

Adhesive Dispense System

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EN

**For proportioning, mixing, pumping, and dispensing high viscosity, wide ratio materials.
For professional use only.**

Paste Adhesive Dispense System

2000 psi (14 MPa, 138 bar) Maximum Working Pressure

Job Number SN8280 / SN8283



Important Safety Instructions

Read all warnings and instructions in all supplied and related manuals. Save all instructions.

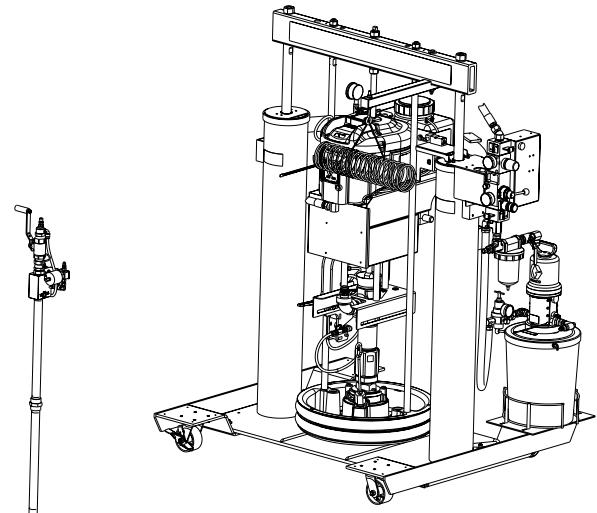
⚠ WARNING



FIRE AND EXPLOSION HAZARD

Oil left in the system at the factory can react with catalyst and create a fire or explosion.

- Flush before first use.
- Do not add catalyst to the catalyst reservoir until the system has been flushed.



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Related Manuals

Part	Description
311828	Dura-Flo® Pumps
311827	Dura-Flo Lowers
310523	55 Gallon Global Ram
311238	NXT® Air Motor
308116	Stainless Steel Pumps
307043	Monark® Air Motor
308169	Air Filters, Lubricators
308168	High Volume Air Regulators

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.

See **Important Methyl Ethyl Ketone Peroxide (MEKP) Safety Information** on page 6.

 WARNING	
  	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • 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. • See additional information on MEKP in the MEKP section of this manual.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>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:</p> <ul style="list-style-type: none"> • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.
	<p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • 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.

⚠ WARNING



SKIN INJECTION HAZARD

High-pressure fluid from dispensing device, 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. **Get immediate surgical treatment.**

- Do not point dispensing device at anyone or at any part of the body.
- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.



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.



EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

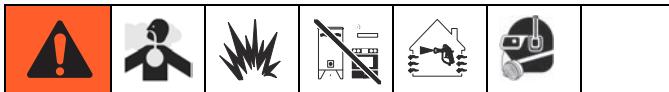
- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted 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.

Important Methyl Ethyl Ketone Peroxide (MEKP) Safety Information

MEKP is among the more hazardous materials found in commercial channels. Proper handling of the “unstable (reactive)” chemicals presents a serious challenge to the plastics industry. The highly reactive property which makes MEKP valuable to the plastics industry in producing the curing reaction of polyester resins and gel-coats also produces the hazards which require great care and caution in its storage, transportation, handling, processing and disposal.

Workers must be thoroughly informed of the hazards that may result from improper handling of MEKP, especially in regard to contamination and heat. They must be thoroughly instructed regarding the proper storage, use and disposal of MEKP and other hazardous materials used in the laminating operation.

MEKP is flammable and potentially explosive, as well as potentially damaging to the eyes and skin.													
Read material manufacturer's warnings and material MSDS to know specific hazards and precautions related to MEKP.													
Contaminated MEKP can become explosive. Prevent contamination of MEKP with other materials, including but not limited to polyester overspray, polymerization accelerators and promoters, and non-stainless metals. Even small amounts of contaminates can make MEKP explosive. This reaction may start slowly, and gradually build-up heat, which can accelerate until fire or an explosion result. This process can take from seconds to days.													
Heat applied to MEKP, or heat build-up from contamination reactions can cause it to reach what is called its Self-Accelerating Decomposition Temperature (SADT), which can cause fire or explosion. Spills should be promptly removed, so no residues remain. Spillage can heat up to the point of self-ignition. Dispose in accordance with manufacturer's recommendation.													
Store MEKP in a cool, dry and well-ventilated area in the original containers away from direct sunlight and away from other chemicals. It is strongly recommended that the storage temperature remain below 86° F (30° C). Heat will increase the potential for explosive decomposition. Refer to NFPA 432. Keep MEKP away from heat, sparks and open flames.													
Current catalysts are premixed and do not require any diluents. Graco strongly recommends that diluents not be used. Diluents add to the possibility of contaminates entering the catalyst system. Never dilute MEKP with acetone or any solvent since this can produce an extremely shock-sensitive compound which can explode.													
Use only original equipment or equivalent parts from Graco in the catalyst system (i.e.: hoses, fittings, etc.) because a hazardous chemical reaction may result between substituted parts and MEKP.													
To prevent contact with MEKP, appropriate personal protective equipment, including chemically impermeable gloves, boots, aprons and goggles are required for everyone in the work area.													

Polyester Resins and Gel-Coats

Spraying materials containing polyester resin and gel-coats creates potentially harmful mist, vapors and atomized particulates. Prevent inhalation by providing sufficient ventilation and the use of respirators in the work area.

Read the material manufacturer's warnings and material MSDSs to know specific hazards and precautions related to polyester resins and gel-coats.

To prevent contact with polyester resins and gel-coats, appropriate personal protective equipment, including chemically impermeable gloves, boots, aprons and goggles are required for everyone in the work area.

Spraying and Lamination Operations

Remove all accumulations of overspray, FRP sandings, etc. from the building as they occur. If this waste is allowed to build up, spillage of catalyst is more likely to start a fire.

If cleaning solvents are required, read material manufacturer's warnings and material MSDS to know specific hazards and precautions. (Graco recommends that clean-up solvents be nonflammable.)

Graco recommends that you consult OSHA Sections 1910.94, 1910.106, 1910.107 and NFPA No. 33, and NFPA No. 91 for further guidance.

Important Two-Component Material Information**Material Self-ignition**

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

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.

NOTE:**Keep Resin and Catalyst Components Separate**

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, **never** interchange catalyst (usually MEKP) and resin (usually polyester resin or gel-coat) parts.

Theory of Operation

Usage

Is used with two component materials.

Major Components

The major components of the Paste Adhesive system include the:

- air motor
- resin or master pump
- catalyst or slave pump
- ram
- catalyst feed supply
- mixer manifold or 2K gun
- mixer
- solvent flush

Ratio Proportioning

The master and slave pumps are positive displacement pumps. Positive displacement pumps displace a defined volume of fluid for a given stroke length. The pumps displace equal amounts of material on the up and down strokes but load or prime only on the up stroke.

The master and slave pumps displace different volumes for the same stroke length. By adjusting the slave pump box to different points on the slave linkage, you can change the stroke length of the slave pump, which will change the mix ratio.

Note that the mix ratio is achieved by volumetric ratio of resin to catalyst and not by weight. These two ratios may be different depending on material properties.

Frame

The air motor supplies the force and motion required to drive the system. A connecting rod couples the master pump and air motor directly. Air motor force and motion is transmitted through the slave linkage for synchronous motion of the master and slave pumps.

System Components and Operation Overview

Loading the Pumps

The resin and catalyst pumps must completely fill (prime) during the loading stroke, to ensure accurate material displacement.

With high viscosity materials, it is difficult for material to flow into the pump on the loading stroke. A vacuum forms during the piston upstroke, similar to trying to draw thick fluid into a hypodermic syringe. This condition is called *pump cavitation*.

If cavitation occurs, part of the downstroke will be used to fill the vacuum before any material is actually displaced. Since the total stroke length is used to calculate mix ratio, this results in an off-ratio condition.

To prevent cavitation, the resin pump is pressurized by a pneumatic ram applying a downward force on a 55 gallon plate fitted into the drum.

Pumping the Fluids to the Mixer

Fluid is pumped from the pump outlets to a mix manifold, where resin and catalyst are first introduced before being mixed in a static mixer.

A check valve injects catalyst into resin at the mix manifold. When enough pressure builds up, the check valve opens and catalyst flows into the mix manifold. This means that during flow conditions with two positive displacement pumps linked together, the pressures at the mix point are equal.

Mixing the Fluids

Both components leave the mix manifold and enter a static mixer where they are mixed to a homogeneous blend. The mixer consists of a series of spiral elements.

When the components are pumped through the mixer, they are progressively divided and recombined.

Ratio Checks

Volumetric mix ratio can be calculated from the weight of each component or by direct measurement. Ratio checks are performed with the back pressures set to actual operating pressures to simulate the normal back pressures created by the mix manifold and gun.

Dispense Valve

The dispense valve consists of two, 12 element static mixer sections, mix block, material shut off valves, and a three way air-solvent flush valve. When opened, the resin shut off valve pneumatically triggers the catalyst shut off valve to open. The catalyst is injected into the center of the resin stream via a non-drip valve in the mix block. The non-drip valve prevents catalyst from seeping into the resin when the shut-off valves are closed. A three way flush valve allows the operator to select solvent or air to purge the mix block and mixers of material.

Component Identification

Machine Overview

FIG. 1-3 is only a guide for selecting and installing system components and accessories. Contact your Graco distributor for assistance in designing a system to suit your needs.

Key:

A System Air Shutoff Valve (bleed-type)
B Main Air Filter
C NXT 3400 Air Motor
D Operator Controls (See FIG. 4)
E 290 Dura-Flo Pump
F Resin Outlet
G Two Hand Controls
H Catalyst Bypass Valve (back to supply)
J Protective Cover
K Catalyst Tank
L Hose Hanger Support

M Solvent Supply
N Dispense Valve Air Supply
P Catalyst Pump Box
Q Catalyst Strainer (60 mesh), Not Visible
R Vent Stick or Valve
S Ram Plate with drum vent valve
T Air Motor Supply Valve
U Catalyst Pump Inlet Valve
V Safety Label, 16D136
(*Replacement Danger and Warning labels, tags and cards are available at no cost.*)

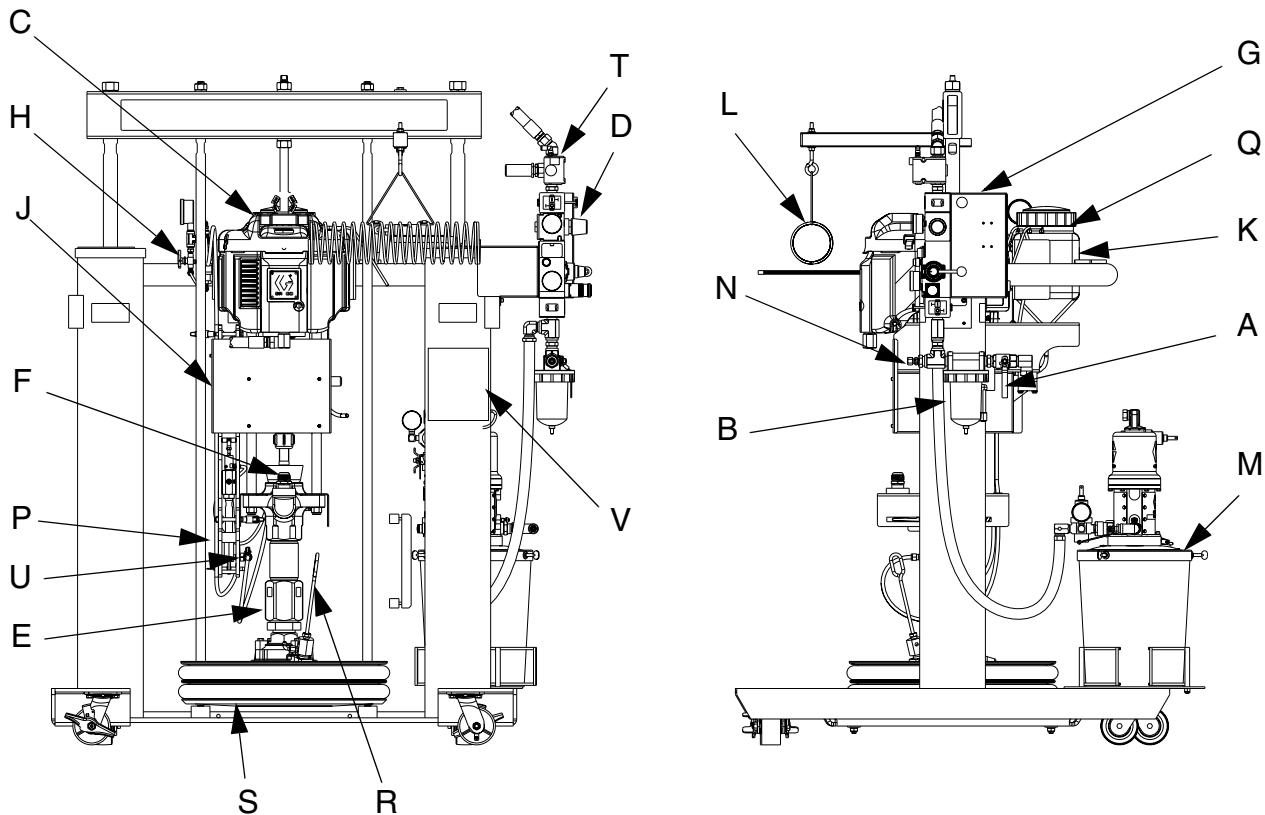


FIG. 1

AA Monark 5:1 Pump
 AB Air Supply
 AC Solvent Outlet

AD 5 Gallon Pail (Customer Supplied)
 AE Air Regulator
 AF Air Shut-off Valve

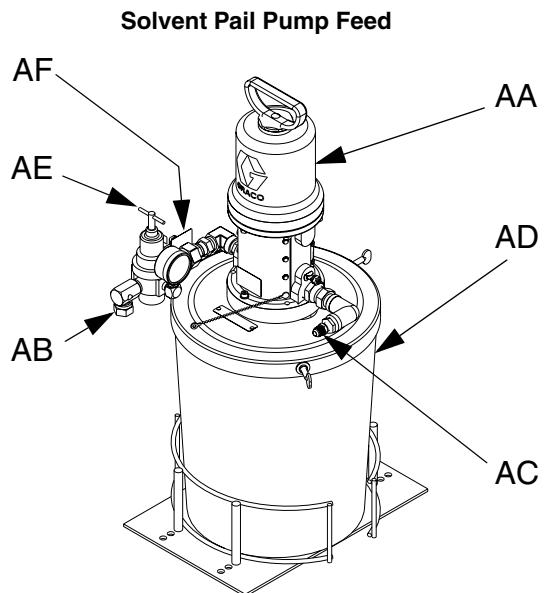


FIG. 2

Key:

BA Static Mixer
 BB Mixer Block
 BC Catalyst Shutoff Valve
 BD Non-drip Valve

BE Resin Shut Off
 BF Air Supply Connection
 BG Solvent/Air Selector Valve
 BH Solvent Non-drip Valve
 BJ Air Motor Signal

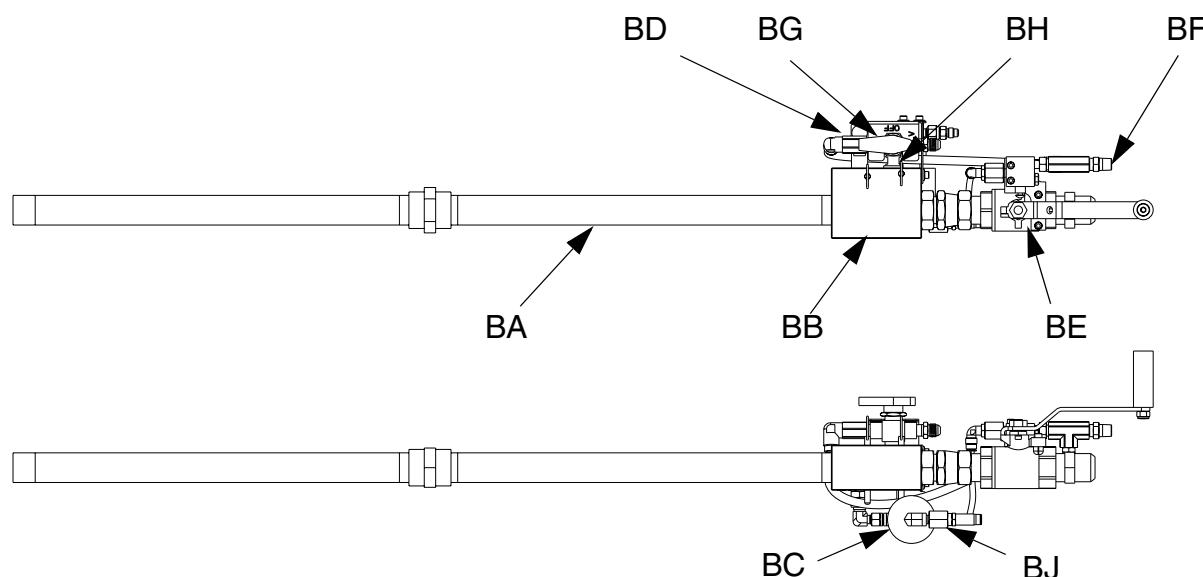


FIG. 3

Pneumatic Controls

The integrated air controls include:

- **Main air slider valve (CA):** turns air on and off to the system. When closed, the valve relieves pressure downstream.
- **Ram air regulator (CB):** controls ram up and down pressure and blowoff pressure.
- **Ram director valve (CC):** controls ram direction.
- **Exhaust port with muffler (CD)**
- **Air motor regulator (CE):** Controls air pressure to motor.
- **Air motor slider valve (CF):** turns air on and off to the air motor. When closed, the valve relieves air trapped between it and the air motor. Push the valve in to shutoff.
- **Blowoff button (CG):** turns air on and off to push the platen out of an empty drum.

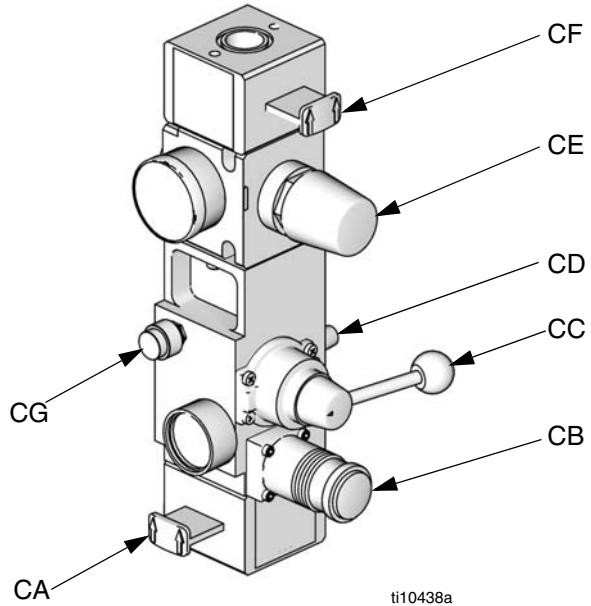


FIG. 4: Integrated Air Controls

Installation

Location

Position the ram so the air regulators for the pump and ram are easily accessible. Ensure that there is sufficient overhead clearance when the ram is fully raised. Refer to the ram manual for clearance dimensions.

Grounding

<p>The system must be properly grounded. Read all Warnings starting on page 4. Follow the instructions below.</p>						

Adhesive Dispenser: Ground the system to a true earth ground at the ground stud located on the back of the ram air cylinder.

A ground wire and clamp (P/N 223547) is available from Graco.

Air compressor: follow manufacturer's recommendations.

Spray gun/dispense valve: ground through connection to a properly grounded fluid hose and pump.

Fluid supply container: follow your local code.

Substrate: follow your local code.

Solvent pails used when flushing: follow your 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 a metal part of the gun/dispense valve firmly to the side of a grounded metal pail, then trigger the gun valve.

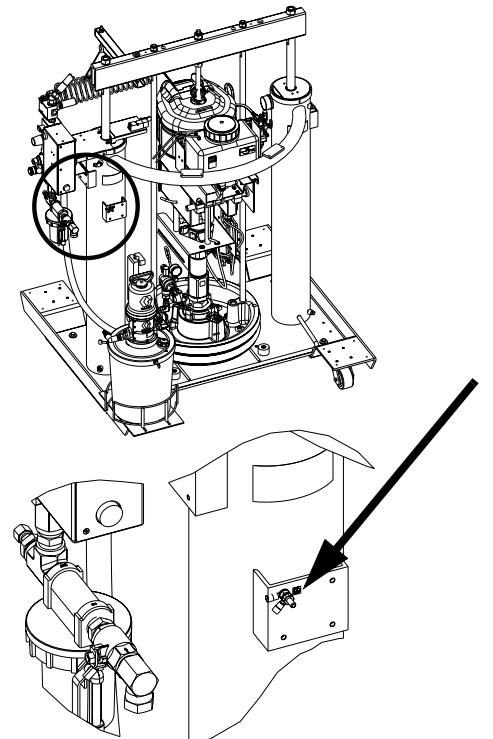


FIG. 5: Ground Stud

Check Resistance



To ensure proper grounding, resistance between components and true earth ground **must** be less than 1 ohm.

Have a qualified electrician check resistance between each component and true earth ground. If resistance is greater than 1 ohm, a different ground site may be required. Do not operate the system until the problem is corrected.

Fluid Lines

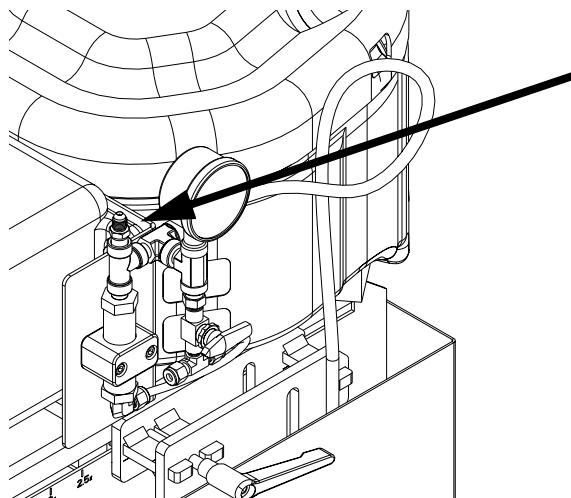


Oil left in the system at the factory can react with catalyst and create a fire or explosion.

- Flush before first use.
- Do not add catalyst to the catalyst reservoir until the system has been flushed.

Machine Hose Connections

1. Connect the resin hose from the hose bundle to the resin outlet fitting (F), FIG. 1, using the hose hanger support.
2. Connect the catalyst hose from the hose bundle to the catalyst outlet fitting (shown below) using the hose hanger support. Route the hose in a manner that does not interfere with the catalyst drive mechanism.



3. Connect the air motor signal tube from the hose bundle to the air motor supply valve (T), FIG. 1.
4. Connect the air supply hose from the hose bundle to the dispense valve air supply (N), FIG. 1.
5. Connect the solvent hose from the hose bundle to the solvent outlet fitting (AC), FIG. 1.

Dispense Valve Hose Connections

Refer to FIG. 6 for the following callouts.

1. Connect the resin hose from the hose bundle to the resin fitting (A).
2. Connect the catalyst hose from the hose bundle to the catalyst fitting (B).
3. Connect the air supply hose from the hose bundle to the air fitting (C).
4. Connect the solvent hose from the hose bundle to the solvent fitting (D).
5. Push the air motor signal tube from the hose bundle into the air motor signal fitting (E).

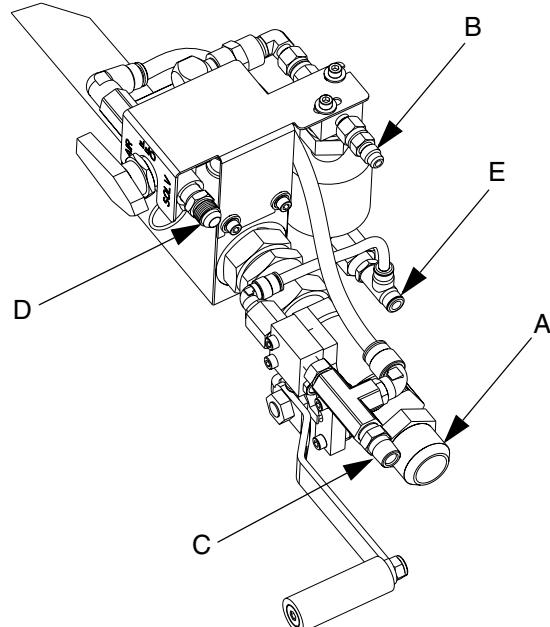


FIG. 6

Air Supply Lines

<p>To reduce the risk of over pressurizing your system, which could result in component rupture and cause serious injury, never exceed the specified maximum incoming air pressure to the pumps. See Technical Data on page 32.</p>						

Description	Requirements
Inlet Port Size	3/4 in. npt(f)
Input Air	100 psi (0.7 MPa, 7 bar)

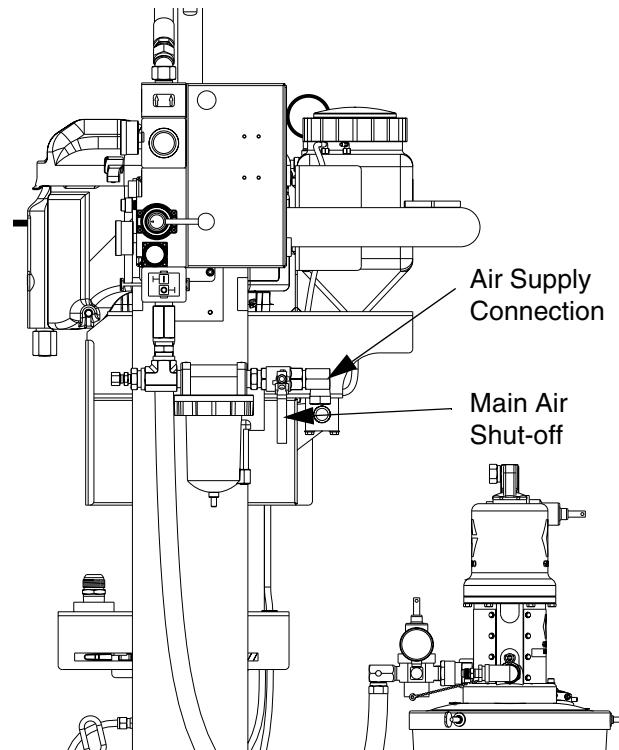
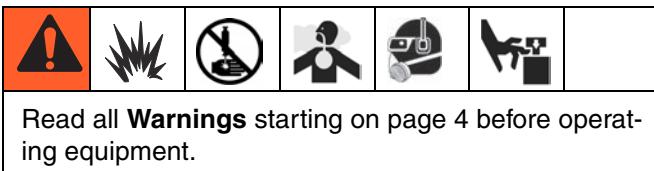


FIG. 7: Air Supply

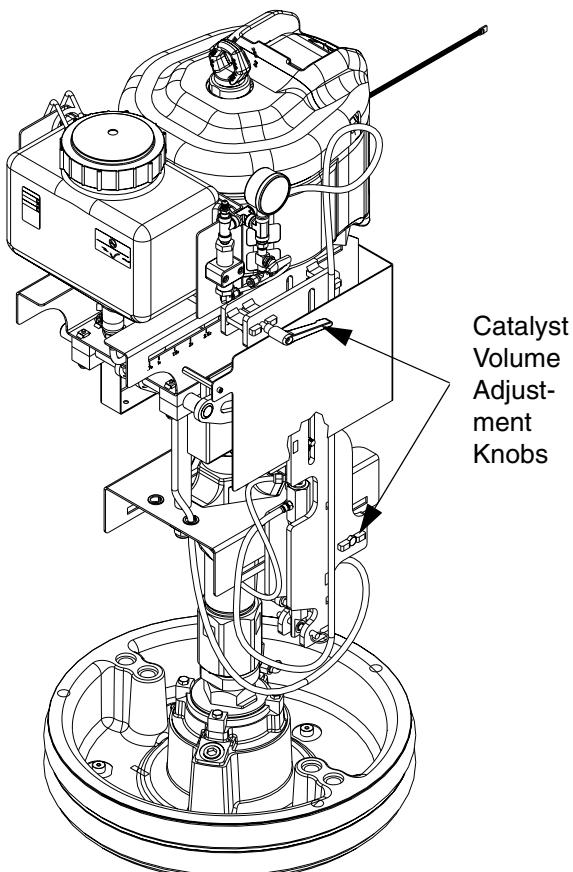
Operation



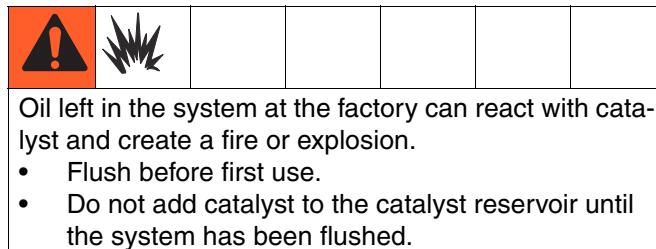
Setting the Ratio

Volume Adjustment

To adjust the volume of material displaced by the slave pump, loosen the clamping knobs on the adjuster. Slide the adjuster along the setpoint scale. Move adjuster toward the master pump to increase volume (closer ratio) and away from the master pump to decrease volume (wider ratio). Refer to the scale on the pump box. When adjuster is in desired position, tighten the knobs.



Before Loading Material



6. Check fluid and air lines and tighten if necessary.
7. Make sure there is a minimum overhead clearance of 110 in. (2.79 m).
8. Fill resin pump wet cup (DD) 1/3 full with Graco TSL™ fluid (throat seal lubricant), FIG. 8. Refer to the specific pump manual for details.

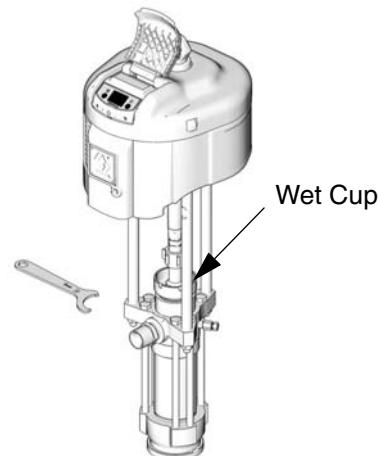


FIG. 8

9. Close (turn fully counterclockwise) all air regulators.

NOTE: Do not use a restrictive quick-disconnect. The air supply pressure must be consistently above the pressure you set on the main air motor regulator.

10. Perform **Flushing** procedure starting on page 17.

Flushing



Read all **Warnings** starting on page 4. Follow **Pneumatic Controls** instructions starting on page 12.



Oil left in the system at the factory can react with catalyst and create a fire or explosion.

- Flush before first use.
- Do not add catalyst to the catalyst reservoir until the system has been flushed.

Perform the following steps when:

- The machine has been installed for the first time. The equipment was tested with light, soluble oil from the factory and may not be compatible with the desired material.
- Changing to a material that is not compatible with the previously loaded material that is currently in the system.

NOTE: Flush at the lowest pressure possible and check connectors for leaks.

To flush the system:

1. Remove all fluid inlet, recirculation, and weep lines from the catalyst reservoir and insert in a container filled with a compatible solvent.
2. You must remove the drum ram plate to immerse the resin pump in a solvent pail. To remove the plate:
 - a. Disconnect the blow-off air line from the ram plate.
 - b. Disconnect the tie rod nuts from the ram cross beam.
 - c. Remove pump clamps between the pump and ram.
 - d. Position the solvent pail so the pump inlet is in the solvent.

NOTE: Use solvent that is compatible with the equipment wetted parts and the material you will dispense.

- e. Support the ram(s) so that the pump inlet will not hit the base plate or pail bottom.
- f. Make sure resin hose is open and catalyst is set to recirculate or open.
3. Flush the system and all hoses by very slowly opening the motor control valves. Flush for 1-2 minutes, then close the motor control slider valve.

NOTICE

To avoid damaging the pump, open the motor control valves very slowly to prevent a pump runaway condition.

NOTE: It is normal for the air valve to exhaust air when it is partially open.

4. Check connectors for leaks and tighten them if necessary.
5. Remove the solvent pail from the pump inlets.
6. Operate the pump at low pressure to remove excess solvent.
7. Reinstall the drum or pail ram plates.

Loading Catalyst



MEKP is flammable and potentially explosive, as well as potentially damaging to the eyes and skin.

Read material manufacturer's warnings and material MSDS to know specific hazards and precautions related to MEKP.

Contaminated MEKP can become explosive. Prevent contamination of MEKP with other materials, including but not limited to polyester overspray, polymerization accelerators and promoters, and non-stainless metals. Even small amounts of contaminants can make MEKP explosive. This reaction may start slowly, and gradually build-up heat, which can accelerate until fire or an explosion result. This process can take from seconds to days.



Oil left in the system at the factory can react with catalyst and create a fire or explosion.

- Flush before first use.
- Do not add catalyst to the catalyst reservoir until the system has been flushed.

NOTE: It is recommended to fill the catalyst supply tank prior to loading the adhesive dispense system with resin.

1. Fill catalyst supply tank with preferred catalyst to the desired level, but no higher than the maximum fill level.

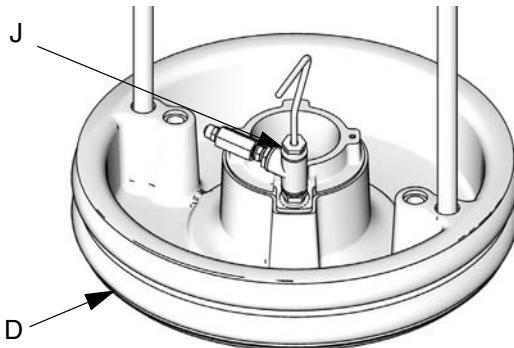
Loading Resin

1. Make sure all air regulators are fully closed (counter clockwise).
2. Push main air slider valve (CA), FIG. 4, to the ON position.
3. Place the ram director valve (CC), FIG. 4, in the UP position.

NOTICE

As the ram rises, make sure hoses do not catch on any components. If a hose catches, immediately stop the ram (move lever to NEUTRAL position) and correct the problem. Lower the ram if necessary to redirect hoses.

4. Slowly turn the ram air regulator (CB), FIG. 4, clockwise until the ram begins rising.
5. Once ram is fully extended, apply a thin coating of compatible lubricant to the ram plate drum seals (D), FIG. 9.
6. Open the material container. Remove any packing materials, and inspect for material contamination. If the container has a plastic liner, pull it tightly over the sides of the container, and secure the liner in place with tape wrapped below the top drum rim.
7. Position the drum so it rests evenly between the centering guides and is fully backed into the stops located near the back of the ram base plate.
8. Remove bleed stick from platen bleed port (J).



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FIG. 9

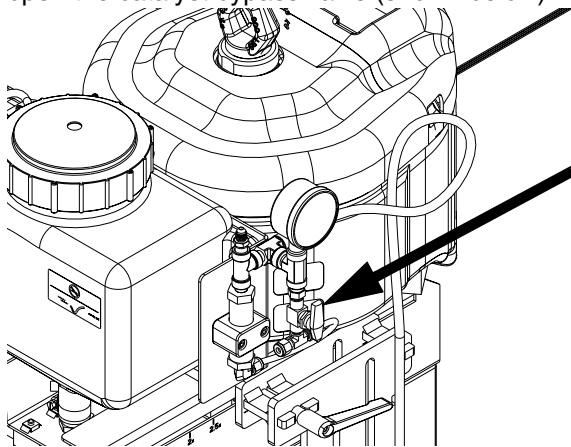
When lowering the ram, keep hands and body away from the ram plate and material drum. Read all **Warnings** starting on page 4.

9. Set the ram director valve to DOWN and lower the ram until fluid appears at the top of the platen bleed port (J). Adjust ram air regulator as needed. **2-Button Interlock:** Press both two-hand control buttons to lower the ram plate into the drum. Once the ram plate enters the drum, the two-hand control is no longer active.
10. After the ram plate seals contact the drum, adjust the ram air regulator to about 30-50 psi (207-345 kPa, 2.1-3.4 bar).
11. When the ram stops and material fills the bleed port (or air stops bleeding out), place the ram lever in the neutral position and replace the bleed stick.

Priming Resin Pump

1. Place a waste container under the pump bleed valve, located behind the displacement pump outlet. Using an adjustable wrench, open the bleed valve counterclockwise 1/3-1/2 turn.

NOTE: Open catalyst pump inlet valve (U), FIG. 1, and open the catalyst bypass valve (shown below).



2. Close air motor regulator (CE), FIG. 4, (turn fully counter clockwise). Open the main air motor slider valve (CF), FIG. 4. Slowly increase air motor pressure by turning regulator clockwise. Make sure the pump begins to cycle and material flows from the bleed valve after several cycles of the pump.



If the pump does not cycle, adjust the air motor regulator up 5 psi (34 kPa, 0.3 bar) and repeat step 2. Never adjust the regulator by more than 5 psi (34 kPa, 0.3 bar) increments.

3. Operate the pump until it moves smoothly in both directions with no air popping or erratic movement, then close the air motor slider valve.
4. Close the bleed valve.
5. Adjust the pump air regulator to approximately 10-15 psi (69-103 kPa, 0.7-1 bar).
6. Place the gun/resin hose over a waste container.
7. With catalyst valve still in recirculation, open the air motor slider valve. Purge material until clean material with no air pockets dispenses from the resin hose into the waste container.
8. Close dispense valve and close air motor slider valve.

Priming Catalyst Pump



Oil left in the system at the factory can react with catalyst and create a fire or explosion.

- Flush before first use.
- Do not add catalyst to the catalyst reservoir until the system has been flushed.

1. Close main air inlet and close air motor slider valve.
2. Perform **Pressure Relief Procedure**, page 20.
3. Remove drive pin to release catalyst pump from drive mechanism. Rotate pump out of pump box.

NOTE: Catalyst pump must be fully retracted.

4. Open catalyst pump inlet valve (U), FIG. 1.

NOTE: Catalyst tank should be full at this time.

5. Remove catalyst non-drip valve from mix block and place in a waste container. Refer to **Ratio Check**, page 22, for non-drip valve removal.
6. With air motor slider valve still closed, open resin dispense ball valve (BE), FIG. 3, to actuate catalyst valve.
7. Hand pump catalyst pump until catalyst dispenses from the non-drip with no air pockets.
8. Rotate pump back into pump box and replace drive pin.
9. Wipe non-drip valve clean and replace into mix block.

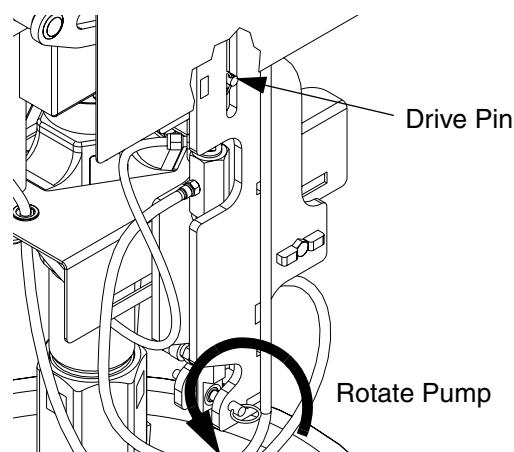


FIG. 10

Pressure Relief Procedure



Read all **Warnings** starting on page 4, and follow the **Pressure Relief Procedure** whenever you:

- are instructed to relieve pressure
- stop dispensing
- check or service any of the equipment
- install or clean the nozzle.

1. Purge mixed material if necessary.
2. Close the system air shutoff valve (A), FIG. 1.
3. Hold a metal part of the dispense valve firmly to the side of a grounded metal pail, and trigger the dispense valve to relieve pressure.
4. Open the catalyst bypass valve (H), FIG. 12, and the resin pump bleeder valve, having a container ready to catch the drainage.
5. Leave the bypass valve open until you are ready to dispense again.
6. *If you suspect that the nozzle or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, very slowly loosen hose end coupling and relieve pressure gradually, then loosen it completely, and clear the nozzle or hose.*
7. Jog the director valve up and down to bleed air from the ram cylinders.

Dispensing Mixed Material

1. Load the material. See page 16.
2. Set ratio. See page 16.
3. Open the air motor air slider valves (G), FIG. 11. Make sure the catalyst bypass valve is closed (H), FIG. 12.

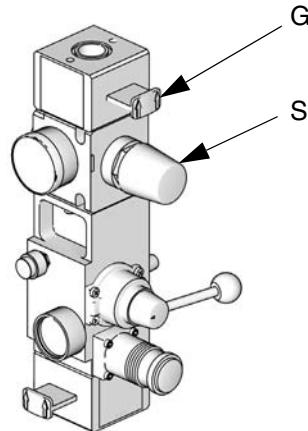


FIG. 11

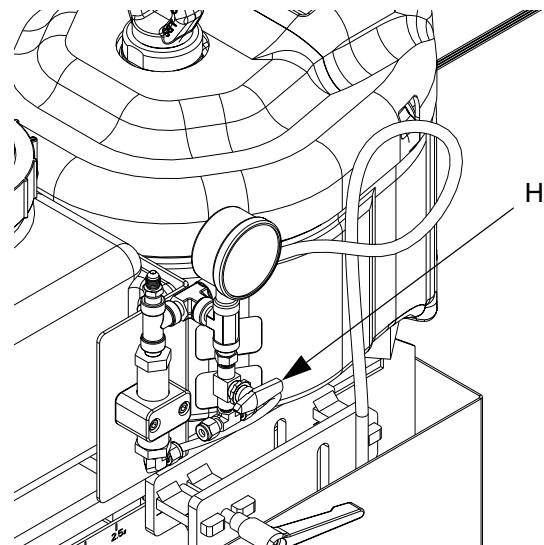


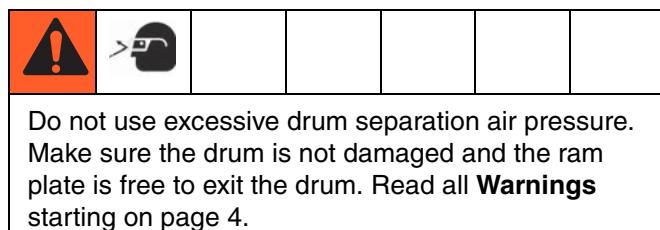
FIG. 12

4. Adjust the air motor air regulator (S) until the desired output is reached.
5. Trigger the dispense valve to dispense mixed material.

Changing Resin Drum

When the ram plate is extended fully to the bottom of the drum and the pump begins to cavitate, you need to change the drum. It is recommended that you check and refill the catalyst material at the same time.

1. Close the system air shutoff valve (A).
2. With the ram lever (C) in the neutral position, adjust the ram regulator (D) to 0 psi.
3. Place the ram lever (C) in the UP position, FIG. 13.



4. Push and hold the ram separation air button (KK).
5. Adjust the ram regulator (D) to approximately 10-15 psi (69-103 kPa, 0.7-1 bar) or until the ram plate begins to rise.
6. Continue to hold the drum separation air button (KK) just enough to keep the drum from rising with the ram plate.
7. Follow the procedure to load material.

NOTE: You need to lubricate the ram plate wipers every time you load material.

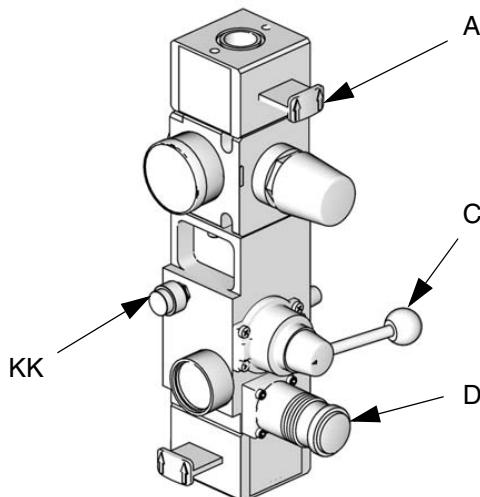


FIG. 13

Ratio Check

NOTE: Volume ratio and weight ratio are not the same. You may need to convert a weight ratio into a volume ratio into volume ratio by using the specific gravity or density of your materials.

1. Perform **Pressure Relief Procedure** on page 20.
2. Remove Catalyst non-drip valve assembly (A) from dispense valve (B) by removing the fasteners shown below. Rotate the catalyst non-drip valve assembly clear of the mounting bracket and remove from the mix block. Place into a waste container.
3. Remove the resin shut off valve assembly (D) from the mix block at the swivel fitting (C) shown below.
4. Place resin shut off valve assembly into a waste container.

5. Set equipment to typical operating pressure and conditions.
6. Open resin shut off valve. Material will be dispensed from both resin ball valve and catalyst non-drip valve.
7. Collect a sample of the resin and catalyst while the materials are flowing. Do not start the flow directly into the measurement containers. Measurement error can be introduced when the valves are opened, as the hoses depressurize and the system reaches equilibrium. Take a sample of at least two pump cycles. Larger samples will have less measurement error.
8. Weigh each sample and compare the ratio by weight to the desired result. Remember to subtract the weight of the container.
9. Adjust ratio as necessary. Refer to **Setting the Ratio** procedure on page 16.

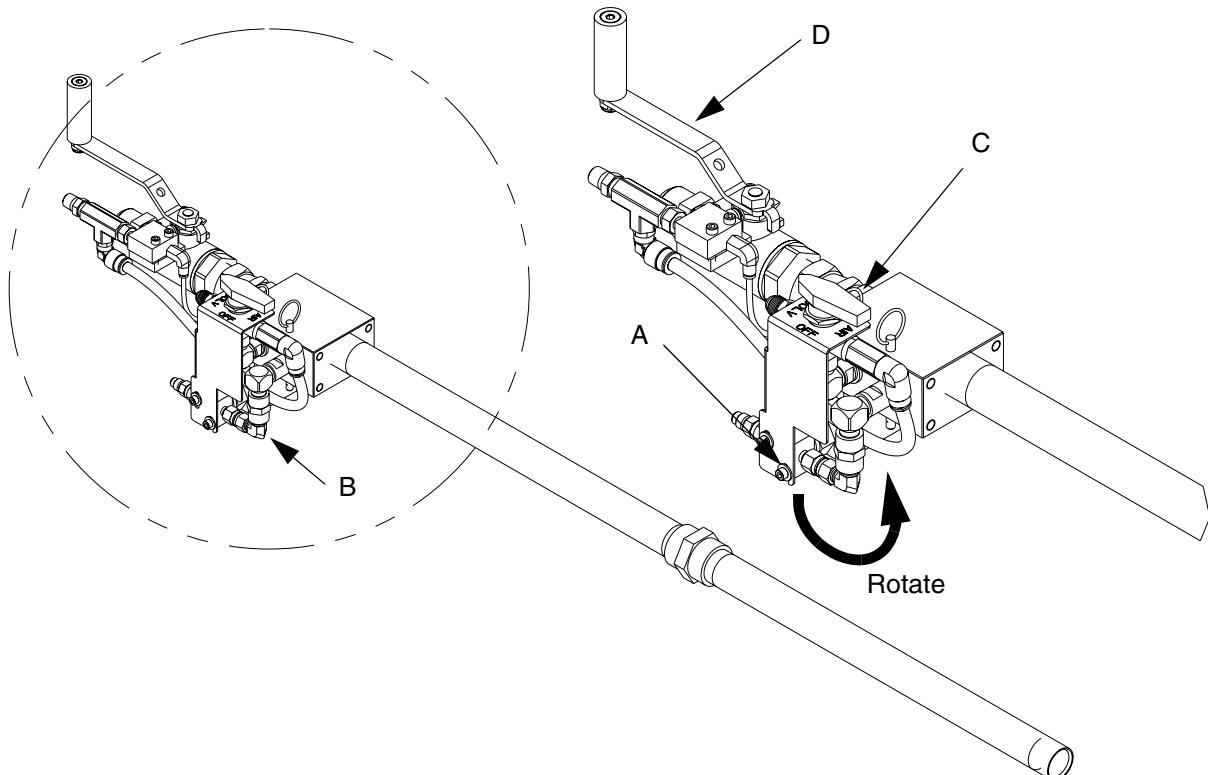


FIG. 14

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.

Flushing the System

Flush the resin pump:

- Before the first use
- When changing material or fluid part number or brand
- Before fluid can dry or settle out in a dormant pump (check the shelf life or pot life of catalyzed fluids)
- Before storing the pump

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.

<ul style="list-style-type: none"> • Before flushing, read the section FIRE AND EXPLOSION HAZARD on page 4. Be sure the entire system and flushing pails are properly grounded. Refer to Grounding on page 13. 						

To flush the system, perform the following procedure:

1. Place a drum of compatible flush material under the follower plate.
2. Run the pumps and circulate the flush material through the system for approximately 1 to 2 minutes or until the solution is clean.
3. Remove the drum containing the flush material from under the follower plate.

4. Return the system to current readiness condition.

Cleaning the System

NOTICE

Cleaning the system after using it can prevent material contamination, which may cause the material to fail or perform poorly. Do not load new material into a contaminated system.

Clean the system to avoid untimely equipment malfunctions and to ensure that system components operate efficiently.

To clean the system, perform the following procedure:

<p>To prevent amputation, use a long-handled flat-bladed ice scraper if it is necessary to scrape the bottom of the follower plate. Do not put your hands between the plate and the drum.</p>						

1. **IMPORTANT:** Being careful not to damage the follower plate wipers, wipe or scrape any material buildup from the follower plate and wipers, and properly dispose of the waste material.
2. Apply a generous amount of lubricant to the follower plate wipers.
3. Return the system to current readiness condition.

Cleaning the Mixer

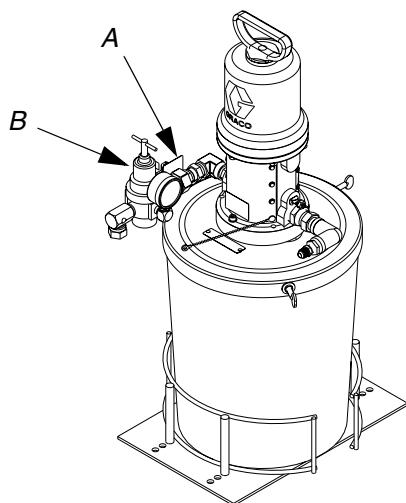


FIG. 15

NOTE: Use a solvent specified by the material manufacturer to clean the dispense valve.

1. Place a waste container beneath the dispense valve.
2. A three way valve (C) mounted on the dispense valve allows solvent or air pressure to be applied to the mixer. Verify the valve is in the OFF position.
3. Following a solvent flush procedure provided by the material manufacturer, open the solvent flush valve (A) on the solvent pail pump. An air regulator (B) on the solvent pump controls the solvent pressure. See FIG. 15.

4. After solvent flushing, switch to air flush to purge lines of solvent. See FIG. 16.

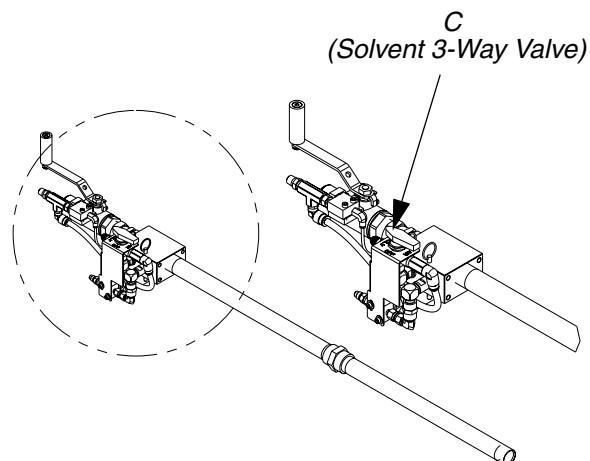


FIG. 16: Valve Positions

5. Once the mixer has been flushed and thoroughly cleaned close solvent flush valve and remove the catalyst non-drip from the mixer block.

NOTE: If the mixer is not thoroughly cleaned, it will directly affect the performance of the equipment. To verify cleanliness of mixer, it may be necessary to remove the mixer sections from the mixer block by unthreading. The element slides out of the housing from one end only to clean.

6. Clean the non-drip valve and lubricate the o-rings with compatible grease.
7. Replace the non-drip valve.

Daily Mixer Maintenance

Remove and clean the mixer and elements from the mix manifold daily to prevent material build-up.

Wet-Cups

See FIG. 17. Check the wet-cup (AC) daily. Keep the wet-cup 1/3 filled with Graco Throat Seal Liquid (TSL) or compatible solvent.

Using the supplied wrench, adjust the packing nut weekly so it is just snug; do not overtighten. Torque to 135-169 N•m (100-125 ft-lb).

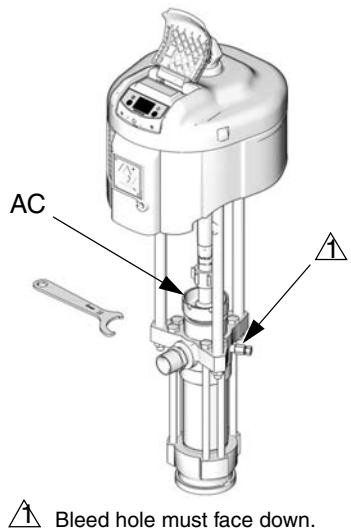


FIG. 17: Bleeder Valve and Wet-Cup

Wiper Lubrication

It is extremely important that the follower plate wipers be thoroughly lubricated between drum changes. The follower plate may stick without lubrication.

Catalyst Supply Tank Screen

Remove, inspect, and clean the catalyst supply tank screen prior to re-filling the tank.

Catalyst Weep Line

Visually inspect the catalyst weep line prior to production runs. Material in the line indicates a pump seal failure.

Pneumatic Service

The pneumatic layout panel service procedures include:

- Filter/element replacement

Filter/Element Replacement



The air filter is located on the pneumatic control stack. See FIG. 18.

To replace an air filter/element, do the following:

1. At the pneumatic controls, do the following:
 - a. Close the air motor slider valve and the ram air slider valve.
 - b. Close the main air inlet valve.

Filter Removal

3. Turn the air filter counterclockwise to unscrew the filter from its mounting. See filter manual 308169 for more information.

Filter/Element Replacement

4. Replace the old air filter element with a new filter element.
5. Clean the sight glass, if necessary. Reinstall the sight glass back on its threaded mounting. Tighten the sight glass.
6. Check for air leakage around the filter.
7. Return the system to current readiness condition.

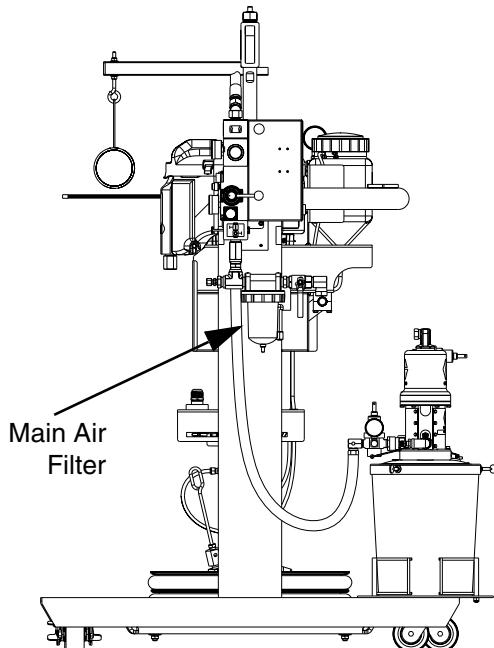
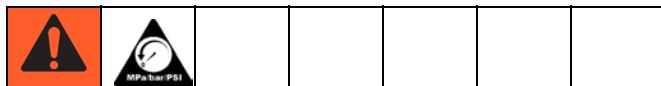


FIG. 18: U81368 shown

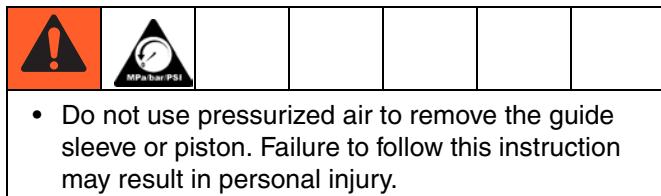
2. Relieve the pressure.

Ram Assembly Service

Piston Rod Seal Service (Fig. 19)



1. Relieve the air pressure.
2. Remove the four nuts and lockwashers holding the tie bar to the rods. Remove the tie bar.
3. Remove the guide sleeve retaining ring by gripping the ring tab with a pair of pliers and rotating the ring out of its groove.
4. Remove the guide sleeve by sliding it off of the rod. Four 1/4 in. – 20 holes are provided to ease removal of the guide sleeve.



5. Inspect the parts for wear or damage. Replace as necessary.
6. Install new o-rings and seal guard. Lubricate the packings with o-ring lubricant.
7. Slide the guide sleeve onto the rod and push it into the cylinder. Replace the retaining ring by feeding it around the guide sleeve groove.

8. Reinstall the tie bar using the nuts and lockwashers. Torque to 40 ft-lb (54 N•m).

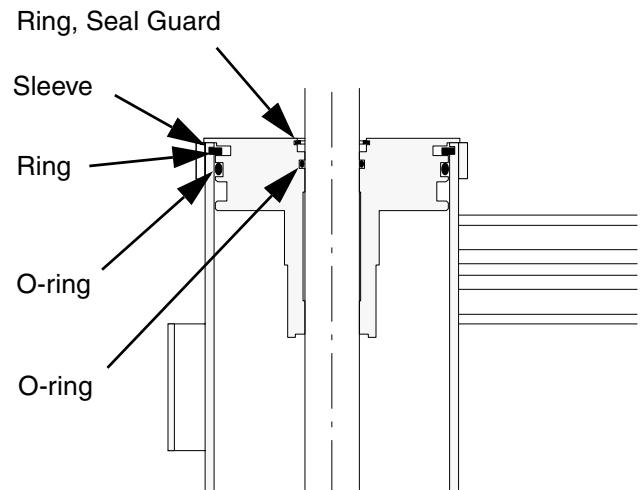
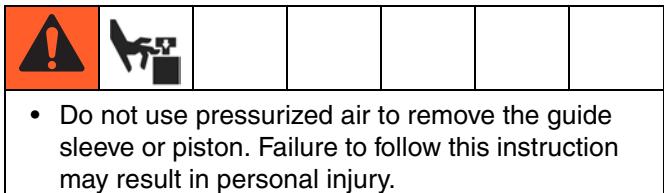


FIG. 19

Ram Piston Service (FIG. 20)



1. Relieve the air pressure.
2. Remove the tie bar as explained under Piston Rod Seal Service.
3. Remove the guide sleeve and slide it off of the piston rod.



4. Carefully pull the piston rod **straight** up out of the cylinder. If the rod is cocked to one side, the piston or inside surfaces of the cylinder could be damaged.
5. Carefully lay the piston and rod down so the rod will not be damaged or bent. Remove the lower piston retaining ring. Slide the piston off the piston rod.
6. Install new O-ring seals on the piston rod and the piston. Lubricate the piston and seals. Reinstall the piston and retaining ring.
7. Carefully insert the piston into the cylinder and push the rod straight down into the cylinder. Add 3 ounces of lubricant to each cylinder after inserting the piston.

8. Slide the guide sleeve onto the piston rod. Reinstall the retaining ring and tie bar, as explained under Piston Rod Seal Service.

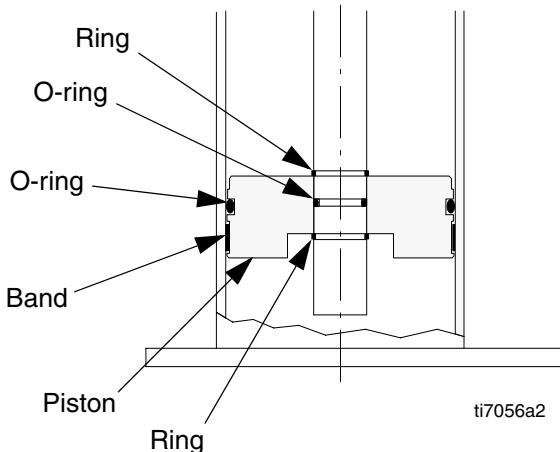


FIG. 20

Remove Platen Wipers

1. To replace worn or damaged wipers (EB), raise platen up out of drum. Remove drum from base. Wipe fluid off of platen.
2. Cut top and bottom wipers with knife and remove from platen. See FIG. 21.

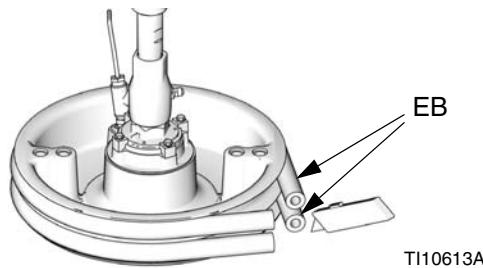


FIG. 21

Reinstall Platen Wipers

1. Using a wooden or plastic tool to prevent damage to the wiper (EB), clean all material from seal grooves.
2. *Working from the bottom*, angle one wiper (EB) over back of platen. See FIG. 22.
3. Insert wiper (EB) in top groove and run front of wiper into groove.
4. Insert second wiper (EB) in lower groove and run front of wiper into groove.
5. Lubricate outside of wiper with lubricant compatible with material being pumped. Check with material supplier.

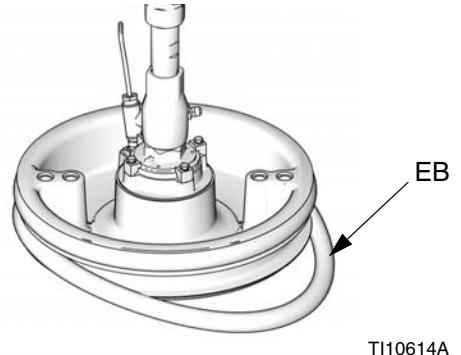


FIG. 22

Pump Assembly Service

Resin Pump Removal



Refer to drawing package.

1. Relieve the air pressure from the air motors and ram assembly to be serviced.
2. Move the RAM POSITION switch to NEUTRAL.
3. Perform **Pressure Relief Procedure** on page 20.

NOTE: Check the Technical Data page in the separate pump manual to find the weight of the pump being serviced. For example, Graco Premier® 45:1 SST Pump (222939) weighs 240 lb (109 kg) per Form 308148.

NOTE: If the air motor does not require servicing, leave it attached to its mounting.

4. If servicing the air motor, detach the air hose from the air motor.
5. Detach the fluid supply hose at the pump outlet.
6. If removing air motor, remove catalyst pumps.
7. On the follower plate adapter, loosen and rotate or remove four lugs and hex bolts holding the flange of the pump lower.
8. Detach any other connections to the pump assembly to ensure the pump is free of attachments before removal. Possible connections include:
 - Air motor exhaust kit
 - Pump proximity switch kit
 - Pump grounding wire

9. Use a hammer and brass rod to loosen coupling nut. When coupling nut drops down remove coupling collars and coupling nut from displacement rod.

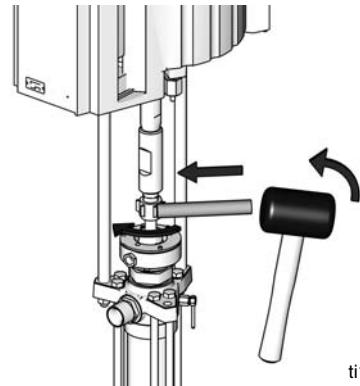


FIG. 23

10. Use a wrench to hold the tie rod flats to keep the rods from turning. Unscrew the nuts from the tie rods and carefully remove the displacement pump.

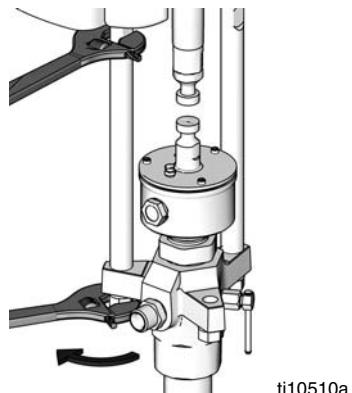


FIG. 24

11. Raise the ram assembly to lift the air motor away from the displacement pump.
12. Use two people to lift out the displacement pump.
13. Remove the o-ring from the pump adapter. They should be discarded and replaced when the pump is reinstalled.
14. Clean excess and hardened material from the pump adapter on the follower plate.

15. Ensure that material is not rising through the pump adapter in the follower plate. If material is flowing upward, move the RAM POSITION switch to RAISE until the flow stops, then move the switch back to NEUTRAL.
16. Move the pump assembly to a suitable work area and repair the pump using the appropriate Graco instruction manual. See **Related Manuals** on page 3.

Pump Installation

Refer to drawing package.

1. When the pump is serviced and tested and ready to be replaced in the Adhesive Dispense system Ram, perform the steps of the Pump Removal procedure in reverse order.
2. It is recommended that the pump be tagged with the type and date of repair and the name of the technician who performed the repair.

							
Failure to open the hose outlet valves in the following step will result in an overpressure situation.							

3. Before returning the reassembled pump to production use, it must be primed with material and air removed from the material.

Technical Data

Maximum Fluid Working Pressure	2000 psi (14 MPa, 138 bar)
Maximum Air Inlet Pressure	100 psi (0.7 MPa, 7 bar)
Maximum Pump Operating Temperature	65.5°C (150°F)
Catalyst Slave Pump Range	0.5% to 2.5%
Pump Cycles Per 3.8 Liters (1 Gal.)	Dura-Flo 1200 (290 cc): 12.5
Fluid Flow At 60 Cycles Per Minute	Dura-Flo 1200 (290 cc): 17.4 lpm (4.6 gpm)
Motor Piston Effective Area	See motor manual, supplied.
Stroke Length	See motor manual, supplied.
Lower Effective Area	See lower manual, supplied.
Motor Fitting Sizes	See motor manual, supplied.
System Main Air Inlet Size	3/4 in. npt(f)
Sound Pressure	NXT® air motors: See manual 311238, supplied.
Sound Power	NXT air motors: See manual 311238, supplied.
Wetted Parts	Dura-Flo 1200 (290 cc): See manual 311827
Dimensions	Width: 69 in. (1753 mm) Depth: 51 in. (1295 mm) Height (lowered): 85.2 in. (2164 mm) Height (raised): 141 in. 3581 mm)
Overall Weight	Approximately 1092 lb (495 kg)
Overall Width	56 in. (1422 mm)
Overall Depth	50 in. (1270 mm)
Overall Height (Lowered)	70 in. (1778 mm)
Overall Height (Raised)	111 in. (2820 mm)

Pump Performance Charts

Fluid Outlet Pressure

To find fluid outlet pressure (MPa/bar/psi) at a specific flow (lpm/gpm) and operating pressure (A/B/C):

1. Locate desired flow at bottom of chart.
2. Follow vertical line up to intersection with selected operating pressure curve (solid line). Follow left to scale to read fluid outlet pressure.

Pump Air or Hydraulic Oil Consumption

To find air or hydraulic oil consumption at a specific flow (lpm/gpm) and operating pressure (A/B/C):

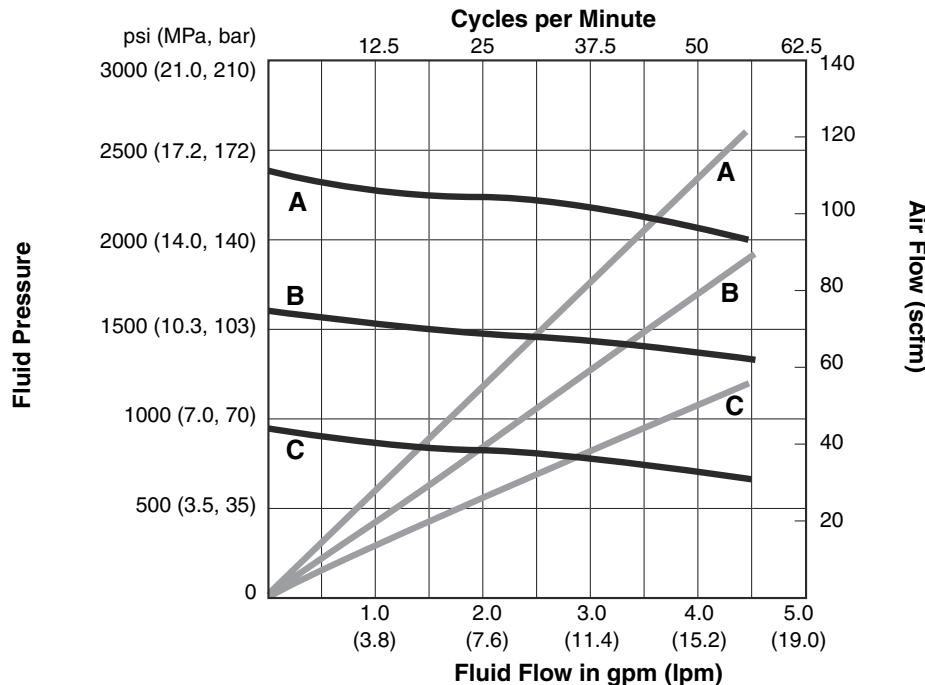
1. Locate desired flow at bottom of chart.
2. Follow vertical line up to intersection with selected operating pressure curve (dashed line). Follow left to scale to read air or oil consumption.

Key

A 0.7 MPa, 7 bar (100 psi) air pressure or 10.5 MPa, 105 bar (1500 psi) hydraulic oil pressure
B 0.5 MPa, 4.9 bar (70 psi) air pressure or 7.5 MPa, 75 bar (1050 psi) hydraulic oil pressure
C 0.3 MPa, 2.8 bar (40 psi) air pressure or 4.2 MPa, 42 bar (600 psi) hydraulic oil pressure

Test Fluid: No. 10 Weight Oil

Dura-Flo 1200 Pumps with NXT Model 3400 Air Motors, Pump Ratio 25:1



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.

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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.

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Original instructions. This manual contains English. MM 3A2339

Graco Headquarters: Minneapolis

International Offices: Belgium, China, Japan, Korea

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