

Models

SP100W/SP100HK

SP200W/SP351W

Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service
Manual



GIANT
Performance Under Pressure

Updated 03/18

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Installation Instructions

Operation and Maintenance

Check oil level prior to starting and ensure trouble-free water supply. Oil: Use only 23.7 ounces (0.7 liters) of Giant's part number 01154 or ISO VG 220 GL4 (e.g. Aral Degol BG220) or SAE 90 GL4 gear oil.

Initial change after 50 operating hours and then every 500 operating hours, after 6 months operation in any case.

Caution! When operating in damp places or with high temperature fluctuations, oil must be changed immediately, should condensate (frothy oil) occur in the gear box.

Keep NPSH under control.

Maximum input pressure 145 PSI (10 bar)
Maximum suction head -4.35 PSI (-0.3 bar).

Safety Rules

Pump operation without safety valve as well as any excess in temperature or speed automatically voids the warranty. The safety valve must be regulated in accordance with the guidelines for liquid spraying units so that the admissible operating pressure can not be exceeded by more than 10%.

When the pump is in operation, the open shaft end must be covered up by shaft protector (17), the driven shaft side and coupling by a contact protector.

Pressure in discharge line and in pump must be at zero before any maintenance to the pump takes place. Close up suction line. Disconnect fuses to ensure that the driving motor does not get switched on accidentally.

Make sure that all parts on the pressure side of the unit are vented and refilled, with pressure at zero, before starting the pump.

In order to prevent air, or an air/water-mixture being absorbed and to prevent cavitation occurring, the pump-NPSHR, positive suction head and water temperature must be kept under control.

Cavitation and/or compression of gases lead to uncontrollable pressure-kicks which can ruin pump and unit parts and also be dangerous to the operator or anyone standing nearby.

Giant Plunger Pumps are suitable for pumping clean water and other non-aggressive or abrasive media with a specific weight similar to water.

Before pumping other liquids - especially flammable, explosive and toxic media - the pump manufacturer must, under all circumstances, be consulted with regard to the resistance of the pump material. It is the responsibility of the equipment manufacturer and/or operator to ensure that all pertinent safety regulations are adhered to.

SP100W/SP100HK/SP200W/SP351W - Specifications

U.S Measurements

	Max. Flow	Maximum Pressure	Max. Speed	Power Required	Max Temp	Plunger Diameter	Stroke
Model	GPM	PSI	RPM	HP	°F	in	in
SP100W	11.2	1885	1420	14.6	160	1.02	0.79
SP100HK	11.2	1885	1420	14.6	195	1.02	0.79
SP200W	9.6	2175	1420	14.4	160	0.94	0.79
SP351W	6.7	3190	1420	14.7	160	0.79	0.79

Metric Measurements

	Max. Flow	Maximum Pressure	Max. Speed	Power Required	Max Temp	Plunger Diameter	Stroke
Model	L/min	bar	RPM	kW	°C	mm	mm
SP100W	42.5	130	1420	10.9	70	26	20
SP100HK	42.5	130	1420	10.9	90	26	20
SP200W	36.2	150	1420	10.7	70	24	20
SP351W	25.2	220	1420	11.0	70	20	20

Consult the factory for special requirements that must be met if the pump is to operate beyond one or more of the limits specified above.

PULLEY INFORMATION

Pulley selection and pump speed are based on a 1725 RPM motor and “B” section belts. When selecting desired GPM, allow for a ±5% tolerance on pumps output due to variations in pulleys, belts and motors among manufacturers.

1. Select GPM required, then select appropriate motor and pump pulley from the same line.
2. The desired pressure is achieved by selecting the correct nozzle size that corresponds with the pump GPM.

HORSEPOWER INFORMATION

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

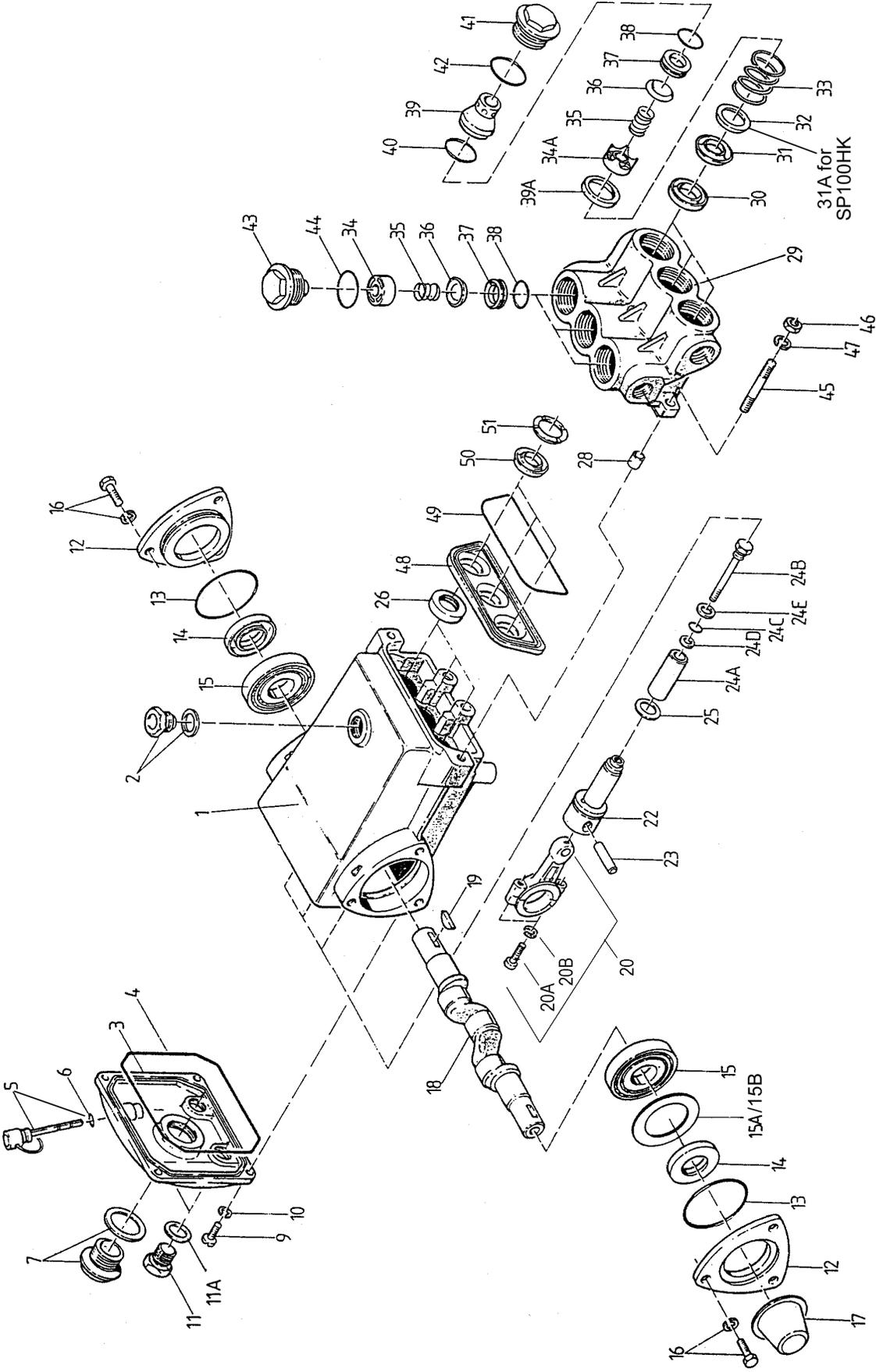
We recommend that a 1.1 service factor be specified when selecting an electric motor as the power source. To compute specific pump horsepower requirements, use the following formula:

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

Common Specifications:

Crankcase Oil Capacity23.7 fl. oz. (0.7 L)
 Inlet Ports(2) 3/4”
 Discharge Ports(2) 3/4”
 Crankshaft MountingEither Side
 Shaft Rotation.....Top of Pulley Toward Fluid End
 Weight41.9 lbs. (19 kg)

SP100W/SP100HK/SP200W/SP351W - Exploded View



SP100W/SP100HK/SP200W/SP351W 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	31	06083	V-Sleeve, SP200W	3
2	06968	Oil Filler Cap with Gasket	1	31	07322	V-Sleeve, SP351W	3
3	07297	Cover, Crankcase	1	31A	11503	V-Sleeve, SP100HK	3
4	07298	O-Ring, Crankcase Cover	1	32	07337	Support Ring, SP100W	3
5	07299	Oil Dipstick Assembly	1	32	13367	Support Ring, SP200W	3
6	01009	O-Ring, Dip Stick	1	32	07270	Support Ring, SP351W	3
7	07186	Oil Sight Glass Assembly	1	33	07338	Pressure Spring,	
9	01010	Screw, Crankcase Cover	4			SP100W(HK)/SP200W	3
10	01011-0400	Spring Washer, Cover Screw	4	33	07275	Pressure Spring, SP351W	3
11	07109	Oil Drain Plug	2	34	07325	Spring Retainer, Discharge	3
11A	06015	O-Ring	2	34A	07326-0100	Spring Retainer, Inlet	3
12	07302	Bearing Cover	2	35	07312-0100	Valve Spring	6
13	07303	O-Ring, Bearing Cover	2	36	07327	Valve Plate	6
14	07459	Seal, Crankshaft	2	37	06014	Valve Seat	6
15	08388	Roller Bearing	2	38	06015	O-Ring, Valve Seat	6
15A	06962	Shim, 1.5mm	1-2	39	07328	Valve Retainer, Inlet,	
15B	07249**	Shim	1			SP100W(HK)/SP200W	3
16	07114	Screw & Washer, Bearing Cover	6	39	07383	Valve Retainer, Inlet, SP351W	3
17	05312	Shaft Protector	1	39A	07329	Spacer	3
18	07309	Crankshaft	1	40	12057	O-Ring, Inlet Valve Retainer	3
19	13331	Fitting Key	1	41	07331	Plug, Inlet	3
20	07310	Connecting Rod Assy.	3	42	07332	O-Ring, Inlet Plug	3
20A	07311	Inner Hexagon Screw	3	43	07213	Plug, Discharge,	
20B	07122	Spring Washer	3			SP100W(HK)/SP200W	3
22	07315	Crosshead with Plunger Base	3	43	06820	Plug, Discharge, SP351W	3
23	07314	Crosshead Pin	3	44	07214	O-Ring, Discharge Plug,	
24A	07346	Ceramic Plunger, SP100W(HK)	3			SP100W(HK)/SP200W	3
24A	13452	Ceramic Plunger, SP200W	3	44	07035	O-Ring, Discharge Plug,	
24A	07340	Ceramic Plunger, SP351W	3			SP351W	3
24B	08399	Tension Screw	3	45	07333	Stud Bolt	4
24C	07023	O-Ring	3	46	07158	Hex Nut, Stud Bolt	4
24D	07203	Support Ring	3	47	07159	Spring Washer, Stud Bolt	4
24E	07258	Copper Seal Washer	3	48	07347	Weep Return Plate, SP100W	1
25	05289	Oil Scraper	3	48	13453	Weep Return Plate, SP200W	1
26*	07318	Radial Shaft Seal	3	48	07343	Weep Return Plate, SP351W	1
28	07319	Seal Retainer	2	49	07344	O-Ring, Weep Plate	1
29	07320	Manifold, SP100W(HK)/SP200W	1	50	07336	Weep Return Seal, SP100W	3
29	07371	Manifold, SP351W	1	50	11503	Weep Return Seal, SP100HK	3
30	07335	Pressure Ring, SP100W(HK)	3	50	07688	Weep Return Seal, SP200W	3
30	13366	Pressure Ring, SP200W	3	50	06064	Weep Return Seal, SP351W	3
30	07268	Pressure Ring, SP351W	3	51	07349	Seal Support Ring, SP100W(HK)	3
31	07336	V-Sleeve, SP100W(HK)	3	51	07687	Seal Support Ring, SP200W	3
				51	07345	Seal Support Ring, SP351W	3

*Older versions have three pieces (07318, 08059 and 08060) rather than a single piece oil seal.

**May not be present.

SP100W/SP100HK/SP200W/SP351W - REPAIR KITS

Plunger Packing Repair #09077, SP100W

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
31	07336	V-Sleeve	3
40	12057	O-Ring, Inlet Valve Retainer	3
42	07332	O-Ring, Inlet Plug	3
49	07344	O-Ring, Weep Plate	1
50	07336	Weep Return Seal	3

Plunger Packing Repair #09798, SP200W

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
31	06083	V-Sleeve	3
40	12057	O-Ring, Inlet Valve Retainer	3
42	07332	O-Ring, Inlet Plug	3
49	07344	O-Ring, Weep Plate	1
50	07688	Weep Return Seal	3

Plunger Packing Repair #09076, SP351W

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
31	07322	V-Sleeve	3
40	12057	O-Ring, Inlet Valve Retainer	3
42	07332	O-Ring, Inlet Plug	3
49	07344	O-Ring, Weep Plate	1
50	06064	Weep Return Seal	3

Plunger Packing Repair Kit #09077-HK, SP100HK

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
31	07336	V-Sleeve	3
31A	11503	V-Sleeve	3
40	12057	O-Ring, Inlet Valve Retainer	3
42	07332	O-Ring, Inlet Plug	3
49	07344	O-Ring, Weep Plate	1
50	11503	V-Sleeve	3

Oil Seal Repair #09797

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
26	07318	Radial Shaft Seal	3

Complete Valve Kit #09814

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
34	07325	Discharge Spring Retainer	3
34A	07326-0100	Inlet Spring Retainer	3
35	07312-0100	Valve Spring	6
36	07327	Valve Plate	6
37	06014	Valve Seat	6
38	06015	O-Ring, Valve Seat	6
40	12057	O-Ring, Inlet Valve Retainer	3
42	07332	O-Ring, Inlet Plug	3
44	07214	O-Ring, SP100W(HK)/SP200W	3
44	07035	O-Ring, SP351W	3

Inlet Valve Kit #09069

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
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 #09068

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
34	07325-0100	Discharge 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
44	07214	O-Ring, SP100W(HK)/SP200W	3
44	07035	O-Ring, SP351W	3

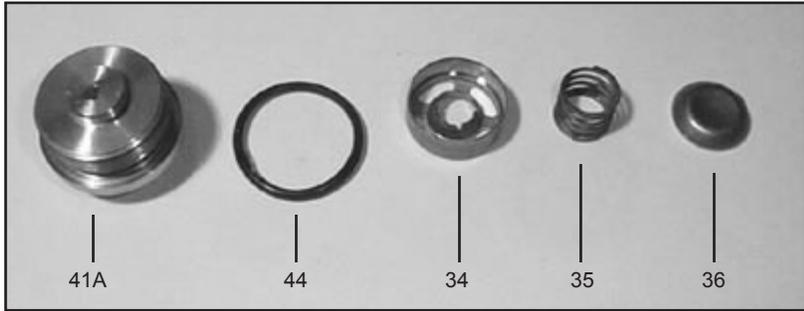
SP100W/SP100HK/SP200W/SP351W TORQUE SPECIFICATIONS

<u>Position</u>	<u>Part#</u>	<u>Description</u>	<u>Torque Amount</u>
7	07186	Oil Sight Glass Assembly (Loctite 5910)	106 in.-lbs. (12 Nm)
9	01010	Screw	221 in.-lbs. (25 Nm)
11	07109	Oil Drain Plug	29 ft.-lbs. (40 Nm)
16	07114	Screw and Washer	132 in.-lbs. (15 Nm)
20A	07311	Inner Hexagon Screw	22 ft.-lbs. (30 Nm)
24B	08399	Tension Screw, SP100(HK)/SP200W (Loctite 243)	247 in.-lbs. (28 Nm)
26	07318	Radial Shaft Seal (Loctite 403)	
41/43	07331/07213	Plug, Inlet and Discharge, SP100W(HK)/SP200W	51 ft.-lbs. (70 Nm)
41/43	07331/06800	Plug, Inlet and Discharge, SP351W	59 ft.-lbs. (80 Nm)
45	07333	Stud Bolt (Loctite 270)	
46	07158	Nut, Stud Bolt	200 in.-lbs. (22.5 Nm)

REPAIR INSTRUCTION - SP100W/SP100HK/SP200W/SP351W PUMPS



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.



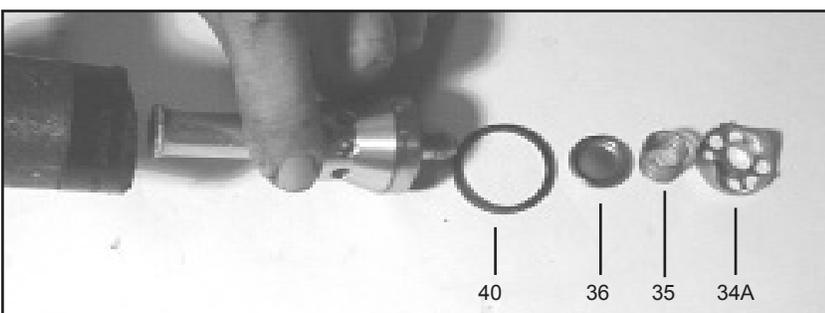
4. Drain the oil from the pump. Turn the pump over to remove the four manifold stud nuts (46) with a 19mm wrench.



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



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

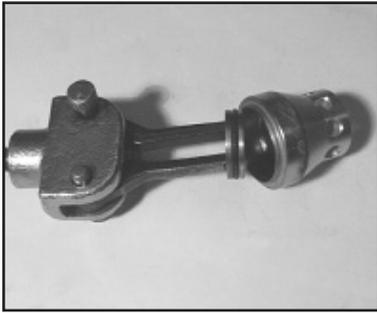


7. Remove the o-ring, (40), valve plate (36), valve spring (35), spring retainer (34A). Check valve retainer o-ring (40) for wear.

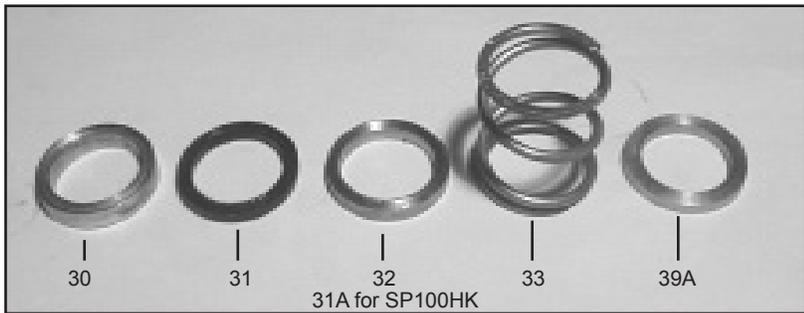
7A. Reassembly valve assemblies and install into manifold (29). Tighten plugs to 51 ft.-lbs. (70 Nm) for SP100W(HK)/SP200W or 59 ft.-lbs. (80 Nm) for SP351W.

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

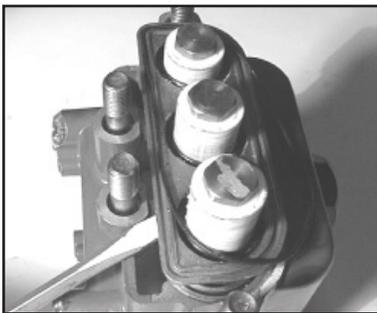
REPAIR INSTRUCTION - SP100W/SP100HK/SP200W/SP351W PUMPS



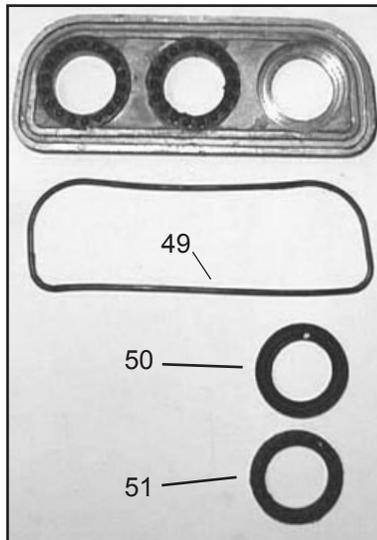
8. With a valve puller remove the valve seat (37) and o-ring (38) replace if worn. If excessive pitting is seen, replace the worn parts. Check valve seat o-ring (38) for wear and replace as necessary.



9. Remove the spacer (39A), pressure spring (33), support ring (32 or 31A for SP100HK), v-sleeve (31), and pressure ring (30), from the manifold (29) and check for wear.



10. With a flat headed screwdriver remove the weep return plate (48). Remove the o-ring (49) and check for wear.

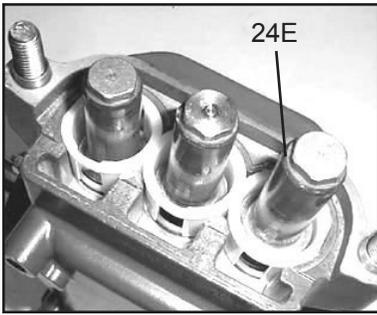


11. Inspect seals (50), seal support ring (51) and O-ring (49) and replace as necessary.

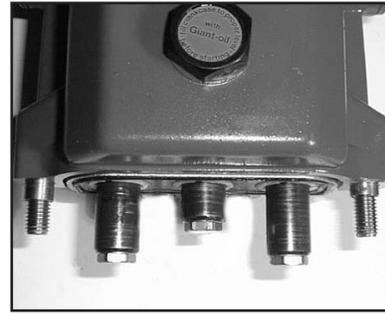


12. Inspect ceramic plunger (24A) tips for wear. If necessary, replacement of the ceramic plungers may be accomplished by removing the plunger bolt assemblies (24) with a 13mm wrench. Ceramic plungers should now slide off the stainless steel plunger base (22). Excessive resistance to plunger removal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

REPAIR INSTRUCTION - SP100W/SP100HK/SP200W/SP351W PUMPS



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



13. 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. (35 Nm) for SP100W(HK)/SP200W and 265 in.-lbs. (30 Nm) for SP351W.

15. Before replacing pump manifold (29), first rotate crankshaft (18) until two outside plungers (24A) extend evenly forward. Next lubricate v-sleeves (50) in the rear v-sleeve housing (48) and slide housing over plungers. 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. (80 Nm).

Gear End Disassembly

16. Remove the crankcase cover screws (9). Inspect the crankcase cover o-ring (4) for wear. Replace if necessary.
17. Inspect the dipstick (5) vent hole for signs of clogging. Clean if necessary.
18. To remove the crankshaft (18), first remove the bearing cover plates (12). Remove the key (19).
19. With a 5 mm allen wrench remove the connecting rod screws (21) 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.
20. 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).
21. 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.**
22. 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.
23. 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.
24. 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.

REPAIR INSTRUCTION - SP100W/SP100HK/SP200W/SP351W PUMPS

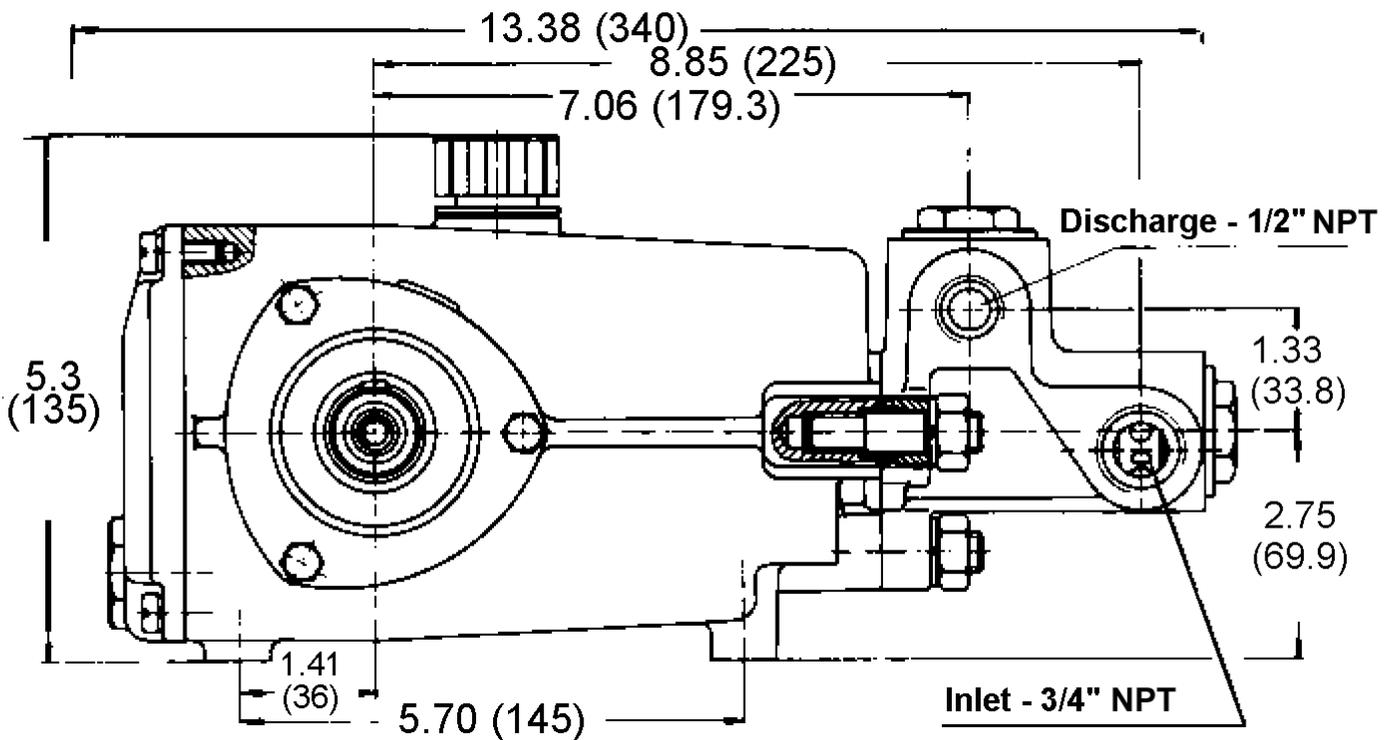
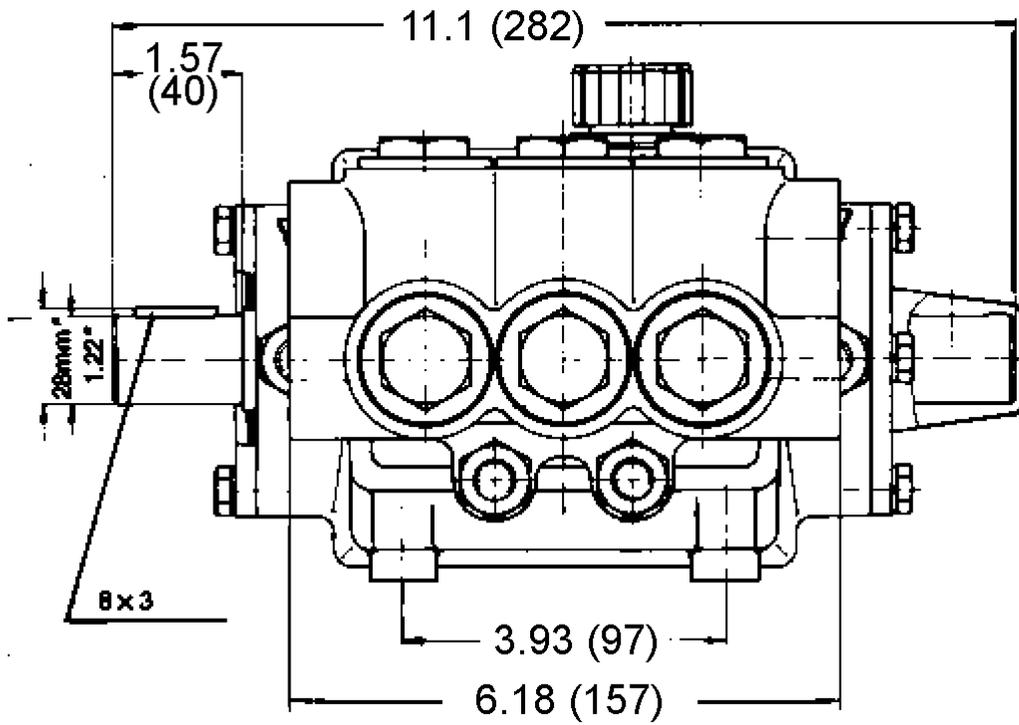
25. To reassemble, place the far bearing (15) in the crankcase (1) bearing housing and with the Giant Bearing tool as a driver, tap into the crankcase using a rubber mallet.
 26. Insert the far side crankshaft oil seal (14) with the Giant Bearing Tool making sure it is firmly seated and well oiled. Always 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.
 27. 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).**
 28. 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.**
 29. 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.
 30. 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. (35 Nm).
 31. 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 steps 7A-15 above for re-installing fluid end onto the gear end.**
32. Fill the crankcase (1) with 24 oz. (0.7 liters) 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.

Preventative Maintenance Check List & Recommended Spare Parts List						
Check	Daily	Weekly	50 Hrs.	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 01154			X	X		
Plunger Packing Kit (1 kit/pump) See page 7 for kit list					X	
Valve Assembly Kit (1 kit/pump) See page 7 for kit list						X
Oil Seal Kit (1 kit/pump) See page 7 for kit list						X

Pump Mounting Selection Guide

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

SP100W/SP100HK/SP200W/SP351W - 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-service 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.

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