SECTION V

AIR VALVE/CENTER SECTION REPAIR/MAINTENANCE

The air valve assembly consists of the air valve body and piston. The unique design of the air valve relies only on differential pressure to cause the air valve to shift. It is reliable and simple to maintain. The bushing in the center block, along with the diaphragm shaft, provides the "trigger" to tell the air valve to shift. The following procedure will ensure that the air valve on your Wilden pump will provide long trouble-free service.

AIR VALVE BODY AND PISTON ASSEMBLY AND DISASSEMBLY

The air valve body and piston can be disconnected from the pump by removing the four socket-head cap screws which attach it to the center section. The piston in the air valve is aluminum with a dark anodized coating (see *Figure A*). The piston should move freely and the ports in the piston should line up with the ports on the face of the air valve body. The piston should also appear to be shiny black in color. If the piston appears to be a shiny aluminum color, the air valve is probably worn beyond working tolerances and should be replaced.

If the piston does not move freely in the air valve, the entire air valve should be immersed in a cleaning solution. (NOTE: Do not force the piston by inserting a metal object.) This soaking should remove any accumulation of sludge and grit which is preventing the air valve piston from moving freely. If the air valve piston does not move freely after the above cleaning, the air valve should be disassembled as follows: Remove the snap ring from the top end of the air valve and apply an air jet alternately to the two 7/64" holes located in the face of the air valve until the end cap is blown out. (See *Figure B.)* **[CAUTION:** The air valve end cap may come out with considerable force. Hand protection such as a padded glove or a rag should be used to capture the end cap.] Inspect the piston and cylinder bore for nicks and scoring.

Small nicks can usually be dressed out and the piston returned to service. Inspect the cylinder end caps. Make sure that the guide pin is straight and smooth or the piston will not move freely in the cylinder. New O-rings should be installed on the end caps. Lubricate the O-rings and install the end caps, assuring that proper alignment of the piston and cylinder ports is maintained.

Figure A

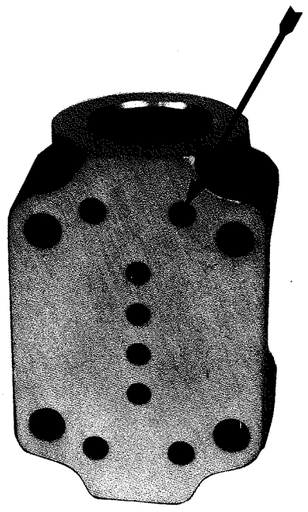


Figure B

O-RING REPLACEMENT/CENTER SECTION

The pump's center section consists of a molded housing with a cast-in bronze bushing. (Bushing is not removable.) the bushing has six grooves cut on the inside diameter. There are four O-rings that fit in these grooves (see *Figure C).* When the O-rings become worn or flat, they will no longer seal and must be replaced. This is most easily accomplished by using a tool called an O-ring pick , available through most industrial supply companies. Since these O-rings form a part of the shifting function of the pump, it is necessary that they be located in the proper grooves. **NOTE:** THE SHAFT BUSHING IS CAST INTO THE CENTER SECTION AND IS NOT REMOVABLE.

Inspect the air valve side of the center section for flatness and to insure no nicks or other damage exists that would prevent the air valve from sealing when installed. Inspect the two channels and their ports to make sure they are clean and the ports are open to the bushing (see *Figure D).* The air valve will not shift if these ports are plugged or an O-ring is in the wrong groove of the center section closing off a port. Inspect the air valve gasket and muffler plate gasket and replace if damaged. Attach the air valve to the center section (see *Figure E).* Tighten air valve mounting screws per the torque specifications* (Item #1).

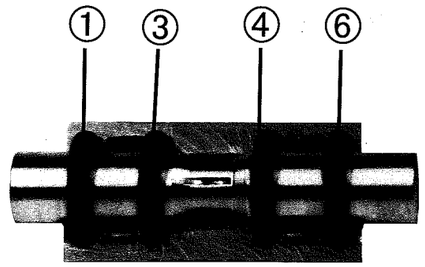


Figure C

*Refer to page 19 for torque specifications.

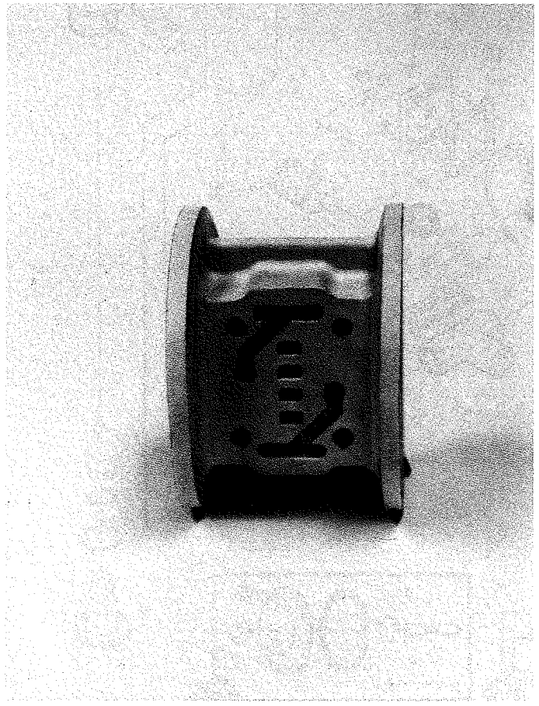


Figure D

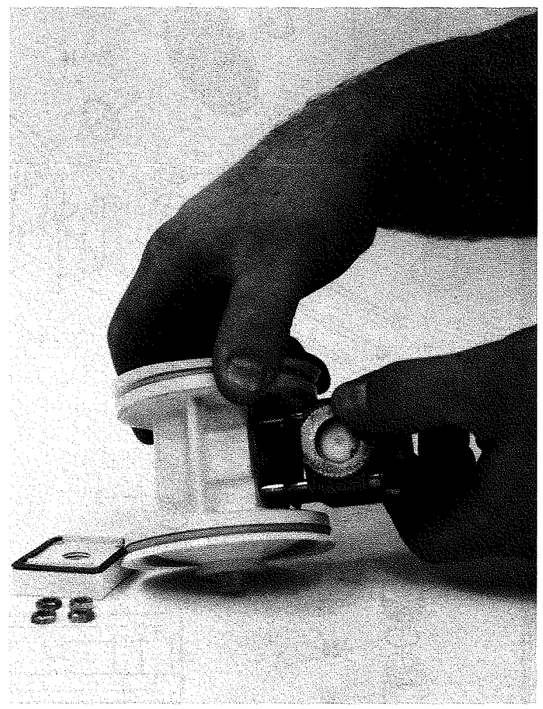
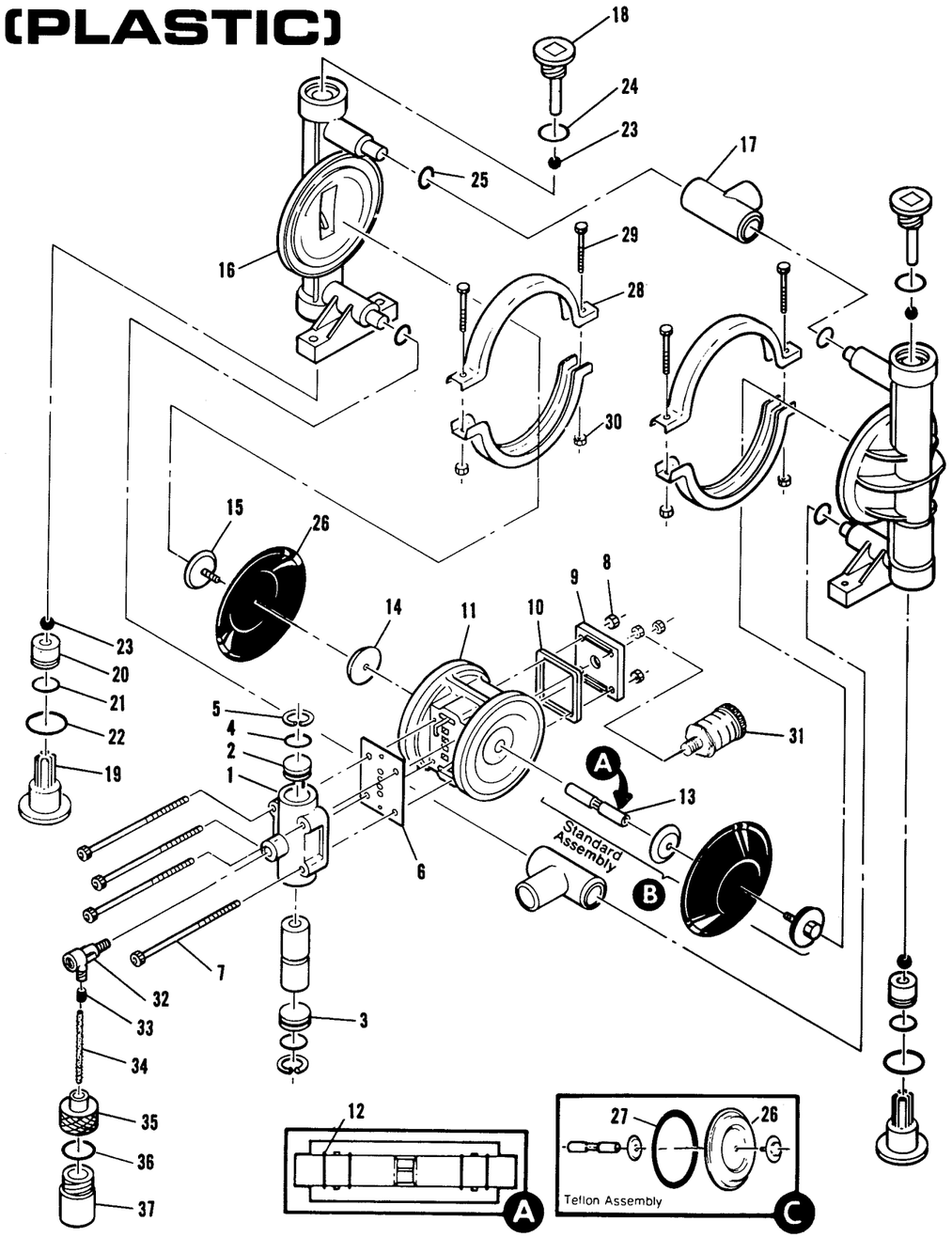


Figure E

M.025 CHAMP (PLASTIC)



STEP 6

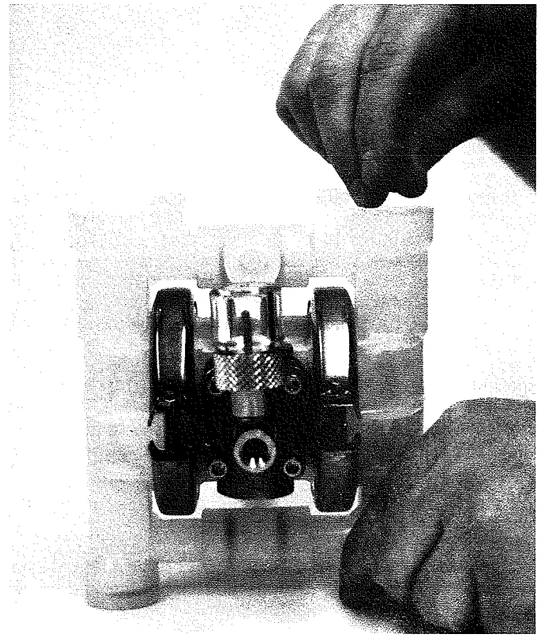


Figure 25

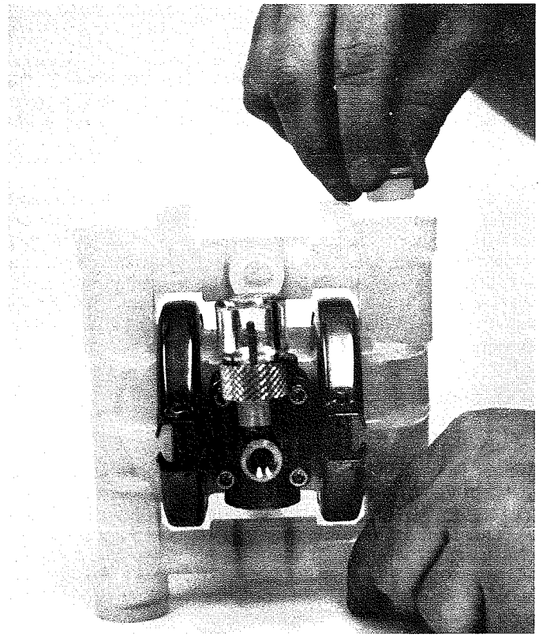


Figure 26

Turn pump upside down and insert valve ball *(Figure 25)*, valve seat *(Figure 26)*, and retainer *(Figure 27)*. Tighten retainer per the torque specifications* (Item #5, #6 or #7).

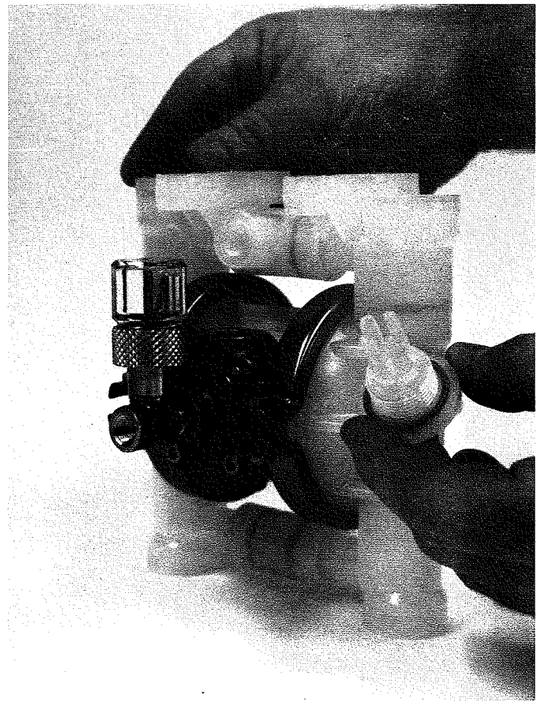


Figure 27

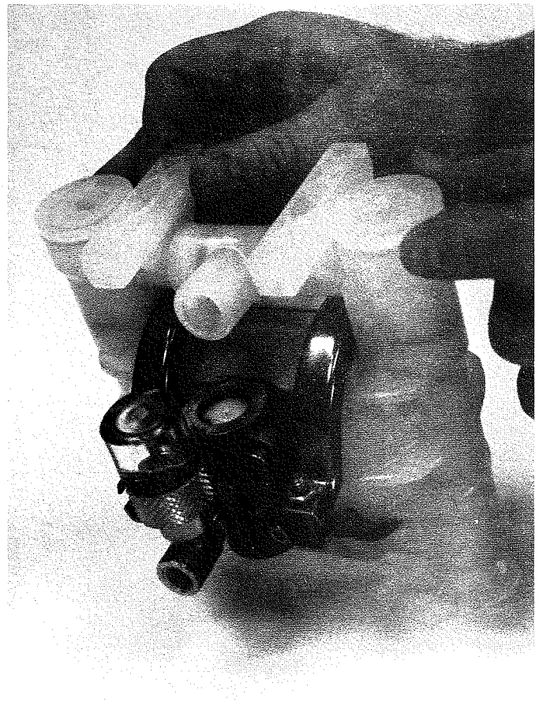


Figure 28

*Refer to page 19 for torque specifications.

STEP 4

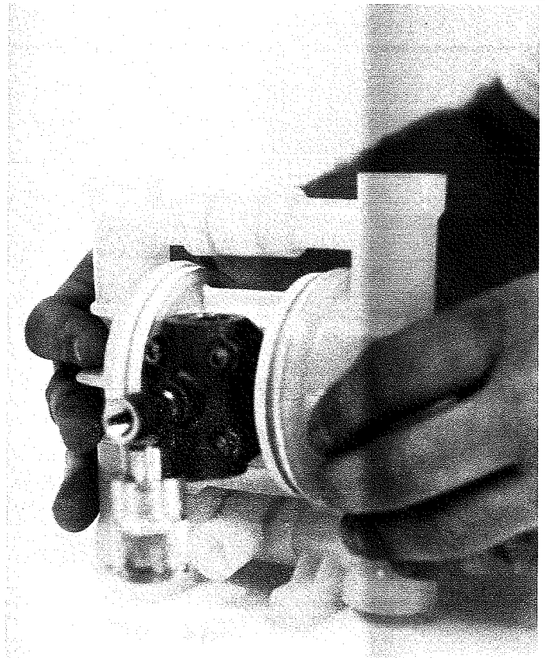


Figure 20

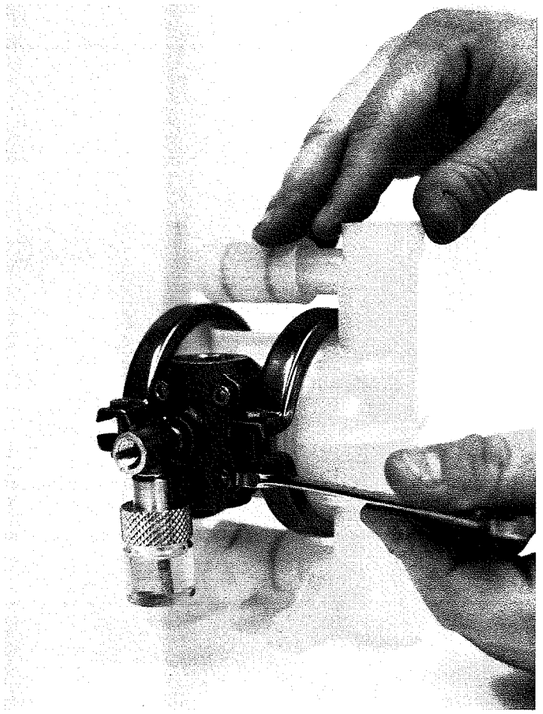


Figure 21

Attach liquid chambers to center section *(Figure 20).* Put clamp bands in place and tighten per the torque specifications* (Item #4).

STEP 5

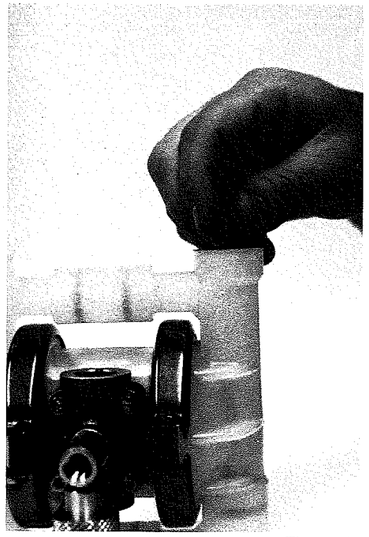


Figure 22

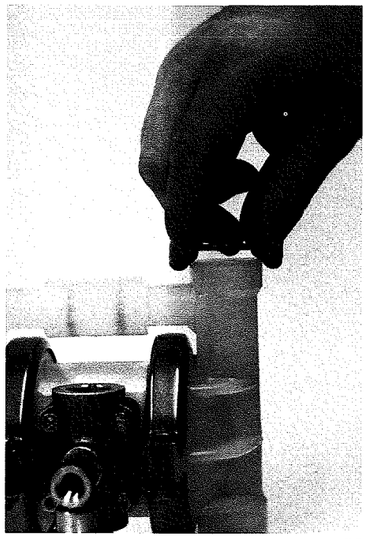


Figure 23

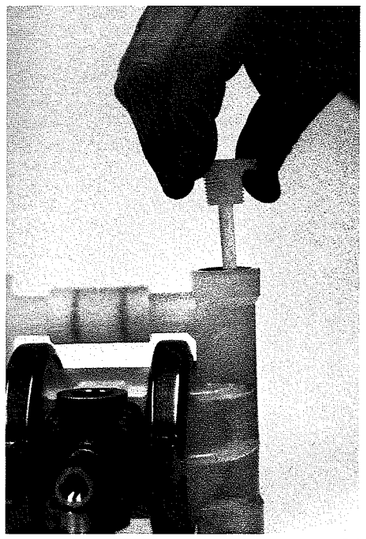


Figure 24

Insert valve ball *(Figure 22),* seat O-ring *(Figure 23),* and retainer *(Figure 24)* in top of liquid chamber. Tighten retainer per the torque specifications* (Item #5, #6 or #7).

*Refer to page 19 for torque specifications.

Wilden Model M.025 Pumps

Models PTD, LTD, KTD, and GTD are Teflon®-fitted.

ITEM #	DESCRIPTION	QTY.	POLYPROPYLENE M.025/POD and M.025/PTD P/N	ACETAL M.025/LOD and M.025/LTD P/N	PVDF M.025/KOD and M.025/KTD P/N	CARBON-FILLED ACETAL M.025/GOD and M.025/GTD P/N
1	Air Valve Assembly[1]	1	00-2000-07	00-2000-07	00-2000-07	02-2000-07
2	End Cap w/Guide	1	00-2370-23	00-2370-23	00-2370-23	00-2370-23
3	End Cap w/o Guide	1	00-2380-23	00-2380-23	00-2380-23	00-2380-23
4	End Cap O-Ring	2	00-2390-52	00-2390-52	00-2390-52	00-2390-52
5	Snap Ring	2	00-2650-03	00-2650-03	00-2650-03	00-2650-03
6	Air Valve Gasket — Buna	1	00-2600-52	00-2600-52	00-2600-52	00-2600-52
7	Air Valve Bolt	4	00-2750-03	00-2750-03	00-2750-03	00-2750-03
8	Air Valve Nut	4	S98C	S98C	S98C	S98C
9	Muffler Plate	1	00-3181-20	00-3181-20	00-3181-20	00-3181-16
10	Muffler Plate Gasket — Buna	1	00-3500-52	00-3500-52	00-3500-52	00-3500-52
11	Center Section	1	00-3150-20	00-3150-13	00-3150-20	00-3150-16
12	Center Block O-Ring	4	00-3200-52	00-3200-52	00-3200-52	00-3200-52
13	Shaft	1	00-4000-09	00-4000-09	00-4000-09	00-4000-09
14	Inner Piston for Rubber/TPE	2	00-4450-01	00-4450-01	00-4450-01	00-4450-01
	Teflon® Fitted	2	00-4510-01	00-4510-01	00-4510-01	00-4510-01
15	Outer Piston	2	00-4550-20	00-4550-13	00-4550-21	00-4550-16
16	Liquid Chamber	2	00-6000-20	00-6000-13	00-6000-21	00-6000-16
17	Manifold Tee-Section	2	00-6160-20	00-6160-13	00-6160-21	00-6160-16
18	Top Retainer	2	00-6410-20	00-6410-13	00-6410-21	00-6410-16
19	Bottom Retainer	2	00-6420-20	00-6420-13	00-6420-21	00-6420-16
20	Valve Seat	2	00-1120-20	00-1120-13	00-1120-21	00-1120-16
21	Valve Seat O-Ring*	2	—	—	—	—
22	Bottom Retainer O-Ring*	2	—	—	—	—
23	Valve Ball*	4	—	—	—	—
24	Top Retainer O-Ring*	2	—	—	—	—
25	Tee Section O-Ring*	2	—	—	—	—
26	Diaphragm*	2	—	—	—	—
27	Back-Up O-Ring*[2]	2	00-1070-58	00-1070-58	00-1070-58	00-1070-58
28	Clamp Band Assembly	2	00-7031-03	00-7031-03	00-7031-03	00-7031-03
29	– Clamp Band Bolt	4	S98B	S98B	S98B	S98B
30	– Clamp Band Nut	4	S98C	S98C	S98C	S98C
31	Muffler	1	00-9010-99	00-9010-99	00-9010-99	00-9010-99
32	Oil Bottle Tee	1	00-2880-07	00-2880-07	00-2880-07	00-2880-07
33	Lube Rod Seal	1	00-2910-52	00-2910-52	00-2910-52	00-2910-52
34	Capillary Rod	1	00-2900-07	00-2900-07	00-2900-07	00-2900-07
35	Oil Bottle Adapter	1	00-2860-07	00-2860-07	00-2860-07	00-2860-07
36	Oil Bottle O-Ring	1	00-2870-52	00-2870-52	00-2870-52	00-2870-52
37	Oil Bottle	1	00-2850-29	00-2850-29	00-2850-29	00-2850-29

*Refer to Elastomer Options on page 19.

[1]Air Valve Assembly includes items 2, 3, 4, and 5.

[2]Part used only on Teflon®-fitted pumps.

Wilden Model M.025 Pumps — Teflon®-Coated Air Valve and Hardware

Models PPD, LLD, KKD, and GGD are Teflon®-fitted.

ITEM #	DESCRIPTION	QTY.	POLYPROPYLENE M.025/PCD and M.025/PPD P/N	ACETAL M.025/LCD and M.025/LLD P/N	PVDF M.025/KCD and M.025/KKD P/N	CARBON-FILLED ACETAL M.025/GCD and M.025/GGD P/N
1	Air Valve Assembly[1]	1	00-2000-05	00-2030-05	00-2020-05	02-2030-05
2	End Cap w/Guide	1	00-2370-23	00-2370-23	00-2370-23	00-2370-23
3	End Cap w/o Guide	1	00-2380-23	00-2380-23	00-2380-23	00-2380-23
4	End Cap O-Ring	2	00-2390-52	00-2390-52	00-2390-52	00-2390-52
5	Snap Ring	2	00-2650-03	00-2650-03	00-2650-03	00-2650-03
6	Air Valve Gasket — Buna	1	00-2600-52	00-2600-52	00-2600-52	00-2600-52
7	Air Valve Bolt	4	00-2750-05	00-2750-05	00-2750-05	00-2750-05
8	Air Valve Nut	4	PCS98C	PCS98C	PCS98C	PCS98C
9	Muffler Plate	1	00-3181-20	00-3181-13	00-3181-20	00-3181-16
10	Muffler Plate Gasket — Buna	1	00-3500-52	00-3500-52	00-3500-52	00-3500-52
11	Center Section	1	00-3150-20	00-3150-13	00-3150-20	00-3150-16
12	Center Block O-Ring	4	00-3200-52	00-3200-52	00-3200-52	00-3200-52
13	Shaft	1	00-4000-09	00-4000-09	00-4000-09	00-4000-09
14	Inner Piston for Rubber/TPE	2	00-4450-01	00-4450-01	00-4450-01	00-4450-01
	Teflon® Fitted	2	00-4510-01	00-4510-01	00-4510-01	00-4510-01
15	Outer Piston	2	00-4550-20	00-4550-13	00-4550-21	00-4550-16
16	Liquid Chamber	2	00-6000-20	00-6000-13	00-6000-21	00-6000-16
17	Manifold Tee-Section	2	00-6160-20	00-6160-13	00-6160-21	00-6160-16
18	Top Retainer	2	00-6410-20	00-6410-13	00-6410-21	00-6410-16
19	Bottom Retainer	2	00-6420-20	00-6420-13	00-6420-21	00-6420-16
20	Valve Seat	2	00-1120-20	00-1120-13	00-1120-21	00-1120-16
21	Valve Seat O-Ring*	2	—	—	—	—
22	Bottom Retainer O-Ring*	2	—	—	—	—
23	Valve Ball*	4	—	—	—	—
24	Top Retainer O-Ring*	2	—	—	—	—
25	Tee Section O-Ring*	2	—	—	—	—
26	Diaphragm*	2	—	—	—	—
27	Back-Up O-Ring*[2]	2	00-1070-58	00-1070-58	00-1070-58	00-1070-58
28	Clamp Band Assembly	2	00-7031-05	00-7031-05	00-7031-05	00-7031-05
29	– Clamp Band Bolt	4	PCS98B	PCS98B	PCS98B	PCS98B
30	– Clamp Band Nut	4	PCS98C	PCS98C	PCS98C	PCS98C
31	Muffler	1	00-9010-99	00-9010-99	00-9010-99	00-9010-99
32	Oil Bottle Tee	1	00-2880-05	00-2880-05	00-2880-05	00-2880-05
33	Lube Rod Seal	1	00-2910-52	00-2910-52	00-2910-52	00-2910-52
34	Capillary Rod	1	00-2900-07	00-2900-07	00-2900-07	00-2900-07
35	Oil Bottle Adapter	1	00-2860-05	00-2860-05	00-2860-05	00-2860-05
36	Oil Bottle O-Ring	1	00-2870-52	00-2870-52	00-2870-52	00-2870-52
37	Oil Bottle	1	00-2850-29	00-2850-29	00-2850-29	00-2850-29
38	End Cap Cover (Not Shown)	2	00-2420-20	00-2420-13	00-2420-21	00-2420-13

*Refer to Elastomer Options on page 19.

[1]Air Valve Assembly includes items 2, 3, 4, and 5.

[2]Part used only on Teflon®-fitted pumps.

REASSEMBLY

STEP 1

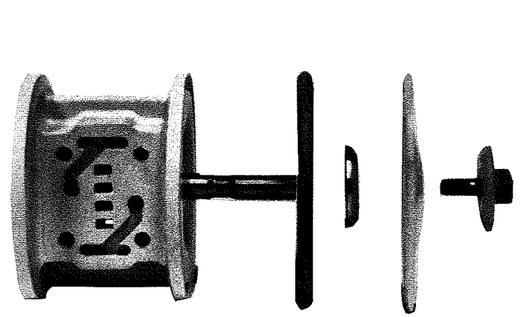


Figure 16

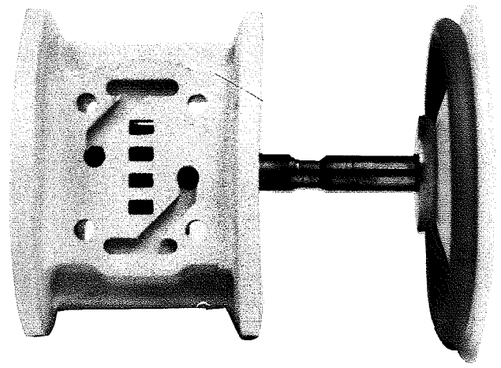


Figure 17

Insert outer piston through diaphragm, inner piston, and back-up O-ring* *(Figure 16)*. Hand tighten this assembly to shaft. Lubricate bushing with 5 wt. oil and push shaft through bushing *(Figure 17)*.

*Note: Back-up O-ring included on models with Teflon® diaphragms only.

STEP 2

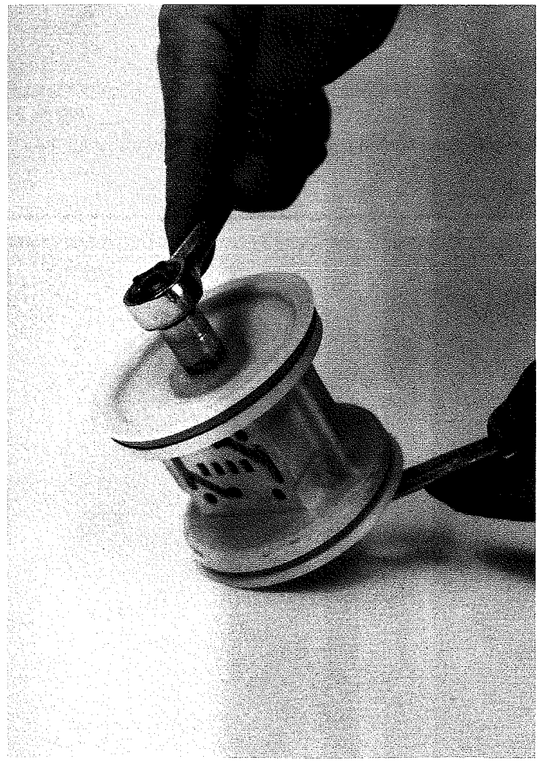


Figure 18

Install opposite outer piston, diaphragms, and inner piston and tighten per the torque specifications* (Item #2 or #3).

*Refer to page 19 for torque specifications.

STEP 3

Figure 19

Place O-ring then tee section on liquid chamber.

STEP 7

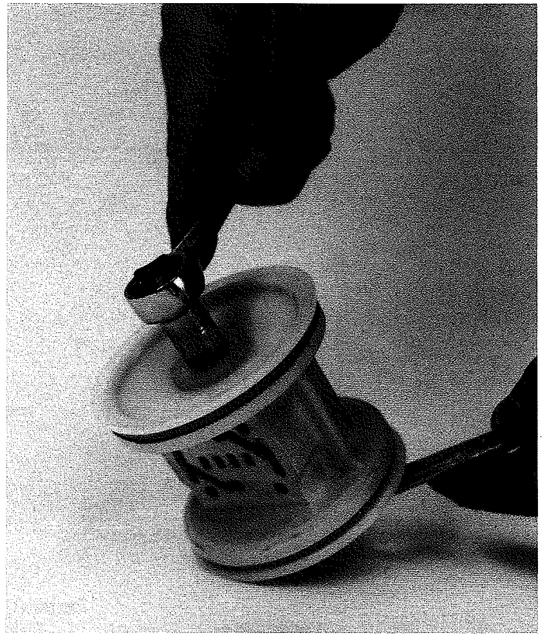


Figure 13

Figure 14

Loosen outer piston with 7/16" wrench *(Figure 13)* and twist off outer piston *(Figure 14)*. Remove the shaft and attached diaphragm from center section. Hold diaphragm and remove outer piston with 7/16" wrench *(Figure 15)*. Inspection of diaphragms, inner pistons and outer pistons is now possible.

NOTE: IF UNABLE TO REMOVE OUTER PISTON BY HOLDING DIAPHRAGM, PLACE SHAFT IN A VISE, PROTECT THE SHAFT FROM DAMAGE BY USING WOOD BLOCKS OR SOFT JAWS IN THE VISE.

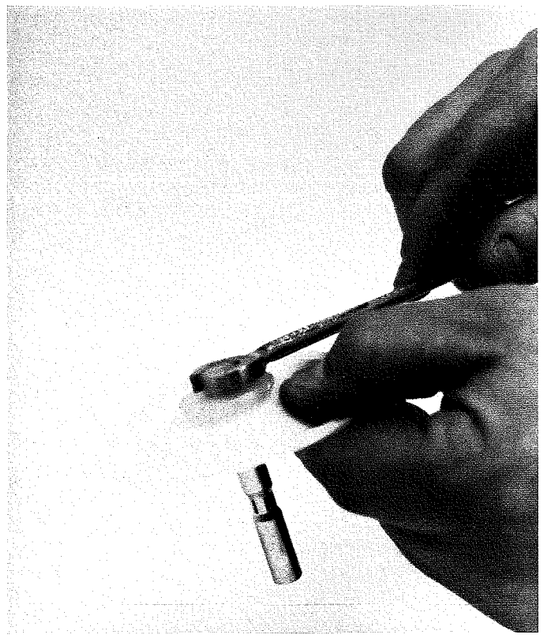


Figure 15

Wilden Model M.025 Pump Elastomers

WIL-FLEX™ Elastomers

ITEM #	PART DESCRIPTION	P/N
21	Valve Seat O-Ring	00-1200-58
22	Bottom Retainer O-Ring	00-1230-58
23	Valve Ball	00-1080-58
24	Top Retainer O-Ring	00-1220-58
25	Tee Section O-Ring	00-6320-58
26	Diaphragm	00-1010-58

BUNA Elastomers

ITEM #	PART DESCRIPTION	P/N
21	Valve Seat O-Ring	00-1200-52
22	Bottom Retainer O-Ring	00-1230-52
23	Valve Ball	00-1080-52
24	Top Retainer O-Ring	00-1220-52
25	Tee Section O-Ring	00-6320-52
26	Diaphragm	00-1010-52

VITON Elastomer

ITEM #	PART DESCRIPTION	P/N
23	Valve Ball	00-1080-53

TEFLON® Elastomers w/Teflon® Encapsulated Silicone Core O-Rings

ITEM #	PART DESCRIPTION	P/N
21	Valve Seat O-Ring[1]	00-1200-59
22	Bottom Retainer O-Ring[1]	00-1230-59
23	Valve Ball (Teflon® TFE)	00-1080-55
24	Top Retainer O-Ring[1]	00-1220-59
25	Tee Section O-Ring[1]	00-6320-59
26	Diaphragm (Teflon® TFE)	00-1010-55
27	Back-up O-Ring (Wil-Flex™)	00-1070-58

[1]For polypropylene and Acetal pumps only.

TEFLON® Elastomers w/Teflon® Encapsulated Viton Core O-Rings

ITEM #	PART DESCRIPTION	P/N
21	Valve Seat O-Ring[2]	00-1200-60
22	Bottom Retainer O-Ring[2]	00-1230-60
23	Valve Ball (Teflon® TFE)	00-1080-55
24	Top Retainer O-Ring[2]	00-1220-60
25	Tee Section O-Ring[3]	00-6320-60
26	Diaphragm (Teflon® TFE)	00-1010-55
27	Back-up O-Ring[2] (Wil-Flex™)	00-1070-58

[2]For PVDF and Carbon-filled Acetal pumps only.
[3]For PVDF pumps only.

FLUORO-SEAL™ Elastomer

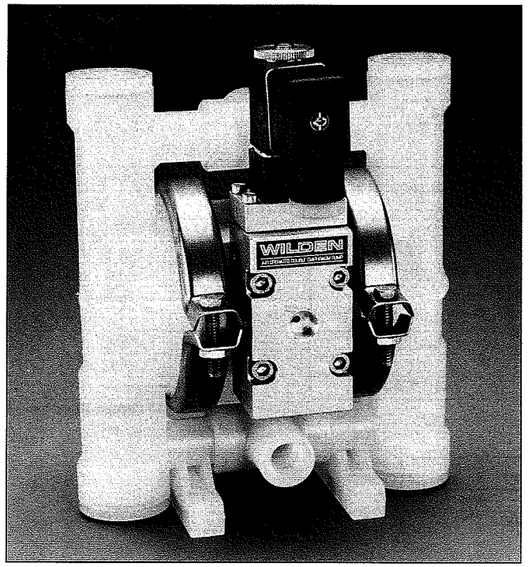
ITEM #	PART DESCRIPTION	P/N
25	Tee Section O-Ring[4]	00-6320-34

[4]For carbon-filled Acetal pumps only.

TORQUE SPECIFICATIONS FOR MODEL M.025

ITEM #	DESCRIPTION OF PART	MAXIMUM TORQUE
1	Air Valve, Standard & Solenoid	20 in.-lbs. [2.3 m-N]
2	Outer Piston, Rubber and TPE Diaphragms	45 in.-lbs. [5.1 m-N]
3	Outer Piston, Teflon Diaphragms	35 in.-lbs. [4.0 m-N]
4	Clamp Band	20 in.-lbs. [2.3 m-N]
5	Top and Bottom Retainer, Poly	35 in.-lbs. [4.0 m-N]
6	Top and Bottom Retainer, Kynar	45 in.-lbs. [5.1 m-N]
7	Top and Bottom Retainer, Acetal and Carbon-filled Acetal	45 in.-lbs. [5.1 m-N]

WILDEN MODEL M.025 SOLENOID-OPERATED



SECTION I

OPERATING PRINCIPLES BEHIND SOLENOID-OPERATED PUMPS

In the solenoid-operated pump models, the standard air valve is replaced with a two position, four-way solenoid valve that has a single operator and spring return. The valve is internally air piloted for longer coil and operator life.

When the solenoid is unpowered, one air chamber is pressurized with air, while the opposite chamber is exhausted. When electric power is applied, the solenoid shifts, and the pressurized air chamber is exhausted while the opposite chamber is pressurized. By alternately applying and removing power, the solenoid-operated pump runs like a standard Wilden pump.

The speed of the pump is controlled electrically. Since each stroke is controlled by an electrical signal, the pump is ideal for batching and other electrically controlled dispensing applications.

Although the speed of the pump is controlled electrically, the air pressure is important. Air pressure displaces the fluid, and if the pressure is insufficient to complete the physical stroke before an electronic impulse signals the pump to shift, the stroke will not be completed, and the displacement per stroke will be reduced. This does not harm the unit in any way, but it may cause inaccuracy when attempting to batch specific quantities with high precision if this effect is not taken into account.

There are three coil voltage options available. One coil allows for 24V DC operation. The second coil option allows for operation with either 12V DC or 24V AC at 60 Hz and the third coil option allows for 110V AC operation.

ELECTRICAL INFORMATION

VOLTAGE	PART NUMBER	RATING	AMPS (INRUSH)	AMPS (HOLDING)	RESISTIVITY (OHMS)
24V DC	00-2120-99	NEMA 4	.25	.25	96
24V DC	00-2120-99-154	NEMA 7	.25	.25	25
24V DC[1]	00-2120-99-157	—[3]	.135	.135	177
12V DC	00-2110-99	NEMA 4	.445	.445	26
12V DC	00-2110-99-153	NEMA 7	.445	.445	26
24V AC[2]	00-2110-99	NEMA 4	.445	.34	26
24V AC[2]	00-2110-99-153	NEMA 7	.445	.34	26
110V AC[3]	00-2110-99-155	NEMA 4	.25	.166	156
110V AC[3]	00-2110-99-156	NEMA 7	.25	.166	156

[1]Meets European standards and regulations; CENELEC/PTB File # EX-91.C.2027X
[2]24 Volts @ 60 Hz, 22 Volts @ 50 Hz.
[3]120 Volts @ 60 Hz, 110 Volts @ 50 Hz.

STEP 5

After clamp bands are removed pull chambers apart *(Figure 10).*

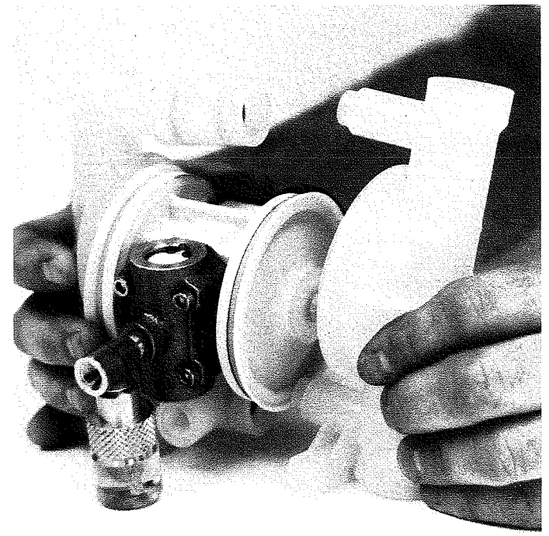


Figure 10

STEP 6

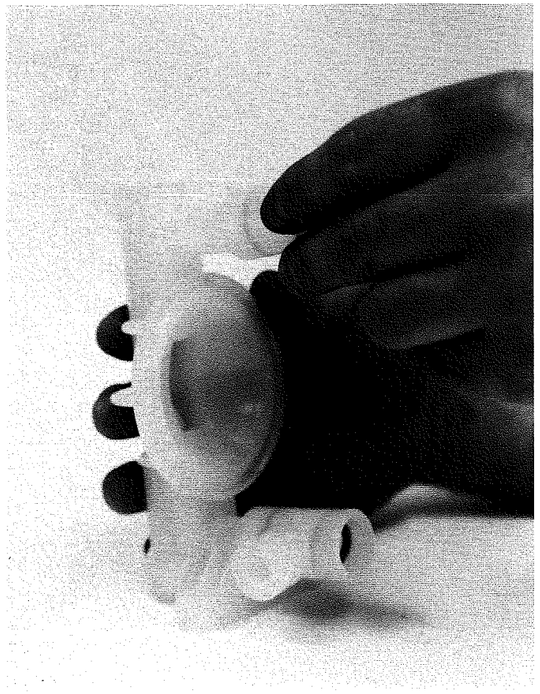


Figure 11

Figure 12

Pull tee sections from liquid chamber *(Figure 11)* and inspect O-ring *(Figure 12).*

STEP 3

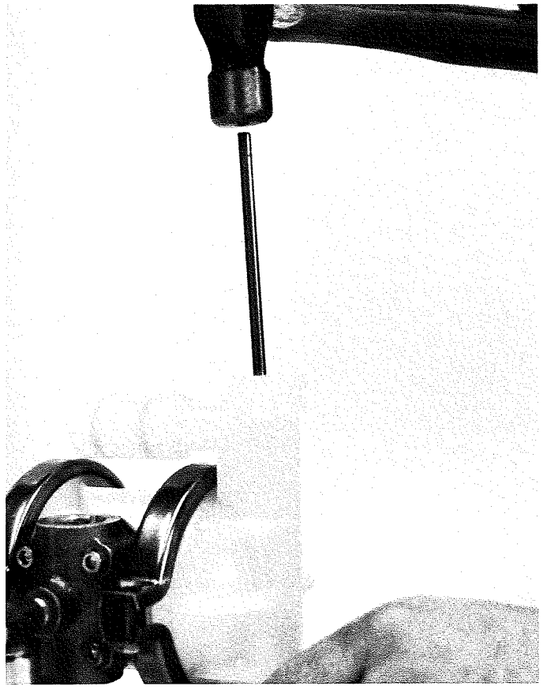


Figure 6

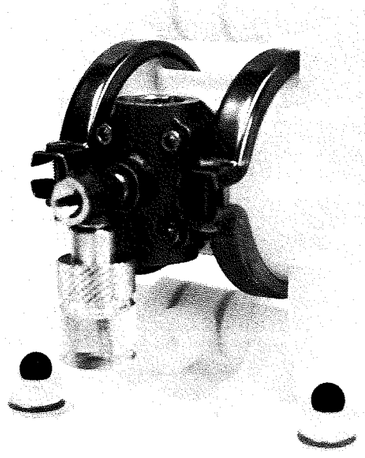


Figure 7

To remove bottom valve seats use ⅜" rod and gently tap seats out *(Figure 6)*. Inspect seat, O-ring, and valve ball *(Figure 7)*.

STEP 4

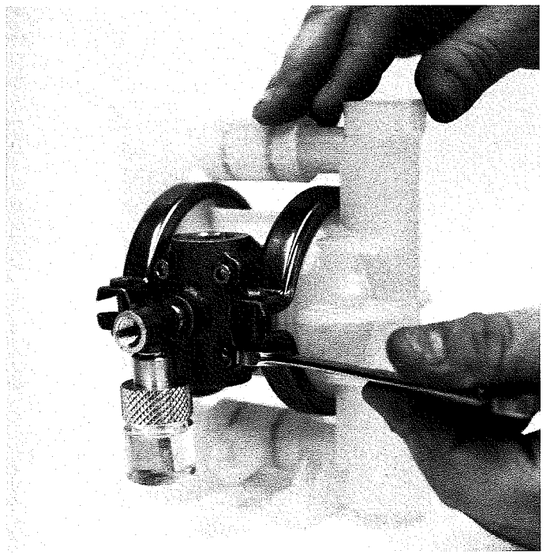


Figure 8

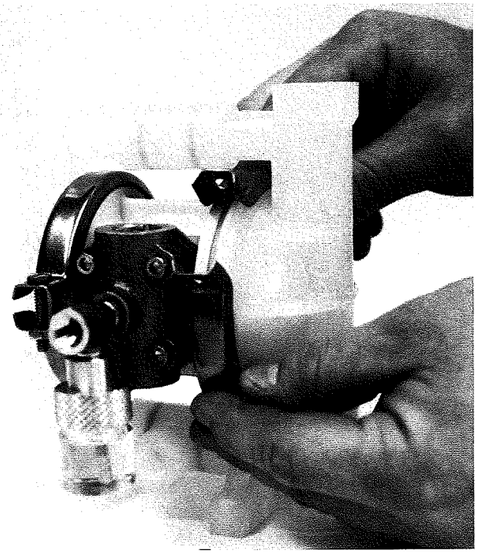
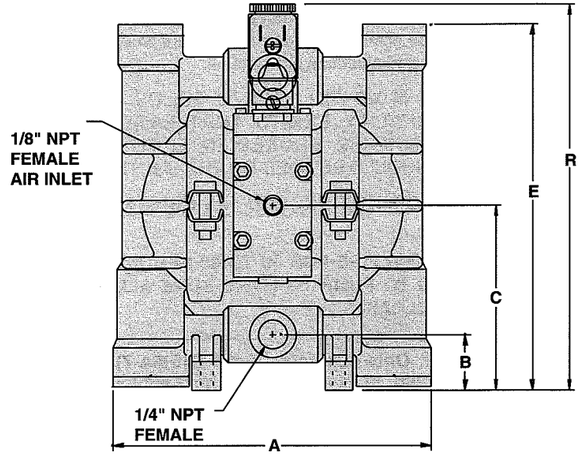
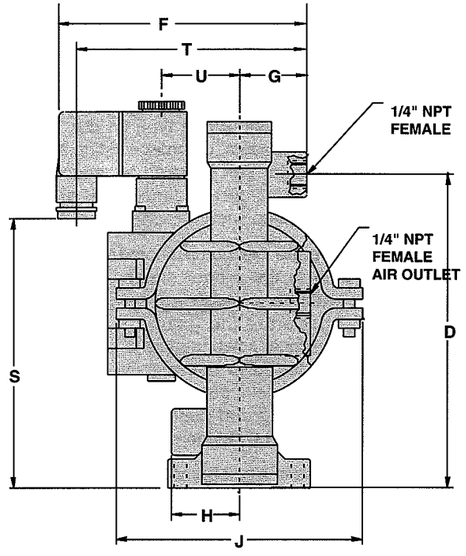


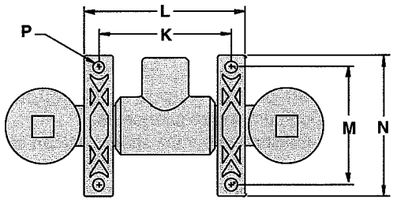
Figure 9

Loosen clamp band with ⅜" box end wrench *(Figure 8)*. Rotate clamp bands and remove *(Figure 9)*.

DIMENSIONAL DRAWING WILDEN MODEL M.025 — SOLENOID-OPERATED







DIMENSIONS – M.025		
ITEM	STANDARD (inch)	METRIC (mm)
A	5 5/8	142.87
B	1	25.40
C	3 1/4	82.55
D	5 1/2	139.70
E	6 1/2	165.10
F	3 1/8	79.37
G	1 3/16	30.15
H	1 3/16	30.15
J	4 1/2	114.30
K	2 3/8	60.33
L	2 7/8	73.03
M	2 1/16	52.37
N	2 1/2	63.50
P	ø7/32	ø5.56
R	6 15/16	176.21
S	4 7/8	123.82
T	2 27/32	72.23
U	1 11/32	34.13

SECTION II
INSTALLATION

The Model M.025 has a ¼" inlet and ¼" outlet and is designed for flows to 4.9 gpm. The **M.025 Champ** pump is manufactured with wetted parts of pure, unpigmented PVDF, Acetal, polypropylene or carbon-filled Acetal. The center section of the **M.025 Champ** is constructed of polypropylene, Acetal or carbon-filled Acetal. A variety of diaphragms, valve balls, and O-rings are available to satisfy temperature, chemical compatibility, abrasion and flex concerns.

The suction pipe size should be at least ¼" diameter or larger if highly viscous material is being pumped. The suction hose must be non-collapsible, reinforced type as the M.025 is capable of pulling a high vacuum. Discharge piping should be at least ¼"; larger diameter can be used to reduce friction losses. It is critical that all fittings and connections are airtight or a reduction or loss of pump suction capability will result.

All wiring used to operate the pump should be placed and connected according to the proper electrical codes. It is important that the wiring is of adequate gauge to carry the current required to operate the pump. In addition, it is necessary that the electrical power supply is large enough to supply the current required to operate the pump. Wiring should be above ground level if possible (in case of fluid spill or leakage), and all wiring and connections which could become wet or damp should be made watertight.

If the pump is to be used in a self-priming application, be sure that all connections are airtight and that the suction lift is within the pump's ability. Note: Materials of construction and elastomer material have an effect on suction lift parameters. Please consult authorized Wilden distributors for specifics.

Pumps in service with a positive suction head are most efficient when inlet pressure is limited to 7–10 psig. Premature diaphragm failure may occur if positive suction head is 11 psig and higher.

The solenoid valve is rated for continuous duty; however, stopping on an even number stroke count insures that the electrical power is off when pump is stopped. This practice is safer and also eliminates unwanted strokes when the system is shut down and electrical power is off.

THE MODEL M.025 WILL PASS ⅛4" SOLIDS. WHENEVER THE POSSIBILITY EXISTS THAT LARGER SOLID OBJECTS MAY BE SUCKED INTO THE PUMP, A STRAINER SHOULD BE USED ON THE SUCTION LINE.

CAUTION: DO NOT EXCEED 125 PSIG AIR SUPPLY PRESSURE.

BLOW OUT AIR LINE FOR 10 TO 20 SECONDS BEFORE ATTACHING TO PUMP TO MAKE SURE ALL PIPE LINE DEBRIS IS CLEAR.

WARNING: Only explosion proof (NEMA 7) solenoid valves should be used in areas where explosion proof equipment is required.

SECTION III
SUGGESTED OPERATION AND MAINTENANCE INSTRUCTIONS

INSTALLATION: Months of careful planning, study, and selection efforts can result in unsatisfactory pump performance if installation details are left to chance.

Premature failure and long term dissatisfaction can be avoided if reasonable care is exercised throughout the installation process.

LOCATION: Noise, safety, and other logistical factors usually dictate that "utility" equipment be situated away from the production floor. Multiple installations with conflicting requirements can result in congestion of utility areas, leaving few choices for siting of additional pumps.

Within the framework of these and other existing conditions, every pump should be located in such a way that five key factors are balanced against each other to maximum advantage.

1. ACCESS: First of all, the location should be accessible. If it's easier to reach the pump, maintenance personnel will have an easier time carrying out routine inspections and adjustments. Should major repairs become necessary, ease of access can play a key role in speeding the repair process and reducing total downtime.

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 (see pump performance chart). Use air pressure up to a maximum of 125 psi depending upon pumping requirements.

For best results, the pumps should use an air filter and a regulator. The use of an air filter before the pump inlet will insure that the majority of pipeline contaminants will be eliminated. The solenoid operated pump is permanently lubricated during assembly, and requires no additional lubrication under normal operation. If the unit runs under extreme conditions (continuous operation at high speeds), it may be necessary to relubricate the center block with a **buna compatible NLGI Grade 2 grease** every 50 million cycles. Continuous lubrication with a compatible oil is not harmful, and will provide longer seal life, but it may flush all grease out of the unit.

Pump discharge rate is controlled electrically by varying the rate of alternation of the stroke signals. The pump will continue to shift if the liquid discharge line is closed, however no media will be pumped. This will not harm the pump in any way, but it is wasteful of the pressurized air. The pump will

STEP 1

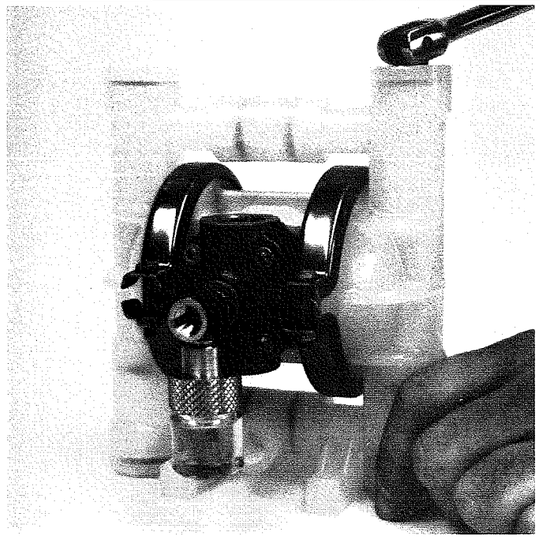


Figure 2

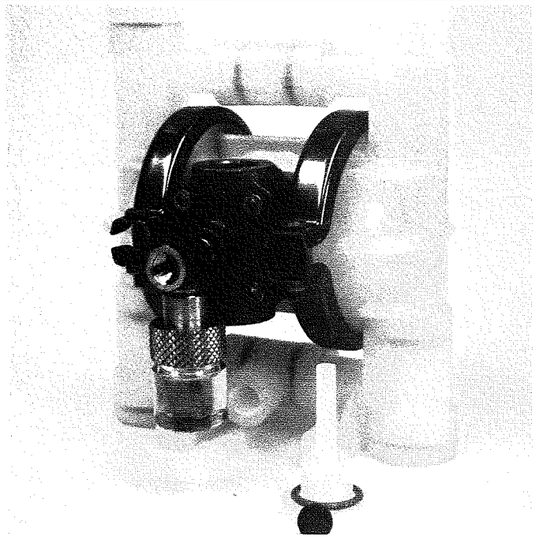


Figure 3

Remove top retainer with ¼" drive socket wrench *(Figure 2)* and inspect ball retainer, retainer O-ring, and valve ball *(Figure 3).* If swelling, cracking or other damage is apparent, these parts must be replaced.

STEP 2

Figure 4

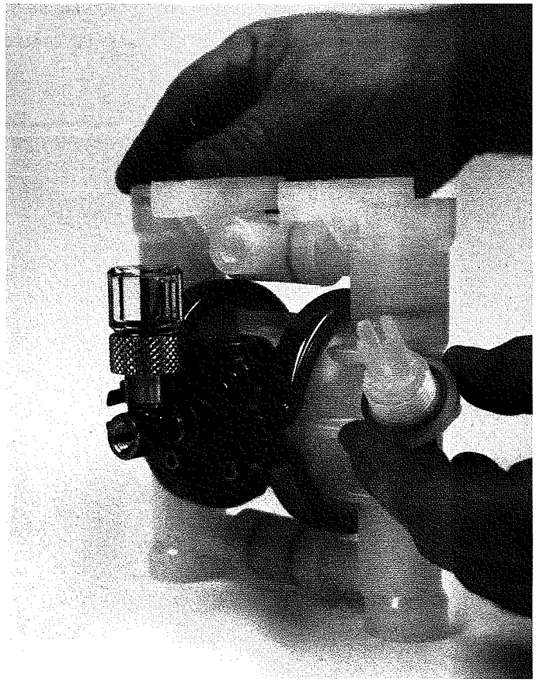


Figure 5

Turn pump upside down and loosen bottom retainer *(Figure 4).* Inspect retainer and O-ring. *(Figure 5).* If swelling, cracking, or other damage is apparent, these parts must be replaced.

SECTION IV

DIRECTIONS FOR DISASSEMBLY/REASSEMBLY

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 allowing any fluid to flow into a suitable container.

The Wilden model M.025 is an air-operated, double-diaphragm pump with all wetted parts of polypropylene, Acetal, carbon-filled Acetal or PVDF. The single-piece center section, consisting of center block and air chambers, is molded from polypropylene, carbon-filled Acetal or Acetal. All fasteners and hardware are stainless steel. The air valve is brass. All O-rings used in the pump are of special materials and should only be replaced with factory-supplied parts.

PLEASE read all directions before starting disassembly.

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. Mark each liquid chamber to its respective air chamber for easy alignment during reassembly.

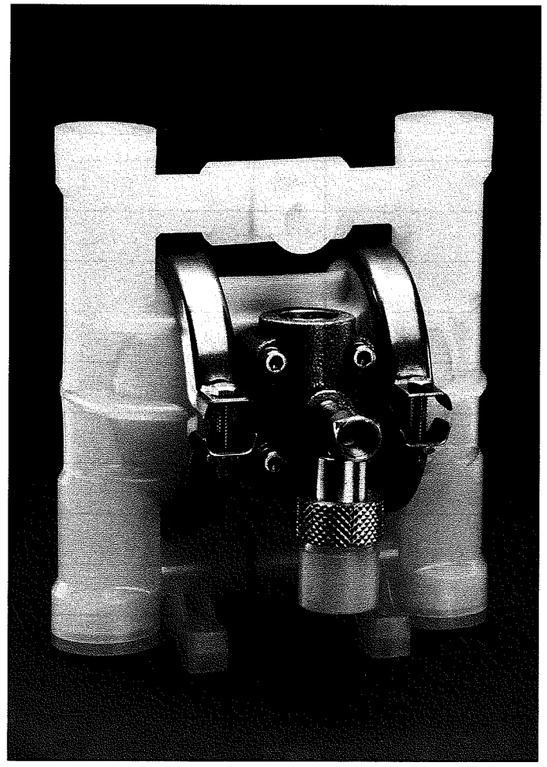


Figure 1

not shift until the air inlet pressure exceeds the minimum supply pressure requirement of approximately 35 psig. A minimum of 40 psi is recommended to ensure reliable operation.

A muffler can be installed to reduce the amount of noise generated by the pump. Use of the specified Wilden muffler will reduce noise levels below OSHA specifications.

3. ELEVATION: Selecting a site that is well within the pump's dynamic lift capability will assure that loss-of-prime troubles will be eliminated. In addition, pump efficiency can be adversely affected if proper attention is not given to elevation (see pump performance chart).

4. PIPING: Final determination of the pump site should not be made until the piping problems of each possible location have been evaluated. The impact of current and future installations should be considered ahead of time to make sure that inadvertent restrictions are not created for any remaining sites.

The best choice possible will be a site involving the shortest and the straightest hook-up of suction and discharge piping. Unnecessary elbows, bends, and fittings should be avoided. Pipe sizes should be selected so as to keep friction losses within practical limits. All piping should be supported independently of the pump. In addition, it should line up without placing stress on the pump fittings.

Expansion joints can be installed to aid in absorbing the forces created by the natural reciprocating action of the pump. If the pump is to be bolted down to a solid foundation, a mounting pad placed between the pump and foundation will assist in minimizing pump vibration. Flexible connections between the pump and rigid piping will also assist in minimizing pump vibration. If quick-closing valves are installed at any point in the discharge system, or if pulsation within a system becomes a problem, a surge suppressor should be installed to protect the pump, piping and gauges from surges and water hammer.

When pumps are installed in applications involving flooded suction or suction head pressures, a gate valve should be installed in the suction line to permit closing of the line for pump service.

INSPECTIONS: Periodic inspections have been found to offer the best means for preventing unscheduled pump downtime.

Individuals responsible for checking and maintaining lubrication levels in the 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.

SECTION IV

TROUBLESHOOTING

Pump will not run.

1. Check for pressurized air at the inlet.
2. Check air inlet and filter for debris.
3. Connect a test lamp to the two wires which run to pump and ensure that the lamp cycles on and off.
4. Make sure that the air valve manual override (small red knob on front of valve) is switched to the "0" position.
5. Check pilot pressure vent at the top of the operator/coil assembly to ensure that it is not clogged.
6. Check for a worn out air valve. If air continually blows out the exhaust in very large quantities, the air valve seals may be worn beyond their ability to function. In this case, the valve must be replaced.

NOTE: Before the valve is scrapped, it is possible that it may be saved by completely disassembling the valve, cleaning all components and relubricating the valve.

Pump runs but little or no fluid comes out.

1. Check that the discharge isolation valve is not closed.
2. Check that the electronic signal is slow enough that the pump is able to complete each physical stroke before it is signaled to change direction. The time required to complete the stroke is determined by a variety of factors which include fluid viscosity and head pressure. The shaft can be viewed if the muffler is removed to verify that the pump is stroking.
3. Check for pump cavitation; slow pump speed down to match the thickness of the material being pumped.
4. Check for sticking ball check valves. If the material being pumped is not compatible with the pump elastomers, swelling may occur. Replace ball check valves and O-ring with the proper elastomers.
5. Check to make sure that all suction connections are air tight, and that the clamp bands are properly tightened.

Pump air passages blocked with ice.

Check for excessive moisture in compressed air line. As the air expands out the exhaust during the operation of the pump, water vapor entrapped in the compressed air can freeze and block the air passageways in the pump. If this occurs, it may be necessary to install a coalescing filter, an air dryer, or a hot air generator for the compressed air.

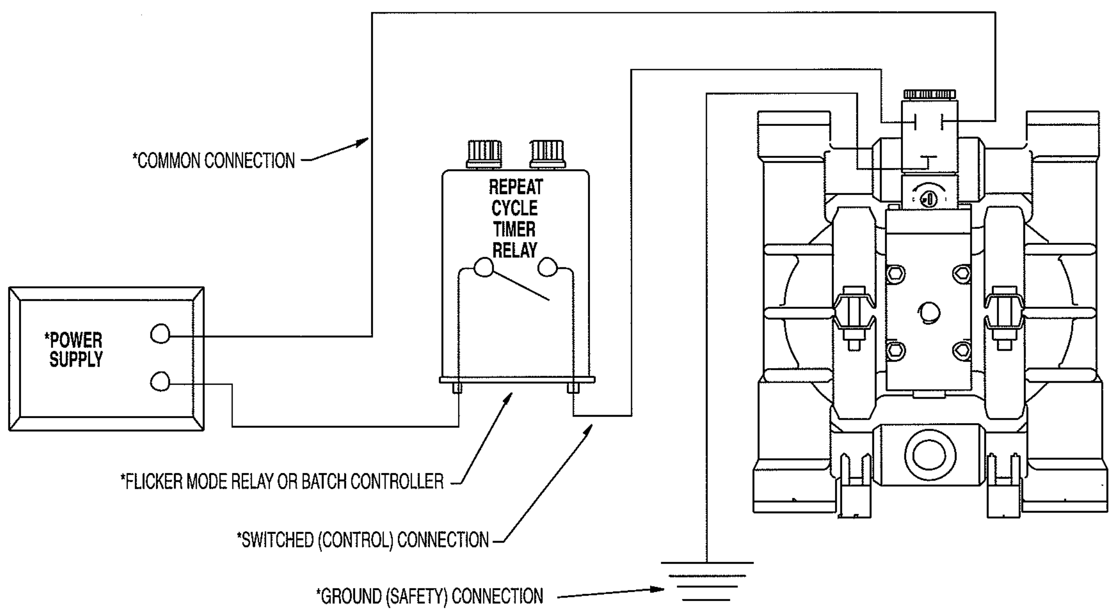
Air bubbles in pump discharge.

1. Check for ruptured diaphragm.
2. Check tightness of clamp bands, and the integrity of the O-rings, especially at intake manifold.

Product comes out of the air exhaust.

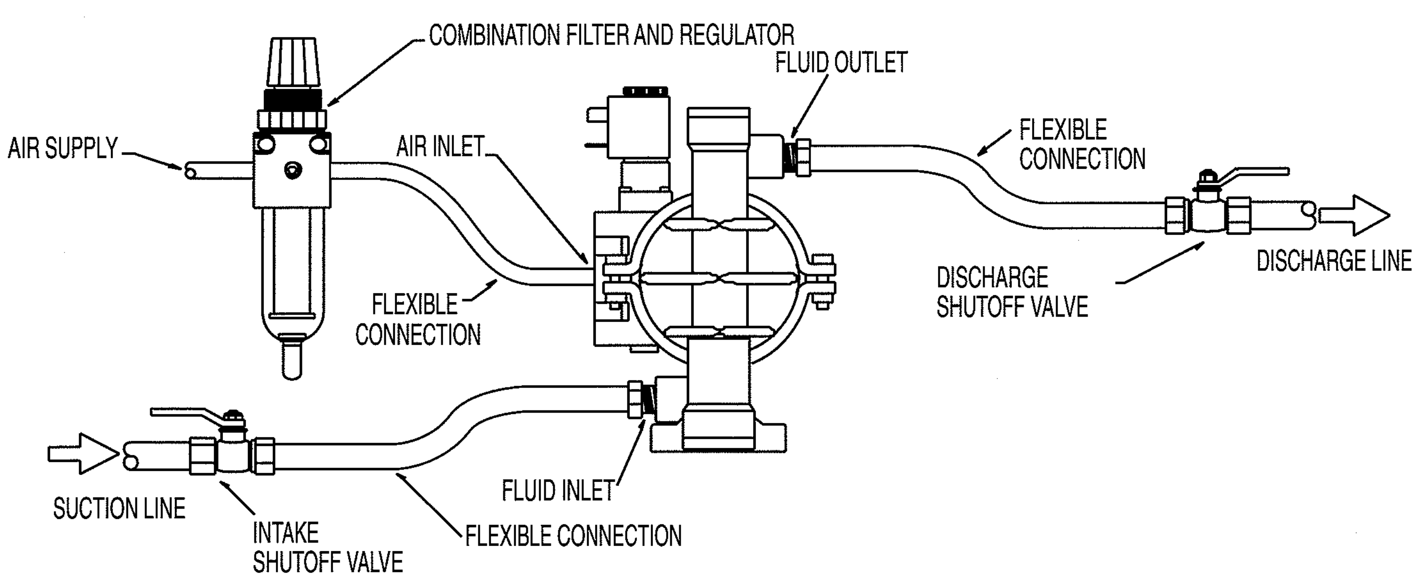
1. Check for diaphragm rupture.
2. Check tightness of piston plates to shaft.

ELECTRICAL CONNECTIONS



*SUPPLIED BY USER

PLUMBING CONNECTIONS



MAINTENANCE RECORD

DATE	SERVICE RENDERED	SERVICED BY

Pump discharge rate can be controlled by limiting the volume and/or pressure of the air supply to the pump (preferred method). The use of a needle valve installed at the air inlet to the pump is suggested for this purpose. Pump discharge rate can also be controlled by throttling the pump discharge by installing a valve in the discharge line of the pump when the need to control the pump from a remote location exists. When the pump discharge pressure equals or exceeds the air supply pressure, the pump will stop; no bypass or pressure relief valve is needed, and pump damage will not occur. When operation is controlled by a solenoid valve in the air line, a three-way valve should be used. Pumping volume can be set by counting the number of strokes per minute.

A muffler installed on the pump's air exhaust will give quiet exhaust. Sound levels are reduced below OSHA specifications using a Wilden muffler.

3. ELEVATION: Selecting a site that is well within the pump's dynamic lift capability will assure that loss-of-prime troubles will be eliminated. In addition, pump efficiency can be adversely affected if proper attention is not given to elevation (see pump performance chart).

4. PIPING: Final determination of the pump site should not be made until the piping problems of each possible location have been evaluated. The impact of current and future installations should be considered ahead of time to make sure that inadvertent restrictions are not created for any remaining sites.

The best choice possible will be a site involving the shortest and the straightest hook-up of suction and discharge piping. Unnecessary elbows, bends, and fittings should be avoided. Pipe sizes should be selected so as to keep friction losses within practical limits. All piping should be supported independently of the pump. In addition, it should line up without placing stress on the pump fittings.

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When pumps are installed in applications involving flooded suction or suction head pressures, a gate valve should be installed in the suction line to permit closing of the line for pump service.

INSPECTIONS: Periodic inspections have been found to offer the best means for preventing unscheduled pump downtime.

Individuals responsible for checking and maintaining lubrication levels in the 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.

SECTION III
TROUBLESHOOTING

Pump will not run or runs slowly.

1. Check air inlet screen and air filter for debris.
2. Check for sticking air valve, flush air valve in solvent.
3. Check for worn out air valve. If piston face in air valve is shiny instead of dull, air valve is probably worn beyond working tolerances and must be replaced.
4. Check center block O-rings. If worn excessively, they will not seal and air will simply flow through pump and out air exhaust. Use only Wilden O-rings as they are of special construction.
5. Check for rotating piston in air valve.
6. Check type of lubricant being used. A higher viscosity oil than suggested may cause the piston to stick or run erratically. Wilden suggests the use of an oil with arctic characteristics (ISO 15-5 wt.).

Pump runs but little or no product flows.

1. Check for pump cavitation; slow pump speed down to match thickness of material being pumped.
2. Check for sticking ball checks. If material being pumped is not compatible with pump elastomers, swelling may occur. Replace ball checks and seal with proper elastomers.
3. Check to make sure all suction connections are air tight, especially clamp bands around intake balls.

Pump air valves freezes.

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

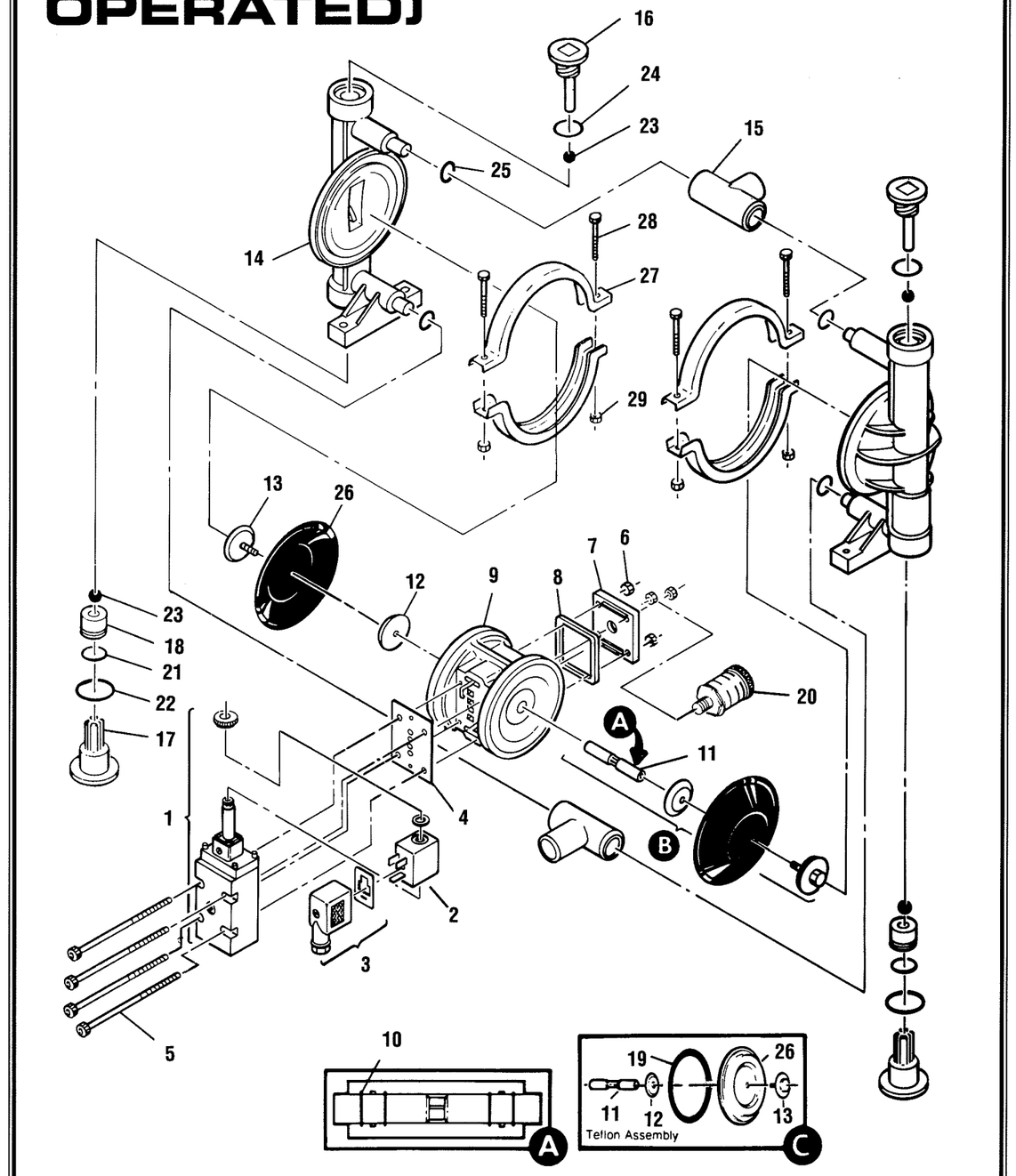
Air bubbles in pump discharge.

1. Check for ruptured diaphragm.
2. Check tightness of clamp bands, especially at intake manifold.

Product comes out air exhaust.

1. Check for diaphragm rupture.
2. Check tightness of piston plates to shaft.

M.025 (SOLENOID-OPERATED)



Wilden Model M.025 Solenoid Operated — DC

Models PTE, LTE, KTE, and GTE are Teflon®-fitted.

ITEM #	DESCRIPTION	QTY.	POLYPROPYLENE M.025/POE and M.025/PTE P/N	ACETAL M.025/LOE and M.025/LTE P/N	PVDF M.025/KOE and M.025/KTE P/N	CARBON-FILLED ACETAL[3] M.025/GOE and M.025/GTE P/N
	24 Volt DC Valve Assembly[1]		See table below	See table below	See table below	See table below
1	Main Valve Body	1	See table below	See table below	See table below	See table below
2	24 Volt DC Coil	1	See table below	See table below	See table below	See table below
3	Terminal Connector	1	00-2130-99	00-2130-99	00-2130-99	00-2130-99
4	Air Valve Gasket — Buna	1	00-2600-52	00-2600-52	00-2600-52	00-2600-03
5	Air Valve Bolt	4	00-2750-03	00-2750-03	00-2750-03	00-2750-03
6	Air Valve Nut	4	S98C	S98C	S98C	S98C
7	Muffler Plate	1	00-3181-20	00-3181-13	00-3181-21	00-3181-16
8	Muffler Plate Gasket — Buna	1	00-3500-52	00-3500-52	00-3500-52	00-3500-30
9	Center Section	1	00-3150-20	00-3150-13	00-3150-20	00-3150-16
10	Center Block O-Ring	4	00-3200-52	00-3200-52	00-3200-52	00-3200-52
11	Shaft	1	00-4000-09	00-4000-09	00-4000-09	00-4000-09
12	Inner Piston for Rubber/TPE	2	00-4430-01	00-4430-01	00-4430-01	00-4430-01
	Teflon® Fitted	2	00-4440-01	00-4440-01	00-4440-01	00-4440-01
13	Outer Piston	2	00-4550-20	00-4550-13	00-4550-21	00-4550-16
14	Liquid Chamber	2	00-6000-20	00-6000-13	00-6000-21	00-6000-16
15	Manifold Tee-Section	2	00-6160-20	00-6160-13	00-6160-21	00-6160-16
16	Top Retainer	2	00-6410-20	00-6410-13	00-6410-21	00-6410-16
17	Bottom Retainer	2	00-6420-20	00-6420-13	00-6420-21	00-6420-16
18	Valve Seat	2	00-1120-20	00-1120-13	00-1120-21	00-1120-16
19	Back-up O-Ring*[2]	2	00-1070-58	00-1070-58	00-1070-58	00-1070-58
20	Muffler	1	00-9010-99	00-9010-99	00-9010-99	00-9010-99
21	Valve Seat O-Ring*	2	—	—	—	—
22	Bottom Retainer O-Ring*	2	—	—	—	—
23	Valve Ball*	4	—	—	—	—
24	Top Retainer O-Ring*	2	—	—	—	—
25	Tee Section O-Ring*	4	—	—	—	—
26	Diaphragm*	2	—	—	—	—
27	Clamp Band Assembly	4	00-7031-03	00-7031-03	00-7031-03	00-7031-03
28	Clamp Band Bolt	4	S98B	S98B	S98B	S98B
29	Clamp Band Nut	4	S98C	S98C	S98C	S98C

*Refer to Elastomer Options on page 19.
[1]Air Valve Assembly includes items 1, 2, and 3.
[2]Part used only on Teflon®-fitted pumps.
[3]Carbon-filled Acetal pumps come equipped with explosion proof (NEMA 7) solenoid valve assemblies only.

Valve Assembly Options (Consists of Valve Body, Coil and Connector)

PUMP MODEL	SUFFIX[4]	PART NUMBER	DESCRIPTION
POE, PTE, PCE, PPE, LOE, LTE, LCE, LLE, KOE, KTE, KCE, KKE	—	00-2040-99	24 Volt DC Valve Assembly
POE, PTE, PCE, PPE, LOE, LTE, LCE, LLE, KOE, KTE, KCE, KKE, GOE, GTE, GCE, GGE	EX	00-2040-99-154	24 Volt DC Valve Assembly (NEMA 7)
POE, PTE, PCE, PPE, LOE, LTE, LCE, LLE, KOE, KTE, KCE, KKE, GOE, GTE, GCE, GGE	EE	00-2040-99-157	24 Volt DC Valve Assembly[5]

Item 1 Main Valve Body Options

PUMP MODEL SUFFIX[4]	PART NUMBER	DESCRIPTION
—	00-2040-01	Main Valve Body
EX	00-2040-01-154	Main Valve Body (NEMA 7)

Item 2 Coil Options

PUMP MODEL	SUFFIX[4]	PART NUMBER	DESCRIPTION
POE, PTE, PCE, PPE, LOE, LTE, LCE, LLE, KOE, KTE, KCE, KKE	—	00-2120-99	24 Volt DC Coil
POE, PTE, PCE, PPE, LOE, LTE, LCE, LLE, KOE, KTE, KCE, KKE, GOE, GTE, GCE, GGE	EX	00-2120-99-154	24 Volt DC Coil (NEMA 7)
POE, PTE, PCE, PPE, LOE, LTE, LCE, LLE, KOE, KTE, KCE, KKE, GOE, GTE, GCE, GGE	EE	00-2120-99-157	24 Volt DC Valve Assembly[5]

[4]If a suffix is not present at the end of the model number, the pump will be equipped with a NEMA 4 valve body.
Example: M.025/PTE/TF/TF/PT
If there is an "EX" suffix at the end of the model number, the pump will be equipped with a NEMA 7 valve body.
Example: M.025/PTE/TF/TF/PT/EX
[5]Meets European standards and regulations; CENELEC/PTB File # EX-91.C.2027X.

SECTION I
INSTALLATION (CHAMP)

Please refer to page 20 for solenoid-operated models.

The Model M.025 has a ¼" inlet and ¼" outlet and is designed for flows to 4.9 gpm. The **M.025 Champ** pump is manufactured with wetted parts of pure, unpigmented PVDF, Acetal, polypropylene or carbon-filled Acetal. The center section of the **M.025 Champ** is constructed of polypropylene, Acetal or carbon-filled Acetal. A variety of diaphragms, valve balls, and O-rings are available to satisfy temperature, chemical compatibility, abrasion and flex concerns.

The suction pipe size should be at least ¼" diameter or larger if highly viscous material is being pumped. The suction hose must be non-collapsible, reinforced type as the M.025 is capable of pulling a high vacuum. Discharge piping should be at least ¼"; larger diameter can be used to reduce friction losses. It is critical that all fittings and connections are airtight or a reduction or loss of pump suction capability will result.

The M.025 can be used in submersible applications only when both wetted and non-wetted portions are compatible with the material being pumped. If the pump is to be used in a submersible application, a hose should be attached to the pump's air exhaust and the exhaust air piped above the liquid level.

If the pump is to be used in a self-priming application, be sure that all connections are airtight and that the suction lift is within the pump's ability. Note: Materials of construction and elastomer material have an effect on suction lift parameters. Please consult with your local Wilden distributor for specifics.

Pumps in service with a positive suction head are most efficient when inlet pressure is limited to 7–10 psig. Premature diaphragm failure may occur if positive suction is 11 psig and higher.

THE MODEL M.025 WILL PASS 1/64" SOLIDS. WHENEVER THE POSSIBILITY EXISTS THAT LARGER SOLID OBJECTS MAY BE SUCKED INTO THE PUMP, A STRAINER SHOULD BE USED ON THE SUCTION LINE.

CAUTION: DO NOT EXCEED 125 PSIG AIR SUPPLY PRESSURE.

BLOW OUT AIR LINE FOR 10 TO 20 SECONDS BEFORE ATTACHING TO PUMP TO MAKE SURE ALL PIPE LINE DEBRIS IS CLEAR.

As per the standard testing method ASTM D257, the surface resistance of carbon-filled Acetal is less than $4x10^3$ Ohms.

SECTION II
SUGGESTED OPERATION AND MAINTENANCE INSTRUCTIONS

INSTALLATION: Months of careful planning, study, and selection efforts can result in unsatisfactory pump performance if installation details are left to chance.

Premature failure and long term dissatisfaction can be avoided if reasonable care is exercised throughout the installation process.

LOCATION: Noise, safety, and other logistical factors usually dictate that "utility" equipment be situated away from the production floor. Multiple installations with conflicting requirements can result in congestion of utility areas, leaving few choices for siting of additional pumps.

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 to maximum advantage.

1. ACCESS: First of all, the location should be accessible. If it's easy to reach the pump, maintenance personnel will have an easier time carrying out routine inspections and adjustments. Should major repairs become necessary, ease of access can play a key role in speeding the repair process and reducing total downtime.

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 (see pump performance chart). Use air pressure up to a maximum of 125 psi depending upon pumping requirements.

For best results, the pumps should use an air filter, regulator, and lubricator system. The use of an air filter before the pump will insure that the majority of any pipeline contaminants will be eliminated. The use of a lubricant, suitable for the application, helps perform a number of functions. Lubricants reduce friction to minimize required shifting forces and reduce wear. Lubricants provide a protective coating against some forms of corrosion and contaminants.

NOTE: PUMP MUST BE LUBRICATED. The M.025 is shipped from Wilden with an oil bottle lubricator. This lubricator is constructed with a Capillary Rod which can be adjusted for proper lubrication. As the Capillary Rod (item #34, page 16) is positioned higher in the Tee Orifice (item #32, page 16), an increase in lubrication will result.

Wilden suggests an oil with arctic characteristics (ISO 15-5Wt.) This oil is chemically compatible with the center block O-rings and has a low pour point to guard against problems associated with low temperatures.

PUMP PERFORMANCE CURVES

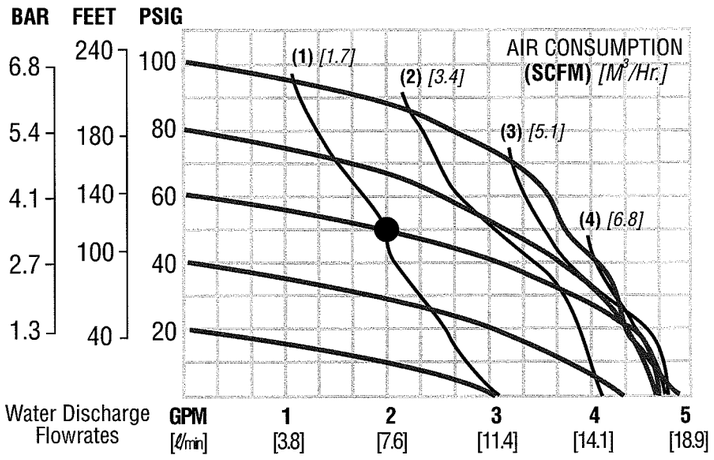
MODEL M.025 (Rubber/TPE-Fitted)

WILDEN MODEL M.025
Rubber/TPE-Fitted

Height ..... 6⁷⁄₁₆"
Width ..... 5¹¹⁄₁₆"
Depth ..... 5¾"
Weight ..... Polypropylene 3.2 lbs.
Acetal, PVDF 3.6 lbs.
Air Inlet ..... ⅜"
Inlet ..... ¾" Female NPT
Outlet ..... ¾" Female NPT
Suction Lift ..... Dry 4½'
Wet 25'
Displacement per Stroke ..... .0036[1]
Solenoid-Operated ..... .0045[1]
Max. Size Solids ..... ⅛₄" Dia.

Example: To pump 2 gpm against a discharge pressure of 50 psig requires 60 psig and 1 scfm air consumption. (See dot on curve.)

[1]Displacement per stroke was calculated at 70 psig air inlet pressure against a 30 psig head pressure.



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

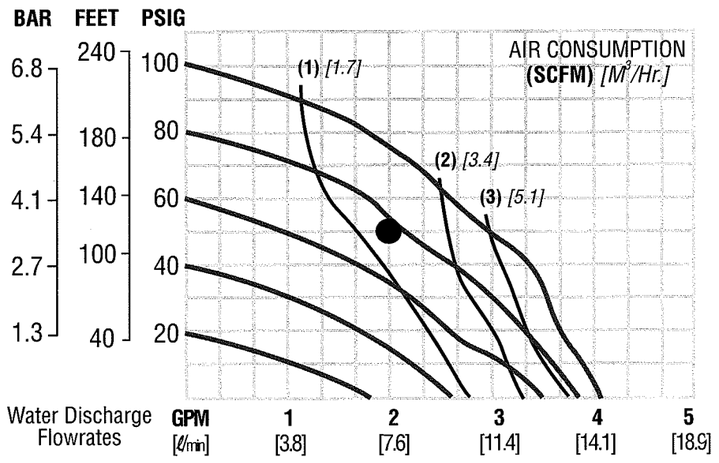
MODEL M.025 (Teflon®-Fitted)

WILDEN MODEL M.025
Teflon®-Fitted

Height ..... 6⁷⁄₁₆"
Width ..... 5¹¹⁄₁₆"
Depth ..... 5¾"
Weight ..... Polypropylene 3.2 lbs.
Acetal, PVDF 3.6 lbs.
Air Inlet ..... ⅜"
Inlet ..... ¾" Female NPT
Outlet ..... ¾" Female NPT
Suction Lift ..... Dry 4½'
Wet 25'
Displacement per Stroke ..... .0035[1]
Solenoid-Operated ..... .0045[1]
Max. Size Solids ..... ⅛₄" Dia.

Example: To pump 2 gpm against a discharge pressure of 50 psig requires 76 psig and 1.2 scfm air consumption. (See dot on curve.)

[1]Displacement per stroke was calculated at 70 psig air inlet pressure against a 30 psig head pressure.



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

Wilden Model M.025 Solenoid Operated — AC

Models PTI, LTI, KTI, and GTI are Teflon®-fitted.

ITEM #	DESCRIPTION	QTY.	POLYPROPYLENE M.025/POI and M.025/PTI P/N	ACETAL M.025/LOI and M.025/LTI P/N	PVDF M.025/KOI and M.025/KTI P/N	CARBON-FILLED ACETAL[3] M.025/GOI and M.025/GTI P/N
	24 Volt AC Valve Assembly[1]		See table below	See table below	See table below	See table below
1	Main Valve Body	1	See table below	See table below	See table below	See table below
2	24 Volt AC Coil	1	See table below	See table below	See table below	See table below
3	Terminal Connector	1	00-2130-99	00-2130-99	00-2130-99	00-2130-99
4	Air Valve Gasket — Buna	1	00-2600-52	00-2600-52	00-2600-52	00-2600-03
5	Air Valve Bolt	4	00-2750-03	00-2750-03	00-2750-03	00-2750-03
6	Air Valve Nut	4	S98C	S98C	S98C	S98C
7	Muffler Plate	1	00-3181-20	00-3181-13	00-3181-21	00-3181-16
8	Muffler Plate Gasket — Buna	1	00-3500-52	00-3500-52	00-3500-52	00-3500-30
9	Center Section	1	00-3150-20	00-3150-13	00-3150-20	00-3150-16
10	Center Block O-Ring	4	00-3200-52	00-3200-52	00-3200-52	00-3200-52
11	Shaft	1	00-4000-09	00-4000-09	00-4000-09	00-4000-09
12	Inner Piston for Rubber/TPE	2	00-4430-01	00-4430-01	00-4430-01	00-4430-01
	Teflon® Fitted	2	00-4440-01	00-4440-01	00-4440-01	00-4440-01
13	Outer Piston	2	00-4550-20	00-4550-13	00-4550-21	00-4550-16
14	Liquid Chamber	2	00-6000-20	00-6000-13	00-6000-21	00-6000-16
15	Manifold Tee-Section	2	00-6160-20	00-6160-13	00-6160-21	00-6160-16
16	Top Retainer	2	00-6410-20	00-6410-13	00-6410-21	00-6410-16
17	Bottom Retainer	2	00-6420-20	00-6420-13	00-6420-21	00-6420-16
18	Valve Seat	2	00-1120-20	00-1120-13	00-1120-21	00-1120-16
19	Back-up O-Ring*[2]	2	00-1070-58	00-1070-58	00-1070-58	00-1070-58
20	Muffler	1	00-9010-99	00-9010-99	00-9010-99	00-9010-99
21	Valve Seat O-Ring*	2	—	—	—	—
22	Bottom Retainer O-Ring*	2	—	—	—	—
23	Valve Ball*	4	—	—	—	—
24	Top Retainer O-Ring*	2	—	—	—	—
25	Tee Section O-Ring*	4	—	—	—	—
26	Diaphragm*	2	—	—	—	
27	Clamp Band Assembly	4	00-7031-03	00-7031-03	00-7031-03	00-7031-03
28	Clamp Band Bolt	4	S98B	S98B	S98B	S98B
29	Clamp Band Nut	4	S98C	S98C	S98C	S98C

*Refer to Elastomer Options on page 19.
[1]Air Valve Assembly includes items 1, 2 and 3.
[2]Part used only on Teflon®-fitted pumps.
[3]Carbon-filled Acetal pumps come equipped with explosion proof (NEMA 7) solenoid valve assemblies only.

Valve Assembly Options (Consists of Valve Body, Coil and Connector)

PUMP MODEL	SUFFIX[4]	PART NUMBER	DESCRIPTION
POI, PTI, PCI, PPI, LOI, LTI, LCI, LLI, KOI, KTI, KCI, KKI	—	00-2060-99	24 Volt AC/ 12 Volt DC Valve Assembly
POI, PTI, PCI, PPI, LOI, LTI, LCI, LLI, KOI, KTI, KCI, KKI, GOI, GTI, GCI, GGI	EX	00-2060-99-153	24 Volt AC/ 12 Volt DC Valve Assembly (NEMA 7)
POU, PTU, PCU, PPU, LOU, LTU, LCU, LLU, KOU, KTU, KCU, KKU	—	00-2060-99-155	110 Volt AC Valve Assembly
POU, PTU, PCU, PPU, LOU, LTU, LCU, LLU, KOU, KTU, KCU, KKU, GOU, GTU, GCU, GGU	EX	00-2060-99-156	110 Volt AC Valve Assembly (NEMA 7)

Item 1 Main Valve Body Options

PUMP MODEL SUFFIX[4]	PART NUMBER	DESCRIPTION
—	00-2040-01	Main Valve Body
EX	00-2040-01-154	Main Valve Body (NEMA 7)

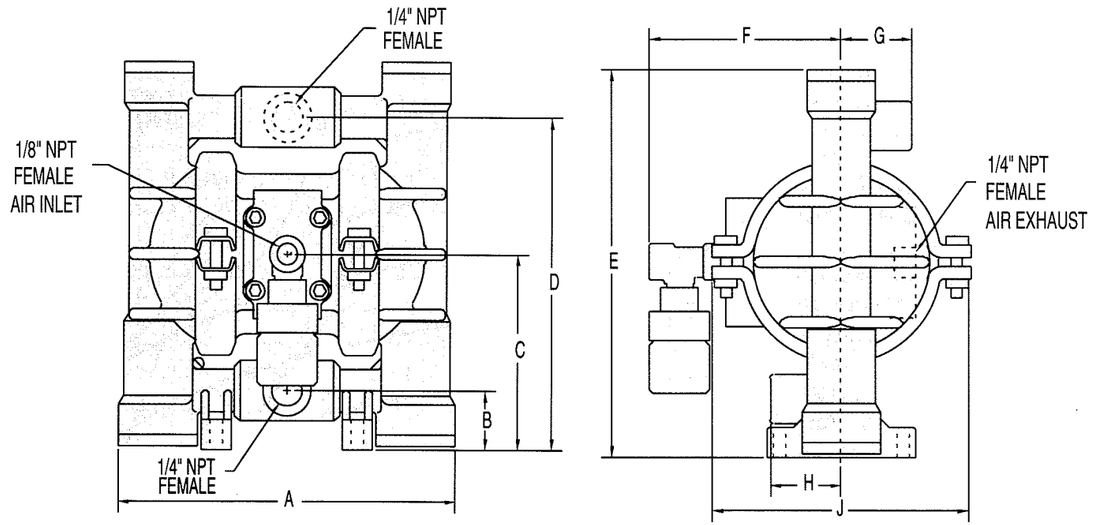
Item 2 Coil Options

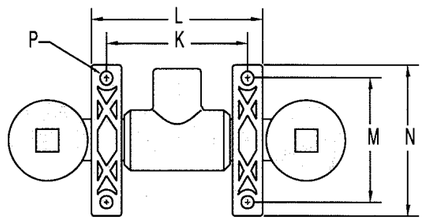
PUMP MODEL	SUFFIX[4]	PART NUMBER	DESCRIPTION
POI, PTI, PCI, PPI, LOI, LTI, LCI, LLI, KOI, KTI, KCI, KKI	—	00-2110-99	24 Volt AC/ 12 Volt DC Coil
POI, PTI, PCI, PPI, LOI, LTI, LCI, LLI, KOI, KTI, KCI, KKI, GOI, GTI, GCI, GGI	EX	00-2110-99-153	24 Volt AC/ 12 Volt DC Coil (NEMA 7)
POU, PTU, PCU, PPU, LOU, LTU, LCU, LLU, KOU, KTU, KCU, KKU	—	00-2110-99-155	110 Volt AC Coil
POU, PTU, PCU, PPU, LOU, LTU, LCU, LLU, KOU< KTU, KCU, KKU, GOU, GTU, GCU, GGU	EX	00-2110-99-156	110 Volt AC Coil (NEMA 7)

[4]If a suffix is not present at the end of the model number, the pump will be equipped with a NEMA 4 valve body.
Example: M.025/PTI/TF/TF/PT
If there is an "EX" suffix at the end of the model number, the pump will be equipped with a NEMA 7 valve body.
Example: M.025/PTI/TF/TF/PT/EX

NOTES

DIMENSIONAL DRAWINGS
WILDEN MODEL M.025





DIMENSIONS – M.025		
ITEM	STANDARD (inch)	METRIC (mm)
A	5 11/16	144.5
B	1	25.0
C	3 5/16	84.1
D	5 17/32	140.5
E	6 7/16	163.1
F	3 17/32	89.7
G	1 3/16	30.2
H	1 3/16	30.2
J	4 17/32	115.1
K	2 13/32	61.1
L	2 15/16	74.6
M	2 3/32	52.8
N	2 17/32	64.3
P	Ø7/32	Ø5.6

THE WILDEN PUMP — HOW IT WORKS

The Wilden diaphragm pump is an air-operated, positive displacement, self-priming pump. These drawings show flow pattern through the pump upon its initial stroke. It is assumed the pump has no fluid in it prior to its initial stroke.

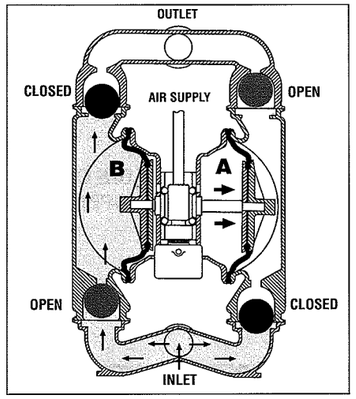


FIGURE 1 The air valve directs pressurized air to the back side of diaphragm A. The compressed air is applied directly to the liquid column separated by elastomer diaphragms. The diaphragm acts as a separation membrane between the compressed air and liquid, balancing the load and removing mechanical stress from the diaphragm which allows for millions of flex cycles. The compressed air moves the diaphragm away from the center block of the pump. The opposite diaphragm is pulled in by the shaft connected to the pressurized diaphragm. Diaphragm B is now on its suction stroke; air behind the diaphragm has been forced out to the atmosphere through the exhaust port of the pump. Diaphragm A is working against atmospheric air pressure. The movement of diaphragm B toward the center block of the pump creates a vacuum within chamber B. Atmospheric pressure forces fluid into the inlet manifold forcing the inlet valve ball off its seat. Liquid is free to move past the inlet valve ball and fill the liquid chamber.

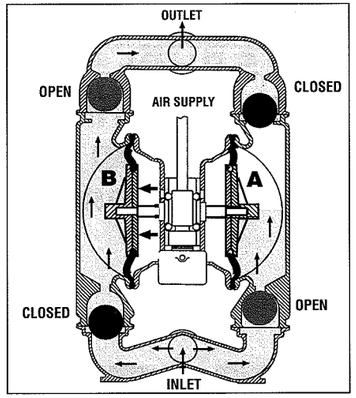


FIGURE 2 When the pressurized diaphragm, diaphragm A, reaches the limit of its discharge stroke, the air valve redirects pressurized air to the back side of diaphragm B. The pressurized air forces diaphragm B away from the center block while pulling diaphragm A to the center block. Diaphragm B is now on its discharge stroke. Diaphragm B forces the inlet valve ball onto its seat due to the hydraulic forces developed in the liquid chamber and manifold of the pump. These same hydraulic forces lift the discharge valve ball off its seat, while the opposite discharge valve ball is forced onto its seat, forcing fluid to flow through the pump discharge. The movement of diaphragm A to the center block of the pump creates a vacuum within liquid chamber A. Atmospheric pressure forces fluid into the inlet manifold of the pump. The inlet valve ball is forced off its seat allowing the fluid being pumped to fill the liquid chamber.

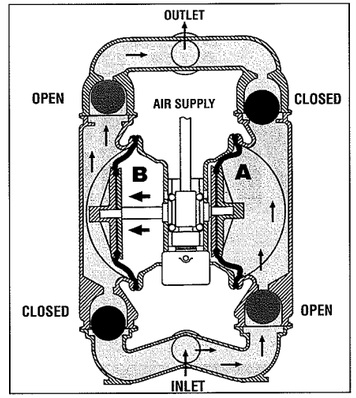
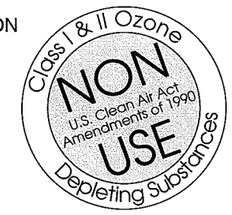


FIGURE 3 At completion of the stroke, the air valve again redirects air to the back side of diaphragm A, which starts diaphragm B on its exhaust stroke. As the pump reaches its original starting point, each diaphragm has gone through one exhaust and one discharge stroke. This constitutes one complete pumping cycle. The pump may take several cycles to completely prime depending on the conditions of the application.

WILDEN PUMP DESIGNATION SYSTEM

XX / XX / XX / XX / XX
1 2 3 4 5 6

1 MODEL (SIZE)
2 WETTED CONSTRUCTION
3 NON-WETTED CONSTRUCTION
4 DIAPHRAGMS
5 VALVE BALLS
6 VALVE SEATS (O-RINGS)

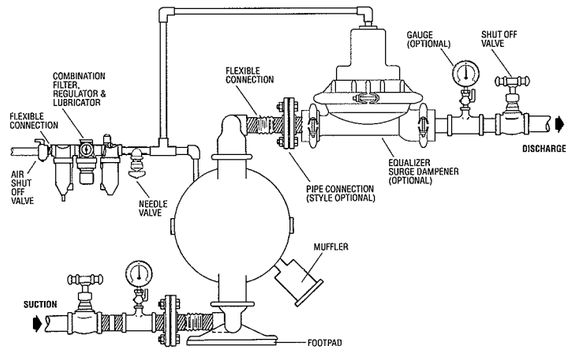


Temperature Limits:

Polypropylene	**+32°F to +175°F (0°C to +79.4°C)**
PVDF	**+10°F to +225°F (–12.2°C to +107.2°C)**
Acetal	**–20°F to +180°F (–28.9°C to +82.2°C)**
Carbon-filled Acetal	**–20°F to +150°F (–28.9°C to +65.6°C)**

CAUTION: Maximum temperature limits are based upon mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperatures. Consult engineering guide for chemical compatibility and temperature limits.

SUGGESTED INSTALLATION



CAUTION: WEAR SAFETY GLASS. WHEN DIAPHRAGM RUPTURE OCCURS, MATERIAL BEING PUMPED MAY BE FORCED OUT AIR EXHAUST.

"Champ" series pumps are made of virgin plastic and are not UV stabilized. Direct sunlight for prolonged periods can cause deterioration of plastics.

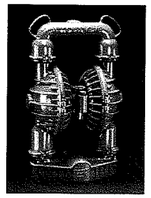
NOTE: Pump must be lubricated. Wilden suggests an arctic 5 weight oil (ISO grade 15).

WARNING: Prevention of static sparking — If static sparking occurs, fire or explosion could result. Pump, valves, and containers must be grounded when handling flammable fluids and whenever discharge of static electricity is a hazard. To ground the Wilden "Champ," all clamp bands must be grounded to a proper grounding point.

NOTES

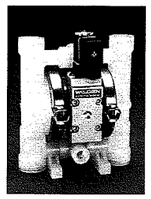
WILDEN'S SPECIALTY PUMPS

M8 STALLION



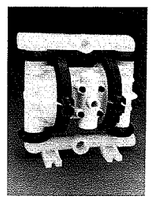
2" inlet. Solids clearance up to ¾". Built to handle rough treatment: cast-in handles for easy portability, reinforced shaft and high impact polyurethane base.

SOLENOID-OPERATED



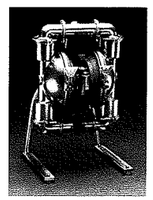
Each stroke of this pump is controlled by electrical impulses making it ideal for batching, metering, and other electrically controlled dispensing applications.

M1 ULTRAPURE III



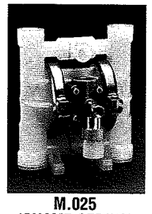
½" inlet. Teflon® PFA construction, temperatures to 300°F. Up to 14 GPM. Materials of construction have been selected to reduce contamination while providing a safer work environment.

FOOD PROCESSING



Constructed with FDA approved materials: bead blasted 316 Stainless Steel construction with tri-clamp porting and wing-nut fasteners. Foodmaster™ (pictured) is USDA accepted.

THE WILDEN PUMP LINE



M.025 (CHAMP SERIES)

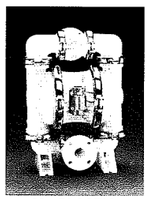
MODEL M.025

- ¼" Inlet
- 125 Max. PSIG
- Up To 4.5 GPM
- Max. Particle Size: 1/64"

Materials of Construction:
PVDF, Acetal, Polypropylene, Carbon-filled Acetal

Suction Lift:

(Rubber)	Dry:	4.5'
	Wet:	25'
(Teflon®)	Dry:	4.5'
	Wet:	25'



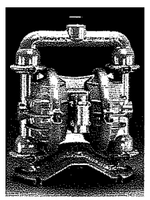
M4 PLASTIC (CHAMP SERIES)

MODEL M4

- 1½" Inlet
- 125 Max. PSIG
- Up To 73 GPM
- Max. Particle Size: 3/16"

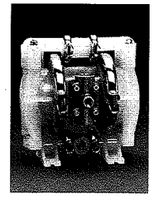
Materials of Construction:
Aluminum, Cast Iron, Stainless Steel, Hastelloy, Polypropylene, PVDF, Teflon® PFA

Suction Lift:	Plastic	Metal
(Rubber) Dry:	17'	21'
Wet:	25'	25'
(Teflon®) Dry:	7'	7'
Wet:	25'	25'



M4 METAL

LUBE-FREE AVAILABLE



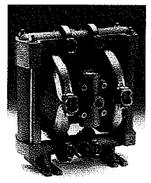
M1 PLASTIC (CHAMP SERIES)

MODEL M1

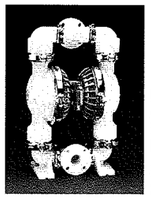
- ½" Inlet
- 110 Max. PSIG
- Up To 14 GPM
- Max. Particle Size: 1/16"

Materials of Construction:
Polypropylene, PVDF, Teflon®, Graphite-filled Polypropylene, Aluminum, Stainless Steel

Suction Lift:	Plastic	Metal
(Rubber) Dry:	10'	10'
Wet:	25'	25'
(Teflon®) Dry:	7'	8'
Wet:	25'	25'



M1 METAL



M8 PLASTIC (CHAMP SERIES)

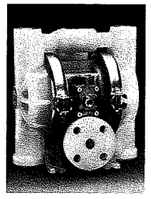
MODEL M8

- 2" Inlet
- 125 Max. PSIG
- Up To 155 GPM
- Max. Particle Size: ¼"

Materials of Construction:
Aluminum, Cast Iron, Stainless Steel, Hastelloy, PVDF, Polypropylene

Suction Lift:	Plastic	Metal
(Rubber) Dry:	17'	20'
Wet:	25'	25'
(Teflon®) Dry:	8'	8'
Wet:	25'	25'

M8 METAL



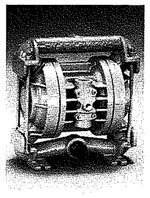
M2R PLASTIC (CHAMP SERIES)

MODEL M2

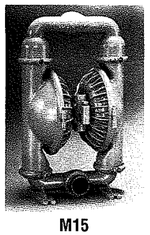
- 1" Inlet
- 125 Max. PSIG
- Up To 37 GPM
- Max. Particle Size: ⅛"

Materials of Construction:
Aluminum, Stainless Steel, Hastelloy, Polypropylene, PVDF

Suction Lift:	Plastic	Metal
(Rubber) Dry:	17'	19'
Wet:	25'	25'
(Teflon®) Dry:	7'	8'
Wet:	25'	25'



M2 METAL



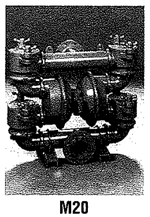
M15

MODEL M15

- 3" Inlet
- 125 Max. PSIG
- Up To 230 GPM
- Max. Particle Size: ⅜"

Materials of Construction:
Aluminum, Cast Iron, Stainless Steel, Hastelloy

Suction Lift:	
(Rubber) Dry:	17'
Wet:	25'
(Teflon®) Dry:	14'
Wet:	25'



M20

MODEL M20

- 4" Inlet
- 125 Max. PSIG
- Up To 304 GPM
- Max. Particle Size: 1⅜"

Materials of Construction:
Cast Iron

Suction Lift:
Dry: 13'
Wet: 25'

For further information contact your local Wilden distributor:

WILDEN PUMP & ENGINEERING COMPANY
22069 Van Buren St., Grand Terrace, CA 92313-5651
(909) 422-1730 • FAX (909) 783-3440

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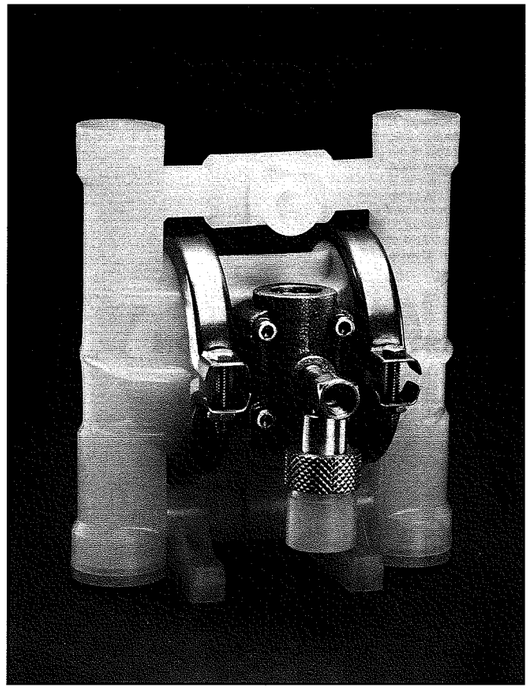
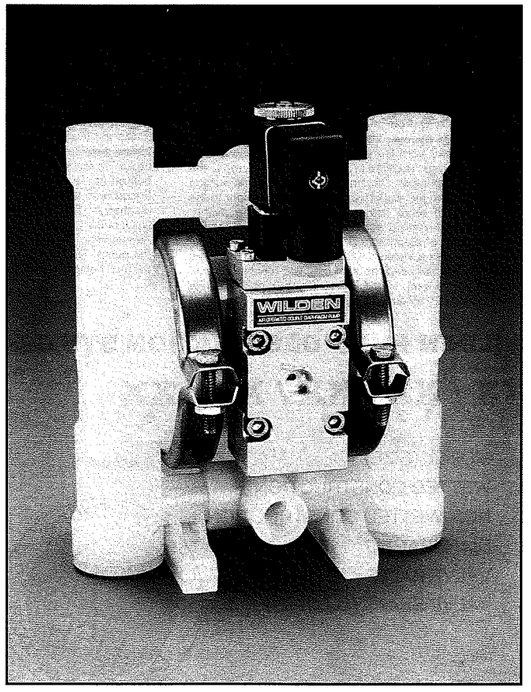
AIR OPERATED DOUBLE DIAPHRAGM PUMPS

M.025 Engineering Operation and Maintenance

M.025 CHAMP
M.025 SOLENOID OPERATED



M.025 CHAMP



M.025 SOLENOID OPERATED

RBG PS-M.025 4/95
REPLACES 1/95