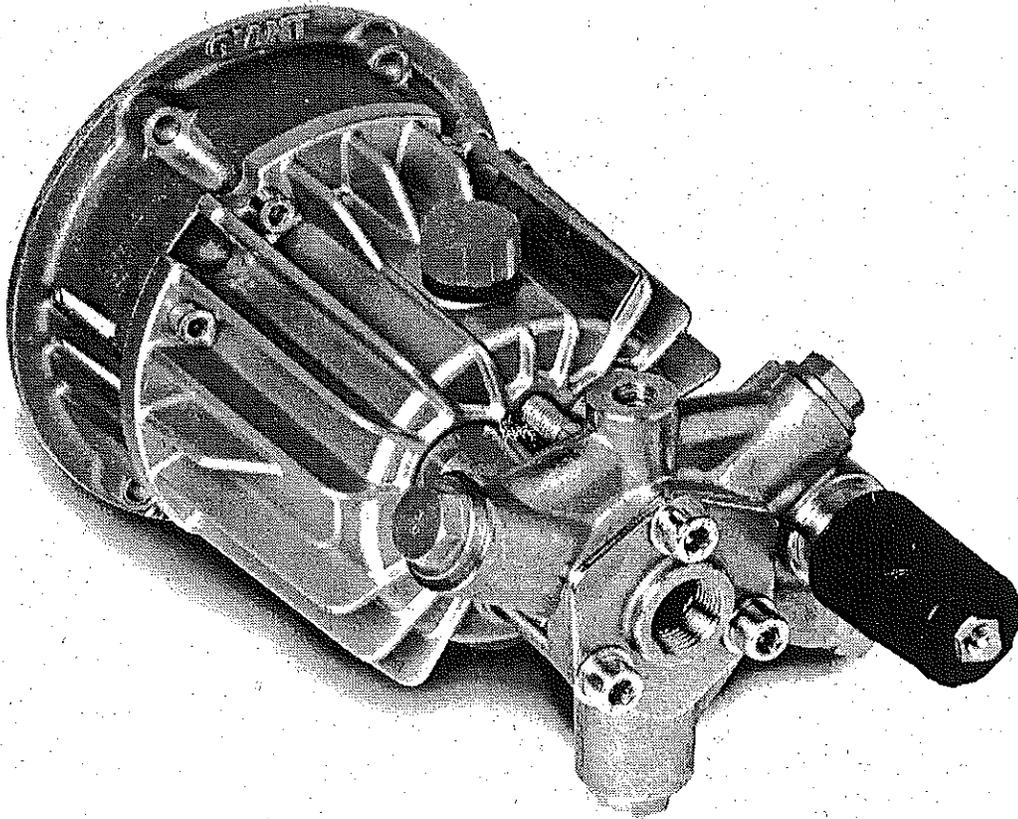


# Series R53000

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Triplex Ceramic  
Plunger Pump  
Operating Instructions/  
Repair and Service  
Manual



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**GIANT**

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Updated 8/98

# 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 120 °F, refer to the specifications for special considerations so as to avoid 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.

4. 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.

**NOTE:** An anti-seize material must be applied to the motor/engine shaft to ensure trouble free disassembly of the pump from the shaft.

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## IMPORTANT OPERATING CONDITIONS

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

1. Prior to initial operation, add oil to crankcase so that oil level is between the two lines on the oil dipstick. **DO NOT OVERFILL.**
2. Operating a direct drive pump above speeds of 1725 RPM and/or when the temperature of the pumped fluid is between 120 °F and 160 °F requires the following:
  - a) a minimum inlet pressure of 25 PSIG;
  - b) a minimum inlet line size I.D. of 3/4";
  - c) Use of Giant Industries Synthetic Crankcase oil (part # 01150) or the equivalent such as Mobil 1 Formula 15W-50 synthetic oil.
3. Vacuum inlet pressures are allowed for fluid temperatures up to 120 °F when operating at or below 1725 RPM.
4. Crankcase oil should be changed after the first 50 hours of operation, then at regular intervals of 250 hours or less depending on operating conditions.

**NOTE:** The number of operating hours allowed between oil changes will be affected by conditions such as high ambient temperature, high humidity and severity of use (operating at a maximum RPM and pressure for extended periods of time). You must decrease the number of hours between changes when operating under these conditions.

5. Pump operation must not exceed rated pressure volume or RPM. A pressure regulator/unloader is built into your R53000 Series pump.
6. Acids, alkalines, or abrasive fluids cannot be pumped unless approval in writing is obtained before operation from Giant Industries, Inc.
7. Run the pump dry approximately 10 seconds to drain the water before exposure to freezing temperatures.
8. Do not allow the pump to remain in by pass mode for more than 5 minutes. Seal damage will occur if this time is exceeded.

## **IMPORTANT:**

Electric motor models of the R53000 Series pump are constructed to fit motors having a shaft length of 2.60" from the mounting surface.

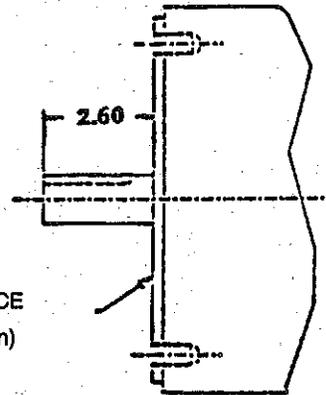
Gas engine models of the R53000 Series pump are constructed to fit gas engines having a shaft length of up to 3.0" from the mounting surface. An optional flange can be ordered\* which allows for mounting on engines with a shaft lengths of up to 3-3/4" from the mounting surface.

\*Add (L) suffix to the pump model number when ordering.  
Example: Model Number R53108-3A becomes R53108-3A-L.

## **WARNING!!!**

Using an electric motor having a shaft length of more than 2.60" from the mounting surface of a gas engine having a shaft length of more than 3.0" from the mounting surface (3-3/4" with optional "L" Flange) **WILL RESULT IN SEVERE CRANKCASE DAMAGE!**

MOUNTING SURFACE  
(Electric Motor Shown)



## **NOTE:**

DO NOT use pumps equipped with the optional "L" Flange with engines having shaft lengths of less than 3.0". For standard gas engine model R53000, the minimum shaft length required is 2.5". Minimum shaft length for electric motors is 2.1". Using a "short shafted" gas engine or electric motor with shaft lengths under the stated minimums will result in damage to the engine crankshaft or wobble plate bore due to insufficient key/keyway engagement.

## **NOTE:**

The shaft key used on you motor/engine must be kept as long as possible but must not extend past the end of the shaft. We recommend using a key which utilizes a minimum of 90% of the available keyway on the motor/engine shaft.

For example: If the available keyway on the engine shaft is 2.0", use a key which is at least 1.8" long.

# Specifications

## Model R53019-3A

### 3 Plunger Axial Pump with Electric Motor Flange

Volume .....	3.8 GPM @ 1725 RPM
Discharge Pressure .....	Up to 3000 PSI
Maximum Inlet Pressure .....	Up to 90 PSIG
Minimum Inlet Pressure .....	-8" Hg
Plunger Diameter .....	18mm
Stroke .....	11.2mm (10.7 ° angle)
Crankcase Oil Capacity .....	8 fl. oz.
Temperature of Pumped Fluids .....	Up to 160 °F *
Inlet Port .....	3/4" NPT
Discharge Port .....	3/8" NPT
Gauge Port .....	1/4" NPT
Shaft Rotation .....	Either Direction**
Weight .....	19 lbs.
Width .....	9.0"
Height .....	9.0"
Swash Plate Bore .....	1-1/8" x 1/4" Keyway

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.

\* See important operating conditions on page 2

\*\* The pump itself can be driven in either direction of rotation; however, the cooling fan on TEFC motors must always be positioned so that the cooling air is drawn from the non-drive end of the motor towards the pump.

R53019-3A Horsepower Requirements							
RPM	GPM	1000 PSI	1200 PSI	1500 PSI	2000 PSI	2500 PSI	3000 PSI
1725	3.80	2.60	3.20	3.90	5.20	6.50	7.80

Horsepower Formula: 
$$hp = \frac{GPM \times PSI}{1460}$$

**Special Note:** The pump is constructed to fit NEMA 182T and 184T, C face, motor frames. If the pump is to be mounted to a 7-1/2" hp, 1725 RPM motor, or any 10 hp motor (standard NEMA 213T and 215T, C face frames), a special 1-1/8" shaft diameter and 2-5/8" shaft length is required for these motors to properly fit the pump.

# Specifications

## Model R53069-3A

### 3 Plunger Axial Pump with Electric Motor Flange

Volume .....	4.7 GPM @ 1725 RPM
Discharge Pressure .....	Up to 2500 PSI
Maximum Inlet Pressure .....	Up to 90 PSIG
Minimum Inlet Pressure .....	-8" Hg
Plunger Diameter .....	18mm
Stroke .....	14mm (13.3 ° angle)
Crankcase Capacity .....	8 fl. oz.
Temperature of Pumped Fluids .....	Up to 160 °F *
Inlet Port .....	3/4" NPT
Discharge Port .....	3/8" NPT
Gauge Port .....	1/4" NPT
Shaft Rotation .....	Either Direction**
Weight .....	19 lbs.
Width .....	9.0"
Height .....	9.0"
Swash Plate Bore .....	1-1/8" x 1/4" Keyway

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.

\* See important operating conditions on page 2

\*\* The pump itself can be driven in either direction of rotation,; however, the cooling fan on TEFC motors must always be positioned so that the cooling air is drawn from the non-drive end of the motor towards the pump.

R53069-3A Horsepower Requirements						
RPM	GPM	1000 PSI	1200 PSI	1500 PSI	2000 PSI	2500 PSI
1725	4.70	3.30	3.90	4.80	6.40	8.0

Horsepower Formula:      $hp = \frac{GPM \times PSI}{1460}$

**Special Note:** The pump is constructed to fit NEMA 182T and 184T, C face , motor frames. If the pump is to be mounted to a 7-1/2" hp, 1725 RPM motor, or any 10 hp motor (standard NEMA213T and 215T, C-face frames), a special 1-1/8" shaft diameter and 2-5/8" shaft length is required for these motors to properly fit the pump.

# Specifications

## Models R53108-3A, R53109-3A, R53108-3A-L, R53109-3A-L

### 3 Plunger Axial Pump

Volume .....	See rating chart below
Discharge Pressure .....	See rating chart below
Maximum Inlet Pressure .....	Up to 90 PSIG
Minimum Inlet Pressure .....	25 PSIG
Plunger Diameter .....	18mm
Stroke .....	7.3mm (7.0° angle)
Crankcase Oil Capacity .....	8 fl. oz.**
Temperature of Pumped Fluids .....	Up to 160 °F*
Inlet Port .....	3/4" NPT
Discharge Port .....	3/8" NPT
Gauge Port .....	1/4" NPT
Shaft Rotation .....	Either Direction
Weight .....	20 lbs. 10 oz. (Standard Models)
.....	20 lbs. ("L" Models)
Length .....	12" (Standard Models)
.....	12-3/4" ("L" Models)
Width .....	7.5"
Height .....	7.5"
Swash Plate Bore (R53108-3A & R53108-3A-L) .....	1" x 1/4" Keyway
Swash Plate Bore (R53109-3A & R53109-3A-L) .....	1-1/8" x 1/4" Keyway

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.

\* See important operating conditions on page 2

\*\* Giant Industries, Inc. High temperature Synthetic Crankcase Oil is required.

1. The pump is constructed to fit engines having a 5-3/4" pilot diameter, 6-1/2" bolt circle, top 2 hole at 30° from the vertical centerline, bottom 2 holes at 45° from the vertical centerline. Models R53109-3A and R53109-3A-L will fit engines with a 1-1/8" shaft diameter. Model R53108-3A and R53108-3A-L will fit engines with a 1" shaft diameter.
2. The maximum allowable distance from the engine mounting surface to the end of the shaft (and shaft key) is 3.0" or 3.75" using optional "L" flange. Severe damage to the crankcase will occur if the shaft or shaft key extends too far into the crankcase.

#### HORSEPOWER RATINGS:

The ratings shown are the power requirements for the pump. Gas engine power outputs will be greater than the brake horsepower listed. Consult with the engine manufacturer for recommendation.

To compute specific pump horse power requirements, use the following formula:  $\frac{\text{GPM} \times \text{PSI}}{1460} = \text{hp}$

Horsepower Requirements						
R53108-3A, R53109-3A, R53108-3A-L, R53109-3A-L						
RPM	GPM	1000 PSI	1500 PSI	2000 PSI	2500 PSI	3000 PSI
3000	3.90	2.70	4.00	5.40	6.70	8.00
3200	4.20	2.90	4.30	5.80	7.30	8.70
3450	4.50	3.10	4.60	6.20	7.70	---

## Specifications

# Models R53128-3A, R53129-3A, R53128-3A-L, R53129-3A-L 3 Plunger Axial Pump

Volume .....	See rating chart below
Discharge Pressure .....	See rating chart below
Maximum Inlet Pressure .....	Up to 90 PSIG
Minimum Inlet Pressure .....	25 PSIG
Plunger Diameter .....	18mm
Stroke .....	8.3mm (8.0 ° angle)
Crankcase Oil Capacity .....	8 fl. oz. **
Temperature of Pumped Fluids .....	Up to 160 °F*
Inlet Port .....	3/4" NPT
Discharge Port .....	3/8" NPT
Gauge Port .....	1/4" NPT
Shaft Rotation .....	Either Direction
Weight .....	20 lbs. 10 oz. (Standard Models)
.....	20 lbs. ("L" Models)
Length .....	12" (Standard Models)
.....	12-3/4" ("L" Models)
Width .....	7.5"
Height .....	7.5"
Swash Plate Bore (R53128-3A & R53128-3A-L) .....	1" x 1/4" Keyway
Swash Plate Bore (R53129-3A & R53129-3A-L) .....	1-1/8" x 1/4" Keyway

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.

\* See important operating conditions on page 2

\*\* Giant Industries, Inc. High temperature Synthetic Crankcase Oil is required.

1. The pump is constructed to fit engines having a 5-3/4" pilot diameter, 6-1/2" bolt circle, top 2 hole at 30° from the vertical centerline, bottom 2 holes at 45° from the vertical centerline. Models R53129-3A and R53129-3A-L will fit engines with a 1-1/8" shaft diameter. Model R53128-3A and R53128-3A-L will fit engines with a 1" shaft diameter.
2. The maximum allowable distance from the engine mounting surface to the end of the shaft (and shaft key) is 3.0" or 3.75" using optional "L" flange. Severe damage to the crankcase will occur if the shaft or shaft key extends too far into the crankcase.

HORSEPOWER REQUIREMENTS R53128-3A, R53128-3A-L, R53129-3A-L						
RPM	GPM	1000 PSI	1500 PSI	2000 PSI	2300 PSI	2500 PSI
3000	4.4	3	4.5	6.1	6.9	7.5
3200	4.7	3.2	4.8	6.5	7.4	8
3450	5.1	3.5	5.2	7	8	8.7

### HORSEPOWER RATINGS:

The ratings shown are the power requirements for the pump. Gas engine power outputs will be greater than the brake horsepower listed. Consult with the engine manufacturer for recommendation.

To compute specific pump horse power requirements, use the following formula:  $\frac{\text{GPM} \times \text{PSI}}{1460} = \text{hp}$

# Specifications

## Model R53247-3A

### 3 Plunger Axial Pump with Universal Flange

Volume .....	4.4 GPM @ 1725 RPM
Discharge Pressure .....	Up to 3000 PSI
Maximum Inlet Pressure .....	Up to 90 PSIG
Minimum Inlet Pressure .....	-8" Hg
Plunger Diameter .....	18mm
Stroke .....	12.2mm
Crankcase Oil Capacity .....	8 fl. oz.
Temperature of Pumped Fluids .....	Up to 160 °F *
Inlet Port .....	3/4" NPT
Discharge Port .....	3/8" NPT
Gauge Port .....	1/4" NPT
Shaft Rotation .....	Either Direction*
Weight .....	19 lbs.
Length .....	11-3/4"
Width .....	9.0"
Height .....	9.0"
Swash Plate Bore .....	25mm x 7mm Keyway

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.

\* See important operating conditions on page 2

R53247-3A-H Horsepower Requirements							
RPM	GPM	1000 PSI	1200 PSI	1500 PSI	2000 PSI	2500 PSI	3000 PSI
1725	4.40	3.01	3.62	4.52	6.03	7.53	9.04

Horsepower Formula:  $hp = \frac{GPM \times PSI}{1460}$

**Special Note:** The pump is constructed to fit a 1/2 speed Honda engine model (Part #GX340L:1X), with the use of the Giant flange (Part # 08000).

## 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 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 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
Pump Pressure as Rated, Pressure Drop at gun	Restricted discharge plumbing	Resize 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	Use Giant Oil (See Page 2)  Adjust oil level to proper amount

## R53000 SERIES PARTS LIST AND KITS

ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.
1	08145	Adapting Plate, Sold Only with Part No. 08152 <sup>1</sup> (R53019-3A and R53069-3A)	1	18	07485	Stuffing Box	3
1	08141	Adapting Plate, Sold Only with Part No. 08152 <sup>1</sup> (R53108-3A, R53109-3A, R53128-3A, and R53129-3A)	1	19	06003	O-Ring	3
1	08146	Adapting Plate, Sold Only with Part No. 08152 <sup>1</sup> (R53108-3A-L, R53109-3A-L, R53128-3A-L, & R53129-3A-L)	1	20	07902	V-Sleeve with Support Ring Must Order with Support Ring. (Part No. 07903)	3
1	07994	Adapting Plate, Sold Only with Part No. 08152 <sup>1</sup> (R53247-3A-H)	1	20A	08252	V-Sleeve with Support Ring	3
2	07544	Socket Head Cap Screw	8	21	10011	O-Ring	3
2A	07803	Socket Head Cap Screw (Electric Motor Flange Models)	4	22	07904	Pressure Ring	6
2A	07804	Socket Head Cap Screw (Gas Engine Flange Models)	4	23	07488	Seal Housing	3
3	08055	O-Ring	1	24	08059	O-Ring, Retainer	3
4	07877	Radial Shaft Seal	1	27	07489	O-Ring	3
5	08140	Gasket	1	28	07490	Manifold	1
7	07597	Crankcase	1	29	07849	Valve Seat	6
8A	07480	Rear Bearing, Complete	1	30	07491	Valve Plate	6
8B	07896	Front Bearing, Complete	1	31	07906	Valve Spring	6
9	07970	Swash Plate, Sold Only with Part No. 08139 <sup>2</sup> (R53019-3A)	1	32	07492	Inlet Valve Spring Retainer	6
9	07971	Swash Plate, Sold Only with Part No. 08139 <sup>2</sup> (R53069-3A)	1	32X	07841	Valve Assembly, Complete	6
9	07985	Swash Plate, Sold Only with Part No. 08139 <sup>2</sup> (R53108-3A and R53108-3A-L)	1	33	07853	O-Ring	6
9	07972	Swash Plate, Sold Only with Part No. 08139 <sup>2</sup> (R53109-3A and R53109-3A-L)	1	34	07854	Manifold Plug	3
9	07975	Swash Plate, Sold Only with Part No. 08139 <sup>2</sup> (R53128-3A and R53128-3A-L)	1	36	07035	O-Ring	3
9	07976	Swash Plate, Sold Only with Part No. 08139 <sup>2</sup> (R53129-3A and R53129-3A-L)	1	37	07494	Suction Flange	1
9	07993	Swash Plate, Sold Only with Part No. 08139 <sup>2</sup> (R53247-3A)	1	38	07495	Form O-Ring	1
10	08150	Plunger Assy., 18mm	3	39	08448	Washer	3
12	07821	Spring Disc	3	40	08484	Inner Hexagon Screw	3
13	07822	Retaining Ring	3	41	07450	Oil Fill Cap with Gasket (For speeds <i>under</i> 1725 RPM)	1
14	07873	Plunger Spring	3	41A	07835	Oil Fill Cap	1
15	08356	Oil Seal (Electric Models)	3	42	07300	Oil Drain Plug with Gasket	1
15	08356-0010	Oil Seal Viton (Gasoline Models)	3	44	08250	Brass Sight Glass with Gasket	1
16	07483	Spacer Ring	3	45	07836	Extension Pipe with Gasket (For speeds <i>above</i> 1725 RPM)	1
17	07484	Weep Return Stuffing Box	3	47	07496	Adjusting Plug	1
				48	07212	O-Ring	1
				49	07497	Adjusting Screw	1
				50	07023	O-Ring	1
				51	07498	Ball Guide	1
				52	07499	Disc	1
				53	07586	Stop Plug	1
				54	12007	O-Ring	1
				55	07587	Piston	1
				56	07588	O-Ring	1
				57	07916	Support Ring	1
				58	08267	Disc Spring	18
				60	07592	Bypass Valve Seat	1
				60A	12324	Kick-Back Valve Seat	1
				61	08461	Bypass Valve Ball (ceramic)	1
				61A	12325	Kick-Back Valve Cone	1
				61B	12326-0001	O-Ring	1
				62	12328	Kick-Back Valve Spring	1
				63	12340	Kick-Back Valve Spring Retainer	1
				64	12322	Hand Wheel	1
				65	12320	Limiting Nut	3
				66	07913	O-Ring	1
				67	08268	Thrust Bearing Assembly	1

### Plunger Packing Kit (Part # 09162)

Qty.	Part #	Description
3	07902	V-Sleeve, Black
3	10011	O-Ring
6	07904	Pressure Ring
3	08252	V-Sleeve with Support Ring

### Valve Assembly Kit (Part # 09132)

Qty.	Part #	Description
6	07841	Valve Assembly Complete
6	07853	O-Ring

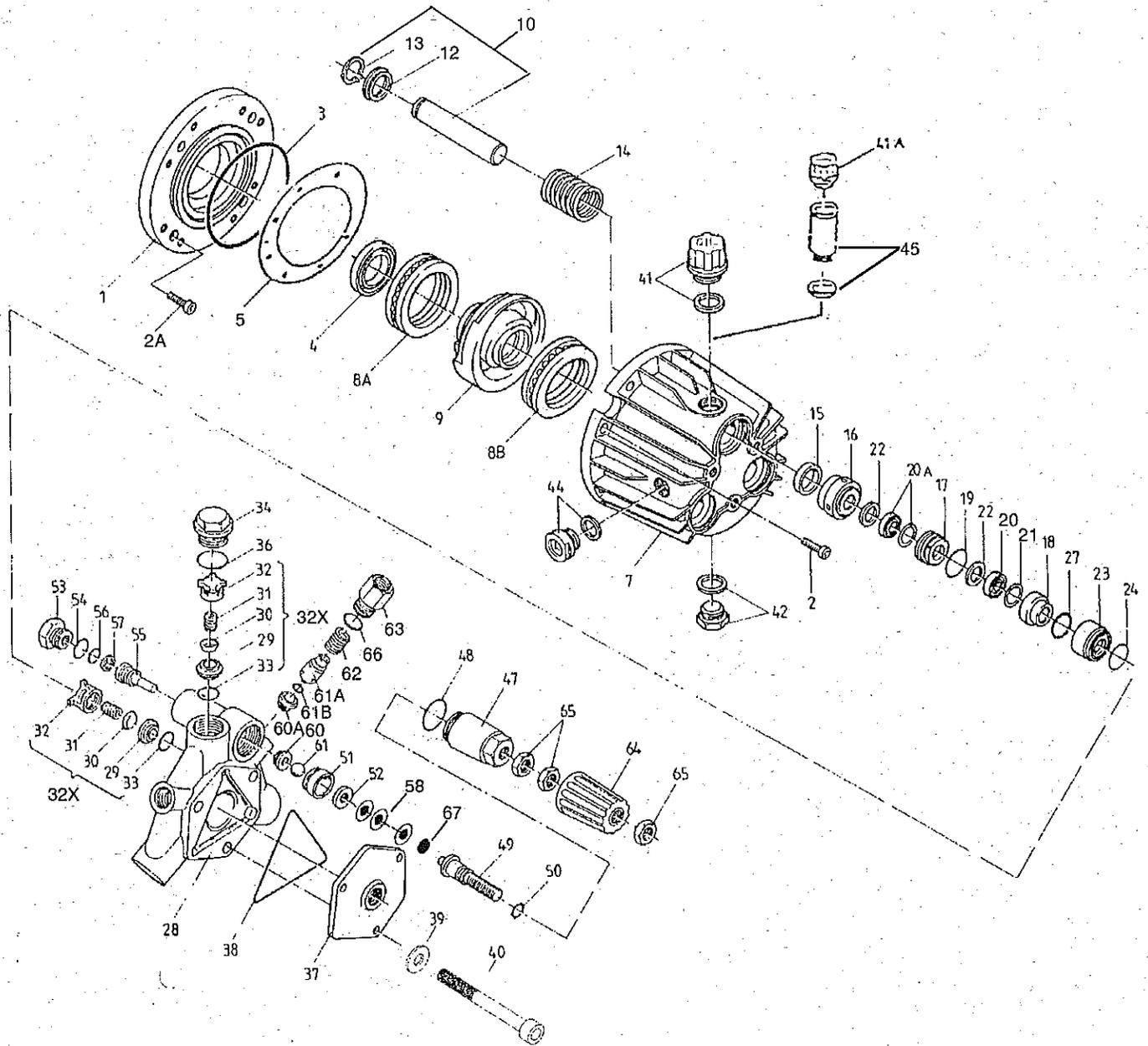
### Oil Seal Kit (Part # 09144)

Qty.	Part #	Description
3	08356-0010	Oil Seal

### Unloader Repair Kit (Part # 09133)

Qty.	Part #	Description
2	12007	O-Ring
1	07588	O-Ring
1	07916	Support Ring
1	07592	By Pass Valve Seat
1	12324	Kick-Back Valve Seat
1	08461	By Pass Valve Ball
1	12326-0001	O-Ring
1	07023	O-Ring
1	07212	O-Ring
1	07913	O-Ring

# Exploded View - R53000 Series



## Notes from Parts List

<sup>1</sup>Part Number 08152 consists of two pieces (front race and cage) of a three piece bearing assembly. The third piece of this assembly (rear race) is pressed into the flange.

<sup>2</sup>Part Number 08139 consists of two pieces (front race and cage) of a three piece bearing assembly. The third piece of this assembly (rear race) is pressed into the swash plate.

## REPAIR INSTRUCTIONS R53000 SERIES PUMPS

**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.

### DISASSEMBLY AND REPAIR SEQUENCE OF THE FRONT END OF THE R530000 SERIES PUMP

1. With a 22mm socket, remove the three (3) discharge manifold plugs (item #34). Inspect the manifold plug o-rings (item #36) for wear, and replace as necessary.
2. Using a needle nose pliers, remove the valve assembly (item #'s 32, 31, 30 and 29). By inserting a small screwdriver between the valve plate (item #30) and the valve spring retainer (item # 32), the valve assembly can be separated. Inspect the valves for wear and replace as necessary.
3. Remove the o-ring (item #33). Inspect for wear and replace as necessary.
4. Next, remove the three (3) manifold studs and washers (item #'s 39 and 40) with an allen wrench. Remove the suction flange o-ring (item #38). Inspect the o-ring for wear and replace as necessary.
5. Tap the back of the manifold (item #28) with a rubber mallet to dislodge, and slide off the pump. Take note of the position of the discharge port so as to place the port in the same position during reassembly.
6. The seal housing (item #23) and valve assembly (item #'s 32, 31, and 30) fit tightly into the manifold head. To remove, use a wooden dowel and tap out from the front side of the manifold. Inspect the parts for wear and replace as necessary.
7. Remove the o-ring (item #33); inspect for wear and replace as necessary. See step 2 for disassembly of the suction valve (suction valve and discharge valve are identical and can be interchanged).
8. With a 14mm socket, remove the limiting nut (item #65). Remove the hand wheel (item #64). Next, remove the two (2) limiting nuts (item #65). Remove the adjusting plug (item #47). Inspect the o-ring (item #48) for wear and replace as necessary. Remove the disc springs (item #58) and thrust bearing (item #67). Note the position and arrangement of the springs and bearing for proper reassembly. Inspect the spring and bearing for wear and replace as necessary.
9. Unscrew the adjusting screw (item #49) from the adjusting plug (item #47). Inspect the o-ring (item #50) for wear and replace as necessary. Replace the adjusting screw (item #49) into the adjusting plug (item #47).
10. Remove the disc (item #52) and bypass valve ball (item #61). Inspect the parts for wear and replace as necessary. Next, with a small screwdriver, carefully remove the ball guide (item #51). Inspect the ball guide for wear and replace as necessary.
11. Using a 6mm allen wrench, remove the bypass valve seat (item #60), taking care not to nick the seating surface. Inspect for wear and replace as necessary.
12. Next, remove the stop plug (item #53). Using a wooden dowel, tap out the piston (item #55). Inspect the parts for wear and replace as necessary. Inspect the o-ring (item #56) and support ring (item #57) for wear and replace as necessary.
13. Remove the kick-back valve spring retainer (item #63), inspect the o-ring (item #66) for wear and replace as necessary.
14. Next, remove the kick-back valve spring (item #62), kick-back valve cone (item #61A), and the o-ring (item #61B). Inspect all parts for wear and replace as necessary.
15. Using a 6mm allen wrench, remove the kick-back valve seat (item #60A). Inspect for wear and replace as necessary. Take care not to nick the seating surface.

## REPAIR INSTRUCTIONS R53000 SERIES PUMPS

16. Inspect the o-ring (item #24) for wear and replace as necessary. Remove the stuffing box (item #18), o-ring (item #27), v-sleeve with support ring (item #'s 20 and 21) and pressure ring (item #22A). Inspect all parts for wear and replace as necessary. Take note of the seal arrangement for proper re-assembly.
17. Next, remove the o-ring (item #19), weep return stuffing box (item #17), v-sleeve with support ring (item #'s 20A and 21) and pressure ring (item #22). Inspect all parts for wear and replace as necessary. Remove the spacer ring (item #16). Inspect the oil seal (item #15) for leakage and replace as necessary. The oil seal can be removed carefully by using a small screwdriver. Make sure not to make contact with the plunger.

### THIS COMPLETES THE DISASSEMBLY AND REPAIR OF THE FRONT END OF THE R53000 SERIES PUMP

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#### DISASSEMBLY SEQUENCE OF THE BACK END OF THE R53000 SERIES PUMP:

NOTE: DRAIN THE OIL FROM THE CRANKCASE.

18. In an even sequence, remove the socket head screws (item #2) that secure the adapting plate (item #1) to the crankcase (item #7). Remove the plate. Next, remove the ball bearing, rear bearing race, swash plate with race and shaft ring, ball bearing and plunger bearing race (Assemblies 8A, and 8B, respectively.). Inspect the o-ring (item #3) and gasket (item #5) for wear and replace as necessary.
19. Pull the plunger assembly with the plunger spring (item #'s 13, 12, 10 and 14) straight out of the crankcase. Inspect all parts and replace as necessary. Remove the shaft seal (item #4) by pressing out the back of the adapting plate. Replace, reversing the above procedure. NOTE: REMOVAL OF THE SEAL USUALLY RESULTS IN DAMAGE TO THE SEAL. THEREFORE, WE RECOMMEND REPLACING THIS SEAL IF IT IS REMOVED.

**CAUTION:** Plungers are specifically designed for only one wobble plate. Disastrous failures will occur if the plunger is used with the incorrect wobble plate. DO NOT exchange the plungers with other R53000 model pumps.

**CAUTION:** DO NOT attempt to remove the expansion plug from the end of the swash plate (if so equipped). Doing so will result in the oil leaking and the destruction of the pump.

### THIS COMPLETES THE DISASSEMBLY OF THE BACK END OF THE R53000 PUMP

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#### REASSEMBLY SEQUENCE OF THE GIANT PRODUCTS COMPANY R53000 PUMP

20. To reassemble, replace the plunger assembly and the plunger springs (item #'s 13, 12, 10, and 14) into the crankcase, making sure the plunger spring is properly seated against the spring disc (item #12).
21. Next, place the adapting plate (item #1) flat on a table. Replace the o-ring (item #3) and the gasket (item #5). Position the ball bearing, rear bearing race, swash plate with race and shaft ring, ball bearing, and plunger bearing race (Assemblies 8A and 8B, respectively) on top of the adapting plate. Care must be taken so that the shaft seal (item #4) is not damaged when positioning the swash plate with the race and the shaft ring onto the adapting plate. Lubricate both the shaft seal and the shaft ring before assembling. Make certain that the plunger assemblies and the plunger springs (item #'s 13, 12, 10 and 14) are pushed into the crankcase as far as possible. Then wrap a rubber band tightly around the plungers (on the manifold side) to secure them in place, as the next step is to turn the crankcase upside down. Turn the crankcase upside down and position it on the adapting plate and the bearings. It is suggested that a flat piece of wood be placed on top of the three (3) studs (item #39) in order to aid in pressing down on the crankcase. Press firmly to secure the adapting plate in the position, making certain that the swash plate (item #9) is properly positioned against the adapting plate. Replace the socket head screws (item #2) and tighten securely in a sequential pattern to a maximum torque of 200 inch-pounds. Remove the rubber band used to hold the plunger in place.
22. If the oil seals (item #15) were removed, replace with the seal lip towards the crankcase (item #7). Gently tap the seal into the crankcase. Replace the spacer ring (item #16).

## REPAIR INSTRUCTIONS R53000 SERIES PUMPS

23. Replace the seal assembly (item #'s 20A, 21, and 22) into the weep return stuffing box (item #17) and grease the plungers. Replace item #'s 17, 20A, 21 and 22 over the plungers until seated on the spacer ring (item #16). Replace the o-ring (item #19). Replace the v-sleeve with support ring (item #'s 20 and 21) and pressure ring (item #22) into the stuffing box (item #18). slide item #'s 18, 20, 21, and 22 over the plungers seating tightly until seated against the spacer ring (item #16).
24. Replace the by-pass valve seat (item #60) with Loctite #572 or other suitable sealant. Replace the ball guide (item #51). Replace the adjusting screw with the o-ring (item #'s 49 and 50) into the adjusting plug (item #47). Position the thrust bearing assembly (item #67) so that the ball/cage assembly rests on the adjusting screw shoulder. Next, replace the bearing washer. The 18 disc springs can now be installed next to the bearing. Position the disc (item #52) and the by-pass valve ball (item #61) on top of the disc springs. Apply a small amount of grease to these items first to keep them assembled during installation. Place this entire assembly into the manifold and tighten down securely.

### SEE UNLOADER ADJUSTMENT PROCEDURE INSTRUCTIONS FOR PROPER HAND WHEEL POSITIONING ON PAGE 15

25. Replace the piston (item #55) and stop plug (item # 53). Grease the o-rings well and tighten securely.
26. Replace the valve assembly (item #'s 61B, 61A and 62) into the manifold. Replace the kick-back valve spring retainer with o-ring (item #'s 63 and 66) and tighten down securely.
27. Next, replace the o-ring (item #33). Replace the valve assembly with the tapered surface of the valve seat (item #29) facing up and the tapered surface of the valve plate (item #30) facing down. Position the spring (item #31) and the snap the valve seat into the valve spring retainer (item #32). Position the assembly into the suction side of the manifold making certain that the leg of the valve spring retainer is not blocking the liquid passages in the manifold.
28. Replace the manifold over the studs (item #39).
29. Grease the suction flange o-ring (item #38) and replace on the suction flange (item #37). Replace the suction flange over the studs. Replace the manifold stud and washer (item #'s 39 and 40) and tighten to 45 foot-pounds. with a 17mm torque wrench.
30. Replace the o-ring (item #33). Next, assemble the discharge valve with the tapered surface of the valve seat (item #29) facing up and the tapered surface of the valve plate (item #30) facing down. Position the spring (item #31) and the snap the valve seat into the valve spring retainer (item #32). Position the assembly into the discharge valve housing. Make certain that the leg of the valve spring retainer is not blocking the liquid passages in the manifold.
31. Replace the manifold plugs (item #34) and tighten to 350 inch-pounds.
32. Mount the pump and fill the crankcase with 8 fluid ounces of oil Pump is now ready for operation.

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

## UNLOADER ADJUSTMENT PROCEDURE

It is critical that the integrated unloader in the Giant R53000 series pumps be adjusted correctly to ensure the safe operation of the pump and pumping system. Failure to do so can result in system malfunction and/ or bodily harm and automatically voids the manufacturer's warranty.

### WARNING

The two brass lock nuts (item #65) located under the hand wheel (item #64) are set in position at the factory. These nuts limit the amount of adjustment that can be made to the unloader. Do not change the position of these nuts on the adjusting screw (item #49). However, the removal of these nuts is necessary to service the o-ring (item #50). Follow the adjustment procedure below for proper placement after servicing.

**NOTE:** The following instructions assume that the various unloader parts are already assembled and that the hand wheel (item #64) has been removed.

1. Lock the two (2) brass nuts together against each other at the end of the stainless steel adjusting screw (item #49).
2. With the motor or gas engine on and the properly sized nozzle in place, open the shut-off gun to allow the pump discharge to exit.
3. Using a wrench, slowly turn the brass nuts clockwise to increase the pressure from the pump. **WARNING!** If at any time during the adjustment procedure, the pressure fails to increase for a given clockwise rotation of the adjusting screw, **STOP**. If an additional 1/2 turn clockwise does not raise the pressure, you have reached the maximum pressure setting for your particular flow and nozzle combination. Rotate the adjusting screw back (counterclockwise) the additional 1/2 turn.
4. Open and close the shut-off gun several times. Check the pressure reading. Re-adjust the setting if necessary as it is not uncommon for slight variations to occur. At this time, Giant also recommends checking the "spike" pressure by installing a gauge between the unloader and the shut off gun. This pressure should not be more than 15% to 20% over the system operating pressure. If it is, turn the adjusting screw counterclockwise until corrected.
5. Stop the motor or gas engine. Unlock the two (2) brass nuts and screw them on the adjusting screw completely until they rest against the adjusting plug (item #47). Lock the nuts in place against the adjusting plug. Screw on the hand wheel and the remaining brass nut against the two brass nuts already in place. Lock the third brass nut against the hand wheel. The maximum unloader pressure setting has now been made.

## 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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