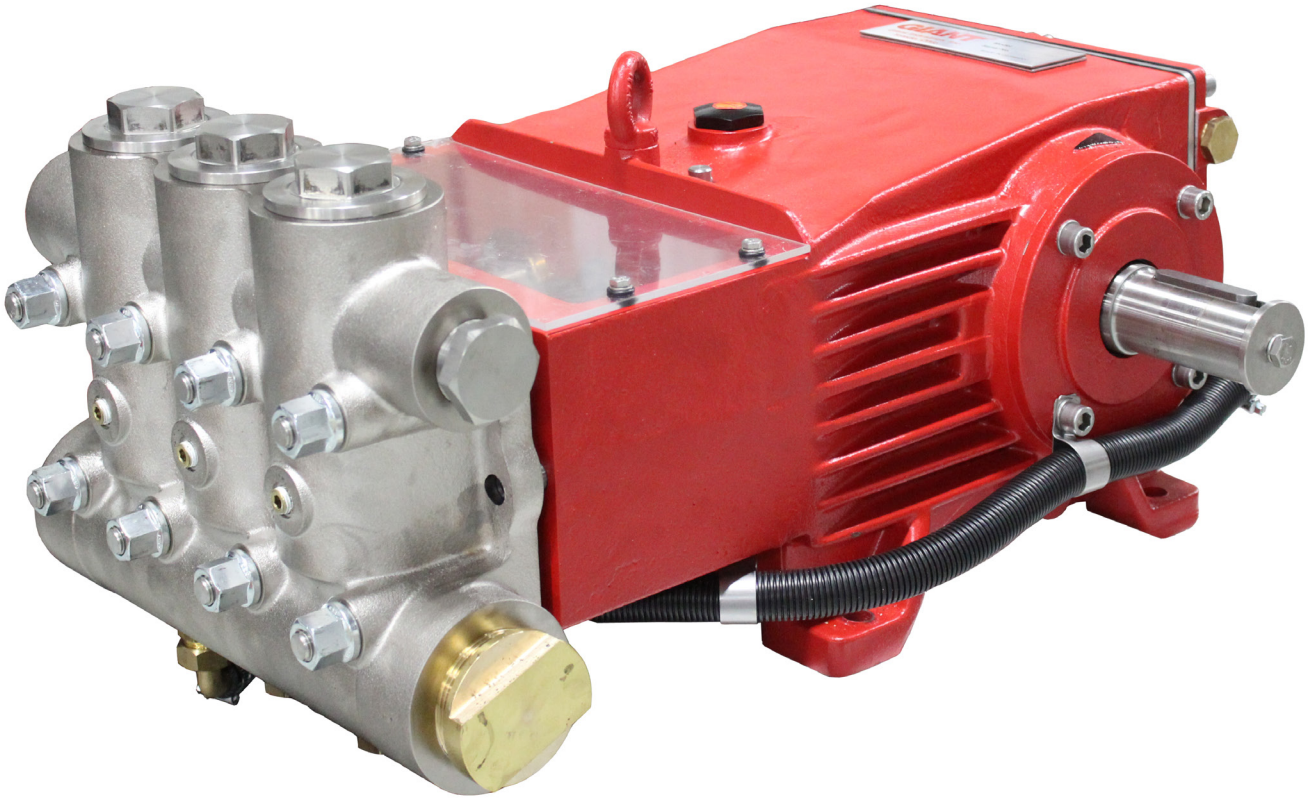
Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service Manual

Models
GP7645/GP7650/GP7655



GIANT
Performance Under Pressure

Updated 05/24

Contents:

INSTALLATION INSTRUCTIONS

The stated figures are maximum values for pressure and speed (rpm) and apply for interval operation with cold water.

These values must be reduced by 10% if the pump is used in continuous operation and/or with water above 86°F (30°C).

NPSH values must be respected.

Required NPSH refers to water (specific weight 1kg/dm3, viscosity 1°E at maximum permissible pump revolutions).

Operation and Maintenance

The pumps can be run without gear oil cooling in continuous operation up to a power rating of **80 HP (60 kW)** or with major intermittent operation at full performance (see bottom of next column regarding the definition for intermittent operation).

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

Oil: Use only 1.6 gallons (6.0 litres) of Giant's p/n 01154 or ISO VG 220 (e.g. Aral Degol BG220) or SAE 90 gear oil.
We recommend ISO VG 68 (SAE80) gear oil for low ambient temperatures (+5°C and lower).
Initial change after 50 operating hours and then after every 1000 operating hours, or after one year if used less.

IMPORTANT! Take care when operating in damp places or with high temperature fluctuations. Oil must be changed immediately should condensate (frothy oil) occur in the gear box.

IMPORTANT! If the pump is mounted on a vehicle (possibility of unevenness) and/or if the pump speed is between 300 rpm and 500 rpm, the oil quantity is 1.8 gallons (7.0 L). To check, put the oil dipstick in the bore situated beside the eye bolt.

IMPORTANT! The pump and cooling system must be emptied if there is a danger of frost.
Note: travel wind can cause water in pumps fitted on open vehicles to freeze even if the outside temperature is above freezing point.

To empty the cooling circuit, remove the L-joints (K11) on the pump head (50). Blow out the circuit liquid (hoses K12) at the joint connection (K11/K7) using compressed air.

The torque tension on the valve casing nuts (49A) is to be checked after approximately 200 operating hours. Please refer to page 6 for the torque values.

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

⚠ 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 void the warranty.
When the pump is in operation, the shaft end must be covered by shaft cap (21A). The driven shaft side and coupling must be enclosed by a protective cover and the plunger area must be covered by plate (30).

Pressure in discharge line and in pump must be at zero before any maintenance to the pump takes place. Close off the suction line. Take necessary precautions to ensure that the driving motor cannot get switched on accidently (by disconnecting the fuses, for example).
Make sure that the pump and 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 cavitation occurring, the pump positive suction head (npshr) and water temperature must be respected.

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.

Definition of intermittent operation:
operation at full performance for not more than altogether 20 minutes per 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.

GP7600 SERIES PUMP SPECIFICATIONS

U.S. Specifications

	Max. Flow	Max. Pressure	Max. Speed	Power Req'd.	Max. Temp.*	Plunger Diameter	NPSH Required
Model	**GPM**	**PSI**	**RPM**	**HP**	**°F**	**in**	**Ft-Head**
GP7645	55.5	3000	800	115	86	1.77	29.8
GP7650	69.7	2500	800	122	86	1.97	30.5
GP7655	84.5	2000	800	117	86	2.17	32.1

Metric Specifications

	Max. Flow	Max. Pressure	Max. Speed	Power Req'd.	Max. Temp.*	Plunger Diameter	NPSH Required
Model	**L/min**	**Bar**	**RPM**	**kW**	**°C**	**mm**	**mWs**
GP7645	210	200	800	82.5	30	45	9.1
GP7650	264	175	800	90	30	50	9.3
GP7655	320	140	800	88	30	55	9.8

*with oil cooling system. If this is not used, the pump can be used up to 140 °F (60 °C).

Common Specifications:

	U.S.	Metric
Crankshaft Diameter	1.9"	(48 mm)
Key Width	0.6"	(14 mm)
Crankshaft Mounting		Either Side
Shaft Rotation		Top of Pulley Toward Manifold
Inlet Ports		(2) 2-1/2" NPT
Discharge Ports		(2) 1-1/4" NPT
Weight	408 lbs	(185 kg)
Crankcase Oil Capacity	1.8 Gal	(6.0 L)
Fluid End Material		Nickel-Plated Spheroidal Cast Iron

Horsepower Ratings:

We recommend a 1.15 service factor be specified when selecting an electric motor as the power source.
To compute electric motor horsepower required, use the following formula: HP = (GPM X PSI) / 1450.
The formula to determine the horsepower required for a gas engine is: HP = (GPM X PSI) / 1150.
The formula to determine the horsepower required for a diesel engine is: HP = (GPM X PSI) / 1250.

For the Application of a Hydraulic Motor:

To Determine the Torque of a Hydraulic Motor -- (GPM x PSI x 36.77) / RPM = Torque (in-lbs)

Calculating RPM / GPM of Pump:

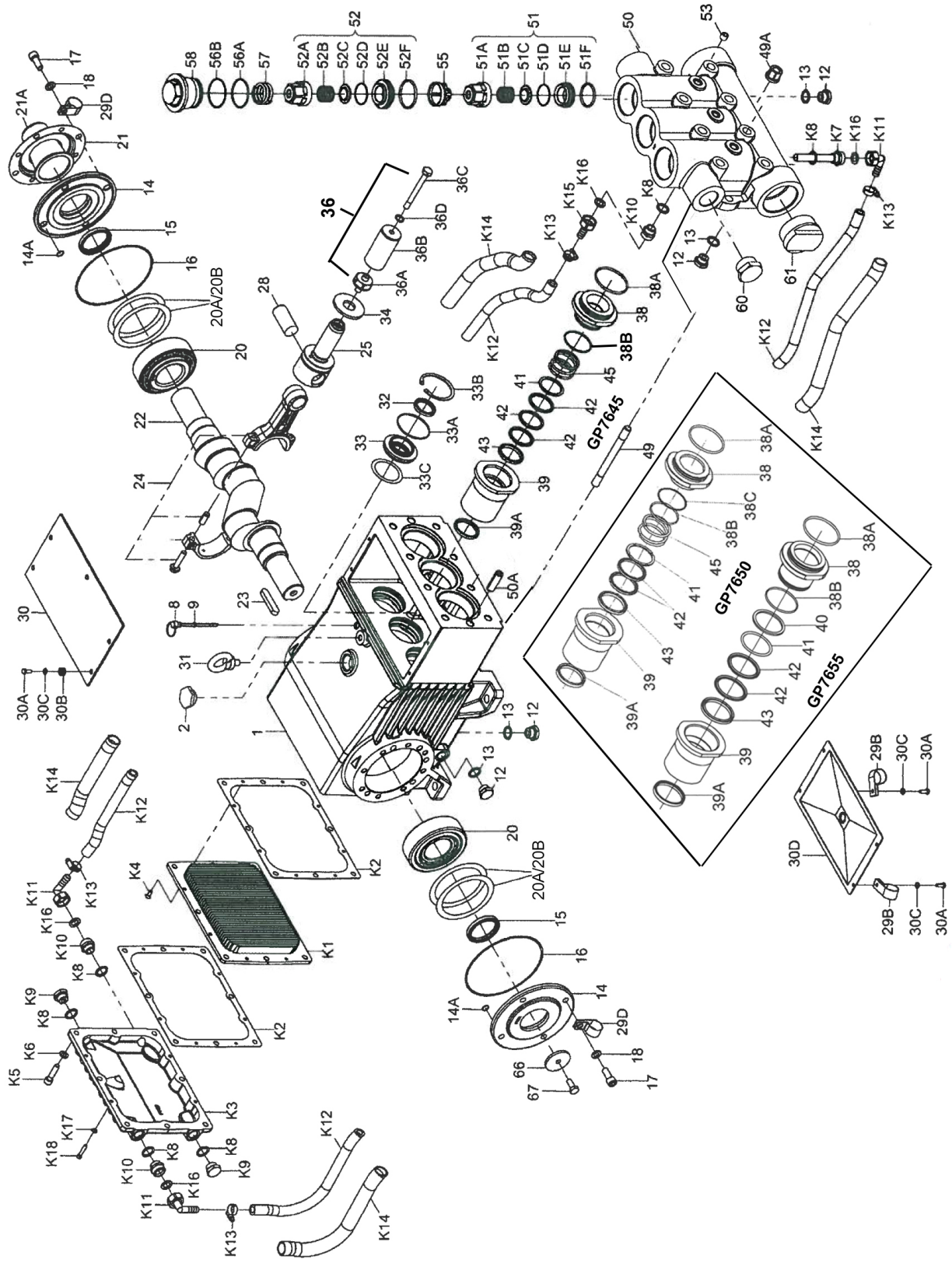
A pump must be connected to an electric motor or gas or diesel engine with the correct ratio of pulleys and belts to attain the required speed and GPM. The use of a Variable Frequency Drive (VFD) may also be used to control the RPM of a properly sized electric motor when variable flows are required.

(Max. Pump RPM / Rated Pump GPM) x Required Pump GPM = **Required Pump RPM**

To calculate a pulley diameter one (1) pulley diameter and the required pump RPM must be known:

(Pump RPM x Pump Pulley Diameter) / Motor RPM = Motor Pulley Diameter
(Motor RPM x Motor Pulley Diameter) / Pump RPM = Pump Pulley Diameter

Exploded View - GP7645, GP7650 & GP7655



GP7645, GP7650 & GP7655 Spare Parts List

ITEM	PART	DESCRIPTION	QTY.
1	05769	Crankcase	1
2	13000	Oil Filler Plug Assembly	1
8	07603	Oil Dip Stick	1
9	01009	O-Ring, Dip Stick	1
12	07109	Drain Plug	7
13	06272	Copper Seal for 12	7
14	05770	Bearing Cover	2
14A	12204	O-Ring	8
15	05771	Radial Shaft Seal	2
16	05772	O-Ring	2
17	05642	Inner Hexagon Screw	8
18	05039	Spring Ring	8
20	05773	Taper Roller Bearing	2
20A	05774	Fitting Disc (Shim), 0.1 mm	1-5
20B	04570	Fitting Disc (Shim), 0.15 mm	1-5
21	05645	Shaft Guard Holder	1
21A	05646	Shaft Guard	1
22	04517A	Crankshaft	1
23	07614	Key	1
24	05777	Connecting Rod Assembly	3
25	05778	Crosshead Assembly	3
28	05779	Crosshead Pin	3
29B	05383	Bracket 2 f. Cooling Hose	2
29D	05381	Bracket 2 f. Cooling Hose	2
30	07619	Cover Plate	1
30A	07225-0100	Hexagon Screw	8
30B	13136	Grommet	4
30C	08280	Disc	8
30D	13154	Cover	1
31	07623	Eye Bolt	1
32	07624	Radial Shaft Seal	3
33	07626	Seal Retainer	3
33A	07627	O-Ring for Seal Retainer	3
33B	07628	Circlip for 33	3
33C	07249	Fitting Disc	3
34	13137	Oil Scraper (Flinger)	3
36	06165A	Plunger Assy. (36A-36D), GP7645	3
36	07630	Plunger Assy. (36A-36D), GP7650	3
36	07706	Plunger Assy. (36A-36D), GP7655	3
36A	07667	Plunger Connection	3
36B	05157A	Plunger Pipe, GP7645	3
36B	07793	Plunger Pipe, GP7650	3
36B	07666	Plunger Pipe, GP7655	3
36C	07664	Tensioning Screw	3
36D	07665	Copper Ring	3
38	06167	Seal Case, GP7645	3
38	07794	Seal Case, GP7650	3
38	13155	Seal Case, GP7655	3
38A	13156	O-Ring	3
38B	06258	O-Ring, GP7645/GP7650	3
38B	07721	O-Ring, GP7655	3
38C	07635	Support Ring, GP7650	3
39	06171	Seal Sleeve, GP7645	3
39	07795	Seal Sleeve, GP7650	3
39	13157	Seal Sleeve, GP7655	3
39A	13290	Grooved Ring, GP7645	3
39A	07796	Grooved Ring, GP7650	3
39A	07723	Grooved Ring, GP7655	3
40	07797	Support Ring, GP7655	3
41	13296	O-Ring, GP7645	3
41	05318	Sleeve Support Ring, GP7650	3
41	13158	O-Ring, GP7655	3

ITEM	PART	DESCRIPTION	QTY.
42	13294	V-Sleeve, GP7645	9
42	07638	V-Sleeve, GP7650	6
42	07711	V-Sleeve, GP7655	6
43	13293	Pressure Ring, GP7645	3
43	07639	Pressure Ring, GP7650	3
43	07712	Pressure Ring, GP7655	3
45	13297	Tension Spring, GP7645	3
45	07636	Tension Spring, GP7650	3
49	13159	Stud Bolt	8
49A	13160	Hexagon Nut	8
50	07791	Valve Casing	1
50A	13162	Centering Stud	2
51	05594	Inlet Valve Assembly (51A-51F)	3
51A	05595	Spring Tension Cap	3
51B	05450	Valve Spring	3
51C	05247	Valve Plate	3
51D	05596	O-Ring	3
51E	05597	Inlet Valve Seat	3
51F	05166	O-Ring	3
52	05600	Discharge Valve Assembly	3
52A	05595	Spring Tension Cap	3
52B	05450	Valve Spring	3
52C	05247	Valve Plate	3
52D	05596	O-Ring	3
52E	05598	Discharge Valve Seat	3
52F	05599	O-Ring	3
53	22610	Plug, 1/4” NPT	3
55	05647	Valve Spacer	3
56A	07658	O-Ring	3
56B	07635	Support Ring	3
57	13173	Tension Spring	3
58	06682	Plug, M64 x 2	3
60	12251	Plug, 1-1/4” NPT	1
61	05170	Plug, 2-1/2” NPT	1
66	13362	Disc for Crankshaft	1
67	13358	Hexagon Screw	1
90	04157	Oil Cooler Assembly	1
K1	05797	Cooling Vane Plate	1
K2	05798	Seal for Gear Cover	2
K3	05799	Gear Cover	1
K4	05029	Hexagon Head Countersunk Screw	4
K5	05800	Hexagon Socket Screw	8
K6	06725	Washer	8
K7	05755	Connection for Oil Cooler	1
K8	06272	Copper Seal	6
K9	07109	Plug, 1/2” BSP	2
K10	05031	Reducing Nipple	3
K11	05032	U-Joint Connector with 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
K17	05053	Washer	4
K18	04158	Hexagon Socket Screw	4
	07662	Valve Tool (not shown)	1
	17498	Gear Assembly (4x12-13, 34,49,49A,50,50A,66,67)	
		Manifold Assembly	
	05210A	Plunger Conversion Kit GP7645	
	04296	Plunger Conversion Kit GP7650	
	05211	Plunger Conversion Kit GP7655	

Repair Kits - GP7645, GP7650 & GP7655

Plunger Packing Kit, GP7645 - # 09603

Item	Part #	Description	Qty.
38A	13156	O-Ring	3
38B	06258	O-Ring	3
39A	13290	Grooved Ring	3
42	13294	V-Sleeve	9

Plunger Packing Kit, GP7650 - # 09526

Item	Part #	Description	Qty.
38A	13156	O-Ring	3
38B	06258	O-Ring	3
38C	07635	Support Ring	3
39A	07796	Grooved Ring	3
42	07638	V-Sleeve	6

Plunger Packing Kit, GP7655 - # 09220

Item	Part #	Description	Qty.
38A	13156	O-Ring	3
38B	07721	O-Ring	3
39A	07723	Grooved Ring	3
41	13158	Support Ring	3
42	07711	V-Sleeve	6

Oil Seal Kit - # 09221

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

Inlet Valve Kit - # 09659

Item	Part #	Description	Qty.
51	05594	Inlet Valve Assembly	1
56A	07658	O-Ring	1
56B	07635	Support Ring	1

Large Discharge Valve Kit - # 09660

Item	Part #	Description	Qty.
52	05600	Discharge Valve Assy	1
55	05647	Valve Spacer	1
56A	07658	O-Ring	1
56B	07635	Support Ring	1

Small Discharge Valve Kit* - # 09661

Item	Part #	Description	Qty.
51B	05450	Valve Spring	1
51C	05247	Valve Plate	1
51D	05596	O-Ring	1
52F	05599	O-Ring	1
56A	07658	O-Ring	1
56B	07635	Support Ring	1

* The discharge valve seat (item 52E) can be flipped over and used. If it is damaged on both sides, order kit # 09660.

GP7645, GP7650 & GP7655 Torque Specifications

Position	Item #	Description	Lubrication Info	Torque Specifications
1	05769	Crankcase	Molycote Cu-Paste	
17	05642	Inner Hexagon Screw		33 ft.-lbs. (45 Nm)
24	05777	Connecting Rod Assembly		29.5 ft.-lbs. (40 Nm)
30A	07225-0100	Hexagon Screw		88.5 in.-lbs. (10 Nm)
32	07624	Radial Shaft Seal	Loctite 403	
36A	07667	Plunger Connection		33 ft.-lbs. (45 Nm)
36C	07664	Tensioning Screw	Loctite 243	29.5 ft.-lbs. (40 Nm)
49	13159	Stud Bolt	Loctite 243	
49A	13160	Hexagon Nut		59 ft.-lbs. (80 Nm)
51E	05597	Inlet Valve Seat	Hylomar	
52E	05598	Discharge Valve Seat	Hylomar	
58	06682	Plug, M64 x 2		107 ft.-lbs. (145 Nm)
K2	05798	Seal for Gear Cover	Loctite 5910	
K5	05800	Hexagon Socket Screw		33 ft.-lbs. (45 Nm)
K9	07109	Plug, 1/2” BSP		59 ft.-lbs. (80 Nm)
K18	04158	Hexagon Socket Screw		124 in.-lbs. (14 Nm)

GP7645, GP7650 & GP7655 Repair Instructions

TO CHECK VALVES

Loosen plugs (58), take out tension spring (57) and then remove the complete valve assembly (#51 & 52) with either a valve tool or an M16 hexagon screw. Check sealing surfaces and replace worn parts. The discharge valve seat (# 52E) can be used on both sides. If you re-use it, make sure you switch the O-Ring (#51D) to the opposite side. Check O-rings and support rings. Tighten plugs (58) to 107 ft.-lbs. (145 NM).

Important! If worn, the discharge valve seat (52E) can be flipped and reused.

TO CHECK SEALS AND PLUNGER PIPE

Loosen nuts (49A) and remove pump head (50). Separate the plunger connection (36A) from the crosshead (25) by means of an open-end wrench (size 36mm). Pull seal sleeves (39) out of their fittings in the crankcase (1). Take the seal case (38) out of the seal sleeve (39). Examine the plunger parts (36A-36D), seals (42 & 39A) and O-rings (38A & 38B). When replacing the plunger pipe (36B), tighten tension screws (36C) to 30 ft. lbs. (40 NM). Replace worn parts; grease seals with Silicone before installing.

CAUTION: Don't loosen the (3) plunger connections (36A) before the valve casing has been removed otherwise the tension screw (51A) could hit against the valve adapter (55) when the pump is being turned. Seal life can be increased if the pre-tensioning 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) at 33 ft.-lbs. (45 Nm).

MOUNTING VALVE CASING

Check O-rings (38A & 38B) on the seal case (38). Clean surfaces of seal sleeves in gear box and sealing surfaces of valve casing (50). Push the valve casing carefully on the O-rings of the seal case and centering studs (50A). Tighten nuts (49A) to 103 ft. lbs. (140 NM).

TO DISASSEMBLE GEAR

Take out plunger (36) and seal sleeves (39) as described above. Drain the oil. After removing the circlip ring (33B), lever out seal retainer (33) with a screw driver. Check seals (32 & 33A) and surfaces of crosshead (25). Remove the crankcase cover (4). Loosen inner hexagon screws on the connecting rods (24).

Note: Connecting rods are marked for identification. Do not twist connecting rod halves. Each connecting rod is to be reinstalled in the same position (and orientation) on the crankshaft journals.

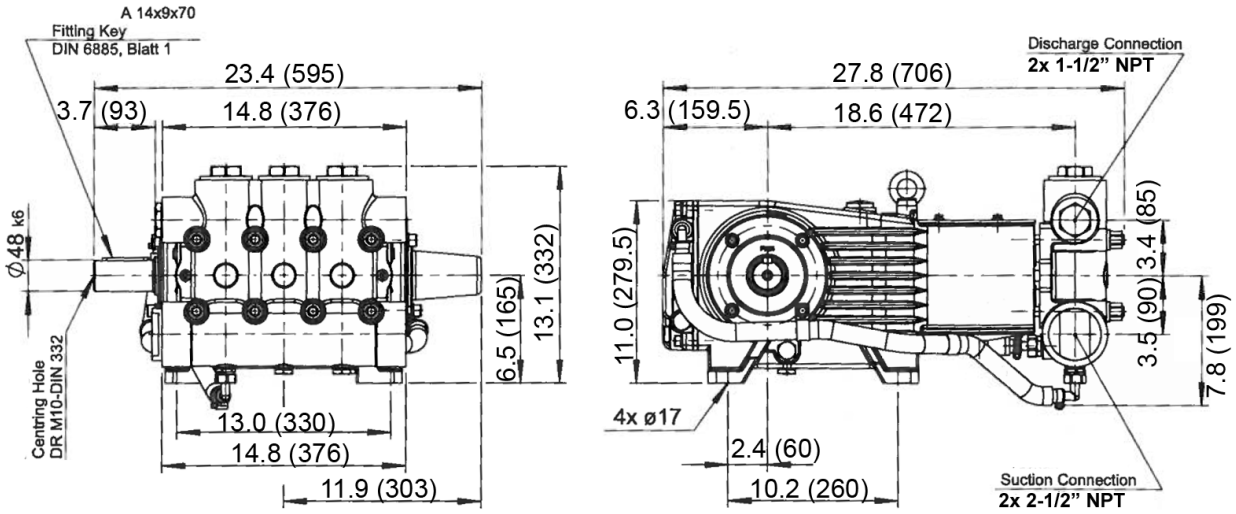
Push the connecting rod halves as far into the crosshead guide as possible. Check the surfaces of connecting rod and crankshaft (22). Take out the bearing cover (14) to one side and push out crankshaft taking particular care that the connecting rod doesn't bend. Re-assemble in reverse order. Regulate axial bearing clearance to a minimum of 0.1mm and a maximum of 0.15mm by means of fitting discs (20A). The crankshaft should turn easily and with little clearance. Tighten screws (24) to 30 ft.-lbs. (40 NM).

Important! The connecting rod has to be able to slightly move sideways at the crankshaft journal.

Important! Seal (32) must always be installed so that the seal-lip on the inside diameter faces the oil. Possible axial float of the seal retainer (33) should be compensated with the shims (33C).

Fit cooler plate (K1) and gear cover (K3) withtheir respective seals (K2). When assembling the cooling circuit line, the connection piece (K7) must always be joined to the upper connection (K3) on the gear cover.

GP7645, GP7650 & GP7655 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

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Performance Under Pressure