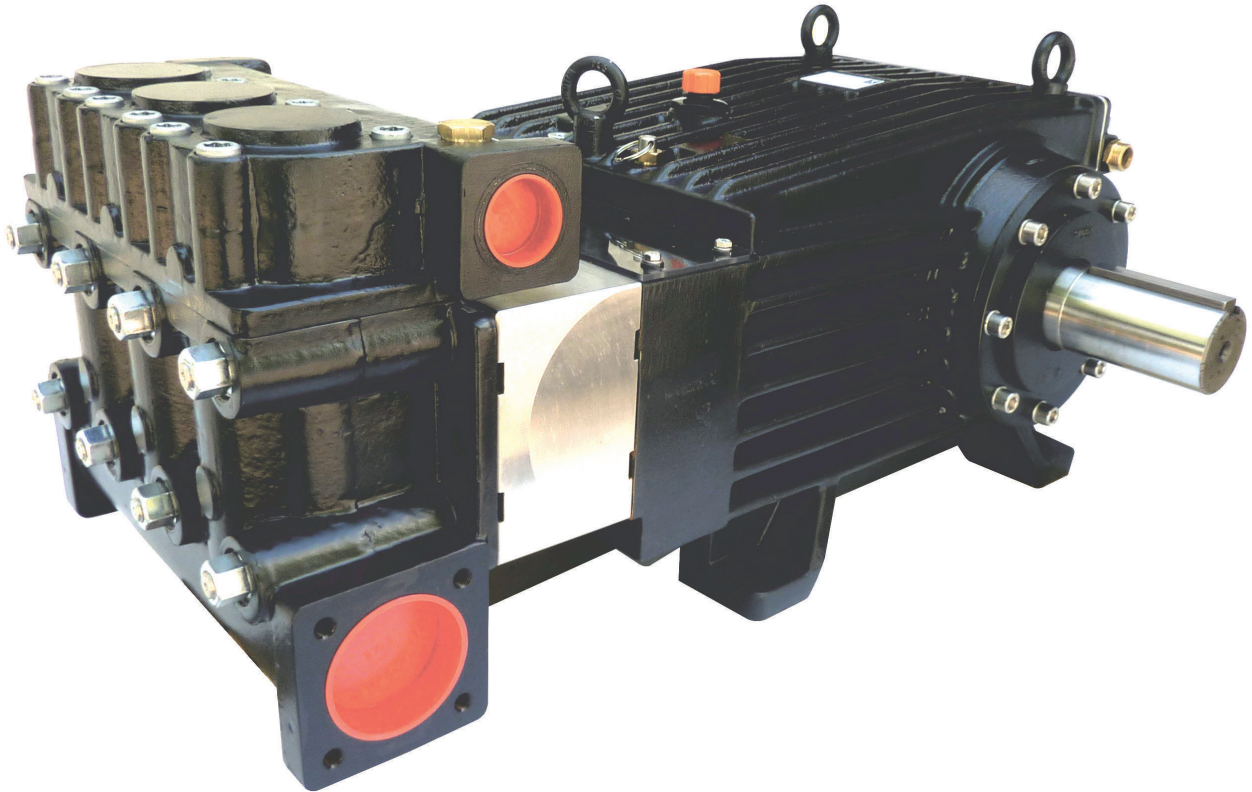


Model BP8076

Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service Manual



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BP8076 Installation Instructions

Operation and Maintenance

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

Oil: Use only 4.6 gallons (17.5 liters) of **ISO VG 220 GL4 (e.g. Aral Degol BG220)** or **SAE 90 GL4 gear oil** (Giant part number 01154).

Initial change after 50 operating hours and then every 1000 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.

Maximum input pressure 145 PSI (10 bar).
Maximum suction head -4.35 PSI (-0.3 bar) (dependent on the viscosity of the medium). Make sure that suction pulsation is sufficiently dampened – water column resonance must be avoided. When starting up for work, the pump must run first at zero pressure for approximately 1 minute.

Important! The pumps can be run without gear oil cooling in continuous operation **up to** a power rating of **107.2 hp (80 kW)** or with major intermittent operation at full performance (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 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 minute followed by a 40 minute break).

Separate Gear Oil Cooling for Continuous Operation

The pump gear cover (K3) has 1/2" BSP female connections on both sides on the top and bottom through which cooling water can be run. The cooling water must be fed in on one side on the bottom of the gear cover and led out on the opposite top side. The cooling water amount should be at least 0.19 gallons (7 L/min) at maximum 104 °F (40°C) before entering the pump. The maximum pressure for the cooling system is 29 PSI (2 bar). Where a closed cooling circuit is involved, the cooling efficiency and circulation amount are to be adapted accordingly. If there is a danger of frost, either antifreeze must be added or the cooling system must be emptied.

Important! The BP8000 series has a black arrow on the crankcase which shows the preferred direction of rotation.

The preferred direction of rotation ensures the motion of the connecting rods correctly distributes the oil onto the crosshead guides – which is a particular advantage where continuous operation is involved.

The pump can also be run against the recommended direction of rotation if operated periodically or at reduced pressure. If so, the pump has to be run in this direction to smoothen the bearing areas. This is done by a one-time operation at zero pressure for at least 30 minutes; thereafter the pressure must be slowly increased over the next hour to the desired maximum operating pressure after which the pump is then run in. The oil temperature is to be checked during this procedure.

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

Expel the circuit liquid at the connecting branch (K10) using compressed air.

The torque tension on the valve casing nuts (49A) is to be checked after approximately 200 operating hours. Please see the torque specification chart on page 5.

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

Important! Retighten the sleeve only 1 to maximum 2 hole distances as otherwise the friction increases too much. Regrease the seal by pressing multi-purpose grease 2M (e.g. Multi Basic 2M) into the grease nipple (39B).

Important! To avoid any incrustation of the medium on the plungers (36B), screw off cover plate (30) after every operation and rinse the plunger area with clear non-pressurized water (e.g. using mains water, never under high pressure).

Important! After finishing the work, run the pump with clear water for 3-5 minutes. The service life of the seals, ceramic plungers and valves depends largely on how fine the recycled bentonite is filtered.



Safety Rules

The operating instructions must be read and adhered to before performing any work on the pump or complete assembled unit. No responsibility will be carried by us for damage to materials or persons caused by improper handling of our pumps.

Access to the pump is not allowed for unauthorized personnel. 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 driven shaft side and its coupling must be covered by a protective guard. The plunger area must also be covered by the protective plate (30).

Do not step onto the protective plate (30) nor put weight on it.

Pressure in the discharge line and pump must be at zero before carrying out any maintenance work to the pump or unit. Close off suction line. Disconnect fuses to ensure that the driving motor cannot get switched on accidentally. Make sure that the pump, the cooling system 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/medium-mixture being absorbed and cavitation occurring, the pump-npshr (positive suction head required) 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 BP8076 Giant pump is 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 (1m³) of water.

Specifications - Model BP8076

	U.S.	Metric
Volume	132 GPM	500 L/min
Discharge Pressure	1500 PSI.....	100 bar
Power Required	129 HP	96 kW
Speed		520 RPM
Inlet Pressure.....	-4.35 to 145 PSI*	-0.3 to 10 bar*
Plunger Diameter.....	2.99"	76 mm
Plunger Stroke	2.83"	72 mm
Crankshaft Diameter.....		70 mm
Key Width		B20 x 12 x 110 mm
Crankshaft Mounting.....		Either side
Shaft Rotation		Top of pulley towards manifold
Temperature of Pumped Fluids.....	Up to 104 °F	(40 °C)
Inlet Ports.....		(2) 3" BSP
Discharge Ports		(2) 1-1/2" BSP
Weight.....	738 lbs.....	(335 kg)
Crankcase Oil Capacity	4.6 Gal.....	(17.5 Liters)
Fluid End Material.....		Cast Iron

*See note on page 2

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:

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

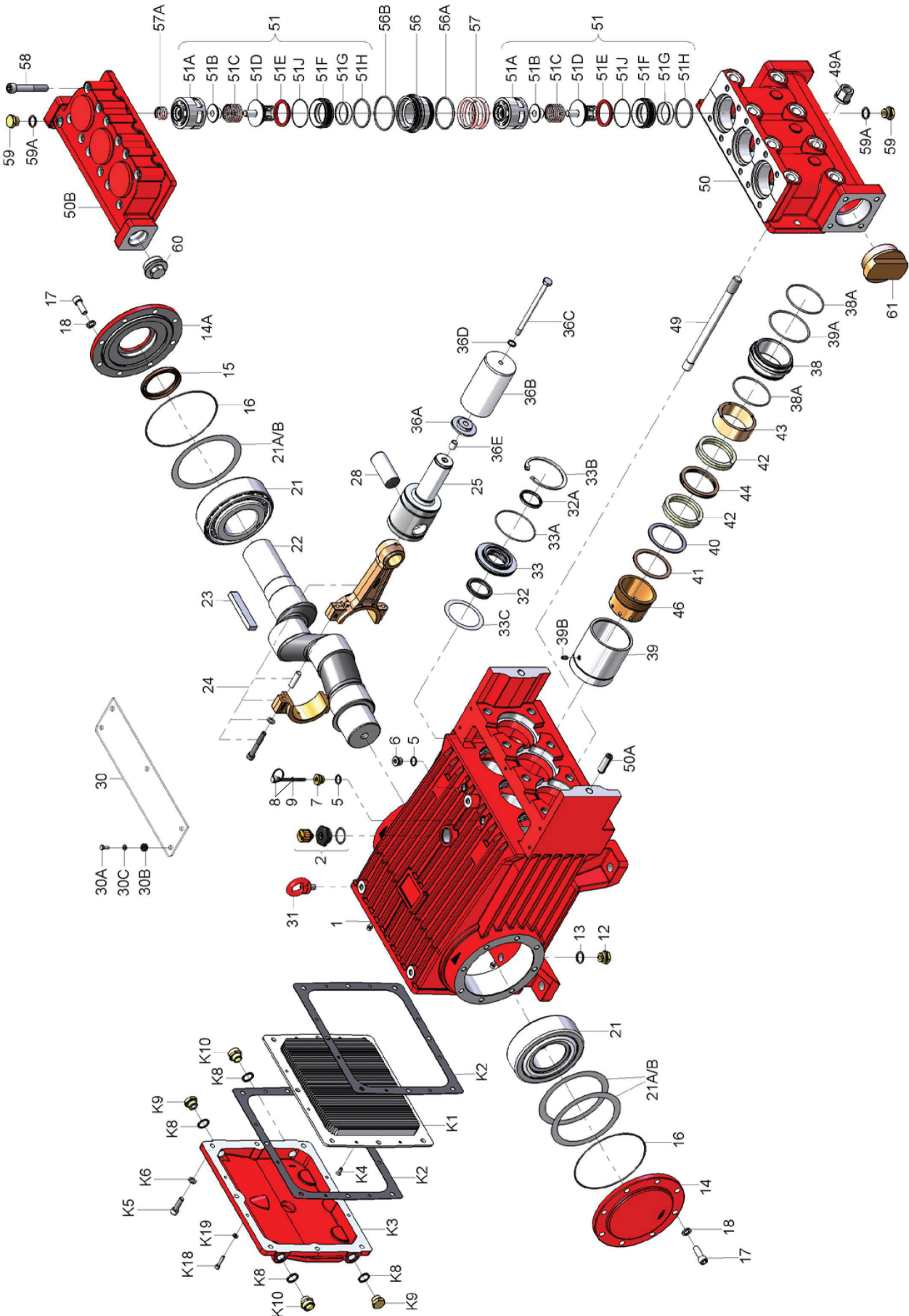
BP8076 Horsepower Requirements					
RPM	GPM	500 PSI	750 PSI	1000 PSI	1500 PSI
260	66.0	22.8	34.1	45.5	68.3
300	76.2	26.3	39.4	52.6	78.8
400	101.5	35.0	52.5	70.0	105.0
500	132	45.5	68.3	91.0	136.6

SPECIAL NOTE:

The theoretical gallons per revolution (gal/rev) is 0.254.
To find specific outputs at various RPM, use the formula:

$$\text{GPM} = 0.254 \times \text{RPM}$$

Exploded View - B8076



Parts List - BP8076

<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	05380	Crankcase	1	41	03599	Guide Ring	3
2	06893	Oil Filler Plug Assy with Vent	1	42	03568	Spiral Ring	6
5	22929	Copper Washer	2	43	03600	Spacer Pipe	3
6	12256	Plug	1	44	03601	Lubrication Ring	3
7	05656	Plug, 3/8" BSP	1	46	03602	Pressure Sleeve	3
8	01008	Oil Dipstick Assembly	1	49	05072	Stud Bolt	8
9	01009	O-Ring	1	49A	05073	Hexagon Nut	8
12	07109	Plug, 1/2" BSP	2	50	03603	Valve Casing	1
13	06272	Seal	2	50A	13162	Centering Stud	4
14	05036	Bearing Cover, Closed	1	50B	03604	Discharge Valve Casing	1
14A	03597	Bearing Cover, Open	1	51	03613	Valve Assembly (51A-51J)	6
15	05112	Radial Shaft Seal	1	51A	03605	Spring Tension Cap	6
16	05037	O-Ring	2	51B	03606	Guide Bush	6
17	05038	Hexagon Socket Screw	16	51C	05080	Valve Spring	6
18	05039	Spring Ring	16	51D	03607	Valve Plate	6
21	05044	Tapered Roller Bearing	2	51E	03608	Gasket for Valve	6
21A	05042	Fitting Disc	1-5	51F	03609	Valve Seat	6
21B	05043	Fitting Disc	1-5	51G	03610	Guide Ring	6
22	05299	Crankshaft	1	51H	03434	O-Ring	6
23	05104	Fitting Key	1	51J	07193	O-Ring	6
24	05047	Connecting Rod Assembly	3	56	03576	Discharge Valve Adaptor	3
25	05048	Crosshead c/w Plunger	3	56A	04955	O-Ring	3
28	05049	Crosshead Pin	3	56B	13156	O-Ring	3
30	05052	Cover Plate	1	57	05279	Pressure Spring	3
30A	07225-0100	Hexagon Screw	5	57A	07210-0100	Pressure Spring	3
30B	13136	Grommet	5	58	05087	Hexagon Socket Screw	12
30C	05053	Washer	5	59	07109	Plug 1/2" BSP	2
31	07623	Eye Bolt	3	59A	06272	Copper Seal	2
32	05058	Radial Shaft Seal	3	60	13322	Plug 1-1/2" BSP	1
32A	03118	Scraper	3	61	05088	Plug 3" BSP	1
33	03119	Seal Retainer	3	68	03611	Mounting Aid for Valve (not shown)	1
33A	05056	O-Ring	3	78	03612	Oil Cooler Assembly	1
33B	05054	Clip Ring	3	K1	05026	Cooling Vane Plate	1
33C	05059	Fitting Disc	3	K2	05027	Seal for Gear Cover	2
36A	04934	Plunger Pipe Cover	3	K3	05028	Gear Cover	1
36B	03561	Plunger Pipe	3	K4	05029	Hexagon Head Countersunk Screw	4
36C	05062	Tension Screw	3	K5	07381	Hexagon Socket Screw	8
36D	07665	Copper Washer	3	K6	08041	Washer	8
36E	06900	Centering Sleeve	3	K8	06272	Copper Seal	4
38	03563	Seal Case	3	K9	07109	Plug, 1/2" BSP	2
38A	03564	O-Ring	6	K10	05031	Connecting Branch	2
39	03598	Seal Sleeve	3	K18	04158	Hexagon Socket Screw	4
39A	05066	O-Ring	3	K19	05053	Washer	4
39B	04374	Lubrication Nipple	3				
40	03566	Support Ring	3				

Repair Kits - BP8076

Plunger Packing Kits - #09863

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
38A	03564	O-Ring	6
39A	05066	O-Ring	3
40	03566	Support Ring	3
41	03599	Guide Ring	3
42	03568	Spiral Ring	6

Valve Repair Kit - #09864

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
51	03613	Valve Assembly	6
56A	04955	O-Ring	3
56B	13156	O-Ring	3

Oil Seal Kit - #09584A

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
32	05058	Radial Shaft Seal	3
32A	03118	Scraper	3
33A	05056	O-Ring	3

BP8076 TORQUE SPECIFICATIONS					
Position	Item #	Thread	Description	Lubrication Info	Torque Amount
12	07109	1/2" BSP	Plug, 1/2" BSP		59 ft.-lbs. (80 Nm)
15	05112		Radial Shaft Seal	Loctite 403	
17	05038	M12	Hexagon Socket Screw		64 ft.-lbs. (87 Nm)
24	05047	M10	Connecting Rod Assembly		37 ft.-lbs. (50 Nm)
32	05058		Radial Shaft Seal	Loctite 403	
36C	05062	M10	Tension Screw	Loctite 243	30 ft.-lbs. (40 Nm)
39	03598		Seal Sleeve	Anti-Seize 350 Crankcase Side	
49	05072	M20	Stud Bolt	Loctite 648 Crankcase Side	
49A	05073	M20	Hexagon Nut		266 ft.-lbs. (360 Nm)
58	05087	M14	Hexagon Socket Screw	Anti-Seize 350	133 ft.-lbs. (180 Nm)
59	07109	1/2" BSP	Plug, 1/2" BSP		59 ft.-lbs. (80 Nm)
K4	05029	M6	Hexagon Head Countersunk Screw		133 in.-lbs. (15 Nm)
K5	07381	M10	Hexagon Socket Screw		33 ft.-lbs. (45 Nm)
K9	07109	1/2" BSP	Plug, 1/2" BSP		59 ft.-lbs. (80 Nm)
K18	04158	M6	Hexagon Socket Screw		133 in.-lbs. (15 Nm)

Preventive Maintenance Check-List & Recommended Spare Parts List						
Check	Daily	Weekly	50hrs	Every 500 hrs	Every 1500 hrs	Every 3000 hrs
Oil Level/Quality	X					
Oil Leaks	X					
Water Leaks	X					
Belts, Pulley		X				
Plumbing		X				
Recommended Spare Parts						
Oil Change p/n 1154			X	X		
Seal Spare Parts (1 kit/pump) (Page 5 for kit list)					X	
Oil Seal Kit (1 kit/pump) (Page 5 for kit list)					X	
Valve Kit (1 kit/pump) (Page 5 for kit list)						X

Problem	Cause	Solution
Pressure drops, medium leaks.	Spiral rings leak.	Replace spiral rings, examine surface of plunger.
Pressure drops, pump becomes loud.	Discharge or suction valve leaks.	Replace valve.
	Steam formation (cavitation).	Reduce suction height, reduce flow resistance in the suction line, clean suction filter, lower medium temperature.
Irregular pressure.	Worn valves.	Examine valves.
	O-Ring on the valves or suction valve adaptor leaks.	Examine O-ring, examine valve casing for unevenness on the sealing surfaces.
Oil leaks at visible part of plunger.	Gear sealing is leaky.	Examine seals and running surface of plunger.
Dirty milk-coloured frothy oil.	Oil has mixed with water.	Replace oil immediately, find and fix the cause.
Oil leakage on the crankshaft.	Shaft seal ring leaks.	Check seal and shaft.
Noise increases without loss of pressure.	Worn bearing.	Dismantle gear, examine all parts, replace worn parts, check oil level. If service life was too short, check for excess strain or whether lubrication intervals were too long. Only specified lubricants are to be used.

BP8076 Repair Instructions

To Check Valves

Remove screws (58), lift discharge casing (50B) up and away. Take out pressure springs (57A). Pull out assembled valves (51) with fitting tool (p/n 03611).

Dismantling valves: the spring tension cap (51A) is screwed together with the valve seat (51F). Remove spring tension cap, take out springs (51C) and valve plate (51D). The seal ring (51E) is snapped onto the valve plate. Examine sealing surfaces and o-rings (51H, 51J). Replace worn parts.

Coat threads of the valve seat with silicon grease or molycote anti-seize Cu-7439 when reassembling. Before refitting the valves, clean the sealing surfaces in the casing and check for any damage. Tighten screws (58) at 133 ft.-lbs. (180 Nm). Check torque tension after 8-10 operating hours.

To Check Seals and Plunger Pipe

Remove hexagon nuts (49A); remove the pump head (50) together with seal case (38) from the crankcase (1). If necessary, carefully tap the valve casing past the centring stud (50A) using a rubber hammer.

Important! If necessary, support the pump head by resting it on wooden blocks or by using a pulley.

Remove tension screw (36C). Then take seal sleeve (39) together with all mounted parts out of the drive. Pull plunger pipe (36B) out of seal assembly and check for any damage. Pull out spiral rings (42), lubrication ring (44), guide ring (41) and support ring (40) and check for any damage. Screw out pressure sleeve (46). If necessary, replace the spiral rings (42) together with support ring (40) and guide ring (41). Clean parts and coat new parts generously with silicone grease before fitting.

Insert the seal unit (40, 41, 42, 44) into the seal sleeve (39). Push the ceramic plunger carefully through the seals from the crankcase side. If necessary, the seals can be held on the other side of the seal sleeve using a suitable pipe support.

Important! Screw the pressure sleeve (46) and seal sleeve (39) into each other so that the seal sleeve is in alignment with the top of the pressure sleeve. Then put the parts back into the crankcase.

Take the seal cases (38) out of the valve casing (50) and check O-rings (38A, 39A). If necessary, secure 2 screwdrivers in the front O-ring groove (to extract seal casing from valve casing). Coat seals with silicon grease before fitting.

Important! The fitting surfaces on the crankcase (1) and valve casing (50) 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 in the crankcase and valve casing.

Coat the seal sleeves (39) lightly with anti-corrosive grease (e.g. molycote no. Cu-7439) in their fitting area towards the crankcase (1). Insert seal sleeves into their crankcase fittings. Coat the threads of the tension screw (36C) lightly with thread glue and insert it together with a new copper ring (36D) through the ceramic pipe (36B). Turn the pump by hand until the plunger (25) rests against the plunger pipe. Tighten tension screw at 30 ft.-lbs. (40 Nm).

Important! Thread glue must never come between the plunger pipe (36B) and centring sleeve (36E). Overtensioning of the plunger pipe by excessive tightening of the tension screw and/or dirt or damage on the mounting surfaces can cause the plunger pipe to fracture.

Mounting the Valve Casing:

Put seal cases (38) in the centring holes of the valve casing (50). Then carefully push the valve casing onto the centring studs (50A).

Tighten hexagon screws (49A) evenly and crosswise at 266 ft.-lbs. (360 Nm).

Important! With no pressure in the pump, the torque tension on the screws (49A) must be checked after 8-10 operating hours. Thereafter the tension is to be checked every 200 operating hours.

To Dismantle Crankcase Gear

Take out the plungers (36B) and seal sleeves (39) as described above.

Drain the oil by removing plug (12).

After removing the clip ring (33B), pry out the seal retainer (33) with a screwdriver.

Remove the gear cover (K3) and remove the cooling vane plate (K1) by taking off the screws (K4). Then remove connecting rod screws (24).

Important! The connecting rods are marked 1 to 3 for identification. Do not twist the connecting rod halves or interchange them. When reassembling, the connecting rods must be fitted in their exact original position on the crankshaft journals.

Push connecting rod halves together with the crosshead as far as possible into the crosshead guides.

Take off the bearing cover (14/14A) and push out the crankshaft (22) [taking particular care not to bend the connecting rods (24)].

Check running surfaces on the connecting rods (24), crankshaft (22) and crossheads (25). Also check the surfaces of the crosshead bores in the crankcase (1) for any unevenness.

Reassemble in reverse order.

Thread the long end of the crankshaft (22) together with the inner bearing rings (21) into the crankcase. Then mount the outer bearing ring.

Fit the connecting rod halves in their exact original position and tighten at 37 ft.-lbs. (50 Nm).

Important! A little clearance must be present to enable slight side-ward movement of the connecting rods on their journals.

Fit bearing cover (14A) and tighten screws (17) at 64 ft.-lbs. (87 Nm).

Adjust axial play (clearance) on the crankshaft to minimum 0.1 mm / max. 0.15 mm using shims (21A/21B). The shaft should turn easily with little clearance. Connecting rods must sit exactly in the middle of each crank pin. Fit the bearing cover (14) and tighten the screws (17) at 64 ft.-lbs. (87 Nm).

Important! Possible axial float of the seal adaptor (33) is to be compensated with shims (33C).

Fit cooler plate (K1) and gear cover (K3) with their respective seals (K2).

Front View:

- Total width: 16.1 (410)
- Total height: 16.5 (420)

Side View:

- Total length: 34.7 (882)
- Distance from suction connection to centerline: 20.2 (142.5)
- Distance from centerline to discharge connection: 7.4 (189)
- Suction Connection: 2 x 3" BSP
- Discharge Connection: 2 x 1-1/2" BSP
- Centring: $\varnothing 154.8 \pm 0.1 \times 7.5$
- LK $\varnothing 120$
- 4 x M12
- 4 x $\varnothing 21$
- Thread Hole 1/2" BSP
- Dimensions from suction connection: 6.9 (176), 4.5 (115), 5.0 (127)
- Dimensions from discharge connection: 11.8 (300), 23.6 (600), 3.0 (75)
- Other dimensions: 13.4 (340), 15.5 (394), 7.5 (190)

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.

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.

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.



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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