

# T2

311882Y

## 2:1 Ratio Transfer Pump

EN

*For use with polyurethane foam, polyurea, and similar non-flammable materials. For professional use only.*

**Not approved for use in European explosive atmosphere locations.**

### Model 295616 (55-gallon drum)

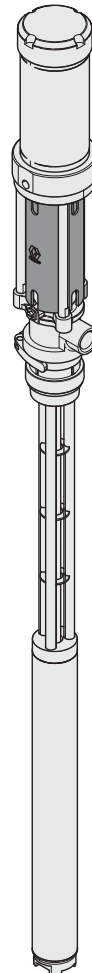
180 psi (1.2 MPa, 12 bar) Maximum Air Working Pressure

405 psi (2.7 MPa, 27 bar) Maximum Fluid Working Pressure



#### Important Safety Instructions

Read all warnings and instructions in this manual before using the equipment. Save these instructions.







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# Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbol refers to procedure-specific risk. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

 <h2 style="margin: 0;">WARNING</h2>	
	<p><b>TOXIC FLUID OR FUMES HAZARD</b></p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled or swallowed.</p> <ul style="list-style-type: none"> <li>• Read Safety Data Sheets (SDSs) for handling instructions and to know the specific hazards of the fluids you are using, including the effects of long-term exposure.</li> <li>• When spraying, servicing equipment, or when in the work area, always keep work area well-ventilated and always wear appropriate personal protective equipment. See <b>Personal Protective Equipment</b> warnings in this manual.</li> <li>• Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.</li> </ul>
	<p><b>PERSONAL PROTECTIVE EQUIPMENT</b></p> <p>Always wear appropriate personal protective equipment and cover all skin when spraying, servicing equipment, or when in the work area. Protective equipment helps prevent serious injury, including long-term exposure; inhalation of toxic fumes, mists or vapors; allergic reaction; burns; eye injury and hearing loss. This protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> <li>• A properly fitting respirator, which may include a supplied-air respirator, chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority.</li> <li>• Protective eyewear and hearing protection.</li> </ul>
	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> <li>• Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li> <li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Specifications</b> in all equipment manuals.</li> <li>• Use fluids and solvents that are compatible with equipment wetted parts. See <b>Technical Specifications</b> in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.</li> <li>• Do not alter or modify equipment.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>• Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>• Keep children and animals away from work area.</li> <li>• Comply with all applicable safety regulations.</li> </ul>

 <h1 style="margin: 0;">WARNING</h1>	
  	<p><b>PRESSURIZED EQUIPMENT HAZARD</b></p> <p>Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</p> <ul style="list-style-type: none"> <li>• Follow <b>Pressure Relief Procedure</b> in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.</li> <li>• Tighten all fluid connections before operating the equipment.</li> <li>• Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.</li> </ul>
	<p><b>BURN HAZARD</b></p> <p>Equipment surfaces and fluid that is heated can become very hot during operation. To avoid severe burns:</p> <ul style="list-style-type: none"> <li>• Do not touch hot fluid or equipment.</li> </ul>
 	<p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts can pinch or amputate fingers and other body parts.</p> <ul style="list-style-type: none"> <li>• Keep clear of moving parts.</li> <li>• Do not operate equipment with protective guards or covers removed.</li> <li>• Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the <b>Pressure Relief Procedure</b> in this manual. Disconnect power or air supply</li> </ul>

# Important Isocyanate (ISO) Information

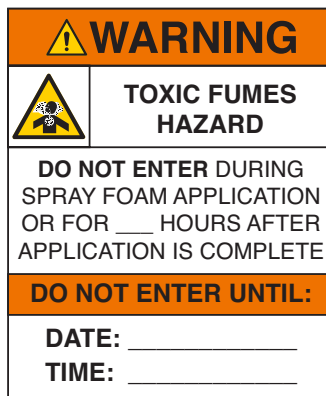
Isocyanates (ISO) are catalysts used in two component materials.

## Isocyanate Conditions





Spraying or dispensing fluids that contain isocyanates creates potentially harmful mists, vapors, and atomized particulates.




- Read and understand the fluid manufacturer’s warnings and Safety Data Sheets (SDSs) to know specific hazards and precautions related to isocyanates.
- Use of isocyanates involves potentially hazardous procedures. Do not spray with this equipment unless you are trained, qualified, and have read and understood the information in this manual and in the fluid manufacturer’s application instructions and SDSs.
- Use of incorrectly maintained or mis-adjusted equipment may result in improperly cured material, which could cause off gassing and offensive odors. Equipment must be carefully maintained and adjusted according to instructions in the manual.
- To prevent inhalation of isocyanate mists, vapors and atomized particulates, everyone in the work area must wear appropriate respiratory protection. Always wear a properly fitting respirator, which may include a supplied-air respirator. Ventilate the work area according to instructions in the fluid manufacturer’s SDSs.
- Avoid all skin contact with isocyanates. Everyone in the work area must wear chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority. Follow all fluid manufacturer recommendations, including those regarding handling of contaminated clothing. After spraying, wash hands and face before eating or drinking.
- Hazard from exposure to isocyanates continues after spraying. Anyone without appropriate personal protective equipment must stay out of the work area during application and after application for the time period specified by the fluid manufacturer. Generally this time period is at least 24 hours.
- Warn others who may enter work area of hazard from exposure to isocyanates. Follow the recommendations of the fluid manufacturer and local regulatory authority. Posting a placard such as the following outside the work area is recommended:



## Material Self-Ignition

				
Some materials may become self-igniting if applied too thick. Read material manufacturer's warnings and Safety Data Sheets (SDSs).				

## Keep Components A and B Separate

				
Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:				
<ul style="list-style-type: none"><li>• <b>Never</b> interchange component A and component B wetted parts.</li><li>• Never use solvent on one side if it has been contaminated from the other side.</li></ul>				

## Moisture Sensitivity of Isocyanates

Exposure to moisture (such as humidity) will cause ISO to partially cure, forming small, hard, abrasive crystal that become suspended in the fluid. Eventually a film will form on the surface and the ISO will begin to gel, increasing in viscosity.

<b>NOTICE</b>				
Partially cured ISO will reduce performance and the life of all wetted parts.				
<ul style="list-style-type: none"><li>• Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. <b>Never</b> store ISO in an open container.</li><li>• Keep the ISO pump wet cup or reservoir (if installed) filled with appropriate lubricant. The lubricant creates a barrier between the ISO and the atmosphere.</li><li>• Use only moisture-proof hoses compatible with ISO.</li><li>• Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.</li><li>• Always lubricate threaded parts with an appropriate lubricant when reassembling.</li></ul>				

**NOTE:** The amount of film formation and rate of crystallization varies depending on the blend of ISO, the humidity, and the temperature.

## Foam Resins with 245 fa Blowing Agents

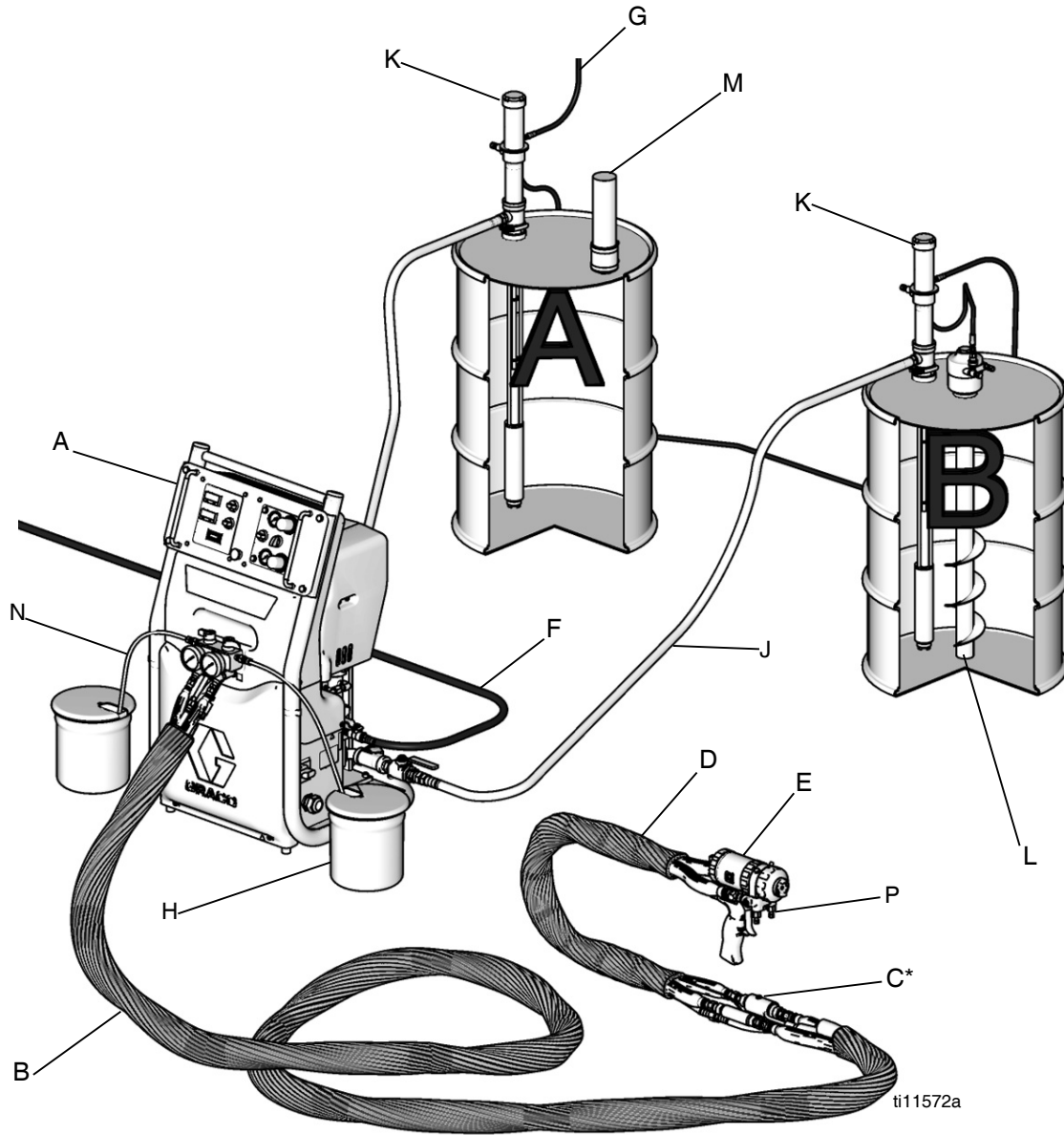
Some foam blowing agents will froth at temperatures above 90°F (33°C) when not under pressure, especially if agitated. To reduce frothing, minimize preheating in a circulation system.

## Changing Materials

<b>NOTICE</b>				
Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime.				
<ul style="list-style-type: none"><li>• When changing materials, flush the equipment multiple times to ensure it is thoroughly clean.</li><li>• Always clean the fluid inlet strainers after flushing.</li><li>• Check with your material manufacturer for chemical compatibility.</li><li>• When changing between epoxies and urethanes or polyureas, disassemble and clean all fluid components and change hoses. Epoxies often have amines on the B (hardener) side. Polyureas often have amines on the B (resin) side.</li></ul>				

# Typical Installation

## Typical Installation, without Circulation



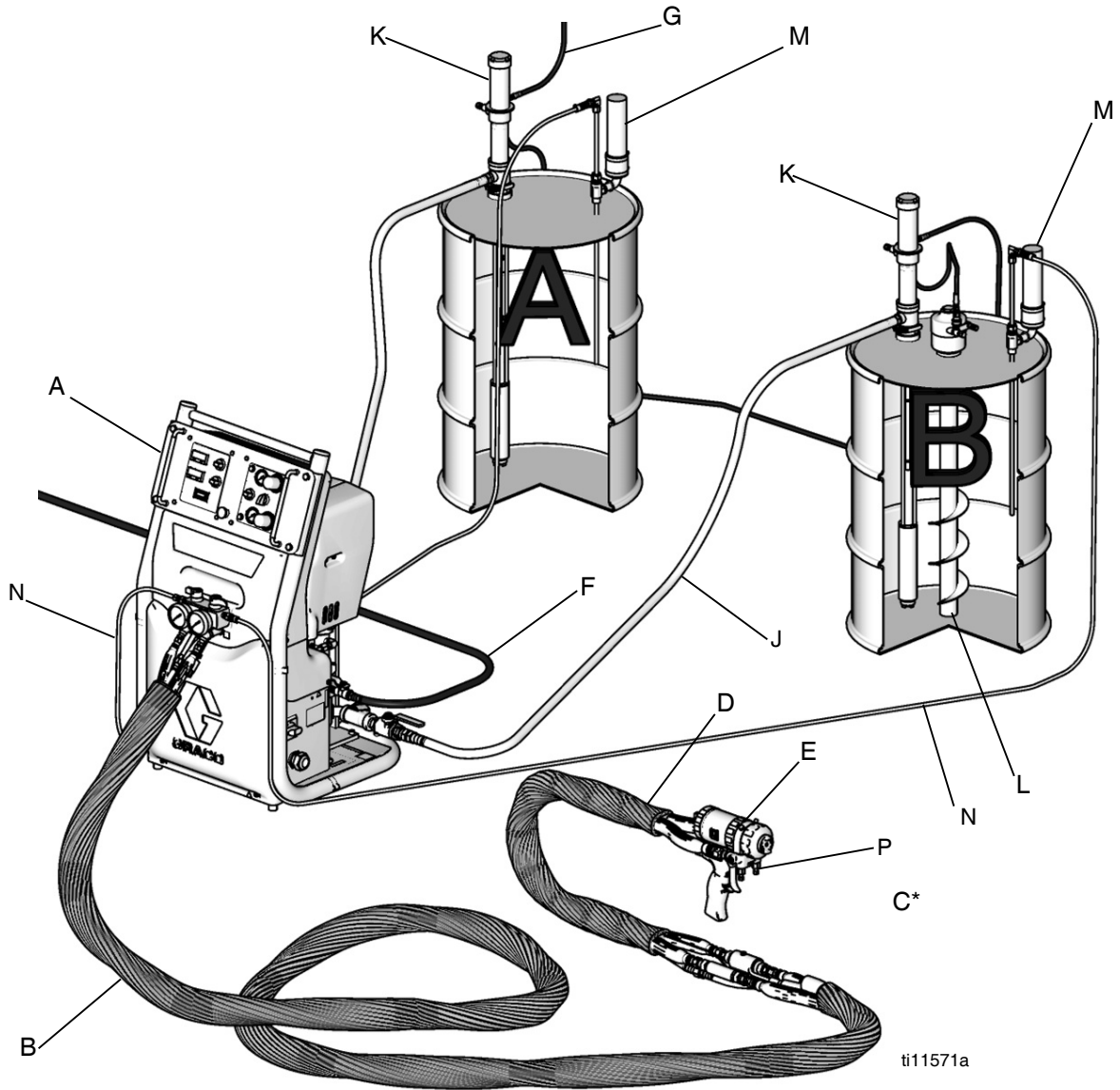
\* Shown exposed for clarity. Wrap with tape during operation.

**FIG. 1: Typical Installation, without Circulation**

**Key:**

- |   |  |   |                                  |
|---|--|---|----------------------------------|
| A | Reactor Proportioner                                 | H | Waste Containers                 |
| B | Heated Hose  | J | Fluid Supply Lines (217382)      |
| C | Fluid Temperature Sensor (FTS)                       | K | Feed Pumps                       |
| D | Heated Whip Hose                                     | L | Agitator                         |
| E | Fusion Spray Gun                                     | M | Desiccant Dryer                  |
| F | Proportioner and Gun Air Supply Hose                 | N | Bleed Lines/Over Pressure Relief |
| G | Feed Pump Air Supply Lines (3/8 in. (76 mm) ID min.) | P | Gun Fluid Manifold               |

## Typical Installation, with Circulation



\* Shown exposed for clarity. Wrap with tape during operation.

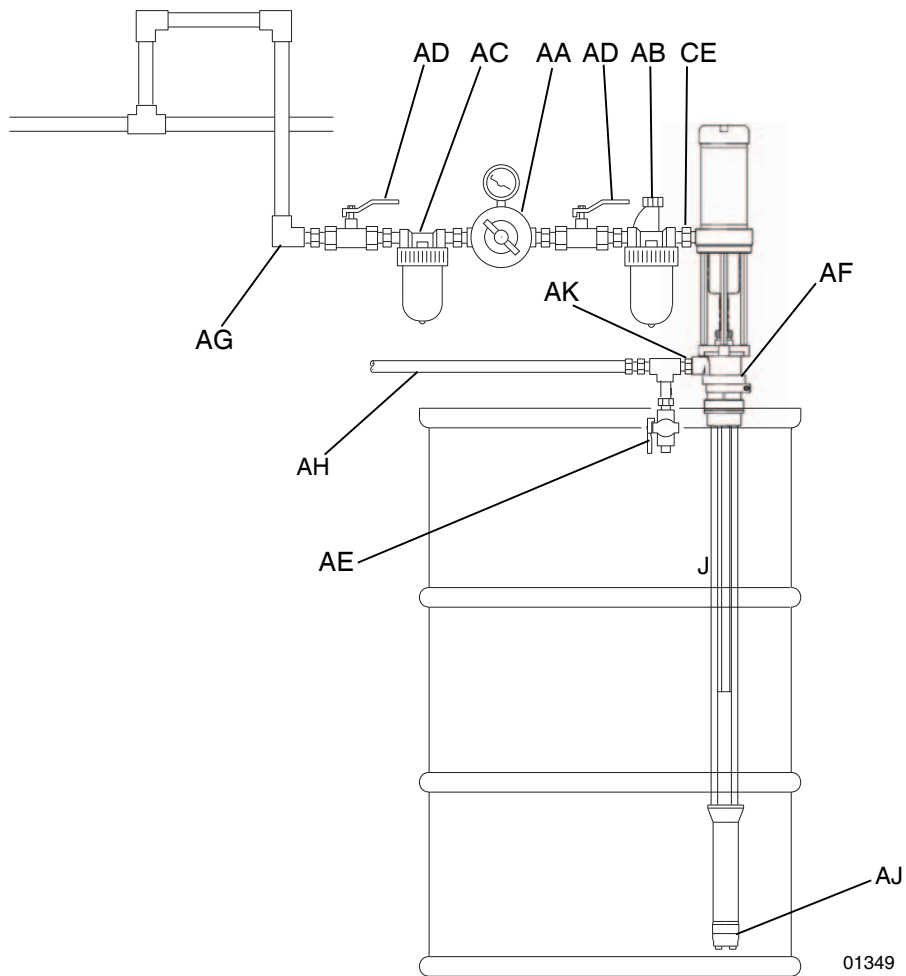
**Fig. 2: Typical Installation, with Circulation**

**Key:**

- |   |                                      |   |   |
|---|--------------------------------------|---|---|
| A | Reactor Proportioner                 | G | Feed Pump Air Supply Lines (3/8 in. (76 mm) ID min) |
| B | Heated Hose                          | J | Fluid Supply Lines                                  |
| C | Fluid Temperature Sensor (FTS)       | K | Feed Pumps  |
| D | Heated Whip Hose                     | L | Agitator  |
| E | Fusion Spray Gun                     | M | Desiccant Dryer                                     |
| F | Proportioner and Gun Air Supply Hose | N | Recirculation/Over Pressure Relief Return Hoses     |
|   |                                      | P | Gun Fluid Manifold                                  |



# Typical Installation for Lubrication Applications



**FIG. 3: Typical Installation for Lubrication Applications**

**Key:**

- |   |                                 |
|---|---------------------------------|
| AA Pump Air Regulator                               | AG Grounded Air Hose            |
| AB Air Line Lubricator                              | AH Grounded Fluid Hose          |
| AC Air Line Filter                                  | AJ Pump Fluid Inlet             |
| AD Bleed-Type Master Air Valve (required, for pump) | AK 1/4 npt(f) Pump Air Inlet    |
| AE Fluid Drain Valve (required)                     | AL 3/4 npt(f) Pump Fluid Outlet |
| AF Bung Adapter                                     |                                 |

# Installation



A bleed-type master air valve (D) and a fluid drain valve (E) are required in your system, to help reduce the risk of serious injury, including splashing fluid in the eyes or on the skin, and injury from moving parts when you are adjusting or repairing the pump.

- The bleed-type master air valve (D) relieves air trapped between this valve and the pump after the pump is shut off. Trapped air can cause the pump to cycle unexpectedly and result in serious injury, including amputation. Install the valve close to the pump.
- The fluid drain valve (E) helps relieve pressure in the displacement pump, hose, and dispensing valve when shutting off the pump. Actuating the dispensing valve to relieve pressure may not be sufficient, especially if there is a clog in the hose or the spray gun or dispensing valve.

## System Accessories

To ensure maximum pump performance, be sure that all accessories used are properly sized to meet your system's requirements. See **Accessories**, page 24.

## Air Line Accessories

Install the following accessories in the order shown in the **Gun Fluid Manifold**, page 8, using adapters as necessary:

**An air line lubricator (AB)** provides automatic air motor lubrication.

**A bleed-type master air valve (AD)** is required in your system to relieve air trapped between it and the air motor when the valve is closed (see the **WARNING** on left). Be sure the bleed valve is easily accessible from the pump, and is located downstream from the air regulator.

**An air line filter (AC)** to remove harmful dirt and moisture from the compressed air supply.


**A second bleed-type air valve (AD)** isolates the air line accessories for servicing. Locate upstream from all other air line accessories.

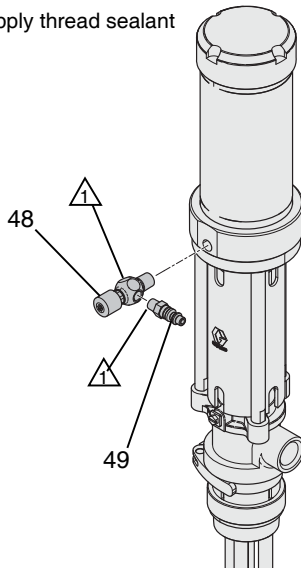
## Fluid Line Accessories

**A fluid drain valve (BA)** is required in your system to relieve fluid pressure in the hose and gun (see the **WARNING** on left). Install the drain valve so that it points down and the handle points up when the valve is opened.

# Setup

1. Apply thread sealant to the male threads of the air needle valve (48) and the quick disconnect fitting (49) and install. See FIG. 4


 Apply thread sealant

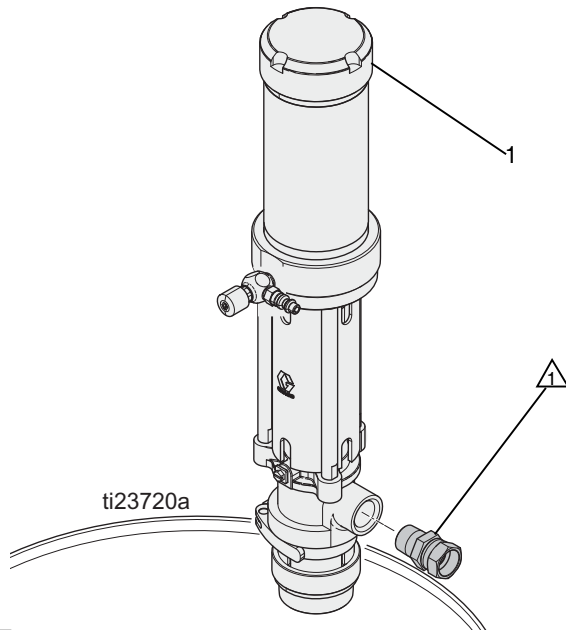


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**FIG. 4**

2. Apply thread sealant to the male outlet fitting (not supplied) and insert into the outlet port. See FIG. 5.

 Apply thread sealant



**FIG. 5**

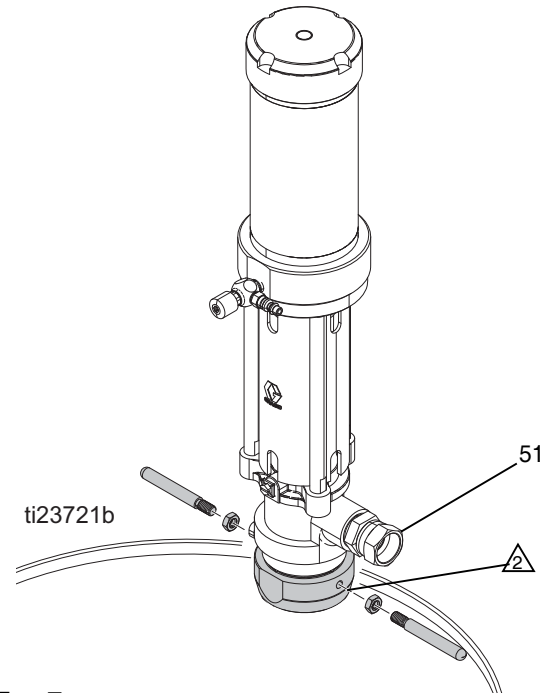
3. Use labels (70) provided to identify the appropriate pump for your material. See FIG. 5.



**FIG. 6**

4. Lubricate the bung adapter inside diameter and mounting threads. Install supplied handles and tighten the jam nuts. Install supplied handles and tighten the jam nuts. Ensure the gasket is in place and screw the bung adapter (51) securely into the bunghole of the drum. Insert the pump through the adapter and lock it in place. See FIG. 7.

 Lubricate threads



**FIG. 7**

5. Install air line (3/8 in. (76 mm) ID minimum) with quick disconnect air coupler (52) provided. See FIG. 8.

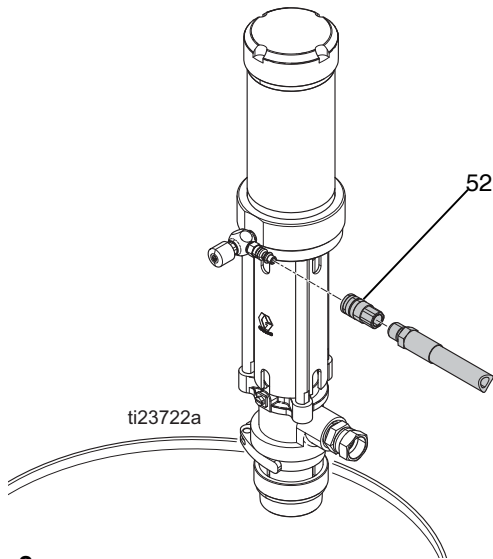


FIG. 8

## Grounding the System



The equipment must be grounded to reduce the risk of static sparking. Static sparking can cause fumes to ignite or explode. Grounding provides an escape wire for the electric current.

To reduce the risk of static sparking, ground the pump and all other equipment used or located in the pumping area. Check your local electrical code for detailed grounding instructions for your area and type of equipment. **Ground all of this equipment.**

**Pump:** Connect Ground Wire (Y) to grounding screw (72) and tighten the screw securely. See FIG. 9. Connect the other end of the wire to a true earth ground. Make certain to comply with all National, State, and Local Electrical Codes.

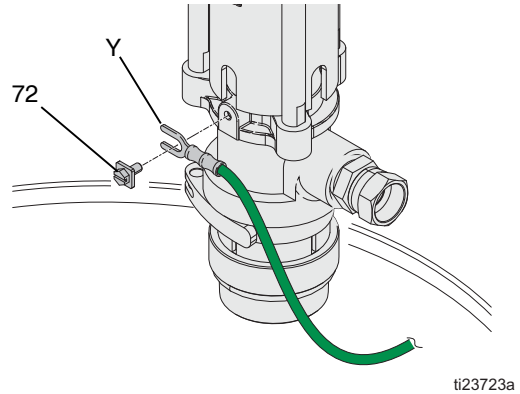


FIG. 9

**Air compressor:** Follow manufacturer's recommendations.

**Fluid hoses:** Use only grounded hoses with a maximum of 300 ft (91 m) combined hose length to ensure grounding continuity. Refer to Hose Grounding Continuity.

**Dispensing valve:** Ground through connection to a properly grounded fluid hose and pump.

**Object being sprayed:** Follow local code.

**Fluid supply container:** Follow local code.

**Solvent pails used when flushing:** Follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.

**To maintain grounding continuity when flushing or relieving pressure:** Hold metal part of the spray gun/dispense valve firmly to the side of a grounded metal pail, then trigger the gun/valve.

# Operation

## Pressure Relief Procedure



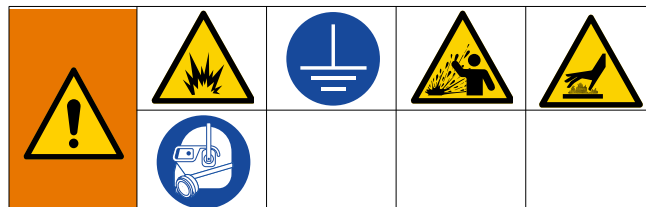
Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

1. Shut off the air to the pump.
2. Close the bleed-type master air valve (D).
3. Hold a metal part of the dispense valve firmly to a grounded metal pail. Trigger the valve to relieve pressure.
4. Open all fluid drain valves in the system, having a waste container ready to catch drainage. Leave drain valve(s) open until you are ready to dispense again.
5. If you suspect the nozzle or hose is clogged or that pressure has not been fully relieved after following the steps above, **VERY SLOWLY** loosen the hose end coupling to relieve pressure gradually, then loosen completely. Clear hose or nozzle obstruction.

## Flushing



To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure.

Hot solvent may ignite. To avoid fire and explosion:

- Flush equipment only in a well-ventilated area
- Flush at the lowest pressure possible. Check connectors for leaks and tighten as necessary.
- Flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.

1. Follow **Pressure Relief Procedure**, page 13.
2. Allow the fluid in the system to cool.
3. Remove spray tip and soak in solvent.
4. Place pump fluid inlet in grounded metal pail containing cleaning fluid.
5. Set pump to lowest possible fluid pressure, and start pump.
6. Hold a metal part of the gun or dispense valve firmly to a grounded metal pail. Trigger the gun or dispense valve until clean solvent dispenses.
7. Remove gun or dispense valve from hose. See gun manual to further clean gun or dispense valve.
8. Follow **Pressure Relief Procedure**, page 13, and Remove fluid filter and soak in solvent. Replace filter cap.

## Daily Startup

1. Verify that the air needle valve is closed.
2. Connect the air line quick disconnect coupler to the transfer pump
3. Turn on the main air supply.
4. Slowly open the air needle valve until the transfer pump runs slowly.
5. Use the air needle valve to control the pump speed.

### **NOTICE**

Never allow the pump to run dry of the fluid being pumped. A dry pump will quickly accelerate to a high speed and could cause damage to the pump. If the pump accelerates quickly or starts running too fast, stop it immediately and check the fluid supply. If the supply container is empty or air has been pumped into the lines, refill the container and prime the pump and the lines with fluid, or flush and leave it filled with a compatible solvent. Be sure to eliminate all air from the fluid system.

Do not attempt to operate pump unless it is securely mounted in a drum.

## Daily Shutdown

1. Disconnect air line coupler.
2. When air pressure is bled off, close the air line needle valve.

# Repair the Air Motor



**NOTE:** Air valve assembly has changed to series B for improved performance. Parts are not interchangeable between series A and B air motor. Series A air valves can be upgraded to series B with kit 262042.

1. Relieve the pressure. Follow **Pressure Relief Procedure**, page 13.
2. Remove cap (1), cylinder (4), and square gaskets (3\*). Inspect all parts, including spring under cap (not shown in FIG. 10) for damage and replace if necessary. See FIG. 10. Unscrew by hand or use a chain wrench to prevent distortion of the cylinder's shape.

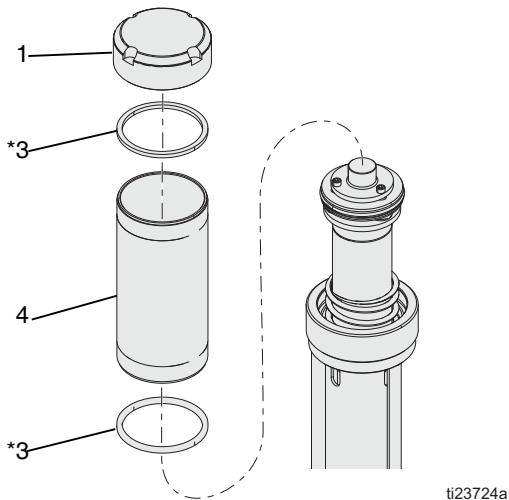


FIG. 10

**NOTE:** Cap (1) was replaced with a spring stop assembly for improved spring life. Existing pumps can be upgraded with Kit 24T043.

**NOTE:** Series A air motors have thin, flat, white seals in air valve. Series B (and later) air motors have thicker black seals in the air valve.

3. **Series A air motors only:** Loosen set screw (18) and unscrew air valve (5). If necessary to assist turning, wedge a screwdriver blade between the screw heads and the hex cap of air valve (5). Discard items 5, 13, 15, and 18. See FIG. 11.

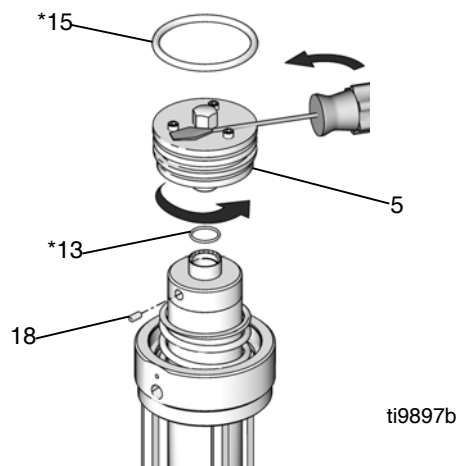


FIG. 11: Series A Air Valve

4. **Series B (and later Air Motors):** Unscrew air valve (5). If necessary to assist turning, wedge a screwdriver blade between the screw heads and the hex cap of the air valve (5). Inspect o-rings (13\* and 15\*) for damage and replace if necessary. Ensure o-ring (13\*) is correctly positioned and not pinched. See FIG. 12.

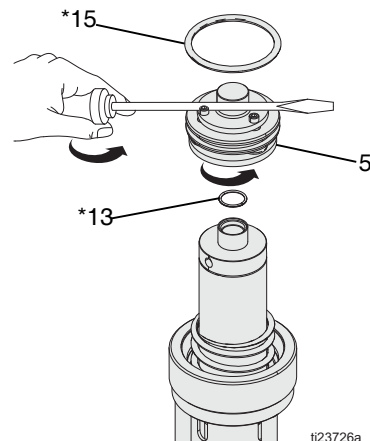
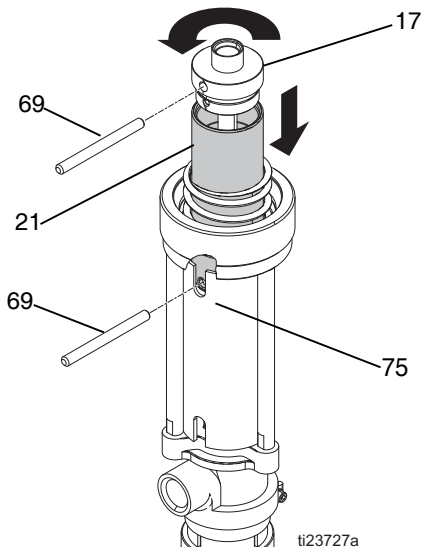


FIG. 12 Series B Air Valve

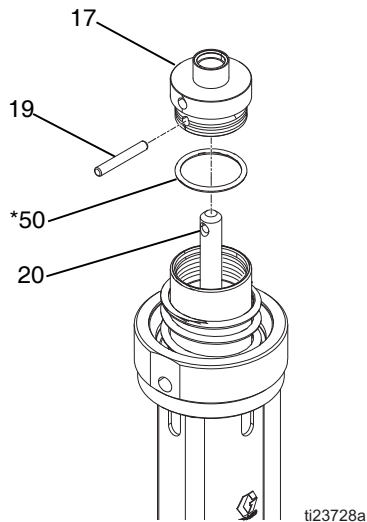
## Repair the Air Motor

- Align slot of shield (75) with piston hole and place pin tool (69) in piston hole to prevent piston from turning. Use second pin tool (69) to unscrew piston cap (17) and separate from piston (21) to expose dowel pin (19). See FIG. 13.



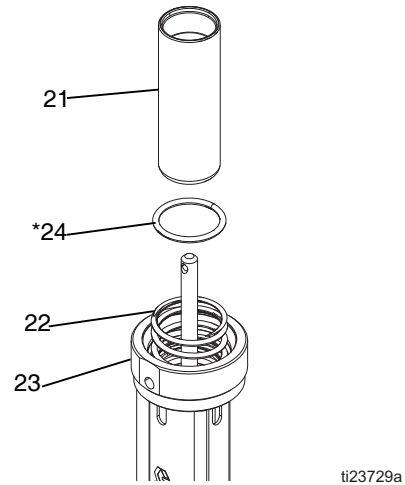
**FIG. 13**

- Remove dowel pin (19) and take piston cap (17) off transfer shaft (20). Remove o-ring (50\*) from piston cap. Inspect all parts for damage. See FIG. 14.



**FIG. 14**

- Slide air piston (21) out the top of the air motor base (23). Remove o-ring (24\*) from air motor base. Inspect all parts, including the spring (22) in the air motor base, for damage. See FIG. 15.



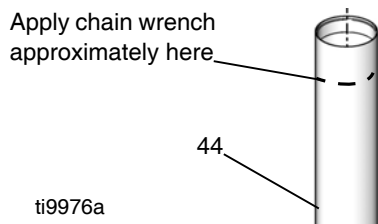
**FIG. 15**



# Repair the Pump Lower



1. Relieve the pressure. Follow **Pressure Relief Procedure**, page 13.
1. Allow the fluid in the system to cool.
2. Use a chain wrench near the top of the suction tube at the point indicated in FIG. 16, and a wrench on the flats of the foot valve (45) to loosen the foot valve from the suction tube (44). To prevent damage to the suction tube, do not remove the foot valve until instructed to do so in step 4.



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FIG. 16

### NOTICE

When removing the suction tube, be very careful not to bend, dent, or damage it. To avoid damage, use the chain wrench only at the top and bottom of the suction tube as indicated in FIG. 16 and FIG. 17. Do not apply the wrench to the middle of the suction tube.

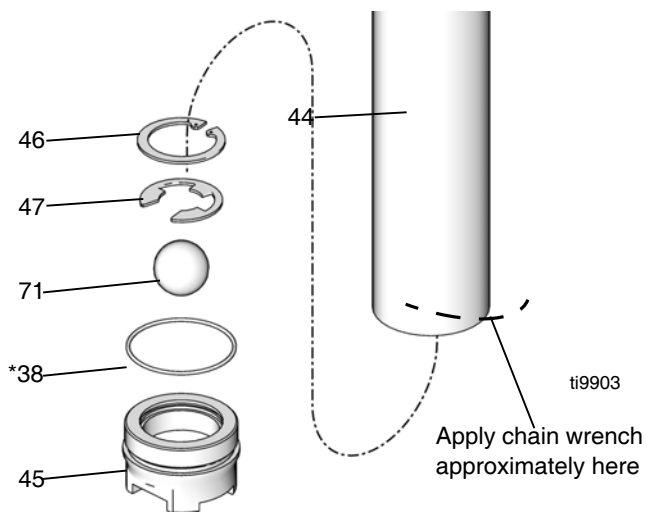


FIG. 17

3. With the foot valve still in place to support the suction tube, use a chain wrench near the bottom of the suction tube at the point indicated in FIG. 17, to loosen the suction tube (44) from the pump body (34).
4. Remove the foot valve assembly from the suction tube (44).
5. Remove retaining ring (46), snap ring (47), ball (71), and o-ring (38\*) from foot valve (45). Inspect all parts for damage. See FIG. 17.
6. Remove suction tube (44) from pump body (34). See FIG. 18.
7. Inspect o-ring (38) on pump body and suction tube for damage. See FIG. 18.

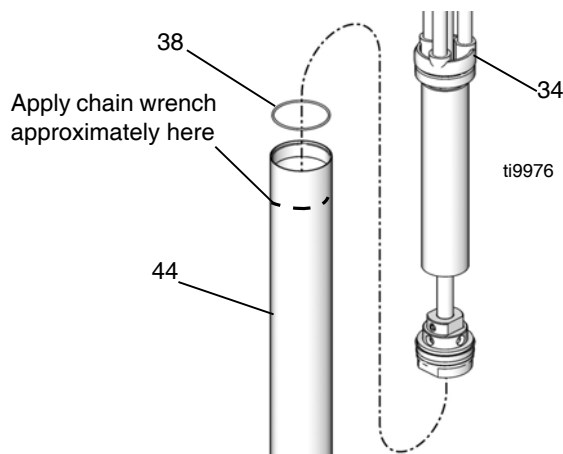


FIG. 18

Repair the Pump Lower

8. Pull transfer shaft (20) out the bottom of pump body (34). See FIG. 19.

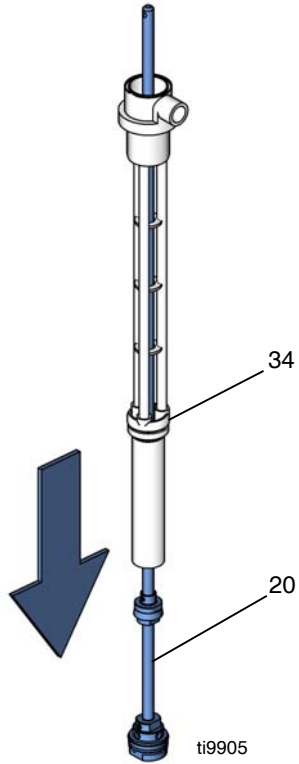


FIG. 19

9. Remove pin (56). Remove piston valve assembly. Unscrew piston valve (43) from piston housing (53). Remove wear ring (41\*), u-cup (40\*) and ball (42). Inspect all parts for damage. See FIG. 20.

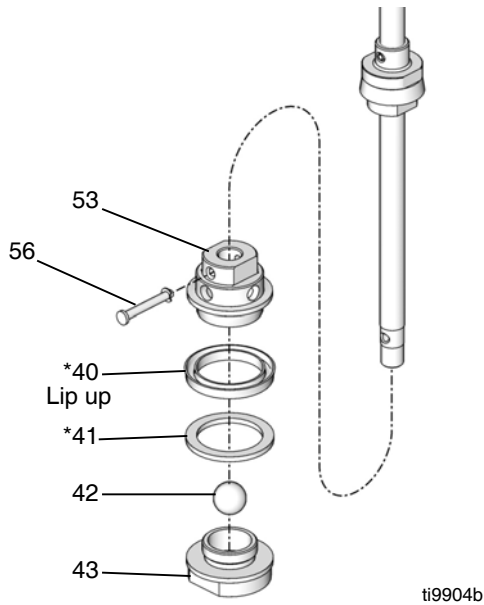


FIG. 20

10. Remove pins (55). See FIG. 21.

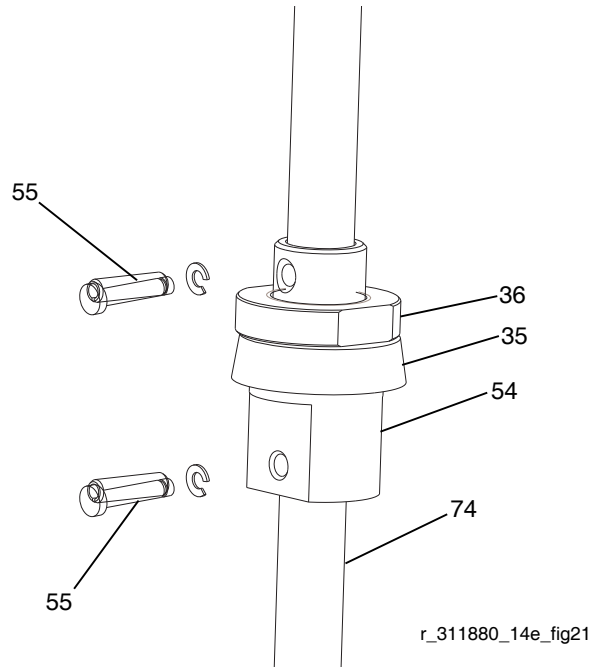


FIG. 21

**NOTE:** Series A and B pumps were equipped with springs pins. In Series C pumps, these pins were replaced with a solid clevis pin (55, 56).

11. Loosen set screw (37) from collar (36). Remove collar from piston housing (54). Remove u-cup (35\*). Inspect all parts for damage. See FIG. 22.

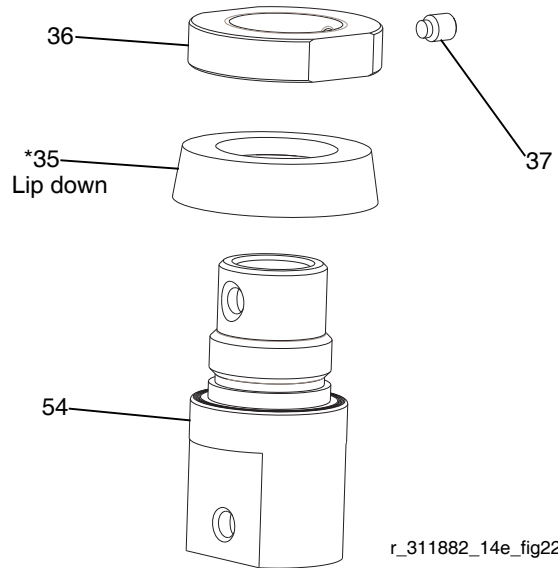
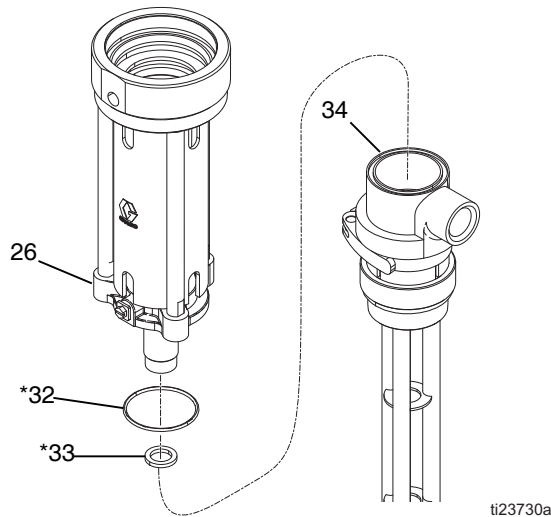


FIG. 22

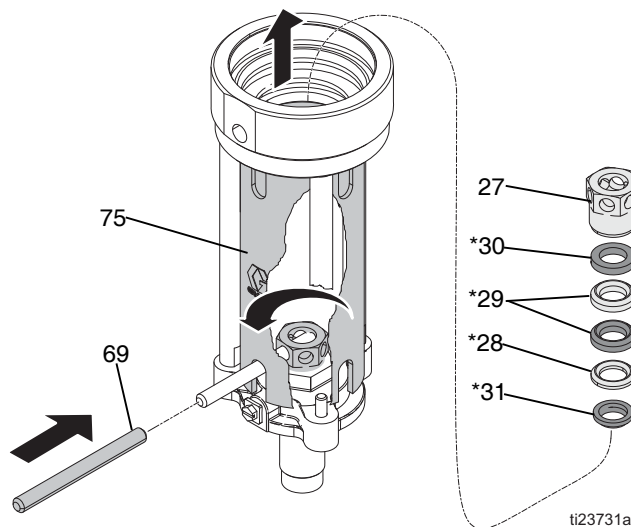
12. Unscrew mounting flange (26) from pump body (34). Remove o-ring (32\*) and PTFE gasket (33\*) from pump body (34). Inspect all parts for damage. See FIG. 23.

**NOTE:** Align a bottom slot of the shield (75) and use pin tool (69) to loosen the hex nut/packings from the pump shaft.



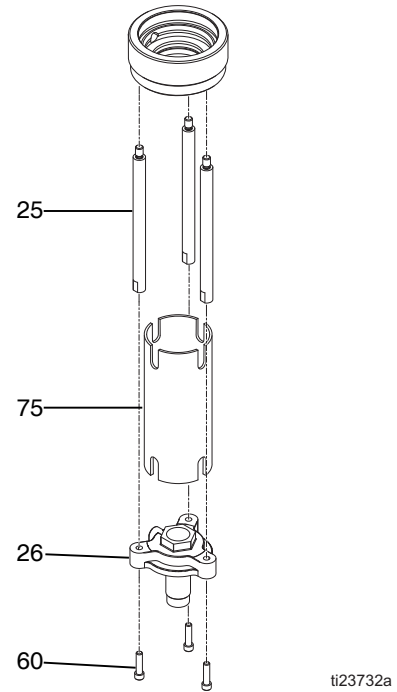
**FIG. 23**

13. Remove hex nut (27) from mounting flange (26). Remove female gland (30\*), 2 PTFE packings (29\*), male gland (28\*) and wiper (31\*). Inspect all parts for damage. See FIG. 25.

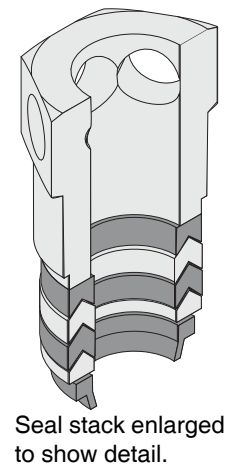


**FIG. 25**

14. Unscrew three fasteners (60) to remove the flange (26) and tie-rods (25). Slide the guard (75) out. Unscrew the tie rods (25) using the wrench flats at the bottom.



**FIG. 24**



Seal stack enlarged to show detail.

## Reassemble the Air Motor and the Pump Lower

To reassemble the pump lower and air motor, reverse the steps on the preceding pages. Follow the torque requirements listed in the drawing on page 21.

**NOTE:** See **Repair the Air Motor**, page 15, step 4 and step 5 (FIG. 12) for special notes on reassembly.

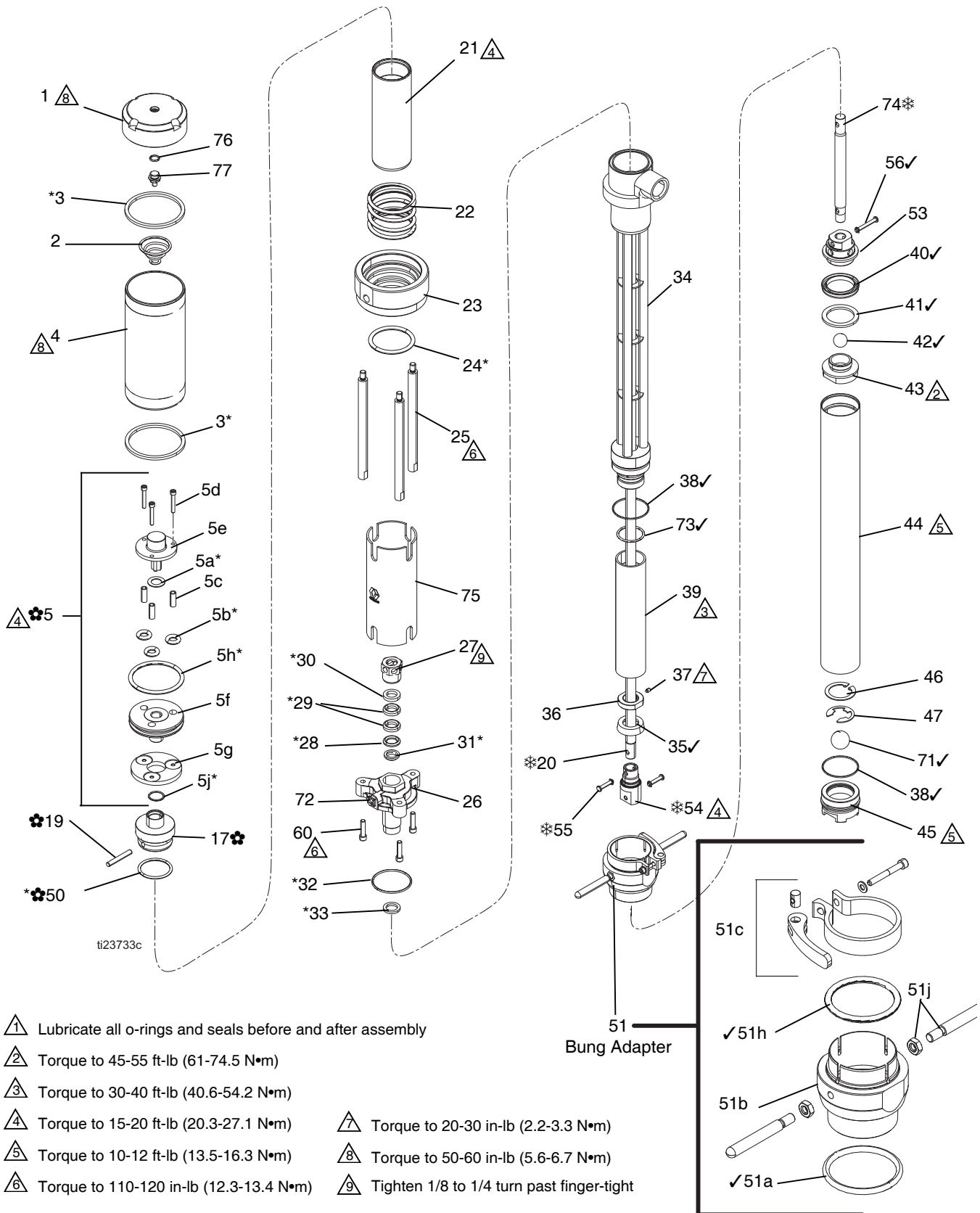
# Troubleshooting



1. Follow **Pressure Relief Procedure**, page 13, before checking or repairing pump.
2. Check all possible problems and causes before disassembling pump.

Problem	Cause	Solution
The pump fails to operate	Dirty or worn air motor.	Clean, service
	Inadequate air supply or restricted lines.	Clean lines or increase the air supply (see Technical Data).
	Closed or clogged air valves.	Open or clear the valves.
	Clogged fluid hose or valve.	Clear the hose or valves
	Worn or damaged valves or seals.	Service the valves or seals.
The pump operates, but the output is low on both strokes.	Clogged fluid hose or valve.	Clear the hose or valves.
	Exhausted fluid supply.	Refill the fluid supply and reprime the pump.
	Worn or damaged valves or seals.	Service the valves or seals.
The pump operates, but the output is low on the downstroke.	Held open or worn intake valve.	Clear or service the valve.
	Worn or damaged valves or seals.	Service the valves or seals.
The pump operates, but the output is low on the upstroke.	Held open or worn piston valve.	Clear or service the valve.
	Worn or damaged valves or seals.	Service the valves or seals.
Erratic or accelerated operation.	Exhausted fluid supply.	Refill the fluid supply and reprime the pump.
	Broken air motor compression spring.	Replace the spring.
Pump slowly moves after fluid shutoff in downstroke.	Clogged or dirty intake valve check ball.	Clean ball and seat.
	Worn or damaged valves or seats.	Install repair kit.
Pump slowly moves after fluid shutoff in upstroke.	Clogged or dirty lower piston ball or seat.	Clean ball and seat.
	Worn or damaged valves or seats.	Install repair kit.

# Parts - Model 295616



- △1 Lubricate all o-rings and seals before and after assembly
- △2 Torque to 45-55 ft-lb (61-74.5 N•m)
- △3 Torque to 30-40 ft-lb (40.6-54.2 N•m)
- △4 Torque to 15-20 ft-lb (20.3-27.1 N•m)
- △5 Torque to 10-12 ft-lb (13.5-16.3 N•m)
- △6 Torque to 110-120 in-lb (12.3-13.4 N•m)
- △7 Torque to 20-30 in-lb (2.2-3.3 N•m)
- △8 Torque to 50-60 in-lb (5.6-6.7 N•m)
- △9 Tighten 1/8 to 1/4 turn past finger-tight

Ref	Part	Description	Qty	Ref	Part	Description	Qty
1‡	16V524	CAP, air cylinder	1	51c	234188	CLAMP, hopper	1
2‡	157630	SPRING, tapered	1	51h✓	120207	O-RING; inner (brown)	1
3‡*	120212	PACKING, square	2	51j	25N940	HANDELS with jam nut	
4	24J528	CYLINDER, air motor	1	52†	114558	COUPLER, air line	1
5✿	262035	VALVE, air	1	53	15J570	HOUSING, piston	1
5a*	15J539	GASKET, upper	1	54*		PISTON, upper	1
5b*	121889	O-RING	3	55✓*	120294	PIN, clevis, 3/16 in. x 3/4 in.	2
5c	15J544	SPACER	3	56✓	120295	PIN, clevis, 3/16 in. x 1-1/4 in.	1
5d	121610	SCREW	3	60	120348	SCREW, cap, socket head 1/4-20 x 1 in. (25 mm)	3
5e	16U730	CAP, air, valve	1	69†	15H197	TOOL, pin	2
5f	15V554	HEAD, air valve	1	70†	15K008	LABEL, material identification.	1
5g	15J546	DISK, air valve	1	71✓	107167	BALL, intake, sst, 1 in. (25 mm)	1
5h*	160258	O-RING	1	72	116343	SCREW, ground	1
5j*	722834	O-RING	1	73✓	113944	O-RING	1
17✿		CAP, air piston	1	74*		SHAFT, transfer, lower	1
19✿	15J548	PIN, dowel	1	75	24V858	GUARD	1
20*		SHAFT, transfer	1	76‡	111819	O-RING	1
21	24J535	PISTON, air	1	77‡	16V523	PIN, spring stop	1
22	15J551	SPRING, compression	1				
23	24J529	BASE, air motor	1				
24*	159846	O-RING (green)	1				
25	15J553	ROD, tie	3				
26	24J530	FLANGE, mounting	1				
27	15J555	NUT, hex	1				
28*	15J556	GLAND, packing, (male)	1				
29*	15J557	V-PACKING, PTFE	2				
30*	15J558	GLAND, packing, (female)	1				
31*	15J559	WIPER, ROD	1				
32*	15C638	O-RING, PTFE, encapsulated	1				
33*	15J560	GASKET, PTFE	1				
34	24J536	BODY, pump, 2:1	1				
35✓	15J562	PACKING, piston cup	1				
36	15J563	COLLAR, retaining	1				
37	101194	SCREW, set, socket head, 10-32 x .25 in. (6 mm)	1				
38✓★	106258	O-RING	2				
39	24J534	CYLINDER, fluid	1				
40✓	15J565	PACKING, u-cup, PTFE	1				
41✓	15J566	RING, wear	1				
42✓	103462	BALL, outlet, sst, 3/4 in. (19 mm)	1				
43	24J531	VALVE, piston	1				
44	24J532	TUBE, suction	1				
45	24J533	VALVE	1				
46	120734	RING, retaining, internal	1				
47	120735	RING, snap, e series	1				
48†	206264	VALVE, needle	1				
49†	169969	FITTING, air line	1				
50*✿	108832	O-RING	1				
51	25B395	ADAPTER, bung	1				
51a✓	120998	O-RING, fluoroelastomer	1				
51b	-----	ADAPTER	1				

\* *Parts included in Upper Seal Repair Kit 262034 (not sold separately).*

✓ *Parts included in Lower Seal Repair Kit 247883.*  
**NOTE:** Seal Repair Kit 24X056 includes all parts in kit 262034 and kit 247883. The spring pins (55, 56) originally supplied in series A and B pumps have been upgraded to a solid clevis pin for improved reliability.

\* *Parts included in repair kit 256560*  
**NOTE:** The pump shaft originally supplied in series A pumps has been upgraded to a multi-piece assembly for better sealing and serviceability. Pumps can be upgraded with repair kit 256560.

✿ *Parts included in repair kit 262042*  
**NOTE:** The air valve originally supplied in series A pumps can be upgraded with kit 262042.

† *Indicates parts not shown, 48, 49, 52, 69, 70 (shipped loose)*

★ *O-rings included in Tube Extension Kit 24N451.*

‡ *Parts included in air cap 24T043.*

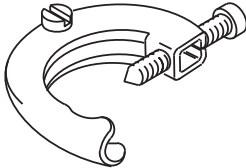
**NOTE:** The cylinder cap has been upgraded with spring stop for improved reliability. Existing pumps can be upgraded with Kit 24T043.

The T2 can be adapted for use in 250 gallon (946 liter) totes. Tube Extension 24N451 increases the length by 6.25 in. (165 mm) to reach material in the bottom of larger totes.

# Accessories

## Grounding Clamp

Part	Description
103538	CLAMP, ground

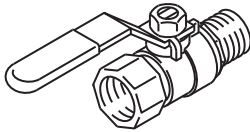


Qty.  
1

## Bleed-Type Master Air Valve

300 psi (2.1 MPa, 21 bar) Maximum Working Pressure

Part	Description
107142	VALVE, ball, vented; 1/2 npt(m) inlet x 1/2 npt(f) outlet

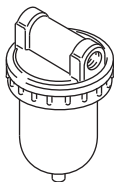


Qty.  
1

## Air Line Filter

250 psi (1.7 MPa, 17.5 bar) Maximum Working Pressure

Part	Description
106149	FILTER, air line; 1/2 npt(f) inlet and outlet

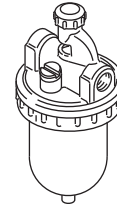


Qty.  
1

## Air Line Lubricator

250 psi (1.7 MPa, 17.5 bar) Maximum Working Pressure

Part	Description
214848	LUBRICATOR, air line; 8 oz (0.24 liter) bowl capacity; 1/2 npt(f) inlet and outlet

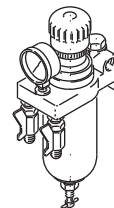


Qty.  
1

## Air Line Filter and Regulator

180 psi (1.3 MPa, 13 bar) Maximum Working Pressure

Part	Description
202660	FILTER, air; includes gauge and two 1/4 npt(m) outlet valves, 50 micron filter element with 100 mesh inlet strainer; 1/2 npt(f) inlet; flow rate is over 50 scfm (1.4 m <sup>3</sup> /min).



01355

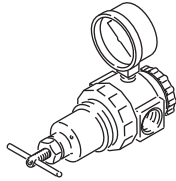
Qty.  
1



### Air Regulator and Gauge

300 psi (2.1 MPa, 21 bar) Maximum Working Pressure

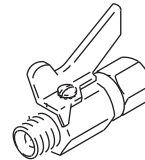
Part	Description	Qty.
202156	REGULATOR, air; 0-200 psi (0-14 bar) regulated pressure range; 3/8 npt(f) inlet and outlet	1



### Fluid Drain Valve

500 psi (3.5 MPa, 35 bar) Maximum Working Pressure

Part	Description	Qty.
208630	VALVE, ball; 1/2 npt(m) x 3/8 npt(f); for non-corrosive fluids; carbon steel and PTFE	1
237534	VALVE, ball; 3/8 npt(m) x 3/8 npt(f); for corrosive fluids; SST and PTFE	1



# Performance Chart

## Calculate Fluid Outlet Pressure (black curves)

To calculate fluid outlet pressure (MPa/bar/psi) at a specific fluid flow (lpm/gpm) and operating air pressure (MPa/bar/psi), use the following instructions and pump data chart.

1. Locate desired fluid flow along bottom of chart.
2. Follow vertical line up to intersection with selected air pressure curve (black). Follow horizontally left to read fluid outlet pressure.

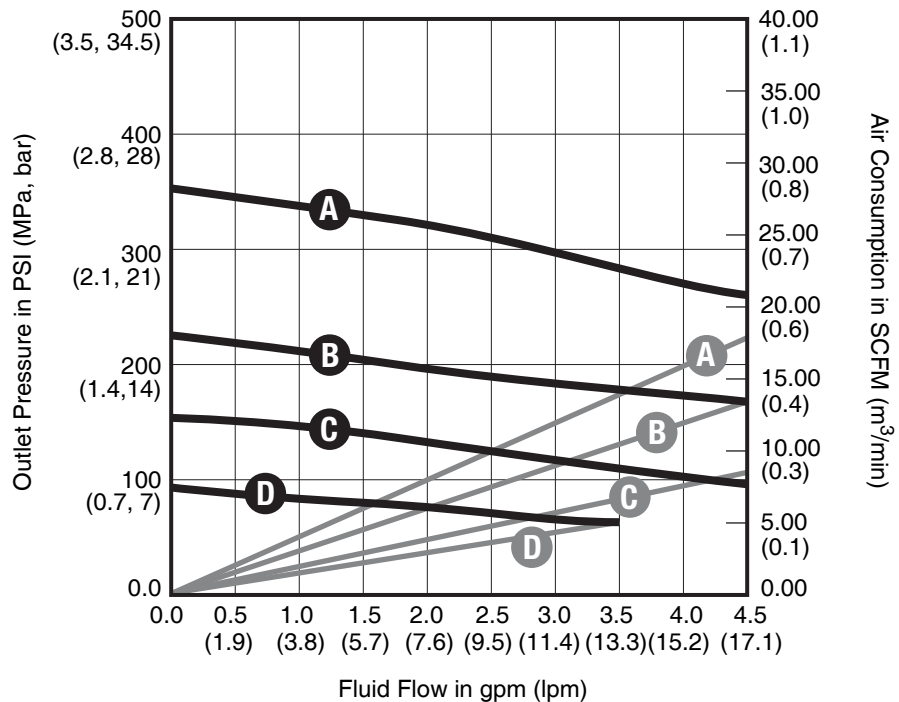
## Calculate Pump Air Consumption (gray curves)

To calculate pump air consumption (m<sup>3</sup>/min or scfm) at a specific fluid flow (lpm/gpm) and air pressure (MPa/bar/psi), use the following instructions and pump data chart.

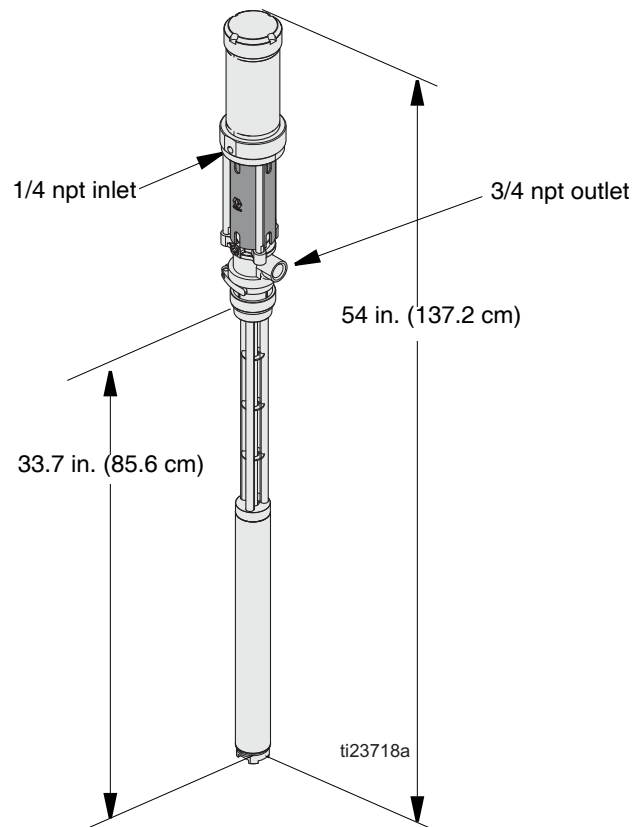
1. Locate desired fluid flow along bottom of chart.
2. Follow vertical line up to intersection with selected air pressure curve (gray). Follow horizontally right to read air consumption.

### Key: Air Pressure

- A 180 psi (1.2 MPa, 12.4 bar)
- B 100 psi (0.7 MPa, 7 bar)
- C 70 psi (0.5 MPa, 4.8 bar)
- D 40 psi (0.3 MPa, 2.8 bar)



# Dimensions





# Technical Specifications

<b>T2, 2:1 Ratio Transfer Pump</b>		
	<b>US</b>	<b>Metric</b>
Pressure ratio	2.25:1	
Maximum fluid working pressure	405 psi	2.8 MPa, 28 bar
Maximum air inlet pressure	180 psi	1.2 MPa, 12 bar
Maximum continuous outlet flow	5 gpm	20 lpm
Maximum intermittent outlet flow	7.5 gpm	28 lpm
Pump cycles per 1 gallon (3.8 liters)	15.9	
Maximum recommended pump speed for continuous operation	100 cpm (150 cpm intermittent)	
Gallons (liters) per pump cycle	0.063 gal	0.24 l
Maximum ambient operating temperature	120°F	49°C
Maximum fluid temperature	190°F	88°C
<b>Inlet/Outlet Sizes</b>		
Air inlet size	1/4 npt(f)	
Fluid outlet size	3/4 npt (f)	
<b>Materials of Construction</b>		
Wetted materials	Stainless steel, PTFE	
<b>Weight</b>		
All models	21 lb.	9.5 kg
<b>Noise (dBa)</b>		
Maximum sound pressure*	88.7 dB(A) at 80 psi (.55 MPa, 5.5 bar)	
Maximum sound power**	96.8 dB(A) at 80 psi (.55 MPa, 5.5 bar)	
*Sound pressure measured 3.28 feet (1 meter) from equipment.		
**Sound power measured per ISO-9614-2.		

## California Proposition 65

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