

# Merkur™ Bellows Pump Assembly

312795E  
EN

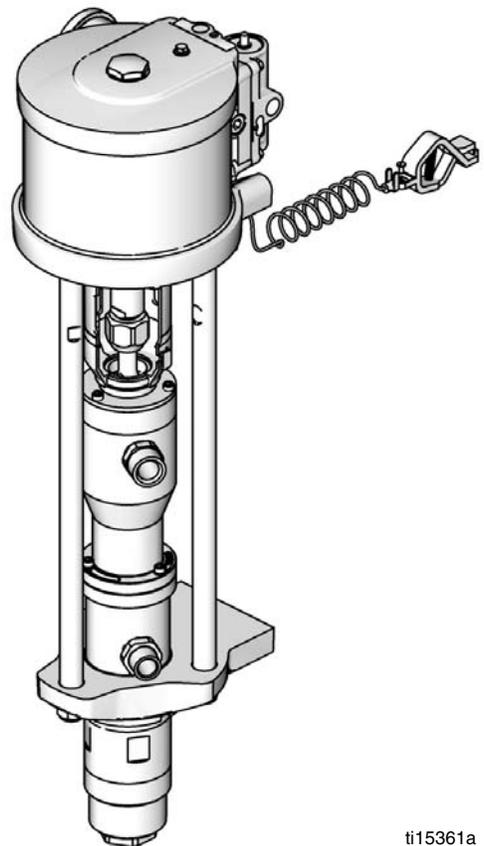
For pumping isocyanates, UV coatings, and other moisture-sensitive materials. For professional use only.



### Important Safety Instructions

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

See page 7 for model information, including maximum working pressure.



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II 2 G c IIB T3 (200°C)



H003

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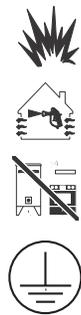
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# Related Manuals

Manual	Description
312793	Merkur Bellows Displacement Pump
312796	NXT™ Air Motor
312799	Merkur Bellows Spray Packages, AA and Airless
312798	Merkur Electrostatic Spray Packages

# 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 symbols refer to procedure-specific risks. When these symbols appear in the body of this manual, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 <b>WARNING</b>	
	<p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>Flammable fumes, such as solvent and paint fumes, in <b>work area</b> can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> <li>• Use equipment only in well ventilated area.</li> <li>• Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).</li> <li>• Keep work area free of debris, including solvent, rags and gasoline.</li> <li>• Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.</li> <li>• Ground all equipment in the work area. See <b>Grounding</b> instructions.</li> <li>• Use only grounded hoses.</li> <li>• Hold gun firmly to side of grounded pail when triggering into pail.</li> <li>• If there is static sparking or you feel a shock, <b>stop operation immediately</b>. Do not use equipment until you identify and correct the problem.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul> <p>Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable vapors. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> <li>• Clean plastic parts only in a well ventilated area.</li> <li>• Do not clean with a dry cloth.</li> <li>• Do not operate electrostatic guns in equipment work area.</li> </ul>
	<p><b>SKIN INJECTION HAZARD</b></p> <p>High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. <b>Get immediate surgical treatment.</b></p> <ul style="list-style-type: none"> <li>• Do not spray without tip guard and trigger guard installed.</li> <li>• Engage trigger lock when not spraying.</li> <li>• Do not point gun at anyone or at any part of the body.</li> <li>• Do not put your hand over the spray tip.</li> <li>• Do not stop or deflect leaks with your hand, body, glove, or rag.</li> <li>• Follow the <b>Pressure Relief Procedure</b> when you stop spraying and before cleaning, checking, or servicing equipment.</li> <li>• Tighten all fluid connections before operating the equipment.</li> <li>• Check hoses and couplings daily. Replace worn or damaged parts immediately.</li> </ul>

# ⚠️ 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** 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.



## MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.

- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.



## SUCTION HAZARD

Powerful suction could cause serious injury.

- Never place hands near the pump fluid inlet when pump is operating or pressurized.



## 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 MSDSs to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear chemically impermeable gloves when spraying, dispensing, or cleaning equipment.



## 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, hearing loss, inhalation of toxic fumes, and burns. This equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

# Important Two-Component Material Information

## Isocyanate Conditions

						
<p>Spraying or dispensing materials containing isocyanates creates potentially harmful mists, vapors, and atomized particulates.</p> <p>Read material manufacturer's warnings and material MSDS to know specific hazards and precautions related to isocyanates.</p> <p>Prevent inhalation of isocyanate mists, vapors, and atomized particulates by providing sufficient ventilation in the work area. If sufficient ventilation is not available, a supplied-air respirator is required for everyone in the work area.</p> <p>To prevent contact with isocyanates, appropriate personal protective equipment, including chemically impermeable gloves, boots, aprons, and goggles, is also required for everyone in the work area.</p>						

## Material Self-ignition

						
<p>Some materials may become self-igniting if applied too thickly. Read material manufacturer's warnings and material MSDS.</p>						

## Keep Components A and B Separate

						
<p>Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination of the equipment's wetted parts, <b>never</b> interchange component A (isocyanate) and component B (resin) parts.</p>						

## Moisture Sensitivity of Isocyanates

Isocyanates (ISO) are catalysts used in two component coatings. ISO will react with moisture (such as humidity) to form small, hard, abrasive crystals, which become suspended in the fluid. Eventually a film will form on the surface and the ISO will begin to gel, increasing in viscosity. If used, this partially cured ISO will reduce performance and the life of all wetted parts.

**NOTE:** The amount of film formation and rate of crystallization varies depending on the blend of ISO, the humidity, and the temperature.

To prevent exposing ISO to moisture:

- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. **Never** store ISO in an open container.
- Use moisture-proof hoses specifically designed for ISO, such as those supplied with your system.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Never use solvent on one side if it has been contaminated from the other side.
- Always lubricate threaded parts with ISO pump oil or grease when reassembling.

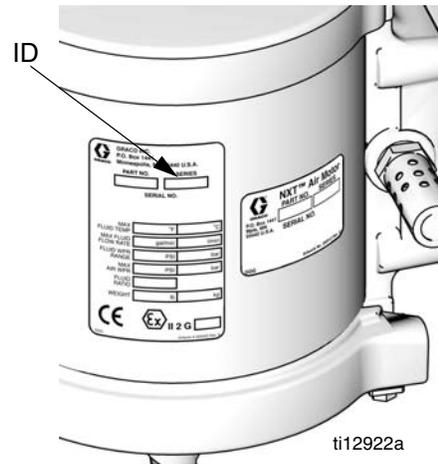
## Changing Materials

- When changing materials, flush the equipment multiple times to ensure it is thoroughly clean.
- Always clean the fluid inlet strainers after flushing.
- Check with your material manufacturer for chemical compatibility.
- Most materials use ISO on the A side, but some use ISO on the B side.

# Models

Check your pump's identification marking (ID) for the 6-digit part number. Use the following matrix to define the construction of your pump, based on the six digits. For example, pump Part No. B05FA0 represents a 5 to 1 ratio, 150 cc pump, with no DataTrak, a low noise exhaust, and v-packings

To order replacement parts, see **Parts** section starting on page 22. The digits in the matrix do not correspond to the reference numbers in the Parts drawings and lists.



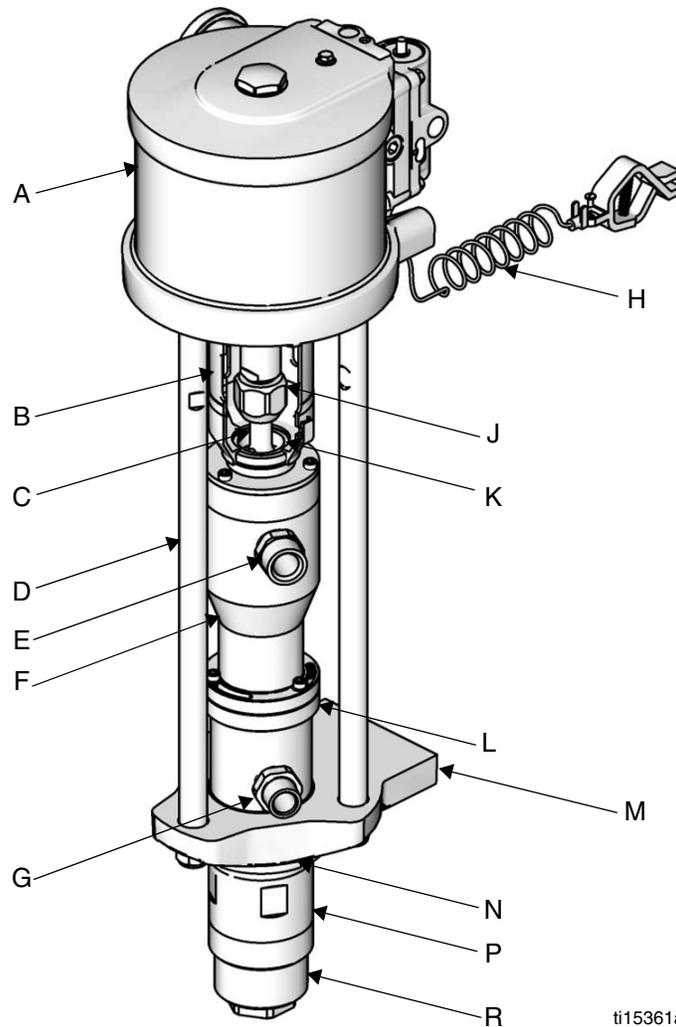
<b>B</b>	<b>05</b>		<b>F</b>	<b>A</b>		<b>0</b>		
<b>First Digit</b>	<b>Second and Third Digit (Ratio)</b>		<b>Fourth Digit (Displacement Pump Volume Per Cycle)</b>		<b>Fifth Digit (Smarts/Exhaust)</b>		<b>Sixth Digit (Packings)</b>	
<b>B</b> (Bellows style)	<b>05</b>	5:1	<b>B</b>	50 cc	<b>A</b>	No DataTrak, low noise exhaust	<b>0</b>	V-packings
	<b>12</b>	12:1	<b>D</b>	100 cc	<b>B</b>	DataTrak Compatible, low noise exhaust	<b>1</b>	U-cup packings
	<b>15</b>	15:1	<b>F</b>	150 cc				
	<b>23</b>	23:1						
	<b>24</b>	24:1						
	<b>25</b>	25:1						
	<b>35</b>	35:1						

\* Cycle refers to combination of one upstroke and one downstroke.

# Pump Data

Model, Series	Air Motor	Displacement Pump	Maximum Fluid Working Pressure psi (MPa, bar)	Flow Rate at 60 cpm gpm (lpm)	Fluid Inlet	Fluid Outlet	Air Inlet
B05FA0, Series A	M04LN0	LB150A	500 (3.4, 34)	2.4 (9.0)	1 in. npt	3/4 in. npt	1/4 in. npt
B05FB0, Series A	M04LT0						
B05FA1, Series A	M04LN0	LB150B					
B05FB1, Series A	M04LT0						
B12DA0, Series A	M07LN0	LB100A	1200 (8.3, 83)	1.6 (6.0)	3/4 in. npt	3/8 in. npt	1/2 in. npt
B12DB0, Series A	M07LT0						
B12DA1, Series A	M07LN0	LB100B					
B12DB1, Series A	M07LT0						
B15BA0, Series A	M04LN0	LB050A	1500 (10.3, 103)	0.8 (3.0)	3/4 in. npt	3/8 in. npt	1/4 in. npt
B15BB0, Series A	M04LT0						
B15BA1, Series A	M04LN0	LB050B					
B15BB1, Series A	M04LT0						
B15FA0, Series A	M12LN0	LB150A	1500 (10.3, 103)	2.4 (9.0)	1 in. npt	3/4 in. npt	1/2 in. npt
B15FB0, Series A	M12LT0						
B15FA1, Series A	M12LN0	LB150B					
B15FB1, Series A	M12LT0						
B23DA0, Series A	M12LN0	LB100A	2300 (15.9, 159)	1.6 (6.0)	3/4 in. npt	3/8 in. npt	1/2 in. npt
B23DB0, Series A	M12LT0						
B23DA1, Series A	M12LN0	LB100B					
B23DB1, Series A	M12LT0						
B24FA0, Series A	M18LN0	LB150A	2400 (16.5, 165)	2.4 (9.0)	1 in. npt	3/4 in. npt	1/2 in. npt
B24FB0, Series A	M18LT0						
B24FA1, Series A	M18LN0	LB150B					
B24FB1, Series A	M18LT0						
B25BA0, Series A	M07LN0	LB050A	2500 (17.2, 172)	0.8 (3.0)	3/4 in. npt	3/8 in. npt	1/2 in. npt
B25BB0, Series A	M07LT0						
B25BA1, Series A	M07LN0	LB050B					
B25BB1, Series A	M07LT0						
B35DA0, Series A	M18LN0	LB100A	3500 (24.1, 241)	1.6 (6.0)	3/4 in. npt	3/8 in. npt	1/2 in. npt
B35DB0, Series A	M18LT0						
B35DA1, Series A	M18LN0	LB100B					
B35DB1, Series A	M18LT0						

# Component Identification



**FIG. 1. Component Identification**

**Key:**

- |   |                 |   |                 |
|---|-----------------|---|-----------------|
| A | Air Motor       | H | Ground Wire     |
| B | Coupler Shield  | J | Coupling Nut    |
| C | Connecting Rod  | K | Coupling Collar |
| D | Tie Rod         | L | Packing Nut     |
| E | Fluid Inlet     | M | Pump Adapter    |
| F | Bellows Chamber | N | Jam Nut         |
| G | Fluid Outlet    | P | Cylinder        |
|   |                 | R | Foot Cap        |



# Installation

## General Information

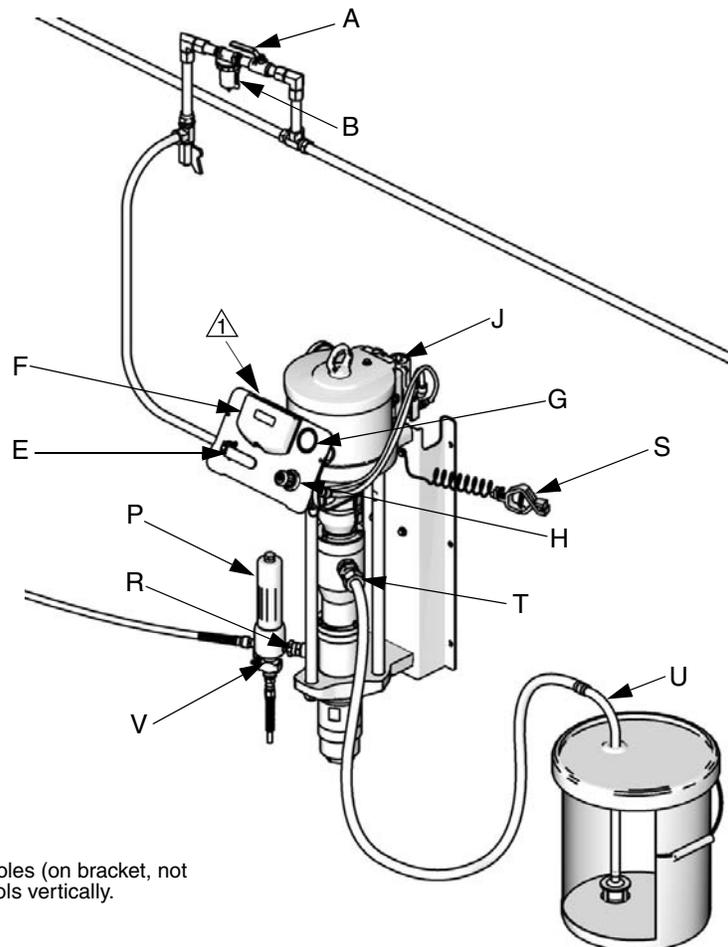
**NOTE:** Reference numbers and letters in parentheses in the text refer to the callouts in the figures and the parts drawing.

**NOTE:** Always use Genuine Graco Parts and Accessories, available from your Graco distributor. If you supply your own accessories, be sure they are adequately sized and pressure-rated for your system.

FIG. 2 and FIG. 3 are only guides for selecting and installing system components and accessories. Contact your Graco distributor for assistance in designing a system to suit your particular needs.

## Prepare the Operator

All persons who operate the equipment must be trained in the operation of all system components as well as the proper handling of all fluids. All operators must thoroughly read all instruction manuals, tags, and labels before operating the equipment.



 Use alternate mounting holes (on bracket, not visible) to mount air controls vertically.

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**FIG. 2: Typical Wall-Mount Installation**

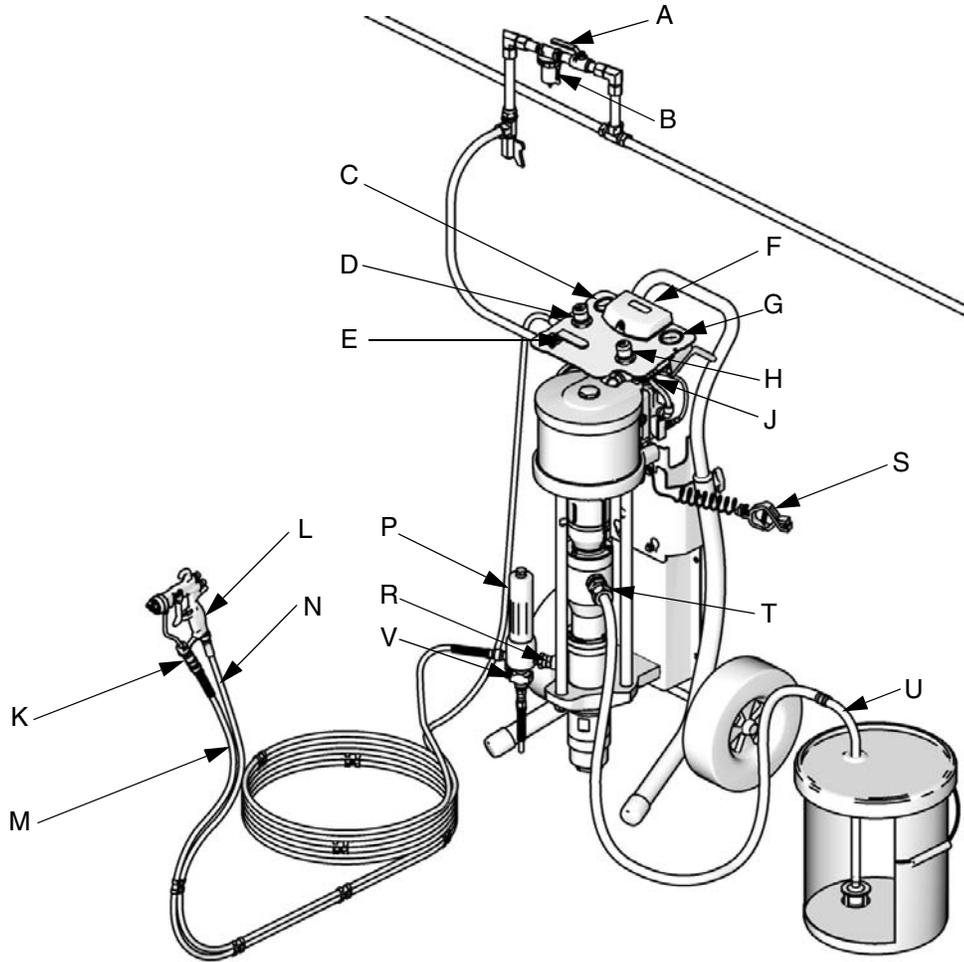
## Prepare the Site

Ensure that you have an adequate compressed air supply.

Bring a compressed air supply line from the air compressor to the pump location. Be sure all air hoses are properly sized and pressure-rated for your system. Use only electrically conductive hoses.

Keep the site clear of any obstacles or debris that could interfere with the operator's movement.

Have a grounded, metal pail available for use when flushing the system.



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**FIG. 3: Typical Cart-Mount Installation**

**Key:**

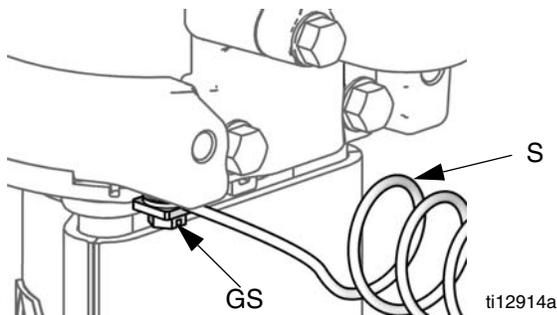
- A Air Shutoff Valve
- B Air Filter (optional accessory)
- C Gun Air Pressure Gauge
- D Gun Air Pressure Regulator
- E Bleed Type Master Air Valve
- F DataTrak
- G Pump Air Pressure Gauge
- H Pump Air Pressure Regulator
- J Solenoid Release Button (not visible)
- K Gun Swivel
- L Air-Assisted Spray Gun

- M Gun Fluid Supply Hose
- N Gun Air Supply Hose
- P Fluid Filter
- R Pump Fluid Outlet
- S Grounding Wire
- T Pump Fluid Inlet
- U Suction Hose
- V Fluid Drain Valve

## Grounding

						
<p>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.</p>						

**Pump:** See FIG. 4. Verify that the ground screw (GS) is attached and tightened securely to the air motor. Connect the other end of the ground wire (S) to a true earth ground.



**FIG. 4. Ground the Pump.**

**Air and fluid hoses:** Static electricity may build up when fluids flow through pumps, hoses, and sprayers. At least one hose must be electrically conductive, with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity. Check electrical resistance of hose. If total resistance to ground exceeds 25 meg-ohms, replace hose immediately.

**Air compressor:** follow manufacturer's recommendations.

**Spray gun / Dispense valve:** Ground the spray gun through connection to a Graco-approved grounded fluid hose.

**Fluid supply container:** follow local code.

**Object being sprayed:** 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.

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

## Mount the Pump

Mount the pump directly to the wall (order Wall Mounting Kit, page 24) or to a Graco cart (order Cart Mounting Kit 24E879). Pump dimensions are shown on page 30.

### Wall-Mounted Pumps

1. Be sure the wall can support the weight of the pump, bracket, hoses and accessories, as well as the stress caused during operation.
2. Position the wall bracket about 1.2-1.5 m (4-5 ft) above the floor. For ease of operation and service, make sure the pump air inlet, fluid inlet, and fluid outlet ports are easily accessible.
3. Using the wall bracket as a template, drill 10 mm (0.4 in.) mounting holes in the wall. Wall mounting dimensions are shown on page 31.
4. Attach the bracket to the wall. Use 9 mm (3/8 in.) screws that are long enough to keep the pump from vibrating during operation.

**NOTE:** Be sure the pump is level.

### Cart-Mounted Pumps

Kit 24E885 is available if you plan to bolt your cart to the floor. It includes two spacers that keep the legs stable. Bolts not included.

## Air and Fluid Hoses

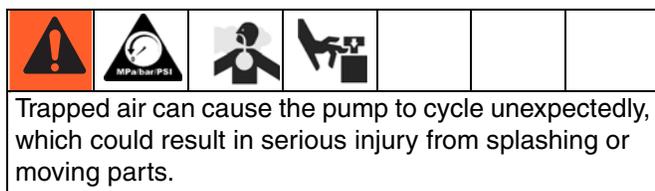
Be sure all air hoses (N) and fluid hoses (M) are properly sized and pressure rated for your system. See FIG. 3. Use only electrically conductive fluid hoses.

## Accessories

Install the following accessories in the order shown in FIG. 2 or FIG. 3, using adapters as necessary.

### Air Line

- **Bleed-type master air valve (E):** required in your system to relieve air trapped between it and the air motor and gun when the valve is closed. Do not block access to the valve.



Be sure the valve is easily accessible from the pump and located downstream from the air regulator.

- **Pump air regulator (H):** controls pump speed and outlet pressure. Locate it close to the pump.
- **Air line filter (B):** removes harmful dirt and moisture from compressed air supply.

- **Air shutoff valve (A):** isolates air line accessories for servicing. Locate upstream from all other air line accessories.
- **Gun air regulator (D):** controls air pressure to the air-assisted spray gun.

### Fluid Line

- **Fluid filter (P):** with a 60 mesh (250 micron) stainless steel element to filter particles from the fluid as it leaves the pump.
- **Fluid drain valve (V):** required in your system, to relieve fluid pressure in the hose and gun.
- **Gun or valve (L):** dispenses the fluid. The gun shown in FIG. 3 is an air-assisted spray gun for light to medium viscosity fluids.
- **Fluid line swivel (K):** for easier gun movement.
- **Suction kit (U):** enables the pump to draw fluid from a container.

# Operation

## Pressure Relief Procedure

						
<p>Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing or moving parts.</p>						

1. Lock the gun trigger.
2. Close the bleed-type master air valve.
3. Unlock the gun trigger.
4. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun to relieve pressure.
5. Lock the gun trigger.
6. Open all fluid drain valves in the system, having a waste container ready to catch drainage. Leave drain valve(s) open until you are ready to spray again.
7. If you suspect that pressure has not been fully relieved after following the steps above, check the following:
  - a. The spray tip may be completely clogged. Very slowly loosen the air cap retaining ring to relieve pressure in the cavity between the ball/seat shutoff and the plugged tip. Clear the tip orifice.
  - b. The gun fluid filter or the fluid hose may be completely clogged. Very slowly loosen the hose end coupling at the gun and relieve pressure gradually. Then loosen completely to clear the obstruction.
  - c. After following the steps above, if the spray tip or hose still seems completely clogged, very slowly loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. With tip removed, trigger gun into waste container.

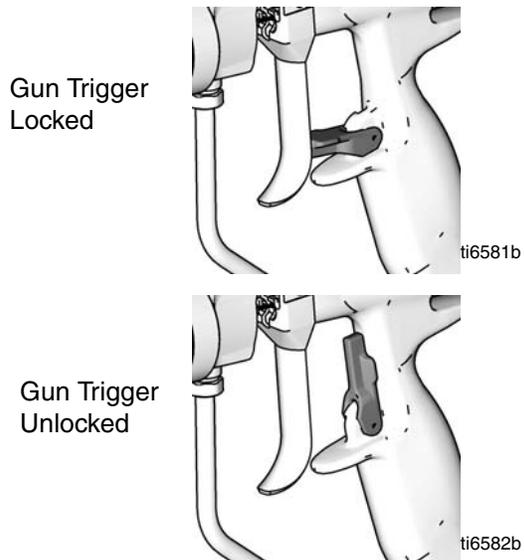
## Flush the Pump Before First Use

The pump is tested with lightweight oil, which is left in to protect the pump parts. If the fluid you are using may be contaminated by the oil, flush it out with a compatible solvent. See **Flushing**, page 16.

## Trigger Lock

						
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Always engage the trigger lock when you stop spraying to prevent the gun from being triggered accidentally by hand or if dropped or bumped.



**FIG. 5. Gun Trigger Lock**

## Prime and Adjust the Pump

### NOTICE

The maximum fluid inlet pressure is 15 psi (0.1 MPa, 1.0 bar). Damage to the bellows may occur if you exceed this pressure. Do not use another pump or checking device to supply the bellows pump.

1. Lock gun trigger. Remove tip guard and spray tip from gun. Refer to gun manual.
2. Close gun air regulator (D) and pump air regulator (H) by turning knobs counterclockwise reducing pressure to zero. Close bleed-type air valve (E). Also verify that all drain valves are closed.
3. Check that all fittings throughout system are tightened securely.
4. Position pail close to pump. Do not stretch suction hose tight; let it hang to assist fluid flow into pump.

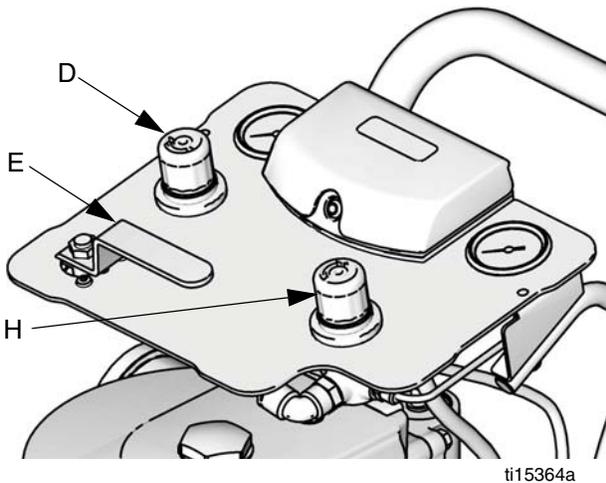


FIG. 6. Air Controls

5. Hold metal part of gun (L) firmly to side of grounded metal pail, unlock trigger, and hold trigger open.
6. Open bleed-type air valve (E). Slowly open the pump air regulator (H) until the pump starts.
7. Cycle pump slowly until all air is pushed out and the pump and hoses are fully primed.
8. Release the gun trigger and engage the trigger lock. Pump should stall against pressure.

9. In a direct supply system, with the pump and lines primed, and with adequate air pressure and volume supplied, the pump will start and stop as the gun/valve is opened and closed.
10. In a circulating system, the pump runs continuously and speeds up or slows down as the system demands until the air supply is shut off.
11. Use the air regulator to control the pump speed and the fluid pressure. Always use the lowest air pressure necessary to get the desired results. Higher pressures cause premature tip/nozzle and pump wear.

### NOTICE

Never allow the pump to run dry of the fluid being pumped. A dry pump quickly accelerates to a high speed, possibly damaging itself. If your pump accelerates quickly, or is running too fast, stop it immediately and check the fluid supply. If the supply container is empty and air has been pumped into the lines, refill the container and prime the pump and the lines with fluid, or flush and leave it filled with a compatible solvent. Be sure to eliminate all air from the fluid system.

## Shutdown and Care of the Pump

For a brief shutdown, **relieve the pressure**, page 14. For a longer shutdown, or overnight, always flush the pump, page 16, and relieve the pressure, page 14.

**NOTE:** If the overflow chamber (optional accessory) contains fluid, unscrew the bottle (103) and discard. If it has not been used, the bottle can remain attached to the cap.



To avoid the buildup of static charge, do not rub the plastic bottle with a dry cloth while it is attached to the pump. Remove the bottle to clean, if needed.

# Maintenance

## Preventive Maintenance Schedule

The operating conditions of your particular system determine how often maintenance is required. Establish a preventive maintenance schedule by recording when and what kind of maintenance is needed, and then determine a regular schedule for checking your system.

## Tighten Threaded Connections

Before each use, check all hoses for wear or damage. Replace as necessary. Check that all threaded connections are tight and leak-free.

## Flushing

						
Read all <b>Warnings</b> . Follow all <b>Grounding</b> instructions. See page <b>12</b> .						

Flush the pump:

- Before first use
- When changing colors or fluids
- Before repairing equipment
- Before fluid dries or settles out in a dormant pump (check the pot life of catalyzed fluids)
- At the end of the day
- Before storing the pump.

Flush at the lowest pressure possible. Flush with a fluid that is compatible with the fluid you are pumping and with the wetted parts in your system. Check with your fluid manufacturer or supplier for recommended flushing fluids and flushing frequency.

1. Follow **Pressure Relief Procedure**, page 14.
2. Remove tip guard and spray tip from gun. Refer to separate gun manual.

3. Place siphon tube in grounded metal pail containing cleaning fluid.
4. Set pump to lowest possible fluid pressure, and start pump.
5. Hold a metal part of the gun firmly to a grounded metal pail.
6. Trigger gun. Flush system until clear solvent flows from gun.
7. Follow **Pressure Relief Procedure**, page 14.
8. Clean the tip guard, spray tip, and fluid filter element separately, then reinstall them.
9. Clean inside and outside of suction tube.

# Troubleshooting



Relieve the pressure, page 14, before checking or servicing the equipment.

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

Problem	Cause	Solution
Pump output low on both strokes.	Restricted air supply lines.	Clear any obstructions; be sure all shutoff valves are open; increase pressure, but do not exceed maximum working pressure.
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Worn piston u-cup or v-packings.	Replace. See Bellows Displacement Pump manual.*
Pump output low on only one stroke.	Held open or worn ball check valves.	Check and repair. See Bellows Displacement Pump manual.*
	Worn piston u-cup or v-packings.	Replace. See Bellows Displacement Pump manual.*
No output.	Improperly installed ball check valves.	Check and repair. See Bellows Displacement Pump manual.*
Pump operates erratically.	Exhausted fluid supply.	Refill and reprime pump.
	Held open or worn ball check valves.	Check and repair. See Bellows Displacement Pump manual.*
	Clogged suction tube or filter	Clear part(s).
	Worn piston u-cup or v-packings.	Replace. See Bellows Displacement Pump manual.*
	Damaged bellows.	Replace. See Bellows Displacement Pump manual.*
Material visible in the overflow chamber (if equipped) or weeping from port in packing nut.	Damaged bellows.	Replace. See Bellows Displacement Pump manual.*
Pump will not operate.	Restricted air supply lines.	Clear any obstructions; be sure all shut off valves are open; increase pressure, but do not exceed maximum working pressure.
	Exhausted fluid supply.	Refill and reprime pump.
	Clogged fluid outlet line, valves, etc.	Clear.
	Damaged air motor.	See NXT Air Motor manual.*
	Runaway solenoid has tripped.	Retract solenoid. NXT Air Motor manual.*

\*See **Related Manuals**, page 2, for manual numbers.

# Repair



## General Information

- Reference numbers and letters in parentheses in the text refer to the callouts in the figures and the parts drawing.
- Always use Genuine Graco Parts and Accessories, available from your Graco distributor. If you supply your own accessories, be sure they are adequately sized and pressure rated for your system.

## Preparation

1. Flush the pump, if possible, page 16.
2. Stop the pump close to the middle of the stroke.
3. Follow **Pressure Relief Procedure**, page 14.
4. Disconnect the air and fluid hoses and the ground wire.
5. Remove the shield.

**NOTE:** If the overflow chamber (optional accessory) contains fluid, unscrew the bottle (103) and discard. If it has not been used, the bottle can remain attached to the cap.



To avoid the buildup of electrostatic charge, do not rub the plastic bottle with a dry cloth while it is attached to the pump. Remove the bottle to clean, if needed.

## Disconnect the Pump

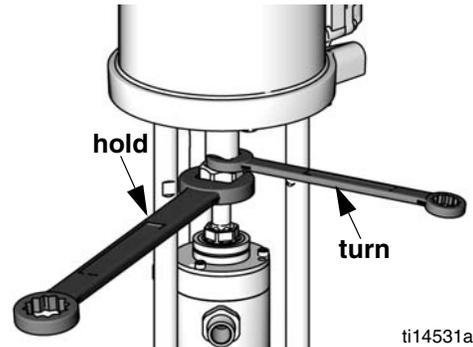
**NOTE:** Follow these instructions to remove the entire pump from the wall or cart bracket. For wall-mounted packages, you may prefer to remove the entire pump, even if only the air motor requires repair.

1. Follow all steps under **Preparation**, page 18.

2. Loosen the four mounting nuts. Use two people to lift the entire pump up and out from the mounting plate. Place it on a work bench.

## Disconnect the Displacement Pump

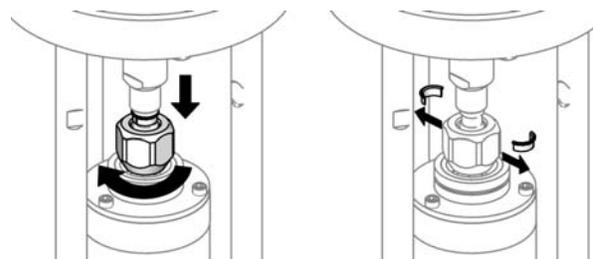
1. Follow all steps under **Preparation**, page 18.
2. Loosen the screws on the top cap.
3. Hold the coupling nut (7) with a wrench. Use another wrench to turn the motor shaft. To avoid damage to the bellows top cap and the D-shaped seal, **do not turn the coupling nut**.



ti14531a

**FIG. 7. Loosen the coupling nut.**

4. Lower the coupling nut (7) and remove the coupling collars (5).



ti15365a

**FIG. 8. Remove coupling collars.**

5. Push up the motor shaft. Remove the coupling nut (7).
6. Use a socket to remove the tie rod nuts (4).
7. Use a socket to remove the bottom two mounting screws.
8. Carefully remove the displacement pump, with the pump adapter attached.
9. Clamp the adapter plate in a vise to service the displacement pump.
10. See your displacement pump manual for service and parts information.

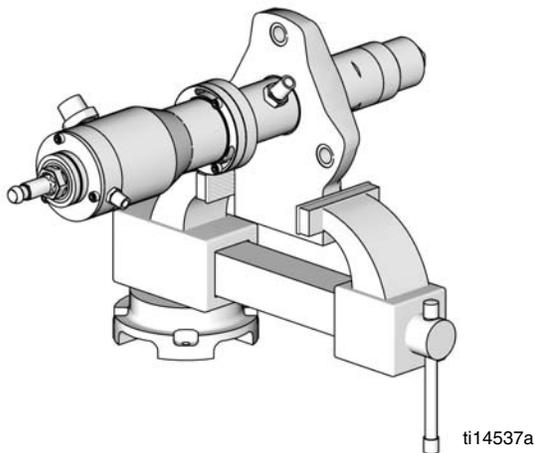


FIG. 9

### Disconnect the Air Motor

1. Follow all steps under **Preparation**, page 18.
2. Loosen the screws on the top cap.
3. Hold the coupling nut (7) with a wrench. Use another wrench to turn the motor shaft. To avoid damage to the bellows top cap and the D-shaped seal, **do not turn the coupling nut**. See FIG. 7.
4. Lower the coupling nut (7) and remove the coupling collars (5). See FIG. 8.
5. Push up the motor shaft. Remove the coupling nut (7).
6. Use a socket to remove the tie rod nuts (4).
7. Use a socket to remove the top two mounting screws.
8. Lift up on the air motor to remove it. The tie rods (3) will remain attached.

**NOTE:** For cart mount pumps, remove the two screws on the arms and tip back or remove the air control panel for easier removal of the air motor.

9. Use a socket on the flats of the tie rods (3) to remove them from the bottom cover of the air motor.

**NOTE:** See your air motor manual for service and parts information.

## Reconnect the Air Motor

1. Screw the tie rods (3) into the bottom cover of the air motor. Torque to 50-55 ft-lb (68-75 N•m).
2. As needed for the larger air motors, use two people to reattach. Align the tie rods (3) with the holes in the pump adapter. Carefully lower the air motor into place.
3. Attach the tie rod nuts (4) and torque to 50-60 ft-lb (68-81 N•m).
4. Tighten the mounting screws.
5. Hold the motor shaft up with one hand. With your other hand, put the coupling nut (7) on the displacement rod.
6. Put the coupling collars (5) into the coupling nut (7) so large flanges point upward.
7. Gently let the motor shaft drop onto the displacement rod. Torque the coupling nut (7) to 75-80 ft-lb (138-146 N•m).
8. Connect the air and fluid hoses, the ground wire, and the shield.

## Reconnect the Displacement Pump

1. Align the straight edge of the pump adapter with the back of the air motor. Slide the pump adapter onto the tie rods (3).
2. Attach the tie rod nuts (4) and torque to 50-60 ft-lb (68-81 N•m).
3. Tighten the mounting screws.
4. Hold the motor shaft up with one hand. With your other hand, put the coupling nut (7) on the displacement rod.
5. Put the coupling collars (5) into the coupling nut (7) so large flanges point upward.
6. Gently let the motor shaft drop onto the displacement rod. Torque the coupling nut (7) to 75-80 ft-lb (138-146 N•m).
7. Connect the air and fluid hoses, the ground wire, and the shield.

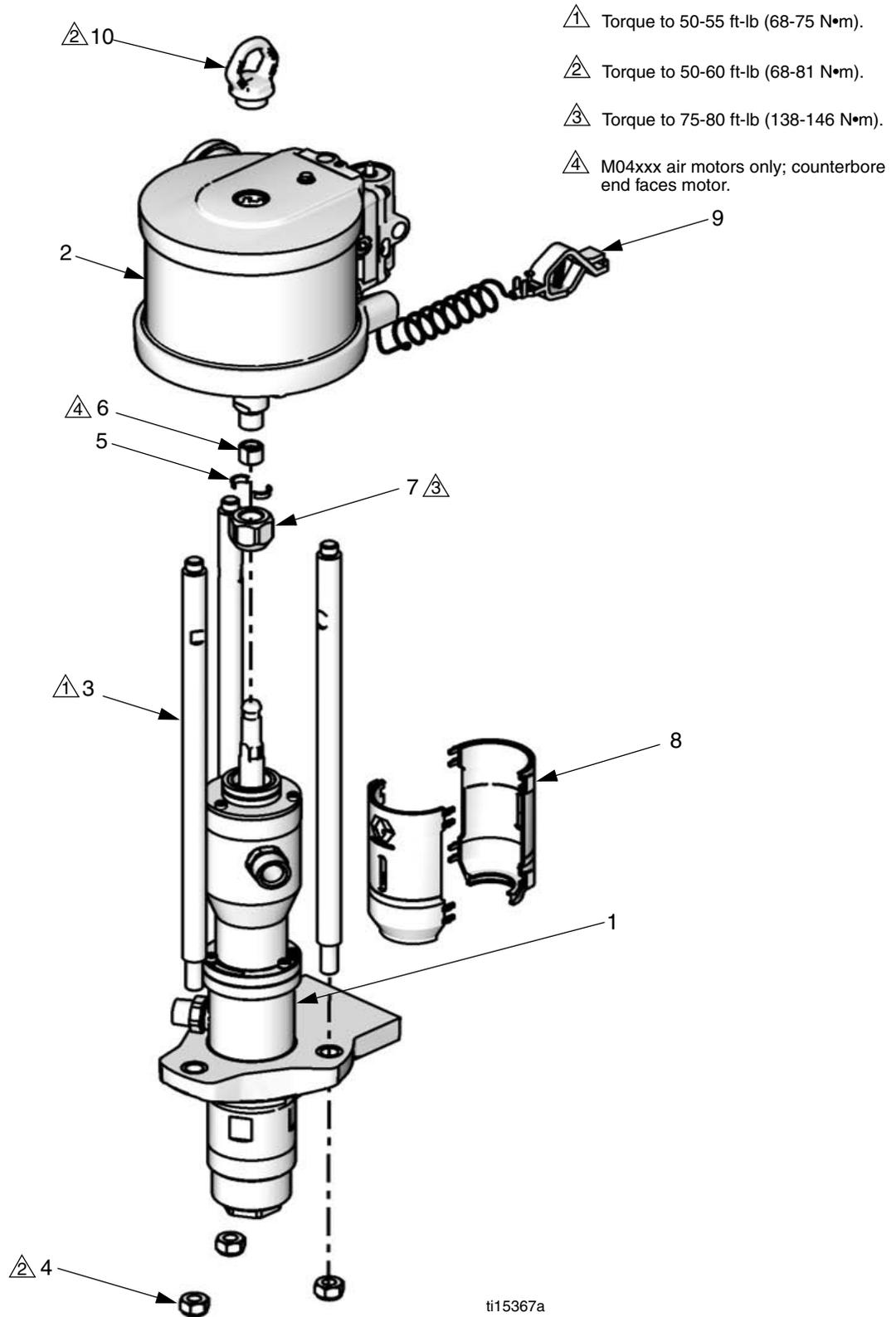
## Reconnect the Pump

**NOTE:** If the entire pump has been removed and is now reassembled, follow these directions:

1. Use two people to lift the pump into place. Slide it in and down onto the mounting plate.
2. Tighten the mounting screws.
3. Connect the air and fluid hoses, the ground wire, and the shield.



# Parts



## Parts That Vary by Model

### Part No./Description

Ref. No.	Part No.	Description	Qty.
1	See Table	DISPLACEMENT PUMP, <i>see manual 312793 for parts</i>	1
2	See Table	MOTOR, <i>see manual 312796 for parts</i>	1
3*	15U691	TIE ROD	3
4*	15U606	NUT, tie rod	3
5*	184128	COLLAR, coupling; <i>see page 23 for package of 10</i>	2
6*	See Table	ADAPTER, used with air motor M04xxx	1
7*	15T311	NUT, coupling	1
8*	24A640	SHIELD, coupler	Set of 2
9	238909	WIRE, grounding assembly	1
10	24E992	LIFT RING, with o-ring	1
11▲	290079	TAG, warning, grounding, not shown	1
12▲	15W718	LABEL, warning, not shown	1
13▲	15W719	LABEL, warning, not shown	1

----- *Not sold separately.*

\* *Included in Connecting Kit. See page 23 to order the correct kit for your pump.*

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

Model	Displacement Pump (1)	Motor (2)	Motor Piston Diam. (in.)	Adapter (6)
B05FA0	LB150A	M04LN0	3.5	15M675
B05FB0		M04LT0		
B05FA1	LB150B	M04LN0		
B05FB1		M04LT0		
B12DA0	LB100A	M07LN0	4.5	
B12DB0		M07LT0		
B12DA1	LB100B	M07LN0		
B12DB1		M07LT0		
B15BA0	LB050A	M04LN0	3.5	15M675
B15BB0		M04LT0		
B15BA1	LB050B	M04LN0		
B15BB1		M04LT0		
B15FA0	LB150A	M12LN0	6.0	
B15FB0		M12LT0		
B15FA1	LB150B	M12LN0		
B15FB1		M12LT0		
B23DA0	LB100A	M12LN0	6.0	
B23DB0		M12LT0		
B23DA1	LB100B	M12LN0		
B23DB1		M12LT0		
B24FA0	LB150A	M18LN0	7.5	
B24FB0		M18LT0		
B24FA1	LB150B	M18LN0		
B24FB1		M18LT0		
B25BA0	LB050A	M07LN0	4.5	
B25BB0		M07LT0		
B25BA1	LB050B	M07LN0		
B25BB1		M07LT0		
B35DA0	LB100A	M18LN0	7.5	
B35DB0		M18LT0		
B35DA1	LB100B	M18LN0		
B35DB1		M18LT0		

# Repair Kits

Kit Description	LB050A and LB050B		LB100A and LB100B			LB150A and LB150B		
	3.5 in. motor	4.5 in. motor	4.5 in. motor	6.0 in. motor	7.5 in. motor	3.5 in. motor	6.0 in. motor	7.5 in. motor
<b>Coupling Collars (5)</b> Package of 10	24A619		24A619			24A619		
<b>Connecting Kit</b> Includes three tie rods (3), three tie rod nuts (4), air motor adapter, if needed (6), coupling nut (7), two coupling collars (5), and two shields (8)	24A291	24A294	24A294	24A294	24A294	24A291	24A294	24A294

**NOTE:** For **displacement pump repair kits**, see manual 312793. For **air motor repair kits**, see manual 312796.

## Wall Mounting Kits

Includes bracket and hardware.

Kit	Air Motor on Pump
24A880	M04xxx
24A881	M07xxx
24A882	M12xxx or M18xxx

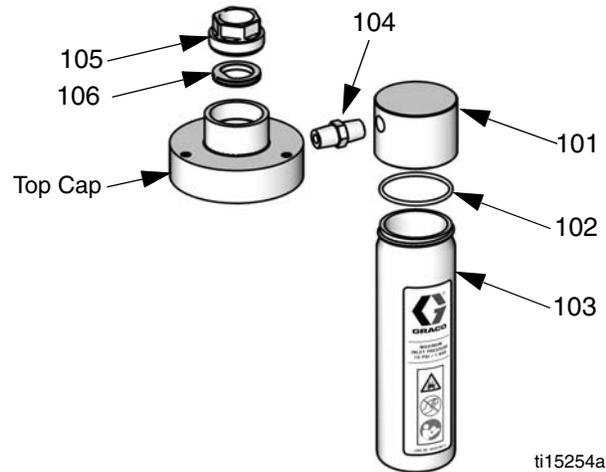
## Cart Mounting Kit 24E879

Includes cart, bracket, and hardware.

## Accessories

### Overflow Chamber Kit 24E298

Kit includes overflow cup with cap, seals and necessary hardware. Parts not sold separately.

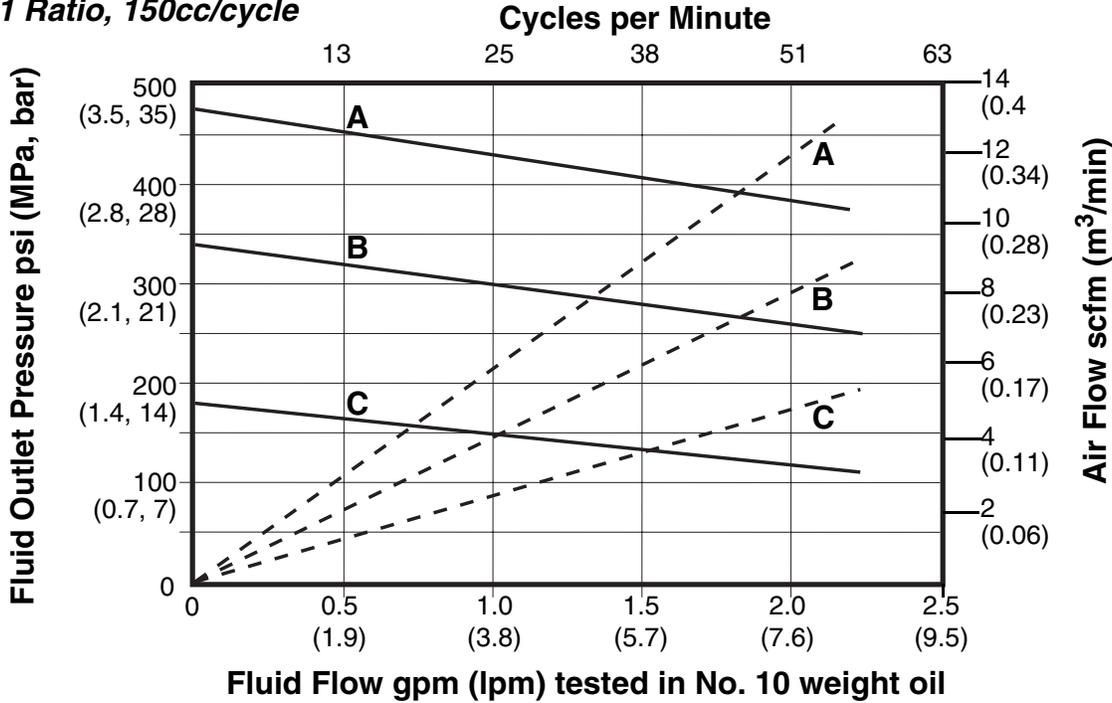


Ref.	Description	Qty.
101	LID	1
102	O-RING	1
103	BOTTLE	1
104	FITTING, 2 x 1/4-18 npt	1
105	NUT, retaining	1
106	D-SHAPED SEAL, bellows	1



# Performance Charts

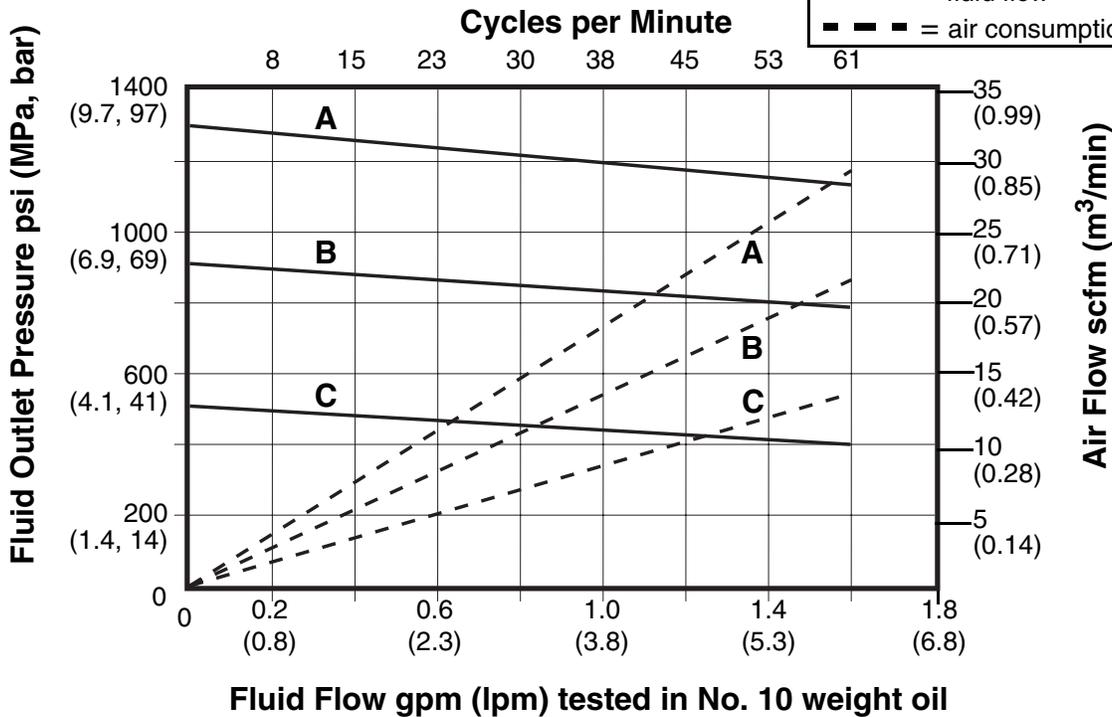
**Model B05Fxx**  
**5:1 Ratio, 150cc/cycle**



**KEY**

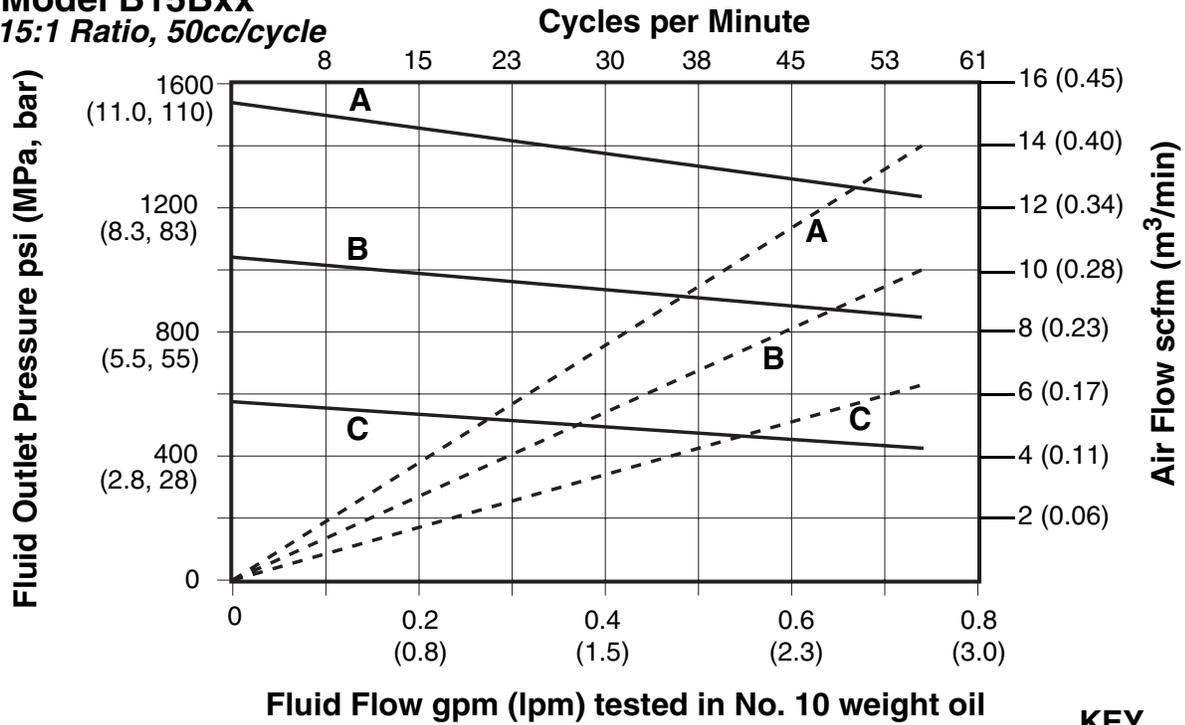
- A** = 100 psi (0.7 MPa, 7 bar)
- B** = 70 psi (0.5 MPa, 5 bar)
- C** = 40 psi (0.3 MPa, 3 bar)
- = fluid flow
- - -** = air consumption

**Model B12Dxx**  
**12:1 Ratio, 100cc/cycle**



**Model B15Bxx**

15:1 Ratio, 50cc/cycle

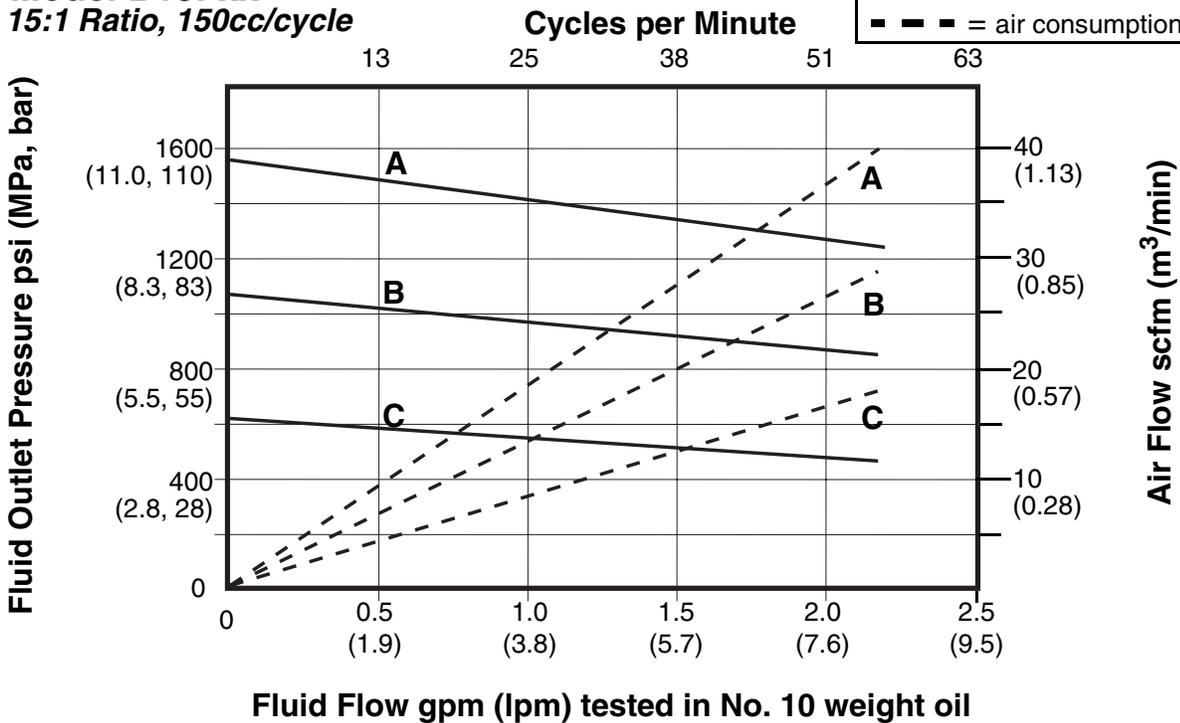


**KEY**

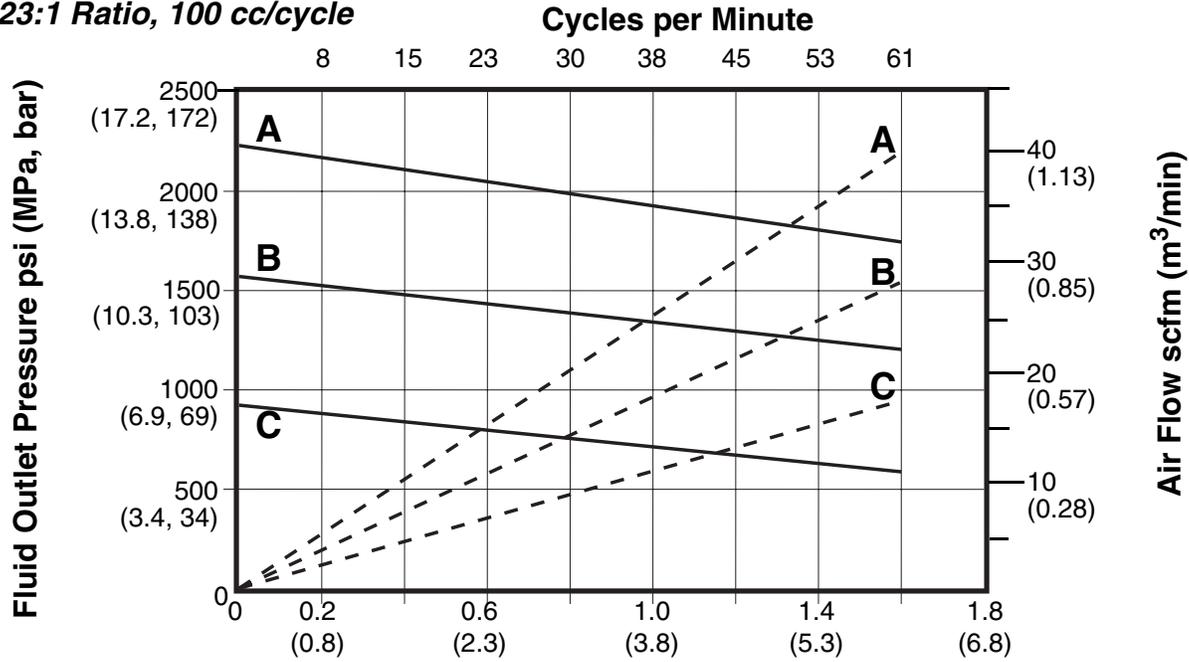
- A** = 100 psi (0.7 MPa, 7 bar)
- B** = 70 psi (0.5 MPa, 5 bar)
- C** = 40 psi (0.3 MPa, 3 bar)
- = fluid flow
- - - = air consumption

**Model B15Fxx**

15:1 Ratio, 150cc/cycle



**Model B23Dxx**  
23:1 Ratio, 100 cc/cycle

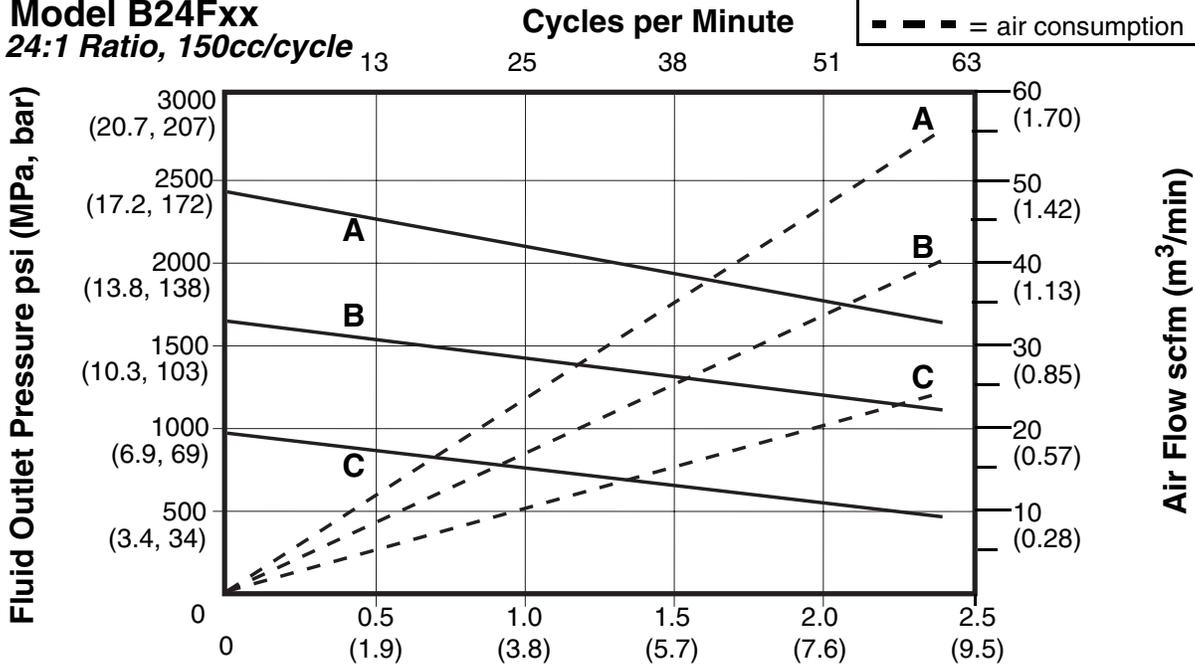


Fluid Flow gpm (lpm) tested in No. 10 weight oil

**KEY**

<b>A</b>	= 100 psi (0.7 MPa, 7 bar)
<b>B</b>	= 70 psi (0.5 MPa, 5 bar)
<b>C</b>	= 40 psi (0.3 MPa, 3 bar)
<b>—</b>	= fluid flow
<b>- - -</b>	= air consumption

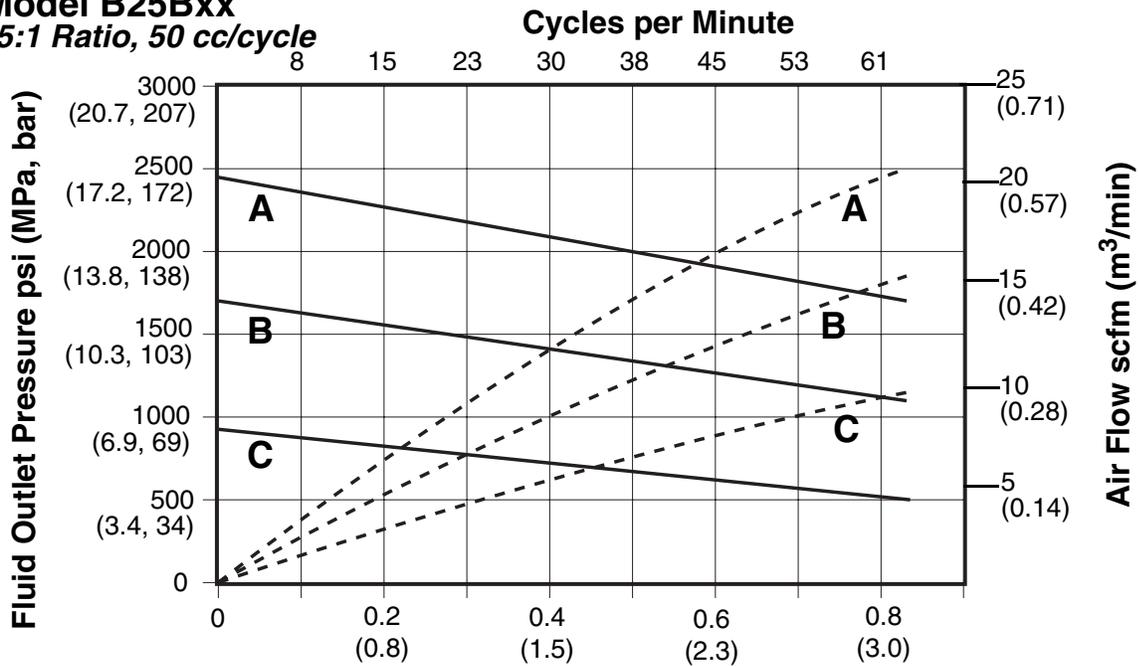
**Model B24Fxx**  
24:1 Ratio, 150cc/cycle



Fluid Flow gpm (lpm) tested in No. 10 weight oil

**Model B25Bxx**

**25:1 Ratio, 50 cc/cycle**



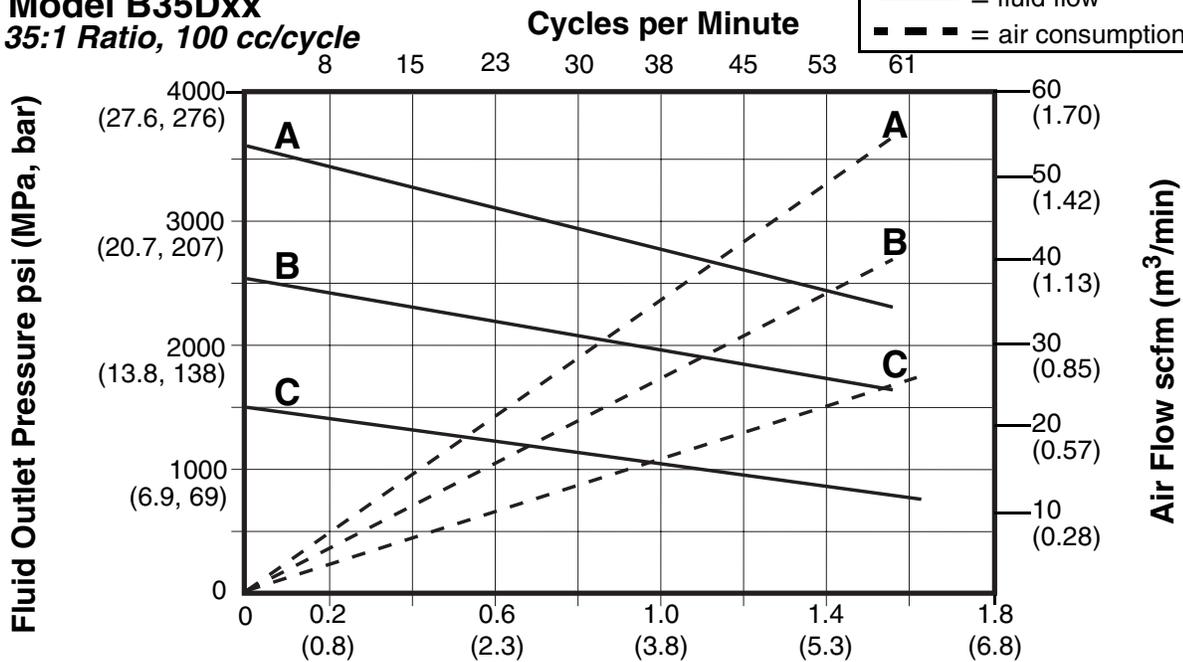
Fluid Flow gpm (lpm) tested in No. 10 weight oil

**KEY**

- A** = 100 psi (0.7 MPa, 7 bar)
- B** = 70 psi (0.5 MPa, 5 bar)
- C** = 40 psi (0.3 MPa, 3 bar)
- = fluid flow
- - - = air consumption

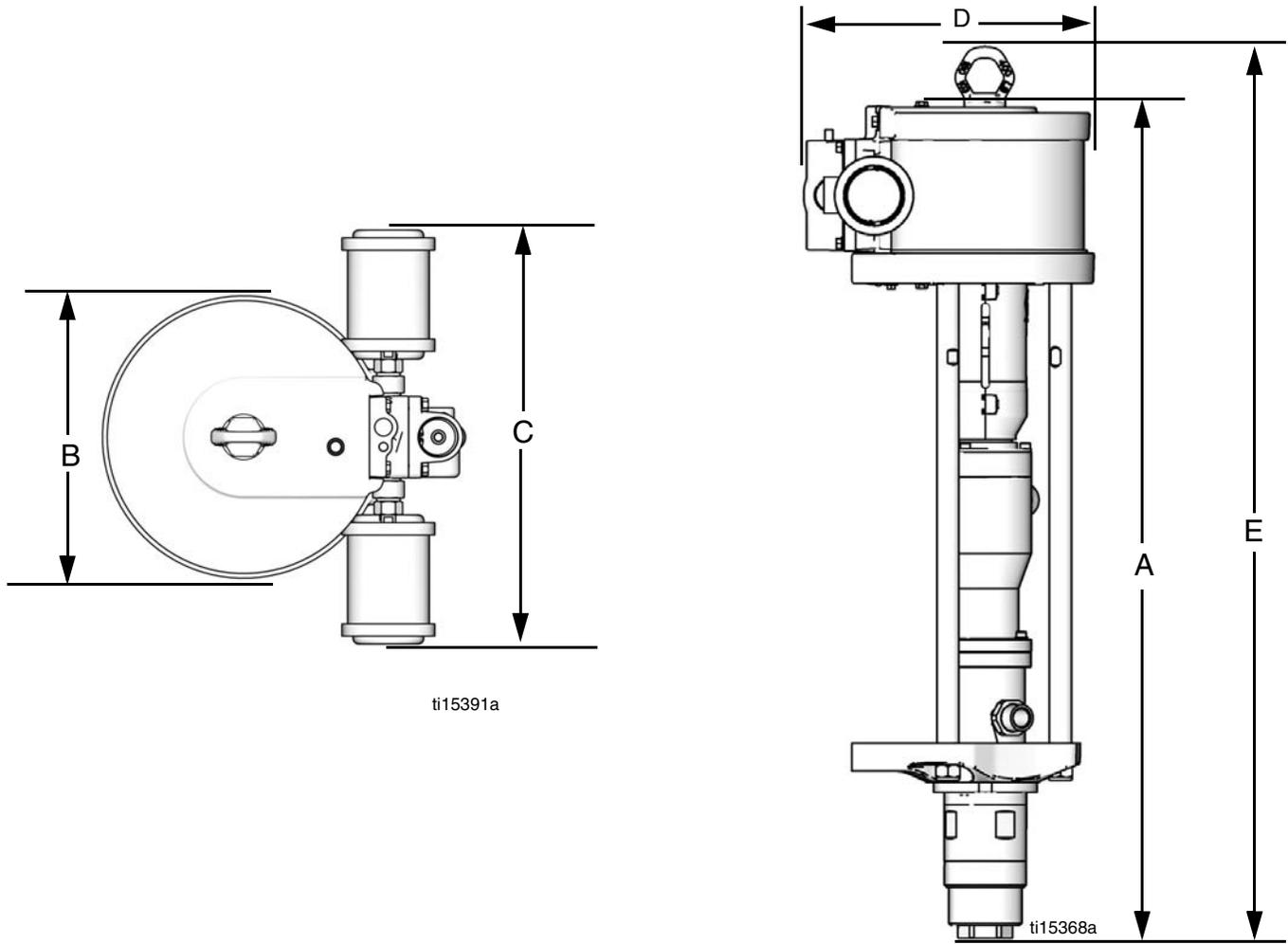
**Model B35Dxx**

**35:1 Ratio, 100 cc/cycle**



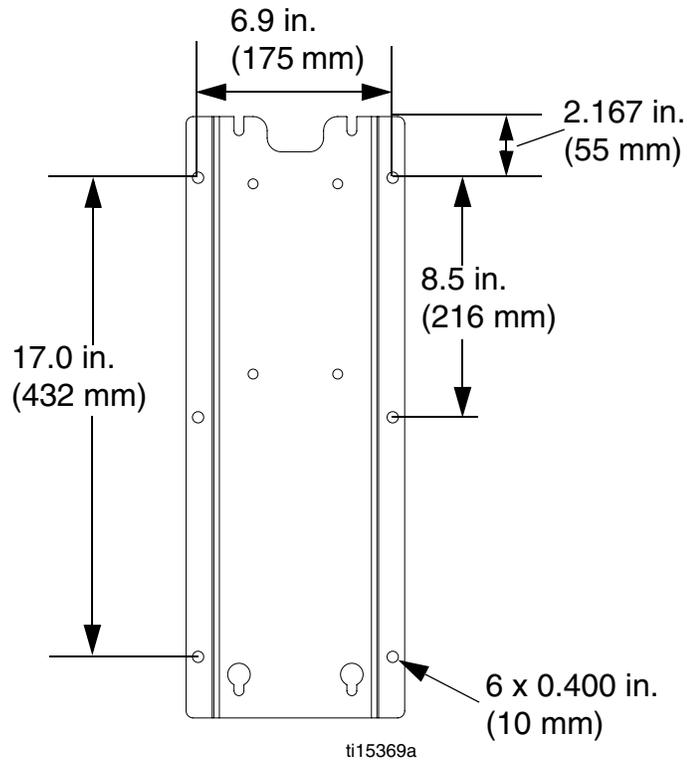
Fluid Flow gpm (lpm) tested in No. 10 weight oil

# Pump Dimensions



Pump Model	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)	Weight lb (kg)
B05FAx	33 (838)	6.9 (175)	5.8 (147)	9.7 (246)	35 (888)	65 (29)
B05FBx						66 (30)
B12DAx	33.5 (851)	6.9 (175)	10.8 (274)	9.7 (246)	35 (888)	71 (32)
B12DBx						72 (33)
B15BAx	33 (838)	6.9 (175)	5.8 (147)	9.7 (246)	35 (888)	56 (25)
B15BBx						57 (26)
B15FAx	33.5 (851)	8.6 (218)	11.7 (297)	11.4 (290)	35.6 (904)	82 (37)
B15FBx						83 (38)
B23DAx	33.5 (851)	8.6 (218)	11.7 (297)	11.4 (290)	35.6 (904)	78 (35)
B23DBx						79 (36)
B24FAx	33.5 (851)	10.1 (257)	14.8 (375)	12.9 (328)	35.6 (904)	85 (38)
B24FBx						86 (39)
B25BAx	33 (838)	6.9 (175)	10.8 (274)	9.7 (246)	35 (888)	62 (28)
B25BBx						63 (29)
B35DAx	33.5 (851)	10.1 (257)	14.8 (375)	12.9 (328)	35.6 (904)	81 (36)
B35DAX						82 (37)

# Wall Bracket Mounting Dimensions



## Technical Data

Maximum fluid working pressure . . . . .	See <b>Pump Data</b> , page 7.
Maximum fluid inlet pressure . . . . .	15 psi (0.1 MPa, 1.0 bar)
Maximum air inlet pressure. . . . .	100 psi (0.7 MPa, 7 bar)
Minimum air inlet pressure . . . . .	10 psi (0.07 MPa, 0.7 bar)
Air consumption . . . . .	See , page 25.
Fluid flow at 60 cycles per minute. . . . .	See <b>Pump Data</b> , page 7.
Maximum fluid temperature . . . . .	160°F (71°C)
Ambient temperature range . . . . .	35°–120°F (2°–49°C)
Stroke length. . . . .	2.5 in. (63.5 mm)
Sound data . . . . .	See Technical Data in NXT Air Motor manual.*
Wetted parts . . . . .	PEEK, PTFE, stainless steel, tungsten carbide, UHMWPE

\* See **Related Manuals**, page 2, for manual number.

# Graco Standard Warranty

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

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

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

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

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

**GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO.** These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

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For the latest information about Graco products, visit [www.graco.com](http://www.graco.com).

**TO PLACE AN ORDER**, contact your Graco distributor or call to identify the nearest distributor.

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

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Graco reserves the right to make changes at any time without notice.*

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**Graco Headquarters:** Minneapolis

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