

## Transfer Stub Pump

### Description

The major components of transfer stub pump model 7222-B4 consist of a differential air-operated motor and a double-acting reciprocating pump tube. This low-pressure (1:1 ratio) pump screws directly onto 1-1/2 " NPTF (m) threaded standpipe and is designed to transfer fluids compatible with a fluid-wetted path of carbon steel, aluminum, Fluorelastomer, and Nylon 11.

When equipped with a 2 " PT (m) bung adapter (purchased separately) the pump can:

- mount to a wall (with the use of a wall bracket) and be used with an optional siphon wand kit. See **Table 2** for details.
- utilize extensions (not included with the pump) that screw directly into the pump's fluid inlet . Extensions allow the pump to accommodate different size drums and tanks.

With an extension, an optional low-level cut-off valve can be used. This valve:

- prevents the pumping of air should the fluid level become low
- is recommended with the use of a fluid meter

### Specifications

#### Differential Air Motor

Piston Diameter x Stroke		Effective Piston Area *		Air Inlet	Maximum Air Pressure	
In	Cm	In <sup>2</sup>	Cm <sup>2</sup>		psi	Bars
2-1/16 x 4	5.2 x 10.2	1.67	10.8	1/4 " NPTF (f)	200	13.8

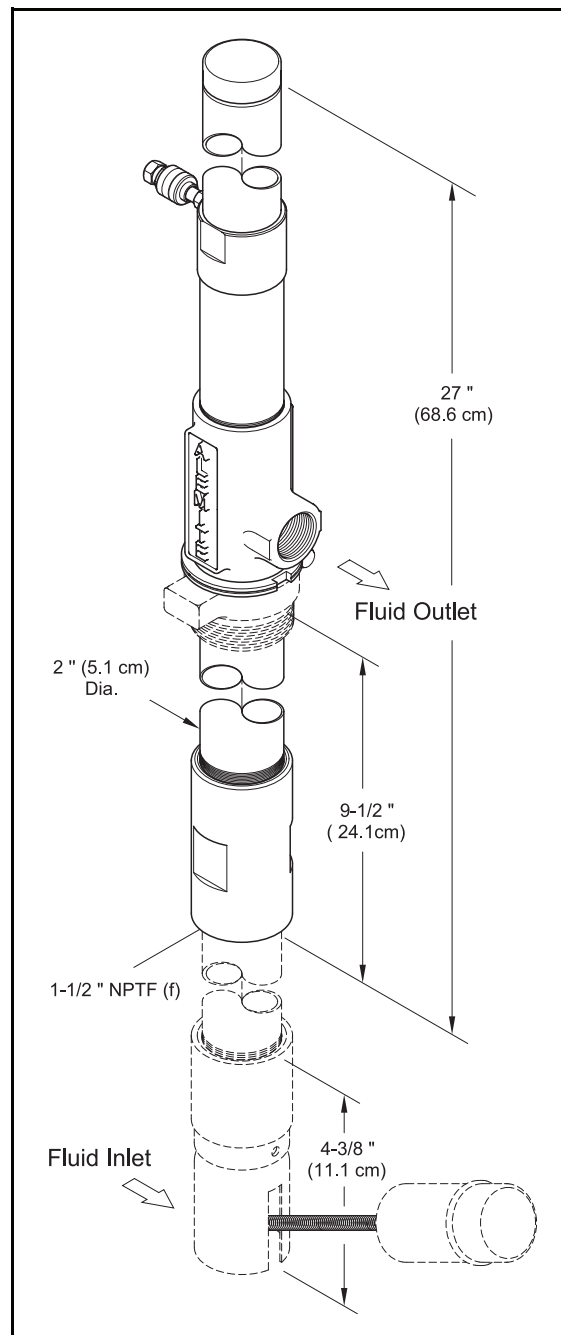
For details on the air motor, refer to Service Guide SER 318450-4.  
See **Figure 3** for performance curves.  
\* The effective piston area of a differential air motor is equal to one-half the actual area of the piston.

#### Pump Tube

Fluid Outlet	Max. Fluid Pressure		Max. Free-Flow Delivery/Minute *		Displacement per Cycle	
	psi	Bars	Gallons	Liters	In <sup>3</sup>	Cm <sup>3</sup>
1 " NPTF (f)	200	13.8	14	53	10.5	172

See **Figure 3** for performance curves.  
\* SAE 10 oil at 75 ° F (24 ° C) and 100 psi (6.9 Bars) air pressure

**Table 1** Transfer Stub Pump Model 7224-B4 Specifications



**Figure 1** Transfer Stub Pump Model 7222-B4 (w/ Optional Bung Adapter and Low-Level Cut-Off Valve)

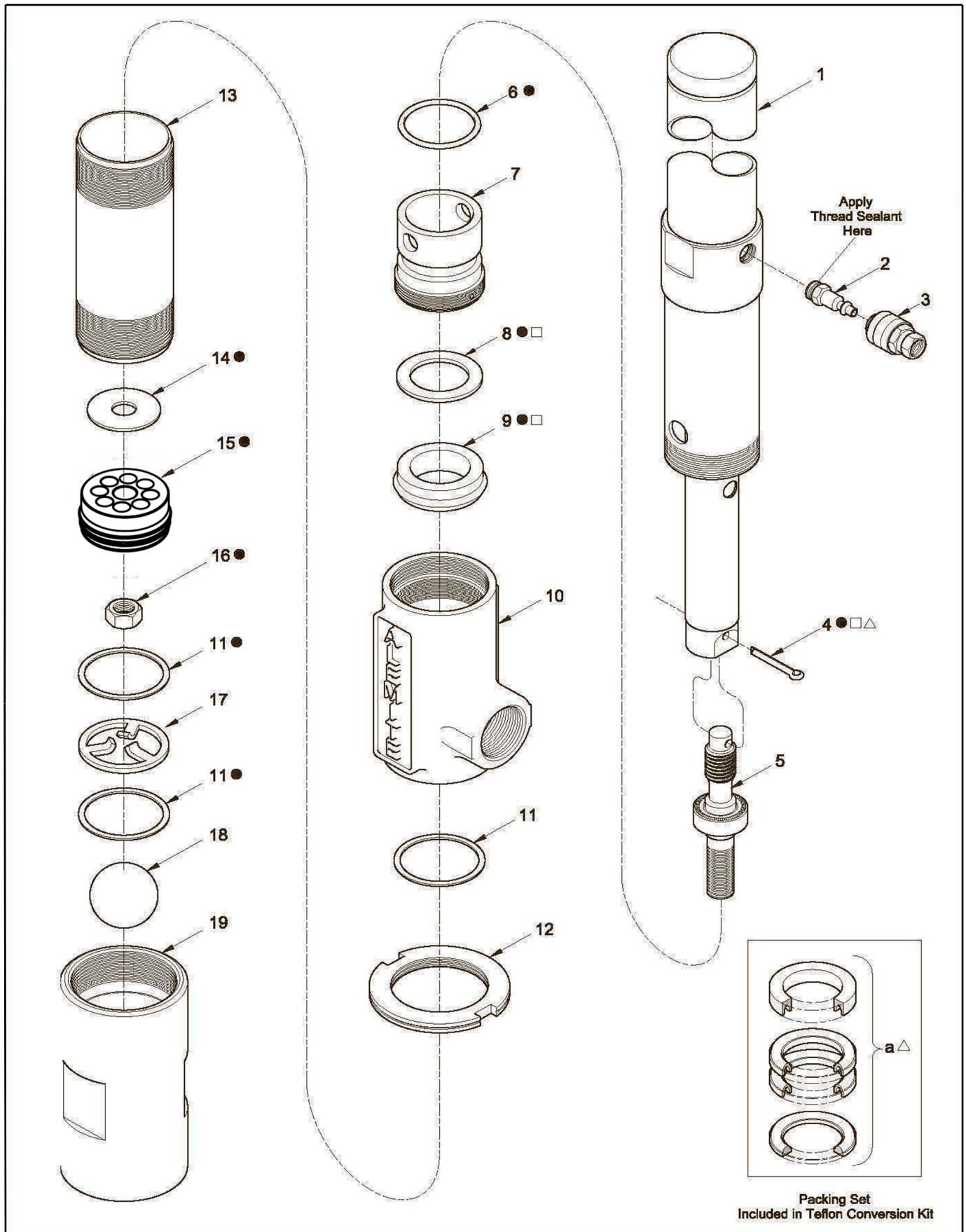


Figure 2 Transfer Pump Model 7216-4 Exploded View

Item No.	Part No.	Description	Qty	Notes	Numeric Order Part # (Item #)
1		Motor Assembly, Air	1	See SER 318450-4	(1)
2	328034	Connector, 1/4 " NPTF (m)	1		51917 (14)
3	328030	Coupler, Air, 1/4 " NPTF (f)	1		51929 (16)
4		Pin, Cotter, 1/8 " Dia. x 1.00 " Long	1	● □ △	X171000-29 (6)
5	337692-B1	Rod and Stop Assembly, 3-1/2 " Long	1		171700-80 (18)
6	X171000-29	O-Ring, 1-5/8 " ID x 2 " OD	1	●	Pack of Ten (10) 172191-1 (9)
7	326320	Bushing	1	.....	172212-16 (4)
8		Washer, Back-Up (Brass)	1	● □	317419 (17)
9		Seal, 1-3/8" ID X 2" OD (Fluoroelastomer)	1	● □	318479-3 (10)
10	318479-3	Body	1		326320 (7)
11	319436	Gasket (Aluminum)	3	● □ △	319436 (11)
12	333348	Nut, Jam	1		321269 (19)
13	321309	Cylinder, 7-1/2 " Long	1		321309 (13)
14	51917	Washer	1	●	Qty of 2 in Kit 328030 (3)
15	337693	Plunger Assembly	1	●	328034 (2)
16	51929	Nut, Elastic Stop, 3/8 " -24	1	●	Qty of 2 in Kit 333348 (12)
17	317419	Washer, Stop	1		336503 (a)
18	171700-80	Ball, 1-1/4 " Dia.	1		337139 (8)
19	321269	Body, Foot Valve	1		337692-B1 (5)
<b>Additional Component Included in PTFE Conversion Kit</b>					337693 (15)
a	336503	Packing Set (PTFE) (4 pieces)	1	△	Replaces Items 8 & 9
<b>Legend:</b> Part numbers left blank (or in <i>italics</i> ) are not available separately ● □ △ designates a kit item					

## Repair Kits

Part No.	Kit Symbol	Description
393730	●	Kit, Major Repair
393488	□	Kit, Minor Repair (Fluoroelastomer)
393640	△	Kit, Conversion (PTFE)

## Accessories

Extension					
Description	Drum			Tank	
	16-Gallon	55-Gallon	200/205 liter	250-Gallon Bench-Top	275-Gallon Obround
V-Cut	338147-10	338147-3		338147-1	338147-4
Threaded at both ends *	338246-10	338246-3		338246-1	338246-4
* For use with low-level cut-off valve					

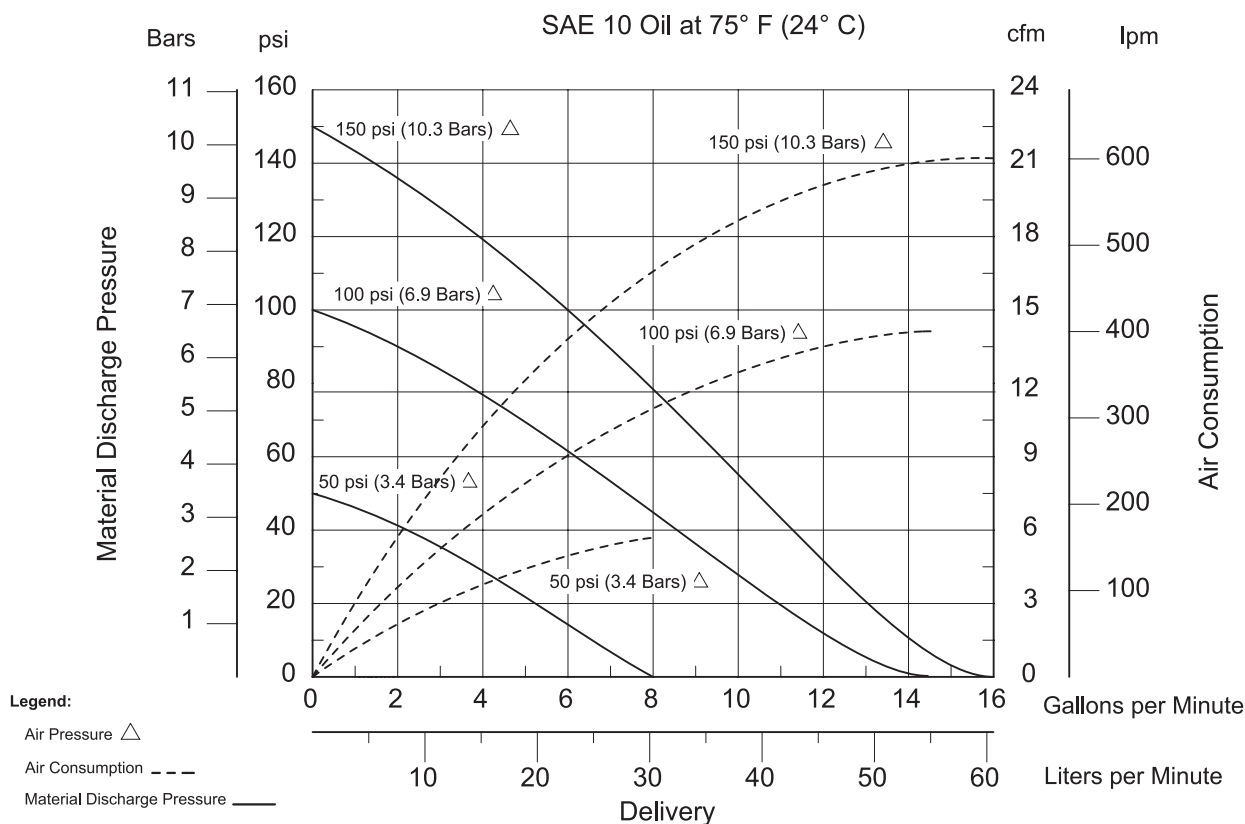
Additional Accessories			
Description	Part Number	Description	Part Number
Bung Adapter	326750-B1	Siphon Wand Kit	SWA 306
16-Gallon Drum Cover (w/ gasket)	338977	Wall Bracket	325749
55-Gallon Drum Cover	318040-4	Low-Level Cut-Off Valve	321206

**Table 2** Transfer Stub Pump Model 7222-B4 Accessories

## Performance Curves

A pump's ability to deliver fluid is based on the pressure (psi/Bars) and quantity (cfm/lpm) of air supplied to the motor and the amount of fluid 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 fluid discharge pressure in psi/Bars (left Y axis).



**Figure 3** Delivery versus Discharge Pressure and Air Consumption

# Overhaul

**NOTE:** Refer to **Figure 2** 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 fluid can result in injury.**

**Read each step of the instructions carefully. Make sure a proper understanding is achieved before proceeding.**

---

---

## Disassembly

Separate Pump Tube from Air Motor

1. Clamp Body (10) horizontally in a soft-jaw vise.
2. Loosen Jam Nut (12) that secures the pump tube assembly to the Body.

---

## CAUTION

**Support the pump tube assembly during removal. Damage to components can occur.**

---

3. Unscrew Cylinder (13) from the Body.
  - Remove the Cylinder [with attached components].
4. Pull on Rod and Stop Assembly (5) to expose the end of the air motor's piston as required.

5. Remove Cotter Pin (4) that secures the air motor's piston to the Rod and Stop Assembly.
6. Unscrew the Rod and Stop Assembly from the air motor's piston.
7. Unscrew and remove Air Motor Assembly (1) from the Body.

## Pump Tube Assembly

### Body Assembly

8. Remove Gasket (11) from the bottom of the Body.
9. Unscrew Bushing (7) from the Body.
  - Remove O-Ring (6) from the Bushing Assembly.
10. Remove Back-Up Washer (8) and Seal (9) from the Body.

### Cylinder Assembly

11. Unscrew Nut (16) that secures Plunger Assembly (15) to the Rod and Stop Assembly.
  - Remove the Plunger and Washer (14) from the Rod and Stop Assembly.
12. Unscrew Foot Valve Body (19) from the Cylinder.
13. Remove Gasket (11), Stop Washer (17), additional Gasket (11), and Ball (18) from the Foot Valve Body.
14. Remove the Jam Nut from the Cylinder as required.

## Clean and Inspect

***IMPORTANT:** If the pump is equipped with a worn old style plunger and/or ring assembly (See **Figure 5**), make sure to also purchase the current Rod and Stop Assembly (5).*

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 Plunger Assembly (15) for wear.
  - Replace as necessary.
4. Inspect bore of Cylinder (13) for 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 (18) into Foot Valve Body (19). 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.

### Pump Tube Assembly

#### Body

1. Clamp Body (**10**) in a soft-jaw vise.

*IMPORTANT: Use care not to damage Seal (9) on the threads of the Body. Angle the Seal [lips first] into the Body then gently rotate the Seal squarely in the bore.*

2. Install and seat Seal (**9**) [lips first] into the Body.
3. Install Back-Up Washer (**8**) into the Body.
4. Install O-Ring (**6**) onto Bushing (**7**).
5. Screw the Bushing Assembly into the Body loosely.
6. Screw Air Motor Assembly (**1**) into the Body.
  - Allow the hole in the Bushing Assembly to align with the hole in the Air Motor Assembly.
7. Insert a rod through the hole in the Air Motor and into the hole of the Bushing Assembly.
8. Tighten the Bushing Assembly into the Body.
  - The Bushing Assembly should bottom.
9. Screw the Air Motor Assembly into the Body.
  - Tighten the Air Motor Assembly securely
10. Install Gasket (**11**) into the Body.

#### Rod and Stop Assembly

11. Install Washer (**14**) and Plunger Assembly (**15**) onto the bottom of Rod and Stop Assembly (**5**).
  - Make sure to orient the Plunger properly.
12. Install Nut (**16**) onto the Rod and Stop Assembly.
  - Tighten the Nut to 30 inch-pounds (3.4 Nm).

13. Screw the Rod and Stop Assembly into the piston of the Air Motor Assembly.
  - Make sure the cotter pin holes align.
14. Install Cotter Pin (**4**) that secures the piston assembly to the Rod and Stop Assembly.

#### Foot Valve Body and Cylinder Assembly

15. Install Ball (**18**), Gasket (**11**), Stop Washer (**17**) [flat side first], and additional Gasket (**11**), into Foot Valve Body (**19**).
16. Screw Cylinder (**13**) into the Foot Valve Body assembly.
  - Do not tighten at this time.
17. Screw Jam Nut (**12**) onto the Cylinder as required.
18. Install the Cylinder (with attached components) onto the Plunger.
  - Use care not to damage the lip of the Plunger.

### Connect Pump Tube to Air Motor

19. Screw the Cylinder into the Body.
  - Make sure the Gasket has not moved.
20. Tighten the Foot Valve Body into the Cylinder and at the same time the Cylinder into the Body.
  - Make sure to properly crush the Gaskets.
21. Tighten the Jam Nut that secures Cylinder to the Body.

Item No.	Description
6	O-Ring, 1-5/8 " ID x 2 " OD
9	Seal, 1-3/8 " ID x 2 " OD (Fluoroelastomer)
13	bore of Cylinder

**Table 3** Components Lubricated in Clean Oil

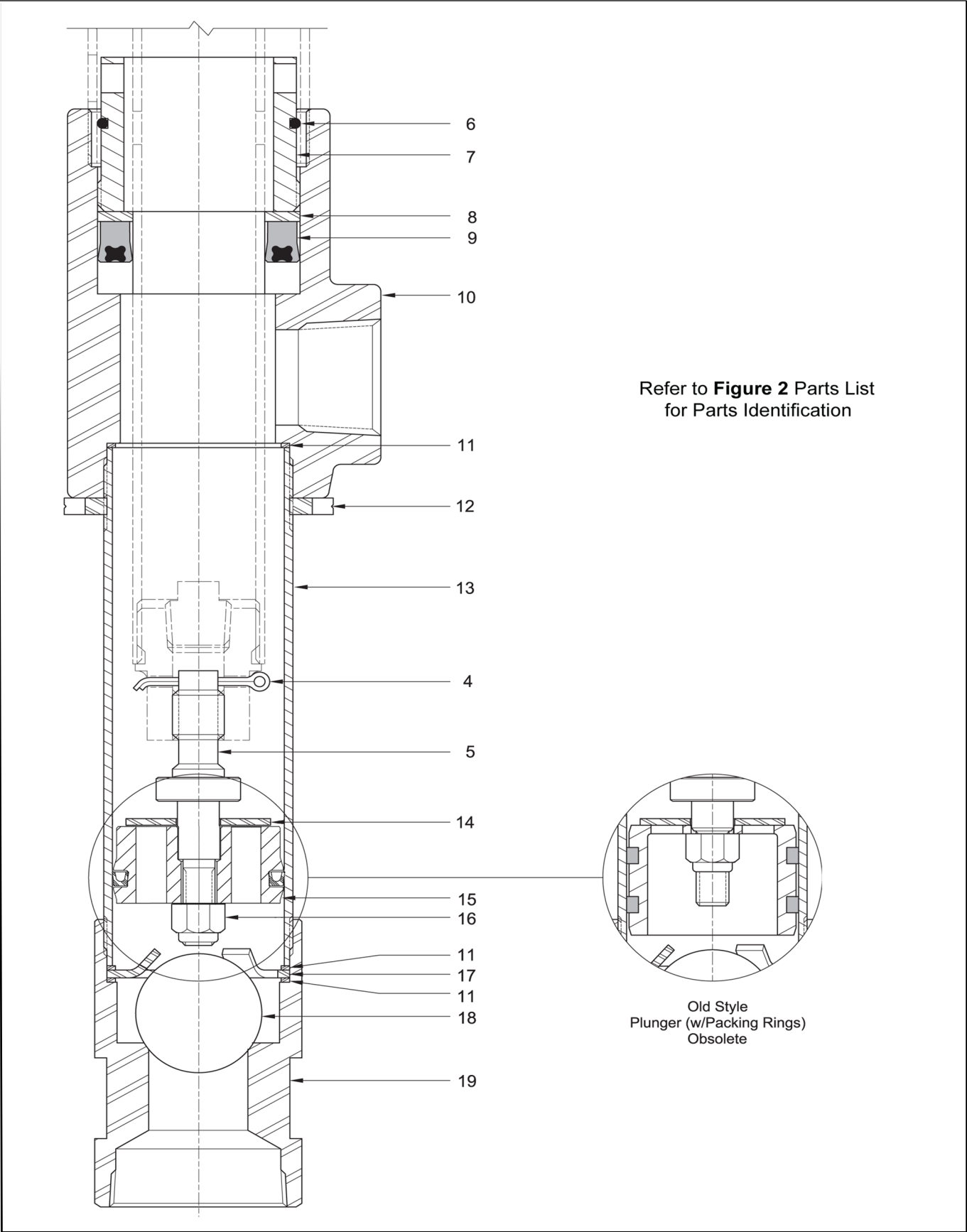



Figure 5 Pump Tube Assembly-Section View



## Bench Test and Operation

---


**WARNING**

**Do not exceed the lowest pressure rating of any component in the system.**

**Ensure all components are in operable condition. Replace any suspect parts prior to operation.**

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

---

### Establishing Starting Pressure

1. Make sure air pressure at the regulator reads zero.
2. Screw Connector (2) [with thread sealant] into the inlet of the Air Motor Assembly.
  - Tighten the Connector securely.
3. Install Air Coupler (3) onto the air supply line.
4. Connect the Air Coupler assembly to the Connector.

*IMPORTANT: The pump must begin to cycle once the air pressure reaches 30 psi (2.1 Bars).*

5. Slowly supply air pressure [not to exceed 30 psi (2.1 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.

### Initial Prime


With air pressure at zero:

6. Connect a product hose to the pump's fluid outlet.
  - Direct the hose into an appropriate collection container.
7. Place the pump in the fluid to be dispensed.
8. Slowly supply air pressure to the pump's motor.
9. Allow the pump to cycle slowly until the fluid is free of air.

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

## Leakage and Stall

---


**WARNING**

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

---

With air pressure at zero:

10. Attach a control valve to the outlet hose of the pump.
  - Make sure the nozzle on the control valve is open.
11. Slowly supply air pressure to the pump's motor.
12. Allow the pump to cycle slowly until the fluid is once again free of air.
13. Set the air pressure to the normal operating pressure.
14. Operate the control valve into a container.
15. 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.

16. 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	1. Air motor not operating properly 2. Pump tube jammed and/or contains loose components 3. Insufficient air pressure	1. Inspect air motor and rebuild or replace as necessary 2. Rebuild pump tube 3. Increase air pressure
Pump will not prime	1. Excessive cycling speed 2. Pump leaking internally	1. Reduce air pressure 2. See <b>Internal Leaks</b>
Pump cycles rapidly	Product source empty	Replenish product
Pump will not stall (cycles more than once or twice/hour)	1. Pump requires break-in period 2. Pump leaking internally 3. Pump leaking externally 4. Distribution system leaking	1. Operate the pump against moderate fluid pressure for up to one hour 2. See <b>Internal Leaks</b> 3. See <b>External Leaks</b> 4. Correct leak
<b>External Leaks</b>		
Product leakage visible at bottom of Body (10)	1. Damaged Gasket (11) 2. Cylinder (13) not sufficiently tight	1. Replace Gasket (11) 2. Tighten Cylinder (13) into Body (10)
Product leakage at exhaust port in Air Motor Assembly (1)	1. Worn or damaged Seal (9) 2. Worn or damaged air motor piston rod	1. Use Minor Repair Kit <b>393488</b> 2. Replace air motor piston rod
Product leakage between Cylinder (13) and Foot Valve Body (19)	1. Worn or damaged Gaskets (11) 2. Foot Valve Body (19) not sufficiently tight	1. Replace Gaskets (11) 2. Tighten Foot Valve Body (19) into Cylinder (13)
<b>Internal Leaks</b>		
Pump does not prime or cycles continuously, or slowly (once or twice/hour)	1. Foreign material between Ball (18) and Foot Valve Body (19) 2. Foreign material between Washer (14) and Plunger Assembly (15) 3. Worn or damaged Ball (18) 4. Worn or damaged Foot Valve Body (19) 5. Worn or damaged Washer (14) 6. Worn or damaged Plunger Assembly (15)	Locate and eliminate source of foreign material  Disassemble pump tube, clean, inspect, and replace worn or damaged components

### Changes Since Last Printing

Changed Plunger to Plunger Assembly

