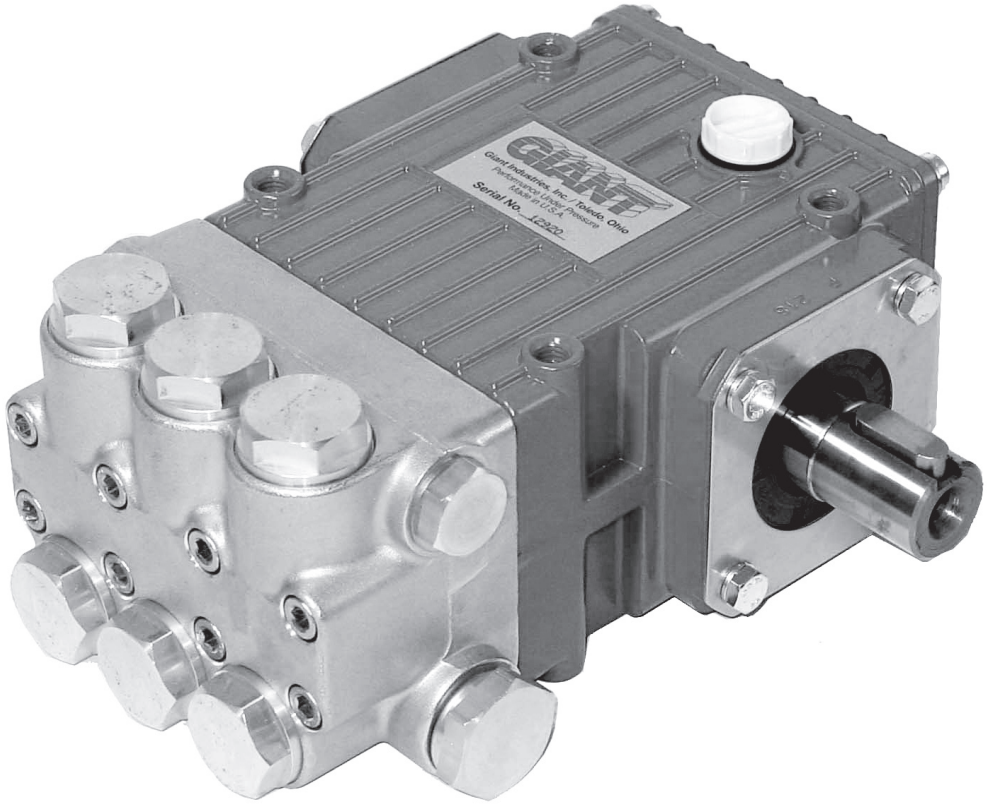
# Series P200-12mm versions

**Triplex Ceramic Plunger Pump Operating Instructions/ Repair and Service Manual**

THE EAGLE LINE™

**P205**
**P206**
**P207**
**P208**
**P209**
**P210**
**P211**




GIANT
Performance Under Pressure

Updated 1/17

**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 °F (71 °C), it is important to insure a positive head to the pump to prevent cavitation.

Make sure that suction pulsation is sufficiently dampened - water column resonance must be avoided.

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. Crankshaft rotation on Giant Industries, Inc. pumps should be made in the direction designated by the arrows on the pump crankcase. 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 3-9.

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.

**Important!** If there is a **danger of frost,** the water in the pump and in the pump fittings (particularly the unloader valve) must be emptied. The second discharge port can be used and the pump run “dry” for 1-2 minutes for this purpose.

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 non detergent motor oil or Giant SAE 20W-50 (p/n 01153)**

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.

5. Important! If there is danger of frost, the water in the pump and in the pump fittings (particularly the unloader valve) must be emptied. The second discharge port can also be used and the pump run “dry” for 1-2 minutes for this purpose.

# Pump Specifications

| | Max. Flow | Max. Flow | Nominal/ Intermittent Pressure | Nominal/ Intermittent Pressure | Max. Speed | Max. Inlet Pressure** | Max. Inlet Pressure** | Plunger Diameter | Plunger Diameter | Stroke | Stroke | Power Req'd | Power Req'd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Model** | **GPM** | **l/min** | **PSI** | **bar** | **RPM** | **PSI** | **bar** | **in** | **mm** | **in** | **mm** | **BHP** | **kW** |
| P205 | 0.5 | 1.9 | 2000/2500 | 140/175 | 1750 | 145 | 10 | 0.47 | 12 | 0.13 | 3.4 | 0.6/0.8 | 0.5/0.6 |
| P206 | 0.8 | 3.0 | 2000/2500 | 140/175 | 1750 | 145 | 10 | 0.47 | 12 | 0.22 | 5.5 | 1.0/1.3 | 0.8/1.0 |
| P205 | 0.9 | 3.4 | 2000/2000 | 140/140 | 3450* | 145 | 10 | 0.47 | 12 | 0.13 | 3.4 | 1.2/1.2 | 0.9/0.9 |
| P207 | 0.9 | 3.4 | 2000/2500 | 140/175 | 1750 | 145 | 10 | 0.47 | 12 | 0.25 | 6.3 | 1.2/1.6 | 0.9/1.2 |
| P208 | 1.0 | 3.8 | 2000/2500 | 140/175 | 1750 | 145 | 10 | 0.47 | 12 | 0.28 | 7.0 | 1.4/1.7 | 1.0/1.3 |
| P206 | 1.5 | 5.7 | 2000/2000 | 140/140 | 3450* | 145 | 10 | 0.47 | 12 | 0.22 | 5.5 | 2.1/2.1 | 1.6/1.6 |
| P208 | 1.5 | 5.7 | 2000/2500 | 140/175 | 1750 | 145 | 10 | 0.47 | 12 | 0.39 | 10.0 | 2.1/2.6 | 1.6/1.9 |
| P207 | 1.7 | 6.4 | 2000/2000 | 140/140 | 3450* | 145 | 10 | 0.47 | 12 | 0.25 | 6.3 | 2.3/2.3 | 1.7/1.7 |
| P210 | 1.8 | 6.8 | 2000/2500 | 140/175 | 1750 | 145 | 10 | 0.47 | 12 | 0.49 | 12.4 | 2.5/3.1 | 1.9/2.3 |
| P208 | 1.9 | 7.2 | 2000/2000 | 140/140 | 3450* | 145 | 10 | 0.47 | 12 | 0.28 | 7.0 | 2.6/2.6 | 1.9/1.9 |
| P211 | 2.1 | 7.9 | 2000/2500 | 140/175 | 1750 | 145 | 10 | 0.47 | 12 | 0.56 | 14.2 | 2.9/3.6 | 2.2/2.7 |
| P209 | 2.7 | 10.2 | 2000/2000 | 140/140 | 3450* | 145 | 10 | 0.47 | 12 | 0.39 | 10.0 | 3.7/3.7 | 2.8/2.8 |
| P210 | 3.3 | 12.5 | 2000/2000 | 140/140 | 3450* | 145 | 10 | 0.47 | 12 | 0.49 | 12.4 | 4.6/4.6 | 3.4/3.4 |
| P211 | 3.8 | 14.4 | 2000/2000 | 140/140 | 3450* | 145 | 10 | 0.47 | 12 | 0.56 | 14.2 | 5.2/5.2 | 3.9/3.9 |

***Positive inlet pressure required- Make sure that suction pulsation is sufficiently dampened-water column resonance must be avoided.

## Common Specifications

| | U.S. | Metric |
|---|---|---|
| Max. Temperature of Pumped Fluids | 160˚ F | 71˚C |
| Inlet Ports | | (2) 1/2" BSP |
| Discharge Ports | | (2) 3/8" BSP |
| Shaft Rotation | | Top of Pulley Towards Fluid End |
| Crankshaft Diameter | 0.98" | 24 mm |
| Key Width | 0.31" | 8 mm |
| Shaft Mounting | | Right Side Facing Manifold |
| Weight | 11.7 lbs. | 5.3 Kg |
| Crankcase Oil Capacity | 7.5 fl.oz. | 0.22 Liters |
| Extended Crankcase Oil Capacity | 9.0 fl.oz. | 0.27 Liters |
| Volumetric Efficiency @ 1750 RPM | | 0.94 |
| Volumetric Efficiency @ 3450 RPM | | 0.87 |
| Mechanical Efficiency @ 3450 RPM | | 0.86 |

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:**

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.

**Horsepower Ratings:**

We recommend a 1.15 service factor be specified when selecting an electric motor as the power source. To compute electric motor horsepower required, use the following formula: HP = (GPM X PSI) / 1450. The formula to determine the horsepower required for a gas engine is: HP = (GPM X PSI) / 1150.

**For the Application of a Hydraulic Motor:**

To Determine the Torque of a Hydraulic Motor -- (GPM x PSI x 36.77) / RPM = Torque (in-lbs)

**Calculating RPM / GPM of Pump:**

A pump must be connected to an electric motor or gas or diesel engine with the correct ratio of pulleys and belts to attain the required speed and GPM. The use of a Variable Frequency Drive (VFD) may also be used to control the RPM of a properly sized electric motor when variable flows are required.

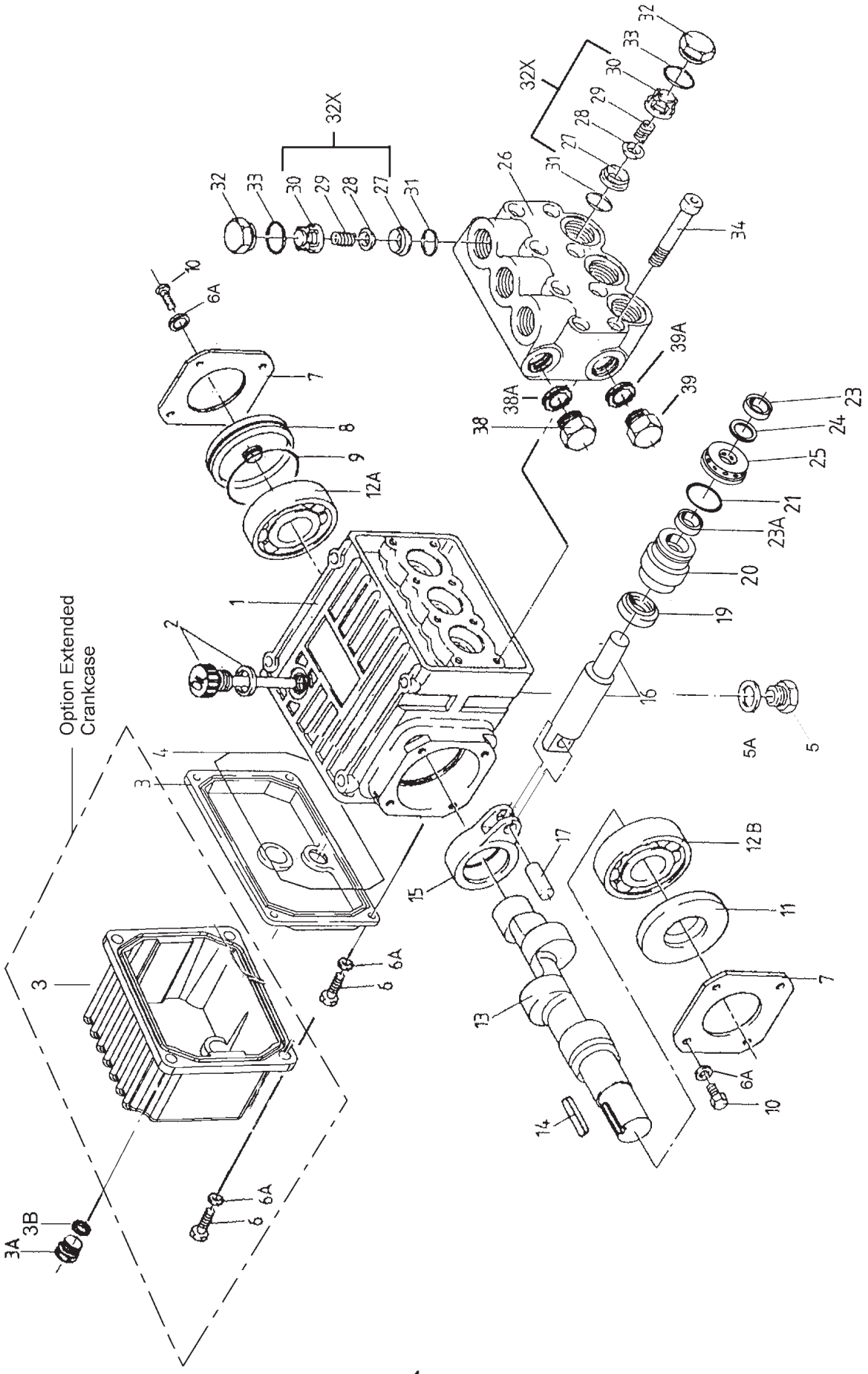
(Max. Pump RPM / Rated Pump GPM) x Required Pump GPM = **Required Pump RPM**

To calculate a pulley diameter one (1) pulley diameter and the required pump RPM must be known:

(Pump RPM x Pump Pulley Diameter) / Motor RPM = Motor Pulley Diameter

(Motor RPM x Motor Pulley Diameter) / Pump RPM = Pump Pulley Diameter

# Exploded View - P205/P206/P207/P208/P209/P210/P211



# P205/P206/P207/P208/P209/P210/P211 PARTS LIST

| ITEM | PART NO. | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | 08300 | Crankcase | 1 |
| 2 | 06773 | Oil Dipstick with O-Ring | 1 |
| 3 | 08302 | Crankcase Cover, Short | 1 |
| 3 | 08302-L | Crankcase Cover, Long | 1 |
| 3A | 07190 | Drain Plug | 1 |
| 3B | 13262 | Gasket for drain plug | 1 |
| 4 | 08005 | O-Ring | 1 |
| 5 | 06273 | Oil Drain Plug with Gasket | 1 |
| 5A | 08192 | Gasket | 1 |
| 6 | 07188 | Screw, Short Cover | 4 |
| 6A | 01176-2 | Spring Washer | 12 |
| 7 | 08303 | Bearing Cover I | 2 |
| 8 | 08490 | Sight Glass | 1 |
| 9 | 08492 | O-Ring for Sight Glass | 1 |
| 10 | 07225 | Screw with Lock Washer | 8 |
| 11 | 01166 | Radial Shaft Seal | 1 |
| 12A | 08020 | Ball Bearing | 1 |
| 12B | 01020 | Ball Bearing | 1 |
| 13 | 06694 | Crankshaft (P205) | 1 |
| 13 | 08465 | Crankshaft (P206) | 1 |
| 13 | 06547 | Crankshaft (P207) | 1 |
| 13 | 12258 | Crankshaft (P208) | 1 |
| 13 | 08440 | Crankshaft (P209) | 1 |
| 13 | 08466 | Crankshaft (P210) | 1 |
| 13 | 08467 | Crankshaft (P211) | 1 |
| 14 | 06207 | Fitting Key | 1 |
| 15 | 08333 | Connecting Rod | 3 |
| 16 | 06641 | Plunger, Complete | 3 |
| 17 | 08442 | Wrist Pin | 3 |
| 19 | 08356 | Oil Seal | 3 |
| 20 | 06645 | Seal Case | 3 |
| 21 | 08443 | O-Ring | 3 |
| 23 | 07391 | V-Sleeve | 3 |
| 23A | 08598 | V-Sleeve, Weep | 3 |
| 24 | 07392 | Support Ring | 3 |
| 25 | 06646 | Weep Return Ring | 3 |
| 26 | 06647 | Valve Casing | 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 | 07928 | Valve Plug | 6 |
| 32X | 07946A | Valve Assembly Complete | 6 |
| 33 | 07913 | O-Ring | 6 |
| 34 | 08316 | Hex Head Cap Screw | 8 |
| 38 | 13338 | Plug, 3/8” BSP | 1 |
| 38A | 07661 | Seal | 1 |
| 39 | 07109 | Plug, 1/2” BSP | 1 |
| 39A | 08486 | Copper Seal Ring | 1 |

# P205/P206/P207/P208/P209/P210/P211 REPAIR KITS

## Plunger Packing Kit

**Part # 09527**

| Item # | Part # | Description | Qty. |
|---|---|---|---|
| 21 | 08443 | O-Ring | 3 |
| 23 | 07391 | V-Sleeve, weep | 3 |
| 23A | 08598 | V-Sleeve | 3 |
| 24 | 07392 | Support Ring | 3 |

## Valve Assembly Kit

**Part # 09116**

| Item # | Part # | Description | Qty. |
|---|---|---|---|
| 32X | 07946A | Valve Assembly Complete | 6 |
| 31 | 07853 | O-Ring | 6 |
| 33 | 07913 | O-Ring | 6 |

## Oil Seal Kit

**Part # 09144**

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

## Optional Teflon Packing Kit

**Part # 09527-0021**

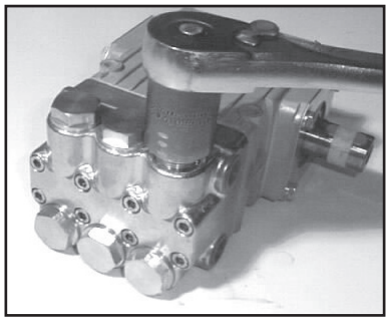
| Item # | Part # | Description | Qty. |
|---|---|---|---|
| 21 | 08443-0001 | O-Ring | 3 |
| 23/23A | 07391-0020 | V-Sleeve, Teflon | 6 |
| 24 | 07392 | Support Ring | 3 |
| 31 | 07853-0001 | O-Ring, Viton | 6 |
| 33 | 07913-0001 | O-Ring, Viton | 6 |

# P205/P206/P207/P208/P210/P211 TORQUE SPECIFICATIONS

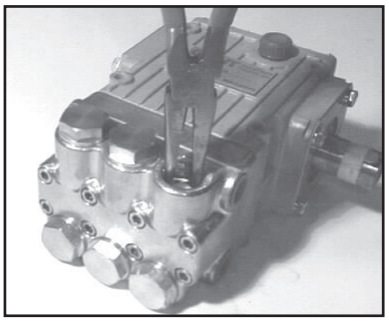
| Item | Part No. | Description | Torque Amount |
|---|---|---|---|
| 32 | 07928 | Valve Plug | 55 ft.-lbs. (75 Nm) |
| 34 | 08316 | Hex Head Cap Screw, Valve Casing | 89-106 in.-lbs. (10-12 Nm) |

# REPAIR INSTRUCTIONS - P205/P206/P207/P208/P209/P210/P211 PUMPS

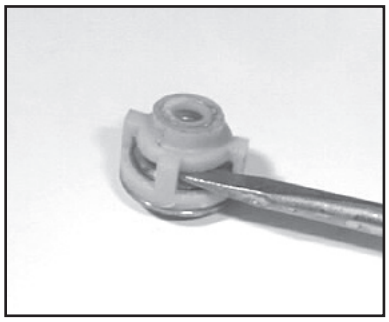
***NOTE: Always take time to lubricate all metal and nonmetal parts with a light film of oil before reassembly. This step will ensure proper fit, at the same time protecting the pump nonmetal parts (i.e., the elastomers) from cutting and scoring.***



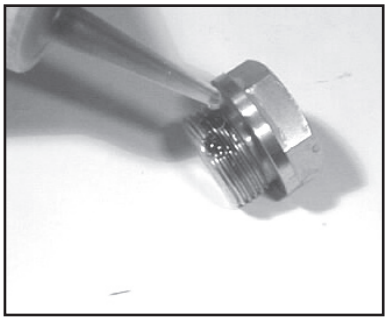
1. With a 22mm socket wrench, remove the (3) discharge valve plugs and (3) inlet valve plugs (32) Inspect the o-ring (33) for wear and replace if damaged.



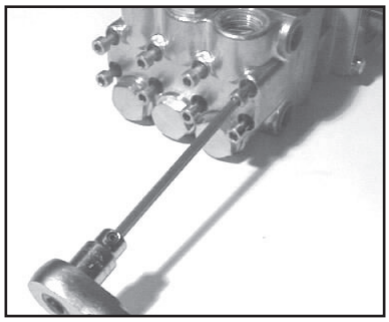
2. Using a needle nose pliers, remove the inlet and discharge valve assemblies (32X).



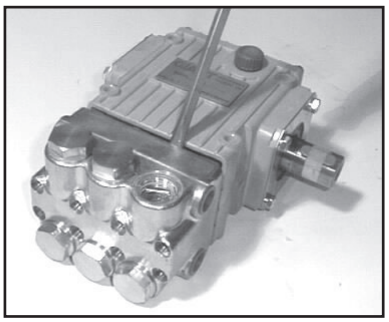
3. By inserting a small screw driver between the valve seat (27) and the valve spring retainer (30), the valve assembly can be separated.



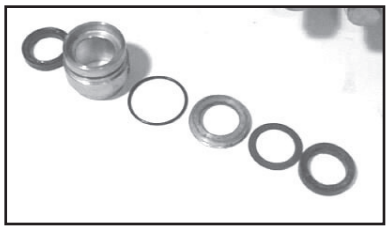
4. Remove the o-ring (31). Inspect all parts for wear and replace as necessary. For pumps manufactured prior to 5/97, tighten plugs (32) to 33 ft-lbs. otherwise, apply one drop of Loctite 243 to the valve plugs (32) and tighten to 55 ft.-lbs. (75 Nm).



5. Next, use a 5mm allen wrench to remove the 8 socket head cap screws (34).



6. Carefully slide the valve casing (26) out over the plungers.



7. Remove the weep return ring (25), pressure ring (24), and v-sleeve (23) from the valve casing (26). Remove the weep v-sleeve (23A) from the seal case (20).Inspect all parts, including o-ring (21) for wear and replace as necessary.

8. Check surfaces of plunger (16). 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!

9. If the crankcase oil seals (19) are to be replaced, they can be removed by first removing the crankshaft (13), connecting rod (15), and plunger assembly (16) from the gear end. Then the oil seals can be pushed out from the rear. Please contact Giant for details.

10. If the ceramic plunger pipe (16) is damaged, replace entire plunger assembly by removing crankshaft (13). Contact Giant for further details.

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

## Reassembly sequence of the P205/P206/P207/P208/P209/P210/P211 PUMPS

1) If oil seals (19) were removed, replace with seal lip towards crankcase. Lubricate seals before replacing. Contact Giant for assistance with the reassembly of the gear end.

2) Replace seal case (20) with o-rings (21) over plungers. Generously lubricate o-rings and oil seal before reassembly. Replace weep v-sleeve (23A) over plungers (16)..

3) Generously lubricate v-sleeve (23). Assemble v-sleeves (23) into valve casing (#26). Assemble weep return ring (25) and pressure ring (24) over plungers (16). Slide valve casing over plungers and seat firmly. Replace the eight socket head cap screws (34) and tighten to 89-106 inch-pounds (10-12 Nm) in a crossing pattern.

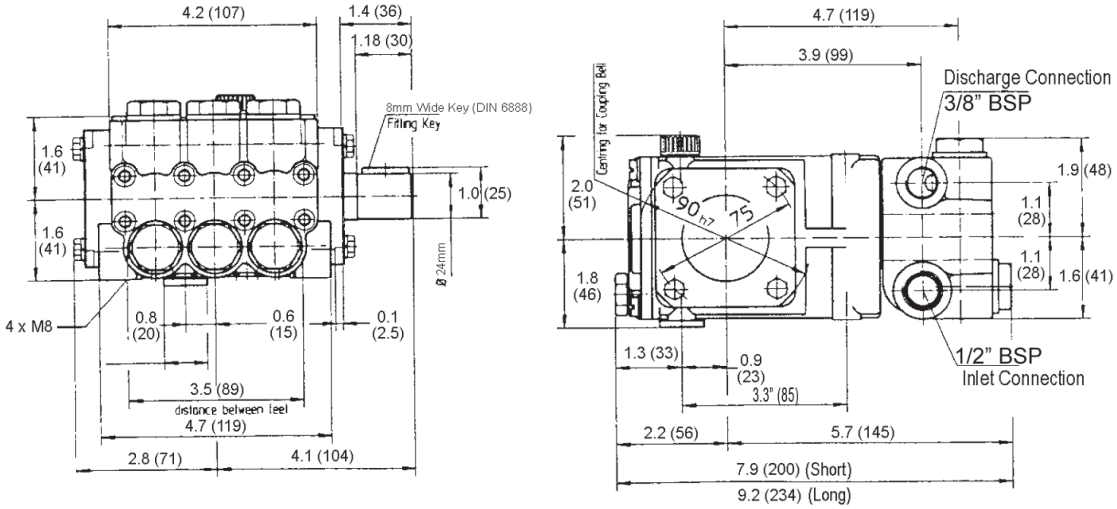
4) Replace the six o-rings (31) and the six valve assemblies (32X). Now replace the six valve plug o-rings (33). Apply one drop of Loctite 243 to the valve plugs (32) and tighten to 55 ft.-lbs. (75 Nm).

**For maintenance of the gear end of your pump contact Giant Industries or your local distributor. Phone: 419/531-4600**

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

| Preventative Maintenance Check List & Recommended Spare Parts List | | | | | | |
|---|---|---|---|---|---|---|
| **Check** | **Daily** | **Weekly** | **50 Hrs.** | **Every 500 Hours** | **Every 1500 Hours** | **Every 3000 Hours** |
| Oil Level/Quality | X | | | | | |
| Oil Leaks | X | | | | | |
| Water Leaks | X | | | | | |
| Belts, Puelly | | X | | | | |
| Plumbing | | X | | | | |
| **Recommended Spare Parts** | | | | | | |
| Oil Change (1 quart) p/n 01153 | | | X | X | | |
| Seal Spare Parts (1 kit/pump) (see page for kit list) | | | | | X | |
| Oil Seal Kit (1 kit/pump) (see page for kit list) | | | | | X | |
| Valve Spare Parts (1 kit/pump) (see page for kit list) | | | | | | X |

# P205/P206/P207/P208/P209/P210/P211 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.

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.

GIANT
Performance Under Pressure

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