Series P300

Triplex Ceramic Plunger Pump Operating Instructions/ Repair and Service Manual

THE EAGLE LINE.

For Models:
P313
P314
P316
P317
P318
P319
P340

GIANT

Updated 5/03

Contents:

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 160^0 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. When viewed from the side of the pump, crankshaft rotation is clockwise on pumps with left handed shafts and counterclockwise on pumps with right handed shafts. 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 charts on pages 3-7 and 10.

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 Giant oil.

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.

Specifications
Model P313/P314

	U.S.	(Metric)
Volume	Up to 3.8 GPM	(14.4 LPM)
Discharge Pressure P313 (Continuous)	Up to 3200 PSI	(220 bar)
Discharge Pressure P313 (Intermittent)	Up to 3500 PSI	(240 bar)
Discharge Pressure P314 (Continuous)	Up to 3500 PSI	(240 bar)
Discharge Pressure P314 (Intermittent)	Up to 4000 PSI	(275 bar)
Inlet Pressure		Positive Inlet Pressure Required
Stroke	0.55”	14.1mm
RPM		Up to 3450 RPM
Plunger Diameter	0.47”	12mm
Temperature of Pumped Fluids	Up to 160 °F	(71 °C)
Inlet Ports		(2) 1/2" BSP
Discharge Ports		(2) 3/8" BSP
Shaft Rotation	Top of pulley towards manifold	
Crankshaft Diameter		24mm
Key Width		8mm
Shaft Mounting		Either side[2]
Weight	16 lbs.	(7.26 kg)
Crankcase Oil Capacity	14.2 fl.oz.	(0.42 liters)
Extended Crankcase Oil Capacity	17 fl. oz.	(0.5 liters)

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.

NOTES:

In order to drive the pump from the side opposite the present shaft extension, simply remove the valve casing from the crankcase and rotate the pumps 180 degrees to the desired position. Be certain to rotate the seal case (item #20) as well, so that the weep holes are down at the six o'clock position. Exchange the oil fill and the oil drain plugs, also. Refer to the repair instructions as necessary for the proper assembly sequence.

P313 HORSEPOWER REQUIREMENTS

RPM	GPM	1000 PSI	1500 PSI	2000 PSI	2500 PSI	3000 PSI	3500 PSI*	4000 PSI*
3000	3.3	2.3	3.4	4.6	5.7	6.8	8.0	9.1
3200	3.5	2.4	3.6	4.8	6.0	7.2	8.4	9.7
3450	3.8	2.6	3.9	5.2	6.6	7.9	9.2	10.5

* **Intermittent duty**
\+ **P314 only!**

SPECIAL NOTE:
The theoretical gallons per revolution (gal/rev) is 0.0011.
To find specific outputs at various RPM, use the formula: GPM = 0.0011 x RPM

HORSEPOWER RATINGS:
The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend a 1.15 service factor be specified when selecting an electric motor as the power source. To compute specific pump horse power requirements, use the following formula:

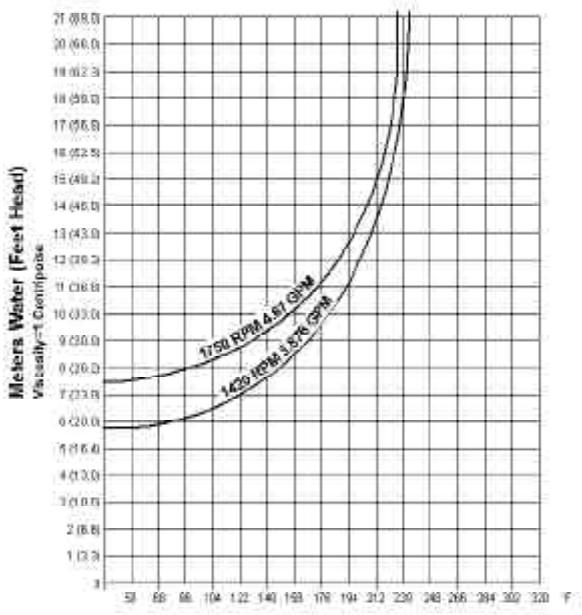
HP = (GPM X PSI) / 1450

Specifications
Model P316

	U.S.	(Metric)
1450 RPM		
Ratings (Continuous)	3.9 GPM @ 3000 PSI	(14.8 LPM @ 200 bar)
Ratings (Intermittent)	3.9 GPM @ 3500 PSI	(14.8 LPM @ 240 bar)
1750 RPM		
Ratings (Continuous)	4.7 GPM @ 2500 PSI	(17.8 LPM @ 175 bar)
Ratings (Intermittent)	4.7 GPM @ 3000 PSI	(17.8 LPM @ 200 bar)
Inlet Pressure	140 PSI	(10 bar)
Stroke	0.55”	14.1mm
Plunger Diameter	0.71”	18mm
Temperature of Pumped Fluids	Up to 160 °F	(71 °C)
Inlet Ports		(2) 1/2" BSP
Discharge Ports		(2) 3/8" BSP
Shaft Rotation		Top of pulley towards manifold
Crankshaft Diameter		24mm
Key Width		8mm
Shaft Mounting		Either side[2]
Weight	16 lbs.	(7.26 kg)
Crankcase Oil Capacity	14.2 fl.oz.	(0.42 liters)
Extended Crankcase Oil Capacity	17 fl. oz.	(0.5 liters)
NPSHR (@ 1450 RPM)		19.0 ft of water - 5.8 mW

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.

P316 NPSHR Chart



HORSEPOWER RATINGS:

The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend a 1.15 service factor be specified when selecting an electric motor as the power source. To compute specific pump horse power requirements, use the following formula:

HP = (GPM X PSI) / 1450

P316 HORSEPOWER REQUIREMENTS

RPM	GPM	1000 PSI	1500 PSI	2000 PSI	2500 PSI	3000 PSI	3500 PSI*
745	2.0	1.4	2.1	2.8	3.4	4.1	4.8
1025	2.7	1.9	2.8	3.8	4.7	5.7	6.6
1340	3.6	2.5	3.7	5.0	6.2	7.4	8.7
1450	3.9	2.7	4.0	5.4	6.7	8.0	9.4
1750	4.7	3.2	4.9	6.5	8.1	9.7	

***Intermittent duty**

SPECIAL NOTE:

The theoretical gallons per revolution (gal/rev) is 0.00268.

To find specific outputs at various RPM, use the formula: GPM = 0.00268 x RPM

Specifications
Model P317

	U.S.	(Metric)
Volume	3.7 GPM	(14.0 LPM)
Discharge Pressure (Continuous)	3000 PSI	(200 bar)
Discharge Pressure (Intermittent)	3500 PSI	(240 bar)
Inlet Pressure	Up to 90 PSI	
Stroke	0.42”	10.6 mm
RPM	Up to 1800 RPM	
Plunger Diameter	0.71”	18mm
Temperature of Pumped Fluids	Up to 160 °F	(71 °C)
Inlet Ports	(2) 1/2" BSP	
Discharge Ports	(2) 3/8" BSP	
Shaft Rotation	Top of pulley towards manifold	
Crankshaft Diameter	24mm	
Key Width	8mm	
Shaft Mounting	Either side[2]	
Weight	16 lbs.	(7.26 kg)
Crankcase Oil Capacity	14.2 fl.oz.	(0.42 liters)
Extended Crankcase Oil Capacity	17 fl. oz.	(0.5 liters)
NPSHR (@ 1450 RPM)	26.2 ft of water - 8.0 mW	

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.

NOTES:

In order to drive the pump from the side opposite the present shaft extension, simply remove the valve casing from the crankcase and rotate the pumps 180 degrees to the desired position. Be certain to rotate the seal case (item #20) as well, so that the weep holes are down at the six o'clock position. Exchange the oil fill and the oil drain plugs, also. Refer to the repair instructions as necessary for the proper assembly sequence.

P317 HORSEPOWER REQUIREMENTS

RPM	GPM	1000 PSI	1500 PSI	2000 PSI	2500 PSI	3000 PSI	3500 PSI*
975	2.0	1.4	2.1	2.8	3.4	4.1	4.8
1220	2.5	1.7	2.6	3.4	4.3	5.2	6.0
1464	3.0	2.1	3.1	4.1	5.2	6.2	7.2
1700	3.5	2.4	3.6	4.8	6.0	7.2	8.4
1800	3.7	2.5	3.8	5.1	6.4	7.6	8.9

***Intermittent duty**

SPECIAL NOTE:

The theoretical gallons per revolution (gal/rev) is 0.00205.

To find specific outputs at various RPM, use the formula: GPM = 0.00205 x RPM

HORSEPOWER RATINGS:

The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

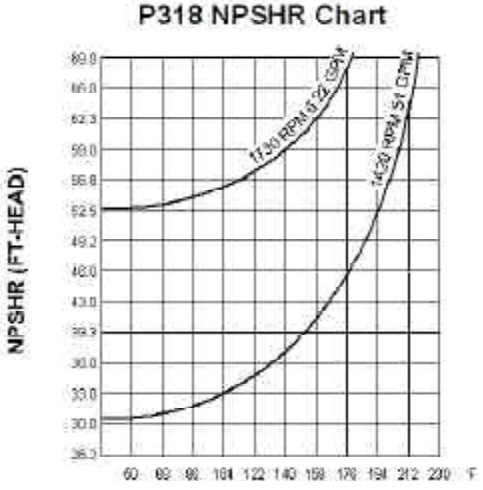
We recommend a 1.15 service factor be specified when selecting an electric motor as the power source. To compute specific pump horse power requirements, use the following formula:

HP = (GPM X PSI) / 1450

Specifications
Model P318

	U.S.	(Metric)
1450 RPM		
Ratings (Continuous)	5.5 GPM @ 2000 PSI	(20.8 LPM @ 140 bar)
1750 RPM		
Ratings (Intermittent)	6.6 GPM @ 1000 PSI	(25 LPM @ 70 bar)
Inlet Pressure	140 PSI	(10 bar)
Stroke	0.63”	16mm
Plunger Diameter	0.78”	20mm
Temperature of Pumped Fluids	Up to 160 °F	(71°C)
Inlet Ports		(2) 1/2" BSP
Discharge Ports		(2) 3/8" BSP
Shaft Rotation	Top of pulley towards manifold	
Crankshaft Diameter		24mm
Key Width		8mm
Shaft Mounting		Either side[1]
Weight	16 lbs.	(7.26 kg)
Crankcase Oil Capacity	14.2 fl.oz.	(0.42 liters)
Extended Crankcase Oil Capacity	17 fl. oz.	(0.5 liters)

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.



HORSEPOWER RATINGS:

The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend a 1.15 service factor be specified when selecting an electric motor as the power source. To compute specific pump horse power requirements, use the following formula:

HP = (GPM X PSI) / 1450

P318 HORSEPOWER REQUIREMENTS

RPM	GPM	750 PSI	1000 PSI	1500 PSI	1750 PSI	2000 PSI
810	3.0	1.6	2.1	3.1	3.7	4.2
1080	4.1	2.1	2.8	4.2	4.9	5.6
1450	5.5	2.8	3.8	5.7	6.6	7.6
1750*	6.6	3.4	4.6			

***Positive Inlet Pressure Required**

SPECIAL NOTE:

The theoretical gallons per revolution (gal/rev) is 0.00375.
To find specific outputs at various RPM, use the formula: GPM = 0.00375 x RPM

Specifications
Model P319

	U.S.	(Metric)
Volume	Up to 4.8 GPM	(18.2 LPM)
Discharge Pressure (Continuous)	Up to 2500 PSI	(175 bar)
Discharge Pressure (Intermittent)	Up to 3000 PSI	(200 bar)
Inlet Pressure	Positive Inlet Pressure Required	
Stroke	0.31"	8mm
RPM		Up to 3400 RPM
Plunger Diameter	0.71"	18mm
Temperature of Pumped Fluids	Up to 160 °F	(71 °F)
Inlet Ports		(2) 1/2" BSP
Discharge Ports		(2) 3/8" BSP
Shaft Rotation	Top of pulley towards manifold	
Crankshaft Diameter		24mm
Key Width		8mm
Shaft Mounting		Either side[1]
Weight	16 lbs.	(7.26 kg)
Crankcase Oil Capacity	14.2 fl.oz.	(0.42 liters)
Extended Crankcase Oil Capacity	17 fl. oz.	(0.5 liters)

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.

NOTE:

1 **In order to drive the pump from the side opposite the present shaft extension, simply remove the valve casing from the crankcase and rotate the pumps 180 degrees to the desired position. Be certain to rotate the seal case (item #20) as well, so that the weep holes are down at the six o'clock position. Exchange the oil fill and the oil drain plugs, also. Refer to the repair instructions as necessary for the proper assembly sequence.**

P319 HORSEPOWER REQUIREMENTS

RPM	GPM	1500 PSI	2000 PSI	2500 PSI	3000 PSI*
3000	4.2	4.3	5.8	7.2	8.7
3200	4.5	4.7	6.2	7.8	9.3
3450	4.8	5.0	6.6	8.3	9.9

* **Intermittent duty**

SPECIAL NOTE:

The theoretical gallons per revolution (gal/rev) is 0.0014.
To find specific outputs at various RPM, use the formula: GPM = 0.0014 x RPM

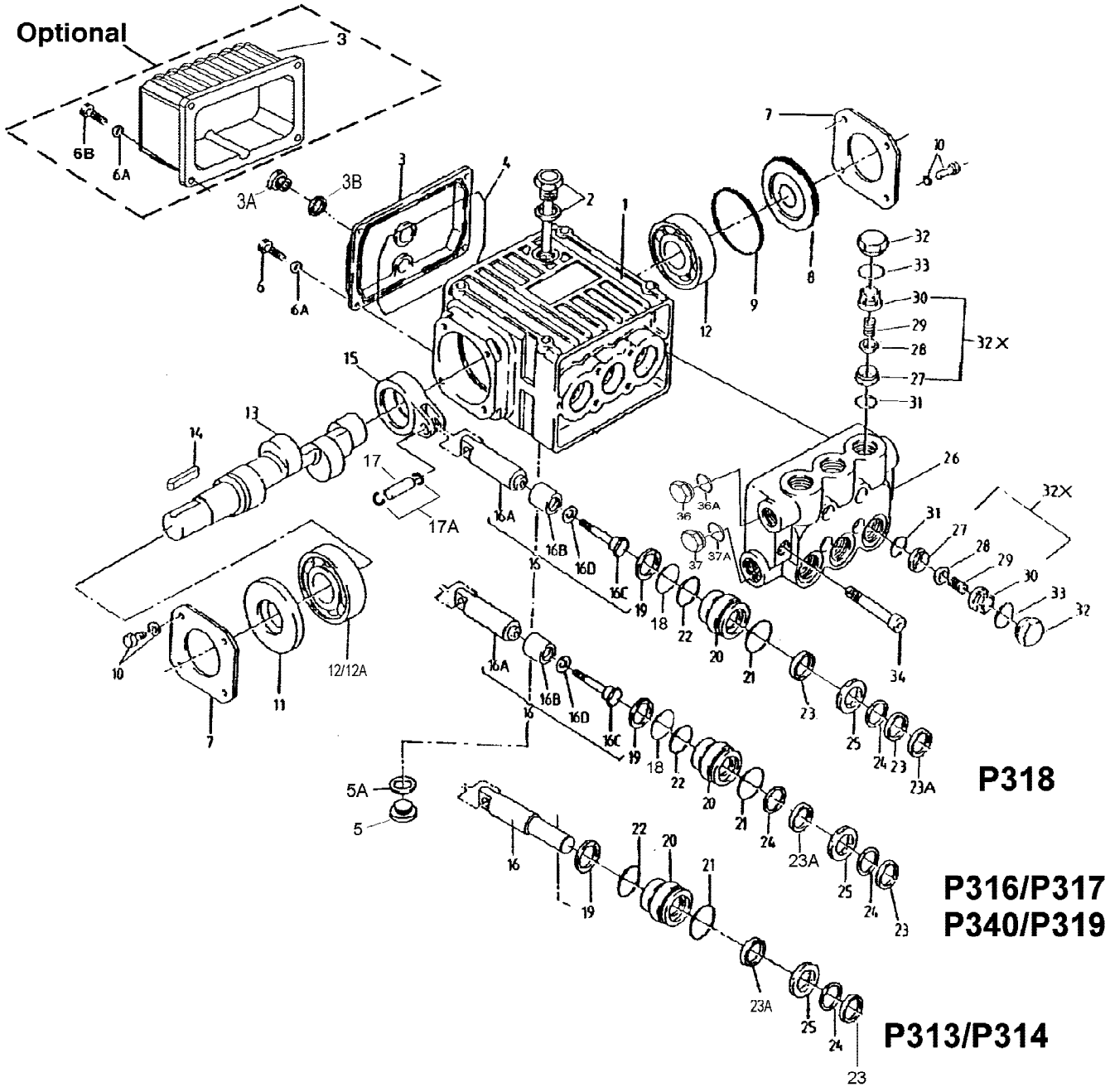
HORSEPOWER RATINGS:

The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend a 1.15 service factor be specified when selecting an electric motor as the power source. To compute specific pump horse power requirements, use the following formula:

HP = (GPM X PSI) / 1450

Exploded View - P300 Series



+ Not present in P340 Pumps

P300 SERIES PARTS LIST

A = P313 B = P314 C = P316 D = P317 E = P318 F = P340 G = P319

ITEM	PART NO.	DESCRIPTION	QTY.
1	08326	Crankcase	1
2	06773	Dipstick Assembly	1
3	08410B	Crankcase Cover, Short	1
3	08410-LG	Crankcase Cover, Extended	1
3A	07190	Oil Drain Plug	1
3B	13262	Gasket for Plug	1
4	08328	O-Ring	1
5	06273	Oil Drain Plug	1
5A	08192	Gasket	1
6	07188	Screw, Short Cover	4
6A	01176-2	Spring Washer	4
6B	01196	Screw, Long Cover	4
7	08303	Bearing Cover I (A, B, G)	1
7	08303	Bearing Cover I (C, D, E, F)	2
8	08330	Bearing Cover II (A, B, G)	1
8	08491	Sight Glass (C, D, E, F)	1
9	07193	O-Ring	1
10	07225	Screw with Lock Washer	8
11	08331	Radial Shaft Seal	1
12	01086	Ball Bearing (A, C, D, E, G)	2
12	01086	Ball Bearing (B, F)	1
12A	07760	Roller Bearing (B, F)	1
13	08332	Crankshaft (A, B, C, F)	1
13	08478	Crankshaft (D)	1
13	08340	Crankshaft (E)	1
13	06508	Crankshaft (G)	1
14	06207	Straight Key	1
15	08333	Connecting Rod	3
16	08413	Plunger Assembly Complete, 12mm (A,B)	3
16	08453	Plunger Assembly Complete, 18mm (C, D, G)	3
16	08452	Plunger Assembly Complete, 20mm (E)	3
16	06540	Plunger Assembly, 16mm (F)	3
16A	08367	Plunger Base (C, D, E, F, G)	3
16B	08455	Plunger Pipe (C, D, G)	3
16B	08449	Plunger Pipe (E)	3
16B	06541	Plunger Pipe (F)	3
16C	08456	Tension Screw (C, D, F, G)	3
16C	08450	Inner Hex Screw (E)	3
16D	07676	Copper Washer (C, D, F, G)	3
16D	08451	Copper Washer (E)	3
17	06542	Wrist Pin	3
17A	22723	Clip Ring	6
18	07770	O-Ring (C, D, E, F, G)	3
19	08356-0010	Oil Seal	3
20	08414	Seal Case (A, B)	3
20	08458	Seal Case (C, D, G)	3
20	08357	Seal Case (E)	3
20	06543	Seal Case (F)	3
21	07234	O-Ring (A, B)	3
21	07780	O-Ring (C, D, E, F, G)	3
22	12027	O-Ring	3
23	07391	Groved Seal Ring (A, B)	3
23	08477	V-Sleeve (C, D, G)	3
23	08358	Groved Seal (E), Black	6
23	07767	Groved Seal (F)	3
23A	08598	Grooved Seal (A, B)	3
23A	08087	Groved Seal (C, D, G), Brown	3
23A	08359	Spacer (E)	3
23A	06315	Grooved Seal (F)	3
24	07392	Pressure Ring (A, B)	3
24	07904	Pressure Ring (C, D, G)	6
24	08346	Pressure Ring (E)	3
24	07768	Pressure Ring (F)	3
25	08417	Weep Return Ring (A, B)	3
25	08337	Weep Return Ring (C, D, G)	3
25	08361	Weep Return Ring (E)	3
25	06544	Weep Return Ring (F)	3
26	06556	Valve Casing (A, B)	1
26	06349*	Valve Casing (C, D, G)	1
26	06413*	Valve Casing (E)	1
26	06545	Valve Casing (F)	1
27	07849	Valve Seat	6
28	07491	Valve Plate	6
29	07906	Valve Spring	6
30	07907	Valve Spring Retainer	6
31	07853	O-Ring	6
32	06350*	Valve Plug (C, D, E, G)	6
32	06546	Valve Plug (A, B, F)	6
32X	07946	Valve Assembly, Complete	6
33	07913	O-Ring	6
34	08363	Hex Head Cap Screw	6
36	13338	Plug, 3/8" BSP	l
36A	08486	Copper Crush Washer, 3/8”	1
37	07109	Plug, 1/2" BSP	1
37A	07661	Seal	1

*For P316/P317 pumps manufacturerd prior to 5/98, Item 26=08459 & Item 32=07928;for P318 pumps manufacture prior to 5/98, Item 26=08362 & Item 32=07928

Specifications
Model P340

	U.S.	(Metric)
Volume	Up to 3.5 GPM	(13.2 LPM)
Discharge Pressure (Continuous)	Up to 3500 PSI	(240 bar)
Discharge Pressure (Intermittent)	Up to 4000 PSI	(275 bar)
Inlet Pressure		Up to 90 PSI
Stroke	0.55”	14.1mm
RPM		Up to 1750 RPM
Plunger Diameter	0.63”	16mm
Temperature of Pumped Fluids	Up to 160 °F	(71 °C)
Inlet Ports		(2) 1/2" BSP
Discharge Ports		(2) 3/8" BSP
Shaft Rotation	Top of pulley towards manifold	
Crankshaft Diameter		24mm
Key Width		8mm
Shaft Mounting		Either side[1]
Weight	16 lbs.	(7.26 kg)
Crankcase Oil Capacity	14.2 fl.oz.	(0.42 liters)
Extended Crankcase Oil Capacity	17 fl. oz.	(0.5 liters)

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.

NOTE:

1 In order to drive the pump from the side opposite the present shaft extension, simply remove the valve casing from the crankcase and rotate the pumps 180 degrees to the desired position. Be certain to rotate the seal case (item #20) as well, so that the weep holes are down at the six o'clock position. Exchange the oil fill and the oil drain plugs, also. Refer to the repair instructions as necessary for the proper assembly sequence.

P340 HORSEPOWER REQUIREMENTS							
RPM	GPM	1500 PSI	2000 PSI	2500 PSI	3000 PSI	3500 PSI	4000 PSI*
745	1.5	1.6	2.1	2.6	3.1	3.6	4.1
1025	2.0	2.1	2.8	3.4	4.1	4.8	5.5
1340	2.7	2.8	3.7	4.7	5.6	6.5	7.4
1450	2.9	3.0	4.0	5.0	6.0	7.0	8.0
1750	3.5	3.6	4.8	6.0	7.2	8.4	9.7

* **Intermittent duty**

SPECIAL NOTE:

The theoretical gallons per revolution (gal/rev) is 0.00201.

To find specific outputs at various RPM, use the formula: GPM = 0.00201 x RPM

HORSEPOWER RATINGS:

The rating shown are the power requirements for the pump. Gas engine power outputs must be approximately twice the pump power requirements shown above.

We recommend a 1.15 service factor be specified when selecting an electric motor as the power source. To compute specific pump horse power requirements, use the following formula:

HP = (GPM X PSI) / 1450

P300 SERIES TORQUE SPECIFICATIONS

Position	Item#	Description	Torque Amount
3B	08410/07190	Oil Drain Plug w/ Gasket	222 in.-lbs.
6	07188/1196	Screw	43 in.-lbs
10	7225	Screw with Lock Washer	85 in.-lbs.
16C	08456 or 08450	Tension Screw, Plunger	220 in.-lbs.
34	08363	Hex Head Cap Screw, Valve Casing	222 in.-lbs.
32	07928/06546	Plug	37 or 59* ft.-lbs.

*For pumps manufactured 5/97 onward.

P300 SERIES REPAIR KITS

Plunger Packing Kits

P313/P314
 # 09152

Item	Part #	Description	Qty.
23	07391	Grooved Seal Ring	3
23A	08598	Grooved Seal	3
24	07392	Pressure Ring, 12mm	3

P316/P317/P319
 # 09119

Item	Part #	Description	Qty.
23	08477	Gooved Seal, Black	3
23A	08087	Grooved Seal, Brown	3
24	07904	Pressure Ring, 18mm	6

P318A
 # 09145

Item	Part #	Description	Qty.
23	08358	Grooved Seal, 20mm	6
24	08346	Pressure Ring, 20mm	3

P340
 # 09507

Item	Part #	Description	Qty.
23	07767	Grooved Seal, 16mm	3
23A	06315	Grooved Seal,16mm	3
24	07768	Pressure Ring	3

Valve Assembly Kit

 # 09116

Item	Part #	Description	Qty.
31	07853	O-Ring	6
32X	07946	Valve Assembly, Complete	6

Oil Seal Kit

 # 09144

Item	Part #	Description	Qty.
19	08356-0010	Oil Seal	3

Optional Viton Seal Kit

P316/P317
 # 09456

Item	Part #	Description	Qty.
21	07780-0001	O-Ring, Viton	3
22	12027-0001	O-Ring, Viton	3
23	07902-0010	V-Sleeve, Viton	6
23	07903-0010	Support Ring, Viton	6
24	07904	Pressure Ring	6
31	07853-0001	O-Ring, Viton	6
33	07913-0001	O-Ring, Viton	6

Pump Mounting Selection Guide

Bushings
01074 - 24 mm Tapered H Bushing

Pulley & Sheaves
01061 - 7.75” Cast Iron 1 gr. - AB Section
01062 - 7.75” Cast Iron - 2 gr. - AB Section

Rails
01160 Plated Steel Channel Rails
(L=5.75”X W=1.0” x H+1.812”)
01161 Plated Steel Channel Rails
(L+5.75”x W+1.00”x H=2.50”)
01163 Retro-Fit Rail
(L=12” x W=1.5” x H=3”)

PUMP SYSTEM MALFUNCTION

MALFUNCTION	CAUSE	REMEDY
The Pressure and/ or the Delivery Drops	Worn packing seals	Replace packing seals
	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
	Unloader	Check for proper operation
Water in crankcase	High humidity	Reduce oil change interval
	Worn seals	Replace seals
Noisy Operation	Worn bearings	Replace bearings, Refill crankcase oil with recommended lubricant
	Cavitation	Check inlet lines for restrictions and/or proper sizing
Rough/Pulsating Operation with Pressure Drop	Worn packing	Replace packing
	Inlet restriction	Check system for stoppage, air leaks, correctly sized inlet plumbing to pump
	Accumulator pressure	Recharge/Replace accumulator
	Unloader	Check for proper operation
	Cavitation	Check inlet lines for restrictions and/or proper size
Pump Pressure as Rated, Pressure Drop at Gun	Restricted discharge plumbing	Re-size discharge plumbing to Flow Rate of Pump
Excessive Leakage	Worn plungers	Replace plungers
	Worn packing/seals	Adjust or Replace packing seals
	Excessive vacuum	Reduce suction vacuum
	Cracked plungers	Replace plungers
	Inlet pressure too high	Reduce inlet pressure
High Crankcase Temperature	Wrong Grade of oil	Giant oil is recommended
	Improper amount of oil in crankcase	Adjust oil level to proper amount

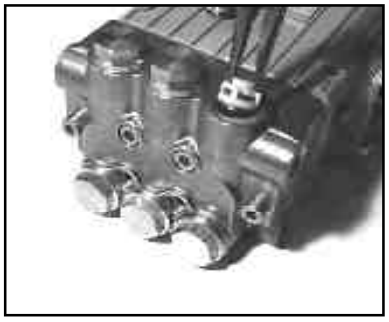
Preventative Maintenance Check-List & Recommended Spare Parts List

Check	Daily	Weekly	50hrs	Every 500 hrs	Every 1500 hrs	Every 3000 hrs
Oil Level/Quality	X					
Oil Leaks	X					
Water Leaks	X					
Belts, Pulley		X				
Plumbing		X				
Recommended Spare Parts						
Oil Change (1 Quart) p/n 1153			X	X		
Seal Spare Parts (1 kit/pump) (See page 11 for kit list)					X	
Oil Seal Kit (1 kit/pump) (See page 11 for kit lit)					X	
Valve Spare Parts (1 kit/pump) (See page 11 for kit list)						X

REPAIR INSTRUCTIONS - P300 SERIES

NOTE: Always take time to lubricate all metal and nonmetal parts with a light film of oil before reassembly. This step will ensure proper fit, at the same time protecting the pump nonmetal parts (i.e., the elastomers) from cutting and scoring.

1. With a 24mm socket wrench, remove the (3) discharge valve plugs and (3) inlet valve plugs (#32). Inspect the o-ring (#33) for wear and replace if damaged.



2. Using a needle nose pliers, remove the inlet and discharge valve assemblies (#32X).

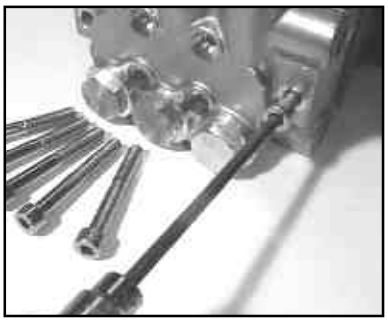
3. The valve assemblies can be separated by inserting a small screw driver between the valve seat (#27) and its valve spring

retainer (#30).

4. Remove each o-ring (#31). Inspect all parts for wear and

replace as necessary.

5. Apply one drop of Loctite 243 to valve plugs (32) and tighten to 59 ft.-lbs. For pumps manufactured prior to 5/97



tighten plugs to 37 ft-lbs.

6. Next, use a 6mm allen wrench to remove the 6 hex head cap screws (#34).

NOTE: If there are deposits of any kind (i.e., lime deposits) in the valve casing, be certain the weep holes in the weep return ring (#25) and valve casing (#26) have not been plugged.

7. Carefully slide the valve casing (#26) out over the plungers with a screwdriver placed between the valve casing and crankcase.

8. Remove weep return rings (#25) from the plungers (#16). Remove the seal case (#20) from either crankcases (#1) or manifold (#26) by using a screwdriver as shown above.

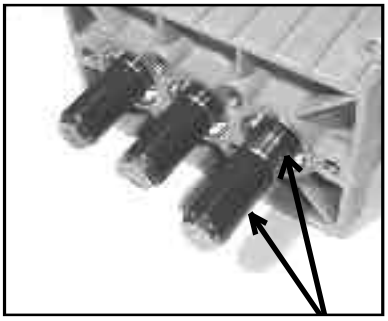
9. Remove the pressure rings (#24) and grooved seals (#23) from the valve casing (#26). Inspect parts for wear and replace if necessary.
For P318 only, the spacers (#23A) can now be removed.

10. Remove the weep grooved seals (23A for all pumps except P318 & #23 for P318 only) from the seal case (#20). For P316, P317, & P319 pumps only, remove the pressure rings (#24).

11. Inspect o-rings (#21 and 22) and replace as necessary.

12. On P313, P314, P316, P317, & P319 pumps, use a flat screw driver to pry the oil seals (#19) loose from the seal
case (#20) .

For P318 Pumps
Note: Occasionally, this procedure can be carried out for P318 pumps. However, for P318 pumps which have the oil seals that remain in the crankcase, use a 6mm allen wrench to first loosen and remove the tension screw (#16C) from the plunger pipes (#16B). Use a flat screwdriver to pry the oil



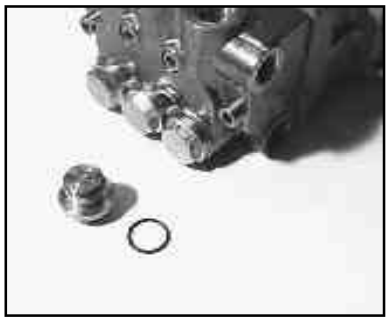
seals loose from the crankcase (#1).

13. Check surfaces of the plunger bases and plunger pipes (#16B). A damaged surface will cause accelerated wear on the seals. Deposits of any kind must be carefully removed from the plunger surface. A damaged plunger must be replaced!

13A. P318 Only! Clean the old sealant from the threads of the tension screw and the plunger base (16A). Place plunger pipes over plunger base and secure with tension screw to 220 in-lbs.

Reassembly sequence of the P300 Series pump

14. If the oil seals (#19) were removed, replace them with the primary seal lip (grooved side) towards the crankcase and the dust lip (tapered end) towards the valve casing (#26). Lubricate the seal before replacing. Install the oil scraper (#18) over the plunger.



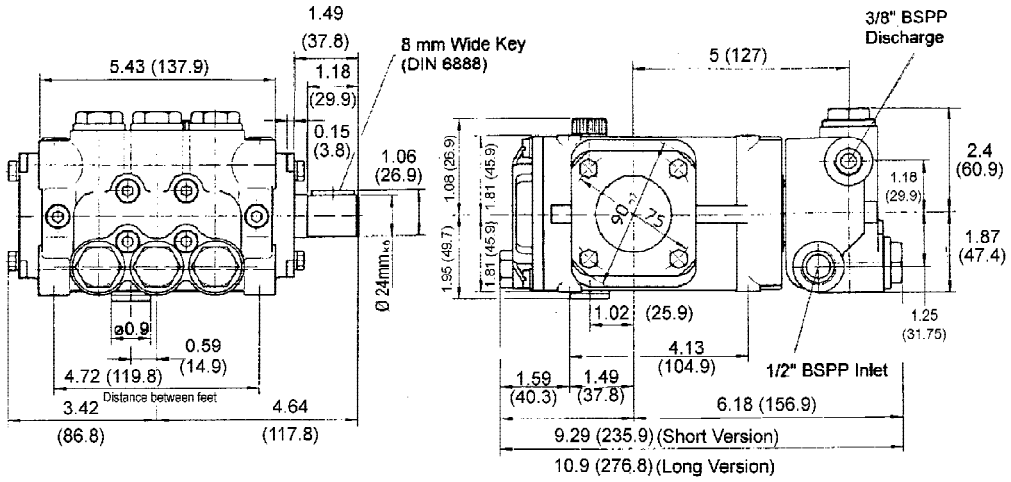
15. Place each seal case (#20) with o-rings (#'s 21 and 22) over the plungers (#16). Be certain the oil seal is centered with the seal case and tap firmly until the seal case is seated squarely on the crankcase (#1).For P316, P317 & P319 pumps, place pressure ring (#24) in seal case).

16. With the grooved side pointed toward the valve casing, place the weep grooved seals (23A for all pumps except P318 & #23 for P318 only) over each plunger and into each seal case (#20).

17. For P318 only, place the spacer (#23A) (#23B) into the valve casing (#26). For all pumps, generously lubricate the grooved seals (#23) and assemble these items into the valve casing. Place the weep return rings (#25) onto each plunger (#16). Place the pressure rings (#24) over the plungers. Slide the valve casing over the plungers and seat firmly. Replace the 6 hex head cap screws (#34) and tighten to 216 in.-lbs. in a crossing pattern.

Contact Giant Industries or you local distributor for maintenance of the gear end of your pump. Phone: 419/531-4600

P300 SERIES DIMENSIONS - INCHES (mm)



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 self-serve 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.

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GIANT INDUSTRIES, INC., 900 N. Westwood Ave., P.O. Box 3187, Toledo, Ohio 43607
PHONE (419) 531-4600, FAX (419) 531-6836, www.giantpumps.com