

# Instructions–Parts List



19 liter (5 gallon)  
120 liter (30 gallon)  
200 liter (55 gallon)

## Ram–Mounted Pumps

308027ZAB

EN

Use to transfer or dispense sealants, adhesives, or other medium– to high–viscosity fluids. For professional use only. Not approved for use in European explosive atmosphere locations.

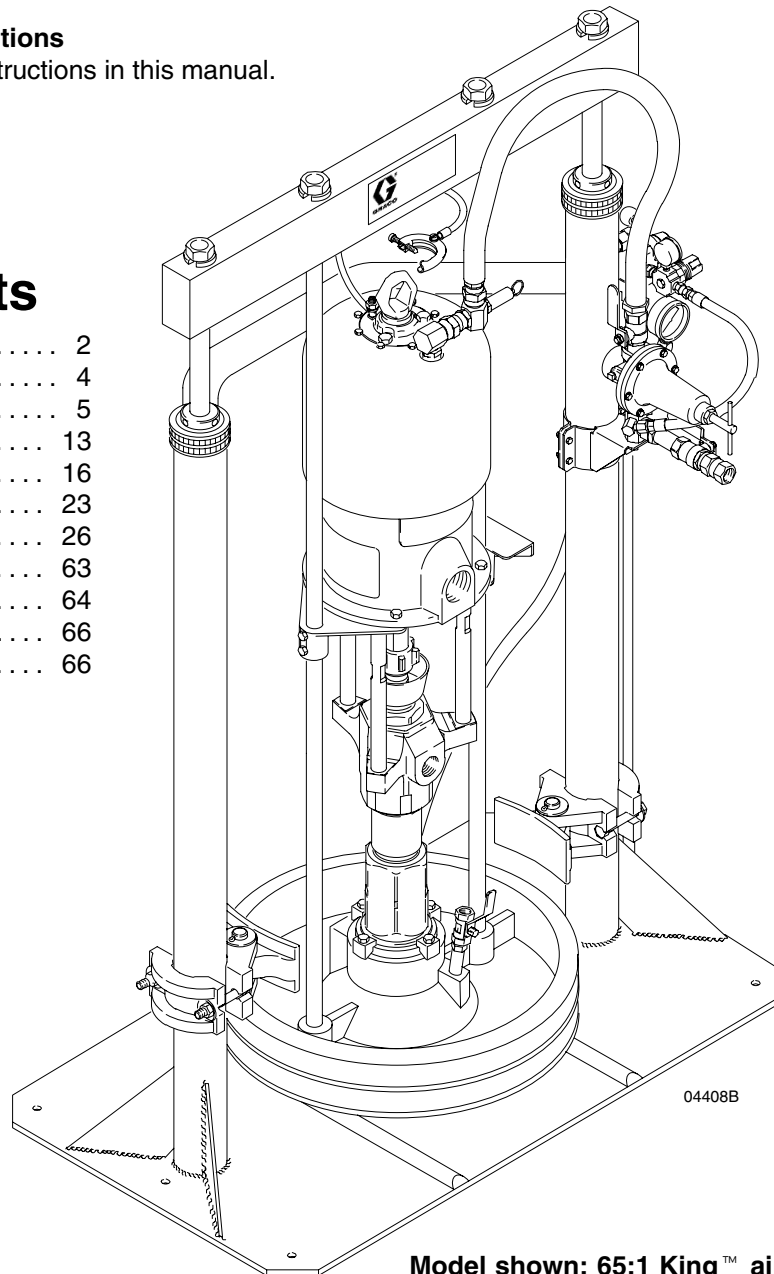


### Important Safety Instructions

Read all warnings and instructions in this manual.  
Save these instructions.

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Model shown: 65:1 King™ air motor with  
Check-Mate™ 800 pump lower

# Symbols

## Warning Symbol






This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

## Caution Symbol

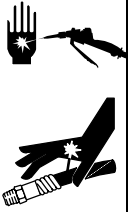


This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.

# ⚠ WARNING

|  |   |
|--|---|
| <br><small>INSTRUCTIONS</small> | <p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.</p> <ul style="list-style-type: none"> <li>• This equipment is for professional use only.</li> <li>• Read all instruction manuals, tags, and labels before you operate the equipment.</li> <li>• Use the equipment only for its intended purpose. If you are not sure, call your Graco distributor.</li> <li>• Do not alter or modify this equipment. Use only Graco parts and accessories.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately.</li> <li>• Do not exceed the maximum working pressure stated on the equipment or in the <b>Technical Data</b> for your equipment. Do not exceed the maximum working pressure of the lowest rated component in your system.</li> <li>• Use fluids and solvents that are compatible with the equipment wetted parts. See the <b>Technical Data</b> section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.</li> <li>• Wear hearing protection when you operate this equipment.</li> <li>• Comply with all applicable local, state, and national fire, electrical, and safety regulations.</li> </ul> |
|                               | <p><b>MOVING PARTS HAZARD</b></p> <p>Moving parts, such as the priming piston and ram plate, can pinch or amputate your fingers.</p> <ul style="list-style-type: none"> <li>• Keep clear of all moving parts when you start or operate the pump.</li> <li>• Keep hands and fingers away from the priming piston during operation and whenever the pump is charged with air.</li> <li>• Keep your hands away from the ram plate and the lip of the drum while the ram is operating.</li> <li>• Before you service the equipment, follow the <b>Pressure Relief Procedure</b> on page 16 to prevent the equipment from starting unexpectedly.</li> </ul>  |
|                               | <p><b>TOXIC FLUID HAZARD</b></p> <p>Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> <li>• Know the specific hazards of the fluid you are using.</li> <li>• Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state, and national guidelines.</li> <li>• Always wear protective eyewear, gloves, clothing, and respirator as recommended by the fluid and solvent manufacturer.</li> </ul>   |

# ! WARNING



## SKIN INJECTION HAZARD

Spray from the spray gun/dispense valve, leaks, or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed in the eyes or on the skin can also cause serious injury.

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate surgical treatment.**
- Do not point the gun/valve at anyone or at any part of the body.
- Do not put your hand or fingers over the spray tip/nozzle.
- Do not stop or deflect leaks with your hand, body, glove or rag.
- Do not “blow back” fluid; this is not an air spray system.
- Always have the tip guard and the trigger guard on the gun when spraying.
- Check the gun diffuser operation weekly. See the gun manual.
- Be sure the gun/valve trigger safety operates before you spray/dispense.
- Lock the gun/valve trigger safety when you stop spraying/dispensing.
- Follow the **Pressure Relief Procedure** on page 16 if the spray tip/nozzle clogs and before you clean, check, or service the equipment.
- Tighten all fluid connections before you operate the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.
- Fluid hoses must have spring guards on both ends to help protect them from rupture caused by kinks or bends near the couplings.



## FIRE AND EXPLOSION HAZARD

Improper grounding, poor ventilation, open flames, or sparks can cause a hazardous condition and result in a fire or explosion and serious injury.

- Ground the equipment and the object being sprayed or dispensed to. See **Ground the System** on page 5.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop spraying/dispensing immediately.** Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being sprayed/dispensed to.
- Keep the spray/dispense area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the spray/dispense area.
- Extinguish all open flames or pilot lights in the spray/dispense area.
- Do not smoke in the spray/dispense area.
- Do not turn on or off any light switch in the spray/dispense area while operating or if fumes are present.
- Do not operate a gasoline engine in the spray/dispense area.

# List of Models

## 55 Gallon Models

| Model No.<br>(Parts page) | Air Motor         | Pump Lower                   | Ratio  | Maximum Fluid<br>Working Pressure | Maximum<br>Input Pressure                   |
|---------------------------|-------------------|------------------------------|--------|-----------------------------------|---|
| <b>223816</b><br>(26)     | Monark®           | Check-Mate™ 450              | 10:1   | 125 bar, 12.5 MPa<br>(1800 psi)   | 10 bar, 1 MPa<br>(150 psi) (Air)            |
| <b>223817*</b><br>(28)    | President®        | Check-Mate™ 450              | 20:1   | 250 bar, 25.0 MPa<br>(3600 psi)   | 10 bar, 1 MPa<br>(150 psi) (Air)            |
| <b>253018*</b><br>(28)    | President®        | Check-Mate™ 450              | 20:1   | 250 bar, 25.0 MPa<br>(3600 psi)   | 10 bar, 1 MPa<br>(150 psi) (Air)            |
| <b>234369*</b><br>(28)    | President®        | Check-Mate™ 450<br>Tuffstack | 20:1   | 250 bar, 25.0 MPa<br>(3600 psi)   | 10 bar, 1 MPa<br>(150 psi) (Air)            |
| <b>234120*</b><br>(30)    | President®        | Check-Mate™ 450              | 46:1   | 320 bar, 32.0 MPa<br>(4600 psi)   | 7 bar, 0.7 MPa<br>(100 psi) (Air)           |
| <b>247156*</b><br>(30)    | President®        | Check-Mate™ 450              | 46:1   | 320 bar, 32.0 MPa<br>(4600 psi)   | 7 bar, 0.7 MPa<br>(100 psi) (Air)           |
| <b>234121*</b><br>(30)    | Monark®           | Check-Mate™ 200              | 23:1   | 290 bar, 29.0 MPa<br>(4140 psi)   | 12 bar, 1.2 MPa<br>(180 psi) (Air)          |
| <b>247155*</b><br>(30)    | Monark®           | Check-Mate™ 200              | 23:1   | 290 bar, 29.0 MPa<br>(4140 psi)   | 12 bar, 1.2 MPa<br>(180 psi) (Air)          |
| <b>257589*</b><br>(30)    | FireBall 425 Pump |                              | 50:1   | 276 bar, 28 MPa<br>(4000 psi)     | 5.5 bar, 0.55 MPa<br>(80 psi) (Air)         |
| <b>570114</b><br>(32)     | NXT 700           | Check-Mate™ 450              | 20:1   | 138 bar, 13 MPa<br>(2000 psi)     | 7 bar, 0.7 MPa<br>(100 psi) (Air)           |
| <b>965572</b><br>(34)     | NXT 2200          | Check-Mate™ 450              | 40:1   | 276 bar, 28 MPa<br>(4000 psi)     | 7 bar, 0.7 MPa<br>(100 psi) (Air)           |
| <b>234371*</b><br>(36)    | Bulldog®          | Check-Mate™ 2100             | 12:1   | 83 bar, 8.3 MPa<br>(1200 psi)     | 7 bar, 0.7 MPa<br>(100 psi) (Air)           |
| <b>234376*</b><br>(38)    | Viscount II®      | Check-Mate™ 2100             | 1.6:1  | 165 bar, 16.5 MPa<br>(2400 psi)   | 104 bar, 10.4 MPa<br>(1500 psi) (Hydraulic) |
| <b>234372</b><br>(40)     | King™             | Check-Mate™ 2100             | 24:1   | 165 bar, 16.5 MPa<br>(2400 psi)   | 7 bar, 0.7 MPa<br>(100 psi) (Air)           |
| <b>234373</b><br>(40)     | King™             | Check-Mate™ 800 Ink          | 65:1   | 448 bar, 44.8 MPa<br>(6500 psi)   | 7 bar, 0.7 MPa<br>(100 psi) (Hydraulic)     |
| <b>234374*</b><br>(44)    | Bulldog™          | Check-Mate™ 800              | 31:1   | 214 bar, 21.4 MPa<br>(3100 psi)   | 7 bar, 0.7 MPa<br>(100 psi) (Hydraulic)     |
| <b>253482</b><br>(46)     | Bulldog™          | Dura-Flo 600                 | 41:1   | 138 bar, 13 MPa<br>(2000 psi)     | 7 bar, 0.7 MPa<br>(100 psi) (Air)           |
| <b>234377*</b><br>(54)    | Senator®          | Check-Mate™ 800              | 19:1   | 132 bar, 13.2 MPa<br>(1900 psi)   | 7 bar, 0.7 MPa<br>(100 psi) (Hydraulic)     |
| <b>234378*</b><br>(56)    | Viscount II®      | Check-Mate™ 800              | 4.33:1 | 448 bar, 44.8 MPa<br>(6500 psi)   | 104 bar, 10.4 MPa<br>(1500 psi) (Hydraulic) |




**NOTE:** Ram Mounting Kit 224829 is available to mount a Check-Mate™ 200 Pump on a 200-liter (55 gal.) Ram. See pages 58 to 61.

# Setup

## Ground the System

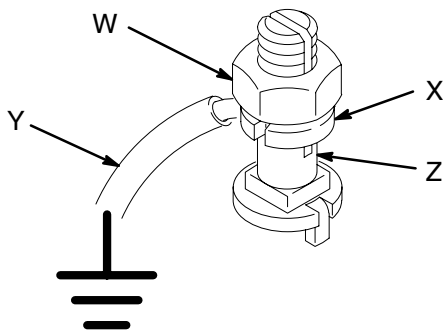
**⚠ WARNING**



**FIRE AND EXPLOSION HAZARD**  
Improper grounding could cause static sparking, which could cause a fire or explosion. To reduce the risk of property damage or serious injury, follow the grounding instructions below.

The following grounding instructions are minimum requirements for a system. Your system may include other equipment or objects that must be grounded. Check your local electrical code for detailed grounding instructions for your area and type of equipment. Your system must be connected to a true earth ground.

- **Pump:** Check the ground wire and clamp. See Fig. 1. To install, loosen the grounding lug locknut (W) and washer (X). Insert one end of a 1.5 mm<sup>2</sup> (12 ga) minimum ground wire (Y) into the slot in the lug (Z), and tighten the locknut securely. Connect the other end of the wire to a true earth ground.



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Fig. 1

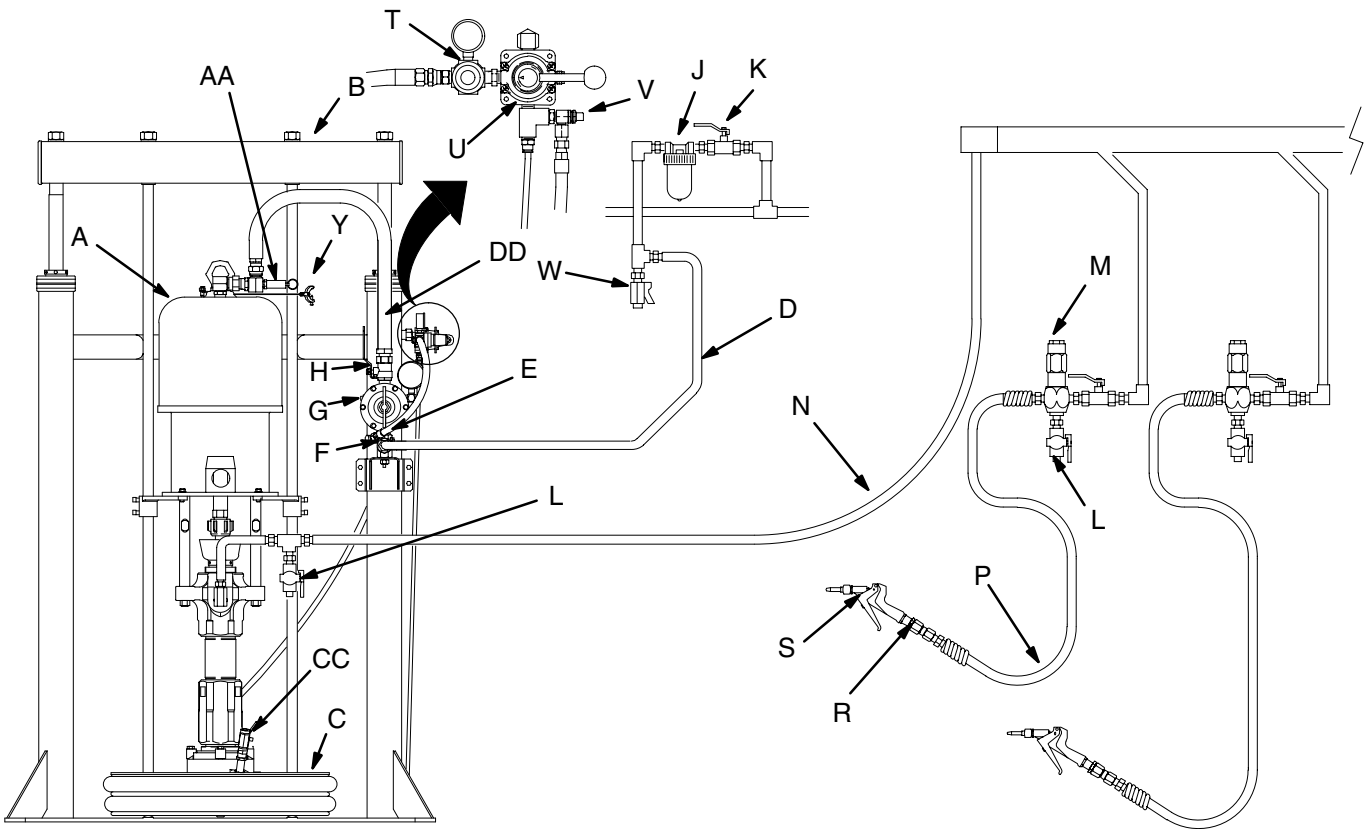
- **Air compressors and hydraulic power supplies:** Follow the manufacturer's grounding recommendations.
- **Air, fluid, and hydraulic hoses connected to the pump:** Use only electrically conductive hoses with a maximum of 150 m (500 ft) combined hose length to ensure grounding continuity. Check the electrical resistance of air and fluid hoses at least once a week. If the total resistance to ground exceeds 29 megohms, replace the hose immediately.  
**NOTE:** Use a meter that is capable of measuring resistance at this level.
- **Spray gun / dispense valve:** Connect to a properly grounded fluid hose and pump.
- **Fluid supply container:** Follow the local code for grounding.
- **Object being sprayed / dispensed to:** Follow the local code for grounding.
- **All solvent pails used when flushing:** Follow the local code for grounding. Use only metal pails, which are conductive. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts the grounding continuity.

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

# Typical Setup

## KEY

- |  |  |
|--|--|
| <b>A</b> Pump  | <b>P</b> Electrically conductive fluid whip hose |
| <b>B</b> Ram   | <b>R</b> Gun/valve swivel                        |
| <b>C</b> Ram plate   | <b>S</b> Gun or dispense valve                   |
| <b>D</b> Electrically conductive air supply hose           | <b>T</b> Ram air regulator                       |
| <b>E</b> Main air bleed valve (required, for pump and ram) | <b>U</b> Ram director valve                      |
| <b>F</b> Air manifold                                      | <b>V</b> Air release valve                       |
| <b>G</b> Pump air regulator                                | <b>W</b> Air line drain valve                    |
| <b>H</b> Pump air bleed valve (required, for pump)         | <b>Y</b> Ground wire (required)                  |
| <b>J</b> Air line filter                                   | <i>See page 5 for installation instructions.</i> |
| <b>K</b> Bleed-type air valve (for accessories)            | <b>AA</b> Safety valve                           |
| <b>L</b> Fluid drain valve (required)                      | <b>CC</b> Vent valve                             |
| <b>M</b> Fluid pressure regulator                          | <b>DD</b> Pump Runaway Valve (location shown)    |
| <b>N</b> Electrically conductive fluid hose                |  |



5097B

Fig. 2

# Setup

**NOTE:** Numbers and letters in parentheses in the text refer to the callouts in the figures and the Parts Drawings.

Accessories are available from Graco. Make certain all accessories are sized and pressure-rated to meet your system requirements.

Fig. 2 is only a guide for selecting and installing system components and accessories. Contact your Graco distributor for assistance in designing a system to suit your particular needs.

## Air Line Components and Accessories

See Fig. 2.

### **WARNING**

A main air bleed valve (E), pump air bleed valve (H), and fluid drain valve (L) are required. These accessories help reduce the risk of serious injury, including fluid injection and splashing of fluid in the eyes or on the skin, and injury from moving parts if you are adjusting or repairing the pump.

The main air bleed valve (E) shuts off and relieves the air to the pump and ram. The ram holds pressure if the ram director valve (U) is in the horizontal (neutral) position. To relieve air pressure in the ram, close the main air bleed valve (E), and move the director valve (U) to DOWN. The ram will slowly drop.

The pump air bleed valve (H) relieves air trapped between it and the pump after the air is shut off. Trapped air can cause the pump to cycle unexpectedly. Install the valve close to the pump.

The fluid drain valve assists in relieving fluid pressure in the displacement pump, hose, and gun. Triggering the gun might not be sufficient for relieving pressure.

- **Main air bleed valve (E)**  
Required in your system to shut off the air supply to the pump and ram (see **WARNING** at left). When closed, the valve bleeds off all air in the ram and pump, and the ram slowly lowers. Be sure the valve is easily accessible from the pump and is installed **upstream** from the air manifold (F).
- **Pump air bleed valve (H)**  
Required in your system to relieve air trapped between it and the air motor when the valve is closed (see **WARNING** at left). Be sure the valve is easily accessible from the pump, and is installed **downstream** from the air regulator (G).
- **Air regulator (G)**  
Controls pump speed and outlet pressure by adjusting the air pressure to the pump. Install the regulator close to the pump, but **upstream** from the pump air bleed valve.
- **Air manifold (F)**  
Has a swivel air inlet. Mounts to the cart and provides ports for connecting lines to air-powered accessories.
- **Air line filter (J)**  
Removes harmful dirt and moisture from the compressed air supply.
- **Second bleed-type air valve (K)**  
Isolates air line accessories for servicing. Install upstream from all other air line accessories.
- **Ram air regulator (T)**  
Controls air pressure to the ram.
- **Ram director valve (U)**  
Controls raising and lowering of the ram.
- **Air release valve (V)**  
Opens and closes flow of air to assist raising the ram plate (C) out of an empty drum.
- **Vent valve (CC)**  
Bleeds air from under the ram plate (C) to assist in priming the pump and lowering the ram plate into the drum.

# Setup

Some pumps require assembly. To install the pump and other components on the ram, follow the instructions at right for **Senator and Bulldog Pumps** or on page 10 for **President and Monark Pumps**. To mount a Check-Mate 200 Pump on a ram, install the 224829 Mounting Kit (see pages 58 to 61).

## Location

Position the ram so the air regulators for the pump and the ram are easily accessible. Ensure that there is sufficient overhead clearance when the ram is fully raised. See the Dimensional Drawing in the separate ram manual 306934, supplied.

Using the holes in the ram base as a guide, drill holes for 1/2 in. (13 mm) anchors.

Check that the ram base is level in all directions. If necessary, level the base using metal shims. Secure the base to the floor using 13 mm (1/2 in.) anchors that are long enough to prevent the ram from tipping.

## Air and Fluid Hoses

Be sure all air hoses (D) and fluid hoses (N, P) are properly sized and pressure-rated for your system. Use only electrically conductive hoses. Fluid hoses must have spring guards on both ends. Use of a short whip hose (P) and a swivel (R) between the main fluid hose (N) and the gun/valve (S) allows freer gun/valve movement.

## Fluid Line Accessories

Install the following accessories in the locations shown in Fig. 2, using adapters as necessary:

- **Fluid drain valve (L)**  
Required in your system to relieve fluid pressure in the hose and gun/valve (see **WARNING** on page 7). Screw the drain valve into the open branch of a tee mounted in the fluid line. Install the drain valve pointing down, but so the handle points up when opened.
- **Fluid regulator (M)**  
Controls fluid pressure to the gun/valve and dampens pressure surges.
- **Gun or dispense valve (S)**  
Dispenses the fluid. The gun shown in Fig. 2 is a dispensing gun for highly viscous fluids.
- **Gun swivel (R)**  
Allows freer gun/valve movement.

## Assembly Procedure

### Senator and Bulldog Pumps

1. Install the gasket or o-ring (6) from Mounting Kit 222776 on the ram plate (P). See Fig. 3.
2. Lower the pump (2) onto the ram plate (P), and secure it with the four lugs (5) and screws (4). Secure the pump to the mounting plates (Q) with the screws and washers (R) included with the ram.
3. Install the drum clamps (17) on the cylinders of the ram (1) to hold the drum steady (55 gal. drum models).
4. Install the air regulation kit (7): Insert the air manifold stud in the hole on the ram mounting bracket (S), and secure it with washers and nut (T). Connect the air regulation kit hose (U) to the pump air inlet.
5. **Check-Mate 450 and 200 Pumps:** Screw the bushing (24) into the elbow (21), and screw the elbow onto the pump outlet fitting so the bushing faces straight up.  
**Check-Mate 2100 Pumps:** Screw the swivel end of the outlet adapter (25) onto the pump outlet fitting so the rigid end of the adapter faces straight up.
6. Connect one end of the air hose (20) to the 1/4 npt(f) port of the air manifold. Connect the other end to the swivel adapter (BB) to the ram air regulator (see Fig. 3).





# Setup

## President and Monark Pumps

1. Install the gasket (6) from Mounting Kit 222776 on the ram plate (P). See Fig. 4.
2. Install the pump mounting plate (32) onto the ram plates (Q) with the hardware included in Mounting Kit 224829.

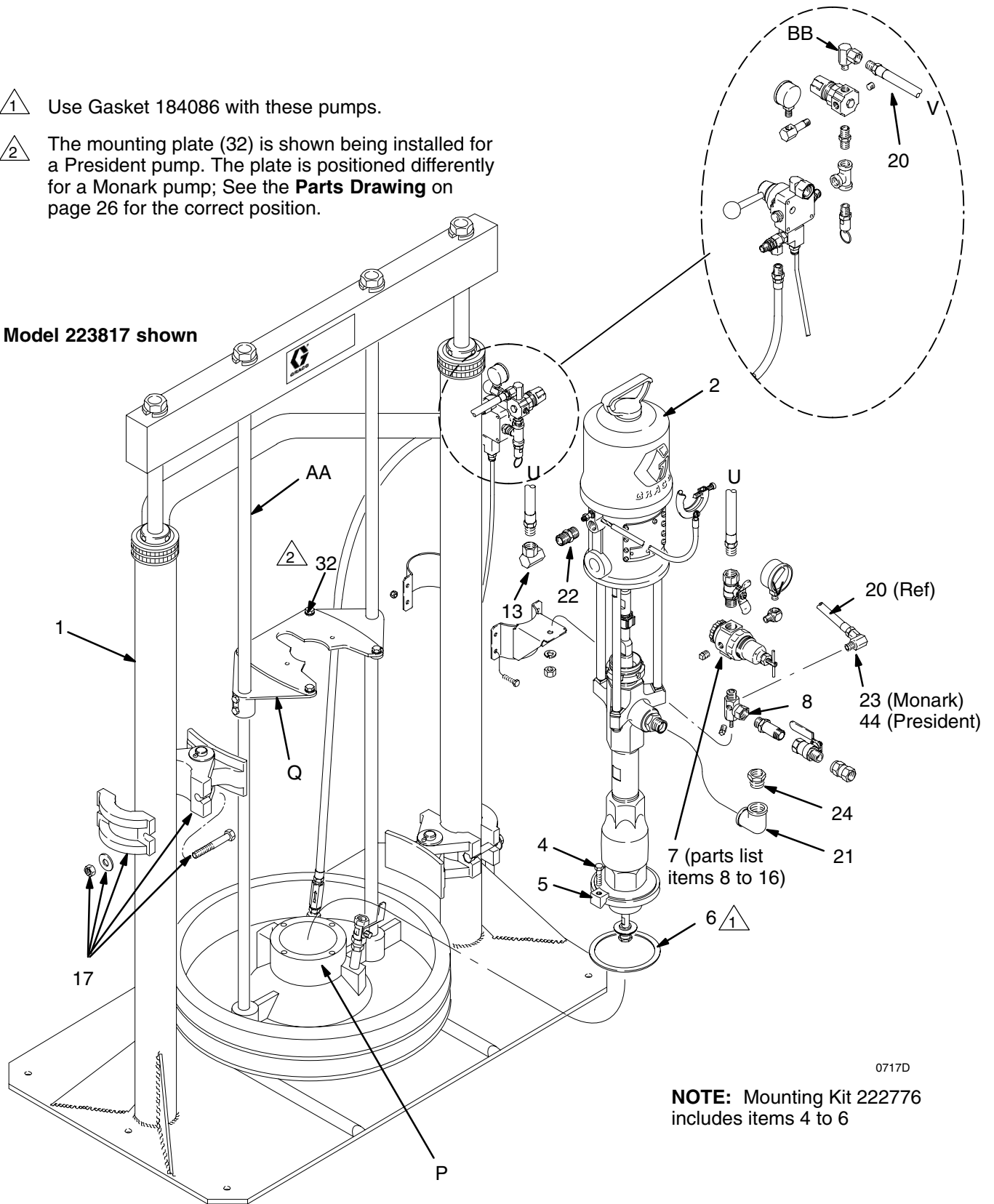
**NOTE:** Fig. 4 shows the plate (32) being installed for a President pump. The mounting plate is positioned differently for a Monark pump. See the correct position in the **Parts Drawing** on page 26.

3. Lower the pump (2) onto the ram plate (P), and secure it with the four lugs (5) and screws (4). Secure the pump to the mounting plate (32) with the supplied hardware.
4. Install the drum clamps (17) on the cylinders of the ram (1) to hold the drum steady.
5. Screw the air inlet adapter (22) from the Accessory Kit 223881 into the pump air inlet. Use 3/8 npt(m) adapter 162505 for Monark pumps. Use 1/2 npt(m) nipple 100122 for President pumps.
6. Install the air regulation kit (7): Connect the non-swivel end of the 90° union (13) to the nipple (22) at the pump air inlet.
7. For Monark pumps, screw the bushing (24) into the elbow (21), then screw the elbow onto the pump outlet fitting so the bushing faces straight up. See the correct position in the **Parts Drawing** on page 26.
8. For Monark pumps, screw the 1/8 npt(m) end of adapter (23) into a 1/8 npt(f) port of the air manifold (8).
9. For President pumps, screw the 1/4 npt male end of 90° swivel union (44) into a 1/4 npt(f) port of the air manifold (8).
10. Connect one end of the air hose (20) to the swivel adapter (23 for Monark) or 90° swivel union (44 for President) at the air manifold (8). Connect the other end to the swivel adapter (BB) to the ram air regulator.

# Setup

- 1 Use Gasket 184086 with these pumps.
- 2 The mounting plate (32) is shown being installed for a President pump. The plate is positioned differently for a Monark pump; See the **Parts Drawing** on page 26 for the correct position.

Model 223817 shown



0717D


**NOTE:** Mounting Kit 222776 includes items 4 to 6


Fig. 4

# Installation

## Connecting Power to the PLC Interface

Perform the following procedure to connect the power to the junction box panel.


**WARNING**



**ELECTRIC SHOCK HAZARD**  
Do not connect the junction box panel to a power source unless you are a trained electrician. Failure to follow standard procedures or to observe the necessary precautions could result in serious bodily injury or equipment damage.



**CAUTION**


If power and grounding connections are not done properly, the equipment may be damaged and the warranty will be voided.

**NOTE:** Have a qualified electrician connect the junction box to a grounded electrical source that has the following required service ratings:

| Description     | Requirements |
|-----------------|--------------|
| Vac:            | 120          |
| Hz:             | 50/60        |
| Phase:          | 1            |
| Circuit Breaker | 5 Amp        |

To connect the junction box panel to the electrical source, do the following:


**WARNING**



**ELECTROCUTION HAZARD**  
Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury. Have only qualified electricians access the control assembly.

1. Shut off system power at the main circuit breaker.
2. Remove the cover from the junction box panel.
3. Locate the PLC power terminals KS102 and KS100 on the terminal strip inside the junction box panel. See Fig. 5. For more information, refer to **Electrical Diagram** on page 14 .
4. Using the upper wire duct on the left-hand side of the junction box panel, string two 14 AWG wires inside the box from the electrical power source.

5. Connect the two 14 AWG wires to power terminals KS102 (L1, hot) and KS100 (L2, neutral) in the junction box panel.
6. Seal the area where wires entered the junction box panel.
7. Replace the cover on the junction box panel.

## PLC Interface (253482 and 253701 only)

The junction box panel includes the following system components. For additional information, refer to the **Electrical Diagram** on page 14.

- System Pressurized lamp is lit when air pressure is supplied to the system; the lamp is extinguished when the air supply is depressurized. This occurs after the Pump On button has been pushed and the pumps turned on.
- Pump Active lamp is lit when the air supply is turned on to the pumps; the lamp is extinguished when the pumps are inactive, thus turned off. This is activated by the Pump On pushbutton.
- Air Pressure On lamp is lit when air pressure to the system is turned on; the lamp is extinguished when air pressure to the system is shutoff.
- Ram Ready lamp is lit when the drum is in position; the lamp is extinguished when the drum is not in position.
- Pump Ready lamp is lit when the pumps are primed and ready for operation; the lamp is extinguished when the pumps are not ready for operation.
- Prime Pump pushbutton turns on the pumps, for priming. When the pumps are primed, the Pump Ready lamp turns on. The switch is not used when the Pump Ready lamp is lit. The Pump Active light will blink.
- Pump Reset pushbutton resets the pumps to an active state. When the pumps are reset, the Pump Active lamp turns off. The switch is not used when the Pump Active lamp is lit. The Pump Ready light is on.
- Pump On pushbutton turns the pumps on and off. When the pumps are turned on, the Pump Active lamp also turns on. When the pumps are turned off, the Pump Active lamp also turns off.
- Bulk Supply Depressurization button opens the depressurization valve to lower the fluid pressure.
- Auto Mode On/Off switch puts the system into or out of automatic operation.

# Installation

## Connecting Power to the PLC Interface (continued)

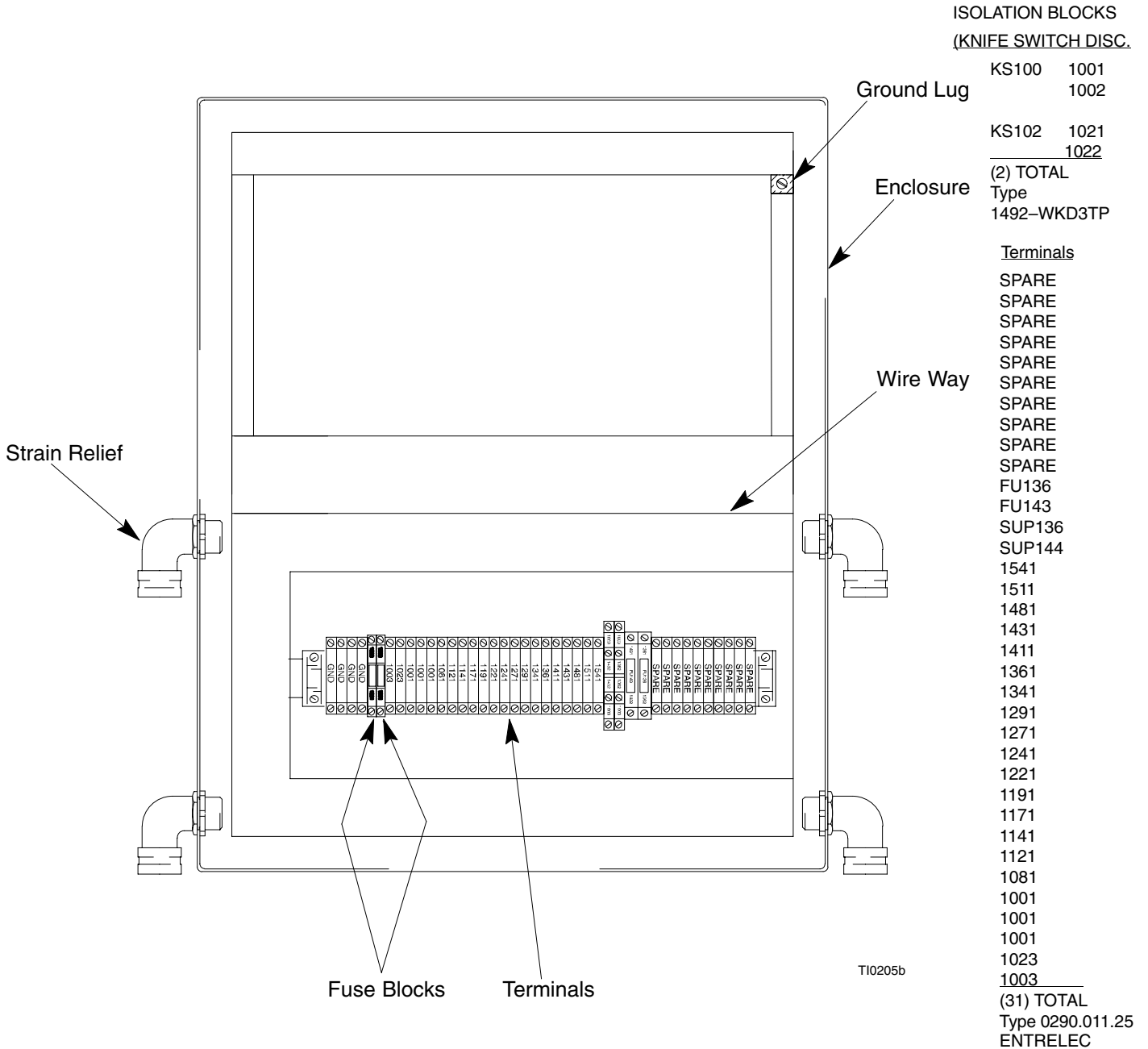
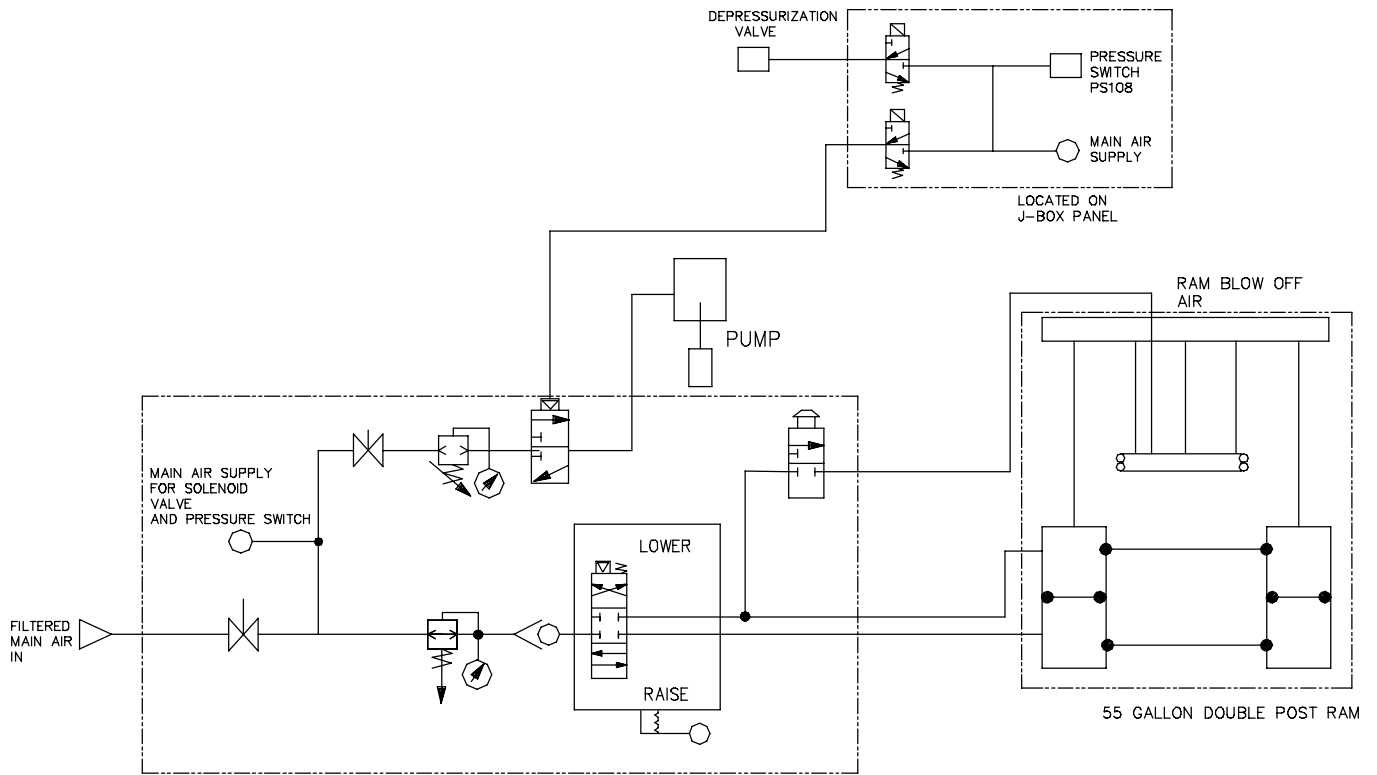


Fig. 5



# Installation



# Operation

## Pressure Relief Procedure

### WARNING



#### SKIN INJECTION HAZARD

The system pressure must be manually relieved to prevent the system from starting or spraying/dispensing accidentally. Fluid under high pressure can be injected through the skin and cause serious injury. To reduce the risk of an injury from injection, splashing fluid, or moving parts, follow the **Pressure Relief Procedure** whenever you

- Are instructed to relieve the pressure
- Stop spraying or dispensing
- Check or service any of the system equipment
- Install or clean the spray tip or nozzle

1. Lock the gun/valve trigger safety.
2. Close the pump air bleed valve (H, required in your system).
3. Shut off the main air bleed valve (E, required in your system). Set the ram director valve (U) to DOWN. The ram will slowly drop.
4. Unlock the gun/valve trigger safety.
5. Hold a metal part of the gun/valve firmly to the side of a grounded metal pail, and trigger the gun/valve to relieve pressure.
6. Lock the gun/valve trigger safety.
7. Open the drain valve (required in your system) and/or the pump bleeder valve (DD), having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray/dispense again.

*If you suspect that the spray tip/nozzle or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, very slowly loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually. Then loosen it completely. Then clear the tip/nozzle or hose.*

## Starting and Adjusting the Ram

1. See Fig. 7. Close all air regulators and air valves.
2. Open the main air bleed valve (E), and set the ram air regulator (T) to 2.8 bar, 0.26 MPa (40 psi). Pull up on the director valve (U) handle so the arrow points to UP, and let the ram raise to its full height.
3. Set a full drum of fluid on the ram base, slide it back against the tube stop, and center it under the ram plate (C). Use the drum clamps (17) to center, hold, and properly align the drum with the ram.
4. Remove the drum cover, and smooth the surface of the fluid with a straightedge.
5. If drum has a plastic liner, pull it over edge of drum. Secure liner with duct tape wrapped around circumference of drum.

### WARNING



#### MOVING PARTS HAZARD

Moving parts can pinch or amputate your fingers. When the pump is operating and when raising or lowering the ram, keep your fingers and hands away from the pump intake, ram plate, and lip of the drum.

**NOTE:** Do not use drums that have side bungs or large dents with this ram. Rough bung openings or large dents will damage the wipers or stop the ram plate, resulting in a runaway pump.

6. Push down on the director valve handle so the arrow points to DOWN, lower the ram until the ram plate is about to enter the drum, and set the valve to neutral. Reposition the drum as necessary so the wipers do not hit the drum lip, and open the vent valve (CC) on the ram plate.
7. Set the director valve to DOWN, and continue to lower the ram until fluid appears at the vent valve (CC). Set the director valve to neutral, and close the vent valve.



# Operation

## Starting and Adjusting the Ram (*continued*)

### Adjusting the Low Limit Switch

**NOTE:** When the low limit switch is activated, the pumps are normally turned off automatically by a customer-supplied control, and a second set of pumps begin pumping.

8. Adjust the low limit switch as follows:

- a. At the junction box panel (see Fig. 8), set the RAM POSITION switch to LOWER, allowing the follower plate to activate the lower limit switch.

- b. Verify that the follower plate lowers to the limit set point: a level between 1–4 in. (25.4–101.6 mm) from the bottom of the drum.
- c. Adjust the low limit switch to activate at the level defined in step 8.b. See Fig. 6.

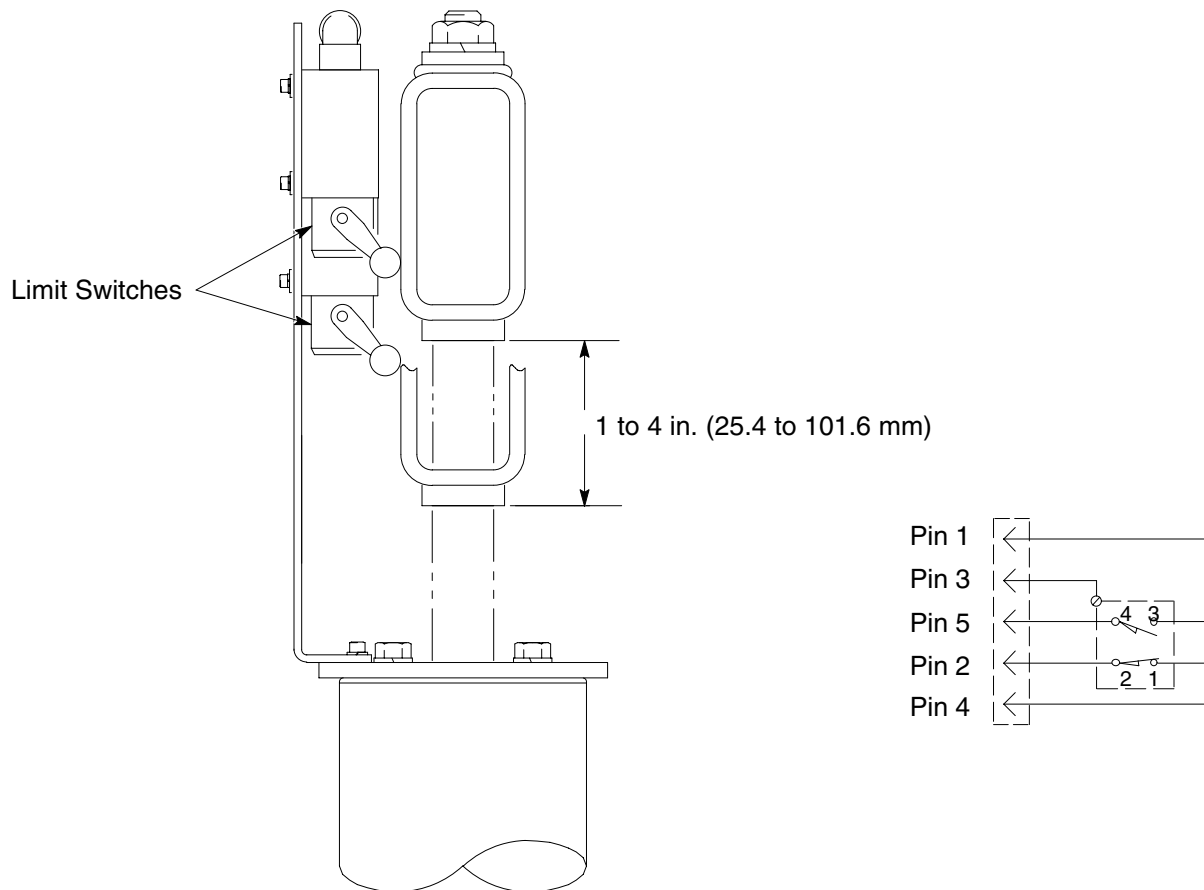


Fig. 6

TI0200

# Operation

Model 236472 shown

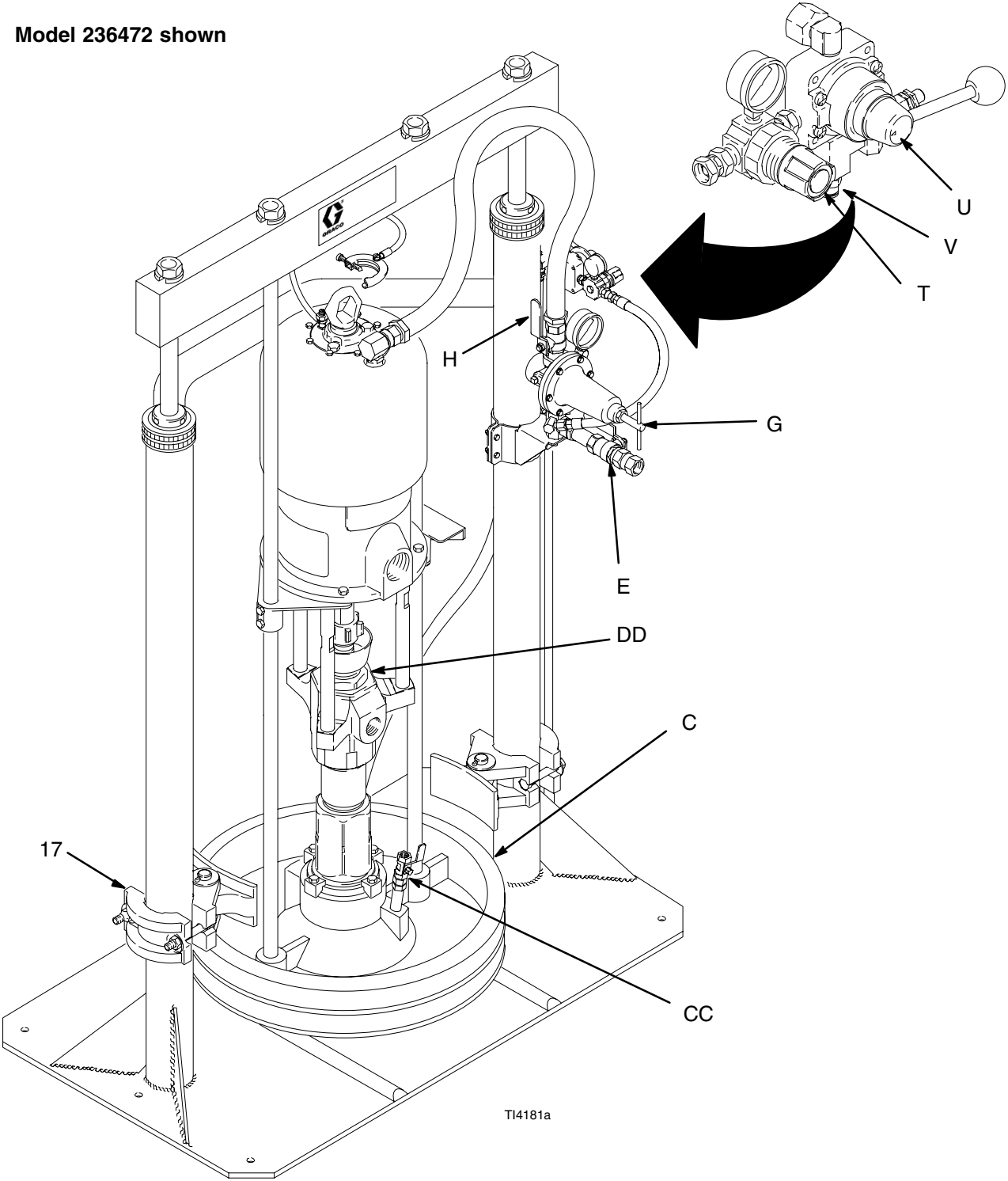


Fig. 7

# Operation

## Starting and Adjusting the Pump

1. Be sure the pump air regulator (G) is closed. Set the ram air regulator (T) to about 3.5 bar, 0.35 MPa (50 psi). Set the director valve (U) to DOWN. See Fig. 7.
2. Start the pump as explained in the separate pump instruction manual.
3. Keep the director valve (U) set to DOWN while the pump is operating.

**NOTE:** Increase air pressure to the ram if the pump does not prime properly with heavier fluids. If fluid is forced out around the top wiper, ram pressure is too high, and the air pressure should be decreased.

## Changing Drums

### **WARNING**



#### **MOVING PARTS HAZARD**

Moving parts can pinch or amputate your fingers. When the pump is operating and when raising or lowering the ram, keep your fingers and hands away from the pump intake, ram plate, and lip of the drum.

1. Stop pump.
2. Close pump air bleed valve (H).
3. Before raising wiper plate, locate push button on air release valve (V) .

4. Set director valve (U) to UP to raise wiper plate. At the same time, carefully equalize pressure in drum by operating air release valve.
5. Raise wiper plate until it is completely out of drum.
6. Remove empty drum.
7. Inspect wiper plate and, if necessary, remove any remaining material or material build-up.
8. Place full drum on ram base.
9. Lower the ram and adjust the position of the drum relative to the ram plate, as explained under **“Starting and Adjusting the Ram”** on page 16.

## Shutdown and Care of the Pump

1. Set the director valve (U) to neutral.

### **WARNING**

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 16.

2. **Relieve the pressure.**
3. Follow the pump shutdown instructions in your separate pump manual.

# Operation

## PLC Interface Switches and Indicators

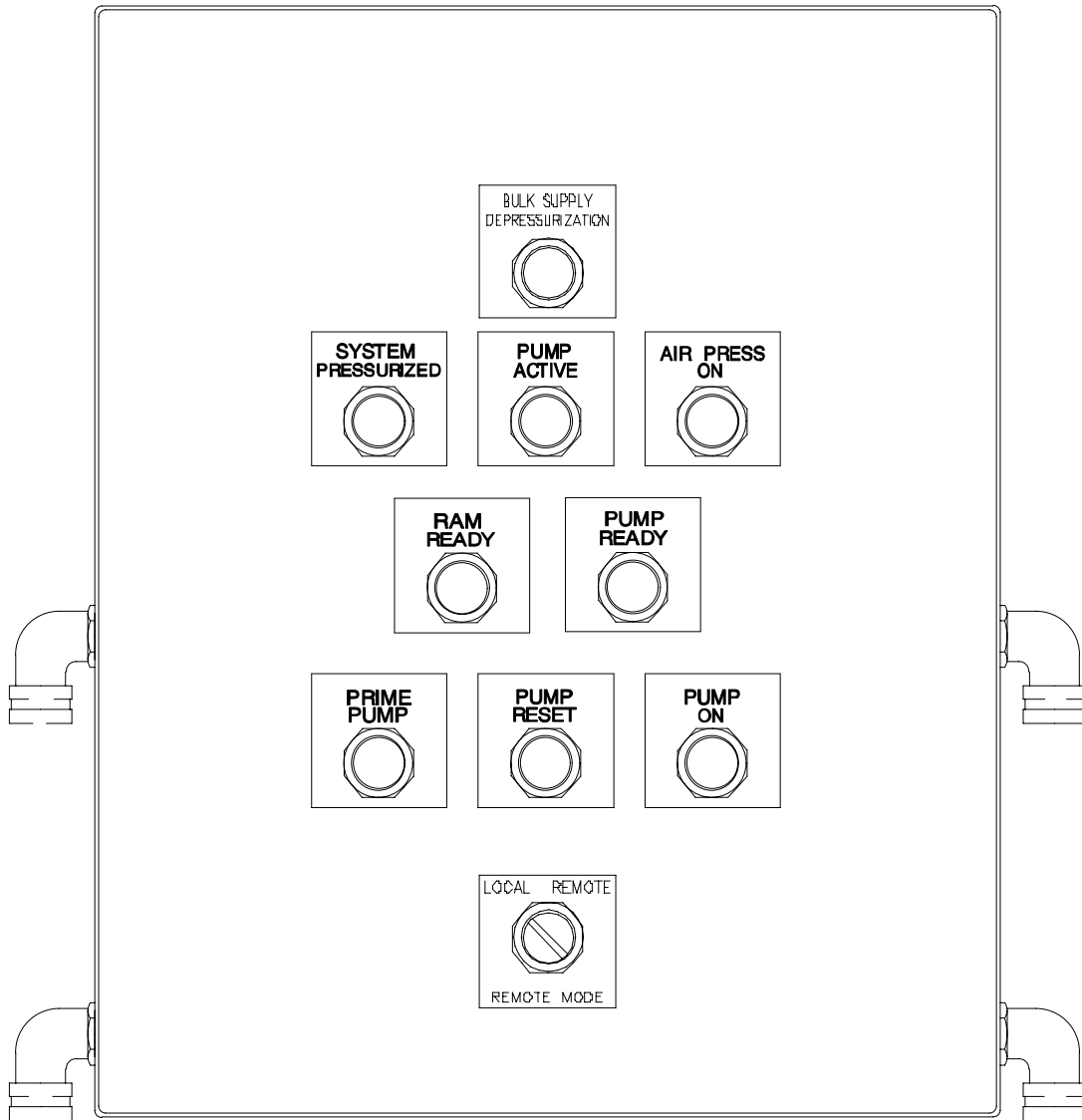
Use the table and Fig. 8 when operating the switches and reading the indicator on the junction box panel.

| Button/Switch                           | What it Does   |
|---|--|
| PRIME PUMP pushbutton                   | <ul style="list-style-type: none"> <li>Primes both displacement pumps with material, making the pumps ready to operate.</li> <li>Lights PUMP READY light.</li> </ul> |
| PUMP RESET pushbutton                   | <ul style="list-style-type: none"> <li>Restarts the pumps after the pumps were turned off.</li> <li>Lights PUMP ACTIVE light</li> </ul>                              |
| PUMP ON pushbutton                      | <ul style="list-style-type: none"> <li>Activates the pumps.</li> <li>Deactivates the pumps.</li> </ul>   |
| Bulk Supply Depressurization pushbutton | <ul style="list-style-type: none"> <li>Opens the depressurization valve to lower the fluid supply pressure.</li> </ul>   |
| AUTO MODE ON/OFF switch                 | <ul style="list-style-type: none"> <li>Places fluid dispensing system into Automatic or Manual mode.</li> </ul>  |

| Indicator                | Indicator Light is | Meaning  |
|--------------------------|--------------------|--|
| SYSTEM PRESSURIZED light | ON                 | System is pressurized.                               |
|                          | OFF                | System is depressurized.                             |
| PUMP ACTIVE light        | ON                 | Pumps are active; air is available to the pumps.     |
|                          | OFF                | Pumps are inactive; air is unavailable to the pumps. |
| AIR PRESSURE ON light    | ON                 | Air pressure is available to the pumps for use.      |
|                          | OFF                | Air pressure is not available to the pumps for use.  |
| RAM READY light          | ON                 | Follower plate is ready for use.                     |
|                          | OFF                | Follower plate is not ready for use.                 |
| PUMP READY light         | ON                 | Pumps are primed and ready to use.                   |
|                          | OFF                | Pumps are not ready to use.                          |

# Operation

## PLC Interface Switches and Indicators (continued)



T10203

195320 Panel Shown

Fig. 8

# PLC Interface Service

This part of the manual provides information about the following junction box panel components:

- Indicator light and pushbutton switch replacement
- Light bulb replacement
- Fuse replacement
- Surge suppressor replacement

**NOTE:** Refer to **PLC Interface Parts** on page 53 while servicing the junction box panel.

## Indicator Light and Pushbutton Switch Removal

**⚠ WARNING**

**ELECTROCUTION HAZARD**  
Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury. Have only qualified electricians access the control assembly.

1. Shut off power to the junction box panel.
2. At the junction box panel, remove the cover from the junction box panel.
3. Disconnect the lead wires from the terminals on the switch. For wiring information, refer to the **Electrical Diagram** on page 14. If necessary, label the wires to facilitate reconnection after replacing the component.
4. Loosen two screws which clamp the fixture to the cover. Rotate and remove the outer ring on the defective component counterclockwise to remove the light lens or switch. Separate the parts and remove them from the cover.

## Indicator Light and Pushbutton Switch Replacement

1. Reverse steps 2 through 4 in the previous paragraph.

2. For wiring information, refer to the **Electrical Diagram** on page 14.
3. Reapply power to the junction box panel.
4. Verify that the replaced component operates correctly.
5. Return the system to current readiness condition.

## Light Bulb Removal

Remove the light bulb as follows:

**⚠ WARNING**

**ELECTROCUTION HAZARD**  
Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury. Have only qualified electricians access the control assembly.

1. Shut off power to the junction box panel.
2. Unscrew and remove the indicator light lens.
3. Gently press and rotate the bulb counterclockwise, 1/4-in. of a turn, unlocking the bulb from its socket. Remove the bulb from the socket.

## Light Bulb Replacement

Replace the light bulb as follows:


1. Insert the light bulb in the socket.
2. Gently press and rotate the bulb clockwise, 1/4-in. of a turn to lock the bulb in its socket.
3. Replace the lens.
4. Reapply power to the junction box panel.
5. Verify that the light bulb operates correctly.
6. Return the system to current readiness condition.

# PLC Interface Service

## Fuse Removal

Remove the fuse as follows:

**⚠ WARNING**



**ELECTROCUTION HAZARD**  
Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury. Have only qualified electricians access the control assembly.

1. Shut off power to the junction box panel.
2. At the junction box panel, remove the cover from the junction box panel.
3. Locate the failed fuse on the terminal strip. Reference Fig. 8 for the fuse terminal identification.
4. Carefully remove the fuse from the fuse holder.

## Fuse Replacement

Replace the fuse as follows:

**NOTE:** Check the new fuse to ensure that it matches the amp rating of the failed fuse.

1. Press both ends of the new fuse evenly into place in the fuse holder. See Fig. 8.
2. Reinstall the cover on the junction box panel.
3. Reapply power to the junction box panel.
4. Verify that the fuse operates correctly.
5. Return the system to current readiness condition.

# PLC Interface Troubleshooting

| Problem  | Cause(s)   | Solution(s)   |
|--|--|---|
| Power from PLC control panel is ON, but no indicator lights are lit at junction box panel. | The knife switch disconnect contacts (KS100 and KS102) are open. | Check the PLC power connections at customer's site.   |
|  | One or more fuses blown.   | Replace the blown fuse(s). Check FU136 and FU143 located inside the knife switch disconnect blocks. |
|  | Voltage limit to circuits in junction box panel was exceeded.    | Check the surge suppressors SUP136 and SUP144. Replace if required. Reset power to unit.            |

# PLC Interface Service

## Surge Suppressor Removal

Remove the surge suppressor as follows:

**⚠ WARNING**

**ELECTROCUTION HAZARD**  
Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury. Have only qualified electricians access the control assembly.

1. Shut off power to the junction box panel.
2. At the junction box panel, remove the cover off the junction box panel.
3. Locate the failed surge suppressor on the terminal strip. Reference Fig. 8 for the surge suppressor terminal identification.
4. Remove the two screws and surge suppressor from the terminal strip.

## Surge Suppressor Replacement

Replace the surge suppressor as follows:

1. Install the new surge suppressor into place on the terminal strip using the two screws. See Fig. 8.
2. Reinstall the cover on the junction box panel.
3. Reapply power to the junction box panel.
4. Verify that the new surge suppressor operates correctly.
5. Return the system to current readiness condition.

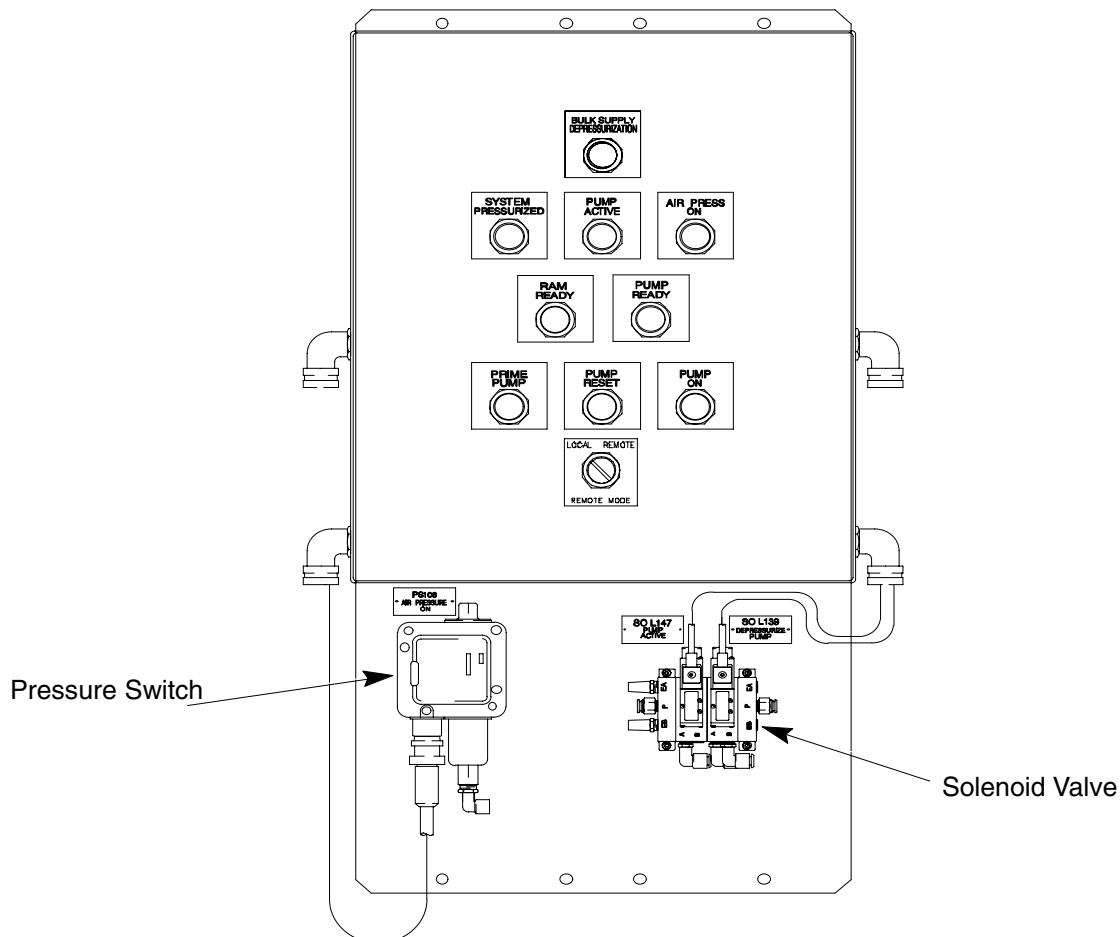


Fig. 9

T10196



# PLC Interface Accessory Kit Service

This part of the manual provides information about the following PLC interface accessory kit components:


- Valve assembly bank replacement
- Pressure switch assembly replacement

## Valve Assembly Bank Replacement

Remove the valve assembly bank that is mounted below the junction box panel as follows:

**NOTE:** The valve assembly bank has two solenoids (SOL139 and SOL147) that are used as switches to control pump operation. SOL139 depressurizes the pumps. SOL147 turns air on to the pumps.

**⚠ WARNING**



**ELECTROCUTION HAZARD**  
Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury. Have only qualified electricians access the control assembly.

1. Shut off power to the junction box panel.

### Valve Assembly Removal

2. At the junction box panel, remove the cover off the junction box panel.
3. Locate the valve assembly (203) that is attached to the mounting plate (201) below the junction box panel (217). See Fig. 9.
4. Disconnect the two cables (216) from the terminal strip inside the junction box panel (217) for the valve assembly (203) bank. For wiring information, refer to the **Electrical Diagram** on page 14.
5. Remove four cap screws (205), the lock washers (206), and the valve assembly (203) from the mounting plate (201).

### Valve Assembly Replacement

6. Install the new valve assembly (203) on the mounting plate (201) using the four cap screws (205) and lock washers (206). See Fig. 9.
7. Reconnect the two cables (216) on the terminal strip inside the junction box panel (217) for the valve assembly (203) bank. For wiring information, refer to the **Electrical Diagram** on page 14.

This part of the manual provides information about the following PLC interface accessory kit components:


- Valve assembly bank replacement
- Pressure switch assembly replacement

## Valve Assembly Bank Replacement

Remove the valve assembly bank that is mounted below the junction box panel as follows:

**NOTE:** The valve assembly bank has two solenoids (SOL139 and SOL147) that are used as switches to control pump operation. SOL139 depressurizes the pumps. SOL147 turns air on to the pumps.

**⚠ WARNING**



**ELECTROCUTION HAZARD**  
Installing and servicing this equipment requires access to parts which could cause an electric shock or other serious injury. Have only qualified electricians access the control assembly.

1. Shut off power to the junction box panel.

### Valve Assembly Removal

2. At the junction box panel, remove the cover off the junction box panel.
3. Locate the valve assembly (203) that is attached to the mounting plate (201) below the junction box panel (217). See Fig. 9.
4. Disconnect the two cables (216) from the terminal strip inside the junction box panel (217) for the valve assembly (203) bank. For wiring information, refer to the **Electrical Diagram** on page 14.
5. Remove four cap screws (205), the lock washers (206), and the valve assembly (203) from the mounting plate (201).

### Valve Assembly Replacement

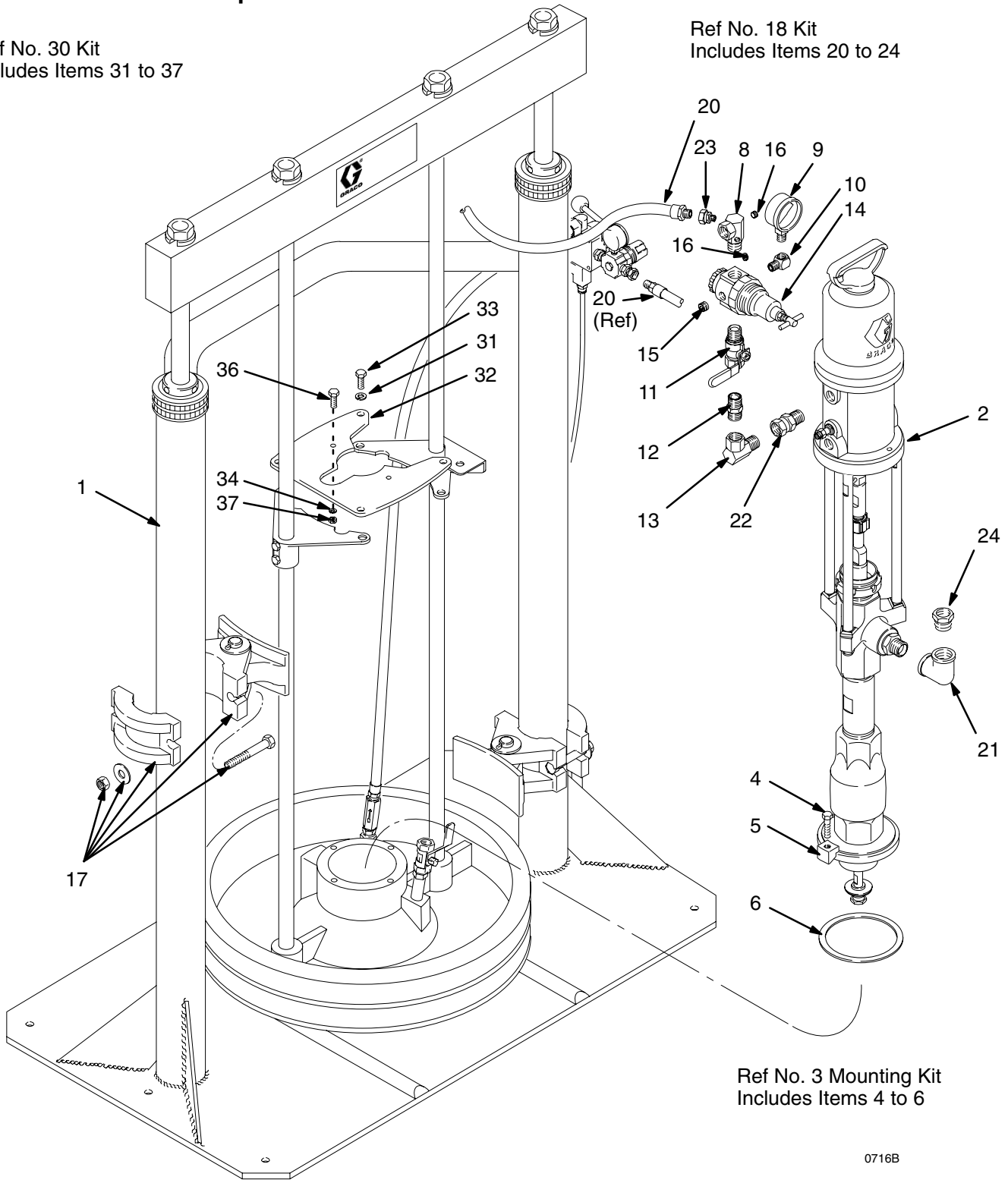
6. Install the new valve assembly (203) on the mounting plate (201) using the four cap screws (205) and lock washers (206). See Fig. 9.
7. Reconnect the two cables (216) on the terminal strip inside the junction box panel (217) for the valve assembly (203) bank. For wiring information, refer to the **Electrical Diagram** on page 14.

# Parts

## Model 223816, Series B 10:1 Ratio Monark Pump

Ref No. 30 Kit  
Includes Items 31 to 37

Ref No. 18 Kit  
Includes Items 20 to 24



0716B

# Parts

## Model 223816, Series B 10:1 Ratio Monark Pump

| Ref No. | Part No. | Description   | Qty | Ref No. | Part No. | Description  | Qty |
|---------|----------|---|-----|---------|----------|--|-----|
| 1       | 207279   | RAM, drum, 200 liter (55 gal.)<br>See 306934 for parts                                | 1   | 20      | 200033   | . HOSE; neoprene; 1/4 in. (6 mm) ID;<br>coupled 1/4 npt (mbe);<br>1.8 m (6 ft) long  | 1   |
| 2       | 222770   | 10:1 RATIO MONARK PUMP<br>See 308017 for parts  | 1   | 21      | 112040   | . ELBOW, fluid outlet, 90°;<br>3/4 npt(fbe)  | 1   |
| 3       | 222776   | KIT, mounting;<br>Includes items 4 to 6   | 1   | 22      | 162505   | . ADAPTER, air inlet;<br>3/8 npt(m) x 1/2 npt(f) swivel;<br>for use with Monark Pump only  | 1   |
| 4       | 102637   | . SCREW, cap, hex hd;<br>3/8-16 unc-2a x 38 mm (1.5 in.) long                         | 4   |         |          |  |     |
| 5       | 276025   | . LUG   | 4   |         | 156684   | . ADAPTER, air inlet;<br>1/2 npt(m) x 1/2 npt(f) swivel;<br>not used on this pump  | 1   |
| 6       | 184086   | . GASKET; PTFE  | 1   |         |          |  |     |
| 7       | 223815   | AIR REGULATION KIT<br>Includes items 8 to 16  | 1   | 23      | 208434   | . ADAPTER, swivel, straight;<br>1/8 npt(m) x 1/4 npsm(f) swivel  | 1   |
| 8       | 162376   | . MANIFOLD, air, swivel;<br>1/2 npt(m) x 1/2 npt(f) swivel;<br>three 1/8 npt(f) ports | 1   | 24      | 100896   | . BUSHING; 3/4 npt(m) x 1/2 npt(f)   | 1   |
| 9       | 100960   | . GAUGE, air pressure;<br>0-14 bar, 0-1.4 MPa (0-200 psi)                             | 1   | 30      | 224829   | RAM MOUNTING KIT<br>Includes items 31 to 37; additional kit<br>parts are not used with this pump;<br>see page 59 for complete list | 1   |
| 10      | 100840   | . ELBOW, street, 90°; 1/4 npt(m x f)  | 1   |         |          |  |     |
| 11      | 107142   | . VALVE, bleed-type; 1/2 npt(m x f)   | 1   | 31      | 100133   | . WASHER, spring lock; 3/8 in.<br>(9.5 mm)   | 4   |
| 12      | 158491   | . NIPPLE; 1/2 npt   | 1   |         |          |  |     |
| 13      | 155470   | . UNION, adapter; 1/2 npt(m) x<br>1/2 npsm(f) swivel                                  | 1   | 32      | 184140   | . PLATE, mounting, pump  | 1   |
| 14      | 104266   | . AIR REGULATOR<br>See 308167 for parts   | 1   | 33      | 100101   | . CAPSCREW, hex hd;<br>3/8-16 unc-2a x 1 in. (25 mm) long  | 4   |
| 15      | 100721   | . PLUG, pipe, headless; 1/4 npt   | 1   | 34      | 100016   | . LOCKWASHER, spring; 1/4 in.<br>(6.3 mm)  | 2   |
| 16      | 104765   | . PLUG, pipe, headless; 1/8 npt   | 2   | 36      | 102313   | . CAPSCREW, hex hd;<br>1/4-20 x 1-3/4 in. (45 mm)  | 2   |
| 17      | 206537   | CLAMP, drum (set of two)  | 1   |         |          |  |     |
| 18      | 223881   | KIT, accessory, ram<br>Includes items 19 to 24  | 1   | 37      | 102025   | . NUT, hex; 1/4-20   | 2   |
| 19      | 155541   | . ADAPTER, swivel, 90°;<br>1/4 npt(m) x 1/4 npsm(f) swivel;<br>not used on this pump  | 1   |         |          |  |     |



# Parts

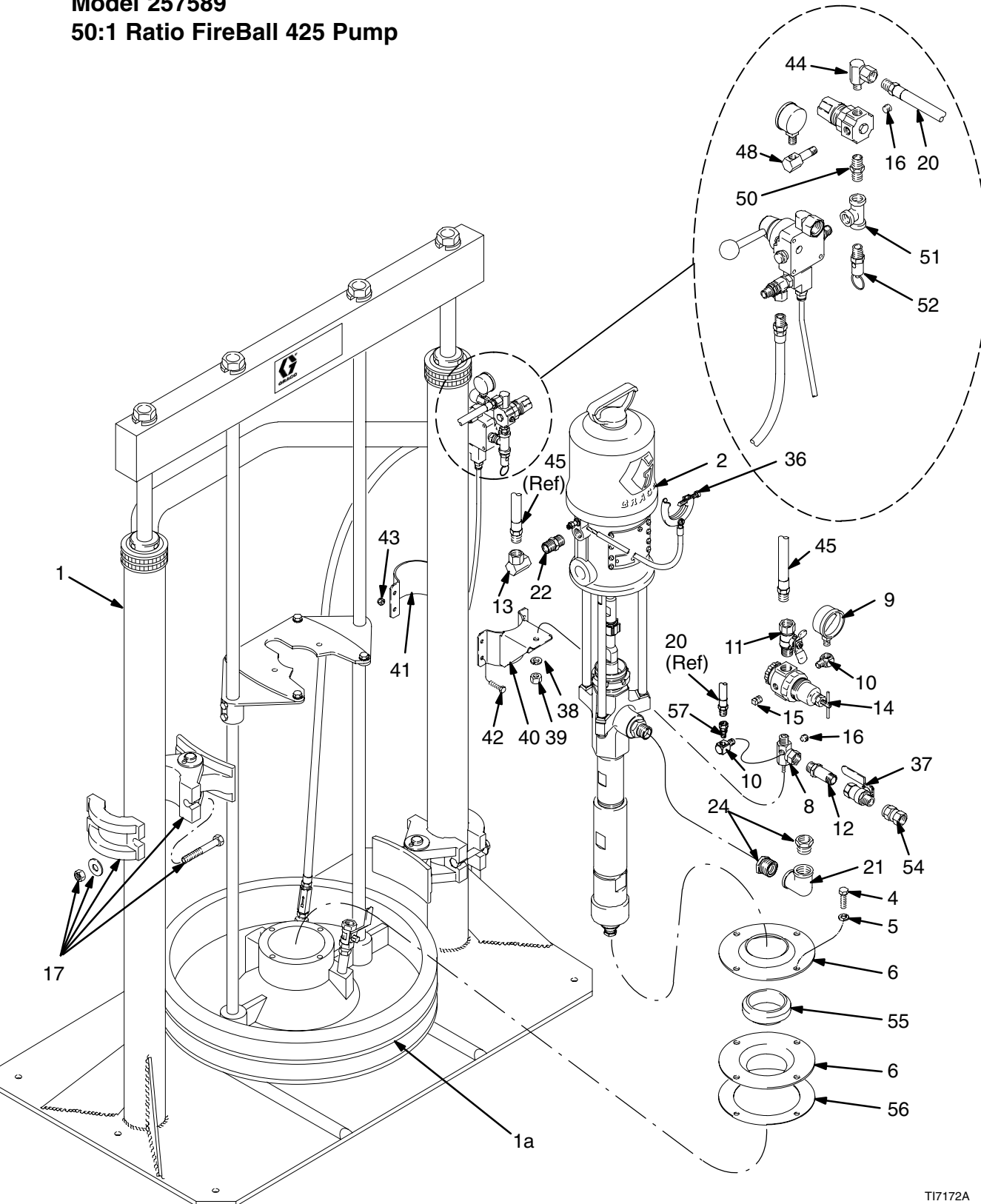
**Model 223817, Series C**  
**Model 253018, Series A**  
**Model 234369, Series A**  
**20:1 Ratio President Pump**

| Ref No. | Part No. | Description   | Qty | Ref No. | Part No. | Description  | Qty |
|---------|----------|---|-----|---------|----------|--|-----|
| 1       | 207279   | RAM, drum, 200 liter (55 gal.)<br>See parts in 306934                                     | 1   | 21      | 112040   | ELBOW, fluid outlet, 90°;<br>3/4 npt(fbe)                            | 1   |
| 1a      | 248088   | PLATE, ram (Model 234369 only)  | 1   | 22      | 100122   | NIPPLE, close; 1/2 npt(m x 2)  | 1   |
|         | C56135   | PLATE, 200 liter (55 gal.) ram; PTFE<br>(Model 253018 only)                               | 1   | 24      | 100896   | BUSHING; 3/4 npt(m) x 1/2 npt(f)                                     | 1   |
| 2       | 222768   | 20:1 RATIO PRESIDENT PUMP<br>(Models 223817 and 253018 only)<br>See 308017 for parts      | 1   | 34      | 100016   | LOCKWASHER, spring; 1/4 in.<br>(6.3 mm)                              | 2   |
|         | 246933   | 20:1 RATIO PRESIDENT PUMP<br>(Model 234369 only)<br>See 308017 for parts                  | 1   | 35      | 100270   | CAPSCREW, hex hd;<br>1/4-20 x 5/8 in. (16 mm)                        | 2   |
| 4       | 102637   | SCREW, cap, hex hd;<br>3/8-16 unc-2a x 38 mm (1.5 in.) long                               | 4   | 36      | 237569   | GROUND WIRE  | 1   |
| 5       | 276025   | LUG   | 4   | 37      | 113269   | VALVE, bleed type; red handled;<br>1/2 npt(m x f)                    | 1   |
| 6       | 109495   | O-RING; fluoroelastomer   | 1   | 38      | 100322   | WASHER, lock   | 2   |
| 8       | 206205   | MANIFOLD, air, swivel;<br>1/2 npt(m) x 3/4 npsm   | 1   | 39      | 100131   | NUT, hex; 3/8-16 unc-2b  | 1   |
| 9       | 100960   | GAUGE, air pressure;<br>0-14 bar, 0-1.4 MPa (0-200 psi)                                   | 1   | 40      | 237962   | BRACKET, welded  | 1   |
| 10      | 100840   | ELBOW, street, 90°; 1/4 npt(m x f)  | 1   | 41      | 190747   | BRACKET, ram   | 1   |
| 11      | 107142   | VALVE, bleed-type; 1/2 npt(m x f)   | 1   | 42      | 100021   | SCREW, cap; 1/4-20 unc-2a  | 4   |
| 12      | 190864   | NIPPLE, reducing; 1/2 npt x 3/4 npt   | 1   | 43      | 102040   | NUT, lock; 1/4-20 unc-3b   | 4   |
| 13      | 157416   | UNION, swivel, 90°; 1/2 npt x<br>1/2 npsm   | 1   | 44      | 155541   | UNION, swivel, 90°;<br>1/4 npt x 1/4 npsm                            | 1   |
| 14      | 104266   | AIR REGULATOR<br>See 308167 for parts   | 1   | 45      | 205418   | HOSE, coupled; buna n/pvc; 1/2 in.<br>(13 mm) ID; 1.8 m (6 ft.) long | 1   |
| 15      | 100509   | PLUG, pipe; 1/4 nptf  | 1   | 46      | 187357   | ELBOW, street  | 1   |
| 16      | 100403   | PLUG, pipe; 1/8 nptf  | 2   | 47      | 156823   | UNION, swivel  | 1   |
| 17      | 206537   | CLAMP, drum (set of two)  | 1   | 48      | 160701   | ELBOW, street, 90°; 1/8 npt(m x f)                                   | 1   |
| 20      | 109123   | HOSE, coupled; buna-n;<br>1/4-18 npt(m x 2); 1/4 in. (6 mm) ID;<br>18.0 in. (0.46 m) long | 1   | 50      | 156971   | NIPPLE; 1/4 npt  | 1   |
|         |          |   |     | 51      | 104984   | TEE; 1/4 npt(f)  | 1   |
|         |          |   |     | 52      | 113286   | VALVE, safety; 1/4 npt(m);<br>10.4 bar, 1.04 MPa (150 psi)           | 1   |
|         |          |   |     | 54      | 155865   | UNION, adapter, swivel;<br>1/2 npt(f) x 1/2 npsm(f)                  | 1   |

# Parts

**Model 234120, Series A**  
**46:1 Ratio President Pump**  
**Model 247156, Series A**  
**46:1 Ratio President Pump, PTFE**  
**Model 257589**  
**50:1 Ratio FireBall 425 Pump**

**Model 234121, Series A**  
**23:1 Ratio Monark Pump**  
**Model 247155, Series A**  
**23:1 Ratio Monark Pump, PTFE**



T17172A

# Parts

## Model 234120, Series A 46:1 Ratio President Pump

## Model 247156, Series A 46:1 Ratio President Pump, PTFE

## Model 257589 50:1 Ratio FireBall 425 Pump

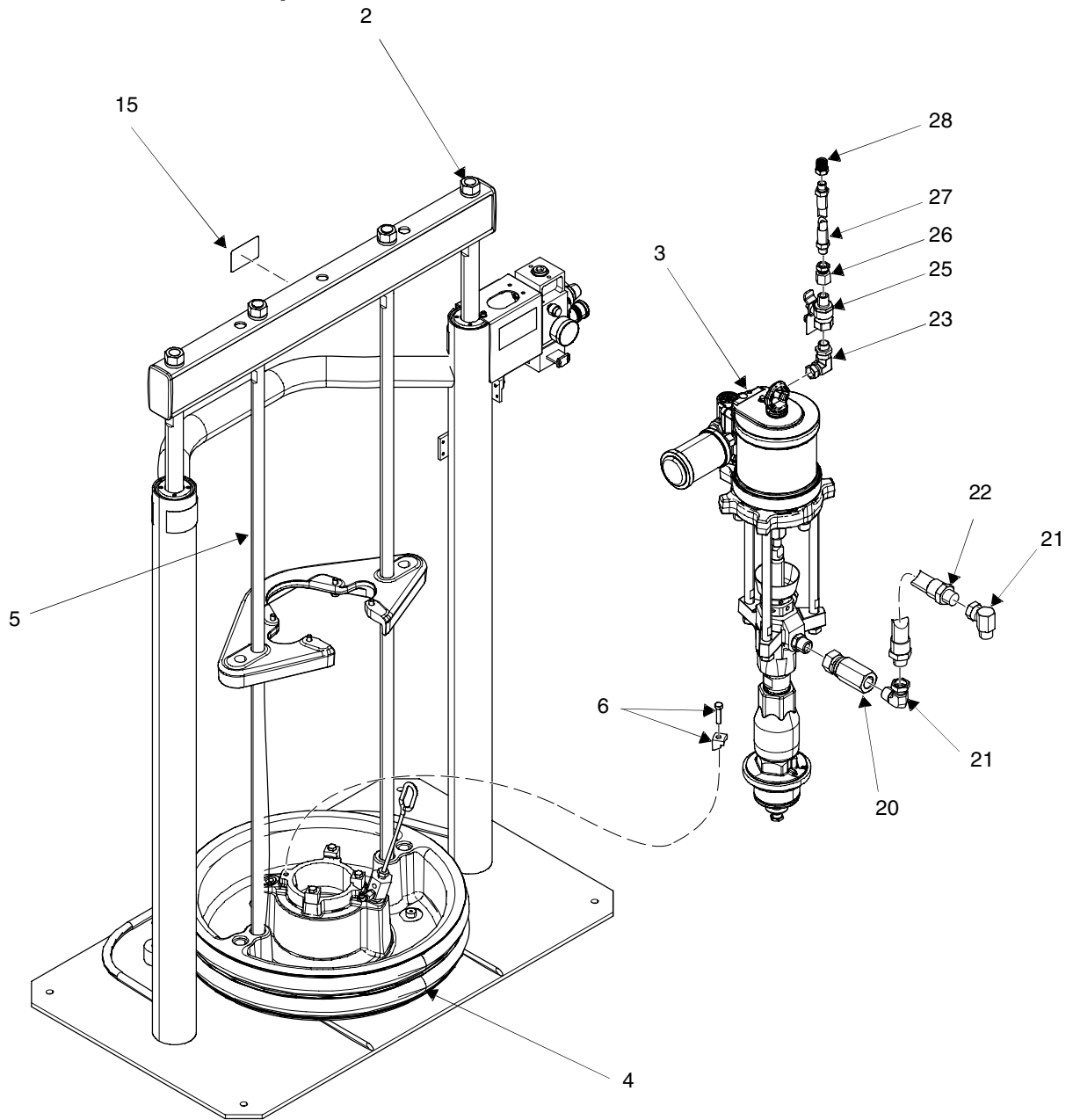
## Model 234121, Series A 23:1 Ratio Monark Pump

## Model 247155, Series A 23:1 Ratio Monark Pump, PTFE

| Ref No. | Part No. | Description   | Qty | Ref No. | Part No. | Description  | Qty |
|---------|----------|---|-----|---------|----------|--|-----|
| 1       | 215335   | RAM, drum, 200 liter (55 gal.)<br>See parts in 306934                                     | 1   | 22      | 100122   | NIPPLE, close; 1/2 npt(m x 2)<br>(Model 234120 only)                     | 1   |
| 1a      | 238929   | PLATE, ram, 200 liter (55 gal.)<br>(234120, 234121, 257589 only)                          | 1   |         | 159239   | NIPPLE, pipe; 1/2 x 3/8npt<br>(Model 234121 only)                        | 1   |
|         | C56135   | PLATE, ram, 200 liter, (55 gal.), PTFE<br>(247155, 247156 only)                           | 1   | 24      | 100896   | BUSHING; 3/4 npt(m) x 1/2 npt(f)   | 2   |
| 2       | 237205   | 46:1 RATIO PRESIDENT PUMP<br>(234120 only)<br>See 308080 for parts                        | 1   | 34      | 100016   | LOCKWASHER, spring; 1/4 in.<br>(6.3 mm)                                  | 2   |
|         | 222907   | 46:1 RATIO PRESIDENT PUMP<br>(247156 only)<br>See 308200 for parts                        | 1   | 35      | 100270   | CAPSCREW, hex hd;<br>1/4-20 x 5/8 in. (16 mm)                            | 2   |
|         | 205395   | 50:1 RATIO FireBall 425 PUMP<br>(257589 only)<br>See 306674 for parts                     | 1   | 36      | 237569   | GROUND WIRE  | 1   |
|         | 222782   | 23:1 RATIO MONARK PUMP<br>(234121 only)<br>See 308080 for parts                           | 1   | 37      | 113269   | VALVE, bleed type; red handled;<br>1/2 npt(m x f)                        | 1   |
|         | 222839   | 23:1 RATIO MONARK PUMP<br>(247155 only)<br>See 308200 for parts                           | 1   | 38      | 100322   | WASHER, lock   | 2   |
| 4       | 100004   | SCREW, cap, hex hd;<br>3/8-16 unc-2a x 32 mm (1.25 in.) long                              | 4   | 39      | 100131   | NUT, hex; 3/8-16 unc-2b  | 1   |
| 5       | 100133   | WASHER, lock; 3/8   | 4   | 40      | 237962   | BRACKET, welded  | 1   |
| 6       | 162789   | PLATE, seal   | 2   | 41      | 190747   | BRACKET, ram   | 1   |
| 8       | 206205   | MANIFOLD, air, swivel;<br>1/2 npt(m) x 3/4 npsm   | 1   | 42      | 100021   | SCREW, cap; 1/4-20 unc-2a  | 4   |
| 9       | 100960   | GAUGE, air pressure;<br>0-14 bar, 0-1.4 MPa (0-200 psi)                                   | 1   | 43      | 102040   | NUT, lock; 1/4-20 unc-3b   | 4   |
| 10      | 187357   | ELBOW, street, 90°; 1/4 npt(m x f)  | 2   | 44      | 155541   | UNION. swivel, 90°;<br>1/4 npt x 1/4 npsm                                | 1   |
| 11      | 107142   | VALVE, bleed-type; 1/2 npt(m x f)   | 1   | 45      | 205418   | HOSE, coupled; buna n/pvc; 1/2 in.<br>(13 mm) ID; 1.8 m (6 ft.) long     | 1   |
| 12      | 190864   | NIPPLE, reducing; 1/2 npt x 3/4 npt   | 1   | 48      | 160701   | ELBOW, street, 90°; 1/8 npt(m x f)                                       | 1   |
| 13      | 157416   | UNION, swivel, 90°; 1/2 npt x<br>1/2 npsm   | 1   | 50      | 156971   | NIPPLE; 1/4 npt  | 1   |
| 14      | 104266   | AIR REGULATOR<br>See 308167 for parts   | 1   | 51      | 104984   | TEE; 1/4 npt(f)  | 1   |
| 15      | 100509   | PLUG, pipe; 1/4 nptf  | 1   | 52      | 113286   | VALVE, safety; 1/4 npt(m);<br>10.4 bar, 1.04 MPa (150 psi)               | 1   |
| 16      | 100403   | PLUG, pipe; 1/8 nptf  | 2   |         | 116643   | VALVE, safety; 1/4 npt(m);<br>6.2 bar, .62 MPa (90 psi)<br>(257589 only) | 1   |
| 17      | 206537   | CLAMP, drum (set of two)  | 1   | 54      | 155865   | UNION, adapter, swivel;<br>1/2 npt(f) x 1/2 npsm(f)                      | 1   |
| 20      | 109123   | HOSE, coupled; buna-n;<br>1/4-18 npt(m x 2); 1/4 in. (6 mm) ID;<br>18.0 in. (0.46 m) long | 1   | 55      | 161452   | SEAL, follow plate   | 1   |
| 21      | 112040   | ELBOW, fluid outlet, 90°;<br>3/4 npt(fbe)   | 1   | 56      | 162788   | GASKET   | 1   |
|         |          |   |     | 57      | 156823   | UNION, swivel  | 1   |

# Parts

## Model 570114, Series A 20:1 Ratio Check-Mate Pump





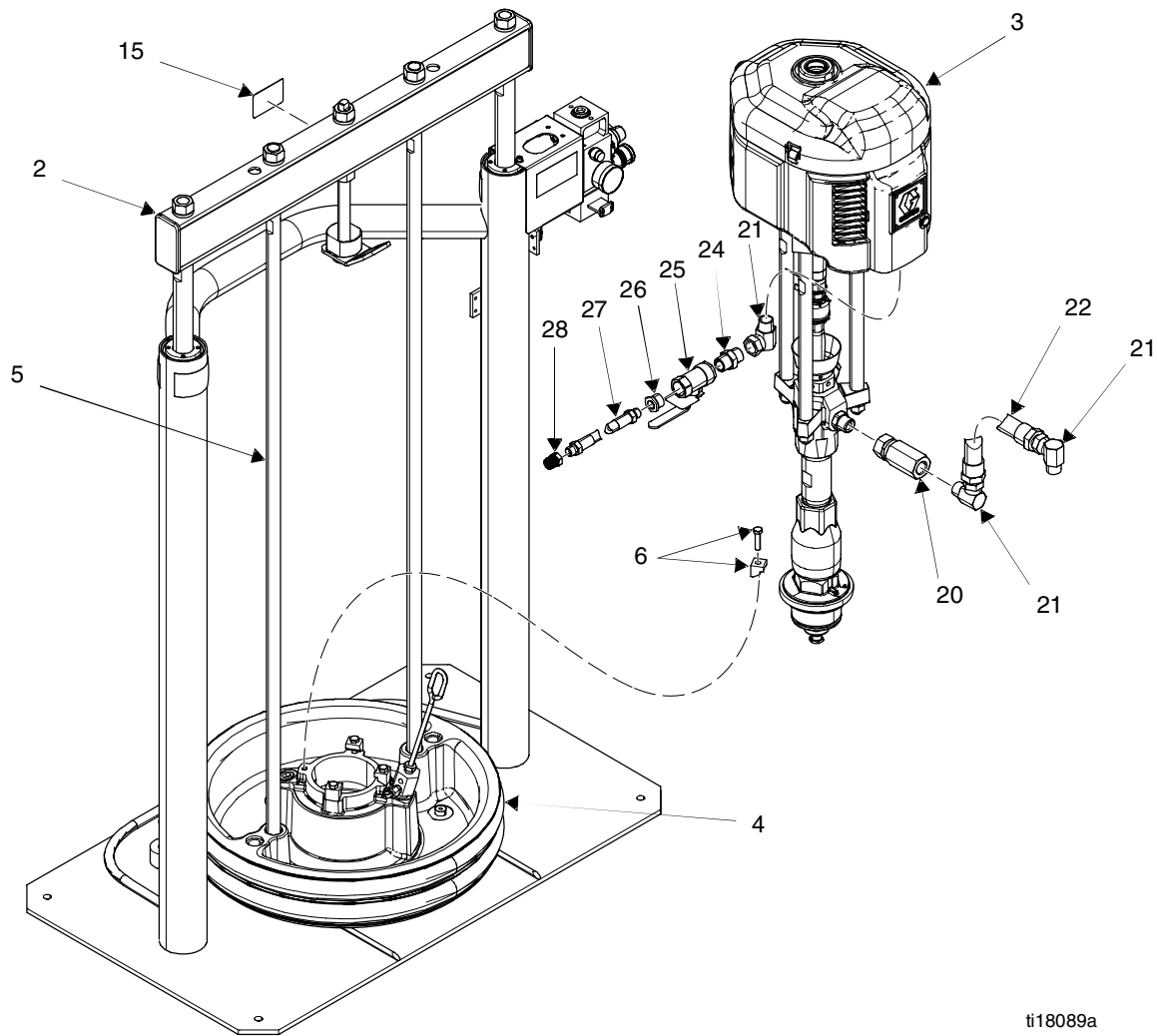
# Parts

## Model 570114 20:1 Ratio Check-Mate Pump

| Ref No. | Part No. | Description                       | Qty |
|---------|----------|-----------------------------------|-----|
| 2       | 24C769   | RAM, 3" int air, (no pump reg)    | 1   |
| 3       | P20LCS   | PUMP, 20:1 700/060 l cs s         | 1   |
| 4       | 255319   | PLATE, wiper 55gal epdm           | 1   |
| 5       | 257299   | KIT, d200, 200l, 700-1800         | 1   |
| 6       | 255392   | KIT, mounting, cm lower           | 1   |
| 6a      | 102637   | SCREW                             | 1   |
| 6b      | 276025   | CLAMP                             | 1   |
| 6c      | 109495   | O-RING                            | 1   |
| 7       | 206537   | CLAMP, drum, set of 2 (not shown) | 1   |
| 9       | 100132   | WASHER, flat (not shown)          | 4   |
| 10      | 100464   | SCREW, lag (not shown)            | 4   |
| 15      | 292735   | ARTWORK, identification           | 1   |
| 17      | 070408   | SEALANT, pipe, sst                | 1   |
| 20      | 220179   | VALVE, check                      | 1   |
| 21      | 160327   | FITTING, union adapter, 90 deg    | 2   |
| 22      | 236422   | HOSE, coupled 61220               | 1   |
| 23      | 100122   | NIPPLE, close                     | 2   |
| 24      | 157416   | FITTING, swivel, union, 90 deg    | 1   |
| 25      | 107142   | VALVE, ball, vented               | 1   |
| 26      | 161077   | FITTING, union, adapter, straight | 1   |
| 27      | 214651   | HOSE, coupled 61209               | 1   |
| 28      | 158212   | BUSHING                           | 1   |
| 31      | 237569   | WIRE, assy, 25 ft                 | 1   |
| 32      | 070182   | TAPE, electrical                  | 1   |
| 33      | 206994   | FLUID, tsl 8 oz bottle            | 1   |

# Parts

## Model 965572, Series A 40:1 Ratio Check-Mate Pump



ti18089a

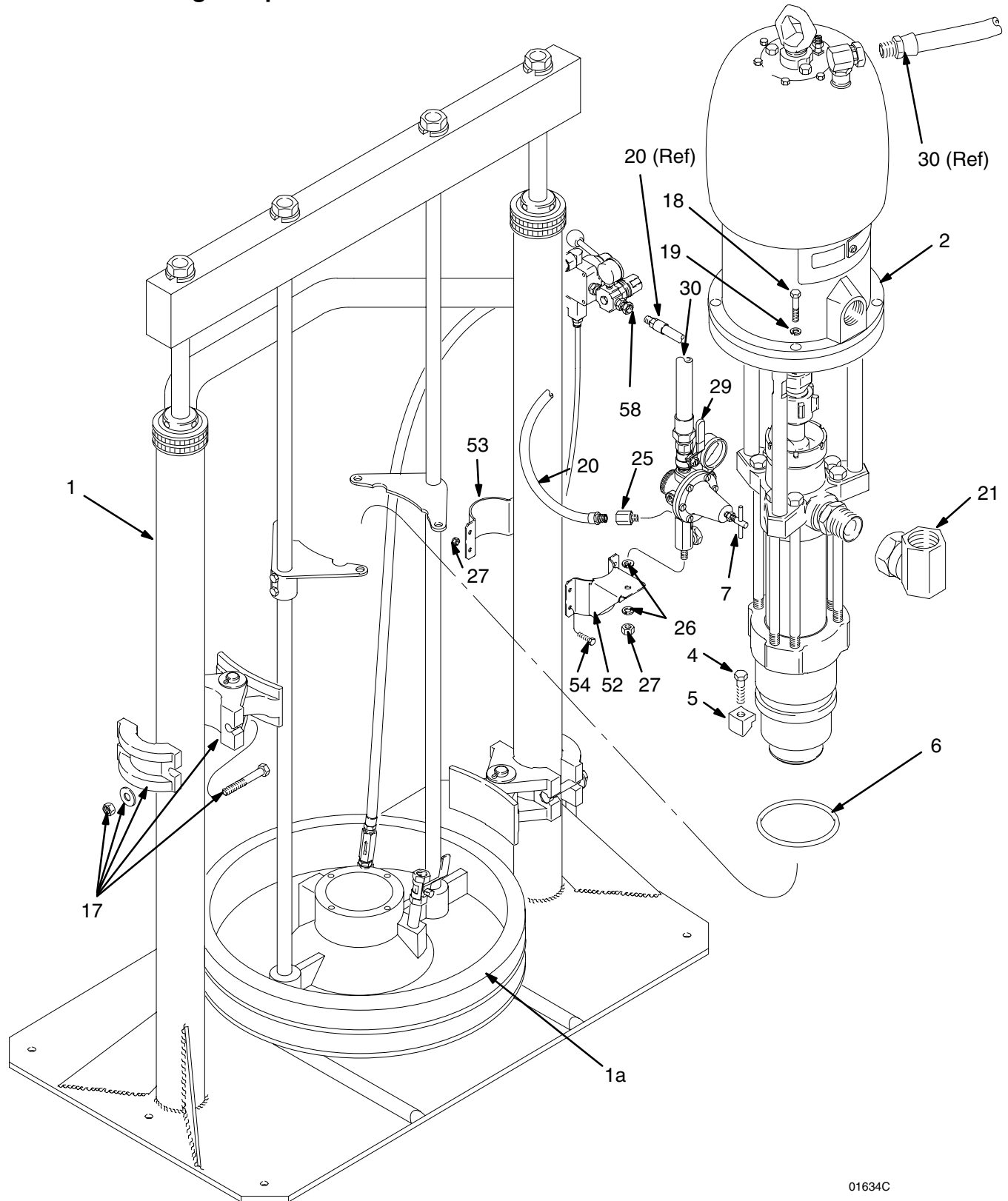
# Parts

## Model 965572, Series A 40:1 Ratio Check-Mate Pump

| Ref No. | Part No. | Description                    | Qty |
|---------|----------|--------------------------------|-----|
| 2       | 24C769   | RAM, 3" int air, (no pump reg) | 1   |
| 3       | P40LCS   | PUMP, 40:1 2200/100 cs sd      | 1   |
| 4       | 255319   | PLATE, wiper 55gal epdm        | 1   |
| 5       | 255305   | KIT, mounting nxt 3in 55gal    | 1   |
| 6       | 255392   | KIT, mounting, cm lower        | 1   |
| 7       | 206537   | CLAMP, drum, set of 2          | 1   |
| 9       | 100132   | WASHER, flat                   | 4   |
| 10      | 100464   | SCREW, lag                     | 4   |
| 15      | 292735   | ARTWORK, identification        | 1   |
| 17      | 070408   | SEALANT, pipe, sst             | 1   |
| 20      | 220179   | VALVE, check                   | 1   |
| 21      | 160327   | FITTING, union adapter, 90 deg | 3   |
| 22      | 236422   | HOSE, coupled, 61220           | 1   |
| 24      | C20487   | FITTING, nipple, hex           | 1   |
| 25      | 113332   | VALVE, ball, vented, .750      | 1   |
| 26      | 100505   | BUSHING, pipe                  | 1   |
| 27      | 214651   | HOSE, coupled, 61209           | 1   |
| 28      | 158212   | BUSHING                        | 1   |
| 31      | 237569   | WIRE, assy, 25 ft              | 1   |
| 32      | 070182   | TAPE, electrical               | 1   |
| 33      | 206994   | FLUID, tsl 8 oz bottle         | 1   |

# Parts

Model 234371, Series A  
12:1 Ratio Bulldog Pump



01634C

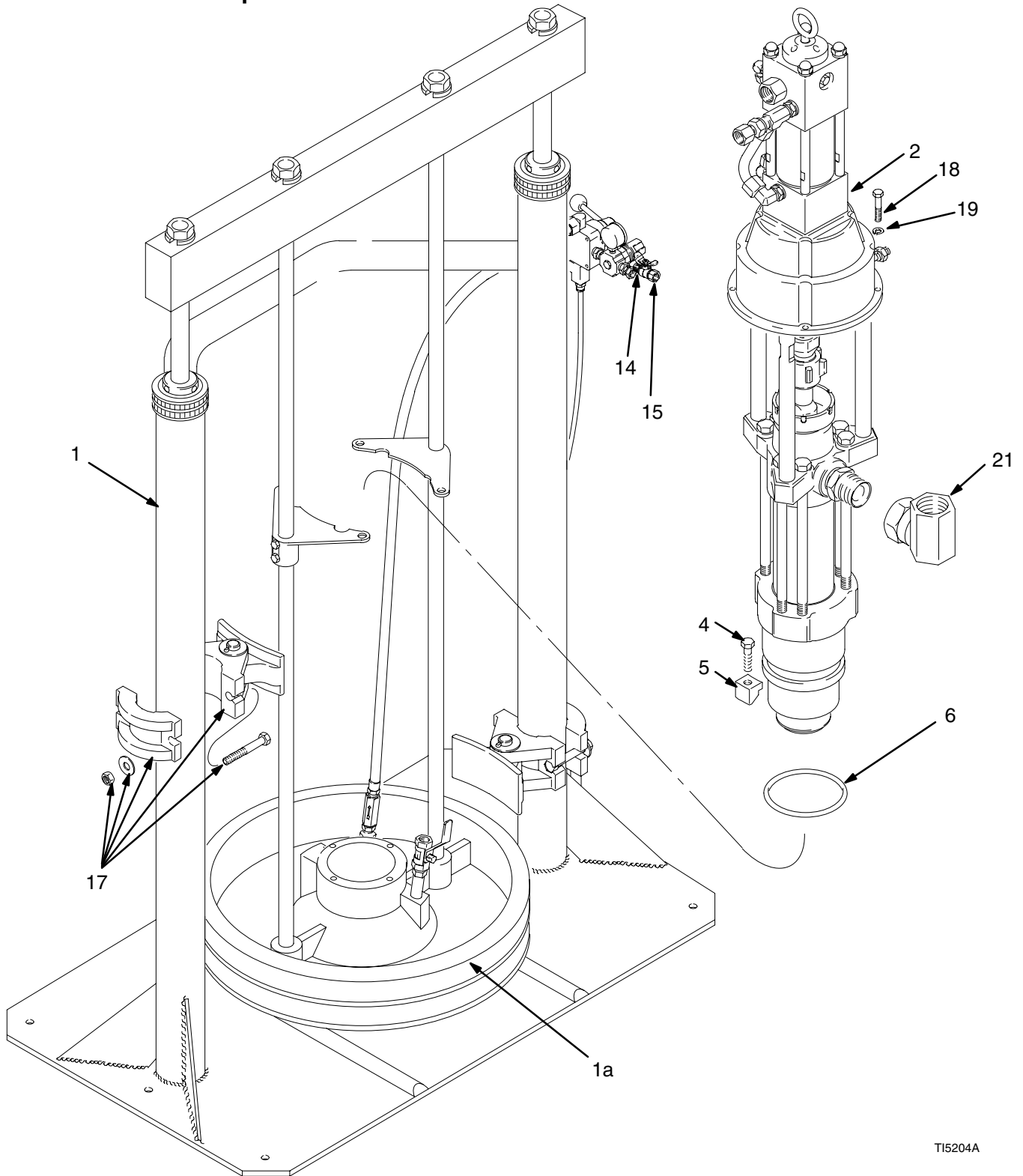
# Parts

## Model 234371, Series A 12:1 Ratio Bulldog Pump

| Ref No. | Part No. | Description  | Qty | Ref No. | Part No. | Description  | Qty |
|---------|----------|--|-----|---------|----------|--|-----|
| 1       | 207279   | RAM, drum, 200 liter (55 gal.)<br>See parts in 306934                                      | 1   | 21      | 109512   | ADAPTER, fluid outlet, 90°;<br>1-1/2 npt(f) x 1-1/2 npsm(f) swivel | 1   |
| 1a      | 248088   | PLATE, ram; used in place of standard<br>ram plate on Model 234371 only.                   | 1   | 25      | 159840   | ADAPTER, swivel, 90°;<br>1/4 npt(m) x 1/4 nps(f) swivel            | 1   |
| 2       | 246935   | 12:1 RATIO BULLDOG PUMP,<br>(Model 234371 only)<br>See 308149 for parts                    | 1   | 26      | 100322   | WASHER, lock   | 2   |
| 4       | 102637   | SCREW, cap, hex hd;<br>3/8-16 unc-2a x 38 mm (1.5 in.) long                                | 4   | 27      | 100131   | NUT, hex; 3/8-16unc-2b   | 1   |
| 5       | 276025   | LUG  | 4   | 29      | 113269   | VALVE, bleed type; red handled;<br>1/2 npt(m x f)                  | 1   |
| 6       | 109495   | O-RING; fluoroelastomer  | 1   | 30      | 238088   | HOSE, coupled; 3/4-14 npt(m x 2);<br>66.0 in. (1.68 m) long        | 1   |
| 7       | 238724   | AIR REGULATOR<br>See 308168 for parts  | 1   | 52      | 237962   | BRACKET, welded  | 1   |
| 17      | 206537   | CLAMP, drum (set of two)   | 1   | 53      | 190747   | BRACKET, ram   | 1   |
| 18      | 100101   | SCREW, hex hd cap;<br>3/8-16 x 1 in. (25.4 mm) long  | 4   | 54      | 100021   | SCREW, cap; 1/4-20unc-2a   | 4   |
| 19      | 100133   | WASHER, spring lock; 3/8 in. (9.5 mm)  | 4   | 55      | 102040   | NUT, lock; 1/4-20unc-3b  | 4   |
| 20      | 109123   | HOSE, coupled; buna-n;<br>1/4-18 npt (m x 2); 1/4 in. (6 mm) ID;<br>18.0 in. (0.46 m) long | 1   | 58      | 113344   | UNION, swivel; 1/2 npt(m) x<br>3/4 npsm(f)                         | 1   |

# Parts

Model 234376, Series B  
Viscount II 2100 Pump



TI5204A

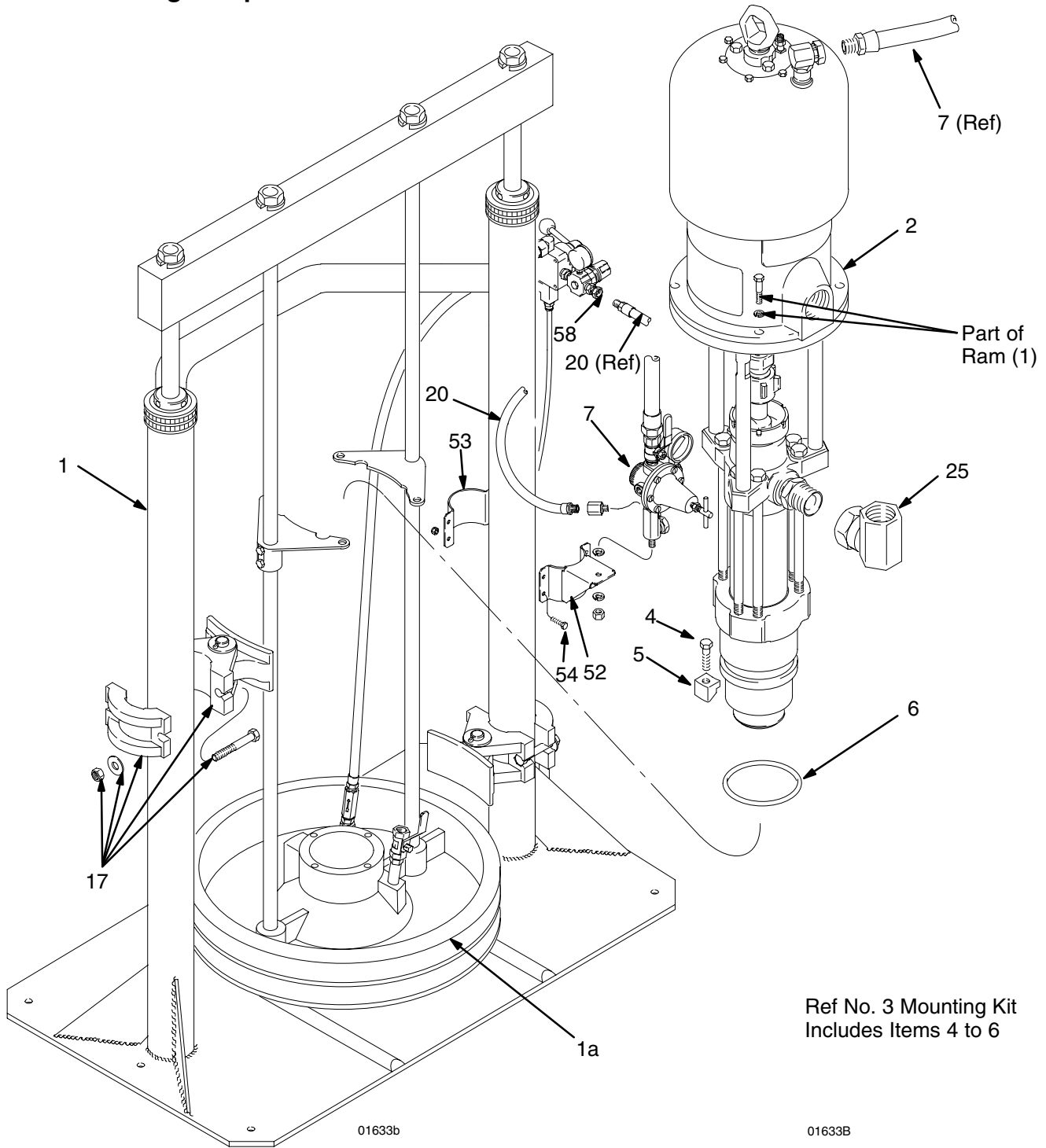
# Parts

## Model 234376, Series B Viscount II 2100 Pump

| Ref No. | Part No. | Description   | Qty | Ref No. | Part No. | Description  | Qty |
|---------|----------|---|-----|---------|----------|--|-----|
| 1       | 207279   | RAM, drum, 200 liter (55 gal.)<br>See parts in 306934       | 1   | 6       | 109495   | O-RING; fluoroelastomer  | 1   |
| 1a      | 248088   | PLATE, ram; used in place of standard<br>ram plate.         | 1   | 14      | 156971   | NIPPLE, short  | 1   |
| 2       | 246937   | PUMP, Viscount/Checkmate<br>See 308149 for parts            | 1   | 15      | 110223   | VALVE, vented 2 way  | 1   |
| 4       | 102637   | SCREW, cap, hex hd;<br>3/8-16 unc-2a x 38 mm (1.5 in.) long | 4   | 17      | 206537   | CLAMP, drum (set of two)   | 1   |
| 5       | 276025   | LUG   | 4   | 18      | 100101   | SCREW, hex hd cap;<br>3/8-16 x 1 in. (25.4 mm) long                | 4   |
|         |          |   |     | 19      | 100133   | WASHER, spring lock; 3/8 in. (9.5 mm)                              | 4   |
|         |          |   |     | 21      | 109512   | ADAPTER, fluid outlet, 90°;<br>1-1/2 npt(f) x 1-1/2 npsm(f) swivel | 1   |

# Parts

Model 234372, Series A  
24:1 Ratio King Pump





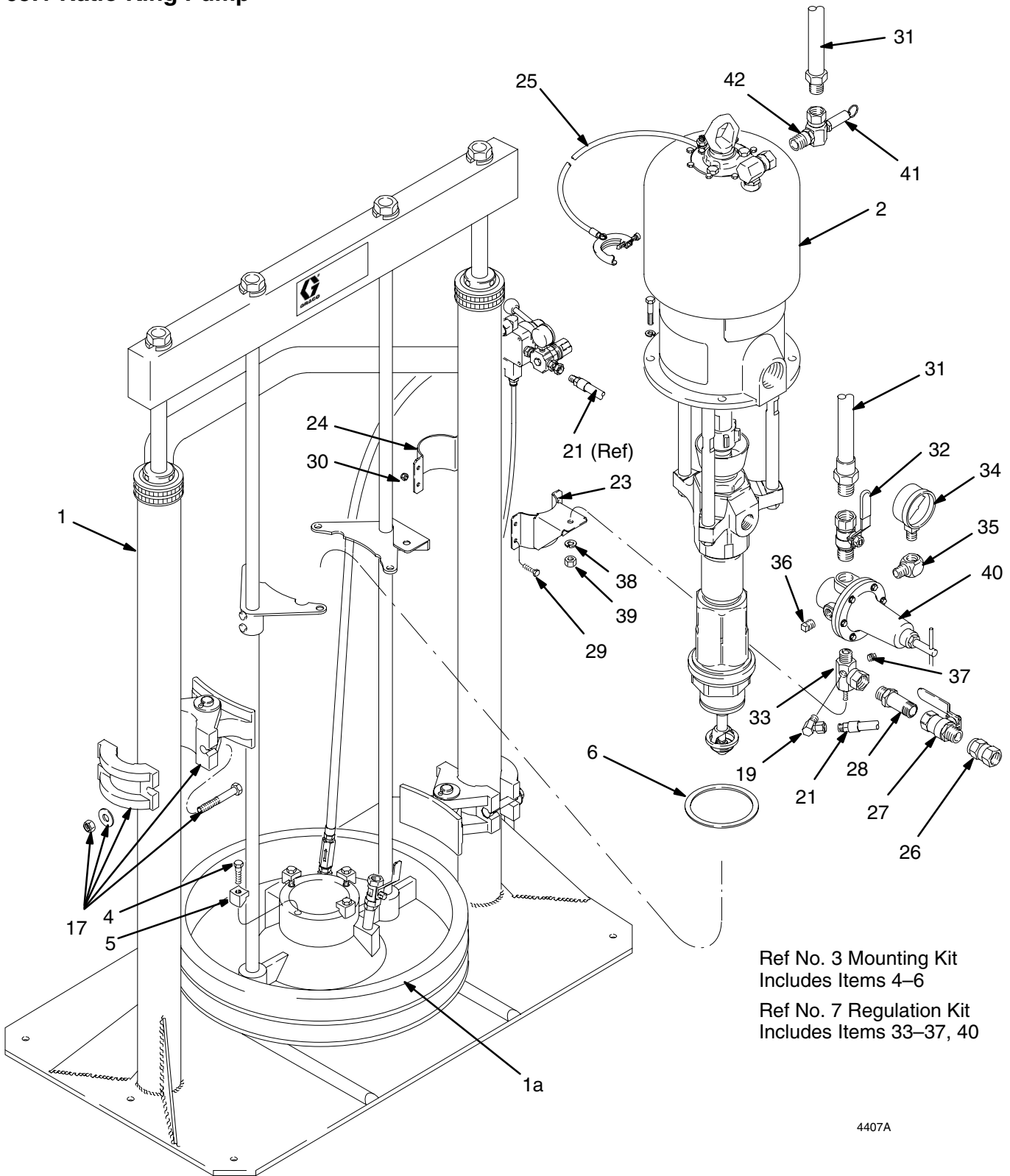
# Parts

## Model 234372, Series A 24:1 Ratio King Pump

| Ref No. | Part No. | Description  | Qty | Ref No. | Part No. | Description   | Qty |
|---------|----------|--|-----|---------|----------|---|-----|
| 1       | 207279   | RAM, drum, 200 liter (55 gal.)<br>See 306934 for parts                   | 1   | 17      | 206537   | CLAMP, drum (set of two)  | 1   |
| 1a      | 248088   | PLATE, ram; used in place of standard<br>ram plate on Model 234372 only. |     | 18      | 223882   | KIT, accessory, ram<br>Includes items 19 to 24                                      | 1   |
|         | 238929   | PLATE, ram; used in place of standard<br>ram plate on Model 235836 only. | 1   | 19      | 155541   | . ADAPTER, swivel, 90°;<br>1/4 npt(m) x 1/4 nps(f) swivel                           | 1   |
| 2       | 246936   | 24:1 RATIO KING PUMP<br>(Model 234372 only)<br>See 308149 for parts      | 1   | 20      | 200115   | . HOSE; neoprene; 1/4 in. (6 mm) ID;<br>coupled 1/4 npt (mbe);<br>1.2 m (4 ft) long | 1   |
| 3       | 222776   | KIT, mounting;<br>Includes items 4 to 6                                  | 1   | 24      | 100896   | . BUSHING; 3/4 npt(m) x 1/2 npt(f)  | 1   |
| 4       | 102637   | . SCREW, cap, hex hd;<br>3/8-16 unc-2a x 38 mm (1.5 in.) long            | 4   | 25      | 109512   | ADAPTER, fluid outlet, 90°;<br>1-1/2 npt(f) x 1-1/2 npsm(f) swivel                  | 1   |
| 5       | 276025   | . LUG  | 4   | 52      | 237962   | BRACKET, welded   | 1   |
| 6       | 109495   | . O-RING; fluoroelastomer  | 1   | 53      | 190747   | BRACKET, ram  | 1   |
| 7       | 238032   | AIR REGULATION KIT<br>See 308168 for parts                               | 1   | 54      | 100021   | SCREW, cap; 1/4-20 unc-2a   | 4   |
| 8       | 238088   | HOSE, coupled; 3/4-14 npt(m x 2);<br>66 in. (1.68 m) long                | 1   | 55      | 102040   | NUT, lock; 1/4-20 unc-3b  | 4   |
|         |          |  |     | 58      | 156823   | UNION, swivel; 1/4 npt(m) x 1/4<br>npsm(f)  | 1   |

# Parts

## Model 234373, Series A 65:1 Ratio King Pump



4407A

# Parts

## Model 234373, Series A 65:1 Ratio King Pump

| Ref No. | Part No. | Description  | Qty | Ref No. | Part No. | Description   | Qty |
|---------|----------|--|-----|---------|----------|---|-----|
| 1       | 207279   | RAM, drum, 200 liter (55 gal.)<br>See 306934 for parts                   | 1   | 24      | 190747   | BRACKET   | 1   |
| 1a      | 248088   | PLATE, ram; used in place of standard<br>ram plate on Model 234373 only. | 1   | 25      | 237569   | GROUND WIRE   | 1   |
| 2       | 246942   | 65:1 RATIO KING PUMP<br>(Model 234373 only)<br>See 308351 for parts      | 1   | 26      | 156172   | SWIVEL; 3/4 npt(m) x 3/4 npsm(f)                          | 1   |
| 3       | 222776   | KIT, mounting;<br>Includes items 4–6                                     | 1   | 27      | 113218   | AIR VALVE, bleed-type; 3/4 npt(m x f)                     | 1   |
| 4       | 102637   | . SCREW, cap, hex hd;<br>3/8–16 unc–2a x 38 mm (1.5 in.) long            | 4   | 28      | 157129   | FITTING, nipple, pipe; 3/4 npt                            | 1   |
| 5       | 276025   | . LUG  | 4   | 29      | 100021   | SCREW; 1/4–20 unc–3a;<br>1.25 in. (31 mm) long            | 4   |
| 6       | 109495   | . O-RING; fluoroelastomer  | 1   | 30      | 102040   | NUT, hex, locking; 1/4–20 unc–3b                          | 4   |
| 7       | 238704   | AIR REGULATION KIT<br>Includes items 33–37, 40<br>See 308168 for parts   | 1   | 31      | 238088   | HOSE, coupled; 3/4–14 npt(m x 2);<br>66 in. (1.68 m) long | 1   |
| 17      | 206537   | CLAMP, drum (set of two)   | 1   | 32      | 107141   | BLEED VALVE; 3/4 npt(m x f)                               | 1   |
| 19      | 155541   | ADAPTER, swivel, 90°;<br>1/4 npt(m) x 1/4 npsm(f) swivel                 | 1   | 33      | 207675   | MANIFOLD, air; 3/4 npsm(f)                                | 1   |
| 20      | 206994   | THROAT SEAL LIQUID;<br>8 oz (0.5 liter); not shown                       | 1   | 34      | 100960   | GAUGE, air  | 1   |
| 21      | 109123   | HOSE, air assist   | 1   | 35      | 100840   | ELBOW, street; 90°; 1/4 npt(m x f)                        | 1   |
| 23      | 237962   | BRACKET  | 1   | 36      | 100509   | PLUG, pipe, sq hd; 1/4 npt                                | 1   |
|         |          |  |     | 37      | 100403   | PLUG, pipe; 1/8 npt                                       | 1   |
|         |          |  |     | 38      | 100322   | WASHER, lock, internal tooth; 3/8 in.                     | 2   |
|         |          |  |     | 39      | 100131   | NUT, hex; 3/8–16  | 1   |
|         |          |  |     | 40      | 207755   | AIR REGULATOR<br>See 308168 for parts                     | 1   |
|         |          |  |     | 41      | 103347   | VALVE, safety; 100 psi                                    | 1   |
|         |          |  |     | 42      | 192171   | FITTING, union, adapter, 90°                              | 1   |



# Parts

## Model 234374, Series A 31:1 Ratio Bulldog Pump

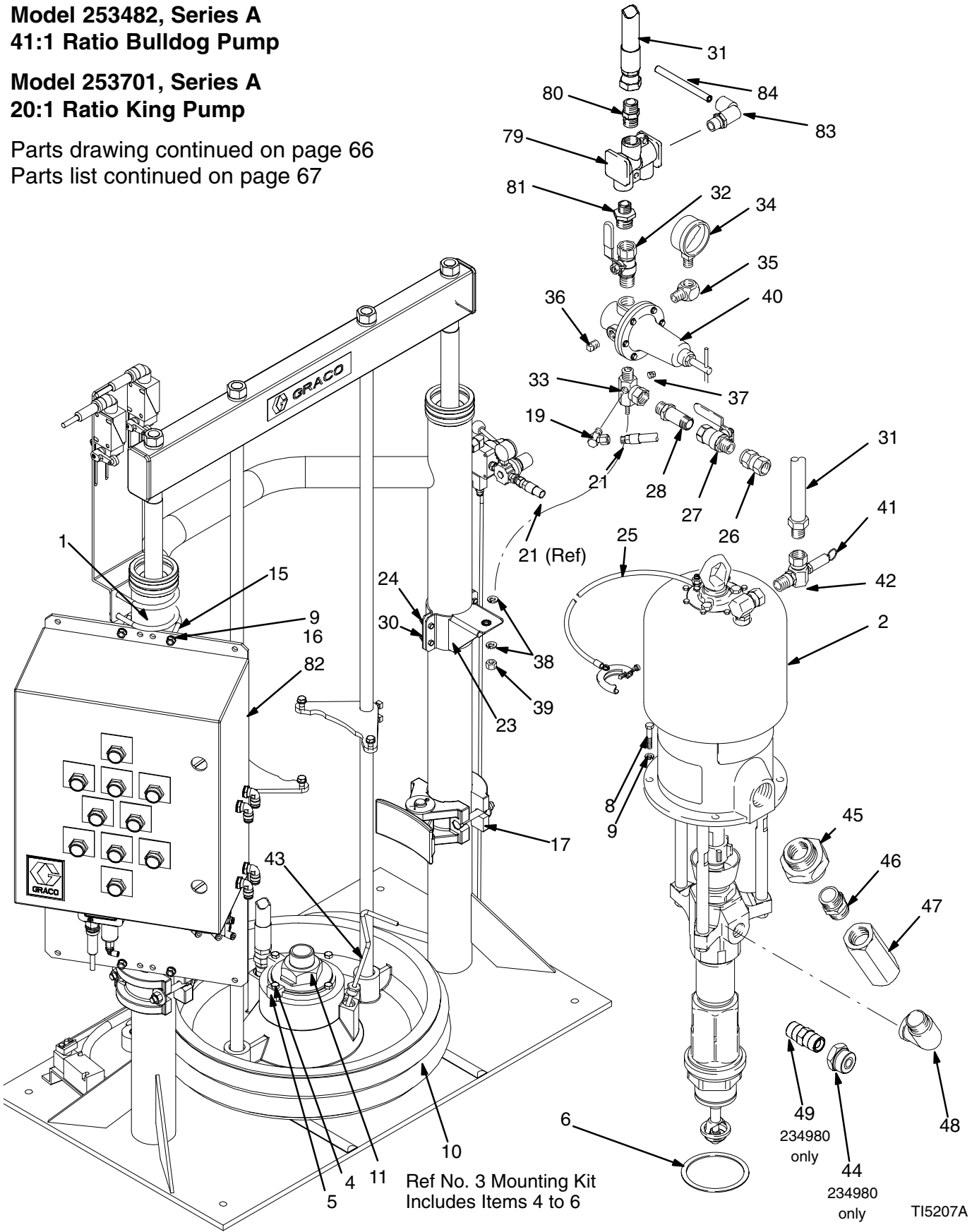
| Ref No. | Part No. | Description  | Qty | Ref No. | Part No. | Description   | Qty |
|---------|----------|--|-----|---------|----------|---|-----|
| 1       | 241252   | RAM, drum, 200 liter (55 gal.) PVC<br>See 306934 for parts               | 1   | 23      | 237962   | BRACKET   | 1   |
| 1a      | 248088   | PLATE, ram; used in place of standard<br>ram plate on Model 234374 only. | 1   | 24      | 190747   | BRACKET   | 1   |
| 2       | 237261   | 31:1 RATIO BULLDOG PUMP<br>(Model 918552 only)                           | 1   | 25      | 237569   | GROUND WIRE   | 1   |
|         | 246940   | 31:1 RATIO BULLDOG PUMP<br>See 308351 for parts                          | 1   | 26      | 156172   | SWIVEL; 3/4 npt(m) x 3/4 npsm(f)                          | 1   |
| 3       | 222776   | KIT, mounting;<br>Includes items 4 to 6                                  | 1   | 27      | 113218   | AIR VALVE, bleed-type; 3/4 npt(m x f)                     | 1   |
| 4       | 102637   | . SCREW, cap, hex hd;<br>3/8-16 unc-2a x 38 mm (1.5 in.) long            | 4   | 28      | 157129   | FITTING, nipple, pipe; 3/4 npt                            | 1   |
| 5       | 276025   | . LUG  | 4   | 29      | 100021   | SCREW; 1/4-20 unc-3a;<br>1.25 in. (31 mm) long            | 4   |
| 6       | 109495   | . O-RING; fluoroelastomer  | 1   | 30      | 102040   | NUT, hex, locking; 1/4-20 unc-3b                          | 4   |
| 7       | 238704   | AIR REGULATION KIT<br>See 308168 for parts)                              | 1   | 31      | 238088   | HOSE, coupled; 3/4-14 npt(m x 2);<br>66 in. (1.68 m) long | 1   |
| 13      | 110300   | ELBOW, street, pipe  | 1   | 32      | 107141   | BLEED VALVE; 3/4 npt(m x f)                               | 1   |
| 16      | 109123   | HOSE, coupled, 18 in.  | 1   | 33      | 207675   | MANIFOLD, air; 3/4 npsm(f)                                | 1   |
| 17      | 206537   | CLAMP, drum (set of two)   | 1   | 34      | 100960   | GAUGE, air  | 1   |
| 19      | 155541   | ADAPTER, swivel, 90°;<br>1/4 npt(m) x 1/4 npsm(f) swivel                 | 1   | 35      | 100840   | ELBOW, street; 90°; 1/4 npt(m x f)                        | 1   |
| 20      | 206994   | THROAT SEAL LIQUID;<br>8 oz (0.5 liter); not shown                       | 1   | 36      | 100509   | PLUG, pipe, sq hd; 1/4 npt                                | 2   |
|         |          |  |     | 37      | 100403   | PLUG, pipe; 1/8 npt                                       | 1   |
|         |          |  |     | 38      | 100322   | WASHER, lock, internal tooth; 3/8 in.                     | 2   |
|         |          |  |     | 39      | 100131   | NUT, hex; 3/8-16  | 1   |
|         |          |  |     | 40      | 110318   | AIR REGULATOR<br>See 308168 for parts                     | 1   |

# Parts

**Model 253482, Series A**  
**41:1 Ratio Bulldog Pump**

**Model 253701, Series A**  
**20:1 Ratio King Pump**

Parts drawing continued on page 66  
 Parts list continued on page 67



# Parts

## Model 253482, Series A 41:1 Ratio Bulldog Pump

## Model 253701, Series A 20:1 Ratio King Pump

Parts drawing continued on page 66

Parts list continued on page 67

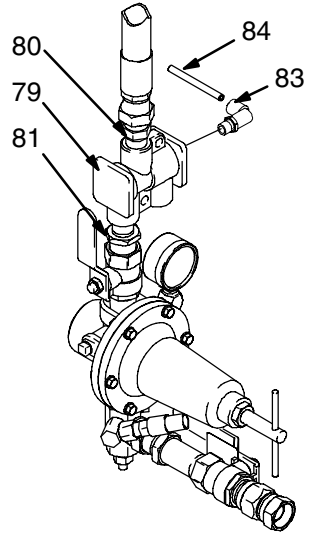
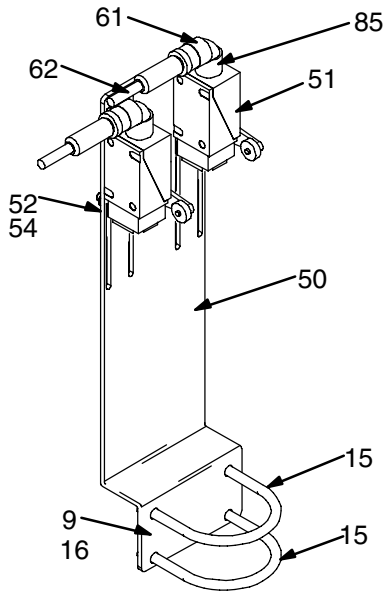
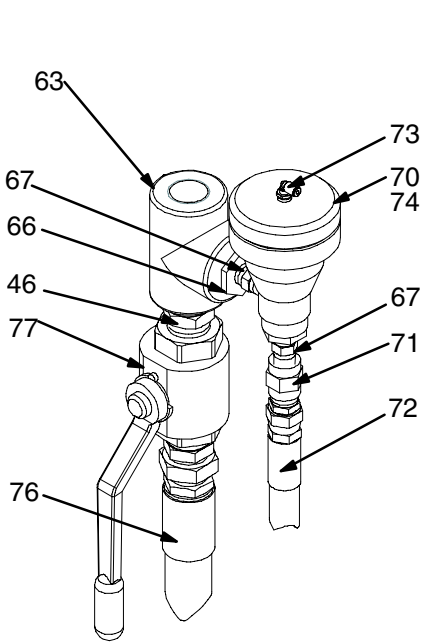
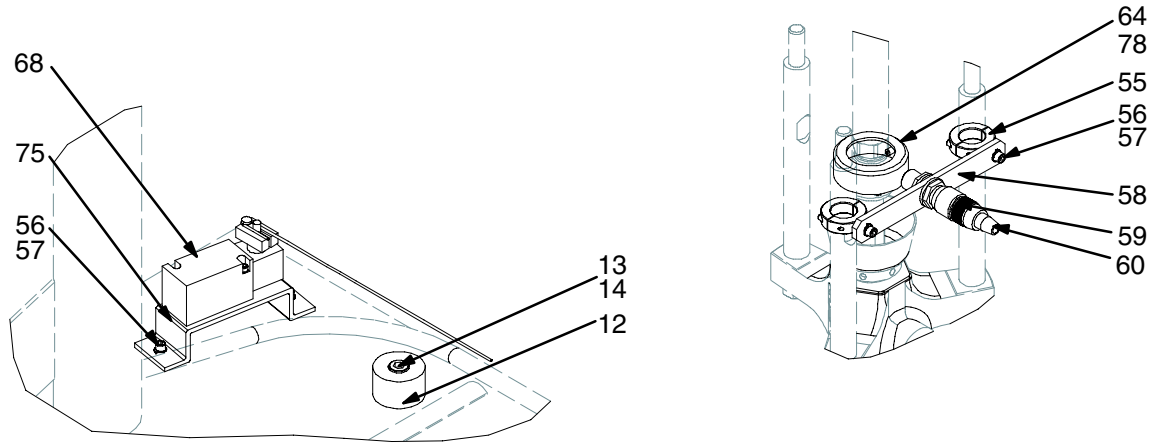
| Ref No. | Part No. | Description   | Qty | Ref No. | Part No. | Description   | Qty   |
|---------|----------|---|-----|---------|----------|---|-------|
| 1       | 207279   | RAM, drum, 200 liter (55 gal.)<br>See 306934 for parts        | 1   | 32      | 107141   | BLEED VALVE; 3/4 npt(m x f)   | 1     |
| 2       | 222833   | 20:1 RATIO KING PUMP<br>(253701 only)                         | 1   | 33*     | 207675   | MANIFOLD, air; 3/4 npsm(f)  | 1     |
|         | 237634   | 41:1 RATIO BULLDOG PUMP<br>(253482 only)                      | 1   | 34*     | 100960   | GAUGE, air  | 1     |
| 3       | 222776   | KIT, mounting;<br>Includes items 4 to 6                       | 1   | 35*     | 100840   | ELBOW, street; 90°; 1/4 npt(m x f)  | 1     |
| 4       | 102637   | . SCREW, cap, hex hd;<br>3/8-16 unc-2a x 38 mm (1.5 in.) long | 4   | 36*     | 100509   | PLUG, pipe, sq hd; 1/4 npt  | 1     |
| 5       | 276025   | . LUG   | 4   | 37*     | 100403   | PLUG, pipe; 1/8 npt   | 1     |
| 6       | 109495   | . O-RING; fluoroelastomer                                     | 1   | 38      | 100322   | WASHER, lock, internal tooth; 3/8 in.   | 2     |
| 7       | 238704   | AIR REGULATION KIT<br>See 308168 for parts                    | 1   | 39      | 100131   | NUT, hex; 3/8-16  | 1     |
| 8       | 100101   | SCREW   | 4   | 40*     | 207755   | AIR REGULATOR<br>See 308168 for parts   | 1     |
| 9       | 100133   | WASHER  | 4   | 41      | 103347   | VALVE, safety, 75 psi (253482 only)   | 1     |
| 10      | C56135   | PLATE, 55gal, PTFE  | 1   | 42      | 192171   | FITTING, union, adapter, 90°<br>(253482 only)                                   | 1     |
| 11      | 190737   | CYLINDER, intake (253482 only)                                | 1   | 43      | 237771   | HANDLE, bleed   | 1     |
| 17      | 206537   | CLAMP, drum (set of two)                                      | 1   | 44      | C19661   | FITTING, nipple, reducing;<br>1-1/4 in. npt(m) by 1 in. npt(m)<br>(234980 only) | 1     |
| 19      | 155541   | ADAPTER, swivel, 90°;<br>1/4 npt(m) x 1/4 npsm(f) swivel      | 1   | 45      | 521975   | FITTING, union, pipe; 1-1/4 in. npt   | 1     |
| 20      | 206994   | THROAT SEAL LIQUID;<br>8 oz (0.5 liter); not shown            | 1   | 46      | C20490   | FITTING, nipple, hex; 1-1/4 in. npt   | 1     |
| 21      | 109123   | HOSE, air assist  | 1   | 47      | 521850   | VALVE, check  | 1     |
| 23      | 237962   | BRACKET   | 1   | 48      | C38324   | FITTING, elbow, street, 90°;<br>1-1/4 in. npt(m x f)                            | 1     |
| 24      | 190747   | BRACKET   | 1   | 49      | 175013   | NIPPLE, pipe; 3/4-14 npt(m)<br>(253482 only)                                    | 1     |
| 25      | 237569   | GROUND WIRE   | 1   |         | C20892   | ADAPTER, hex hd (253701 only)   | 1     |
| 26      | 156172   | SWIVEL; 3/4 npt(m) x 3/4 npsm(f)                              | 1   | 79      | 104632   | VALVE, piloted  | 1     |
| 27      | 113218   | AIR VALVE, bleed-type; 3/4 npt(m x f)                         | 1   | 80      | 113344   | SWIVEL, union assy.   | 1     |
| 28      | 157129   | FITTING, nipple, pipe; 3/4 npt                                | 1   | 81      | 157191   | FITTING, adapter (1/2npt x 3/4npt)  | 1     |
| 29      | 100021   | SCREW; 1/4-20 unc-3a;<br>1.25 in. (31 mm) long                | 4   | 83      | 597151   | FITTING, elbow, air line  | 1     |
| 31      | C12034   | HOSE, coupled; 3/4-14 npt(m x 2);<br>66 in. (1.68 m) long     | 1   | 84      | C12509   | TUBING, air,  | 50 ft |

\* Included in Repair Kit 238704.

# Parts

Model 253482, Series A (continued from page 64)  
41:1 Ratio Bulldog Pump

Model 253701, Series A (continued from page 64)  
20:1 Ratio King Pump





# Parts

## Model 253482, Series A (continued from page 65) 41:1 Ratio Bulldog Pump

## Model 253701, Series A (continued from page 65) 20:1 Ratio King Pump

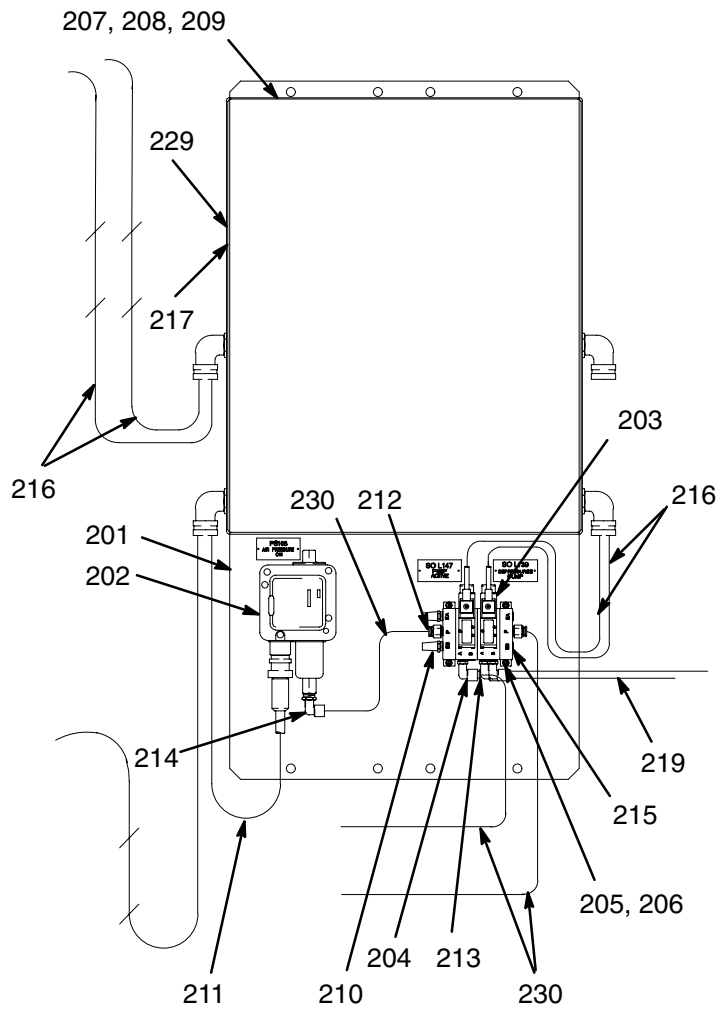
| Ref No. | Part No. | Description                         | Qty | Ref No. | Part No. | Description                           | Qty   |
|---------|----------|-------------------------------------|-----|---------|----------|---------------------------------------|-------|
| 12      | C32467   | STOP, drum                          | 2   | 67      | C20485   | FITTING, nipple, hex                  | 2     |
| 13      | C38185   | WASHER, lock                        | 2   | 68      | 195356   | KIT, accessory                        | 1     |
| 14      | C19853   | SCREW, cap, socket HD               | 2   | 69      | C19871   | SCREW, machined                       | 2     |
| 15      | 515998   | BOLT, U, 3 1/2 x 3/8-16             | 4   | 70      | 918537   | APPLICATOR, ball seat, 1/2 port, 60:1 | 1     |
| 16      | 100307   | NUT, hex                            | 8   | 71      | 158556   | COUPLING, hex pipe                    | 1     |
| 50      | 15H662   | BRACKET, limit switch               | 1   | 72      | 234558   | HOSE, coupled                         | 1     |
| 51      | C07560   | SWITCH, limit w/ arm                | 2   | 73      | C19391   | FITTING, elbow                        | 2     |
| 52      | C19197   | WASHER, plain                       | 8   | 74      | C19254   | PLUG, pipe, flush 1/4 in.             | 1     |
| 54      | 551787   | SCREW, cap, socket head             | 8   | 75      | 15H686   | BRACKET, limit switch                 | 1     |
| 55      | 617337   | COLLAR clamp                        | 2   | 76      | 234428   | HOSE, coupled                         | 1     |
| 56      | C19209   | WASHER, lock                        | 4   | 77      | 118854   | VALVE, ball, high pressure            | 1     |
| 57      | C19800   | SCREW, cap, socket HD               | 4   | 78      | C19363   | SCREW                                 | 1     |
| 58      | 617338   | BRACKET, mounting                   | 1   | 79      | 104632   | VALVE, piloted                        | 1     |
| 59      | 517455   | SWITCH, 18mm proximity              | 1   | 80      | 113344   | SWIVEL, union assy.                   | 1     |
| 60      | C56572   | CABLE                               | 1   | 81      | 157191   | FITTING, adapter (1/2npt x 3/4npt)    | 1     |
| 61      | C07431   | CONNECTOR, sealed (253482 only)     | 2   | 82      | 243255   | KIT, accessory PLC                    | 1     |
| 62      | C07435   | CONNECTOR, sealed (253482 only)     | 2   | 83      | 597151   | FITTING, elbow, air line              | 2     |
| 63      | C19491   | FITTING, tee, 1-1/4 npt(f)          | 1   | 84      | C12509   | TUBING, air,                          | 50 ft |
| 64      | 196510   | HOUSING, coupling nut (253701 only) | 1   | 85      | C20175   | LOCKNUT, conduit                      | 2     |
| 65      | 119417   | SCREW, set, allen, 1/4-20 x 5/8     | 1   |         |          |                                       |       |
| 66      | C19660   | FITTING, 1-1/4 x 1/2                | 1   |         |          |                                       |       |



# Parts

## 243255, PLC Interface Accessory Kit

| Ref No. | Part No. | Description                      | Qty | Ref No. | Part No. | Description                         | Qty   |
|---------|----------|----------------------------------|-----|---------|----------|-------------------------------------|-------|
| 201     | 195330   | PLATE, mounting                  | 1   | 211     | C07434   | CORD, 5-pin; 6 ft long              | 1     |
| 202     | C55568   | SWITCH, pressure; 1/4 in. npt    | 1   | 212     | C19407   | FITTING, tube; 1/4T x 1/8P          | 2     |
| 203     | 115440   | VALVE, assembly                  | 1   | 213     | 103219   | PLUG, pipe; 1/8 npt                 | 1     |
| 204     | 597151   | ELBOW, male                      | 3   | 214     | C19391   | ELBOW, 90 degree, tube; 1/4P x 1/4T | 1     |
| 205     | 111714   | SCREW, S.H.C.; CS PL #4-40x 5/8  | 4   | 215     | C19264   | PLUG, pipe; 1/4 npt                 | 2     |
| 206     | 103739   | WASHER, lock; CS PL #4           | 4   | 216     | C20536   | CABLE, 2 cond.                      | 8 ft  |
| 207     | 102313   | SCREW, S.H.C.; CS PL #4-20x1.75L | 2   | 217     | 195320   | PANEL, junction box; see page 52    | 1     |
| 208     | 101345   | NUT, hex; CS PL 1/4-20           | 2   | 218     | C07435   | CONNECTOR, sealed (not shown)       | 3     |
| 209     | 100016   | WASHER, lock; CS PL 1/4          | 2   | 219     | C12509   | TUBE; 1/4 in.; nylon                | 50 ft |
| 210     | 517449   | MUFFLER                          | 2   |         |          |                                     |       |



T10196



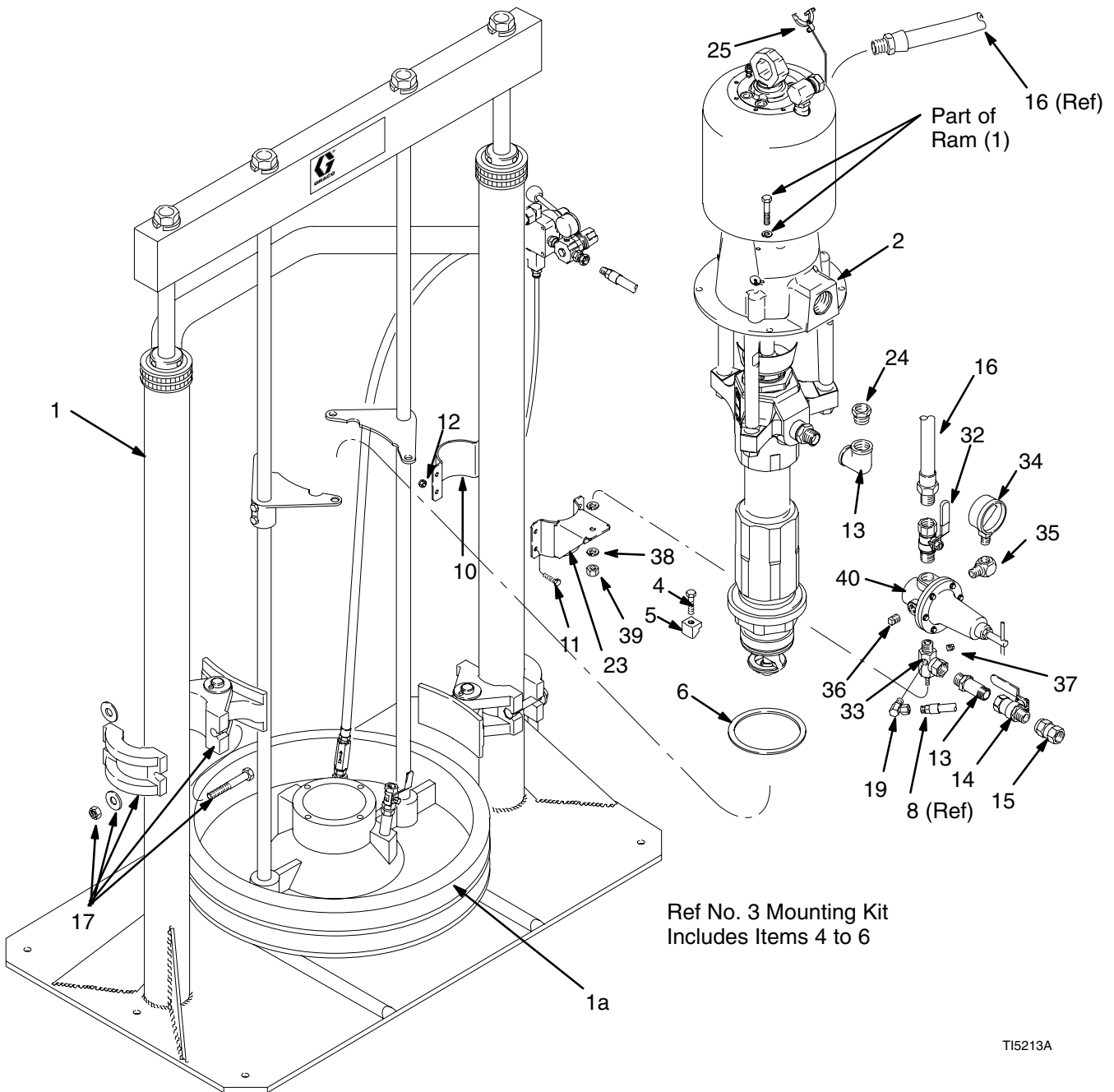
# Parts

## Part No. 195320, PLC Interface Panel

| Ref No. | Symbol | Description                     | Remark      | U.L. File No. | Qty |
|---------|--------|---------------------------------|-------------|---------------|-----|
| 290     |        | P-N 90 DEG. CORD GRIP DB-1090   |             |               | 4   |
| 280     |        | A-B PB 800T-XD2                 |             |               | 1   |
| 270     | PB     | A-B PB 800T FX 9A1              |             |               | 1   |
| 260     | SS     | A-B SS 800T-H2A                 |             |               | 1   |
| 250     |        | BARRIER ENTRELEC 02910.422.10   |             |               | 1   |
| 240     |        |                                 |             |               |     |
| 230     | FU     | BUSS FUSS GDC-250 MA 5 X 20 mm  |             |               | 2   |
| 220     |        | GND ENTRELEC 0290.019.05        |             | E160646       | 4   |
| 210     | DISC   | ENTRELEC 0290.041.03            | K5100, 102  | E40735        | 2   |
| 200     | FU     | ENTRELEC FUSE BLOCK 0115.662.22 | FU136, 143  | E40735        | 2   |
| 190     | SUP    | A-B SUPPRESSOR 1492-WD4SS       | SUP136, 144 | E40735        | 2   |
| 180     | PB     | A-B PB #800T-A2D1 (BLACK)       | PB119, 122  |               | 2   |
| 170     | PB     | A-B PB #800T-A2D1 (GREEN)       | PB124       |               | 1   |
| 160     | LT     | A-B LIGHT WHITE #800T-PT16W     | LT148       | E14840-NKCR   | 1   |
| 150     | LT     | A-B LIGHT BLUE #800T-PT16B      | LT110       | E14840-NKCR   | 1   |
| 140     | LT     | A-B LIGHT AMBER #800T-PT16A     | LT141       | E14840-NKCR   | 1   |
| 130     | LT     | A-B LIGHT GREEN #800T-PT16G     | LT134, 106  | E14840-NKCR   | 2   |
| 120     |        | A-B JUMPER 0291.103.24          |             |               | AR  |
| 110     |        | TERMINAL ENTRELEC 0290.011.25   |             | E40735        | 31  |
| 70      |        | T & B SEAL RING 5262            |             |               | 8   |
| 60      |        | T & B LOCKNUT 141               |             |               | 8   |
| 50      |        | P-N 90 DEG. CORD GRIP DB-890    |             |               | 4   |

# Parts

Model 234377, Series A  
19:1 Ratio Senator Pump



TI5213A

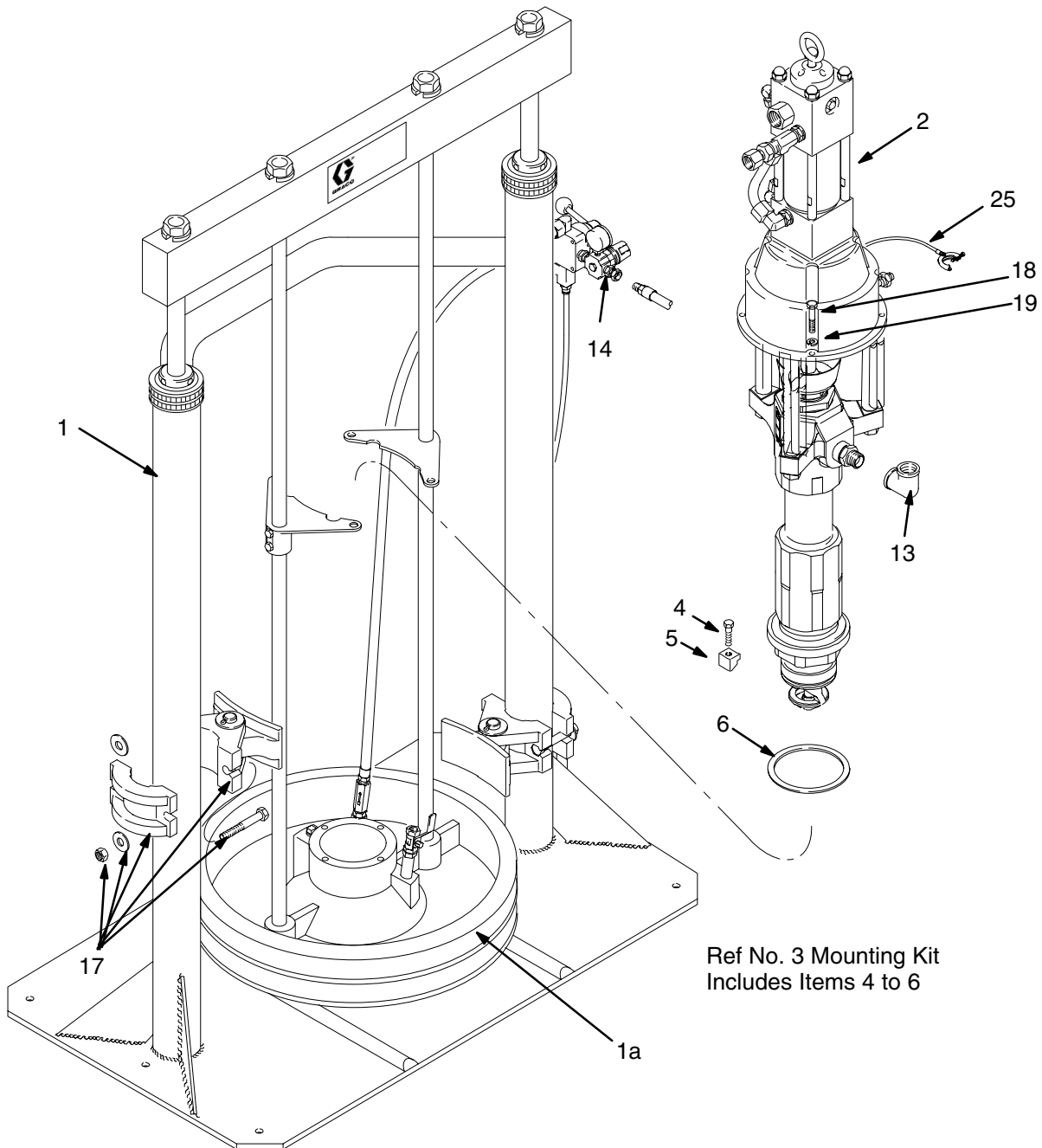
# Parts

## Model 234377, Series A 19:1 Ratio Senator Pump

| Ref No. | Part No. | Description   | Qty | Ref No. | Part No. | Description   | Qty |
|---------|----------|---|-----|---------|----------|---|-----|
| 1       | 241252   | RAM, drum, 200 liter (55 gal.) PVC<br>See 306934 for parts    | 1   | 23      | 237962   | BRACKET   | 1   |
| 1a      | 248088   | PLATE, ram; used in place of<br>standard ram plate            | 1   | 24      | 190747   | BRACKET   | 1   |
| 2       | 246941   | 19:1 RATIO Senator PUMP<br>See 308351 for parts               | 1   | 25      | 237569   | GROUND WIRE   | 1   |
| 3       | 222776   | KIT, mounting;<br>Includes items 4 to 6                       | 1   | 26      | 156172   | SWIVEL; 3/4 npt(m) x 3/4 npsm(f)                          | 1   |
| 4       | 102637   | . SCREW, cap, hex hd;<br>3/8-16 unc-2a x 38 mm (1.5 in.) long | 4   | 27      | 113218   | AIR VALVE, bleed-type; 3/4 npt(m x f)                     | 1   |
| 5       | 276025   | . LUG   | 4   | 28      | 157129   | FITTING, nipple, pipe; 3/4 npt                            | 1   |
| 6       | 109495   | . O-RING; fluoroelastomer                                     | 1   | 29      | 100021   | SCREW; 1/4-20 unc-3a;<br>1.25 in. (31 mm) long            | 4   |
| 7       | 238704   | AIR REGULATION KIT<br>See 308168 for parts                    | 1   | 30      | 102040   | NUT, hex, locking; 1/4-20 unc-3b                          | 4   |
| 13      | 110300   | ELBOW, street, pipe   | 1   | 31      | 238088   | HOSE, coupled; 3/4-14 npt(m x 2);<br>66 in. (1.68 m) long | 1   |
| 16      | 109123   | HOSE, coupled, 18 in.   | 1   | 32      | 107141   | BLEED VALVE; 3/4 npt(m x f)                               | 1   |
| 17      | 206537   | CLAMP, drum (set of two)                                      | 1   | 33      | 207675   | MANIFOLD, air; 3/4 npsm(f)                                | 1   |
| 19      | 155541   | ADAPTER, swivel, 90°;<br>1/4 npt(m) x 1/4 npsm(f) swivel      | 1   | 34      | 100960   | GAUGE, air  | 1   |
| 20      | 206994   | THROAT SEAL LIQUID;<br>8 oz (0.5 liter); not shown            | 1   | 35      | 100840   | ELBOW, street; 90°; 1/4 npt(m x f)                        | 1   |
|         |          |   |     | 36      | 100509   | PLUG, pipe, sq hd; 1/4 npt                                | 2   |
|         |          |   |     | 37      | 100403   | PLUG, pipe; 1/8 npt                                       | 1   |
|         |          |   |     | 38      | 100322   | WASHER, lock, internal tooth; 3/8 in.                     | 2   |
|         |          |   |     | 39      | 100131   | NUT, hex; 3/8-16  | 1   |
|         |          |   |     | 40      | 207755   | AIR REGULATOR<br>See 308168 for parts                     | 1   |

# Parts

Model 234378, Series B  
Viscount II 800 Pump



Ref No. 3 Mounting Kit  
Includes Items 4 to 6

T15214A



# Parts

## Model 234378, Series B Viscount II 800 Pump

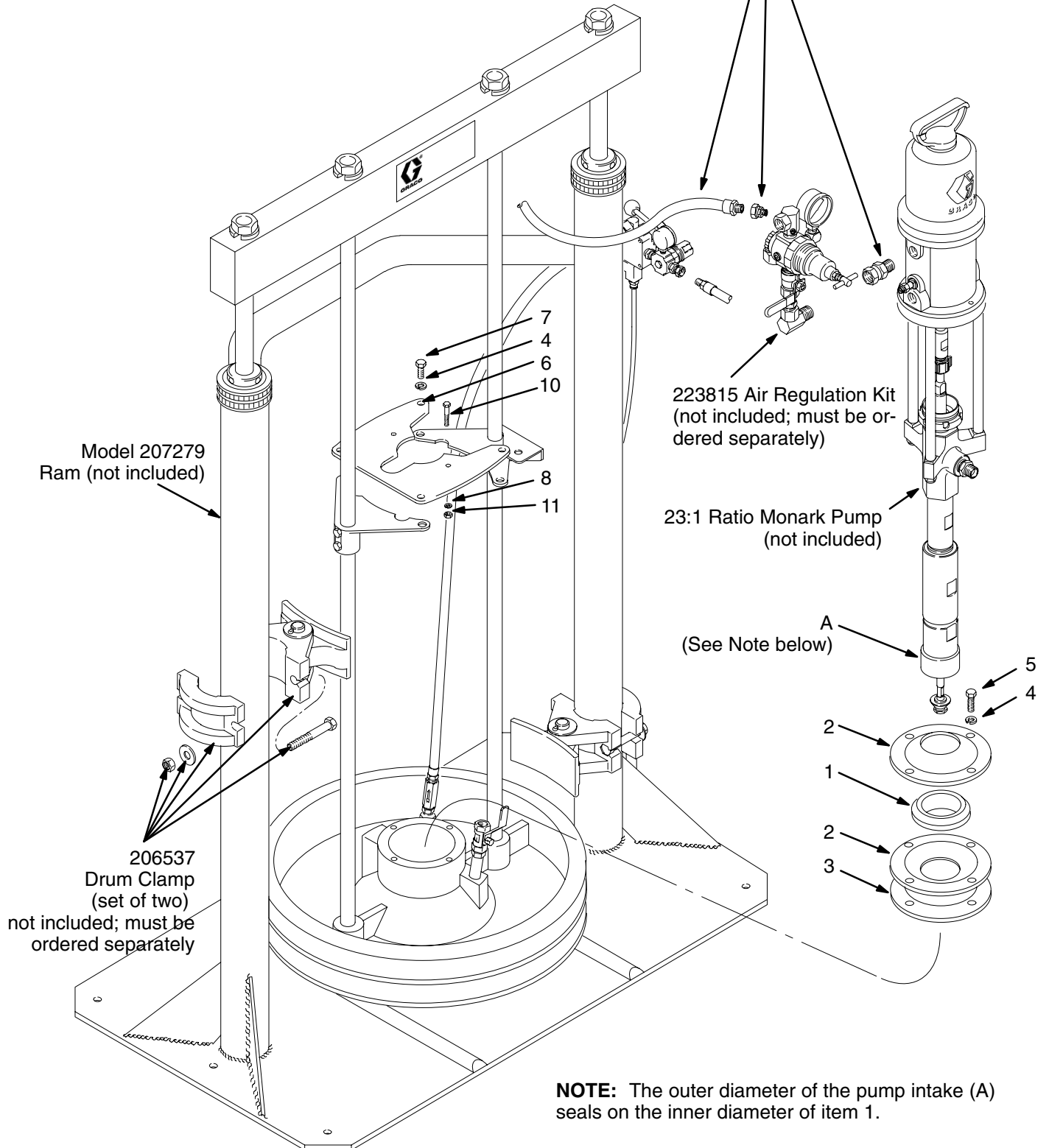
| Ref No. | Part No. | Description   | Qty | Ref No. | Part No. | Description   | Qty |
|---------|----------|---|-----|---------|----------|---|-----|
| 1       | 207279   | RAM, drum, 200 liter (55 gal.)<br>See 306934 for parts        | 1   | 6       | 109495   | . O-RING; fluoroelastomer                           | 1   |
| 1a      | 248088   | PLATE, ram; used in place of<br>standard ram plate            | 1   | 13      | 110300   | ELBOW, street, pipe                                 | 1   |
| 2       | 246938   | PUMP, Viscount/Checkmate                                      | 1   | 14      | 156971   | NIPPLE, short                                       | 1   |
| 3       | 222776   | KIT, mounting;<br>Includes items 4 to 6                       | 1   | 17      | 206537   | CLAMP, drum (set of two)                            | 1   |
| 4       | 102637   | . SCREW, cap, hex hd;<br>3/8-16 unc-2a x 38 mm (1.5 in.) long | 4   | 18      | 100101   | SCREW, hex hd cap;<br>3/8-16 x 1 in. (25.4 mm) long | 4   |
| 5       | 276025   | . LUG   | 4   | 19      | 100133   | WASHER, spring lock; 3/8 in. (9.5 mm)               | 4   |
|         |          |   |     | 20      | 206994   | THROAT SEAL LIQUID;<br>8 oz (0.5 liter); not shown  | 1   |
|         |          |   |     | 25      | 237569   | GROUND WIRE   | 1   |

# Parts

## 224829 Ram Mounting Kit, used with 23:1 Ratio Monark Pump, Model 222782

**NOTE:** Parts included in Mounting Kit 224829 are listed on page 59. Kits 223881, 223815, and 206537 must also be ordered to create the assembly pictured below. See page 10 for further information.

Part Of 223881  
Ram Accessory Kit  
(not included; must be  
ordered separately)



**NOTE:** The outer diameter of the pump intake (A) seals on the inner diameter of item 1.

# Parts

## 224829 Ram Mounting Kit, used with 23:1 Ratio Monark Pump, Model 222782

| Ref No. | Part No. | Description   | Qty | Ref No. | Part No.                      | Description                                     | Qty |
|---------|----------|---|-----|---------|-------------------------------|---|-----|
| 1       | 161452   | SEAL, ram plate   | 1   | 9**     | 100270                        | CAPSCREW, hex hd;<br>1/4-20 x 5/8 in. (16 mm)   | 2   |
| 2       | 162789   | PLATE, seal   | 2   |         |                               |   |     |
| 3       | 162788   | GASKET; cork  | 1   | 10*     | 15B588                        | CAPSCREW, hex hd;<br>1/4-20 x 1-3/4 in. (45 mm) | 2   |
| 4       | 100133   | LOCKWASHER; 3/8 in. (9.5 mm)                            | 8   |         |                               |   |     |
| 5       | 100004   | CAPSCREW, hex hd;<br>3/8-16 x 1-1/4 in. (31 mm) long    | 4   | 11*     | 102025                        | NUT, hex; 1/4-20                                | 2   |
| 6       | 184140   | PLATE, mounting, pump                                   | 1   | *       | Used on Monark pumps only.    |   |     |
| 7       | 100101   | CAPSCREW, hex hd;<br>3/8-16 unc-2a x 1 in. (25 mm) long | 4   | **      | Used on President pumps only. |   |     |
| 8       | 100016   | LOCKWASHER, spring;<br>1/4 in. (6.3 mm)                 | 2   |         |                               |   |     |



# Parts

## 224829 Ram Mounting Kit, used with 46:1 Ratio President Pump, Model 222783

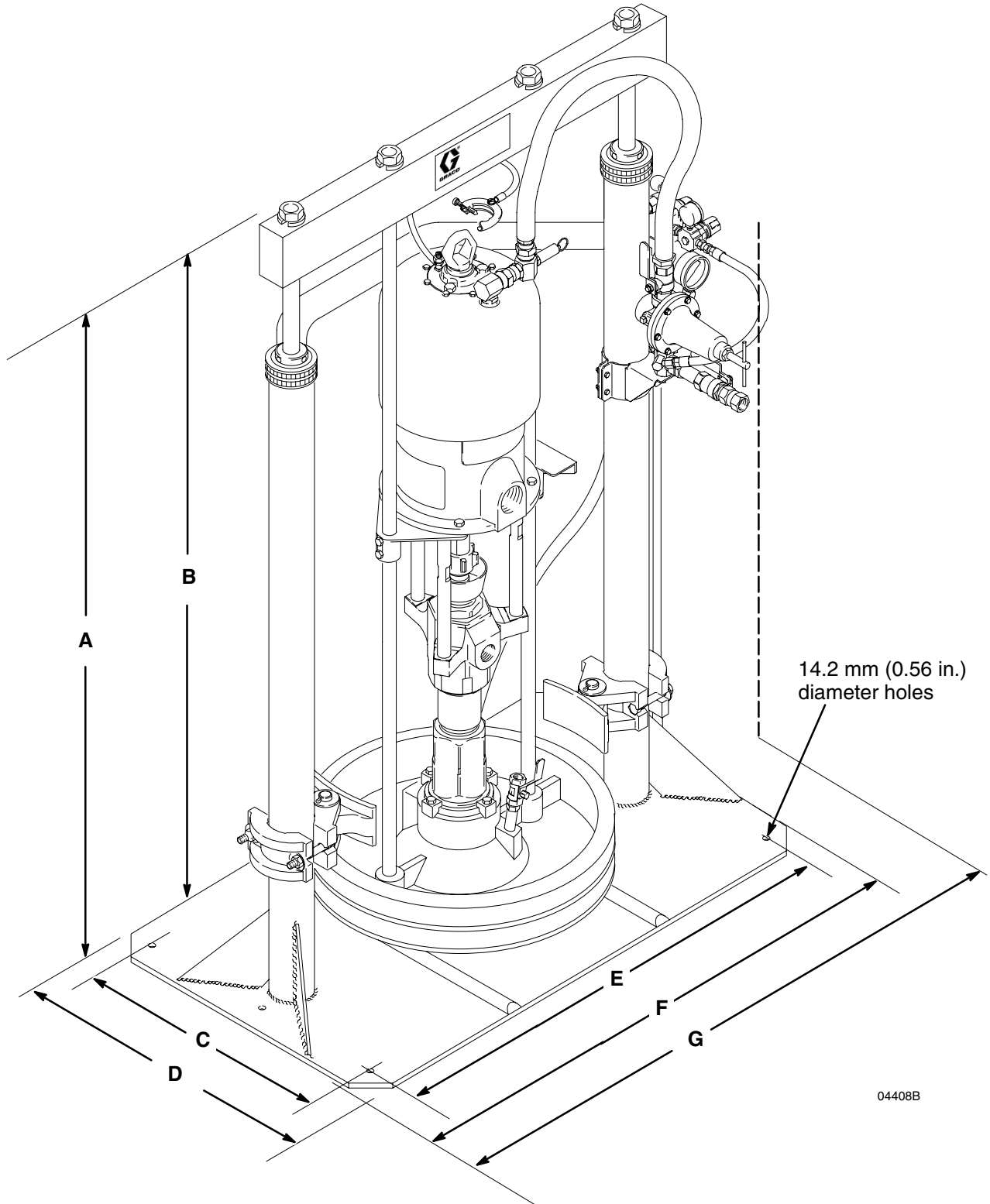
| Ref No. | Part No. | Description   | Qty | Ref No. | Part No. | Description                                     | Qty |
|---------|----------|---|-----|---------|----------|---|-----|
| 1       | 161452   | SEAL, ram plate   | 1   |         |          | 1/4 in. (6.3 mm)                                | 2   |
| 2       | 162789   | PLATE, seal   | 2   | 9**     | 100270   | CAPSCREW, hex hd;<br>1/4-20 x 5/8 in. (16 mm)   | 2   |
| 3       | 162788   | GASKET; cork  | 1   | 10*     | 15B588   | CAPSCREW, hex hd;<br>1/4-20 x 1-3/4 in. (45 mm) | 2   |
| 4       | 100133   | LOCKWASHER; 3/8 in. (9.5 mm)                            | 8   | 11*     | 102025   | NUT, hex; 1/4-20                                | 2   |
| 5       | 100004   | CAPSCREW, hex hd;<br>3/8-16 x 1-1/4 in. (31 mm) long    | 4   |         |          |   | 2   |
| 6       | 184140   | PLATE, mounting, pump                                   | 1   |         |          |   | 2   |
| 7       | 100101   | CAPSCREW, hex hd;<br>3/8-16 unc-2a x 1 in. (25 mm) long | 4   |         |          |   |     |
| 8       | 100016   | LOCKWASHER, spring;                                     |     |         |          |   |     |

\* Used on Monark pumps only.

\*\* Used on President pumps only.



# Dimensions



04408B

| Pump Model | A (raised)          | B (lowered)        | C               | D               | E               | F                | G                   |
|------------|---------------------|--------------------|-----------------|-----------------|-----------------|------------------|---------------------|
| All        | 2663 mm (104.8 in.) | 1707 mm (67.2 in.) | 533 mm (21 in.) | 635 mm (25 in.) | 965 mm (38 in.) | 1067 mm (42 in.) | 1111 mm (43.74 in.) |

# Technical Data

| Model No.                                      | Air Motor         | Air Pressure of Sound Tests<br>(25 cycles/min) | * Sound Pressure<br>Level | ** Sound Power<br>Level |
|--|-------------------|--|---------------------------|-------------------------|
| 223816<br>234121<br>247156                     | Monark®           | 10 bar, 1 MPa<br>(150 psi)                     | 96 dBa                    | 112 dBa                 |
| 223817<br>253018<br>234369<br>234120<br>247155 | President®        | 10 bar, 1 MPa<br>(150 psi)                     | 98 dBa                    | 113 dBa                 |
| 257589   | FireBall 425 Pump | 10 bar, 1 MPa<br>(150 psi)                     | 98 dBa                    | 113 dBa                 |
| 570114   | Check-Mate        | 7 bar, 0.7 MPa<br>(100 psi)                    | —                         | —                       |
| 965572   | Check-Mate        | 7 bar, 0.7 MPa<br>(100 psi)                    | —                         | —                       |
| 234377   | Senator®          | 7 bar, 0.7 MPa<br>(100 psi)                    | 93 dBa                    | 108 dBa                 |
| 234374   | Bulldog®          | 7 bar, 0.7 MPa<br>(100 psi)                    | 94 dBa                    | 109 dBa                 |
| 234371   | Bulldog®          | 7 bar, 0.7 MPa<br>(100 psi)                    | 94 dBa                    | 109 dBa                 |
| 234373   | King™             | 6.3 bar, 0.63 MPa<br>(90 psi)                  | 98 dBa                    | 113 dBa                 |
| 234372<br>253701                               | King™             | 6.3 bar, 0.63 MPa<br>(90 psi)                  | 98 dBa                    | 113 dBa                 |
| 253482   | Bulldog™          | 7 bar, 0.7 MPa<br>(100 psi)                    | 94 dBa                    | 109 dBa                 |

\* Sound pressure level was measured in accordance with Cagi Pneurop, 1969.

\*\* Sound power level was measured in accordance with ISO 3744, 1981.



# Technical Data

Maximum air input pressure (ram) ..... 10 bar, 1.0 MPa (150 psi)  
Maximum fluid working pressure and air input pressure (pump) ..... See page 4.  
Wetted parts (fluid outlet fittings) ..... zinc or cadmium-plated carbon steel  
Wetted parts (pump) ..... See separate pump instruction manual.  
*Mobilux® is a registered trademark of the Mobile Oil Corporation.*

# Graco Standard Warranty

Graco warrants all equipment manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Original instructions. This manual contains English. MM 308027

**Graco Headquarters:** Minneapolis  
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