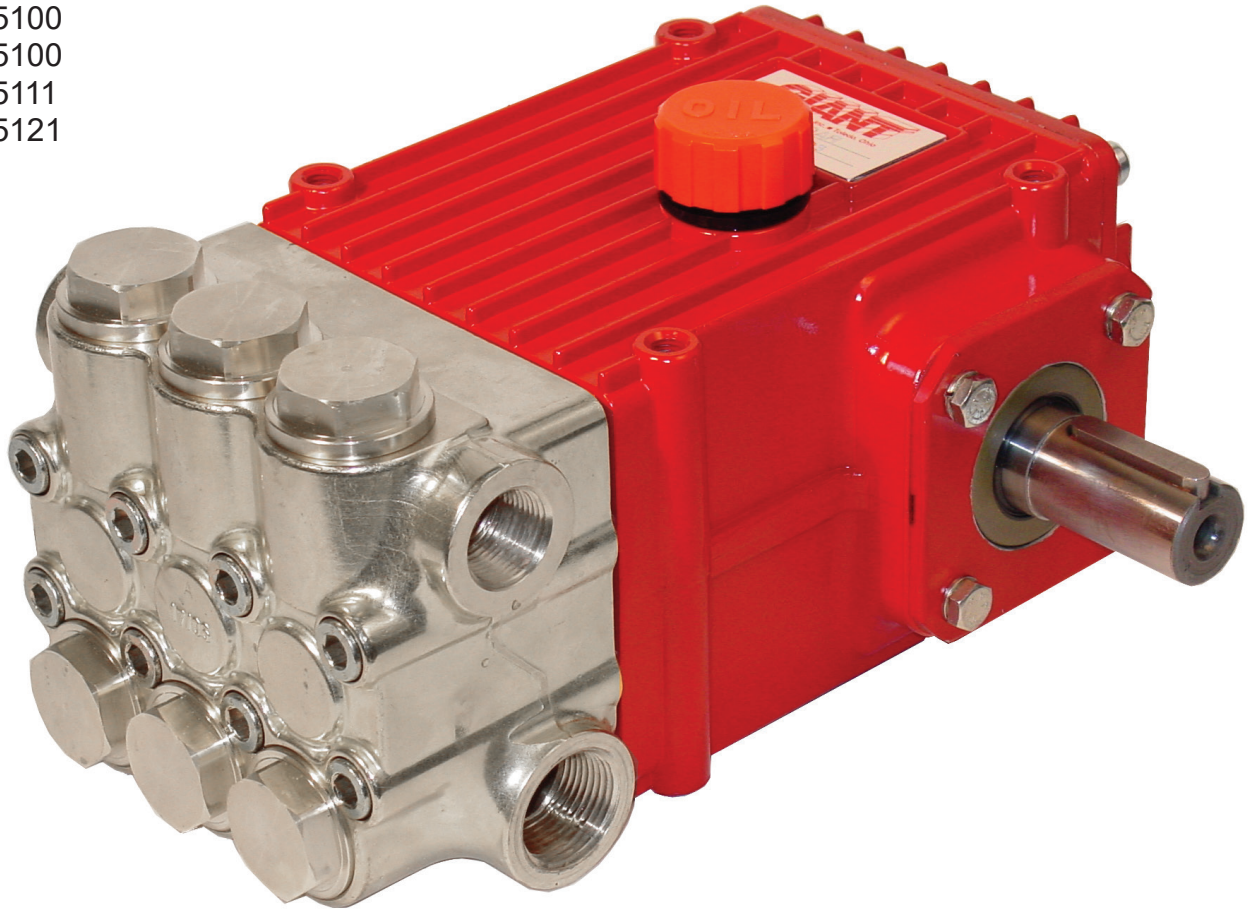


P400-5100 Series 22mm & 25mm Versions

Triplex Ceramic
Plunger Pump
Operating Instructions/
Repair and Service Manual

316 Stainless Steel
Corrosion Resistant Pumps

Models: -5100 = Standard Seals
P420A-5100 -5111 = Viton Seals/Viton O-Rings
P420A-5111 -5121 = Teflon Seals/Viton O-Rings
P420A-5121
P422-5100
P423-5100
P425-5100
P425-5111
P425-5121



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Updated 07/23

P400-5100 Series Pumps

1. Performance

U.S. Measurements

	Max. Flow	Pressure	Max. Speed	Power Req'd.	Plunger Diameter	Stroke	NPSHR
Model	GPM	PSI	RPM	BHP	In.	In.	ft. of head
P423-5100	8.2	3000	1450	16.4	0.87	0.79	21.0
P422-5100	9.9	2600	1450	17.7	0.87	0.94	22.3
P425-5100	10.7	2500	1450	18.1	0.98	0.79	26.2
P420A-5100	12.8	2200	1450	19.2	0.98	0.94	30.5

Metric Measurements

	Max. Flow	Pressure	Max. Speed	Power Req'd.	Plunger Diameter	Stroke	NPSHR
Model	LPM	Bar	RPM	kW	mm	mm	mWs
P423-5100	31.1	200	1450	12.2	22	20	6.4
P422-5100	37.3	180	1450	13.2	22	24	6.8
P425-5100	40.4	170	1450	13.5	25	20	8.0
P420A-5100	48.4	150	1450	14.3	25	24	9.3

Common Specifications

	U.S.	(Metric)
Inlet Pressure	145 PSI.....	(10 bar)
Temperature of Pumped Fluids	Up to 160 °F	(70 °C)
Inlet Ports		2 x 1" BSP
Discharge Ports		2 x 3/4" BSP
Shaft Rotation		Top of pulley towards manifold
Crankshaft Diameter		(28 mm)
Key Width.....		(8 mm)
Shaft Mounting.....		Either side (specify when ordering)
Weight.....	38.3 lbs	(17.4 kg)
Crankcase Capacity.....	30.4 fl.oz.	(0.9 liters)

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: ≤ 88 dB(A)

SPECIAL NOTE:

P420-5100:

The theoretical gallons per revolution (gal/rev) is 0.00883. To find specific outputs at various RPM, use the formula: $GPM = 0.00883 \times RPM$

P422-5100:

The theoretical gallons per revolution (gal/rev) is 0.00679. To find specific outputs at various RPM, use the formula: $GPM = 0.00679 \times RPM$

P423-5100:

The theoretical gallons per revolution (gal/rev) is 0.00455. To find specific outputs at various RPM, use the formula: $GPM = 0.00566 \times RPM$

P425-5100:

The theoretical gallons per revolution (gal/rev) is 0.00738. To find specific outputs at various RPM, use the formula: $GPM = 0.00738 \times RPM$

P400-5100 Series Pumps

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:

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

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: **30.4 fl. oz. (0.9 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 To Turn Drive Shaft to the Other Side

Remove the valve casing.

Turn the seal adaptors (20) by 180° also so that the leakage holes are underneath.

Remount valve casing rotated by 180°.

Interchange plug (5B) and oil dipstick (2) with each other.

Turn crankcase cover (3) by 180°.

5.2 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.

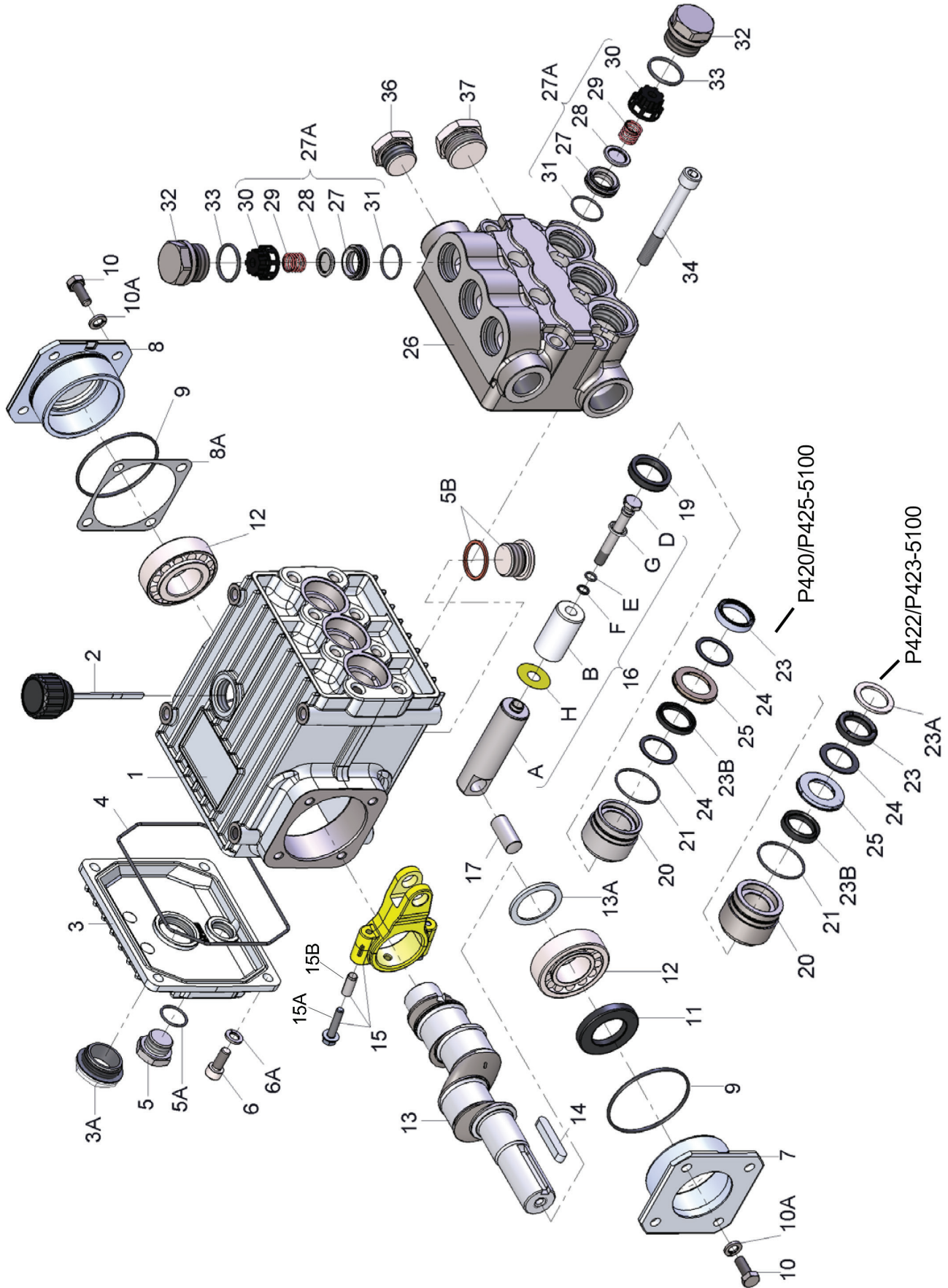
5.3 Suction line filter

Recommended mesh size 150 µm.

6. Operation

For information, see assembly instructions Giant Pumps.

EXPLODED VIEW - P400-5100 Series - 22mm & 25mm



P420A-5100 / P422-5100 / P423-5100 and P425-5100 SPARE PARTS LIST

A = P420A-5100 B = P425-5100 C = P422-5100 D = P423-5100

<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	08377	Crankcase	1	16D	08399-0100	Tensioning Screw	3
2	08378	Oil Fill Plug with Gasket	1	16E	07023-0001	O-Ring, Viton	3
3	06479	Crankcase cover	1	16F	07203	Backup Ring	3
3A	07186	Oil Sight Glass w/ Gasket	1	16G	07161-0100	Seal Ring	3
4	08380	O-Ring	1	16H	06431	Flinger	3
5	07109-0400	Oil Drain Plug	1	17	06790	Crosshead Pin	3
5A	06015	O-Ring	1	19	05444	Oil Seal	3
5B	08092-0100	Plug with Gasket	1	20	05443-0100	Seal Case (A and B)	3
6	08093	Screw	4	20	05592-0100	Seal Case (C and D)	3
6A	01011-0400	Spring Washer	4	21	07266	O-Ring	3
7	04739	Bearing Cover, Open	1	23	12254	V-Sleeve, 25mm (A and B)	3
8	05291	Bearing Cover, Closed	1	23	06249	V-Sleeve with Support Ring, 22mm (C and D)	3
8A	05292	Shim	1-6	23A	06251-0100	Spacer Ring (C and D)	3
9	01016	O-Ring	2	23B	12255	Weep Seal (A and B)	3
10	07114-0100	Screw with Washer	8	23B	13390	Weep Seal (C and D)	3
10A	01011-0400	Spring Washer	8	24	08376	Pressure Ring (A and B)	6
11	07459	Radial Shaft Seal	1	24	06252	Pressure Ring (C and D)	3
12	05350	Taper Roller Bearing	2	25	06373	Weep Return Ring (A and B)	3
13	04741	Crankshaft (A and C)	1	25	06254-0100	Weep Return Ring (C and D)	3
13	04740	Crankshaft (B and D)	1	26	06255-5000	Manifold	1
13A	04742	Spacer Ring	1	27A	08408-0100	Valve Assembly (27-31)	6
14	08091	Fitting Key	1	27	08370-0100	Valve Seat	6
15	08390	Connecting Rod Assembly	3	28	06791-0100	Valve Plate	6
15A	05349	Connecting Rod Screw	3	29	06377-0100	Valve Spring	6
15B	05348	Adapter Sleeve	3	30	08372	Valve Spring Retainer	6
16	05351-0100	Plunger Assy., 25mm, (A and B)	3	31	07212-0001	O-Ring, Viton	6
16	05353-0100	Plunger Assy., 22mm, (C and D)	3	32	08373-0600	Plug	6
		For items 16A-16H	3	33	07214	O-Ring	6
16A	08384-0600	Plunger Base	3	34	08396-0100	Hexagon Screw	8
16B	08398	Plunger Pipe, 25mm (A and B)	3	36	13150-0100	Plug, 3/4" BSP	1
16B	06247	Plunger Pipe, 22mm (C and D)	3	37	13321-0100	Plug, 1" BSP	1

P420A-5100 / P422-5100 / P423-5100 and P425-5100 Repair Kits

Plunger Packing Kits

P420-5100, P425-5100 - # 09653

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
21	07266	O-Ring	3
23	12254	V-Sleeve	3
23B	12255	Weep Seal	3
24	08376	Pressure Ring	6

P422-5100, P423-5100 - # 09654

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
21	07266	O-Ring	3
23	06249	V-Sleeve	3
23B	13390	Weep Seal	3
24	06252	Pressure Ring	3

Valve Assembly Kits

P400 Series - # 09655

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
27A	08408-0100	Valve Assembly, Complete	6
33	07214	O-Ring	6

Oil Seal Kit

P400 Series - # 09641

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
19	05444	Oil Seal	3

Optional Viton Plunger Packing Kit

P420A-5111, P425-5111 - # 09653-0011

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
21	07266-0001	O-Ring, Viton	3
23	12254-0010	V-Sleeve, Viton	3
23B	12255-0010	Weep Seal, Viton	3
24	08376	Pressure Ring	6

Optional Teflon Plunger Packing Kit

P420A-5121, P425-5121 - # 09653-0021

<u>Item</u>	<u>Part #</u>	<u>Description</u>	<u>Qty</u>
21	07266-0001	O-Ring, Viton	3
23	12254-0020	V-Sleeve, Teflon	3
23B	12255-0020	Weep Seal, Teflon	3
24	08376	Pressure Ring	6

REPAIR INSTRUCTIONS - P400-5100 Series

8. Maintenance and Servicing

For the type of threadlocker used and the required tightening torques, see table on page 7.

8.1 Special tools required

The following special tools are required for assembly:

- Fitting Sleeve - Tool-13 (22 mm), Tool-14 (25mm)
- Pull-out tool size 2 (Ø20mm)

8.2 Suction and Discharge Valves

Remove plugs (32) with a 12-point socket wrench. Check suction and discharge valves that are under the plugs by taking out the valves with a pair of flat tongs and then taking them apart. Examine valve plate (28) and valve seat (27). Check O-rings (31/33) and replace if necessary. Wet O-rings thinly with silicone grease or mineral oil and insert carefully. Tighten the plugs 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). Remove drip-return ring (25), support ring (24), v-sleeve (23) and spacer disc (23A – P422/P423) out valve casing (26). Remove v-sleeve (23B) together with support ring (24 – P420/P425) out of seal adaptor (20). Wet new seals and O-rings thinly with silicone grease or mineral oil and insert carefully. Pay attention to the installation position of the seals. Check O-rings (21) and replace if necessary.



The grooved seal (23) or respectively grooved seal pack (23) on the high-pressure side is to be fitted carefully into the valve casing (26) using a special tool - Tool-13 (22 mm) or Tool-14 (25mm).

Alternatively, the seal can also be carefully fitted into the valve casing using a screwdriver. Under no circumstances must the seal surface in the valve casing or the seal lip be damaged.

Check plunger surfaces (16). Damaged surfaces cause hard wear on seals. Lime deposits or similar on the plunger must be removed.



Plunger surface must not be damaged in the process. In the case of lime deposits in the pump, care must be taken that the drip-return bores in parts (25) and (26) ensure trouble-free drip-return.

If the plunger pipe (16B) is worn out, loosen tension screw (16D) and remove together with plunger pipe. Check and clean contact surface on plunger (16A), check oil scraper(16H), fit new plunger pipe. Cover thread of tension screw (16D) 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 centring neck on the plunger (16A). 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 assembling, tighten the screws (34) to the required torque.

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

PUMP SYSTEM MALFUNCTION

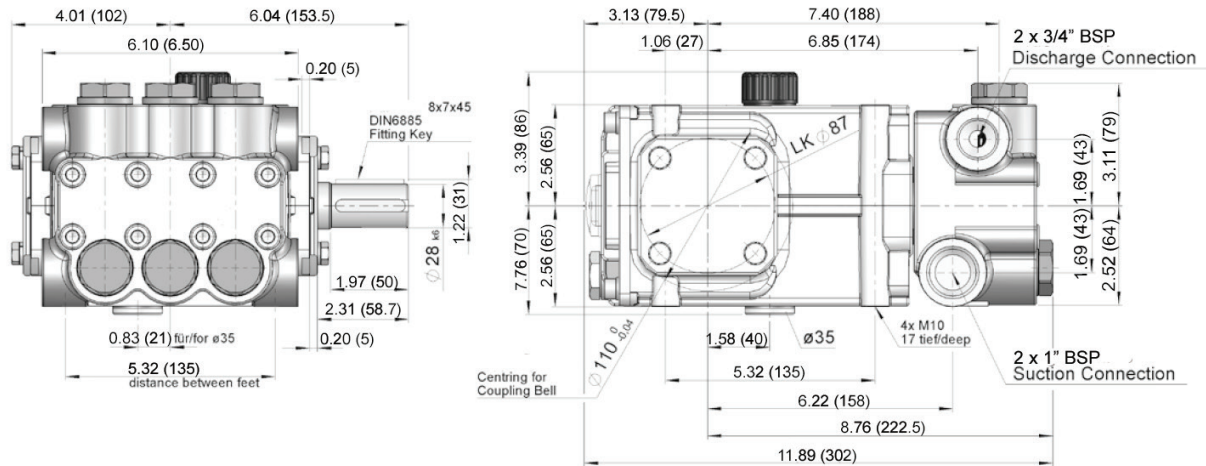
<u>MALFUNCTION</u>	<u>CAUSE</u>	<u>REMEDY</u>
The Pressure and/or the Delivery Drops	Worn packing seals Broken valve spring Belt slippage Worn or Damaged nozzle Fouled discharge valve Fouled inlet strainer Worn or Damaged hose Worn or Plugged relief valve on pump Cavitation Unloader	Replace packing seals Replace spring 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 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
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

P400-5100 Series Torque Specifications/Lubrication

Position	Item #	Description	Threads	Lubrication Info	Torque Amount
3A	07186	Oil Sight Glass	1" BSP	Loctite 5910	106 in.-lbs (12 Nm)
5	07109-0400	Oil Drain Plug	1/2" BSP		59 ft.-lbs. (80 Nm)
5B	08092-0100	Plug with Gasket	3/4" BSP		59 ft.-lbs. (80 Nm)
6	08093	Screw	M8		110 in.-lbs. (12.5 Nm)
10	07114-0100	Screw with Washer	M8		132 in.-lbs. (15 Nm)
15	08390	Connecting Rod Assembly	M6		97 in.-lbs. (11 Nm)
16D	08399-0100	Tensioning Screw	M8	Loctite 243	20.7 ft.-lbs (28 Nm)
16G	07161-0100	Seal Ring		Loctite 577 Both sides	
32	08373-0600	Plug	M30x1.5		107 ft.-lbs. (145 Nm)
34	08396-0100	Cap Screw	M10		30 ft.-lbs (40 Nm)

Dimensions

P420A-5100/P422-5100/P423-5100 and P425-5100 - 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.

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.



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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