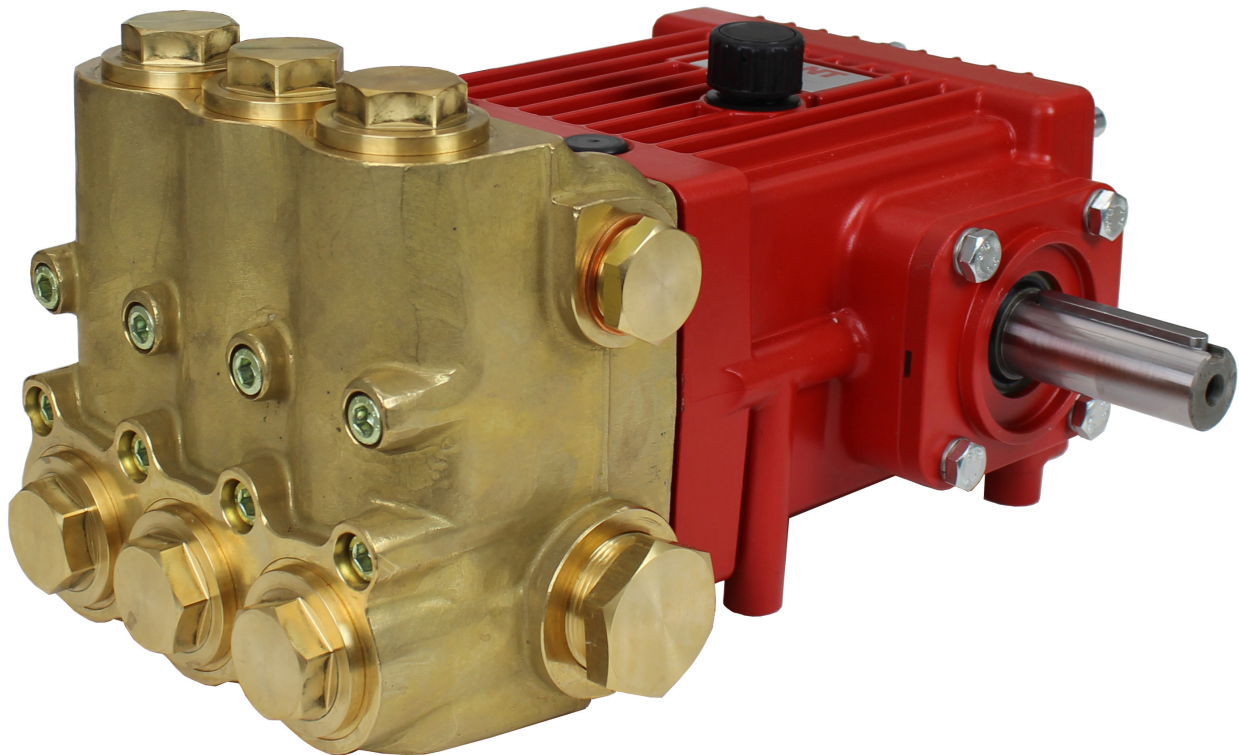


Models P540 and P541

Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service Manual



GIANT
Performance Under Pressure

Updated 05/23

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Performance - P540 and P541

1. Performance

	U.S.	(Metric)
Maximum Volume	35.4 GPM	(134 LPM)
Maximum Discharge Pressure	1450 PSI	(100 bar)
Speed		1450 RPM
Power Required	35.3 HP	26.3 kW
Inlet Pressure	-4.35 to 145 PSI	-0.3 to 10 bar
Plunger Diameter	1.57"	40 mm
Crankshft Stroke	1.02"	26 mm
Crankshaft Diameter		30 mm
Crankshaft Mounting		Either side
Shaft Rotation		Top of pulley towards manifold
Temperature of Pumped Fluids	Up to 104 °F	(40 °C)
Inlet Ports		(2) 1-1/2" BSP
Discharge Ports		(2) 1" BSP
Weight (P540)	91.5 lbs.	(41.5 kg)
Weight (P451)	84.9 lbs.	(38.5 kg)
Crankcase Oil Capacity	54.1 fl. oz.	(1.6 liter)
Fluid End Material (P540)		Forged Brass
Fluid End Material (P541)		Nickel-Plated Spheroidal Cast Iron
NPSHR	26.9 ft. of head	8.2 mWs
Plungers		Solid Ceramic Oxide
Valves		Stainless Steel
Seals		Nitrile with Fabric Reinforcing
Gear End		Die-Cast Aluminum

1.2 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.

Performance data for intermittent operation, data for continuous operation on request.

For information on intermittent operation and calculating of the performance data, see the Giant Pumps assembly instructions.

NPSHR / Inlet pressure

Required NPSH refers to water at 60 °F (20 °C) at max. permissible pump speed.

Maximum inlet pressure: 29 PSI (2 bar)

Level of noise emission

Emission sound pressure level: ≤ 85 dB(A)

Installation - P540 and P541

1.3 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:

$$(\text{GPM} \times \text{PSI}) / 1450 = \text{HP}$$

P540 and P541 Horsepower Requirements						
RPM	GPM	500 PSI	750 PSI	1000 PSI	1250 PSI	1450 PSI
725	17.7	6.1	9.2	12.2	15.3	17.7
800	19.5	6.7	10.1	13.5	16.8	19.5
900	22.0	7.6	11.4	15.2	19.0	22.0
1000	24.4	8.4	12.6	16.8	21.0	24.4
1200	29.3	10.1	15.2	20.2	25.3	29.3
1450	35.4	12.2	18.3	24.4	30.5	35.4

2. Fields of application

The fields of application of these pump types correspond to the specifications in the assembly instructions Giant Pumps.

3. Ambient conditions

Ambient temperature: $41\text{ }^{\circ}\text{F} < T_{\text{Amb.}} < 86\text{ }^{\circ}\text{F}$
Ambient temperature: $5\text{ }^{\circ}\text{C} < T_{\text{Amb.}} < 30\text{ }^{\circ}\text{C}$

4. Oil filling

- Filling quantity: **0.42 gallons (1.6 l)**
- Quality: Industrial gear oil **ISO VG 220** or automotive gear oil **SAE 90 GL4 (Giant's p/n 01154)**
Intervals: first oil change after **50 operating hours** then every **500 operating hours**, but at the latest after **12 months**

5. Installation/ Putting into Operation

5.1 Direction of pump rotation

When looking at crankshaft with valve casing mounted on left-hand side, counterclockwise direction of rotation.

When looking at crankshaft with valve casing mounted on right-hand side, clockwise direction of rotation.

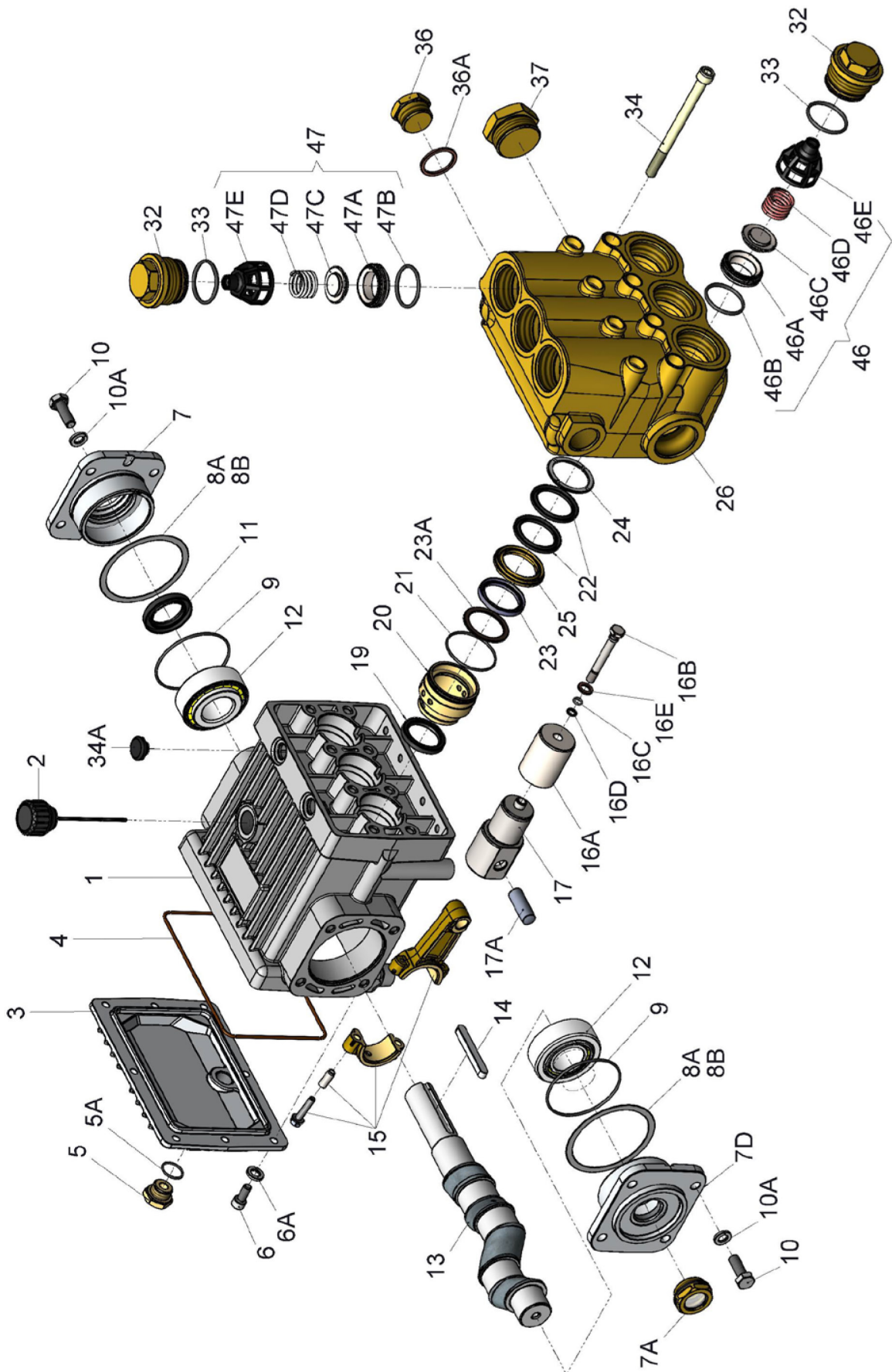
5.2 Suction line filter

Recommended mesh size 150 μm .

6. Operation

For informations, see assembly instructions Giant Pumps.

EXPLODED VIEW - P540 and P541



SPARE PARTS LIST - P540 and P541

<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	04405	Crankcase	1	21	06560	O-Ring	3
2	04234	Oil Dipstick Assembly	1	22	05308	Sleeve	6
3	04406	Crankcase Cover	1	23	04430	Grooved Ring	3
4	04407	O-Ring	1	23A	04431	Scraper	3
5	07109	Oil Drain Plug	1	24	04432	Sleeve Support Ring	3
5A	06015	Gasket for Oil Drain Plug	1	25	04433	Drip Return Ring	3
6	01010	Screw	4	26	04434	Valve Casing (P540)	1
6A	01011-0400	Spring Washer	4	26	04458	Valve Casing (P541)	1
7	04408	Bearing Cover	1	32	04435	Plug	6
7A	05943	Oil Sight Glass	1	33	12055	O-Ring	6
7D	03545	Bearing Cover	1	34	06494	Cap Screw	8
8A	04409	Shim	1-3	34A	04417	Cap	2
8B	04410	Shim	1	36	12249	Plug, 1" BSP	1
9	04411	O-Ring	2	36A	13372-0300	Copper Ring	1
10	13133	Screw with Washer	8	37	04436	Plug, 1-1/2" BSP	1
10A	06725	Spring Washer	8	46	04437	Inlet Valve Assembly	3
11	04238	Radial Shaft Seal	1	46A	13304	Valve Seat	3
12	04239	Tapered Roller Bearing	2	46B	12055	O-Ring	3
13	04425	Crankshaft	1	46C	13306	Valve Plate	3
14	04241	Fitting Key	1	46D	13307	Inlet Valve Spring	3
15	04242	Connecting Rod Assembly	3	46E	13308	Spring Tension Cap	3
16A	03542	Plunger Pipe	3	47	04438	Discharge Valve Assembly	3
16B	04865	Tension Screw	3	47A	13304	Valve Seat	3
16C	07023	O-Ring	3	47B	12055	O-Ring	3
16D	07203	Support Ring	3	47C	13306	Valve Plate	3
16E	07258	Steel Washer	3	47D	04439	Discharge Valve Spring	3
17	04412	Crosshead w/Plunger Base	3	47E	13308	Spring Tension Cap	3
17A	07124	Crosshead Pin	3		04400	Gear Assy. (1-19, 34)	
19	07624	Radial Shaft Seal	3		04441	Manifold Assy. (20-47 w/out 34)	
20	03533	Seal Retainer	3		04442	Manifold Assy. (20-47 w/out 34)	

REPAIR KITS - P540 and P541

Plunger Packing Kit - #09776

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
21	06560	O-Ring	3
22	05308	Sleeve	6
23	04430	Grooved Seal	3
23A	04431	Scraper	3

Inlet Valve Assembly Kit - #09777

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
33	12055	O-Ring	3
46	04437	Inlet Valve Assembly	3

Discharge Valve Assembly Kit - #09778

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
33	12055	O-Ring	3
47	04438	Valve Assembly	3

Oil Seal Kit - #09755

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
19	07624	Radial Shaft Seal	3

REPAIR INSTRUCTIONS - P540 and P541

8. Maintenance and Servicing

For the type of threadlocker used and the required tightening torques, observe the table in the exploded view.

8.1 Special tools required

The following special tools are required for assembly:
- Pull-out tool size 2 (Ø20mm)

8.2 Suction and Discharge Valves

Screw out plugs (32) with a socket wrench.
Remove the exposed spring tension cap (46E or 47E) from the valve seat by pushing it sideways using a screwdriver.
Remove spring tension cap, valve spring (46D or 47D) and valve plate (46C or 47C).
Pull out valve seat (46A or 47A) with a size 2 (Ø20mm) extractor tool.
Examine valve components for wear and damage.
Check O-rings. Replace worn parts.
New O-rings slightly coated with oil should be preferably used.
Tighten the plugs (32) to the required torque.
Take care to reassemble in correct sequence.

8.3 Seals and Plunger pipe

Loosen screws (34) and remove valve casing (26) by pulling it off over the plungers.
Remove seal adaptors (20) out of the valve casing (26) or crankcase (1).
Examine O-rings (21), grooved rings (23) and scraper (23A).
Remove drip return rings (25), V-sleeves (22) and support rings (24) from the valve casing.
Check that the bores in the leakage rings and the corresponding bores in the valve casing are free of obstruction.
When replace, wet new seals and O-rings thinly with silicone grease or mineral oil and insert carefully.
Take care to reassemble in correct sequence.
Check plunger surfaces (16A).
Damaged surfaces cause hard wear on seals.
Lime deposits or similar on the plunger must be carefully removed using a sharp knife.



Plunger surface must not be damaged in the process.

If plunger pipe (16A) is worn, remove tensioning screw (16B) with the plunger.

Examine and clean the crosshead mounting surface (17).

Check and mount the new plunger pipe.

Cover thread of tension screw (16B) with a thin coat of thread locker and tighten carefully to the required torque.



Under no circumstances should thread-locker get between the plunger pipe (16B) and the centering neck on the plunger (17) resp. centering sleeve (16F).

Tensioning of the plunger pipe due to eccentric tightening of the tensioning screw or due to dirt or damage to the contact surface can lead to breakage of the plunger pipe.

When reassembling, insert scraper (23A) and grooved ring (23) into seal retainer (20).

Carefully push the whole unit onto the ceramic plunger (if necessary use the drip return ring to hold the grooved ring in its seal retainer) and push it down into its crankcase fitting.

Slide on drip return ring (25) with its V-profile facing upwards.

Put sleeve support ring (24) into the valve casing.

Tilt V-sleeve (22) into its fitting.

Then carefully press it level using the flat side of a screwdriver.



Be careful not to scratch the valve casing!

Carefully push the whole pump head over the ceramic plungers and against the crankcase.

When assembling, tighten the screws (34) evenly and crosswise to the required torque.

If required, supplementary assembly instructions can be requested from the manufacturer Giant Industries, Inc.

TORQUE SPECIFICATIONS - P540 and P540

Position	Item #	Description	Thread	Lubrication Info	Torque Amount
5	07109	Oil Drain Plug	1/2" BSP		59 ft.-lbs. (80 Nm)
6	01010	Screw	M8		110 in.-lbs. (12.5 Nm)
7A	05943	Oil Sight Glass	1" BSP	Loctite 572	22 ft.-lbs. (40 Nm)
10	13113	Screw with Washer	M10		132 in.-lbs. (15 Nm)
15	04242	Connecting Rod Assembly	M6		97 in.-lbs. (11 Nm)
16B	04865	Tension Screw	M8	Loctite 243	247 in.-lbs. (28 Nm)
32	04435	Plug	M48 x 1.5		106 ft.-lbs. (145 Nm)
34	06494	Cap Screw	M10		22 ft.-lbs. (40 Nm)

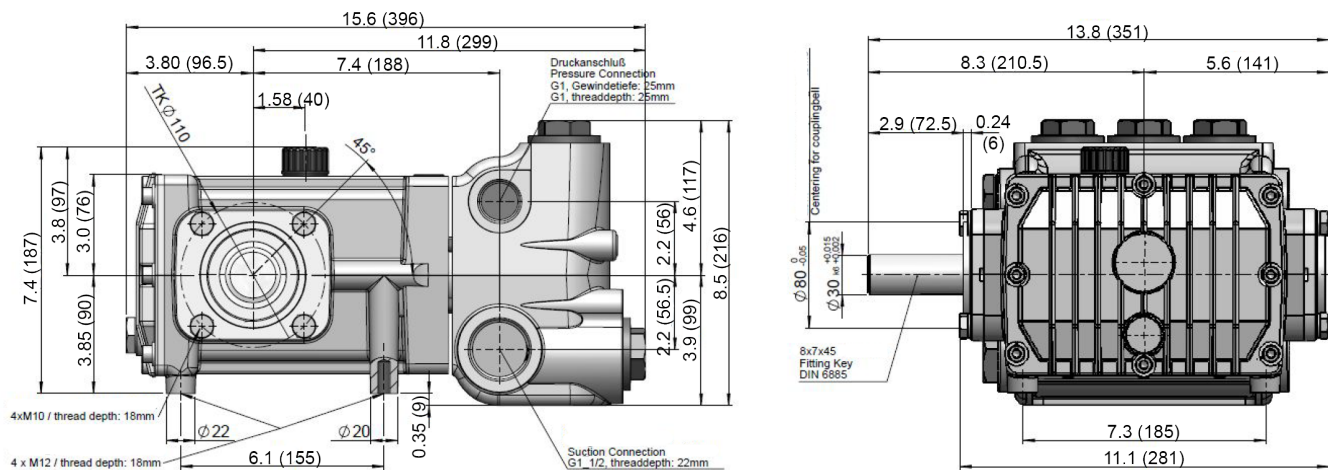
PUMP SYSTEM MALFUNCTION

MALFUNCTION	CAUSE	REMEDY
The Pressure and/ or the Delivery Drops	Worn packing seals Broken valve spring Belt slippage Worn or Damaged nozzle Fouled discharge valve Fouled inlet strainer Worn or Damaged hose Worn or Plugged relief valve on pump Cavitation pump for restrictions Unloader	Replace packing seals Replace spring Tighten or Replace belt Replace nozzle Clean valve assembly Clean strainer Repair/Replace hose Clean, Reset, and Replace worn parts Check suction lines on inlet of 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	Re-size 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	Giant oil is recommended 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 (54 ounces) p/n 1154			X	X		
Seal Spare Parts (1 kit/pump) (See page 5 for kit list)					X	
Oil Seal Kit (1 kit/pump) (See page 5 for kit list)					X	
Valve Spare Parts (1 kit/pump) (See page 5 for kit list)						X

DIMENSIONS - P540 and P541 - 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. Five (5) years from the date of shipment for all pumps used in portable pressure washers with NON-SALINE, clean water applications.
2. Two (2) years from the date of shipment for Giant pumps used in car wash applications.
3. One (1) year from the date of shipment for all other Giant industrial and consumer pumps.
4. Six (6) months from the date of shipment for all rebuilt pumps
5. 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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WARNING: This product might contain a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.gov

GIANT
Performance Under Pressure

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