H800 Engineering Operation & Maintenance

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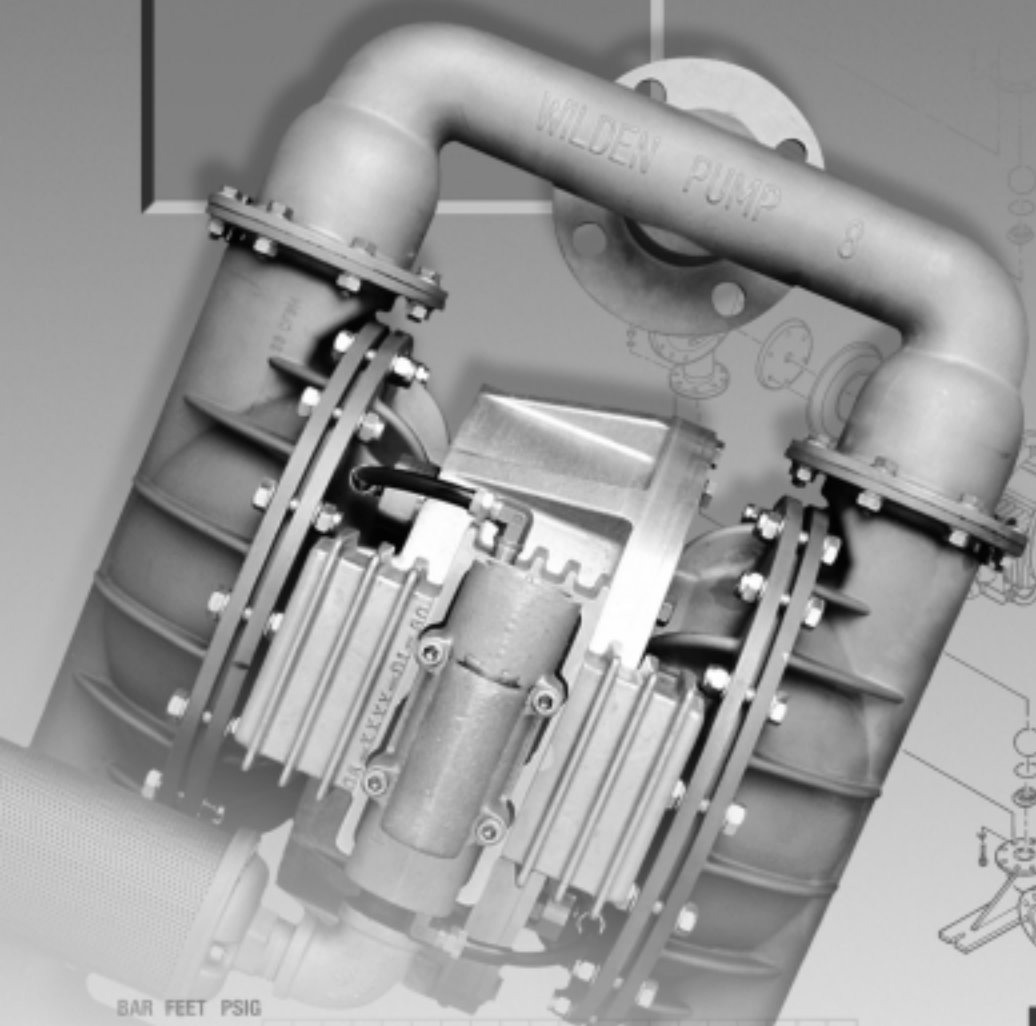


WILDEN®

A DOVER COMPANY

H800 Metal Pumps

EOM-H800 6/02
REPLACES EOM-T8HP 3/01

THE H800 HIGH PRESSURE PUMP

A Powerful New Solution…

Wilden air-operated, double-diaphragm pumps have been the cost effective solution to problematic pumping applications for over 40 years. Inherent characteristics enable them to excel in a wide variety of applications where other pump types fail. The introduction of the H800 expands Wilden's application range to include head pressures up to 250 psig. Wilden's patent pending high pressure technology yields a 250 psig discharge pressure while maintaining many of the same standard Wilden pump features:

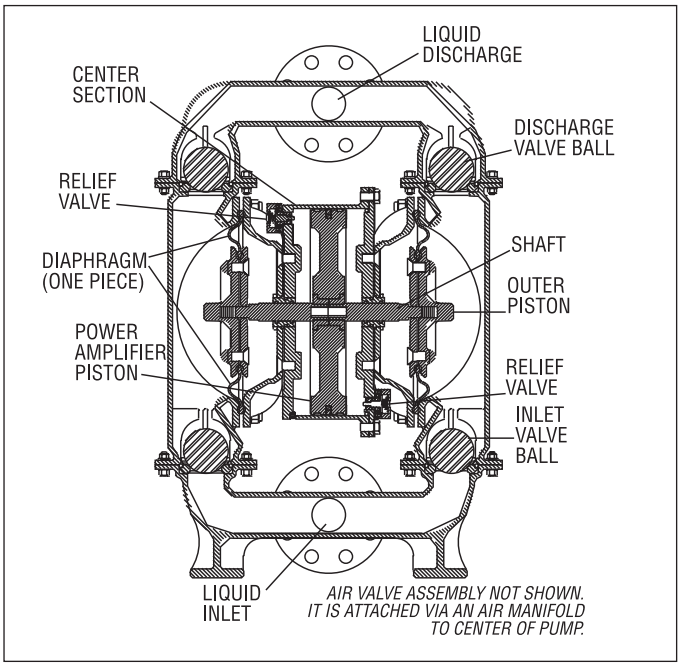
- Ease of operation
- Variable speed
- Variable pressure
- Dead head capability
- Intrinsically safe
- Ability to pass solids
- Ability to run dry
- No dynamic seals

The Power Principle…

The H800 utilizes an integral power amplifier piston together with two diaphragms to yield a pressure ratio of 3:1 (e.g. 80 psig air inlet will develop pump discharge pressures up to 250 psig). Air is simultaneously directed behind the amplifier piston as well as one of the diaphragms via specialized air manifold porting. The sum of these two surface areas is three times greater than the diaphragm surface area. Therefore, the supplied air pressure is internally amplified which results in a 3:1 pressure output ratio without sacrificing efficiencies.

Air Powered Pump…

Two diaphragms (one located on each side of the pump) are connected via shafts to the amplifier piston. As the compressed air is routed to the backside of the power amplifier piston, as well as one of the diaphragms, the diaphragm moves outward and discharges the process fluid. At the same time, the opposite diaphragm is pulled inward creating a pressure drop in the liquid chamber which allows fluid to enter the pump. As the amplifier piston and diaphragm complete their stroke, the amplifier piston contacts a pressure relief valve. This pressure relief valve initiates air valve piston movement which re-directs the compressed air supply to the other side of the power amplifier piston and opposite diaphragm, therefore, reciprocating the pump.

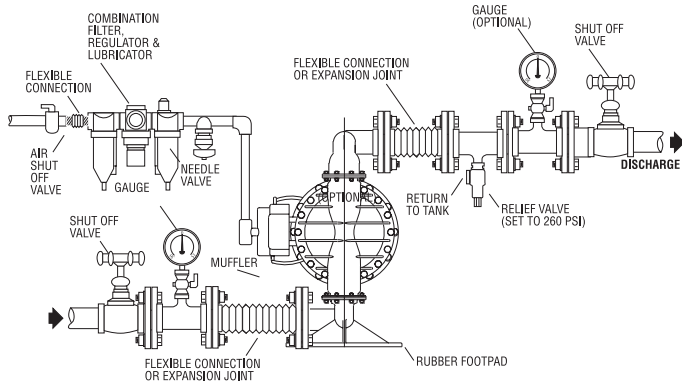


WILDEN PUMP DESIGNATION SYSTEM

T8/XXXX XX / XX / XXX /*xxx*

- ***xxx*** SPECIALTY CODE (IF APPLICABLE)
- XXX O-RINGS
- XX VALVE SEAT
- XX VALVE BALLS
- XX DIAPHRAGMS
- XXXX AIR VALVE
- XXXX CENTER BLOCK OR CENTER SECTION
- XXXX AIR CHAMBERS OR CENTER SECTION
- XX WETTED CONSTRUCTION
- T8 MODEL

SUGGESTED INSTALLATION



CAUTIONS! READ FIRST

Temperature Limitation:
107°C (225°F) Operating Temperature
107°C (225°F) Cleaning Temperature

CAUTION: Maximum temperature limits are based upon mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperatures.

CAUTION: Verify that process fluid and cleaning chemicals are compatible with all pump components. Consult Chemical Guide (RBG E-4) for chemical compatibility and temperature limitations.

CAUTION: ALWAYS WEAR SAFETY GLASSES WHEN PERFORMING INSPECTION, CLEANING, OR MAINTENANCE. READ ALL INSTRUCTIONS PRIOR TO INSTALLATION.

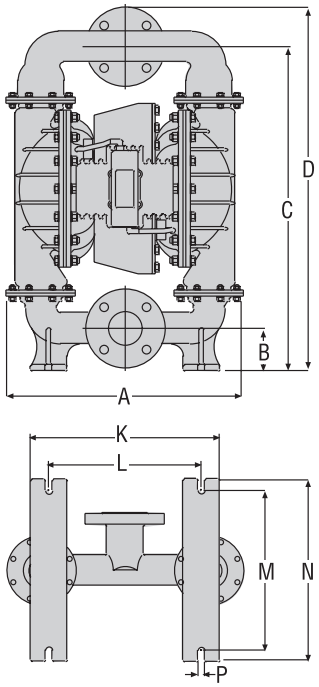
CAUTION: Always drain and flush pump prior to performing maintenance.

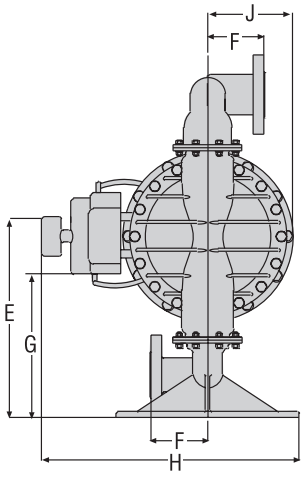
CAUTION: 85 psig maximum air inlet pressure. Do not exceed 250 psig liquid discharge pressure.

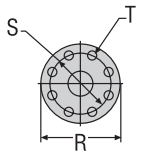
CAUTION: All piping, valves, gauges and other components installed on the liquid discharge must have a minimum pressure rating of 300 psig.

SECTION 1

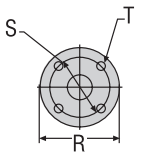
DIMENSIONAL DRAWING
WILDEN MODEL H800







ANSI FLANGE



DIN FLANGE

DIMENSIONS – H800		
ITEM	METRIC (mm)	STANDARD (inch)
A	493.7	19.43
B	88.9	3.50
C	676.3	26.62
D	758.8	29.87
E	419.1	16.50
F	117.5	4.62
G	303.2	11.93
H	539.7	21.25
J	176.2	6.93
K	393.7	15.50
L	317.5	12.50
M	325.4	12.81
N	379.4	14.93
P	14.3	.56
	DIN DN50	ANSI 300 # CLASS
R	165.1	6.50
S	124.9	5
T	Ø18.0	Ø.75

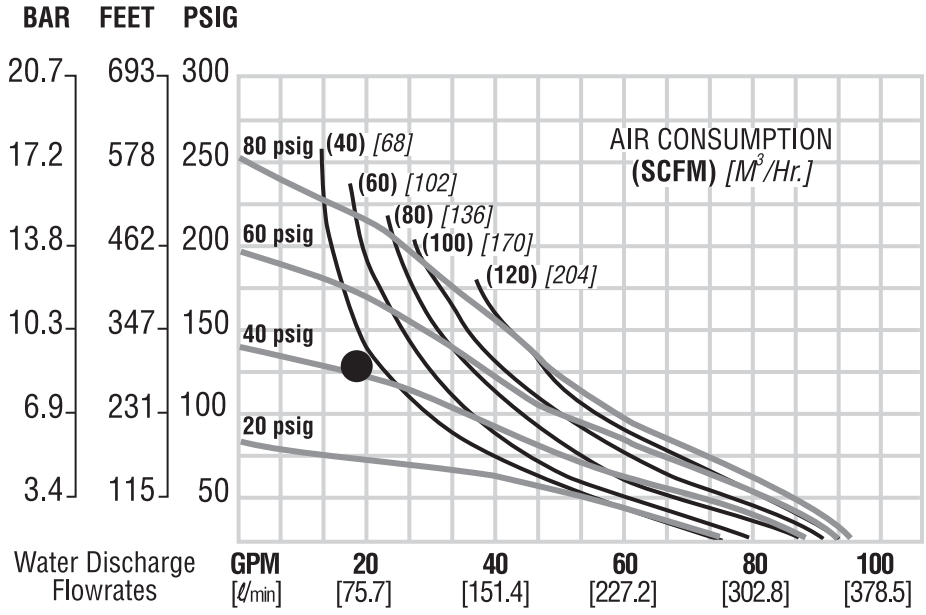
SECTION 2A

PUMP PERFORMANCE CURVE
WILDEN MODEL H800

Height .....758.8 mm (29⅞")
Width .....493.7 mm (19⅞₁₆")
Depth .....539.7 mm (21¼")
Weight ..... Stainless Steel 128.4 kg (283 lbs.)
Air Inlet .....1.27 mm (½")
Inlet .....5.08 mm (2")
Outlet .....5.08 mm (2")
Suction Lift ..... 3.66 m Dry (12')
9.14 m Wet (30')
Displacement per Stroke .....1.67 l (0.44 gal.)
Max. Flow Rate.....359.6 l/m (95 gpm)
Max. Size Solids.....1.27 mm (½")

Example: To pump 20 gpm against a discharge head of 125 psig requires 42 psig and 38 scfm air consumption. (See dot on chart.)

[1]Displacement per stroke was calculated at 70 psig air inlet pressure against a 75 psig head pressure.



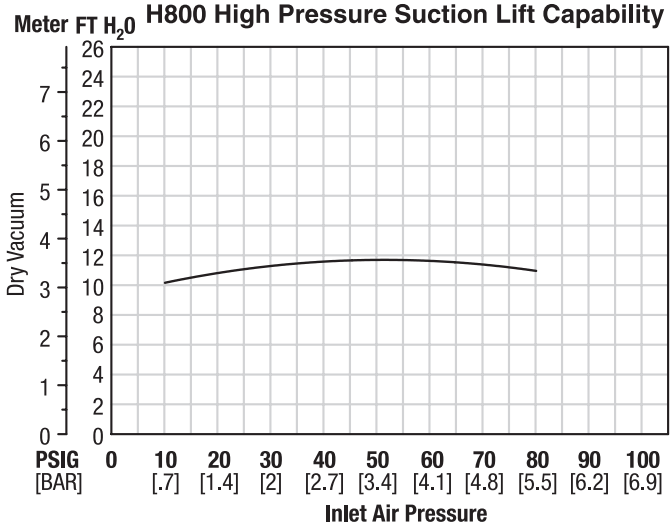
Flow rates indicated on chart were determined by actually pumping water in calibrated tanks.

For optimum life and performance, pumps should be specified so that daily operation parameters will fall in the center of the pump performance curve.

SECTION 2B

SUCTION LIFT CURVE AND DATA
MODEL H800

Suction lift curves are calibrated for pumps operating at 305 m (1,000') above sea level. This chart is meant to be a guide only. There are many variables which can affect your pump's operating characteristics. The number of intake and discharge elbows, viscosity of pumping fluid, elevation (atmospheric pressure) and pipe friction loss all affect the amount of suction lift your pump will attain.



SECTION 3

INSTALLATION
MODEL H800

Months of careful planning, study, and selection efforts can result in unsatisfactory pump performance if installation details are left to chance. Long term satisfaction can be assured if reasonable care is exercised throughout the installation process.

Operator safety, liquid supply vessels, discharge sites, noise levels, and other logistical factors usually dictate where the pump will be installed on the production floor. Within the framework of these and other existing conditions, every pump should be located in such a way that four key factors are balanced against each other for maximum advantage.

1. **ACCESS:** Pumps must be cleaned, inspected, and maintained on a regular basis in accordance with company or Federal protocol. To this end, the installation site should be easily accessible allowing personnel room to carry out their tasks. Ease of access will reduce downtime and maintenance costs.

2. **AIR SUPPLY:** Every pump location should have an air line large enough to supply the volume of air necessary to achieve the desired pumping rate. (Refer to the pump performance chart on page 1.) 3/4" air line is the minimum size required. Most applications require far less than the maximum air inlet pressure of 85 psig. (Refer to pump performance chart.)

For best results, the air supply should be free of pipe scale and moisture. The use of an air filter installed just prior to the pump will eliminate the majority of any pipeline contaminates. It is important that this filter does not restrict the air volume below the value required to achieve the desired pumping rate. The filter should be cleaned periodically to ensure its operation integrity. The use of an oil with arctic characteristics (ISO 15-5 wt) will reduce friction resulting in longer part life. An air regulator and needle valve installed on the air supply line enables the operator to adjust pump speed and therefore, flow rate. The pump's supply air line should be connected to the top of the main air header so that water does not run down from the main air header and into the pump. Excessive moisture can crystallize in the pump forming ice which blocks air ports causing reliability concerns.

A muffler installed on the discharge port will reduce sound levels below OSHA specifications. Sound levels will vary depending on air inlet and liquid discharge pressure; therefore, an aftermarket muffler may be needed to satisfy your ecosystem needs.

3. **ELEVATION:** The pump can be installed in such a way that it has positive liquid inlet pressure or that a suction lift condition exists. The maximum positive liquid inlet pressure is 10 psig when pump is in operation. Excessive positive liquid inlet pressure will reduce diaphragm life. The maximum suction lift is listed in Section 2 on page 1. To avoid loss of prime and erratic operation in suction lift conditions, a foot valve can be installed at the end of the suction pipe.

4. **PIPING:** Final determination of the pump site should not be made until all piping concerns are addressed. The most advantageous pump site will involve the shortest and straightest suction and discharge piping possible. Unnecessary elbows, bends, fittings, and components will increase head pressure and therefore decreasing efficiencies. Pipe sizes should be selected so as to keep friction losses to a minimum. All piping should be supported independently of the pump. Approximately 18" of non-collapsible hose or expansion joints should be installed immediately prior to and after the pump to isolate it from the piping. This practice protects the pump and the pipe from undue stress. Suction and discharge pipe size should be at least 2" diameter. If viscous product is being pumped, larger pipe size will reduce friction loss, lower air requirements and/or increase flow rate. It is critical that all fittings and connections are airtight or a reduction in suction lift capability and/or flow rate will result. The pump system should be thoroughly flushed with chemically compatible sanitizer prior to initiating line in production.

NOTE: The air pressure regulator should be set so that the pressure does not exceed 80 psig. Pressure relief valve should be set at 260 psig so that pressure does not exceed safe operating pressures.

SECTION 4
SUGGESTED OPERATION
MODEL H800

Do not attempt to operate the pump until you have read the installation section (Section 3) of this manual. Verify that the pump is chemically compatible to the pumping fluid and assure that the discharge line is positioned in such a way that the pumped fluid will be contained. It is important that all pump hardware (nuts, bolts, etc.) be tightened.

There are two ways of controlling flow rate which allow flexibility in design. 1) Adjusting the air inlet volume and/or pressure of the air supply line. As air volume is increased, the faster the pump should reciprocate. As air pressure is increased, the more head pressure the pump can overcome. 2) Adjusting the discharge head with a valve. As pressure is increased, the flow rate should decrease.

If the pump is to be installed as a batching or metering pump, the Wilden FCSI computerized batching computer can automatically operate the pump resulting in repeatable batch quantities.

NOTE: The H800 has a minimum stroke rate of 2 strokes per minute. If fewer strokes per minute are required, consult the factory.

SECTION 5
INSPECTION, CLEANING & MAINTENANCE

INSPECTION: Periodic inspection reduces unscheduled pump downtime. Individuals responsible for inspecting and maintaining lubrication levels for pumps should also check for any abnormal noise or leakage. Personnel familiar with the pumps' construction and service should be informed of any abnormalities that are detected.

RECORDS: When service is required, a record should be made of all necessary repairs and replacements. Over a period of time, such records can become a valuable tool for predicting and preventing future maintenance problems and unscheduled downtime. In addition, accurate records make it possible to identify pumps that are poorly suited to their applications.

MAINTENANCE AND CLEANING: Read the entire Engineering, Operation and Maintenance Manual before starting any maintenance. To avoid serious injury or health hazards, neutralize any chemicals present in the pump prior to maintenance. Before cleaning, check to make sure that your cleaning solution is chemically compatible with the pump's elastomers and wetted parts. Some cleaning fluids can cause severe damage to diaphragms, balls and seals. Ensure that cleaning fluid temperatures do not exceed the recommended limitations of elastomers and materials of construction. When flushing the pump, disconnect the air line from the pump to avoid damaging diaphragms, pistons and shafts. Maximum inlet pressure for cleaning is 50 psig.

SECTION 6
TROUBLESHOOTING

Pump will not run or runs slowly.

1. Verify air pressure and volume required and available based on pump performance curve on page 1.
2. Check air inlet screen and air filter for debris.
3. Check for sticking air valve, remove and flush air valve with cleaning fluid.
4. Check for rotating piston in air valve. (Replace air valve end cap if needed.)
5. Check for worn out air valve or pump amplifier piston slipper seal. Replace if necessary.
6. Check center block seals. If worn excessively, they will not seal and air will simply flow through pump and out air exhaust. Use only Wilden seals as they are of special construction.
7. Check for sticking pressure relief valve. Clean or replace assembly.

Pump runs but little or no product flows.

1. Check for pump cavitation; slow pump speed down to allow material to enter pumping chambers. Increase speed accordingly.
2. Check for sticking ball checks. If material being pumped is not compatible with pump elastomers, swelling may occur. Replace ball with the proper elastomers.
3. Check to make sure all suction connections are air tight, especially hardware around intake balls.
4. Verify pump is installed within its suction lift capability.

Pump air valve freezes.

Check for excessive moisture in compressed air. Either install dryer or hot air generator for compressed air.

Air bubbles in pump discharge.

1. Check for ruptured diaphragm.
2. Check tightness of hardware, especially at intake manifold.
3. Check for loose inner piston bolts.

Product comes out air exhaust.

1. Check for diaphragm rupture.
2. Check tightness of hardware.
3. Check for loose inner piston bolts.

SECTION 7A
DIRECTIONS FOR DISASSEMBLY / REASSEMBLY
MODEL H800

CAUTION: Before any maintenance or repair is attempted, the compressed air line to the pump should be disconnected and all air pressure allowed to bleed from pump. Disconnect all intake, discharge, and air lines. Drain the pump by turning it upside down and allow any fluid to flow into a suitable container. Wetted flushing of parts may be required prior to handling.

The Wilden model H800 *(Figure 1)* is a high-pressure, air-operated, double-diaphragm pump with all wetted parts of 316 stainless steel. The center section consists of an aluminum power amplifier cylinder, 316 S.S. air chambers, and a brass air valve. All O-rings and seals used in the pump are of special materials and should only be replaced with factory-supplied parts.

To expedite parts ordering, please find an exploded view of the H800 at the back of this manual.

DISASSEMBLY

Before actual disassembly is started, turn pump upside down and drain all liquid trapped in the pump into a suitable container. Be sure to use proper caution if liquid is corrosive or toxic. Read all instructions prior to disassembly.

TOOLS REQUIRED

⅞" Open end wrench
⅝" Socket
¾" Socket and open end wrench
½" Socket and open end wrench
⅜" Open end wrench
1" Socket
5/16" Hex wrench
¼" Hex wrench
5/64" Hex wrench
5/32" Hex wrench
50 ft. lbs. Torque wrench

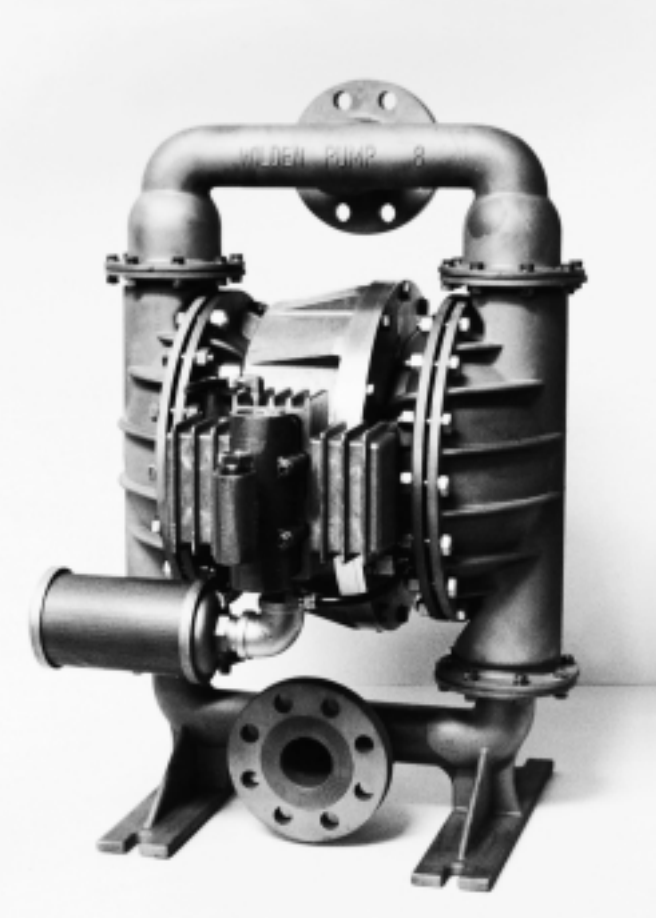


Figure 1

SECTION 7B
PRESSURE RELIEF VALVE DISASSEMBLY

STEP 1

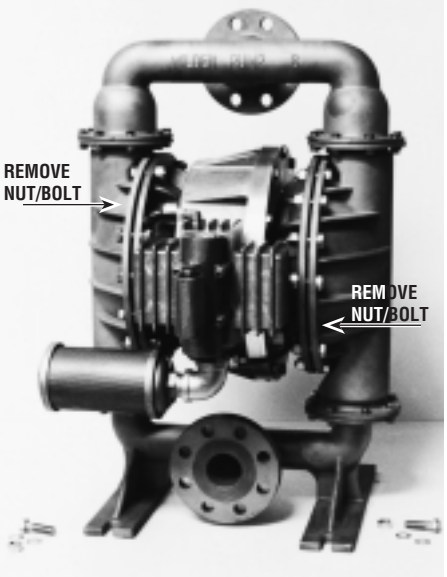


Figure 2

Figure 3

Figure 4

Remove liquid chamber bolts/nuts adjacent to relief valves with a ¾" socket and box end wrench. Loosen tubing nuts located by each pressure relief valve with a 9/16" wrench. *(Figure 3.)*

Loosen pipe fitting and elbow with a ½" wrench so that relief valve can be removed. *(Figure 4.)*

STEP 2

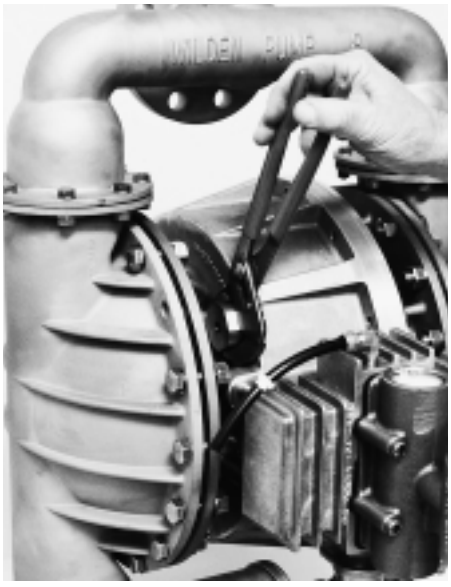


Figure 5

Figure 6

Figure 7

Remove each pressure relief valve with channel lock pliers. If pressure relief valve needs inspection, simply remove four flat head screws with a 5/64" hex wrench *(Figure 6).* Check for broken spring or damaged O-ring. Clean parts and re-assemble. NOTE: Pressure relief valve is only sold as an assembly.

SECTION 7C
AIR VALVE DISASSEMBLY

STEP 1

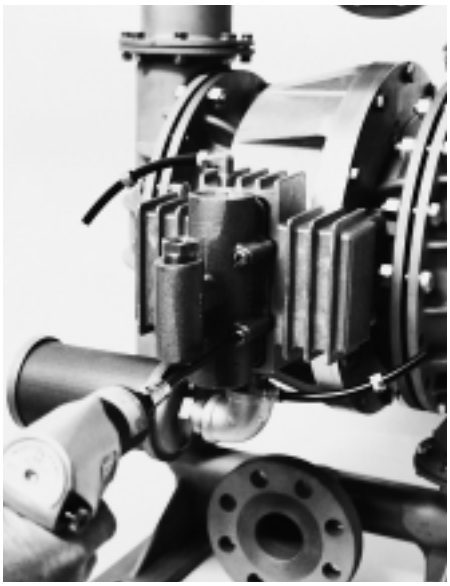


Figure 8

Remove air valve and gasket by removing 4 hex bolts (¼" hex wrench or socket).

Figure 9

Remove snap ring which retains the air valve end cap. *(Figure 9.)*

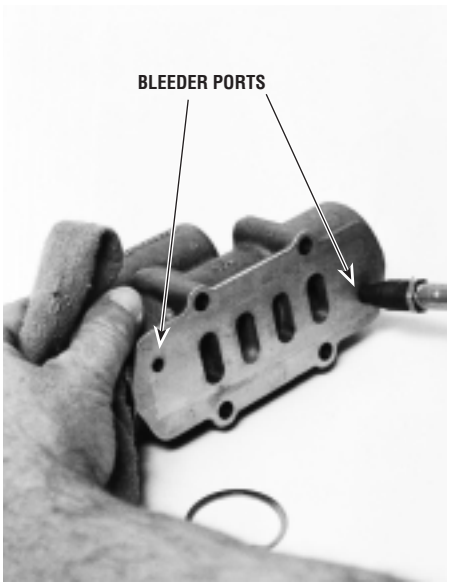


Figure 10

Alternately pressurize top round (bleeder) holes with air gun until end cap pops off into rag. (Caution: End cap may come out with considerable force.)

STEP 2

Figure 11

Check air valve, end cap O-ring, and guide pin for abrasion or chemical attack. Replace parts as needed.

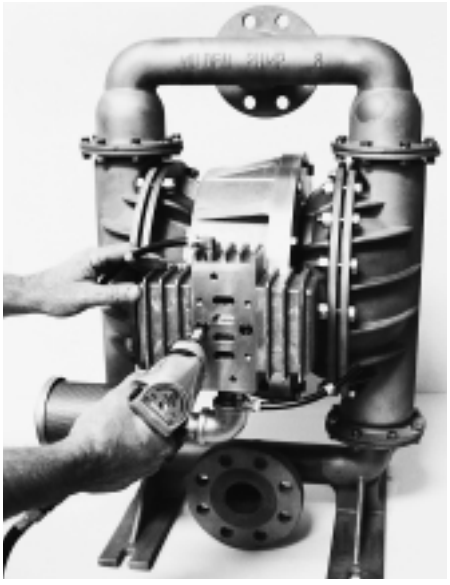


Figure 12

Remove air valve manifold by unloosening qty. 2 socket head cap screws with a 5/16" hex wrench.

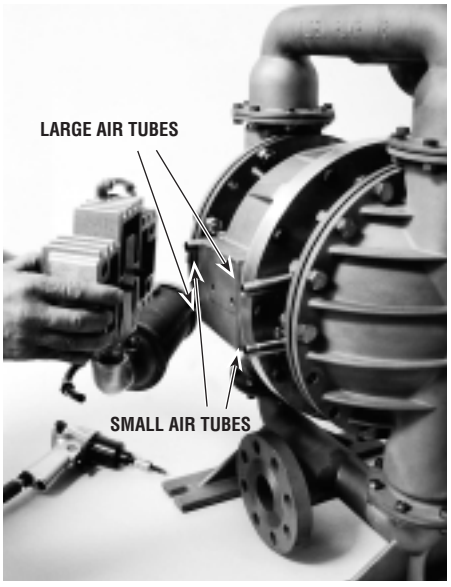


Figure 13

Remove qty. 4 air tubes. (Note: 2 small, 2 large.)

SECTION 7D
WETTED PARTS DISASSEMBLY

STEP 1

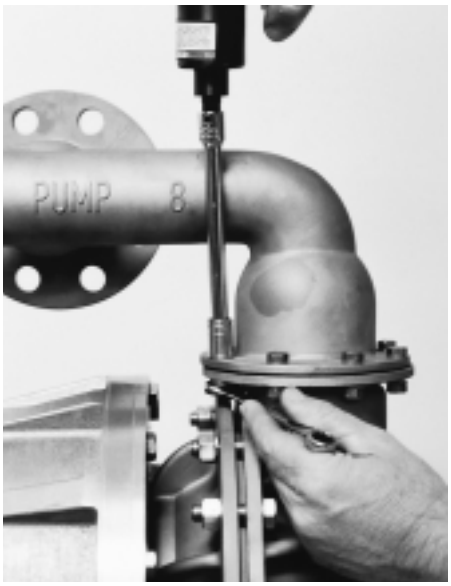


Figure 14

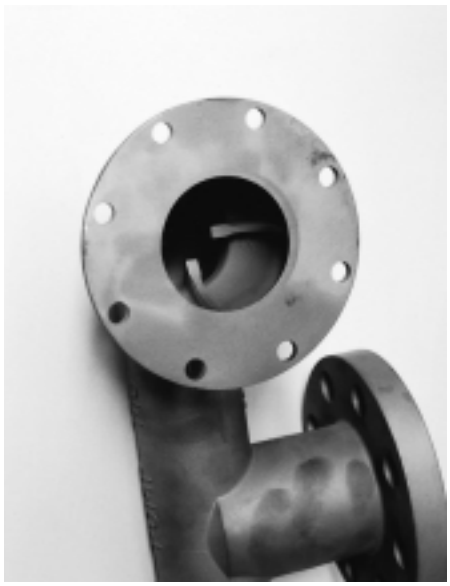


Figure 15

Figure 16

Remove discharge manifold bolts with ½" wrench and socket. *(Figure 14.)* Remove discharge manifold and inspect ball cage area for abrasion. *(Figure 15.)* Remove top valve balls and inspect for abrasion, chemical attack, or nicks. Replace as needed. Remove valve seat O-ring and valve seat (square side up) and inspect for abrasion and chemical attack. Replace as needed. *(Figure 16.)*

STEP 2

Figure 17

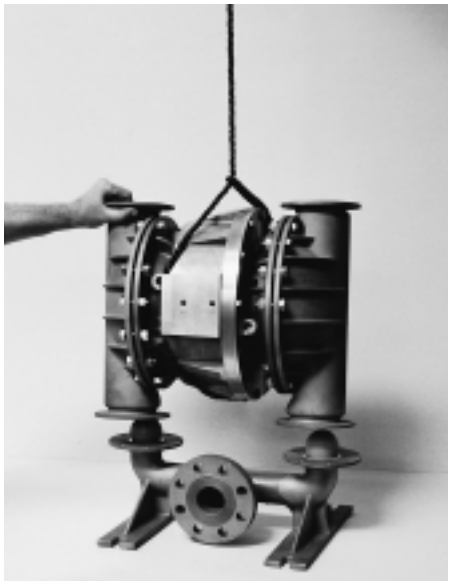


Figure 18

Figure 19

Remove inlet manifold bolts with two ½" wrenches. *(Figure 17.)*

Remove pump body from inlet manifold with the assistance of a crane or forklift with straps. (Note: the pump body is heavy.) Keeping the pump suspended, remove liquid chamber bolts located on front side of pump with two ¾" wrenches. Drain plugs are located on the bottom of power cylinder to drain liquid which may have entered the air chambers if diaphragm failed.

Lower the pump body onto the air valve mounting base (flat side of power cylinder). Remove bolts on back side of unit and remove both liquid chambers.

SECTION 7E
CENTER SECTION DISASSEMBLY

STEP 1

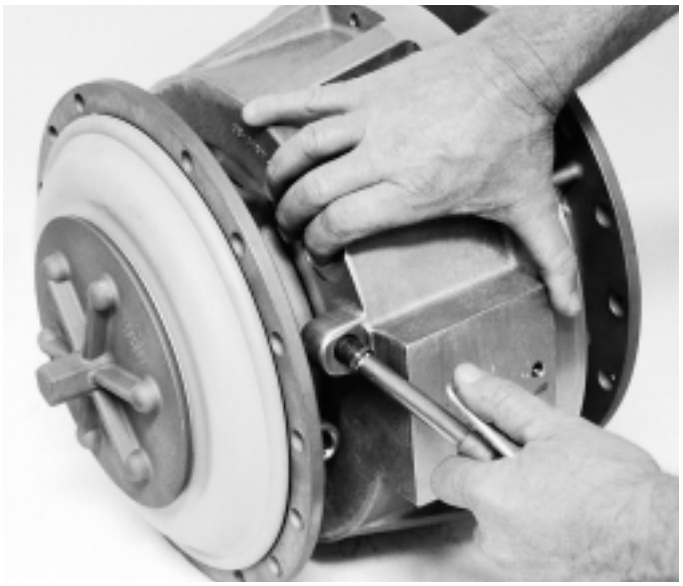


Figure 20

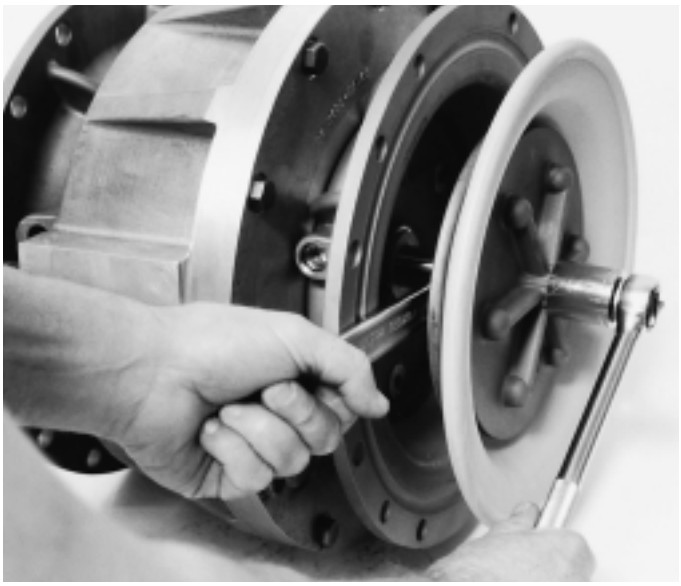


Figure 21

Rotate power cylinder so that front of power cylinder is accessible. Apply air pressure via air gun to air tube port and place suitable object over relief valve port to create back-pressure. *(Figure 20.)* This operation will shift pump and invert diaphragm for ease of disassembly. Place a ⅞" open end wrench on flats of shaft (other side of pump). Place a 1" socket on outer piston and remove diaphragm assembly by turning counterclockwise. *(Figure 21.)* Shift assembly back over to other side by supplying air to opposite ports and then remove the opposite diaphragm assembly.

STEP 2

Figure 22

Figure 23

Remove inner piston by removing qty. 6 flat head screws with 5/16" hex wrench. Replace diaphragm.

Remove qty. 2 air chamber with gasket by removing qty. 6 flat head screws with a 5/16" hex wrench.

STEP 3

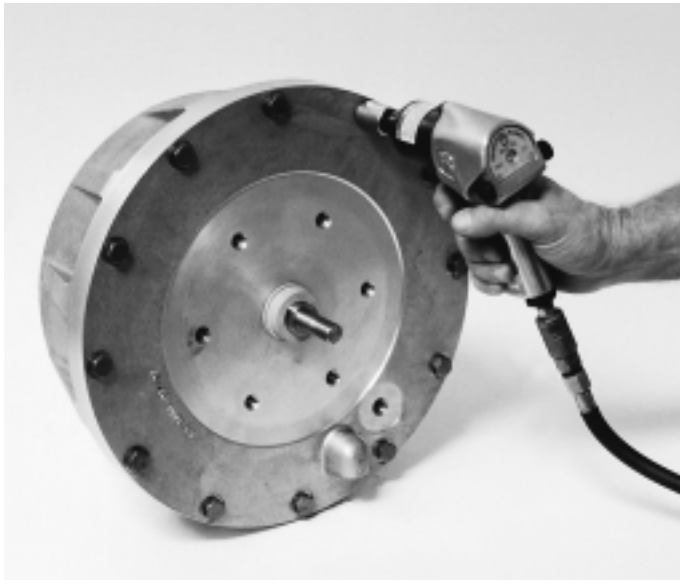


Figure 24

Remove power cylinder cover by removing qty. 12 hex head bolts with a ⅝" socket or wrench.

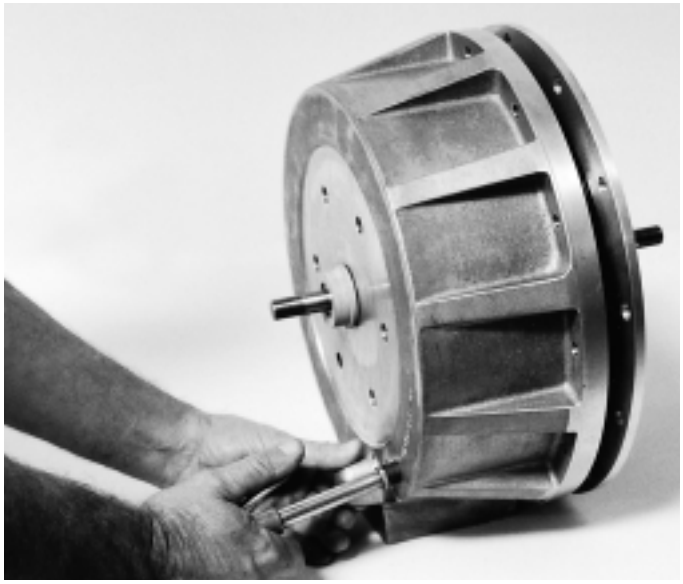


Figure 25

Apply air pressure via air gun to relief valve port to pressurize power cylinder and “pop-off” power cylinder cover and shaft bushing. Check seal integrity in shaft bushing and O-ring on cover.

STEP 4

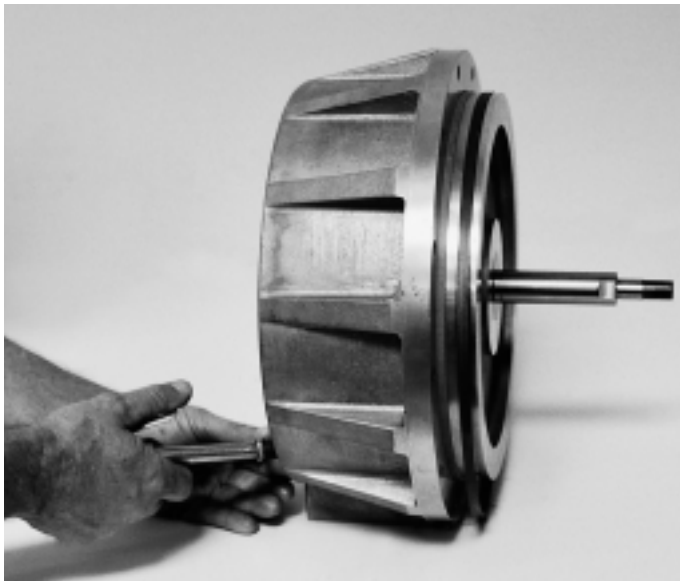


Figure 26

Continue pushing power cylinder piston out by applying air pressure to pressure relief port.

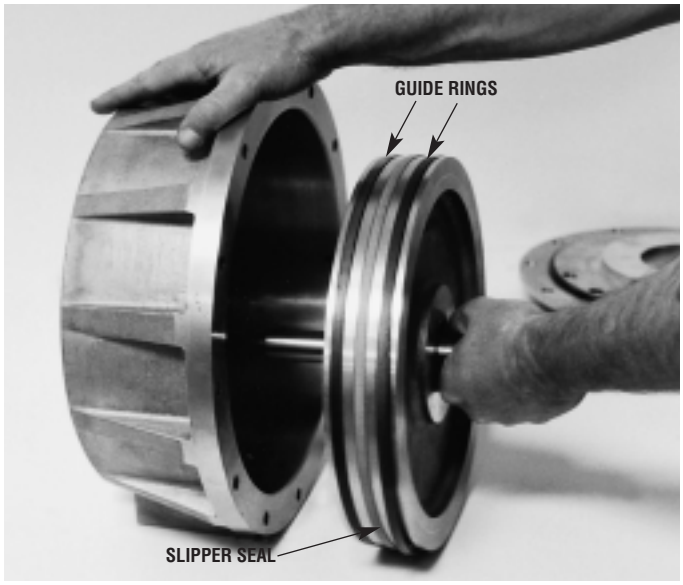


Figure 27

Pull out power cylinder piston with hand. Inspect and/or replace power cylinder slipper seal and guide rings, which is sold as an assembly. Clean center section and power piston prior to reassembly.

STEP 5

Inspect shafts for wear. To replace, remove shafts from power piston. Place ⅞" open end wrenches on flats of shafts and turn counterclockwise. Pull shaft and bushing out.

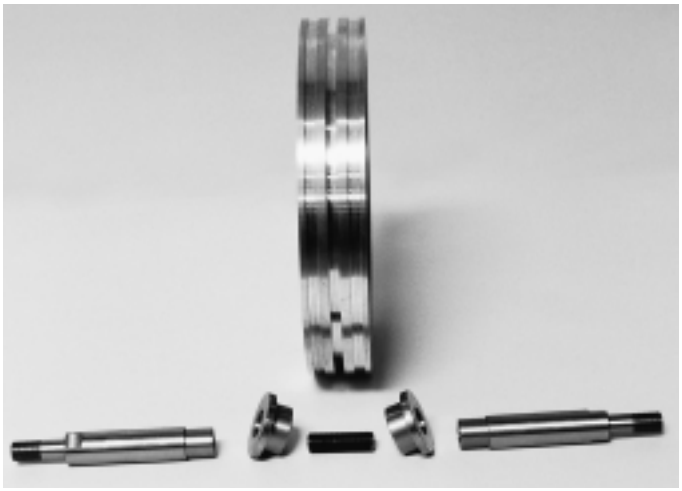


Figure 28

SECTION 7F
REASSEMBLY

STEP 1 Assemble shafts to power piston (refer to Step 5 above).

STEP 2 Place power piston in vise with soft jaws (do not damage or scratch piston) to insert new O-ring and slipper seal. TIP: Install slipper seal by using a strip of material (like an old O-ring) with back and forth motions until slipper seal is situated over seal groove. *(Figure 29)*

STEP 3 Place power cylinder on blocks of wood (*Figure 30).* Insert new guide rings in outer grooves. Insert power piston into power cylinder. TIP: A conical (tapered) piece of cylindrical sheet metal (or other tool) will help hold the guide rings in place as they slide into the power cylinder. *(Figure 31)*

Figure 29

Figure 30

Figure 31

Figure 32

STEP 4 Tap piston into cylinder with soft mallet. Verify that slipper seal and guide rings are not damaged. *(Figure 32)*

STEP 5 Check seal integrity in shaft bushing and O-ring on cover.

STEP 6 Install cover as shown in *Figure 33.*

STEP 7 Follow the reverse order of "disassembly instructions" starting with Section 7E, Step 3.

NOTE: Torque fasteners to specifications.

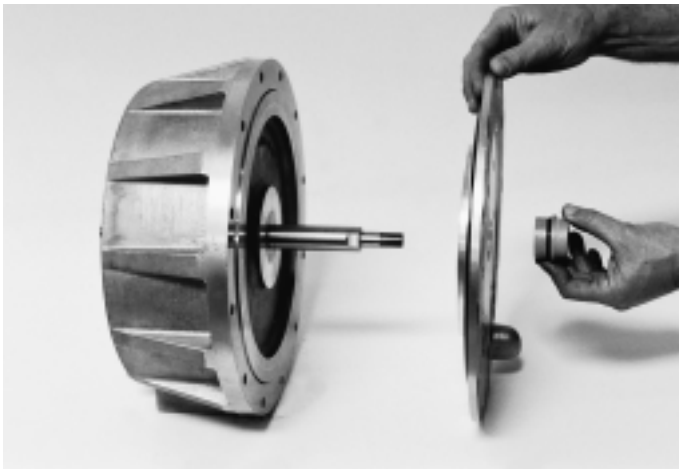


Figure 33

SECTION 7G
TORQUE SPECIFICATIONS

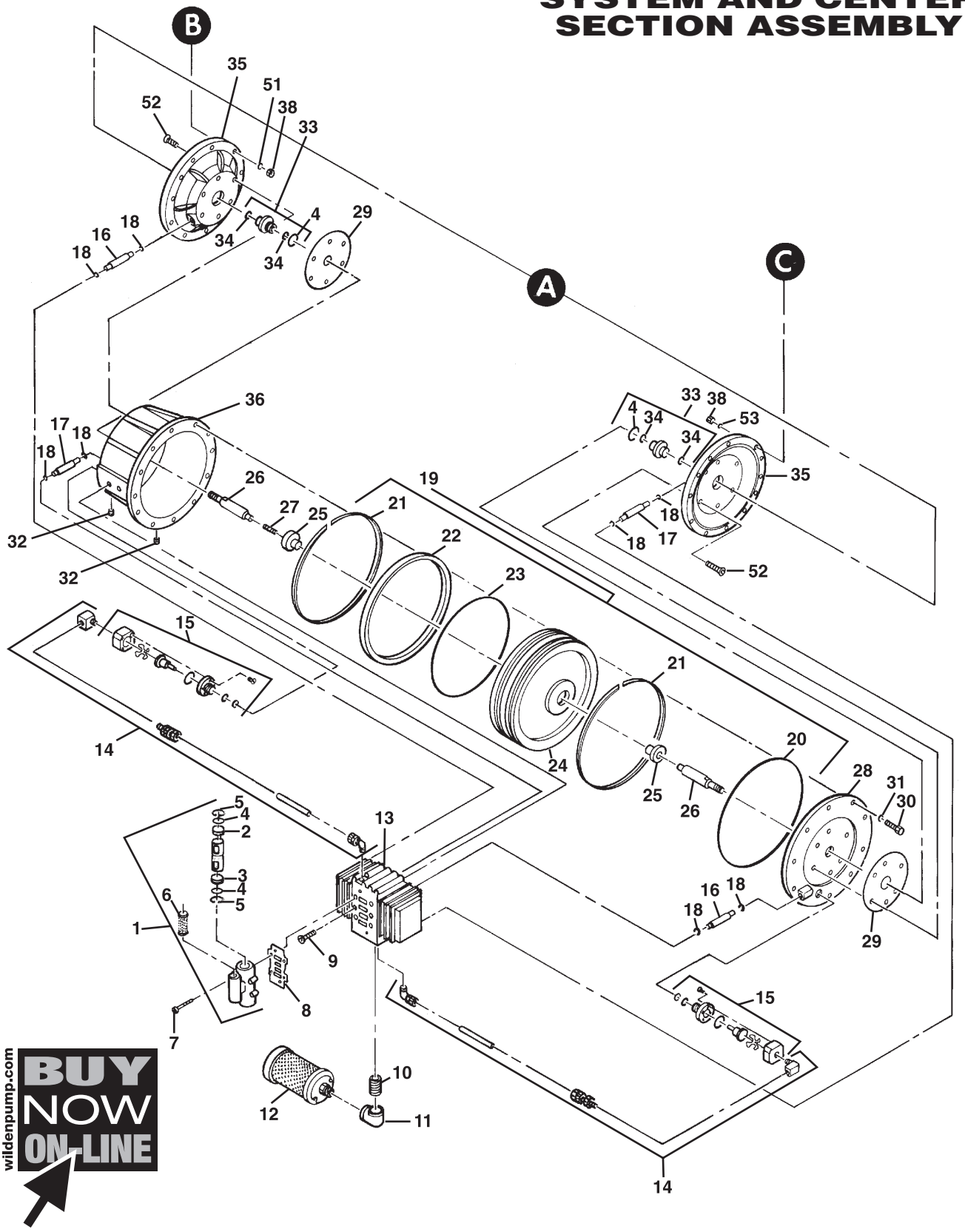
COMPONENT	MAX. TORQUE
Inner Piston Screws*	54 m-N [40 ft. lbs.]
Outer Piston	114.75 m-N [85 ft. lbs.]
Air Valve Bolts	9.45 m-N [7 ft. lbs.]
Inlet/Discharge Manifold Bolts	16.2 m-N [12 ft. lbs.]
Center Section Cover Bolts	54 m-N [40 ft. lbs.]
Air Chamber Screws*	54 m-N [40 ft. lbs.]
Liquid Chamber Bolts	54 m-N [40 ft. lbs.]

Torque all hardware in an opposing torque sequence. Liquid Chamber (LC) bolts may require periodic re-torquing. If LC preload torque values fall below 25 ft.-lbs. [34 m-N], re-torque both Liquid Chambers to 40 ft.-lbs [54 m-N]. LC torque loading must be even. If a bolt is tightened during an LC bolt check procedure, then all LC bolts must be tightened to ensure even distribution.

*Use #242 removable Loctite® on fastener threads. (24 total.)

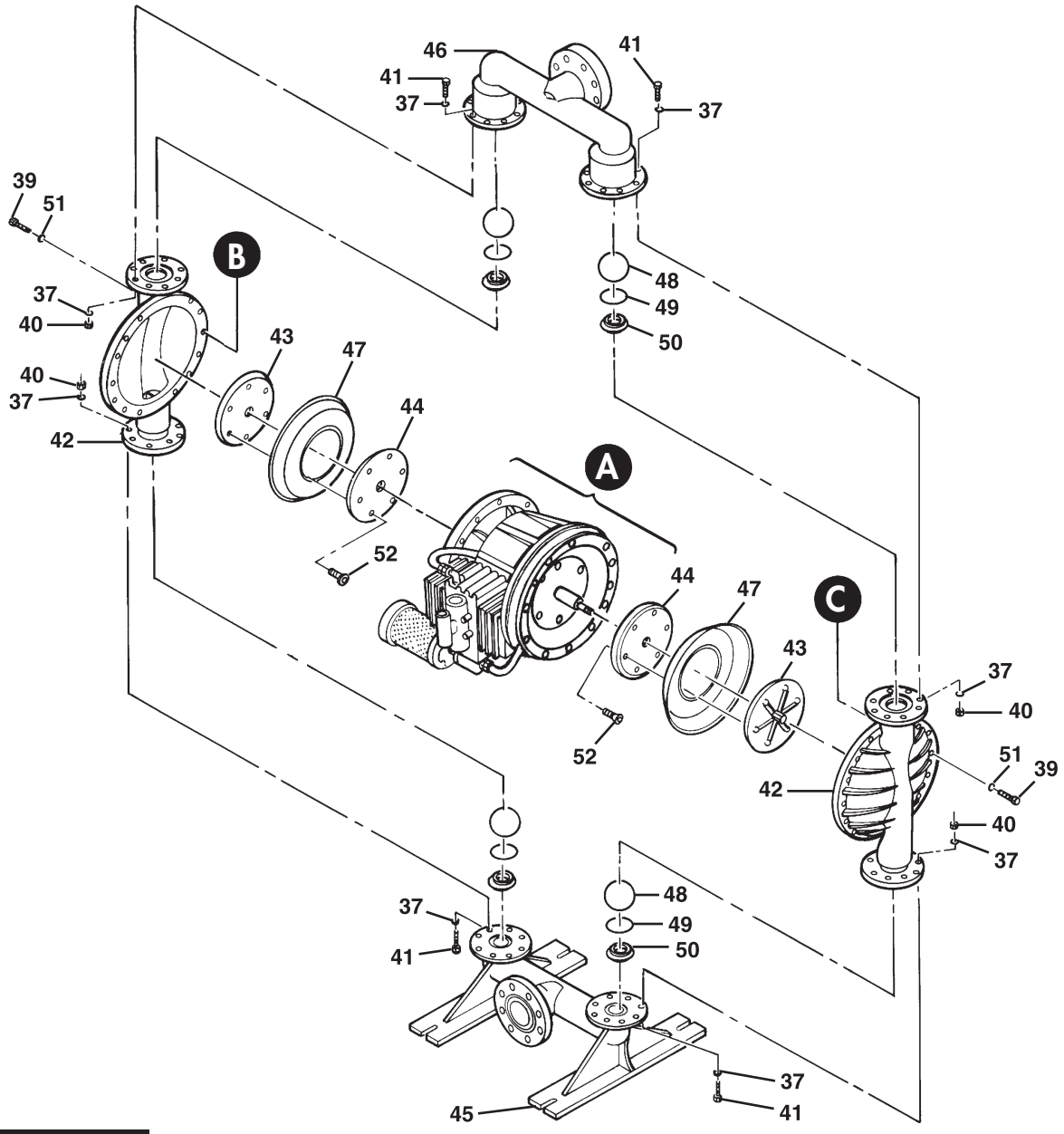
SECTION 8A
EXPLODED VIEW

H800
AIR DISTRIBUTION SYSTEM AND CENTER SECTION ASSEMBLY



SECTION 8B
EXPLODED VIEW

H800
WETTED PARTS ASSEMBLY



SECTION 8C

PARTS LISTING – WILDEN MODEL H800

ITEM NO.	DESCRIPTION	QTY. PER	H800/SSAB/WF/WF/SWF ANSI FLANGED PART NUMBER	H800/SSAB/WF/WF/SWF/504 DIN FLANGED PART NUMBER
1	**Air Valve Assembly[1]**	**1**	**15-2000-07-225**	**15-2000-07-225**
2	End Cap w/Guide, Nylon	1	15-2300-23	15-2300-23
3	End Cap w/o Guide, Nylon	1	15-2330-23	15-2330-23
4	O-Ring, -220, Buna	2	15-2390-52	15-2390-52
5	Snap Ring, S.S.	2	15-2650-03	15-2650-03
6	Air Valve Screen, Bronze	1	08-2500-07	08-2500-07
7	SHCS, 5/16"-18 x 2¼" S.S.	4	08-6000-03	08-6000-03
8	Air Valve Gasket	1	15-2600-52	15-2600-52
9	SHCS, 3/8"-16 x 2¼"	2	08-6030-08-60	08-6030-08-60
10	Nipple, NPT 1", Galvanized	1	08-7430-08-60	08-7430-08-60
11	Elbow, 90°, 1" NPT, Galvanized	1	08-7840-08-60	08-7840-08-60
12	Muffler	1	15-3510-99	15-3510-99
13	Air Valve Manifold, Aluminum	1	08-2700-01-60	08-2700-01-60
14	Relief Tube Assembly	2	08-9230-99-60	08-9230-99-60
15	**Pressure Relief Valve Assembly**	**2**	**08-2740-99-60**	**08-2740-99-60**
	Rebuild Pressure Relief Seal Kit*	**1**	**99-9346-99**	**99-9346-99**
16	Pipe, S.S.	2	08-7520-03-60	08-7520-03-60
17	Pipe, S.S.	2	08-7510-03-60	08-7510-03-60
18	O-Ring, -114, Buna	8	00-2870-52	00-2870-52
19	Power Piston Seal Kit[2]	1	08-9210-99-60	08-9210-99-60
20	**O-Ring, -379, Buna**	**1**	**—**	**—**
21	Guide Ring, Bronze-Filled	2	—	—
22	**Slipper Seal, PTFE-Filled**	**1**	**—**	**—**
23	**O-Ring, -450, Buna**	**1**	**—**	**—**
24	Piston, Cylinder, Aluminum	1	08-3720-01-60	08-3720-01-60
25	Bushing, Cylinder Piston, S.S.	2	08-3730-03-60	08-3730-03-60
26	Shaft, S.S.	2	08-3800-03-60	08-3800-03-60
27	Stud, Shaft, S.S.	1	08-6150-08-60	08-6150-08-60
28	Cover, Center Section, Aluminum	1	08-3000-01-60	08-3000-01-60
29	**Gasket, Center Section, Buna**	**2**	**08-3260-52-60**	**08-3260-52-60**
30	HHCS, 7/16"-14 x 1", Grade 5	12	08-6260-08-60	08-6260-08-60
31	Washer, 7/16", S.S.	12	08-6830-03-60	08-6830-03-60
32	Plug, Pipe, 1/16"	2	08-7030-08-60	08-7030-08-60
33	Bushing, Center Section[3]	2	08-3300-99-60	08-3300-99-60
34	**Glyd™ Ring**	**2**	**15-3210-55-225**	**15-3210-55-225**
	O-Ring, -220, Buna (Item no. 4)	**1**	**15-2390-52**	**15-2390-52**
35	Air Chamber, S.S.	2	08-3650-03-60	08-3650-03-60
36	Center Section, Aluminum	1	08-3150-01-60	08-3150-01-60
37	Washer, 5/16", S.S.	64	08-6730-03-42	08-6730-03-42
38	Hex Nut, ½"-13, S.S.	28	15-6420-03	15-6420-03
39	HHCS, ½"-13 x 1¾, Grade 8	28	08-6190-08-60	08-6190-08-60
40	Hex Nut, 5/16"-18, S.S.	32	08-6400-03	08-6400-03
41	HHCS, 5/16"-18 x 1", S.S.	32	08-6180-03-42	08-6180-03-42
42	Liquid Chamber, S.S.	2	08-5000-03-60	08-5000-03-60
43	Outer Piston, S.S.	2	08-4550-03-60	08-4550-03-60
44	Inner Piston, S.S.	2	08-3700-03-60	08-3700-03-60
45	Inlet Manifold, S.S.	1	08-5080-03-62	08-5080-03-63
46	Discharge Manifold, S.S.	1	08-5020-03-62	08-5020-03-63
47	**Diaphragm, Wil-Flex™**	**2**	**08-1011-58**	**08-1011-58**
48	**Ball, Valve, Wil-Flex™**	**4**	**08-1080-58**	**08-1080-58***
49	**O-Ring, Seat, Wil-Flex™**	**4**	**08-1200-58**	**08-1200-58***
50	**Valve Seat, S.S.**	**4**	**08-1120-03-60**	**08-1120-03-60**
51	Washer, ½", S.S.	56	08-6840-03-60	08-6840-03-60
52	SFCHCS, ½"-13 x 1", S.S.	24	08-6220-03-60	08-6220-03-60

[1]Item #1, Air Valve Assembly, includes items #2, 3, 4, 5, 6.
[2]Item #20, Power Piston Seal Kit, includes items #21, 22, 23, and 24
[3]Item #34, Bushing, Center Section, includes qty. 1 of item #35 and #4.

All boldface items are primary wear parts.
*Also available with PTFE O-Rings & Balls 08-1200-55, 08-1080-55

*Both sides of the pump must be rebuilt at the same time. One rebuild seal kit includes the parts to rebuild both sides.
NOTE: Do not utilize the smaller O-ring for this pump model.