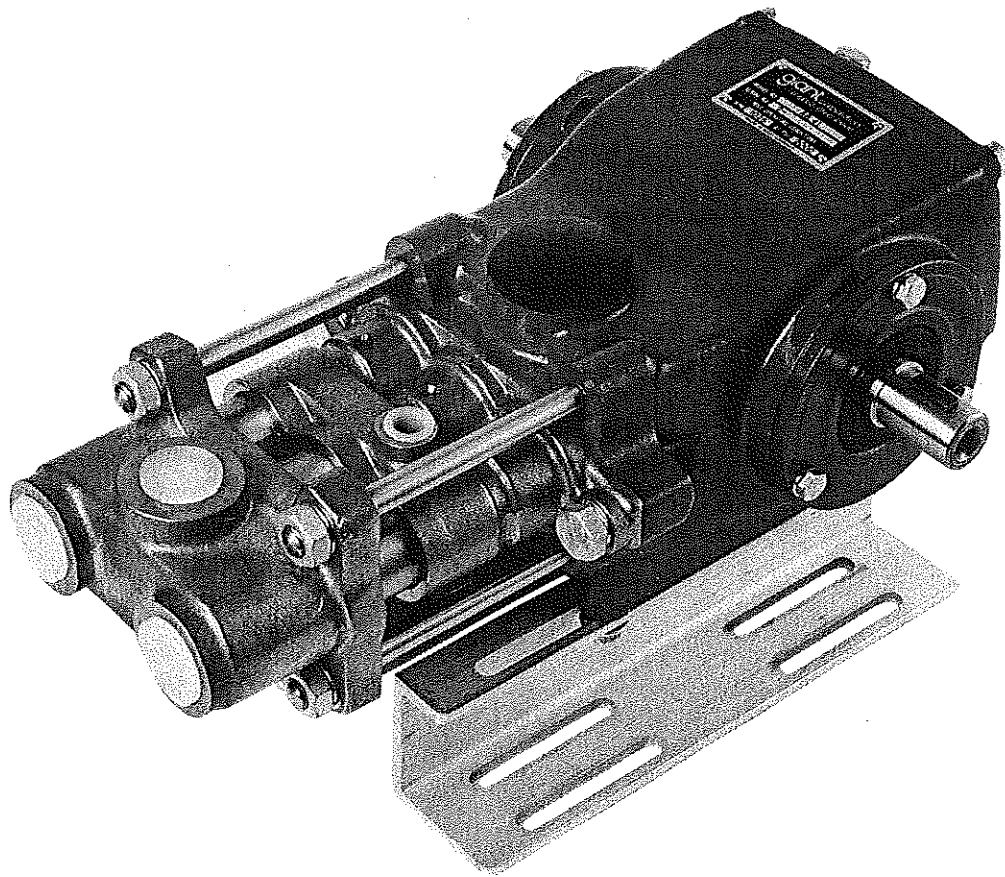


# **Model A-45 Triplex Cup Pump Operating Instructions**



# **GIANT**

Giant Products / 3156 Bellevue Rd. / Toledo, OH / 43606

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# INSTALLATION INSTRUCTIONS

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Installation of the Giant Products Company 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 Products Company or your local distributor for assistance.

1. The pump should be installed flat on a base to a maximum 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 160°F., it is important to insure a positive head to the pump to prevent cavitation.
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 by-pass 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 gun.
4. The triplex design of Giant Products Company piston-type pumps minimizes pulsation, but use of an accumulator is necessary to further minimize pulsation at drive elements, plumbing, connections, and other system areas. The accumulator must be sized for the pump operation or approximately 50 percent of the pump operating capacity. The use of an accumulator with Giant

Products Company pumps is optional, although recommended by Giant Products Company to further reduce system pulsation, particularly where a shut-off gun results in pressure spikes 10 percent higher than operating pressure. Accumulator must be positioned downstream from unloader.

5. The Giant Products Company pumps may be operated in either direction of rotation, however the direction indicated on the crankcase housing is preferred. Required horsepower for system operation can be obtained from the charts below and on page 2.

The vibration damping properties of a V-Belt drive make this the most suitable method of operation. A suitable belt guard is required to comply with OSHA standards.

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, used carelessly and without regard to its potential hazard, can cause serious injury.**

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## **IMPORTANT OPERATING CONDITIONS** **Failure to comply with any of these conditions invalidates the warranty.**

1. Prior to initial operation, fill the crankcase with Giant Products Company crankcase oil or an equivalent heavy duty SAE85W-140 gear oil. Oil wicks thoroughly with a light weight transmission grade oil, at least every 50 hours. Crankcase oil should be changed within the first 50 hours of operation and every 500 hours thereafter dependent upon operating conditions.

2. Pump operation must not exceed rated pressure, volume or R.P.M. 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 Products Company.

4. Pumps must be run dry approximately 10 seconds to drain water before exposure to freezing temperature.

Volume	Up to 5 G.P.M.
Discharge Pressure	Up to 1800 P.S.I.
Inlet Pressure	Up to 40 P.S.I.
R.P.M.	Up to 1140 R.P.M.
Bore	20MM
Stroke	19MM
Crankcase Capacity	16 Fl. Ozs.
Temperature of Pumped Fluids	Std. 180° F.
Inlet Port	1/2" N.P.T.
Discharge Ports	(2) 3/8" N.P.T. (1) 1/2" N.P.T.
Pulley Mtg.	Either Side
Shaft Rotation	Top of pulley toward cylinders
Weight	25 pounds

A-45 PULLEY SELECTION*			
Pump Pulley	Motor Pulley	R.P.M.	G.P.M.
7.75"	3.15"	655	3.0
7.75"	3.55"	745	3.4
7.75"	3.75"	790	3.6
7.75"	3.95"	840	3.8
7.75"	4.25"	910	4.1
7.75"	4.75"	1025	4.6
7.75"	5.25"	1140	5.0

\*Pump speed and pump output in gallons per minute based on use with a 1725 R.P.M. motor. Select motor pulley size to give desired pump output. Various other pulley sizes are available from Giant Products Co. upon request. Pulley selection, speeds, and outputs for 3450 R.P.M. electric motors are also available.

1. Select G.P.M. required then select appropriate motor pulley from same line.
2. The pressure desired is determined by using correct nozzle sized to the P.S.I. you require.

A-45 HORSEPOWER REQUIREMENTS*									
GPM	1000 PSI	1100 PSI	1200 PSI	1300 PSI	1400 PSI	1500 PSI	1600 PSI	1700 PSI	1800 PSI
3.0	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5
3.4	2.2	2.4	2.6	2.8	3.0	3.3	3.5	3.7	4.0
3.6	2.3	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2
3.8	2.4	2.7	2.9	3.2	3.4	3.7	3.9	4.2	4.4
4.1	2.6	2.9	3.1	3.4	3.7	4.0	4.2	4.5	4.8
4.6	3.0	3.3	3.6	3.9	4.2	4.5	4.8	—	—
5.0	3.3	3.6	3.9	4.2	4.5	4.9	5.0	—	—

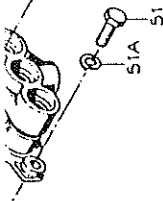
\*We recommend that you generally specify a service factor of 1.1 when selecting a motor for your horsepower requirements. To compute your own horsepower needs use the following formula:

\*Horsepower ratings shown are for electric motors only. Gas engines require approximately twice the horsepower ratings shown.

$$\frac{\text{G.P.M.} \times \text{P.S.I.}}{1542.6} = \text{HP}$$



the PART NUMBER and DESCRIPTION, plus the MODEL NUMBER of your pump. All parts are available either from your dealer or direct from the factory. To find the correct part number, first locate the part in the exploded view to get the reference number. Then, using the reference number, find the corresponding part number in the parts list.



## PARTS LIST A-45

Item	Part No.	Description	Qty/Assy	Item	Part No.	Description	Qty/Assy
1	01070	Crankcase	1	37	02008	Sleeve, Piston Rod	3
2	01002	Oil Filler Cap	1	38	02009	O-Ring, Piston Rod	6
3	01003	O-Ring, Filler Cap	1	39	08031	Inlet Valve	3
4	01107	Cover, Crankcase	1	40	08032	Spacer, Piston	3
5	01005	O-Ring, Crankcase Cover	1	41	02012	Piston	3
8	01008	Oil Dip Stick	1	42	02013	Cup (20mm)	3
9	01009	O-Ring, Dip Stick	1	42A	08034	Back-Up Ring	3
10	01010	Screw, Crankcase Cover	4	43	08035	Retainer, Piston	3
11	01011	Spring Washer	4	44	08036	Nut, Piston	3
12	01095	Oil Drain Plug	1	45	08037	Washer, Piston	3
13	01096	Gasket, Drain Plug	1	47	02045	Manifold, Inlet	1
14	01101	Bearing Cover	2	51	03012	Hex Screw, Manifold	2
15	01166	Seal, Crankshaft	2	51A	08041	Washer	6
16	01016	O-Ring, Bearing Cover	2	52	02047	Stud, Manifold	4
17	01017	Hex Screw, Bearing Cover	6	53	08040	Nut, Manifold Stud	4
18	01018	Spring Washer	6	54	02025	Cylinder	3
19	01019	Gasket, Bearing	1-5	55	02026	O-Ring, Cylinder	6
20	01086	Ball Bearing	2	56	02027	Discharge Valve Seat	3
21	01022	Shaft Protector	1	57	02028	Discharge Valve	3
22	01023	Crankshaft	1	58	02029	Valve Spring	3
23	01024	Key	1	59	02030	Retainer, Valve Spring	3
24	02044	Connecting Rod	3	60	02046	Manifold, Discharge	1
24A	01027, 28	Hex Screw, Conn. Rod w/washer	6	63	01058	Crankcase Lubrication Label	1
27	02001	Crosshead (sold only with item no. 36)	3	Z65	01075	Channel Rail	2
28	01031	Pin, Crosshead	3	Z73	01056	Tapered "H" Bushing, 22mm	1
29	02002	Seal Retainer	3	Z73	01062	7.75" OD Pulley, 2 Groove,	1
30	02003	O-Ring, Seal Retainer	3			AB Section	1
31	02004	- Seal, Inlet Manifold & Crankcase	6	Z73	01064	8" Steel Pulley, 1 Groove,	1
31A	01087	Washer	3	Z76	01103	AB Section 22mm	1
32	02005	Wick, Oil	3			Operating Instructions	1
33	01032	Pin, Name Plate	4				
34	01033	Name Plate	1				
35	02006	Flinger	3				
36	02038	Piston Rod (sold only with item no. 27)	3				

# PUMP SYSTEM MALFUNCTION

## **MALFUNCTION:** THE PRESSURE AND/OR THE DELIVERY DROPS

### **Cause and Remedy:**

Worn Cups—Replace Cups and Back-Up Ring  
Worn Inlet Valve—Lap or Replace Inlet Valve.  
Worn Cylinder—Replace Cylinder.  
Broken Valve Spring—Replace Spring  
Belt Slippage—Tighten or Replace Belt.  
Worn or damaged Nozzle—Replace Nozzle.  
Fouled Discharge Valve—Clean Valve Assembly.  
Fouled Inlet Strainer—Clean Strainer  
Worn or Damaged Hose—Repair/Replace Hose.  
Worn or Plugged Relief Valve on Pump—Clean, Reset, and Replace Worn Parts.  
Cavitation—Check Suction Lines on Inlet of Pump for Restrictions.  
Worn Inlet Manifold Seals—Replace Seals.

## **MALFUNCTION:** CYLINDER LEAKAGE

### **Cause and Remedy:**

Loose Cylinders—Tighten Nuts on Discharge Manifold  
Worn Cylinders—Replace Cylinders  
O-Rings—Replace O-Rings.

## **MALFUNCTION:** OIL LEAKAGE UNDER PUMP

### **Cause and Remedy:**

Worn Crankcase Seals—Replace Seals.  
Oil Wicks Overfilled—Reduce Amount of Lubrication.

## **MALFUNCTION:** OIL LEAKAGE AT CRANK-SHAFT

### **Cause and Remedy:**

Worn Shaft Seal—Replace Seal.

## **MALFUNCTION:** OIL LEAKAGE AT CRANKCASE COVER

### **Cause and Remedy:**

Worn Cover Seal—Replace Seal.  
Worn Dip Stick Seal—Replace Seal.  
Worn Drain Plug Seal—Replace Seal.

## **MALFUNCTION:** WATER IN CRANKCASE

### **Cause and Remedy:**

High Humidity—Reduce Oil Change Interval.  
Worn Piston Rod—Replace Piston Rod Sleeves.  
O-Rings—Replace O-Rings.

## **MALFUNCTION:** NOISY OPERATION

### **Cause and Remedy:**

Worn Bearings—Replace Bearings, Refill Crankcase Oil with Recommended Lubricant.

## **MALFUNCTION:** ROUGH/PULSATING OPERATION WITH PRESSURE DROP

### **Cause and Remedy:**

Worn Manifold Seals—Replace Seals.  
Inlet Restriction—Check System for Stoppage, Air Leaks, Correctly Sized Inlet Plumbing to Pump.  
Accumulator Pressure—Recharge/Replace Accumulator.

## **MALFUNCTION:** PUMP PRESSURE AS RATED, PRESSURE DROP AT GUN

### **Cause and Remedy:**

Restricted Discharge Plumbing—Resize Discharge Plumbing to Flow Rate of Pump.

## **MALFUNCTION:** SHORT SEAL LIFE

### **Cause and Remedy:**

Scored Piston Rods—Replace Piston Rod Sleeves.  
Dry Oil Wicks—Oil Wicks Per Recommended Schedule.  
Excessive Inlet Pressure—Reduce Inlet Pressure to Recommended Levels.

## **MALFUNCTION:** SHORT CUP LIFE

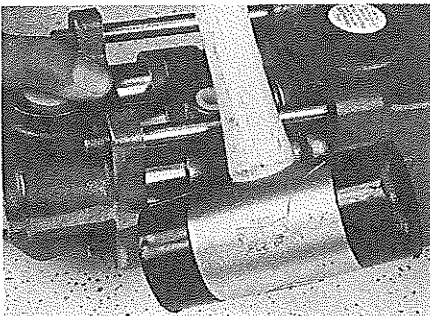
### **Cause and Remedy:**

Excessive Operating Pressures—Reduce Pressure to Recommended Levels.  
Worn Pistons—Lap or Replace Piston.  
Worn Cylinders—Replace Cylinders.  
Excessive Temperatures—Reduce Operating Temperatures or Replace With Hot Cups.

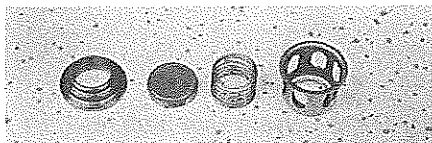
**NOTE:** Always take time to lubricate all metal and non-metal parts with a light film of oil before reassembly. This step will help ensure proper fit, at the same time protecting the pump non-metal parts [elastomers] from cutting and scoring.

# REPAIR INSTRUCTIONS

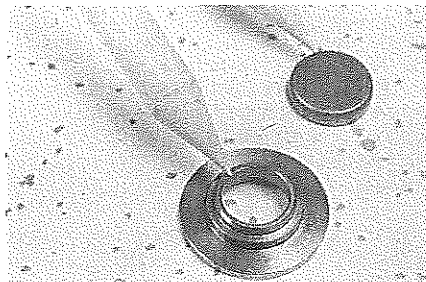
**IMPORTANT:** TAKE NOTE OF THE POSITION AND DIRECTION OF THE CYLINDERS AS ORIGINALLY INSTALLED. WHEN REMOUNTING USED CYLINDERS THEY MUST BE REINSTALLED IN THE ORIGINAL POSITION AND DIRECTION TO AVOID PREMATURE PUMPING FAILURE.



1. Remove the stud bolt nuts with a 17mm open end wrench. To remove the discharge manifold, support the manifold with one hand and gently tap it with a rubber mallet on the top end until it's loose.



2. Remove the discharge valve assembly from the manifold.

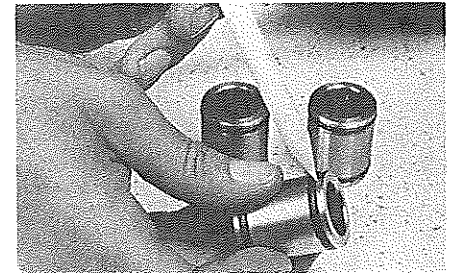


3. The discharge valves should be checked for any cavitation, pitting, or uneven wear. If either of the above is evident replace with new parts.

Inspect the spring retainer for any signs of internal wear or stress cracking at the side ports.



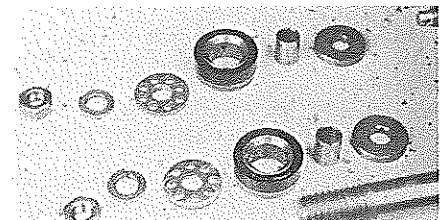
4. Inspect inside the cylinder bore of the discharge manifold for signs of scoring which could indicate spinning of the discharge valve assembly.



5. To remove the cylinders, pull the cylinder forward until it is dislodged. It may be necessary to use a rubber gripper to enable you to grasp the cylinder. Make certain that you never use anything such as pliers as this will damage the "O" Ring grooves.

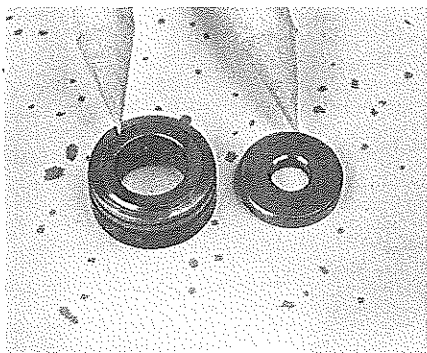
Be sure to inspect the "O" Rings for any sign of abrasion or extrusion which may indicate cylinder movement.

Check the inside of the cylinder bore for any signs of wear.

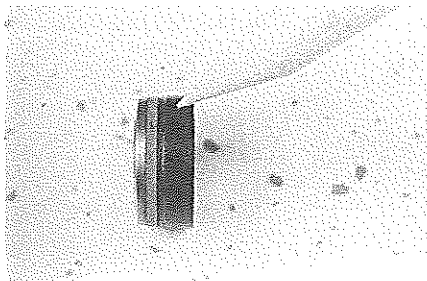


6. Remove the cotter pin, piston rod nut, piston retainer, piston, spacer and inlet valve respectively, and replace any worn parts. Discard the old cotter pin.

# REPAIR INSTRUCTIONS

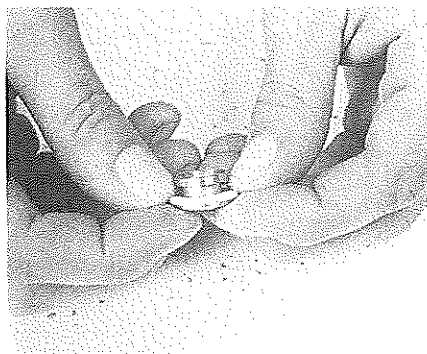


7. Check the piston and inlet valve seating surfaces for any signs of cavitation and wear, and if necessary, lap surfaces or replace to insure proper seating.



8. Check the piston cup assembly for signs of wear or shrinkage at the rear of the cup. Shrinking is obvious if you notice that the cup is separating from the back up ring. Excessive heat and/or pressure can often cause shrinking. If this condition exists, replace as necessary.

To remove the old piston cup, cut the cup from the piston.

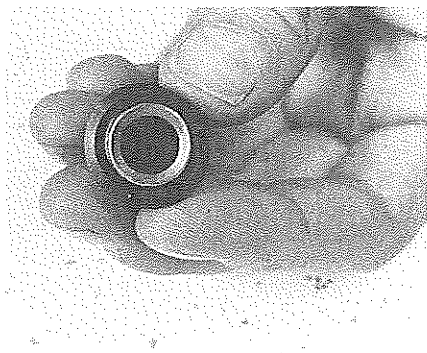


9. Place the back up ring on piston making sure it is down against the back of the piston.

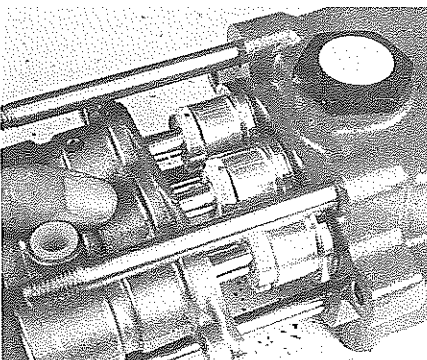
Insert the piston cup inserter onto the piston and lubricate the entire surface with oil.

Push down on the piston cup until the cup is firmly seated against the back up ring.

To remove the plastic cup inserter, insert a screwdriver through the rear of the piston. This forces the cup inserter away from the new cup. Be careful to insure that none of the plastic cup inserter remains wedged between the piston and the new cup.



10. Make sure the cup is firmly set against the piston. To do so, you must rotate the new cup against the piston by pressing firmly with the thumb and forefinger. This will insure it is properly seated.



11. Remove inlet manifold bolt.

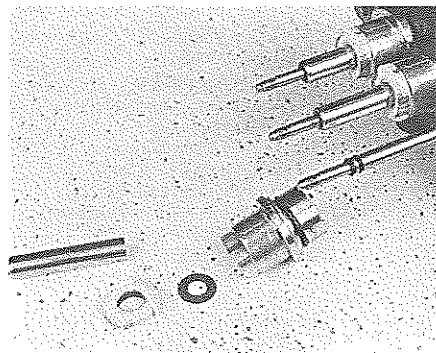
Remove the inlet manifold by gently tapping on the top of the manifold with a rubber mallet. When it is dislodged, remove the inlet manifold.



12. Using a socket with an OD of  $\frac{1}{2}$ ", insert the socket into the inlet manifold and using a rubber mallet tap the inlet seals from the manifold. Retainer washer will also come out at the same time.

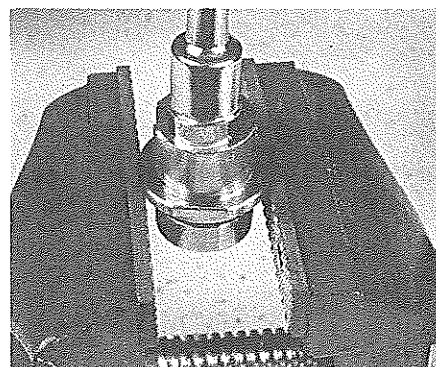
Check the inlet manifold seals for wear. Replace where necessary. Insert seal into the back of the manifold and press firmly into place. Make sure the three (3) dots are installed toward the discharge manifold and not visible to installer when inserted.

Check retainer washer and replace if necessary.



13. Remove the oil seal retainers and wicks by inserting a screwdriver between crankcase and retainer and prying them loose.

The flinger and wick will come off the piston rod at the same time as the retainer. The sleeve will also be removed at the same time.

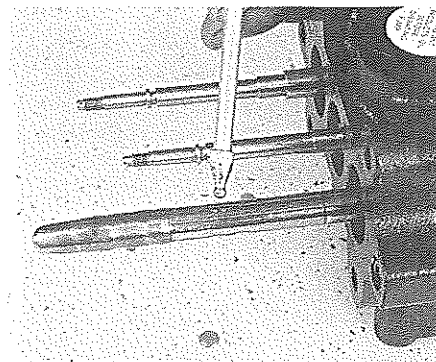


14. Remove the oil seal. Lay the edge of the seal retainer on a vice and push down on the seal.

Insert a new seal, carefully putting the three (3) dots against oil side when replacing in crankcase housing and visible to installer when inserted.

Replace the seal in the retainer and make sure it is properly seated.

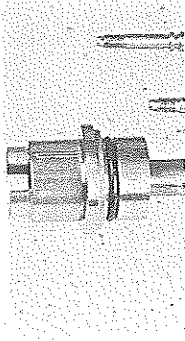
**THIS COMPLETES DISASSEMBLY.  
TO REASSEMBLE, USE THE  
FOLLOWING SEQUENCE.**



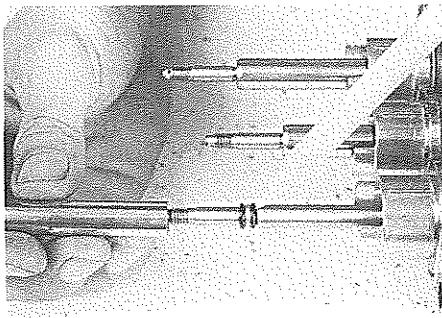
15. Put the sleeve back onto the piston rod without the "O" Rings. Next put the seal inserter over the sleeve and oil the entire rod thoroughly.



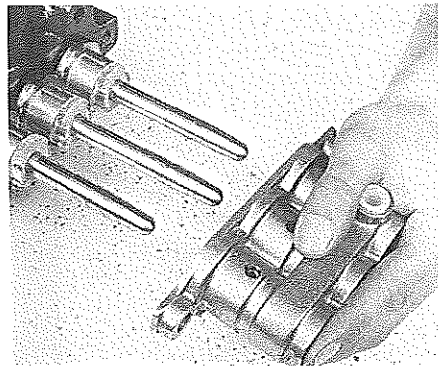
# REPAIR INSTRUCTIONS



16. Gently insert the rear seal assembly with the oil seal over the oiled rod until firmly positioned in the crankcase. Check O Ring, replace if necessary.

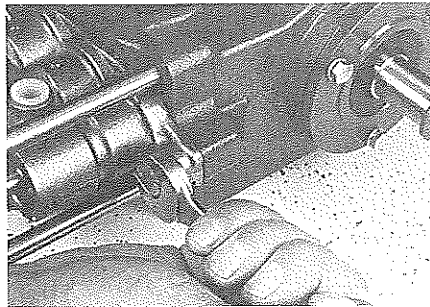


17. Remove the seal inserter and sleeve. Install the two (2) "O" Rings on the piston rod as shown. Install the flinger, the sleeve, and the oil wicks. Oil all parts freely.

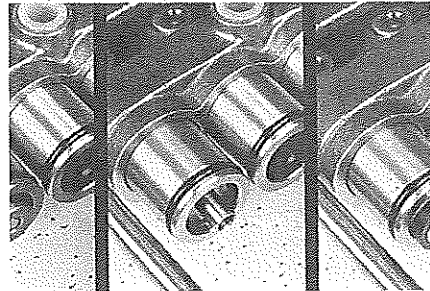


18. Reinstall the seal inserter and oil the entire rod assembly.

Take the inlet manifold and slide the entire manifold assembly over the piston rods until it seats against the crankcase.

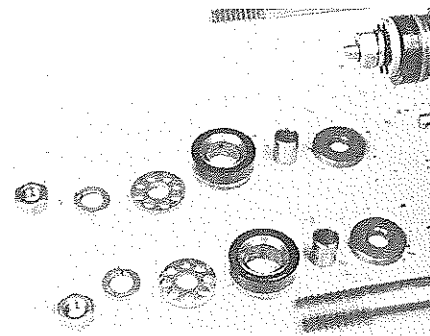


19. Bolt the inlet manifold to the crankcase housing. If the manifold studs had been removed earlier, replace them at this time. Torque to 225" pounds.

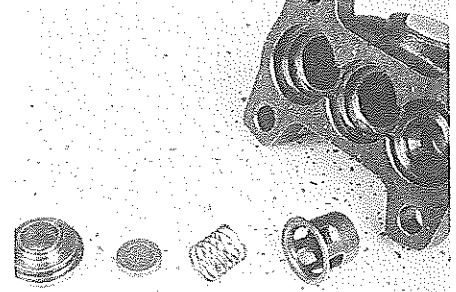


20. Install the cylinders into the inlet manifold. Rotate the piston rod until it is at the top-most position where the end is visible through the cylinder and install the inlet valve, spacer, cup/piston assembly and retainer. Pumps with lock washers should have lock washer reinstalled.

Replace the lock nut and tighten down to 50" pounds with a 10mm socket wrench.



21. Piston assembly sequence must be in the order shown.



22. Replace the discharge valve assembly into the discharge manifold. Insert the discharge valve spring retainer.

Insert the spring.

Insert the Hastalloy poppet valve on top of the spring making sure it is installed with the lips down on top of the spring.

Then insert the discharge valve seat into the manifold.

Replace the discharge manifold making sure it is seated squarely into place against all three (3) cylinders. Replace the lock washer and stud bolt nuts and torque to 175" pounds.



23. Fill your Giant Products Company pump with Giant Oil.

Check the dip stick to insure the proper level of oil.

That completes the reassembly of your Giant Products Company Model A45 Pump.

**NOTE: For crankcase entry refer to Giant Service and Repair Manual.**

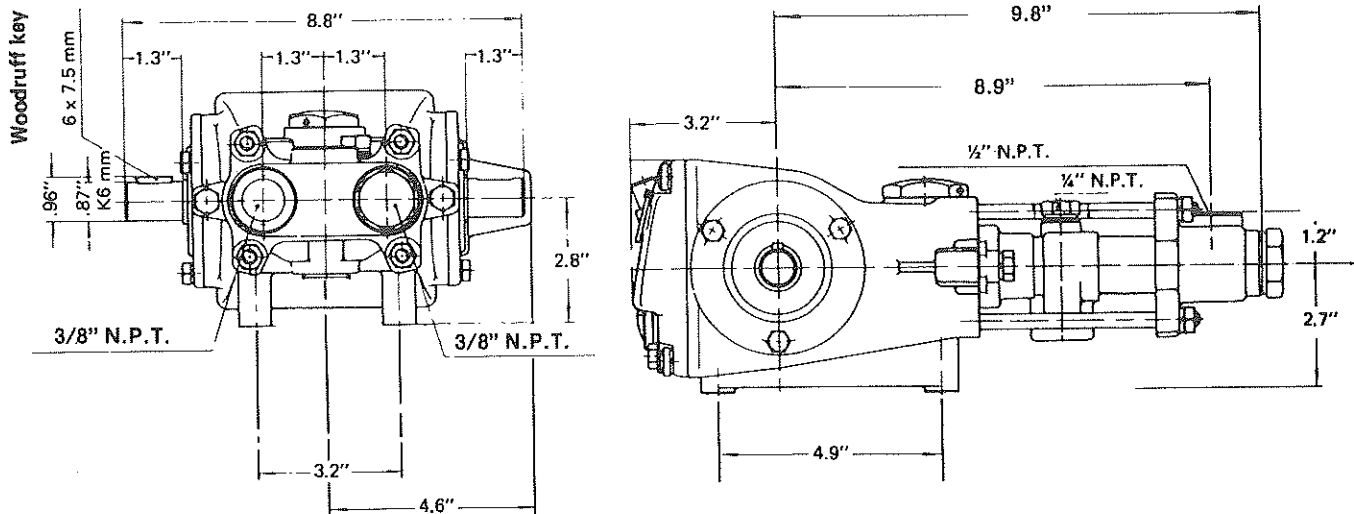


# A-45 SERIES

## DIMENSIONS AND WEIGHTS

All dimensions are given in mm or inches.

Weight without belt pulley, without rail 25 lbs.



### LIMITED WARRANTY

Giant Products Company products are warranted by the manufacturer to be free from defects in workmanship and material for one year from date of manufacturer's shipment. This warranty is limited to repairing or replacing products which manufacturer's investigation shows were defective at the time of shipment by the manufacturer. All products subject to this warranty shall be returned F.O.B. Giant Products Company, 3156 Bellevue Road, Toledo, Ohio 43606, for examination, repair, or replacement.

THE EXPRESS WARRANTY SET FORTH HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, 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. Repair or replacement of defective products as provided is the sole and exclusive remedy provided hereunder and the manufacturer shall not be liable for any further loss, damages or expenses, including incidental and consequential damages, directly or indirectly arising from the sale or use of this product.

This warranty is subject to installation and operating conditions as described in this manual.

Use of other than original replacement parts voids this warranty.

There are no warranties which extend beyond the description of the face hereof.

# GIANT

Giant Products / 3156 Bellevue Rd. / Toledo, OH / 43606