

## Sanitary Ram Module

309505 rev.G

**For sanitary application.  
200 Liter (55 Gallon) Size**

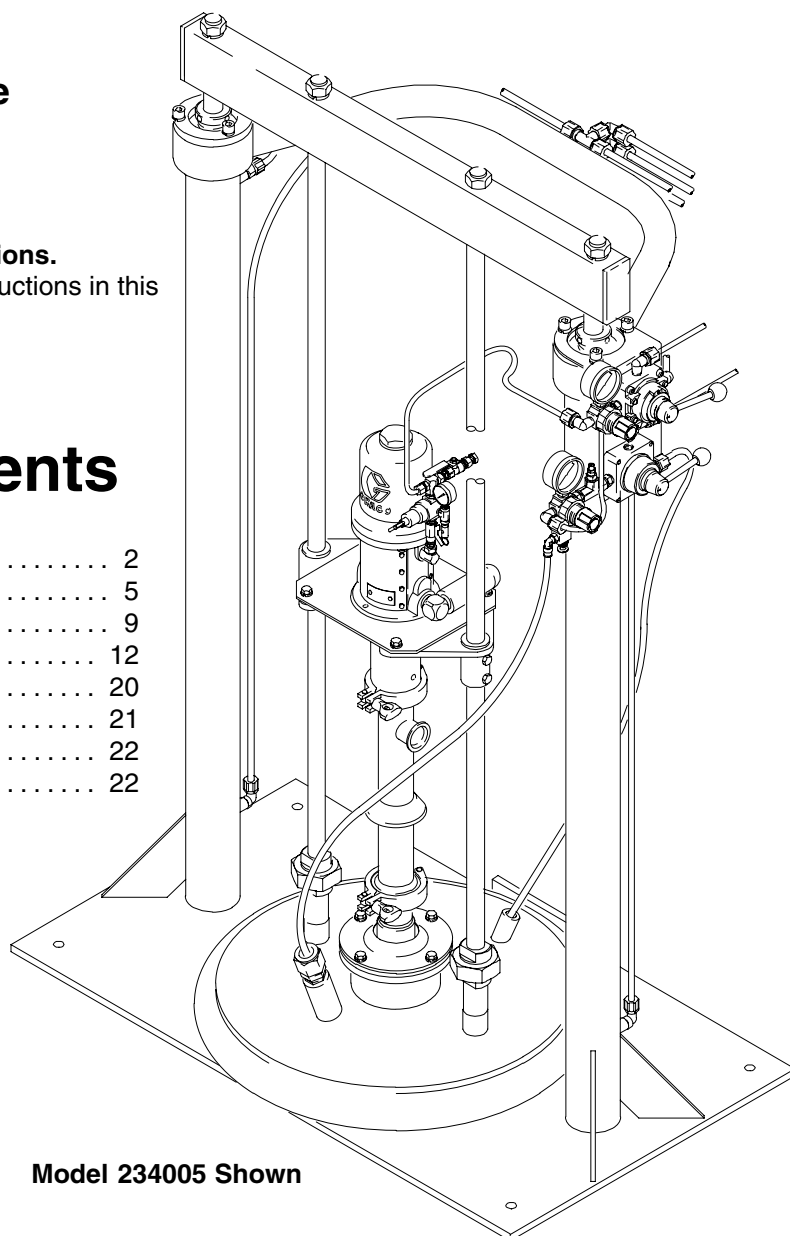
See **List of Models** on page 4.



**Important Safety Instructions.**  
Read all warnings and instructions in this manual.  
Save these instructions.

## Table of Contents

Warnings .....	2
Setup .....	5
Operation .....	9
Parts .....	12
Dimensions .....	20
Technical Data .....	21
Graco Standard Warranty .....	22
Graco Information .....	22



**Model 234005 Shown**

**PROVEN QUALITY. LEADING TECHNOLOGY.**

# 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



INSTRUCTIONS

### EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before you operate the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your Graco distributor.
- Do not alter or modify this equipment. Use only Graco parts and accessories.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure stated on the equipment or in the **Technical Data** for your equipment. Do not exceed the maximum working pressure of the lowest rated component in your system.
- Use fluids and solvents that are compatible with the equipment wetted parts. See the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Wear hearing protection when you operate this equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.



### MOVING PARTS HAZARD

Moving parts, such as the priming piston and ram plate, can pinch or amputate your fingers.

- Keep clear of all moving parts when you start or operate the pump.
- Keep hands and fingers away from the priming piston during operation and whenever the pump is charged with air.
- Keep your hands away from the ram plate and the lip of the drum while the ram is operating.
- Before you service the equipment, follow the **Pressure Relief Procedure** on page 9 to prevent the equipment from starting unexpectedly.

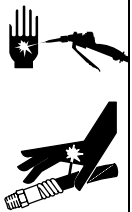


### TOXIC FLUID HAZARD

Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin, inhaled, or swallowed.

- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state, and national guidelines.
- Always wear protective eyewear, gloves, clothing, and respirator as recommended by the fluid and solvent manufacturer.

# 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 9 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

<b>Model No.</b> (Parts page)	<b>Series</b>	<b>Air Motor</b>	<b>Pump</b>	<b>Ratio</b>	<b>Maximum Fluid Working Pressure</b>	<b>Maximum Pump Air Input Pressure</b>
234005 (12)	C	Monark®	Priming Piston	5:1	41 bar, 4.1 MPa (600 psi)	8 bar, 0.8 MPa (120 psi)
234006 (12)	C	Monark®	Priming Piston	5:1	41 bar, 4.1 MPa (600 psi)	8 bar, 0.8 MPa (120 psi)
234007 (12)	C	Monark®	Double Ball	5:1	41 bar, 4.1 MPa (600 psi)	8 bar, 0.8 MPa (120 psi)
234008 (12)	C	Monark®	Double Ball	5:1	41 bar, 4.1 MPa (600 psi)	8 bar, 0.8 MPa (120 psi)
234009 (14)	C	Senator®	Priming Piston	4:1	30 bar, 3.0 MPa (430 psi)	6.9 bar, 0.7 MPa (100 psi)
234010 (14)	C	Senator®	Priming Piston	4:1	30 bar, 3.0 MPa (430 psi)	6.9 bar, 0.7 MPa (100 psi)
234011 (14)	C	Senator®	Double Ball	4:1	30 bar, 3.0 MPa (430 psi)	6.9 bar, 0.7 MPa (100 psi)
234012 (14)	C	Senator®	Double Ball	4:1	30 bar, 3.0 MPa (430 psi)	6.9 bar, 0.7 MPa (100 psi)
234013 (16)	C	Bulldog®	Priming Piston	10:1	69 bar, 6.9 MPa (1000 psi)	6.9 bar, 0.7 MPa (100 psi)
234014 (16)	C	Bulldog®	Priming Piston	10:1	69 bar, 6.9 MPa (1000 psi)	6.9 bar, 0.7 MPa (100 psi)
234016 (16)	C	Bulldog®	Priming Piston	10:1	69 bar, 6.9 MPa (1000 psi)	6.9 bar, 0.7 MPa (100 psi)
248275 (20)	B	Husky® 3150	Air-operated Double Diaphragm, Ball Check	1:1	8.3 bar, 0.83 MPa (120 psi)	8.3 bar, 0.83 MPa (120 psi)
248277 (20)	B	Husky® 3150	Air-operated Double Diaphragm, Ball Check	1:1	8.3 bar, 0.83 MPa (120 psi)	8.3 bar, 0.83 MPa (120 psi)
248276 (20)	B	Husky® 3150	Air-operated Double Diaphragm, Flapper Check	1:1	8.3 bar, 0.83 MPa (120 psi)	8.3 bar, 0.83 MPa (120 psi)
248278 (20)	B	Husky® 3150	Air-operated Double Diaphragm, Flapper Check	1:1	8.3 bar, 0.83 MPa (120 psi)	8.3 bar, 0.83 MPa (120 psi)

# Setup

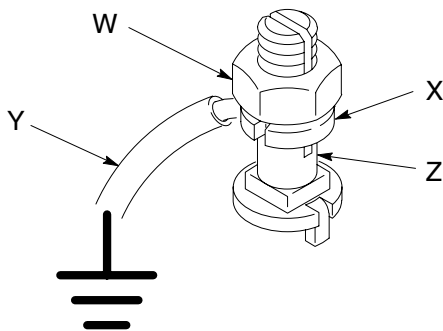
## Ground the System

**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:** Follow the manufacturer's grounding recommendations.
- **Air and fluid 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.

# Setup

## Priming Piston and Double Ball Pumps

### KEY

- |  |   |   |
|--|---|---|
| <b>A</b> Pump  | <b>G</b> Pump Air Regulator                       | <b>Y</b> Pump Ground Wire (required)            |
| <b>B</b> Ram   | <b>H</b> Pump Air Bleed Valve (required for pump) | <b>W</b> Air Line Drain Valve                   |
| <b>C</b> Wiper Plate                                       | <b>J</b> Air Line Filter                          | <b>CC</b> Inflatable Seal Air Regulator         |
| <b>D</b> Electrically Conductive Air Supply Hose           | <b>T</b> Ram Air Regulator                        | <b>DD</b> Inflatable Seal Director Valve        |
| <b>E</b> Main Air Bleed Valve (required, for pump and ram) | <b>U</b> Ram Director Valve                       | <b>EE</b> Fluid Drain Valve (required for pump) |
| <b>F</b> Air Manifold                                      |   | <b>FF</b> Blow-off Switch (ram up assist)       |

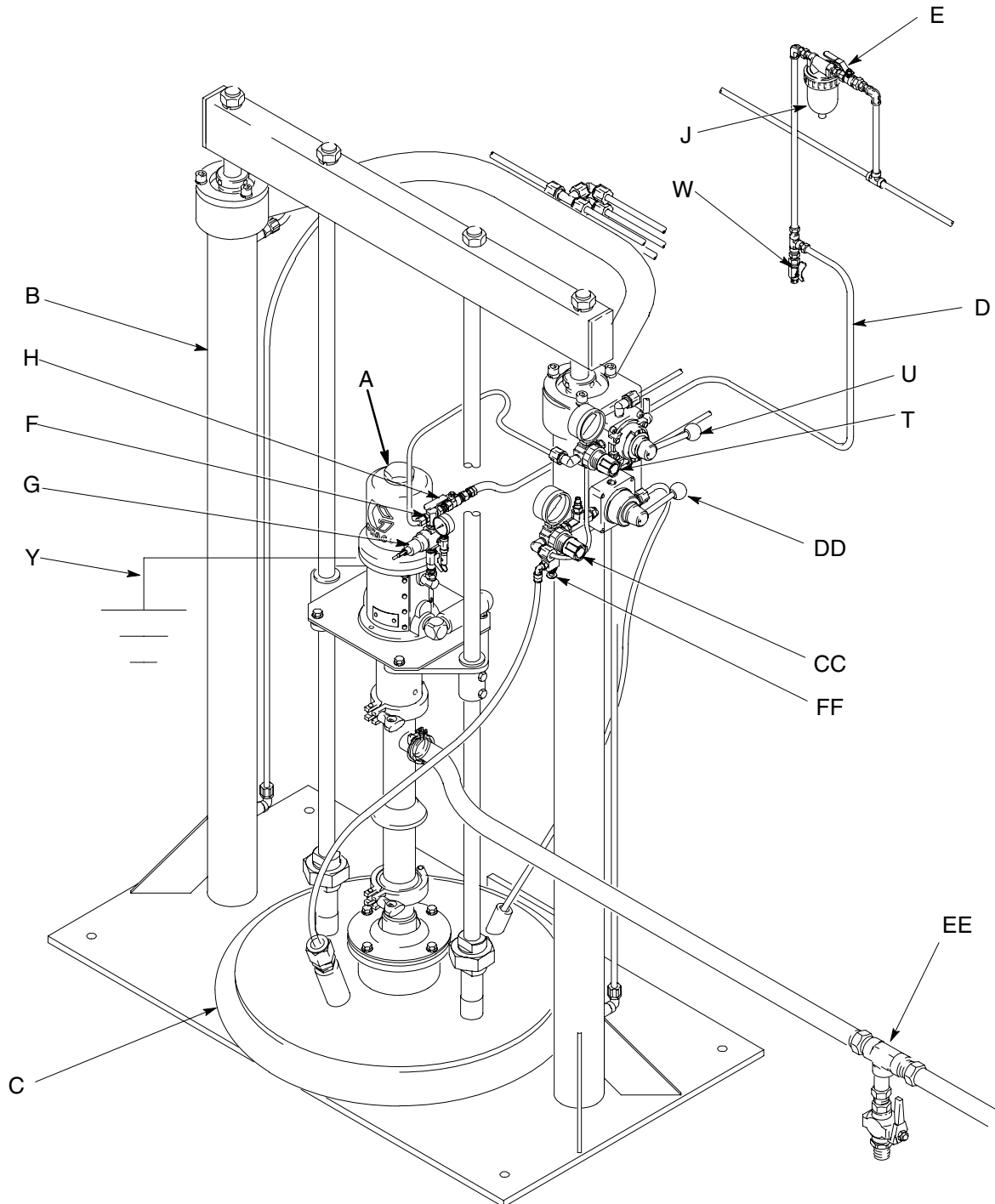


Fig. 2

TI2260C

# Setup

## Double Diaphragm Pumps

### KEY

- |  |   |   |
|--|---|---|
| <b>A</b> Double Diaphragm Pump                             | <b>F</b> Air Manifold                             | <b>U</b> Ram Director Valve                     |
| <b>B</b> Ram   | <b>G</b> Pump Air Regulator                       | <b>Y</b> Pump Ground Wire (required)            |
| <b>C</b> Wiper Plate                                       | <b>H</b> Pump Air Bleed Valve (required for pump) | <b>W</b> Air Line Drain Valve                   |
| <b>D</b> Electrically Conductive Air Supply Hose           | <b>J</b> Air Line Filter                          | <b>CC</b> Inflatable Seal Air Regulator         |
| <b>E</b> Main Air Bleed Valve (required, for pump and ram) | <b>T</b> Ram Air Regulator                        | <b>DD</b> Inflatable Seal Director Valve        |
|  |   | <b>EE</b> Fluid Drain Valve (required for pump) |

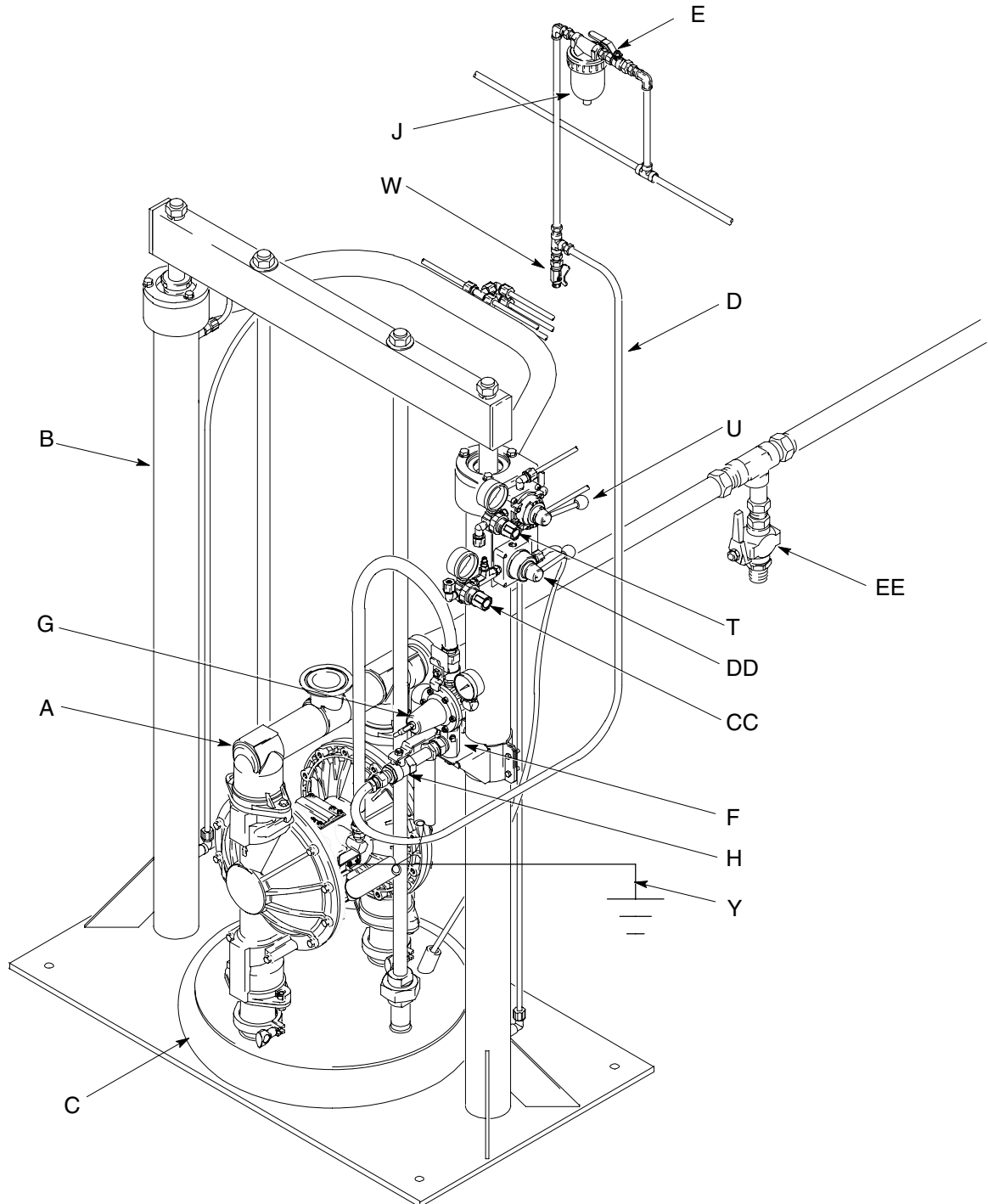


Fig. 3

TI3946A

# 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.

## 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 on page 20.

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.

## Components and Accessories

See Fig. 2.

### WARNING

A main air bleed valve (E), pump air bleed valve (H), and fluid drain valve (EE) 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 RAM 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 (EE) 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. Provides ports for connecting lines to air-powered accessories.
- **Air line filter (J)**  
Removes harmful dirt and moisture from the compressed air supply.
- **Ram air regulator (T)**  
Controls air pressure to the ram.
- **Ram director valve (U)**  
Controls raising and lowering of the ram.
- **The inflatable seal air regulator (CC)** controls air pressure to the ram plate seal.
- **The inflatable seal director valve (DD)** controls the raising and lowering of the ram plate.
- **The fluid drain valve (EE)** (required in your system) relieves fluid pressure between the pump and dispense device.

## Air and Fluid Hoses

Be sure all air hoses (D) and fluid hoses are properly sized and pressure-rated for your system. Use only electrically conductive hoses.



# 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 RAM 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), 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. 4. 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 RAM 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).
4. Remove the drum cover, and smooth the surface of the fluid with a straightedge.

### 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.

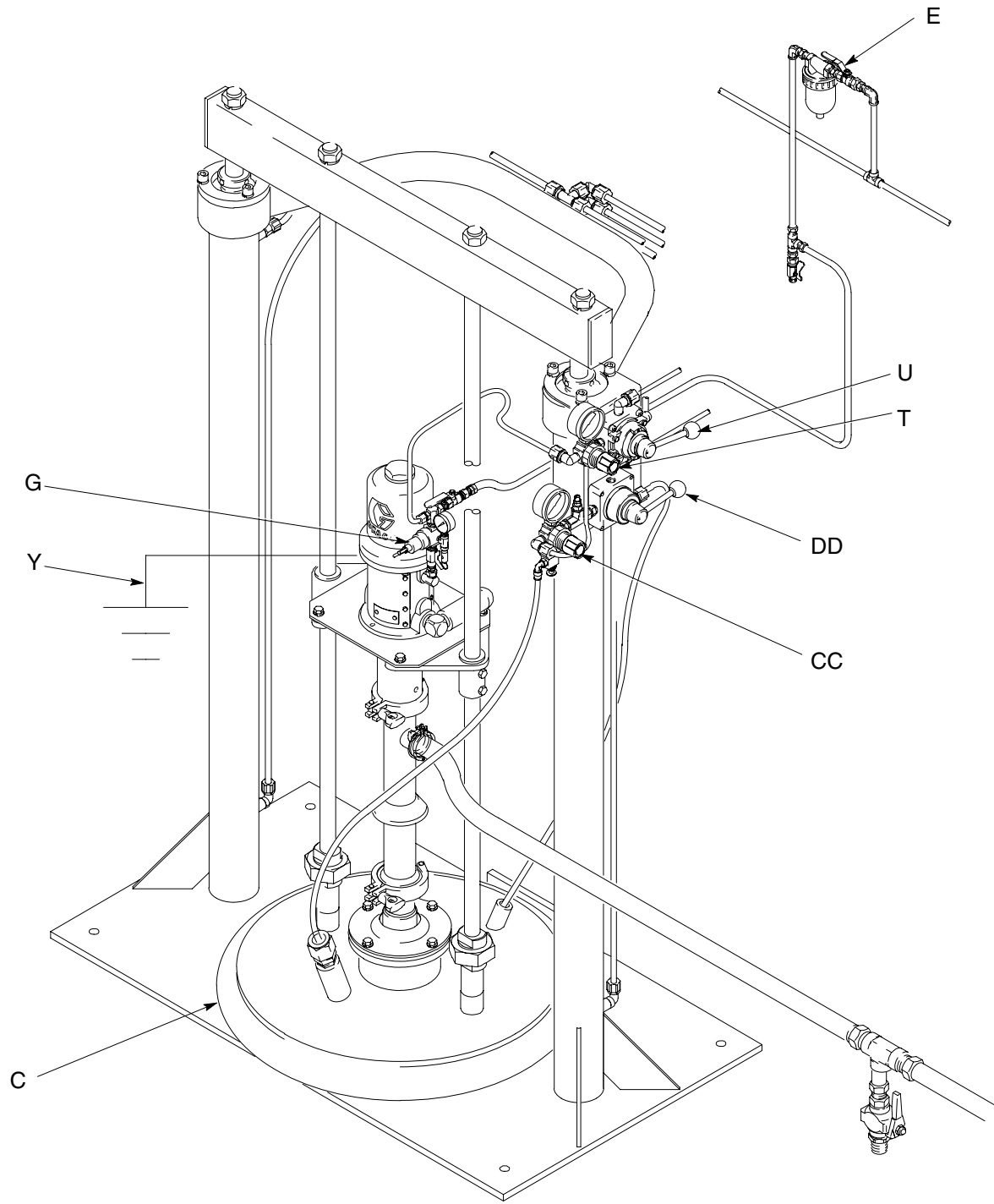
**NOTE:** Do not use drums that have side bungs or large dents with this ram. Rough bung openings or large dents will damage the wipers or stop the ram plate, resulting in a runaway pump.

5. Push down on the director valve handle so the arrow points to RAM 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.
6. Set the director valve to RAM DOWN, and continue to lower the ram until the ram plate contacts the fluid. Inflate the seal to 10 psi (.07 MPa, 0.7 bar) to start.

**NOTE:** If fluid leaks past the seal, increase the air pressure to the seal gradually until leaking stops. To prevent overpressurization, a relief valve limits seal pressure to 25 psi (1.8 bar, 0.18 MPa).

# Operation

Model 234005 shown



TI2260C

Fig. 4

# 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 RAM DOWN. See Fig. 4.
2. Start the pump as explained in the separate pump instruction manual.
3. Keep the director valve (U) set to RAM 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 wiper, ram pressure is too high, and the air pressure should be decreased. Different combinations of seal and ram pressure may be necessary for proper seal and pump operation.

**NOTE:** For diaphragm pump models, adjust RAM DOWN pressure to the minimum level, to ensure that the pump inlet balls seat properly.

## 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 9.

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

## 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 the pump. **Close the pump air bleed valve (H).**
2. Set the director valve (U) to RAM UP to raise ram plate.
3. Raise the ram plate until it is completely out of drum.
4. Remove the empty drum.
5. Inspect the ram plate and, if necessary, remove any remaining material or buildup.
6. Place a full drum on ram base.
7. 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 9.

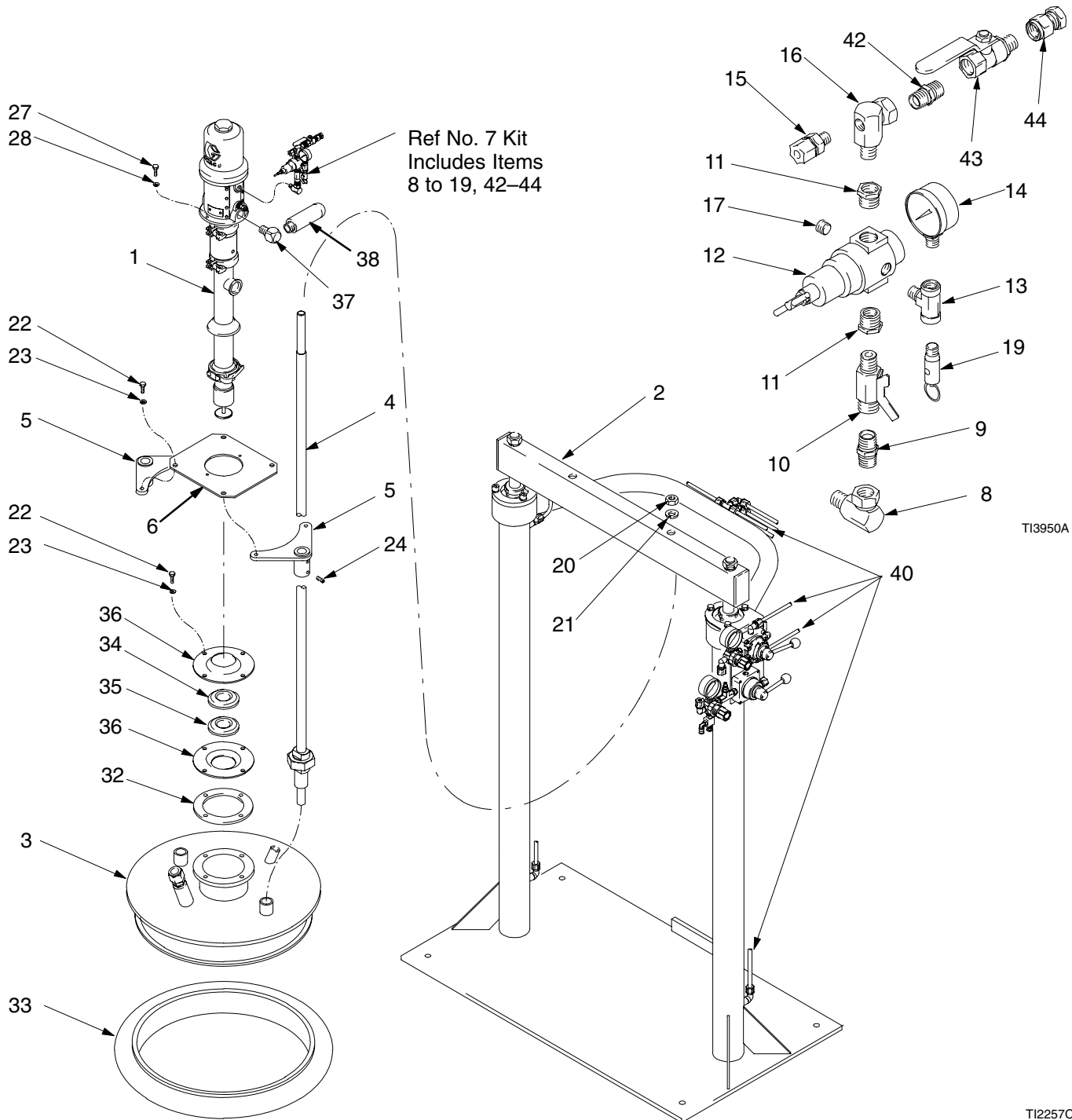
# Parts

**Model 234005, Series C**  
**5:1 Ratio Monark Pump**

**Model 234007, Series C**  
**5:1 Ratio Monark Pump**

**Model 234006, Series C (shown)**  
**5:1 Ratio Monark Pump**

**Model 234008, Series C**  
**5:1 Ratio Monark Pump**



# Parts

## Model 234005, Series C 5:1 Ratio Monark Pump

## Model 234006, Series C (shown) 5:1 Ratio Monark Pump

## Model 234007, Series C 5:1 Ratio Monark Pump

## Model 234008, Series C 5:1 Ratio Monark Pump

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	952793	5:1 RATIO MONARK PUMP See 307056 for parts Models 234005 and 234006	1	17	101970	. PLUG, pipe, headless; 1/4 npt; sst	1
	207550	5:1 RATIO MONARK PUMP See 307056 for parts Models 234007 and 234008	1	19	113498	. VALVE, safety relief	1
2	234015	RAM, drum, 200 liter (55 gal) See 310572 for parts	1	20	510221	NUT, hex; 7/8–9; sst	2
3	15B080	PLATE, ram; 21–1/2 in. (546 mm); Models 234005 and 234007	1	21	512743	WASHER; 7/8; sst	2
	15B081	PLATE, ram; 22–1/2 in. (572 mm); Models 234006 and 234008	1	22	102471	SCREW, cap, hex–hd; 3/8–16 x 1 in. (25 mm); sst	8
4	947376	ROD, tie	2	23	103975	WASHER, lock; 3/8; sst	8
5	948329	BRACKET, tie rod/air motor	2	24	510964	SCREW, set; 3/8–16 x 1.25 in. (31 mm); sst	4
6	624317	PLATE, pump mounting	1	27	102023	SCREW, cap, hex–hd; 1/4–20 x 3/4 in. (19 mm); sst	2
7	948112	KIT, air, pump; includes items 8–19, 42–44	1	28	102024	WASHER, lock; 1/4; sst	2
8	207123	. UNION, swivel, 90°; 3/8 npt(m) x 3/8 npsm(f) swivel	1	32	601809	GASKET, sanitary	1
9	166469	. NIPPLE; 3/8 npt; sst	1	33	15B097	SEAL, ram plate; 21–1/2 in. (546 mm); neoprene; Models 234005 and 234007	1
10	237534	. VALVE, ball; 3/8 npt (m x f); sst	1		15B098	SEAL, ram plate; 22–1/2 in. (572 mm); neoprene; Models 234006 and 234008	1
11	504285	. BUSHING, pipe; 1/2 npt(m) x 3/8 npt(f); sst	2	34	160098	SEAL, ram plate	1
12	104267	. AIR REGULATOR See 308167 for parts	1	35	161452	SEAL, ram plate	1
13	185281	. TEE; 1/4 npt(m) x 1/4 npt(f); sst	1	36	609034	PLATE	2
14	512218	. GAUGE, air pressure	1	37	500263	ELBOW, street	1
15	608789	. CONNECTOR, tube, straight; 3/8 in. (10 mm) OD tube x 1/4 npt(m)	1	38	512913	MUFFLER; Models 234007 and 234008	1
16	622687	. UNION, swivel, 90°; 3/8 npt(m) x 3/8 npsm(f) swivel x 1/4 npt(f)	1	40	513066	TUBE, air; nylon; 3/8 in. (10 mm) OD; 6 ft (1.8 m)	1
				42	C20483	NIPPLE, 3/8 npt	1
				43	113333	VALVE, ball; bleed-type; 3/8 npt (m x f)	1
				44	207152	UNION, swivel, straight; 3/8 npt(f) x 3/8 npsm(f)	1

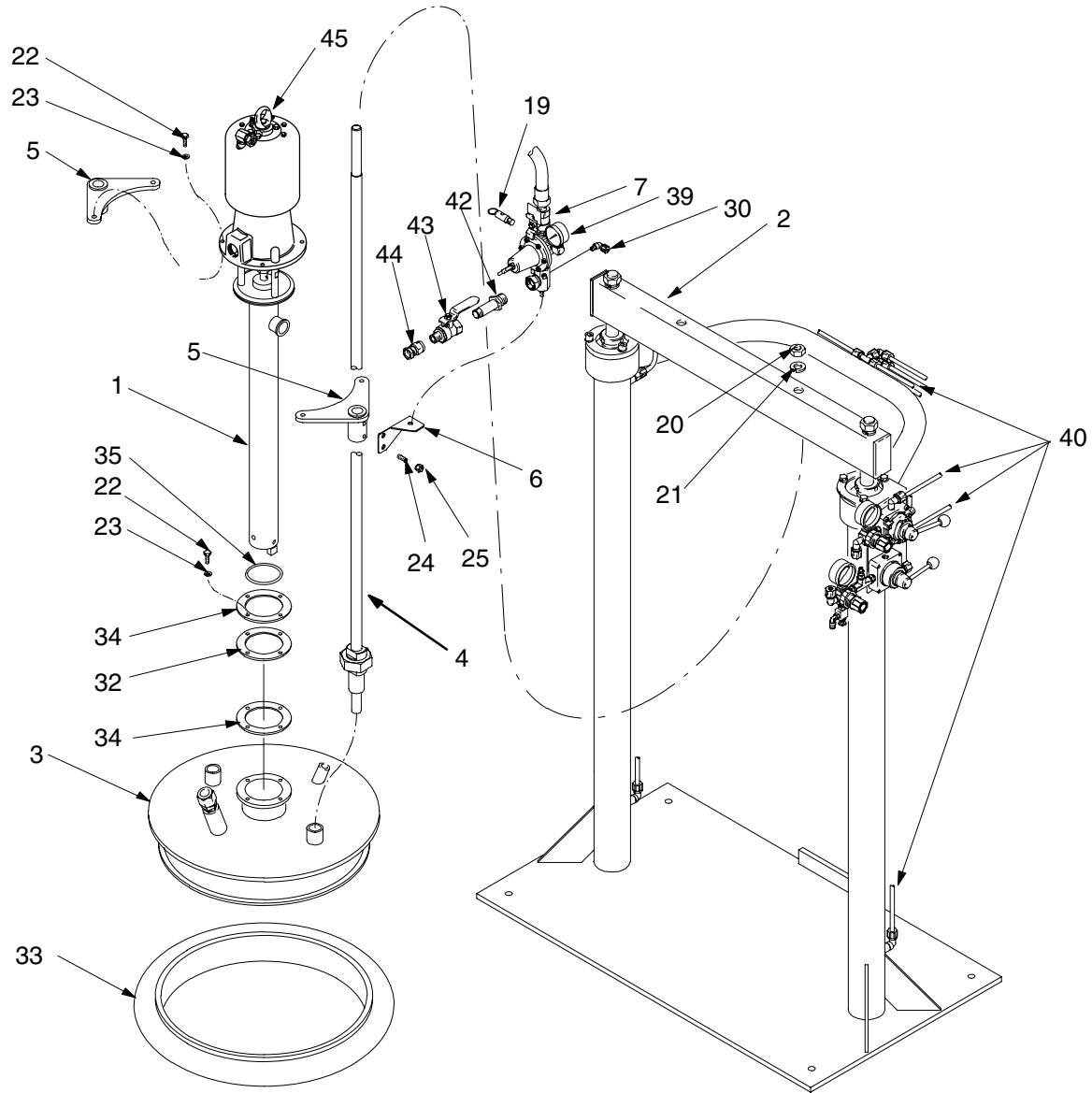
# Parts

**Model 234009, Series C**  
**4:1 Ratio Senator Pump**

**Model 234011, Series C (shown)**  
**4:1 Ratio Senator Pump**

**Model 234010, Series C**  
**4:1 Ratio Senator Pump**

**Model 234012, Series C**  
**4:1 Ratio Senator Pump**



TI2259C

# Parts

## Model 234009, Series C 4:1 Ratio Senator Pump

## Model 234010, Series C 4:1 Ratio Senator Pump

## Model 234011, Series C 4:1 Ratio Senator Pump

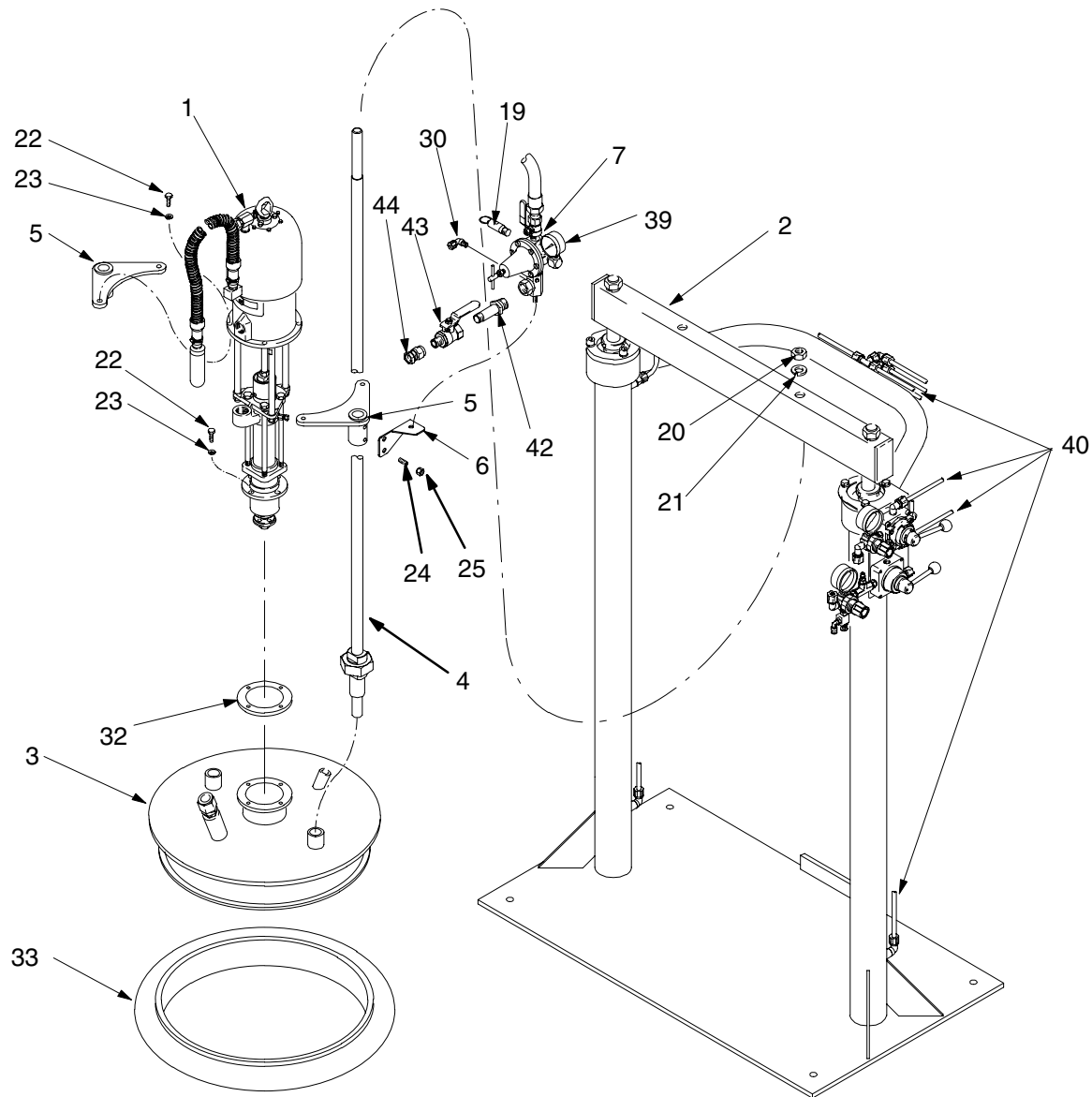
## Model 234012, Series C 4:1 Ratio Senator Pump

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	948649	4:1 RATIO FT14 PUMP See 308076 for parts; Models 234011 and 234012	1	25	102021	NUT, lock; 3/8–16; sst	2
	570019	4:1 RATIO FT14 PUMP See 308076 for parts; Models 234009 and 234010	1	30	608780	ELBOW, 90°; 3/8 in. (10 mm) OD tube x 1/4 npt(m)	1
2	234015	RAM, drum, 200 liter (55 gal) See 310572 for parts	1	32	601809	GASKET, sanitary	1
3	15B080	PLATE, ram; 21–1/2 in. (546 mm); Models 234009 and 234011	1	33	15B097	SEAL, ram plate; 21–1/2 in. (546 mm); neoprene; Models 234009 and 234011	1
	15B081	PLATE, ram; 22–1/2 in. (572 mm); Models 234010 and 234012	1		15B098	SEAL, ram plate; 22–1/2 in. (572 mm); neoprene; Models 234010 and 234012	1
4	947376	ROD, tie	2	34	624970	PLATE, adapter	2
5	948329	BRACKET, tie rod/air motor	2	35	513460	O-RING; neoprene	1
6	621871	PLATE, regulator mounting	1	39	512218	GAUGE, air pressure	1
7	205712	KIT, air, pump; see 308168 for parts	1	40	513066	TUBE, air; nylon; 3/8 in. (10 mm) OD; 6 ft (1.8 m)	1
19	103347	VALVE, safety relief	1	42	190864	NIPPLE, 1/2 npt x 3/4 npt	1
20	510221	NUT, hex; 7/8–9; sst	2	43	113269	VALVE, ball; bleed-type; 1/2 npt (m x f)	1
21	512743	WASHER; 7/8; sst	2	44	155865	UNION, swivel, straight; 1/2 npt(fbe)	1
22	102471	SCREW, cap, hex-hd; 3/8–16 x 1 in. (25 mm); sst	8	45	169627	NUT, cap, motor; Models 234009 and 234010	1
23	103975	WASHER, lock; 3/8; sst	8				
24	510964	SCREW, set; 3/8–16 x 1.25 in. (31 mm); sst	4				

# Parts

**Model 234013, Series C**  
**10:1 Ratio Bulldog Pump**  
**Model 234014, Series C**  
**10:1 Ratio Bulldog Pump**

**Model 234016, Series C**  
**10:1 Ratio Bulldog Pump, with**  
**Adjust-A-Stroke Motor**



T12258C



# Parts

## Model 234013, Series C 10:1 Ratio Bulldog Pump

## Model 234014, Series C 10:1 Ratio Bulldog Pump

## Model 234016, Series C 10:1 Ratio Bulldog Pump, with Adjust-A-Stroke Motor

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	949444	10:1 RATIO BULLDOG PUMP See 306916 for parts; Models 234013 and 234014	1	23	103975	WASHER, lock; 3/8; sst	8
	954180	10:1 RATIO BULLDOG PUMP, with Adjust-A-Stroke Motor See 306916 for parts; Model 234016	1	24	510964	SCREW, set; 3/8-16 x 1.25 in. (31 mm); sst	4
2	234015	RAM, drum, 200 liter (55 gal) See 310572 for parts	1	25	102021	NUT, lock; 3/8-16; sst	2
3	15B080	PLATE, ram; 21-1/2 in. (546 mm); Model 234013	1	30	608780	ELBOW, 90°; 3/8 in. (10 mm) OD tube x 1/4 npt(m)	1
	15B081	PLATE, ram; 22-1/2 in. (572 mm); Models 234014 and 234016	1	32	601809	GASKET, sanitary	1
4	947376	ROD, tie	2	33	15B097	SEAL, ram plate; 21-1/2 in. (546 mm); neoprene; Model 234013	1
5	948329	BRACKET, tie rod/air motor	2		15B098	SEAL, ram plate; 22-1/2 in. (572 mm); neoprene; Models 234014 and 234016	1
6	621871	PLATE, regulator mounting	1	39	512218	GAUGE, air pressure	1
7	205712	KIT, air, pump; see 308168 for parts	1	40	513066	TUBE, air; nylon; 3/8 in. (10 mm) OD; 6 ft (1.8 m)	1
19	103347	VALVE, safety relief	1	42	190864	NIPPLE, 1/2 npt x 3/4 npt	1
20	510221	NUT, hex; 7/8-9; sst	2	43	113269	VALVE, ball; bleed-type; 1/2 npt (m x f)	1
21	512743	WASHER; 7/8; sst	2	44	155865	UNION, swivel, straight; 1/2 npt(fbe)	1
22	102471	SCREW, cap, hex-hd; 3/8-16 x 1 in. (25 mm); sst	8				

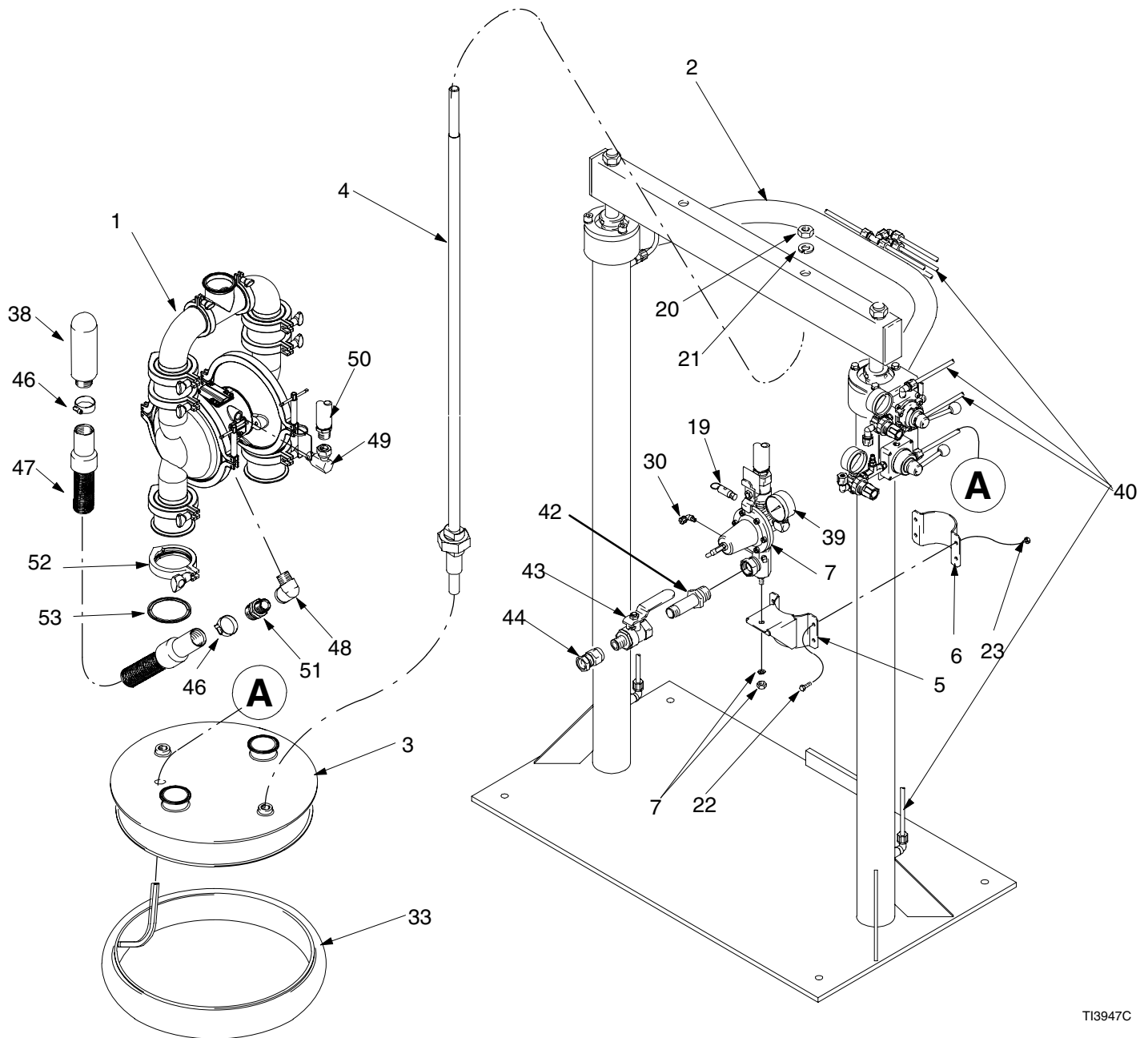
# Parts

**Model 248275, Series B**  
**1:1 Ratio 3150 Husky Pump,**  
**Ball Check**

**Model 248277, Series B**  
**1:1 Ratio 3150 Husky Pump,**  
**Ball Check**

**Model 248276, Series B**  
**1:1 Ratio 3150 Husky Pump,**  
**Flapper Check**

**Model 248278, Series B**  
**1:1 Ratio 3150 Husky Pump,**  
**Flapper Check**



TI3947C

# Parts

**Model 248275, Series B**  
**1:1 Ratio 3150 Husky Pump,**  
**Ball Check**

**Model 248277, Series B**  
**1:1 Ratio 3150 Husky Pump,**  
**Ball Check**

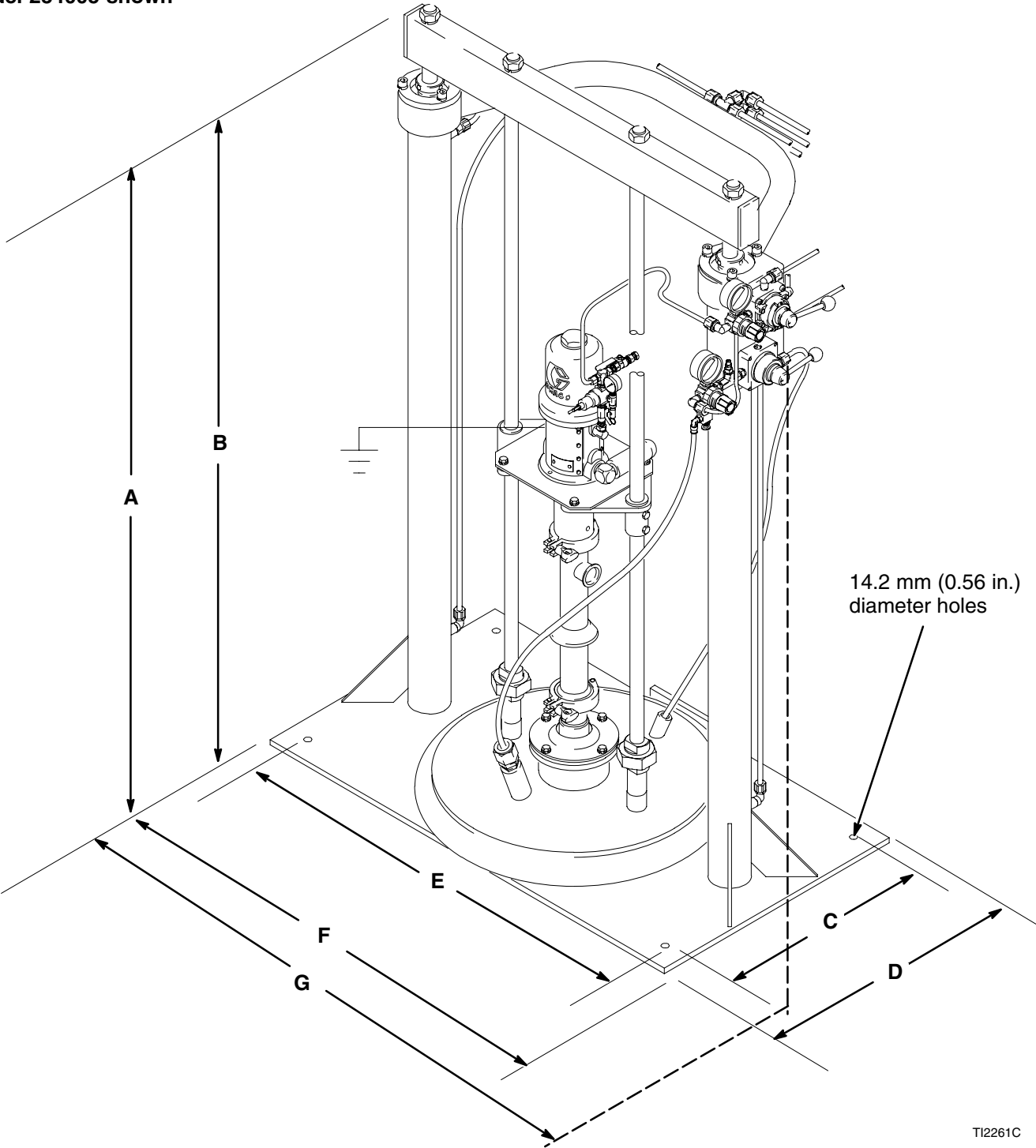
**Model 248276, Series B**  
**1:1 Ratio 3150 Husky Pump,**  
**Flapper Check**

**Model 248278, Series B**  
**1:1 Ratio 3150 Husky Pump,**  
**Flapper Check**

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	248273	1:1 RATIO HUSKY PUMP See 310622 for parts; Models 248275 and 248277	1	38	512914	MUFFLER	1
	248274	1:1 RATIO HUSKY PUMP See 310622 for parts; Models 248276 and 248278	1	39	512218	GAUGE, air pressure	1
2	234015	RAM, drum, 200 liter (55 gal) See 310572 for parts	1	40	513066	TUBE, air; nylon; 3/8 in. (10 mm) OD; 6 ft (1.8 m)	1
3	15D653	PLATE, ram; 21-1/2 in. (546 mm); Models 248275 and 248276	1	42	190864	NIPPLE, 1/2 npt x 3/4 npt	1
	15D654	PLATE, ram; 22-1/2 in. (572 mm); Models 248277 and 248278	1	43	113269	VALVE, ball; bleed-type; 1/2 npt (m x f)	1
4	947376	ROD, tie	2	44	155865	UNION, swivel, straight; 1/2 npt(fbe)	1
5	237962	BRACKET, regulator mounting	1	46	101818	CLAMP, hose	2
6	190747	BRACKET	1	47	102810	HOSE, exhaust; 1 in. (25 mm) ID; 5 ft (1.52 m); nylon	1
7	205712	KIT, air, pump; see 308168 for parts	1	48	500263	ELBOW; 3/4 npt(m)	1
19	113811	VALVE, safety relief	1	49	155470	UNION, swivel, 90°; 1/2 npt(m) x 1/2 npsm(f)	1
20	510221	NUT, hex; 7/8-9; sst	2	50	205418	HOSE, air; 1/2 in. (13 mm) ID; 1/2 npt(mbe); 6 ft (1.8 m); buna-N	1
21	512743	WASHER; 7/8; sst	2	51	171439	NIPPLE, pipe, reducing	1
22	100021	SCREW, cap, hex-hd; 1/4-20 x 1 in. (25 mm)	4	52	510480	CLAMP, 4 in; sanitary	2
23	102040	NUT, lock, hex; 1/4-20	4	53	513548	SEAL, 4 in; sanitary	2
30	608780	ELBOW, 90°; 3/8 in. (10 mm) OD tube x 1/4 npt(m)	1				
33	15B097	SEAL, ram plate; 21-1/2 in. neoprene; Models 248275 and 248276	1				
33	15B098	SEAL, ram plate; 22-1/2 in. neoprene; Models 248277 and 248278	1				

# Dimensions

Model 234005 shown



TI2261C

Pump Model	A (raised)	B (lowered)	C	D	E	F	G
All	2718 mm (107 in.)	1702 mm (67 in.)	508 mm (20 in.)	610 mm (24 in.)	965 mm (38 in.)	1067 mm (42 in.)	1111 mm (43.74 in.)

# Technical Data

Maximum air input pressure (ram) ..... 8.6 bar, 0.9 MPa (125 psi)

Maximum fluid working pressure and air input pressure (pump) ..... See page 4.

Wetted parts (fluid outlet fittings) ..... zinc or cadmium-plated carbon steel or stainless steel

Wetted parts (pump) ..... See separate pump instruction manual.

Model No.	Air Motor	Air Pressure of Sound Tests (25 cycles/min)	*Sound Pres- sure Level	**Sound Power Level
234005	Monark®	12.5 bar, 1.25 MPa (180 psi)	96 dB(A)	112 dB(A)
234006	Monark®	12.5 bar, 1.25 MPa (180 psi)	96 dB(A)	112 dB(A)
234007	Monark®	12.5 bar, 1.25 MPa (180 psi)	96 dB(A)	112 dB(A)
234008	Monark®	12.5 bar, 1.25 MPa (180 psi)	96 dB(A)	112 dB(A)
234009	Senator®	7 bar, 0.7 MPa (100 psi)	93 dB(A)	108 dB(A)
234010	Senator®	7 bar, 0.7 MPa (100 psi)	93 dB(A)	108 dB(A)
234011	Senator®	7 bar, 0.7 MPa (100 psi)	93 dB(A)	108 dB(A)
234012	Senator®	7 bar, 0.7 MPa (100 psi)	93 dB(A)	108 dB(A)
234013	Bulldog®	7 bar, 0.7 MPa (100 psi)	94 dB(A)	109 dB(A)
234014	Bulldog®	7 bar, 0.7 MPa (100 psi)	94 dB(A)	109 dB(A)
234016	Bulldog®	7 bar, 0.7 MPa (100 psi)	94 dB(A)	109 dB(A)
248275	Husky® 3150 Ball Check	8.3 bar, 0.83 MPa (120 psi)	90 dB(A)	103 dB(A)
248277	Husky® 3150 Ball Check	8.3 bar, 0.83 MPa (120 psi)	90 dB(A)	103 dB(A)
248276	Husky® 3150 Flapper Check	8.3 bar, 0.83 MPa (120 psi)	90 dB(A)	103 dB(A)
248278	Husky® 3150 Flapper Check	8.3 bar, 0.83 MPa (120 psi)	90 dB(A)	103 dB(A)

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

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

# 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.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

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.

**THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

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# Graco Information

**TO PLACE AN ORDER**, contact your Graco distributor, or call one of the following numbers to identify the distributor closest to you:

**1-800-328-0211 Toll Free**

**612-623-6921**

**612-378-3505 Fax**

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