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**Parts Manual  
Vermeer/ McLaughlin  
Mud System 230P**

**SN 230P032611116 - Present**

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# MUD SYSTEM 230P



## MUD SYSTEM 230P

Item	Qty	Part No.	Description
1	1	P030200	Engine, Kohler 12HP
2	1	T100160	Pump, Hydraulic
	1	HM00099	Bell Housing
	1	HM00126	Coupling, Hub 1" Bore (for Engine)
	1	HM00130	Coupling, Hub 3/4" Bore (for Hydraulic Pump)
	1	HM00128	Coupling, Insert
3	1	T700080	Filter, Hydraulic Assembly
4	1	T200110	Motor, Hydraulic
	1	8011020	Mixing Motor Extension Arm
	1	8011023	Mixing Motor Mounting Plate
	1	8011024	Mixer Shaft Coupling
	1	8011027	Mixer Shaft
	1	8011028	Mixer Head
	1	8011032	Mixer Shaft Coupling Guard
5	1	8011056	Mud Relief Valve (1000psi / 69 bar)
6	1	X400040	Battery
	1	8040239	Battery Box
7	1	8011062	Pump, Mud Assembly
8	1	8011038	Valve, Hydraulic Flow Control
9	1	8030338	Mixing Tank (230 Gallon / 920 Quart)
	2	8040084	Strap, Mixing Tank
10*	1	8011061	Controller with 50 Ft / 1524 cm Cable w/ Male Connector
11*	1	J200072	Decal Kit Safety McL230P (CE Certified)
	1	J200073	Decal Kit Safety McL230P (Standard)

\*Not Shown

# Mud Pump

## Model BP100

Triplex Ceramic  
Plunger Pump  
Operating Instructions/  
Repair and Service Manual

## Bentonite Pump



The logo for GIANT, featuring the word 'GIANT' in a bold, black, sans-serif font. The letters are stylized with a 3D effect, showing the top and side surfaces of the characters.

Contents:	
Installation Instructions:	page 9
Pump Specifications:	page 10
Parts List:	page 11
Exploded View / Kits:	page 12
Recommended Spare Parts List:	page 13
Pump Mounting Selection Guide:	page 13
Torque Requirements:	page 13
Repair Instructions:	pages 14-17
Dimensions:	page 17

# Mud Pump

## 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 194° 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 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 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.

### 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.**  
  
Use SAE 80-90W or Giant's p/n 01154  
  
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.
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.



# Mud Pump

## Specifications Model BP 100

	U.S.	(Metric)
Volume .....	5.9 GPM .....	(22.4 LPM)
Discharge Pressure .....	1880 PSI .....	(130 bar)
Maximum Crankshaft Speed .....		750 RPM
Plunger Diameter .....	1.02" .....	(26mm)
Stroke .....	0.79" .....	(20mm)
Crankcase Oil Capacity .....	24 fl.oz .....	(710 ml)
Temperature of Pumped Fluids .....	194 °F .....	(90° C)
Inlet Ports .....		(2) 3/4" NPT
Discharge Ports .....		(2) 1/2" NPT
Crankshaft Mounting .....		Either Side
Shaft Rotation .....	Top of Pulley Towards Fluid End	
Weight .....	41.9 lbs. ....	(19 kg)

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:

$$(GPM \times PSI) / 1450 = HP$$

BP100 HORSEPOWER REQUIREMENTS					
RPM	GPM	500 PSI	1000 PSI	1500 PSI	2000 PSI
250	2.0	0.7	1.4	2.0	2.7
350	2.8	0.9	1.9	2.8	3.8
450	3.5	1.2	2.4	3.7	4.9
550	4.3	1.5	3.0	4.5	6.0
650	5.1	1.8	3.5	5.3	7.0
750	5.9	2.0	4.1	6.1	8.1

**SPECIAL NOTE:**  
 The theoretical gallons per revolution (gal/rev) is 0.0078667  
 To find specific outputs at various RPM, use the formula:

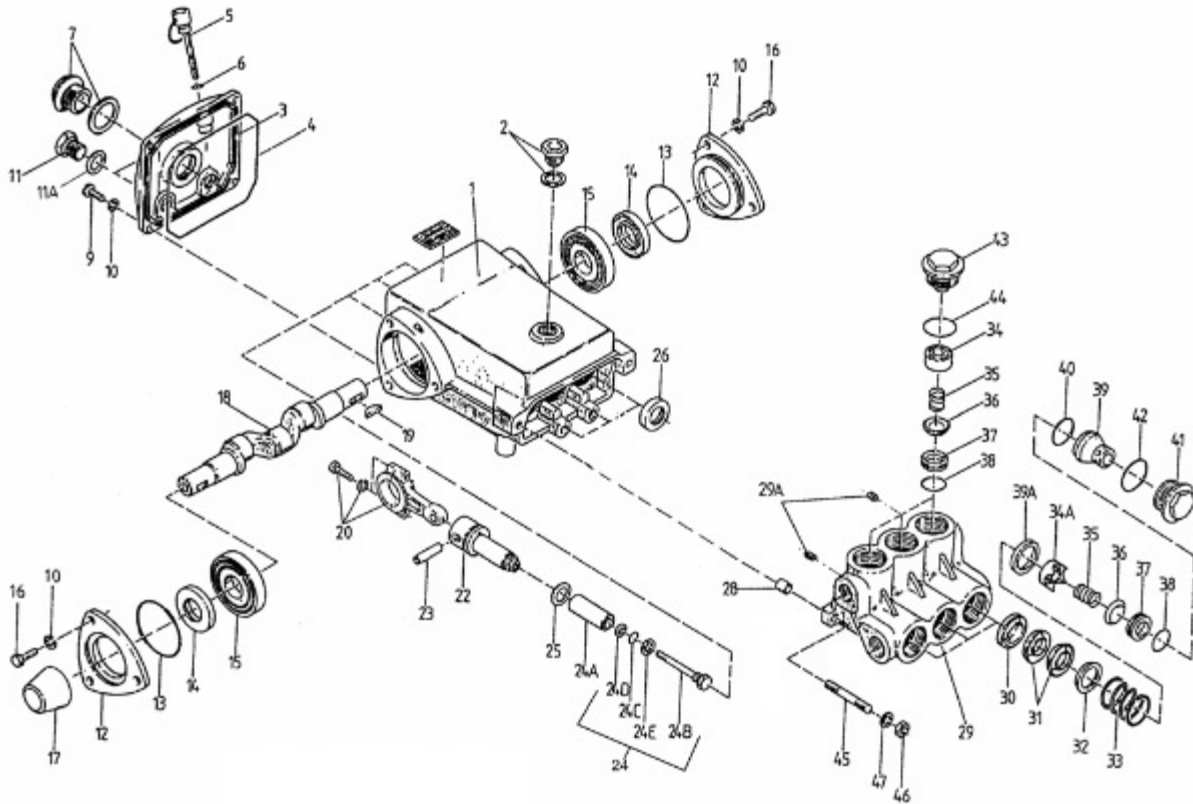
$$GPM = 0.00787 \times RPM$$

# Mud Pump

## BP100 PARTS LIST

<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTIONS</u>	<u>QTY</u>	<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTIONS</u>	<u>QTY</u>
1	07294	Crankcase	1	24C	07023	O-Ring, Bolt Assy. (Viton)	3
2	06968	Oil Filler Cap with Gasket	1	24D	07203	Support Ring	3
3	07297	Cover, Crankcase	3	24E	07258	Copper Seal Washer	3
4	07298	O-Ring, Crankcase Cover	1	25	05289	Flinger	3
5	07299	Oil Dipstick	1	26	07318	Radial Shaft Seal	3
6	01009	O-Ring, Dip Stick	1	28	07319	Shim, Stud	2
7	07186	Oil Sight Glass	1	29	07320	Manifold	1
9	01010	Screw, Crankcase Cover	4	29A	06176	Inner Hexagon Stud Bolt	2
10	01011-0400	Spring Washer, Cover Screw	4	30	07335	Pressure Ring	3
11	07109	Oil Drain Plug	2	31	11503	V-Sleeve	6
11A	07182	Gasket for Oil Drain Plug	2	32	07349	Support Ring	3
12	07302	Bearing Cover	2	33	07338	Pressure Spring	3
13	07303	O-Ring, Bearing Cover	2	34	07325	Spring Retainer, Discharge	3
14	07459	Seal, Crankshaft	2	34A	07326-0100	Spring Retainer, Inlet	3
15	08388	Roller Bearing	2	35	07312-0100	Valve Spring	6
15A	06962	Shim, 1.5mm	2	36	07327	Valve Plate	6
16	07114	Screw & Washer, Bearing Cover	6	37	06014	Valve Seat	6
17	05312	Shaft Protector	1	38	06015	O-Ring, Valve Seat	6
18	07309	Crankshaft	1	39	07328	Valve Retainer, Inlet	3
19	07252	Woodruff Key	1	39A	07329	Spacer	3
20	07310	Connecting Rod Assy.	3	40	12057	O-Ring, Inlet Valve Retainer	3
20A	07311	Inner Hexagon Screw	3	41	07331	Plug, Inlet	3
20B	07122	Spring Washer	3	42	07332	O-Ring, Inlet Plug	3
22	07315	Crosshead with Plunger Base	3	43	07213	Plug, Discharge	3
23	07314	Crosshead Pin	3	44	07214	O-Ring, Discharge Plug	3
24	07360	Bolt Assembly		45	07333	Stud Bolt	4
		(Items 24B, 24C, 24D, 24E)	3	46	07158	Hex Nut, Stud Bolt	4
24A	07346	Ceramic Plunger	3	47	07159	Spring Washer, Stud Bolt	4
24B	08399	Tension Screw	3				

## BP 100 EXPLODED VIEW



### BP 100 REPAIR KITS

#### Plunger Packing Repair #09649

Item	Part #	Description	Qty.
31	11503	V-Sleeve	6
40	12057	O-Ring, Inlet Valve Retainer	3
42	07332	O-Ring, Inlet Plug	3

#### Ceramic Plunger Kit #09650

Item	Part #	Description	Qty.
24	07360	Bolt Assy. (24B-E)	3
24A	07346	Ceramic Plunger	3
25	05289	Flinger	3

#### Inlet Valve Kit #09651

Item	Part #	Description	Qty.
34A	07326-0100	Inlet Spring Retainer	3
35	07312-0100	Valve Spring	3
36	07327	Valve Plate	3
37	06014	Valve Seat	3
38	06015	O-Ring, Valve Seat	3
40	12057	O-Ring, Inlet Valve Retainer	3
42	07332	O-Ring, Inlet Plug	3

#### Discharge Valve Kit #09652

Item	Part #	Description	Qty.
34	07325	Spring Retainer, Discharge	3
35	07312-0100	Valve Spring	3
36	07327	Valve Plate	3
37	06014	Valve Seat	3
38	06015	O-Ring, Valve Seat	3
44	07214	Discharge Plug O-Ring	3



Preventative Maintenance Check-List & Recommended Spare Parts List							
Check	Daily	Weekly	50hrs	Every	Every	Every	
					500hrs	1500hrs	3000hrs
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		
Plunger Packing Kits (1 kit/pump) (See page 5 for kit list)						X	
Valve Assembly Kit (1 kit/pump) (See page 5 for kit list)						X	
Oil Seal Kit (1 kit/pump) (See page 5 for kit list)							X

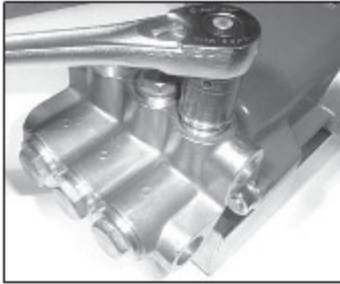
### Pump Mounting Selection Guide

<b>Bushings</b> 07175 - 28 mm Tapered H Bushing	<b>Rails</b> 07358 - Plated Steel Channel Rails (L=9.18" x W=1.88" x H=3.00")
<b>Pulley &amp; Sheaves</b> 01055 - 9.75" Cast Iron 2 gr. - AB Section 01062 - 7.75" Cast Iron - 2 gr. - AB Section	

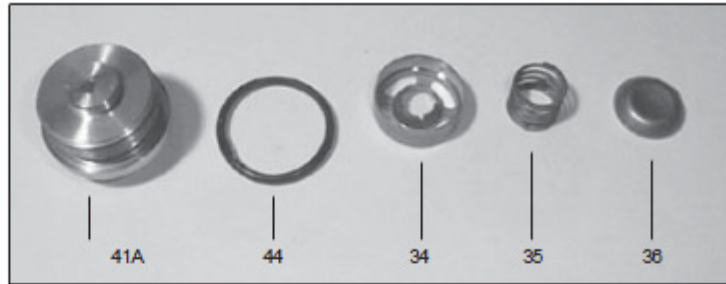
### BP100 TORQUE SPECIFICATIONS

<u>Position</u>	<u>Part#</u>	<u>Description</u>	<u>Torque Amount</u>
20A	07311	Inner Hexagon Screw	310 in.-lbs.
24B	08399	Tension Screw	310 in.-lbs.
41	07331	Plug, Inlet	59 ft.-lbs.
43	07332	Plug, Discharge	59 ft.-lbs.
46	07158	Nut, Stud Bolt	59 ft.-lbs.

## REPAIR INSTRUCTIONS - BP100 PUMP



1. With a 22mm socket, remove the three discharge (43) and three inlet (41) manifold plugs.



2. Check o-ring (44) for wear and replace as necessary. Remove the discharge spring retainer (34), valve spring (35), and valve plate (36).



3. Use a small slide hammer to remove valve seats (37) from manifold (29). Inspect valve plate (36) and valve seats (37) for wear. If excessive pitting is seen, replace the worn parts. Check valve seat o-ring (38) for wear and replace as necessary.



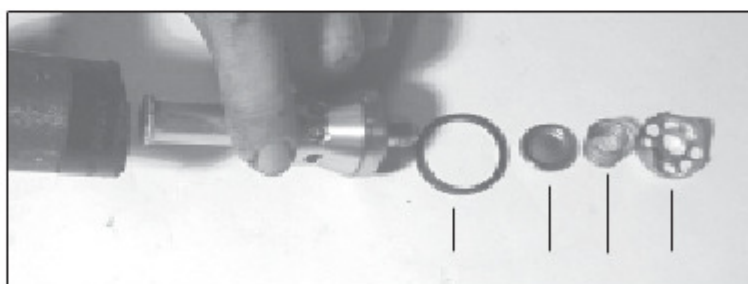
4. Drain the oil from the pump. Turn the pump over to remove the four manifold stud nuts (46) with a 19mm wrench.



5. Tap the back of the valve casing (29) with a rubber mallet.



6. Remove the inlet valve retainer assembly (34A-39)



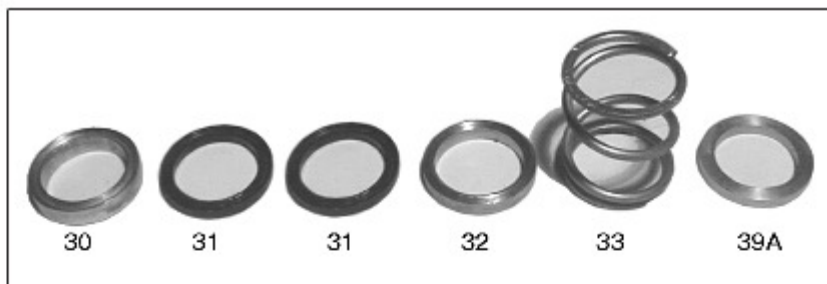
7. Remove the o-ring, (40), valve plate (36), valve spring (35), spring retainer (34A). Check valve retainer o-ring (40) for wear.

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

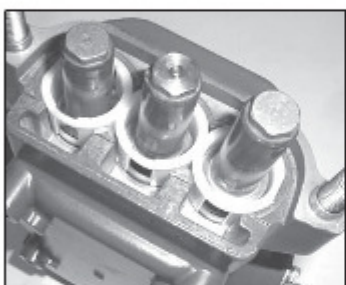
## REPAIR INSTRUCTIONS - BP100 PUMP



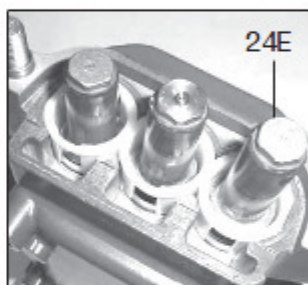
8. With a valve puller remove the valve seat (37) and o-ring (38). If excessive pitting is seen, replace the worn parts. Check valve seat o-ring (38) for wear and replace as necessary.



9. Remove the spacer (39A), pressure spring (33), support ring (32), v-sleeves (31), and pressure ring (30), from the manifold (29) and check for wear.



10. Inspect ceramic plunger (24A) tips for wear. If necessary, replacement of the ceramic plungers may be accomplished by removing the plunger bolt assemblies (24) with a 13mm wrench. Ceramic plungers should now slide off the stainless steel plunger base (22). Excessive resistance to plunger removal may be overcome by heating the stainless steel plunger base. This will melt any excess loc-tite beneath the ceramic plunger allowing easy removal.



11. Replace copper ring (24E) onto plunger bolt (24B). Slide plunger bolt assembly (24) into ceramic plunger (24A). Apply a light film of loc-tite to plunger bolt threads and place plunger assembly onto stainless steel plunger base (22) and tighten to 310 in.-lbs.

12. To replace plunger oil seals (26), proceed to "Gear End Disassembly" section below. Otherwise, continue as described below.



13. Before replacing pump manifold (29), first rotate crankshaft (18) until two outside plungers (24A) extend evenly forward. Lubricate ceramic plungers with a light film of oil. Carefully and evenly slide manifold over plungers and press manifold firmly against crankcase (1). Replace manifold stud bolts (45), washers (47) and nut (46) and tighten to 59 ft.-lbs.

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



## REPAIR INSTRUCTIONS - BP100 PUMP

### Gear End Disassembly

14. Remove the crankcase cover screws (9). Inspect the crankcase cover o-ring (4) for wear. Replace if necessary.
15. Inspect the dipstick (5) vent hole for signs of clogging. Clean if necessary.
16. To remove the crankshaft (18), first remove the bearing cover plates (12). Remove the key (19).
17. With a 5 mm allen wrench remove the connecting rod screws (20A) and rear portion of connecting rod assemblies (20). Push the connecting rod (20) and plunger rod (22) down as far as possible into the crankcase housing.
18. Hold the pump rear assembly with a wooden fixture, or other suitable device, in order to secure it while removing the crankshaft (18). Using a plastic mallet, tap the crankshaft from one side while turning it from the other side. The turning insures that during this sequence the crankshaft does not become wedged against the front portion of the connecting rods (20). The far side bearing (15) will remain in the crankcase (1). When free, the crankshaft can be removed by hand. The opposite side crankshaft seal (14) will be removed by this procedure. It is important that you turn the crankshaft (18) constantly while tapping from the opposite end to avoid any binding. The crankshaft bearing (15) remains on the crankshaft as it is removed. If necessary, use a bearing puller to remove the crankshaft bearing (15).
19. Remove the front portion of the connecting rods (20) and plunger base assembly (22) from the rear of the pump by pulling straight out of the crankcase crosshead guides. Notice that the connecting rod (20) halves are numbered or colored. Connecting rods must be positioned with their numbers or colors on the upper left-hand side, in the same numerical sequence as when they were removed.
20. Using a dowel and a rubber mallet, tap the oil seals (26) out from the rear of crankcase (1). The area onto which the oil seal rests should be clean and dry. Put a small drop of loc-tite on the oil seals and place into crankcase with lips facing the rear of the pump.
21. To remove the crosshead pin (23) from the crosshead (22), the assembly should be positioned on a wooden fixture to avoid damage to crosshead. Drive out the pin on opposite side of mark located on the crosshead. On those pumps without mark on crosshead, drive out pin by tapping on tapered side of pin.
22. To remove the bearing (15) remaining in the crankcase (1), insert small end of Giant bearing tool and tap with a rubber mallet until bearing and seal (14) are completely removed. The bearing can only be removed from the inside by inserting the Giant Bearing Tool through the opposite side of the crankcase. The crosshead guide in the crankcase should be inspected for possible damage.

## REASSEMBLY INSTRUCTIONS - BP100 PUMP

23. To reassemble, place the far bearing (15) in the crankcase (1) bearing housing and with the Giant Bearing tool as a driver, tap into the crankcase using a rubber mallet.
24. Insert the far side crankshaft oil seal (14) with the Giant Bearing Tool making sure it is firmly seated and well oiled. Always make sure that the crankshaft seal lip does not show signs of wear and that the garter spring is firmly in place on the seal before reinserting into the pump. Replace the bearing cover (12) and o-ring (13) and tighten securely.
25. Replace the front portion of the connecting rod (20) and plunger rod/ crosshead assembly (22) by press-fitting the crosshead pin (23). Make sure to insert the beveled edge of the crosshead pin into crosshead. If the crosshead has a mark, install pin from marked side. The crosshead pin (23) should not extend beyond either side of the crosshead (22) in order to prevent damage to the crosshead bore of the crankcase (1).
26. Place each crosshead/ plunger assembly into the pump making sure that all of the parts are well oiled before insertion into the crankcase (1). Notice that the connecting rod (20) halves are numbered or colored. Connecting rods must be positioned with their numbers or colors on the upper left-hand side, in the same numerical sequence as when they were removed.
27. Replace near side bearing (15) on crankshaft by using the Giant Bearing Tool and mallet to tap into place. Take the crankshaft (18) end with the bearing (15) and insert the other end through the bearing housing and tap with a rubber mallet until the bearing is seated.

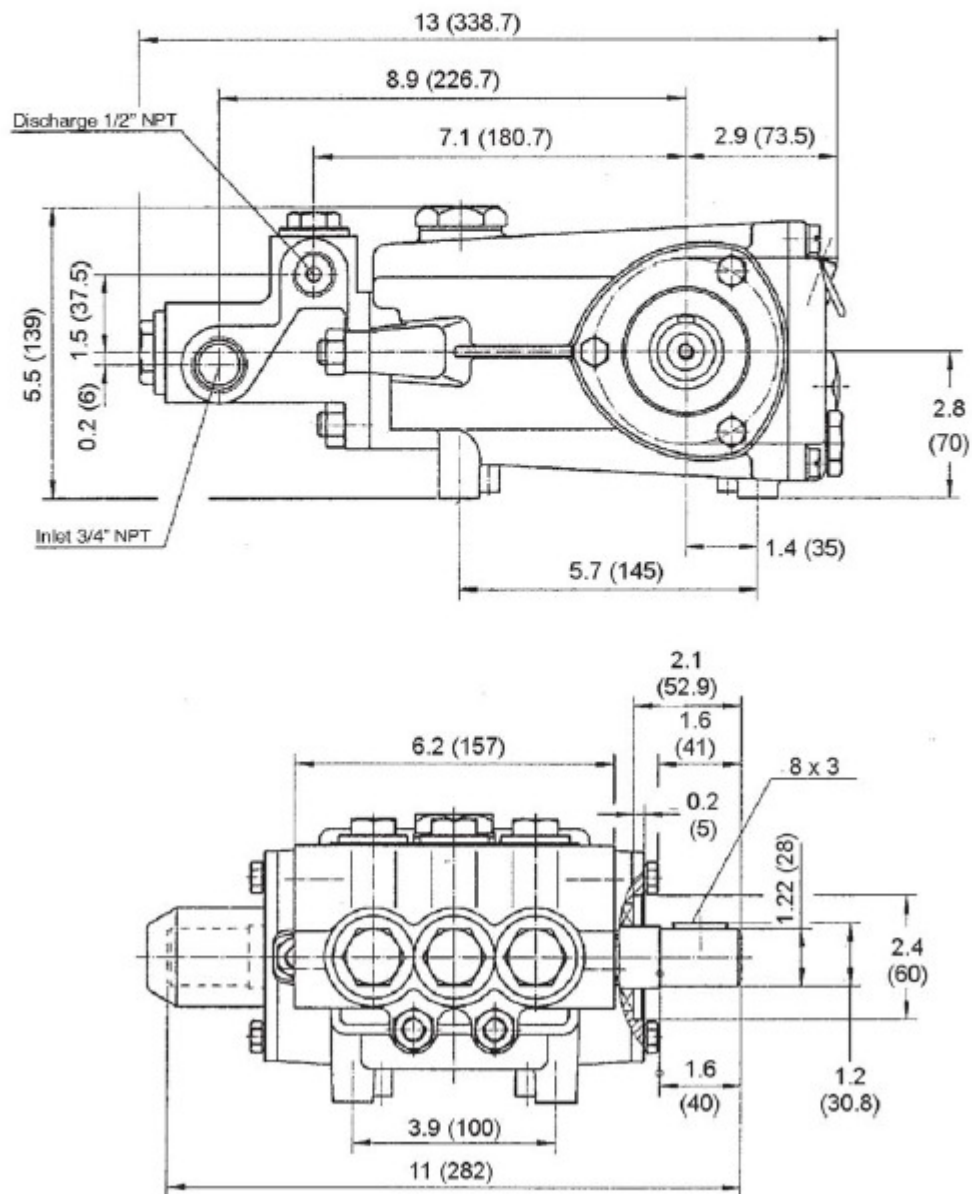
## REASSEMBLY INSTRUCTIONS - BP100 PUMP (Cont)

28. When reassembling the connecting rods (20), note that the connecting rod halves are numbered or colored and that the numbers or colors must be matched and aligned. Torque the connecting rod bolts to 310 in.-lbs.
29. Insert the near side crankshaft oil seal (14) with the Giant Bearing Tool making sure it is firmly seated and well oiled. Replace the bearing cover (12) and o-ring (13) and tighten securely.

See instructions above for re-installing fluid end onto the gear end.

30. Fill the BP100 crankcase (1) with 24 oz. of Giant Industries' oil and check the oil level with the dipstick (5). Proper level is center of two lines. Reinstall the pump into your system.

### BP100 DIMENSIONS - INCHES (mm)





# WARRANTY RETURN GOODS POLICY

## LIMITED WARRANTY

The Manufacturer warrants its products to be free from defects in material and workmanship for a period of twelve months from the date of shipment from the factory. The Manufacturer shall not be responsible for any damage resulting to or caused by its products by reason of installation, improper storage, unauthorized service, alteration of the products, neglect or abuse, or use of the product in a manner inconsistent with its design. The warranty does not extend to any component parts not manufactured by Manufacturer; however, Manufacturer's warranty herein shall not limit any warranties made by manufacturers of component parts which extend to Buyer.

Claims for defects in material and workmanship shall be made in writing to Manufacturer within ten days of discovery of defect. Manufacturer may either send a service representative or have the product returned to its factory at Buyer's expense for inspection. Upon notification of defect, Manufacturer will issue a return goods authorization number to Buyer. The return goods authorization number must accompany the product returned. If judged by the Manufacturer to be defective in material or workmanship, the product will be replaced or repaired at the option of the Manufacturer, free from all charges except authorized transportation. Buyer shall be responsible for all maintenance services consisting of lubrication and cleaning of equipment, replacing expandable parts, making minor adjustments, and performing operating checks, all in accordance with procedures outlined in Manufacturer's maintenance literature.

THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES AND NO REPRESENTATIONS, GUARANTEES, OR WARRANTIES, EXPRESS OR IMPLIED, (INCLUDING BUT NOT LIMITED TO A WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), ARE MADE BY THE MANUFACTURER IN CONNECTION WITH THE MANUFACTURE OR SALE OF ITS PRODUCTS. NO EMPLOYEE, DISTRIBUTOR, OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY ON BEHALF OF MANUFACTURER. THE REMEDIES OF BUYER SET FORTH HEREIN ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER REMEDIES. THE LIABILITY OF MANUFACTURER WHETHER IN CONTRACT, TORT, UNDER ANY WARRANTY, OR OTHERWISE SHALL NOT EXTEND BEYOND ITS OBLIGATION TO REPAIR OR REPLACE, AT ITS OPTION ANY PRODUCT OR PART FOUND BY MANUFACTURER TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP. MANUFACTURER SHALL NOT BE LIABLE FOR COST OF INSTALLATION AND/OR REMOVAL OR BE RESPONSIBLE FOR DIRECT, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE.

## GENERAL RETURNS OF MERCHANDISE

1. All returns must be pre-authorized
  - A. Please call our parts department for an RGA number
  - B. Please include RGA number on the outside of box
  - C. Include any required paper work or special instructions
  - D. Items returned without an RGA number will not be accepted
2. All returns are subject to a 20% restock charge.
3. Special items are non-returnable
  - A. Non-stock parts
  - B. Custom parts
  - C. If you are unsure about a parts status when ordering, ask your McLaughlin representative if the item fits on of the above conditions.
4. Items must be returned within thirty days of original order date.
5. Items not returned within 30 days from the date of RGA is issued will not be accepted.
6. The item(s) must be in new condition. Used item(s) are not returnable.



