

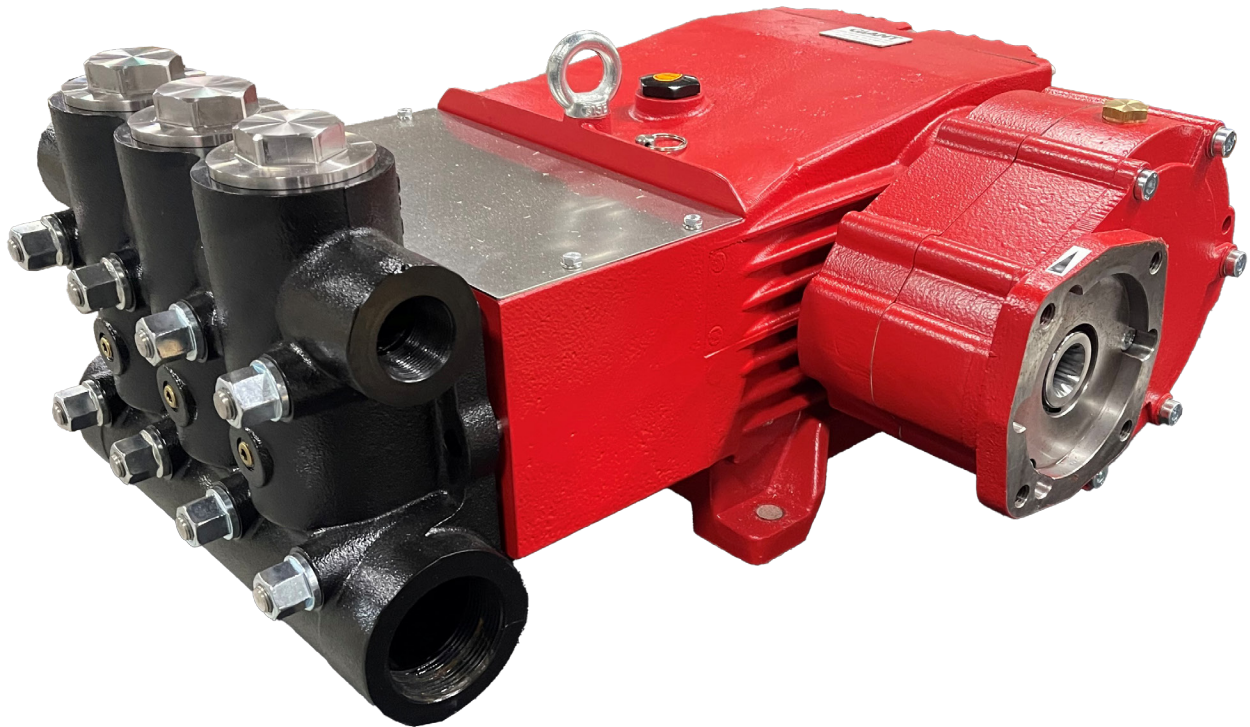
Models

GP7645BGBHS-MC

GP7655BGBHS-MC

Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service Manual

Gearbox Versions for Hollow Shaft Drives with gearbox, no oil cooler and metal cover



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GP7645BGBHS/GP7655BGBHS PUMP SPECIFICATIONS

Performance

| | Power Required | Pressure | Max. Speed | Max. Flow | Max. Temp. | Plunger \varnothing | Plunger Stroke | Weight | NPSHR |
|--------|----------------|------------|------------|-------------|------------------------------|-----------------------|----------------|-----------|-------------------|
| Model | BHP (kW) | PSI (bar) | RPM | GPM (l/min) | $^{\circ}$ F ($^{\circ}$ C) | in (mm) | in (mm) | lbs. (kg) | ft. of head (mWs) |
| GP7645 | 110 (82.5) | 3000 (200) | 800 | 55.5 (210) | 86 (30) | 1.77 (45) | 2.28 (58) | 476 (216) | (9.1) |
| GP7655 | 118 (88.0) | 2000 (140) | 800 | 84.5 (320) | 86 (30) | 2.17 (55) | 2.28 (58) | 476 (216) | (9.8) |

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 inbetween.

For example, this can be full load operation for 5 minutes four times an hour with 10 minute breaks inbetween 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 $^{\circ}$ F (20 $^{\circ}$ 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 is connected.

The max. system pressure for a separately fitted oil cooling system must likewise not exceed 29 PSI (2 bar).

If the integrated gear oil cooling system is not used, the max. admissible input pressure on the pump suction side is 29 PSI (2 bar). In this case, transmitted pulsation from the pump to the suction line must be sufficiently damped.

Level of noise emission

Emission sound pressure level: ≤ 94 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 $< T_{Amb.} < 86^{\circ}$ F

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

Oil filling

• Filling quantities

Pump **with gear and oil cooler 2.1 gal (8,0 l)**

Pump **without gear with oil cooler 1.6 gal (6,0 l)**

Pump **with gear without oil cooler 2.4 gal (9,2 l)**

Pump **without gear without oil cooler 1.9 gal (7,2l)**

• Quality: Industrial gear oil **ISO VG 220** or 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 gal (1 liter)**.

Installation/ Putting into Operation

Shaft protector

When the pump is in operation, the open shaft end must be covered up by shaft protector (21), the driven shaft side and coupling by a contact-protector and the plunger room by cover (30).

Direction of pump rotation

An arrow on the pump crankcase indicates the recommended direction of rotation for the drive shaft. 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.

Reduction gears can be fitted on the left or right side and at different angles to accommodate the recommended rotational direction thus facilitating planning and fitting of pump units.

Suction line filter

Recommended mesh size 150 μ m.

Gear oil cooling

The GP7600 pump series comes with a gear oil cooling system.



The pumps can be run without gear oil cooling in continuous operation **up to** a power rating of **80.5 HP (60 kW)** or with major intermittent operation at full performance.

If operational power exceeds **80.5 HP (60 kW)** or for pumps fitted with a flanged reduction gear, this oil cooling system is recommended.

The cooling system works independently using the conveyed water during pump operation. A part of the water drawn by the plunger goes through a pipe and to a cooler plate in the drive casing. The flow amount in the cooling system therefore depends on the plunger diameter and the pump rpm. The amount of conveyed cooling water ensures satisfactory oil cooling under observation of max. admissible pump rpm limits. The temperature of the pumped water should not exceed **86 $^{\circ}$ F (30 $^{\circ}$ C)**.



If higher medium temperatures or liquids other than water are involved or aggressive media such as seawater, demineralised water etc the integrated gear oil cooling system must be decoupled and a separate cooling circuit set up.

The separate cooler must have a cooling efficiency of 1500 watt.

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

Operation



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 (12) 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 (K11) on the pump head and by blowing the hoses with compressed air on the (K11/K7) side.

Anti-freeze is recommended to guard against frost where a separate cooling circuit is used.

Maintenance and Servicing

For the type of threadlocker used and the required tightening torques, observe the table in the exploded view.

Special tools required

The following special tools are required for assembly:

- Extraction tool (code no. 15.0038)
- Pull-out tool size 5
- Snap-ring tongs

Suction and Discharge Valves

Screw off plugs (58).

Take out tension spring (57).

Remove the complete valve (51, 52) and valve holder (55) using either a valve tool or an M16 hexagon screw.

To dismantle valves:

Screw valve seat (51E, 52E) out of spring tension cap (51A, 52A).

Check sealing surfaces and replace worn parts.

Check O-rings and support rings.

Tighten plugs (58) to the required torque.



If worn, the discharge valve seat (52E) can be turned 180° round and refitted.

Seals and Plunger

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) and remove tension spring (45) (GP7645).

Take seal unit (40,41,42,43 – GP7655) or (41,42,43 – GP7645/GP7650) out of the seal sleeve.

Examine plunger pipe (36B) and seals (39A, 42) and O-rings (38A, 38B) or (41 – GP7655).

Worn parts to be replaced.

When replacing plunger pipe (36B), tighten tension screws (36C) to the required torque.

Replace worn parts; grease seals with Silicone before installing.



Always remove the valve casing first before taking the 3 plungers (36) off the crossheads (25).

Otherwise the plunger (36) could hit against the spring tension cap (51A) and valve holder (55) when turning the pump.

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).

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 the required torque.

Mounting Valve Casing:

Examine the O-rings (38A, 38B) on seal cases (38).

Clean the seal sleeve contact surfaces in the crankcase and the sealing surfaces in the valve casing.

Carefully push the valve casing onto the seal case O-rings and centring studs (50A).

Tighten nuts (49A) to the required torque.

Mounting the Reduction Gear to the Crankcase

Remove the screws (10/11).

Take bearing cover (14) with its radial shaft seal and fitting key (23) off the crankcase.

Mount the casing bottom (68) together with O-ring (16) and centring ring (71) using the six screws (84).

Coat O-ring (16) lightly with grease and place it into the groove of the casing bottom.

Fit the casing bottom with screws (84).

Tap the fitting pins (78) into both bores.

Press the pinion shaft (72 with bearing 74) into the bearing area of the casing bottom.

Put the spacer ring (80) onto the pump shaft.

Mount the fitting key (23) and then the gear wheel (72).

To ease fitting, the pinion can also be pushed away from the gear wheel due to the movability of the roller bearing (74).

Secure the gear wheel with the second spacer ring (81) and tension disc (82), coating screw (83) with Loctite before tightening. Coat seal (70) lightly on one side only.

Position the greased side onto the casing bottom.

Fit cylinder roller bearing (75) and shims (76) onto pinion (72B) and mount the casing top.

Making sure to carefully thread the pinion shaft through the radial shaft seal ring.



The casing bottom (68) has threaded bores for fitting at 4 different angles of 90°.

The positioning of these flange bores onto the pump crankcase determines the position of the gear drive shaft.

The gearbox drive shaft can be rotated 180° to the pump drive shaft.

Where the UH version is concerned, fit adaptor flange (89) and centring ring (89A) using screws (87, 88).



Cover the sharp-edged fitting key groove with adhesive tape to avoid the radial shaft seal lip being damaged.

Use screws (85) to secure casing parts. Turn the drive several times by hand to check for smoothness.

To Dismantle Reduction Gear

Remove screws (85).

Press off casing top (69) by screwing two screws into both thread bores.

Push off casing top (69). Remove screw (83) and take off spacer ring (81) and tension disc (82).

Push the gear wheel off the crankcase by also screwing in two M10x110 screws towards the bearing cover side.

If required, supplementary assembly instructions can be requested from the manufacturer Giant Industries.

Repair Kits - GP7645BGBHS & GP7655BGBHS

Plunger Packing Kit, GP7645BGBHS # 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, GP7655BGBHS # 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

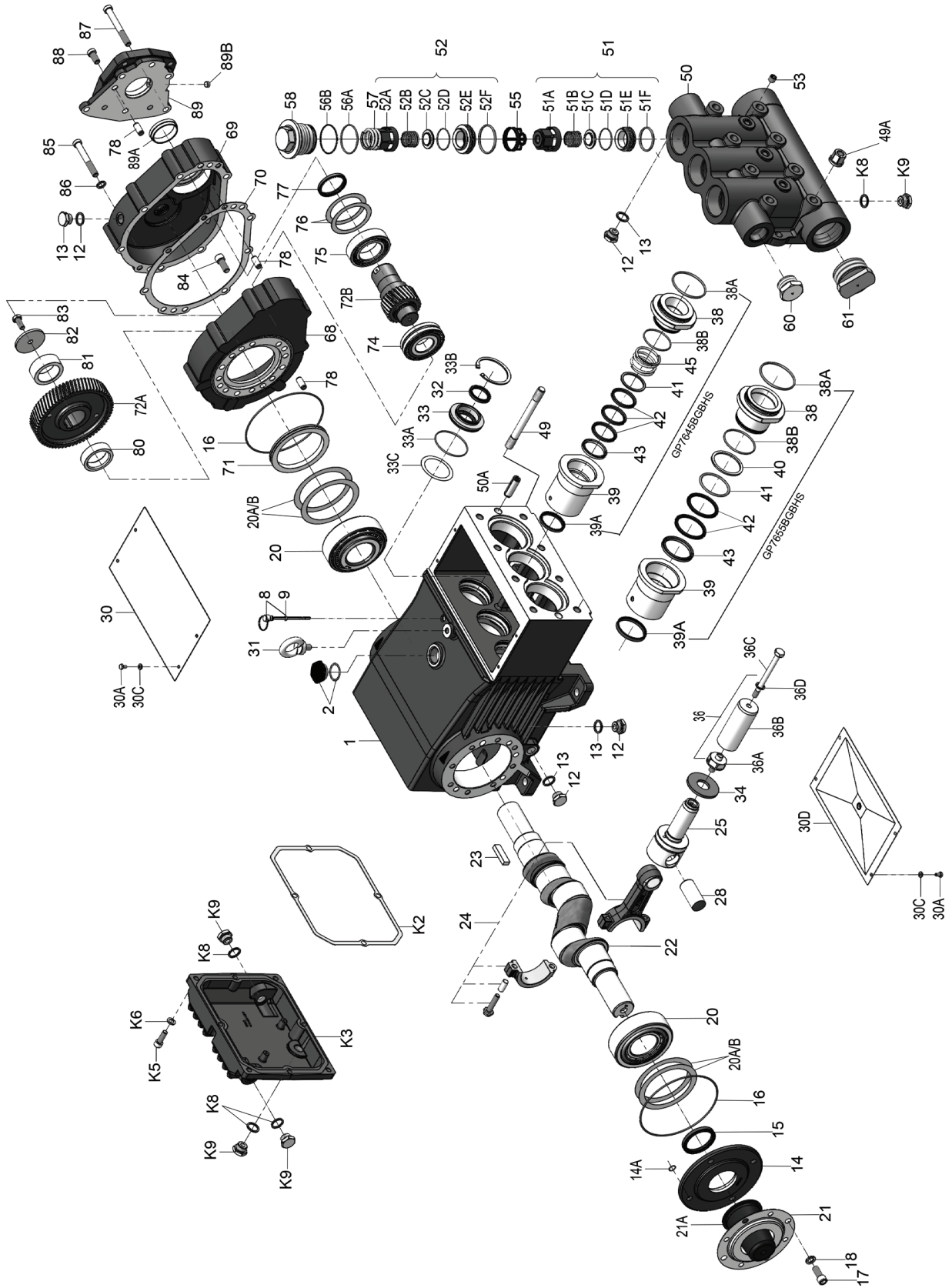
| Item | Part # | Description | Qty. |
|------|--------|--------------|------|
| 51B | 05450 | Valve Spring | 1 |
| 51C | 05247 | Valve Plate | 1 |
| 51D | 05596 | O-Ring | 1 |
| 52F | 05599 | O-Ring | 1 |
| 56A | 07658 | O-Ring | 1 |
| 56B | 07635 | Support Ring | 1 |

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

GP7645BGBHS & GP7655BGBHS Torque Specifications

| Position | Lubrication Info | Torque Specifications |
|----------|-------------------|-----------------------|
| 1 | Molycote Cu-Paste | |
| 17 | | 33 ft.-lbs. (45 Nm) |
| 24 | | 29.5 ft.-lbs. (40 Nm) |
| 30A | | 88.5 in.-lbs. (10 Nm) |
| 32 | Loctite 403 | |
| 36A | | 33 ft.-lbs. (45 Nm) |
| 36C | Loctite 243 | 29.5 ft.-lbs. (40 Nm) |
| 49 | Loctite 243 | |
| 49A | | 133 ft.-lbs. (180 Nm) |
| 51E | Hylomar | |
| 52E | Hylomar | |
| 58 | | 107 ft.-lbs. (145 Nm) |
| 85 | | 62.7 ft.-lbs. (85 Nm) |
| K2 | Loctite 5910 | |
| K5 | | 33 ft.-lbs. (45 Nm) |
| K9 | | 59 ft.-lbs. (80 Nm) |
| K18 | | 124 in.-lbs. (14 Nm) |

Exploded View - GP7645BGBHS & GP7655BGBHS

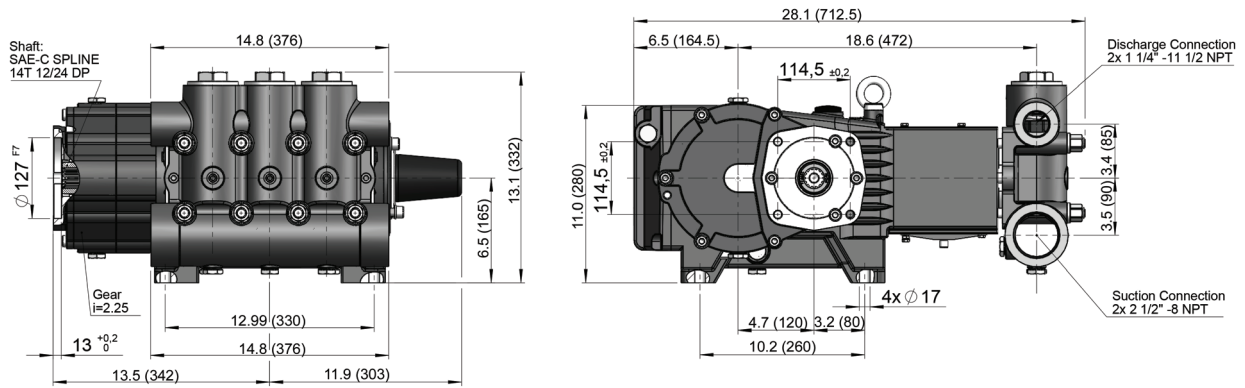


GP7645BGBHS & GP7655BGBHS Spare Parts List

| <u>ITEM</u> | <u>PART</u> | <u>DESCRIPTION</u> | <u>QTY.</u> | <u>ITEM</u> | <u>PART</u> | <u>DESCRIPTION</u> | <u>QTY.</u> |
|-------------|-------------|------------------------------|-------------|-------------|-------------|---------------------------------------|-------------|
| 1 | 05769 | Crankcase | 1 | 49A | 13160 | Hexagon Nut | 8 |
| 2 | 13000 | Oil Filler Plug Assembly | 1 | 50 | 07791 | Valve Casing | 1 |
| 8 | 07603 | Oil Dip Stick | 1 | 50A | 13162 | Centering Stud | 2 |
| 9 | 01009 | O-Ring, Dip Stick | 1 | 51 | 05594 | Inlet Valve Assembly (51A-51F) | 3 |
| 12 | 07109 | Drain Plug | 9 | 51A | 05595 | Spring Tension Cap | 3 |
| 13 | 06272 | Copper Seal for 12 | 9 | 51B | 05450 | Valve Spring | 3 |
| 14 | 05770 | Bearing Cover | 1 | 51C | 05247 | Valve Plate | 3 |
| 14A | 12204 | O-Ring | 4 | 51D | 05596 | O-Ring | 3 |
| 15 | 05771 | Radial Shaft Seal | 1 | 51E | 05597 | Inlet Valve Seat | 3 |
| 16 | 05772 | O-Ring | 2 | 51F | 05166 | O-Ring | 3 |
| 17 | 05642 | Inner Hexagon Screw | 4 | 52 | 05600 | Discharge Valve Assembly (52A-52F) | 3 |
| 18 | 05039 | Spring Ring | 4 | 52A | 05595 | Spring Tension Cap | 3 |
| 20 | 05773 | Taper Roller Bearing | 2 | 52B | 05450 | Valve Spring | 3 |
| 20A | 05774 | Fitting Disc (Shim), 0.1 mm | 1-5 | 52C | 05247 | Valve Plate | 3 |
| 20B | 04570 | Fitting Disc (Shim), 0.15 mm | 1-5 | 52D | 05596 | O-Ring | 3 |
| 21 | 05645 | Shaft Guard Holder | 1 | 52E | 05598 | Discharge Valve Seat | 3 |
| 21A | 05646 | Shaft Guard | 1 | 52F | 05599 | O-Ring | 3 |
| 22 | 04517A | Crankshaft | 1 | 53 | 22610 | Plug, 1/4" NPT | 3 |
| 23 | 05776 | Key | 1 | 55 | 05647 | Valve Spacer | 3 |
| 24 | 05777 | Connecting Rod Assembly | 3 | 56A | 07658 | O-Ring | 3 |
| 25 | 05778 | Crosshead Assembly | 3 | 56B | 07635 | Support Ring | 3 |
| 28 | 05779 | Crosshead Pin | 3 | 57 | 13173 | Tension Spring | 3 |
| 30 | 07619-0400 | Cover Plate | 1 | 58 | 06682 | Plug, M64 x 2 | 3 |
| 30A | 07225-0100 | Hexagon Screw | 8 | 60 | 12251 | Plug, 1-1/4" NPT | 1 |
| 30C | 05053 | Disc | 8 | 61 | 05170 | Plug, 2-1/2" NPT | 1 |
| 30D | 13154 | Cover | 1 | 68 | 05782 | Bottom Casing for Gear | 1 |
| 31 | 07623 | Eye Bolt | 1 | 69 | 05783 | Top Casing for Gear | 1 |
| 32 | 07624 | Radial Shaft Seal | 3 | 70 | 05784 | Gear Seal | 1 |
| 33 | 07626 | Seal Retainer | 3 | 71 | 05785 | Centering Ring | 1 |
| 33A | 07627 | O-Ring for Seal Retainer | 3 | 72A/B | 03366 | Gear Wheel Set, i=2.25 | 1 |
| 33B | 07628 | Circlip for 33 | 3 | 72A/B | 05786 | Gear Wheel Set, i=2.44 | 1 |
| 33C | 07249 | Fitting Disc | 1-3 | 72A/B | 04670 | Gear Wheel Set, i=2.75 | 1 |
| 34 | 13137 | Oil Scraper (Flinger) | 3 | 74 | 05787 | Self-Aligning Roller Bearing | 1 |
| 36 | 06165A* | Plunger Assembly, GP7645 | 3 | 75 | 05788 | Roller Bearing | 1 |
| 36 | 07706* | Plunger Assembly, GP7655 | 3 | 76 | 07117 | Fitting Disc (Shim), 0.1 mm | 1-5 |
| 36A | 07667 | Plunger Connection | 3 | 77 | 05789 | Radial Shaft Ring | 1 |
| 36B | 05157A | Plunger Pipe, GP7645 | 3 | 78 | 05665 | Cylinder Pin | 6 |
| 36B | 07666 | Plunger Pipe, GP7655 | 3 | 80 | 05790 | Spacer Ring 1 for Gear | 1 |
| 36C | 07664 | Tensioning Screw | 3 | 81 | 05791 | Spacer Ring 2 for Gear | 1 |
| 36D | 07665 | Copper Ring | 3 | 82 | 05802 | Fixing Plate for Gear | 1 |
| 38 | 06167 | Seal Case, GP7645 | 3 | 83 | 13358 | Hexagon Screw | 1 |
| 38 | 13155 | Seal Case, GP7655 | 3 | 84 | 05792 | Hexagon Socket Screw | 7 |
| 38A | 13156 | O-Ring | 3 | 85 | 05702 | Hexagon Socket Screw | 3 |
| 38B | 06258 | O-Ring, GP7645 | 3 | 86 | 07159 | Washer | 3 |
| 38B | 07721 | O-Ring, GP7655 | 3 | 87 | 05793 | Hexagon Socket Screw | 5 |
| 39 | 06171 | Seal Sleeve, GP7645 | 3 | 88 | 05655 | Hexagon Socket Screw | 1 |
| 39 | 13157 | Seal Sleeve, GP7655 | 3 | 89 | 05794 | Gear Flange, Hollow | 1 |
| 39A | 13290 | Grooved Ring, GP7645 | 3 | 89B | 03297 | Plug | 1 |
| 39A | 07723 | Grooved Ring, GP7655 | 3 | 89A | 05795 | Centering Ring, Hollow | 1 |
| 40 | 07797 | Support Ring, GP7655 | 3 | K2 | 03708 | Seal for Gear Cover | 1 |
| 41 | 13296 | O-Ring, GP7645 | 3 | K3 | 03709 | Gear Cover | 1 |
| 41 | 13158 | O-Ring, GP7655 | 3 | K5 | 22706 | Hexagon Socket Screw | 8 |
| 42 | 13294 | V-Sleeve, GP7645 | 9 | K6 | 06725 | Washer | 8 |
| 42 | 07711 | V-Sleeve, GP7655 | 6 | K8 | 06272 | Copper Seal | 5 |
| 43 | 13293 | Pressure Ring, GP7645 | 3 | K9 | 07109 | Plug, 1/2" BSP | 5 |
| 43 | 07712 | Pressure Ring, GP7655 | 3 | | 07662 | Valve Tool (not shown) | 1 |
| 45 | 13297 | Tension Spring, GP7645 | 3 | | | | |
| 49 | 13159 | Stud Bolt | 8 | | | | |

*Consists of items 36A-36D

GP7645BGBHS & GP7655BGBHS 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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