Operation

Husky® 1050 Air-Operated Diaphragm Pump

312877F

ENG

1-inch pump with modular air valve for fluid transfer applications.
For professional use only.

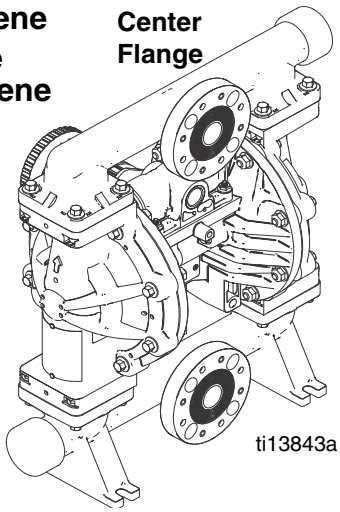
See page 3 for model information, including approvals.

125 psi (0.86 MPa, 8.6 bar) Maximum Fluid Working Pressure
125 psi (0.86 MPa, 8.6 bar) Maximum Air Input Pressure

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

1050P Polypropylene
1050C Conductive Polypropylene
1050F PVDF

Center Flange



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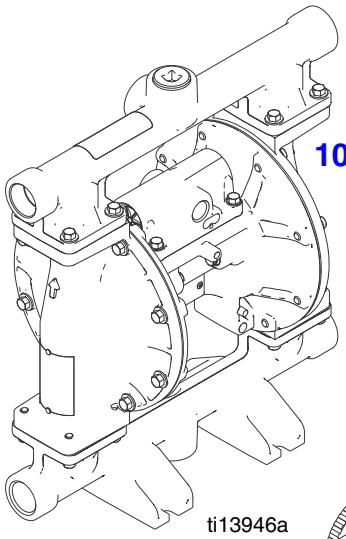

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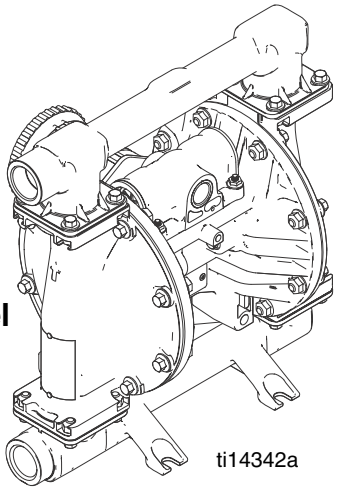
1050A Aluminum



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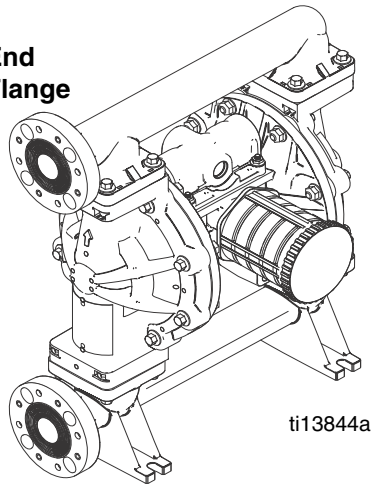
1050S Stainless Steel
1050H Hastelloy

End Flange



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Related Manuals

Manual	Description
313435	Husky 1050 Air-Operated Diaphragm Pump, Repair/Parts
313597	Husky 1050A UL-Listed Diaphragm Pump, Operation
313598	Husky 1050A CSA-Certified Diaphragm Pump, Operation
313840	DataTrak, Instructions/Parts
406824	Pulse Count Kits, Instructions

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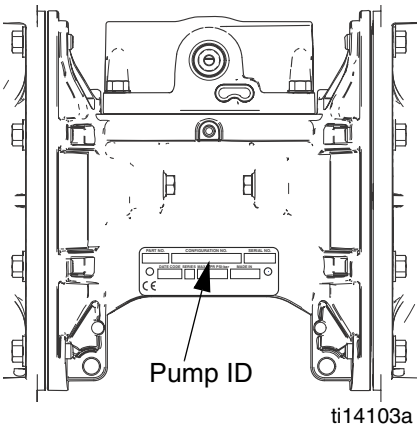
Pump Matrix

Check the identification plate (ID) for the 20-digit part number of your pump. Use the following matrix to define the components of your pump. For example, pump number **1050A-A01AA1SSBNBNPT** represents a Husky 1 inch, 50 gpm aluminum pump (**1050A**), with aluminum center section (**A01**), a standard air valve (**A**), aluminum fluid covers (**A**) and manifolds with standard ports in inches (**1**). The pump has stainless steel seats (**SS**), buna-N check balls (**BN**), buna-N diaphragms (**BN**), and PTFE manifold o-rings (**PT**).

NOTE: Available options for seats, check balls, diaphragms, and seals vary based on pump model (1050A-1050S). To build a pump, use the selector tool at www.graco.com or talk to your distributor.



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Pump (1 inch ports, 50 gpm)	Center Section and Air Valve Material		Air Valve/Monitoring
1050A★ Aluminum	Aluminum	**A01A**	Standard
		A01B	Pulse Count✖
		A01C	DataTrak✖
		A01D	Remote
1050C★ Conductive Polypropylene	Conductive Polypropylene	**C01A**	Standard
		C01B	Pulse Count✖
		C01C	DataTrak✖
		C01D	Remote
1050F PVDF	Polypropylene	**P01A**	Standard
		P01B	Pulse Count✖
		P01C	DataTrak✖
		P01D	Remote
1050H‡ Hastelloy			
1050P Polypropylene			
1050S‡ Stainless Steel			
★, ‡, or ✖: See **ATEX Certifications** below.			

Fluid Covers and Manifolds	
A1	Aluminum, standard ports, inch
A2	Aluminum, standard ports, metric
C1	Conductive polypropylene, center flange
C2	Conductive polypropylene, end flange
F1	PVDF, center flange
F2	PVDF, end flange
H1	Hastelloy, standard ports, inch
H2	Hastelloy, standard ports, metric
P1	Polypropylene, center flange
P2	Polypropylene, end flange
S1	Stainless steel, standard ports, inch
S2	Stainless steel, standard ports, metric

Check Valve Seats	
AC	Acetal
AL	Aluminum
BN	Buna-N
FK	FKM Fluoroelastomer
GE	Geolast®
PP	Polypropylene
PV	PVDF
SP	Santoprene®
SS	316 Stainless Steel
TP	TPE

Check Valve Balls	
AC	Acetal
BN	Buna-N
CR	Polychloroprene Standard
CW	Polychloroprene Weighted
FK	FKM Fluoroelastomer
GE	Geolast
PT	PTFE
SP	Santoprene
SS	316 Stainless Steel
TP	TPE

Diaphragm	
BN	Buna-N
CO	Polychloroprene Overmolded
FK	FKM Fluoroelastomer
GE	Geolast
PO	PTFE/EPDM Overmolded
PT	PTFE/EPDM Two-Piece
SP	Santoprene
TP	TPE

Manifold O-Rings	
—	None
PT	PTFE

ATEX Certifications

★ *All 1050A (Aluminum) and 1050C (Conductive Polypropylene) pumps are certified:*

II 2 GD c IIC T4

‡ *1050S (Stainless Steel) and 1050H (Hastelloy) pumps with aluminum or conductive polypropylene centers are certified:*

II 2 GD c IIC T4

✖ *DataTrak and Pulse Count are certified:*

II 1 G

EEx ia IIA T3
Nemko
06ATEX1124

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Warnings

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

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail.
- If there is static sparking or you feel a shock, **stop operation immediately.** Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable materials and gases. To help prevent fire and explosion:

- Clean plastic parts in a well ventilated area.
- Do not clean with a dry cloth.

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WARNING

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure. Turn off all equipment and follow the **Pressure Relief Procedure** in this manual when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

PRESSURIZED EQUIPMENT HAZARD

Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.

- Follow **Pressure Relief Procedure** in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.

PRESSURIZED ALUMINUM PARTS HAZARD

Use of fluids that are incompatible with aluminum in pressurized equipment can cause serious chemical reaction and equipment rupture. Failure to follow this warning can result in death, serious injury, or property damage.

- Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents.
- Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.

PLASTIC PARTS CLEANING SOLVENT HAZARD

Use only compatible water-based solvents to clean plastic structural or pressure-containing parts. Many solvents can degrade plastic parts and cause them to fail, which could cause serious injury or property damage. See **Technical Data** in this and all other equipment instruction manuals. Read fluid and solvent manufacturer's warnings.

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⚠ WARNING

TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDS's to know the specific hazards of the fluids you are using.
- Route exhaust away from work area. If diaphragm ruptures, fluid may be exhausted with air.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear impervious gloves when spraying or cleaning equipment.

BURN HAZARD

Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns:

- Do not touch hot fluid or equipment.
- Wait until equipment/fluid has cooled completely.

PERSONAL PROTECTIVE EQUIPMENT

You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:

- Clothing and respirator as recommended by the fluid and solvent manufacturer
- Protective eyewear, gloves, and hearing protection

Installation

The Typical Installations shown in FIG. 3 and FIG. 4 are only guides for selecting and installing system components. Contact your Graco distributor for assistance in planning a system to suit your needs.

Tighten Fasteners Before Setup

Before using the pump for the first time, check and retorque all external fasteners. Follow **Torque Instructions**, page 16.

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Mounting

- The pump exhaust air may contain contaminants. Ventilate to a remote area. See **Air Exhaust Ventilation** on page **8.**
- Never move or lift a pump under pressure. If dropped, the fluid section may rupture. Always follow the **Pressure Relief Procedure** on page **14** before moving or lifting the pump.

1. For wall mounting, order Graco Kit 24C637.
2. Be sure the mounting surface can support the weight of the pump, hoses, and accessories, as well as the stress caused during operation.
3. For all mountings, be sure the pump is bolted directly to the mounting surface.
4. For ease of operation and service, mount the pump so air valve, air inlet, fluid inlet and fluid outlet ports are easily accessible.
5. Rubber Foot Mounting Kit 236452 is available to reduce noise and vibration during operation.

Grounding

The equipment must be grounded. Grounding reduces the risk of static and electric shock by providing an escape wire for the electrical current due to static build up or in the event of a short circuit.

Pump: See FIG. 1. Loosen the grounding screw (GS). Insert one end of a 12 ga. minimum ground wire (R) behind the grounding screw and tighten the screw securely. Connect the clamp end of the ground wire to a true earth ground. A ground wire and clamp, Part 238909, is available from Graco.

Polypropylene and PVDF: Only aluminum, conductive polypropylene, hastelloy, and stainless steel pumps have a ground screw. Standard polypropylene and PVDF pumps are **not** conductive. **Never** use a non-conductive polypropylene or PVDF pump with non-conductive flammable fluids. Follow your local fire codes. When pumping conductive flammable fluids, **always** ground the entire fluid system as described.

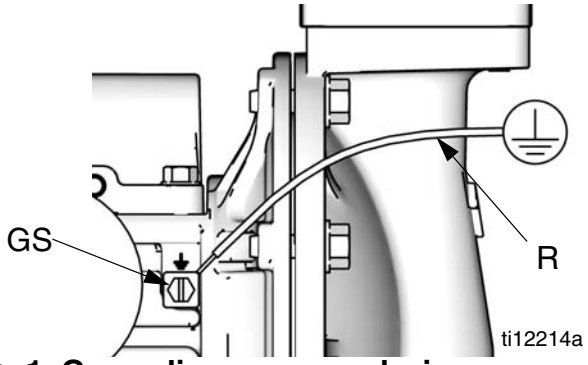

FIG. 1. Grounding screw and wire

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 manufacturer's recommendations.

Fluid supply container: Follow local code.

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

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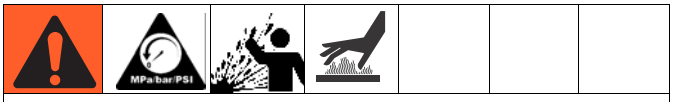
Check your system electrical continuity after the initial installation, and then set up a regular schedule for checking continuity to be sure proper grounding is maintained.

Air Line

See FIG. 3 and FIG. 4, pages 10 and 11.

1. Install an air regulator (C) and gauge to control the fluid pressure. The fluid stall pressure will be the same as the setting of the air regulator.

2. Locate a bleed-type master air valve (B) close to the pump and use it to relieve trapped air. Be sure the valve is easily accessible from the pump and located downstream from the regulator.



Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing.

3. Locate another master air valve (E) upstream from all air line accessories and use it to isolate them during cleaning and repair.

4. An air line filter (F) removes harmful dirt and moisture from the compressed air supply.

5. Install a grounded, flexible air hose (A) between the accessories and the 1/2 npt(f) pump air inlet (D). Use a minimum 3/8 in. (10 mm) ID air hose.

Remote option: Insert 5/32 OD tubing into the push-to-connect fitting at each pilot and route to your control.

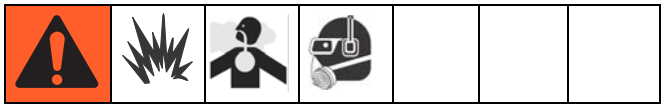
NOTICE

Pilot supply pressure should not exceed main air supply pressure. If pilot supply pressure is too high, the pump could leak air or exhaust excessive air at stall.

Reed Switch

Pulse Count models are intended for use with customer-supplied fluid management or inventory tracking systems. Attach an M12, 5-pin female cable to connect the reed switch to your data monitoring system. *See Manual 406824.*

Air Exhaust Ventilation



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 (T) from the pump air exhaust port.

2. Install a grounded air exhaust hose (U) and connect the muffler (T) 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 at the end of the air exhaust line to catch fluid in case a diaphragm ruptures. If the diaphragm ruptures, the fluid being pumped will exhaust with the air.

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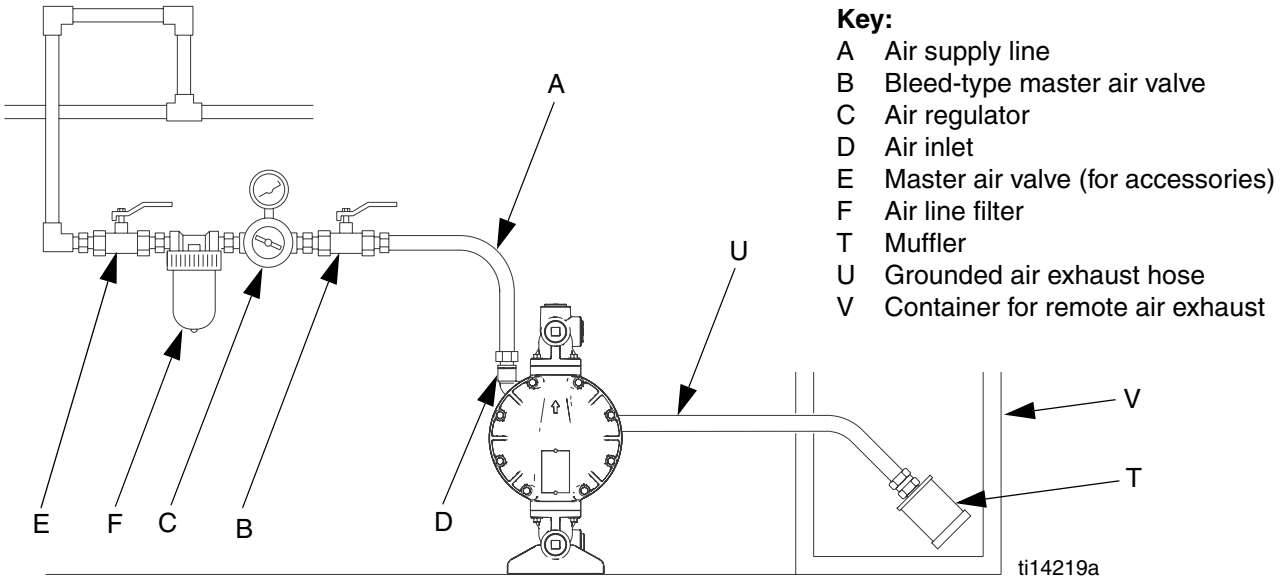

FIG. 2. Vent exhaust air

Fluid Supply Line

See FIG. 3 and FIG. 4, pages 10 and 11.

1. Use grounded fluid supply lines (G). See **Grounding**, page 7.
2. If the inlet fluid 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 (0.1 MPa, 1 bar), diaphragm life will be shortened.
4. For maximum suction lift (wet and dry), see **Technical Data**, page 22.

Fluid Outlet Line

See FIG. 3 and FIG. 4, pages 10 and 11.

1. Use grounded fluid hoses (L). See **Grounding**, page 7.
2. Install a fluid drain valve (J) near the fluid outlet.
3. Install a shutoff valve (K) in the fluid outlet line.

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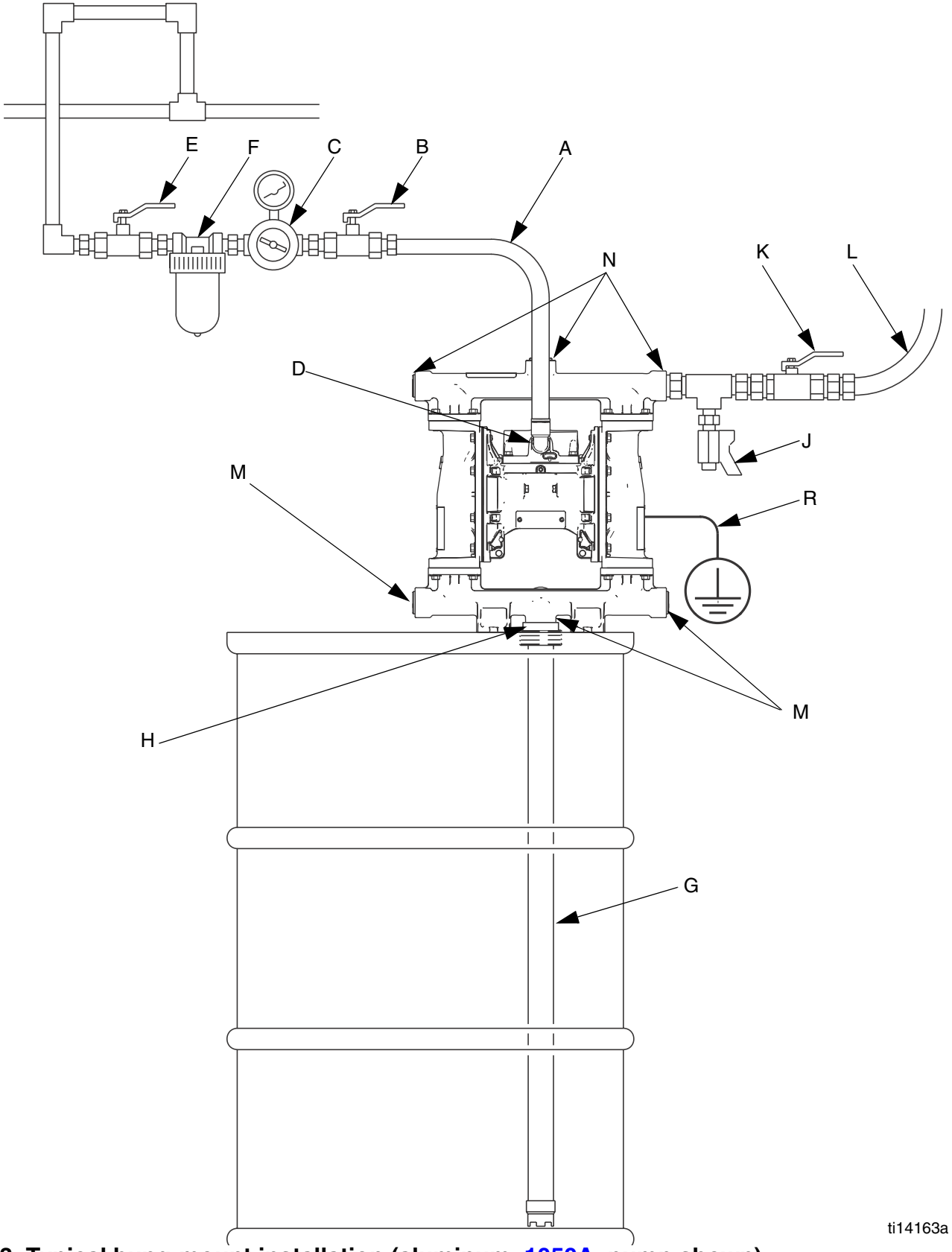

FIG. 3. Typical bung-mount installation (aluminum, 1050A, pump shown)

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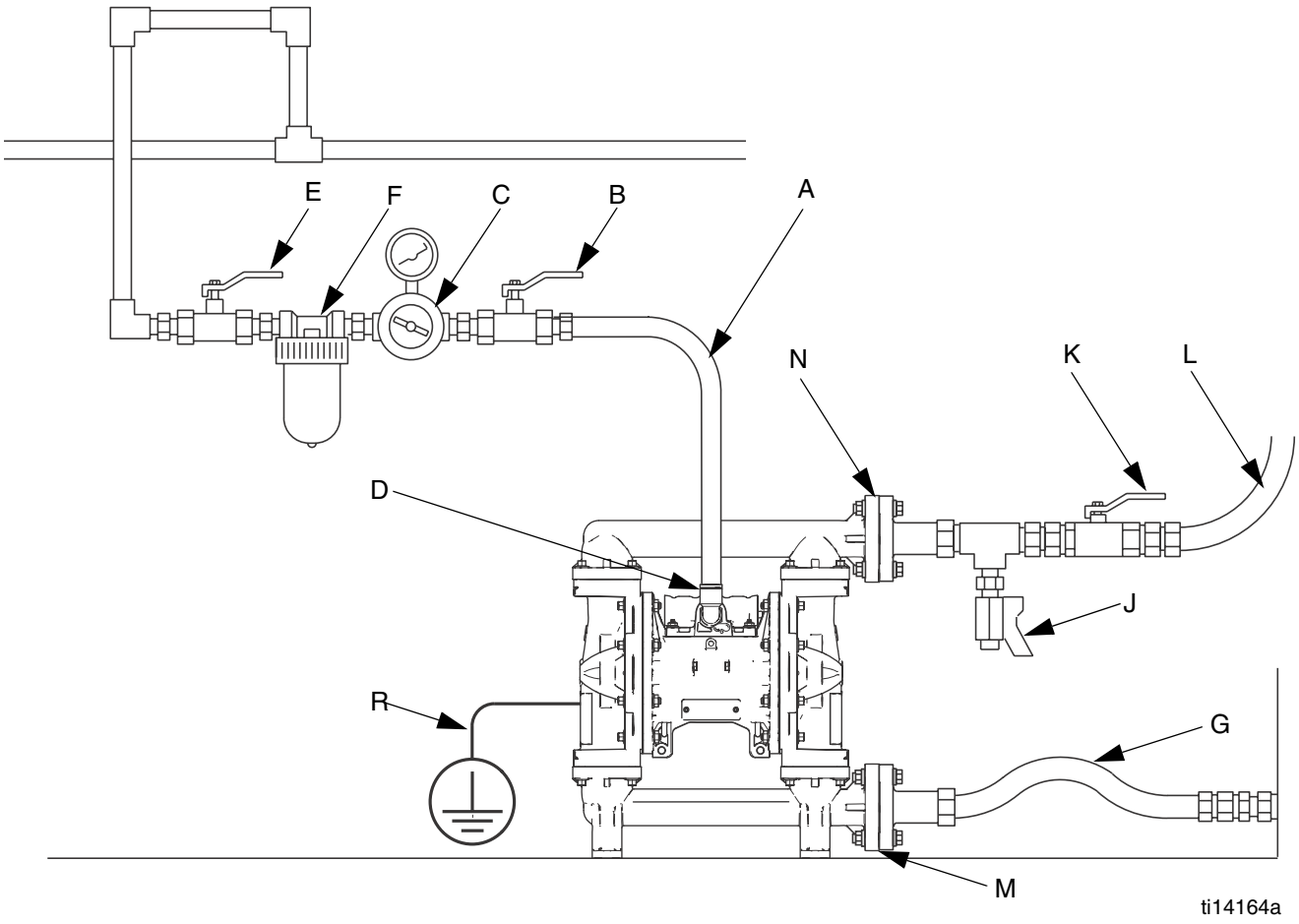

FIG. 4. Typical floor-mount installation (polypropylene, 1050P, pump shown)

Key for FIG. 3 and FIG. 4:

A Air supply line
B Bleed-type master air valve (required for pump)
C Air regulator
D Air inlet
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
M Fluid inlet (Aluminum, FIG. 3, four ports, one not visible; Plastic, FIG. 4, center or end flanges available; Hastelloy and stainless steel, not pictured, one port)
N Fluid outlet (Aluminum, FIG. 3, four ports, one not visible; Plastic, FIG. 4, center or end flanges available; Hastelloy and stainless steel, not pictured, one port)
R Ground wire (required for aluminum, conductive polypropylene, hastelloy, and stainless steel pumps; see page 7 for installation instructions)

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Fluid Inlet and Outlet Ports

NOTE: Remove and reverse the manifold(s) to change the orientation of inlet or outlet port(s). Follow **Torque Instructions** on page 16.

Aluminum (1050A)

The fluid inlet and outlet manifolds each have four 1 in. npt(f) or bspt threaded ports (FIG. 3, M, N). Close off the unused ports, using the supplied plugs.

Plastic (1050P, 1050C, 1050F)

The fluid inlet and outlet manifolds each have a 1 in. raised face ANSI/DIN flange (FIG. 4, M, N) in either a center or end location. Connect 1 in. standard flanged plastic pipe to the pump. See FIG. 5.

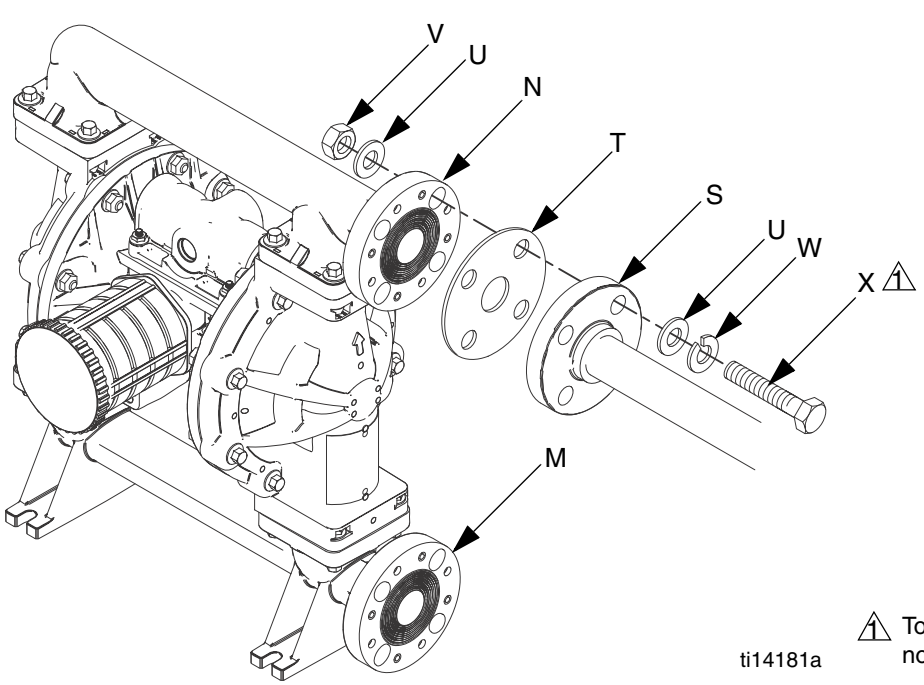
Graco standard pipe flange kits are available in polypropylene (239005), stainless steel (239008), and PVDF (239009). These kits include:

- the pipe flange
- a PTFE gasket
- four 1/2 in. bolts, spring lock washers, flat washers and nuts.

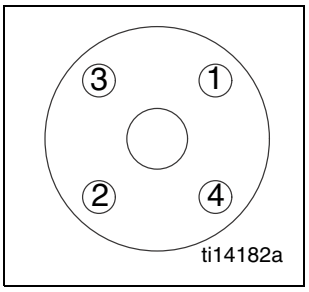
Be sure to lubricate the threads of the bolts and torque to 10-15 ft-lb (14-20 N•m). Follow the bolt tightening sequence and **do not over-torque.**

Hastelloy (1050H) or Stainless Steel (1050S)

The fluid inlet and outlet manifolds each have one 1 in. npt (f) or bspt threaded port.



Bolt tightening sequence



Key:

M	1 in. fluid inlet flange
N	1 in. fluid outlet flange
S	1 in. standard pipe flange
T	PTFE gasket
U	Flat washer
V	Nut
W	Lock washer
X	Bolt

1 Torque to 10-15 ft-lb (14-20 N•m). Do not over-torque.

FIG. 5. Flange connections (plastic pumps only, 1050P, 1050C, and 1050F models)

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Fluid Pressure Relief Valve

Some systems may require installation of a pressure relief valve at the pump outlet to prevent overpressurization and rupture of the pump or hose.

Thermal expansion of fluid in the outlet line can cause overpressurization. Thermal expansion 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 also can occur if the Husky pump is 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.

FIG. 6 shows Fluid Pressure Relief Kit 238428 for aluminum pumps. Use Fluid Pressure Relief Kit 112119, not shown, for plastic pumps.

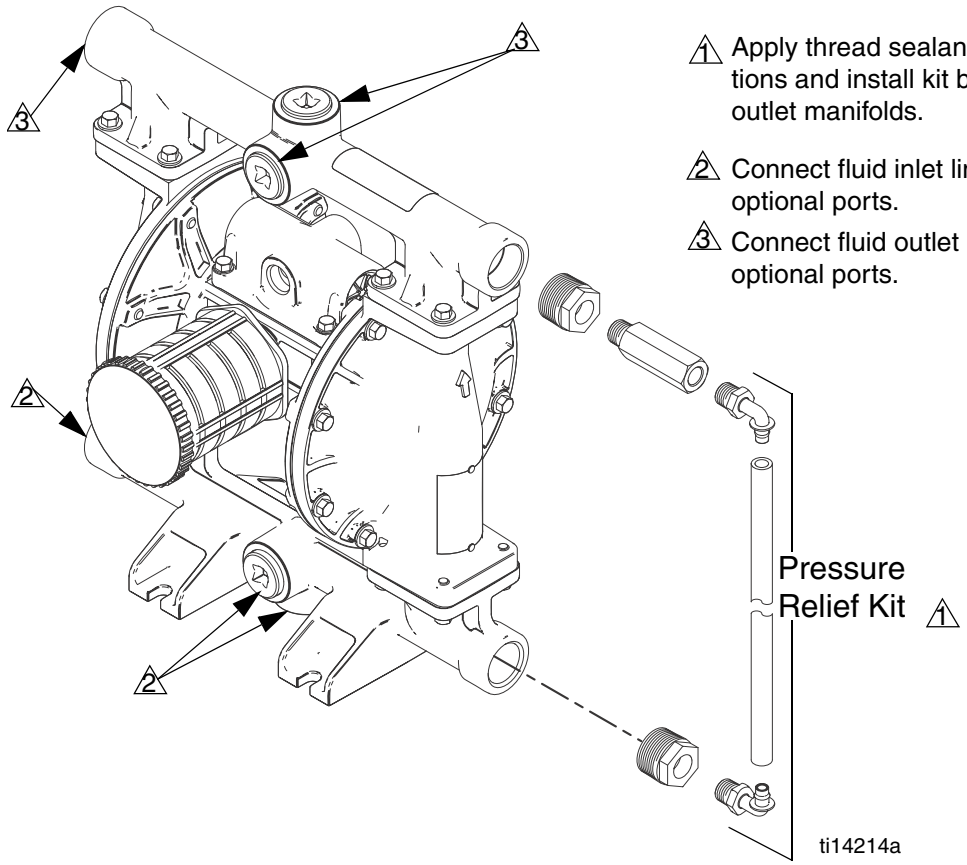

FIG. 6. Fluid pressure relief kit (Aluminum pumps only, 1050A models)

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Pressure Relief Procedure

Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing.

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

Flush the Pump Before First Use

The pump was tested in water. If water could contaminate the fluid you are pumping, flush the pump thoroughly with a compatible solvent. See **Flushing and Storage**, page 15.

Tighten Fasteners Before Setup

Before using the pump for the first time, check and retorque all external fasteners. Follow **Torque Instructions**, page 16. After the first day of operation, retorque the fasteners.

Starting and Adjusting the Pump

1. Be sure the pump is properly grounded. Refer to **Grounding** on page 7.
2. Check fittings to be sure they are tight. Use a compatible liquid thread sealant on male threads. Tighten fluid inlet and outlet fittings securely.
3. Place the suction tube (if used) in fluid to be pumped.

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.

4. Place the end of the fluid hose into an appropriate container.
5. Close the fluid drain valve.
6. Back out the air regulator knob, and open all bleed-type master air valves.
7. If the fluid hose has a dispensing device, hold it open.
8. *Pumps with runaway protection:* Enable the prime/flush function by pushing the prime/flush button on the DataTrak.
9. Slowly increase air pressure with the air regulator 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.

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10. If you are flushing, run the pump long enough to thoroughly clean the pump and hoses.

11. Close the dispensing valve, if used.

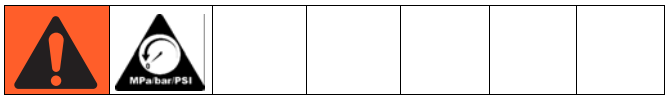
12. Close the bleed-type master air valve.

13. *Pumps with runaway protection:* Disable the prime/flush function by pushing the prime/flush button on the DataTrak.

DataTrak Operation

See DataTrak manual 313840 for all DataTrak information and parts, including detailed operation instructions.

Pump Shutdown



At the end of the work shift and before you check, adjust, clean or repair the system, follow **Pressure Relief Procedure**, page 14.

Maintenance

Maintenance Schedule

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

Lubrication

The pump is lubricated at the factory. It is designed to require no further lubrication for the life of the pump.

Tighten 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. Check fasteners. Tighten or retorque as necessary. Although pump use varies, a general guideline is to retorque fasteners every two months. See **Torque Instructions**, page 16.

Flushing and Storage

- Flush before fluid can dry in the equipment, at the end of the day, before storing, and before repairing equipment.
- Flush at the lowest pressure possible. Check connectors for leaks and tighten as necessary.
- Flush with a fluid that is compatible with the fluid being dispensed and the equipment wetted parts.

Flush the pump often enough to prevent the fluid you are pumping from drying or freezing in the pump and damaging it. Use a compatible solvent.

Always flush the pump and relieve the pressure before storing it for any length of time.

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Torque Instructions

NOTE: Fluid cover and manifold fasteners have a thread-locking adhesive patch applied to the threads. If this patch is excessively worn, the fasteners may loosen during operation. Replace screws with new ones or apply medium-strength (blue) Loctite or equivalent to the threads.

If fluid cover or manifold fasteners have been loosened, it is important to torque them using the following procedure to improve sealing.

NOTE: Always completely torque fluid covers before torquing manifolds.

Start all fluid cover screws a few turns. Then turn down each screw just until head contacts cover. Then turn each screw by 1/2 turn or less working in a crisscross pattern to specified torque. Repeat for manifolds.

Fluid cover and manifold fasteners:
100 in-lb (11.3 N•m)

Retorque the air valve fasteners (V) in a criss-cross pattern to specified torque.

Plastic center sections: 55 in-lb (6.2 N•m)
Metal center sections: 80 in-lb (9.0 N•m)

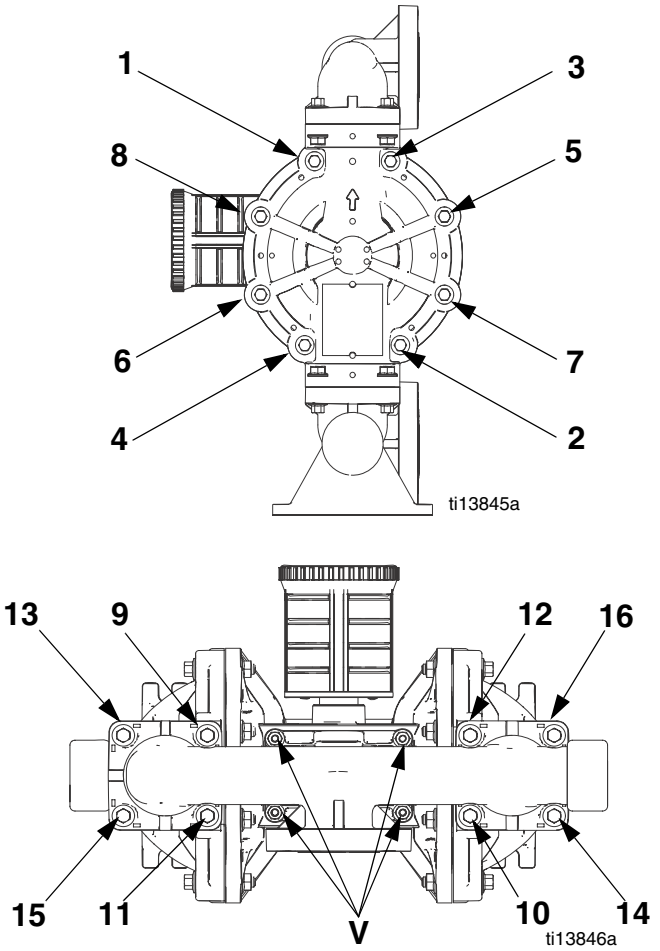

FIG. 7. Torque sequence

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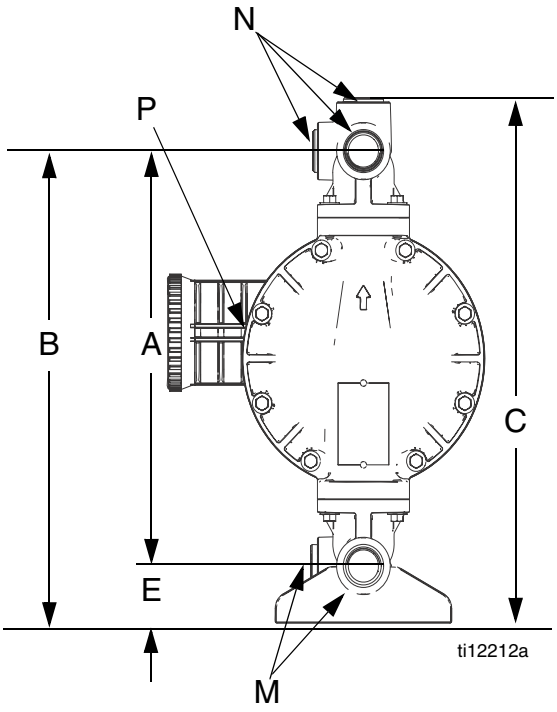
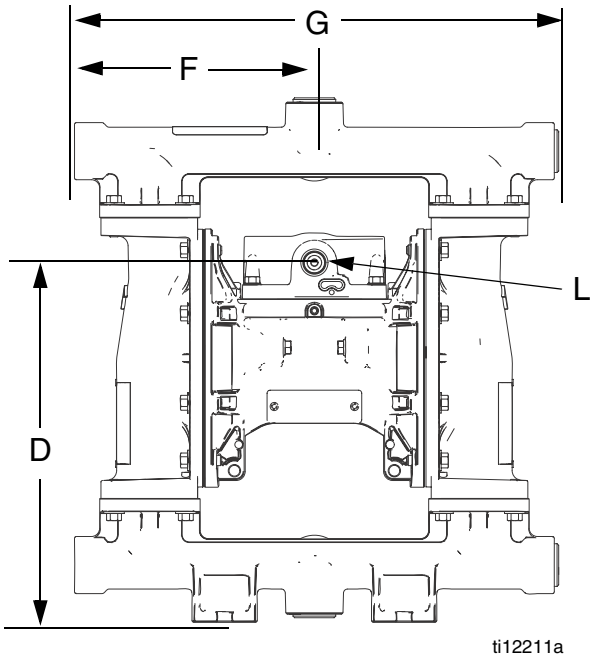
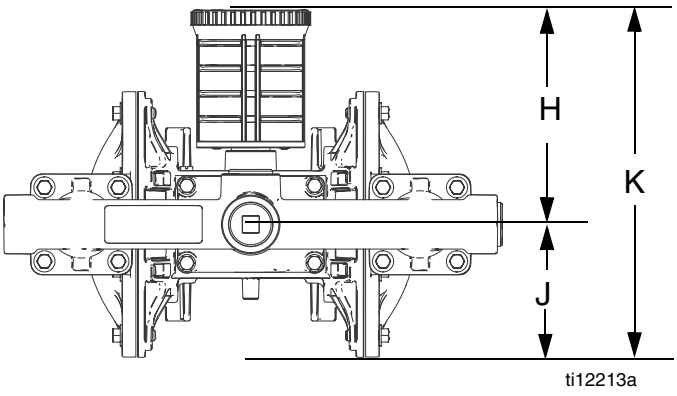
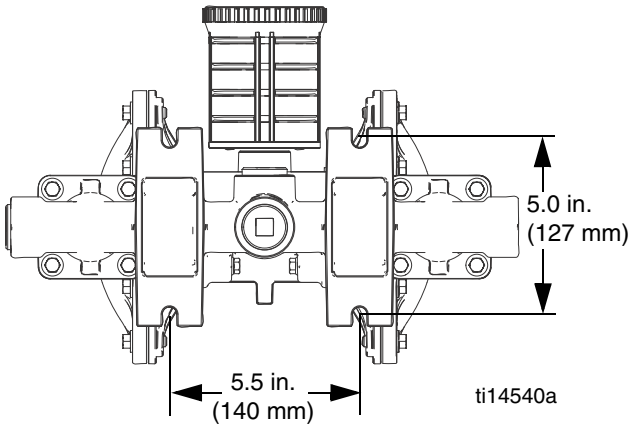
Dimensions and Mounting

Aluminum (1050A)









A ..... 12.7 in. (323 mm)
B ..... 14.4 in. (366 mm)
C ..... 15.9 in. (404 mm)
D ..... 10.9 in. (277 mm)
E..... 1.8 in. (46 mm)
F..... 7.3 in. (185 mm)
G ..... 14.7 in. (373 mm)
H ..... 6.1 in. (155 mm)

J ..... 3.9 in. (99 mm)
K..... 10.0 in. (254 mm)
L ..... 1/2 npt(f) air inlet
M .... 1 in. npt(f) or 1 in. bspt fluid inlet ports (4)
N..... 1 in. npt(f) or 1 in. bspt fluid outlet ports (4)
P ..... 3/4 npt(f) air exhaust port

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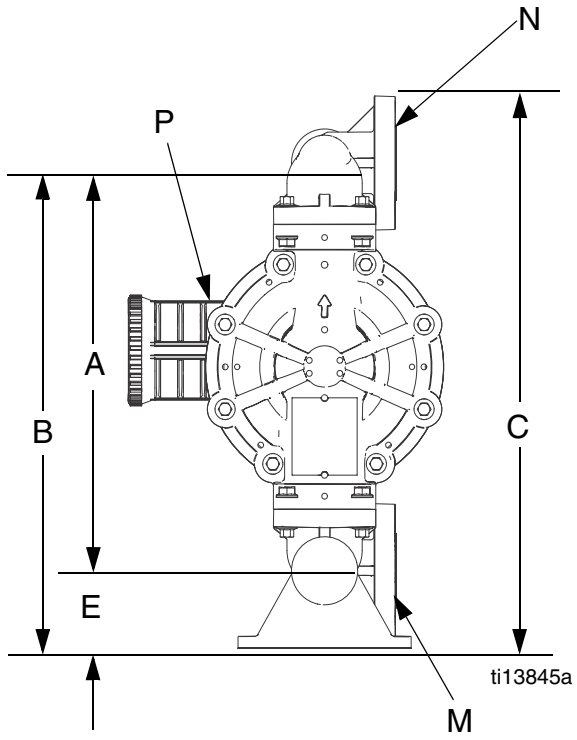
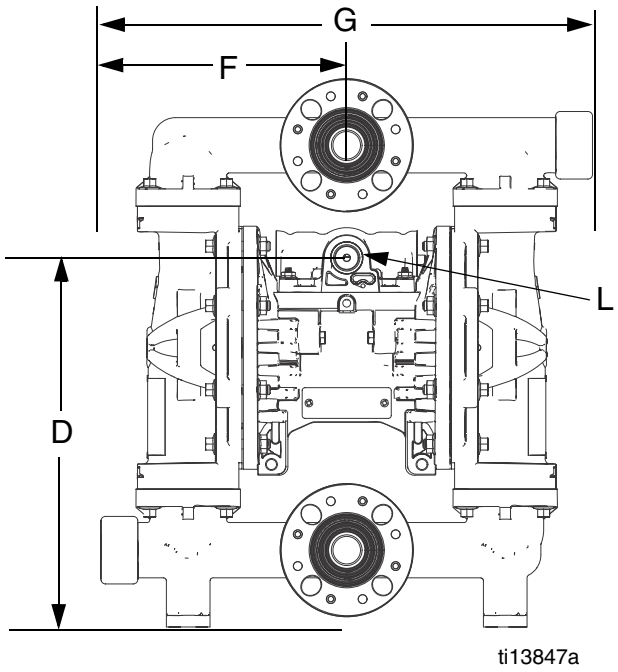
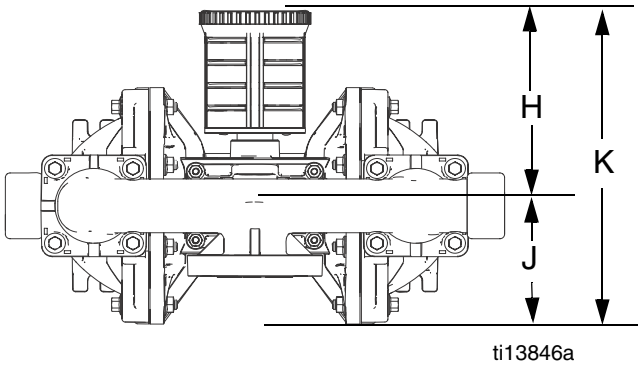
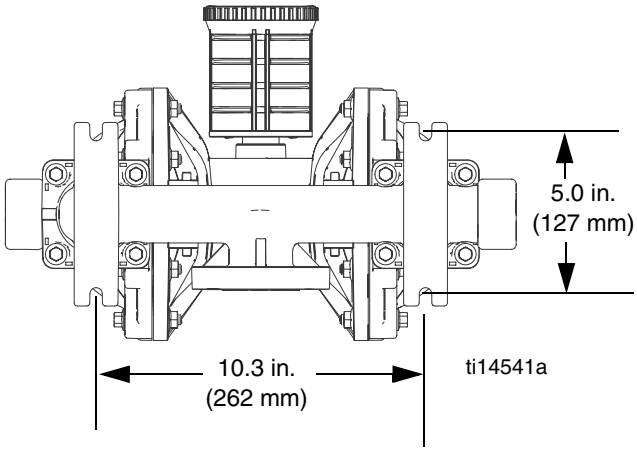
Polypropylene (1050P), Conductive Polypropylene (1050C) and PVDF (1050F)









A ..... 13.2 in. (335 mm)
B ..... 15.7 in. (399 mm)
C ..... 17.8 in. (452 mm)
D ..... 12.0 in. (305 mm)
E ..... 2.5 in. (63.5 mm)
F..... 8.0 in. (203 mm)
G ..... **Center Flange:** 16.0 in. (406 mm)
End Flange: 15.2 in. (386 mm)
H ..... 5.6 in. (142 mm)

J ..... 3.9 in. (99 mm)
K..... 9.6 in. (244 mm)
L ..... 1/2 npt(f) air inlet
M .... 1 in. ANSI/DIN flange
N..... 1 in. ANSI/DIN flange
P ..... 3/4 npt(f) air exhaust port

NOTE: Listed dimensions are accurate for both center and end flange models, except where noted.

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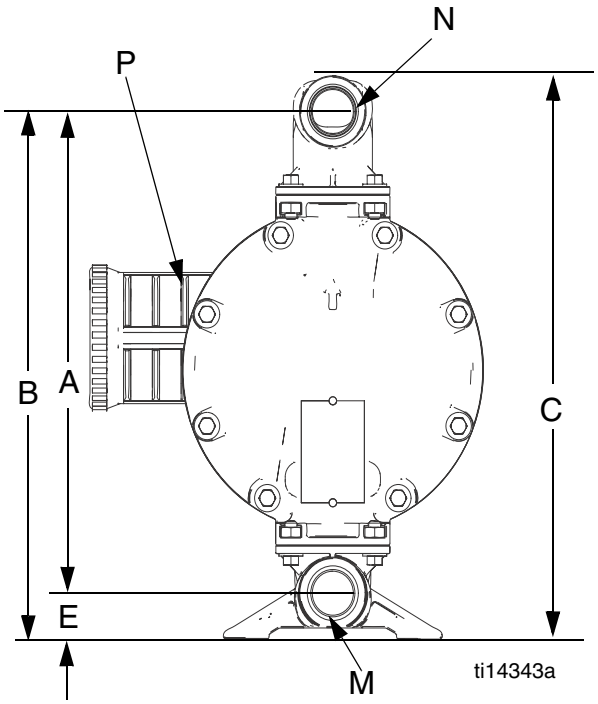
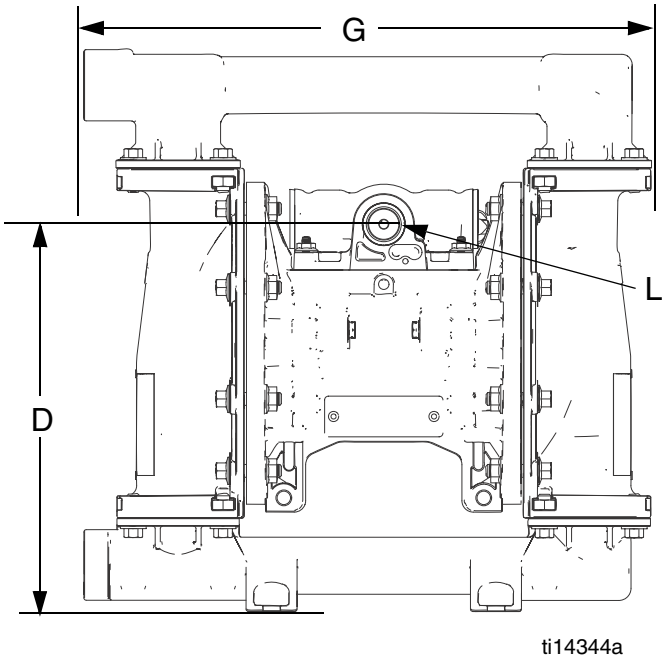
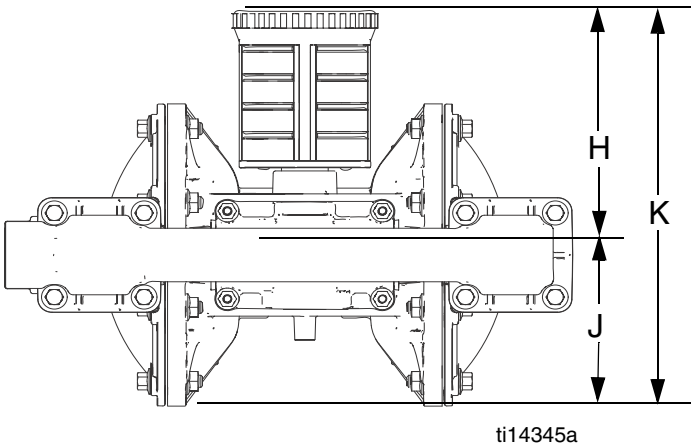
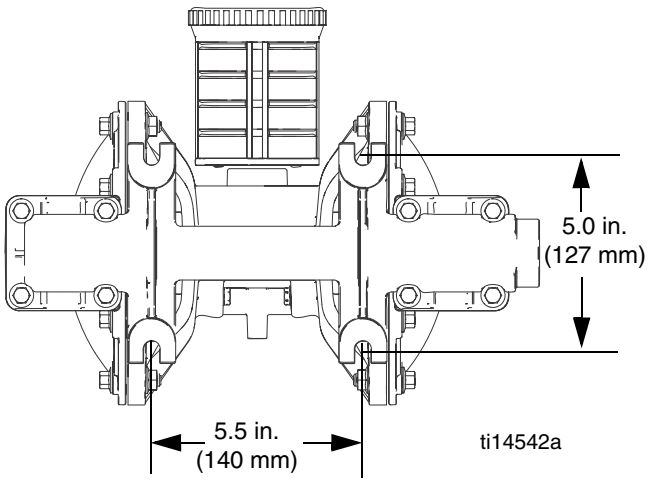
Hastelloy (1050H) and Stainless Steel (1050S)









A ..... 11.8 in. (300 mm)
B ..... 12.9 in. (328 mm)
C ..... 13.7 in. (348 mm)
D ..... 9.5 in. (241 mm)
E..... 1.1 in. (28 mm)
G ..... 13.9 in. (353 mm)
H ..... 5.7 in. (145 mm)
J..... 4.0 in. (102 mm)
K ..... 9.6 in. (245 mm)

L ..... 1/2 npt(f) air inlet
M .... 1 in. npt(f) or 1 in. bspt fluid inlet ports (4)
N..... 1 in. npt(f) or 1 in. bspt fluid outlet ports (4)
P ..... 3/4 npt(f) air exhaust port

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Performance Charts

Test Conditions: Pump tested in water with inlet submerged.

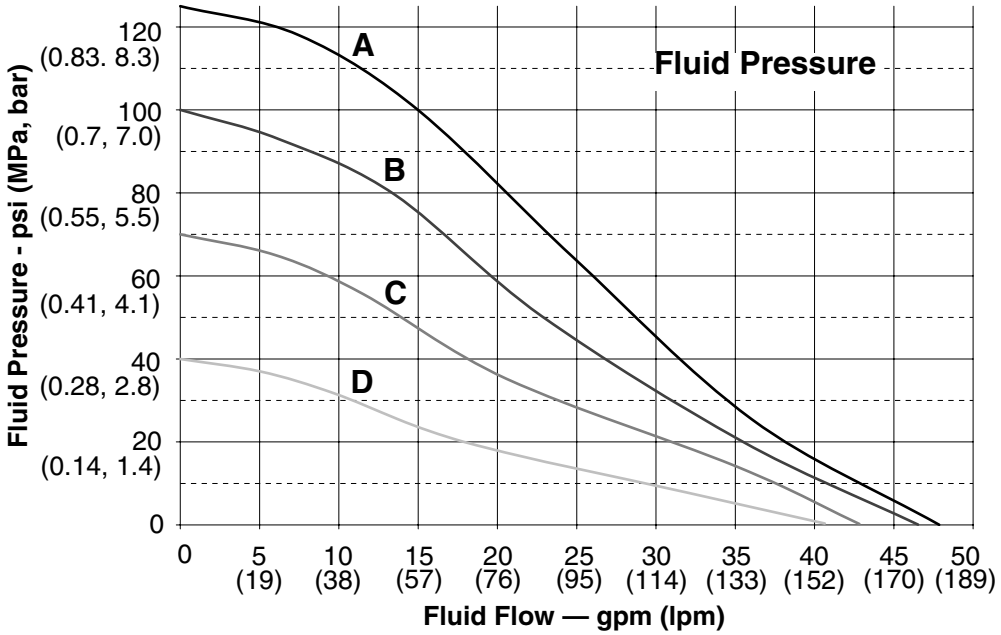
Operating Air Pressure

A
125 psi (0.83 MPa, 8.3 bar)

B
100 psi (0.7 MPa, 7.0 bar)

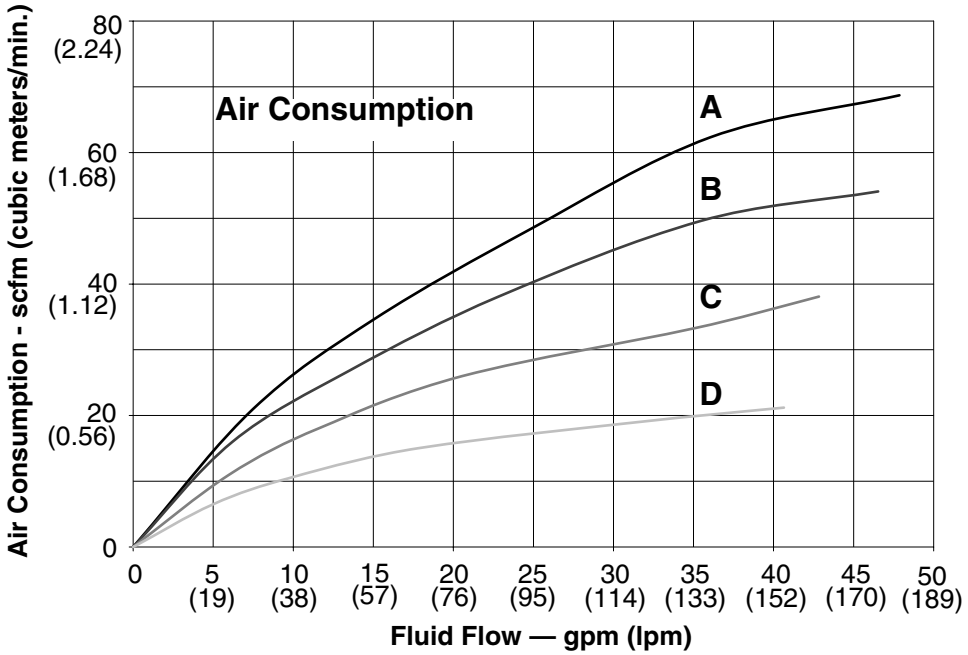
C
70 psi (0.48 MPa, 4.8 bar)

D
40 psi (0.28 MPa, 2.8 bar)



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).



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Technical Data

Maximum fluid working pressure	125 psi (0.86 MPa, 8.6 bar)
Air pressure operating range	20-125 psi (0.14-0.86 MPa, 1.4-8.6 bar)
Fluid displacement per cycle	0.17 gal. (0.64 liters)
Air consumption at 70 psi (0.48 MPa, 4.8 bar), 20 gpm (76 lpm)	25 scfm
Maximum values with water as media under submerged inlet conditions at ambient temperature:	
Maximum air consumption	67 scfm
Maximum free-flow delivery	50 gpm (189 lpm)
Maximum pump speed	280 cpm
Maximum suction lift	16 ft (4.9 m) dry, 29 ft (8.8 m) wet
Maximum size pumpable solids	1/8 in. (3.2 mm)
Sound Power*	
at 70 psi (0.48 MPa, 4.8 bar) and 50 cpm	78 dBa
at 100 psi (0.7 MPa, 7.0 bar) and full flow	90 dBa
Sound Pressure**	
at 70 psi (0.48 MPa, 4.8 bar) and 50 cpm	84 dBa
at 100 psi (0.7 MPa, 7.0 bar) and full flow	96 dBa
Fluid temperature range	see page 23
Air inlet size	1/2 npt(f)
Fluid inlet size	
Aluminum (1050A), Hastelloy (1050H) or Stainless Steel (1050S)	1 in. npt(f) or 1 in. bspt
Conductive Poly (1050C), Polypropylene (1050P), or PVDF (1050F)	1 in. raised face ANSI/DIN flange
Fluid outlet size	
Aluminum (1050A), Hastelloy (1050H) or Stainless Steel (1050S)	1 in. npt(f) or 1 in. bspt
Conductive Poly (1050C), Polypropylene (1050P), or PVDF (1050F)	1 in. raised face ANSI/DIN flange
Weight	
Aluminum (1050A)	23 lb. (10.5 kg)
Conductive Polypropylene (1050C) and Polypropylene (1050P)	18 lb. (8.2 kg)
Hastelloy	41 lb. (18.6 kg)
PVDF (1050F)	26 lb (11.8 kg)
Stainless Steel (1050S)	
with conductive polypropylene center	36.3 lb. (16.5 kg)
with polypropylene center	37.3 lb. (16.9 kg)
with aluminum center	41.4 lb. (18.8 kg)
Wetted parts include material(s) chosen for seat, ball, and diaphragm options, **plus** the pump's material of construction	
1050A	Aluminum
1050H	Hastelloy
1050C and 1050P	Polypropylene
1050F	PVDF
1050S	Stainless Steel

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Non-wetted external parts

Aluminum (1050A)	aluminum, coated carbon steel
Hastelloy (1050H)	hastelloy, stainless steel, polypropylene or aluminum (if used in center section)
Plastic (1050P, 1050C, and 1050F)	stainless steel, polypropylene
Stainless Steel (1050S)	stainless steel, polypropylene or aluminum (if used in center section)

** Sound power measured per ISO-9614-2.*
*** Sound pressure was tested 3.28 ft (1 m) from equipment.*

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Fluid Temperature Range

NOTICE

Temperature limits are based on mechanical stress only. Certain chemicals will further limit the fluid temperature range. Stay within the temperature range of the most-restricted wetted component. Operating at a fluid temperature that is too high or too low for the components of your pump may cause equipment damage.

Diaphragm/Ball/Seat Material	Fluid Temperature Range					
	Aluminum, Hastelloy, or Stainless Steel Pumps		Polypropylene or Conductive Polypropylene Pumps		PVDF Pumps	
	Fahrenheit	Celsius	Fahrenheit	Celsius	Fahrenheit	Celsius
Acetal (AC)	10° to 180°F	-12° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
Buna-N (BN)	10° to 180°F	-12° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
FKM Fluoroelastomer (FK)*	-40° to 275°F	-40° to 135°C	32° to 150°F	0° to 66°C	10° to 225°F	-12° to 107°C
Geolast® (GE)	-40° to 150°F	-40° to 66°C	32° to 150°F	0° to 66°C	10° to 150°F	-12° to 66°C
Neoprene overmolded diaphragm (CO) or Neoprene check balls (CR or CW)	0° to 180°F	-18° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
Polypropylene (PP)	32° to 150°F	0° to 66°C	32° to 150°F	0° to 66°C	32° to 150°F	0° to 66°C
PTFE overmolded diaphragm (PO)	40° to 180°F	4° to 82°C	40° to 150°F	4° to 66°C	40° to 180°F	4.0° to 82°C
PTFE check balls or two-piece PTFE/EPDM diaphragm (PT)	40° to 220°F	4° to 104°C	40° to 150°F	4° to 66°C	40° to 220°F	4° to 104°C
PVDF (PV)	10° to 225°F	-12° to 107°C	32° to 150°F	0° to 66°C	10° to 225°F	-12° to 107°C
Santoprene® (SP)	-40° to 180°F	-40° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
TPE (TP)	-20° to 150°F	-29° to 66°C	32° to 150°F	0° to 66°C	10° to 150°F	-12° to 66°C

** The maximum temperature listed is based on the ATEX standard for T4 temperature classification. If you are operating in a non-explosive environment, FKM fluoroelastomer's maximum fluid temperature in aluminum or stainless steel pumps is 320°F (160°C).*

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Repair/Parts

Husky® 1050 Air-Operated Diaphragm Pump

313435G
ENG

1-inch pump with modular air valve for fluid transfer applications.
For professional use only.

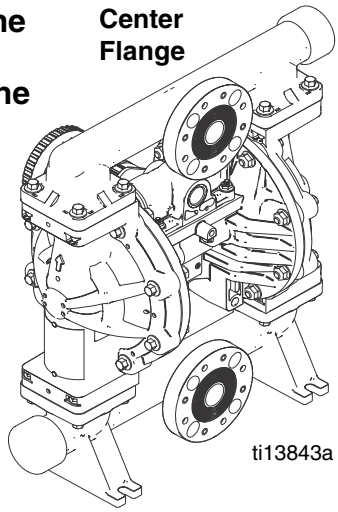
See page 3 for model information, including approvals.

125 psi (0.86 MPa, 8.6 bar) Maximum Fluid Working Pressure
125 psi (0.86 MPa, 8.6 bar) Maximum Air Input Pressure

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

1050P Polypropylene
1050C Conductive Polypropylene
1050F PVDF

Center Flange



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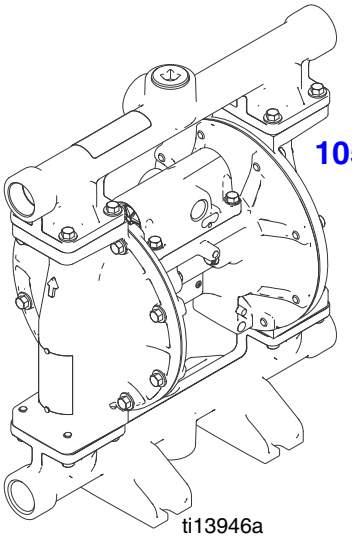

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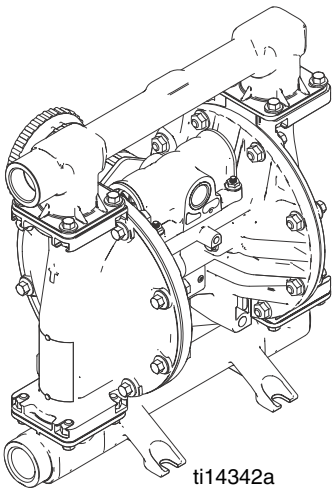
1050A Aluminum



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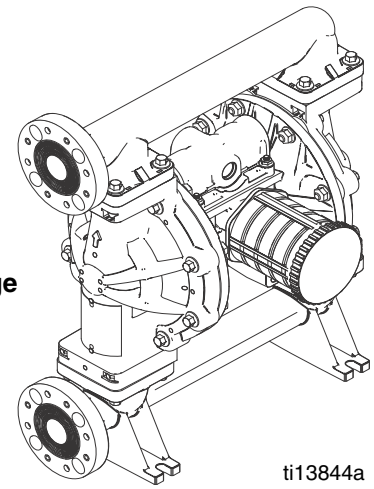
1050S Stainless Steel
1050H Hastelloy

End Flange



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Related Manuals

Manual	Description
312877	Husky 1050 Air-Operated Diaphragm Pump, Operation
313597	Husky 1050A UL-Listed Diaphragm Pump, Operation
313598	Husky 1050A CSA-Certified Diaphragm Pump, Operation
313840	DataTrak, Instructions/Parts
406824	Pulse Count Kits, Instructions
406825	Reed Switch with Solenoid Kits, Instructions
406826	Torque Instructions (Manifolds and Fluid Covers)

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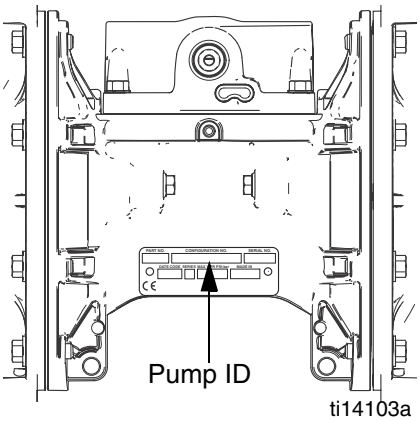
Pump Matrix

Check the identification plate (ID) for the 20-digit part number of your pump. Use the following matrix to define the components of your pump. For example, pump number **1050A-A01AA1SSBNBNPT** represents a Husky 1 inch, 50 gpm aluminum pump **(1050A)**, with aluminum center section **(A01),** a standard air valve **(A),** aluminum fluid covers **(A)** and manifolds with standard ports in inches **(1).** The pump has stainless steel seats **(SS),** buna-N check balls **(BN),** buna-N diaphragms **(BN),** and PTFE manifold o-rings **(PT)**.

NOTE: Available options for seats, check balls, diaphragms, and seals vary based on pump model (1050A-1050S). To build a pump, use the selector tool at www.graco.com or speak with your distributor.



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Pump Model (1 inch ports, 50 gpm)	Center Section and Air Valve Material		Air Valve/Monitoring
1050A★ Aluminum **1050C**★ Conductive Polypropylene **1050F** PVDF **1050H**‡ Hastelloy **1050P** Polypropylene **1050S**‡ Stainless Steel	Aluminum	**A01A**	Standard
		A01B	Pulse Count✖
		A01C	DataTrak✖
		A01D	Remote
	Conductive Polypropylene	**C01A**	Standard
		C01B	Pulse Count✖
		C01C	DataTrak✖
		C01D	Remote
	Polypropylene	**P01A**	Standard
		P01B	Pulse Count✖
		P01C	DataTrak✖
		P01D	Remote
★, ‡, or ✖: See **ATEX Certifications** below.			

Fluid Covers and Manifolds	
A1	Aluminum, standard ports, inch
A2	Aluminum, standard ports, metric
C1	Conductive polypropylene, center flange
C2	Conductive polypropylene, end flange
F1	PVDF, center flange
F2	PVDF, end flange
H1	Hastelloy, standard ports, inch
H2	Hastelloy, standard ports, metric
P1	Polypropylene, center flange
P2	Polypropylene, end flange
S1	Stainless steel, standard ports, inch
S2	Stainless steel, standard ports, metric

Check Valve Seats	
AC	Acetal
AL	Aluminum
BN	Buna-N
FK	FKM Fluoroelastomer
GE	Geolast®
PP	Polypropylene
PV	PVDF
SP	Santoprene®
SS	316 Stainless Steel
TP	TPE

Check Valve Balls	
AC	Acetal
BN	Buna-N
CR	Polychloroprene Standard
CW	Polychloroprene Weighted
FK	FKM Fluoroelastomer
GE	Geolast
PT	PTFE
SP	Santoprene
SS	316 Stainless Steel
TP	TPE

Diaphragm	
BN	Buna-N
CO	Polychloroprene Overmolded
FK	FKM Fluoroelastomer
GE	Geolast
PO	PTFE/EPDM Overmolded
PT	PTFE/EPDM Two-Piece
SP	Santoprene
TP	TPE

Manifold O-Rings	
—	None
PT	PTFE

ATEX Certifications

★ *All 1050A (Aluminum) and 1050C (Conductive Polypropylene) pumps are certified:*

II 2 GD c IIC T4

‡ *1050S (Stainless Steel) and 1050H (Hastelloy) pumps with aluminum or conductive polypropylene centers are certified:*

II 2 GD c IIC T4

✖ *DataTrak and Pulse Count are certified:*

II 1 G

EEx ia IIA T3
Nemko
06ATEX1124

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Warnings

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

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in **work area** can ignite or explode. To help prevent fire and explosion:

- Use equipment only in well ventilated area.
- Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.
- Ground all equipment in the work area. See **Grounding** instructions.
- Use only grounded hoses.
- Hold gun firmly to side of grounded pail when triggering into pail.
- If there is static sparking or you feel a shock, **stop operation immediately.** Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable materials and gases. To help prevent fire and explosion:

- Clean plastic parts in a well ventilated area.
- Do not clean with a dry cloth.

EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See **Technical Data** in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- Do not leave the work area while equipment is energized or under pressure. Turn off all equipment and follow the **Pressure Relief Procedure** in this manual when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

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⚠ WARNING

PRESSURIZED EQUIPMENT HAZARD

Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.

- Follow **Pressure Relief Procedure** in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.

PRESSURIZED ALUMINUM PARTS HAZARD

Use of fluids that are incompatible with aluminum in pressurized equipment can cause serious chemical reaction and equipment rupture. Failure to follow this warning can result in death, serious injury, or property damage.

- Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents.
- Many other fluids may contain chemicals that can react with aluminum. Contact your material supplier for compatibility.

PLASTIC PARTS CLEANING SOLVENT HAZARD

Use only compatible water-based solvents to clean plastic structural or pressure-containing parts. Many solvents can degrade plastic parts and cause them to fail, which could cause serious injury or property damage. See **Technical Data** in this and all other equipment instruction manuals. Read fluid and solvent manufacturer's warnings.

TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDS's to know the specific hazards of the fluids you are using.
- Route exhaust away from work area. If diaphragm ruptures, fluid may be exhausted with air.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear impervious gloves when spraying or cleaning equipment.

BURN HAZARD

Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns:

- Do not touch hot fluid or equipment.
- Wait until equipment/fluid has cooled completely.

PERSONAL PROTECTIVE EQUIPMENT

You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:

- Clothing and respirator as recommended by the fluid and solvent manufacturer
- Protective eyewear, gloves, and hearing protection.

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Troubleshooting

Problem	Cause	Solution
Pump cycles but will not prime.	Check valve ball severely worn or wedged in seat or manifold.	Replace ball and seat. See page 11.
	Seat severely worn.	Replace ball and seat. See page 11.
	Outlet or inlet clogged.	Unclog.
	Inlet or outlet valve closed.	Open.
	Inlet fittings or manifolds loose.	Tighten.
	Manifold o-rings damaged.	Replace o-rings. See page 11.
Pump cycles at stall or fails to hold pressure at stall.	Worn check valve balls, seats, or o-rings.	Replace. See page 26.
Pump will not cycle, or cycles once and stops.	Air valve is stuck or dirty.	Disassemble and clean air valve. See page 9. Use filtered air.
	Check valve ball severely worn and wedged in seat or manifold.	Replace ball and seat. See page 11.
	Pilot valve worn, damaged, or plugged.	Replace pilot valve. See page 12.
	Air valve gasket damaged.	Replace gasket. See page 8.
	Check valve ball is wedged into seat due to overpressurization.	Install pressure relief kit. See **Accessories**, page 29.
	Dispensing valve clogged.	Relieve pressure and clear valve.
	Air tubing is plugged (remote air control models).	Clear tube.
Pump operates erratically.	Clogged suction line.	Inspect; clear.
	Sticky or leaking check valve balls.	Clean or replace. See page 11.
	Diaphragm (and backup) ruptured.	Replace. See page 12.
	Restricted exhaust.	Remove restriction.
	Pilot valves damaged or worn.	Replace pilot valves. See page 12.
	Air valve damaged.	Replace air valve. See page 8.
	Air valve gasket damaged.	Replace air valve gasket. See page 8.
	Air supply erratic.	Repair air supply.
	Exhaust muffler icing.	Use drier air supply or use low ice muffler (Graco part 102656).

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Problem	Cause	Solution
Air bubbles in fluid.	Suction line is loose.	Tighten.
	Diaphragm (and backup) ruptured.	Replace. See page 12.
	Loose manifolds, damaged seats or manifold o-rings.	Tighten manifold bolts or replace seats or o-rings. See page 11.
	Diaphragm shaft bolt o-ring damaged.	Replace o-ring.
	Pump cavitation.	Reduce pump speed or suction lift.
	Loose diaphragm shaft bolt.	Tighten.
Exhaust air contains fluid being pumped.	Diaphragm (and backup) ruptured.	Replace. See page 12.
	Loose diaphragm shaft bolt.	Tighten or replace. See page 12.
	Diaphragm shaft bolt o-ring damaged.	Replace o-ring. See page 12.
Moisture in exhaust air.	High inlet air humidity.	Use drier air supply.
Pump exhausts excessive air at stall.	Worn air valve cup or plate.	Replace cup and plate. See page 9.
	Damaged air valve gasket.	Replace gasket. See page 8.
	Damaged pilot valve.	Replace pilot valves. See page 12.
	Worn shaft seals or bearings.	Replace shaft seals or bearings. See page 12.
	Air tubing is damaged or loose (remote air control models).	Replace tubing or secure connection.
	Remote air pressure is higher than pump air pressure (remote air control models).	Regulate remote pilot air pressure to be equal to or less than main air.
Pump leaks air externally.	Air valve or fluid cover screws loose.	Tighten.
	Diaphragm damaged.	Replace diaphragm. See page 12.
	Air valve gasket damaged.	Replace gasket. See page 8.
	Remote air pressure is higher than pump air pressure (remote air control models).	Regulate remote pilot air pressure to be equal to or less than main air.
Pump leaks fluid externally from joints.	Loose manifold screws or fluid cover screws.	Tighten manifold screws or fluid cover screws. See page 15.
	Manifold o-rings worn out.	Replace o-rings. See page 11.
Pump leaks fluid externally through manifold or fluid cover.	Excessive pump speed or inlet starvation.	Replace manifold and reduce pump speed or improve pump feed.

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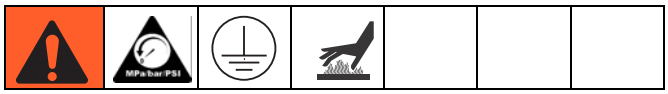
Repair

Pressure Relief Procedure

Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing.

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

Repair or Replace Air Valve



Replace Complete Air Valve

1. Stop the pump. Relieve the pressure. See **Pressure Relief Procedure** in previous section.
2. Disconnect the air line to the motor.
3. **For motors with Pulse Count or DataTrak:** Remove screw to disconnect the reed switch assembly from the air valve.

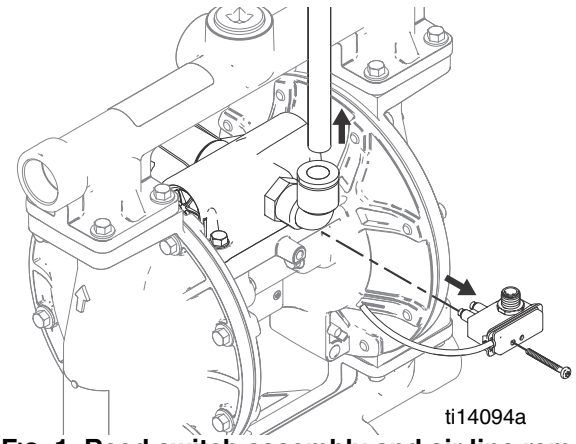


FIG. 1. Reed switch assembly and air line removal

4. **For motors with DataTrak:** Remove two screws and the solenoid bracket. Pull the solenoid out of the air valve.

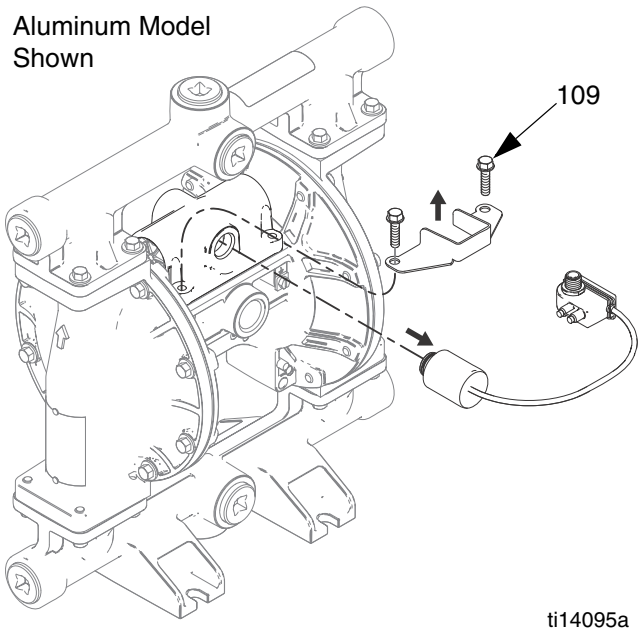


FIG. 2. Solenoid removal

5. Remove screws (109, metal pumps) or nuts (112, plastic pumps). Remove the air valve and gasket (108).
6. To repair the air valve, go to **Disassemble the Air Valve,** step 1, in next section. To install a replacement air valve, continue with step 7.
7. Align the new air valve gasket (108) on the center housing, then attach the air valve. See **Torque Instructions,** page 15.
8. **For motors with DataTrak:** Remember to reattach the solenoid bracket and the solenoid.
9. **For motors with Pulse Count or DataTrak:** Use screw to attach the reed switch assembly to the new air valve. Reconnect cable.
10. Reconnect the air line to the motor.

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Replace Seals or Rebuild Air Valve

NOTE: Repair kits are available. See page 21 to order the correct kit(s) for your pump. Air Valve Seal Kit parts are marked with a †. Air Valve Repair Kit parts are marked with a ◆. Air Valve End Cap Kit parts are marked with a ✠.

Disassemble the Air Valve

1. Perform steps 1-5 under **Replace Complete Air Valve,** page 8.

2. See FIG. 4. Use a Torx screwdriver (T8 for aluminum centers, T9 for plastic centers) to remove two screws (209). Remove the valve plate (205), cup (212), spring (211), and detent assembly (203).

3. See FIG. 4. Remove the retaining ring (210) from each end of the air valve. Use the piston (202) to push the end caps (207, 217) out of the ends. Remove end cap o-rings (206). If pump model is equipped with a runaway protection solenoid, also remove the solenoid release button (218) and o-ring (219).

4. Remove the u-cup seals (208) from each end of the piston (202), then remove the piston. Remove the detent cam (204) from the air valve housing (201).

Reassemble the Air Valve

NOTE: Apply lithium-based grease whenever instructed to grease.

1. Use all parts in the repair kits. Clean other parts and inspect for damage. Replace as needed.

2. Grease the detent cam (204) and install into housing (201).

3. Grease the u-cups (208) and install on the piston with lips facing toward the center of the piston.

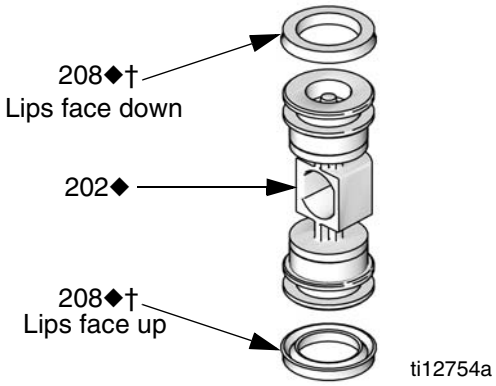

FIG. 3. Air valve u-cup installation

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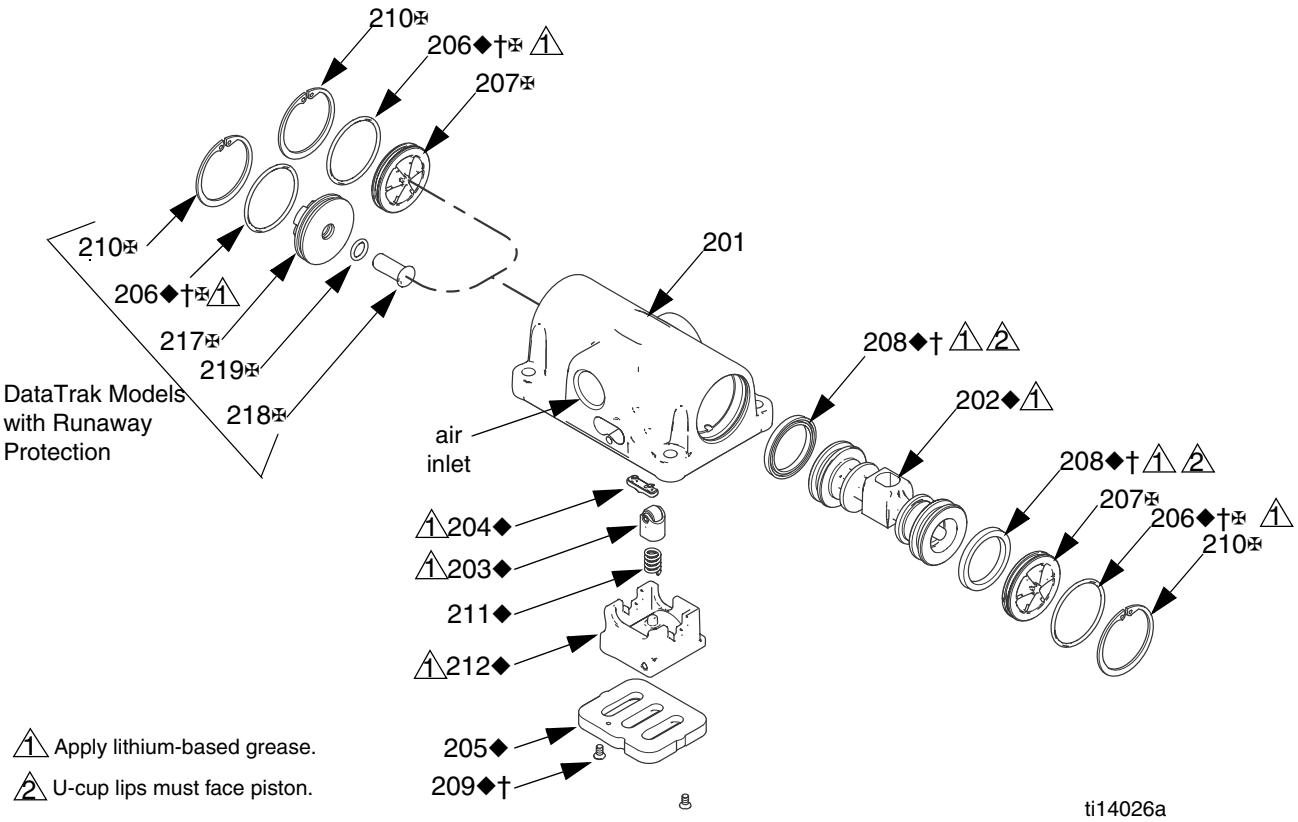

FIG. 4. Air valve assembly

4. Grease both ends of the piston (202) and install it in the housing (201), with the flat side toward the cup (212). Be careful not to tear u-cups (208) when sliding piston into housing.

5. **Standard or Pulse Count models (no runaway protection solenoid):** Grease new o-rings (206) and install on the end caps (207). Install the end caps into the housing.
   DataTrak models (with runaway protection solenoid): Orient the air valve so the air inlet faces forward. Grease and install new o-ring (206) on right-side end cap (207). Grease and install new o-ring (206) and the solenoid release button (218) and o-ring (219) on left-side end cap (217). Install the end caps into the housing.

6. Install a retaining ring (210) on each end to hold end caps in place.

7. Grease and install the detent assembly (203) into the piston. Install the spring (211). Grease the side of the air valve cup (212) that will contact the valve plate (205). Install the air valve cup (212). Align the small round magnet with the air inlet.

8. Install the valve plate (205). Align the small hole in the plate with the air inlet. Tighten the screws (209) to hold it in place.

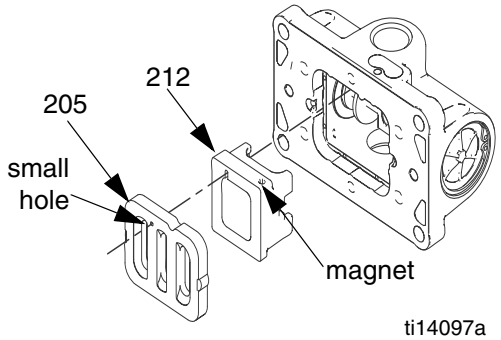

FIG. 5. Air valve cup and plate installation

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DataTrak

NOTE: See DataTrak manual, 313840, for all DataTrak service and repair information.

Check Valve Repair

NOTE: Kits are available for new check valve balls and seats in a range of materials. See page 26 to order kits in the material(s) desired. An o-ring kit and fastener kits also are available.

NOTE: To ensure proper seating of the check balls, always replace the seats when replacing the balls. Also, on models with manifold o-rings, replace the o-rings.

Disassembly

1. Follow the **Pressure Relief Procedure** on page 8. Disconnect all hoses.
2. Remove the pump from its mounting.

NOTE: For plastic pumps (1050P, 1050C, and 1050F), use hand tools only until thread-locking adhesive patch releases.

3. Use a 10 mm socket wrench to remove the outlet manifold fasteners (6). See FIG. 6.
4. Remove the o-rings (12, *not used on some models),* seats (10), and balls (11).
5. Turn the pump over and remove the inlet manifold. Remove the o-rings (12, *not used on some models),* seats (10), and balls (11).

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. 6. Be sure the ball checks (10-12) and manifolds (4, 5) are assembled **exactly** as shown. The arrows (A) on the fluid covers **must** point toward the outlet manifold (4).

1 Torque to 100 in-lb (11.3 N•m). See **Torque Instructions**, page 15.

2 Arrow (A) must point toward outlet manifold.

3 Not used on some models.

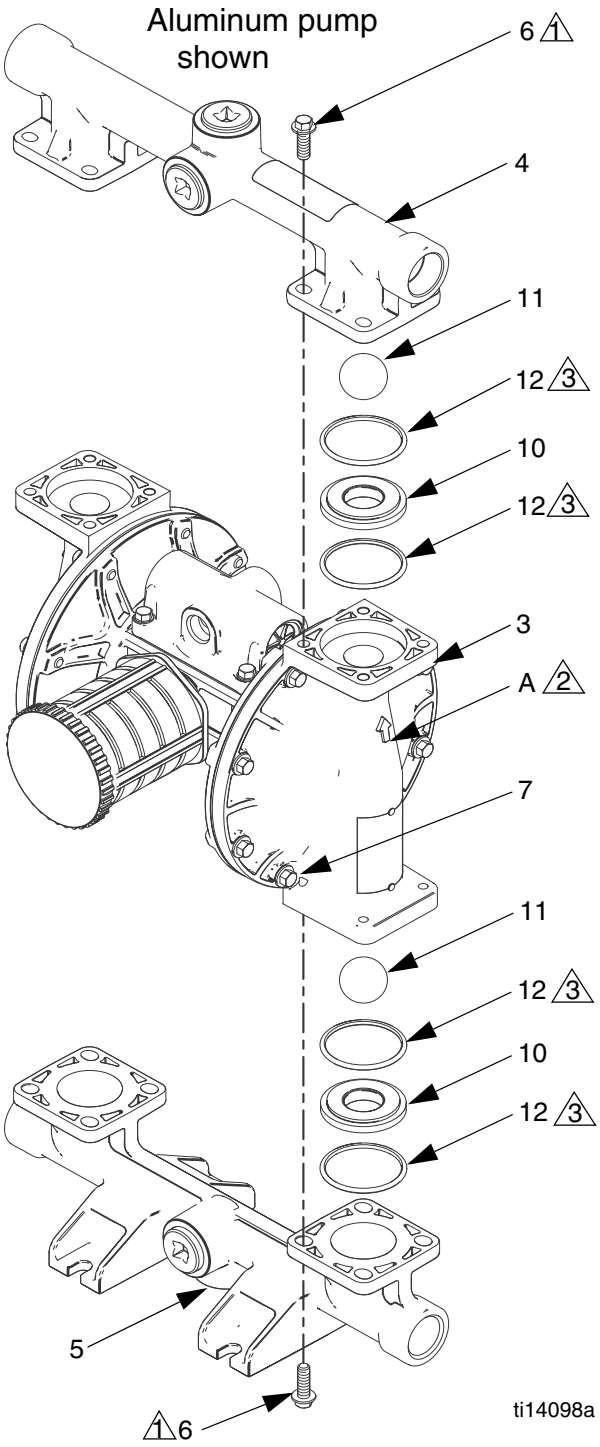

FIG. 6. Ball check valve assembly

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Diaphragms and Center Section

Disassembly

NOTE: Diaphragm kits are available in a range of materials and styles. See page 27 to order the correct diaphragms for your pump. A Center Rebuild Kit also is available. See page 19. Parts included in the Center Rebuild Kit are marked with an *. For best results, use all kit parts.

1. Follow the **Pressure Relief Procedure** on page 8.

2. Remove the manifolds and disassemble the ball check valves as explained on page 11.

3. **Overmolded Diaphragms**

   a. Orient the pump so one of the fluid covers faces up. Use a 10 mm socket wrench to remove the fluid cover screws (7), then pull the fluid cover (3) up off the pump.

   b. The exposed diaphragm (15) will screw off by hand from the diaphragm shaft (104). The diaphragm shaft bolt will remain attached to the diaphragm. Remove the air side diaphragm plate (14).

   c. Turn the pump over and remove the other fluid cover. Pull the diaphragm and shaft up through the center housing.

   d. Grasp the diaphragm firmly and use a wrench on the flats of the shaft to remove. Also remove the air side diaphragm plate (14). Continue with Step 5.

4. **All Other Diaphragms**

   a. Orient the pump so one of the fluid covers faces up. Use a 10 mm socket wrench to remove the fluid cover screws (7), then pull the fluid cover up off the pump. Turn the pump over and remove the other fluid cover.

   b. **Plastic Pumps:** Use a 1-1/4 socket or box end wrench on the hex of a fluid side diaphragm plate to remove. Then remove all parts of the diaphragm assembly. See FIG. 7.
   Metal Pumps: Remove the bolt (304) from one side of the diaphragm shaft, then remove all parts of that diaphragm assembly. See FIG. 7.

   c. Follow the same procedure to disassemble the other diaphragm assembly.

5. Inspect the diaphragm shaft (104) for wear or scratches. If it is damaged, inspect the bearings (105) in place. If they are damaged, use a bearing puller to remove them.

NOTE: Do not remove undamaged bearings.

6. Use an o-ring pick to remove the u-cup packings (106) from the center housing. Bearings (105) can remain in place.

7. If necessary, use a socket wrench to remove the pilot valves (101) or pilot inserts (113, remote air control models).

8. Remove the pilot valve cartridges only if necessary due to a known or suspected problem. **After removing pilot valves,** use a hex to remove the cartridges (102), then remove cartridge o-rings (103). If stripped, use two screwdrivers to screw out the cartridge.

NOTE: Do not remove undamaged pilot valve cartridges.

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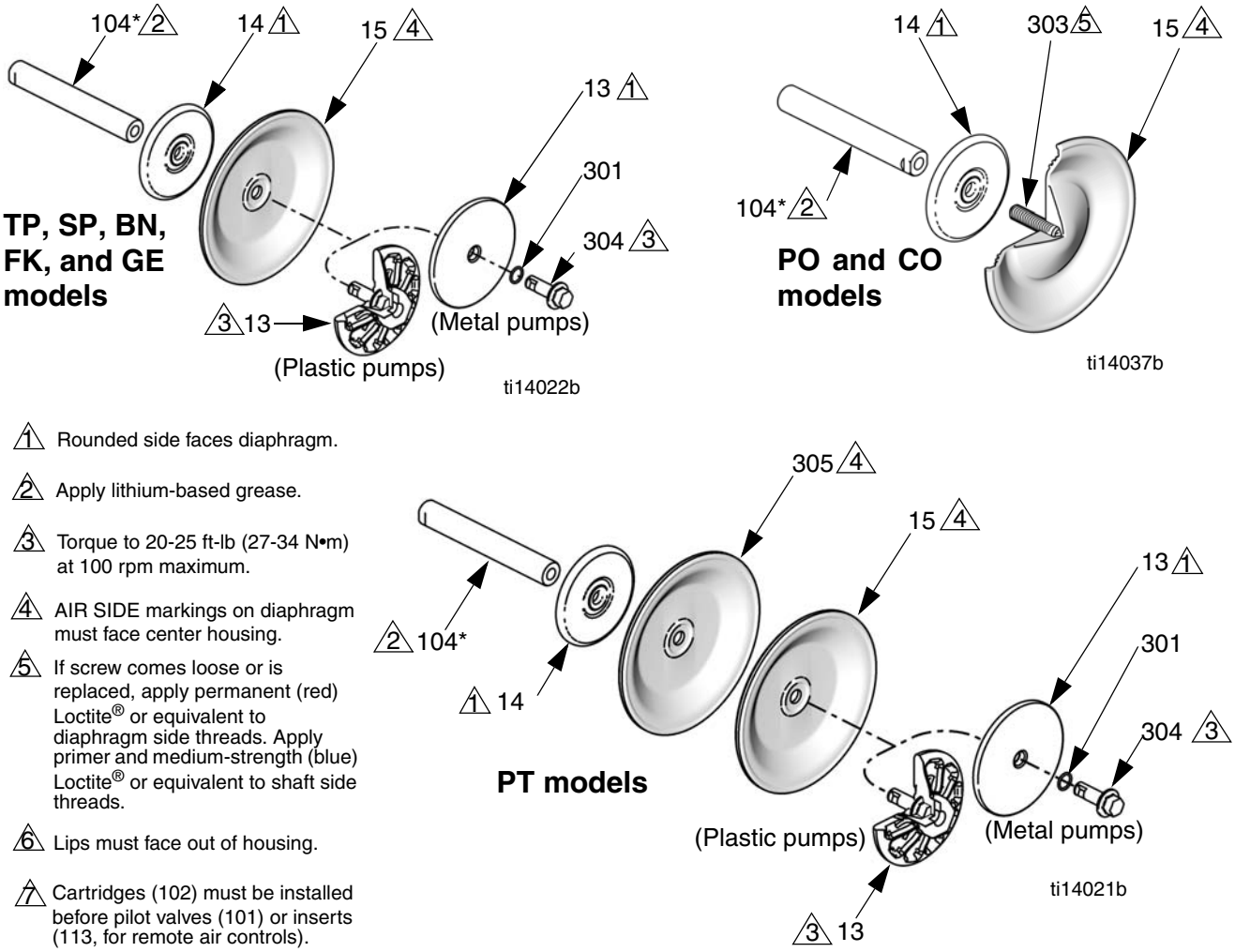

FIG. 7. Assemble diaphragms and center section

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Reassembly

Follow all notes in FIG. 7. These notes contain **important** information.

NOTE: Apply lithium-based grease whenever instructed to grease.

1. Clean all parts and inspect for wear or damage. Replace parts as needed.

2. If removed, grease and install the new pilot valve cartridges (102) and cartridge o-rings (103). Screw in until seated.

NOTE: Cartridges (102) *must* be installed before pilot valves (101).

3. Grease and install the pilot valves (101). Torque to 20-25 in.-lb (2.3-2.8 N•m). Do not over-torque.

4. Grease and install the diaphragm shaft u-cup packings (106) so the lips face **out** of the housing.

5. If removed, insert the new bearings (105) into the center housing. Use a press or a block and rubber mallet to press-fit the bearing so it is flush with the surface of the center housing.

6. **Overmolded Diaphragms:**

   a. Clamp the shaft flats in a vise.

   b. If diaphragm setscrew comes loose or is replaced, apply permanent (red) Loctite® or equivalent to diaphragm side threads. Screw into diaphragm until tight.

   c. Assemble the air side plate (14) onto the diaphragm. The rounded side of the plate must face the diaphragm.

   d. Apply medium-strength (blue) Loctite or equivalent to the threads of the diaphragm assembly. Screw the assembly into the shaft as tight as possible by hand.

   e. Grease the shaft u-cups (106) and the length and ends of the diaphragm shaft (104). Slide the shaft into the housing.

   f. Reattach the first fluid cover (3). See **Torque Instructions,** page 15.

   g. Repeat Steps b and c for the other diaphragm assembly. Go to Step 7.

All Other Diaphragms - Metal Pumps:

a. Install the o-ring (301) on the shaft bolt (304).

b. Assemble the fluid side plate (13), the diaphragm (15), the backup diaphragm (305, if present), and the air side diaphragm plate (14) on the bolt exactly as shown in FIG. 7.

c. Apply medium-strength (blue) Loctite or equivalent to the bolt (304) threads. Screw the bolt into the shaft hand tight.

d. Grease the shaft u-cups (106) and the length and ends of the diaphragm shaft (104). Slide the shaft into the housing.

e. Repeat Steps a-c for the other diaphragm assembly.

f. Hold one shaft bolt with a wrench and torque the other bolt to 20-25 ft-lb (27-34 N•m) at 100 rpm maximum. Do not over-torque.

g. Reattach the first fluid cover (3). See **Torque Instructions,** page 15. Go to Step 7.

All Other Diaphragms - Plastic Pumps:

a. Assemble the diaphragm (15), the backup diaphragm (305, if present), and the air side diaphragm plate (14) on the fluid side plate (13) exactly as shown in FIG. 7.

b. Apply medium-strength (blue) Loctite or equivalent to the threads of the screw on the fluid side plate. Screw the assembly into the shaft hand-tight.

c. Grease the shaft u-cups (106) and the length and ends of the diaphragm shaft (104). Slide the shaft into the housing.

d. Repeat for the other diaphragm assembly

e. Hold one of the plates with a wrench, and torque the other plate to 20-25 ft-lb (27-34 N•m) at 100 rpm maximum. Do not over-torque.

f. Reattach the first fluid cover (3). See **Torque Instructions,** page 15.

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7. To ensure proper seating and extend diaphragm life, attach the second fluid cover with air pressure on the pump.

   a. See FIG. 8. Place the supplied tool (302) where the air valve gasket (108) normally goes. Arrows (A) must face toward the fluid cover that is already attached.

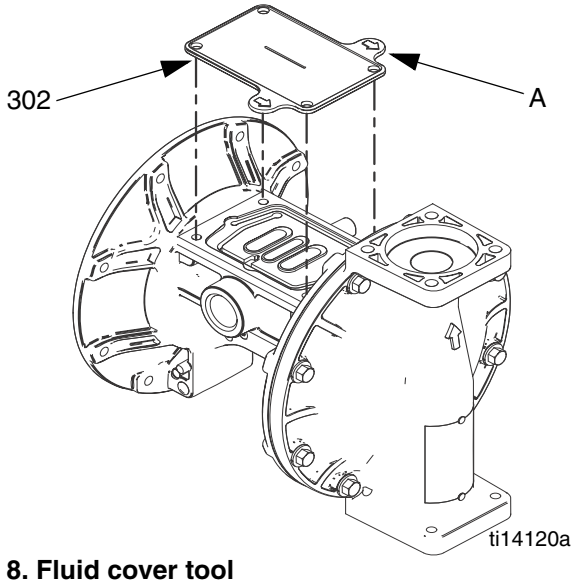

FIG. 8. Fluid cover tool

   b. Reattach the air valve.

   c. Supply a minimum of 20 psi (0.14 MPa, 1.4 bar) air pressure to the air valve. Shop air may be used. The diaphragm will shift so the second fluid cover will seat properly. Keep air pressure on until the second fluid cover is attached.

   d. Attach the second fluid cover (3). See **Torque Instructions,** page 15.

   e. Remove the air valve and the tool (302), replace the gasket (108), and reattach the air valve. See **Torque Instructions,** page 15.

NOTE: If you are replacing the diaphragms but not the air valve, you must remove the air valve and gasket, put the tool in place of the gasket, and put the air valve back on to get the air pressure needed for proper installation of the second fluid cover. Remember to remove the tool and replace the gasket when finished.

8. Reassemble the ball check valves and manifolds as explained on page 11.

Torque Instructions

NOTE: Fluid cover and manifold fasteners have a thread-locking adhesive patch applied to the threads. If this patch is worn, the screws may loosen during operation. Replace screws with new ones, or apply medium-strength (blue) Loctite or equivalent to the threads.

If fluid cover or manifold fasteners have been loosened, it is important to torque them using the following procedure to improve sealing.

NOTE: Always completely torque fluid covers before torquing manifolds.

Start all fluid cover screws a few turns. Then turn down each screw just until head contacts cover. Then turn each screw by 1/2 turn or less working in a crisscross pattern to specified torque. Repeat for manifolds.

Fluid cover and manifold fasteners:
100 in-lb (11.3 N•m)

Retorque the air valve fasteners (V) in a crisscross pattern to specified torque.

Air valve fasteners:
55 in-lb (6.2 N•m) for **plastic center sections**
80 in-lb (9.0 N•m) for **metal center sections**

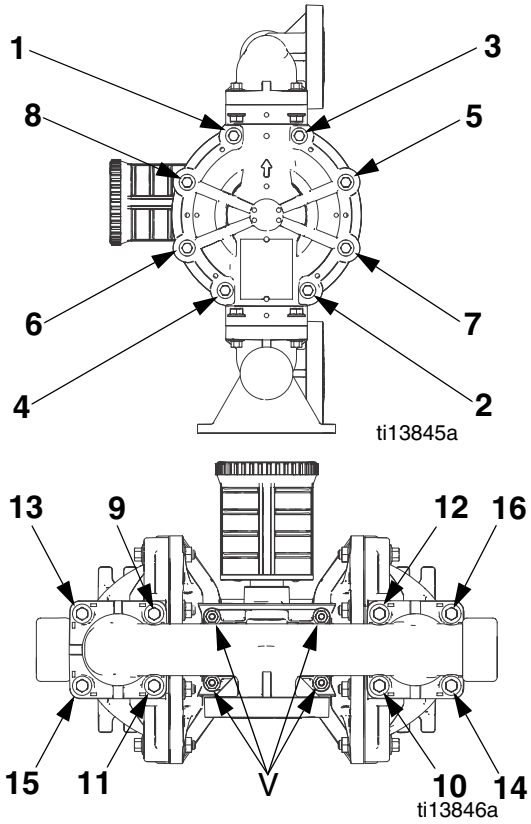

FIG. 9. Torque sequence

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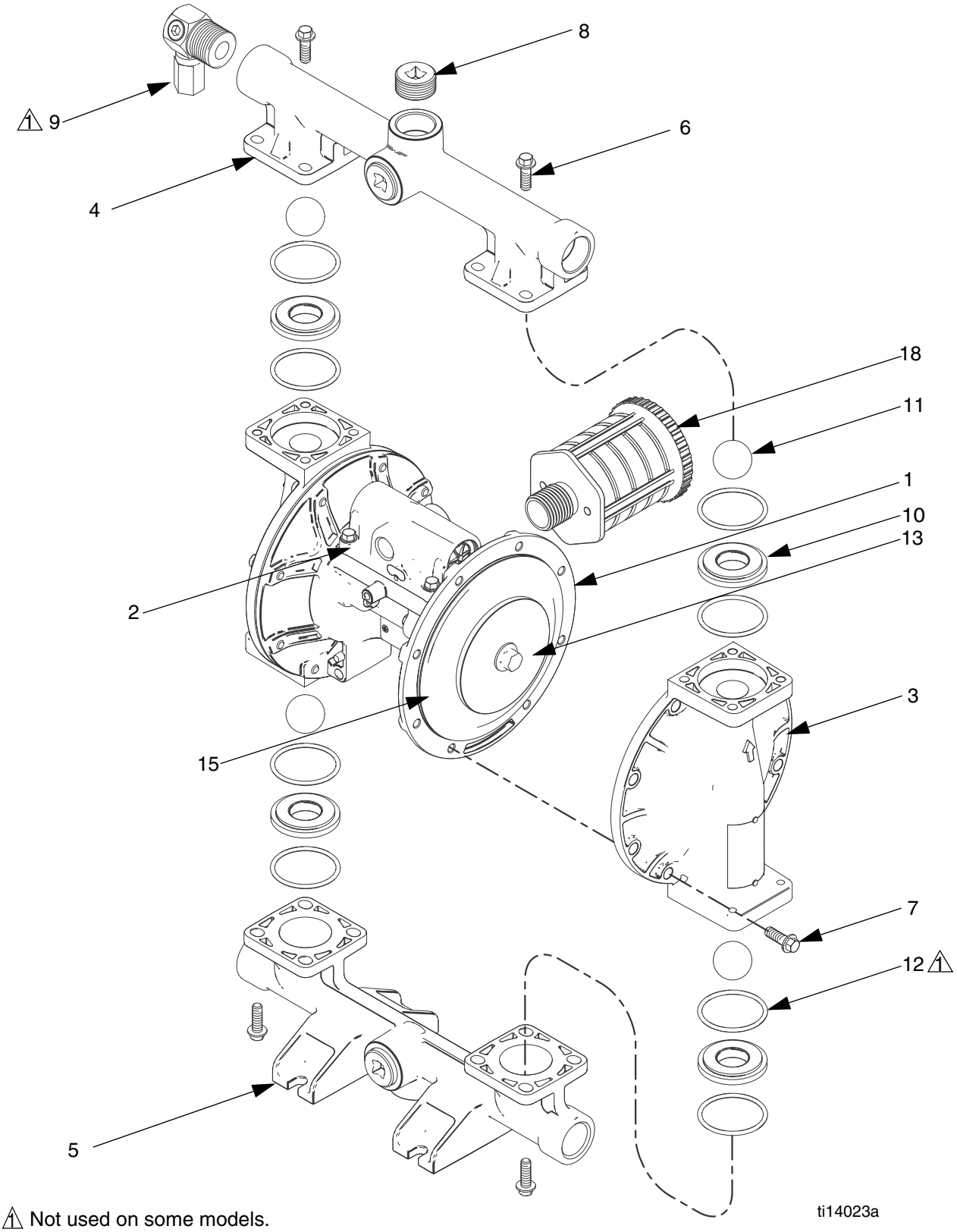
Parts



⚠ Not used on some models.

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Parts/Kits Quick Reference

Use this table as a quick reference for parts/kits. See pages indicated in table for full description of kit contents.

Ref.	Part/Kit	Description	Qty.
1	Varies	Center Section; not sold separately, *see page 18*	1
		Aluminum	
		Conductive Polypropylene	
		Polypropylene	
2	Varies	Air Valve; *see page 20*	1
3		Fluid Cover Kits; *see page 24*	2
	24B653	Aluminum	
	24C051	Conductive Polypropylene	
	24D347	Hastelloy	
	24C050	Polypropylene	
	24C052	PVDF	
	24C061	Hastelloy	
4		Outlet Manifold Kits; *see page 24*	1
	24B649	Aluminum, npt	
	24B650	Aluminum, bspt	
	24C039	Conductive Poly, center flange	
	24C042	Conductive Poly, end flange	
	24D343	Hastelloy, npt	
	24D344	Hastelloy, bspt	
	24C038	Polypropylene, center flange	
	24C041	Polypropylene, end flange	
	24C040	PVDF, center flange	
	24C043	PVDF, end flange	
	24C057	Stainless Steel, npt	
	24C058	Stainless Steel, bspt	
5		Inlet Manifold Kits; *see page 25*	1
	24B651	Aluminum, npt	
	24B652	Aluminum, bspt	
	24C045	Conductive Poly, center flange	
	24C048	Conductive Poly, end flange	
	24D345	Hastelloy, npt	
	24D346	Hastelloy, bspt	
	24C044	Polypropylene, center flange	
	24C047	Polypropylene, end flange	
	24C046	PVDF, center flange	
	24C049	PVDF, end flange	
	24C059	Stainless Steel, npt	
	24C060	Stainless Steel, bspt	
6		Manifold Fasteners; 8-pack, *see page 24*	16
	24B654	Aluminum	
	24C056	Conductive Poly, Poly, and PVDF	
	24C064	Stainless Steel and Hastelloy	
7		Fluid Cover Fasteners; 8-pack, *see page 24*	16
	24B654	Aluminum	
	24C055	Conductive Poly, Poly, and PVDF	
	24C063	Stainless Steel or Hastelloy, aluminum center	
	24C056	Stainless Steel or Hastelloy, plastic center	
8	24C617	Plug; 6-pack, aluminum pumps only	6
9	24B910	Pressure Relief Valve; fuel dispense model only, *see page 24*	1

Ref.	Part/Kit	Description	Qty.
10		Seats; 4-pack, includes 8 o-rings where needed, *see page 26*	4
	24B630	Acetal	
	24B631	Aluminum	
	24B632	Buna-N	
	24B638	FKM Fluoroelastomer	
	24B633	Geolast	
	24B635	Polypropylene	
	24B636	Santoprene	
	24B637	Stainless Steel	
	24B634	TPE	
11		Check Balls; 4-pack, includes 8 o-rings, *see page 26*	4
	24B639	Acetal	
	24B640	Buna-N	
	24B643	Neoprene	
	24B644	Neoprene with SST core	
	24B648	FKM Fluoroelastomer	
	24B641	Geolast	
	24B645	PTFE	
	24B646	Santoprene	
	24B647	Stainless Steel	
	24B642	TPE	
12	24B655	Manifold O-Ring (not used on some models); ptfe, 8-pack, *see page 29*	8
13		Fluid Side Diaphragm Plate; included in Air and Fluid Plate Kits, *see page 28*	2
	24C035	Aluminum	
	24C036	Conductive Polypropylene	
	24D342	Hastelloy	
	24C036	Polypropylene	
	24C037	PVDF	
	24C062	Stainless Steel	
14	-----	Air Side Diaphragm Plate (not visible); included in Air and Fluid Plate Kits, *see Part 13 or page 28*	2
15		Diaphragm Kits; *see page 27*	2
	24B622	Buna-N Standard	
	24B629	FKM Fluoroelastomer Standard	
	24B623	Geolast Standard	
	24B628	Santoprene Standard	
	24B624	TPE Standard	
	24B625	Neoprene Overmolded	
	24B626	PTFE Overmolded	
	24B627	PTFE/EPDM Two-Piece	
18	112182	Muffler; 3/4 npt, plastic	1
19		Screw, ground, M5 x 0.8; not shown	1
	116343	Pumps with aluminum air valve	
	116344	Pumps with conductive poly air valve	
20▲	188621	Label, warning (not shown)	1

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

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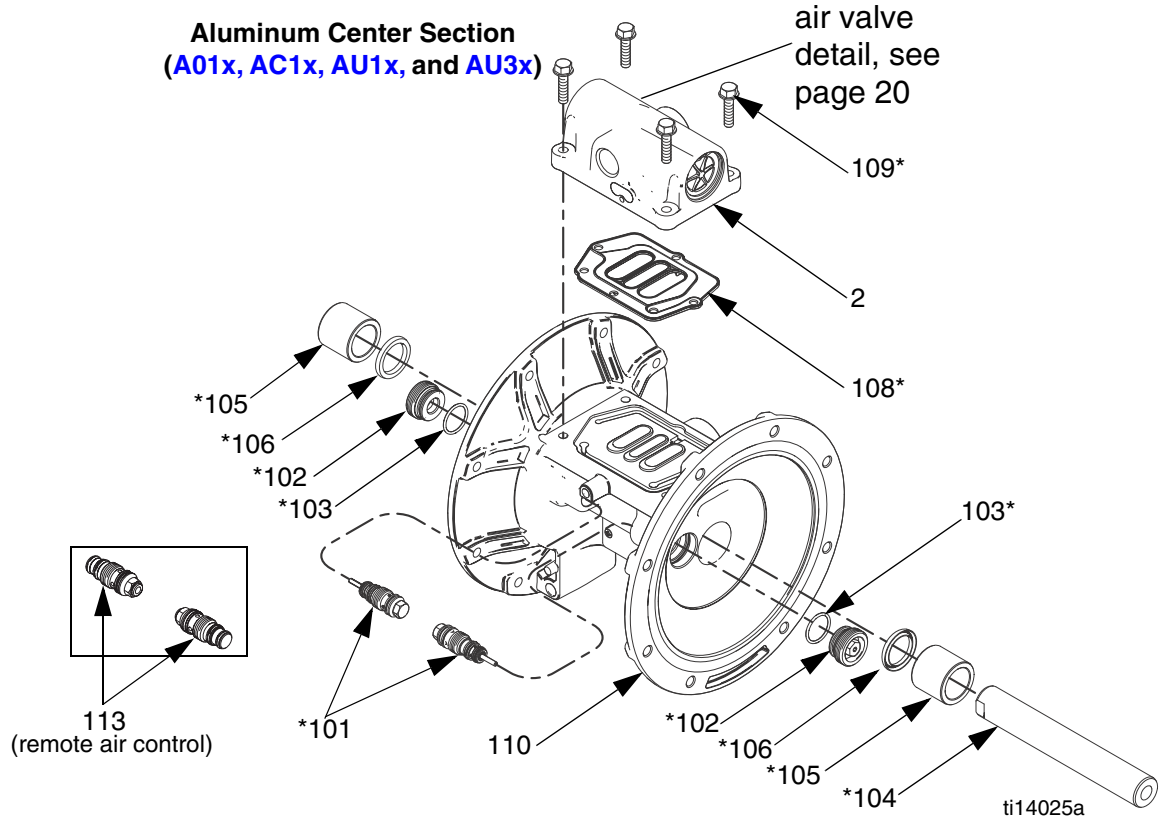
Center Section

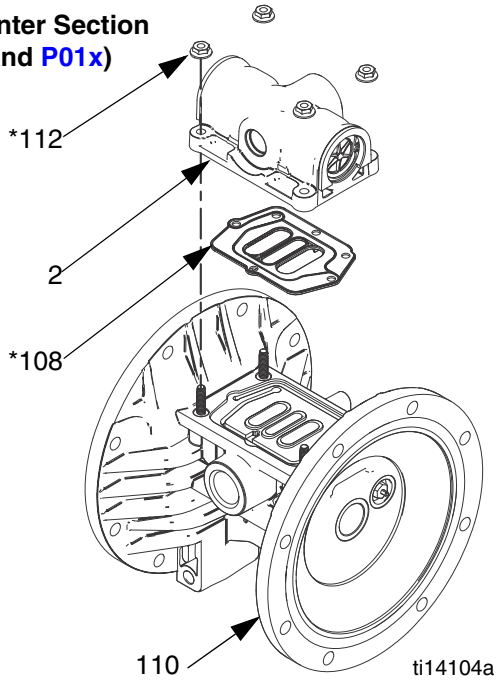
Pump Size and Material		Fluid Covers and Manifolds	Seats	Check Balls	Diaphragm	Manifold O-Rings
1050A	XXXX	A2	AL	BN	TP	PT

Aluminum Center Section
(A01x, AC1x, AU1x, and AU3x)



Ref.	Description	Qty.
101*	VALVE, pilot	2
102*	CARTRIDGES, pilot valve receiver	2
103*	O-RING, receiver cartridge	2
104*	SHAFT, center	1
105*	BEARING, center shaft	2
106*	U-CUP, center shaft	2
108*	GASKET, air valve	1
109*	SCREW, M6 x 25, stainless steel, (for aluminum center section models, Axxx)	4
110	HOUSING, center, not sold separately	1
112*	NUTS (for plastic center section models, C01x and P01x)	4
113	INSERT, remote pilot (for remote air control models, xxxD)	2

Plastic Center Section
(C01x and P01x)



** Included in Center Section Rebuild Kit 24B621*

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Kit 24B621, Center Section Rebuild (*)
All models

Kit includes:
- 2 pilot valves (101)
- 2 pilot cartridges (102)
- 2 cartridge o-rings, buna-N (103)
- 1 center shaft (104)
- 2 center shaft bearings (105)
- 2 center shaft u-cups (106)
- 1 air valve gasket (108)
- 4 bolts, M6 x 25, for A01x pumps (109)
- 4 nuts, for P01x and C01x pumps (112)
- 8 o-rings, PTFE (12)

Kit 24B657, Pilot Valve Assembly
Standard, Pulse Count, and DataTrak with runaway protection models (xxxA, xxxB, and xxxC)

Kit includes:
- 2 pilot valve assemblies (101)
- 2 pilot valve receiver cartridges (102)
- 2 receiver cartridge o-rings (103)

Kit 24D043, Remote Pilot Inserts
Remote air control models (xxxD)

Kit includes:
- 2 remote pilot inserts

Kit 24B656, Center Shaft Kit
All models

Kit includes:
- 1 center shaft (104)
- 2 center shaft bearings (105)
- 2 center shaft u-cups (106)

Kit 24B658, Center Shaft Bearing Kit
All models

Kit includes:
- 2 center shaft bearings (105)
- 2 center shaft u-cups (106)

The center housing (110) is not sold separately.

Ground Screws

Center Section Material		Ground Screw (19)
A01A-A01D, AU1A, AU3A, and AC1A	Aluminum	116343
C01A-C01D	Conductive Polypropylene	116344
P01A-P01D	Polypropylene	None

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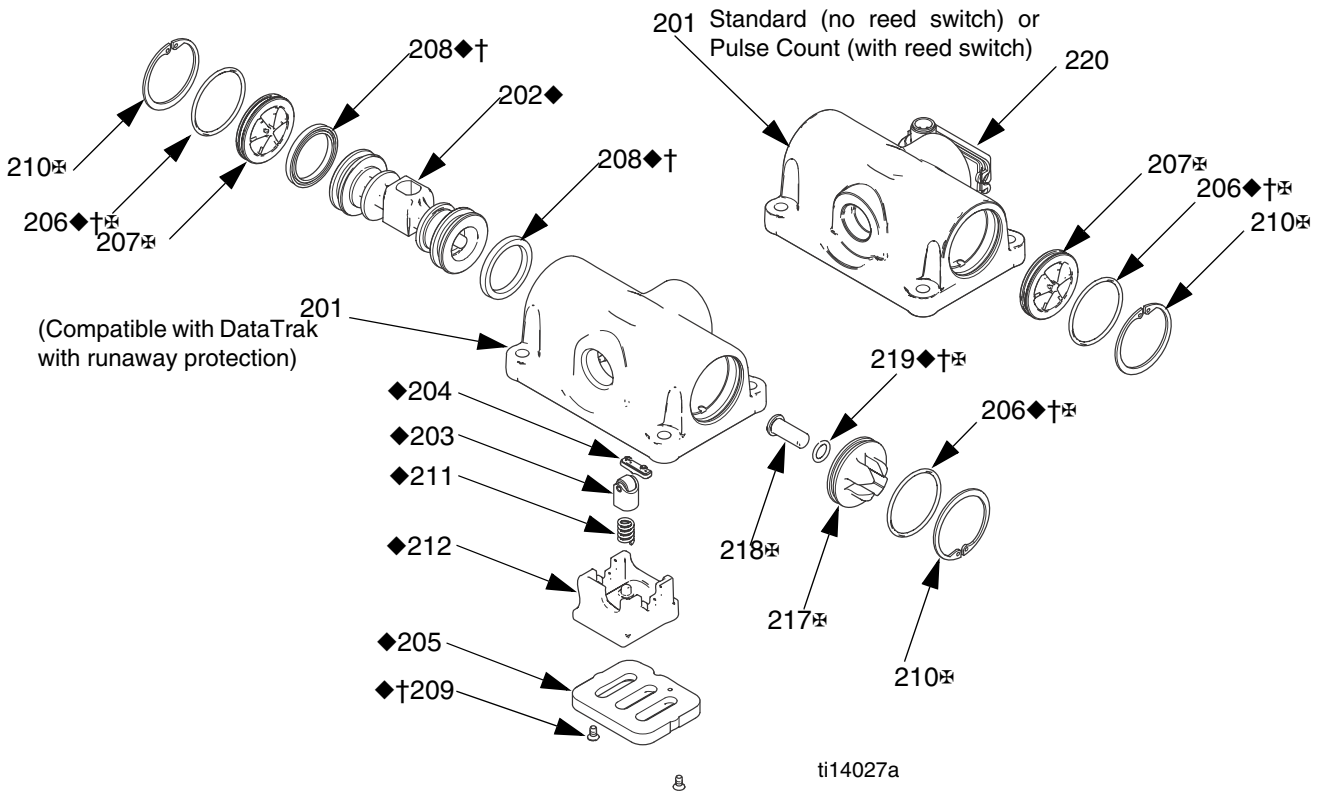
Air Valve and Data Monitoring



Ref.	Description	Qty.
201	HOUSING, not sold separately	1
202◆	PISTON	1
203◆	DETENT PISTON ASSEMBLY	1
204◆	CAM, detent	1
205◆	PLATE, air valve	1
206◆†✠	O-RING	2
207✠	CAP, end Standard (xxxA), Pulse Count (xxxB), or Remote (xxxD) DataTrak (xxxC)	 2 1
208◆†	U-CUP	2
209◆†	SCREW	2
210◆✠	RETAINING RING	2
211◆	DETENT SPRING	1
212◆	CUP	1
217✠	CAP, end (for DataTrak models with runaway protection, xxxC)	1
218✠	BUTTON, solenoid release (for DataTrak models with runaway protection, xxxC)	1

Ref.	Description	Qty.
219◆†✠	O-RING (for DataTrak models with runaway protection, xxxC)	1
220	REED SWITCH ASSEMBLY (for Pulse Count models, xxxB, includes fastener)	1

◆*Parts included in Air Valve Repair Kit 24B768.*
† *Parts included in Air Valve Seals Kit 24B769.*
✠ *Parts included in Air Valve End Cap Kit. See page 21.*

Kit 24B769, Air Valve Seals (†)
All Models

Kit includes:

- 2 end cap o-rings (206)
- 2 piston u-cups (208)
- 2 screws, M3, shorter (209, for metal pumps)
- 2 screws, #4, longer (209, for plastic pumps)
- 1 solenoid release button o-ring (219)
- 1 air valve gasket (108)

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Air Valve End Cap Kits (⌘)

Standard or **Pulse Count** (no runaway protection solenoid) kits include:

- 2 end caps (207)
- 2 retaining rings (210)
- 2 o-rings (206)

Center Section Material		Monitoring	Air Valve End Cap Kit
AxxA, A01B, or A01D	Aluminum	Standard, Pulse Count, or Remote	24A361
C01A, C01B, or C01D	Conductive Polypropylene	Standard, Pulse Count, or Remote	24C053
P01A, P01B, or P01D	Polypropylene	Standard, Pulse Count, or Remote	24C053

DataTrak (runaway protection solenoid) Kits include:

- 1 standard end cap (207)
- 1 end cap with opening (217)
- 2 retaining rings (210)
- 2 o-rings (206)
- solenoid release button (218)
- o-ring for button (219)

Center Section Material		Monitoring	Air Valve End Cap Kit
A01C	Aluminum	DataTrak, with runaway protection	24A363
C01C	Conductive Polypropylene	DataTrak, with runaway protection	24C054
P01C	Polypropylene	DataTrak, with runaway protection	24C054

Air Valve Repair (◆)

Kits include:

- 1 air valve piston (202)
- 1 detent piston assembly (203)
- 1 detent cam (204)
- 1 air valve plate (205)
- 2 end cap o-rings (206)
- 2 piston u-cups (208)
- 2 screws, M3, shorter (209, for metal pumps)
- 2 screws, #4, longer (209, for plastic pumps)
- 1 detent spring (211)
- 1 air cup (212)
- 1 solenoid release button o-ring (219)
- 1 air valve gasket (108)

Center Section Number	Air Valve Style	Air Valve Repair Kit
A01A-A01C, AU1A, AU3A, AC1A, C01A-C01C, P01A-P01C	Standard, Pulse Count, DataTrak with Runaway Protection	24B768
A01D, C01D, P01D	Remote Air Control	24D044

Remote Air Control Conversion Kits

Kits include:

- 1 air valve assembly (2) with restrictor
- 1 air valve gasket (108)
- 4 screws (109; models with aluminum centers)
  OR
- 4 nuts (112; models with plastic centers)
- 2 remote pilot inserts

Air Valve Material	Conversion Kit
Aluminum	24D037
Conductive Polypropylene	24D039
Polypropylene	24D038

Pulse Count Kit

Kit includes:

- reed switch module (220)
- mounting screw

Air Valve Material	Pulse Count Kit
Aluminum	24B798
Conductive Polypropylene or Polypropylene	24B796

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Complete Air Valve Replacement Kits

Kits include:

- 1 air valve assembly (2)
- 1 air valve gasket (108)
- 4 screws (109; models with aluminum centers) **OR**
- 4 nuts (112; models with plastic centers)

Center Section Material		Monitoring	Air Valve Replacement Kit
AxxA	Aluminum	Standard (no monitoring)	24B766
A01B		Pulse Count	24B766
A01C		DataTrak, with runaway protection	24B767
A01D		Remote	24D040
C01A	Conductive Polypropylene	Standard (no monitoring)	24B775
C01B		Pulse Count	24B775
C01C		DataTrak, with runaway protection	24B776
C01D		Remote	24D042
P01A	Polypropylene	Standard (no monitoring)	24B773
P01B		Pulse Count	24B773
P01C		DataTrak, with runaway protection	24B774
P01D		Remote	24D041

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Fluid Covers and Manifolds

Pump Size and Material	Air Valve and Center Section		Seats	Check Balls	Diaphragm	Manifold O-Rings
1050A	A01A	XX	AL	BN	TP	PT

Manifold Fasteners (9)

Fluid Cover and Manifold Material		Kit	Description	Qty.
A1, A2	Aluminum	24B654	BOLT, hex head, steel, M8 x 25	8
C1, C2 P1, P2, F1, F2	Cond. poly Polypropylene PVDF	24C056	BOLT, flange head, M8 x 32, stainless steel, includes nuts	8
S1, S2, H1, H2 with any center (Axxx, Cxxx, or Pxxx)	Stainless steel Hastelloy	24C064	BOLT, hex head, M8 x 20, stainless steel, includes nuts	8

Fluid Cover Fasteners (7)

Fluid Cover and Manifold Material		Kit	Description	Qty.
A1, A2	Aluminum	24B654	BOLT, hex head, steel, M8 x 25	8
C1, C2 P1, P2, F1, F2	Cond. poly Polypropylene PVDF	24C055	BOLT, flange head, M8 x 45, stainless steel, includes nuts	8
S1, S2, H1, H2 aluminum center (Axxx)	Stainless steel Hastelloy	24C063	BOLT, flange head, M8 x 25, stainless steel	8
S1, S2, H1, H2 plastic center (Cxxx or Pxxx)	Stainless steel Hastelloy	24C056	BOLT, flange head, M8 x 32, stainless steel, includes nuts	8

Fluid Covers

Kits include:

- 1 fluid cover (3)
- 4 o-rings, ptfe (12)

Fluid Cover and Manifold Material		Fluid Cover Kit
A1, A2	Aluminum	24B653
C1, C2	Conductive Polypropylene	24C051
H1, H2	Hastelloy	24D347
P1, P2	Polypropylene	24C050
F1, F2	PVDF	24C052
S1, S2	Stainless Steel	24C061

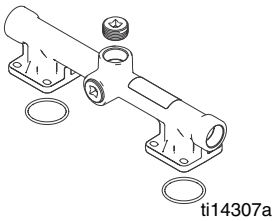
Kit 24B910, Fluid Pressure Relief Valve
Fuel Dispense Model only

Kit includes:

- 1 valve, 3/8 nptf (9)

NOTE: See page 29 for manifold o-rings (12).

Aluminum Outlet Manifold


ti14307a

Kits include:

- 1 outlet manifold (4)
- 3 pipe plugs (8)
- 4 o-rings, ptfe (12)
- 1 warning label (20▲)

Fluid Cover and Manifold Material		Porting	Outlet Manifold Kit
A1	Aluminum	npt	24B649
A2	Aluminum	bspt	24B650

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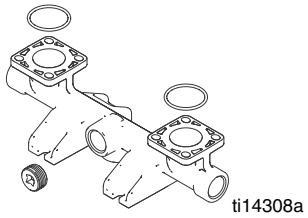
Aluminum Inlet Manifolds

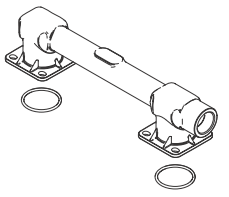

ti14308a

Kits include:

- 1 inlet manifold (5)
- 3 pipe plugs (8)
- 4 o-rings, ptfe (12)

Fluid Cover and Manifold Material		Porting	Inlet Manifold Kit
A1	Aluminum	npt	24B651
A2	Aluminum	bspt	24B652

Hastelloy and Stainless Steel Outlet Manifolds

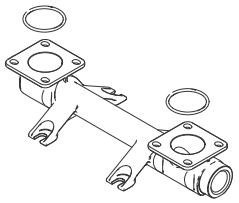

ti14313a

Kits include:

- 1 outlet manifold (4)
- 4 o-rings, ptfe (12)
- 1 warning label (20▲)

Fluid Cover and Manifold Material		Porting	Outlet Manifold Kit
H1	Hastelloy	npt	24D343
H2	Hastelloy	bspt	24D344
S1	Stainless Steel	npt	24C057
S2	Stainless Steel	bspt	24C058

Hastelloy and Stainless Steel Inlet Manifolds

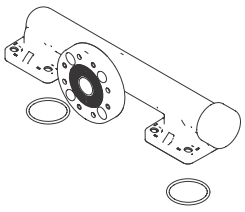

ti14314a

Kits include:

- 1 inlet manifold (5)
- 4 o-rings, ptfe (12)

Fluid Cover and Manifold Material		Porting	Inlet Manifold Kit
H1	Hastelloy	npt	24D345
H2	Hastelloy	bspt	24D346
S1	Stainless Steel	npt	24C059
S2	Stainless Steel	bspt	24C060

Plastic Outlet Manifolds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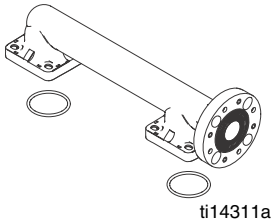
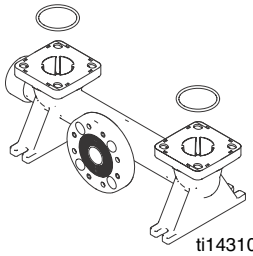

ti14311a

Kits include:

- 1 outlet manifold (4)
- 4 o-rings, ptfe (12)
- 1 warning label (20▲)

Fluid Cover and Manifold Material		Porting	Outlet Manifold Kit
C1	Conductive Poly	Center flange	24C039
C2	Cond. Poly	End flange	24C042
P1	Polypropylene	Center flange	24C038
P2	Polypropylene	End flange	24C041
F1	PVDF	Center flange	24C040
F2	PVDF	End flange	24C043

Plastic Inlet Manifolds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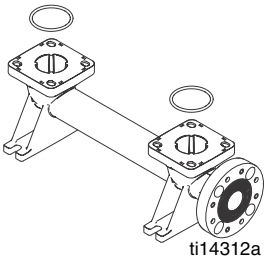
ti14312a

Kits include:

- 1 inlet manifold (5)
- 4 o-rings, ptfe (12)

Fluid Cover and Manifold Material		Porting	Inlet Manifold Kit
C1	Conductive Poly	Center flange	24C045
C2	Conductive Poly	End flange	24C048
P1	Polypropylene	Center flange	24C044
P2	Polypropylene	End flange	24C047
F1	PVDF	Center flange	24C046
F2	PVDF	End flange	24C049

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

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Pump Size and Material	Air Valve and Center Section	Fluid Covers and Manifolds			Diaphragm	Manifold O-Rings
1050A	A01A	A2	XX	XX	TP	PT

Seats

NOTE: Some kits may not be available for your model. See the selector tool at www.graco.com or speak with your distributor.

Kits include:

- 4 seats, material indicated in table (10)
- 8 o-rings, PTFE, included unless table says “not used” (12)

Seat Material		Kit
AC	Acetal	24B630
AL	Aluminum	24B631
BN	Buna-N (o-rings not used)	24B632
FK	FKM Fluoroelastomer (o-rings not used)	24B638
GE	Geolast	24B633
PP	Polypropylene	24B635
PV	PVDF	24C721
SP	Santoprene	24B636
SS	Stainless steel	24B637
TP	TPE (o-rings not used)	24B634

Check Balls

NOTE: Some kits may not be available for your model. See the selector tool at www.graco.com or speak with your distributor.

Kits Include:

- 4 balls, material indicated in table (11)
- 8 o-rings, PTFE (12)

Check Ball Material		Kit
AC	Acetal	24B639
BN	Buna-N	24B640
CR	Neoprene®	24B643
CW	Neoprene® with stainless steel core	24B644
FK	FKM Fluoroelastomer	24B648
GE	Geolast®	24B641
PT	PTFE	24B645
SP	Santoprene®	24B646
SS	Stainless Steel	24B647
TP	TPE	24B642

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Diaphragms

Pump Size and Material	Air Valve and Center Section	Fluid Covers and Manifolds	Seats	Check Balls		Manifold O-Rings
1050A	A01A	A2	AL	BN	XX	PT

NOTE: Some kits may not be available for your model. See the selector tool at www.graco.com or speak with your distributor.

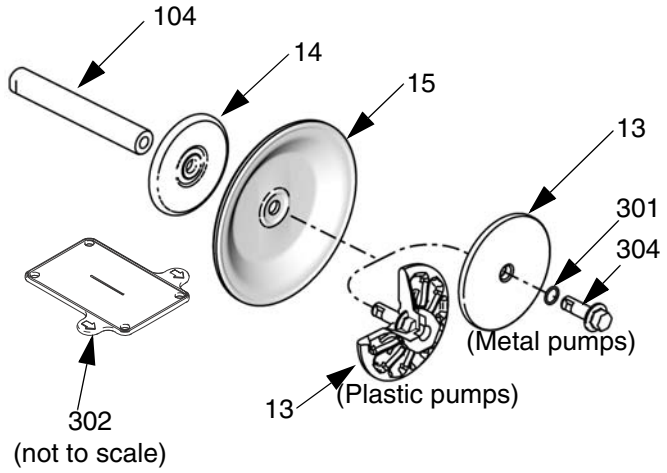
Standard Diaphragms

Kits include:

- 8 o-rings, ptfe (12)
- 2 diaphragms (15, material indicated in table)
- 2 o-rings for the bolt (301, used only on metal pumps)
- 1 diaphragm install tool (302)

NOTE: See page **28** to order a diaphragm shaft bolt (304) if needed.

Diaphragm Material		Kit
BN	Buna-N	24B622
FK	FKM Fluoroelastomer	24B629
GE	Geolast	24B623
SP	Santoprene	24B628
TP	TPE	24B624



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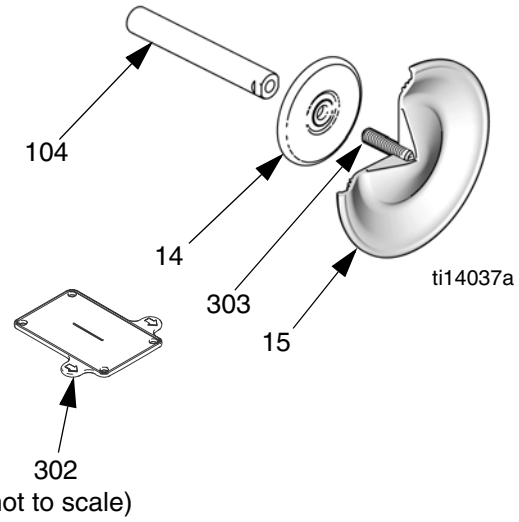
Overmolded Diaphragms

Kits include:

- 8 o-rings, ptfe (12)
- 2 overmolded diaphragms (15, material indicated in table)
- 2 diaphragm set screws, stainless steel (303)
- 1 diaphragm install tool (302)

NOTE: See page **28** to order a diaphragm shaft bolt (304) if needed.

Diaphragm Material		Kit
CO	Neoprene	24B625
PO	PTFE	24B626



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Diaphragms (continued)

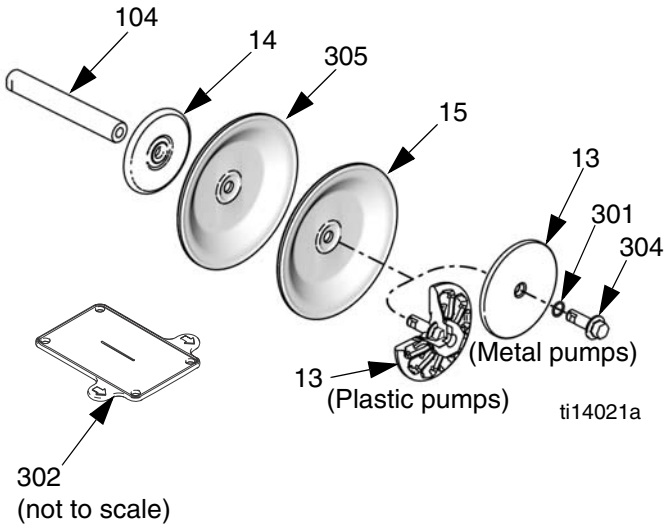
Pump Size and Material	Air Valve and Center Section	Fluid Covers and Manifolds	Seats	Check Balls		Manifold O-Rings
1050A	A01A	A2	AL	BN	XX	PT

Two-Piece Diaphragms

Kits include:

- 8 o-rings, PTFE (12)
- 2 diaphragms, PTFE (15)
- 2 backup diaphragms, EPDM (305)
- 2 o-rings for the bolt (301, used only on metal pumps)
- 1 diaphragm install tool (302)

Diaphragm Material		Kit
PT	PTFE and EPDM	24B627



Air and Fluid Plates

Kits for **aluminum, hastelloy, and stainless steel** pumps include:

- air side diaphragm plate (14)
- fluid side diaphragm plate (13)
- o-ring (301)
- bolt (304)

Kits for **polypropylene, conductive polypropylene,** and **PVDF** pumps include:

- air side diaphragm plate (14)
- fluid side diaphragm plate (13, includes bolt)

Pump Material	Air and Fluid Plate Kit
Aluminum	24C035
Conductive Polypropylene	24C036
Hastelloy	24D342
Polypropylene	24C036
PVDF	24C037
Stainless Steel	24C062

Diaphragm Shaft Bolt (Metal Pumps)

Kit 24C099 includes:

- 8 bolts, stainless steel, M12 x 35 (304)
- 8 o-rings (301)

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Manifold O-Rings

Pump Size and Material	Air Valve and Center Section	Fluid Covers and Manifolds	Seats	Check Balls	Diaphragm	
1050A	A01A	A2	AL	BN	TP	XX

Kit Includes:

- 8 o-rings, PTFE (12)

O-Ring	Kit	Qty.
PT	24B655	8
--	Model includes no o-rings	0

DataTrak

NOTE: See DataTrak manual, 313840, for all DataTrak related part numbers and kit information, including the reed switch and solenoid.

Accessories

Fluid Pressure Relief Kit 238428
(for aluminum pumps)
Includes pipe bushings, hose adapter, relief valve, and tubing.

Fluid Pressure Relief Kit 112119
(for plastic pumps)
Includes fluid pressure relief valve.

Wall Mount Kit 24C637
Includes bracket, 4 dampeners, 8 washers, and 8 lock nuts.

Wall Bracket Dampener Kit 24E769
Includes 4 dampeners.

Rubber Foot Mounting Kit 236452
Includes washers, nuts, and rubber feet.

Grounding Wire Assembly Kit 238909
Includes ground wire and clamp.

Air Controls Kit 246946
Includes 1/4 npt air filter/regulator with 40 micron element and air pressure gauge.

Air Controls Kit 246947
Includes 1/2 npt air filter/regulator with 40 micron element and air pressure gauge.

Standard Pipe Flange Kits
239005 - Polypropylene
239008 - Stainless steel
239009 - PVDF
Each kit includes the pipe flange, a PTFE gasket, bolts, spring lock washers, flat washers and nuts.

Low-Ice Muffler
Part No. 102656, 3/4 npt, aluminum.

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Technical Data

Maximum fluid working pressure	125 psi (0.86 MPa, 8.6 bar)
Air pressure operating range	20-125 psi (0.14-0.86 MPa, 1.4-8.6 bar)
Fluid displacement per cycle	0.17 gal. (0.64 liters)
Air consumption at 70 psi (0.48 MPa, 4.8 bar), 20 gpm (76 lpm)	25 scfm
Maximum values with water as media under submerged inlet conditions at ambient temperature:	
Maximum air consumption	67 scfm
Maximum free-flow delivery	50 gpm (189 lpm)
Maximum pump speed	280 cpm
Maximum suction lift	16 ft (4.9 m) dry, 29 ft (8.8 m) wet
Maximum size pumpable solids	1/8 in. (3.2 mm)
Sound Power*	
at 70 psi (0.48 MPa, 4.8 bar) and 50 cpm	78 dBa
at 100 psi (0.7 MPa, 7.0 bar) and full flow	90 dBa
Sound Pressure**	
at 70 psi (0.48 MPa, 4.8 bar) and 50 cpm	84 dBa
at 100 psi (0.7 MPa, 7.0 bar) and full flow	96 dBa
Fluid temperature range	see page 31
Air inlet size	1/2 npt(f)
Fluid inlet size	
Aluminum (1050A), Hastelloy (1050H) or Stainless Steel (1050S)	1 in. npt(f) or 1 in. bspt
Conductive Poly (1050C), Polypropylene (1050P), or PVDF (1050F)	1 in. raised face ANSI/DIN flange
Fluid outlet size	
Aluminum (1050A), Hastelloy (1050H) or Stainless Steel (1050S)	1 in. npt(f) or 1 in. bspt
Conductive Poly (1050C), Polypropylene (1050P), or PVDF (1050F)	1 in. raised face ANSI/DIN flange
Weight	
Aluminum (1050A)	23 lb. (10.5 kg)
Conductive Polypropylene (1050C) and Polypropylene (1050P)	18 lb. (8.2 kg)
Hastelloy	41 lb. (18.6 kg)
PVDF (1050F)	26 lb (11.8 kg)
Stainless Steel (1050S)	
with conductive polypropylene center	36.3 lb. (16.5 kg)
with polypropylene center	37.3 lb. (16.9 kg)
with aluminum center	41.4 lb. (18.8 kg)
Wetted parts include material(s) chosen for seat, ball, and diaphragm options, **plus** the pump's material of construction	
1050A	Aluminum
1050H	Hastelloy
1050C and 1050P	Polypropylene
1050F	PVDF
1050S	Stainless Steel

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Non-wetted external parts

Aluminum (1050A)	aluminum, coated carbon steel
Hastelloy (1050H)	hastelloy, stainless steel, polypropylene or aluminum (if used in center section)
Plastic (1050P, 1050C, and 1050F)	stainless steel, polypropylene
Stainless Steel (1050S)	stainless steel, polypropylene or aluminum (if used in center section)

** Sound power measured per ISO-9614-2.*
*** Sound pressure was tested 3.28 ft (1 m) from equipment.*

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Fluid Temperature Range

NOTICE

Temperature limits are based on mechanical stress only. Certain chemicals will further limit the fluid operating temperature range. Stay within the temperature range of the most-restricted wetted component. Operating at a fluid temperature that is too high or too low for the components of your pump may cause equipment damage.

	Fluid Temperature Range					
	Aluminum, Hastelloy, or Stainless Steel Pumps		Polypropylene or Conductive Polypropylene Pumps		PVDF Pumps	
Diaphragm/Ball/Seat Material	Fahrenheit	Celsius	Fahrenheit	Celsius	Fahrenheit	Celsius
Acetal (AC)	10° to 180°F	-12° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
Buna-N (BN)	10° to 180°F	-12° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
FKM Fluoroelastomer (FK)*	-40° to 275°F	-40° to 135°C	32° to 150°F	0° to 66°C	10° to 225°F	-12° to 107°C
Geolast® (GE)	-40° to 150°F	-40° to 66°C	32° to 150°F	0° to 66°C	10° to 150°F	-12° to 66°C
Neoprene overmolded diaphragm (CO) or Neoprene check balls (CR or CW)	0° to 180°F	-18° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
Polypropylene (PP)	32° to 150°F	0° to 66°C	32° to 150°F	0° to 66°C	32° to 150°F	0° to 66°C
PTFE overmolded diaphragm (PO)	40° to 180°F	4.0° to 82°C	40° to 150°F	4° to 66°C	40° to 180°F	4.0° to 82°C
PTFE check balls or two-piece PTFE/EPDM diaphragm (PT)	40° to 220°F	4° to 104°C	40° to 150°F	4° to 66°C	40° to 220°F	4° to 104°C
PVDF (PV)	10° to 225°F	-12° to 107°C	32° to 150°F	0° to 66°C	10° to 225°F	-12° to 107°C
Santoprene® (SP)	-40° to 180°F	-40° to 82°C	32° to 150°F	0° to 66°C	10° to 180°F	-12° to 82°C
TPE (TP)	-20° to 150°F	-29° to 66°C	32° to 150°F	0° to 66°C	10° to 150°F	-12° to 66°C

** The maximum temperature listed is based on the ATEX standard for T4 temperature classification. If you are operating in a non-explosive environment, FKM fluoroelastomer's maximum fluid temperature in aluminum or stainless steel pumps is 320°F (160°C).*

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