

Instructions - Parts List



Husky™ 1040 Air-Operated Diaphragm Pumps

308326ZAB

EN

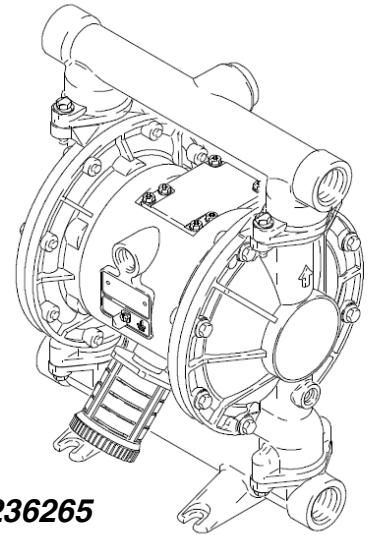
Intended for use in accordance with the United States Flammable and Combustible Liquids Code (NFPA 30) and the Automotive and Marine Service Station Code (NFPA 30A).

Evacuation and Transfer Pumps

120 psi (0.84 MPa, 8.4 bar) Maximum Fluid Working Pressure
120 psi (0.84 MPa, 8.4 bar) Maximum Air Input Pressure

Part No. 236265

with TPE diaphragms and seats, acetal balls



Model 236265

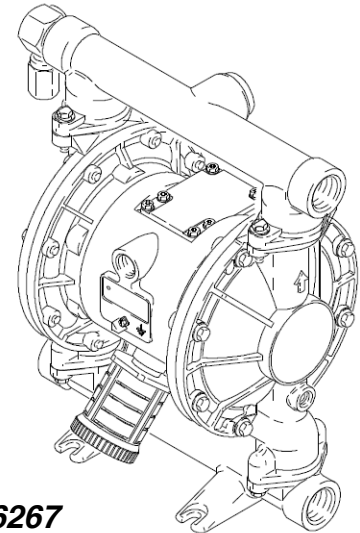
02632B

Fuel Dispense Pumps

with TPE diaphragms and seats, acetal balls
50 psi (0.35 MPa, 3.5 bar) Maximum Fluid Working Pressure
50 psi (0.35 MPa, 3.5 bar) Maximum Air Input Pressure

Part No. 236267

with TPE diaphragms and seats, acetal balls



Model 236267

03538B



Important Safety Instructions

Read all warnings and instructions in the manual.
Save these instructions.
See page 2 for **Table of Contents**.



II 2 GD

Ex h IIC 66°...135°C Gb

Ex h IIIC T135°C Db

ATEX T-code rating is dependent on the temperature of the fluid being pumped. Fluid temperature is limited by the materials of the pump interior wetted parts. See Technical Data for the maximum fluid operating temperature for your specific pump model.



This symbol on the nameplate means the product is listed by Underwriters Laboratories Inc. (UL Standard No. 79, Standard for Power-Operated Pumps for Petroleum Product Dispensing Systems).

Table of Contents

Warnings	3	Maintenance	
Installation		Lubrication	14
General Information	5	Flushing and Storage	14
Tightening Screws Before First Use	5	Tightening Threaded Connections	14
Grounding	5	Preventive Maintenance Schedule	14
Mountings	6	Troubleshooting	15
Air Line	6	Service	
Typical Installation Drawings		Repairing the Air Valve	16
Waste Oil Receiver Evacuation System, or		Ball Check Valve Repair	18
General Fluid Transfer Application	7	Diaphragm Repair	19
Gear Oil Evacuation System	7	Bearing and Air Gasket Removal	22
Fuel Dispense System	8	Parts Drawings & Lists	
Pressure Relief Valve (Fuel Dispense Systems) .	8	Evacuation and Transfer Pumps	24
Changing the Orientation of the Fluid Inlet		Fuel Dispense Pumps	26
and Outlet Ports	8	Repair Kits	28
Fluid Suction Line	9	Torque Sequence	29
Fluid Outlet Line	9	Dimensions	30
Air Exhaust Ventilation	10	Technical Data and Performance Charts	
Fluid Pressure Relief Kit	11	Evacuation and Transfer Pumps	31
Operation		Fuel Dispense Pumps	32
Pressure Relief Procedure	12	Graco Warranties	34
Flush the Pump Before First Use	13	Graco Information	34
Starting and Adjusting the Pump	13		
Pump Shutdown	14		

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



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 operating 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.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated component in your system. Refer to the **Technical Data** on pages 31 and 32 for the maximum working pressure of your equipment.
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Do not kink or overbend hoses or use hoses to pull equipment.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 82°C (180°F) or below -40°C (-40°F).
- Wear hearing protection when operating this equipment.
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.
- Never use 1.1.1--trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in pressurized aluminum equipment. Such use could result in a chemical reaction, with the possibility of explosion.

! WARNING



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.
- Pipe and dispose of the exhaust air safely, away from people, animals, and food handling areas. If the diaphragm fails, the fluid is exhausted along with the air. See **Air Exhaust Ventilation** on page 10.
- Never use an acetal pump to pump acids. Take precautions to avoid acid or acid fumes from contacting the pump housing exterior. Stainless steel parts will be damaged by exposure to acid spills and fumes.



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. Refer to **Grounding** on page 5.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop pumping 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.
- Pipe and dispose of the exhaust air safely, away from all sources of ignition. If the diaphragm fails, the fluid is exhausted along with the air. See **Air Exhaust Ventilation** on page 10.
- Keep the work area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the work area.
- Extinguish all open flames or pilot lights in the work area.
- Do not smoke in the work area.
- Do not turn on or off any light switch in the work area while operating or if fumes are present.
- Do not operate a gasoline engine in the work area.
- Keep a fire extinguisher in the work area.

Installation

General Information

- The Typical Installations shown in Figs. 2–4 are only guides for selecting and installing system components. Contact your Graco distributor for assistance in planning a system to suit your needs.
- Reference numbers and letters in parentheses refer to the callouts in the figures and the parts lists on pages 24 to 27.
- Installation and use must be in accordance with the Flammable and Combustible Liquids Code (NFPA 30) and Automotive and Marine Service Station Code (NFPA 30A) and must comply with all local, state and federal codes.
- All pipe joints are to be made tight with UL listed gasoline--resistant pipe compound.

Tightening Screws Before First Use

Before using the pump for the first time, check and retorquer all external fasteners. See **Torque Sequence**, page 29. After the first day of operation, retorquer the fasteners. Although pump use varies, a general guideline is to retorquer fasteners every two months.

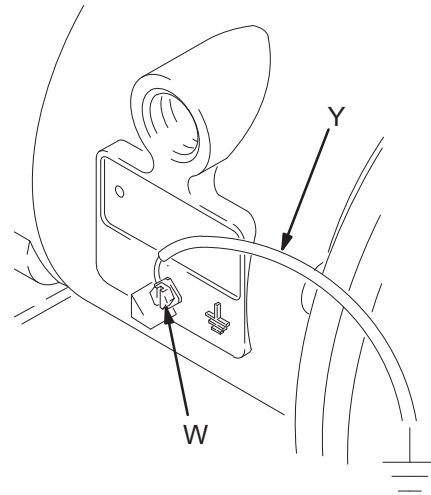
Grounding

! WARNING

FIRE AND EXPLOSION HAZARD

Before operating the pump, ground the system as explained below. Also, read the section **FIRE AND EXPLOSION HAZARD**, on page 4.

- *Pump:* Connect a ground wire and clamp as shown in Fig. 1. Loosen the grounding screw (W). Insert one end of a 12 ga (1.5 mm²) minimum ground wire (Y) behind the grounding screw and tighten the screw securely. See Fig. 1. Connect the clamp end of the ground wire to a true earth ground. Order Part No. 222011 Ground Wire and Clamp.



02646B

Fig. 1

- *Air and fluid hoses:* Use only grounded hoses with a maximum of 500 ft (150 m) combined hose length to ensure grounding continuity.
- *Air compressor:* Follow the manufacturer's recommendations.
- *All solvent pails used when flushing:* Follow the 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.
- *Fluid supply container:* Follow the local code.
- *Suction device nozzle:* must be bonded to metal container from which it is suctioning by firm metal-to-metal contact to a properly grounded suction hose and pump.
- *Piping, valves, and fittings:* use only electrically conductive materials. Bond and ground per code.

Check your system electrical continuity after the initial installation, and then set up a regular schedule for checking continuity to be sure proper grounding is maintained.

Installation

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 10.

- Be sure the mounting surface can support the weight of the pump, hoses, and accessories, as well as the stress caused during operation.
- For all mountings, be sure the pump is bolted directly to the mounting surface.
- 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.
- Rubber Foot Mounting Kit 236452 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 12 before moving or lifting the pump.

Air Line

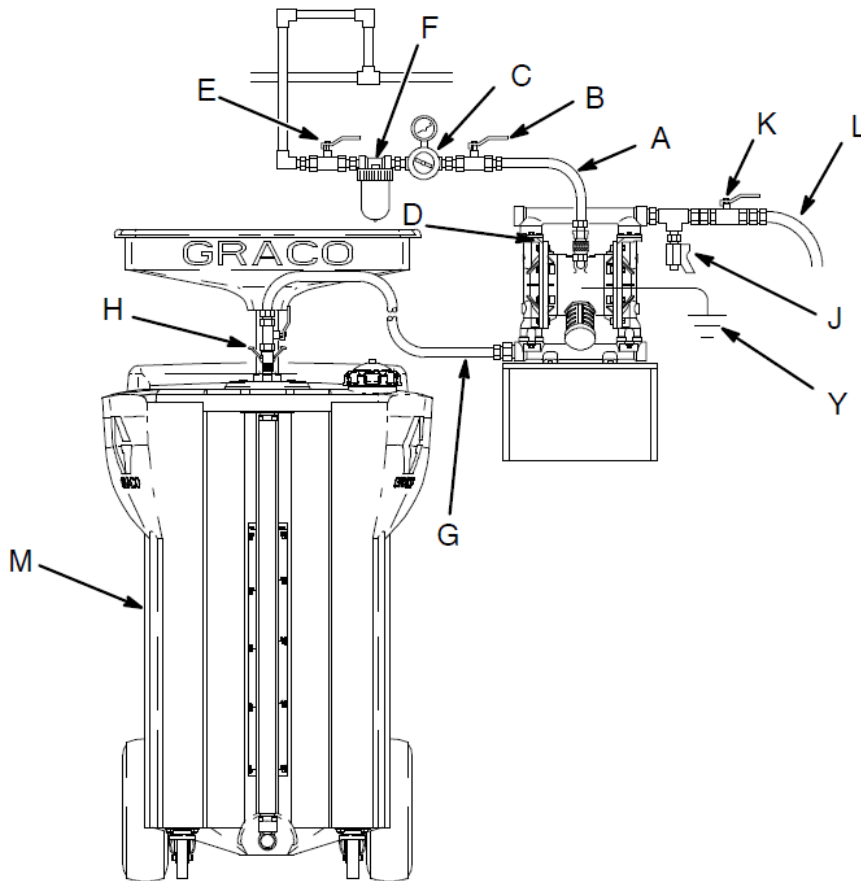
WARNING

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 7 and 8. 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 at stall 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** above. 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 1/2" (13 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

Waste Oil Receiver Evacuation System, or General Fluid Transfer Application



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 Fluid line quick disconnect
- J Fluid drain valve (required)
- K Fluid shutoff valve
- L Fluid line
- M Waste oil receiver
- Y Ground wire (required; see page 5 for installation instructions)

Fig. 2

Gear Oil Evacuation System

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
- H Fluid line quick disconnect
- J Fluid drain valve (required)
- K Fluid shutoff valve
- L Waste oil line (to storage tank)
- P Suction hose
- R Control valve
- S Suction wand
- Y Ground wire (required; see page 5 for installation instructions)

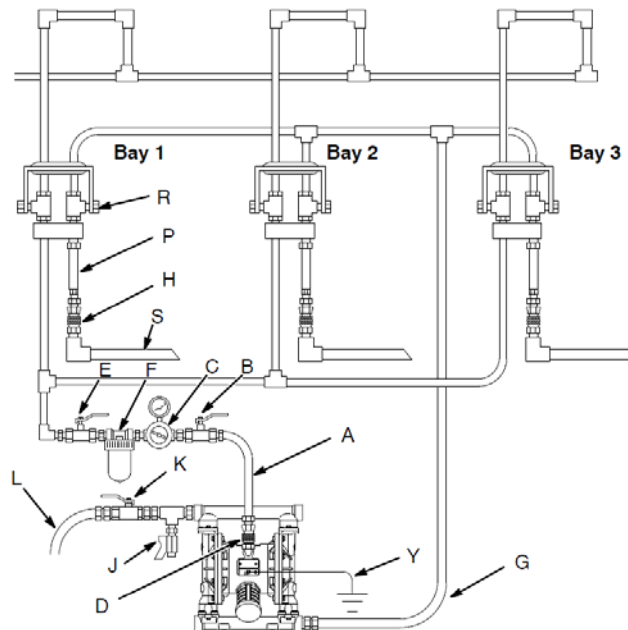



Fig. 3

Installation

Fuel Dispense System

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
- T Hose reel
- V Fuel dispense valve
- Y Ground wire (required; see page 5 for installation instructions)
- 46 Pressure relief valve (required to limit fluid outlet pressure to 50 psi [350 kPa, 3.5 bar])

 Fluid from the relief valve (46) must be vented to a safe area.

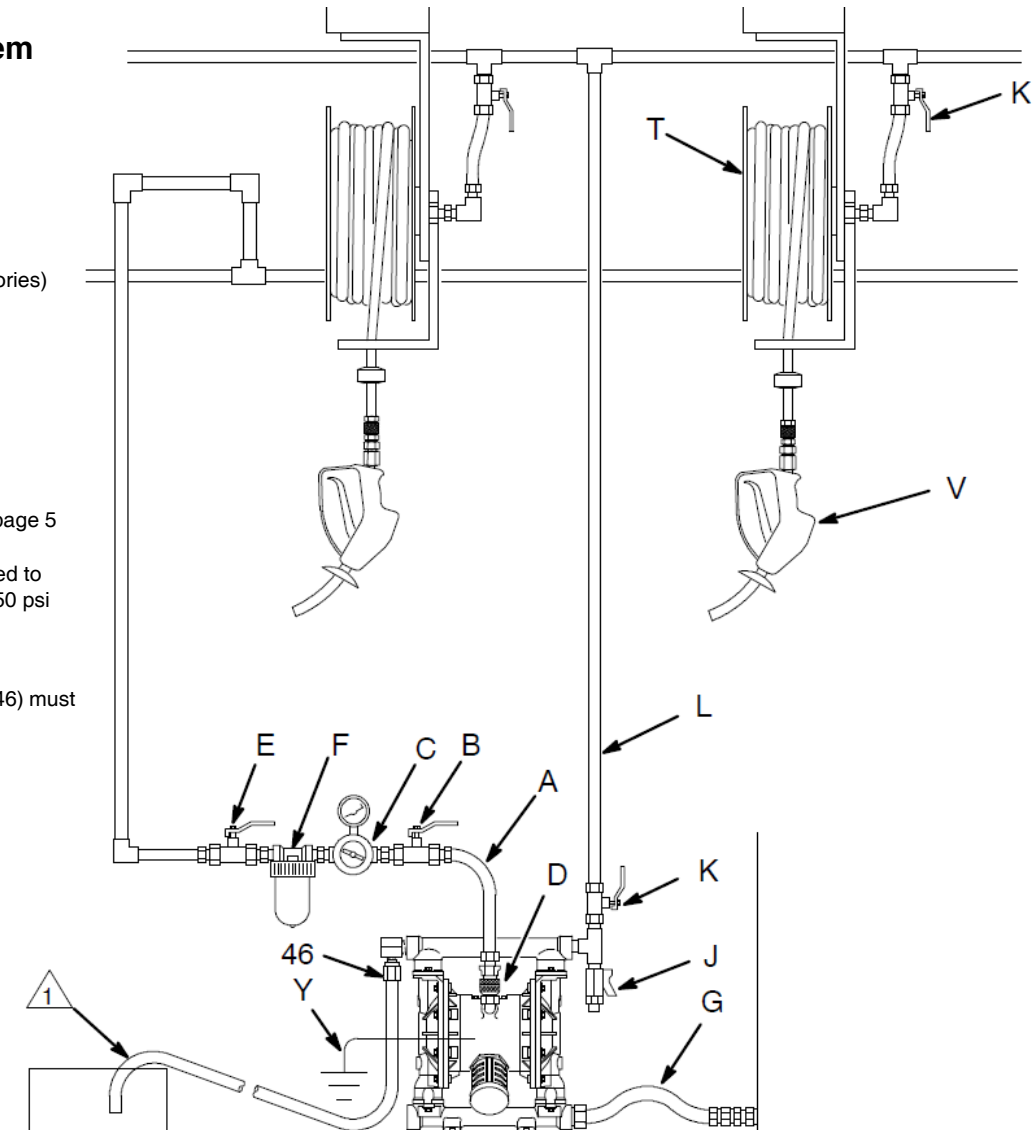


Fig. 4

Pressure Relief Valve (Fuel Dispense Systems)

WARNING

Fuel Dispense Model 236267 requires a pressure relief valve 112353 (46), which is supplied with the pump, to prevent fluid pressure from exceeding 50 psi (350 kPa, 3.5 bar). Do not exceed the maximum air inlet pressure of 50 psi (350 kPa, 3.5 bar). Recommended air operating pressure is 40 psi (280 kPa, 2.8 bar) or less. As the air inlet pressure approaches 50 psi (350 kPa, 3.5 bar), the relief valve will open and vent fluid. Vented fluid must be routed to a container in a safe place.

Changing the Orientation of the Fluid Inlet and Outlet Ports

If desired, you can easily change the orientation of the fluid inlet and outlet ports. See Fig. 5.

1. Remove the screws (6) holding the inlet and/or outlet manifold (1, 3) to the covers (2).
2. Reverse the manifold and reattach. Install the screws and torque to 120 to 150 in-lb (14–17 N•m). See **Torque Sequence**, page 29.

Installation

Fluid Section Line

1. **Use only electrically conductive fluid hoses.** The pump fluid inlet (3) 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 31 and 32 for maximum suction lift (wet and dry).
5. For the Waste Oil Receiver Evacuation System, connect an appropriate suction hose (G) and fluid quick coupler (H) between the pump fluid inlet and the waste oil receiver (M). See Fig. 2.
6. For the Gear Oil Evacuation System, install a control valve (R) and an appropriate wand (S). See Fig. 3.

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.

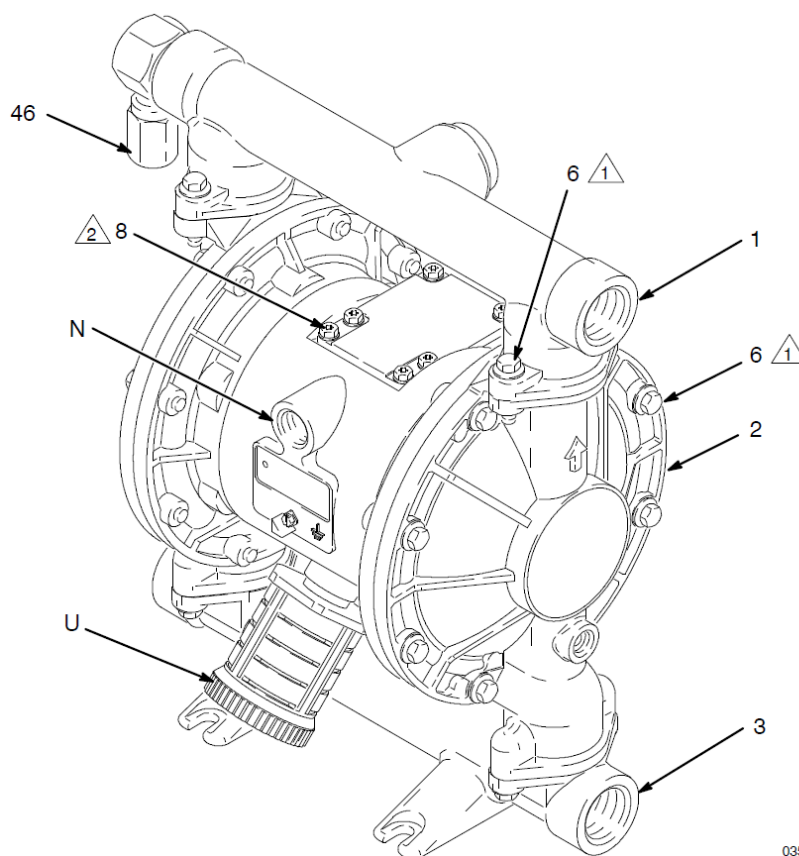
1. **Use only electrically conductive fluid hoses (L).** The pump fluid outlet (1) is 1" npt(f). See Fig. 5. Screw the fluid fitting into the pump outlet securely.
2. Install a fluid drain valve (J) near the fluid outlet. See the **WARNING** above, and Figs. 2 to 4 on pages 7 and 8.
3. Install a shutoff valve (K) in the fluid outlet line.

KEY

- N 1/2 npt(f) air port
- U Muffler; air exhaust port is 3/4 npt(f)
- 1 1" npt(f) fluid outlet port
- 2 Fluid covers
- 3 1" npt(f) fluid inlet port
- 6 Manifold and cover screws
- 8 Air valve screws
- 46 3/8 npt(f) pressure relief valve (Models 236267 only)

 Torque to 120 to 150 in-lb (14 to 15 N•m). See Torque Sequence, page 29. Apply medium-strength (blue) thread sealant to threads.

 Torque to 50–60 in-lb (5.6–6.87 N•m).



Model 236267 Shown

03538B

Fig. 5

Installation

Air Exhaust Ventilation

WARNING

Be sure to read and follow the **TOXIC FLUID HAZARD** and **FIRE AND EXPLOSION HAZARD** warnings on page 4 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.

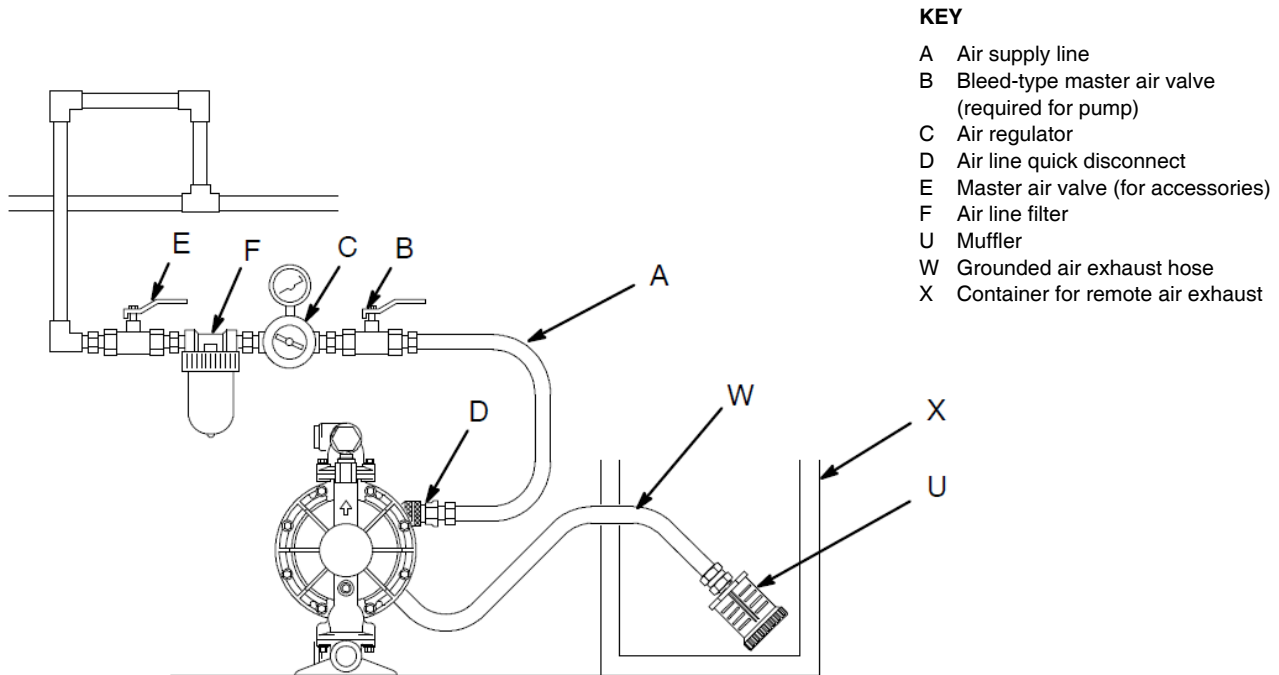
Diaphragm failure will cause the fluid being pumped to exhaust with the air. Place an appropriate container at the end of the air exhaust line to catch the fluid. See Fig. 6.

To provide a remote exhaust:

1. Remove the muffler (U) from the pump air exhaust port.
2. Install a grounded air exhaust hose (W) and connect the muffler (U) 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 (X) at the end of the air exhaust line to catch fluid in case a diaphragm ruptures. See Fig. 6. Locate the container away from all sources of ignition, including pilot lights and waste materials. If the diaphragm ruptures, the fluid being pumped will exhaust with the air.

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

VENTING EXHAUST AIR



03539

Fig. 6

Installation

Fluid Pressure Relief Kit (for Pump Model 236265 only)

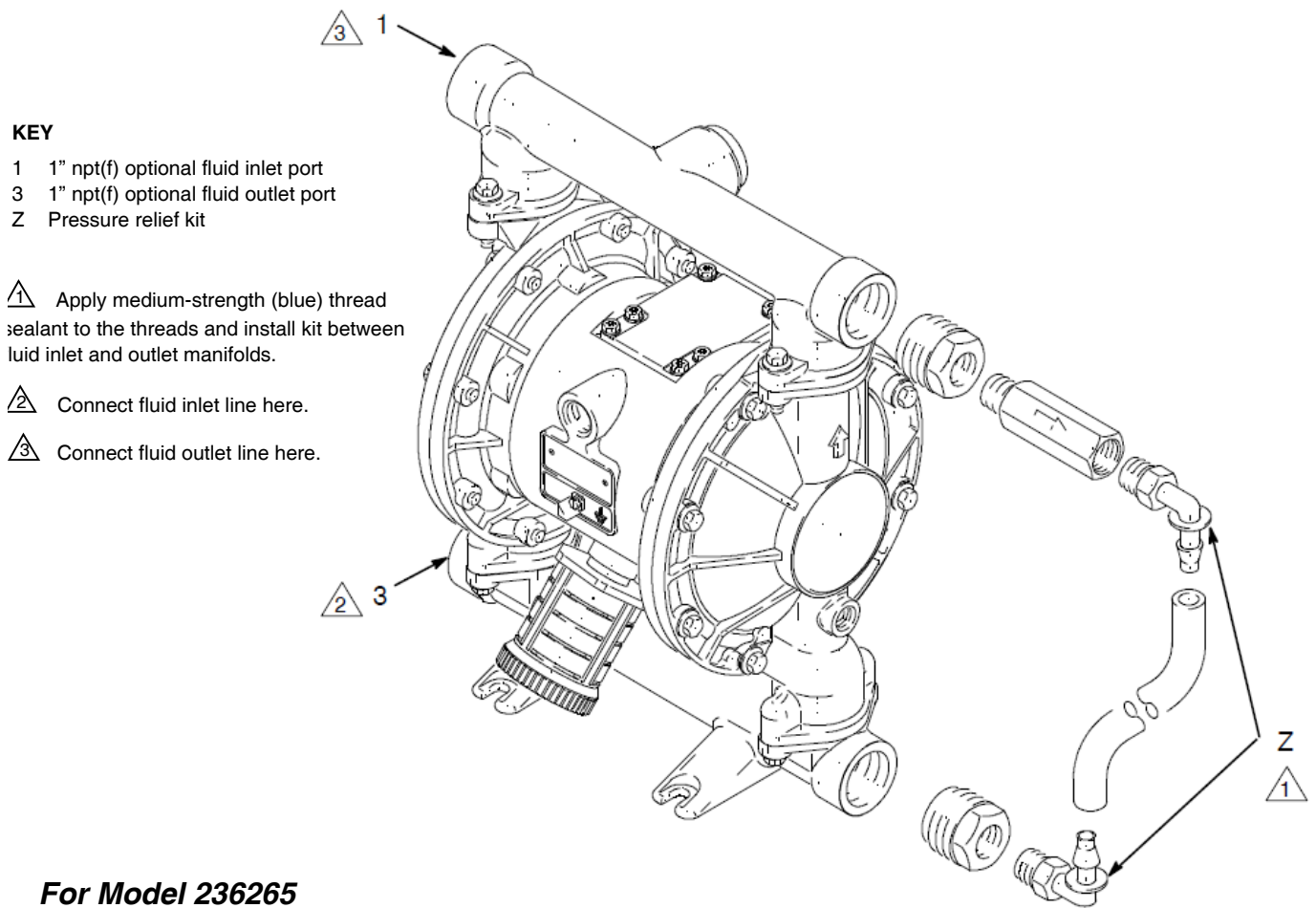
CAUTION

Pressure Relief Kit 238428 (V) is available to prevent overpressurization and rupture of the pump or hose. See Fig. 7. The kit includes instructions.

This kit is not for use in fuel dispense applications. Order a fuel dispense pump, Model 236267, which is equipped with a pressure relief valve 112353. See page 8.

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.



For Model 236265

02653C

Fig. 7

Operation

Pressure Relief Procedure



WARNING

PRESSURIZED EQUIPMENT HAZARD

The equipment stays pressurized until pressure is manually relieved. To reduce the risk of serious injury from pressurized fluid, accidental spray from the gun or splashing fluid, follow this procedure whenever you

- Are instructed to relieve pressure
- Stop pumping
- Check, clean or service any system equipment
- Install or clean fluid nozzles

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

Flush the Pump Before First Use

The pump was tested with water. If 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** on page 12 before lifting the pump.

All Systems

1. Be sure the pump is properly grounded. Read and follow **FIRE AND EXPLOSION HAZARD**, on page 4.
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.

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

NOTE: *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.

Waste Oil Receiver Evacuation Systems, or General Fluid Transfer Applications (see Fig. 2)

1. Close the pump air regulator (C) and all bleed-type master air valves (B, E).
2. Connect the pump suction hose (G) to the pump fluid inlet. Attach a fluid quick coupler (H) to the other end of the hose, then connect the coupler to the outlet fitting of the waste oil receiver (M).
3. Place the end of the fluid hose (L) into an appropriate container.
4. Close the fluid drain valve (J). Open the fluid shutoff valve (K).
5. Connect the air side quick coupler (D) to the pump air inlet fitting.
6. Open all bleed-type master air valves (B, E).

7. Slowly increase air with 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.
8. Adjust the air regulator. Do not use higher air pressure than necessary for the pump to provide good suction. Increasing the pump cycle rate does not necessarily improve suction.

Gear Oil Evacuation Systems (see Fig. 3)

1. Close the pump air regulator (C) and all bleed-type master air valves (B, E).
2. Attach an appropriate wand (S) to the suction hose (P). Place the wand in the differential or fluid to be pumped.
3. Place the end of the fluid hose (L) into an appropriate container.
4. Close the fluid drain valve (J). Open the fluid shutoff valve (K).
5. Connect the air side quick coupler (D) to the pump air inlet fitting.
6. Open all bleed-type master air valves (B, E).
7. Set the air regulator (C) to about 50 psi (3.5 bar).
8. Pull the control valve handle (R) down to start the pump.
9. Adjust the air regulator. Allow the pump to cycle slowly until all air is pushed out of the lines and the pump is primed. Do not use higher air pressure than necessary for the pump to provide good suction. Increasing the pump cycle rate does not necessarily improve suction.

NOTE: To provide better control of the cycle rate, order Air Supply Kit 221147.

10. Push the control valve handle (R) up when finished. Place the wand (S) in the holder on the control valve.

NOTE: Be sure the control valve handle is closed when evacuation is completed. Failure to close it may prevent other service bays from developing full suction.

Operation

Fuel Dispense Systems (see Fig. 4)

WARNING

Fuel Dispense Model 236267 requires a pressure relief valve (46), which is supplied with the pump, to prevent fluid pressure from exceeding 50 psi (350 kPa, 3.5 bar). Do not exceed the maximum air inlet pressure of 50 psi (350 kPa, 3.5 bar). Recommended air operating pressure is 40 psi (280 kPa, 2.8 bar) or less. As the air inlet pressure approaches 50 psi (350 kPa, 3.5 bar), the relief valve will open and vent fluid. Vented fluid must be routed to a container in a safe place.

1. Close the pump air regulator (C) and all bleed-type master air valves (B, E).
2. Close the fluid drain valve (J). Open the fluid shutoff valve (K).
3. Hold the dispense valve (V) firmly to a grounded metal container, and open the valve.
4. Connect the air side quick coupler (D) to the pump air inlet fitting.

5. Open all bleed-type master air valves (B, E).
6. 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.
7. Adjust the air regulator. Do not use higher air pressure than necessary for the pump to provide good suction. Increasing the pump cycle rate does not necessarily improve suction.

Pump Shutdown (All Systems)

WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

At the end of the work shift and before checking, adjusting, cleaning or repairing the system, **relieve the pressure.**

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. Contact your Graco distributor for more information.

Flushing and Storage

WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

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 relieve the pressure before storing it for any length of time. Use a compatible solvent.

Tightening Threaded Connection

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. Check fasteners. Tighten or retorque as necessary. Although pump use varies, a general guideline is to retorque fasteners every two months. See Torque Sequence, page 29.

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

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

Relieve the pressure before checking or servicing the equipment.

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) or seats (17).	Replace. See page 18.
Pump will not cycle, or cycles once and stops.	Air valve is stuck or dirty. Check valve ball (16) severely worn and wedged in seat (17) or manifold (1 or 3). Check valve ball (16) is wedged into seat (17), due to overpressurization. Dispensing valve clogged.	Disassemble and clean air valve. See pages 16 and 18. Use filtered air. Replace ball and seat. See page 18. Install Pressure Relief Kit (see page 11). Relieve pressure and clear valve.
Pump operates erratically.	Clogged suction line. Sticky or leaking balls (16). Diaphragm (29) ruptured. Restricted exhaust.	Inspect; clear. Clean or replace. See page 18. Replace. See pages 19 to 21. Remove restriction.
Pump will not operate Air bubbles in fluid.	Foreign material in ball checks. Suction line is loose. Diaphragm (29) ruptured. Loose manifolds (1, 3), or damaged seal between manifold and seat (17). Loose diaphragm shaft bolt (21). Damaged o-ring (25).	Clean ball check area. Tighten. Replace. See pages 19 to 21. Tighten manifold bolts (6) or replace seats (17). See page 18. Tighten. See pages 19 to 21. Replace. See pages 19 to 21.
Fluid in exhaust air.	Diaphragm (29) ruptured. Loose diaphragm shaft bolt (21). Damaged o-ring (25).	Replace. See pages 19 to 21. Tighten. See pages 19 to 21. Replace. See pages 19 to 21.
Pump exhausts excessive air at stall.	Worn air valve block (13), o-ring (12), plate (14), pilot block (9), or o-ring (27). Worn shaft seals (22).	Repair or replace. See pages 16 and 18. Replace. See pages 19 to 21.
Pump leaks air externally.	Air valve cover (7) or air valve cover screws (8) are loose. Air valve gasket (10) or air cover gasket (32) is damaged. Air cover screws (6) are loose.	Tighten screws. See page 17. Inspect; replace. See pages 16 and 17, 22 and 23. Tighten screws. See pages 22 and 23.
Pump leaks fluid externally from ball check valves.	Loose manifolds (1, 3), or damaged seal between manifold and seat (17).	Tighten manifold bolts (6) or replace seats (17). See page 18.
Relief valve relieving (Fuel Dispense Model 236267).	Air inlet pressure is too high.	Reduce inlet air pressure to below 50 psi (3.5 bar).
In evacuation application, pump is not drawing suction.	Pump should run at uniform speed.	Reduce inlet air pressure or use Air Supply Kit 221147.

Service

Repairing the Air Valve

Tools Required

- Torque wrench
- Torx (T20) screwdriver or 7 mm (9/32") socket wrench
- Needle-nose pliers
- O-ring pick
- Lithium base grease

NOTE: Air Valve Repair Kit 236273 is available. Refer to page 28. Parts included in the kit are marked with a symbol, for example (10†). Use all the parts in the kit for the best results.

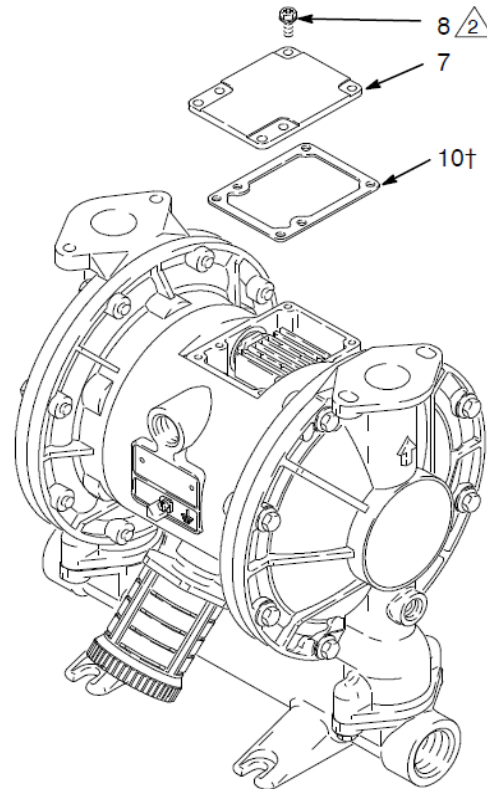
Disassembly

! WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

1. **Relieve the pressure.**
2. With a Torx (T20) screwdriver or 7 mm (9/32") 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 (T20) screwdriver or 7 mm (9/32") 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 22.

7. Clean all parts and inspect for wear or damage. Replace as needed. Reassemble as explained on page 17.



Torque to 50--60 in-lb (5.6--6.8 N·m).

Fig. 8

See Detail at right.

Grease.

Grease lower face.

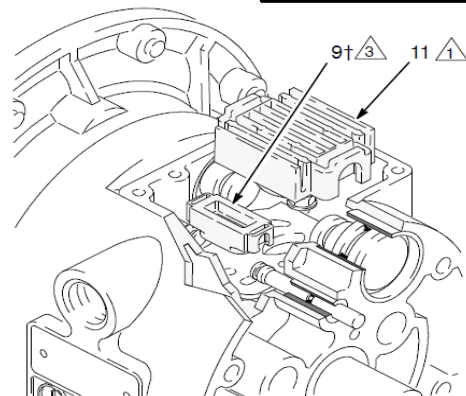
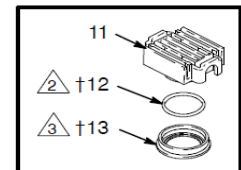


Fig. 9

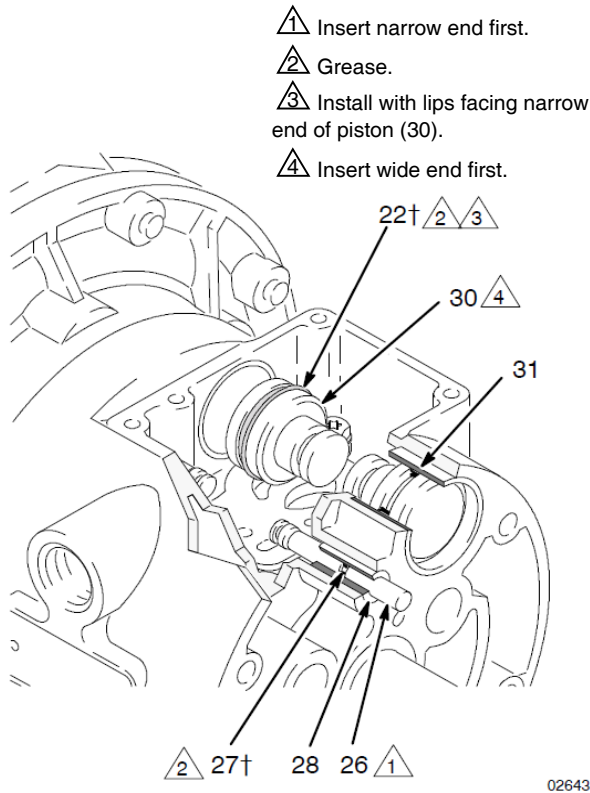


Fig. 10

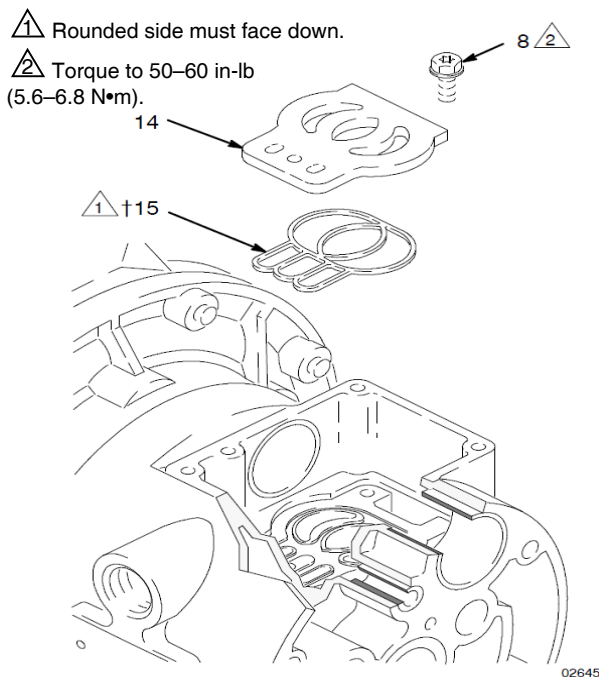


Fig. 11

Reassembly

1. If you replaced the bearings (28, 31), reinstall as explained on page 22. 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 (T20) screwdriver or 7 mm (9/32") socket wrench. Torque to 50–60 in-lb (5.6–6.8 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 (T20) screwdriver or 7 mm (9/32") socket wrench. Torque to 50–60 in-lb (5.6–6.8 N•m). See Fig. 8.

Service

Ball Check Valve Repair

Tools Required

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

Disassembly

! WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

NOTE: A Fluid Section Repair Kit is available. Refer to page 28 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: To ensure proper seating of the balls (16), always replace the seats (17) when replacing the balls.

1. **Relieve the pressure.** Disconnect all hoses.
2. Remove the pump from its mounting.
3. Using a 10 mm socket wrench, remove the four bolts (6) holding the outlet manifold (1) to the fluid covers (2). See Fig. 12.
4. Remove the seats (17) and balls (16) from the manifold.
5. Turn the pump over and remove the inlet manifold (3). Remove the 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).

⚠ Apply medium-strength (blue) thread sealant to the threads, and torque to 120–150 in-lb (14–17 N•m). See **Torque Sequence**, page 29.

➡ Arrow (A) must point toward outlet manifold (1).

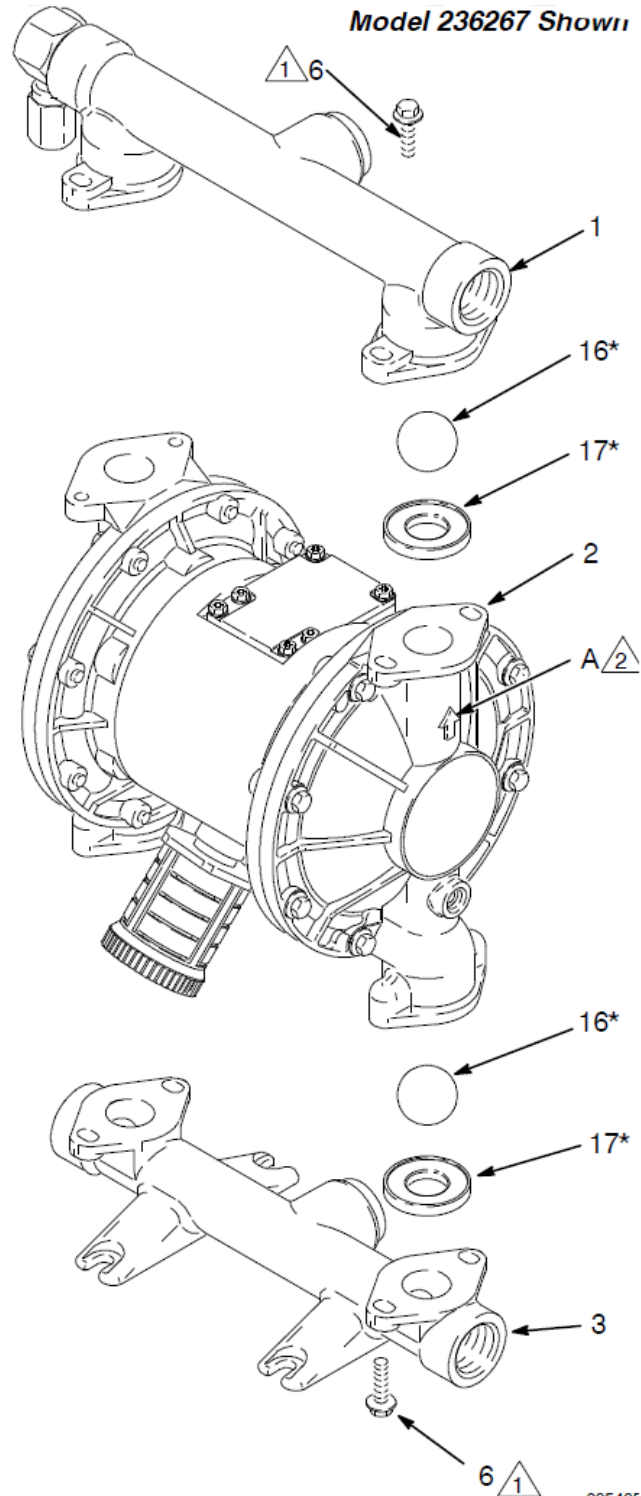


Fig. 12

Service

Diaphragm Repair

Tools Required

- Torque wrench
- 10 mm socket wrench
- 15 mm socket wrench
- O-ring pick
- Lithium-base grease

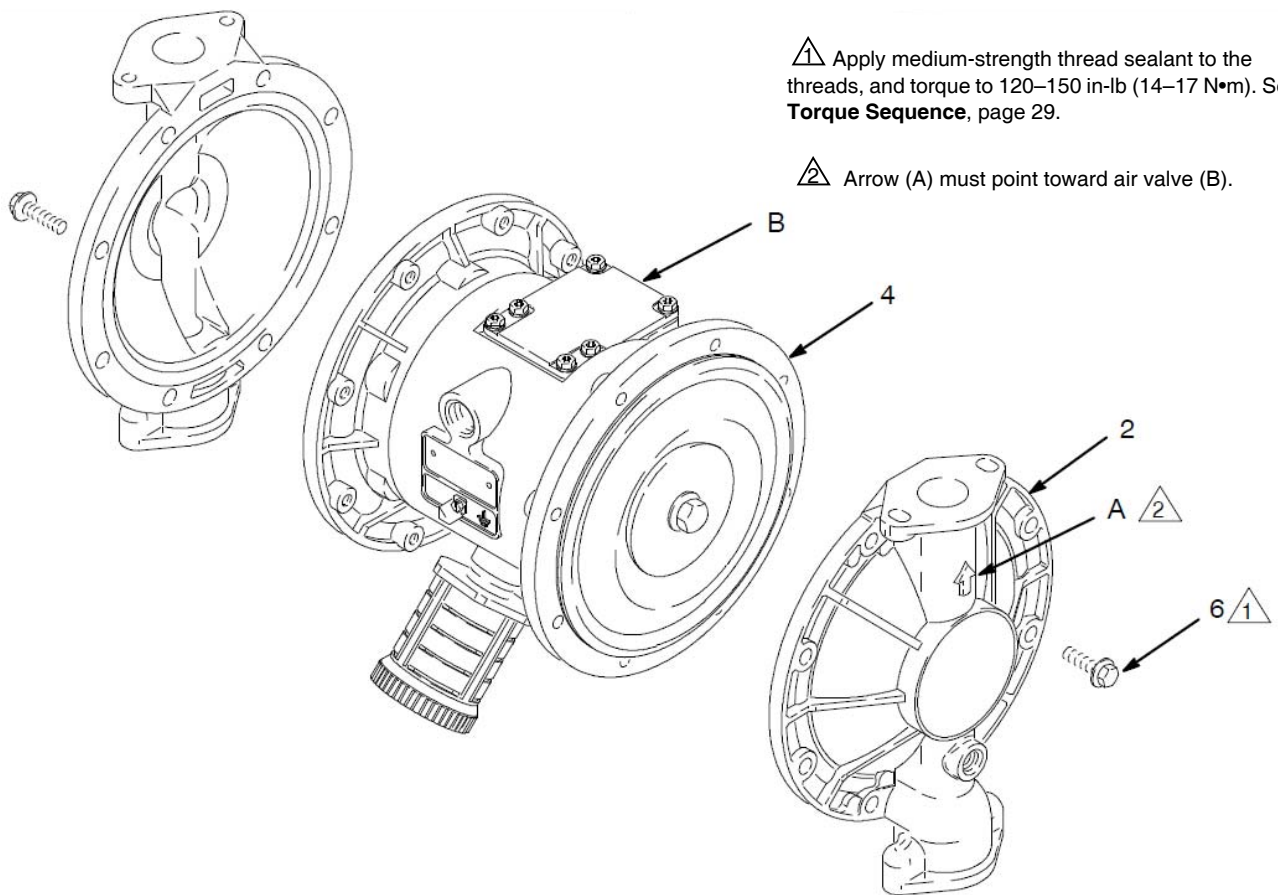
Disassembly

⚠ WARNING

To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

NOTE: A Fluid Section Repair Kit is available. Refer to page 28 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. **Relieve the pressure.**
2. Remove the manifolds and disassemble the ball check valves as explained on page 18.
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.



02635B

Fig. 13

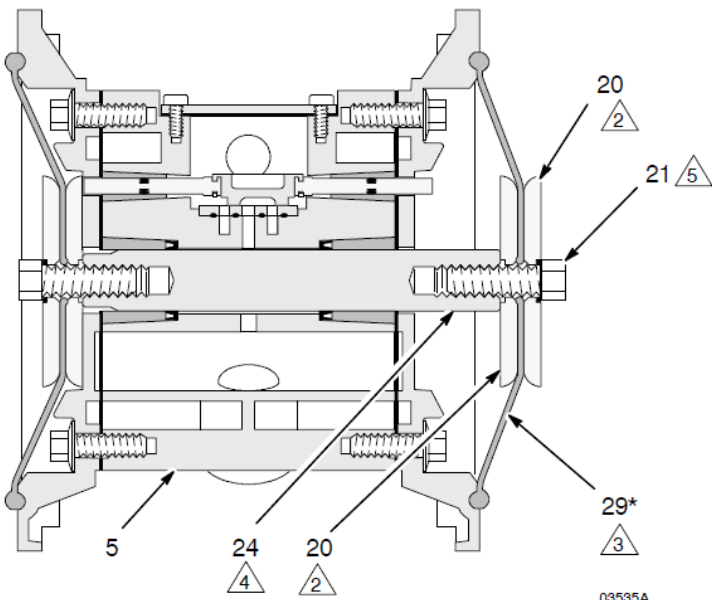
Service

- Loosen but do not remove the diaphragm shaft bolts (21), using a 15 mm socket wrench on both bolts.
- Unscrew one bolt from the diaphragm shaft (24) and remove the o-ring (25), fluid side diaphragm plate (20), diaphragm (29), and air side diaphragm plate (20). See Fig. 14.
- Pull the other diaphragm assembly and the diaphragm shaft (24) out of the center housing (5). Remove the bolt (21) from the shaft and disassemble the remaining diaphragm assembly.
- 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 22.
- 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.
- Clean all parts and inspect for wear or damage. Replace parts as needed.
- 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). Apply medium-strength (blue) thread sealant to the threads of the screws (6), and secure the covers with the screws (6) hand tight. See Fig. 13. Using a 10 mm socket wrench, torque the screws oppositely and evenly to 120 to 150 in-lb (14 to 17 N•m). See **Torque Sequence**, page 29.
- Reassemble the ball check valves and manifolds as explained on page 18.

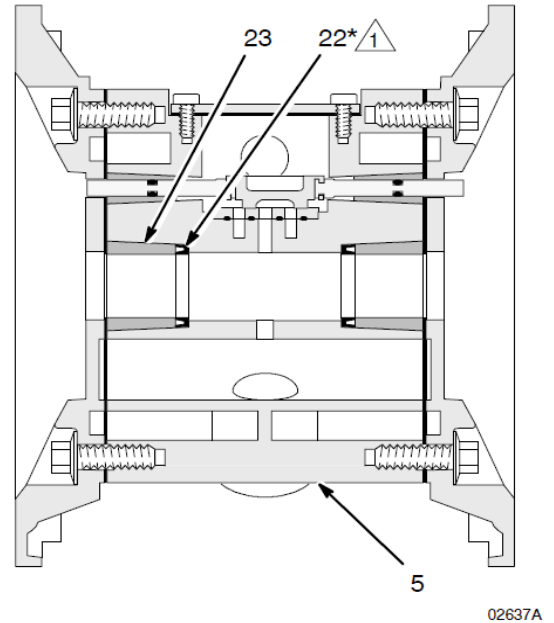
Reassembly

- Install the shaft u-cup packings (22*) so the lips face **out** of the housing (5). Lubricate the packings. See Fig. 14.
- Install the diaphragm assembly on one end of the shaft (24) as follows.
 - Install the o-ring (25*) on the shaft bolt (21).
 - Install the fluid side diaphragm plate (20) on the bolt so the rounded side faces the diaphragm (29).
 - Install the diaphragm (29*) on the bolt. Make certain the side marked AIR SIDE faces the center housing (5).
 - Install the air side diaphragm plate (20) so the rounded side faces the diaphragm (29).
 - Apply medium-strength (blue) thread sealant to the bolt (21) threads. Screw the bolt (21) into the shaft (24) hand tight.
- Grease the length and ends of the diaphragm shaft (24), and slide it through the housing (5).
- Assemble the other diaphragm assembly to the shaft as explained in step 2.
- Hold one shaft bolt (21) with a wrench and torque the other bolt to 20–25 ft-lb (27–34 N•m) at 100 rpm maximum.

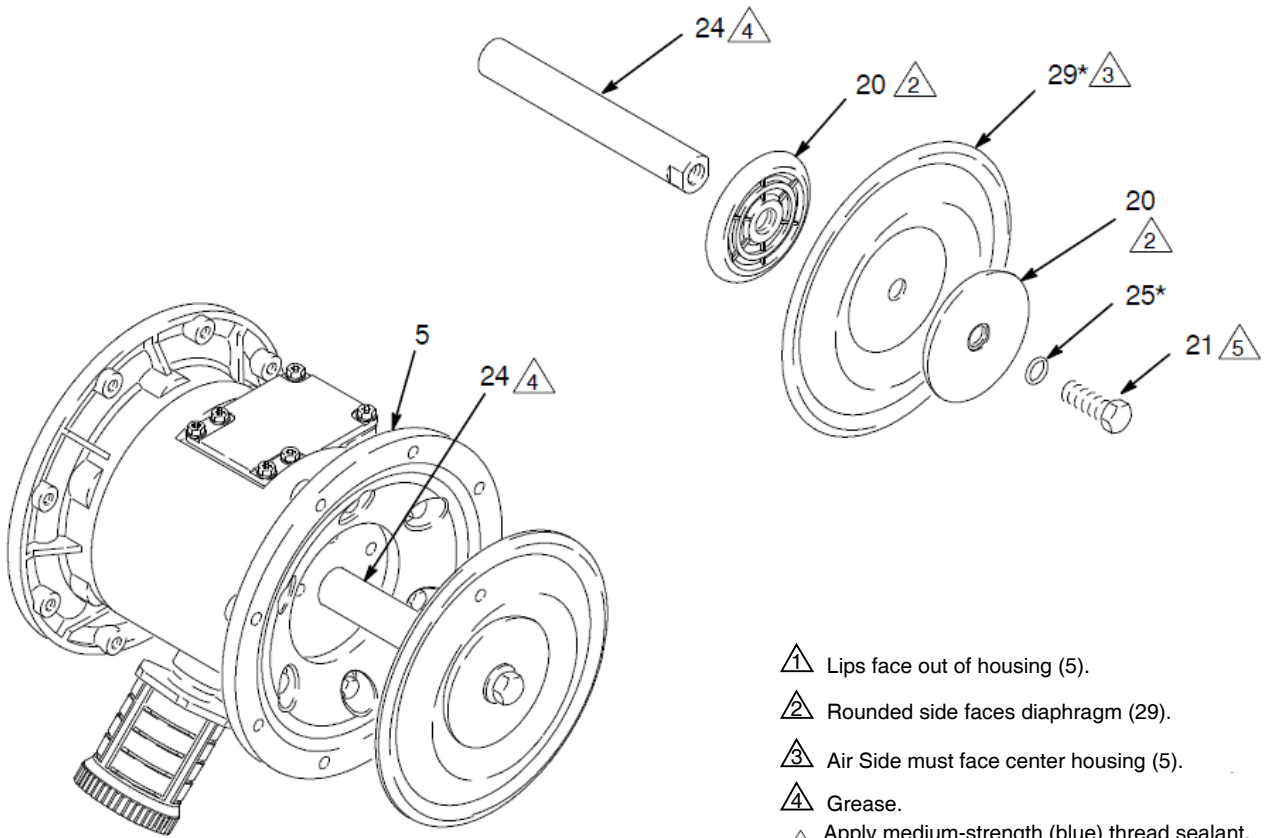
Service



Cutaway View, with Diaphragms in Place



Cutaway View, with Diaphragms Removed



- ⚠ Lips face out of housing (5).
- ⚠ Rounded side faces diaphragm (29).
- ⚠ Air Side must face center housing (5).
- ⚠ Grease.
- ⚠ Apply medium-strength (blue) thread sealant. Torque to 20–25 ft-lb (27–34 N•m) at 100 rpm maximum.

03533B

Fig. 14

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.



To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the **Pressure Relief Procedure** on page 12.

1. **Relieve the pressure.**
2. Remove the manifolds and disassemble the ball check valves as explained on page 18.
3. Remove the fluid covers and diaphragm assemblies as explained on page 19.

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

4. Disassemble the air valve as explained on page 16.
5. Using a 10 mm socket wrench, remove the screws (6) holding the air covers (4) to the center housing (5). See Fig. 15.

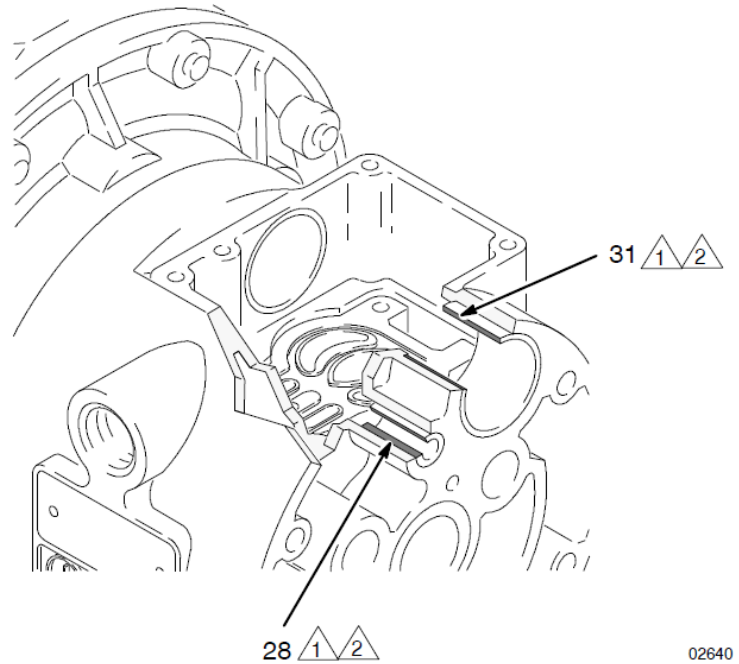
6. Remove the air cover gaskets (32). Always replace the gaskets with new ones.
7. Use a bearing puller to remove the diaphragm shaft bearings (23), air valve bearings (31) or pilot pin bearings (28). Do not remove undamaged bearings.
8. If you removed the diaphragm shaft bearings (23) reach into the 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 17.
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 (25), handtight. Apply medium-strength thread sealant to the threads of the screws (6). See Fig. 15. Using a 10 mm socket wrench, torque the screws oppositely and evenly to 120–150 in-lb (14–17 N•m).
6. Install the diaphragm assemblies and fluid covers as explained on page 19.
7. Reassemble the ball check valves and manifolds as explained on page 18.

Service

- 1 Insert bearings tapered end first.
- 2 Press-fit bearings flush with surface of center housing.
- 3 Apply medium-strength (blue) thread sealant. Torque to 120–150 in-lb (14–17 N•m).



02640
Detail of Air Valve Bearings

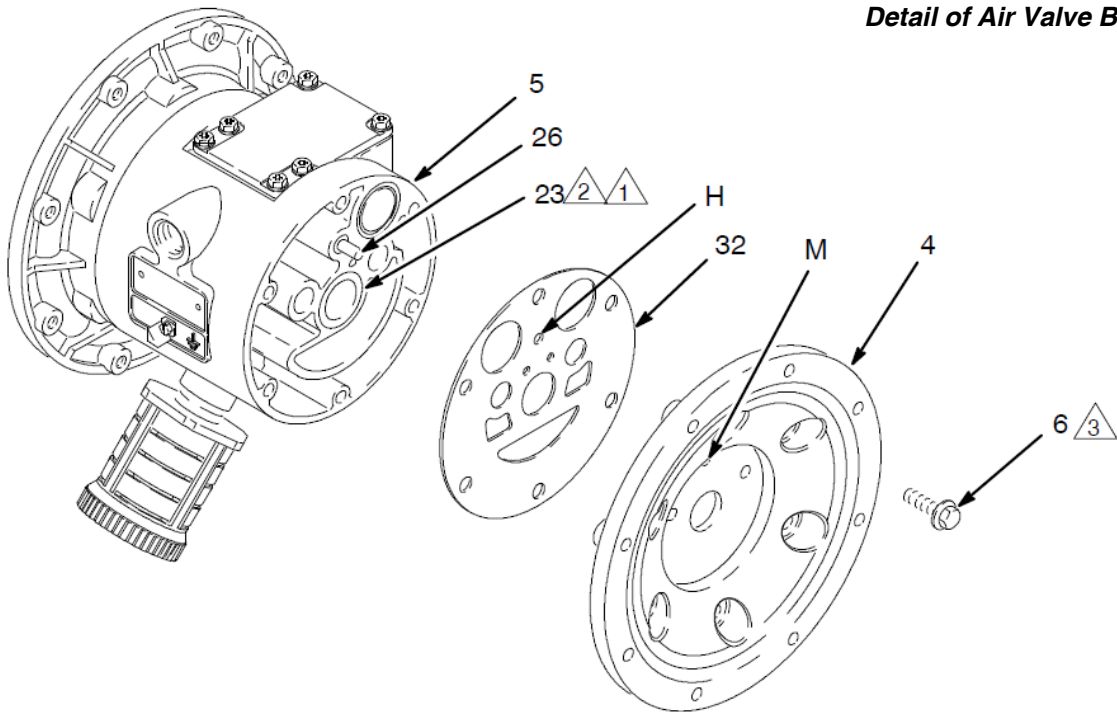


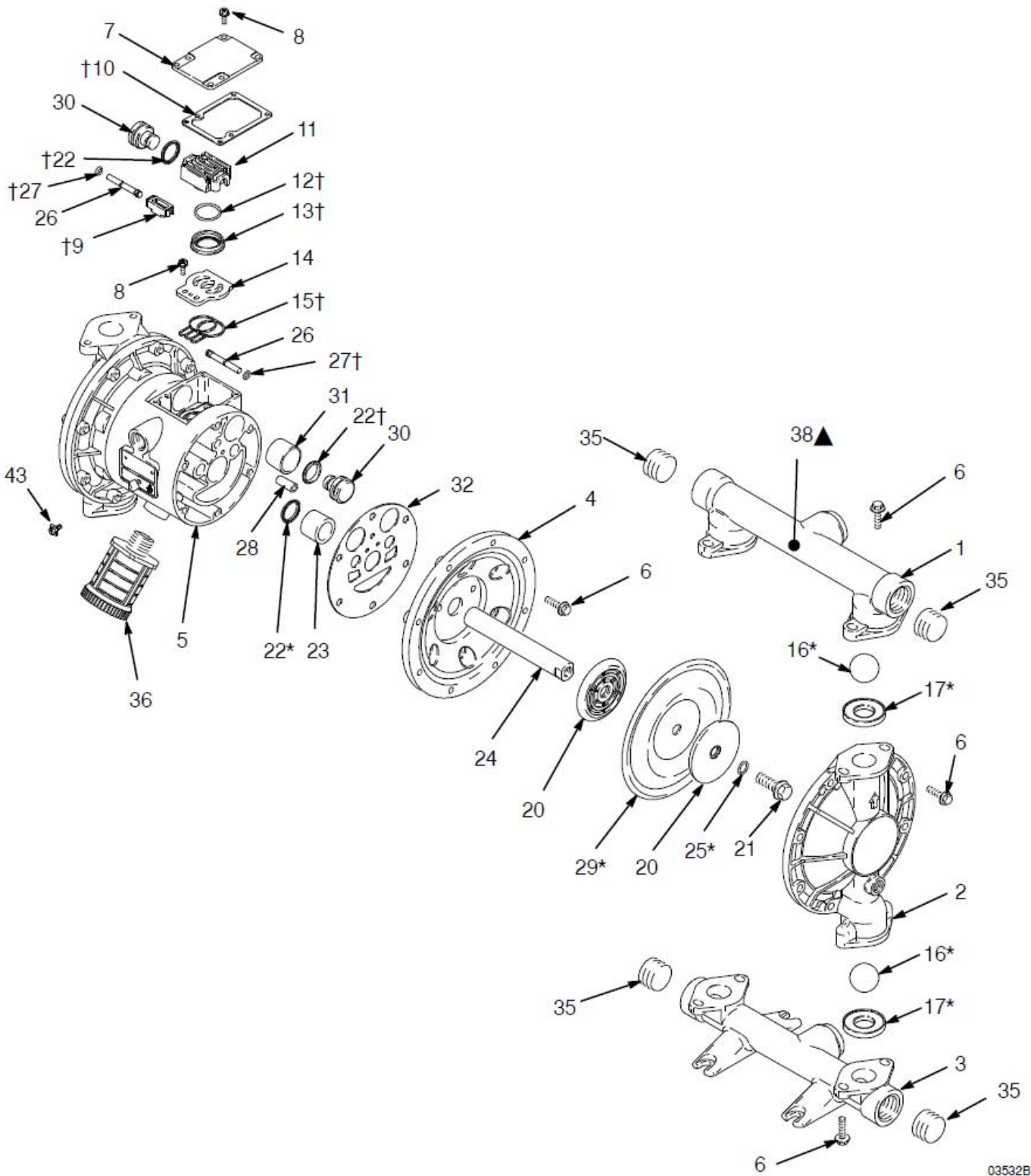
Fig. 15

Parts Drawing

EVACUATION AND TRANSFER PUMPS

Part No. 236265

with TPE Diaphragms and Seats, Acetal Balls



03532B

Parts List

EVACUATION AND TRANSFER PUMPS

Part No. 236265

with TPE Diaphragms and Seats, Acetal Balls

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
1	188842	MAINFOLD, outlet; aluminum	1	23	188609	BEARING, shaft; acetal	2
2	188840	COVER, fluid; aluminum	2	24	188608	SHAFT, diaphragm; stainless steel	1
3	188841	MANIFOLD, inlet; aluminum	1	25*	104319	O-RING; PTFE	2
4	188839	COVER, air; aluminum	2	26	188610	PIN, push; stainless steel	2
5	188838	HOUSING, center; aluminum	1	27†	157628	O-RING; buna-N	2
6	115643	SCREW, machine, hex washer hd; M8 x 1.25; 25 mm (1 in.) long	36	28	188611	BEARING, pin; acetal	2
7	188838	COVER, air valve; aluminum	1	29*	188606	DIAPHRAGM, TPE	2
8	116344	SCREW, machine, hex flange hd; M5 x 0.8 thread forming; 12 mm (0.47 in.) long	9	30	188612	PISTON, actuator; acetal	2
9†	188614	BLOCK, pilot; acetal	1	31	188613	BEARING, piston; acetal	2
10†	188618	GASKET, cover; molded Santoprene	1	32	188603	GASKET, air cover; HDPE foam	2
11	188855	CARRIAGE, air valve; aluminum	1	35	121497	PLUG, pipe; 1" npt; carbon steel	4
12†	108730	O-RING; nitrile	1	36	112182	MUFFLER	1
13†	188616	BLOCK, air valve; acetal	1	38▲	188970	LABEL, warning	2
14	188615	PLATE, air valve; stainless steel	1	43	116343	SCREW, grounding	1
15†	188617	SEAL, valve plate; buna-N	1				
16*	112254	BALL, Acetal	4				
17*	188711	SEAT, ball, TPE	4				
20	188607	PLATE, diaphragm; aluminum	4				
21	189044	BOLT, hex hd; M12 x 1.75; 35 mm (1.38 in.) long	2				
22*†	112181	PACKING, u-cup; nitrile	4				

* These parts are included in the Pump Repair Kit, which may be purchased separately. Refer to page 28 to determine the correct kit for your pump.

† These parts are included in Air Valve Repair Kit 236273, which may be purchased separately.

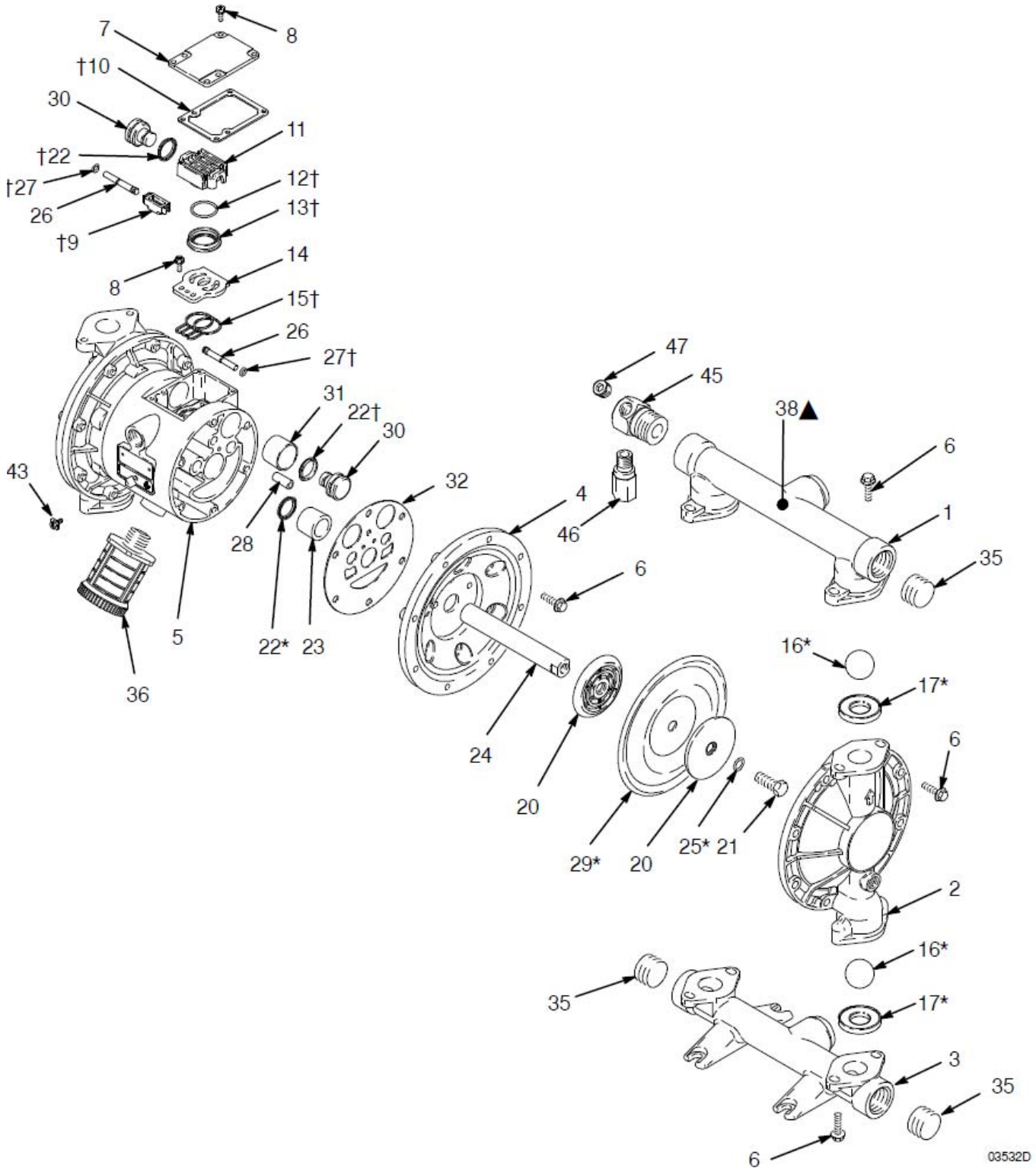
▲ Replacement Danger and Warning labels, tags and cards are available at no cost.

Parts Drawing

FUEL DISPENSE PUMPS

Part No. 236267

with TPE Diaphragms and Seats, Acetal Balls



03532D

Parts List

FUEL DISPENSE PUMPS

Part No. 236267

with TPE Diaphragms and Seats, Acetal Balls

Ref No.	Part No.	Description	Qty	Ref No.	Part No.	Description	Qty
				24	188608	SHAFT, diaphragm; stainless steel	1
				25*	104319	O-RING; PTFE	2
1	188842	MAINFOLD, outlet; aluminum	1	26	188610	PIN, push; stainless steel	2
2	188840	COVER, fluid; aluminum	2	27†	157628	O-RING; buna-N	2
3	188841	MANIFOLD, inlet; aluminum	1	28	188611	BEARING, pin; acetal	2
4	188839	COVER, air; aluminum	2	29*	188606	DIAPHRAGM, TPE	2
5	188838	HOUSING, center; aluminum	1	30	188612	PISTON, actuator; acetal	2
6	115643	SCREW, machine, hex washer hd; M8 x 1.25; 25 mm (1 in.) long	36	31	188613	BEARING, piston; acetal	2
7	188854	COVER, air valve; aluminum	1	32	188603	GASKET, air cover; HDPE foam	2
8	116344	SCREW, machine, hex flange hd; M5 x 0.8 thread forming; 12 mm (0.47 in.) long	9	35	121497	PLUG, pipe; 1" npt; carbon steel	4
9†	188614	BLOCK, pilot; acetal	1	36	112182	MUFFLER	1
10†	188618	GASKET, cover; molded Santoprene	1	38▲	188970	LABEL, warning	2
11	188855	CARRIAGE, air valve; aluminum	1	43	116343	SCREW, grounding	1
12†	108730	O-RING; nitrile	1	45	166444	ELBOW, reducing, 90°; 1" npt(m) x two 3/8 npt(f); brass	1
13†	188616	BLOCK, air valve; acetal	1	46	112353	VALVE, relief; 3/8 npt (m x f); brass with fluoroelastomer seal	1
14	188615	PLATE, air valve; stainless steel	1	47	101754	PLUG, pipe; socket hd; 3/8 npt	1
15†	188617	SEAL, valve plate; buna-N	1				
16*	112254	BALL, Acetal	4				
17*	188711	SEAT, ball, TPE	4				
20	188607	PLATE, diaphragm; aluminum	4				
21	189044	BOLT, hex hd; M12 x 1.75; 35 mm (1.38 in.) long	2				
22*†	112181	PACKING, u-cup; nitrile	4				
23	188609	BEARING, shaft; acetal	2				

* These parts are included in the Pump Repair Kit, which may be purchased separately. Refer to page 28 to determine the correct kit for your pump.

† These parts are included in Air Valve Repair Kit 236273, which may be purchased separately.

▲ Replacement Danger and Warning labels, tags and cards are available at no cost.

Repair Kits

Use Only Genuine Graco Parts and Accessories

Fluid Section Repair Kit D07525

For Model 236265 and 236267 Husky 1040 pumps.
TPE diaphragms and seats, acetal balls. Includes:

Ref No.	Part No.	Description	Qty
16	112254	BALL; acetal	4
17	188711	SEAT, ball; TPE	4
22	112181	PACKING, u-cup; nitrile	2
25	104319	O-RING; PTFE	2
29	188606	DIAPHRAGM; TPE	2

Air Valve Repair Kit 236273

For all Husky 1040 pumps. Includes:

Ref No.	Part No.	Description	Qty
9	188614	BLOCK, pilot; acetal	1
10	188618	GASKET, cover; molded Santoprene	1
12	108730	O-RING; nitrile	1
13	188616	BLOCK, air valve; acetal	1
15	188617	SEAL, valve plate; buna-N	1
22	112181	PACKING, u-cup; nitrile	2
27	157628	O-RING; buna-N	2

Pressure Relief Kit 238428

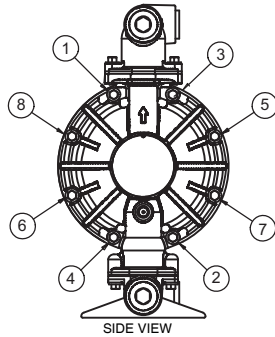
For aluminum Husky 1040 pumps.

150 to 180 psi (1.03 to 1.4 MPa, 10.3 to 14 bar)

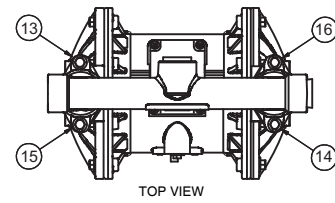
Torque Sequence

When instructed to torque fasteners, always follow torque sequence.

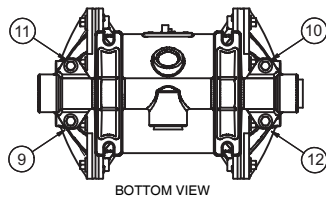
1. Left/Right Fluid Cover
Torque Bolts to 120–150 in-lb (14–17 N•m)



3. Outlet Manifold
Torque Bolts to 120–150 in-lb (14–17 N•m)

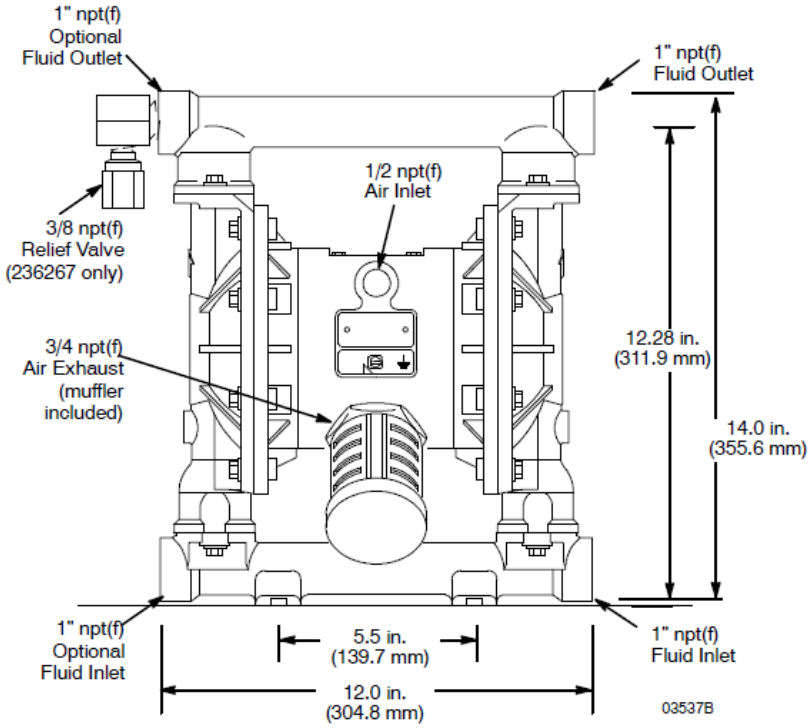


2. Inlet Manifold
Torque Bolts to 120–150 in-lb (14–17 N•m)

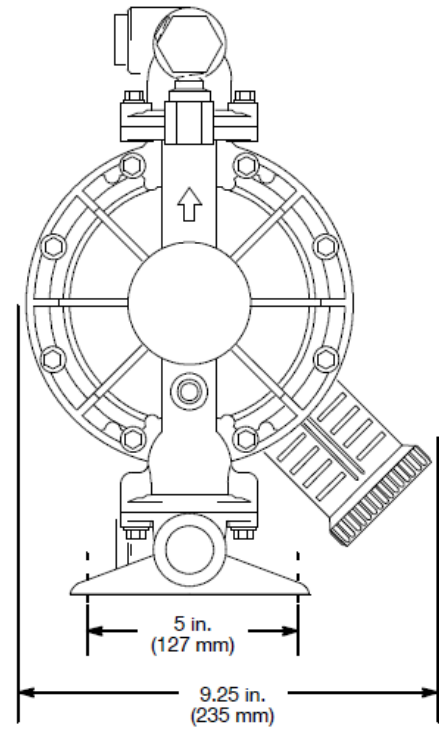


Dimensions

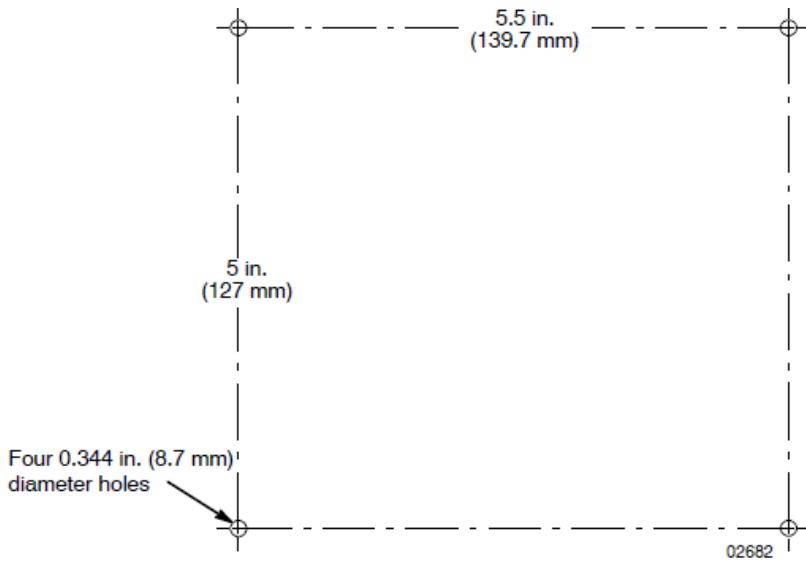
FRONT VIEW
Model 236267 Shown



SIDE VIEW
Model 236267 Shown



PUMP MOUNTING HOLE PATTERN



Technical Data

Evacuation and Transfer Pumps (Model 236265)

Maximum fluid working pressure 120 psi
 (0.84 MPa, 8.4 bar)
 Air pressure operating range 20 to 120 psi
 (0.14 to 0.84 MPa, 1.4 to 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 operating temperature. 150°F (65.5°C)
 * 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
 Air inlet size 1/2 npt(f)

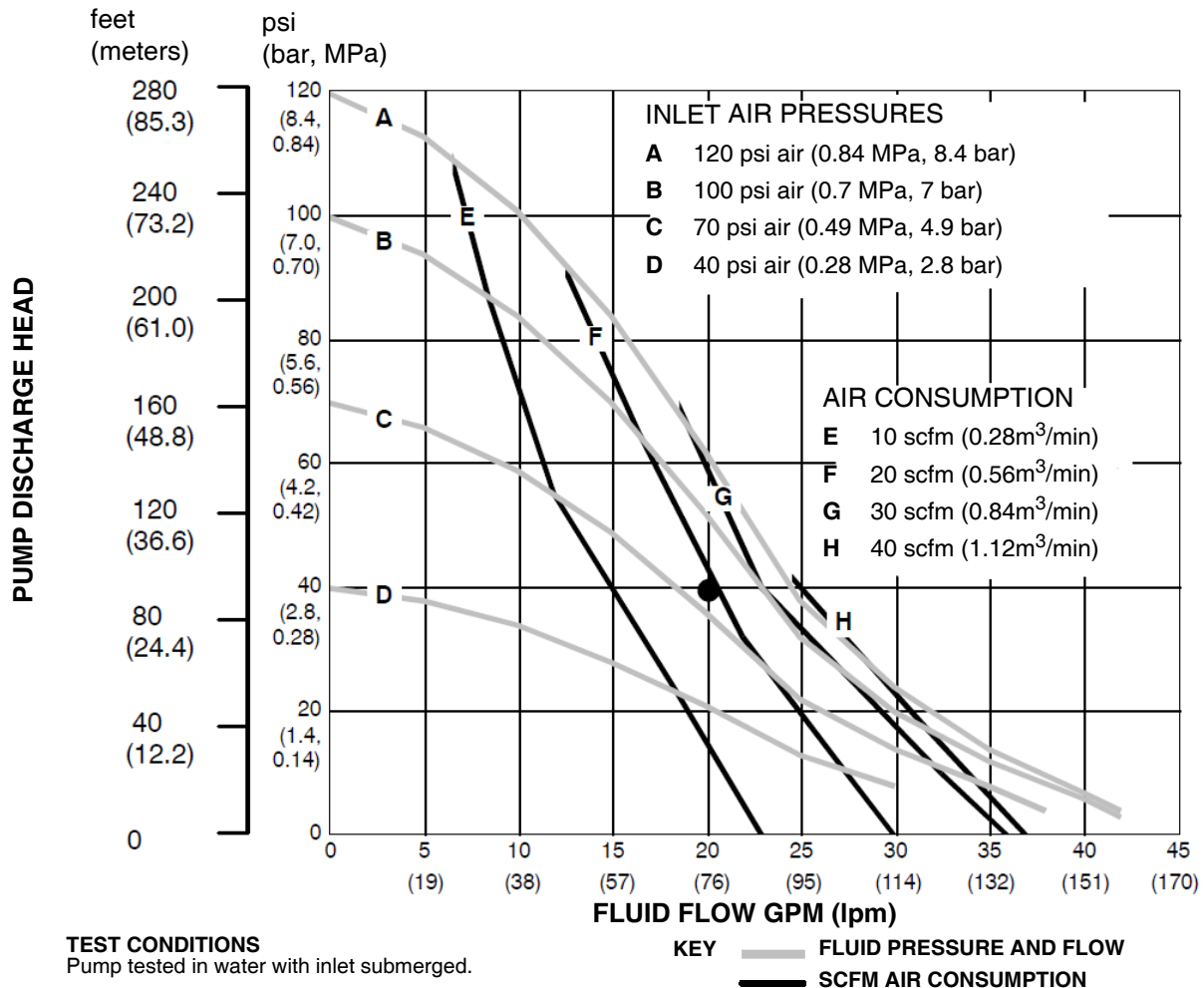
Fluid inlet size. 1" npt(f)
 Fluid outlet size. 1" npt(f)
 Wetted parts Model 236265: aluminum, TPE,
 acetal, PTFE
 Non-wetted external parts aluminum, 302 stainless steel,
 polyester (labels)
 Weight 18 lb (8.2 kg)

Geolast® and Santoprene® are registered trademarks of the Monsanto Co.

* Noise levels measured with the pump mounted on the floor, using Rubber Foot Kit 236452. Sound power measured per ISO Standard 9216.

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 (0.28 MPa, 2.8 bar) discharge head pressure (vertical scale) requires approximately 20 scfm (0.56 m³/min) air consumption at 70 psi (0.49 MPa, 4.9 bar) inlet air pressure.



Technical Data

Fuel Dispense Pumps (Model 236267)

Maximum fluid working pressure . . . 50 psi (350 kPa, 3.5 bar)
 Air pressure operating range . . . 20 to 50 psi (140 to 350 kPa, 1.4 to 3.5 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 operating temperature 150°F (65.5°C)
 * Noise level at 50 psi, 50 cycles/min: 78 dBa
 Air inlet size 1/2 npt(f)
 Fluid inlet size 1" npt(f)
 Fluid outlet size 1" npt(f)

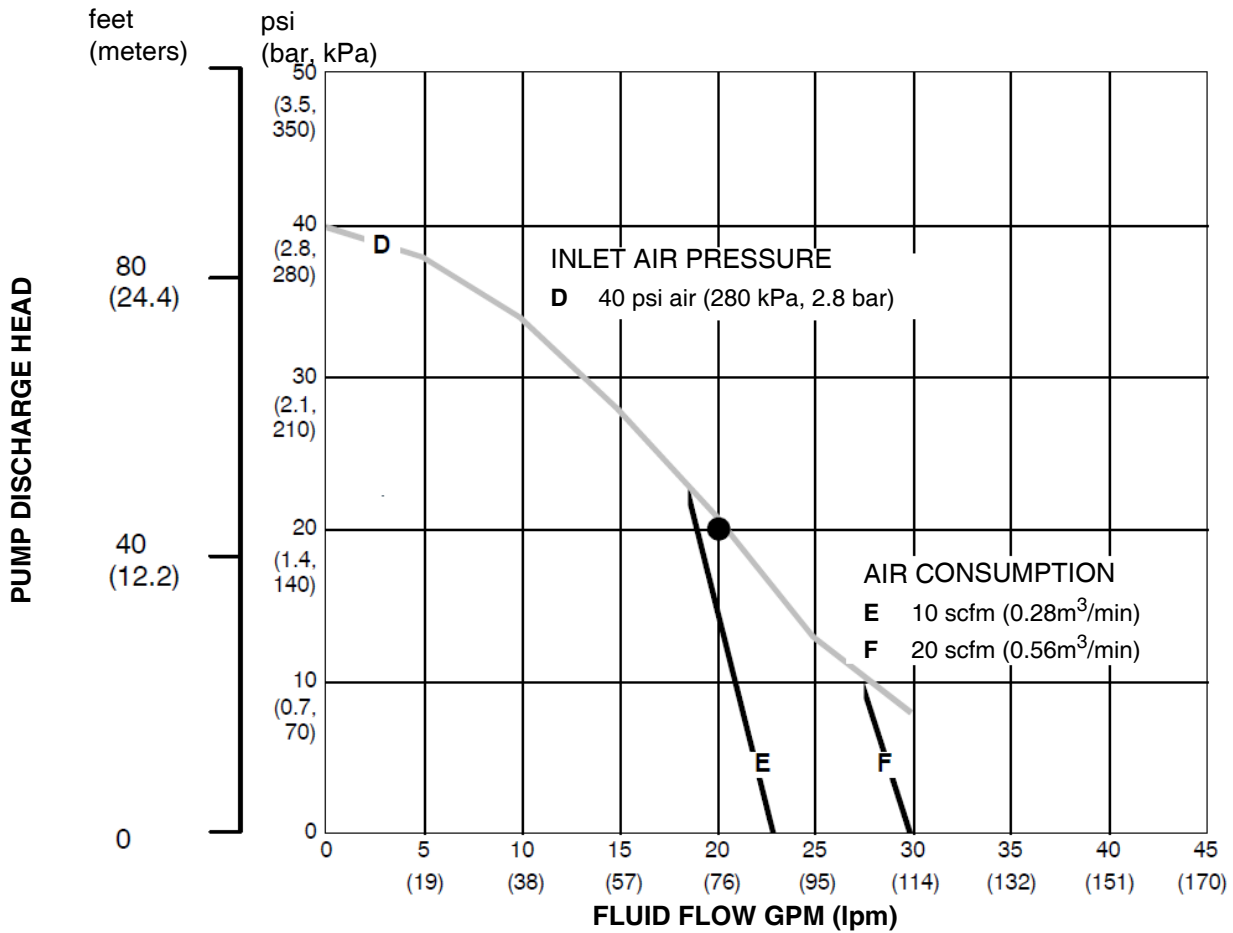
Wetted parts Model 236267: aluminum, TPE, fluoroelastomer, acetal, PTFE
 Non-wetted external parts aluminum, 302 stainless steel, polyester (labels)
 Weight 18 lb (8.2 kg)

Geolast® and Santoprene® are registered trademarks of the Monsanto Co.

* Noise levels measured with the pump mounted on the floor, using Rubber Foot Kit 236452. Sound power measured per ISO Standard 9216.

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 20 psi (140 kPa, 1.4 bar) discharge head pressure (vertical scale) requires approximately 11 scfm (0.31 m³/min) air consumption at 40 psi (280 kPa, 2.8 bar) inlet air pressure.



TEST CONDITIONS
 Pump tested in water with PTFE diaphragm and inlet submerged.

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

Notes

Graco Standard Husky Pump Warranty

Graco warrants all equipment referenced in this document which is 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.

FOR GRACO CANADA CUSTOMERS

The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

Graco Information

For the latest information about Graco products, visit www.graco.com.

For patent information, see www.graco.com/patents.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the distributor closest to you:

Phone: +1 612-623-6921 or **Toll Free:** 1-800-328-0211 **Fax:** +1 612-378-3505

All written and visual data contained in this document reflects the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice.

Original instructions. This manual contains English. MM 308326

Graco Headquarters: Minneapolis

International Offices: Belgium, China, Japan, Korea

GRACO INC. AND SUBSIDIARIES • P.O. BOX 1441 • MINNEAPOLIS MN 55440-1441 • USA

Copyright 1994, Graco Inc. All Graco manufacturing locations are registered to ISO 9001.

www.graco.com

Revision ZAB, July 2019