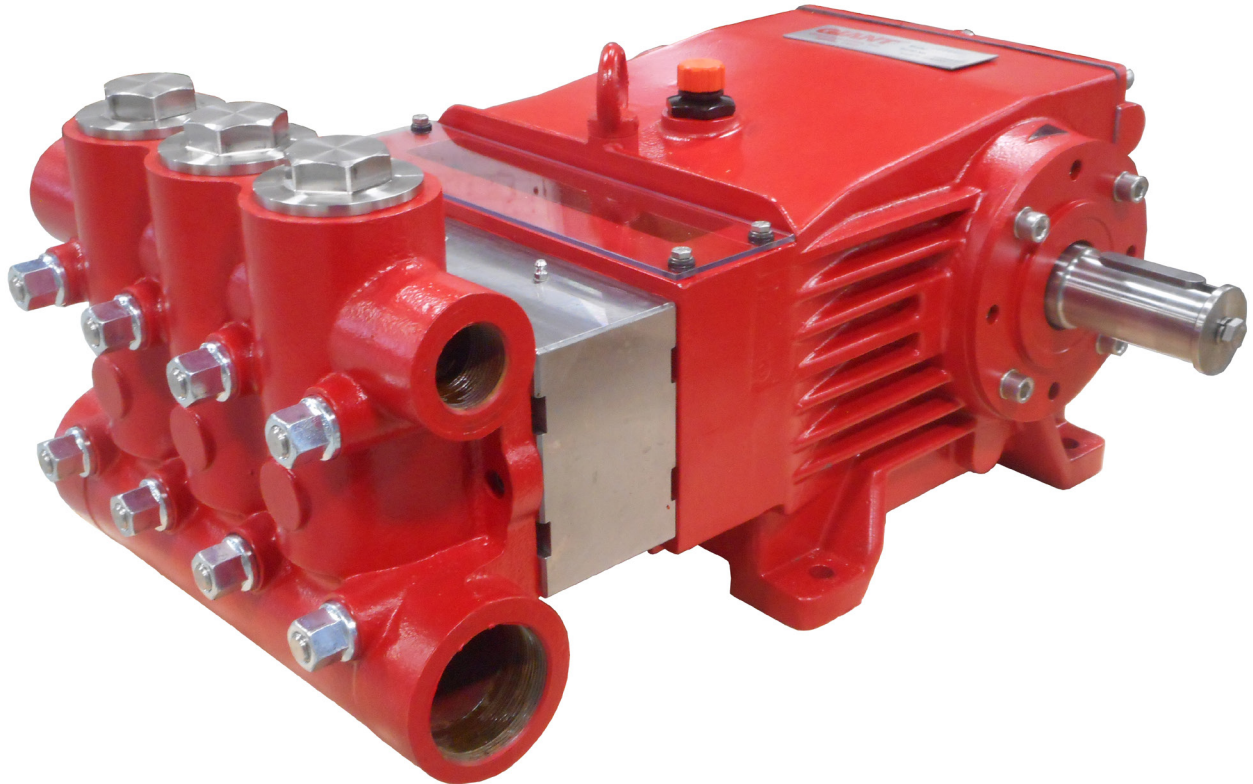


# Models BP7170/BP7171

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Triplex Ceramic  
Plunger Pump  
Operating Instructions/  
Repair and Service Manual



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Updated 07/20

# INSTALLATION INSTRUCTIONS

## Operation and Maintenance

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

Oil: Use only 2.4 gallons (9.0 litres) of SAE 80W-90 gear oil (Giant's part number 01154) or ISO VG220 Industrial Gear oil.

Initial change after 50 operating hours and then after every 1000 operating hours.

**Caution:** When operating in damp places or with high temperature fluctuations. If condensate (frothy oil) occur in the gear box, oil must be changed immediately.

**Maximum input pressure 145 PSI (10 bar).  
Maximum suction head -4.35 PSI (-0,3 bar).  
(These values might vary depending on the viscosity of the medium).**

**Important!** To avoid any incrustation of the medium on the plungers (36B), screw cover plate (30) off after every operation and rinse the plunger area with clear non-pressurized water (at maximum water main pressure, never use high pressure).

**Important!** If recycled bentonite is being pumped, the pump must be rinsed for 3 - 5 minutes with clear water after usage to flush out dirt particles (sand) in the bentonite. The service life of the seals, ceramic plungers and valves depends largely on how fine the recycled bentonite is filtered.

**Important!** The service life of the seals is maximized if a minimal amount of leakage is present. A few drops of medium should drip from each plunger every minute. If leakage increases, the spiral rings can be tightened by turning the pressure sleeve (44) to the right. Leakage has to be examined every day. The plunger seals must be changed should leakage become excessive i.e., constant dripping.

**Important!** Only turn the sleeve past one or maximum two hole spaces. Otherwise friction will be too strong. Coat the seal by putting silicone grease in the grease nipples (47).

## 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.

Pressure in the discharge line and in the pump must be a zero before any maintenance to the pump takes place. Before work is performed on the pump, close off the suction line.

Take necessary precautions to ensure that the driving motor cannot get switched on accidentally (by disconnecting the fuses, for example).

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 kicks which can ruin the pump and unit parts and also be dangerous to the operator or anyone standing nearby.**

The BP7170/BP7171 pumps are suitable for pumping clean water as well as water containing bentonite in a concentration of maximum 55 lbs (25 kg) of bentonite diluted in 264 gallons (1 m<sup>3</sup>) of water.

# Specifications - Model BP7170

|                                   |                        |                                |
|-----------------------------------|------------------------|--------------------------------|
|                                   | U.S. ....              | Metric                         |
| Volume .....                      | 84.5 GPM .....         | 320 L/min                      |
| Discharge Pressure .....          | 1015 PSI.....          | 70 bar                         |
| Power Consumption .....           | 59 BHP .....           | 44 kW                          |
| Speed .....                       |                        | 560 RPM                        |
| Inlet Pressure.....               | -4.35 to 140 PSI ..... | -0.3 to 10 bar                 |
| Plunger Diameter.....             | 2.75" .....            | 70mm                           |
| Plunger Stroke .....              | 2.04" .....            | 52mm                           |
| Crankshaft Diameter.....          |                        | 48mm                           |
| Key Width .....                   |                        | 14mm                           |
| Crankshaft Mounting.....          |                        | Either side                    |
| Shaft Rotation .....              |                        | Top of pulley towards manifold |
| Temperature of Pumped Fluids..... | Up to 104 °F .....     | (40 °C)                        |
| Inlet Ports.....                  |                        | (2) 2-1/2" BSP                 |
| Discharge Ports .....             |                        | (2) 1-1/4" BSP                 |
| Weight.....                       | 423 lbs.....           | (192 kg)                       |
| Crankcase Oil Capacity .....      | 2.4 Gal.....           | (9.0 Liters)                   |
| Fluid End Material.....           |                        | 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.

## 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:

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

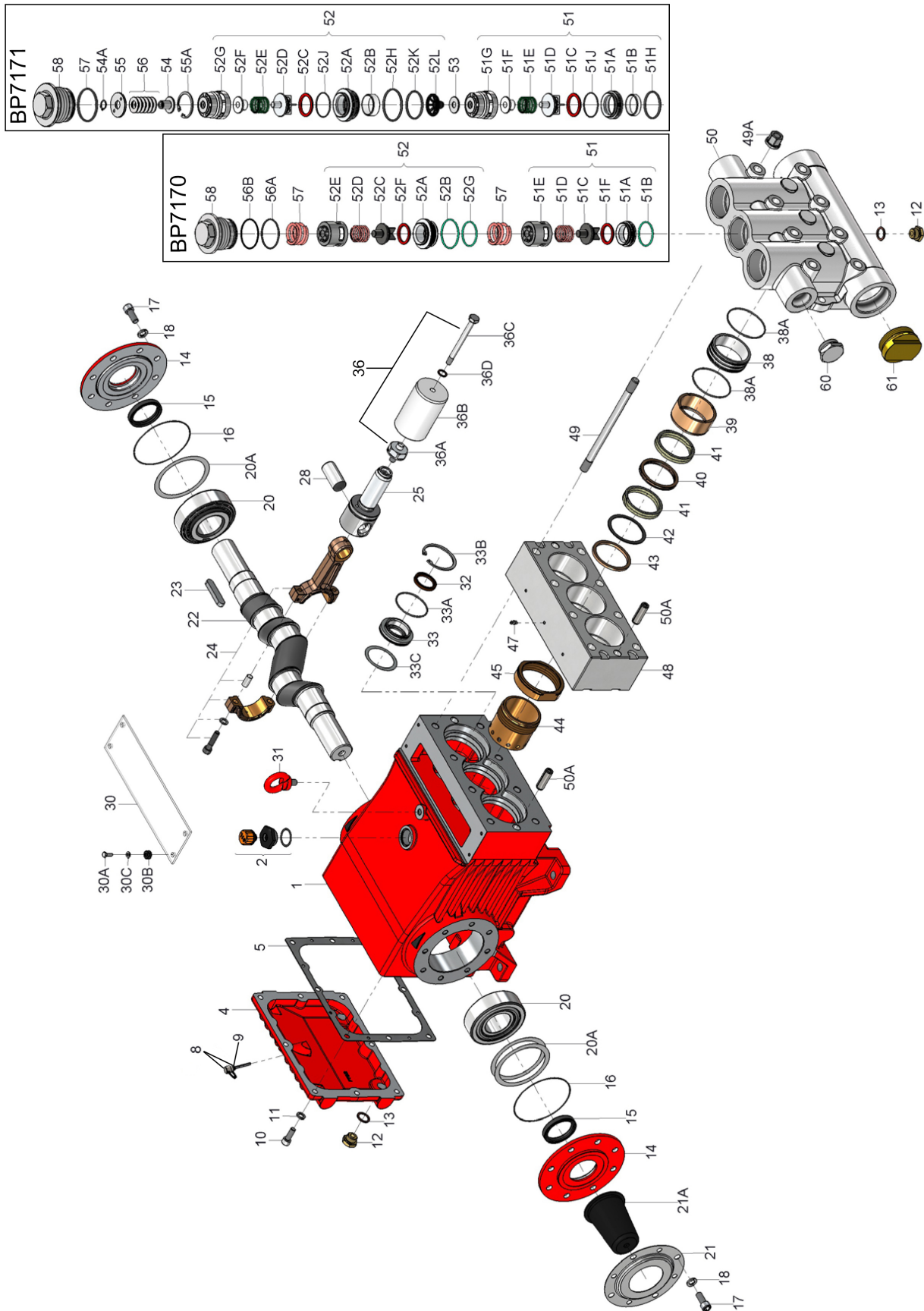
| BP7170 Horsepower Requirements |      |         |         |         |          |
|--------------------------------|------|---------|---------|---------|----------|
| RPM                            | GPM  | 500 PSI | 700 PSI | 900 PSI | 1015 PSI |
| 300                            | 45.3 | 15.6    | 21.9    | 28.1    | 31.7     |
| 400                            | 60.4 | 20.8    | 29.2    | 37.5    | 42.3     |
| 500                            | 75.4 | 26.0    | 36.4    | 46.8    | 52.8     |
| 560                            | 84.5 | 29.1    | 40.8    | 54.5    | 59.2     |

## SPECIAL NOTE:

The theoretical gallons per revolution (gal/rev) is 0.151.  
To find specific outputs at various RPM, use the formula:

$$\text{GPM} = 0.151 \times \text{RPM}$$

# Exploded View - BP7170/BP7171





## Parts List - BP7170/BP7171

| ITEM | PART       | DESCRIPTION                          | QTY. | ITEM | PART       | DESCRIPTION   | QTY. |
|------|------------|--------------------------------------|------|------|------------|---|------|
| 1    | 04674      | Crankcase                            | 1    | 51A  | 04704      | Inlet Valve Seat, BP7170                              | 3    |
| 2    | 06893      | Oil Filler Plug Assembly             | 1    | 51A  | 04685      | Inlet Valve Seat, BP7171                              | 3    |
| 4    | 07601      | Crankcase Cover                      | 1    | 51B  | 05408      | O-Ring for 51, BP7170                                 | 3    |
| 5    | 05798      | Gasket, Crankcase Cover              | 1    | 51B  | 04686      | Guide Ring, BP7171                                    | 3    |
| 8    | 03215      | Oil Dip Stick Assembly               | 1    | 51C  | 06678      | Valve Plate, BP7170                                   | 3    |
| 9    | 01009      | O-Ring, Dip Stick                    | 1    | 51C  | 04687      | Valve Seal Ring, BP7171                               | 3    |
| 10   | 22706      | Hexagon Screw                        | 8    | 51D  | 07732-0100 | Valve Spring, BP7170                                  | 3    |
| 11   | 06725      | Spring Washer                        | 8    | 51D  | 04688      | Valve Plate, BP7171                                   | 3    |
| 12   | 07109      | Drain Plug                           | 3    | 51E  | 06679      | Spacer Pipe, BP7170                                   | 3    |
| 13   | 06272      | Gasket, Drain Plug                   | 2    | 51E  | 05450      | Valve Spring, BP7171                                  | 3    |
| 14   | 04675      | Bearing Cover                        | 2    | 51F  | 06680      | Valve Seal Ring, BP7170                               | 3    |
| 15   | 07608      | Radial Shaft Seal                    | 2    | 51F  | 04690      | Guide Sleeve, BP7171                                  | 3    |
| 16   | 07184      | O-Ring                               | 2    | 51G  | 04691      | Spring Tension Cap, BP7171                            | 3    |
| 17   | 05647      | Inner Hexagon Screw                  | 8    | 51H  | 05167      | O-Ring, BP7171  | 3    |
| 18   | 05039      | Spring Washer                        | 8    | 51J  | 07758      | O-Ring, BP7171  | 3    |
| 20   | 07610      | Taper Roller Bearing                 | 2    | 52   | 06673      | Discharge Valve Assembly (52A-G), BP7170              | 3    |
| 20A  | 07611      | Fitting Disc (Shim)                  | 1-5  | 52   | 04692      | Discharge Valve Assembly (52A-L), BP7171              | 3    |
| 21   | 05645      | Shaft Guard Holder                   | 1    | 52A  | 04705      | Discharge Valve Seat, BP7170                          | 3    |
| 21A  | 05646      | Shaft Guard                          | 1    | 52A  | 04693      | Discharge Valve Seat, BP7171                          | 3    |
| 22   | 13405      | Crankshaft                           | 1    | 52B  | 05818      | O-Ring, BP7170  | 3    |
| 23   | 07614      | Key                                  | 1    | 52B  | 04694      | Guide Ring, BP7171                                    | 3    |
| 24   | 13182      | Connecting Rod Assembly              | 3    | 52C  | 06678      | Valve Plate, BP7170                                   | 3    |
| 25   | 13183      | Crosshead Assembly                   | 3    | 52C  | 04687      | Valve Seal Ring, BP7171                               | 3    |
| 28   | 13184      | Crosshead Pin                        | 3    | 52D  | 07732-0100 | Valve Spring, BP7170                                  | 3    |
| 30   | 06661      | Cover Plate                          | 1    | 52D  | 04688      | Valve Plate, BP7171                                   | 3    |
| 30A  | 07225-0100 | Hexagon Screw                        | 4    | 52E  | 06679      | Spacer Pipe, BP7170                                   | 3    |
| 30B  | 13136      | Grommet                              | 4    | 52E  | 05450      | Valve Spring, BP7171                                  | 3    |
| 30C  | 05053      | Washer                               | 4    | 52F  | 06680      | Valve Seal Ring, BP7170                               | 3    |
| 31   | 07623      | Eye Bolt                             | 1    | 52F  | 04690      | Guide Sleeve, BP7171                                  | 3    |
| 32   | 07624      | Radial Shaft Seal                    | 3    | 52G  | 05408      | O-Ring, BP7170  | 3    |
| 33   | 06662      | Seal Retainer                        | 3    | 52G  | 04691      | Spring Tension Cap, BP7171                            | 3    |
| 33A  | 13286      | O-Ring                               | 3    | 52H  | 05169      | O-Ring, BP7171  | 3    |
| 33B  | 05719      | Circlip                              | 3    | 52J  | 07758      | O-Ring, BP7171  | 3    |
| 33C  | 04676      | Fitting Disc (Shim)                  | 3    | 52K  | 05599      | O-Ring, BP7171  | 3    |
| 36   | 06664      | Plunger Pipe Assembly (36 A-D)       | 3    | 52L  | 13309      | Spacer, BP7171  | 3    |
| 36A  | 07667      | Plunger Connection                   | 3    | 53   | 04694      | Valve Holder, BP7171                                  | 3    |
| 36B  | 06665      | Plunger Pipe                         | 3    | 54   | 04695      | Plate Spring Adapter, BP7171                          | 3    |
| 36C  | 07664      | Tension Screw                        | 3    | 54A  | 04696      | Clip Ring, BP7171                                     | 3    |
| 36D  | 07665      | Copper Ring                          | 3    | 55   | 04187      | Tension Disc, BP7171                                  | 3    |
| 38   | 06666      | Seal Case                            | 3    | 55A  | 04697      | Clip Ring, BP7171                                     | 3    |
| 38A  | 06667      | O-Ring                               | 6    | 56   | 04698      | Plate Spring, BP7171                                  | 18   |
| 39   | 04677      | Spacer Sleeve                        | 3    | 56A  | 07658      | O-Ring, BP7170  | 3    |
| 40   | 04678      | Lubrication Ring                     | 3    | 56B  | 07635      | Support Ring, BP7170                                  | 3    |
| 41   | 06670      | Spiral Ring                          | 6    | 57   | 13173      | Tension Spring, BP7170                                | 6    |
| 42   | 06671      | Support Ring                         | 3    | 57   | 04699      | O-Ring, BP7171  | 3    |
| 43   | 04679      | Guide Ring                           | 3    | 58   | 06682      | Plug M64 X 2, BP7170                                  | 3    |
| 44   | 04680      | Pressure Sleeve                      | 3    | 58   | 04700      | Valve Plug, BP7171                                    | 3    |
| 45   | 04681      | Adjusting Ring                       | 3    | 60   | 13151      | Plug, 1-1/4" BSP, BP7170                              | 1    |
| 47   | 04374      | Grease Nipple                        | 3    | 60   | 13322      | Plug, 1-1/2" BSP, BP7171                              | 1    |
| 48   | 04682      | Intermediate Casing                  | 1    | 61   | 13171      | Plug, 2-1/2" BSP                                      | 1    |
| 49   | 06675      | Stud Bolt, BP7170                    | 8    |      | 04706      | Gear End Assembly, BP7170 (1-33C, 49, 49A, 50A)       | 1    |
| 49   | 04683      | Stud Bolt, BP7171                    | 8    |      | 04701      | Gear End Assembly, BP7171 (1-33C, 49, 49A, 50A)       | 1    |
| 49A  | 13160      | Hex Nut, BP7170                      | 8    |      | 04707      | Manifold Assembly, BP7170 (1 x 12, 50-61 without 50A) | 1    |
| 49A  | 13430      | Hex Nut, BP7171                      | 8    |      | 04703      | Manifold Assembly, BP7171 (50-61)                     | 1    |
| 50   | 06676      | Valve Casing, BP7170                 | 1    |      | 04702      | Plunger Replacement Kit, (36-45)                      | 1    |
| 50   | 04689      | Valve Casing, BP7171                 | 1    |      |            |   |      |
| 50A  | 13162      | Cylinder Stud                        | 4    |      |            |   |      |
| 51   | 06683      | Inlet Valve Assembly (51A-F), BP7170 | 3    |      |            |   |      |
| 51   | 04684      | Inlet Valve Assembly (51A-J), BP7171 | 3    |      |            |   |      |

# Specifications - Model BP7171

|                                    |                        |                                |
|------------------------------------|------------------------|--------------------------------|
|                                    | U.S. ....              | Metric                         |
| Volume .....                       | 105.7 GPM .....        | 400 L/min                      |
| Discharge Pressure .....           | 1015 PSI .....         | 70 bar                         |
| Power Consumption .....            | 74 BHP .....           | 55 kW                          |
| Speed .....                        |                        | 700 RPM                        |
| Inlet Pressure .....               | -4.35 to 140 PSI ..... | -0.3 to 10 bar                 |
| Plunger Diameter .....             | 2.75" .....            | 70mm                           |
| Plunger Stroke .....               | 2.04" .....            | 52mm                           |
| Crankshaft Diameter .....          |                        | 48mm                           |
| Key Width .....                    |                        | 14mm                           |
| Crankshaft Mounting .....          |                        | Either side                    |
| Shaft Rotation .....               |                        | Top of pulley towards manifold |
| Temperature of Pumped Fluids ..... | Up to 104 °F .....     | (40 °C)                        |
| Inlet Ports .....                  |                        | (2) 2-1/2" BSP                 |
| Discharge Ports .....              |                        | (2) 1-1/2" BSP                 |
| Weight .....                       | 423 lbs. ....          | (192 kg)                       |
| Crankcase Oil Capacity .....       | 2.4 Gal. ....          | (9.0 Liters)                   |
| Fluid End Material .....           |                        | 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.

## 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:

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

| BP7171 Horesepower Requirements |       |         |         |         |          |
|---------------------------------|-------|---------|---------|---------|----------|
| RPM                             | GPM   | 500 PSI | 700 PSI | 900 PSI | 1015 PSI |
| 300                             | 45.3  | 15.6    | 21.9    | 28.1    | 31.7     |
| 400                             | 60.4  | 20.8    | 29.2    | 37.5    | 42.3     |
| 500                             | 75.4  | 26.0    | 36.4    | 46.8    | 52.8     |
| 560                             | 84.5  | 29.1    | 40.8    | 54.5    | 59.2     |
| 700                             | 105.7 | 36.5    | 51.0    | 65.6    | 74.0     |

## SPECIAL NOTE:

The theoretical gallons per revolution (gal/rev) is 0.151.  
To find specific outputs at various RPM, use the formula:

$$\text{GPM} = 0.151 \times \text{RPM}$$

## Repair Kits - BP7170/BP7171

### Plunger Packing Kit

# 09558

| Item | Part # | Description  | Qty. |
|------|--------|--------------|------|
| 38A  | 06667  | O-Ring       | 6    |
| 41   | 06670  | Spiral Ring  | 6    |
| 42   | 06671  | Support Ring | 3    |

### Oil Seal Kit

# 09557

| Item | Part # | Description       | Qty. |
|------|--------|-------------------|------|
| 32   | 07624  | Radial Shaft Seal | 3    |
| 33A  | 13286  | O-Ring            | 3    |

### Valve Repair Kit - BP7170

# 09559

| Item    | Part #     | Description           | Qty. |
|---------|------------|-----------------------|------|
| 51A     | 04704      | Valve Seat, Inlet     | 3    |
| 51B     | 05408      | O-Ring                | 3    |
| 51C/52C | 06678      | Valve Plate           | 6    |
| 51D/52D | 07732-0100 | Valve Spring          | 6    |
| 51E/52E | 06679      | Spacer Pipe           | 6    |
| 51F/52F | 06680      | Ring for Valve        | 6    |
| 52A     | 04705      | Valve Seat, Discharge | 3    |
| 52B     | 05818      | O-Ring                | 3    |
| 52G     | 05408      | O-Ring                | 3    |
| 56A     | 07658      | O-Ring                | 3    |
| 56B     | 07635      | Support Ring          | 3    |

### Valve Repair Kit - BP7171

# 09836

| Item    | Part # | Description           | Qty. |
|---------|--------|-----------------------|------|
| 51A     | 04685  | Valve Seat, Inlet     | 3    |
| 51B     | 04686  | Guide Ring            | 3    |
| 51C/52C | 04687  | Valve Seal Ring       | 6    |
| 51D/52D | 04688  | Valve Plate           | 6    |
| 51E/52E | 05480  | Valve Spring          | 6    |
| 51F/52F | 04690  | Guide Sleeve          | 6    |
| 51G/52G | 04691  | Spring Tension Cap    | 6    |
| 51H     | 05167  | O-Ring                | 3    |
| 51J/52J | 07758  | O-Ring                | 6    |
| 52A     | 04693  | Valve Seat, Discharge | 3    |
| 52B     | 04694  | Guide Ring            | 3    |
| 52H     | 05169  | O-Ring                | 3    |
| 52K     | 05599  | O-Ring                | 3    |
| 52L     | 13309  | Spacer                | 3    |
| 57      | 04699  | O-Ring                | 3    |

## Torque Specifications BP7170/BP7171

| Item | Part #     | Description                  | Torque                | Tool Needed/<br>Lubrication |
|------|------------|------------------------------|-----------------------|-----------------------------|
| 1    | 04674      | 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  | 07225-0100 | Hexagon Screw                | 89 in.-lbs. (10 Nm)   |                             |
| 33B  | 05719      | Circlip                      |                       | Loctite 403                 |
| 36A  | 07667      | Plunger Connection           | 33 ft.-lbs. (40 Nm)   |                             |
| 36C  | 07664      | Tension Screw                | 30 ft.-lbs. (40 Nm)   | Loctite 243                 |
| 49   | 06675      | Stud Bolt, BP7170            |                       | Loctite 243                 |
| 49   | 04683      | Stud Bolt, BP7171            |                       | Loctite 243                 |
| 49A  | 13160      | Hex Nut, BP7170              | 103 ft.-lbs. (140 Nm) |                             |
| 49A  | 13430      | Hex Nut, BP7171              | 59 ft.-lbs. (80 Nm)   |                             |
| 51A  | 04704      | Inlet Valve Seat, BP7170     |                       | Hylomar                     |
| 51A  | 04685      | Inlet Valve Seat, BP7171     |                       | Hylomar                     |
| 52A  | 04705      | Discharge Valve Seat, BP7170 |                       | Hylomar                     |
| 52A  | 04693      | Discharge Valve Seat, BP7171 |                       | Hylomar                     |
| 58   | 06682      | Valve Plug                   | 107 ft.-lbs. (145 Nm) |                             |
| 58   | 04700      | Valve Plug                   | 107 ft.-lbs. (145 Nm) |                             |

## BP7170/BP7171 Repair Instructions

### To Check Valves

Remove plugs (58). For BP7171, remove items 54-56. Using valve removal tool (07662), lift the complete discharge valve assembly (52) and suction valve assembly (51) from the valve casing (50).

**Dismantling Valves (BP7170):** the spring tension cap (51E, 52E) is screwed together with valve seat (51A, 52A). Remove spring tension cap, remove spring (51D, 52D) and valve plate (51C, 52C). The seal ring (51F, 52F) is snapped onto the valve plate. Examine sealing surfaces, o-rings (51B/52B/56A/56G) and support rings (56B). Replace worn parts. Glue in valve seats with Hylomar.

**Dismantling Suction Valves (BP7171):** the spring tension cap (51G) is screwed together with valve seat (51A). Remove spring tension cap and remove spring (51E) and valve plate (51D). The seal ring (51C) is snapped on to the valve plate. The guide sleeve (51F) is clipped into the spring tension cap. The guide ring (51B) is pushed into the valve seat from below.

**Disassemble discharge valves (BP7171)** (52) like the suction valves. Check sealing surfaces and o-rings (51H/52H/52J/52K/57). Replace worn parts. Glue in valve seats with Hylomar or Permatex.

### Checking Seals and Plunger Pipes

Remove hexagon nut (49A) and take the pump head (50) off to the front. The intermediate casing (48) will either stay on the valve casing or on the crankcase (1).

**Important!** Pay attention to avoid any injury due to the heavy weight of the parts when removing these from the stud screws (49). If necessary, secure the valve casing by supporting it with wooden blocks or using a hoist. Pry intermediate casing (48) off the valve casing or crankcase with two screwdrivers (use the slots in the intermediate casing).

Examine seals and replace if necessary. The seal cases (38) normally remain in the valve casing (50) when this is separated from the intermediate casing. Remove spacer sleeves (39) and seal units (40/41/42/43) from the intermediate casing and examine them. Take adjusting rings (45) together with pressure sleeves (44) out of the crankcase. Unscrew these items and clean.

**Important!** Screw the pressure sleeve and adjusting ring into each other so that the adjusting ring is in alignment with the top of the pressure sleeve. Then put the parts back into the crankcase (1).

### To Check Seals

Remove seal cases (38) from valve casing (50) and check o-rings (38A). Replace worn parts. Coat seals and o-rings with silicone grease before refitting.

**Important!** Mounting surfaces of the crankcase and intermediate casing must be clean and free of damage. The components must lie exactly and evenly on one another. The same exactness applies for all centring positions within the crankcase, intermediate and valve casing.

**Important!** Seal unit (40, 41, 42, 43) can only be fitted after intermediate casing (48) has been mounted on the drive. The seal unit is then mounted on to the plunger pipe and pushed into the intermediate casing using a sleeve or the spacer sleeve.

**Important!** The seal unit (40-43) is tensioned by spacer sleeve (39). To achieve long seal service life, the tension on the seal unit allows for a small amount of leakage which helps lubricate and cool the seals. If leakage increases, the spiral rings can be tightened by turning the pressure sleeve (44) in its seal sleeve (40) a little to the right. Grease the spiral rings (41) via the lubricating nipple (47). If necessary, replace the spiral rings (41) together with support ring (42). It is only necessary to change seals should leakage considerably increase, in turn causing the flow and pressure to fall.

### To Check Plunger Pipes

**Important!** If the plunger pipe (36B) is worn, tap the tension screw (36C) lightly with a plastic hammer beforehand to loosen the glue on the threads of the tension screw. Then screw out tension screw (36C) and remove the plunger pipe from plunger connection (36A).



## BP7170/BP7171 Repair Instructions

Using the tension screw, put the new plunger pipe together with a new copper ring (36D) on to the plunger connection. Cover the threads on the tension screw lightly with bonding agent and tighten at 30 ft.-lbs. (40 Nm).

**Important!** Glue must never come between the plunger pipe (36B) and the plunger connection (36A). Deformation of the plunger pipe due to excessive tightening of the tension screw or dirt or damage on the front surface can cause the plunger pipe to fracture.

### Mounting the Valve Casing

Check mounting and sealing surfaces of the crankcase (1), intermediate casing (48) and valve casing (50), and clean where necessary. Put seal cases (38) in the centring holes of the valve casing, then push the valve casing carefully onto the centring studs (50A). Tighten hexagon nuts (49) at 59 ft.-lbs. 103 ft.-lbs. (140 Nm) for BP7170 and (80 Nm) for BP7171.

### 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 screwdriver. Check seals (32, 32A, 33A) and crosshead surfaces. Screw off crankcase cover (4). Remove fitting screws on the connecting rods (24).

**Important!** Do not twist the connecting rod halves. The connecting rods are marked for identification and must be refitted onto the shaft journals in the exact original position. Check surfaces of connecting rod and crankshaft (22). Push connecting rod halves together with the crosshead as far as possible into the crosshead guide. Remove one bearing cover and push the crankshaft out, taking care not to bend any connecting rods.

**Important!** Seal (32A) must always be fitted so that the seal-lip on the inside diameter faces the oil. Possible axial float of the seal adaptor (33) to be compensated with shims (33C). Reassembly in reverse order. Adjust axial play on the crankshaft with shims (20A) of size min. 0.1mm max. 0.15mm. The shaft should turn easily with little clearance. Tighten fitting screws (24) to 30 ft.-lbs. (40 Nm).

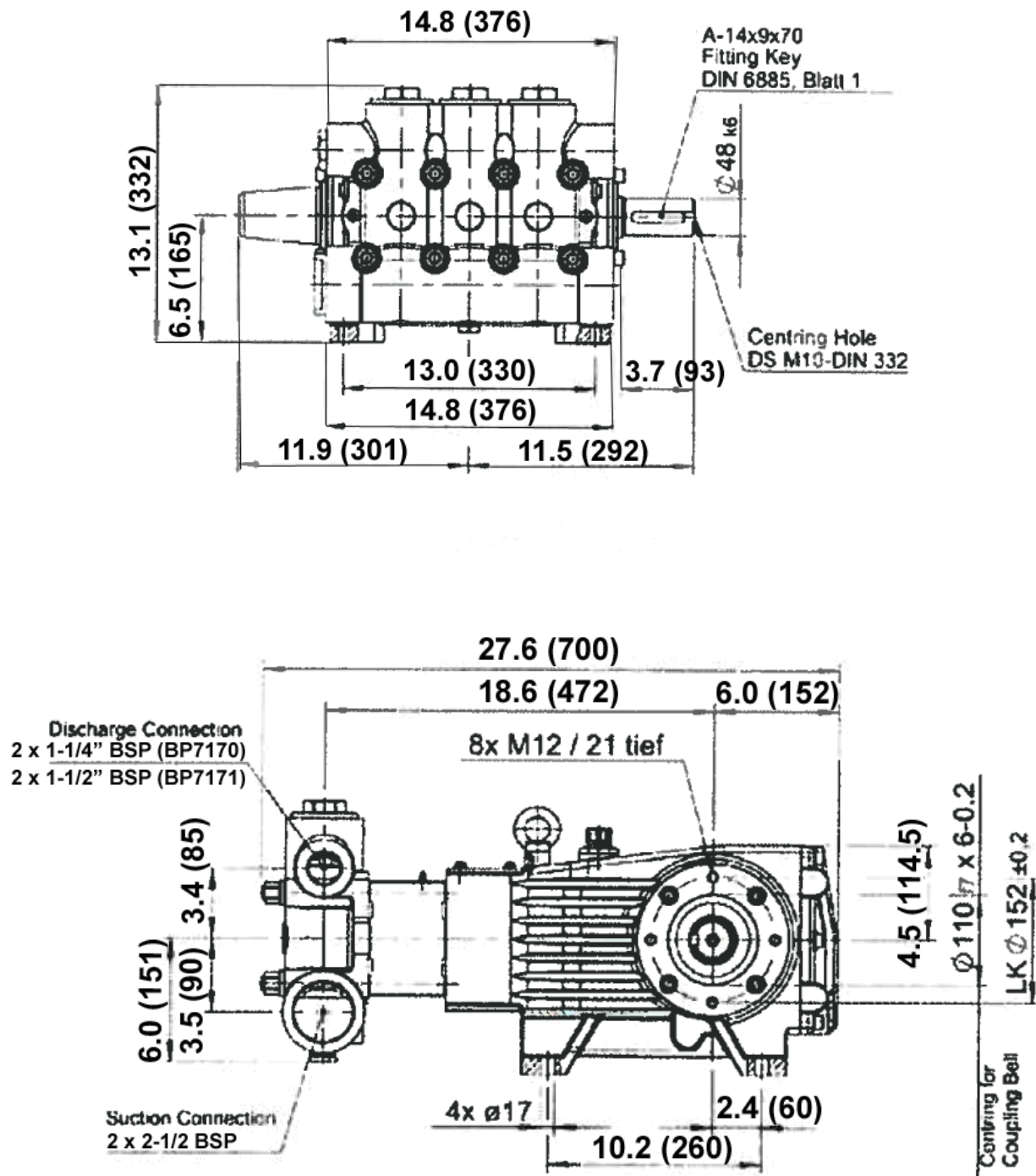
**Important!** A little clearance must exist to enable slight sideward movement of the connecting rod on its journal.

| Preventative Maintenance Check-List & Recommended Spare Parts List |       |        |       |                  |                   |                   |
|--|-------|--------|-------|------------------|-------------------|-------------------|
| Check  | Daily | Weekly | 50hrs | Every<br>500 hrs | Every<br>1500 hrs | Every<br>3000 hrs |
| Oil Level/Quality  | X     |        |       |                  |                   |                   |
| Oil Leaks  | X     |        |       |                  |                   |                   |
| Water Leaks  | X     |        |       |                  |                   |                   |
| Belts, Pulley  |       | X      |       |                  |                   |                   |
| Plumbing   |       | X      |       |                  |                   |                   |
| Recommended Spare Parts  |       |        |       |                  |                   |                   |
| Oil Change p/n 1154  |       |        | X     | X                |                   |                   |
| Seal Spare Parts (1 kit/pump)<br>(Page 7 for kit list)             |       |        |       |                  | X                 |                   |
| Oil Seal Kit (1 kit/pump)<br>(Page 7 for kit list)                 |       |        |       |                  | X                 |                   |
| Valve Kit (1 kit/pump)<br>(Page 7 for kit list)                    |       |        |       |                  |                   | X                 |

## PUMP SYSTEM MALFUNCTION

| <u>MALFUNCTION</u>                                 | <u>CAUSE</u>   | <u>REMEDY</u>  |
|--|--|--|
| The Pressure and/<br>or the Delivery<br>Drops      | Worn packing seals<br>Broken valve spring<br>Belt slippage<br>Worn or Damaged nozzle<br>Fouled discharge valve<br>Fouled inlet strainer<br>Worn or Damaged hose<br>Worn or Plugged relief valve on pump<br><br>Cavitation<br>pump for restrictions<br>Unloader | Replace packing seals<br>Replace spring<br>Tighten or Replace belt<br>Replace nozzle<br>Clean valve assembly<br>Clean strainer<br>Repair/Replace hose<br>Clean, Reset, and Replace worn parts<br>Check suction lines on inlet of<br><br>Check for proper operation |
| Water in crankcase                                 | High humidity<br>Worn seals  | Reduce oil change interval<br>Replace seals  |
| Noisy Operation                                    | Worn bearings<br><br>Cavitation  | Replace bearings, Refill crankcase oil with recommended lubricant<br>Check inlet lines for restrictions and/or proper sizing   |
| Rough/Pulsating<br>Operation with<br>Pressure Drop | Worn packing<br>Inlet restriction<br><br>Accumulator pressure<br>Unloader<br>Cavitation  | Replace packing<br>Check system for stoppage, air leaks, correctly sized inlet plumbing to pump<br>Recharge/Replace accumulator<br>Check for proper operation<br>Check inlet lines for restrictions and/or proper size   |
| Pump Pressure as<br>Rated, Pressure<br>Drop at gun | Restricted discharge plumbing  | Re-size discharge plumbing to flow rate of pump  |
| Excessive<br>Leakage                               | Worn plungers<br>Worn packing/seals<br>Excessive vacuum<br>Cracked plungers<br>Inlet pressure too high   | Replace plungers<br>Adjust or Replace packing seals<br>Reduce suction vacuum<br>Replace plungers<br>Reduce inlet pressure  |
| High Crankcase<br>Temperature                      | Wrong Grade of oil<br>Improper amount of oil in crankcase  | Giant oil is recommended<br>Adjust oil level to proper amount  |

BP7170/BP7171 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](http://www.P65Warnings.ca.gov)

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