OPERATOR'S MANUAL 670144-A

INCLUDING: OPERATION, INSTALLATION AND MAINTENANCE

RELEASED: 12-18-15
REVISED: 7-17-20
(REV: E)

1/4" DIAPHRAGM PUMP

1:1 RATIO (NON-METALLIC)

67 0144-A

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.

PUMP DATA

Models..... 670144-A
Pump Type.. Non-Metallic Air Operated Double Diaphragm
Material..... See Parts List
Weigh..... ..... 2.86 lbs (1.30 kgs)
Maximum Air Inlet Pressure ..... 125 psig (8.6 bar)
Minimum Air Inlet Pressure..... 10 psig (0.69 bar)
Maximum Material Inlet Pressure... 10 psig (0.69 bar)
Maximum Outlet Pressure..... 125 psig (8.6 bar)
Maximum Flow Rate (flooded inlet)..... 5.3 gpm (20 lpm)
Displacement / Cycle @ 125 psig.... 0.019 gal / 0.072 ltrs
Maximum Particle Size ..... 1/16" dia. (1.6 mm)
Maximum Temperature Limits (diaphragm / ball / seat material)

Acetal	-20° to 180° F (-29° to 82° C)
E.P.R. / EPDM	-60° to 280° F (-51° to 138° C)
Kynar® PVDF	10° to 200° F (-12° to 93° C)
Hytrel®	-20° to 180° F (-29° to 82° C)
Neoprene	0° to 200° F (-18° to 93° C)
Nitrile®	10° to 180° F (-12° to 82° C)
Polypropylene	32° to 175° F (0° to 79° C)
Viton®	-40° to 350° F (-40° to 177° C)
Santoprene®	-40° to 225° F (-40° to 107° C)
PTFE	40° to 225° F (4° to 107° C)

Dimensional Data..... see page 7
Noise Level @ 70 psig, 60 cpm..... 62.3 dB(A)①

① The pump sound pressure levels published here have been updated to an Equivalent Continuous Sound Level (LA_{eq}) to meet the intent of ANSI S1.13-2005, CAGI-PNEUROP S5.1.

Model 670144-A

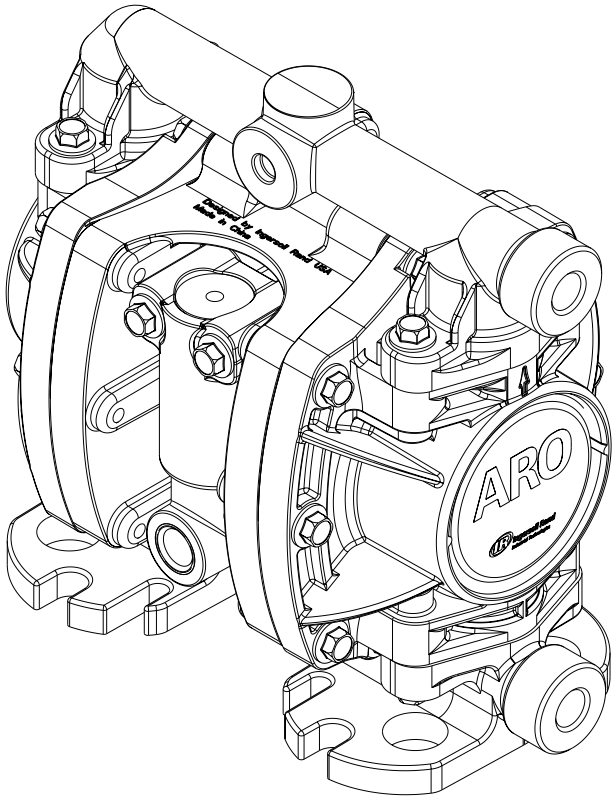

Figure 1

MODEL DESCRIPTION

670144-A Polypropylene Fluid Section/Center Body Material, NPTF / BSPT / Hydrid Threaded

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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.

- Sparks can ignite flammable material and vapors.
- The pumping system and object being sprayed must be grounded when it is pumping, flushing, recirculating or spraying flammable materials such as paints, solvents, lacquers, etc. or used in a location where surrounding atmosphere is conducive to spontaneous combustion. Ground the dispensing valve or device, containers, hoses and any object to which material is being pumped.
- 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 0.1 ohms or less.
- Submerse 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 1/4" minimum ID 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.

⚠ 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. For specific fluid compatibility, consult the chemical manufacturer.

⚠ CAUTION Maximum temperatures are based on mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperature. Consult the chemical manufacturer 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 Install the pump in the vertical position. The pump may not prime properly if the balls do not check by gravity upon start-up.

NOTICE RE-TORQUE ALL FASTENERS BEFORE OPERATION. Creep of housing and gasket materials may cause fasteners to loosen. Re-torque all fasteners to insure against fluid or air leakage.

NOTICE Replacement warning labels are available upon request.

⚠ 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.

GENERAL DESCRIPTION

The ARO diaphragm pump offers high volume delivery even at low air pressures, easy self priming and the ability to pump various viscosity materials. The pump is designed to correspond to the needs of the user by offering a variety of wetted parts configurations to handle almost any application.

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. Flat checks insure a 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.

The Acetal material used in this pump contains stainless steel fibers. It's conductivity allows it to be connected to a suitable ground. A ground screw is provided for this.

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.
- The pump, when fitted with flex checks, can be rotated 360° to suit the application. It may be mounted upside down or on the wall with no effect on suction lift or operating efficiency. The filter and regulator need to be oriented in a normal vertical direction to function properly.
- If lubricated air is present, make sure that it is compatible with the "O" rings and seals in the air motor section of the pump.

INSTALLATION

- Apply PTFE tape or pipe sealant to threads upon assembly to prevent leakage.
- Secure the diaphragm pump legs to a suitable surface to insure against damage by vibration.
- 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.

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.

MAINTENANCE

- This product is not intended to be repairable. However, some service items are available.
- 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 the pump in preventive maintenance program.
- At the end of its service life, please dispose of pump and contents properly.

PARTS LIST / FLUID SECTION

COMMON PARTS				
Item	Description	Part no	Qty	[Mtl]
1	Rod Assembly (includes seals)	24028284	(1)	---
5	Washer, Diaphragm	23981541	(2)	[P]
26	Screw	23981574	(32)	[SS]
74	Pipe Plug	93832-3	(2)	[K]
77	Plate	93264	(2)	---

FLUID CONNECTION				
Item	Description	Part no	Qty	[Mtl]
3	"O" Ring	Y327-108	(2)	[V]
6	Diaphragm Screw	93810-7	(2)	[P]
15	Fluid Cap	23981632	(2)	[P]
60	Inlet Manifold	23981673	(1)	[P]
61	Outlet Manifold	23981715	(1)	[P]

SEAT OPTION				
Item	Description	Part no	Qty	[Mtl]
21	Seat	96580-1	(4)	[P]

DIAPHRAGM OPTION				
Item	Description	Part no	Qty	[Mtl]
7	Diaphragm	93898	(2)	[T]
19	"O" Ring	Y327-119	(4)	[V]
64	"O" Ring	93947	(2)	[B]

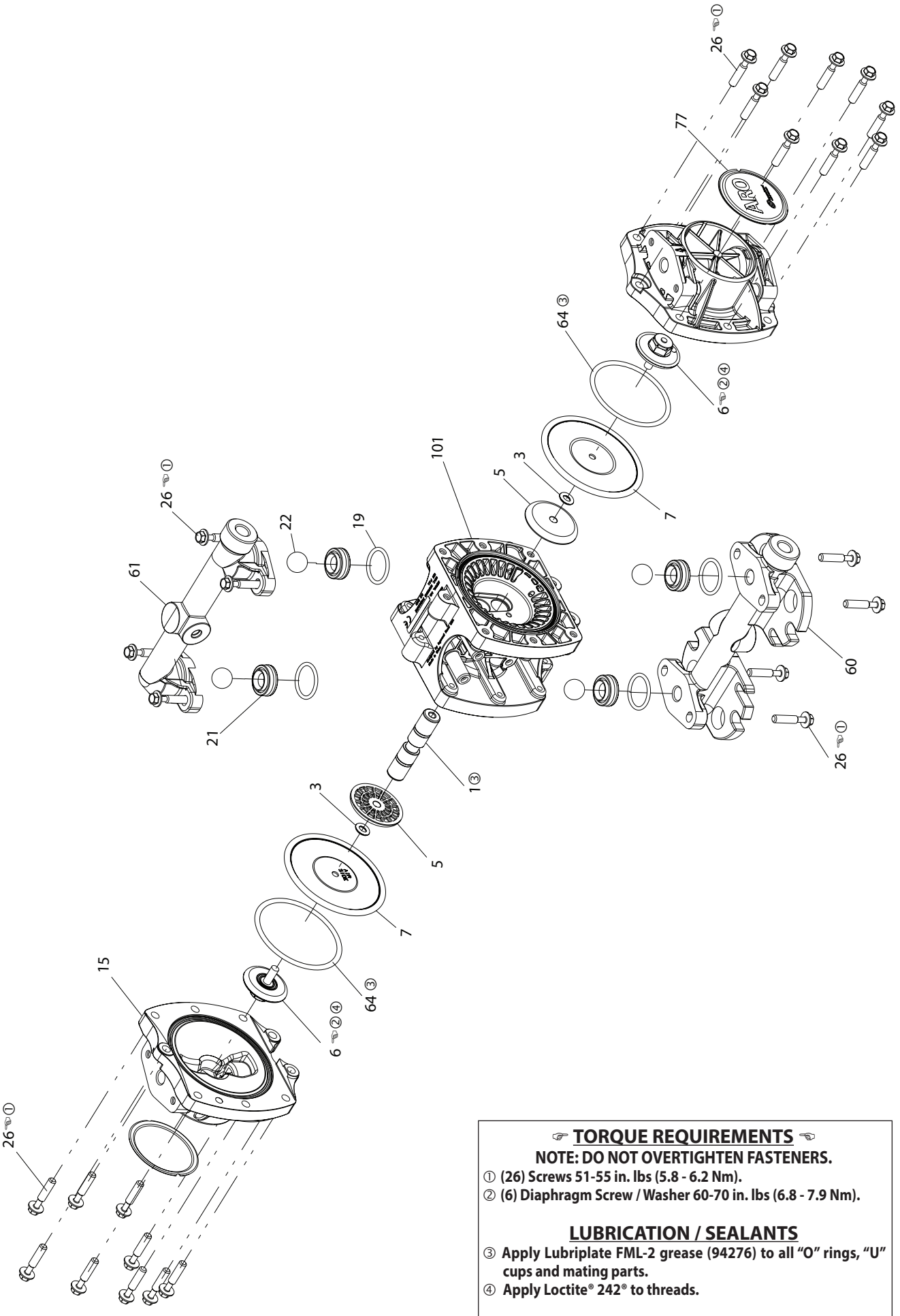
BALL OPTION				
Item	Description	Part no	Qty	[Mtl]
22	Ball	96481-4	(4)	[T]

MATERIAL CODE

[B] = Nitrile
[Co] = Copper
[D] = Acetal
[E] = E.P.R. / EPDM
[G] = Nitrile
[GP] = Groundable Polypropylene
[H] = Hytrel
[K] = Kynar PVDF
[N] = Neoprene
[P] = Polypropylene
[Sy] = Syn-Seal
[SS] = Stainless Steel
[T] = PTFE
[U] = Polyurethane
[V] = Viton

PARTS LIST / AIR MOTOR SECTION

AIR SECTION PARTS				
Item	Description	Part no	Qty	[Mtl]
101	Center Body	23981608	(1)	[P]
107	Valve Block Plug	23981434	(1)	[P]
111	Major Valve spool Asm (includes seals)	24028268	(1)	[P]
129	Major Baffle	23981475	(1)	[P]
132	Gasket	23981525	(1)	[B]
135	Valve Block Assembly	24243388	(1)	[P]
137	"O" Ring	Y325-17	(1)	[P]
167	Pilot Valve Spool Assembly (includes seals)	24028276	(1)	[D]
173	"O" Ring	24243313	(1)	[U]
226	Gasket, Muffler	23981533	(1)	[SY]



☞ TORQUE REQUIREMENTS ☜

NOTE: DO NOT OVERTIGHTEN FASTENERS.

① (26) Screws 51-55 in. lbs (5.8 - 6.2 Nm).

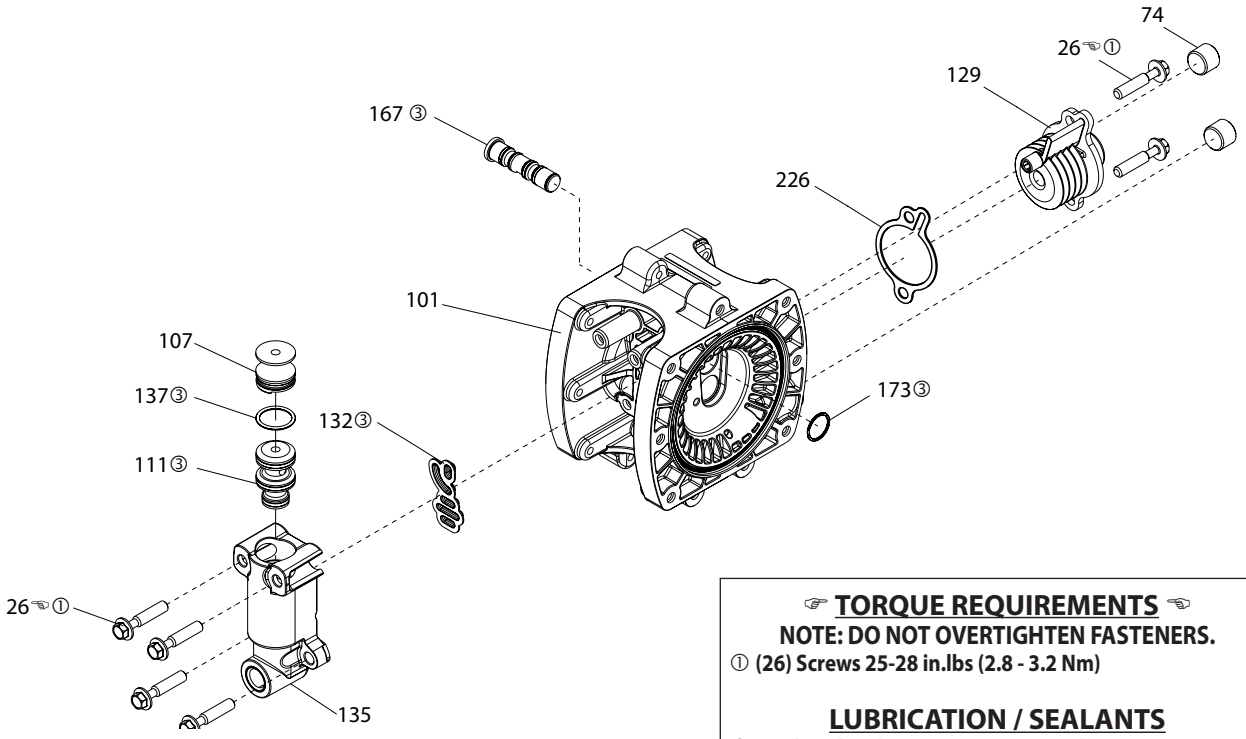
② (6) Diaphragm Screw / Washer 60-70 in. lbs (6.8 - 7.9 Nm).

LUBRICATION / SEALANTS

③ Apply Lubriplate FML-2 grease (94276) to all "O" rings, "U" cups and mating parts.

④ Apply Loctite® 242® to threads.

PART LIST/ AIR MOTOR SECTION



☞ TORQUE REQUIREMENTS ☜

NOTE: DO NOT OVERTIGHTEN FASTENERS.

① (26) Screws 25-28 in.lbs (2.8 - 3.2 Nm)

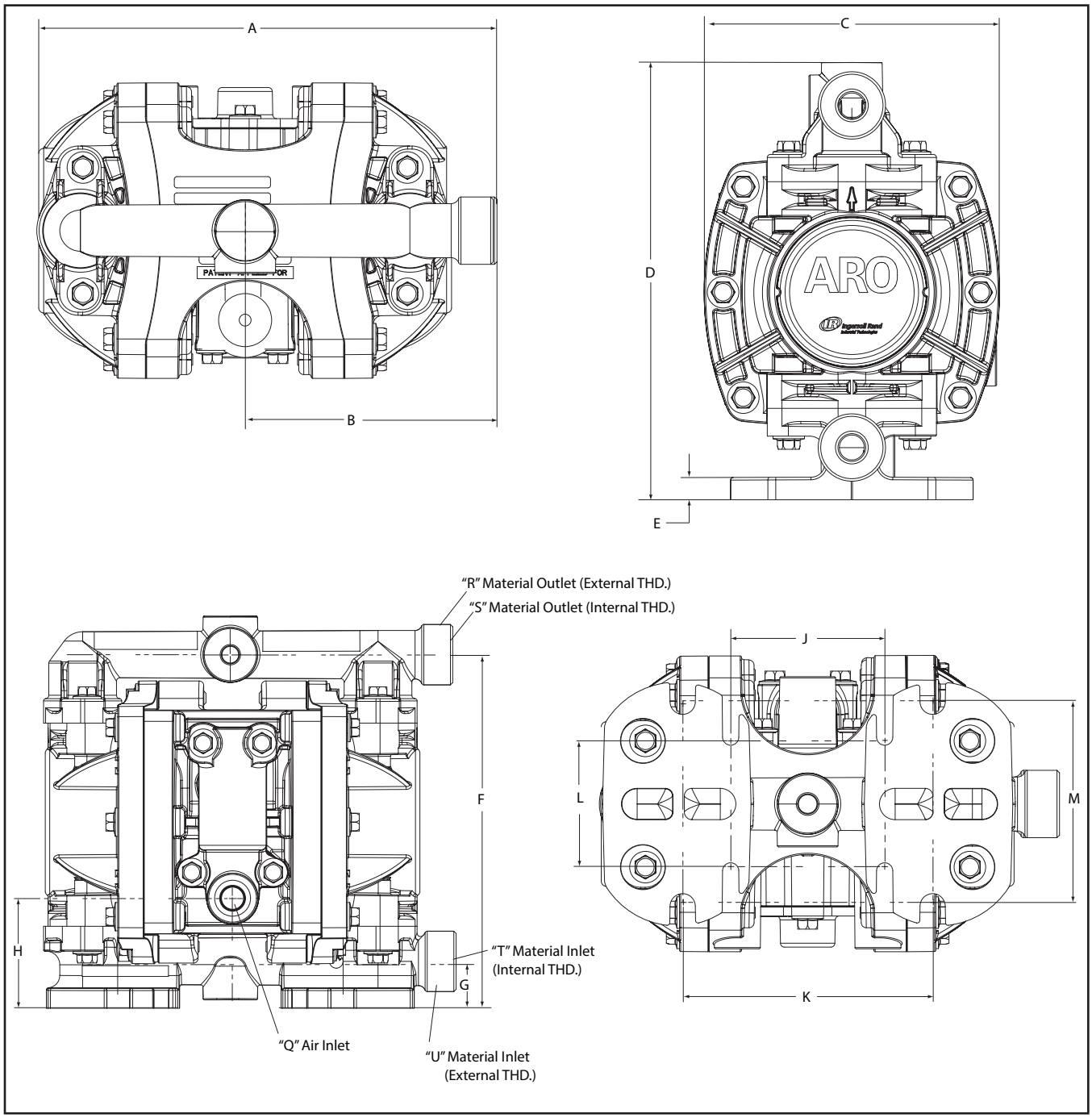
LUBRICATION / SEALANTS

③ Apply Lubriplate FML-2 grease to all "O" rings, "U" cups and mating parts.

④ Apply Loctite® 242® to threads.

DIMENSIONAL DATA

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



DIMENSIONS

A - 7.2" (182 mm)	H - 1.9" (48.6 mm)	S - 1/4 NPTF/BSPT/Hybrid
B - 3.9" (100.0 mm)	J - 2.4" (61 mm)	T - 1/4 NPTF/BSPT/Hybrid
C - 4.6" (117.0 mm)	K - 3.9" (99 mm)	U- 3/4-14 NPTF
D- 6.8" (173.0 mm)	L - 2.1" (53 mm)	
E- 0.3" (8.8 mm)	M - 3.2" (81 mm)	
F- 6.1 " (156 mm)	Q - 1/4 - 18 PTF SAE Short	
G- 0.8" (20.7 mm)	R- 3/4-14 NPTF	