

## “SHOCK BLOCKER®”

### PULSATION DAMPENER

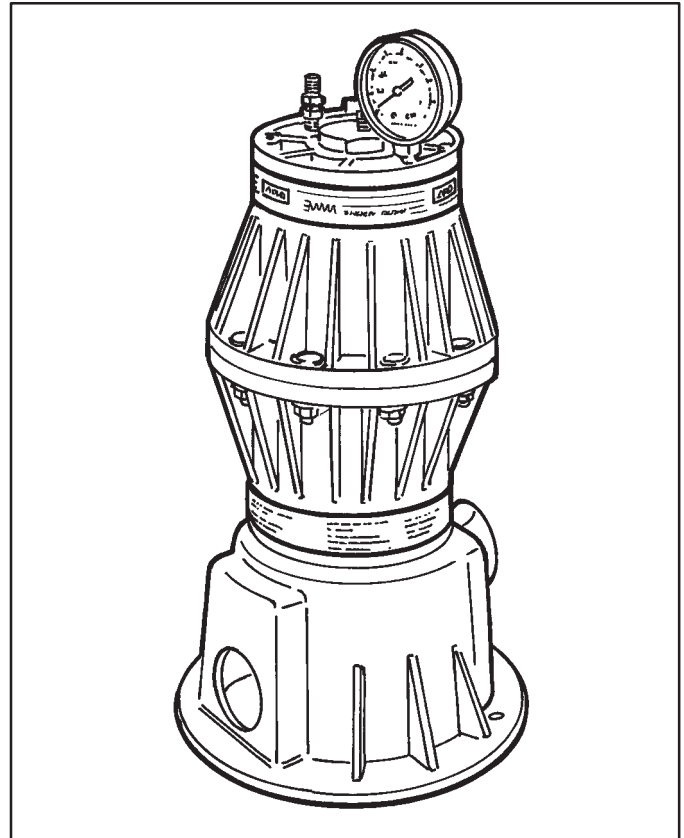
### AND “AIR TAMER” AUTO ADJUSTMENT KIT



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

#### SHOCK BLOCKER DATA

- MODELS** – See Model Description Chart for “-XXX” on page 3.
- PUMP TYPE** – Non-Metallic
- MATERIAL** – Polypropylene, Conductive Acetal or Pure Kynar
- WEIGHT** – Polypropylene 5 lbs (2.3 kgs)  
– Conductive Acetal 5 lbs (2.3 kgs)  
– Pure Kynar 5 lbs (2.3 kgs)
- MAXIMUM FLUID INLET PRESSURE**  
– 100 p.s.i.g. (6.9 bar)
- MAXIMUM AIR CHARGE PRESSURE** – 100 p.s.i.g. (6.9 bar)
- MAXIMUM TEMP. LIMITS**  
– Polypropylene 35°F to 150°F (2°C to 66°C)  
– Conductive Acetal 10°F to 180°F (-12°C to 82°C)  
– Pure Kynar 10°F to 200°F (-12°C to 93°C)
- DIMENSIONAL DATA** – See page 8.
- MATERIAL INLET**  
– 1” NPTF (Female), Standard  
– 1” BSP (Female), Fitting included
- AIR INLET** – Air Chuck Style Valve, Standard  
– Air Tamer is 3/8” NPTF (Male) (Optional)
- KITS AVAILABLE**  
– 66911-1 Air Tamer Automatic Air Pressure Adjustment Kit  
– 66108 Mounting Pedestal  
– 66885-1 Grounding Kit (For use with model 667006-XXX, includes 25’ - 14 gauge wire.)



#### GENERAL DESCRIPTION

The ARO Shock Blocker, pulsation dampener is designed to work with 1:1 ratio pumps having an outlet pressure not exceeding 100 psi (6.9 bar). The Shock Blocker will effectively reduce material pressure variations, surges and shock to piping and delivery in fluid systems during pump reversal. It can significantly contribute to pulse reduction in low pressure spray applications.

Accurate selection of wetted material will assure longest service life and minimize down time. Several material options are available for the body and bladder materials. Body materials available include: Polypropylene, Conductive Acetal and Pure Kynar. Use Conductive Acetal and ground cable when pumping flammable materials. Fluid compatibility guide (Aro form 8677-P is available upon request).

The Shock Blocker uses a single air pressurized, flexible bladder working against the fluid line pressure. Several bladder material options are

available to allow custom matching to the fluid material for best compatibility (refer to chart on page 3).

The base model requires manual pressurization on initial start-up. An optional automatic upgrade kit is available for use when a higher level of automatic pressure adjustment and accuracy is important. It uses a sensing rod to detect the position of the bladder and an automatic air valve to adjust the air line pressure or to exhaust excessive pressure in the bladder chamber as needed. An air pressure gauge is standard to monitor the air side internal chamber pressure.

Shock blocker units can also be added in series to provide additional dampening on the material.

Shock Blocker® is a registered trademark of the ARO Corporation.

**ARO**

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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** **EXPLOSION HAZARD.** Do not exceed maximum fluid inlet pressure of 100 P.S.I. (6.9 bar). Operating at higher pressure can cause explosion resulting in property damage or severe injury.

**⚠️ WARNING** **USE ONLY WITH COMPRESSED AIR.** Do not use bottled gas products to run the Shock Blocker. Unregulated high pressure bottled gas has the potential for over-pressurization. Certain gasses such as Nitrogen can cause unpredictable results. The pressure source MUST BE REGULATED.

**⚠️ WARNING** **TEMPERATURE LIMITATIONS.** Do not exceed maximum temperature limits of; (POLYPROPYLENE 150° F), (CONDUCTIVE ACETAL 180° F), (KYNAR 200° F). Excessive operating temperatures can weaken the body material. Limits are based on mechanical stress only.

**⚠️ WARNING** **CHEMICAL COMPATIBILITY HAZARD.** Do not use with certain fluids. Incompatible fluids may attack and weaken the housing causing rupture or explosion which can result in property damage or severe injury. See manufacturers information on fluid compatibility.

**⚠️ WARNING** **DISASSEMBLY HAZARD.** Do not disassemble this unit when it is under pressure. Relieve all material pressure in the pumping system before attempting service or disassembly. Disconnect air lines and carefully bleed any pressure off the system. Be certain the system is not maintaining pressure due to a material restriction in the hose, line, dispensing device, or the spray or extrusion tip. Failure to relieve pressure both up stream and down-stream may result in an injury upon disassembly.

**⚠️ WARNING** **MATERIAL ATOMIZATION.** The relief / exhaust valve must be piped away from the work area. In the event of a diaphragm rupture the material can be atomized and forced out the relief / exhaust valve.

**⚠️ CAUTION** **CHARGE WITH AIR BEFORE INTRODUCING MATERIAL.** Failure to charge with air first can damage diaphragm. Air charge should not exceed 80% of the material inlet pressure.

**⚠️ CAUTION** **NOT FOR STRUCTURAL SUPPORT.** Do not use this product to support other system components or use as a step. Improper support can result in fracture of the housing causing damage. Plumbing must be supported to prevent stresses upon it, install using the mounting hardware supplied.

**NOTICE** Replacement warning labels are available upon request: "Static Spark" PN \ 93616-1, "Diaphragm Rupture" PN \ 93122.

**⚠️ 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.

## OPERATING INSTRUCTIONS

**⚠️ WARNING** HEED WARNINGS AS SHOWN IN "OPERATING AND SAFETY PRECAUTIONS" ABOVE.

### AIR REQUIREMENTS

Clean, dry air should be used to charge the unit.

A filter capable of filtering out particles larger than 50 microns should be used on the air supply.

### INSTALLATION INSTRUCTIONS

Position the Shock Blocker pulsation dampener as close to the pump discharge as possible.

Use the ground lug and optional 66885-1 grounding cable kit with the Conductive Acetal models (667006-XXX) in applications where flammable fluids are used to help guard against static spark hazard resulting in possible fire or explosion. The terminal on the end of the ground wire must be removed and the wire stripped back 1/2" (13 mm) to be accepted by the Shock Blocker ground fitting.

Mount the Shock Blocker in one of the recommended positions as illustrated in the views on page 3.

Different materials affect the mounting configuration. For best performance and typical applications, mount the Shock Blocker upright versus horizontally. Heavier particles in some fluids may settle out, gravity will help discharge heavier particles when mounted vertically.

In many situations, mounting the unit directly to the pump outlet would not be advisable due to the added weight of the unit. It should be independently mounted and plumbed using flexible tubing and not expected physically support other components.

The material flow should be in the direction of the Shock Blocker, not passing by at right angles for best results (see figure 1).

Use the mounting base as provided and additional mounting kit 66108 is also available to gain extra vertical height. This may be necessary when using pumps outlets 1" and larger because of the increased size and space requirements of the fittings. The second mounting kit is inverted to provide an elevated base (see page 8).

When connecting pipe, cut or press the "knock-out" panels from the pedestal base as needed to accommodate piping. Do not alter or cut out other parts of the pedestal.

Shock Blockers used in series should be installed as illustrated in figure 1.

### AIR TAMER MODELS

Air Tamer improved models are completely automatic, no further adjustment is needed after initial set-up. The control device is activated by changes in the material pressure and it will self-adjust the air pressure to the correct level regardless of the material used. Refer to installation instructions on page 6.

When pumping fluids that may pose a hazard to human health, use the 1/8" NPTF exhaust port to capture fluids in the event of a bladder failure. Tubing and fittings are not supplied.

## MODEL DESCRIPTION CHART

# 66700X - 0 1X

### BODY MATERIAL

- 3 POLYPROPYLENE (Glass Filled)
- 6 CONDUCTIVE ACETAL
- 7 PVDF (KYNAR® 720) (Unfilled)

### BLADDER MATERIAL

- 3 VITON®
- 4 T.F.E (TEFLON®)
- 5 E.P.R.
- 8 POLYURETHANE
- 9 HYTREL®
- B SANTOPRENE®

## OPERATION (MANUAL BASE MODEL)

1. Charge the shock blocker with 100 psi (6.9 bar) air pressure.
2. Operate the pump to generate material pressure.

**NOTE: THE SHOCK BLOCKER INNER PRESSURE MUST BE BELOW THE MATERIAL OPERATING PRESSURE FOR PROPER RESULTS.**

3. MONITOR THE GAUGE PRESSURE. RELIEVE OR ADD AIR PRESSURE AS NEEDED to balance the pressure needed to deliver the best pulsation dampening action. Best results will be obtained when the dampener pressure is 80% of the material pressure.
4. Operate the system a few minutes between pressure adjustments allowing for system equalizing.

**NOTE: IF THE PRESSURE IS CHANGED, THE AIR SIDE MUST BE ADJUSTED ACCORDINGLY.**

## SERVICE

**NOTE: BE CERTAIN TO DISCONNECT THE AIR SUPPLY AND RELIEVE FLUID PRESSURE BEFORE ATTEMPTING SERVICE OR DISASSEMBLY.**

**⚠ CAUTION** RELIEVING AIR CHARGE WILL NOT AFFECT THE FLUID SYSTEM PRESSURE. THE GAUGE READING COULD FALSELY REPRESENT ANY RESIDUAL FLUID PRESSURE.

## INSTALLATION MOUNTING CONFIGURATIONS

**Installation Note:** The material flow should flow directly towards the Shock Blocker, not at a right angle to the flow path.

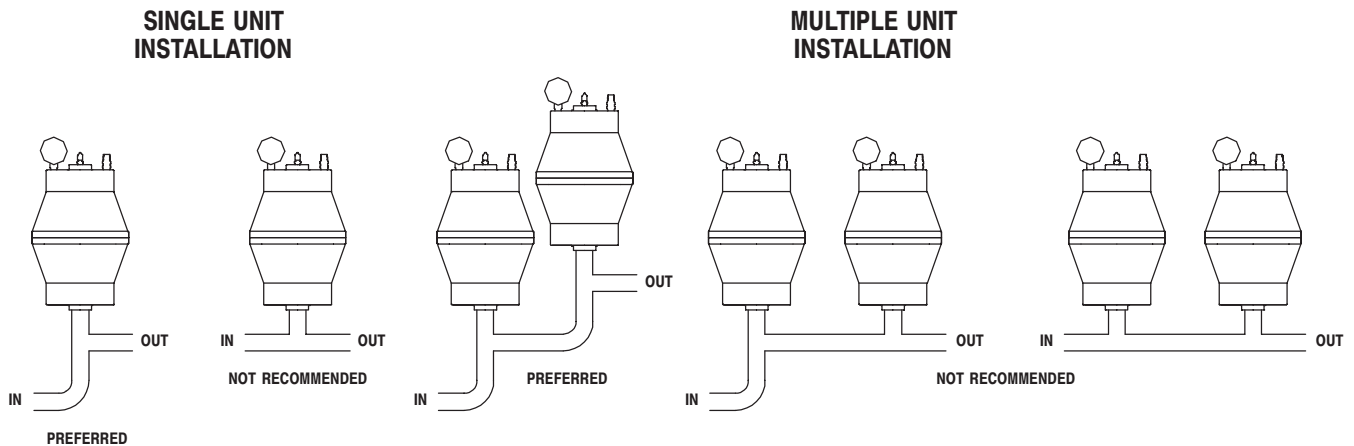


Figure 1

## PARTS LIST / 66700X-X

### BLADDER OPTIONS

-01X	ITEM "8"			ITEM "7"*	
	BLADDER	MATERIAL	COLOR	RING	[MT]
-013	93733-3	VITON	(-) YELLOW	-----	-
-014	93742-4	TEFLON	WHITE	93735-1	[B]
-015	93733-5	EPR	(-) BLUE	-----	-
-018	93734-8	POLYURETHANE	(-) WHITE	-----	-
-019	93734-9	HYTREL	CREAM	-----	-
-01B	93734-B	SANTOPRENE	(-) GREEN	-----	-

(-) = Stripe

MATERIAL CODE
[B] = Nitrile
[C] = Carbon Steel
[Co] = Copper
[GA] = Groundable Acetal
[N] = Neoprene
[P] = Polypropylene (glass filled)
[PE] = Polyethylene
[PK] = Pure Kynar
[SS] = Stainless Steel
[T] = Teflon

### BODY MATERIAL OPTIONS

ITEM	DESCRIPTION (SIZE IN INCHES)	QTY	POLYPROPYLENE		GROUNDABLE		PURE KYNAR	
			667003-		667006-		667007-	
			PART NO.	[MT]	PART NO.	[MT]	PART NO.	[MT]
<input type="checkbox"/> 1	Top Adapter	(1)	93736-1	[P]	93736-3	[GA]	93736-2	[PK]
2	End Cap (Top)	(1)	92875-3	[P]	92875-6	[GA]	92875-7	[PK]
3	End Cap (Bottom)	(1)	93745-3	[P]	93745-6	[GA]	93745-7	[PK]
<input type="checkbox"/> 4	Bottom Adapter (1" - 11-1/2 NPT)	(1)	93739-1	[P]	93739-3	[GA]	93739-2	[PK]
5	Ground Lug	(1)	-----	-	93004	[Co]	-----	-
18	Bottom Adapter (1" - 11 BSPPL)	(1)	93739-4	[P]	93739-6	[GA]	93739-5	[PK]
19	Screw (1/4" - 20 x 1")	(1)	-----	-	Y254-182-Z	[S]	-----	-

### COMMON PARTS

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	[MTL]	ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	[MTL]
6	Screw (1/4" - 20 x 1" for pedestal)	(4)	Y254-182-Z	[C]	14	Washer (13/32")	(10)	93747-1	[SS]
9	Air Test Valve Asm.	(1)	59422	[C]	15	Nut (M10 - 1.5)	(10)	93010	[SS]
10	Gauge (0 - 100 p.s.i. / 0 - 7 bar)	(1)	93833	-	<input type="checkbox"/> 16	"O" Ring (9/64" x 1-31/32" o.d.)	(2)	93743-1	[T]
<input type="checkbox"/> 11	"O" Ring (9/64" x 1-57/64" o.d.)	(1)	93823	[B]	17	Mounting Pedestal	(1)	93744-1	[PE]
12	Relief Valve (1/4" - 18 NPT)	(1)	93368-1	[B]	20	Tube (1/4" i.d. x 1-3/8" long)	(2)	93285-1-F	[N]
13	Bolt (M10 - 1.5 x 45 mm)	(10)	92998	[SS]					

\* "7" Backing ring is used on -014 teflon models only.

A replacement 93793 safety label is available at no cost.

"Smart Parts", Keep these items on hand in addition to the service kits for fast repair and reduction of down time.

## TROUBLE SHOOTING

#### No dampening effect or erratic performance.

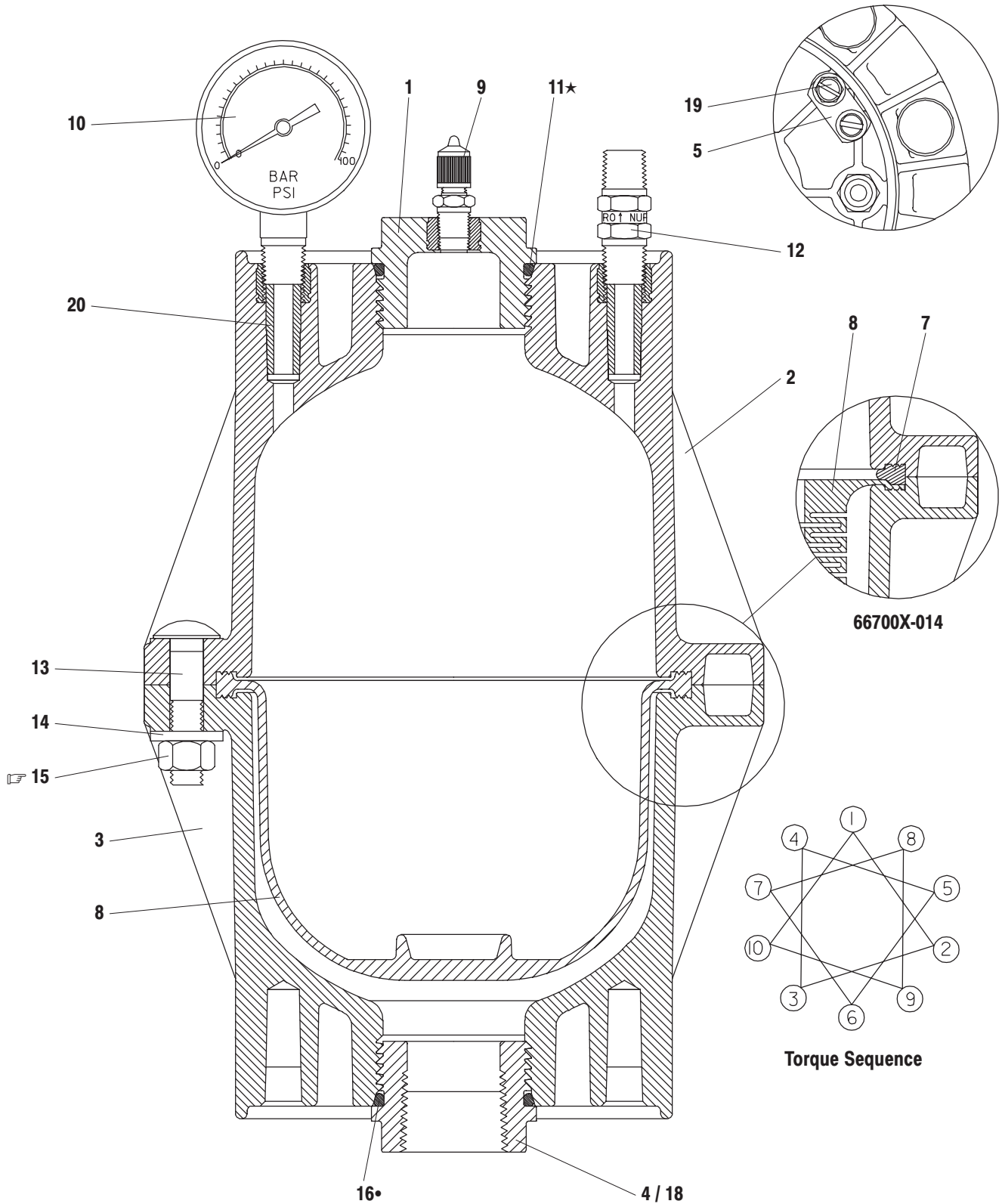
- Check for bladder rupture.
- Check for blocked or restricted outlet hoses.
- Check for a solid object lodged in the fluid inlet or in the bladder area.  
(standard models)
- Check to see that the air charge is 80% of the system pressure.  
(with air tamer)
- Check the air supply. Make certain the air pressure supply available to the tamer is equal to the fluid pressure. The air tamer will automatically adjust to 80% operating pressure.

#### Fluid or air leakage at the top.

- Check for bladder rupture.
- Check for defective pressure relief valve.
- Check for damaged (11) "O" ring.
- Check the tightness of the flange bolts (50 - 60 in. lbs / 5.6 - 6.8 Nm).

#### Cracks in the housing.

- Discontinue use. This would indicate possible fluid incompatibility with the Shock Blocker body material.



**Torque Requirements**  
 (15) 50 - 60 in. lbs (5.6 - 6.8 Nm). Do not overtighten fasteners.

**Lubrication**  
 ★ Apply 93706-1 Keylube.  
 • Apply 93706-1 Keylube upon assembly if Key-lube is compatible with the fluid being pumped.

Figure 2

## 66911-1 AIR TAMER FIELD UPGRADE KIT

### 66911-1 AIR TAMER PARTS LIST

ITEM	DESCRIPTION (Size in Inches)	QTY	PART NO.	[MTL]
101	"O" Ring (1/16" x 13/64" o.d.)	(2)	Y325-4	[B]
102	Spring	(2)	24124	[SS]
103	Stem	(1)	93741-1	[C]
104	Cylinder Assembly	(1)	66886-1	[C]
105	"O" Ring (1/8" x 1-7/8" o.d.)	(1)	Y325-223	[B]
106	Plunger	(1)	93740-1	[C]
107	Piston	(1)	93727-1	[C]
108	Guard	(1)	92996	[SS]
109	Rod Nut	(1)	93724-1	[C]
110	Screw (#6 - 32 x 3/8")	(1)	Y154-31	[C]
111	Plate	(1)	93730-1	[SS]
112	Retaining Ring	(1)	90102	[C]
113	Spring	(1)	93723-1	[SS]
114	Rod	(1)	93726-1	[C]
115	Button	(1)	93729-1	[C]
116	Bolt (1/4" - 20 UNC x 5-1/2")	(1)	92997	[C]

### AIR TAMER INSTALLATION

This optional Field Upgrade Accessory Kit converts a standard manually filled Shock Blocker and makes it self adjusting using air line pressure.

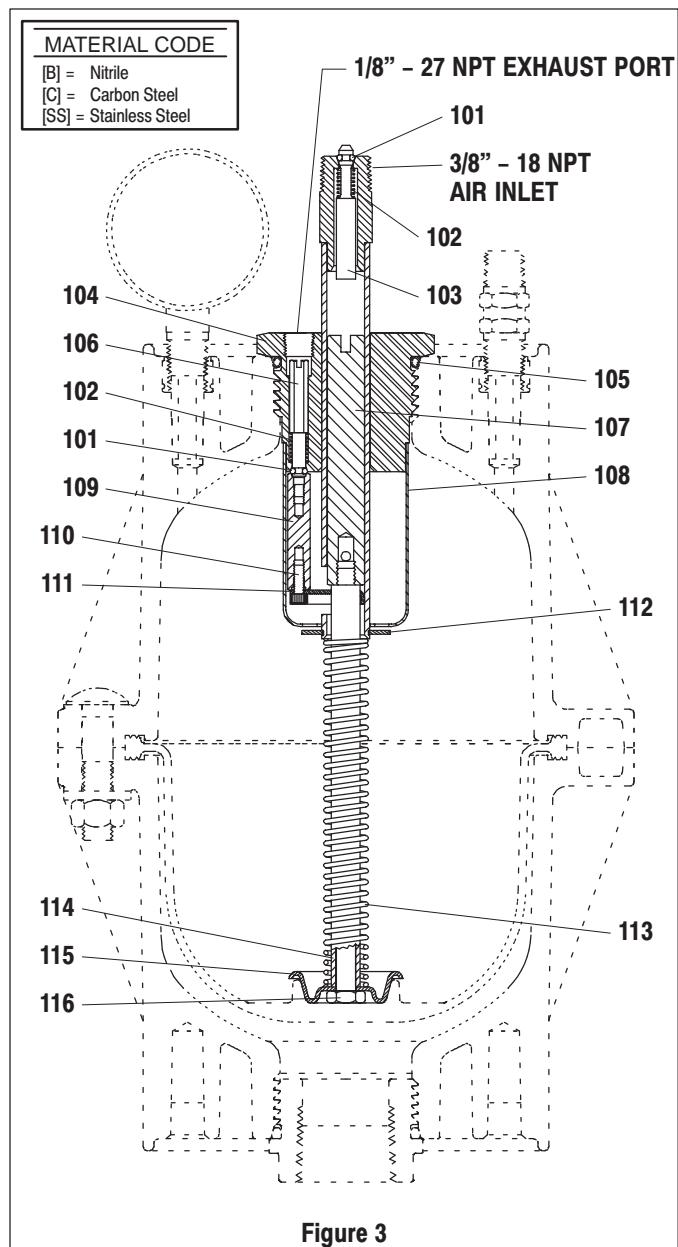
To install the kit:

1. Disconnect the air supply to the pumping system.
2. Relieve any residual material pressure.
3. Relieve air pressure from the Shock Blocker (via the air chuck style valve). NOTE: The Shock Blocker should be supplied with air separately from the pump.
4. Remove (1) adapter from the upper cap.
5. Place the assembled air tamer into the Shock Blocker while being certain to locate the (115) button in the locator boss on the (8) bladder.
6. Thread the air tamer into the end cap by hand to insure good engagement of the threads before tightening with wrench to **25 ft lbs (33.9 Nm)**.
7. Connect the air tamer 3/8" - 18 NPT air inlet to the regulated air inlet supply hose.
8. Connect a drain line to the 1/8" - 27 NPT exhaust port as a safety precaution.

**SAFETY NOTE:** In the event of a bladder rupture, the material being pumped could leak from the exhaust port. Route the drain line to a location where escaping air, material or air containing atomized material will not harm personnel or property.

### AIR TAMER OPERATION

**CAUTION: DO NOT EXCEED 100 P.S.I. (6.9 bar) MAXIMUM AIR INLET PRESSURE SUPPLIED TO THE AIR INLET.**



**Figure 3**

Pressure relief through the exhaust port is a normal compensating function of the control valve in the air tamer. It will automatically adjust itself to the required operating pressure once the material pressure has been applied.

The air pressure supplied to the air tamer needs to be slightly higher than the material pressure to provide the proper dampening effect.

1. Connect a regulated air supply (100 P.S.I. / 6.9 bar MAX.) to the air tamer inlet.

**CAUTION: AIR MUST BE SUPPLIED TO THE AIR TAMER BEFORE APPLYING FLUID PRESSURE. Failure to pressurize with air first can damage the bladder.**

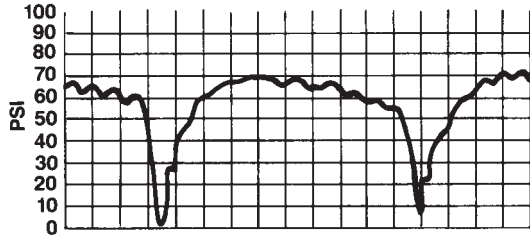
2. Reconnect the air supply to the pumping system.

**CAUTION: ALWAYS RELIEVE THE FLUID PRESSURE BEFORE REMOVING THE AIR PRESSURE. Failure to relieve fluid pressure can damage the bladder.**



# SHOCK BLOCKER PERFORMANCE

**1" PUMP WITHOUT SHOCK BLOCKER**  
(From center chart at right)



**1" PUMP WITH SHOCK BLOCKER**  
(From center chart at right)

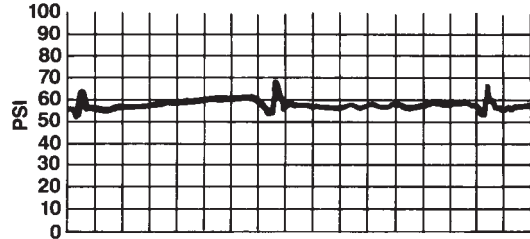


Figure 4

**1/2" PUMP**

**% REDUCTION IN PULSATION**

Fluid Pressure PSI Back Pressure	1	2	3	4	5	10	12
20	94			81		70	65
40	92			83		70	
60	91			85			

**1" PUMP**

**% REDUCTION IN PULSATION**

Fluid Pressure PSI Back Pressure	1	5	10	15	20	25	30
20	90	80	70				60
40	90		75				70
60	85		80	*			75
80	85						80

**1-1/2" & 2" PUMP**

**% REDUCTION IN PULSATION**

Fluid Pressure PSI Back Pressure	1	10	20	30	40	50	60	70	80
20	80			70					60
40	90			70					65
60	70								65
80	70								70

## TYPICAL SYSTEM VIEW

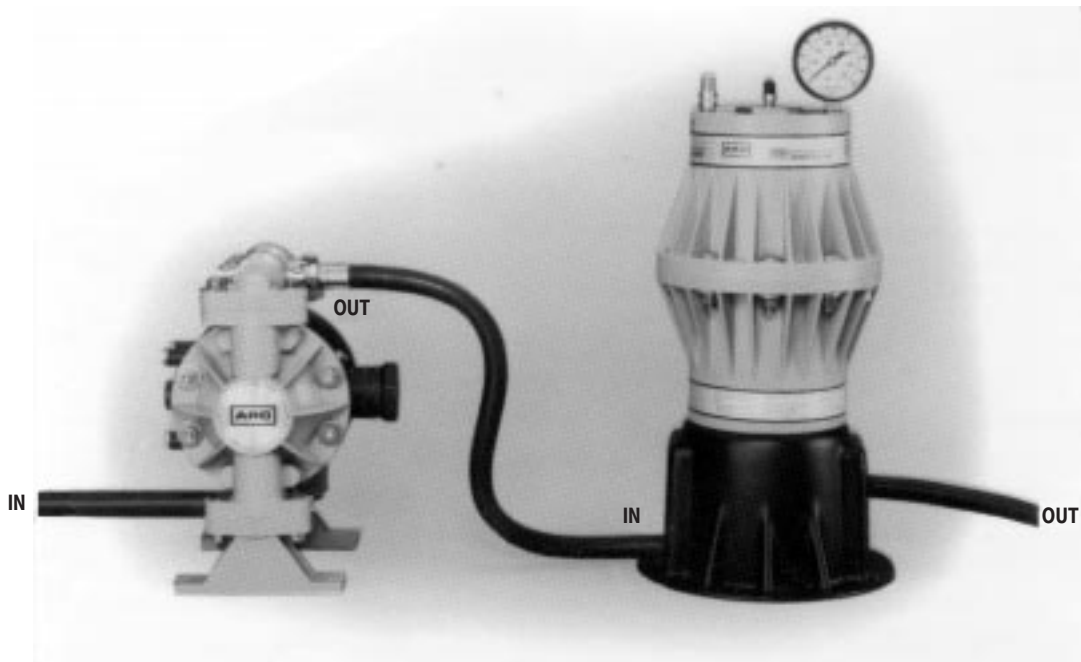
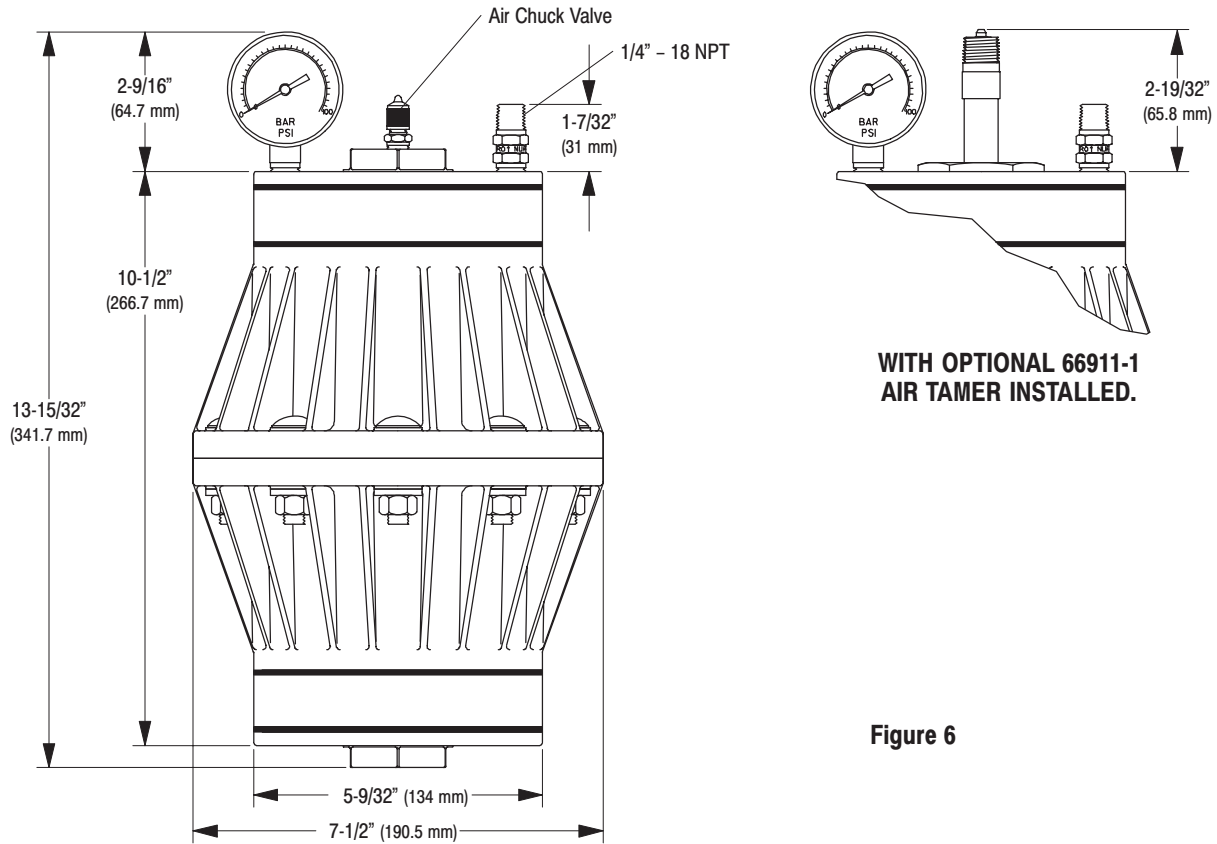


Figure 5

## DIMENSIONAL DATA

All dimensions are given in inches and (millimeters).

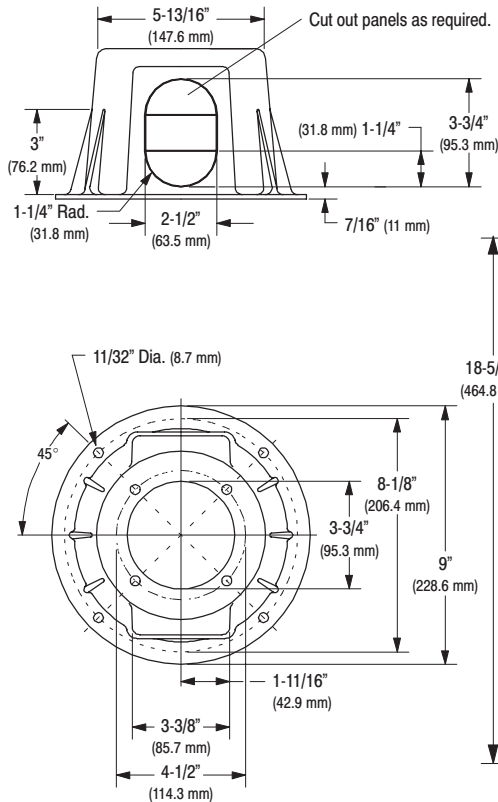


**WITH OPTIONAL 66911-1  
AIR TAMER INSTALLED.**

Figure 6

## PEDESTAL DIMENSIONAL DATA

### 93744-1 Mounting Stand



### OPTIONAL 66108 PEDESTAL KIT

- "A" A single pedestal is included along with four (6) screws with each unit.
- "B" Optional 66108 accessory pedestal kit is available separately for use with larger hoses and fittings to gain added height. The kit includes hardware.

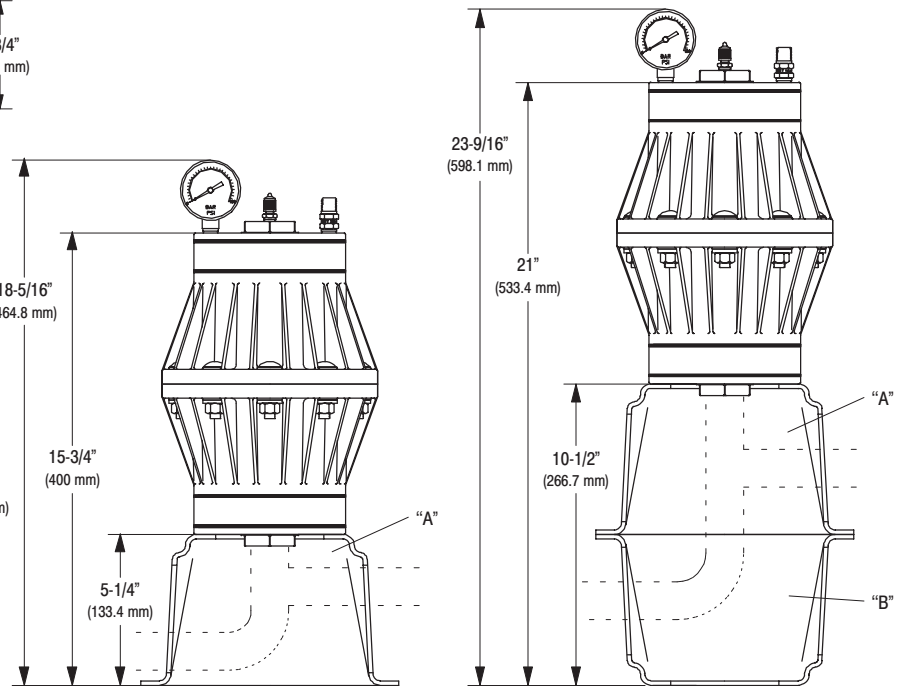


Figure 7

PN 97999-484