

# Models P205/206/208

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Triplex Ceramic  
Plunger Pump  
Operating Instructions/  
Repair and Service  
Manual



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# 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, 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. 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 chart on page 3.

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 P205

### 1750 RPM<sup>+</sup>

Ratings (Continuous) ..... 0.5 GPM @ 2000 PSI  
 Ratings (Intermittent) ..... 0.5 GPM @ 2500 PSI\*

### 3450 RPM<sup>+</sup>

Ratings (Continuous) ..... 0.9 GPM @ 2000 PSI  
 Ratings (Intermittent) ..... 0.9 GPM @ 2500 PSI\*  
 Inlet Pressure ..... Up to 90 PSI  
 RPM ..... Up to 1750 RPM  
 Plunger Diameter ..... 12mm  
 Stroke ..... 3.4mm  
 Temperature of Pumped Fluids ..... Up to 160°F  
 Inlet Ports ..... (2) 1/2" BSP  
 Discharge Ports ..... (2) 3/8" BSP  
 Shaft Rotation ..... Top of Pulley Towards Fluid End  
 Crankshaft Diameter ..... 24mm  
 Key Width ..... 8mm  
 Shaft Mounting ..... Right Side Facing Manifold  
 Weight ..... 11 lbs. 11oz.  
 Crankcase Oil Capacity ..... 7.5 fl.oz.  
 Extended Crankcase Oil Capacity ..... 9.0 fl.oz.  
 Volumetric Efficiency @ 3450 RPM ..... 0.88  
 Mechanical Efficiency @ 3450 RPM ..... 0.86

\*Positive inlet pressure required

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.

P205 HORSEPOWER REQUIREMENTS					
RPM	GPM	1000 PSI	1500 PSI	2000 PSI	2500 PSI*
500	0.13	0.1	0.1	0.2	0.2
1000	0.26	0.2	0.3	0.4	0.4
1750	0.46	0.3	0.5	0.6	0.8
3000	0.80	0.6	0.8	1.1	1.4
3200	0.83	0.6	0.9	1.1	1.4
3450	0.90	0.6	0.9	1.2	1.6

\*intermittent duty

### SPECIAL NOTE:

The theoretical gallons per revolution (gal/rev) is 0.0002899.  
 To find specific outputs at various RPM, use the formula: GPM = 0.0002899 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 electricmotor as the power source. To compute specific pump horse power requirements, use the following formula:

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

# Specifications

## Model P206

### 1750 RPM<sup>+</sup>

Ratings (Continuous) ..... 0.8 GPM @ 2000 PSI  
 Ratings (Intermittent) ..... 0.8 GPM @ 2500 PSI\*

### 3450 RPM<sup>+</sup>

Ratings (Continuous) ..... 1.5 GPM @ 2000 PSI  
 Ratings (Intermittent) ..... 1.5 GPM @ 2500 PSI\*  
 Inlet Pressure ..... up to 140 PSI  
 Plunger Diameter ..... 12mm  
 Stroke ..... 5.5mm  
 Temperature of Pumped Fluids ..... Up to 160° F  
 Inlet Ports ..... (2) 1/2" BSP  
 Discharge Ports ..... (2) 3/8" BSP  
 Shaft Rotation ..... Top of Pulley Towards Fluid End  
 Crankshaft Diameter ..... Solid, 24mm  
 Key Width ..... 8mm  
 Shaft Mounting ..... Right Side Facing Manifold  
 Weight ..... 11 lbs. 11oz.  
 Crankcase Oil Capacity ..... 7.5 fl.oz.  
 Extended Crankcase Oil Capacity ..... 9.0 fl.oz.  
 Volumetric Efficiency @ 1750 RPM ..... 0.94  
 Volumetric Efficiency @ 3450 RPM ..... 0.88  
 Mechanical Efficiency @ 3450 RPM ..... 0.86

<sup>+</sup>Positive inlet pressure required

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.**

P206 HORSEPOWER REQUIREMENTS					
RPM	GPM	1000 PSI	1500 PSI	2000 PSI	2500 PSI*
250	0.11	0.1	0.1	0.2	0.2
500	0.21	0.1	0.2	0.3	0.4
1000	0.43	0.3	0.4	0.6	0.7
1750	0.76	0.5	0.8	1.0	1.3
3000	1.30	0.9	1.3	1.8	2.2
3200	1.40	1.0	1.4	1.9	2.4
3450	1.50	1.0	1.6	2.1	2.6

\*Intermittent duty only

#### 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:

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

# Specifications

## Model P208

### 1750 RPM

Ratings (Continuous) ..... 1.0 GPM @ 2000 PSI  
 Ratings (Intermittent) ..... 1.0 GPM @ 2500 PSI\*

### 3450 RPM

Ratings (Continuous) ..... 1.9 GPM @ 2000 PSI  
 Ratings (Intermittent) ..... 1.9 GPM @ 2500 PSI\*  
 Inlet Pressure ..... up to 140 PSI  
 Plunger Diameter ..... 12mm  
 Stroke ..... 7mm  
 Temperature of Pumped Fluids ..... Up to 160° F  
 Inlet Ports ..... (2) 1/2" BSP  
 Discharge Ports ..... (2) 3/8" BSP  
 Shaft Rotation ..... Top of Pulley Towards Fluid End  
 Crankshaft Diameter ..... 24mm  
 Key Width ..... 8mm  
 Shaft Mounting ..... Right Side Facing Manifold  
 Weight ..... 11 lbs. 11oz.  
 Crankcase Oil Capacity ..... 7.5 fl.oz.  
 Extended Crankcase Oil Capacity ..... 9.0 fl.oz.  
 Volumetric Efficiency @ 1750 RPM ..... 0.94  
 Volumetric Efficiency @ 3450 RPM ..... 0.88  
 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.**

P208 HORSEPOWER REQUIREMENTS					
RPM	GPM	1000 PSI	1500 PSI	2000 PSI	2500 PSI*
250	0.14	0.1	0.1	0.2	0.2
500	0.29	0.2	0.3	0.4	0.5
1000	0.57	0.4	0.6	0.8	1.0
1750	1.00	0.7	1.0	1.4	1.7
3000	1.60	1.1	1.7	2.2	2.8
3200	1.80	1.2	1.9	2.5	3.1
3450	1.90	1.3	2.0	2.6	3.3

\*Intermittent duty only

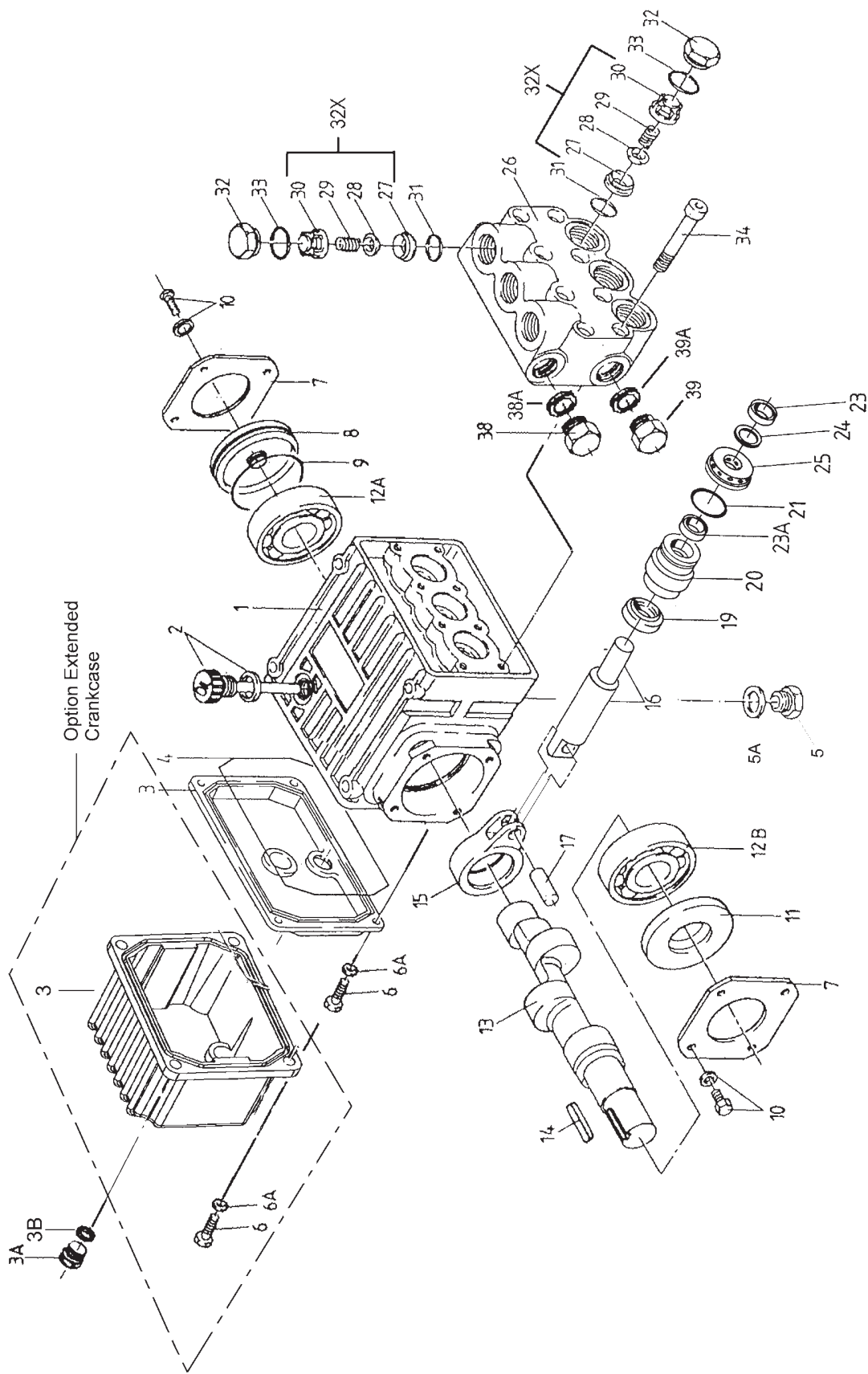
#### HORSEPOWER RATINGS:

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:

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

Exploded View - P205/206/208





## P205/206/208 PARTS LIST

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	08300	Crankcase	1	16	06641	Plunger, Complete, 12mm	3
2	08301	Dipstick and Gasket, Black	1	17	08442	Wrist Pin	3
3	08302	Crankcase Cover, Short	1	19	08356-0010	Oil Seal	3
3	08302-L	Crankcase Cover, Long	1	20	06645	Seal Case	3
3A	07190	Drain Plug	1	21	08443	O-Ring	3
3B	13262	Gasket for drain plug	1	23	07391	V-Sleeve	3
4	08005	O-Ring	1	23A	08598	V-Sleeve, Weep	3
5	06273	Oil Drain Plug with Gasket	1	24	07392	Support Ring	3
5A	08192	Gasket	1	25	06646	Weep Return Ring	3
6	07188	Screw, Short Cover	4	26	06647	Valve Casing	1
6A	01176-2	Spring Washer	4	27	07849	Valve Seat	6
7	08303	Bearing Cover I	2	28	07491	Valve Plate	6
8	08490	Sight Glass	1	29	07906	Valve Spring	6
9	08492	O-Ring	1	30	07907	Valve Spring Retainer	6
10	07225	Screw with Lock Washer	8	31	07853	O-Ring	6
11	01166	Radial Shaft Seal	1	32	07928	Valve Plug	6
12A	08020	Ball Bearing	1	32X	07946	Valve Assembly Complete	6
12B	01020	Ball Bearing	1	33	07913	O-Ring	6
13	06694	Crankshaft (P205)	1	34	08316	Hex Head Cap Screw	8
13	08465	Crankshaft (P206)	1	38	13338	Plug, 3/8" BSP	1
13	12258	Crankshaft (P208)	1	38A	07661	Seal	1
14	06207	Woodruff Key	1	39	07109	Plug, 1/2" BSP	1
15	08333	Connecting Rod	3	39A	08486	Copper Seal Ring	1

## P205/206/208 REPAIR KITS

### Plunger Packing Kit

#### Part # 09527

<u>Item #</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
23	07391	V-Sleeve, weep	3
23A	08598	V-Sleeve	3
24	07392	Support Ring	3

### Oil Seal Kit

#### Part # 09144

<u>Item #</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
19	08356-0010	Oil Seal	3

### Valve Assembly Kit

#### Part # 09116

<u>Item #</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
32X	07946	Valve Assembly Complete	6
31	07853	O-Ring	6

## P205/206/208 TORQUE SPECIFICATIONS

<u>Position</u>	<u>Item#</u>	<u>Description</u>	<u>Torque Amount</u>
32	07928	Valve Plug	33 or 59* (ft.-lbs.)
34	08316	Hex Head Cap Screw, Valve Casing	105 (in.-lbs.)

## REPAIR INSTRUCTIONS - P205/206/208 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 59 ft.-lbs.



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.



## REPAIR INSTRUCTIONS - P205/206/208 PUMPS

10. If the ceramic plunger pipe (16B) 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 P205/206/208 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 105 inch-pounds 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 59 ft.-lbs.

**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**

## 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

