

OPERATOR'S MANUAL

6662XX-X-C

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

RELEASED: 5-31-88
REVISED: 10-2-96
(REV.I)

2" DIAPHRAGM PUMP 1:1 RATIO (METALLIC)



**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,
OPERATING OR SERVICING THIS EQUIPMENT.**

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

THIS MANUAL COVERS THE FOLLOWING MODELS

MODEL	TH'D	CENTER BODY MAT'L	WETTED SIDE MATERIAL	MODEL	TH'D	CENTER BODY MAT'L	WETTED SIDE MATERIAL
666200, 20A, -XXX-C	NPT	ALUMINUM	ALUMINUM	666220, 22A, -XXX-C	BSP	ALUMINUM	ALUMINUM
666201, 20B, -XXX-C	NPT	ALUMINUM	S'STEEL	666221, 22B, -XXX-C	BSP	ALUMINUM	S'STEEL
666202, 20C, -XXX-C	NPT	ALUMINUM	CAST IRON	666222, 22C, -XXX-C	BSP	ALUMINUM	CAST IRON
666210, 21A, -XXX-C	NPT	CAST IRON	ALUMINUM	666230, 23A, -XXX-C	BSP	CAST IRON	ALUMINUM
666211, 21B, -XXX-C	NPT	CAST IRON	S'STEEL	666231, 23B, -XXX-C	BSP	CAST IRON	S'STEEL
666212, 21C, -XXX-C	NPT	CAST IRON	CAST IRON	666232, 23C, -XXX-C	BSP	CAST IRON	CAST IRON

SERVICE KITS

637118-C for Air Section repair. (See page 6.)
637124-XX for Fluid Section repair. (See page 4.)
637155 Abrasion Resistant Conversion Kit is available for use with heavy and abrasive material applications. (See page 4)

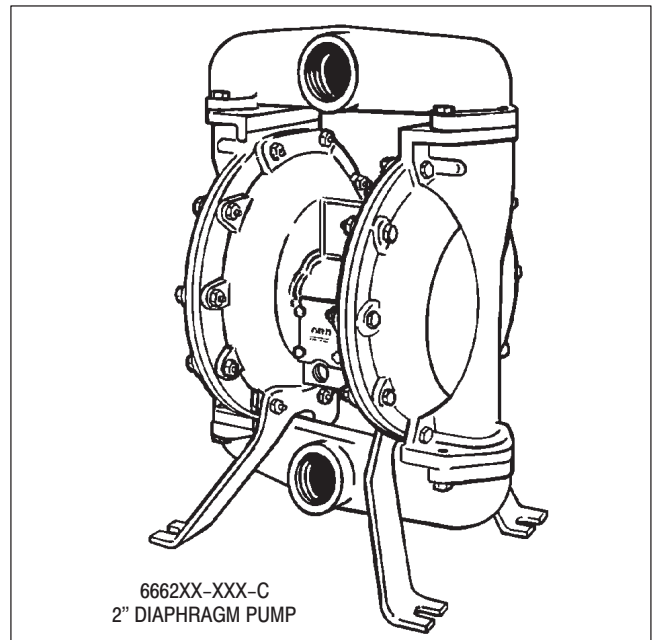
PUMP DATA

Models . . . See Model Description Chart for "-XXX" on page 3.
Pump Type Metallic Air Operated Double Diaphragm
Material . . . See Model Description Chart on page 3.
Weight . . . ALUMINUM (CTR-BODY) 46 lbs to 82 lbs
CAST IRON (CTR-BODY) 89 lbs
Maximum Air Inlet Pressure 120 p.s.i. (8 bar)
Maximum Outlet Pressure 120 p.s.i. (8 bar)
Maximum Flow Rate (Flooded Inlet) 135 g.p.m.
Maximum Particle Size 1/4" dia.
Maximum Temp. Limits
Polypropylene 35°F to 150°F (Seats)
PVDF 10°F to 200°F (Seats)

Dimensional Data See page 8.

Noise Level* 77.7 db(A) @ 70 psi, 60 cycles per minute.

*The pump sound pressure levels published here have been updated to an Equivalent Continuous Sound Level (L_{Aeq}) to meet the intent of ANSI S1.13-1971, CAGI-PNEUROP S5.1 using four microphone locations.



GENERAL DESCRIPTION

The ARO Diaphragm Pump offers high volume delivery even at low air pressure and a broad range of material compatibility options available. Refer to the model and option chart on page 3. ARO pumps feature stall resistant design, modular air motor / fluid sections. Air operated double diaphragm pumps utilize a pressure differential in the air chambers to alternately create suction and positive fluid pressure

in the fluid chambers, ball checks insure the positive flow of fluid. Pump cycling will begin as air pressure is applied and it will continue to pump and keep up with the demand. It will build and maintain line pressure and will stop cycling once maximum line pressure is reached (dispensing device closed) and will resume pumping as needed.



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INGERSOLL-RAND
FLUID PRODUCTS

OPERATING AND SAFETY PRECAUTIONS

READ, UNDERSTAND, AND FOLLOW THIS INFORMATION TO AVOID INJURY AND PROPERTY DAMAGE



⚠ WARNING EXCESSIVE AIR PRESSURE. Can cause personal injury, pump damage or property damage.

- Do not exceed the maximum inlet air pressure as stated on the pump model plate.
- Be sure material hoses and other components are able to withstand fluid pressures developed by this pump. Check all hoses for damage or wear. Be certain dispensing device is clean and in proper working condition.

⚠ WARNING STATIC SPARK. Can cause explosion resulting in severe injury or death. Ground pump and pumping system.

- Use the pump grounding screw terminal provided. Use Aro Part No. 66885-1 Ground Kit or connect a suitable ground wire (12 ga. min.) to a good earth ground source.
- Secure pump, connections and all contact points to avoid vibration and generation of contact or static spark.
- Consult local building codes and electrical codes for specific grounding requirements.
- After grounding, periodically verify continuity of electrical path to ground. Test with an ohmmeter from each component (e.g., hoses, pump, clamps, container, spray gun, etc.) to ground to insure continuity. Ohmmeter should show 100 ohms or less.
- Submerge the outlet hose end, dispensing valve or device in the material being dispensed if possible. (Avoid free streaming of material being dispensed.)
- Use hoses incorporating a static wire.
- Use proper ventilation.
- Keep inflammables away from heat, open flames and sparks.
- Keep containers closed when not in use.

⚠ WARNING Pump exhaust may contain contaminants. Can cause severe injury. Pipe exhaust away from work area and personnel.

- In the event of a diaphragm rupture material can be forced out of the air exhaust muffler.
- Pipe the exhaust to a safe remote location when pumping hazardous or inflammable materials.
- Use a grounded 3/4" min. I.D. hose between the pump and the muffler.

⚠ WARNING HAZARDOUS PRESSURE. Can result in serious injury or property damage. Do not service or clean pump, hoses or dispensing valve while the system is pressurized.

- Disconnect air supply line and relieve pressure from the system by opening dispensing valve or device and/or carefully and slowly loosening and removing outlet hose or piping from pump.

⚠ WARNING HAZARDOUS MATERIALS. Can cause serious injury or property damage. Do not attempt to return a pump to the factory or service center that contains hazardous material. Safe handling practices must comply with local and national laws and safety code requirements.

- Obtain Material Safety Data Sheets on all materials from the supplier for proper handling instructions.

⚠ WARNING EXPLOSION HAZARD. Models containing aluminum wetted parts cannot be used with III.-Trichloroethane, Methylene Chloride or other Halogenated Hydrocarbon solvents which may react and explode.

- Check pump motor section, fluid caps, manifolds and all wetted parts to assure compatibility before using with solvents of this type.

⚠ CAUTION Verify the chemical compatibility of the pump wetted parts and the substance being pumped, flushed or recirculated. Chemical compatibility may change with temperature and concentration of the chemical(s) within the substances being pumped, flushed or circulated. Consult ARO Form No. 8677-P, Fluid Compatibility Guide, for information on chemical compatibility.

⚠ CAUTION Maximum temperatures are based on mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperature. Consult Fluid Compatibility Guide for chemical compatibility and temperature limits. Refer to PUMP DATA on page 1 of this manual.

⚠ CAUTION Be certain all operators of this equipment have been trained for safe working practices, understand it's limitations, and wear safety goggles/equipment when required.

⚠ CAUTION Do not use the pump for the structural support of the piping system. Be certain the system components are properly supported to prevent stress on the pump parts.

- Suction and discharge connections should be flexible connections (such as hose), not rigid piped, and should be compatible with the substance being pumped.

⚠ CAUTION Prevent unnecessary damage to the pump. Do not allow pump to operate when out of material for long periods of time.

- Disconnect air line from pump when system sits idle for long periods of time.

⚠ CAUTION Use only genuine ARO replacement parts to assure compatible pressure rating and longest service life.

NOTICE Replacement warning labels are available upon request : "Static Spark" (93616-1) & "Diaphragm Rupture" (93122-1).

⚠ WARNING = Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

⚠ CAUTION = Hazards or unsafe practices which could result in minor personal injury, product or property damage.

NOTICE = Important installation, operation or maintenance information.

MODEL DESCRIPTION CHART

<h1 style="font-size: 2em; margin: 0;">666 X X X</h1> <p style="text-align: center;">(2" THREAD) BODY MAT'L-[HWR]</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; vertical-align: top;"> <p>(NPT) - ALUMINUM</p> 200 - [STD] 20A - [S ST'L] 201 - [STD] 20B - [S ST'L] 202 - [STD] 20C - [S ST'L] </td> <td style="width: 33%; vertical-align: top;"> <p>(BSP) - ALUMINUM</p> 220 - [STD] 22A - [S ST'L] 221 - [STD] 22B - [S ST'L] 222 - [STD] 22C - [S ST'L] </td> <td style="width: 33%; vertical-align: top;"> <p>0 ALUMINUM 1 ST' STEEL 2 CAST IRON</p> </td> </tr> <tr> <td style="vertical-align: top;"> <p>(NPT) - CAST IRON</p> 210 - [STD] 21A - [S ST'L] 211 - [STD] 21B - [S ST'L] 212 - [STD] 21C - [S ST'L] </td> <td style="vertical-align: top;"> <p>(BSP) - CAST IRON</p> 230 - [STD] 23A - [S ST'L] 231 - [STD] 23B - [S ST'L] 232 - [STD] 23C - [S ST'L] </td> <td></td> </tr> </table>	<p>(NPT) - ALUMINUM</p> 200 - [STD] 20A - [S ST'L] 201 - [STD] 20B - [S ST'L] 202 - [STD] 20C - [S ST'L]	<p>(BSP) - ALUMINUM</p> 220 - [STD] 22A - [S ST'L] 221 - [STD] 22B - [S ST'L] 222 - [STD] 22C - [S ST'L]	<p>0 ALUMINUM 1 ST' STEEL 2 CAST IRON</p>	<p>(NPT) - CAST IRON</p> 210 - [STD] 21A - [S ST'L] 211 - [STD] 21B - [S ST'L] 212 - [STD] 21C - [S ST'L]	<p>(BSP) - CAST IRON</p> 230 - [STD] 23A - [S ST'L] 231 - [STD] 23B - [S ST'L] 232 - [STD] 23C - [S ST'L]		<h1 style="font-size: 2em; margin: 0;">X X X - C</h1> <p style="text-align: right; font-size: 0.8em;">(REV)</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; vertical-align: top;"> <p>SEAT MAT'L</p> 2 STAINLESS STEEL 3 POLYPROPYLENE 4 PVDF (KYNAR®) 8 HARDENED 440 STAINLESS STEEL </td> <td style="width: 33%; vertical-align: top;"> <p>BALL MAT'L</p> 4 T.F.E (TEFLON)® 6 ACETAL 8 POLYURETHANE </td> <td style="width: 33%; vertical-align: top;"> <p>DIAPHRAGM</p> 1 NEOPRENE 2 BUNA N 3 VITON® 4 T.F.E.(TEFLON)® 5 E.P.R. 9 HYTREL® B SANTOPRENE® </td> </tr> </table> <div style="border: 1px solid black; padding: 5px; margin-top: 10px; text-align: center;"> <p>FLUID SECTION SERVICE KIT SELECTION</p> <p>666200 - X <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> -C</p> <p>637124 - <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p> <p style="font-size: 0.8em;">Diaphragm Material Ball Material</p> <p style="font-size: 0.7em;">EXAMPLE: Model #666200-362-C Fluid Section Service Kit is 637124-62</p> </div>	<p>SEAT MAT'L</p> 2 STAINLESS STEEL 3 POLYPROPYLENE 4 PVDF (KYNAR®) 8 HARDENED 440 STAINLESS STEEL	<p>BALL MAT'L</p> 4 T.F.E (TEFLON)® 6 ACETAL 8 POLYURETHANE	<p>DIAPHRAGM</p> 1 NEOPRENE 2 BUNA N 3 VITON® 4 T.F.E.(TEFLON)® 5 E.P.R. 9 HYTREL® B SANTOPRENE®
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AIR AND LUBE REQUIREMENTS

⚠ WARNING EXCESSIVE AIR PRESSURE. Can cause pump damage, personal injury or property damage.

- A filter capable of filtering out particles larger than 50 microns should be used on the air supply. In most applications there is no lubrication required other than the "O"ring lubricant which is applied during assembly or repair.
- When lubricated air is necessary, supply the air lubricator with a good grade of SAE 90 wt. non-detergent oil and set the lubricator to a rate not to exceed one drop per minute.

OPERATING INSTRUCTIONS

- Always flush the pump with a solvent compatible with the material being pumped if the material being pumped is subject to "setting up" when not in use for a period of time.
- Disconnect the air supply from the pump if it is to be inactive for a few hours.
- The outlet material volume is governed not only by the air supply but also by the material supply available at the inlet. The material supply tubing should not be too small or restrictive. Be sure not to use hose which might collapse.
- When the diaphragm pump is used in a forced-feed (flooded inlet) situation it is recommended that a "Check Valve" be installed at the air inlet.
- Secure the diaphragm pump legs to a suitable surface to insure against damage by vibration.

PARTS AND SERVICE KITS

Refer to the part views and descriptions as provided on page 4 through 7 for parts identification and Service Kit information.

- Certain ARO "Smart Parts" are indicated which should be available for fast repair and reduction of down time.
- Service kits are divided to service two separate diaphragm pump functions: 1. AIR SECTION, 2. FLUID SECTION. The FLUID SECTION is divided further to match typical part MATERIAL OPTIONS.

• Viton®, Teflon®, and Hytrel® are trademarks of the DuPont Company, • Kynar® is a trademark of Penwalt Corp.
• Santoprene® is a registered trademark of Monsanto Company, licensed to Advanced Elastomer Systems, L.P. • Key-Lube is a trademark of Key Industries.

MAINTENANCE

- Provide a clean work surface to protect sensitive internal moving parts from contamination from dirt and foreign matter during service disassembly and reassembly.
- Keep good records of service activity and include pump in preventive maintenance program.
- Before disassembling empty captured material in the outlet manifold by turning the pump upside down to drain material from the pump.

FLUID SECTION DISASSEMBLY

- Remove top manifold(s).
 - Remove (22) balls, (19), (33) "O" Rings, (21) seats.
 - Remove (15) fluid caps.
- NOTE: Only Teflon diaphragm models use a primary diaphragm (7) and a backup diaphragm (8). Refer to the auxiliary view in the Fluid Section illustration.
- Remove the (6) nut, (7) or (7/8) diaphragms, and (5) washers.
 - Remove (3), (4) "O"Rings.
- NOTE: Do not scratch or mar the surface of (1) diaphragm rod.

FLUID SECTION REASSEMBLY

- Reassemble in reverse order.
- Clean and inspect all parts. Replace worn or damaged parts with new parts as required.
- Lubricate diaphragm rod (1) and (2) "O"ring with Key-Lube® "O"ring lube or equivalent.
- Use ARO PN/98930-T Bullet (installation tool) to aid in installation of "O"ring (2) on diaphragm rod (1).
- Be certain (7) or (7/8) diaphragm(s) align properly with (15) fluid caps before making final torque adjustments on bolt and nuts to avoid twisting the diaphragm.
- For models with Teflon diaphragms: Item (8) Santoprene diaphragm is installed with the side marked "AIR SIDE" towards the pump center body. Install the Teflon Diaphragm with the side marked "FLUID SIDE" towards the fluid cap.
- Re-check torque settings after pump has been re-started and run a while.

PARTS LIST / 6662XX-X-C FLUID SECTION

FLUID SECTION SERVICE KITS

☆ KITS INCLUDE: BALLS (See Ball Option, refer to -XX in chart below) DIAPHRAGMS (See Diaphragm Option, refer to -XX in chart below) 93706-1 Key-Lube grease, plus O-Ring items: 2, 3, 9, 19.

MATERIAL CODE

[A]=Aluminum
 [B]=Buna "N"
 [C]=Carbon Steel
 [CI]=Cast Iron
 [D]=Acetal
 [E]=E. P. R.
 [H]=Hytrek
 [K]=P.V.D.F. (Kynar)
 [N]=Neoprene
 [P]=Polypropylene
 [SH]=Hard S'Steel
 [SP]=Santoprene
 [SS]=Stainless Steel
 [T]=Teflon
 [U]=Polyurethane
 [V]=Viton

SEAT OPTIONS			BALL OPTIONS		
ITEM "21"			ITEM "22"		
-XXX	SEAT (4)	[MTL]	-XXX	BALL (4)	[MTL]
-2XX	92776	[SS]	-X4X	92757-4	[T]
-3XX	92924	[P]	-X6X	92757-6	[D]
-4XX	94514	[K]	-X8X	92757-8	[U]
-8XX	93266	[SH]			

DIAPHRAGM OPTIONS							
6662XX -XXX	☆ SERVICE KIT -XX = (Ball) -XX = (Diaphragm)	"7" / "8" DIAPHRAGM (2)		"3" O-RING (4) 3/4" O.D.		"19" O-RING (4) 2-3/4" O.D.	
		[MTL]		[MTL]		[MTL]	
-XX1	637124-X1	92755-1	[N]	Y325-16	[B]	Y325-230	[B]
-XX2	637124-X2	92755-2	[B]	Y325-16	[B]	Y325-230	[B]
-XX3	637124-X3	92755-3	[V]	Y328-16	[T]	Y327-230	[V]
-XX4	637124-X4	93415-4 / 93374-B	[T/SP]	Y328-16	[T]	Y220-230	[T]
-XX5	637124-X5	92755-5	[E]	Y328-16	[T]	92761	[E]
-XX9	637124-X9	92755-9	[H]	Y328-16	[T]	Y327-230	[V]
-XXB	637124-XB	92755-B	[SP]	Y328-16	[T]	92761	[E]

637155 ABRASION RESISTANT CONVERSION KIT

Includes:
 93266 (4) [SH] Seat
 92757-8 (4) [U] Ball

WETTED COMMON PARTS										
ITEM	DESCRIPTION (SIZE IN INCHES)	QTY	ALUMINUM 666XX0-		STAINLESS STEEL 666XX1-		CAST IRON 666XX2-		666XXA,XXB,XXC S' STEEL HWR	
			PART NO.	[MTL]	PART NO.	[MTL]	PART NO.	[MTL]	PART NO.	[MTL]
□1	Rod	(1)	98720-1	[C]	98720-1	[C]	98720-1	[C]	98720-1	[C]
2	"O" Ring (1 O.D.)	(1)	Y330-117	[B]	Y330-117	[B]	Y330-117	[B]	Y330-117	[B]
5	Plate (Air side)	(2)	92752	[C]	92752	[C]	92752	[C]	92752	[C]
□6	Plate (Fluid side)	(2)	92752	[C]	92775	[SS]	92775	[SS]	92775	[SS]
9	Washer (5/8)	(2)	93065	[SS]	93065	[SS]	93065	[SS]	93065	[SS]
14	Screw	(2)	Y5-107-K	[C]	Y5-107-T	[SS]	Y5-107-T	[SS]	Y5-107-T	[SS]
15	Fluid Cap	(2)	92750	[A]	92773	[SS]	92778	[CI]	◆ SAME	-
16	Manifold	(2)	92855 (*)	[A]	92856 (*)	[SS]	92857 (*)	[CI]	◆ SAME	-
26	Bolt (3/8-16 x 1-1/4)	(8)	Y6-66-C	[C]	Y6-66-C	[C]	Y6-66-C	[C]	Y6-66-T	[SS]
27	Bolt (5/16-18 x 2-1/4)	(4)	Y6-510-C	[C]	Y6-510-C	[C]	Y6-510-C	[C]	Y6-510-T	[SS]
29	Nut (5/16-18)	(20)	Y12-5-C	[C]	Y12-5-C	[C]	Y12-5-C	[C]	Y12-5-S	[SS]
32	Leg	(2)	92759	[CS]	92759	[CS]	92759	[CS]	92759-1	[SS]
43	Ground Lug	(1)	93004	[C]	93004	[C]	93004	[C]	93004	[C]
59	Bolt (5/16-18 x 2)	(16)	93608	[C]	93608	[C]	93608	[C]	Y6-59-T	[SS]

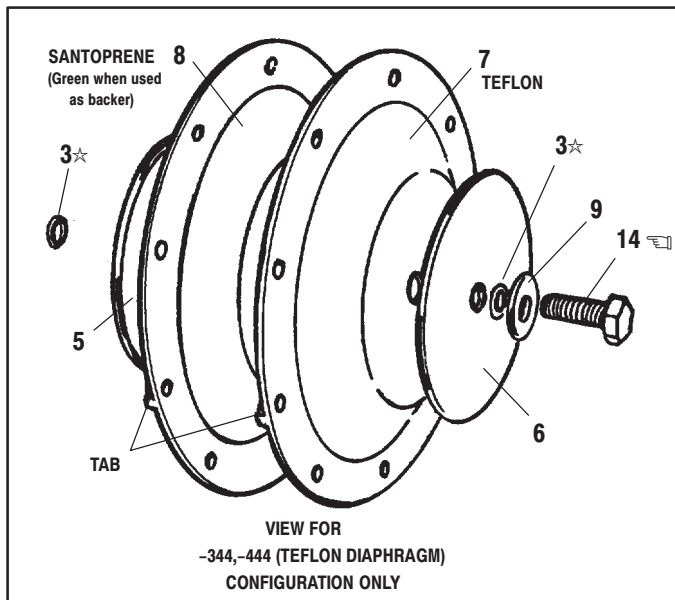
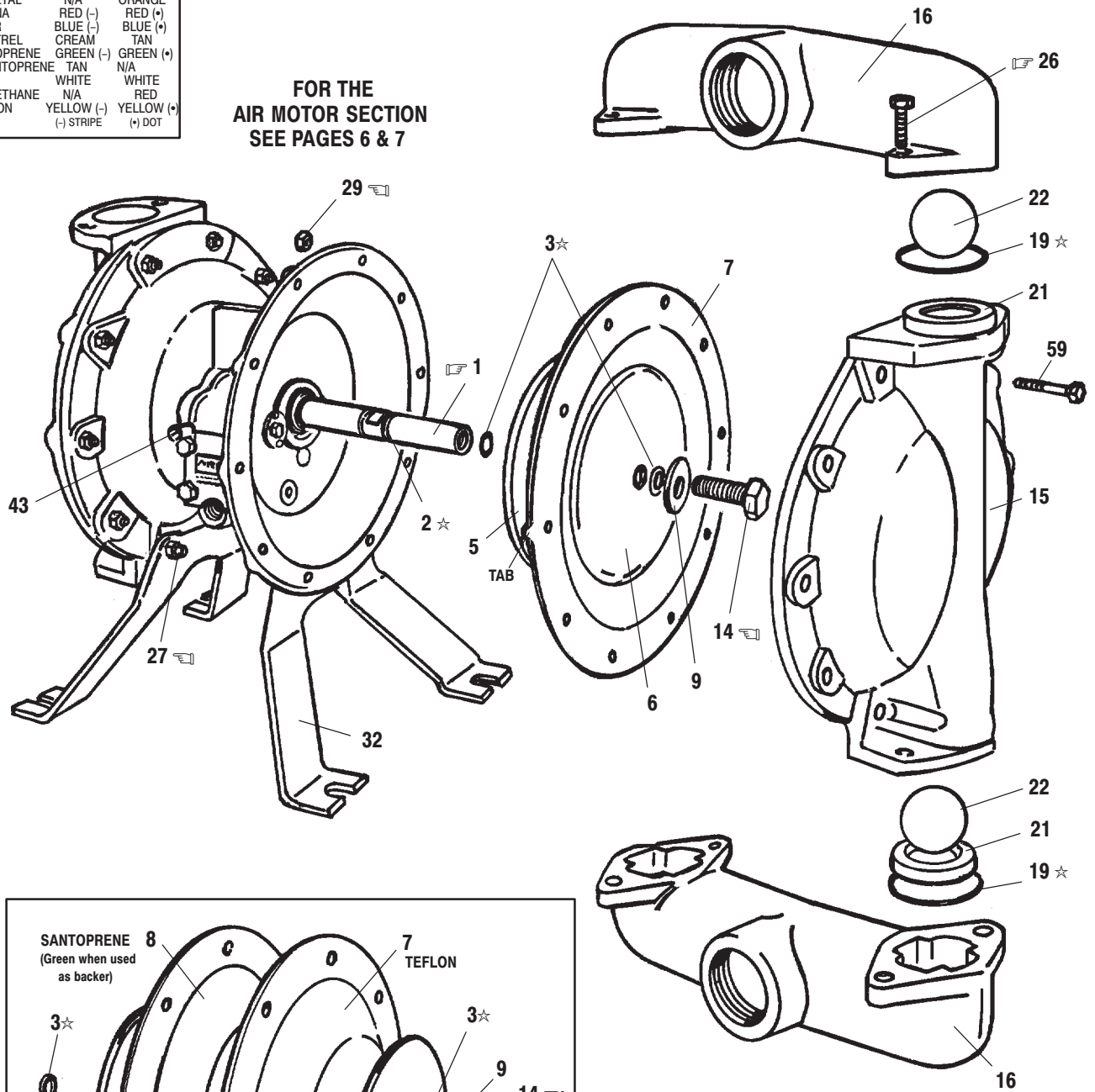
* NOTE: 666X2X-, X3X- ARE BSP MODELS, ADD "-1" TO THE MANIFOLD PART NO.

Service Note: Part No. 98931-T Installation Tool is available separately for use with items 1 and 2.
 □ "Smart Parts" keep these items on hand in addition to the Service Kits for fast repair and reduction of down time.

PARTS LIST / 6662XX-X-C FLUID SECTION

COLOR CODE		
MATERIAL	DIAPHRAGM COLOR	BALL COLOR
ACETAL	N/A	ORANGE
BUNA	RED (-)	RED (+)
EPR	BLUE (-)	BLUE (+)
HYTREL	CREAM	TAN
NEOPRENE	GREEN (-)	GREEN (+)
SANTOPRENE	TAN	N/A
TFE	WHITE	WHITE
URETHANE	N/A	RED
VITON	YELLOW (-)	YELLOW (+)
	(-) STRIPE	(+) DOT

FOR THE
AIR MOTOR SECTION
SEE PAGES 6 & 7



TORQUE REQUIREMENTS
NOTE: DO NOT OVERTIGHTEN FASTENERS
 (14) Diaphragm Bolt 65-70 ft.lbs (88-96 Nm.),
 apply Loctite 271 to threads.
 (26, 29) Fluid Caps/Manifold nuts and bolts 120-140 in lbs.,
 (13.5-15.8 Nm.) apply Loctite Nickel Antiseize to threads.
LUBRICATION / SEALANTS
 ☆ Apply Keylube to all O-rings,
 U-Cups & mating parts

PARTS LIST / 6662XX-X-C AIR SECTION

✓ Indicates parts included in 637118-C Air Section Service Kit.

SERVICE KIT NOTE: Service Kit 637118-C is a general repair kit for all 1" and larger ARO diaphragm pump air motors. It contains extra O-Rings and extra parts that may not be needed to service this model.

AIR MOTOR PARTS

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	[MTL]	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	[MTL]
101	Motor Body (66620X, 22X)	(1)	98725-1	[A]	□115	Spacer	(4)	92876	[Z]
	Motor Body (66621X, 23X)	(1)	98719-1	[CI]	□116	Spacer	(1)	92006	[Z]
□102	O-Ring (1 O.D.)	(1)	Y325-24	[B]	✓117	Gasket	(1)	92004	[B/NY]
□103	Sleeve	(1)	98718-1	[BZ]	118	Pilot Rod	(1)	93309-2	[C]
✓104	Retaining Ring, TruArc (13/16 O.D.)	(2)	Y145-26	[C]	✓119	O-Ring (3/4 O.D.)	(4)	93075	[U]
105	Screw/Washer (1/4-20 x 5/8) (6662X0,1,2)	(8)	93860	[C]	120	Spacer	(3)	115959	[Z]
	Cap Screw (1/4-20 x 5/8) (6662XA,B,C)	(8)	Y6-42-T	[SS]	121	Sleeve Bushing	(2)	98723-2	[BZ]
106	Lockwasher (1/4) (6662XA,B,C Only)	(8)	Y14-416-T	[C]	✓122	O-Ring (1/2 O.D.)	(2)	Y330-110	[B]
107	Plate	(2)	93707-1	[SS]	✓123	Screw (8-32 x 3/8)	(4)	Y154-41	[C]
✓108	Gasket (With Notch)	(1)	92878	[B/NY]	126	Pipe Plug (1/2)	(1)	Y227-5	[SS]
□109	Piston	(1)	92011	[D]	127	Elbow	(1)	Y43-5-C	[C]
✓110	U-Cup (1-3/8 O.D.)	(1)	Y186-51	[B]	128	Pipe Plug (66620X,22X) (1/8)	(1)	Y17-50-C	[C]
□111	Spool (66620X,22X)	(1)	92005	[A]		Pipe Plug (66621X,23X) (1/8)	(1)	Y17-50-S	[SS]
	Spool (66621X,23X)	(1)	93047	[C]	201	Muffler	(1)	93139	[P]
□112	Washer (1.557 O.D.)	(5)	92877	[Z]					
✓113	O-Ring (Small) (1-1/4 O.D.)	(5)	Y325-214	[B]	✓	Keylube, O-Ring Lube Packet	(1)		
✓114	O-Ring (Large) (1-9/16 O.D.)	(6)	Y325-126	[B]		Keylube O-ring Packets (10)		637175	

AIR MOTOR SECTION SERVICE

Service is divided into two parts - 1.Pilot Valve, 2.Major Valve.

GENERAL REASSEMBLY NOTES:

- Air Motor Section Service is continued from Fluid Section repair.
- Inspect and replace old parts with new parts as necessary. Look for deep scratches on metallic surfaces, and nicks or cuts in "O"rings.
- Take precautions to prevent cutting "O"rings upon installation.
- Lubricate "O"rings with Key-lube or equivalent.
- Do not over-tighten fasteners, refer to torque specification block on view.
- Re-torque fasteners following restart.

PILOT VALVE DISASSEMBLY

1. Remove (104) retaining ring.
2. Remove (123) screws, (122) "O"rings.
3. Remove (118) piston rod, (121) sleeve bushing, (119) "O"rings, and (120) spacers from the (101) motor body.
4. Remove (103) sleeve and (102) "O"ring.

PILOT VALVE REASSEMBLY

1. Replace (102) "O"ring if worn or damaged and reinstall (103) sleeve.
2. Install one of the (121) sleeve bushings, (119) "O"rings, (120) spacers, and the remaining (121) bushing.
3. Carefully push (118) pilot rod into bushings etc. and retain on each end with the two (122) "O"rings, retain with (123) screws.
4. Replace (104) retaining rings.

MATERIAL CODE

[A] = Aluminum	[N] = Neoprene
[B] = Buna "N"	[NY] = Nylon
[BZ] = Bronze	[P] = Polypropylene
[C] = Carbon Steel	[SS] = Stainless Steel
[CI] = Cast Iron	[U] = Polyurethane
[D] = Acetal	[Z] = Zinc

MAJOR VALVE DISASSEMBLY

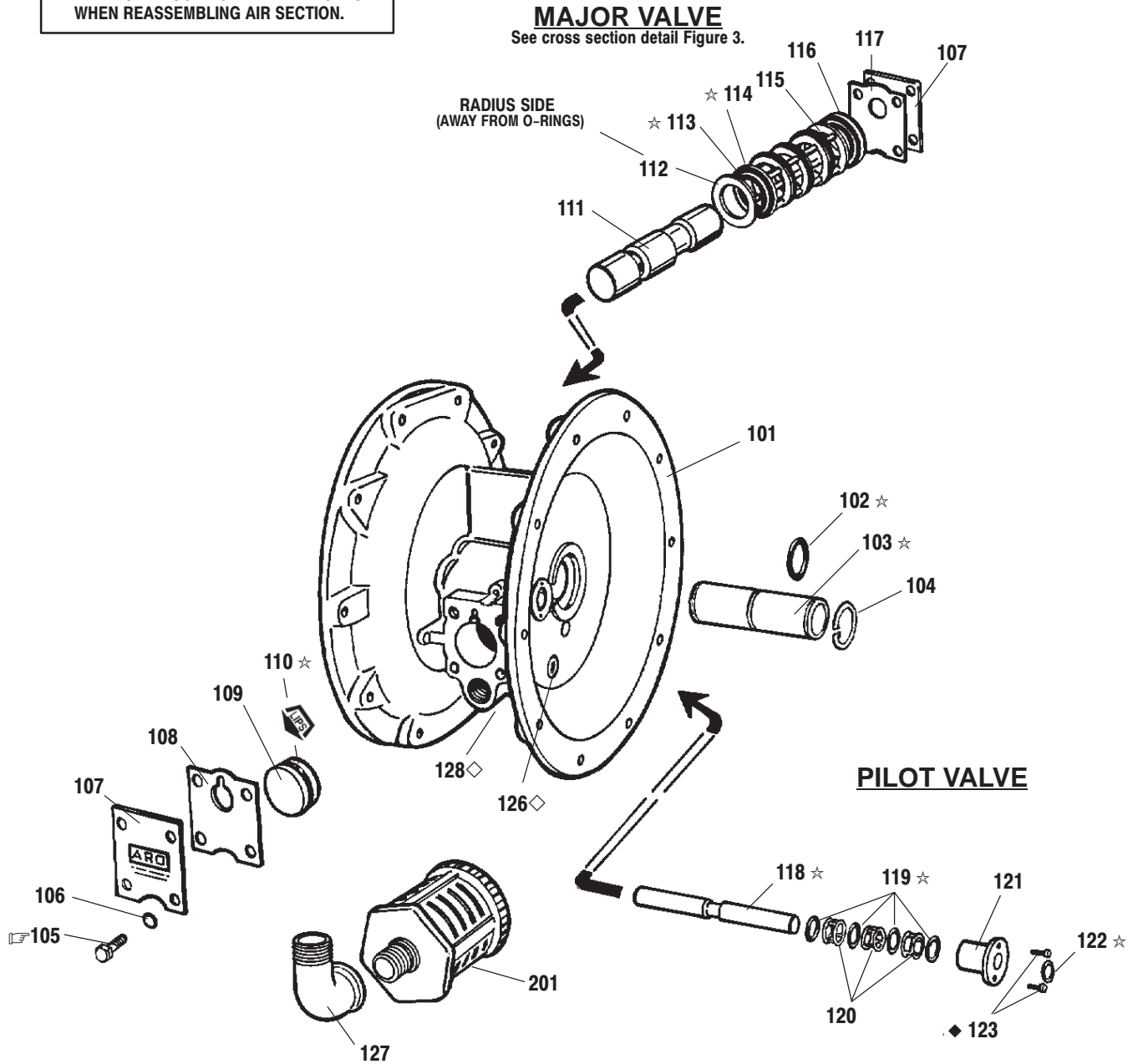
1. Remove (107) plate (or leg depending on model), (108) and (117) gaskets.
2. On the side opposite the air inlet, push on the inner diameter (111) spool. This will force the (109) piston out. Continue pushing the (111) spool and remove. Check for scratches and gouges.
3. Reach into the air section (exhaust side) and remove (116) spacer, (115) spacers, (113) "O"rings, (114) "O"rings, (112) washers, etc. Check for damaged "O"rings.

MAJOR VALVE REASSEMBLY

1. Replace (112) washer, (114) "O"ring, (113) "O"ring onto (115) spacer and insert etc.
- NOTE: Be careful to orient spacer legs away from blocking internal ports.**
2. Lubricate and carefully insert (111) spool.
3. Install (117) gasket and (107).
4. Lubricate and install (110) packing cup and insert (109) piston into (air inlet side) cavity, the (110) packing cup lips should point outward.
5. Install (108) gasket and replace (107).

□ "Smart Parts" Keep these items on hand in addition to the Service Kits for fast repair and reduction of down time.

IMPORTANT
 BE CERTAIN TO ORIENT (115) SPACER LEGS
 AWAY FROM BLOCKING INTERNAL PORTS
 WHEN REASSEMBLING AIR SECTION.



MAJOR VALVE CROSS SECTION DETAIL

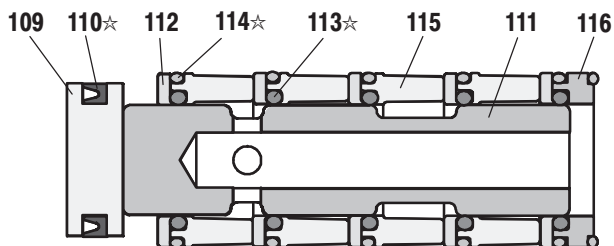


FIGURE 3

TORQUE REQUIREMENTS
 NOTE: DO NOT OVERTIGHTEN FASTENERS
 (105) 40-50 in. lbs., (4.5-5.6 Nm. apply Loctite Nickel Anti-seize to threads.

LUBRICATION / SEALANTS
 ☆ Apply Keylube to all O-rings, U-Cups & mating parts.
 ◆ Apply Loctite 271 to threads.
 ◇ Apply pipe sealant to threads.

TROUBLE SHOOTING

Product discharged from exhaust outlet.

- Check for diaphragm rupture.
- Check tightness of diaphragm nut.

Air bubbles in product discharge.

- Check connections of suction plumbing.
- Check "O"rings between intake manifold and fluid caps.
- Check tightness of diaphragm nut.

Low output volume, erratic flow, or no flow.

- Check air supply.
- Check for plugged outlet hose.
- Check for kinked (restrictive) outlet material hose.
- Check for kinked (restrictive) or collapsed inlet material hose.
- Check for pump cavitation – suction pipe should be sized at least as large as the inlet thread diameter of the pump for proper flow if high viscosity fluids are being pumped. Suction hose must be a non-collapsing type, capable of pulling a high vacuum.
- Check all joints on the inlet manifolds and suction connections. These must be air tight.
- Inspect the pump for solid objects logged in the diaphragm chamber or the seat area.

DIMENSIONAL DATA

(Dimensions shown are for reference only, they are displayed in inches and millimeters (mm)).

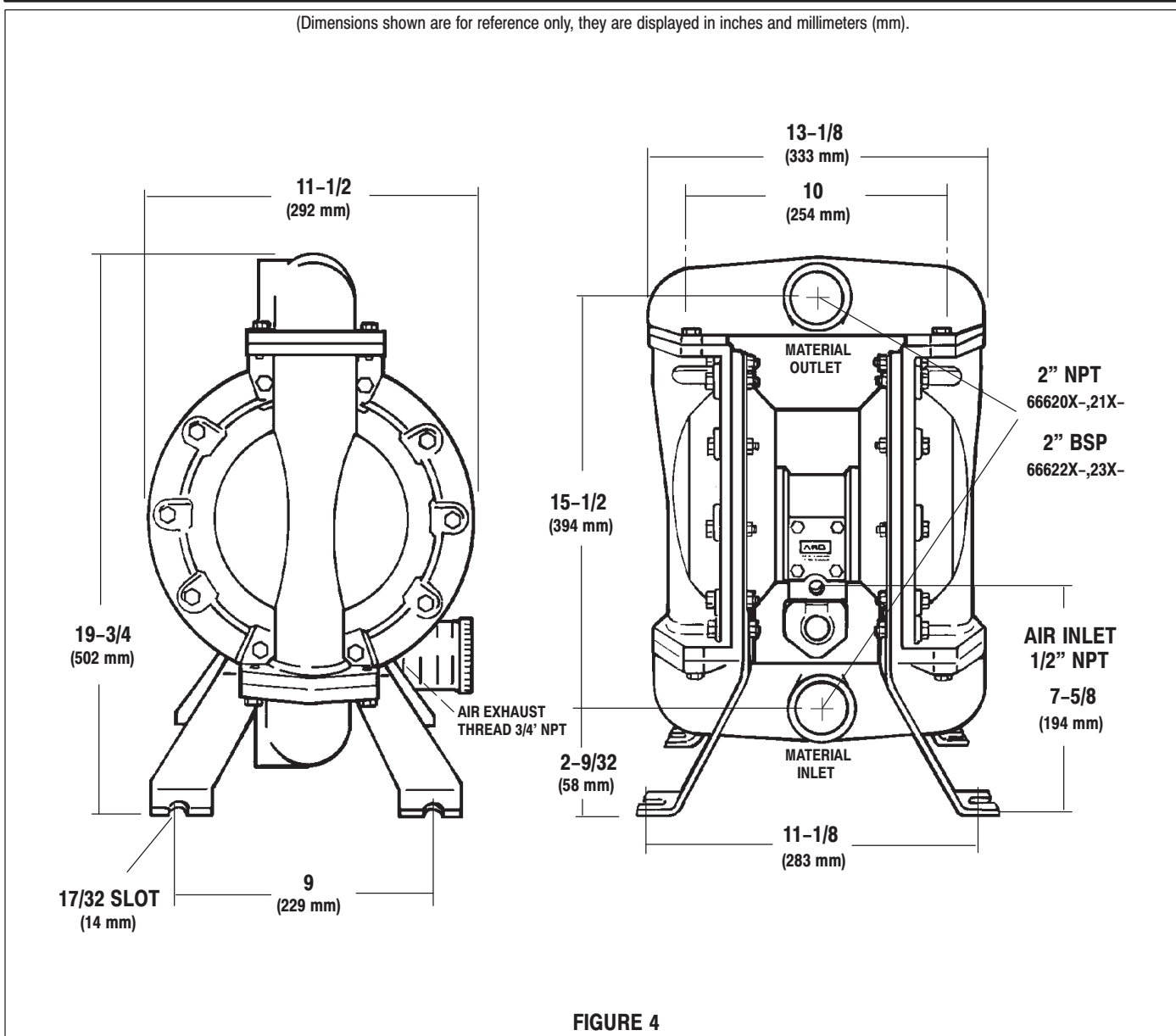


FIGURE 4

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