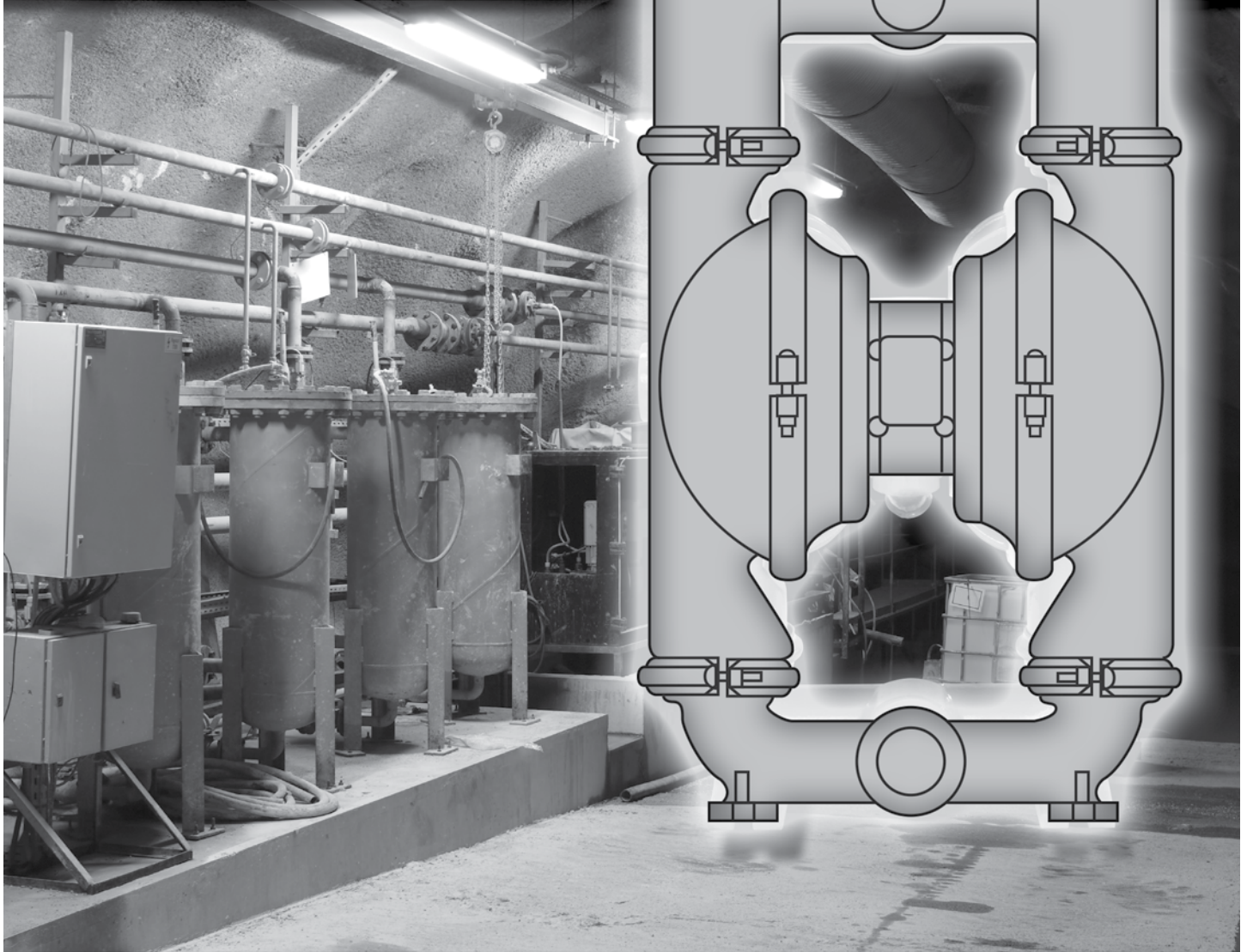




# NOMAD™

## OPERATION MANUAL

### NTG50 NOMAD TRANS-FLO™



AIR-OPERATED     DOUBLE DIAPHRAGM     PUMPS

ALUMINUM Models  
DUCTILE IRON Models  
316 STAINLESS STEEL Models



## 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

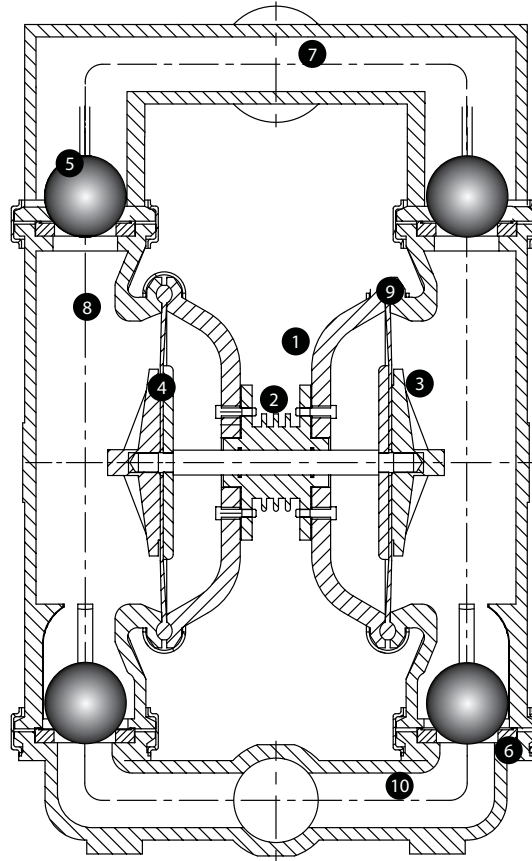
**XXX XX / XXXX / XX / XX / XXX / X / X / X**

1	Air Distribution System	2	Liquid Port Size	3	Wetted Parts	7,8	Diaphragms & Valve Balls	9	Valve Seats	11	Fittings	12	Connections	13	ATEX
N	Nomad	07	07mm/.25"	A	Aluminum	BN	Buna - N/ Nitrile	A	Aluminum	N	NPT	C	Clamped		
T	Trans-Flo	15	15mm/.5"	W	Ductile	ND	Nordel/EPDM	S	Stainless Steel	B	BSP	B	Bolted		
TG	Gold	25	25mm/1"	S	Stainless Steel	NE	Neoprene	BN	Buna - N/Nitrile	TC	Tri-Clamp				
PF	Pwr-Flo	40	40mm/1.5"	P	Polypropylene	TF	PTFE (with Neoprene back-up)	NE	Neoprene	FL	Flanged				
DF	Dura-Flo	50	50mm/2"	4	Air Chambers	VT	Viton/FKM	ND	Nordel/EPDM						
		80	80mm/3"	A	Aluminum	FG	Hytrel®	VT	Viton						
		100	100mm/4"	W	Ductile	SN	Santoprene®	SP	Santoprene						
				S	Stainless Steel	SNF	Santoprene® - UFI	FG	Hytrel						
				W	Mild Steel	TFF	PTFE - UFI	P	Polypropylene						
				P	Polypropylene	TGN	Garlock® - NEO BACKED	K	Kynar						
				5	Center Block	TGE	Garlock® - EPDM BACKED	PU	Polyurethane						
				A	Aluminum	TGV	Garlock® - Viton BACKED	MTF	Mild Steel						
				P	Polypropylene	PU	Polyurethane	10	O-Ring						
				6	Air Valve	FGF	Hytrel UFI	BN	Buna - N/Nitrile						
				B	Brass	PUF	Polyurethane UFI	NE	Neoprene						
				P	Polypropylene			ND	Nordel/EPDM						
				A	Aluminum			VT	Viton						
								TF	PTFE						
								PU	Polyurethane						
								SN	Santoprene						
								PTV	Viton Encap.						

**NTG 50 / AAAB / TF / TF / ATF / N / C / X**

1	Air Distribution System	2	Liquid Port Size	3	Wetted Parts	7,8	Diaphragms & Valve Balls	9	Valve Seats	11	Fittings	12	Connections	13	ATEX
N	Nomad	50	50mm/2"	A	Aluminum	TF	PTFE (with Buna back-up)	A	Aluminum	N	NPT	C	Clamped		
T	Trans-Flo			4	Air Chambers			10	O-Ring						
TG	Gold			A	Aluminum			TF	PTFE						
PF	Pwr-Flo			5	Center Block										
DF	Dura-Flo			A	Aluminum										
				6	Air Valve										
				B	Brass										

The NOMAD 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.



## 1. Air Chamber

The air chamber is the chamber that houses the air which powers the diaphragms.

## 2. Air Distribution System

The air distribution system is the heart of the pump. The air distribution system is the mechanism that shifts the pump in order to create suction and discharge strokes.

## 3. Lock Nut (Outer Diaphragm Piston)

The outer diaphragm pistons provide a means to connect the diaphragms to the reciprocating common shaft and to seal the liquid side from the air side of the diaphragm.

## 4. Holding plate (Inner Diaphragm Piston)

The inner piston is located on the air side of the pump and does not come into contact with the process fluid.

## 5. Check Valve Ball

NOMAD air-operated pumps use suction and discharge check valves to produce directional flow of process fluid in the liquid chamber. The check valve balls seal and release on the check valve seats allowing for discharge and suction of process fluid to occur.

## 6. Check Valve Seat

The removable seats provide the ball valves a site to check.

## 7. Discharge Manifold

Process fluid exits the pump from the discharge port located on the discharge manifold at the top of the pump.

## 8. Liquid Chamber

The liquid chamber is filled with the process fluid during the suction stroke and is emptied during the discharge stroke. It is separated from the compressed air by the diaphragms.

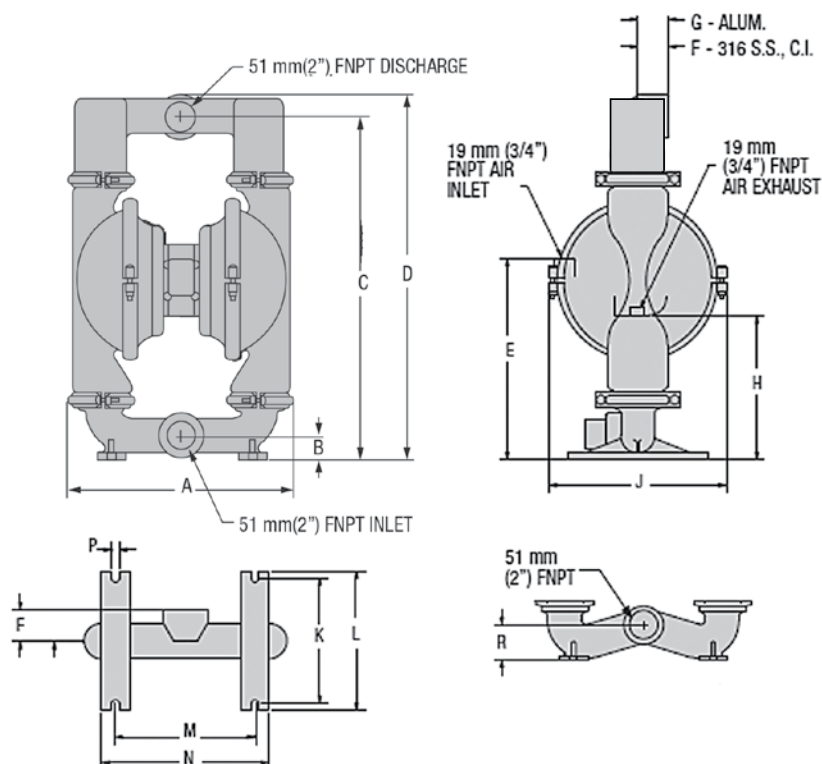
## 9. Diaphragm

The diaphragm membrane provides for separation of the process fluid and the compressed air power source. To perform adequately, diaphragms should be of sufficient thickness and of appropriate material to prevent degradation or permeation in specific process fluid applications. NOMAD offers a variety of diaphragm materials for your specific application requirements.

## 10. Inlet Manifold

Process fluid enters the pump from the intake port located on the inlet manifold at the bottom of the pump.

## DIMENSIONAL DRAWINGS



## DIMENSIONS

ITEM	METRIC (mm)	STANDARD (inch)
A	404	15.9
B	48	1.9
C	630	24.8
D	668	26.3
E	361	14.2
F	58	2.3
G	61	2.4
H	272	10.7
J	343	13.5
K	229	9.0
L	254	10.0
M	257	10.1
N	312	12.3
P	15	0.6
R	64	2.5

BSP threads

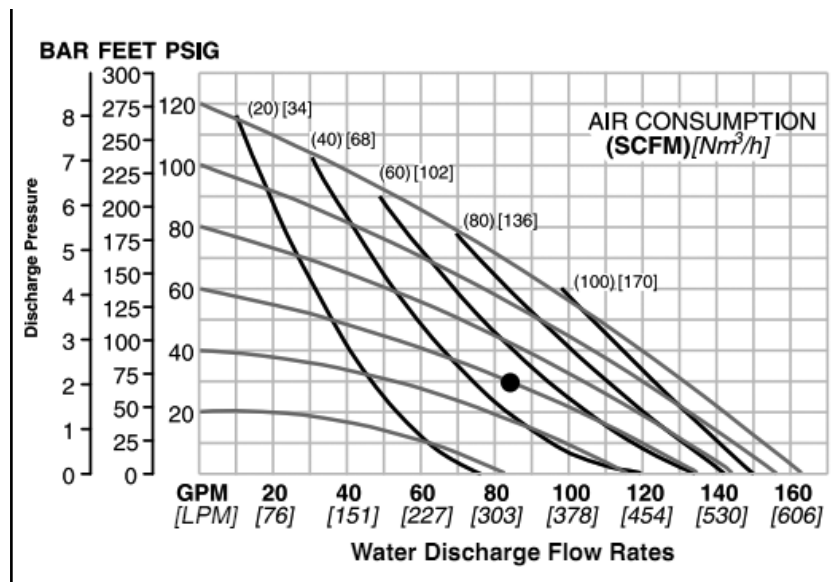
## PERFORMANCE NTG50 METAL RUBBER-FITTED

Height ..... 668 mm (26.3")  
 Width ..... 404 mm (15.9")  
 Depth ..... 343 mm (13.5")  
 Est. Ship Weight ... Aluminum 33 kg (72 lbs)  
                                   316 S.S. 51 kg (112 lbs)  
                                   Ductile Iron 49 kg (107.5 lbs)  
 Air Inlet ..... 19 mm (3/4")  
 Inlet ..... 51 mm (2")  
 Outlet ..... 51 mm (2")  
 Suction Lift ..... 6.4 m Dry (21')  
                                   9.5 m Wet (31')  
 Displacement/Stroke ..... 2.69 l (0.71 gal.)<sup>1</sup>  
 Max. Flow Rate ..... 617 lpm (163 gpm)  
 Max. Size Solids ..... 6.4 mm (1/4")

<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 318 lpm (84 gpm) against a discharge pressure head of 2.1 bar (30 psig) requires 4.1 bar (60 psig) and 85 Nm<sup>3</sup>/h (50 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.

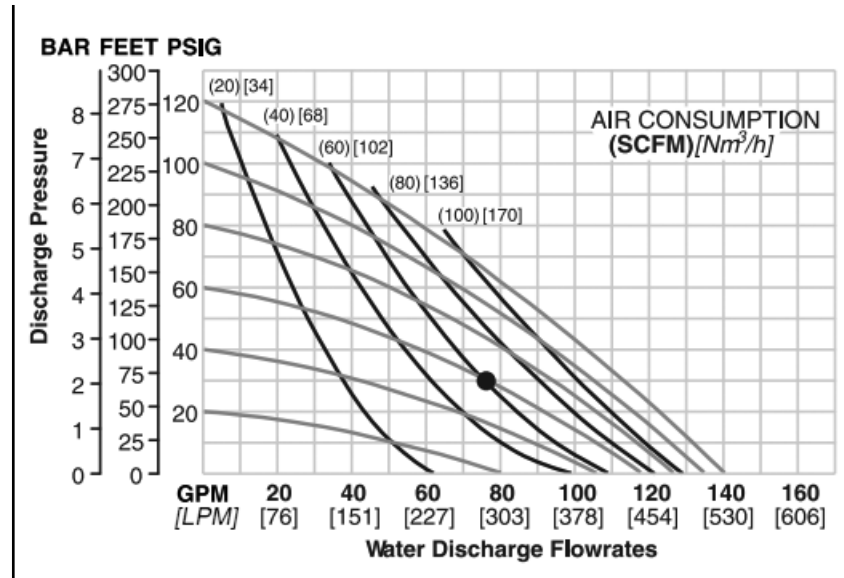
For optimum life and performance, pumps should be specified so that daily operation parameters

## PERFORMANCE NTG50 METAL PTFE-FITTED

Height.....668 mm (26.3")  
 Width.....404 mm (15.9")  
 Depth.....343 mm (13.5")  
 Est. Ship Weight Aluminum 33.1 kg (72 lbs)  
 316 S.S. 51 kg (112 lbs)  
 Ductile Iron 49 kg (107.5 lbs)  
 Air Inlet ..... 19 mm (3/4")  
 Inlet..... 51 mm (2")  
 Outlet..... 51 mm (2")  
 Suction Lift ..... 3.7 m Dry (12')  
 9.5 m Wet (31')  
 Displacement/Stroke.....1.51 l (0.40 gal.)<sup>1</sup>  
 Max. Flow Rate.....534 lpm (141 gpm)  
 Max. Size Solids.....6.4 mm (1/4")

<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 284 lpm (75 gpm) against a discharge pressure head of 2.1 bar (30 psig) requires 4.1 bar (60 psig) and 102 Nm<sup>3</sup>/h (60 scfm) air consumption. (See dot on chart.)



Flow rates indicated on chart were determined by pumping water.

For optimum life and performance, pumps should be specified so that daily operation parameters

## SUGGESTED INSTALLATION

The suction pipe size should be at least 51 mm (2") diameter or larger if highly viscous material is being pumped. The suction hose must be non-collapsible, reinforced type as the NTG50 is capable of pulling a high vacuum. Discharge piping should be at least 51 mm (2"); 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.

Every pump location should have an air line large enough to supply the volume of air necessary to achieve the desired pumping rate.

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.

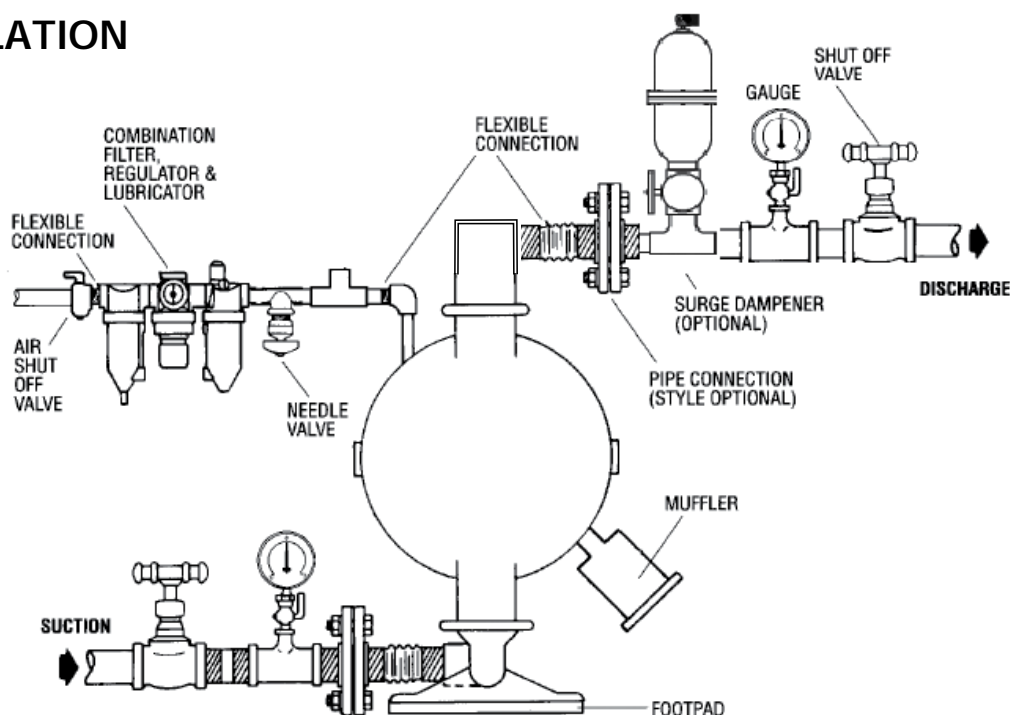
Expansion joints can be installed to aid in absorbing the forces created by the natural reciprocating action of the pump. Flexible connections between the pump and rigid piping will also assist in minimizing pump vibration. A surge suppressor should be installed to protect the pump, piping and gauges 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.

The NTG50 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.



## 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.

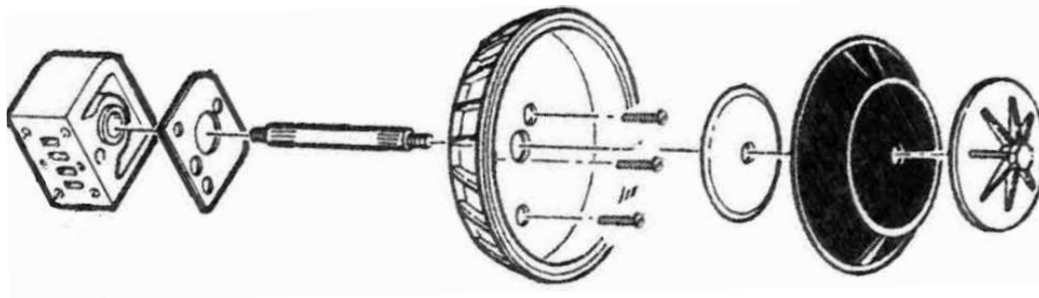
### Product comes out air exhaust.

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

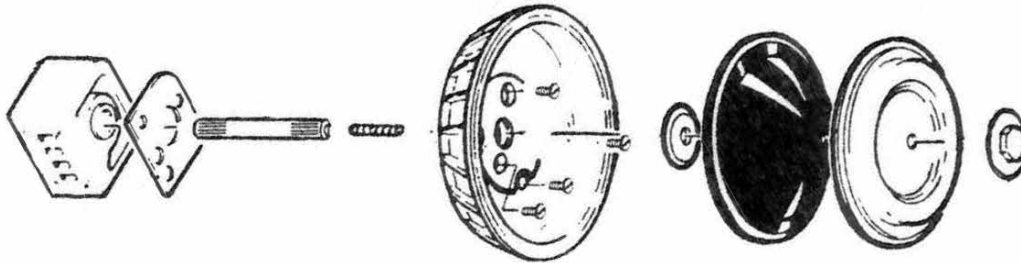
### Pump rattles.

Create false discharge head or suction lift.

## EXPLODED VIEW (RUBBER DIAPHRAGMS)



## EXPLODED VIEW (PTFE DIAPHRAGMS)





## NTG50 RUBBER-FITTED

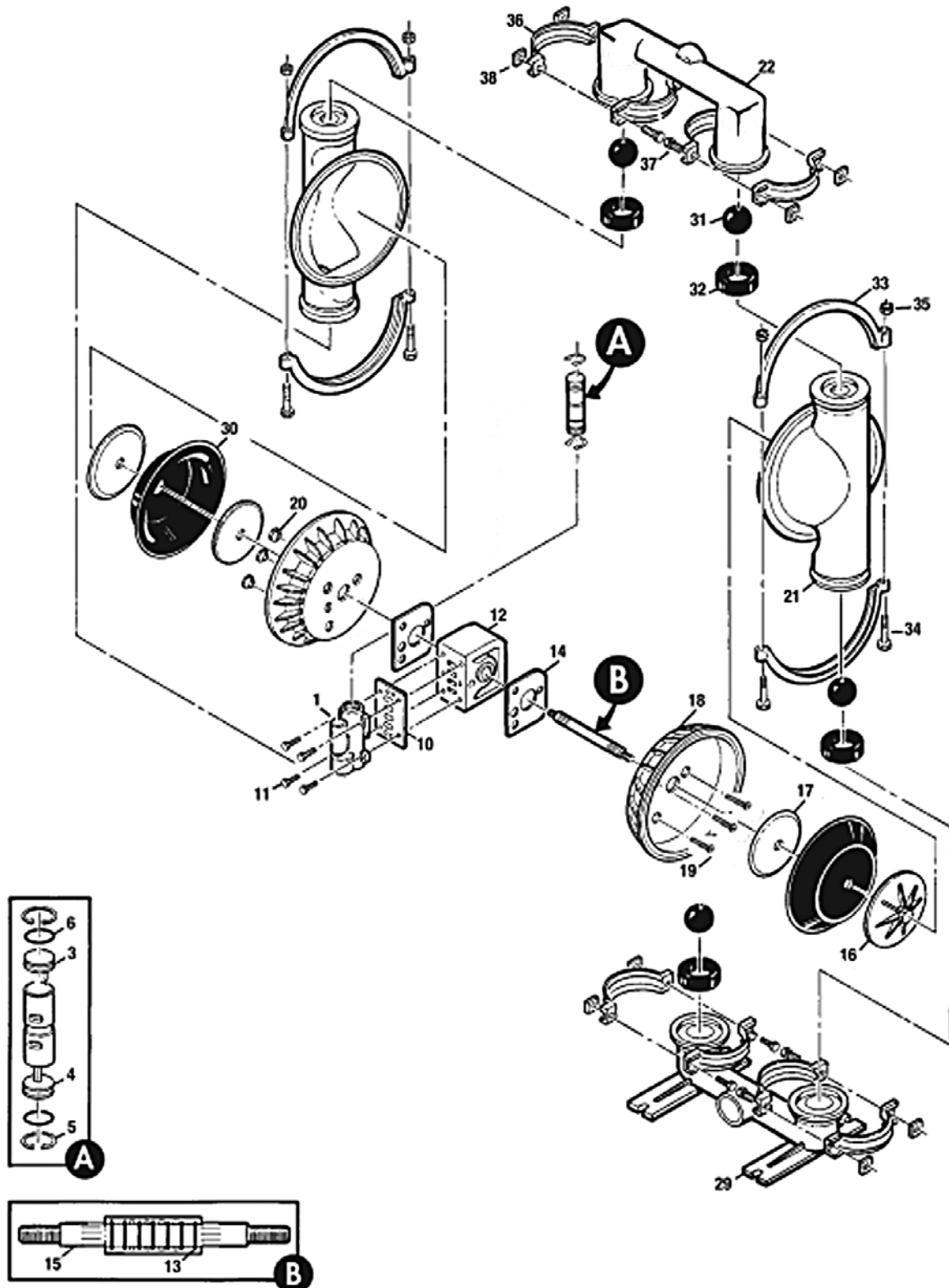
Item	Description	Qty.	Aluminum	Stainless Steel	Ductile Iron
1	Air Valve Assembly	1	N08-2012-07	N08-2012-07	N08-2012-07
3	Air Valve End Cap w/ Guide	1	N08-2332-01	N08-2332-01	N08-2332-01
4	Pressure Differential Cap	1	N08-2301-01	N08-2301-01	N08-2301-01
5	Air Valve Snap Ring	2	N08-2651-01	N08-2651-01	N08-2651-01
6	Air Valve Cap O-ring	2	N08-3201-52	N08-3201-52	N08-3201-52
10	Air Valve Gasket	1	N08-2600-52	N08-2600-52	N08-2600-52
11	Air Valve Screw 5/16" - 18 x 2 1/4"	4	N08-6000-08	N08-6000-03	N08-6000-08
12	Center Block	1	N08-3100-01-225	N08-3100-01-225	N08-3100-01-225
13	Center Block TRACKER™ Seal	7	N08-3210-77-225	N08-3210-77-225	N08-3210-77-225
14	Block Gasket	2	N08-3520-52	N08-3520-52	N08-3520-52
15	Shaft	1	N08-3800-03-07	N08-3800-03-07	N08-3800-03-07
16	Outer Piston	2	N08-4550-01	N08-4550-03	N08-4550-02
17	Inner Piston	2	N08-3700-01	N08-3700-01	N08-3700-01
18	Air Chamber	2	N08-3650-01	N08-3650-01	N08-3650-01
19	Air Chamber Screw 3/8" - 16 x 4"	3	N08-6200-08	N08-6200-08	N08-6200-08
20	Air Chamber Cone Nut 3/8" - 16	3	N08-6550-08	N08-6550-08	N08-6550-08
21	Liquid Chamber	2	N08-5000-01	N08-5000-03	N08-5000-02
22	Discharge Manifold	1	N08-5021-01	N08-5021-03	N08-5021-02
29	Inlet Manifold	1	N08-5080-01	N08-5080-03	N08-5080-02
30	Diaphragm - Neoprene	2	*N08-1010-51	*N08-1010-51	*N08-1010-51
31	Valve Ball - Neoprene	4	*N08-1080-51	*N08-1080-51	*N08-1080-51
32	Valve Seat - Neoprene	4	*N08-1120-51	*N08-1120-51	*N08-1120-51
33	Large Clamp Band Assembly	2	N08-7300-08	N08-7300-03	N08-7300-08
34	Large Carriage Bolt 3/8" - 16 x 3"	4	N08-6120-08	N08-6120-03	N08-6120-08
35	Large Hex Nut 3/8" - 16	4	N08-6420-08	N08-6420-03	N08-6420-08
36	Small Clamp Band Assembly	4	N08-7100-08	N08-7100-03	N08-7100-08
37	Small Carriage Bolt 5/16" - 18 x 1-3/8"	8	N08-6050-08	N08-6050-03	N08-6050-08
38	Small Hex Nut 5/16"-18	8	N08-6450-08	N08-6450-03	N08-6450-08
	Muffler (Not Shown)	1	N08-3510-99	N08-3510-99	N08-3510-99

\*Consult Elastomer Options

## NTG50 SCREEN BASE (ALUMINUM ONLY)

Inlet Manifold	1	N08-5080-01-30
Screen Base	1	N08-5620-01
Suction Hook Up Cover	1	N08-5660-01
Hex Machine Screw (3/8" - 16 X 7/8")	1	N08-6140-08
Hex Nut (3/8" - 16)	2	N08-6450-08
Hex Machine Screw (3/8" - 16 X 3")	2	N08-6120-08

## NTG50 RUBBER-FITTED

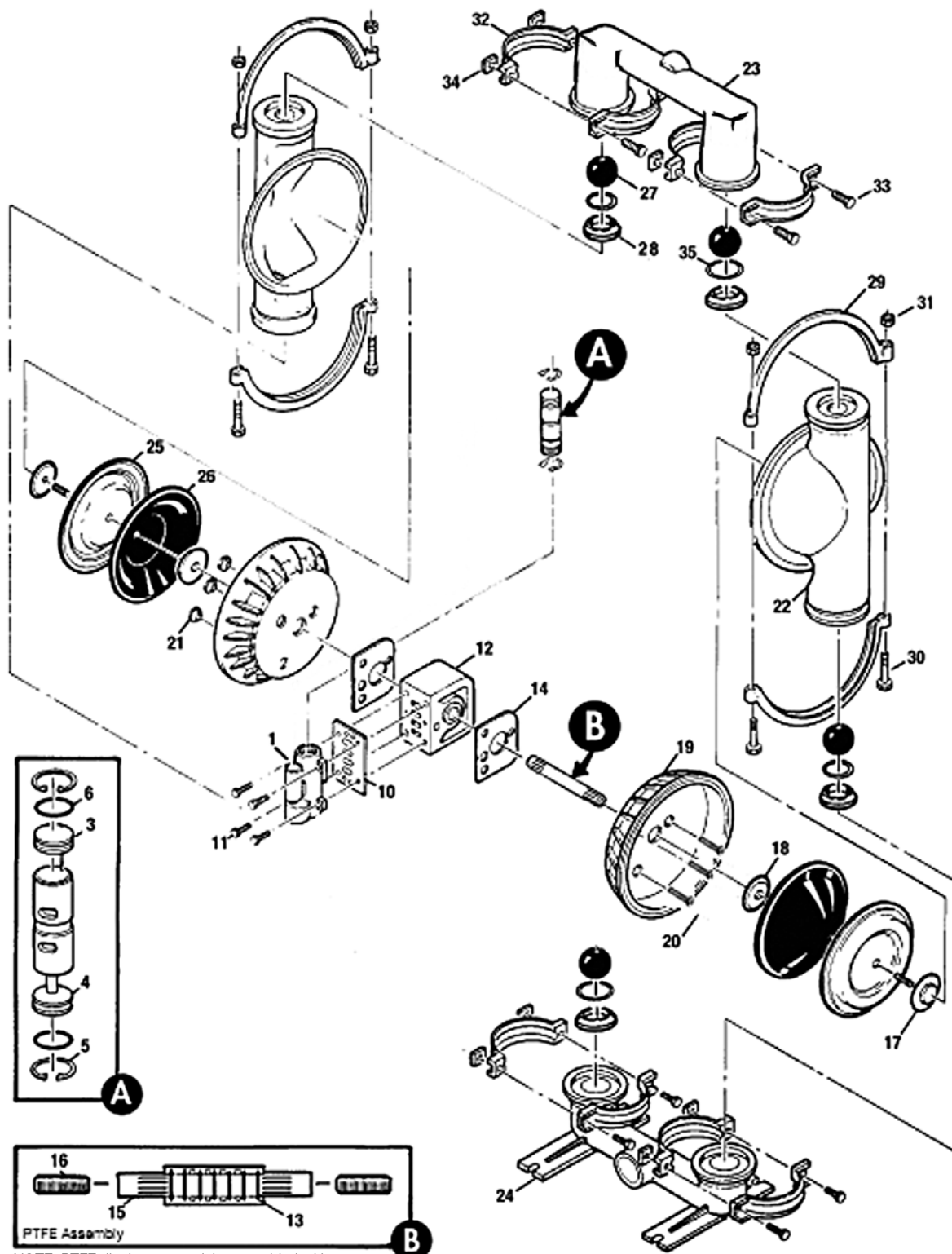


## NTG50 PTFE-FITTED

Item	Description	Qty.	Aluminum	Stainless Steel	Ductile Iron
1	Air Valve Assembly	1	N08-2012-07	N08-2012-07	N08-2012-07
3	Air Valve End Cap w/ Guide	1	N08-2332-01	N08-2332-01	N08-2332-01
4	Pressure Differential Pump	1	N08-2301-01	N08-2301-01	N08-2301-01
5	Air Valve Snap Ring	2	N08-2651-01	N08-2651-01	N08-2651-01
6	Air Valve Cap O-ring	2	N08-3201-52	N08-3201-52	N08-3201-52
10	Air Valve Gasket	1	N08-2600-52	N08-2600-52	N08-2600-52
11	Air Valve Cap Screw 5/16" - 18 x 2 1/4"	4	N08-6000-08	N08-6000-03	N08-6000-08
12	Center Block	1	N08-3100-01-225	N08-3100-01-225	N08-3100-01-225
13	Center Block TRACKER™ Seal	7	N08-3210-77-225	N08-3210-77-225	N08-3210-77-225
14	Block Gasket	2	N08-3520-52	N08-3520-52	N08-3520-52
15	Shaft	1	N08-3820-03-07	N08-3820-03-07	N08-3820-03-07
16	Shaft Stud 1/2" - 20 x 1 - 7/8"	2	N08-6152-08	N08-6152-08	N08-6152-08
17	Outer Piston	2	N08-4600-01	N08-4600-03	N08-4600-03
18	Inner Piston	2	N08-3750-01	N08-3750-01	N08-3750-01
19	Air Chamber	2	N08-3650-01	N08-3650-01	N08-3650-01
20	Air Chamber Screw 3/8" - 16 x 3 - 9/16"	3	N08-6200-08	N08-6200-08	N08-6200-08
21	Air Chamber Cone Nut 3/8" - 16	3	N08-6550-08	N08-6550-08	N08-6550-08
22	Liquid Chamber	2	N08-5000-01	N08-5000-03	N08-5000-02
23	Discharge Manifold	1	N08-5021-01	N08-5021-03	N08-5021-02
24	Inlet Manifold	1	N08-5080-01	N08-5080-03	N08-5080-02
25	Diaphragm	2	*N08-1010-55	*N08-1010-55	*N08-1010-55
26	Back-up Diaphragm	2	*N08-1060-51	*N08-1060-51	*N08-1060-51
27	Valve Ball	4	*N08-1080-55	*N08-1080-55	*N08-1080-55
28	Valve Seat	4	N08-1121-01	N08-1121-03	N08-1121-08
29	Large Clamp Band Assembly	2	N08-7300-08	N08-7300-03	N08-7300-03
30	Large Carriage Bolt 1/2" - 13 x 3 1/2"	4	N08-6120-08	N08-6120-03	N08-6120-03
31	Large Hex Nut 1/2" -13	4	N08-6420-08	N08-6420-03	N08-6420-03
32	Small Clamp Band Assembly	4	N08-7100-08	N08-7100-03	N08-7100-03
33	Small Hex Head Cap Screw 5/16"-18 x 1-3/8"	8	N08-6050-08	N08-6050-03	N08-6050-03
34	Small Hex Nut 5/16" -18	8	N08-6400-08	N08-6400-03	N08-6400-03
35	PTFE Valve Seat O-Ring	4	*N08-1200-55	*N08-1200-55	*N08-1200-55
	Muffler (Not Shown)	1	N08-3510-99	N08-3510-99	N08-3510-99

\*Consult Elastomer Options

## NTG50 PTFE-FITTED





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NOMAD™



NO BOUNDARIES™