

Low-Pressure Stub Pump

Description

The major components of stub pump model 9918-A consist of an air-operated motor and a pump tube. The air motor connects directly to the double-acting reciprocating pump tube.

This low-pressure stub pump (3:1 ratio) is designed to deliver all grades of oil.

Mounting

This pump mounts directly onto original containers or bulk tanks that have a 2 " NPTF bung fitting. The required length downtube screws directly into the 1-1/2 " NPTF female threads in the foot valve body.

As an alternative, the pump mounts to a wall (with the use of a wall bracket) and be used with an optional suction hose. See **Table 2** for details.

The pump also screws directly onto two different size threaded standpipes [1-1/2 " NPTF (m) or 2 " NPTF (f)].

Specifications

Air Motor

Piston Diameter x Stroke		Air Inlet	Maximum Air Pressure	
Inches	Centimeters		psi	Bars
3 x 3-5/16	7.6 x 8.4	1/4 " NPTF (f)	150	10.3
For details on the air motor, refer to Service Guide SER 339413				

Pump Tube

Material Inlet	Material Outlet	Max. Material Pressure		Delivery/Minute (Approximate)*		Displacement per Cycle	
		psi	Bars	Gallons	Liters	In ³	Cm ³
See Figure 1	1/2 " NPTF	450	31	9	34	10.5	172
* For detailed information, refer to Figure 3							

Table 1 Low-Pressure Stub Pump Specifications

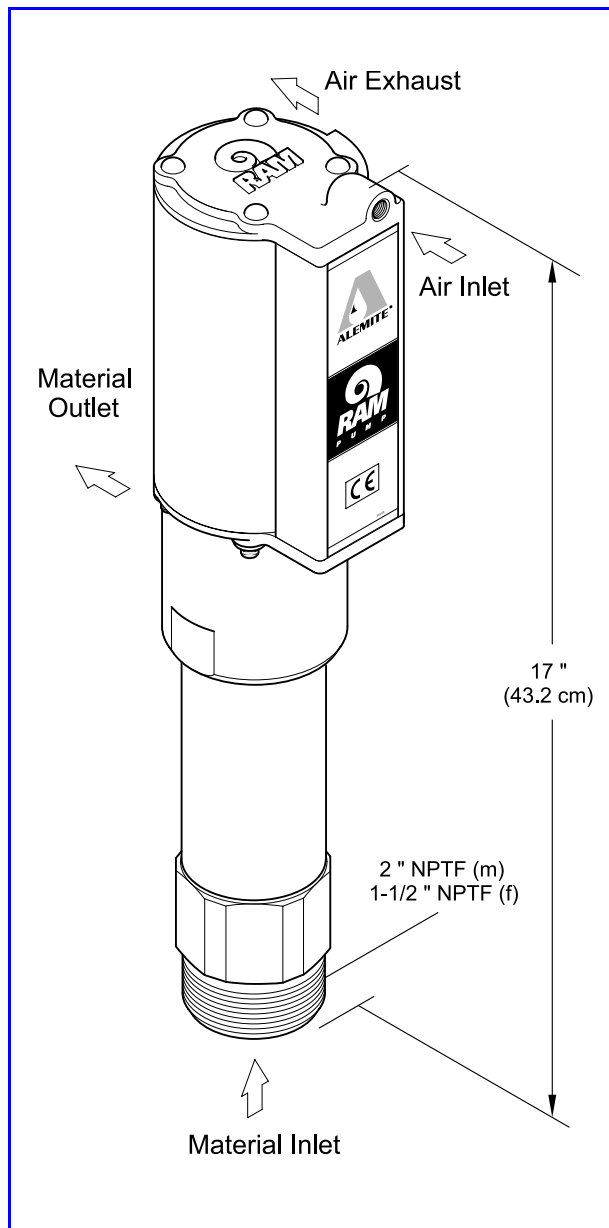


Figure 1 Low-Pressure Stub Pump Model 9918-A

COURTESY OF

MASCOTT EQUIPMENT COMPANY

Portland Seattle Tri-Cities

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SER 9918-A
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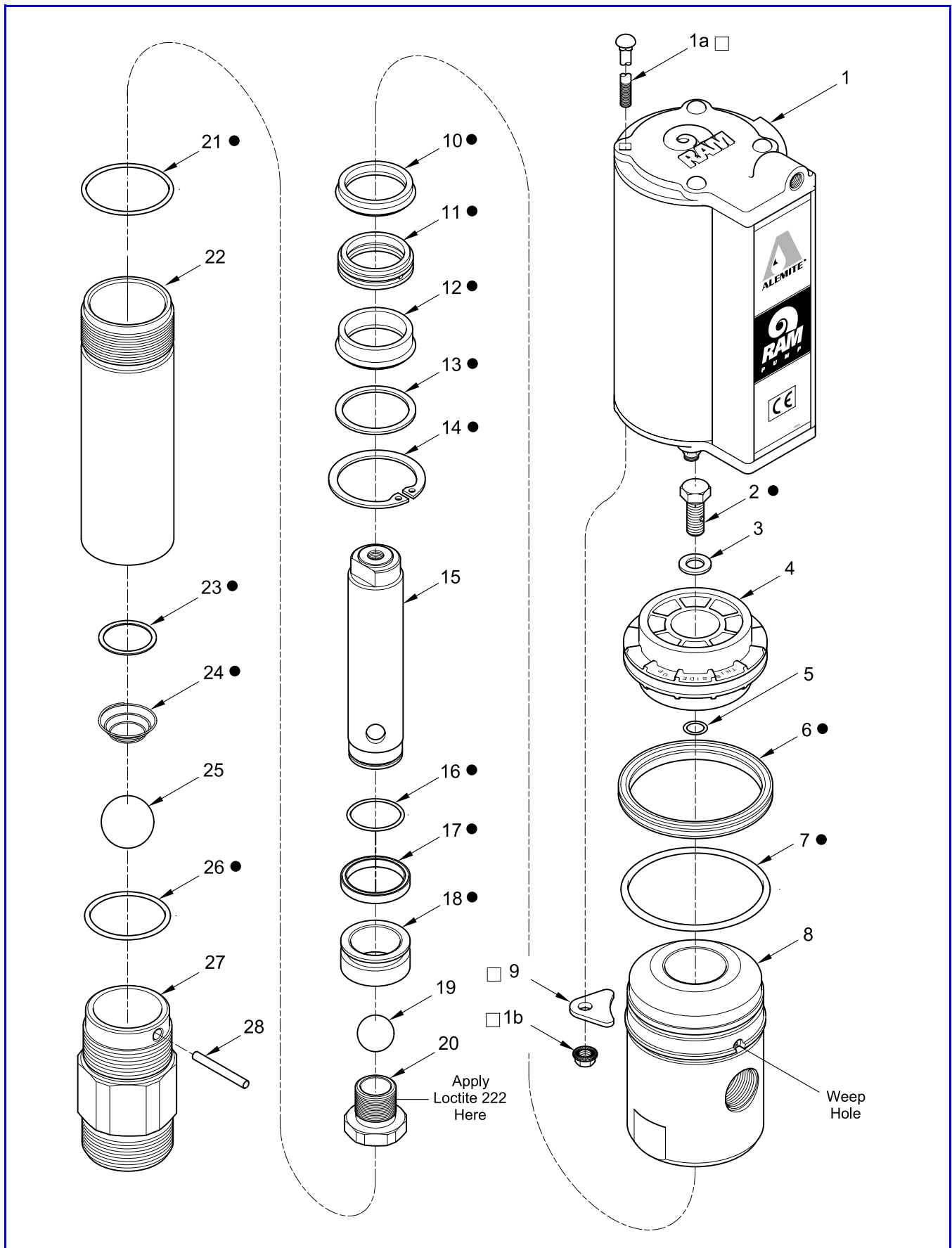


Figure 2 Low-Pressure Stub Pump Model 9918-A- Exploded View

Item No.	Part No.	Description	Qty	Notes	Numeric Order Part # (Item #)
1		Motor Assembly, Air	1	See SER 339413	14536 (3)
1a		Bolt, Carriage, 1/4 " -20 x 7-1/2 "	4	Included w/ Motor Assembly	X171000-7 (5)
1b		Nut, Serrated Flange, 1/4 " -20	4		X171003-10 (7)
2		Screw, 3/8 " -24 x 3/4 "	1		X171008-37 (6)
3		Washer, 3/8 "	1		171006-40 (14)
4	339429	Piston, Air	1		171009-16 (16)
5	X171000-7	O-Ring, 3/8 " ID x 1/2 " OD	1	Pack of Ten (10)	X171009-38 (26)
6	X171008-37	O-Ring, 2-5/8 " ID x 3 " OD	1		X171009-40 (21)
7	X171003-10	O-Ring, 2-3/4 " ID x 3 " OD	1		171700-56 (19)
8	338887	Body	1		171700-80 (25)
9	339412	Keeper	4		172190-37 (10)
10		Seal, 1-5/8 " ID x 1-7/8 " OD	1		172190-38 (12)
11		Bearing (Brass)	1		172409 (2)
12		Seal, 1-5/8 " ID x 2 " OD	1		332448 (24)
13		Washer	1		338278-3 (28)
14		Ring, Retaining	1		338887 (8)
15	338897	Rod and Plug Assembly	1		338888 (11)
16		O-Ring, 1-3/8 " ID x 1-1/2 " OD	1		338889 (13)
17		Packing, Block-V	1		338891 (18)
18		Piston (Brass)	1		338893 (27)
19	171700-56	Ball, 7/8 " Dia,	1		338894 (20)
20	338894	Seat, Valve	1		338895 (22)
21	X171009-40	O-Ring, 2-1/4 " ID x 2-7/16 " OD	1	Pack of Ten (10)	338897 (15)
22	338895	Tube	1		338898 (17)
23		Washer	1		338899 (23)
24		Spring, Tapered	1		339375 (1b)
25	171700-80	Ball, 1-1/4 " Dia.	1		339412 (10)
26	X171009-38	O-Ring, 2-1/8 " ID x 2-5/16 " OD	1	Pack of Ten (10)	339413 (1)
27	338893	Body, Foot Valve	1		339425 (1a)
28	338278-3	Pin, 1/4 " Dia. x 2-1/16 " Long	1		339429 (4)

Legend:

Part numbers left blank (or in *italics*) are not available separately

● □ designates a repair kit item

Repair Kits

Part No.	Kit Symbol	Description
393710	●	Kit, Major Repair [Includes tube of 393590 Teflon Grease]
393708	□	Kit, Repair, Air Motor Keeper
393530-37		Kit, Seal [includes five (5) of item number 10]
393530-38		Kit, Seal [includes five (5) of item number 12]

Accessories

Extension Description	Drum			Tank	
	16-Gallon	55-Gallon	200/205 liter	250-Gallon Bench-Top	275-Gallon Obround
V-Cut	338147-3	338147-4		338147-8	338147-9
Threaded at both ends *	338246-3	338246-4		338246-8	338246-5
* NOTE: For use with low level cut-off valve part number 321206					
Additional Accessories					
Low Level Cut-Off Valve	321206				
Siphon Kit	SWA 306				
Wall Bracket	325749				
Metal Discharge Hose (4-Feet)	338360				

Table 2 Model 9918-A Accessory Components

Performance Curves

A pump's ability to deliver material is based on the pressure (psi/Bars) and quantity (cfm/lpm) of air supplied to the motor and the amount of material discharge [back] pressure to be overcome within the system.

This chart contains curves based on three different air pressures. The curves relate delivery in gallons (liters) per minute (X axis) to air consumption in cubic feet (liters) per minute (right Y axis) and to material discharge pressure in psi/Bars (left Y axis).

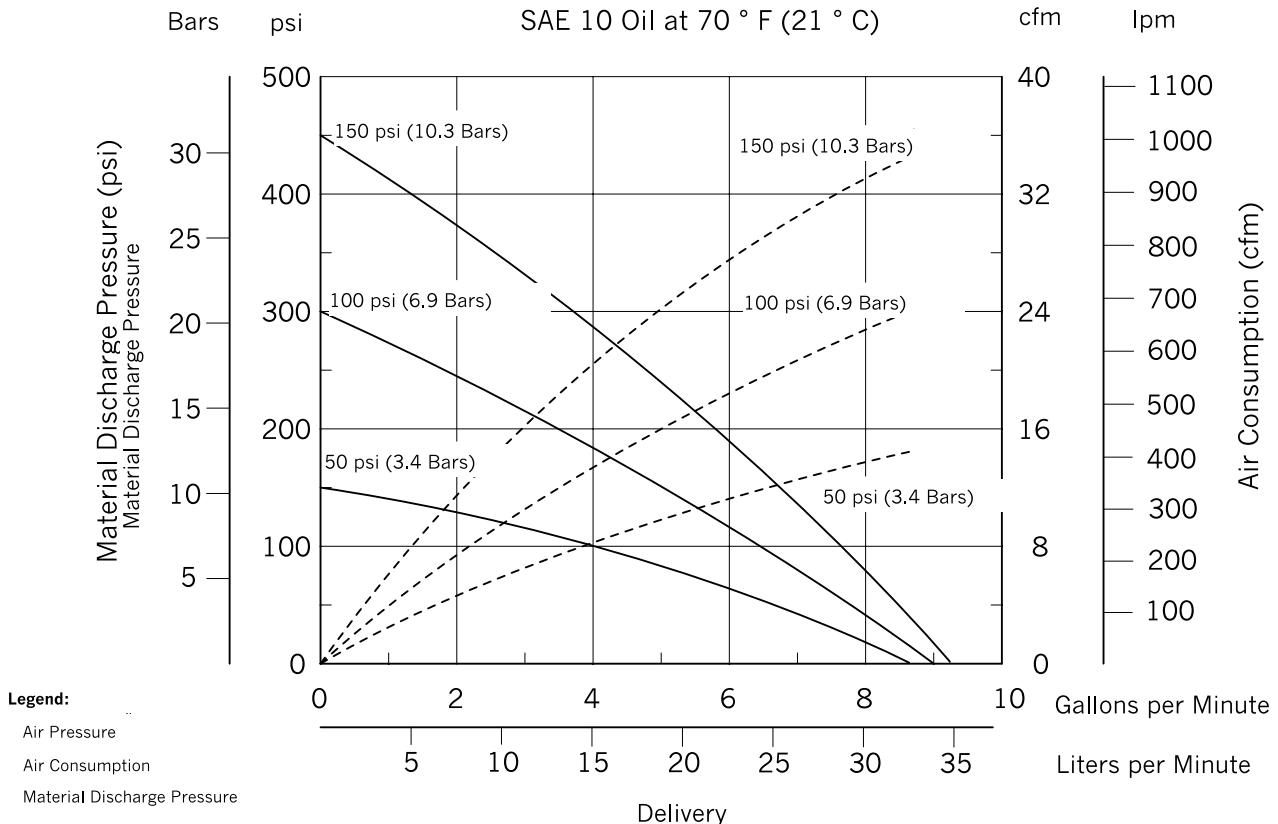
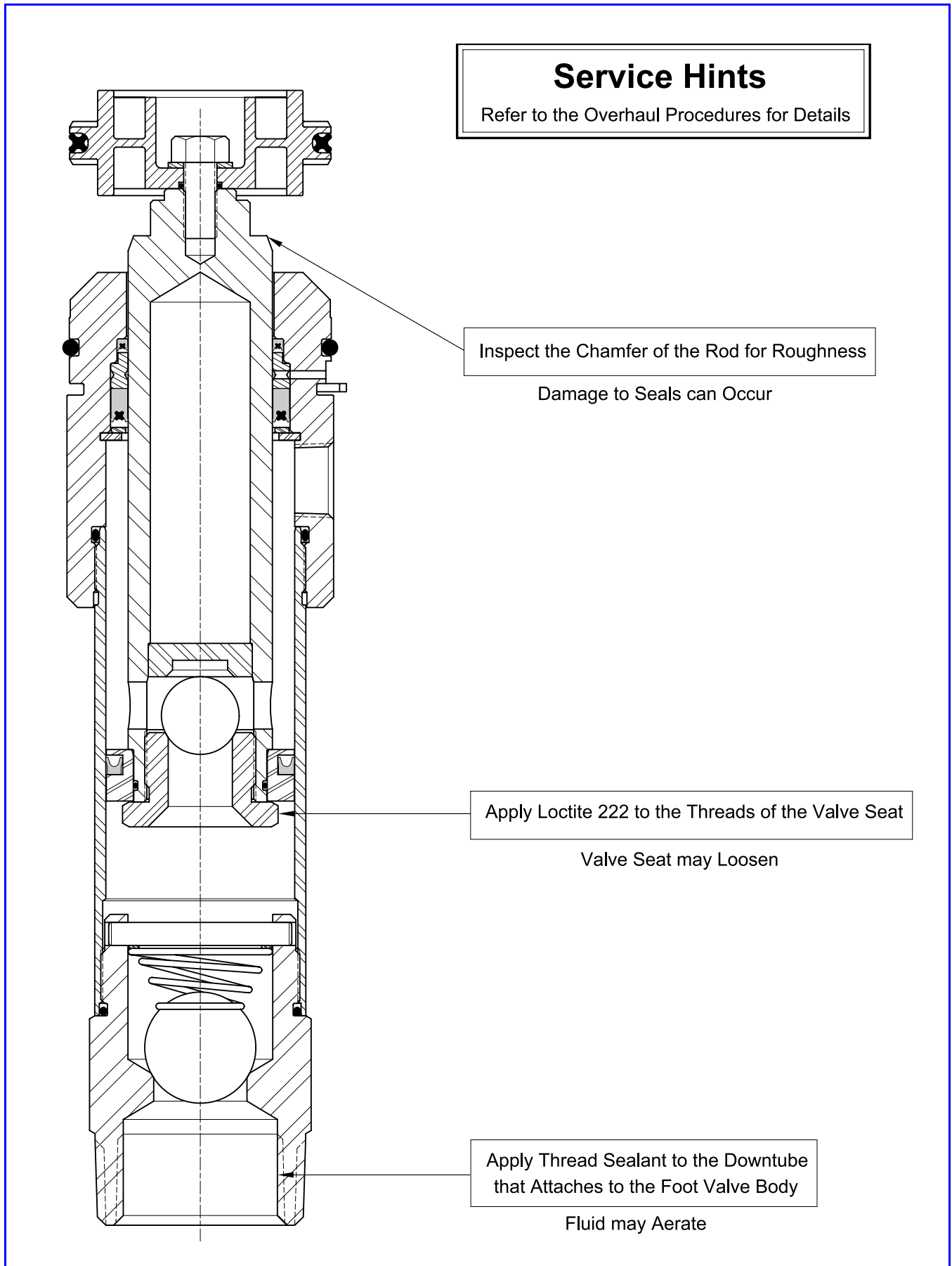


Figure 3 Delivery versus Discharge Pressure and Air Consumption



Service Hints
Refer to the Overhaul Procedures for Details

Inspect the Chamfer of the Rod for Roughness

Damage to Seals can Occur

Apply Loctite 222 to the Threads of the Valve Seat

Valve Seat may Loosen

Apply Thread Sealant to the Downtube
that Attaches to the Foot Valve Body

Fluid may Aerate

Overhaul

NOTE: Refer to **Figures 2** and **4** for component identification on all overhaul procedures.

Prior to performing any maintenance procedure, the following safety precautions must be observed. Personal injury may occur.



WARNING

Do not use halogenated hydrocarbon solvents such as methylene chloride or 1,1,1-trichloroethane in this pump. An explosion can result when aluminum and/or zinc-plated parts in the pump come in contact with halogenated hydrocarbon solvents.

Release all pressure within the system prior to performing any overhaul procedure.

- **Disconnect the air supply line from the pump motor.**
- **Into an appropriate container, operate the control valve to discharge remaining pressure within the system.**

Never point a control valve at any portion of your body or another person. Accidental discharge of pressure and/or material can result in injury. Read each step of the instructions carefully. Make sure a proper understanding is achieved before proceeding.

Disassembly

Separate Air Motor from Pump Tube

1. Clamp the pump assembly in a soft-jaw vise at Body (8).
2. Remove Nuts (1b) that secure the Body to Air Motor Assembly (1).

NOTE: The bottom end cap (339416) of the Air Motor Assembly remains on the pump tube during the next procedure.

3. With a side-to-side motion, pull the Air Motor Assembly from the Body.
4. Remove Keepers (9) from the Body.
5. Remove the bottom end cap from the Body.

Pump Tube Assembly

Tube and Foot Valve Body

6. Unscrew Tube (22) from Body (8).
7. Unscrew Foot Valve Body (27) from the Tube.
8. From the Foot Valve Body remove:
 - Pin (28)
 - Washer (22)
 - Spring (24)
 - Ball (25)
 - O-Ring (26)

Air Piston

9. Remove Screw (2) that secures Air Piston (4) to Rod and Plug Assembly (15).
 - Remove the Air Piston from the Rod and Plug Assembly .
10. Remove Washer (3), Quad-Ring (6), and O-Ring (5) from the Air Piston.

Rod

11. Pull the Rod assembly from the bottom of the Body.
12. Unscrew Valve Seat (20) from the Rod and Plug Assembly.
 - Remove Ball (19).
13. Remove Piston (18) and O-Ring (16) from the Rod and Plug Assembly.
14. Remove Block-V Packing (17) from the Piston.

Body

15. From inside the Body remove:
 - O-Ring (21)
 - Retaining Ring (14)
 - Washer (13)
 - Seal (12)
 - Bearing (11)
 - Seal (10)

Clean and Inspect

1. Clean all metal parts in cleaning solvent. The solvent should be environmentally safe.
2. Inspect all parts for wear and/or damage.
 - Replace as necessary.
3. Inspect Air Piston (4) for fatigue cracks.
 - Replace as necessary.
4. Inspect Rod (15) closely. Use a magnifying glass to detect any score marks.
 - Replace as necessary.
5. Closely inspect the mating surfaces of all check valve components for any imperfections. Ensure a smooth and clean contact is obtained when assembled.

EXAMPLE: Place Ball (25) into Foot Valve Body (27). Fill the Foot Valve Body with solvent. Make sure no leakage occurs.

Assembly

NOTE: Prior to assembly, certain components require lubrication. Refer to **Table 3** for details.

Refer to **Figure 4** for a section view of the pump tube assembly.

Foot Valve Body

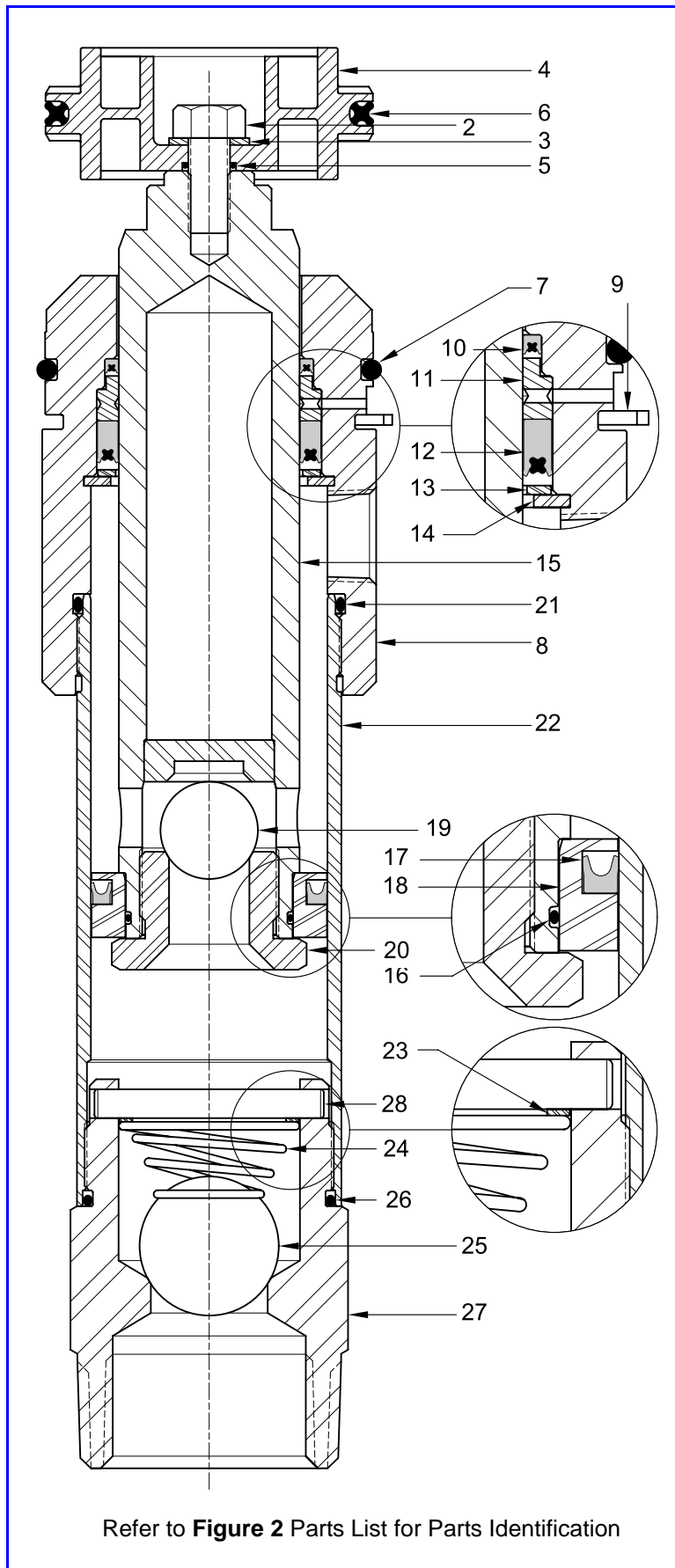
1. Install O-Ring (26) onto Foot Valve Body (27).
2. Install Ball (25), Spring (24) [small diameter first], and Washer (23) into the Foot Valve Body.
3. Install Pin (28) into the Foot Valve.
 - Make sure the Pin retains the Washer properly and is flush with the Foot Valve.

Body

4. Install O-Ring (7) onto the upper groove of Body (8).
5. Install and seat Seal (10) [heel end first] into the bottom of the Body.
6. Install and seat Bearing (11) [small diameter first] into the Body.
7. Install and seat Seal (12) [heel end first] into the Body.
8. Install and seat Washer (13) into the Body.
9. Install Retaining Ring (14) into the Body.
10. Install O-Ring (21) into the groove of Body.

Item No.	Description	Item No.	Description
Clean Oil			
5	O-Ring, 3/8 " ID x 1/2 " OD	16	O-Ring, 1-3/8 " ID x 1-1/2 " OD
6	Quad-Ring, 2-5/8 " ID x 3 " OD	17	Block-V Packing
7	O-Ring, 2-3/4 " ID x 3 " OD	21	O-Ring, 2-1/4 " ID x 2-7/16 " OD
10	Seal, 1-5/8 " ID x 1-7/8 " OD	26	O-Ring, 2-1/8 " ID x 2-5/16 " OD
12	Seal, 1-5/8 " ID x 2 " OD		
Magnalube-G Teflon Grease *			
Coat the Bore of the Air Motor Assembly			
* Part number 393590 is a 0.75 ounce (21.8 gm) tube of Magnalube-G Teflon grease			

Table 3 Lubricated Components



Refer to **Figure 2** Parts List for Parts Identification

Rod

11. Install O-Ring (16) into the groove of Rod and Plug Assembly (15).
12. Install Block-V Packing (17) [lips upward] onto the short end of Piston (18).
13. Install the Piston assembly onto the Rod and Plug Assembly.
 - Use care not to damage the O-Ring.
14. Install Ball (19) into the Rod and Plug Assembly.
15. Screw Valve Seat (20) [with Loctite 222] into the Rod and Plug Assembly.
 - Follow the thread sealant manufacturer's recommendations.

CAUTION

Install the Rod and Plug Assembly into the Body with a twisting motion. Use care not to damage the Seals.

16. Install the Rod assembly into the bottom of the Body.
 - Allow the Rod assembly to protrude approximately two-inches (5 cm) from the top of the Body.

Tube

17. Screw Tube (22) into the Body.
 - Use care passing the Block-V Packing.
 - Do not tighten the Tube at this time.
18. Screw the Foot Valve Body assembly into the Tube.
 - Tighten the Foot Valve Body assembly securely to the Tube and the Tube to the Body.

Air Piston

19. Install Quad-Ring (6) onto Air Piston (4).
20. Install and seat O-Ring (5) into the bottom of the Air Piston.
21. Place the Air Piston (observe THIS SIDE UP) on top of the Rod and Plug Assembly.
22. Install Screw (2) and Washer (3) that secures the Air Piston to the Rod and Plug Assembly.
 - Tighten the Screw to 15 ft. lbs. (20.7 Nm).

Figure 4 Pump Tube Assembly (w/o Air Motor) - Section View

Attach Air Motor to Pump Tube

IMPORTANT: The Air Motor Assembly must be secured with at least one Carriage Bolt (1a) and Flange Nut (1b) [preferably at the front].

- Clamp the Body of the pump securely in a soft-jaw vise.

CAUTION

Install the RAM Air Motor Assembly with care. Damage to Quad-Ring (8) and/or O-Ring (9) can occur.

HINT: Angle the Air Motor Assembly onto the Quad-Ring and press the exposed portion into Air Piston (4) with your thumb or finger.

- Install and seat the Air Motor Assembly onto Body (8).
 - Make sure the outlet of the Body orients properly with the inlet of the Air Motor.
- Attach the Air Motor Assembly to the Body of the pump tube with Keepers (9), Carriage Bolts, and Flange Nuts.

CAUTION

Do not overtighten Flange Nuts (1b). Component damage can occur.

- Torque the Flange Nuts in a crisscross pattern from 60 to 70 inch-pounds (6.8 - 7.9 Nm).

Bench Test and Operation

- Slowly supply air pressure [recommended minimum of 25 psi (1.7 Bars)] to the pump's motor.
 - The pump assembly should cycle.

If the pump assembly does not cycle, refer to the **Troubleshooting Chart** for details.

With air pressure at zero:

- Connect a product hose to the pump's material outlet.
 - Direct the hose into an appropriate collection container.

- Place the pump in oil.
- Slowly supply air pressure to the pump's motor.
- Allow the pump to cycle slowly until the oil is free of air.

If the pump assembly does not prime, refer to the **Troubleshooting Chart** for details.

WARNING



Should leakage occur anywhere within the system, disconnect air to the motor. Personal injury can occur.

With air pressure at zero:

- Attach a control valve to the outlet hose of the pump.
 - Make sure the nozzle on the control valve is open.
- Slowly supply air pressure to the pump's motor.
- Allow the pump to cycle slowly until the oil is once again free of air.
- Set the air pressure to the normal operating pressure.
- Operate the control valve into a container.
- Shut off the control valve.
 - Visually inspect the pump for external leaks.
 - The pump should not cycle more than once or twice in one hour.

If the pump does not stall, refer to the **Troubleshooting Chart** for details.

- Check the motor for air leakage.

If the motor leaks, refer to the **Air Motor Service Guide** for details.

Installation

Additional items that should be incorporated into the air piping systems are listed in **Table 4**.

Part Number	Description
5604-2	Moisture Separator
7604-B	Regulator and Gauge

Table 4 Air Line Components

Troubleshooting Chart

Pump Indications	Possible Problems	Solution
Pump does not cycle	<ol style="list-style-type: none"> 1. Air motor not operating properly 2. Pump tube jammed and/or contains loose components 3. Insufficient air pressure 	<ol style="list-style-type: none"> 1. Inspect air motor and rebuild or replace as necessary 2. Rebuild pump tube 3. Increase air pressure
Pump will not prime	<ol style="list-style-type: none"> 1. Excessive cycling speed 2. Pump leaking internally 3. Downtube not sufficiently tight and/or thread sealant missing or inadequate 	<ol style="list-style-type: none"> 1. Reduce air pressure 2. See Internal Leaks 3. Apply thread sealant* to male pipe threads and tighten extension
Pump cycles rapidly	<ol style="list-style-type: none"> 1. Product source empty 2. Extension not sufficiently tight and/or thread sealant missing or inadequate 	<ol style="list-style-type: none"> 1. Replenish product 2. Apply thread sealant* to male pipe threads and tighten extension
Pump will not stall (cycles more than once or twice/hour)	<ol style="list-style-type: none"> 1. Pump requires break-in period 2. Pump leaking internally 3. Pump leaking externally 4. Distribution system leaking 5. Extension not sufficiently tight and/or thread sealant missing or inadequate 	<ol style="list-style-type: none"> 1. Operate the pump against moderate fluid pressure for up to one hour 2. See Internal Leaks 3. See External Leaks 4. Correct leak 5. Apply thread sealant* to male pipe threads and tighten extension
External Leaks		
Product leakage visible at weep hole in Body (8)	<ol style="list-style-type: none"> 1. Damaged Seal (12) 2. Damaged Rod and Plug Assembly (15) 	<ol style="list-style-type: none"> 1. Replace Seal (12) 2. Inspect Rod and Plug Assembly (15) and replace as necessary
Product leakage visible at bottom of Body (8)	<ol style="list-style-type: none"> 1. Tube (22) not sufficiently tight 2. Damaged O-Ring (20) 	<ol style="list-style-type: none"> 1. Tighten Tube (22) into Body (8) 2. Separate Tube (22) from Body (8) and replace O-Ring (21)
Air leakage at weep hole in Body (8)	Damaged Seal (10)	Replace Seal (10)
Product leakage visible between Tube (22) and Foot Valve Body (27)	<ol style="list-style-type: none"> 1. Foot Valve Body (27) not sufficiently tight 2. Damaged O-Ring (26) 	<ol style="list-style-type: none"> 1. Tighten Foot Valve Body (27) into Tube (22) 2. Separate Foot Valve Body (27) from Tube (22) and replace O-Ring (26)
Internal Leaks		
Continuous slow air leak	Worn or damaged O-Ring (5)	Replace O-Ring (5)
Pump does not prime or cycles continuously, or slowly (once or twice/hour)	<ol style="list-style-type: none"> 1. Foreign material between Ball (19) and Valve Seat (20) 2. Foreign material between Ball (25) and Foot Valve Body (27) 3. Worn or damaged Ball (19) 4. Worn or damaged Valve Seat (20) 5. Worn or damaged Ball (25) 6. Worn or damaged Foot Valve Body (27) 7. Worn or damaged Block-V Packing (17) 8. Worn or damaged O-Ring (16) ** 	<p>Locate and eliminate source of foreign material</p> <p>Disassemble pump tube, clean, inspect, and replace worn or damaged components</p>
* Do not apply thread sealant to the first two (2) threads. Contamination can occur.		
** Pump may cycle once (on upstroke)		

Changes Since Last Printing

Changed Bench Test Air Pressure Setting