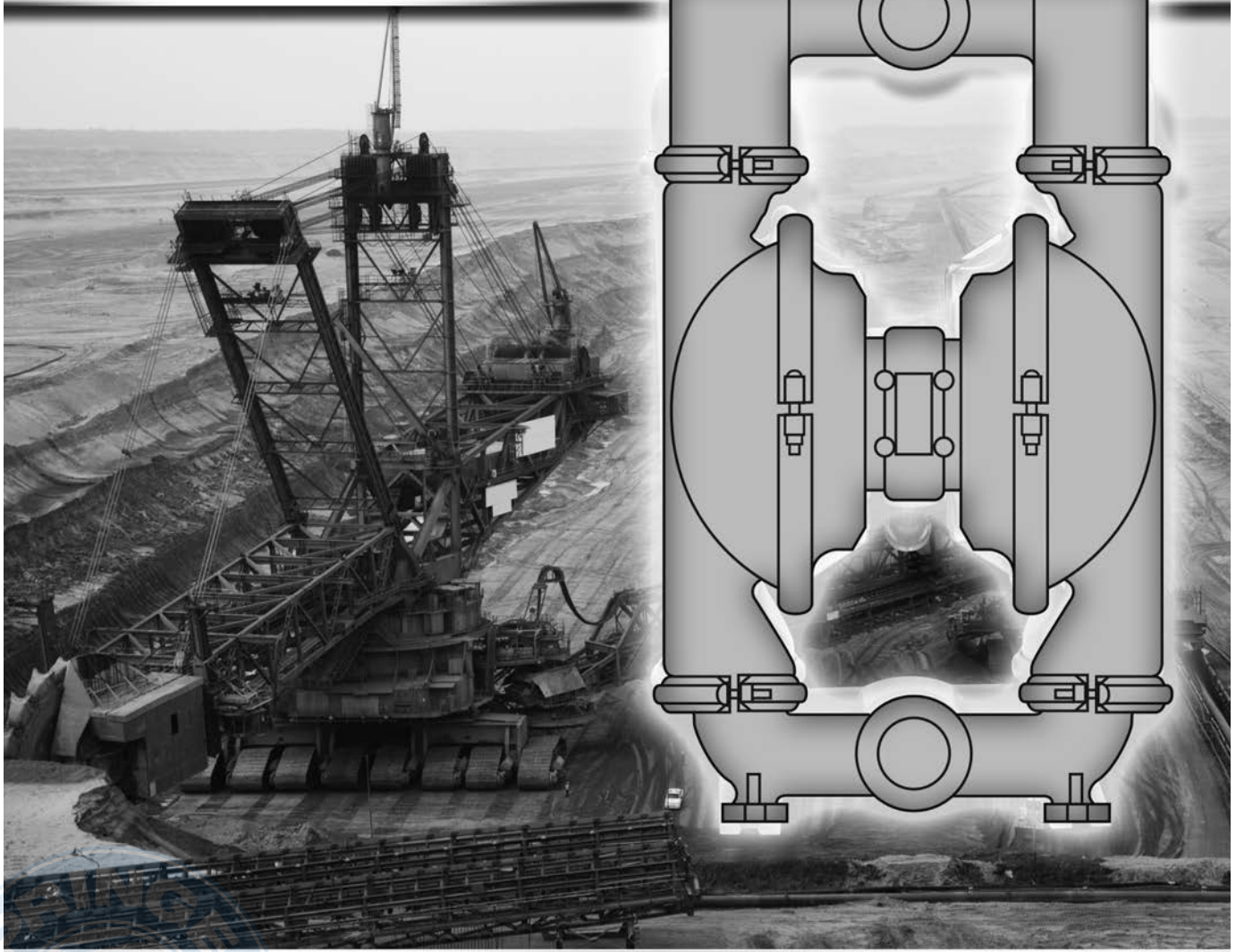




# NOMAD™ OPERATION MANUAL

## NTG80 NOMAD TRANS-FLO™



AIR-OPERATED  DOUBLE DIAPHRAGM  PUMPS

ALUMINUM Models

DUCTILE IRON Models



A JDA Global Company

5/14 rev.3

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Springer Pumps, LLC

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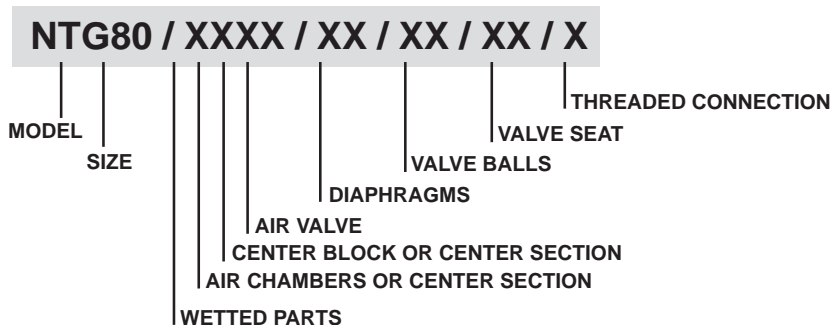
**CAUTION – SAFETY POINTS****TEMPERATURE LIMITS:**

Neoprene	-17.8°C to 93.3°C	0°F to 200°F
Buna-N	-12.2°C to 82.2°C	10°F to 180°F
EPDM	-51.1°C to 137.8°C	-60°F to 280°F
Viton	-40°C to 176.7°C	-40°F to 350°F
Santoprene	-40°C to 107.2°C	-40°F to 225°F
Polyurethane	12.2°C to 65.6°C	10°F to 150°F
Hytrel	-28.9°C to 104.4°C	-20°F to 220°F
PTFE	4.4°C to 104.4°C	40°F to 220°F

1. Review the NOMAD Chemical Field Guide for all applications. The information provided is the “best thinking available” regarding chemical compatibility. The guide however, does not provide a recommendation.
2. Always wear safety glasses during pump operation. A diaphragm rupture may force liquid to exit via air exhaust.
3. When handling flammable fluids, prevent static sparking by properly grounding the pump.
4. Do not exceed 125 psig (8.6 bar).
5. Prior to maintenance, compressed air line should be disconnected to allow air pressure to bleed from pump.
6. Tighten all clamp bands and hardware parts prior to installation. Fittings may loosen during transportation.

## PUMP DESIGNATION SYSTEM

76 mm (3") Pump  
 Maximum Flow Rate:  
 878 lpm (232 gpm)



## MATERIAL CODES

### MODEL

NTG80 = 76MM (3")

### WETTED PARTS & OUTER PISTON

AA = ALUMINUM / ALUMINUM  
 W = DUCTILE IRON

### AIR CHAMBERS

A = ALUMINUM

### CENTER BLOCK

A = ALUMINUM  
 P = POLYPROPYLENE

### AIR VALVE

B = BRASS

### DIAPHRAGMS

BN = BUNA-N (Red Dot)  
 FG = HYTREL  
 ND = EPDM (Blue Dot)  
 NE = NEOPRENE (Green Dot)  
 SN = SANTOPRENE  
 TF = PTFE  
 VT = VITON (White Dot)  
 SNF = SANTOPRENE UFI  
 TGN = GORE/GARLOCK NEO BACKED  
 TGE = GORE/GARLOCK EPDM BACKED  
 TGV = GORE/GARLOCK VITON BACKED

### VALVE BALL

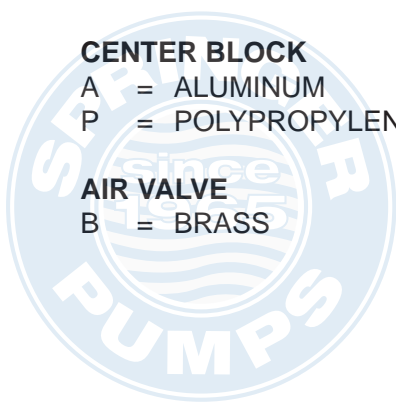
BN = BUNA-N (Red Dot)  
 FG = HYTREL  
 ND = EPDM (Blue Dot)  
 NE = NEOPRENE (Green Dot)  
 SN = SANTOPRENE  
 TF = PTFE (White)  
 VT = VITON (White Dot)

### VALVE SEAT

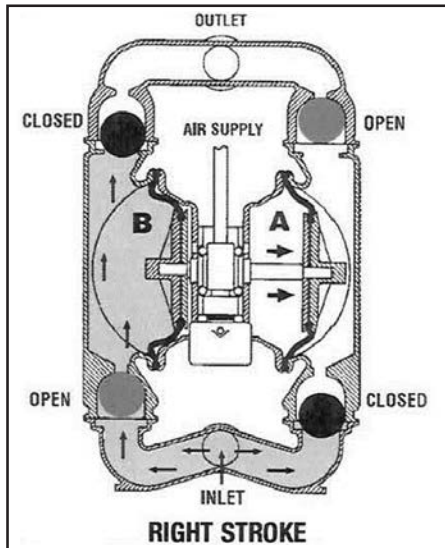
A = ALUMINUM\*  
 BN = BUNA-N (Red Dot)  
 FG = HYTREL  
 ND = EPDM (Blue Dot)  
 NE = NEOPRENE (Green Dot)  
 SN = SANTOPRENE  
 VT = VITON  
 \*Valve seat o-ring required.

### VALVE SEAT O-RING

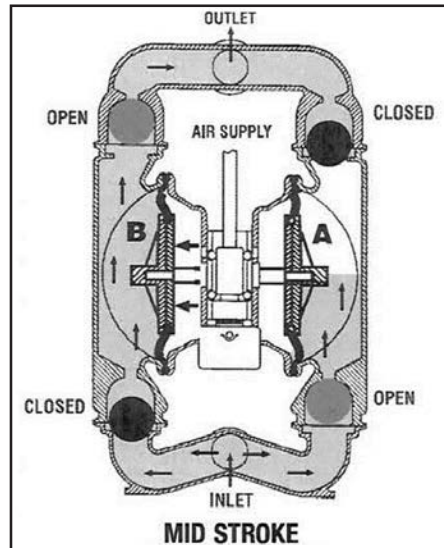
TF = PTFE (White)



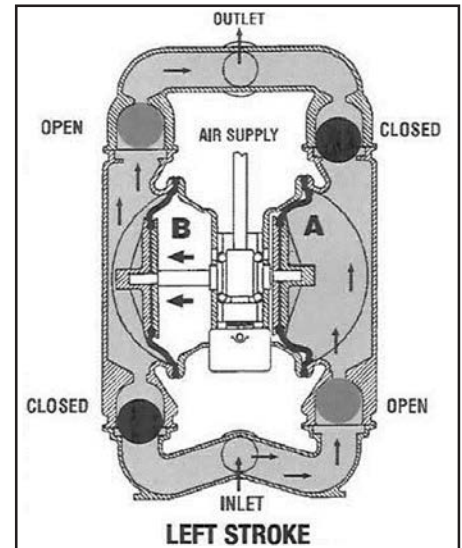
## AIR OPERATED DOUBLE DIAPHRAGM PUMPS FUNCTIONALITY AND FLOW PATTERN



**Figure 1:** Air valve directs pressurized air to the back side of diaphragm A. Compressed air is applied directly to the liquid column separated by elastomeric diaphragms. The diaphragm acts as a separation membrane between the compressed air and liquid, balancing the load and removing mechanical stress from the diaphragm. The opposite diaphragm is pulled in by the shaft connected to the pressurized diaphragm. Diaphragm B is on its suction stroke; air behind the diaphragm has been forced out to the atmosphere through the exhaust port of the pump. 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 (see shaded area).



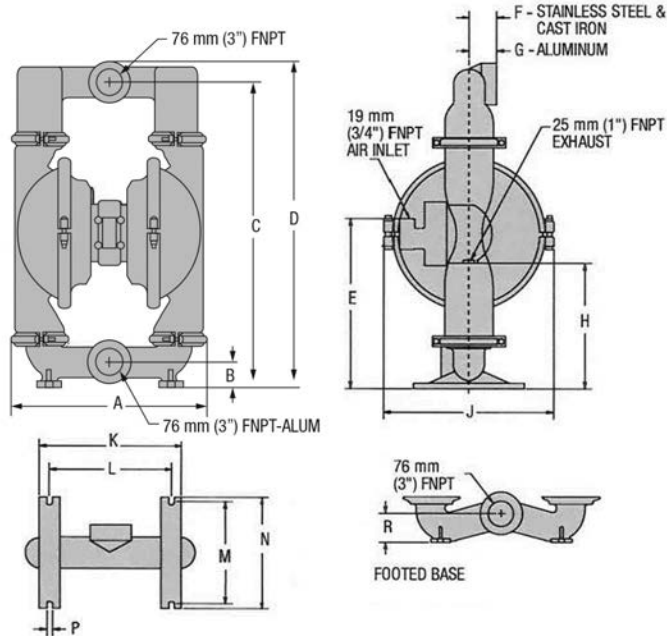
**Figure 2:** When the pressurized diaphragm, diaphragm A, reaches the limit of its discharge stroke, the air valve redirects pressurized air to the back side of the diaphragm B. The pressurized air forces diaphragm B away from the center block while pulling diaphragm A to the center block. Diaphragm B is now on its discharge stroke. These same hydraulic forces lift the discharge valve ball off its seat, forcing fluid to flow through the pump discharge. 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.



## DIMENSIONAL DRAWINGS



## DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	505	19.9
B	58	2.3
C	762	30.0
D	823	32.4
E	419	16.5
F	71	2.8
G	69	2.7
H	312	12.3
J	427	16.8
K	361	14.2
L	305	12.0
M	259	10.2
N	282	11.1
P	15	0.6
R	71	2.8

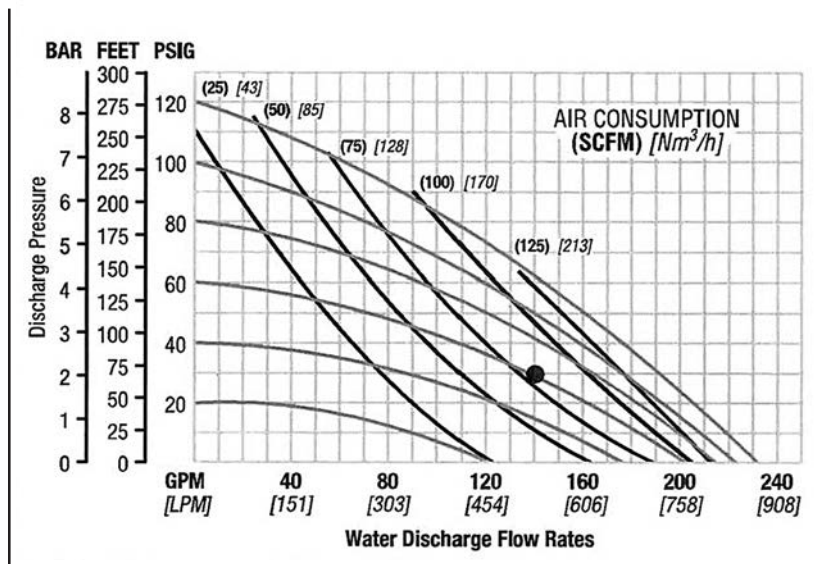
## PERFORMANCE NTG80 METAL RUBBER-FITTED

Height..... 810 mm (31.9")  
 Width..... 432 mm (17.0")  
 Depth..... 279 mm (11.0")  
 Est. Ship Weight..... Aluminum 53 kg (116 lbs)  
 ..... Ductile 91kg (200lbs)  
 Air Inlet..... 19 mm (3/4")  
 Inlet..... 76 mm (3")  
 Outlet..... 76 mm (3")  
 Suction Lift ..... 5.5 m Dry (18')  
 ..... 9.45 m Wet (31')  
 Displacement/Stroke ..... 5.3 l (1.40 gal.)<sup>1</sup>  
 Max. Flow Rate ..... 878 lpm (232 gpm)  
 Max. Size Solids..... 10 mm (3/8")

<sup>1</sup>Displacement per stroke was calculated at 4.8 bar (70 psig) air inlet pressure against a 2 bar (30 psig) head pressure.

**Example:** To pump 530 lpm (140 gpm) against a discharge pressure head of 2.1 bar (30 psig) requires 4.1 bar (60 psig) and 136 Nm<sup>3</sup>/h (80 scfm) air consumption. (See dot on chart.)

**Caution:** Do not exceed 8.6 bar (125 psig) air supply pressure.

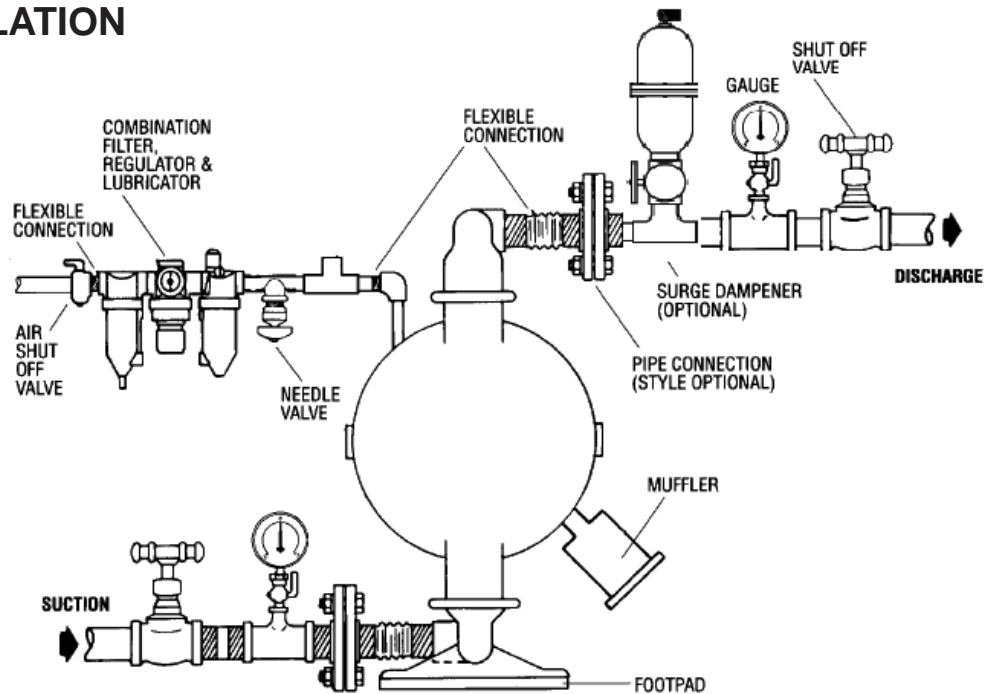


Flow rates indicated on chart were determined by pumping water.

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



## SUGGESTED INSTALLATION



Note: In the event of a power failure, the shutoff valve should be closed, if the restarting of the pump is not desirable once power is regained.

## 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 worn beyond working tolerances and must be replaced.
4. Check center block rings. If worn excessively, they will not seal and air will simply flow through pump and out air exhaust.
5. Check type of lubricant being used. ISO 15-5 wt. recommended.

### ***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 valves. If material being pumped is not compatible with pump elastomers, swelling may occur.
3. Make sure all suction connections are air tight.

### ***Pump air valve freezes.***

Check for excessive moisture in compressed air.

### ***Air bubbles in pump discharge.***

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

### ***Product comes out air exhaust.***

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

### ***Pump rattles.***

Create false discharge head or suction lift.

## DISASSEMBLY/REASSEMBLY

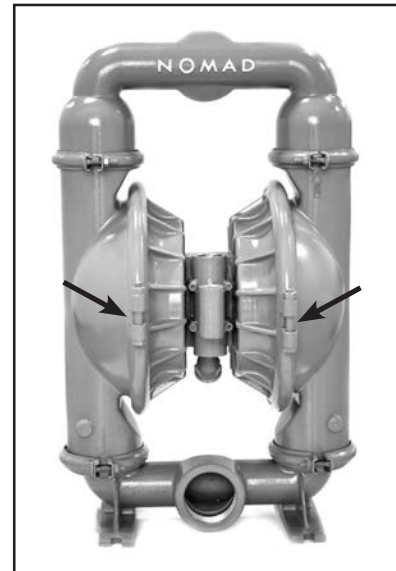
### Tools Required:

Adjustable Wrench

17mm (11/16") Socket Wrench

19mm (3/4") Box Wrench

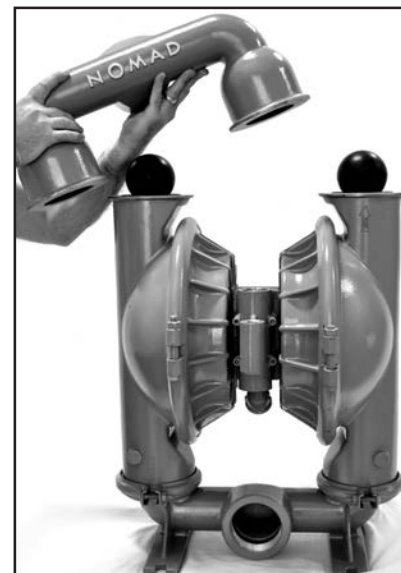
19mm (3/4") Socket



**Step 1:** Before starting disassembly, mark a line from each liquid chamber to its corresponding air chamber. This line will assist in proper alignment during reassembly.

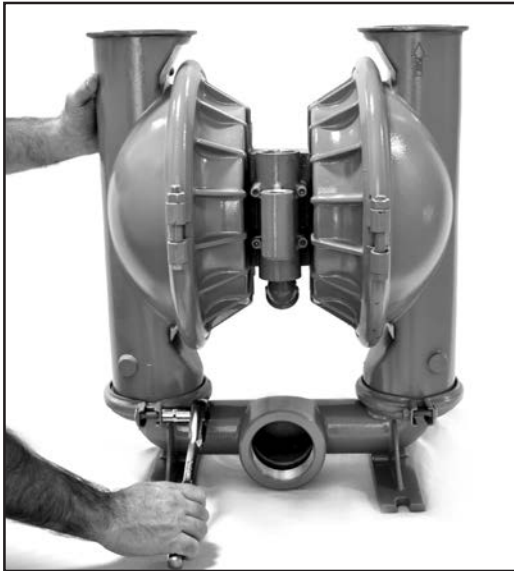


**Step 2:** Utilizing the 11/16" socket wrench, remove the two small clamp bands that fasten the discharge manifold to the liquid chambers.

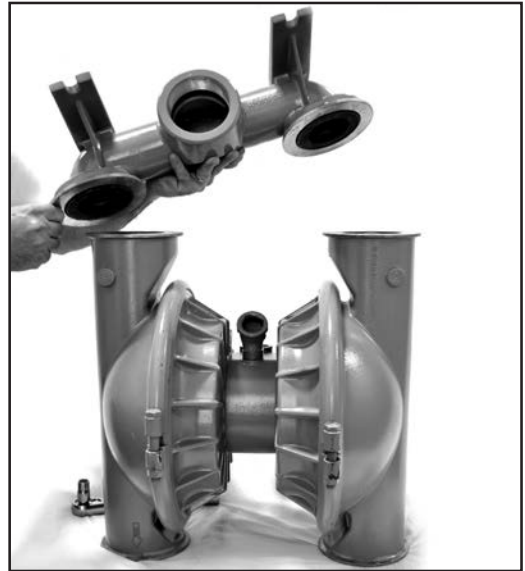


**Step 3:** Remove the discharge manifold to expose the valve balls and seats. Inspect the ball cage area of the manifold for excessive wear or damage. Remove the discharge valve balls, seats and o-rings from the discharge manifold and inspect for nicks, gouges, chemical attack or abrasive wear.





**Step 4:** Remove the two small clamp bands that fasten the intake manifold to the liquid chambers.



**Step 5:** Lift the intake manifold away to expose the valve balls and seats. Inspect intake valve ball cage for excessive wear or damage. Remove the intake valve balls, seats and o-rings from the discharge manifold and inspect for nicks, gouges, chemical attack or abrasive wear.



**Step 6:** With 3/4" socket and 3/4" box wrench, remove one set of large clamp bands that attach liquid chamber to center section assembly.



**Step 7:** Lift liquid chamber away from center section to expose diaphragm and outer piston.



**Step 8:** Using an adjustable wrench, or by rotating the diaphragm by hand, remove the diaphragm assembly.



## DISASSEMBLY/REASSEMBLY



**Step 9:** NOTE: Due to varying torque values, one of the following two conditions may occur: 1) The outer piston, diaphragm and inner piston remain attached to the shaft and the entire assembly can be removed from the center section. 2) The outer piston, diaphragm and inner piston separate from the shaft which remains connected to the opposite side diaphragm assembly. Repeat disassembly instructions for opposite liquid chamber. Inspect diaphragm assembly and shaft for signs of wear or chemical attack. Use a socket wrench to disassemble the diaphragm assembly if replacement is necessary.



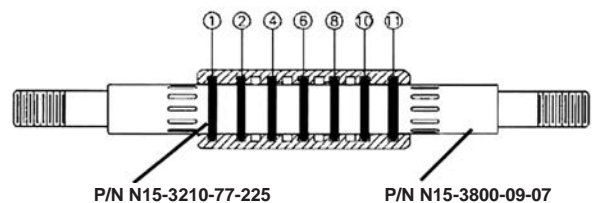
**Step 10:** To remove diaphragm assembly from shaft, secure shaft with soft jaws. Using an adjustable wrench, remove diaphragm assembly from shaft.

## CENTER BLOCK/SEAL DISASSEMBLY

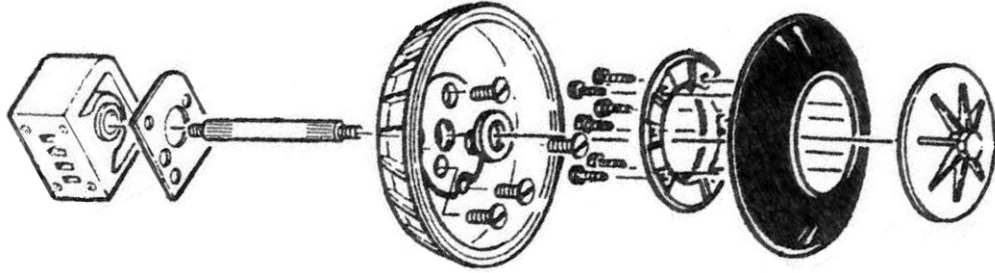
### Center Block Assembly:

The pump's center block consists of a polypropylene or aluminum housing with a cast-in bronze bushing. The bushing has eleven grooves cut on the inside diameter. There are seven TRACKER™ seals that fit in these grooves. Since these TRACKER™ seals form a part of the shifting function of the pump, it is necessary that they be located in the proper grooves. When bushing wear becomes excessive, a new center block must be used.

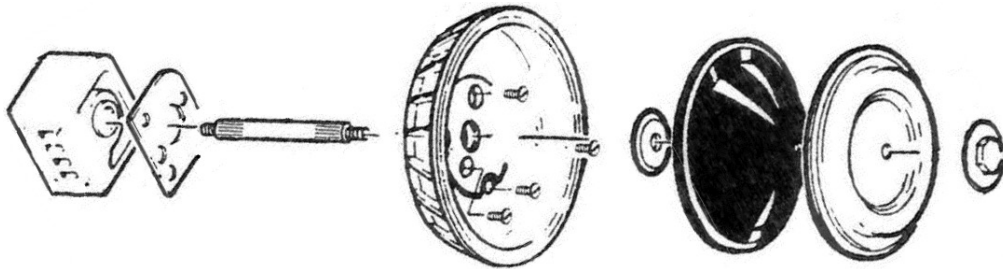
Grooves in bushing which contain TRACKER™ seals



**EXPLODED VIEW (RUBBER DIAPHRAGMS)**



**EXPLODED VIEW (PTFE DIAPHRAGMS)**



## NTG80 RUBBER-FITTED (ALUMINUM)

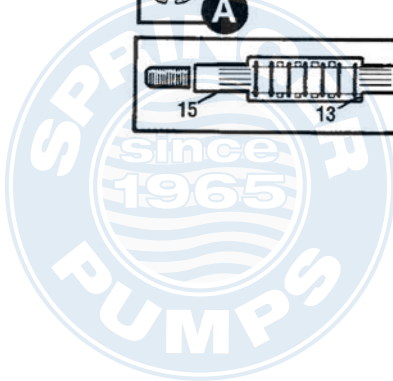
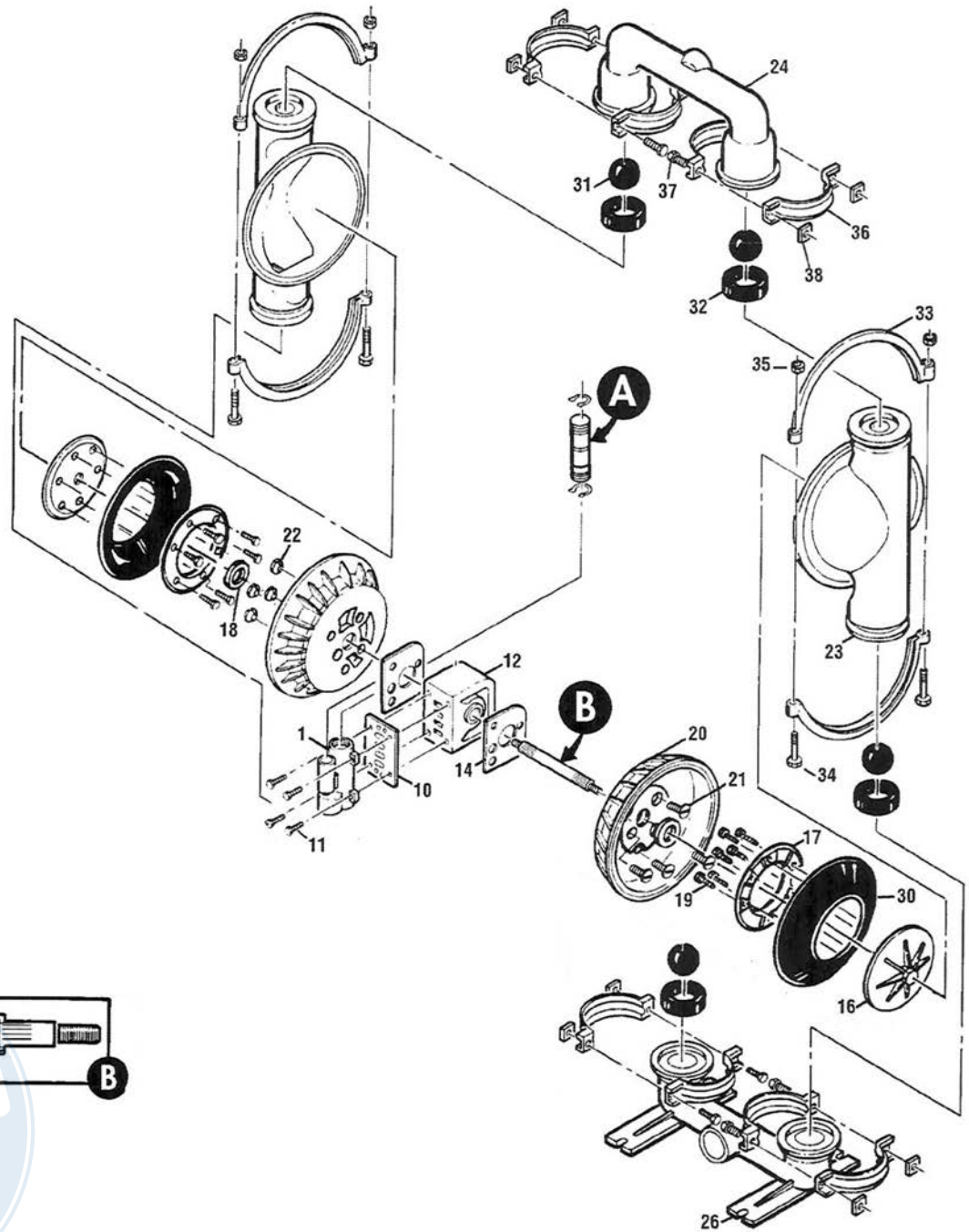
Item	Description	Qty.	Part Number
1	Air Valve Assembly	1	N15-2012-07
3	Air Valve End Cap w/ Guide (Top)	1	N15-2332-23
4	Differential Cap	1	N15-2301-23
5	Air Valve Snap Ring	2	N15-2651-03
6	Air Valve Cap O-ring	2	N15-3201-52
10	Air Valve Gasket	1	N15-2600-52
11	Air Valve Screw 5/16" - 18 x 2 1/4"	4	N08-6000-08
12	Center Block	1	N15-3100-01-225
13	Center Block TRACKER™ Seal	7	N15-3210-77-225
14	Block Gasket	2	N15-3520-52
15	Shaft	1	N15-3800-03-07
16	Outer Piston	2	N15-4550-01
17	Inner Piston	2	N15-3700-01
18	Inner Piston Back-up Washer	2	N15-6850-08
19	Piston Assembly - Bolt 2 3/8" - 16 x 1 1/2"	12	N15-6130-08
	Washer, Flat (Not Shown)	12	N15-6720-08
20	Air Chamber	2	N15-3650-01
21	Air Chamber Screw 3/8" - 16 x 4"	4	N15-6200-08
22	Air Chamber Cone Nut 3/8" - 16	4	N08-6550-08
23	Liquid Chamber	2	N15-5000-01
24	Discharge Manifold	1	N15-5020-01
26	Inlet Manifold	1	N15-5080-01
30	Diaphragm - Neoprene	2	N15-1010-51
31	Valve Ball - Neoprene	4	N15-1080-51
32	Valve Seat - Neoprene	4	N15-1120-51
33	Large Clamp Band Assembly	2	N15-7300-08
34	Large Carriage Bolt 1/2" - 13 x 3 1/2"	4	N15-6120-08
35	Large Hex Nut 1/2" -13	4	N15-6420-08
36	Small Clamp Band Assembly	4	N15-7100-08
37	Small Carriage Bolt 3/8" - 16 x 2"	8	N15-6050-08
38	Small Hex Nut 3/8" -16	8	N08-6450-08
	Muffler (Not Shown)	1	N15-3510-99

## NTG80 RUBBER-FITTED (DUCTILE IRON)

16	Outer Piston	2	N15-4550-02
23	Liquid Chamber	2	N15-5000-02
24	Discharge Manifold	1	N15-5020-02
26	Inlet Manifold	1	N15-5080-02



## NTG80 RUBBER-FITTED

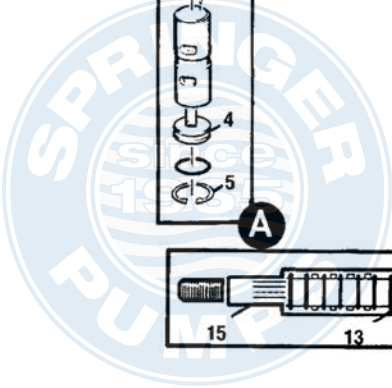
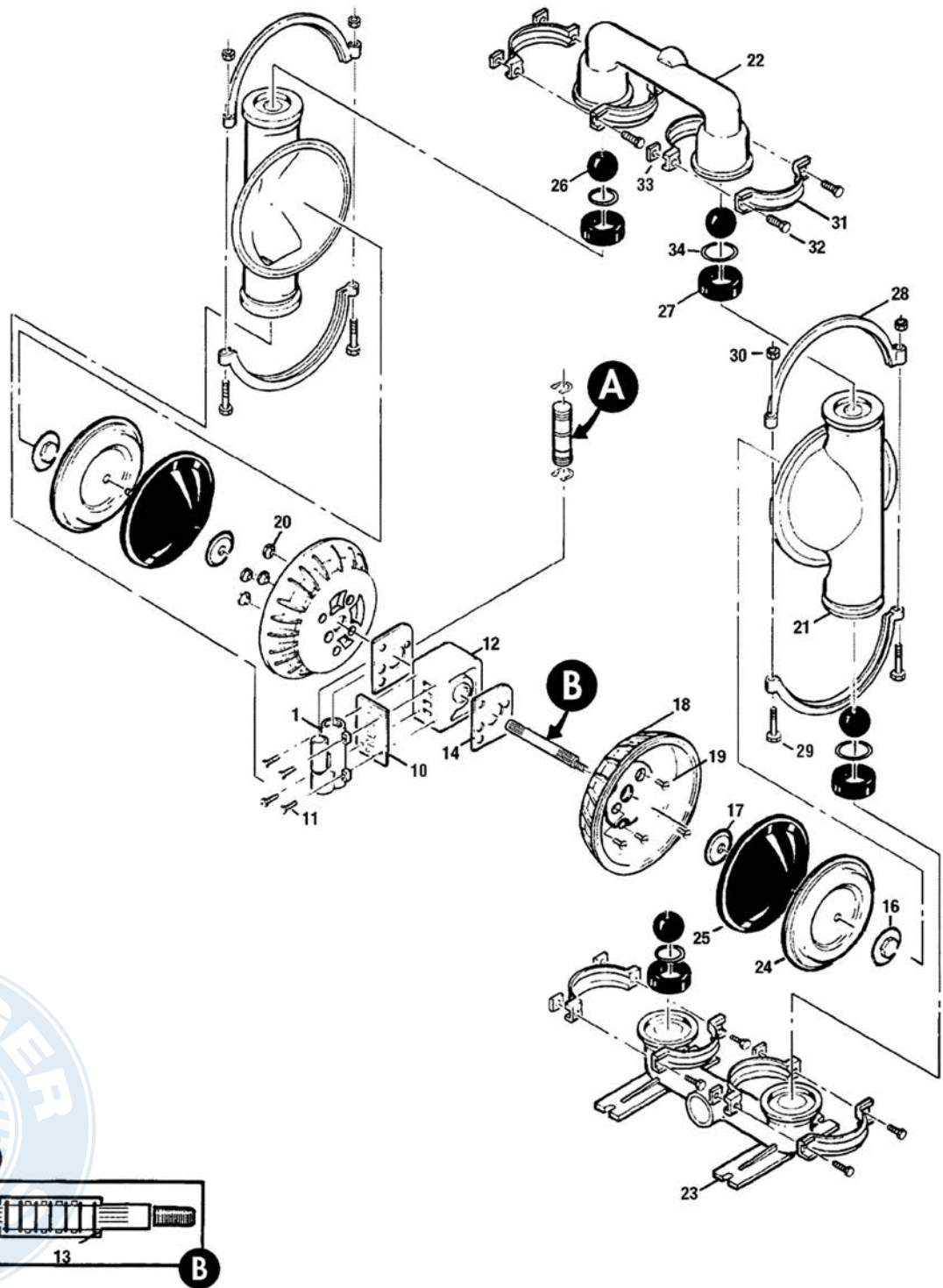


## NTG80 PTFE-FITTED (ALUMINUM)

Item	Description	Qty.	Part Number
1	Air Valve Assembly	1	N15-2012-07
3	Air Valve End Cap w/ Guide (Top)	1	N15-2332-23
4	Differential Cap	1	N15-2301-23
5	Air Valve Snap Ring	2	N15-2651-03
6	Air Valve Cap O-ring	2	N15-3201-52
10	Air Valve Gasket	1	N15-2600-52
11	Air Valve Screw 5/16" - 18 x 2 1/4"	4	N08-6000-08
12	Center Block	1	N15-3100-01-225
13	Center Block TRACKER™ Seal	7	N15-3210-77-225
14	Block Gasket	2	N15-3520-52
15	Shaft	1	N15-3800-03-07
16	Outer Piston SS	2	N15-4600-03
17	Inner Piston SS	2	N15-3750-03
18	Air Chamber	2	N15-3650-01
19	Air Chamber Screw 3/8" - 16 x 4"	4	N15-6200-08
20	Air Chamber Cone Nut 3/8" - 16	4	N08-6550-08
21	Liquid Chamber	2	N15-5000-01
22	Discharge Manifold	1	N15-5020-01
23	Inlet Manifold	1	N15-5080-01
24	Diaphragm	2	N15-1010-55
25	Back-up Diaphragm	2	N15-1060-51
26	Valve Ball	4	N15-1080-55
27	Valve Seat	4	N15-1121-01
28	Large Clamp Band Assembly	2	N15-7300-03
29	Large Carriage Bolt 1/2" - 13 x 3 1/2"	4	N15-6120-03
30	Large Hex Nut 1/2" -13	4	N15-6420-03
31	Small Clamp Band Assembly	4	N15-7100-08
32	Small Carriage Bolt 3/8" - 16 x 2"	8	N15-6050-08
33	Small Hex Nut 3/8" -16	8	N08-6450-08
34	PTFE Valve Seat O-Ring	4	N15-1200-55
	Muffler (Not Shown)	1	N15-3510-99

**NOTE:** Ductile Iron: N.A.with PTFE Diaphragms

## NTG80 PTFE-FITTED





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N  M A D <sup>TM</sup>



NO BOUNDARIES <sup>TM</sup>

