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INSTRUCTIONS

This manual contains important  
warnings and information.  
**READ AND RETAIN FOR REFERENCE**

# Husky™ 1040 Air-Operated Diaphragm Pumps

*120 psi (8.4 bar) MAXIMUM FLUID WORKING PRESSURE*

*120 psi (8.4 bar) MAXIMUM AIR INPUT PRESSURE*

## ALUMINUM PUMPS

### Part No. 236-250

with PTFE® Diaphragms and Balls, Polypropylene Seats

### Part No. 236-251

with Hytrel® Diaphragms and Seats, Acetal Balls

### Part No. 236-252

with Santoprene® Diaphragms, Balls and Seats

### Part No. 236-253

with PTFE® Diaphragms and Balls, Stainless Steel Seats

## STAINLESS STEEL PUMPS

### Part No. 236-260

with PTFE® Diaphragms and Balls, Stainless Steel Seats

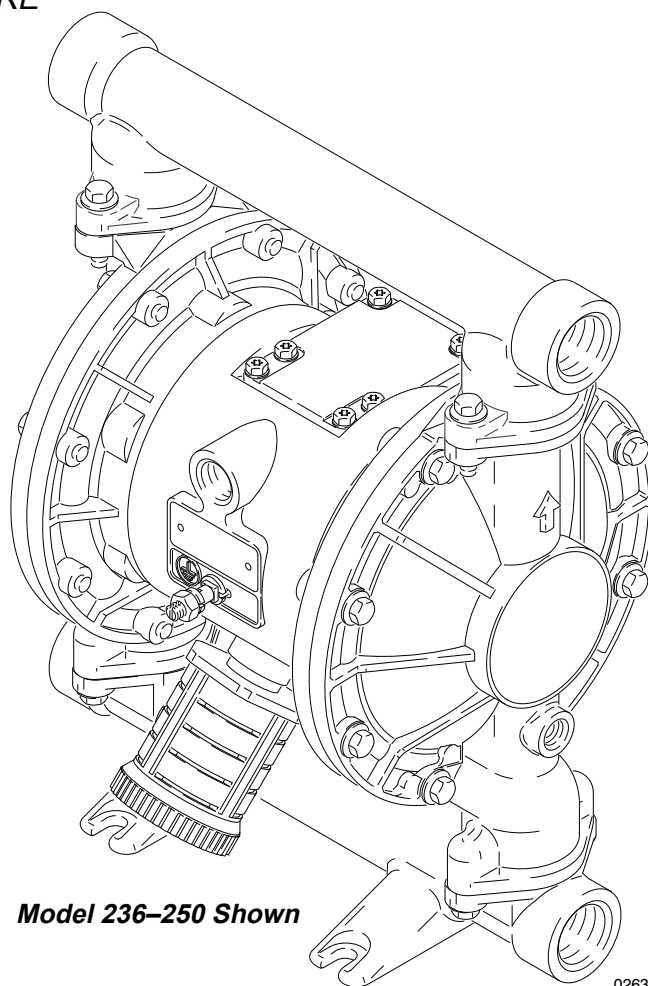
### Part No. 236-261

with Hytrel® Diaphragms and Seats, Acetal Balls

### Part No. 236-262

with Santoprene® Diaphragms, Balls and Seats

US and Foreign Patents Pending



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## WARNING

### Hazard of Using Fluids Containing Halogenated Hydrocarbons

Never use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in Aluminum Pump Models 236-250, 236-251, 236-252 and 236-253. Such use could result in a serious chemical reaction, with the possibility of explosion, which could cause death, serious bodily injury and/or substantial property damage.

Consult your fluid suppliers to ensure that the fluids used are compatible with aluminum parts.

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## WARNINGS

**For Professional Use Only. Observe All Warnings.**  
**Read and understand all instruction manuals before operating equipment.**

### EQUIPMENT MISUSE HAZARD

#### General Safety

Any misuse of the equipment or accessories, such as over-pressurizing, modifying parts, using incompatible chemicals and fluids, or using worn or damaged parts, can cause them to rupture and result in serious injury, including splashing in the eyes or on the skin, fire, explosion or property damage.

Never alter or modify any part of this equipment; doing so could cause it to malfunction.

Check all equipment regularly and repair or replace worn or damaged parts immediately.

Take precautions to avoid a toxic fluid spill. See **USING HAZARDOUS FLUIDS**, on page 3.

#### System Pressure

This pump develops 120 psi (8.4 bar) *Maximum Fluid Working Pressure* at 120 psi (8.4 bar) maximum incoming air pressure. Never exceed these maximum pressures, or the maximum working pressure of the lowest rated component in your system.

**2 308–313**

#### Fluid Compatibility

Be sure all fluids and solvents used are chemically compatible with the “Wetted Parts” and “Non-wetted Parts” shown in the **Technical Data** on pages 30 and 31. Always read the fluid and solvent manufacturer’s literature before using them in this pump.

Diaphragm failure will cause non-wetted parts to be exposed to fluid. This fluid will be exhausted with the air through the muffler. When pumping flammable or hazardous fluids, you must vent the exhaust to a safe place, away from people, animals, food handling areas, and all sources of ignition. Put a container at the end of the air exhaust line to catch the fluid. See Air Exhaust Ventilation on page 8.

#### Pressure Relief Procedure

To reduce the risk of serious injury, including splashing fluid or solvent in the eyes or on the skin, always follow this procedure before checking, adjusting, cleaning, moving, or repairing any part of the system.

1. Shut off the air to the pump.
2. Open the dispensing valve, if used.
3. Open the fluid drain valve to relieve all fluid pressure, having a container ready to catch the drainage.

## USING HAZARDOUS FLUIDS

Improper handling of hazardous fluids or inhaling toxic vapors can cause extremely serious injury, even death, due to splashing in the eyes, ingestion, or bodily contamination. Know what fluid you are pumping and its specific hazards. Store hazardous fluid in an appropriate, approved container. Dispose of it according to all Local, State and Federal guidelines for hazardous fluids. Observe all the following precautions when handling known or potentially hazardous fluids.

1. Always wear appropriate clothing and equipment, such as eye protection and breathing apparatus, to protect yourself.
2. Pipe and dispose of the exhaust air safely. If the diaphragm fails, the fluid is exhausted along with the air. See Air Exhaust Ventilation on page 8.
3. Secure the fluid outlet hose tightly into the receiving container to prevent it from coming loose and improperly draining the fluid.
4. Never move or lift a pump under pressure. If dropped, the fluid section may rupture. Always follow the **Pressure Relief Procedure** on page 2 before moving or lifting the pump.

## FIRE OR EXPLOSION HAZARD

Static electricity is created by the fluid flowing through the pump and hose. If the equipment is not properly grounded, sparking may occur, and the system may become hazardous. Sparks can ignite fumes from solvents and the fluid being pumped, dust particles and other flammable substances, whether you are pumping indoors or outdoors, and cause a fire or explosion, serious injury, and property damage.

If you experience any static sparking or even a slight shock while using this equipment, **stop dispensing immediately**. Do not use the system again until the cause of the problem is identified and corrected.

### Grounding

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

1. *Pump*: connect a ground wire and clamp as shown in Fig. 1.
2. *Air and fluid hoses*: use only grounded hoses with a maximum of 500 ft (150 m) combined hose length to ensure grounding continuity.
3. *Air compressor*: according to manufacturer's recommendations.
4. *All solvent pails used when flushing*, according to local code. 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.
5. *Fluid supply container*: according to local code.

**To ground the pump:** Loosen the grounding lug locknut (W) and washer (X). Insert one end of a 12 ga (1.5 mm<sup>2</sup>) minimum ground wire (Y) into the slot in the lug (Z) and tighten the locknut securely. See Fig. 1. Connect the clamp end of the ground wire to a true earth ground. Refer to the Accessories section to order a ground wire and clamp.

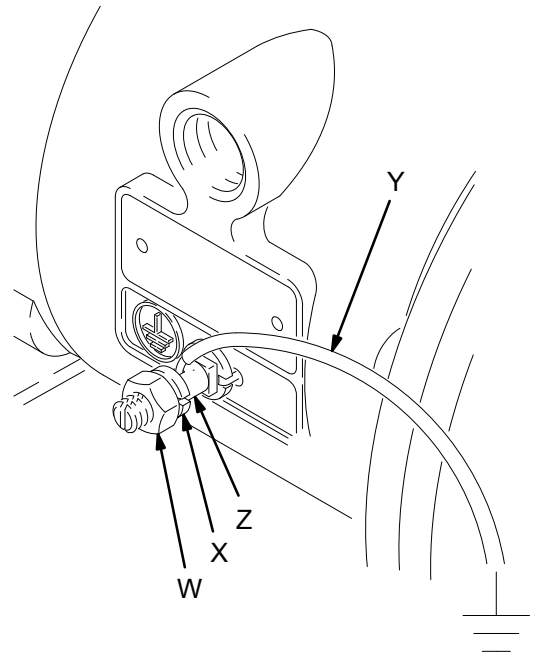


Fig. 1

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## IMPORTANT

United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards – particularly the General Standards, Part 1910, and the Construction Standards, Part 1926 – should be consulted.

## TERMS

**WARNING** Alerts user to avoid or correct conditions that could cause bodily harm.

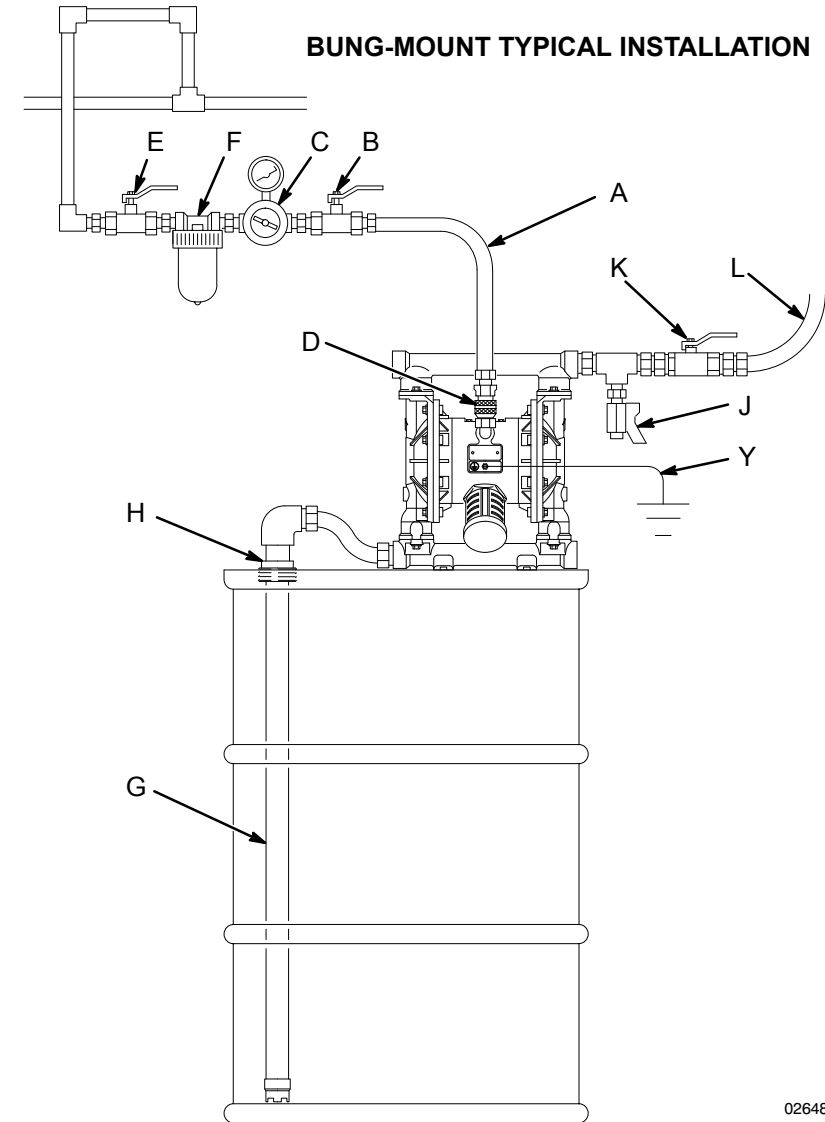
**CAUTION** Alerts user to avoid or correct conditions that could cause damage to or destruction of equipment.

**NOTE** Identifies essential procedures or helpful information.

# Installation

## KEY FOR FIG. 2

- A Air Supply Line
- B Bleed-Type Master Air Valve (required for pump)
- C Air Regulator
- D Air Line Quick Disconnect
- E Master Air Valve (for accessories)
- F Air Line Filter
- G Fluid Suction Line
- H Bung Adapter
- J Fluid Drain Valve (required)
- K Fluid Shutoff Valve
- L Fluid Line
- Y Ground Wire (required; see page 3 for installation instructions)



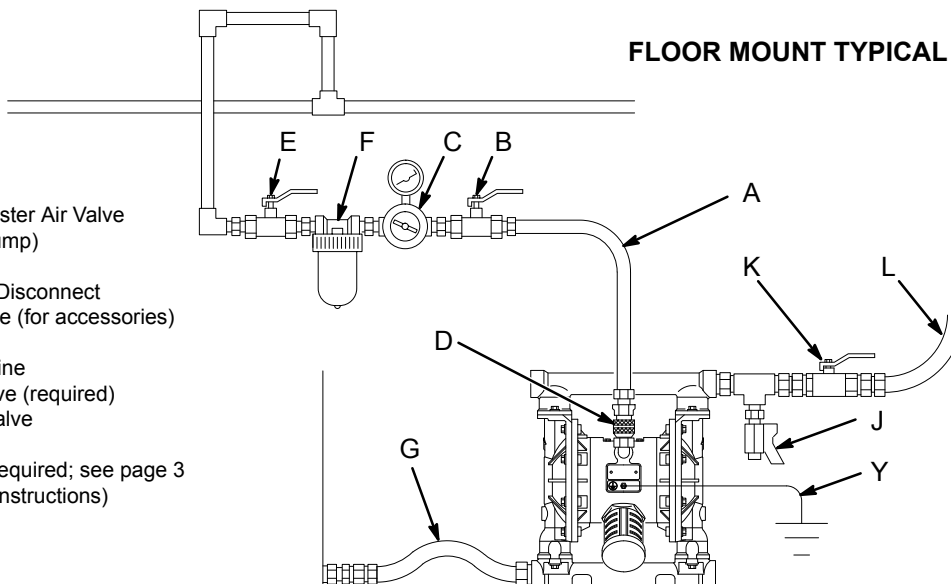
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**Fig. 2**

## FLOOR MOUNT TYPICAL INSTALLATION

## KEY FOR FIG. 3

- A Air Supply Line
- B Bleed-Type Master Air Valve (required for pump)
- C Air Regulator
- D Air Line Quick Disconnect
- E Master Air Valve (for accessories)
- F Air Line Filter
- G Fluid Suction Line
- J Fluid Drain Valve (required)
- K Fluid Shutoff Valve
- L Fluid Line
- Y Ground Wire (required; see page 3 for installation instructions)



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**Fig. 3**

# Installation

## KEY FOR FIG. 4

- A Air Supply Line
- B Bleed-Type Master Air Valve (required for pump)
- C Air Regulator
- D Air Line Quick Disconnect
- E Master Air Valve (for accessories)
- F Air Line Filter
- G Fluid Suction Line
- J Fluid Drain Valve (required)
- K Fluid Shutoff Valve
- L Fluid Line
- M Wall Mounting Bracket
- Y Ground Wire (required; see page 3 for installation instructions)

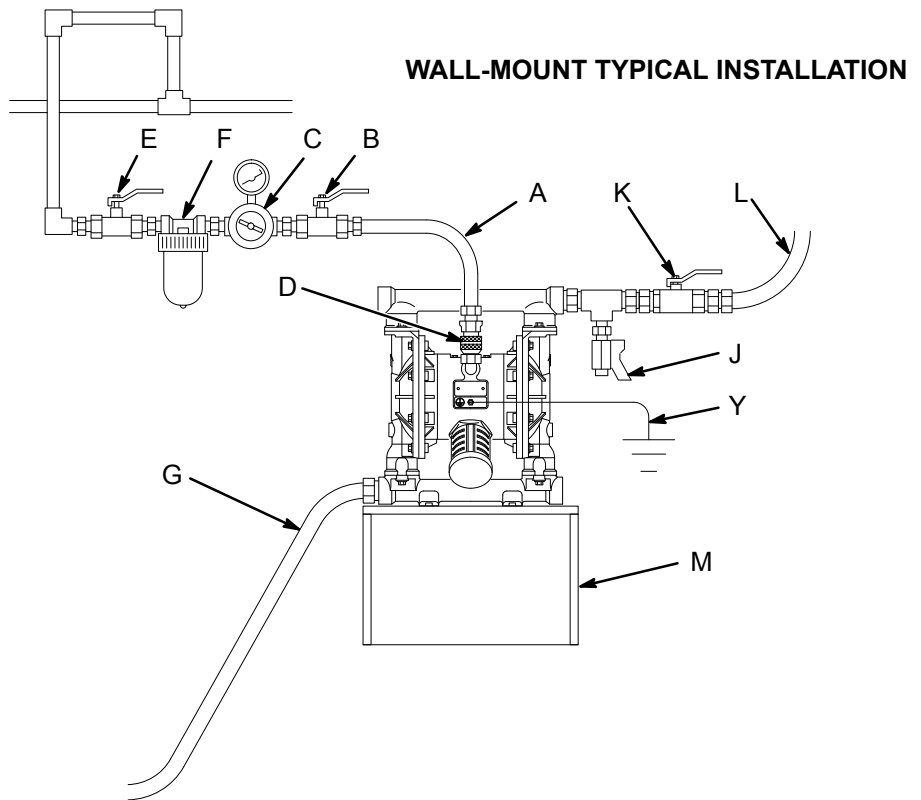


Fig. 4

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## General Information

1. The Typical Installations shown in Figs. 2–4 are only guides for selecting and installing system components. Contact your Graco distributor or Graco Technical Assistance (see back page) for assistance in planning a system to suit your needs.
2. See pages 27 and 28 for accessories available from Graco. Always use Genuine Graco Parts and Accessories.
3. Reference numbers and letters in parentheses refer to the callouts in the figures and the parts lists on pages 22–25.

## Grounding

### WARNING

This pump must be grounded. Before operating the pump, ground the system as explained in **FIRE OR EXPLOSION HAZARD** on page 3.

## Mountings

### CAUTION

The pump exhaust air may contain contaminants. Ventilate to a remote area if the contaminants could affect your fluid supply. See **Air Exhaust Ventilation** on page 8.

1. Be sure the mounting surface can support the weight of the pump, hoses, and accessories, as well as the stress caused during operation.
2. For all mountings, be sure the pump is bolted directly to the mounting surface.
3. For ease of operation and service, mount the pump so the air valve cover (7), air inlet, and fluid inlet and outlet ports are easily accessible.
4. Rubber Foot Mounting Kit 236–452 is available to reduce noise and vibration during operation.

### WARNING

To reduce the risk of serious injury, splashing in the eyes or on the skin, and toxic fluid spills, **never** move or lift a pump under pressure. If dropped, the fluid section may rupture. Always follow the **Pressure Relief Procedure Warning** on page 2 before moving or lifting the pump.

# Installation

## Changing the Orientation of the Fluid Inlet and Outlet Ports

**On aluminum pumps**, the fluid inlet and outlet manifolds have threaded ports on both ends. The pump is shipped with a plug installed in one end of each manifold, and the opposite end open. See Fig. 5. To change the orientation of the inlet and/or outlet port, remove the plug from one end of a manifold and install it in the opposite end.

**On stainless steel pumps**, the fluid inlet and outlet manifolds have threaded ports on one end only. The pump is shipped with the ports facing the same direction. To reverse the orientation of the ports:

1. Remove the screws and nuts holding the inlet and/or outlet manifold to the covers.
2. Reverse the manifold and reattach. Install the screws and torque to 120–130 in-lb (14–15 N.m).

## Air Line

### WARNING

A bleed-type master air valve (B) is required in your system to relieve air trapped between this valve and the pump. Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury, including splashing in the eyes or on the skin, injury from moving parts, or contamination from hazardous fluids.

1. Install the air line accessories as shown in Figs. 2–4 on pages 4 and 5. Mount these accessories on the wall or on a bracket. Be sure the air line supplying the accessories is grounded.
  - a. Install an air regulator (C) and gauge to control the fluid pressure. The fluid outlet pressure will be the same as the setting of the air regulator.
  - b. Locate one bleed-type master air valve (B) close to the pump and use it to relieve trapped air. See the **WARNING** at left. Locate the other master air valve (E) upstream from all air line accessories and use it to isolate them during cleaning and repair.
  - c. The air line filter (F) removes harmful dirt and moisture from the compressed air supply.
2. Install a grounded, flexible air hose (A) between the accessories and the 1/2 npt(f) pump air inlet (N). See Fig. 5. Use a minimum 3/8" (9.5 mm) ID air hose. Screw an air line quick disconnect coupler (D) onto the end of the air hose (A), and screw the mating fitting into the pump air inlet snugly. Do not connect the coupler (D) to the fitting until you are ready to operate the pump.

# Installation

## Fluid Suction Line

1. Use grounded fluid hoses. The pump fluid inlet (R) is 1" npt(f). See Fig. 5. Screw the fluid fitting into the pump inlet securely.
2. If the fluid inlet pressure to the pump is more than 25% of the outlet working pressure, the ball check valves will not close fast enough, resulting in inefficient pump operation.
3. At inlet fluid pressures greater than 15 psi (1.05 bar), diaphragm life will be shortened.
4. See the **Technical Data** on pages 30 and 31 for maximum suction lift (wet and dry).

## Fluid Outlet Line

### WARNING

A fluid drain valve (J) is required to relieve pressure in the hose if it is plugged. The drain valve reduces the risk of serious injury, including splashing in the eyes or on the skin, or contamination from hazardous fluids when relieving pressure. Install the valve close to the pump fluid outlet.

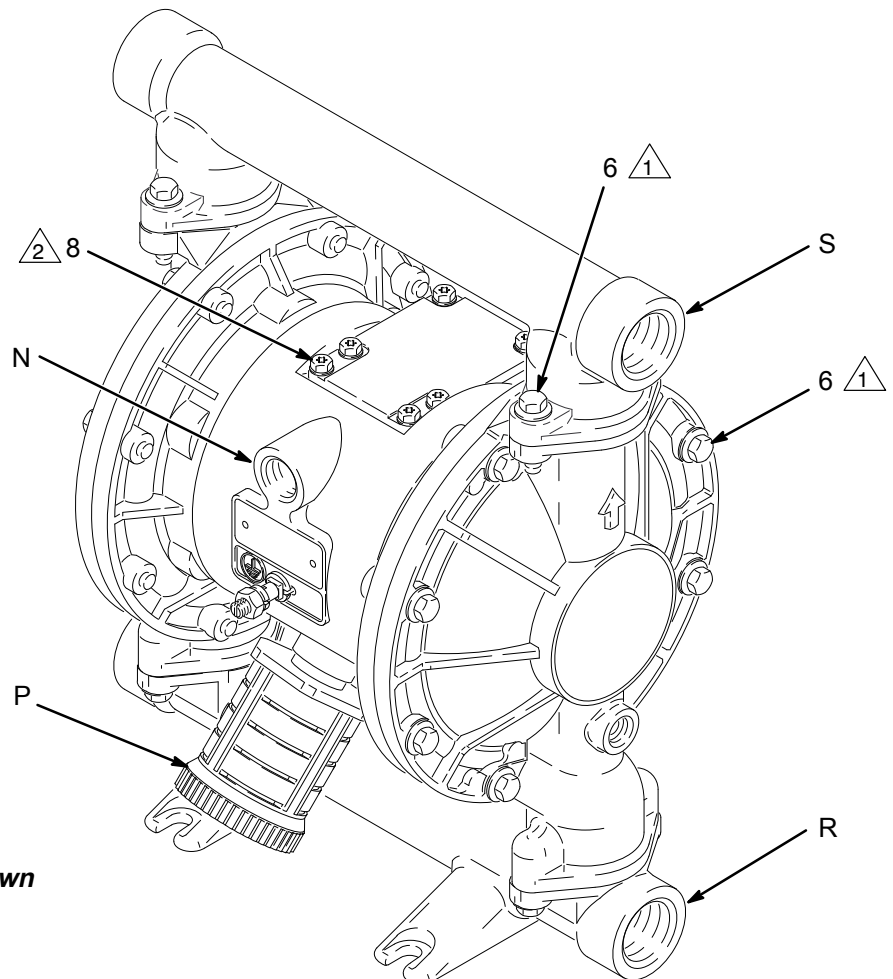
1. Use grounded fluid hoses (L). The pump fluid outlet (S) is 1" npt(f). See Fig. 5. Screw the fluid fitting into the pump outlet securely.
2. Install a fluid drain valve (J) near the fluid outlet. See the **WARNING** above, and Figs. 2–4 on pages 4 and 5.
3. Install a shutoff valve (K) in the fluid outlet line.

### KEY

- N 1/2 npt(f) Air Inlet Port
- P Muffler; Air Exhaust Port is 3/4 npt(f)
- R 1" npt(f) Fluid Inlet Port
- S 1" npt(f) Fluid Outlet Port
- 6 Manifold and Cover Screws
- 8 Air Valve Screws

1 Torque to 120–130 in-lb (14–15 N.m).

2 Torque to 38–43 in-lb (4.4–5.0 N.m).



Model 236-250 Shown

Fig. 5

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# Installation

## Air Exhaust Ventilation

### WARNING

Be sure to read and follow the warnings and precautions regarding **USING HAZARDOUS FLUIDS**, and **FIRE OR EXPLOSION HAZARD** on page 3, before operating this pump.

Be sure the system is properly ventilated for your type of installation. You must vent the exhaust to a safe place, away from people, animals, food handling areas, and all sources of ignition when pumping flammable or hazardous fluids.

Diaphragm failure will cause the fluid being pumped to exhaust with the air. Place an appropriate container at the end of the air exhaust line to catch the fluid. See Fig. 6.

The air exhaust port is 3/4 npt(f). Do not restrict the air exhaust port. Excessive exhaust restriction can cause erratic pump operation.

To provide a remote exhaust:

1. Remove the muffler (P) from the pump air exhaust port.
2. Install a grounded air exhaust hose (T) and connect the muffler (P) to the other end of the hose. The minimum size for the air exhaust hose is 3/4 in. (19 mm) ID. If a hose longer than 15 ft (4.57 m) is required, use a larger diameter hose. Avoid sharp bends or kinks in the hose.
3. Place a container (U) at the end of the air exhaust line to catch fluid in case a diaphragm ruptures. See Fig. 6.

### VENTING EXHAUST AIR

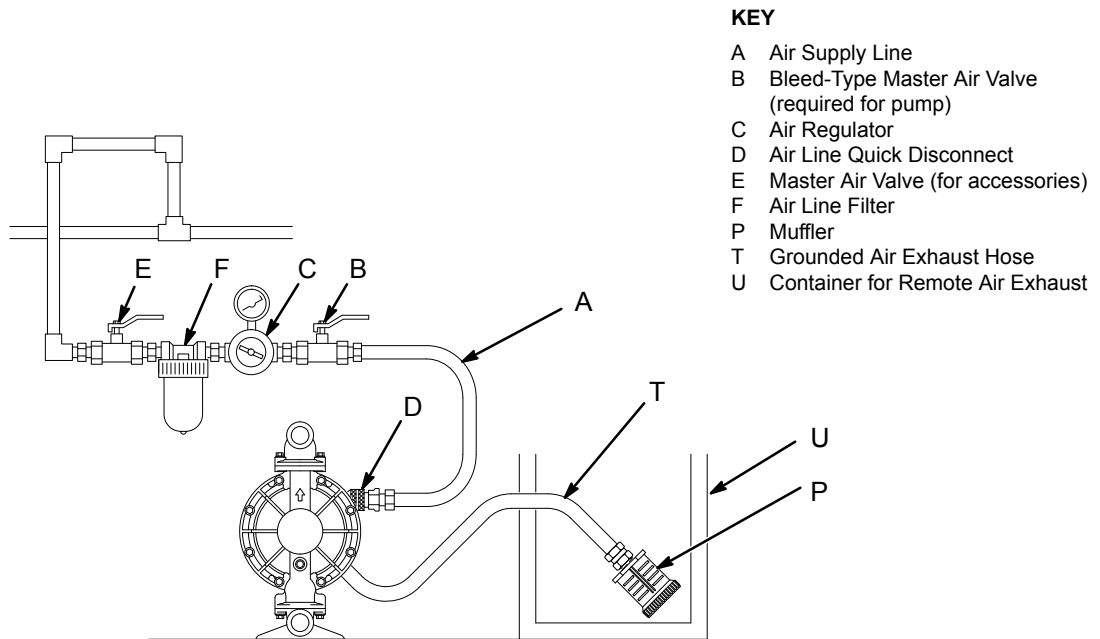


Fig. 6

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# Installation

## Fluid Pressure Relief Kit

### CAUTION

Pressure Relief Kit 235–409 (V) is available for Aluminum Pumps, Models 236–250, 236–251, 236–252 and 236–253, to prevent overpressurization and rupture of the pump or hose. See Fig. 7 and **Accessories** on page 28. The kit includes instructions.

Thermal expansion of fluid in the outlet line can cause overpressurization. This can occur when using

long fluid lines exposed to sunlight or ambient heat, or when pumping from a cool to a warm area (for example, from an underground tank).

Overpressurization can also occur if the Husky pump is being used to feed fluid to a piston pump, and the intake valve of the piston pump does not close, causing fluid to back up in the outlet line.

### KEY

- R 1" npt(f) Optional Fluid Inlet Port
- S 1" npt(f) Optional Fluid Outlet Port
- V Pressure Relief Kit

- 1 Install kit between fluid inlet and outlet manifolds.
- 2 Connect fluid inlet line here.
- 3 Connect fluid outlet line here.

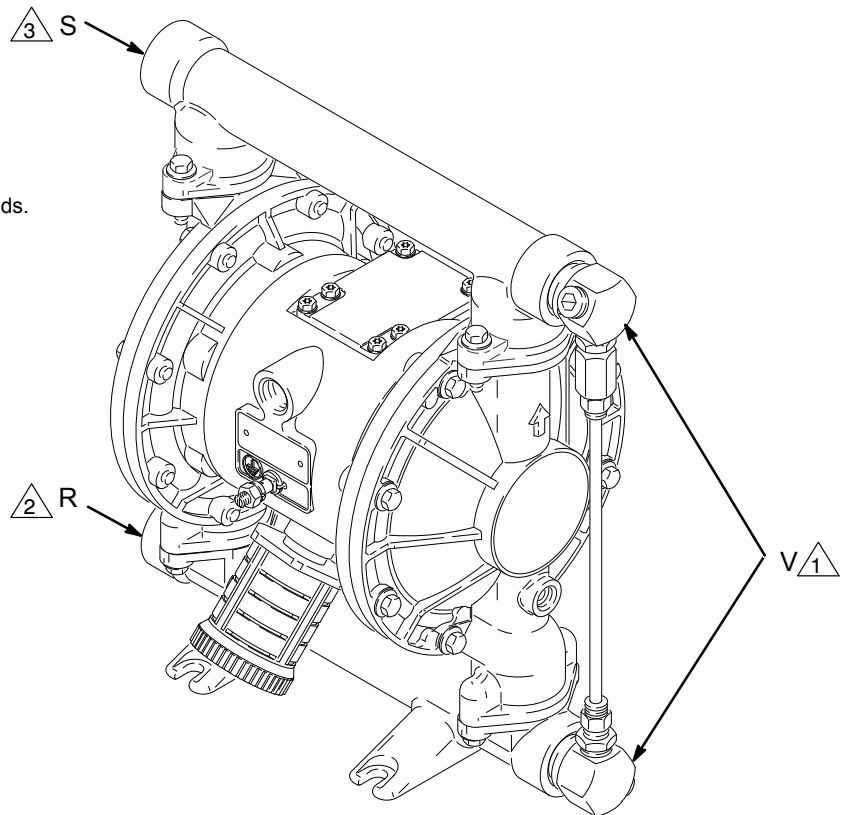


Fig. 7

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# Operation

## Flush the Pump Before First Use

The pump was tested in water. If the water could contaminate the fluid you are pumping, flush the pump thoroughly with a compatible solvent. Follow the steps under **Starting and Adjusting the Pump**.

## Starting and Adjusting the Pump

### WARNING

To reduce the risk of serious injury, splashing in the eyes or on the skin, and toxic fluid spills, **never** move or lift a pump under pressure. If dropped, the fluid section may rupture. Always follow the **Pressure Relief Procedure Warning** at right before moving or lifting the pump.

1. Be sure the pump is properly grounded. Read and follow **FIRE OR EXPLOSION HAZARD**, on page 3.
2. Check all fittings to be sure they are tight. Be sure to use a compatible liquid thread sealant on all male threads. Tighten the fluid inlet and outlet fittings securely.
3. Place the suction tube (if used) in the fluid to be pumped.

**NOTE:** If the fluid inlet pressure to the pump is more than 25% of the outlet working pressure, the ball check valves will not close fast enough, resulting in inefficient pump operation.

4. Place the end of the fluid hose (L) into an appropriate container.
5. Close the fluid drain valve (J).

6. With the pump air regulator (C) closed, open all bleed-type master air valves (B, E).
7. If the fluid hose has a dispensing device, hold it open while continuing with the following step.
8. Slowly open the air regulator (C) until the pump starts to cycle. Allow the pump to cycle slowly until all air is pushed out of the lines and the pump is primed.

*If you are flushing*, run the pump long enough to thoroughly clean the pump and hoses. Close the air regulator. Remove the suction tube from the solvent and place it in the fluid to be pumped.

## Pump Shutdown

At the end of the work shift and before checking, adjusting, cleaning or repairing the system, follow the **Pressure Relief Procedure Warning**.

### WARNING

#### Pressure Relief Procedure

To reduce the risk of serious injury, including splashing fluid or solvent in the eyes or on the skin, always follow this procedure before checking, adjusting, cleaning, moving, or repairing any part of the system.

1. Shut off the air to the pump.
2. Open the dispensing valve, if used.
3. Open the fluid drain valve to relieve all fluid pressure, having a container ready to catch the drainage.

# Maintenance

## Lubrication

The air valve is designed to operate unlubricated, however if lubrication is desired, every 500 hours of operation (or monthly) remove the hose from the pump air inlet and add two drops of machine oil to the air inlet.

### CAUTION

Do not over-lubricate the pump. Oil is exhausted through the muffler, which could contaminate your fluid supply or other equipment. Excessive lubrication can also cause the pump to malfunction.

An air line lubricator is available, for automatic lubrication. See **Accessories** on page 27.

## Flushing and Storage

Flush the pump often enough to prevent the fluid you are pumping from drying or freezing in the pump and damaging it. Always flush the pump and follow the **Pressure Relief Procedure Warning** on page 10 before storing it for any length of time. Use a compatible solvent.

## Tightening Threaded Connections

Before each use, check all hoses for wear or damage and replace as necessary. Check to be sure all threaded connections are tight and leak-free.

At least every six months, check and retorque all threaded connections, including manifold screws, plugs, and air valve screws.

## Preventive Maintenance Schedule

Establish a preventive maintenance schedule, based on the pump's service history. This is especially important for prevention of spills or leakage due to diaphragm failure.



# Troubleshooting

## WARNING

### Pressure Relief Procedure

To reduce the risk of serious injury, including splashing fluid or solvent in the eyes or on the skin, always follow this procedure before checking, adjusting, cleaning, moving, or repairing any part of the system.

1. Shut off the air to the pump.
2. Open the dispensing valve, if used.
3. Open the fluid drain valve to relieve all fluid pressure, having a container ready to catch the drainage.

**NOTE: Check all possible problems and causes before disassembling the pump.**

PROBLEM	CAUSE	SOLUTION
Pump cycles at stall or fails to hold pressure at stall.	Worn check valve balls (16), seats (17) or o-rings (18).	Replace. See page 16.
Pump will not cycle, or cycles once and stops.	Air valve is stuck or dirty.	Disassemble and clean air valve. See pages 14–15. Use filtered air.
	Check valve ball (16) severely worn and wedged in seat (17) or manifold (1 or 3).	Replace ball and seat. See page 16.
	Check valve ball (16) is wedged into seat (17), due to overpressurization.	Install Pressure Relief Kit (see page 9).
	Dispensing valve clogged.	Relieve pressure and clear valve.
Pump operates erratically.	Clogged suction line.	Inspect; clear.
	Sticky or leaking check valve balls (16).	Clean or replace. See page 16.
	Diaphragm (19) and backup (29) ruptured.	Replace. See pages 17–19.
	Restricted exhaust.	Remove restriction.
Air bubbles in fluid.	Suction line is loose.	Tighten.
	Diaphragm (19) and backup (29) ruptured.	Replace. See pages 17–19.
	Loose manifolds (1, 3), damaged seal between manifold and seat (17), or damaged o-rings (18).	Tighten manifold bolts (6) or replace seats (17) or o-rings (18). See page 16.
	Loose diaphragm shaft bolt (21).	Tighten. See pages 17–19.
	Damaged o-ring (25).	Replace. See pages 17–19.
Fluid in exhaust air.	Diaphragm (19) and backup (29) ruptured.	Replace. See pages 17–19.
	Loose diaphragm shaft bolt (21).	Tighten. See pages 17–19.
	Damaged o-ring (25).	Replace. See pages 17–19.
Pump exhausts excessive air at stall.	Worn air valve block (13), o-ring (12), plate (14), pilot block (9), or pilot pin o-ring (27).	Repair or replace. See pages 14–15.
	Worn shaft seals (22).	Replace. See pages 17–19.
Pump leaks air externally.	Air valve cover (7) or air valve cover screws (8) are loose.	Tighten screws. See page 15.
	Air valve gasket (10) or air cover gasket (32) is damaged.	Inspect; replace. See pages 14–15, 20–21.
	Air cover screws (6) are loose.	Tighten screws. See pages 20–21.
Pump leaks fluid externally from ball check valves.	Loose manifolds (1, 3), damaged seal between manifold and seat (17), or damaged o-rings (18).	Tighten manifold bolts (6) or replace seats (17) or o-rings (18). See page 16.

# Service

## Repairing the Air Valve

### Tools Required

- Torque wrench
- Torx screwdriver or 8 mm (5/16") socket wrench
- Needle-nose pliers
- O-ring pick
- Lithium base grease

**NOTE:** Air Valve Repair Kit 236–273 is available. Refer to page 26. Parts included in the kit are marked with a symbol, for example (8†). Use all the parts in the kit for the best results.

### Disassembly

1. Follow the **Pressure Relief Procedure Warning** on page 13.
2. With a torx screwdriver or 8 mm (5/16") socket wrench, remove the six screws (8), air valve cover (7), and gasket (10). See Fig. 8.
3. Move the valve carriage (11) to the center position and pull it out of the cavity. Remove the valve block (13) and o-ring (12) from the carriage. Using a needle-nose pliers, pull the pilot block (9) straight up and out of the cavity. See Fig. 9.
4. Pull the two actuator pistons (30) out of the bearings (31). Remove the u-cup packings (22) from the pistons. Pull the push pins (26) out of the bearings (28). Remove the o-rings (27) from the push pins. See Fig. 10.
5. Inspect the valve plate (14) in place. If damaged, use a torx screwdriver or 8 mm (5/16") socket wrench to remove the three screws (8). Remove the valve plate (14) and seal (15). See Fig. 11.
6. Inspect the bearings (28, 31) in place. See Fig. 10. The bearings are tapered and, if damaged, must be removed from the outside. This requires disassembly of the fluid section. See page 20.
7. Clean all parts and inspect for wear or damage. Replace as needed. Reassemble as explained on page 15.

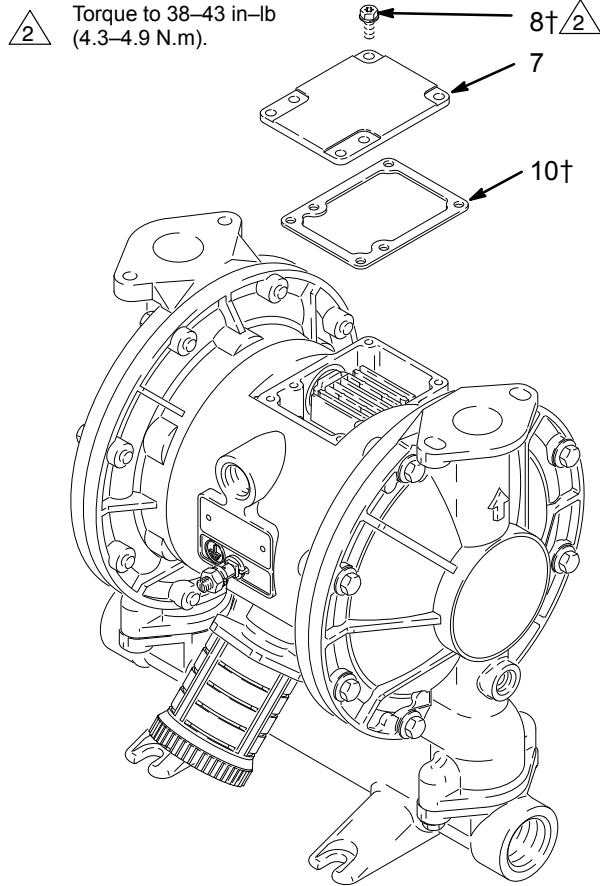


Fig. 8

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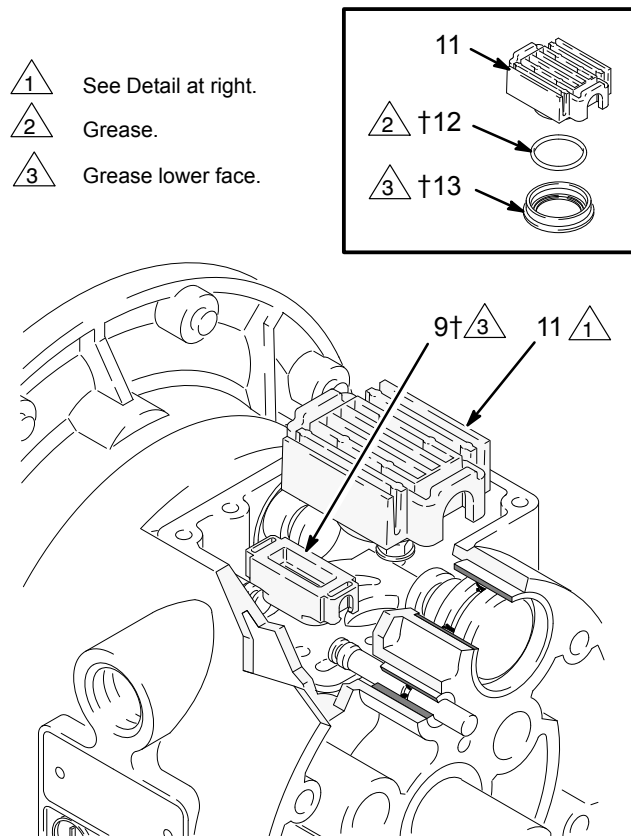


Fig. 9

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# Service

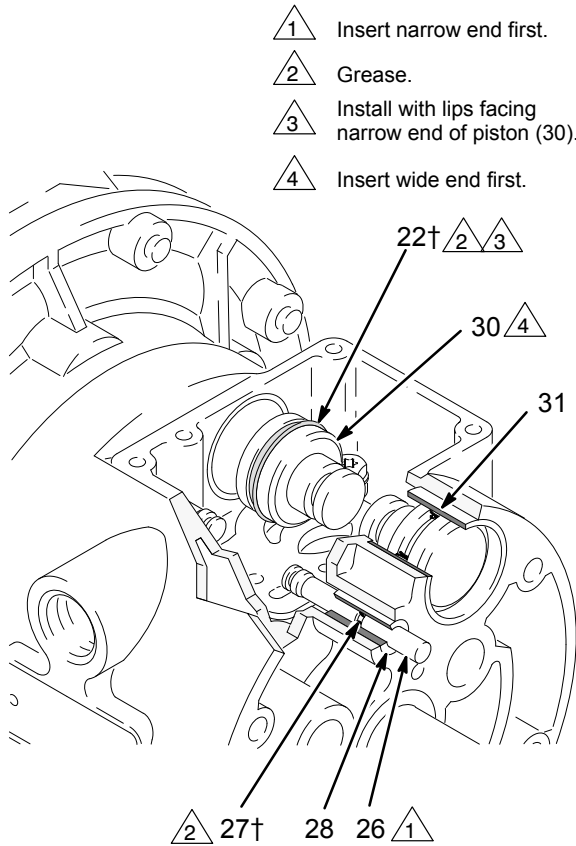


Fig. 10

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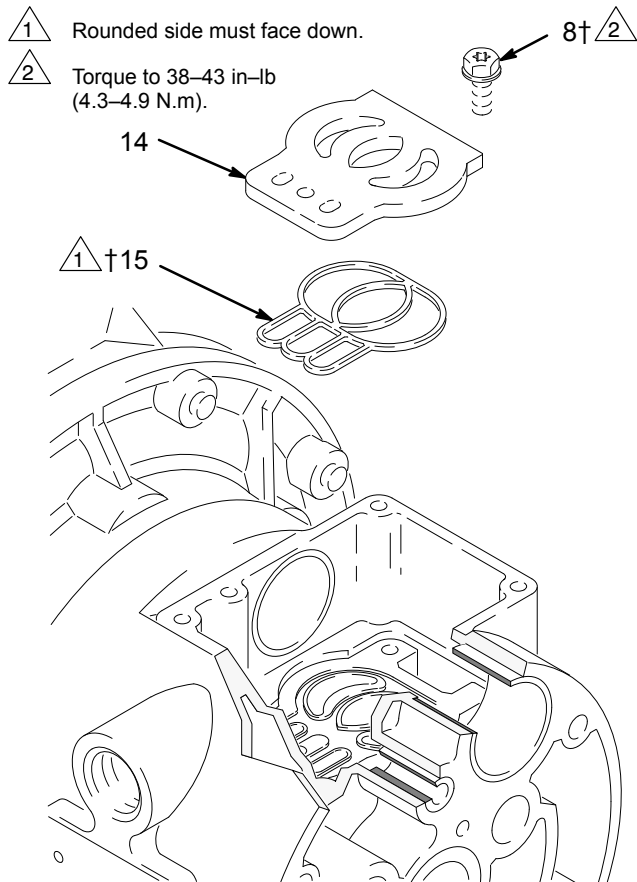


Fig. 11

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## Reassembly

1. If you replaced the bearings (28, 31), reinstall as explained on page 20. Reassemble the fluid section.
2. Install the valve plate seal (15†) into the groove at the bottom of the valve cavity. The rounded side of the seal **must face down** into the groove. See Fig. 11.
3. Install the valve plate (14) in the cavity. The plate is reversible, so either side can face up. Install the three screws (8†), using a torx screwdriver or 8 mm (5/16") socket wrench. Torque to 38–43 in-lb (4.3–4.9 N.m). See Fig. 11.
4. Install an o-ring (27†) on each push pin (26). Grease the pins and o-rings. Insert the pins into the bearings (28), **narrow** end first. See Fig. 10.
5. Install a u-cup packing (22†) on each actuator piston (30), so the lips of the packings face the **narrow** end of the pistons. See Fig. 10.
6. Lubricate the u-cup packings (22†) and actuator pistons (30). Insert the actuator pistons in the bearings (31), **wide** end first. Leave the narrow end of the pistons exposed. See Fig. 10.
7. Install the pilot block (9†) so its tabs snap into the grooves on the ends of the push pins (26). See Fig. 9.
8. Grease the o-ring (12†) and install it in the valve block (13). Push the block onto the valve carriage (11). Grease the lower face of the valve block. See Fig. 9.
9. Align the valve carriage (11) with the actuator pistons (30) and install so its tabs slip into the grooves on the narrow end of the pistons. See Fig. 9.
10. Align the valve gasket (10†) and cover (7) with the six holes in the center housing (5). Secure with six screws (8†), using a torx screwdriver or 8 mm (5/16") socket wrench. Torque to 38–43 in-lb (4.3–4.9 N.m). See Fig. 8.



# Service

## Ball Check Valve Repair

### Tools Required

- Torque wrench
- 10 mm socket wrench
- O-ring pick

### Disassembly

**NOTE:** A Fluid Section Repair Kit is available. Refer to page 26 to order the correct kit for your pump. Parts included in the kit are marked with an asterisk, for example (16\*). Use all the parts in the kit for the best results.

**NOTE:** Optional stainless steel balls and seats are available, for use when pumping highly abrasive fluids. Refer to page 26.

**NOTE:** To ensure proper seating of the balls (16), always replace the seats (17) when replacing the balls. Also, on Models 236–252, 236–253, 236–260, and 236–262, replace the o-rings (18), and make sure the flat side of the seat (17) faces the ball (16).

1. Follow the **Pressure Relief Procedure Warning** on page 13. Disconnect all hoses.
2. Remove the pump from its mounting.
3. Using a 10 mm socket wrench, remove the four bolts (6) and nuts (45, *used on Models 236–260, 236–261, and 236–262 only*) holding the outlet manifold (1) to the fluid covers (2). See Fig. 12.
4. Remove the o-rings (18, *used on Models 236–252, 236–253, 236–260, and 236–262 only*), seats (17), and balls (16) from the manifold.
5. Turn the pump over and remove the inlet manifold (3). Remove the o-rings (18, *used on Models 236–252, 236–253, 236–260, and 236–262 only*), seats (17), and balls (16) from the fluid covers (2).

### Reassembly

1. Clean all parts and inspect for wear or damage. Replace parts as needed.
2. Reassemble in the reverse order, following all notes in Fig. 12. Be sure the ball checks and manifolds are assembled **exactly** as shown. The arrows (A) on the fluid covers (2) **must** point toward the outlet manifold (1).

1. Torque to 120–130 in-lb (14–15 N.m).
2. Arrow (A) must point toward outlet manifold (1).
3. On Models 236–252, 236–253, 236–260, and 236–262, the flat side of the seat must face the ball.
4. Used on Models 236–252, 236–253, 236–260, and 236–262 only.

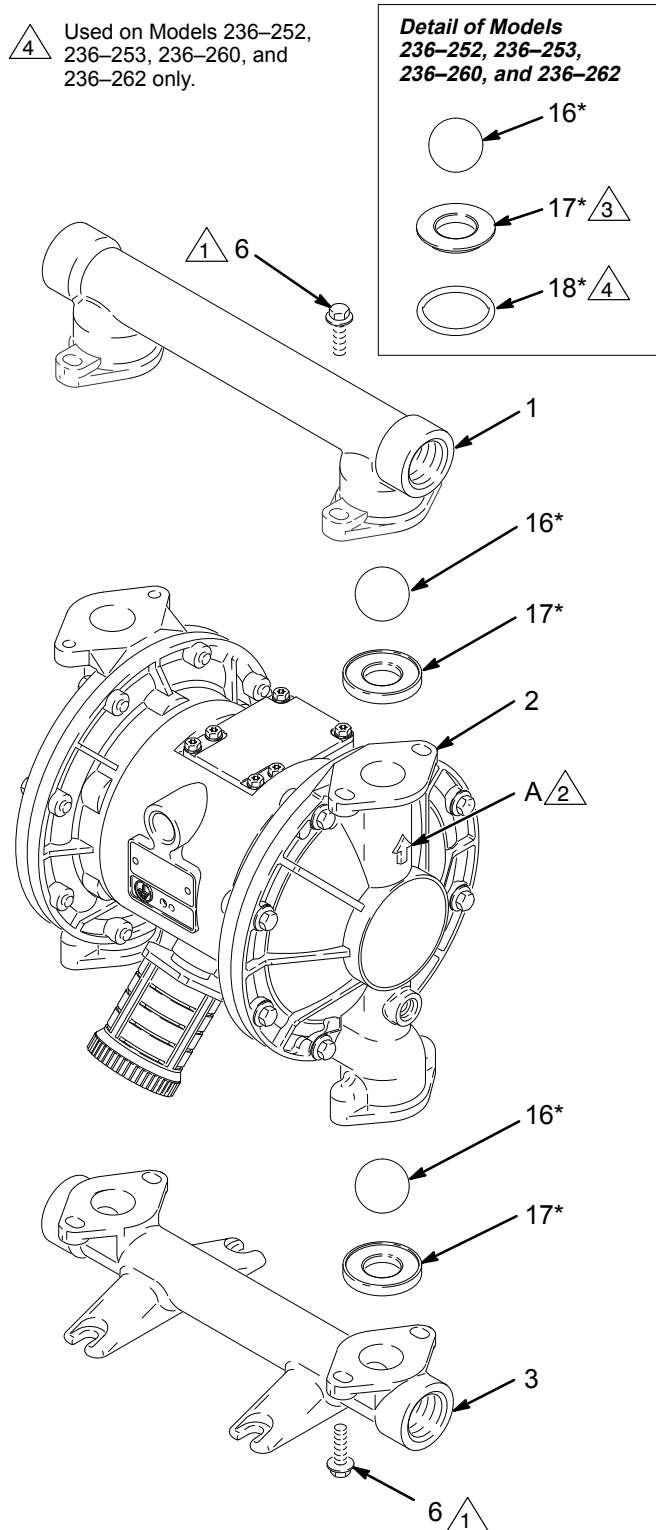


Fig. 12

02647

# Service

## Diaphragm Repair

### Tools Required

- Torque wrench
- 10 mm socket wrench
- 15 mm socket wrench (aluminum models) or 1" socket wrench (stainless steel models)
- 19 mm socket wrench
- O-ring pick
- Lithium-base grease

### Disassembly

**NOTE:** A Fluid Section Repair Kit is available. Refer to page 26 to order the correct kit for your pump. Parts included in the kit are marked with an asterisk, for example (29\*). Use all the parts in the kit for the best results.

1. Follow the **Pressure Relief Procedure Warning** on page 13.
2. Remove the manifolds and disassemble the ball check valves as explained on page 16.
3. Using a 10 mm socket wrench, remove the screws (6) holding the fluid covers (2) to the air covers (4). Pull the fluid covers (2) off the pump. See Fig. 13.

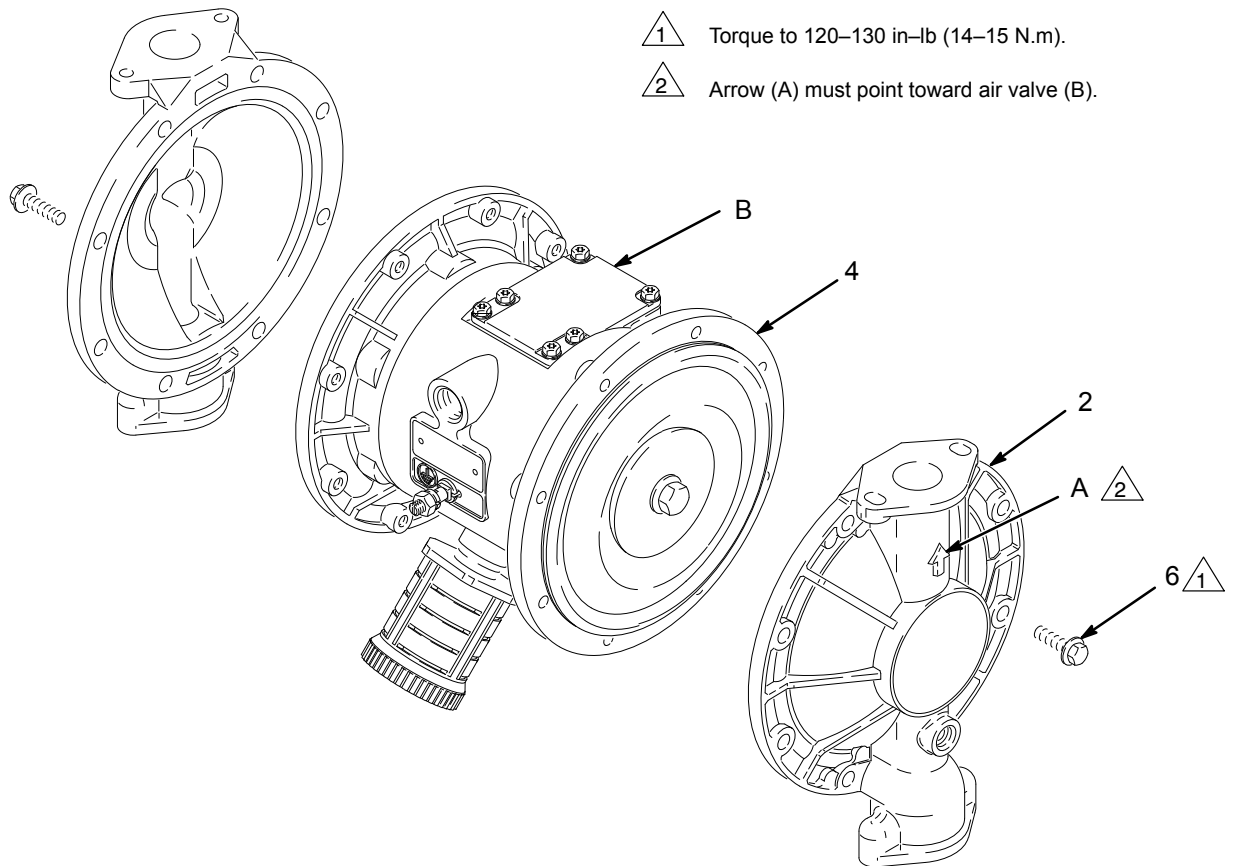


Fig. 13

02635

# Service

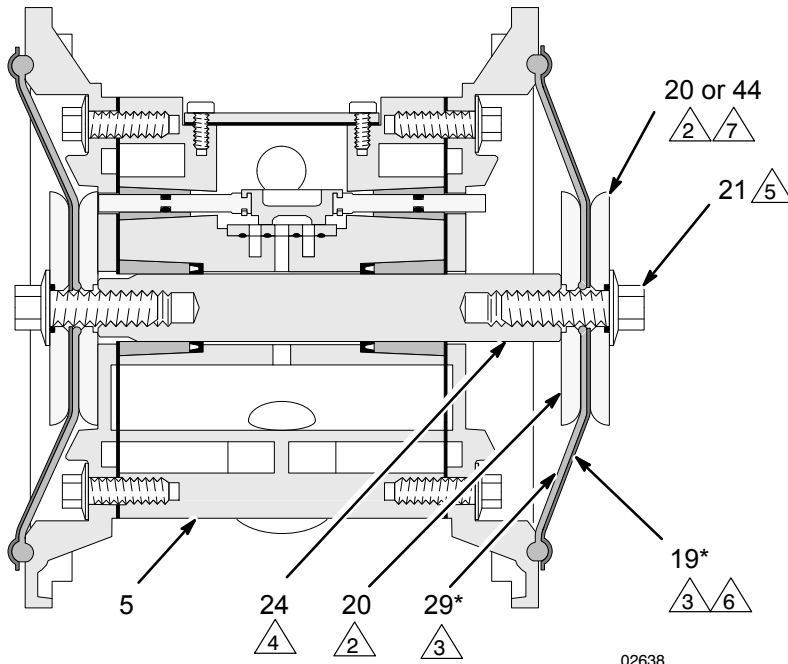
4. Loosen but do not remove the diaphragm shaft bolts (21), using a 15 mm socket wrench (1" on stainless steel models) on both bolts.
5. Unscrew one bolt from the diaphragm shaft (24) and remove the o-ring (25), fluid side diaphragm plate (20 or 44), PTFE diaphragm (19, *used on Models 236–250, 236–253 and 236–260 only*), diaphragm (29), and air side diaphragm plate (20). See Fig. 14.
6. Pull the other diaphragm assembly and the diaphragm shaft (24) out of the center housing (5). Hold the shaft flats with a 19 mm socket wrench, and remove the bolt (21) from the shaft. Disassemble the remaining diaphragm assembly.
7. Inspect the diaphragm shaft (24) for wear or scratches. If it is damaged, inspect the bearings (23) in place. If the bearings are damaged, refer to page 20.
8. Reach into the center housing (5) with an o-ring pick and hook the u-cup packings (22), then pull them out of the housing. This can be done with the bearings (23) in place.
9. Clean all parts and inspect for wear or damage. Replace parts as needed.

## Reassembly

1. Install the shaft u-cup packings (22\*) so the lips face **out** of the housing (5). Lubricate the packings. See Fig. 14.
2. Install the diaphragm assembly on one end of the shaft (24) as follows:
  - a. Install the o-ring (25\*) on the shaft bolt (21).
  - b. Install the fluid side diaphragm plate (20 or 44) on the bolt so the rounded side faces the diaphragm (29).

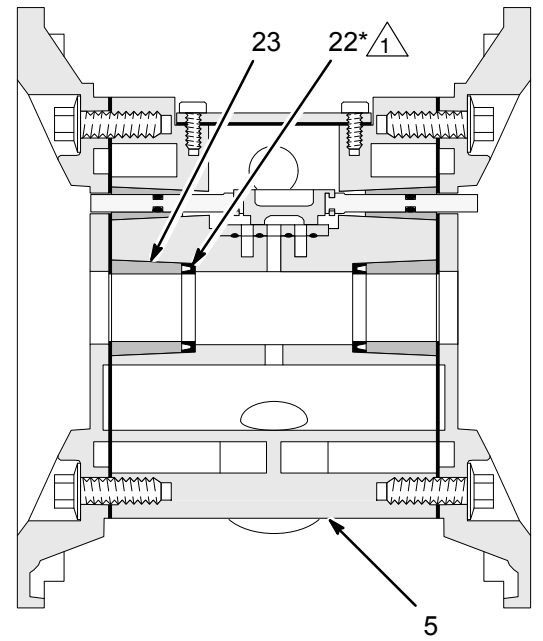
**NOTE:** *On Models 236–260, 236–261 and 236–262 only*, the fluid side diaphragm plate (44) is stainless steel. This plate **is not** stamped with its part number. Be sure to install this plate on the fluid side of the diaphragm.

- c. *On Models 236–250, 236–253 and 236–260 only*, install the PTFE diaphragm (19\*). Make certain the side marked AIR SIDE faces the center housing (5).
  - d. Install the diaphragm (29\*) on the bolt. Make certain the side marked AIR SIDE faces the center housing (5).
  - e. Install the air side diaphragm plate (20) so the rounded side faces the diaphragm (29). This plate is used on all models, and is stamped with its part number.
  - f. Screw the bolt (21) into the shaft (24) hand-tight.
3. Grease the length and ends of the diaphragm shaft (24), and slide it through the housing (5).
  4. Assemble the other diaphragm assembly to the shaft as explained in step 2.
  5. Hold one shaft bolt (21) with a wrench and torque the other bolt to 20–25 ft–lb (27–34 N.m).
  6. Align the fluid covers (2) and the center housing (5) so the arrows (A) on the covers face the same direction as the air valve (B). Secure the covers with the screws (6), handtight. See Fig. 13. Using a 10 mm socket wrench, torque the screws oppositely and evenly to 120–130 in–lb (14–15 N.m).
  7. Reassemble the ball check valves and manifolds as explained on page 16.



**Cutaway View, with Diaphragms in Place**

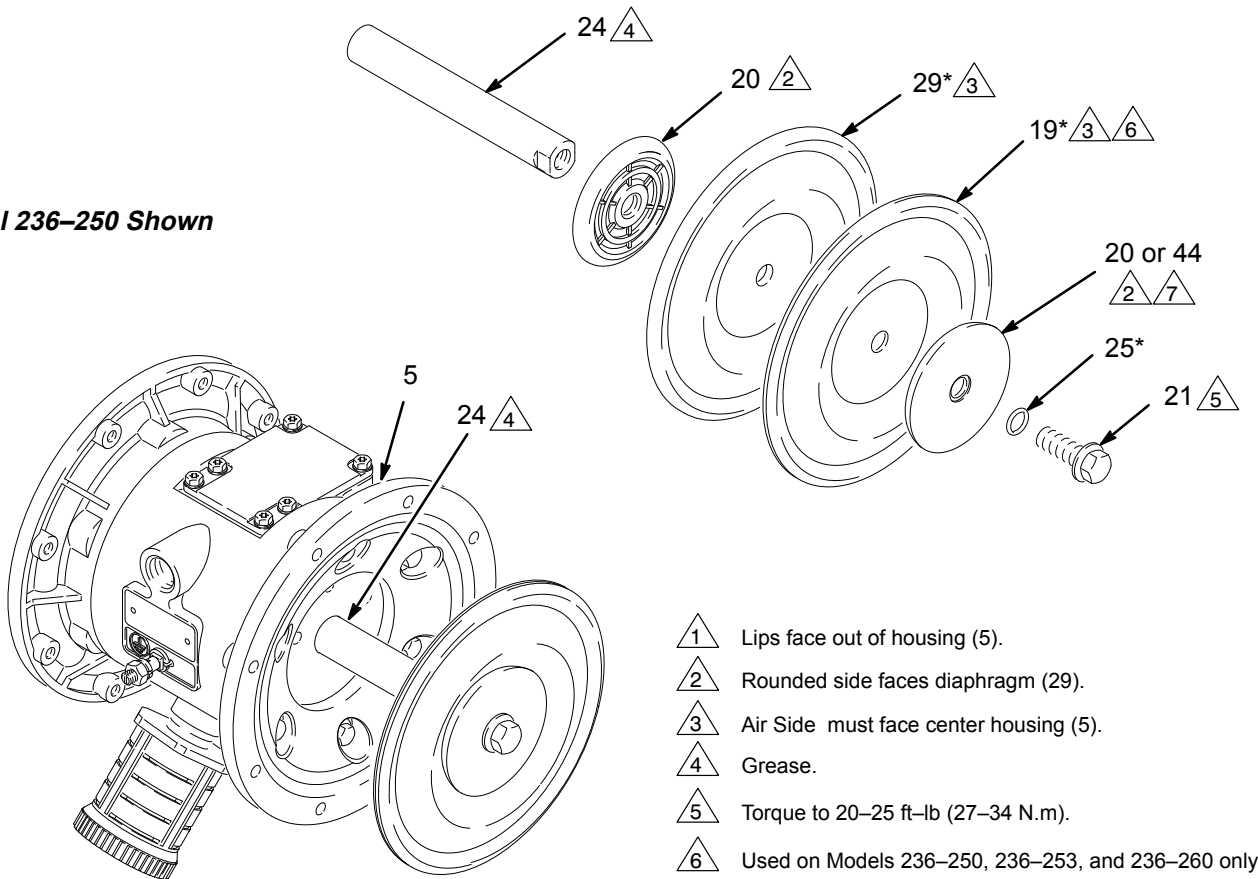
02638



**Cutaway View, with Diaphragms Removed**

02637

**Model 236–250 Shown**



- 1 Lips face out of housing (5).
- 2 Rounded side faces diaphragm (29).
- 3 Air Side must face center housing (5).
- 4 Grease.
- 5 Torque to 20–25 ft-lb (27–34 N.m).
- 6 Used on Models 236–250, 236–253, and 236–260 only.
- 7 Item 44 used on Models 236–260, 236–261 and 236–262 only.

**Fig. 14**

02636

# Service

## Bearing and Air Gasket Removal

### Tools Required

- Torque wrench
- 10 mm socket wrench
- Bearing puller
- O-ring pick
- Press, or block and mallet

### Disassembly

**NOTE:** Do not remove undamaged bearings.

1. Follow the **Pressure Relief Procedure Warning** on page 13.
2. Remove the manifolds and disassemble the ball check valves as explained on page 16.
3. Remove the fluid covers and diaphragm assemblies as explained on page 17.

**NOTE:** If you are removing only the diaphragm shaft bearing (23), skip step 4.

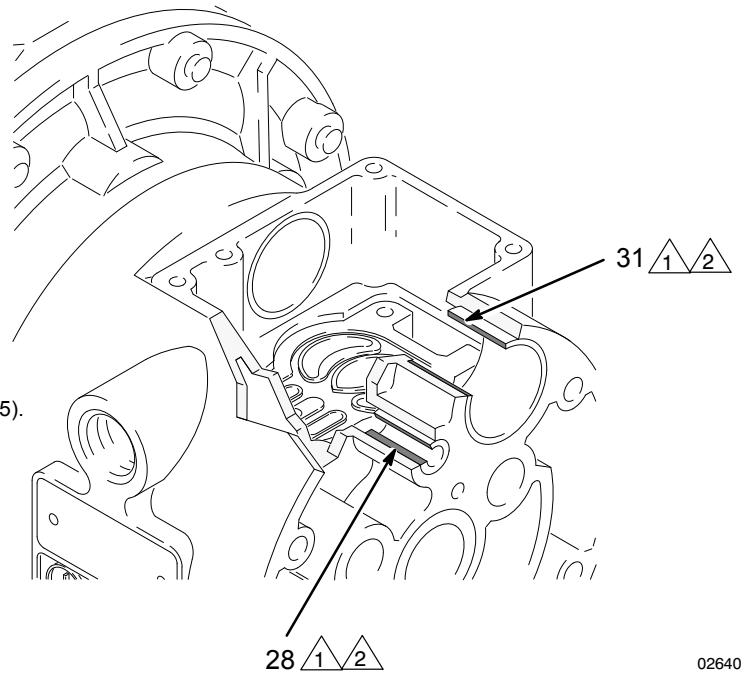
4. Disassemble the air valve as explained on page 14.
5. Using a 10 mm socket wrench, remove the screws (6) holding the air covers (4) to the center housing (5). See Fig. 15.
6. Remove the air cover gaskets (32). Always replace the gaskets with new ones.

7. Use a bearing puller to remove the diaphragm shaft bearings (23), air valve bearings (31) or pilot pin bearings (28). Do not remove undamaged bearings.
8. If you removed the diaphragm shaft bearings (23) reach into the center housing (5) with an o-ring pick and hook the u-cup packings (22), then pull them out of the housing. Inspect the packings. See Fig. 14.

### Reassembly

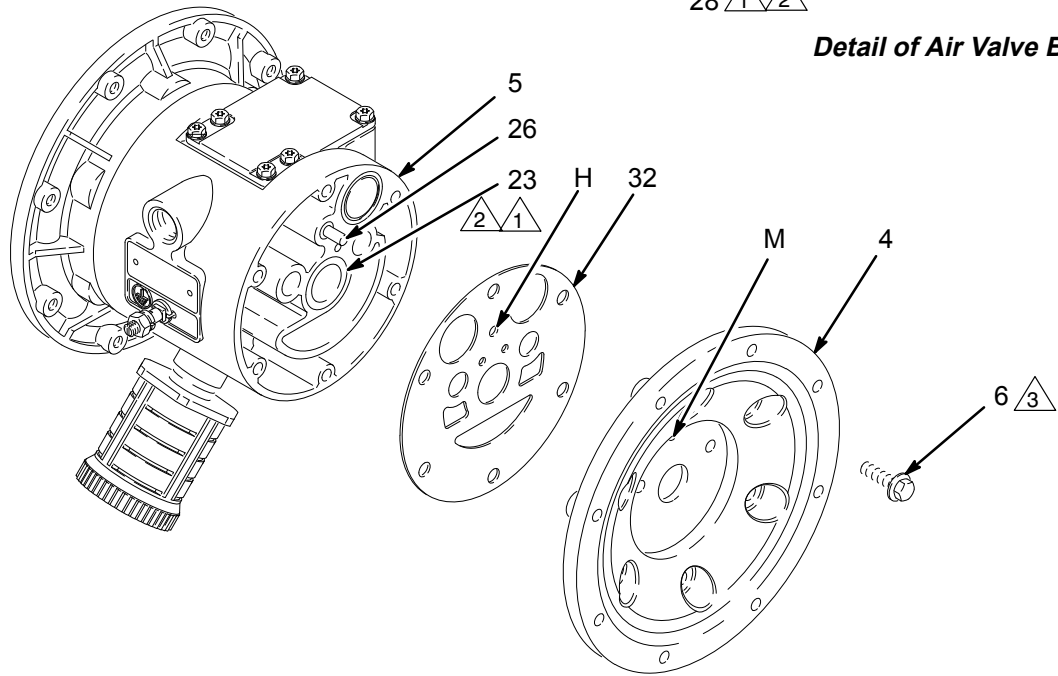
1. If removed, install the shaft u-cup packings (22\*) so the lips face **out** of the housing (5).
2. The bearings (23, 28, and 31) are tapered and can only be installed one way. Insert the bearings into the center housing (5), **tapered end first**. Using a press or a block and rubber mallet, press-fit the bearing so it is flush with the surface of the center housing.
3. Reassemble the air valve as explained on page 15.
4. Align the new air cover gasket (32) so the pilot pin (26) protruding from the center housing (5) fits through the proper hole (H) in the gasket.
5. Align the air cover (4) so the pilot pin (26) fits in the middle hole (M) of the three small holes near the center of the cover. Install the screws (6), handtight. See Fig. 15. Using a 10 mm socket wrench, torque the screws oppositely and evenly to 120–130 in-lb (14–15 N.m).
6. Install the diaphragm assemblies and fluid covers as explained on page 17.
7. Reassemble the ball check valves and manifolds as explained on page 16.

- 1 Insert bearings tapered end first.
- 2 Press-fit bearings flush with surface of center housing (5).
- 3 Torque to 120–130 in-lb (14–15 N.m).



02640

**Detail of Air Valve Bearings**



02639A

**Fig. 15**

# Parts Drawing

## ALUMINUM PUMPS

### Part No. 236-250

with PTFE® Diaphragms and Balls,  
Polypropylene Seats

### Part No. 236-251

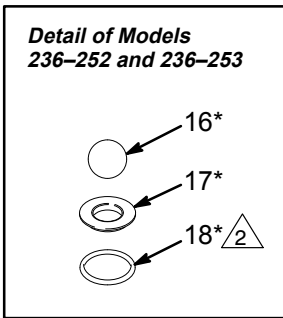
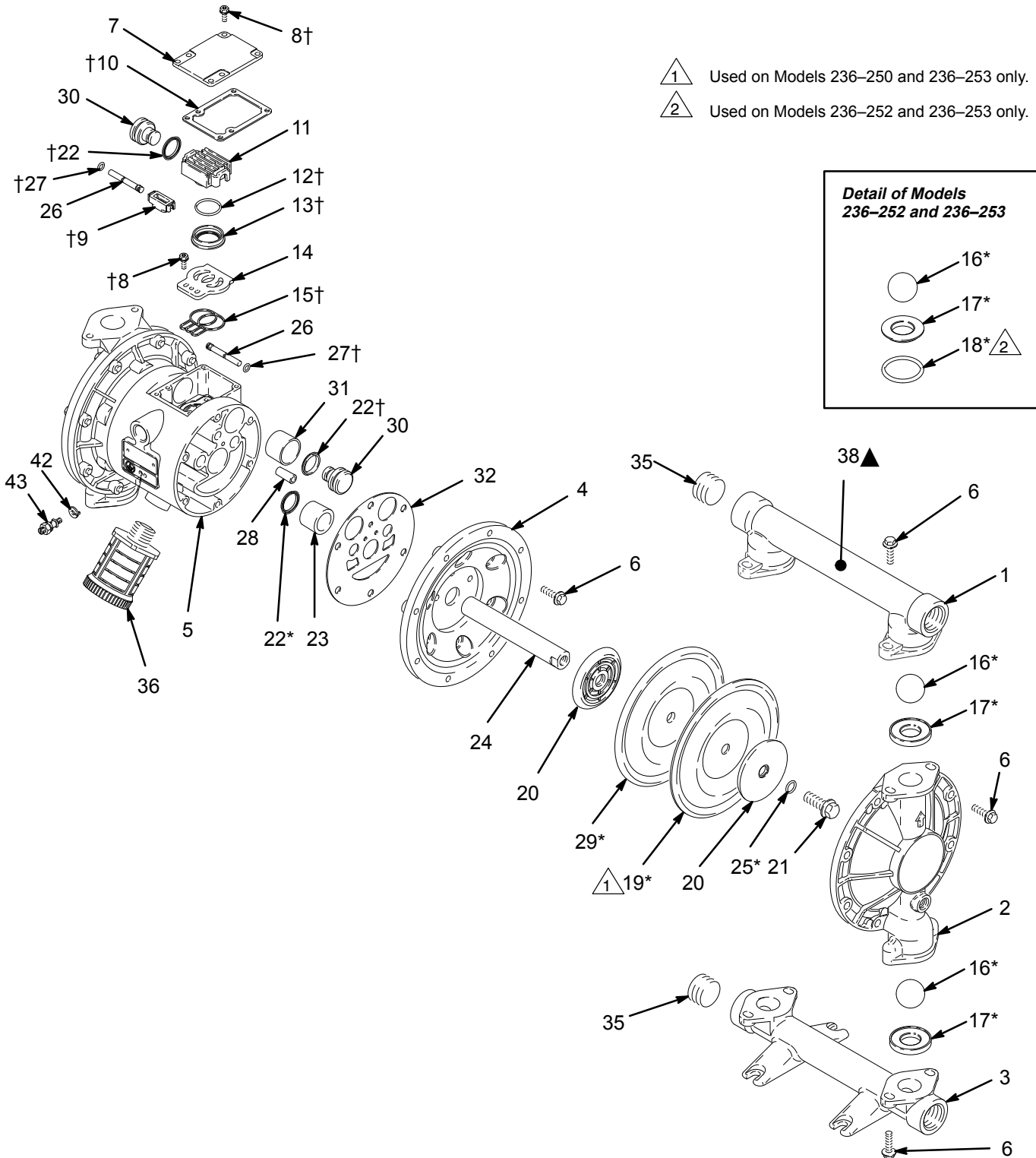
with Hytrel® Diaphragms and Seats, Acetal Balls

### Part No. 236-252

with Santoprene® Diaphragms, Balls and Seats

### Part No. 236-253

with PTFE® Diaphragms and Balls,  
Stainless Steel Seats



# Parts List

## ALUMINUM PUMPS

### Part No. 236–250

with PTFE® Diaphragms and Balls, Polypropylene Seats

### Part No. 236–251

with Hytrel® Diaphragms and Seats, Acetal Balls

### Part No. 236–252

with Santoprene® Diaphragms, Balls and Seats

### Part No. 236–253

with PTFE® Diaphragms and Balls, Stainless Steel Seats

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	188–842	MANIFOLD, outlet; aluminum	1	22*†	112–181	PACKING, u-cup; nitrile	4
2	188–840	COVER, fluid; aluminum	2	23	188–609	BEARING, shaft; acetal	2
3	188–841	MANIFOLD, inlet; aluminum	1	24	188–608	SHAFT, diaphragm; stainless steel	1
4	188–839	COVER, air; aluminum	2	25*	104–319	O-RING; PTFE	2
5	188–838	HOUSING, center; aluminum	1	26	188–610	PIN, push; stainless steel	2
6	112–178	SCREW, machine, hex washer hd; M8 x 1.25; 25 mm (1 in.) long	36	27†	157–628	O-RING; buna-N	2
7	188–854	COVER, air valve; aluminum	1	28	188–611	BEARING, pin; acetal	2
8†	112–179	SCREW, machine, torx, hex washer hd; M5 x 0.8 thread forming; 12 mm (0.47 in.) long	9	29*	See Matrix	DIAPHRAGM	2
9†	188–614	BLOCK, pilot; acetal	1	30	188–612	PISTON, actuator; acetal	2
10†	188–618	GASKET, cover; HDPE foam	1	31	188–613	BEARING, piston; acetal	2
11	188–855	CARRIAGE, air valve; aluminum	1	32	188–603	GASKET, air cover; HDPE foam	2
12†	108–730	O-RING; nitrile	1	35	112–183	PLUG, pipe; 1" npt; carbon steel	2
13†	188–616	BLOCK, air valve; acetal	1	36	112–182	MUFFLER	1
14	188–615	PLATE, air valve; stainless steel	1	38▲	188–970	LABEL, warning	2
15†	188–617	SEAL, valve plate; buna-N	1	42	104–582	WASHER, tab	1
16*☆	See Matrix	BALL	4	43	104–029	STUD, grounding	1
17*☆	See Matrix	SEAT, ball	4	* These parts are included in the Fluid Section Repair Kits. Refer to page 26 for the correct kit for your pump.			
18*	See Matrix	O-RING	4	† These parts are included in Air Valve Repair Kit 236–273.			
19*	See Matrix	DIAPHRAGM; PTFE	2	▲ Replacement Danger and Warning labels, tags and cards are available at no cost.			
20	188–607	PLATE, diaphragm; aluminum	4	☆ Optional stainless steel balls and seats are available for use with highly abrasive fluids. See page 26.			
21	112–094	BOLT, hex hd; M12 x 1.75; 35 mm (1.38 in.) long	2				

## Parts Matrix

Find the part number of your pump in the left column. Read across from left to right to find the applicable part numbers for ref. numbers 16, 17, 18, 19 and 29.

Pump Part No.	Ref. No. 16* Ball	Ref. No. 17* Seat	Ref. No. 18* O-Ring	Ref. No. 19* PTFE Diaphragm	Ref. No. 29* Diaphragm
236–250	112–088 PTFE	188–710 Polypropylene	Not Used	188–605 PTFE	188–606 Hytrel (Backup)
236–251	112–254 Acetal	188–711 Hytrel	Not Used	Not Used	188–606 Hytrel
236–252	112–092 Santoprene	190–212 Santoprene	104–804 PTFE	Not Used	188–857 Santoprene
236–253	112–088 PTFE	188–707 Stainless Steel	104–804 PTFE	188–605 PTFE	188–606 Hytrel (Backup)

\* These parts are included in the Fluid Section Repair Kits. Refer to page 26 for the correct kit for your pump.



# Parts Drawing

## STAINLESS STEEL PUMPS

### Part No. 236-260

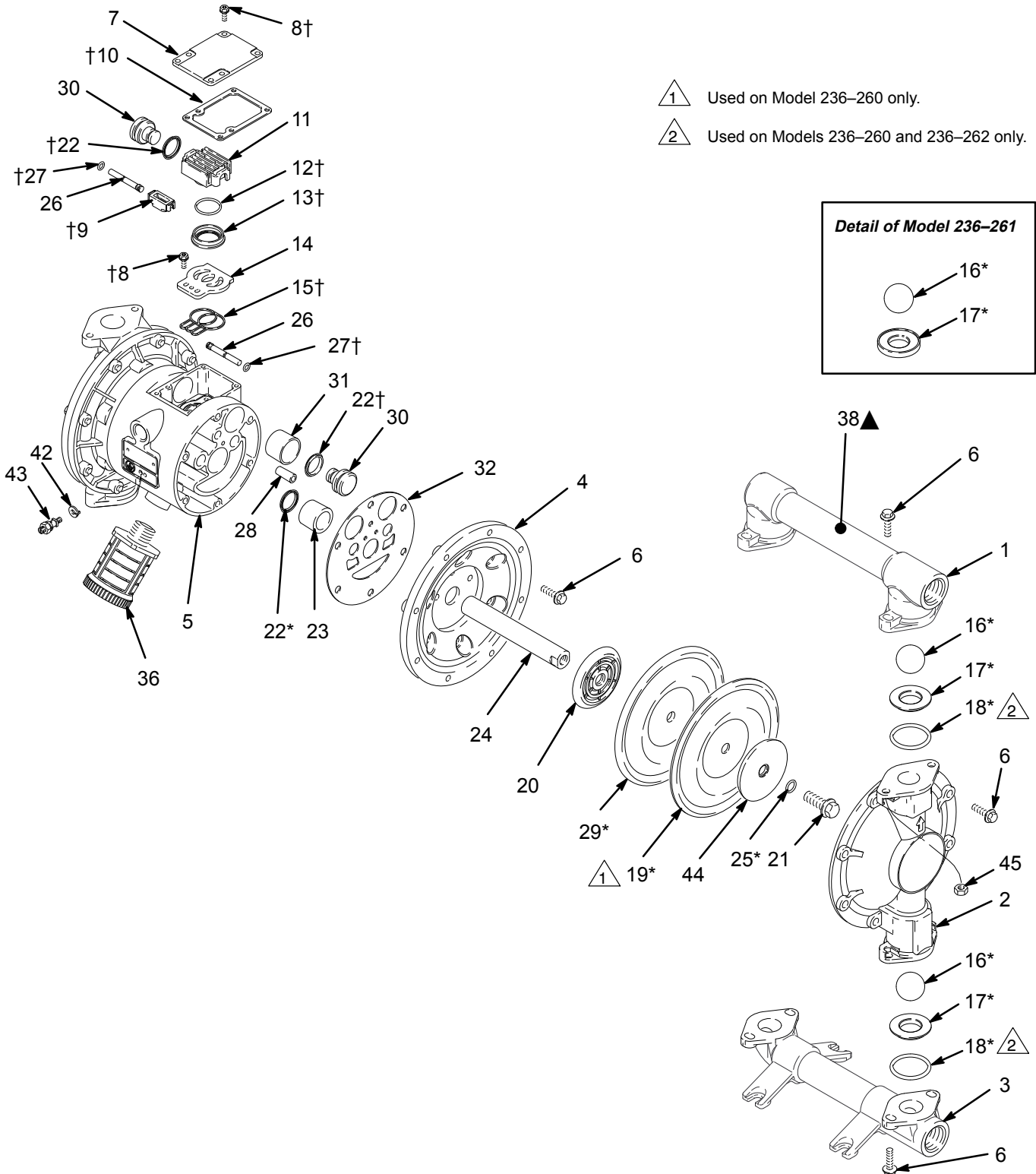
with PTFE® Diaphragms and Balls,  
Stainless Steel Seats

### Part No. 236-261

with Hytrel® Diaphragms and Seats, Acetal Balls

### Part No. 236-262

with Santoprene® Diaphragms, Balls and Seats



# Parts List

## STAINLESS STEEL PUMPS

### Part No. 236–260

with PTFE® Diaphragms and Balls, Stainless Steel Seats

### Part No. 236–261

with Hytrel® Diaphragms and Seats, Acetal Balls

### Part No. 236–262

with Santoprene® Diaphragms, Balls and Seats

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	188–861	MANIFOLD, outlet; stainless steel	1	23	188–609	BEARING, shaft; acetal	2
2	188–860	COVER, fluid; stainless steel	2	24	188–608	SHAFT, diaphragm; stainless steel	1
3	188–862	MANIFOLD, inlet; stainless steel	1	25*	104–319	O-RING; PTFE	2
4	188–839	COVER, air; aluminum	2	26	188–610	PIN, push; stainless steel	2
5	188–838	HOUSING, center; aluminum	1	27†	157–628	O-RING; buna-N	2
6	112–178	SCREW, machine, hex washer hd; M8 x 1.25; 25 mm (1 in.) long	36	28	188–611	BEARING, pin; acetal	2
7	188–854	COVER, air valve; aluminum	1	29*	See Matrix	DIAPHRAGM	2
8†	112–179	SCREW, machine, torx, hex washer hd; M5 x 0.8 thread forming; 12 mm (0.47 in.) long	9	30	188–612	PISTON, actuator; acetal	2
9†	188–614	BLOCK, pilot; acetal	1	31	188–613	BEARING, piston; acetal	2
10†	188–618	GASKET, cover; HDPE foam	1	32	188–603	GASKET, air cover; HDPE foam	2
11	188–855	CARRIAGE, air valve; aluminum	1	36	112–182	MUFFLER	1
12†	108–730	O-RING; nitrile	1	38▲	188–621	LABEL, warning	2
13†	188–616	BLOCK, air valve; acetal	1	42	104–582	WASHER, tab	1
14	188–615	PLATE, air valve; stainless steel	1	43	104–029	STUD, grounding	1
15†	188–617	SEAL, valve plate; buna-N	1	44	188–960	PLATE, diaphragm, fluid side; stainless steel	2
16*☆	See Matrix	BALL	4	45	112–257	NUT, hex; M8 x 1.25; stainless steel	8
17*☆	See Matrix	SEAT, ball	4	* These parts are included in the Fluid Section Repair Kits. Refer to page 26 for the correct kit for your pump.			
18*	See Matrix	O-RING	4	† These parts are included in Air Valve Repair Kit 236–273.			
19*	See Matrix	DIAPHRAGM; PTFE	2	▲ Replacement Danger and Warning labels, tags and cards are available at no cost.			
20	188–607	PLATE, diaphragm, air side; aluminum	2	☆ Optional stainless steel balls and seats are available for use with highly abrasive fluids. See page 26.			
21	189–044	BOLT, hex hd; M12 x 1.75; 35 mm (1.38 in.) long	2				
22*†	112–181	PACKING, u-cup; nitrile	4				

## Parts Matrix

Find the part number of your pump in the left column. Read across from left to right to find the applicable part numbers for ref. numbers 16, 17, 18, 19 and 29.

Pump Part No.	Ref. No. 16* Ball	Ref. No. 17* Seat	Ref. No. 18* O-Ring	Ref. No. 19* PTFE Diaphragm	Ref. No. 29* Diaphragm
236–260	112–088 PTFE	188–707 Stainless Steel	104–804 PTFE	188–605 PTFE	188–606 Hytrel (Backup)
236–261	112–254 Acetal	188–711 Hytrel	Not Used	Not Used	188–606 Hytrel
236–262	112–092 Santoprene	190–212 Santoprene	104–804 PTFE	Not Used	188–857 Santoprene

\* These parts are included in the Fluid Section Repair Kits. Refer to page 26 for the correct kit for your pump.

# Repair Kits

Use Only Genuine Graco Parts and Accessories

## Air Valve Repair Kit 236–273

For all Husky 1040 pumps. Includes:

Ref No.	Part No.	Description	Qty
8	112–179	SCREW, machine, torx, hex washer hd; M5 x 0.8 thread forming; 12 mm (0.47 in.) long	3
9	188–614	BLOCK, pilot; acetal	1
10	188–618	GASKET, cover; HDPE foam	1
12	108–730	O-RING; nitrile	1
13	188–616	BLOCK, air valve; acetal	1
15	188–617	SEAL, valve plate; buna-N	1
22	112–181	PACKING, u-cup; nitrile	2
27	157–628	O-RING; buna-N	2

## Optional Stainless Steel Balls and Seats

For use with all models, when pumping highly abrasive fluids. Four of each required per pump.

<b>188–708 Seat</b>	Hardened 17–4 Stainless Steel.
<b>103–869 Ball</b>	316 Stainless Steel.
<b>102–973 Ball</b>	Hardened 440C Stainless Steel.

## Fluid Section Repair Kit 236–274

For Model 236–252 and 236–262 Husky 1040 pumps. Santoprene diaphragms, balls and seats. Includes:

Ref No.	Part No.	Description	Qty
16	112–092	BALL; Santoprene	4
17	190–212	SEAT, ball; Santoprene	4
18	104–804	O-RING;PTFE	4
22	112–181	PACKING, u-cup; nitrile	2
25	104–319	O-RING;PTFE	2
29	188–857	DIAPHRAGM; Santoprene	2

## Fluid Section Repair Kit 236–275

For Model 236–251 and 236–261 Husky 1040 pumps. Hytrel diaphragms and seats, acetal balls. Includes:

Ref No.	Part No.	Description	Qty
16	112–254	BALL; acetal	4
17	188–711	SEAT, ball; Hytrel	4
22	112–181	PACKING, u-cup; nitrile	2
25	104–319	O-RING;PTFE	2
29	188–606	DIAPHRAGM; Hytrel	2

## Fluid Section Repair Kit 236–276

For Model 236–253 and 236–260 Husky 1040 pumps. PTFE diaphragms and balls, stainless steel seats. Includes:

Ref No.	Part No.	Description	Qty
16	112–088	BALL;PTFE	4
17	188–707	SEAT, ball; stainless steel	4
18	104–804	O-RING;PTFE	4
19	188–605	DIAPHRAGM;PTFE	2
22	112–181	PACKING, u-cup; nitrile	2
25	104–319	O-RING;PTFE	2
29	188–606	DIAPHRAGM, backup; Hytrel	2

## Fluid Section Repair Kit 236–277

For Model 236–250 Husky 1040 pumps. PTFE diaphragms and balls, polypropylene seats. Includes:

Ref No.	Part No.	Description	Qty
16	112–088	BALL;PTFE	4
17	188–710	SEAT, ball; polypropylene	4
19	188–605	DIAPHRAGM;PTFE	2
22	112–181	PACKING, u-cup; nitrile	2
25	104–319	O-RING;PTFE	2
29	188–606	DIAPHRAGM, backup; Hytrel	2

## Fluid Section Conversion Kit 236–441

Use to convert the fluid section on Husky 1040 pumps to Viton diaphragms, balls, and seats. Includes:

Ref No.	Part No.	Description	Qty
16	112–184	BALL; Viton	4
17	188–712	SEAT, ball; Viton	4
19	188–858	DIAPHRAGM; Viton	2
22	112–181	PACKING, u-cup; nitrile	2
25	104–319	O-RING;PTFE	2

## Fluid Section Conversion Kit 236–442

Use to convert the fluid section on Husky 1040 pumps to buna-N diaphragms and balls, polypropylene seats. Includes:

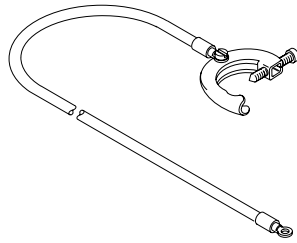
Ref No.	Part No.	Description	Qty
16	112–090	BALL; buna-N	4
17	188–710	SEAT, ball; polypropylene	4
19	188–859	DIAPHRAGM; buna-N	2
22	112–181	PACKING, u-cup; nitrile	2
25	104–319	O-RING;PTFE	2

# Accessories

Use Only Genuine Graco Parts and Accessories

## Grounding Wire and Clamp 222-011

25 ft (7.6 m) long, 1.5 mm<sup>2</sup> (12 ga.)

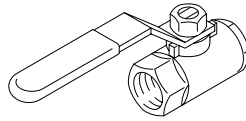


## Bleed-Type Master Air Valve 110-224

300 psi (21 bar) Maximum Working Pressure

Relieves air trapped in the air line between the pump air inlet and this valve when it is closed.

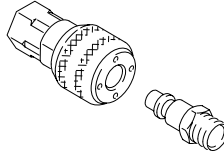
3/8 npt(f) inlet and outlet.



## Air Line Quick Disconnect Coupler

110-198 Coupler 3/8 npt(f)

169-971 Fitting 3/8 npt(m)



## Filter/Regulator/Lubricator Assembly 110-150

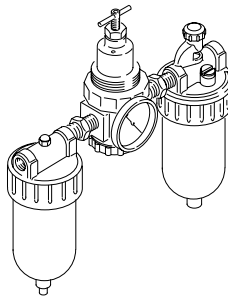
250 psi (17.5 bar) Maximum Working Pressure

0-250 psi (0-17.5 bar) Air Adjustment Range

3/8 npt(f) inlet and outlet.

Includes Air Filter 106-148, Regulator 110-234, and Lubricator 214-847, and mounting hardware.

See manual 308-169.



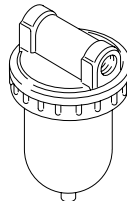
## Air Line Filter 106-148

250 psi (17.5 bar) Maximum Working Pressure

Reusable 20 micron filter and drain cock.

3/8 npt(f) inlet and outlet.

See manual 308-169.



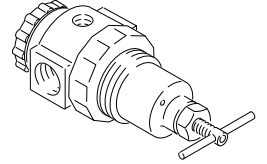
## Air Regulator 110-234

300 psi (21 bar) Maximum Working Pressure

0-250 psi (0-17.5 bar) Adjustment Range

3/8 npt(f) inlet and outlet, 1/4 npt(f) gauge port.

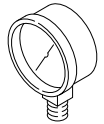
See manual 308-167.



## Air Regulator Gauge 100-960

0-200 psi (0-14 bar) Scale

1/4 npt(m).

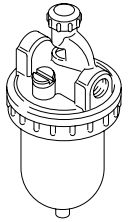


## Air Line Lubricator 214-847

250 psi (17.5 bar) Maximum Working Pressure

3/8 npt(f) inlet and outlet.

See manual 308-169.



## Groundable Air Hoses

180 psi (12.6 bar) Maximum Working Pressure

Buna-S core, buna-N cover. 1/2 in. (13 mm) ID.

214-650 3/8 npt(mbe); 5 ft (1.52 m) long

214-655 3/8 npt(mbe); 25 ft (7.62 m) long

214-656 1/2 npt(mbe); 10 ft (3.05 m) long

## Groundable Exhaust Air Hoses

180 psi (12.6 bar) Maximum Working Pressure

Buna-N core, buna-N cover. 3/8 in. (10 mm) ID.

208-610 3/4 npt(mbe); 6 ft (1.83 m) long

205-548 3/4 npt(mbe); 15 ft (4.57 m) long

## Exhaust Hose Coupling 100-385

To connect the muffler to the exhaust hose.

3/4 npt (fbe).

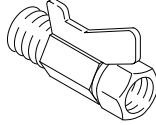
# Accessories

*Use Only Genuine Graco Parts and Accessories*

## Fluid Drain Valve

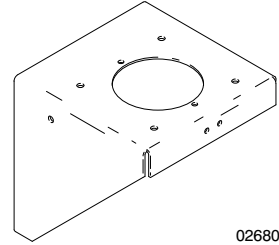
500 psi (35 bar) Maximum Working Pressure  
Use at fluid outlet to help relieve pressure.

- 210-071 Stainless steel and PTFE  
3/8 npt(m x f)
- 208-391 Steel and PTFE  
3/8 npt(m x f)



## Wall Mounting Bracket 189-233

Mounts the Husky 1040 Pump to a wall.  
See page 29 for mounting hole pattern.



02680

## Fluid Shutoff Valves

1" npt(fbe).

- 512-152 Carbon Steel  
2000 psi (140 bar) Maximum Working Pressure
- 512-486 Stainless Steel  
600 psi (42 bar) Maximum Working Pressure

## Groundable Fluid Hose 109-064

1000 psi (70 bar) Maximum Working Pressure  
Nitrile core, nitrile cover. 1 in. (25 mm) ID,  
1 npt(mbe), 28 in. (0.7 m) long.

## Fluid Suction Line Assemblies

For bung-mounted transfer applications from a 55 gallon (200 liter) drum, order the following parts:

- 157-785 Swivel Union; 3/4 npt(m) x 3/4 npsm(f);  
carbon steel
- 158-555 Nipple; 1" npt x 3/4 npt; carbon steel
- 206-266 Suction Tube

For wall-mounted transfer applications from a 55 gallon (200 liter) drum, order the following parts:

- 158-586 Bushing; 1" npt(m) x 3/4 npt(f);  
carbon steel
- 223-009 Suction Tube

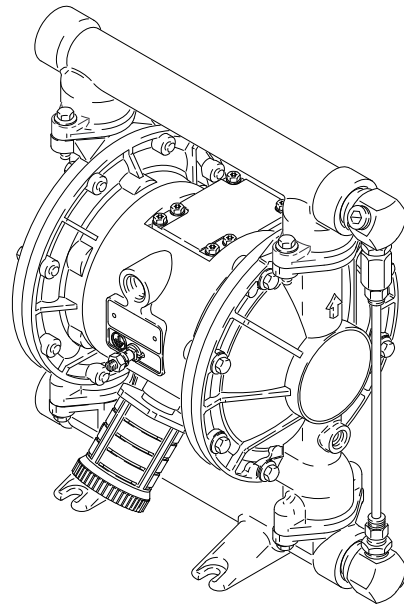
## Rubber Foot Kit 236-452

Install on pump feet to reduce noise and vibration. Includes four rubber feet and attaching hardware.

## Fluid Pressure Relief Valve Kit 235-409

**For use with Aluminum Pump Models 236-250, 236-251, 236-252 and 236-253 only.**

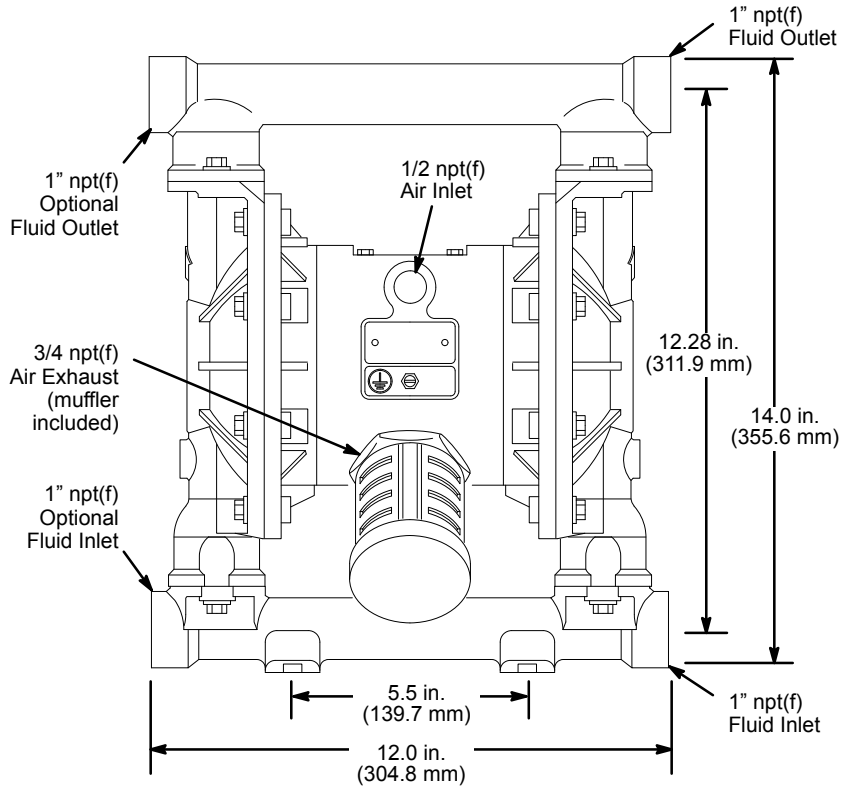
Prevents overpressurization of pump due to thermal expansion or backup of fluid in the outlet line. Shown below installed on the pump. See page 9. 150 psi (10.5 bar) venting pressure. Brass and buna-N. Includes instructions.



02653

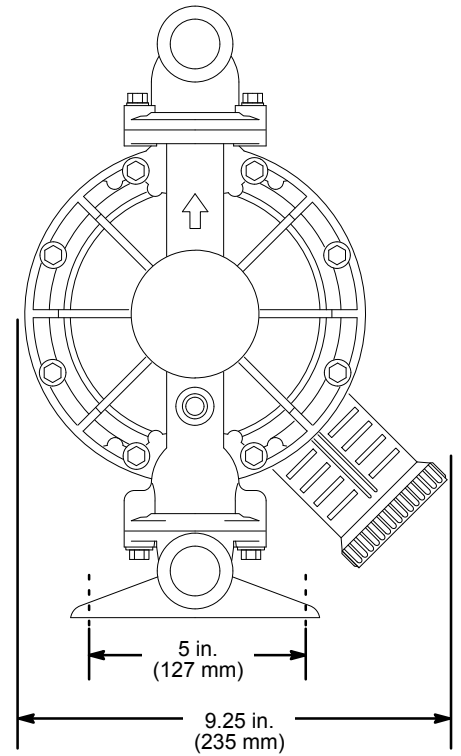
# Dimensions

**FRONT VIEW**



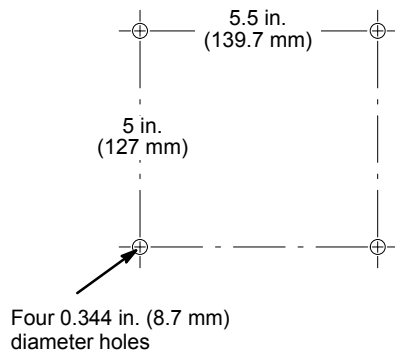
02665

**SIDE VIEW**



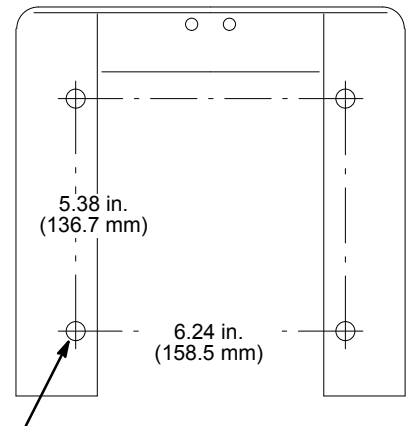
02664

**PUMP MOUNTING HOLE PATTERN**



02682

**WALL BRACKET MOUNTING HOLE PATTERN (Viewed from Wall)**



Four 0.437 in. (11.1 mm) diameter holes

02681

# Technical Data

## Aluminum Pumps

Maximum Fluid Working Pressure ..... 120 psi (8.4 bar)  
 Air Pressure Operating Range ..... 20–120 psi (1.4–8.4 bar)  
 Maximum Air Consumption ..... 60 scfm  
 Air Consumption at 70 psi/20 gpm ..... 20 scfm (see chart)  
 Maximum Free Flow Delivery ..... 42 gpm (159 l/min)  
 Maximum Pump Speed ..... 276 cpm  
 Gallons (Liters) per cycle ..... 0.15 (0.57)  
 Maximum Suction Lift ..... 18 ft (5.48 m) wet or dry  
 Maximum Size Pumpable Solids ..... 1/8 in. (3.2 mm)  
 \* Maximum Noise Level at 100 psi, full flow: ..... 89 dBA  
 Sound Power Level: ..... 100 LwA  
 \* Noise Level at 70 psi, 50 cycles/min: ..... 78 dBA  
 Maximum Operating Temperature ..... 150°F (65.5°C);  
 200°F (93.3°C) for models with PTFE diaphragms  
 Air Inlet Size ..... 1/2 npt(f)  
 Fluid Inlet Size ..... 1" npt(f)

Fluid Outlet Size ..... 1" npt(f)  
 Wetted Parts ..... Model 236–250: Aluminum, PTFE®, Polypropylene  
 Model 236–251: Aluminum, Hytrel®, Acetal, PTFE®  
 Model 236–252: Aluminum, Santoprene®, PTFE®  
 Model 236–253: Aluminum, 316 Stainless Steel, PTFE®  
 Non-wetted External Parts .. Aluminum, 302 Stainless Steel, Polyester (labels)  
 Weight ..... 18 lb (8.2 kg)

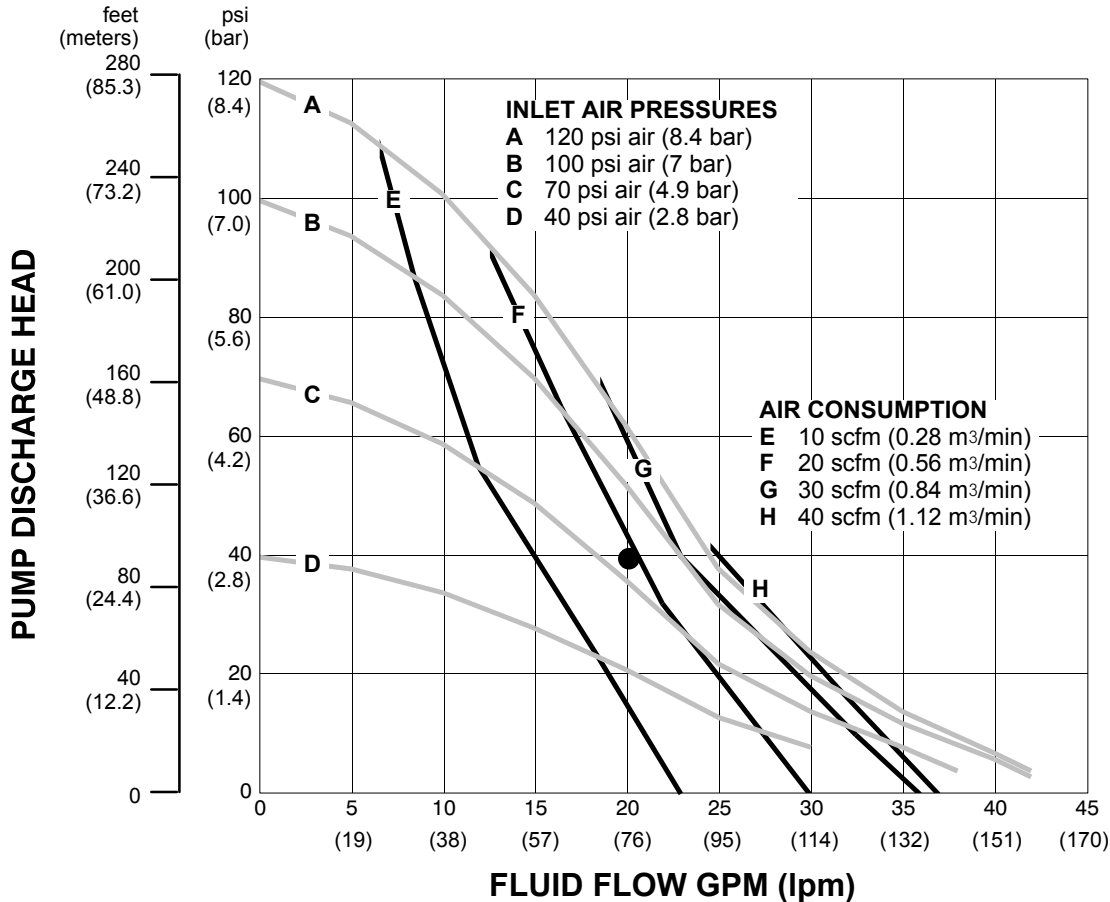
PTFE®, Viton®, and Hytrel® are registered trademarks of the Du Pont Co.

Santoprene® is a registered trademark of the Monsanto Co.

\* Noise levels measured with the pump mounted on the floor, using Rubber Foot Kit 236–452. Sound power measured per ISO Standard 9614–1.

### Example of Finding Pump Air Consumption and Air Pressure at a Specific Fluid Delivery and Discharge Head:

To supply 20 gpm (76 liters) fluid flow (horizontal scale) at 40 psi (2.8 bar) discharge head pressure (vertical scale) requires approximately 20 scfm (0.56 m<sup>3</sup>/min) air consumption at 70 psi (4.9 bar) inlet air pressure.



#### TEST CONDITIONS

Pump tested in water with PTFE diaphragm and inlet submerged.

KEY ———— FLUID PRESSURE AND FLOW  
 ———— SCFM AIR CONSUMPTION

# Technical Data

## Stainless Steel Pumps

Maximum Fluid Working Pressure ..... 120 psi (8.4 bar)  
 Air Pressure Operating Range .... 20–120 psi (1.4–8.4 bar)  
 Maximum Air Consumption ..... 60 scfm  
 Air Consumption at 70 psi/20 gpm ..... 20 scfm (see chart)  
 Maximum Free Flow Delivery ..... 42 gpm (159 l/min)  
 Maximum Pump Speed ..... 276 cpm  
 Gallons (Liters) per cycle ..... 0.15 (0.57)  
 Maximum Suction Lift ..... 18 ft (5.48 m) wet or dry  
 Maximum Size Pumpable Solids ..... 1/8 in. (3.2 mm)  
 \* Maximum Noise Level at 100 psi, full flow: ..... 89 dBA  
 Sound Power Level: ..... 100 LwA  
 \* Noise Level at 70 psi, 50 cycles/min: ..... 78 dBA  
 Maximum Operating Temperature ..... 150°F (65.5°C);  
 200°F (93.3°C) for models with PTFE diaphragms  
 Air Inlet Size ..... 1/2 npt(f)  
 Fluid Inlet Size ..... 1" npt(f)

Fluid Outlet Size ..... 1" npt(f)  
 Wetted Parts .. Model 236–260: 316 Stainless Steel, PTFE®  
 Model 236–261: 316 Stainless Steel, Hytrel®,  
 Acetal, PTFE®  
 Model 236–262: 316 Stainless Steel,  
 Santoprene®, PTFE®  
 Non-wetted External Parts ... Aluminum, 302 Stainless Steel  
 Polyester (labels)  
 Weight ..... 33 lb (15 kg)

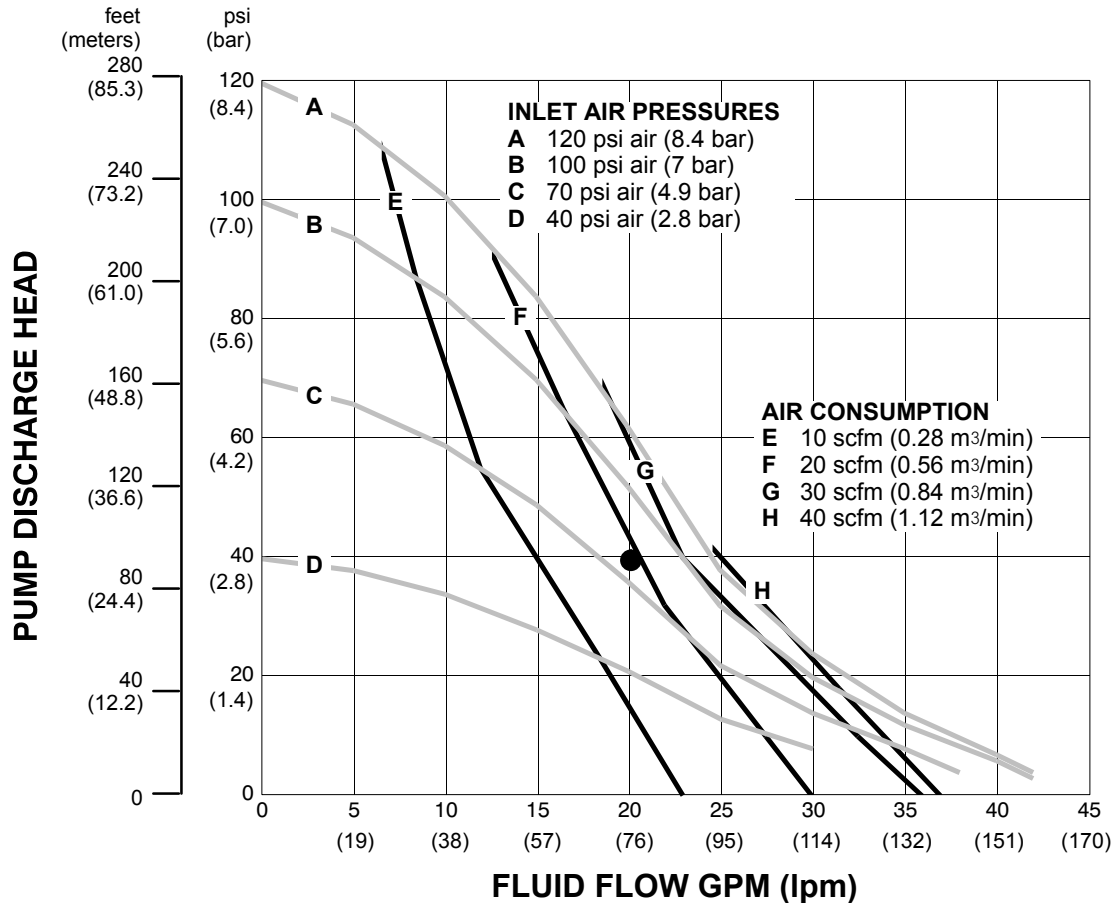
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#### TEST CONDITIONS

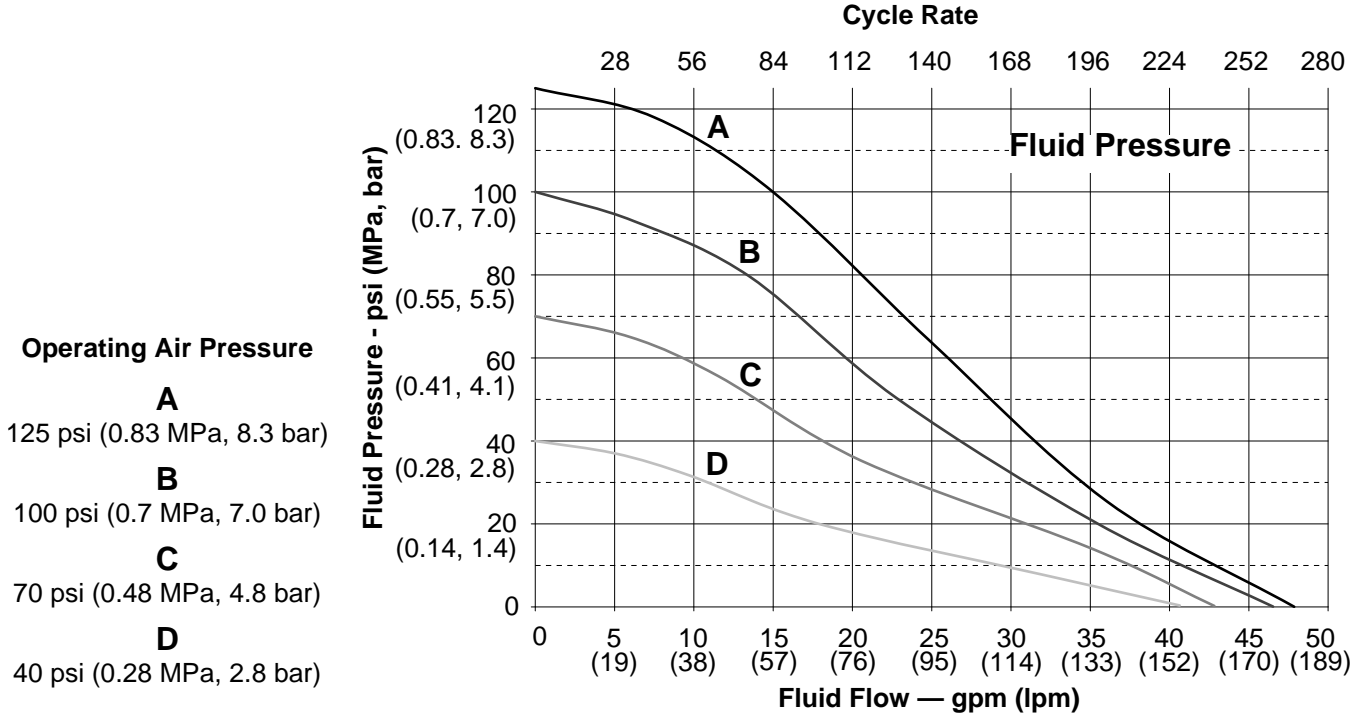
Pump tested in water with PTFE diaphragm and inlet submerged.

KEY ——— FLUID PRESSURE AND FLOW  
 ——— SCFM AIR CONSUMPTION



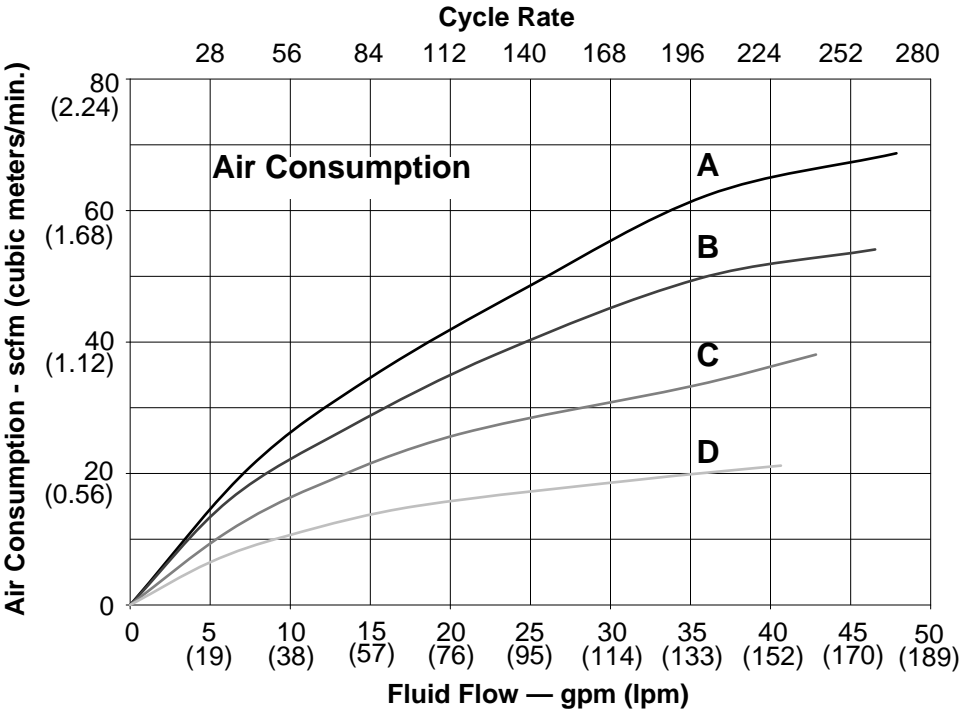
# Performance Charts

**Test Conditions:** Pump tested in water with inlet submerged.



**How to Read the Charts**

1. Locate fluid flow rate along bottom of chart.
2. Follow vertical line up to intersection with selected operating air pressure curve.
3. Follow left to scale to read **fluid outlet pressure** (top chart) or **air consumption** (bottom chart).



# The Graco Warranty and Disclaimers

## WARRANTY

Graco warrants all equipment manufactured by it and bearing its name to be free from defects in material and workmanship on the date of sale by an authorized Graco distributor to the original purchaser for use. As purchaser's sole remedy for breach of this warranty, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment proven 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, 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 with Graco equipment of 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.

## DISCLAIMERS AND LIMITATIONS

THE TERMS OF THIS WARRANTY CONSTITUTE PURCHASER'S SOLE AND EXCLUSIVE REMEDY AND ARE IN LIEU OF ANY OTHER WARRANTIES (EXPRESS OR IMPLIED), INCLUDING WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY NON-CONTRACTUAL LIABILITIES, INCLUDING PRODUCT LIABILITIES, BASED ON NEGLIGENCE OR STRICT LIABILITY. EVERY FORM OF LIABILITY FOR DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR LOSS IS EXPRESSLY EXCLUDED AND DENIED. IN NO CASE SHALL GRACO'S LIABILITY EXCEED THE AMOUNT OF THE PURCHASE PRICE. ANY ACTION FOR BREACH OF WARRANTY MUST BE BROUGHT WITHIN TWO (2) YEARS OF THE DATE OF SALE.

## EQUIPMENT NOT COVERED BY GRACO WARRANTY

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ACCESSORIES, EQUIPMENT, MATERIALS, OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motor, 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.

## Graco Phone Numbers

**TO PLACE AN ORDER**, contact your Graco distributor, or call this number to identify the distributor closest to you: **1-800-367-4023 Toll Free**

**FOR TECHNICAL ASSISTANCE**, service repair information or assistance regarding the application of Graco equipment: **1-800-543-0339 Toll Free**

## Manual Change Summary

Assembly Changed	Part Status	Ref No.	Part No.	Name
Model 236-252 and	Old	17	188-709	Seat
236-262 Pumps, and	New	17	190-212	Seat
Repair Kit 236-274	Added	18	104-804	O-ring

CE identification has been added to the manual.

**Sales Offices:** Atlanta, Chicago, Dallas, Detroit, Los Angeles, Mt. Arlington (N.J.)

**Foreign Offices:** Canada; England; Korea; Switzerland; France; Germany; Hong Kong; Japan

**GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1441**

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