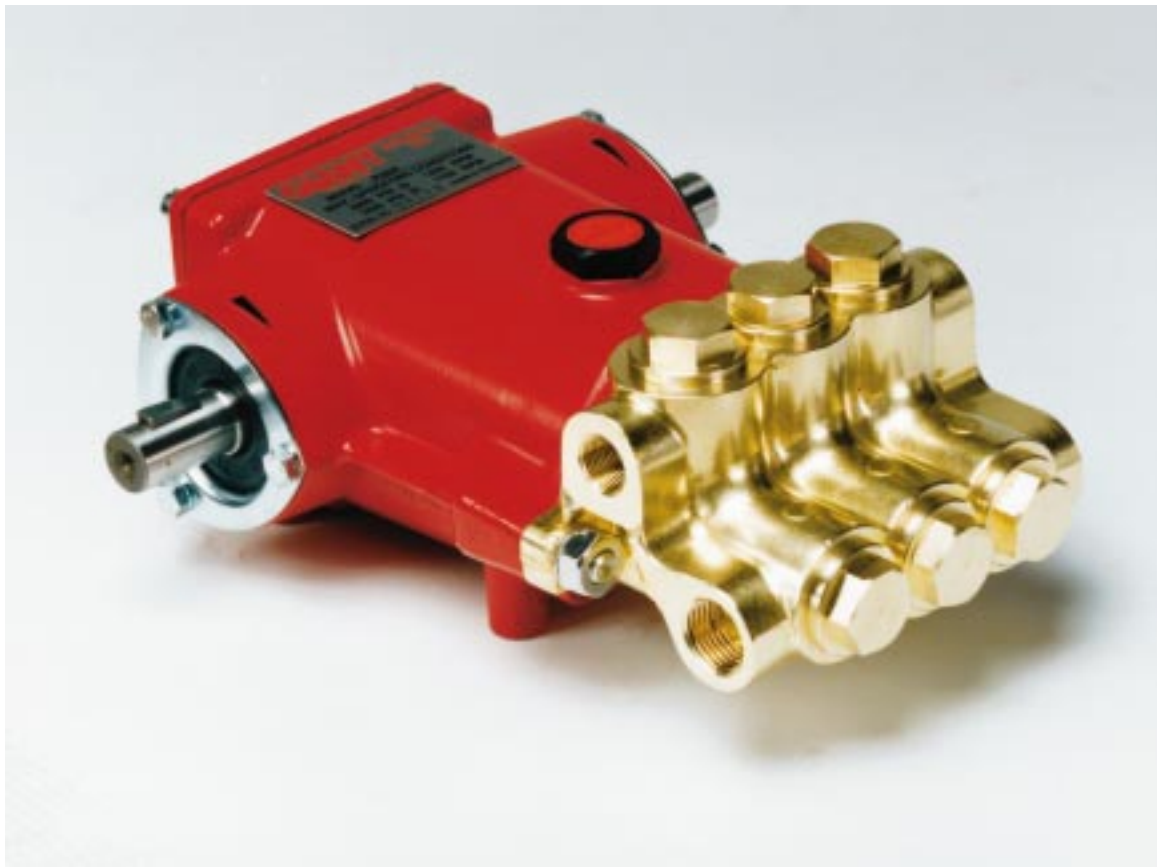


Model P46HT

Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service
Manual



GIANT

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Updated 3/98

REPAIR INSTRUCTIONS - P46HT

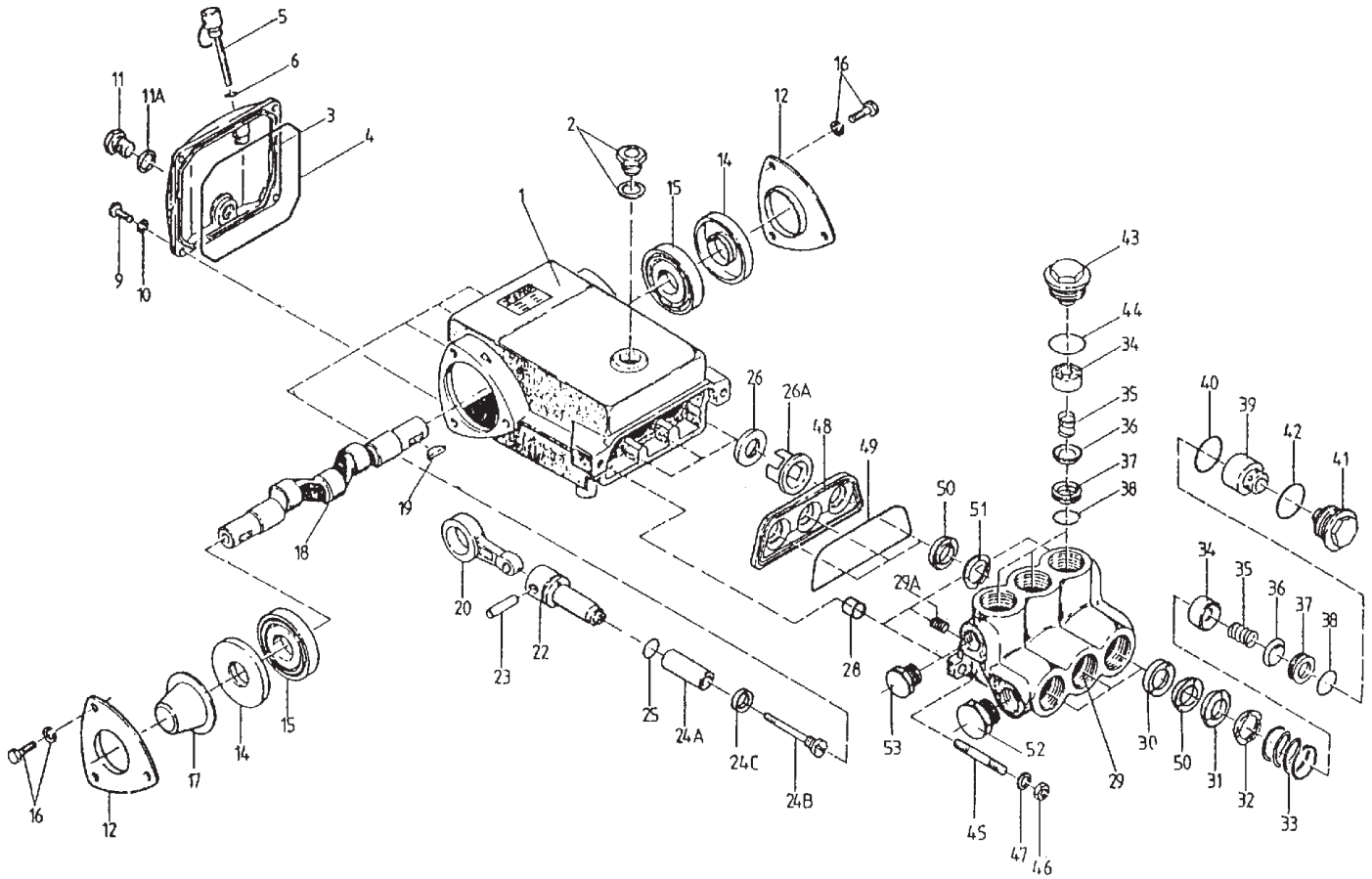
1. **To Check Suction and Discharge Valves**
Loosen valve plugs (41 and 43) using a socket wrench. Note the arrangement for reassembly and check the discharge valves underneath and suction valves (in suction valve adapter 39).
2. **To Check V-Sleeves**
Separate valve casing (29) from the crankcase (1) and pull off over the plungers. If the seals have to be replaced, remove all parts from the valve casing (29) in the suction valve direction. Grease new v-sleeves (31) with grease before installing. Examine the surfaces of the plunger pipes (24A) as damaged surfaces cause the seals to wear out quickly.
3. **To Check Plungers and Crankcase**
If oil leaks at plunger outlet (22), and or the radial shaft seal (26), the worn plungers and crosshead (plunger assembly) must be placed. Drain oil and remove crankcase cover (3) and valve casing (29). Take off bearing cover (12) and shaft protector (17) on one side before removing the crankshaft (18). Then remove crankshaft axially by means of a press or a rubber hammer. Do not force the cranks on the shaft when pulling through the connecting rod (20). Do not bend connecting rod. Dismantle crosshead and connecting rod and replace worn parts. Reinstall the crankshaft first being particularly careful with the cranks. Then press on the bearing on both sides and finally install radial shaft seal and bearing cover.
4. **To Replace Plunger Pipes**
Screw out tension screw (24B), pull off plunger pipes (24A) and clean plunger surface. Install new plunger pipe. Fix tension screw with screw-glue and tighten carefully at 106 ft.-lbs.
5. **Drip-Return**
After the valve casing has been removed, the weep seals (50) in the intermediate casing (46) can be examined and replaced as necessary. Should lime deposits occur in the valve casing, care must be taken in keeping the two holes in the valve casing (29) free to ensure trouble-free drip-return.

NOTE: Contact Giant Industries for Service School Information. Phone: (419)-531-4600

PUMP SYSTEM MALFUNCTION

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

Exploded View - P46HT



P46HT REPAIR KITS

Valve Kit #09458

Qty.	Part #	Description
3	06018-0100	Valve Cage
3	06017-0100	Valve Spring
3	06016	Valve Plate
3	06014	Valve Seat
3	06015	O-Ring

Seal Kit # 09514

Qty.	Part #	Description
3	11510	Spacer Sleeve
3	11511	Sleeve

P46HT TORQUE SPECIFICATIONS

Position	Item#	Description	Torque Amount
24B	08456	Tension Screw, Plunger	108 in.-lbs.
41	07235	Plug, Inlet	33-37 ft.-lbs.
43	07034	Plug, Outlet	32 ft.-lbs.

P46HT PARTS LIST

<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	07222	Crankcase	1
2	07181	Vent/Filler Plug with Seal	1
3	08004	Cover, Crankcase	1
4	08005	O-Ring	1
5	08008	Oil Dipstick	1
6	01009	O-Ring	1
9	07188	Cylinder Screw with Slot	4
10	07223	Spring Washer	4
11	08012	Oil Drain Plug with Seal	1
11A	08013	Gasket	1
12	07245	Bearing Cover	2
14	08015	Radial Shaft Seal	2
15	08020	Grooved Ball Bearing	2
16	07225	Hexagon Screw	1
17	07226	Shaft Protector	1
18	08022	Crankshaft	1
19	01024	Woodruff Key	1
20	08024	Connecting Rod	3
22	07201	Crosshead Assy.	3
23	01031	Crosshead Pin	3
24A	07021	Plunger Pipe	3
24B	08456	Tension Screw	3
24C	08457	Copper Screw	3
25	13333	Oil Scraper	3
26	07206	Radial Shaft Seal	3
26A	11510	Spacer Sleeve	3
28	07207	Centering Sleeve	2
29	07033	Valve Casing	1
29A	11502	Stud Bolt	2
30	07230	Pressure Ring	3
31	11511	Sleeve	3
32	07231	Support Ring	3
33	07232	Pressure Spring	3
34	06018-0100	Spring Tension Cap	6
35	06017-0100	Valve Spring	6
36	06016	Valve Plate	6
37	06014	Valve Seat	6
38	06015	O-Ring	6
39	07233	Suction Valve Adaptor	3
40	07234	O-Ring	3
41	07235	Plug	3
42	12004	O-Ring	3
43	07792	Plug	3
44	07035	O-Ring	3
45	07215	Stud Bolt	2
46	08040	Hex Nut	2
47	08041	Disc	2
48	07237	Intermediate Casing	1
49	07238	O-Ring	1
50	11512	Sleeve	6
51	07240	Support Ring	3
52	07109	Plug	1
53	13338	Plug	1

Model P46HT

TRIPLEX CERAMIC PLUNGER PUMP

Volume	Up to 127 GPH ¹
Discharge Pressure	900 PSI
Inlet Pressure	6 PSI minimum @ 194°F
.....	15 PSI min. @ 194°F to 220°F
Plunger Diameter	18mm
Crankcase Capacity	8 fl. oz.
Temperature	Up to 220°F
Inlet Ports	(2) 1/2" BSP
Discharge Ports	(2) 3/8" BSP
Pulley Mounting	Either Side
Shaft Rotation	Top of pulley towards Head
Weight	14 lbs.

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 1.1 service factor be specified when selecting an electric motor as the power source. To compute specific pump horsepower requirements, use the following formula:

$$(GPH \times PSI) / 87,375 = HP$$

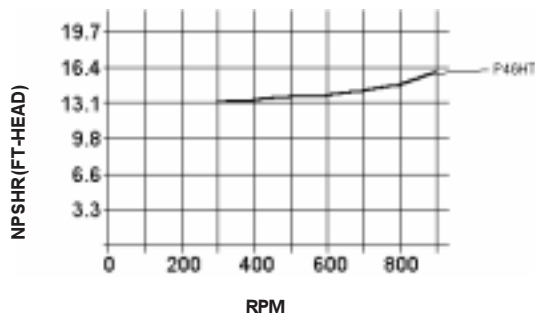
P46HT PULLEY SELECTION AND HORSEPOWER REQUIREMENTS						
GPH ¹	RPM	PUMP PULLEY	MOTOR PULLEY	500 PSI	700 PSI	900 PSI
71	500	7.75"	2.0"	0.41	0.57	0.73
106	750	7.75"	3.25"	0.61	0.84	1.09
127	900	7.75"	4.0"	0.72	1.02	1.31

¹ GPH=Gallons per hour

INSTALLATION INSTRUCTIONS

Installation of the Giant Industries, Inc., pump is not a complicated procedure, but there are some basic steps common to all pumps. The following information is to be considered as a general outline for installation. If you have unique requirements, please contact Giant Industries, Inc. or your local distributor for assistance.

1. The pump should be installed flat on a base to a maximum of a 15 degree angle of inclination to ensure optimum lubrication.
2. The inlet to the pump should be sized for the flow rate of the pump with no unnecessary restrictions that can cause cavitation. Teflon tape should be used to seal all joints. If pumps are to be operated at temperatures in excess of 220° F, it is important to insure a positive head to the pump to prevent cavitation. (See chart below)
3. The discharge plumbing from the pump should be properly sized to the flow rate to prevent line pressure loss to the work area. It is essential to provide a safety bypass valve between the pump and the work area to protect the pump from pressure spikes in the event of a blockage or the use of a shut-off



IMPORTANT OPERATING CONDITIONS

Failure to comply with any of these conditions invalidates the warranty.

1. Prior to initial operation, add oil to the crankcase so that oil level is between the two lines on the oil dipstick. **DO NOT OVERFILL. Industrial Grade 90 wt. oil may be used.** Crankcase oil should be changed after the first 50 hours of operation, then at regular intervals of 500 hours or less depending on operating conditions.

gun.

4. Use of a dampener is necessary to minimize pulsation at drive elements, plumbing, connections, and other system areas. The use of a dampener with Giant Industries, Inc. pumps is optional, although recommended by Giant Industries, Inc. to further reduce system pulsation. Dampeners can also reduce the severity of pressure spikes that occur in systems using a shut-off gun. A dampener must be positioned downstream from the unloader.
5. Crankshaft rotation on Giant Industries, Inc. pumps should be made in the direction designated by the arrows on the pump crankcase. Reverse rotation may be safely achieved by following a few guidelines available upon request from Giant Industries, Inc. Required horsepower for system operation can be obtained from the chart on page 3.

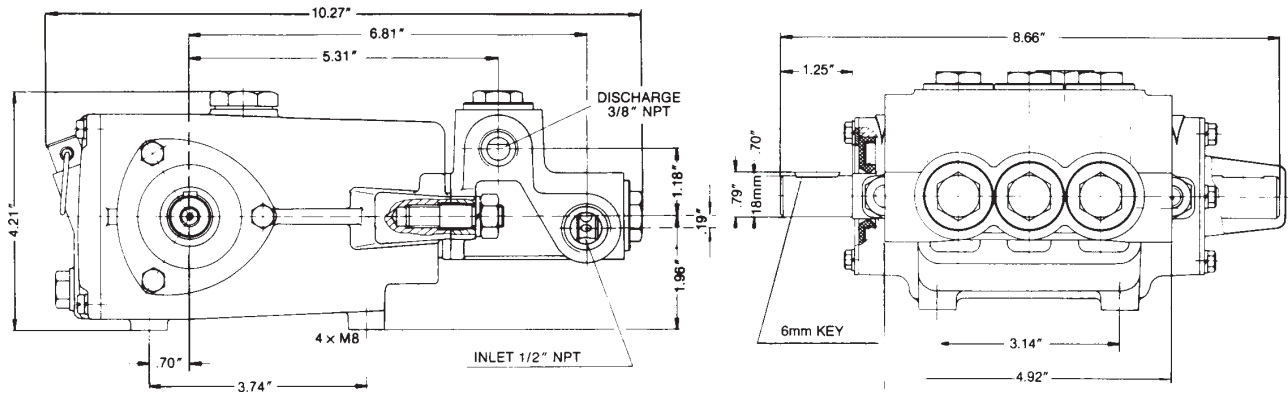
6. Before beginning operation of your pumping system, remember: Check that the crankcase and seal areas have been properly lubricated per recommended schedules. Do not run the pump dry for extended periods of time. Cavitation will result in severe damage. Always remember to check that all plumbing valves are open and that pumped media can flow freely to the inlet of the pump.

Finally, remember that high pressure operation in a pump system has many advantages. But, if it is used carelessly and without regard to its potential hazard, it can cause serious injury.

2. Pump operation must not exceed rated pressure, volume, or RPM. A pressure relief device must be installed in the discharge of the system.
3. Acids, alkalines, or abrasive fluids cannot be pumped unless approval in writing is obtained before operation from Giant Industries, Inc.
4. Run the pump dry approximately 10 seconds to drain the water before exposure to freezing temperatures.

NOTE: Contact Giant Industries for Service Information. Phone: (419) 531-4600.

P46HT DIMENSIONS (INCHES)



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. For portable pressure washers and car wash applications, the discharge manifolds will never fail, period. If they ever fail, we will replace them free of charge. Our other pump parts, used in portable pressure washers and in car wash applications, are warranted for five years from the date of shipment for all pumps used in NON-SALINE, clean water applications.
2. One (1) year from the date of shipment for all other Giant industrial and consumer pumps.
3. Six (6) months from the date of shipment for all rebuilt pumps.
4. 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.



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