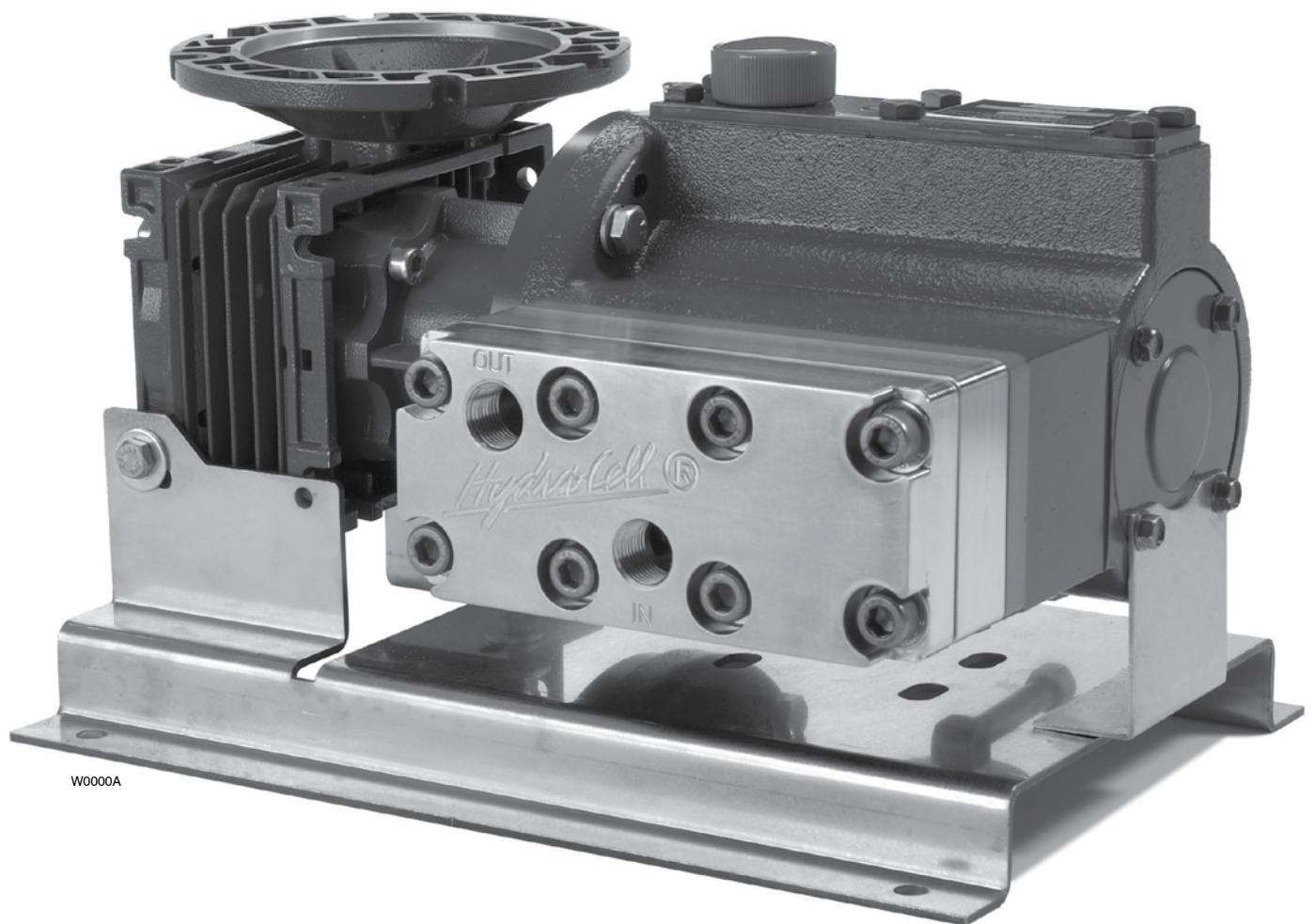


Hydra·Cell[®]
METERING SOLUTIONS™

P300 Metering Pump

Installation & Service

P300-991-2400B



W0000A

 **Wanner Engineering, Inc.**

1204 Chestnut Avenue, Minneapolis, MN 55403

TEL: (612) 332-5681 FAX: (612) 332-6937

TOLL-FREE FAX [US only]: (800) 332-6812

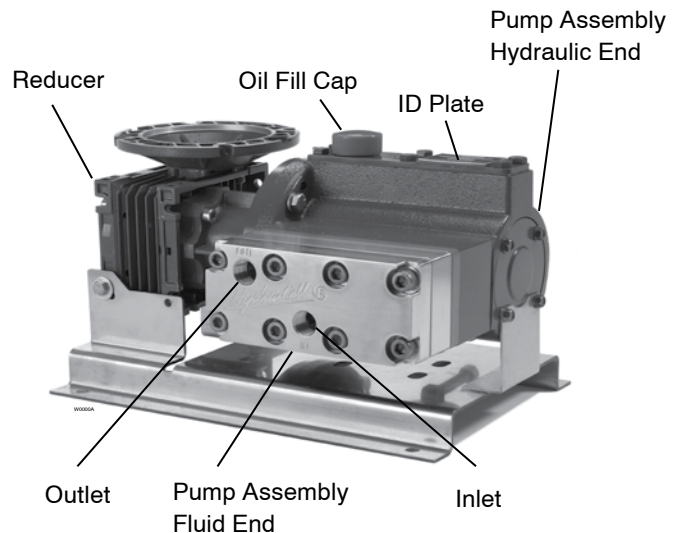
www.hydra-cell.com/metering

email: sales@wannereng.com

P300 Contents

	Page
Specifications.....	2
Dimensions	3
Installation.....	5
Maintenance.....	7
Fluid End	
Service	8
Parts List	10
Hydraulic End Parts List	11
Reducer Parts List	12
Troubleshooting.....	14
Replacement Parts Kits	15
Warranty.....	16

Component Identification



P300 Specifications

Steady State Accuracy	±1%
Linearity	±3%
Repeatability	±3%
<hr/>	
Maximum Pressure	
Metallic Head:	2500 psi (173 bar)
<hr/>	
Maximum Inlet Pressure	500 psi (35 bar)
<hr/>	
Maximum Temperature	
Metallic Head:	250°F (121°C) – consult factory for temperatures above 160°F (71°C)

Inlet Port	1/2 inch NPT or BSPT
Discharge Port	1/2 inch NPT or BSPT
Shaft Rotation	Bi-directional
Oil Capacity	1.1 US quart (1.05 liters)
<hr/>	
Weight	
Metallic Head:	51 lbs (23.1 kg)
Metallic Head with motor adapter:	57 lbs (25.9 kg)

Gallons Per Hour (GPH) Maximum Flow at Designated Pressure

GPH Metallic Pump Heads				Pump RPM	Gear Ratio	Motor RPM
100 PSI (*)	500 PSI (*)	1500 PSI (*)	2500 PSI (*)			
2.00 (1/4)	1.85 (1/4)	1.50 (1/4)	1.15 (1/4)	18	100:1	1800
2.51 (1/4)	2.36 (1/4)	1.98 (1/4)	1.60 (1/4)	22.5	80:1	
3.37 (1/4)	3.21 (1/4)	2.79 (1/4)	2.36 (1/4)	30	60:1	
4.06 (1/4)	3.88 (1/4)	3.43 (1/4)	2.97 (1/4)	36	50:1	
5.09 (1/4)	4.89 (1/4)	4.40 (1/4)	3.88 (1/4)	45	40:1	
6.80 (1/4)	6.58 (1/4)	6.01 (1/4)	5.39 (1/4)	60	30:1	
8.17 (1/4)	7.94 (1/4)	7.30 (1/4)	6.60 (1/4)	72	25:1	
10.23 (1/4)	9.62 (1/4)	9.23 (1/4)	8.41 (1/2)	90	20:1	
13.66 (1/4)	13.34 (1/4)	12.46 (1/2)	11.44 (1/2)	120	15:1	
20.52 (1/4)	20.10 (1/4)	18.90 (1/2)	17.50 (3/4)	180	10:1	
27.38 (1/4)	26.86 (1/4)	25.35 (1/2)	23.55 (1)	240	7.5:1	
41.10 (1/4)	40.37 (1/2)	38.24 (3/4)	35.67 (1 1/2)	360	5:1	
54.82 (1/4)	53.89 (1/2)	51.13 (1)	47.78 (2)	480	7.5:1	3600
82.26 (1/4)	80.91 (3/4)	76.91 (1 1/2)	72.00 (3)	720	5:1	

*Required Motor HP

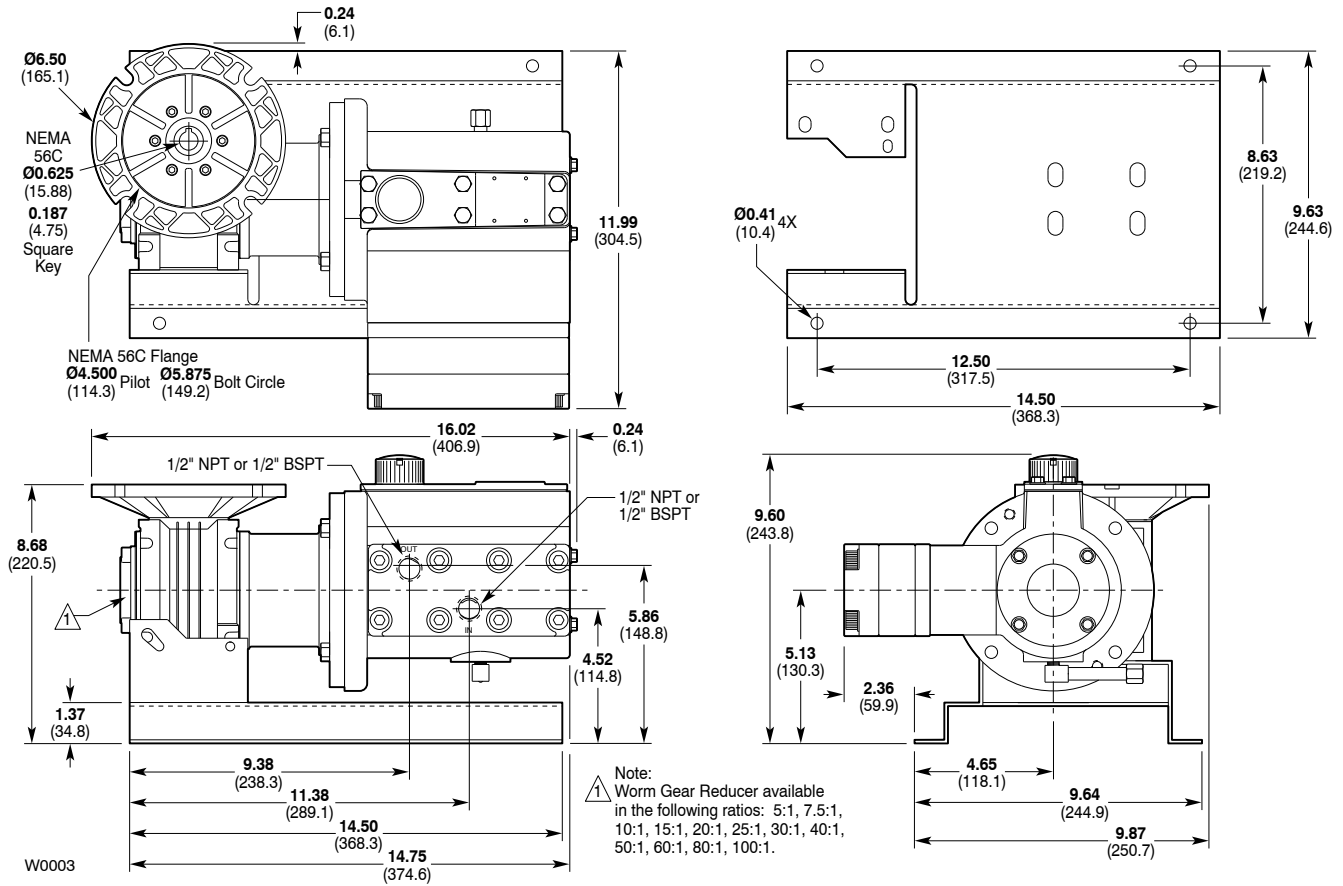
P300 Dimensions

P300 Models with Metallic Pumping Head

304 Stainless Steel

316 Stainless Steel

Hastelloy® C



P300 Installation

Location

NOTE: The numbers in parentheses are Reference Numbers located in the Parts List exploded views of this manual.

Locate the pump as close to the supply source as possible.

Install it in a lighted clean space where it will be easy to inspect and maintain.

Motor and Controller

The P Series pump shaft can rotate in either direction, therefore direction of motor shaft rotation is not critical.

Accessories

Consult installation drawing below for typical precision metering fluid system components. Contact Wanner Engineering or the distributor in your area for more details.

Important Precautions

Adequate Fluid Supply. To avoid cavitation and premature pump failure, be sure that the pump will have an adequate fluid supply and that the inlet line will not be obstructed. See **Inlet Piping** on page 6.

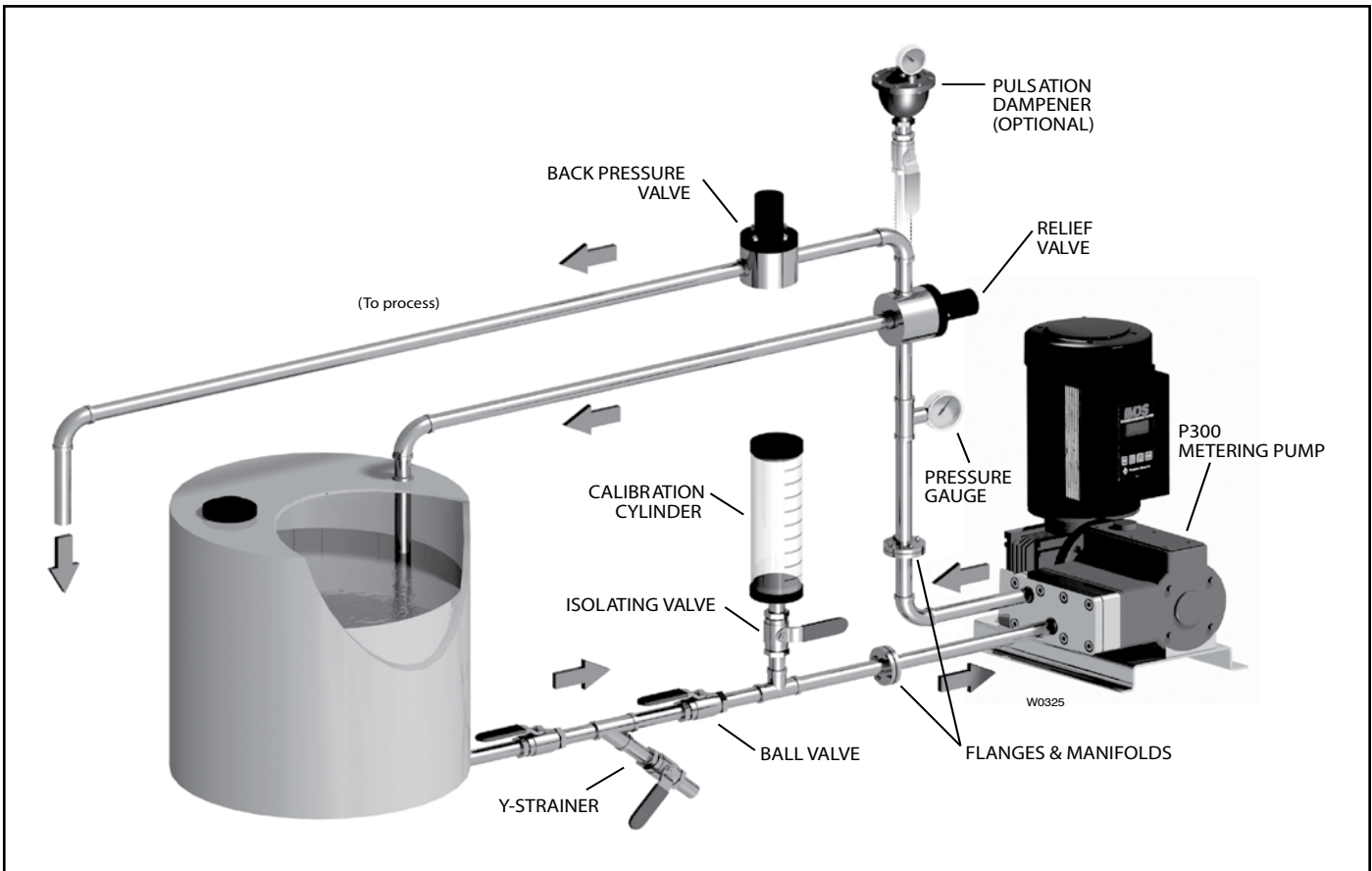
Positive Displacement. This is a positive-displacement pump. To avoid severe system damage if the discharge line ever becomes blocked, install a relief valve downstream from the pump. See **Discharge Piping** on page 6.

Safety Guards. Follow all codes and regulations regarding installation and operation of the pumping system.

Shut-Off Valves. Never install shut-off valves between the pump and discharge pressure regulator, or in the regulator bypass line.

Consult the Factory for the following situations:

- Extreme temperature applications (above 160°F or below 40°F)
- Pressure feeding of pumps
- Viscous or abrasive fluid applications
- Chemical compatibility problems
- Hot ambient temperatures (above 110°F)



P300 Installation

Inlet Piping

Provide for permanent or temporary installation of a compound pressure gauge to monitor the inlet pressure. To maintain maximum flow, the pump inlet should be under flooded suction conditions at all times. **Do not supply more than one pump from the same inlet line.**

Supply Tank

Use a supply tank that is large enough to provide time for any trapped air in the fluid to escape. The tank size should be at least twice the maximum pump flow rate.

Install a separate inlet line from the supply tank to each pump.

Place a cover over the supply tank, to prevent foreign objects from falling into it.

Hose Sizing and Routing

To minimize acceleration head and frictional losses, size the suction line at least one size larger than the pump inlet, and keep the suction line as short and direct as possible.

Recommendations:

- Keep inlet lines less than 3 ft. (1 m) long
- Use at least 5/8" (16 mm) I.D. inlet hose
- Minimize fittings (elbows, valves, tees, etc.)

Inlet Piping (Pressure Feed)

Provide for permanent or temporary installation of a pressure gauge to monitor the inlet pressure. Pressure at the pump inlet should not exceed 500 psi (35 bar); if it could get higher, install a pressure reducing valve. **Do not supply more than one pump from the same inlet line.**

Note: System back pressure must exceed the pump inlet pressure by at least 15 psi (1 bar) in order to prevent flow thru.

Discharge Piping

Hose and Routing

Use the shortest, most-direct route for the discharge line.

Select pipe or hose with a **working pressure** rating of at least 1.5 times the maximum system pressure. EXAMPLE: Select a 1500 psi (103 bar) W.P.-rated hose for systems to be operated at 1000 psi (69 bar) gauge pressure.

Support the pump and piping independently.

Pressure Regulation

Install a pressure relief valve in the discharge line. Bypass pressure must not exceed the pressure limit of the pump.

Size the valve so that, when fully open, it will be large enough to relieve the full capacity of the pump without over-pressurizing the system.

Locate the valve as close to the pump as possible and ahead of any other valves.

Adjust the pressure relief valve to no more than 10% over the maximum working pressure of the system. Do not exceed the manufacturer's pressure rating for the pump or valve.

Route the bypass line to the supply tank.

CAUTION: Never install shutoff valves in the bypass line or between the pump and pressure regulator or relief valve.

Provide for permanent or temporary installation of a pressure gauge to monitor the discharge pressure at the pump.

Minimum Discharge Pressure

To ensure proper capacity control, a minimum discharge pressure of 50 psi (3.5 bar) is required.

P300 Installation

Initial Start-Up Procedure

Before you start the pump, be sure that:

- All shut-off valves are open, and the pump has an adequate supply of fluid.
 - All connections are tight.
 - The oil level is 1/4 inch (6 mm) above the cast surface in the upper oil reservoir.
1. Open the priming valve on the system back pressure valve so the pump starts under minimum pressure.
 2. Turn on power to the pump motor.
 3. Check the inlet pressure or vacuum. To maintain maximum flow, the pump inlet should be under flooded suction conditions at all times. Inlet pressure must not exceed 500 psi (35 bar).
 4. Listen for any erratic noise and look for unsteady flow.
 - Jog the pump on and off until fluid coming from the priming valve is air-free.
 - Close the priming valve.

Calibration Procedure

Each individual metering pump put into service must be calibrated in order to accurately determine required pump speed to achieve the desired flow. The capacity curves shown on page 3 represent a typical pump; individual pumps may vary slightly from these curves. In order to achieve the best possible results, perform calibration under actual process conditions. Follow these steps:

1. Run the pump for 20 minutes at actual process conditions. If the process system cannot be used, circulate back to the supply tank through a pressure relief valve (see Installation drawing on page 5). If required system pressure is less than 50 PSI (3.5 bar) a back pressure valve must be installed and set to produce a minimum of 50 PSI (3.5 bar) pressure at the pump head.
2. Determine maximum pump speed required for all system conditions that need to be satisfied. Measure pump delivery at this maximum speed using your system calibration cylinder, flow meter, or some other means. This is considered to be the "rated capacity" for your particular metering pump.
3. Measure pump delivery at 75%, 50%, 25%, and 10% of the maximum speed just determined. Let the pump run for 5 minutes at each speed setting before taking the capacity measurement.
4. Plot these values on linear graph paper using the horizontal axis for RPM and the vertical axis for GPH, or any other unit of measure you may be using for capacity.
5. Draw a best-fit straight line through the points just plotted. For stable conditions, this line predicts pump speed required to achieve desired flow over a 10:1 turndown ratio.

Note: as pump discharge pressure increases, capacity decreases slightly. For any metering pump there are a series of valid capacity curves that may apply. Use the curve that depends on actual pump discharge pressure and other system conditions. It is critically important to develop a custom capacity curve for each pump and each system.

P300 Maintenance

NOTE: The numbers in parentheses are Reference Numbers located in the Parts List exploded views of this manual.

Periodically

Change the oil according to the guidelines below. When changing, remove the drain plug (60), Allow all oil and contaminant to drain out. Catch the oil and dispose of it properly.

Hours Between Oil Changes @ Various Process Fluid Temperatures

Pressure	<90°F (32°C)	<139°F (60°C)	<180°F (82°C)
<1500 psi (104 bar)	6,000	4,000	2,000
<2500 psi (173 bar)	3,000	2,000	1,500

NOTE: Minimum oil viscosity for proper hydraulic end lubrication is 16-20 cST (80-100 SSU).

CAUTION: Do not turn the drive shaft while the oil reservoir is empty.

Use the appropriate Hydra-Oil for the application.

Note: P Series replacement parts kits (complete kits and diaphragm kits) include the appropriate oil for each specific P Series pump configuration.

CAUTION: If you are losing oil but don't see any external leakage, or if the oil becomes discolored and contaminated, the diaphragm (17) may be damaged. Refer to the Fluid-End Service Section. Do not operate the pump with a damaged diaphragm.

CAUTION: Do not leave contaminated oil in the pump housing or leave the housing empty. Remove contaminated oil. Dispose of properly. Replace with clean oil.

Check the inlet pressure periodically with a gauge.

P300 Fluid End Service

NOTE: The reference numbers in parentheses are shown in the Fluid End Parts List.

This section explains how to disassemble and inspect all easily serviceable parts of the pump.

CAUTION: Do not disassemble the hydraulic end of the pump. For assistance, contact Wanner Engineering (TEL 612-332-5681 or FAX 612-332-6937) or the distributor in your area.

Tools and Supplies

- Straightedge (at least 6 in. long)
- Grease or petroleum jelly
- Torque wrench, rated to at least 50 ft-lbs (70 N-m)
- Emery cloth
- 1/2-in. drive socket wrench
- 5/16-in. (8-mm) open-end wrench
- 5-mm hex Allen wrench
- 8-mm hex bit socket (1/2 inch drive)
- Wanner D-04/G-04 Tool Kit, which includes the following:
 - Seat puller
 - Plunger holder
 - Plunger guide lifter
 - Shaft rotator

1. Remove Manifold (3) and Valve Plate (12)

- Remove eight capscrews (1) around manifold (3). Use 8-mm hex Allen wrench.
- Remove manifold (3).
- Inspect manifold (3) for warping or wear around inlet and outlet ports. If wear is excessive, replace manifold. To check if manifold is warped, remove O-rings (4) and place a straightedge across it. If warped replace.
- Remove two socket-head capscrews (14) that hold valve plate (12) to pump housing (78). Use a 5-mm hex Allen wrench.
- Inspect the valve plate as in step c. Replace if necessary.

2. Inspect Valves (5-11)

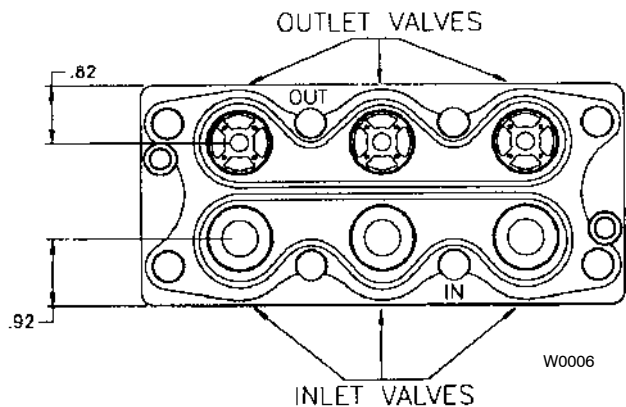
The three inlet and three outlet valve assemblies are identical and face opposite directions. Inspect each valve as follows:

- Check spring retainer (10), and replace if worn.
- Check valve spring (8). If shorter than new spring, replace (do not stretch old spring).
- Check valve (7). If worn excessively, replace.
- Remove valve seat (6) and O-ring (5). A seat puller is included in the Wanner Tool Kit.

Inspect valve seat for wear, and replace if necessary. A new O-ring (5) should be installed.

- Reinstall inlet and outlet valve assemblies:
 - Clean valve ports and shoulders with emery cloth, and lubricate with lubricating gel or petroleum jelly.
 - Install O-ring (5) on the valve seat (6).
 - **Inlet Valves** (3 lower valves in the illustration below). Insert spring retainer (10) into valve plate (12), insert spring (8), valve (7), and valve seat (6).
 - **Outlet Valves** (3 upper valves in the illustration below). Insert valve seat (6), valve (7), spring (8), and spring retainer (10).

INSTALLING INLET AND OUTLET VALVES



P300 Fluid End Service

3. Inspect and Replace Diaphragms (17)

- a. Lift diaphragm (17) by one edge, and turn pump shaft (**use the shaft rotator from the Wanner Tool Kit**) until diaphragm moves up to “top dead center”. This will expose machined cross-holes in plunger shaft behind diaphragm.
- b. Insert the plunger holder tool through one of the machined cross-holes, to hold the diaphragm (17) up. (Don't remove tool until new diaphragm is installed in step f below.)
- c. Unscrew the diaphragm. Use a 5/16-in. (8-mm) open-end wrench, and turn counterclockwise.
- d. Inspect diaphragm carefully. A damaged diaphragm generally indicates a pumping system problem. Replacing diaphragm only, will not solve the larger problem. Inspect diaphragm for the following:
 - **Small puncture.** Usually caused by sharp foreign object in fluid.
 - **Diaphragm pulled away** from metal insert. Usually caused by excessive inlet vacuum, or by overpressurization of pump inlet.
 - **Outer diaphragm bead extruded.** Usually caused by overpressurization of pump.
 - **Diaphragm becoming stiff** and losing flexibility. Usually caused by pumping fluid that is incompatible with diaphragm material.
 - **Cut diaphragm convolute.** Usually caused by excessive inlet vacuum.

CAUTION: If a diaphragm has ruptured and foreign material or water has entered the oil reservoir, do not operate the pump. Check all diaphragms, then flush the reservoir completely (as outlined below) and refill it with fresh oil. Never let the pump stand with foreign material or water in the reservoir, or with the reservoir empty.
- e. Clean away any spilled oil.
- f. Install diaphragm (17) and tighten to 10 in-lbs (113 N-cm).
- g. Repeat above inspection procedure with other two diaphragms (17). Replace if necessary.

4. Flush Contaminant from Hydraulic End

(only if diaphragm has ruptured)

- a. With valve plate and manifold still removed (see above), remove the brass cap (60). Allow all oil and contaminant to drain out.
- b. Fill reservoir with kerosene or solvent, manually turn pump shaft to circulate kerosene, and drain. Dispose of contaminated fluid properly.
- c. Repeat step b flushing procedure.
- d. Fill reservoir with fresh oil and manually turn pump shaft to circulate oil. Drain oil.
- e. Refill reservoir with fresh oil. If oil appears milky, there is still contaminant in reservoir. Repeat steps c and d until oil appears clean.

5. Prime Hydraulic Cells

- a. With pump **horizontal**, fill reservoir with correct Hydra-oil for application.

Note: P Series replacement parts kits (complete kits and diaphragm kits) include the correct oil for each specific P Series pump configuration.
- b. All air in oil within hydraulic cell (behind diaphragm) must be forced out by turning shaft and pumping piston. A shaft rotator is included in the Wanner Tool Kit. Use glove when turning shaft by hand.

Turn shaft until **bubble-free** flow of oil comes from behind all diaphragms. Watch oil level in reservoir. If oil gets too low during priming air will be drawn into piston (inside hydraulic end). Air will cause pump to run rough and repriming will be necessary.
- c. After Hydra-Cells are fully primed, ensure that oil level is 1/4 in. (6 mm) above cast surface in upper oil reservoir.
- d. Wipe excess oil from the diaphragm plate (18) and diaphragms (17).

6. Reinstall Valve Plate (12) and Manifold (3)

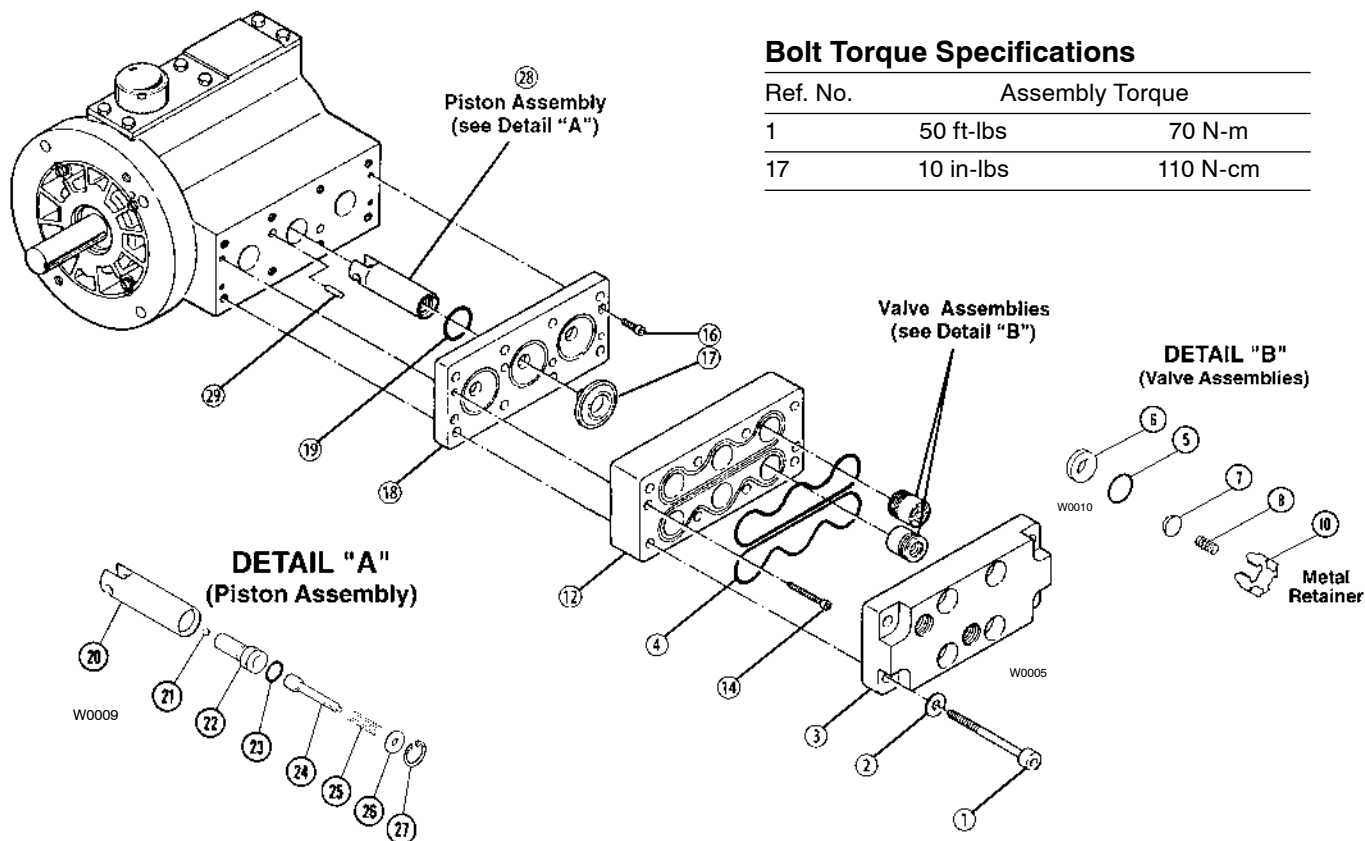
- a. Reinstall valve plate (12), with valve assemblies installed as outlined above, onto diaphragm plate (18) and alignment pins (29).

Tighten two socket-head capscrews (14) evenly and snugly to compress outer diaphragm beads and hold valve plate (12) in place.
- b. Reinstall O-rings (4) on front side of the valve plate (12). Use petroleum jelly or lubricating gel to hold them in place.
- c. Reinstall manifold (3) onto valve plate (12).
- d. Insert all capscrews (1), with washers (2), around edge of the manifold, and alternately tighten opposite bolts until all are secure. Torque to 50 ft-lbs (70 N-m).
- e. Recheck all bolts for tightness and proper torque.

P300 Fluid End Parts List

Bolt Torque Specifications

Ref. No.	Assembly Torque	
1	50 ft-lbs	70 N-m
17	10 in-lbs	110 N-cm



Ref No.	Part Number	Description	Quantity/ Pump
1	G10-024-2012	Cap Screw, socket-head, sst	8
2	100-037	Washer, flat, hardened, sst	8
3	D03-004-1034	Manifold, 304 SST, NPT	1
	D03-004-1036	Manifold, 316 SST, NPT	1
	G03-004-1034	Manifold, 304 SST, BSPT	1
	G03-004-1036	Manifold, 316 SST, BSPT	1
4	D03-073-2140	O-ring, manifold, Buna	2
	D03-073-2141	O-ring, manifold, Viton	2
5	D25-046-2110	O-ring, valve seat, Buna	6
	D25-046-2111	O-ring, valve seat, Viton	6
6	D15-020-2011	Valve Seat, Nitronic 50	6
	D15-020-2017	Valve Seat, Hastelloy C	6
7	D03-021-1011	Valve, Nitronic 50	6
	D03-021-1017	Valve, Hastelloy C	6
8	D03-022-3113	Valve Spring, Hastelloy C	6
	D03-022-3114	Valve Spring, Elgiloy	6
10	D03-023-1017	Retainer, valve spring, Hastelloy C	6
12	D03-003-1034	Valve Plate, 304 SST	1
	D03-003-1036	Valve Plate, 316 SST	1
14	G10-088-2010	Cap Screw, socket-head,	2

Ref No.	Part Number	Description	Quantity/ Pump
16	G03-088-2010	Cap Screw, socket-head	2
17	D03-018-1240	Diaphragm, Buna-N-XS	3
	D03-018-1245	Diaphragm, Viton-XT	3
18	D03-002-1012	Diaphragm Plate, steel	1
19	D03-075-2110	O-ring, diaphragm plate, Buna	3
20	D03-014-1004	Piston	3
21	D10-015-3010	Ball	3
22	D03-043-1000	Valve Cylinder	3
23	D03-034-2110	O-ring, valve cylinder, Buna	3
24	D03-044-1000	Valve Plunger	3
25	D03-045-3110	Spring, sleeve valve	3
26	D03-049-1000	Washer	3
27	D03-048-2210	Snap Ring	3
28	D03-014-1210	Piston Assembly	3
29	D03-026-2210	Pin	2

P300 Hydraulic End Parts Lists

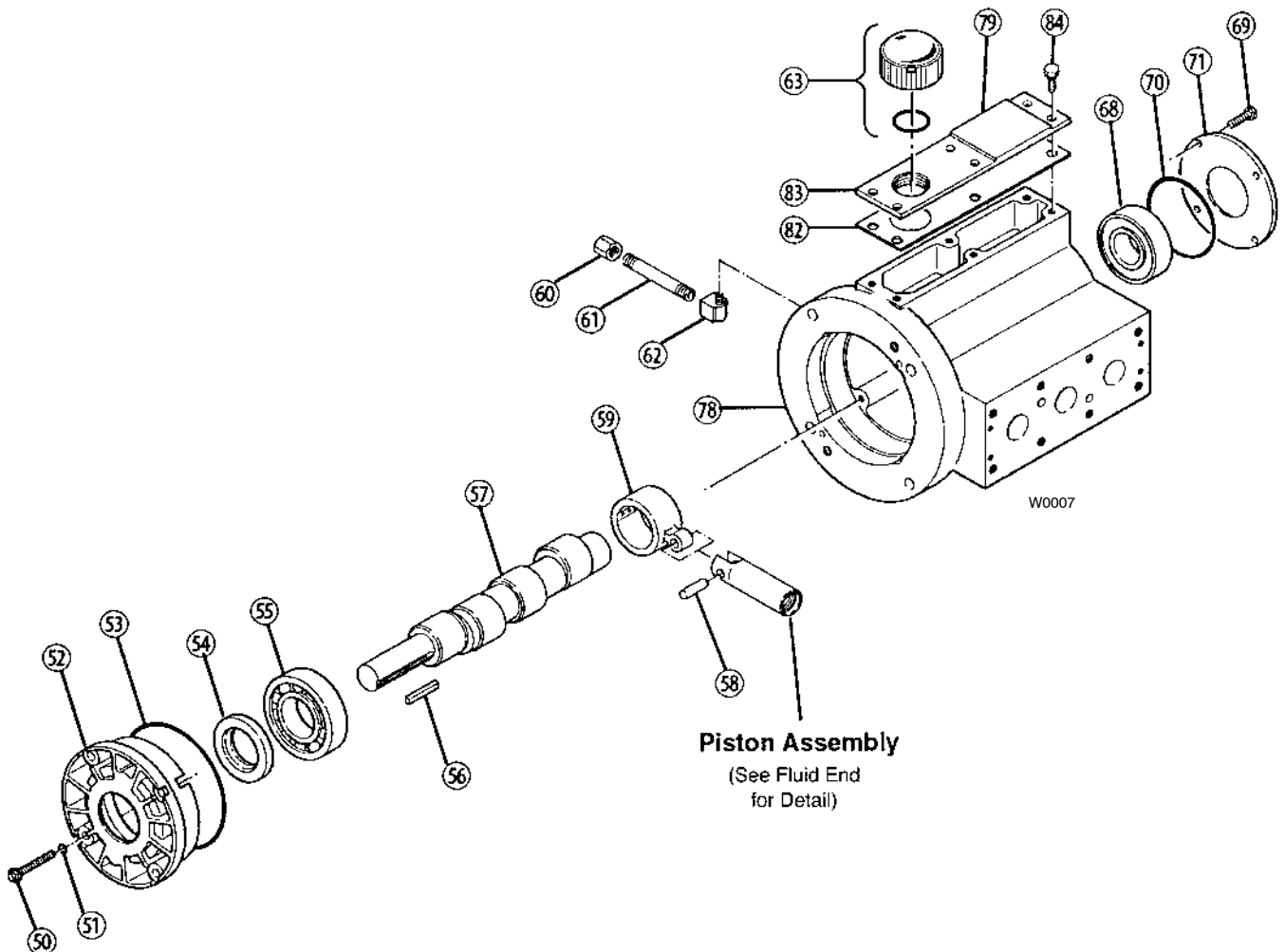
Ref No.	Part Number	Description	Quantity/ Pump
50	G03-086-2010	Bolt, hex flange	4
51	D25-047-2110	O-ring, back cover screws, Buna.....	4
52	D03-131-1000	Back Cover.....	1
53	D03-037-2110	O-ring, back cover, Buna	1
54	D03-031-2110	Seal, Buna.....	1
55	D03-011-2910	Back Bearing.....	1
56	D10-085-2210	Key, shaft	1
57	D03-009-1040	(X) Crank Shaft, shaft-driven, 7/8" O.D.	1
58	D03-133-1000	Pin	3
59	D03-132-1004	Connecting Rod, aluminum-bronze....	3
60	D10-078-2210	Cap, brass, 1/8" npt.....	1
61	D10-077-2210	Pipe, brass, 1/8" npt.....	1
62	D10-076-2210	Elbow, brass, 1/8" npt	1
63	D03-039-1030	Cap with O-ring, oil fill.....	1

Ref No.	Part Number	Description	Quantity/ Pump
68	D03-010-2910	Front Bearing	1
69	D03-087-2010	Cap Screw, hex-head,	4
70	D40-074-2110	O-ring, front cover, Buna.....	1
71	D03-130-1000	Front Cover	1
78	G03-001-1033	Pump Housing	1
79	D10-040-2420	Nameplate.....	1
82	G25-106-2318	Gasket, cover.....	1
83	H25-105-1018	Cover, housing	1
84	G25-090-2010	Cap Screw, hex-head.....	6

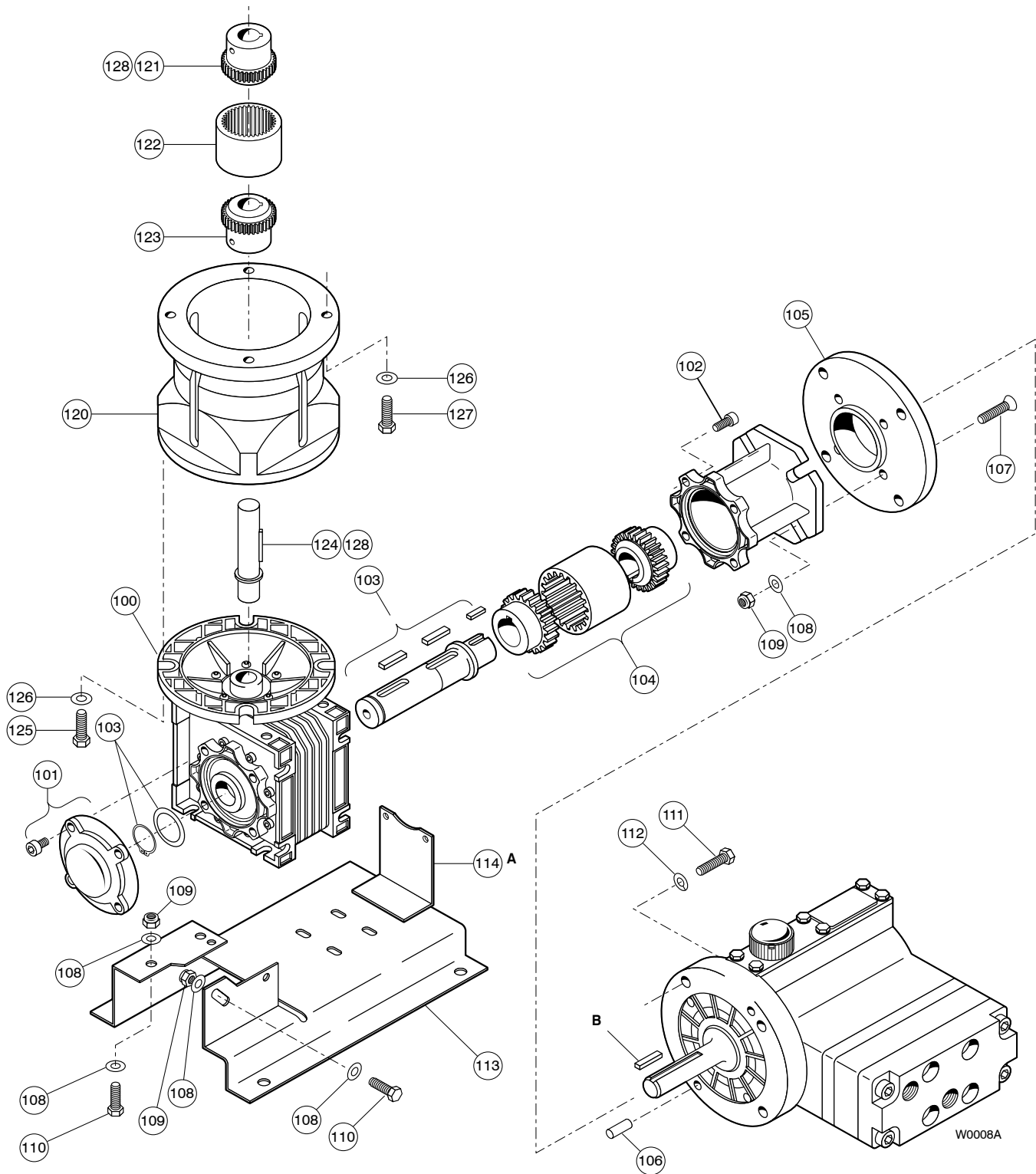
Hydraulic End Service

CAUTION: Do not disassemble or service the hydraulic end.

For assistance, contact Wanner Engineering at (612)332-5681 for the distributor in your area.



P300 Reducer Parts List



A Fasten Item 114 to Pump Assembly using Item 69 from P300 Hydraulic End Parts List.

B Key is included with P300 Pump Assembly.

P300 Reducer Parts List

Ref No.	Part Number	Description	Quantity/ Pump
100	112-200	Reducer, 5:1 ratio, 56C	1
		Reducer, 5:1 ratio, 143/145TC (requires 112-351 Motor Adapter Kit) ..	1
	112-201	Reducer, 7.5:1 ratio, 56C	1
		Reducer, 7.5:1 ratio, 143/145TC (requires 112-351 Motor Adapter Kit) ..	1
	112-202	Reducer, 10:1 ratio, 56C	1
	112-203	Reducer, 15:1 ratio, 56C	1
	112-204	Reducer, 20:1 ratio, 56C	1
	112-205	Reducer, 25:1 ratio, 56C	1
	112-206	Reducer, 30:1 ratio, 56C	1
	112-207	Reducer, 40:1 ratio, 56C	1
	112-208	Reducer, 50:1 ratio, 56C	1
	112-209	Reducer, 60:1 ratio, 56C	1
	112-210	Reducer, 80:1 ratio, 56C	1
	112-211	Reducer, 100:1 ratio, 56C	1
101	112-212	Kit, Protective Cover	1
102	112-213	Kit, Output Flange, FB	1
103	112-225	Kit, Single Output Shaft, P300	1
104	A04-024-1205	Assembly, M24 Coupling 7/8" x 7/8" ...	1
105	D03-100-1012	Adapter, P300	1
106	D03-026-2211	Dowel Pin	2
107	D03-101-2012	Screw, FHSCS	4
108	S1156-100	Washer, flat	10
109	100-938	Lock Nut	7
110	100-948	Screw, HHCS	3
111	D03-068-2010	Screw, HHCS	4
112	G25-048-2010	Lock Washer, M10.....	4
113	112-217	Metering Pump Base, Carbon Steel, epoxy painted.....	1
	112-218	Metering Pump Base, 304 SST	1
114	112-219	Plate, Support, SST	1

Ref No.	Part Number	Description	Quantity/ Pump
The following parts are used on 112-200 and 112-201 Reducers with 143/145TC only			
-	112-351	Motor Adapter Kit	1
		(includes items 120 thru 128)	
120	A04-032-1033	Adapter, Motor, NEMA 143/5TC	1
121	A04-110-2200	Hub, 7/8" M28	1
122	A04-109-2200	Sleeve, M28, Nylon.....	1
123	A04-110-2205	Hub, 5/8", M28.....	1
124	112-025	Kit, Shaft	1
125	G25-029-2011	Screw, M10 x 1.5	4
126	100-037	Washer, flat	8
127	D10-087-2012	Screw, HHCS	4
128	A04-085-2210	Key, 0.187 square.....	2

P300 Troubleshooting

Problem	Probable Cause	Solution
Motor/Pump Does Not Operate:	No power.	Supply correct power according to motor requirements.
	Blown fuse/tripped circuit breaker.	Replace/reset, eliminate circuit overload.
	Shaft coupling to pump not in place.	Install proper coupling hardware (see parts list).
	Current overload - motor.	Motor not rated for pump operating conditions - install proper motor.
	Thermal overload - motor.	Motor not rated for pump and/or ambient operating conditions - supply cooling or install proper motor.
	Faulty motor drive/controller.	Repair/replace.
	Faulty motor.	Repair/replace.
	Low liquid level in supply tank (if low-level shut-off is used).	Fill tank.
No Delivery	Supply tank empty.	Fill tank.
	Inlet line or strainer clogged.	Clear debris and flush, or replace.
	Inadequate supply pressure at pump inlet.	Increase supply pressure by raising fluid level in tank, raising tank, or pressurizing suction tank.
	Inlet line too restrictive.	Increase inlet line diameter and/or decrease inlet line length.
	Fluid viscosity too high.	Reduce viscosity if possible (by heat or some other means). Increase inlet line diameter and/or decrease inlet line length. Increase supply pressure.
	Vapor lock/cavitation.	Increase inlet pressure. Decrease fluid temperature.
	Pump valves held open or worn out.	Clear debris and flush, or replace (see Fluid End Service)
	System relief valve actuating.	Adjust relief valve, or repair, clean, or replace with new relief valve.
Delivery Too Low and/or Erratic	Review all Probable Causes and Solutions in Problem 2 No Delivery above.	
	Air leak(s) in inlet line.	Locate all leaks and repair.
	System back pressure too low.	Adjust back pressure valve to higher setting. Install back pressure valve if none in system.
	Pumped fluid characteristics changed.	Monitor supply tank temperature to determine if fluid is too hot (leading to cavitation) or too cold (increasing fluid viscosity). Stabilize temperature at suitable level to resolve problem. Check for entrapped air in the fluid supply system.
	Inlet supply pressure changed.	Monitor inlet supply pressure (at the pump) to determine if it is too low, causing a starved condition/cavitation. Stabilize pressure at suitable level to resolve problem.
	Pump OK - Calibration system or flow meter error.	Evaluate components and repair/correct problem(s).
	Oil condition in pump hydraulic end changed.	Check oil level - if low evaluate for source of leakage. Consult factory for hydraulic end service.
		Change oil per recommended guidelines in maintenance section.
Delivery Too High and/or Erratic.	System back pressure too low.	Adjust back pressure valve to higher setting. Install back pressure valve if none in system.
	Inlet supply pressure changed.	Monitor inlet supply pressure (at the pump) to determine if it is too high, causing a "flow-through" condition. Stabilize pressure at suitable level to resolve problem.
	Pump OK - Calibration system or flow meter error.	Evaluate components and repair/correct problem(s).

P300 Replacement Parts Kits

TO ORDER REPLACEMENT PARTS KIT: A Replacement Parts Kit contains 9 digits corresponding to customer-specified design options.

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Digit	Order Code	Description
1-2	P3	Pump Configuration For all P300 Pumps
3		Kit Designator
	K	Complete Fluid End Kit*
	D	Diaphragm Kit*
	V	Valve Kit
4-5		Pump Head Version
	51	Standard
6		Spring Retainers
	R	For 304 Stainless Steel pump head
	S	For 316 Stainless Steel pump head
	X	Not included in Diaphragm Kit
7		Diaphragm & O-ring Material
	G	Viton®-XT
	S	Viton®-XT (Food Contact Oil)
	X	Viton®-XT (Synthetic Oil)
	T	Buna-N-XS
	F	Buna-N-XS (Food Contact Oil)
	Y	Buna-N-XS (Synthetic Oil)
8-9		Check Valve Material (Valve Spring / Valve & Seat)
	SS	316 SST / 316 SST
	XX	Not included in Diaphragm Kit

* Includes Hydraulic End Oil

Part Number†	Description	Qty	Kit Designator		
			K	D	V
D03-018-___	Diaphragm	3	•	•	
D25-073-___	O-ring, manifold	2	•	•	•
D25-046-___	O-ring, valve seat	6	•		•
D03-020-___	Valve seat	6	•		•
D03-021-___	Valve	6	•		•
D03-022-___	Valve spring	6	•		•
D03-023-___	Retainer, valve spring	6	•		•
A01-113-3400	Thread locker	1	•	•	
	Hydraulic End Oil	(1.5 qt)	•	•	

† Last four digits of part numbers with -___ refer to specific material of construction.

Limited Warranty

Wanner Engineering, Inc. extends to the original purchaser of equipment manufactured by it and bearing its name, a limited one-year warranty from the date of purchase against defects in material or workmanship, provided that the equipment is installed and operated in accordance with the recommendations and instructions of Wanner Engineering, Inc. Wanner Engineering, Inc. will repair or replace, at its option, defective parts without charge if such parts are returned with transportation charges prepaid to Wanner Engineering, Inc., 1204 Chestnut Avenue, Minneapolis, Minnesota 55403.

This warranty does not cover:

1. The electric motors (if any), which are covered by the separate warranties of the manufacturers of these components.
2. Normal wear and/or damage caused by or related to abrasion, corrosion, abuse, negligence, accident, faulty installation or tampering in a manner which impairs normal operation.
3. Transportation costs.

This limited warranty is exclusive, and is in lieu of any other warranties (express or implied) including warranty of merchantability or warranty of fitness for a particular purpose and of any non-contractual liabilities including product liabilities based on negligence or strict liability. Every form of liability for direct, special, incidental or consequential damages or loss is expressly excluded and denied.



1204 Chestnut Avenue, Minneapolis, MN 55403
TEL: (612) 332-5681 FAX: (612) 332-6937
TOLL-FREE FAX [US only]: (800) 332-6812

www.hydra-cell.com/metering
email: sales@wannereng.com

© 2005 Wanner Engineering, Inc. Printed in USA
P300-991-2400B 8/2005, Revised 2/2007