

M2K Spray Packages

333309F

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For two-component finishing and coating applications in hazardous and non-hazardous locations. For professional use only.

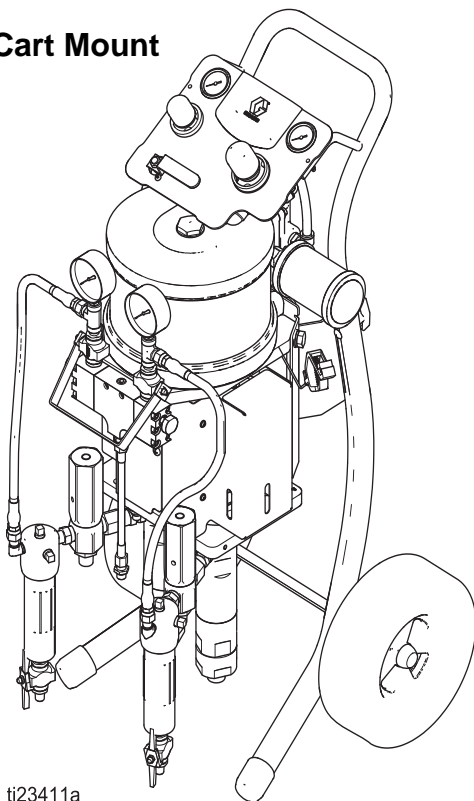


Important Safety Instructions

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

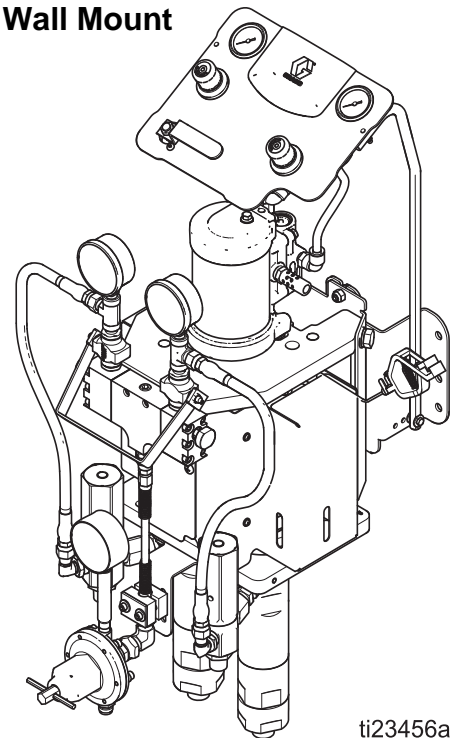
See page 4 for Model Information.
See page 53 for Maximum Working Pressure.

Cart Mount



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Wall Mount



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Related Manuals


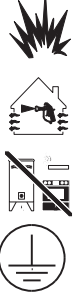

Manual	Description
333309	M2K Spray Packages
334625	M2K Mix Manifolds
3A0732	Merkur® ES Spray Packages
308652	Husky™ 205 Air-Operated Diaphragm Pumps
312796	NXT® Air Motor
312792	Merkur® Displacement Pump
307273	Fluid Outlet Filter
308547	Pressure Relief Valve
306861	Ball Valves, Check Valves, and Swivels
312414	AirPro™ Pressure Feed Airspray Gun
3A0149	G15/G40 Spray Gun
312145	XTR™ 5 and XTR™ 7 Airless Spray Gun
311254	Silver and Flex Plus Airless Spray Guns

Models

Sprayer Type	Pump Ratio	Mounting Type	Model	Fluid Filters and Fluid/Air Hose	Lower A	Lower B	Air Motor
Air Spray	1:1	Cart	24V868	1/4 ID Mix Fluid Hose x 25 ft. (7.6 m)	50cc	50cc	2.5 in.
		Wall	24V874	None			
	2:1	Cart	24V869	1/4 ID Mix Fluid Hose x 25 ft. (7.6 m)	100cc	50cc	
		Wall	24V875	None			
	3:1	Cart	24V870	1/4 ID Mix Fluid Hose x 25 ft. (7.6 m)	75cc	25cc	
		Wall	24V876	None			
	4:1	Cart	24V871	1/4 ID Mix Fluid Hose x 25 ft. (7.6 m)	100cc	25cc	
		Wall	24V877	None			
	5:1	Cart	24V872	1/4 ID Mix Fluid Hose x 25 ft. (7.6 m)	125cc	25cc	
		Wall	24V878	None			
	6:1	Cart	24V873	1/4 ID Mix Fluid Hose x 25 ft. (7.6 m)	150cc	25cc	
		Wall	24V879	None			
Air Assisted Air Spray	1:1	Cart	24V880	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	50cc	50cc	7.5 in.
		Wall	24V886	None			
	2:1	Cart	24V881	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	100cc	50cc	
		Wall	24V887	None			
	3:1	Cart	24V882	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	75cc	25cc	
		Wall	24V888	None			
	4:1	Cart	24V883	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	100cc	25cc	
		Wall	24V889	None			
	5:1	Cart	24V884	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	125cc	25cc	
		Wall	24V890	None			
	6:1	Cart	24V885	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	150cc	25cc	
		Wall	24V891	None			
Airless	1:1	Cart	24V892	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	50cc	50cc	7.5 in.
		Wall	24V898	None			
	2:1	Cart	24V893	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	100cc	50cc	
		Wall	24V899	None			
	3:1	Cart	24V894	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	75cc	25cc	
		Wall	24V901	None			
	4:1	Cart	24V895	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	100cc	25cc	
		Wall	24V902	None			
	5:1	Cart	24V896	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	125cc	25cc	
		Wall	24V903	None			
	6:1	Cart	24V897	3/16 ID Mix Fluid Hose x 25 ft. (7.6 m)	150cc	25cc	
		Wall	24V904	None			
Airless - For Split-Batch Polyester Applications	1:1	Cart	24W609	Remote Manifold to Airless Gun 3/16 ID Mix Fluid Hose x 25 ft. (7.6 m) + 10 ft. (3 m)	25cc	25cc	4.5 in.

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. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

 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.
	<p>SKIN INJECTION HAZARD</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. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> • Do not spray without tip guard and trigger guard installed. • Engage trigger lock when not spraying. • Do not point gun at anyone or at any part of the body. • Do not put your hand over the spray tip. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop spraying 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.

⚠️ 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. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- 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 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** in this manual. Disconnect power or air supply.



TOXIC FLUID OR FUMES HAZARD

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

- Read MSDS's to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.



PERSONAL PROTECTIVE EQUIPMENT

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

- Protective eyewear
- Clothing and respirator as recommended by the fluid and solvent manufacturer
- Gloves
- Hearing protection

Important Isocyanate (ISO) Information

Isocyanates (ISO) are catalysts used in two component materials.

Isocyanate Conditions



Spraying or dispensing materials containing isocyanates creates potentially harmful mists, vapors, and atomized particulates.

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

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.

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.

Keep Components A and B Separate



Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:

- **Never** interchange component A and component B wetted parts.
- Never use solvent on one side if it has been contaminated from the other side.

Moisture Sensitivity of Isocyanates

Exposure to moisture (such as humidity) will cause ISO to partially cure; forming 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.

NOTICE

Partially cured ISO will reduce performance and the life of all wetted parts.

- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. **Never** store ISO in an open container.
- Keep the ISO pump wet cup or reservoir (if installed) filled with appropriate lubricant. The lubricant creates a barrier between the ISO and the atmosphere.
- Use only moisture-proof hoses compatible with ISO.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Always lubricate threaded parts with an appropriate lubricant when reassembling.

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

Changing Materials

NOTICE

Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime.

- 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.
- When changing between epoxies and urethanes or polyureas, disassemble and clean all fluid components and change hoses. Epoxies often have amines on the B (hardener) side. Polyureas often have amines on the B (resin) side

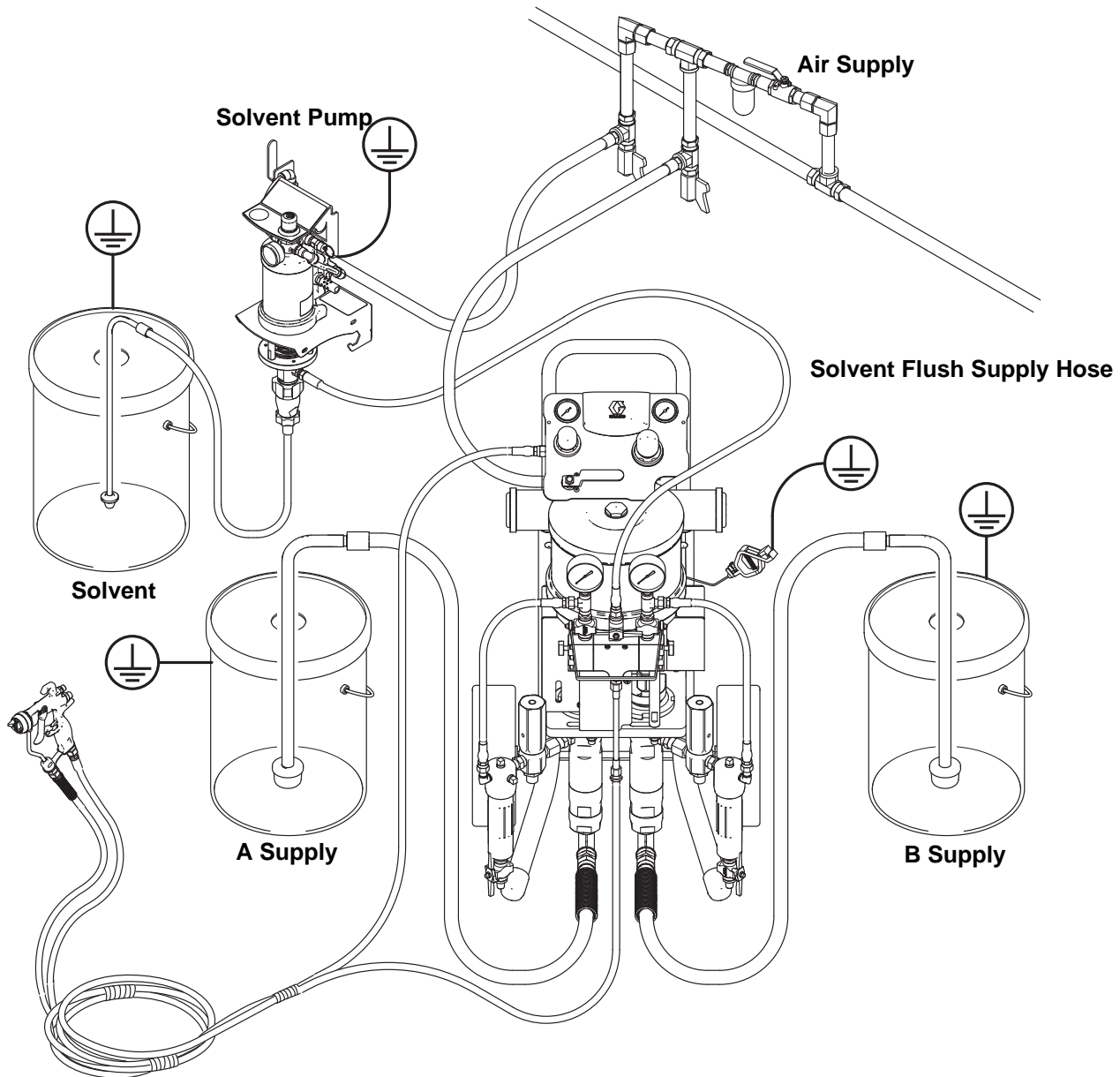
Introduction

The Graco M2K spray packages are intended for use with two-component epoxy, polyurethane, and polyester split batch (Model 24W609) materials in industrial applications. When maintained and operated properly they can produce a $\pm 1\%$ ratio accuracy, while simultaneously reducing material waste and cleanup solvent use, over hand mixing, and hot potting applications.

Typical System Installation

FIG. 1 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 particular needs.

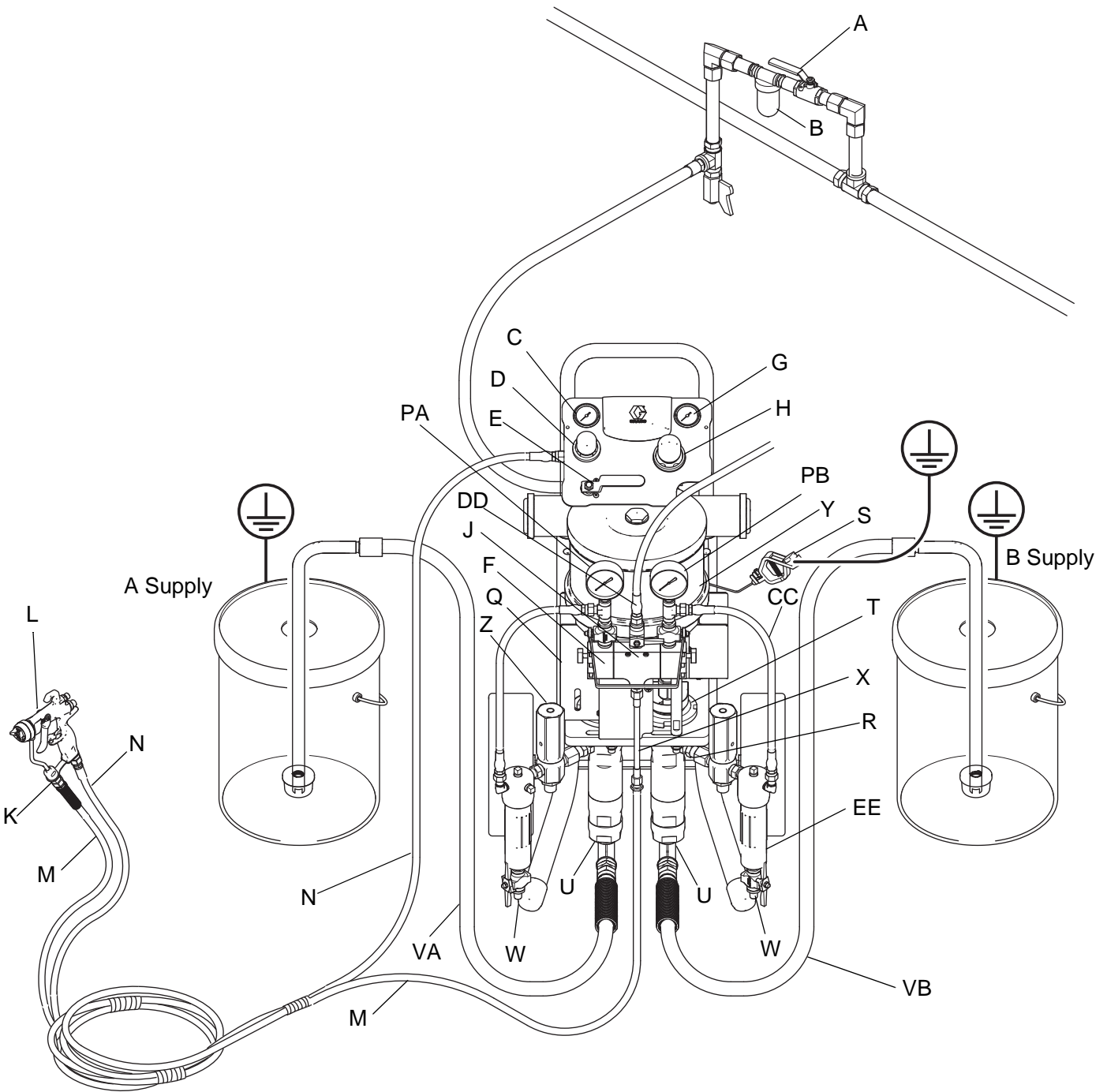
Always use Genuine Graco Parts and Accessories, available from your Graco distributor. If you supply your own accessories, be sure they are adequately sized and pressure-rated for your system.



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FIG. 1 Typical System Installation

Proportioner Overview

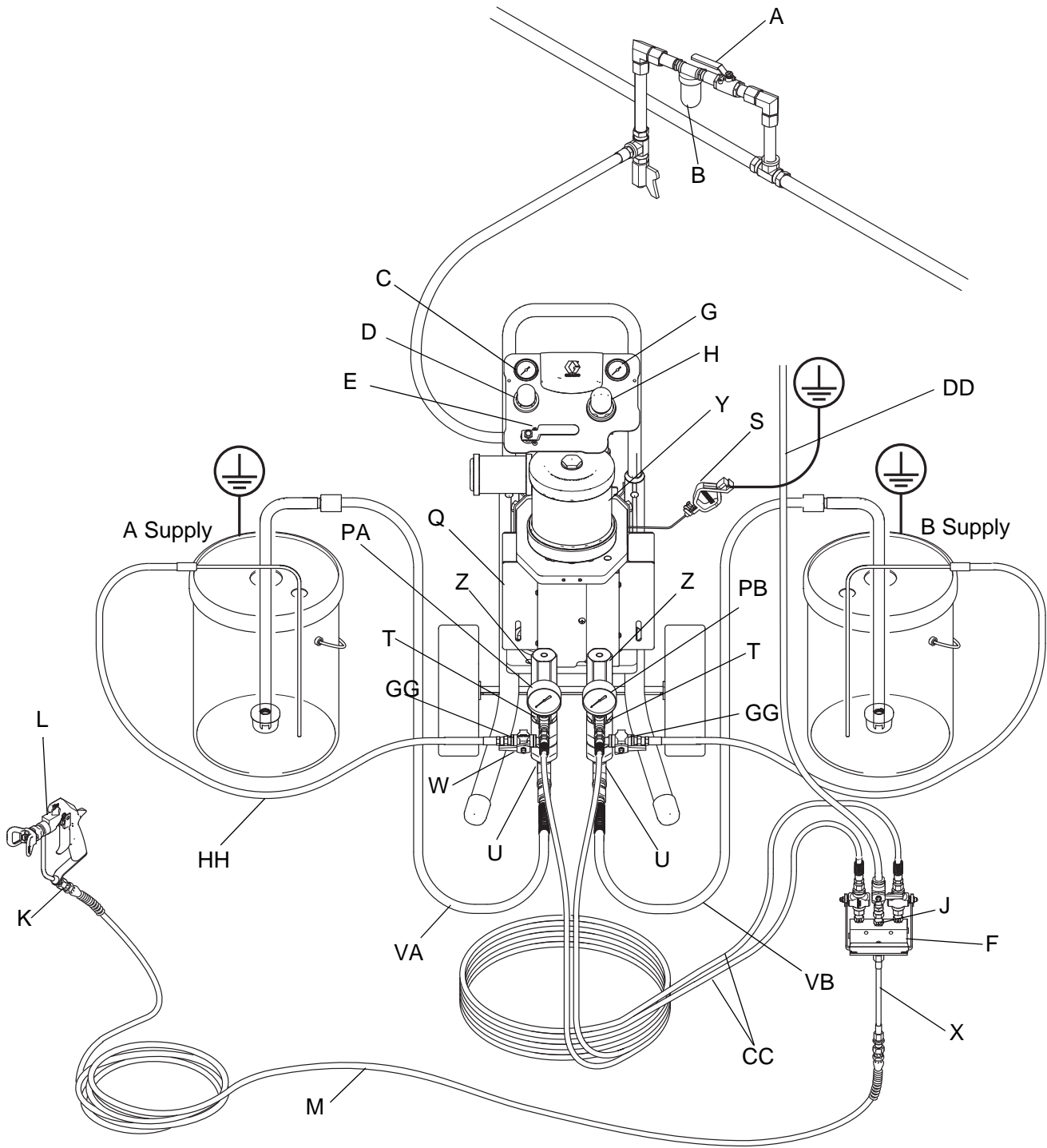


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FIG. 2 Typical Installation, Non-Polyester Models

A	Air Shutoff Valve (optional accessory, purchase separately) - Isolates the air line accessories for servicing.
B	Air Filter (optional accessory, purchase separately) - Removes harmful dirt and moisture from the compressed air supply.
C	Gun Air Pressure Gauge - Displays atomizing air pressure to spray gun.
D	Gun Air Pressure Regulator - Adjusts the air pressure to the air spray or air-assisted spray gun (L).
E	Bleed Type Master Air Valve - Red-handled valve required to relieve air trapped between it and the air motor and gun when the valve is closed. Do not block access to the valve.
F	Mix Manifold - Combines A and B fluid flows out to mixer.
G	Pump Air Pressure Gauge - Displays pump air pressure.
H	Pump Air Pressure Regulator - Controls pump speed and outlet pressure by adjusting the air pressure to the pump.
J	Solvent Flush Inlet - On the mix manifold; provides flush point for mixed material.
K	Gun Swivel - Allows for easier gun movement and comes attached to the blue hose (AA packages). The airless gun has a built-in fluid swivel.
L	Spray Gun - The air spray, air-assisted, or airless spray gun (L) dispenses the fluid. The gun houses the spray tip or nozzle (not shown), which is available in a wide range of sizes for different spray patterns and rates of flow. Refer to gun manual for tip installation. See Related Manuals , page 3.
M	Gun Fluid Supply Hose - Blue hose. Provides the gun fluid supply.
N	Gun Air Supply Hose - Transparent hose (labeled "Air Hose Only") provides the gun air supply.
PA	Fluid Pressure Gauge A Supply Side - Displays fluid pressure from pump to mix manifold
PB	Fluid Pressure Gauge B Supply Side - Displays fluid pressure from pump to mix manifold
Q	Pinch Guard - Shield covering all moving parts.
R	Pump Fluid Outlet - Outlet port of the pump.
S	Grounding Wire - Provides true earth ground for static dissipation.
T	Wet-Cup - Maintains consistent lubrication for packings and keeps paint from drying on displacement rod.
U	Pump Fluid Inlet - Inlet port of the pump.
VA	Suction Hose with Strainer A Supply - Allows the pump to draw fluid from a 5 gallon (19 liter) pail. A fluid hopper with screen also is available.
VB	Suction Hose with Strainer B Supply - Allows the pump to draw fluid from a 5 gallon (19 liter) pail. A fluid hopper with screen also is available.
W	Fluid Drain Valve - Relieves fluid pressure in the filter and allows for easier filter removal for cleaning.
X	Mixer - Static fluid mixer. Mixes combined flows of A and B from mix manifold.
Y	Motor - Powers pump
Z	Pressure Relief Valve - Prevents pumps from generating pressures higher than system rated pressure. Do not cap or restrict the bottom threaded port. Fluid must be allowed to exit the bottom port if an over pressure occurs. Refer to Relief Valve manual. See Related Manuals , page 3.
CC	Pump Outlet Hose - Provides fluid to the mix manifold from the pump.
DD	Solvent Flush Supply Hose - Provides fluid to the mix manifold from solvent pump.
EE	Fluid Filter - 60 mesh (250 micron) stainless steel element filters particles from fluid as it leaves the pump.
	Air Relief Valve (not shown) - Opens automatically to prevent overpressurization of the air motor.

Model 24W609 (for Polyester applications)



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FIG. 3 Typical Installation, Polyester Model

A	Air Shutoff Valve (optional accessory, purchase separately) - Isolates the air line accessories for servicing.
B	Air Filter (optional accessory, purchase separately) - Removes harmful dirt and moisture from the compressed air supply.
C	Gun Air Pressure Gauge - Displays atomizing air pressure to spray gun. Used only if the application requires an optional air spray or air-assisted spray gun (sold separately).
D	Gun Air Pressure Regulator - Adjusts the air pressure to the air spray or air-assisted spray gun (L). Used only if the application requires an optional air spray or air-assisted spray gun (sold separately).
E	Bleed Type Master Air Valve - Red-handled valve required to relieve air trapped between it and the air motor and gun when the valve is closed. Do not block access to the valve.
F	Mix Manifold - Combines A and B fluid flows out to mixer.
G	Pump Air Pressure Gauge - Displays pump air pressure.
H	Pump Air Pressure Regulator - Controls pump speed and outlet pressure by adjusting the air pressure to the pump.
J	Solvent Flush Inlet - On the mix manifold; provides flush point for mixed material.
K	Gun Swivel - Allows for easier gun movement and comes attached to the blue hose (AA packages). The airless gun has a built-in fluid swivel.
L	Spray Gun - The air spray, air-assisted, or airless spray gun (L) dispenses the fluid. The gun houses the spray tip or nozzle (not shown), which is available in a wide range of sizes for different spray patterns and rates of flow. Refer to gun manual for tip installation. See Related Manuals , page 3.
M	Gun Fluid Supply Hose - Blue hose. Provides the gun fluid supply.
PA	Fluid Pressure Gauge A Supply Side - Displays fluid pressure from pump to mix manifold
PB	Fluid Pressure Gauge B Supply Side - Displays fluid pressure from pump to mix manifold
Q	Pinch Guard - Shield covering all moving parts.
S	Grounding Wire - Provides true earth ground for static dissipation.
T	Wet-Cup - Maintains consistent lubrication for packings and keeps paint from drying on displacement rod.
U	Pump Fluid Inlet - Inlet port of the pump.
VA	Suction Hose with Strainer A Supply - Allows the pump to draw fluid from a 5 gallon (19 liter) pail. A fluid hopper with screen also is available.
VB	Suction Hose with Strainer B Supply - Allows the pump to draw fluid from a 5 gallon (19 liter) pail. A fluid hopper with screen also is available.
X	Mixer - Static fluid mixer. Mixes combined flows of A and B from mix manifold.
Y	Motor - Powers pump
Z	Pressure Relief Valve - Prevents pumps from generating pressures higher than system rated pressure. Do not cap or restrict the bottom threaded port. Fluid must be allowed to exit the bottom port if an over pressure occurs. Refer to Relief Valve manual. See Related Manuals , page 3.
CC	Pump Outlet Hose - Provides fluid to the mix manifold from the pump.
DD	Solvent Flush Supply Hose - Provides fluid to the mix manifold from solvent pump.
	Air Relief Valve (not shown) - Opens automatically to prevent overpressurization of the air motor.
GG	Return Line Valve
HH	Return Line Tube/Hose Assembly

Installation

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.

Prepare the Site

Compressed Air

- 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. The air hose should have a 3/8 npt(m) thread and minimum 3/8" (9.5 mm) ID.
- Use only electrically conductive hoses. A quick disconnect coupling may be used.

Work Area

- 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.

Wall Mount Packages

Before installing a wall mounted package, ensure the wall can support the weight of the pump, bracket, hoses and accessories, as well as the stress caused during operation.

1. Position the wall bracket about 1-1.5 m (3-5 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.
2. 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 51.
3. Attach the bracket to the wall. Use 3/8 in. (9 mm) screws that are long enough to anchor the pump securely during operation.

NOTE: Be sure the bracket is level.

Air Line Accessories

Install the following accessories in FIG. 1, using adapters as necessary.

- An air filter (B) removes harmful dirt and moisture from the compressed air supply.
- A second bleed-type air shutoff valve (A) isolates the air line accessories for servicing. Locate upstream from all other air line accessories.

Grounding



The equipment must be grounded to reduce the risk of static sparking. Static sparking can cause fumes to ignite or explode. Grounding wire provides an escape path for static electric current.

The following components must be grounded.

1. 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.

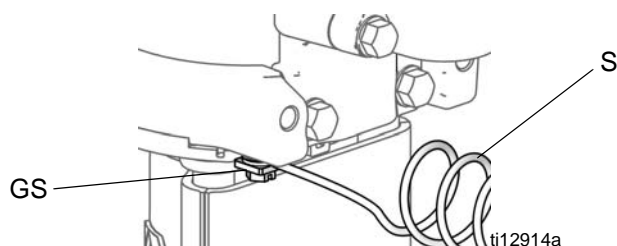


FIG. 4. Ground screw and wire

2. Pump fluid hoses

Use only electrically conductive fluid hoses. Check electrical resistance of hoses. If total resistance to ground exceeds 25 megohms, replace hose immediately.

3. Air compressor

Follow manufacturer's recommendations.

4. Spray gun

Ground through connection to a properly grounded fluid hose and pump.

5. Fluid supply container

Follow your local code.

6. Object being sprayed

Follow your local code.

7. Solvent pails used when flushing

Use only metal pails, which are conductive, placed on a grounded surface. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts the grounding continuity. All solvent pails used when flushing must be grounded according to local code.

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

Setup

See FIG. 2.

1. Install suction hoses (VA, VB) to the pump fluid inlets (U). See page 46.
2. Connect solvent supply (DD) to solvent flush inlet (J).
3. Attach one end of the gun fluid supply hose (M) to the mixer (X) outlet.
4. Attach one end of the gun air supply hose (N) to gun air pressure regulator (D) atomizing air port.
5. Attach remaining end of the gun air supply hose (N) to air inlet at base of gun (L).
6. Connect gun fluid supply hose (M) to the base of the gun (L) at swivel (K).
7. Clip gun fluid supply hose (M) and gun air supply hose (N) together with the supplied hose clips (qty. of 7). Space clips as needed.
8. Apply lens cover to both regulator gauge lenses.
9. Verify that suction hose (VA, VB) fittings are tight.

NOTE: Loose suction hose fittings allow air to enter into the proportioning pump resulting in the fluid ratio to be altered.

Connect Air Lines

See FIG. 1.

1. Attach fittings to the air control module.
2. Attach the air hose to the fitting on the air control module.

NOTE: The air supply line to proportioner module has to be a minimum of 3/8 in. (9.5 mm) ID.

3. Attach air line to solvent pump.

Feed Systems

Ensure your feed systems are designed to supply twice the volume used by each component. This supply pump pressure should never exceed 25% of the proportioner output pressure or 250 psi (16 bar) maximum supply pressure.

Example: 4:1 proportioner. 2.0 lpm output, 100 bar.

4:1 ratio at 2.0 lpm = 1.6 lpm of “A” component and .4 lpm of component “B”.

- “A” feed pump needs to have a 3.2 lpm capacity at a max of 250psi (16 bar).
- “B” feed pump needs to be at least .8 lpm at 250 psi max.

Material supply is critical to proper proportioner operation. Material must fill the proportioner cylinders on their upstroke totally to eliminate a “diving” of the cylinders on the top change-over. This “diving” will also be seen as a pressure drop at the change over. This will cause an off ratio condition.





NOTICE

Using more supply pressure than necessary to fully supply the proportioning cylinder can cause varying atomization, inconsistent spray pressure, and incorrect fluid ratios.

If materials require heating they can be heated in the supply feed as well as the outbound side of the pumps. The maximum fluid temperature of 160°F should not be exceeded.

Review your feed systems with your Graco Distributor.

A and B Components

						
<p>Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:</p> <ul style="list-style-type: none"> • Never interchange component A and component B wetted parts. • Never use solvent on one side if it has been contaminated from the other side. 						

NOTE: Material suppliers can vary in how they refer to plural component materials.

Be aware that when facing the manifold on the proportioner:

- Component A is on the left side.
- Component B is on the right side.

For all machines:

- The A side is intended for polyols, resins, and bases.
- If one of the materials being used is moisture-sensitive, that material should always be in the B side.
- The B side is intended for ISO, hardeners, and catalysts.

NOTE: For machines with material volume ratios other than 1:1, the higher volume side is typically at the A side.

Polyester Model 24W609: This model is intended for use with split-batch polyester applications. The A side will contain polyester, resin, and the promoter. The B side will contain polyester, resin, and the activator.

Checking the Mix Ratio



The pump must be operating in order to accurately check the proportioning ratio of the pumps. The outlet pressures at the pumps must be maintained at a minimum level of 4 times that of the inlet pressures.

When the mix manifold is removed to check the mix ratio, a flow restrictor will be needed to simulate the pressure conditions during normal operation. The preferred flow restrictor is a small diameter, 1/16 in. ID, 1/2 in. (13 mm) long steel tube, coupled to the fluid supply hoses. A needle-type flow control valve could also be used. Contact your Graco distributor for assistance in selecting the proper type of flow restrictor for your application.

If the mixed fluid does not cure or harden properly, check the ratio of part A to part B. To check the ratio:

1. Relieve the pressure, see page 19.
2. Flush the mixed fluid out of the mix manifold, dispensing lines, and equipment.
3. Disconnect the fluid hoses from the mix manifold inlet, taking note of which hose was connected to which valve.
4. Place the hose ends into a waste container. Set two graduated cylinders of the same size next to the waste container. See FIG. 5.
5. Set the air pressure to the proportioning pumps at zero pressure. Open the air shut off valves to the feed pumps and proportioning pump.
6. Turn up air pressure until fluids are flowing freely, at exactly the same time, move the hoses over the cylinders – part A hose over one cylinder and part B hose over the other.

7. When you have a large enough sample, move both hoses back into the waste containers, at exactly the same time. Then shut off the air to all the pumps.
8. Compare part A volume to part B volume. If the ratio is not correct, refer to the **Troubleshooting Chart** on page 31 for further information on how to correct the ratio.
9. Connect the fluid hoses back to the mix manifold inlet.

NOTICE

Be sure to connect the hoses back to the same valves they had originally been connected to. The mix manifold could be damaged by reversing them. See FIG. 5.

MOVE HOSES AT THE SAME TIME

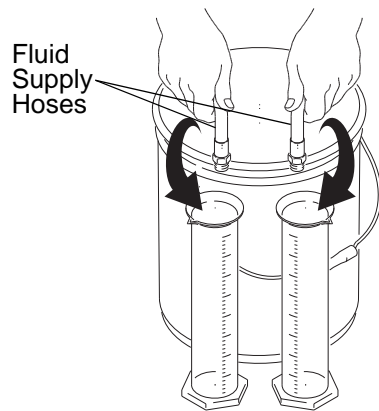


FIG. 5 Checking Mix Ratio

Flush the Pump Before First Use

The pump is tested with lightweight oil, which is left in to protect the pump parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using. See **Flush the Pump** on page 29.

Wet Cup



Check the wet cup (T) daily before starting the pump.

1. To access the wet cups (T) remove the pinch guard (Q) using a Phillips head screwdriver.
2. Fill the wet cup (T) one-half full with Graco Throat Seal Liquid (TSL) or compatible solvent. ISO oil may be used on the "B" side of the proportioner.

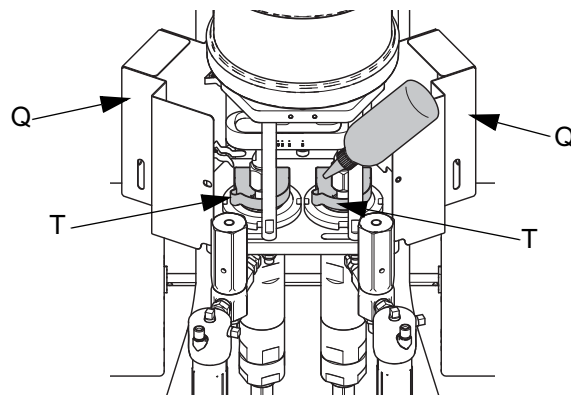


FIG. 6. Wet Cup

3. Re-install the pinch guard (Q) and screw using a Phillips head screwdriver.

Operation

Pressure Relief Procedure

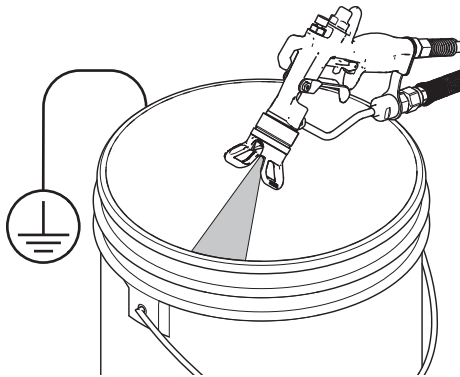


Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

1. Engage the gun trigger lock, if present.
2. See FIG. 2. Turn off the bleed-type master air valve (E) and air to supply pumps, if present.
3. Disengage the gun trigger lock, if present.
4. Hold a metal part of the gun firmly to a grounded metal waste container. Trigger the gun to relieve fluid pressure.



5. Engage the trigger lock, if present.
6. Open all fluid drain valves (W) in the system, having a waste container ready to catch the drainage. Leave the 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.

Prime the Pump



To avoid injury and equipment damage from over-pressurization, always use the minimum air pressure required to make the pump cycle and complete a fill operation. Monitor the fluid gauges during fill operations to ensure the catalyst pump is not over pressurized. Attainable pressures can increase significantly when only one fluid pump is pumping against a restriction or a closed valve.

1. Engage the gun trigger lock. Remove tip guard and spray tip from gun (L). Refer to gun manual. See **Related Manuals**, page 3.
 2. Close gun air pressure regulator (D) and pump air pressure regulator (H) by turning knobs counter-clockwise reducing pressure to zero. Close bleed-type master 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. Suction hose is 4 ft (1.2 m) long. Do not stretch hose tight; let it hang to assist fluid flow into pump.
- NOTE:** Loose suction hose fittings allow air to enter into the proportioning pump resulting in the fluid ratio to be altered.
5. **Standard Procedure:** Disconnect the fluid hoses from the mix manifold inlet, taking note of which hose was connected to which valve.
Procedure for Polyester Model 24W609: Open the return valves on both A and B pump outlets.
 6. **Standard Procedure:** Direct A and B pump outlet hoses (CC) from manifold (F) to a grounded metal waste pail.
Procedure for Polyester Model 24W609: Direct A and B return hoses and tubes to a grounded metal pail.
 7. Open bleed-type air valve (E). Slowly turn clockwise pump air regulator (H) increasing pressure until pump starts.
 8. Cycle pump slowly until all air is pushed out and pump and hoses are fully primed.

9. **Standard Procedure:** Reattach A and B pump outlet hoses (CC) to fluid pressure gauges (PA, PB) on the mix manifold (F).

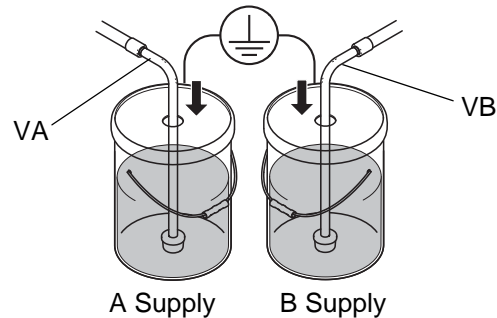
Procedure for Polyester Model 24W609: Close the return valves on both A and B pump outlets.

NOTE: For **Polyester Model 24W609**, continue with steps 10 to 14.

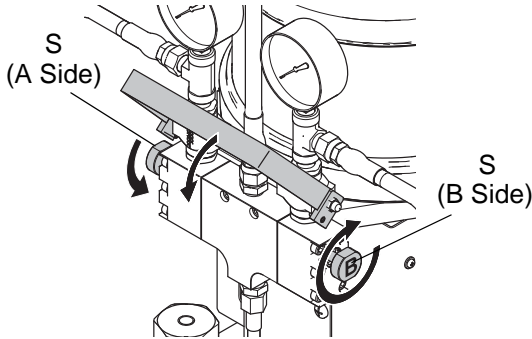
10. Disengage the gun trigger lock and trigger the spray gun into a grounded metal waste container.
11. Increase the pump air supply pressure until the pump cycles.
12. Cycle the pumps until mixed material flows from the spray gun.
13. Engage the trigger lock.
14. Install the spray tip into the spray gun.
15. Disengage the trigger lock, increase the air pressure, and begin to spray.

Load Mix Material to the Gun

1. Insert the A supply suction hose (VA) into a full container of part A supply. Insert the B (VB) supply suction hose into a full container of part B supply.

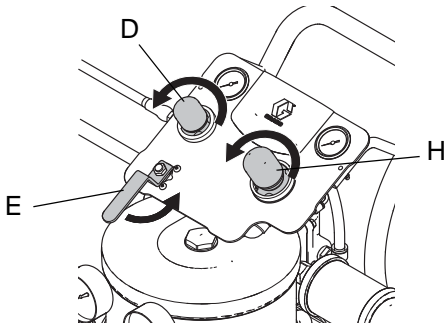


2. Verify solvent valves (S) on the mix manifold (F) are closed (both A and B sides). Move mix manifold handle to the mix position.



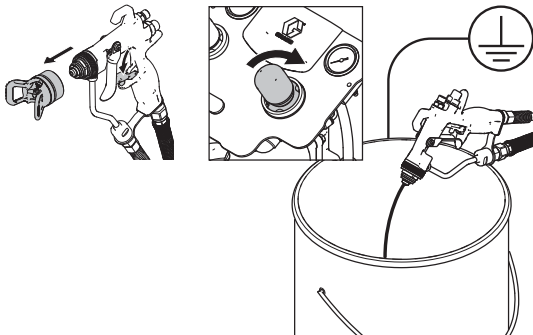
3. Verify pump air pressure regulator (H) and the gun air pressure regulator (D) are in the off (no pressure) setting.

4. Turn on bleed type master air valve (E).

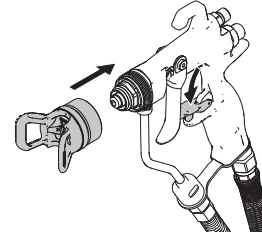


- 5.

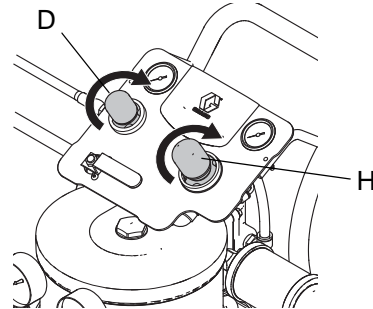
- a. Engage the gun trigger lock.
- b. Remove the tip guard, spray tip and/or air cap.
- c. Disengage the gun trigger lock.
- d. Open the pump air pressure regulator (H). Increase the air pressure just enough to keep the pumps running. Trigger the spray gun.



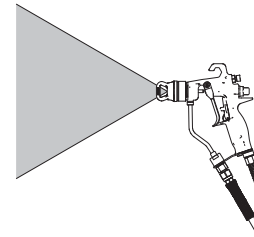
7. Allow pumps to run until mixed material is flowing from the front of the gun then release the gun trigger.
8. Engage the gun trigger lock.
9. Install the tip guard, spray tip and/or air cap.



10. Increase pump air pressure regulator (H) and gun air pressure regulator (D) until desired fluid and air pressure is achieved.



11. Disengage the gun trigger lock and spray. See **Spray Gun Adjustment**, page 22.



NOTE: The following section is intended as a general guideline for spray gun operation. Refer to the appropriate spray gun manual for more details.

Spray Gun Adjustment

For AA Spray Guns

Adjust the Atomization



- Do not turn on atomizing air supply. Fluid pressure is controlled by the air pressure supplied to the pump (pump air pressure regulator). Set fluid pressure at low starting pressure.
 - For low viscosity fluids (less than 25 sec, #2 Zahn cup) with lower percent solids (typically less than 40%), start at 300 psi (2.1 MPa, 21 bar) at pump outlet.
 - For fluids with higher viscosity or higher solids content, start at 600 psi (4.2 MPa, 42 bar). Refer to the following example.

Example:

Pump Fluid/Air Pressure Ratio		Pump Air Regulator Setting psi (MPa, bar)	=	Approximate Fluid Pressure psig (MPa, bar)
15:1	x	20 (0.14, 1.4)	=	300 (2.1, 21)
30:1	x	20 (0.14, 1.4)	=	600 (4.2, 42)

- Hold gun perpendicular and approximately 12 inches (304 mm) from surface.
- Move gun first, then pull gun trigger to spray onto test paper.
- Increase fluid pressure in 100 psi (0.7 MPa, 7 bar) increments, just to the point where a further increase in fluid pressure does not significantly improve fluid atomization. Refer to the following example.

Example:

Pump Fluid/Air Pressure Ratio		Pump Air Regulator Increment psi (MPa, bar)	=	Incremental Fluid Pressure psi (MPa, bar)
15:1	x	7 (.05, 0.5)	=	100 (0.7, 7.0)
30:1	x	3.3 (0.02, 0.2)	=	100 (0.7, 7.0)

Adjust the Spray Pattern

Packages with Airless Guns

The spray tip orifice and spray angle determine pattern coverage and size. When you need more coverage, use a larger spray tip rather than increasing fluid pressure. Align guard horizontally to spray a horizontal pattern. Align guard vertically to spray a vertical pattern.

Packages with AA Guns

- See FIG. 7. Close off pattern adjustment air by turning knob (AA) clockwise (in) all the way. This sets gun for its widest pattern.

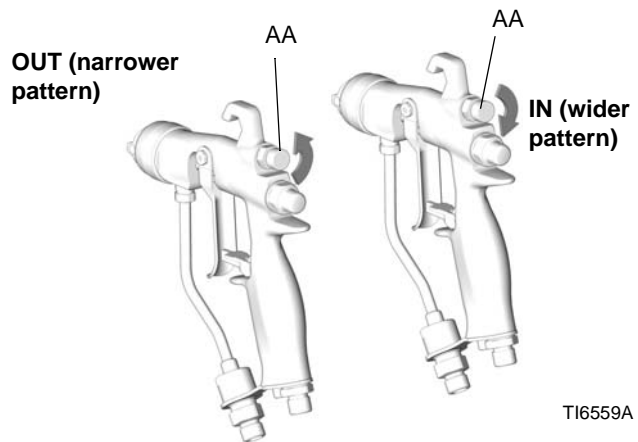


FIG. 7. Pattern Air Knob

- See FIG. 8. Set atomizing air pressure at about 5 psi (0.35 bar, 35 kPa) when triggered. Check spray pattern, then slowly increase air pressure until tails are completely atomized and pulled into spray pattern. Do not exceed 100 psi (0.7 MPa, 7 bar) air pressure to gun.
- See FIG. 7. For narrower pattern, turn pattern adjustment valve knob (AA) counterclockwise (out). If pattern is still not narrow enough, increase air pressure to gun slightly or use different size tip.

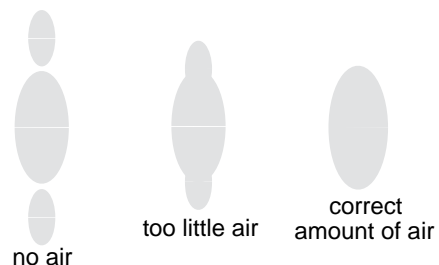


FIG. 8. Spray Pattern Problems

Mix Material Flush Procedure

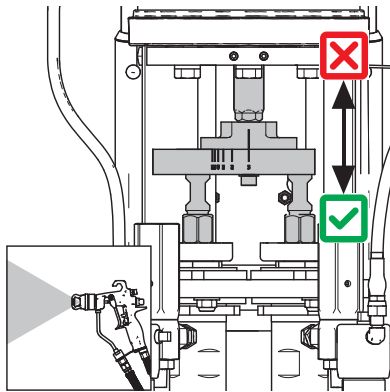
Standard procedure for all pumps except polyester model 24W609



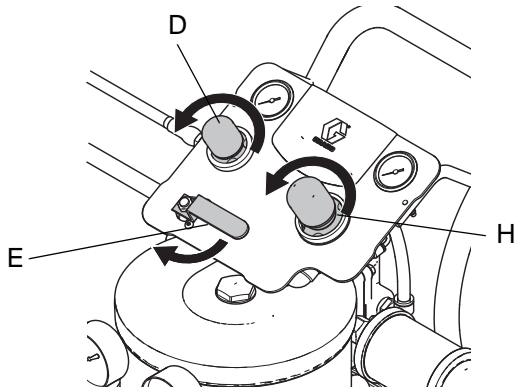
To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at lowest possible pressure. Monitor the fluid gauges during flush operations to ensure the pumps are not over pressurized.

NOTICE
Before flushing stop the pump at the bottom of its stroke to keep fluid from drying on the exposed displacement rod and damaging throat packings.

1. Trigger the gun to stop the pump at the bottom of its stroke.

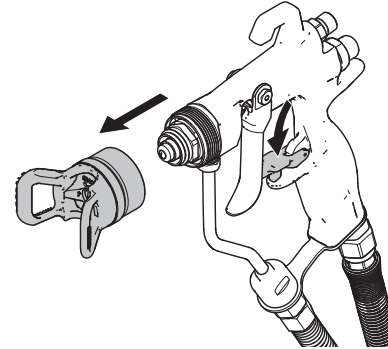


2. Shut off air to gun air pressure regulator (D) and the pump air pressure regulator (H). Close the bleed type master air valve (E).

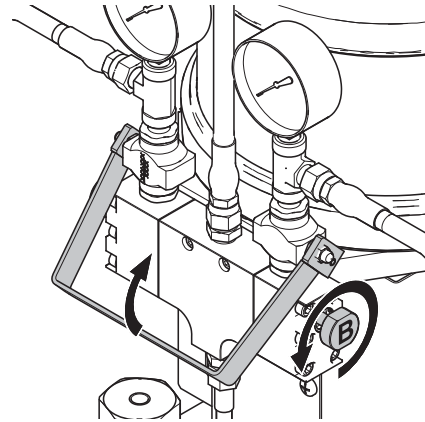


3. Relieve the pressure, see page 19.

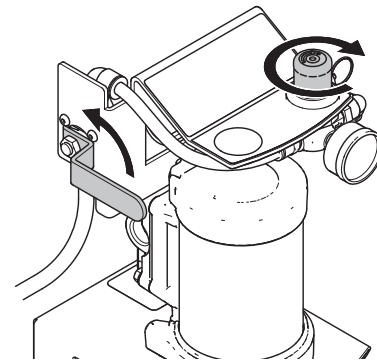
4. Engage the gun trigger lock.
5. Remove the spray tip and/or air cap.



6. Move mix manifold handle to standby position. Open B side solvent flush valve.



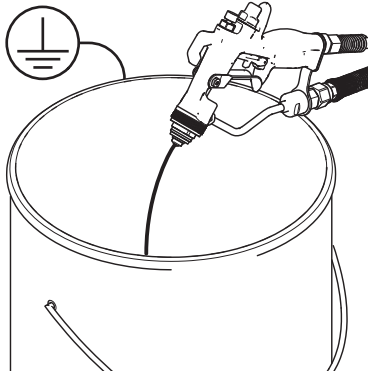
7. Open bleed type air valve on the solvent pump to provide air to flush the pump. Increase air pressure regulator on solvent pump.



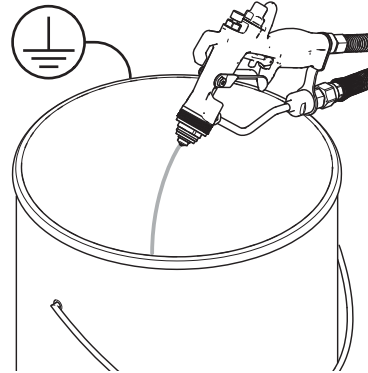
8. Disengage the gun trigger lock.

Operation

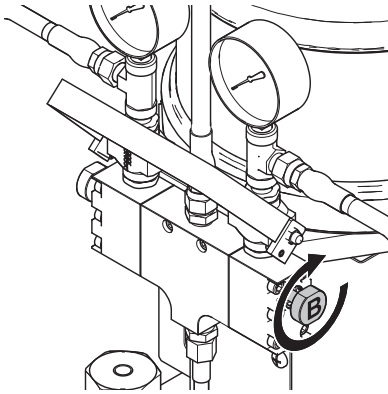
9. Trigger gun for 3 seconds into a grounded metal waste pail holding a metal part of gun firmly to the pail.



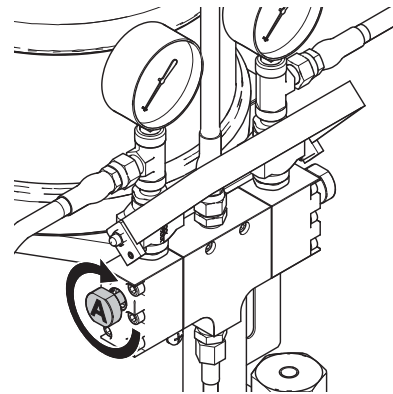
- pail, until the mixed fluid is purged from the system and clean solvent is flowing.



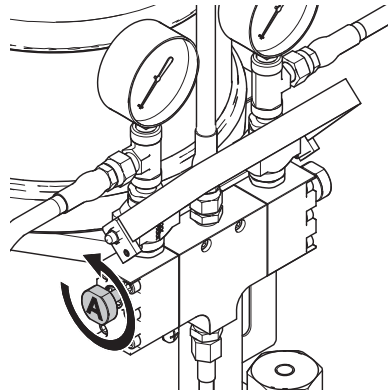
10. Close B side solvent flush valve.



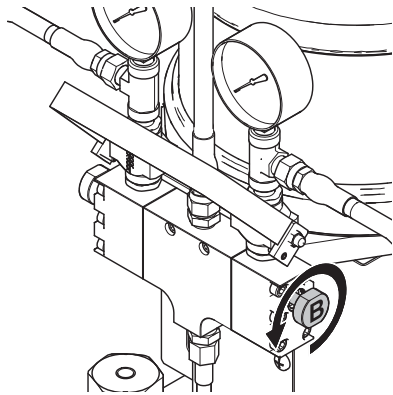
13. Close A side solvent flush valve.



11. Open A side solvent flush valve.

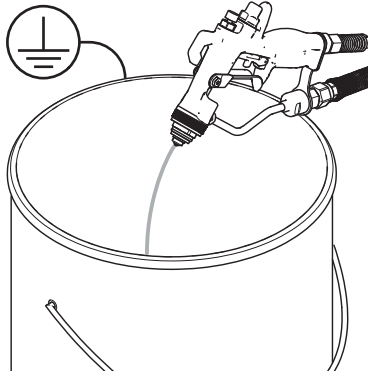


14. Open B side solvent flush valve.

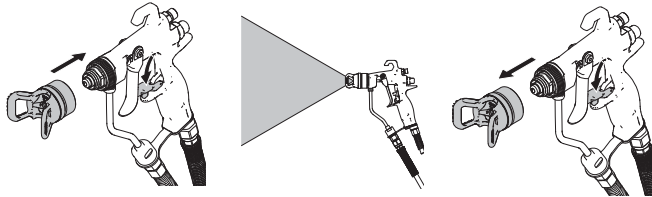


12. Trigger gun for 3 seconds into a grounded metal waste pail, holding a metal part of gun firmly to the

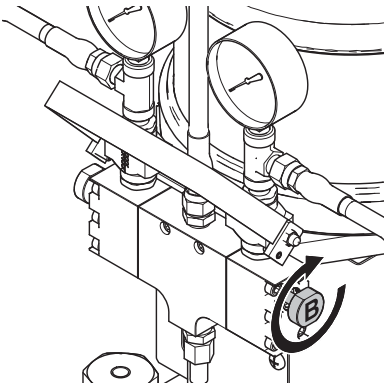
15. Trigger gun for 3 seconds into a grounded metal waste pail holding a metal part of gun firmly to the pail.



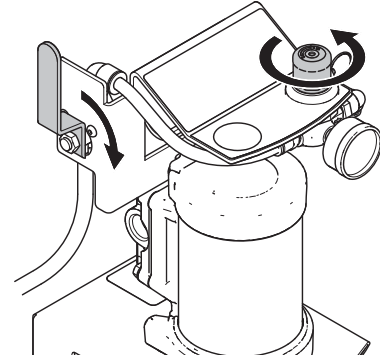
16. Engage trigger lock. Install the spray tip and/or air cap. Disengage trigger lock and trigger gun to flush tip and/or air cap with solvent. Engage trigger lock and remove the spray tip and/or air cap.



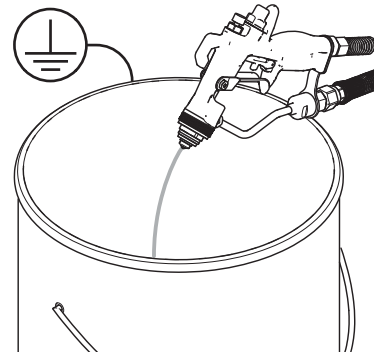
17. Close B side solvent flush valve.



18. Turn off air regulator to solvent pump. Close the bleed type air supply valve to the solvent pump.



19. Disengage the trigger lock and trigger the gun into a grounded metal waste pail until flow stops and pressure is relieved.



Procedure for Polyester Model 24W609 with Solvent Flush Pump




1. Move remote mix manifold handle to standby position.
2. Open the solvent inlet valve (J).
3. Turn on the solvent pump and adjust the air pressure.
4. Engage the gun trigger lock.
5. Remove the spray tip from the gun.
6. Disengage the trigger lock and trigger the gun into a grounded metal waste pail until the mixed fluid is purged from the system and clean solvent is flowing.
7. Engage trigger lock. Install the spray tip and/or air cap. Disengage trigger lock and trigger gun to flush tip and/or air cap with solvent. Engage trigger lock and remove the spray tip and/or air cap.

8. Turn off the solvent supply pump.
9. Trigger the gun into a grounded metal waste pail until flow stops and pressure is relieved.
10. Close the solvent inlet valve (J).
11. Engage the gun trigger lock.

Procedure to Flush Polyester Model 24W609 Pumps

1. Place return line tube and hose assembly (HH) into a grounded metal waste pail.
2. Open A and B return line valves.
3. Place suction tubes into a clean solvent supply pail.
4. Open the pump air inlet valve.
5. Increase the pump air pressure until the pump cycles. Run the pump until clean solvent is flowing from both return tubes.
6. Close the A and B return line valves.
7. Engage the gun trigger lock. Remove the spray tip.
8. Disengage the gun trigger lock. Spray the gun into a grounded metal waste pail until clean solvent is flowing from the gun.
9. Engage trigger lock. Install the spray tip and/or air cap. Disengage trigger lock and trigger gun to flush tip and/or air cap with solvent. Engage trigger lock and remove the spray tip and/or air cap.
10. Shut off the pump air pressure and close the pump air inlet valve.
11. Disengage the trigger lock and trigger the gun into a grounded metal waste pail until flow stops and pressure is relieved.

Using the Proportioning Pump System

						
<p>To reduce the risk of serious injury, including fluid injection:</p> <ul style="list-style-type: none"> • Do not exceed the maximum air and fluid working pressure of the lowest rated component in your system. • Always close the air supply valve to the pump before opening the fluid drain valves to relieve system pressure. This will reduce the risk of excessive pressure buildup in the opposite component hose and fittings. 						

When the system is primed and operating, check the fluid outlet pressure gauges. Check the gauges frequently while using the system and note the pressures. These notes will be helpful in analyzing problems that may occur, as a change in the displacement pump performance will be indicated by a change in the pressure gauge readings.

NOTE: A pressure drop does occur during pump stroke changeover.

1. Set the air pressure to the proportioning pump to obtain the fluid pressure you require.
2. Set the air pressure to the feed pumps at a pressure that will not give more than 25% of sprayer outlet pressure at their fluid outlets.

NOTE: Pressures greater than 25% may prevent the proportioning pump inlet ball checks from seating properly.

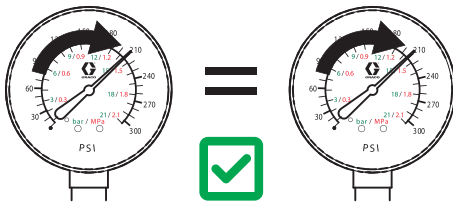
3. Point the spray gun into a grounded metal waste container and trigger the spray gun to purge air out of the dispensing lines. After all air has been purged from the lines, release the trigger and engage the gun trigger lock.

NOTE: The pumps will start and stop as the gun is triggered and released.

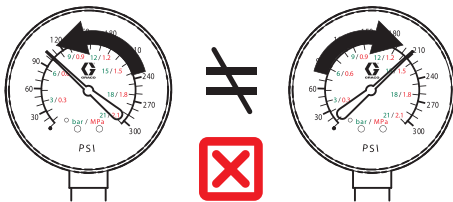
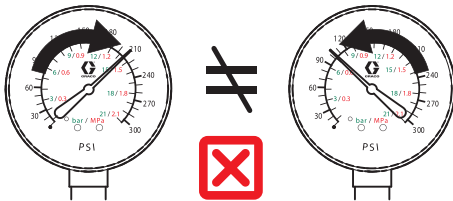
Monitoring the Proportioner During Operation

When the spray gun is triggered:

- Both A and B fluid pressure gauges should be increasing and decreasing in pressure at the same time.



- If one pressure or the other increases while the other decreases the proportioner is not working correctly. The cause should be determined and corrected.



- The most typical time for pressure variations to occur is right after the top change over. This pressure variation is caused by one of the double acting piston pumps "A" or "B" cavitating during the up, or fill stroke, and then not having fluid to pump until it travels down to the filled level. Cavitation causes ratio errors and should not be allowed at any time while spraying.

Changing ratios

Remove Pump Lowers

Remove pump lowers as needed (change only the pump(s) required to achieve the new ratio)

1. Disconnect the suction tube assembly from the pump inlet.
2. Disconnect the Fluid filter and safety relief valve assembly from the pump outlet port.
3. Remove coupler nut (24) from connecting rod (36) using wrench on coupler nut and flats on the connecting rod. Do not lose keepers (23 Qty. 2) required.
4. Remove retaining ring (22) using a spanner wrench or hammer and punch.
5. Remove pump assembly by lowering out the bottom of the mounting plate.

Install Replacement Lower for New Ratio

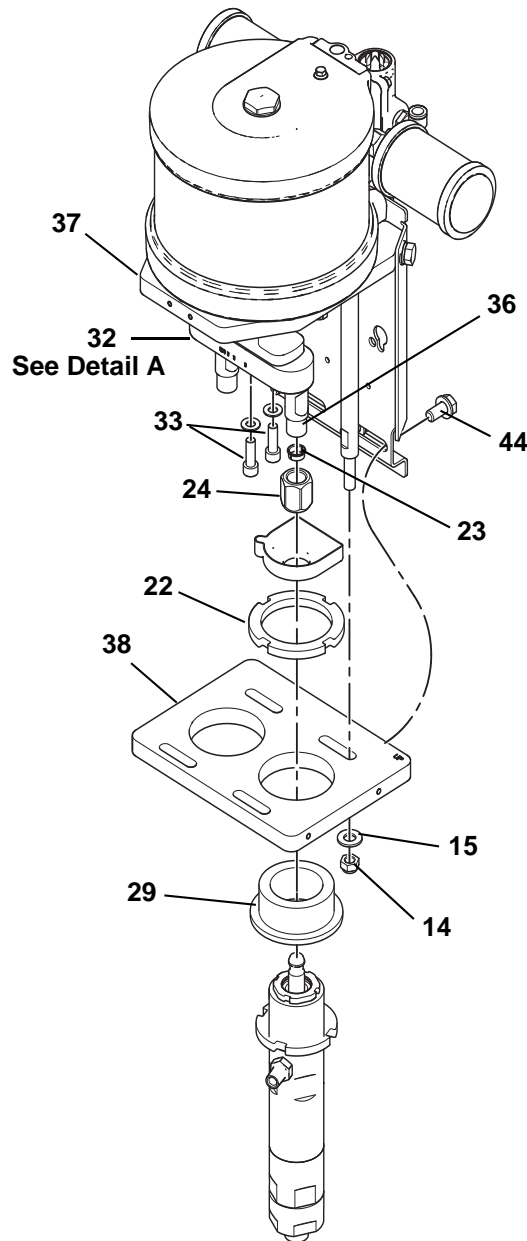
1. Install pump adapter (29) and new pump. Thread adapter (29) flush with top threaded upper pump housing. Secure in position by locking in place with jam ring on pump assembly. See FIG. 6.
2. Install pump into mounting plate and retain in position with lock ring (22) loose fit.
3. Install coupler nut (24) and keepers (23, qty. 2) on pump displacement rod. Thread coupler nut (24) to connector rod (36). Tighten and torque to 75-80 lb-ft (102-108 N•m). If changing to a 25 cc fluid section, the pump connecting rod (36), keepers (23, qty 2) and connector nut (24) need to be replaced with the 25cc parts. For the 25cc lower coupler nut (24) torque to 25-30 lb-ft (31-35 N•m) See **Lower Assembly**, page 44.
4. Position pump outlet port fitting for connection to the relief valve/ fluid filter.
5. Allow pump assembly to center in mounting plate vertically under connecting rod center line.
6. Torque locking ring (22) to approximately 50 lb/ft with spanner wrench or hammer and punch while ensuring pump remains vertical under the yoke to prevent throat packing side loading when in operation.
7. Re-connect the safety relief valve, filter, and outlet hose

8. Reconnect the suction tube assembly.

Adjust Pump Assembly for Balanced Yoke Forces

At each ratio setup the pump assembly must be adjusted to balance the yoke forces. To adjust the pump assembly:

1. Loosen mounting plate screw (44, 2 locations)
2. Loosen yoke bolts (33, 2 locations).
3. Loosen Tie rod nuts (14, 4 locations)
4. Slide the yoke (32) until the desired ratio marks on the yoke (32) align with the center line mark on the connector (31). See Detail A.
5. Remove yoke assembly screws (33, 2 locations), clean threads and apply medium strength thread adhesive. Re-install screws (33, 2 locations) and tighten the yoke assembly screws (33, 2 locations), while maintaining the mark alignment. Torque to 40 lb-ft (47-54 N•m).
6. Position the fluid assembly vertically under the yoke and tighten the tie rod nuts (14), ensure washers (15) are in place. Torque to 45 lb-ft (68-80 N•m).



NOTICE

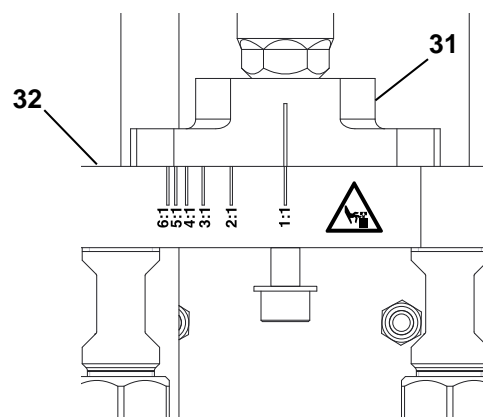
Verify that fluid pumps are aligned vertically under the yoke position. If they are not aligned correctly, side loading of motor and fluid pumps will occur, causing premature wear to seals and bearings.

7. Re-tighten mounting bracket screws (44) and torque to 35 lb-ft. (47 N•m)

Cycle the pump slowly and observe up and down stroke changeover verifying correct operation. If binding is observed, re-align fluid pumps by repeating step 6.

NOTE: 1:1 and 6:1 ratios have yoke and pump positioned against yoke and plate slot ends. Adjusted full left or right positions.

Detail A



Maintenance

Care of the Pump

NOTICE

Do not allow the supply containers to run dry of the fluid being pumped. A dry container allows air to be pumped into the system and can cause incorrect proportioning. One dry displacement pump can damage the other displacement pump by causing a pressure rise in the other pump.

- If a supply container is dry, stop the pump immediately and relieve the pressure. Refill the container, and prime the system. Be sure to eliminate all of the air from the system.
- Keep the throat packing reservoirs one-half filled with TSL.
- Observe the pot life limit. Flush the mixed fluid out of the mix manifold, dispensing lines and equipment before it hardens.
- Flush the complete system, when necessary to prevent the fluids from hardening in the equipment and hoses.
- Check the fluid manufacturer's instructions for fluid shelf life, and flush the entire system before this time is reached.
- Flush the system with a compatible solvent.
- With heavy fluids, flushing solvents could channel through the fluid, leaving a coating of fluid on the inside of the hoses. Allow pump to flush at higher cycle rates to create turbulent flow and better cleaning action. Disconnect the hoses and clean the fluid out with a rag and wire or a ramrod type cleaner, or use a solvent and air purge to agitate the solvent, and flush until the mix manifold, hose, and gun are clean.
- For daily or long term shutdown stop the pump at the bottom of the stroke to protect the displacement rod from dried or cured material.

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.

Flush the Pump



To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at lowest possible pressure.

When to 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)
- Before storing the pump

Flushing Guidelines

- 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.
- If the pump is to be stored for any period of time, and you are pumping water-based fluid, first flush it with water, then with mineral spirits to protect the pump parts.


Wet Cup

The wet cup helps to provide consistent lubrication for the pump packings and to keep exposed rod from being coated with dried paint. To maintain the wet cup:

1. Fill the wet cup one-half full with Graco Throat Seal Liquid (TSL).
2. Maintain level daily.

Fluid Pressure Relief Valves

The fluid pressure relief valves are used to prevent pumps from generating pressures higher than they system rated pressure. If an overpressure situation occurs the valve will open and discharge fluid from the bottom relief port. Do not modify, remove, or plug the pressure relief valve.

						
Materials that cure when exposed to air may defeat the ability of the pressure relief valve to relieve an overpressure condition, resulting in burst components and serious injury						

Refer to separate relief valve manual for additional details. See **Related Manuals**, page 3.

Lubrication

An accessory air line lubricator provides automatic air motor lubrication. For daily, manual lubrication:

1. Disconnect the regulator
2. Place about 15 drops of light machine oil in the pump air inlet
3. Reconnect the regulator.
4. Turn on the air supply to blow oil into the motor.

Storage and Extended Shutdown

NOTICE

Before flushing stop the pump at the bottom of its stroke to keep fluid from drying on the exposed displacement rod and damaging throat packings.

Water or moist air can cause material residue in ball checks and packings to cure.

- Never leave the pump filled with water or air.
- After normal flushing, flush the pump again with mineral spirits or oil-based solvent; relieve the pressure; and leave the mineral spirits in the pump.

Troubleshooting



To avoid serious injury, always **Relieve the pressure** before checking or servicing the equipment.

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

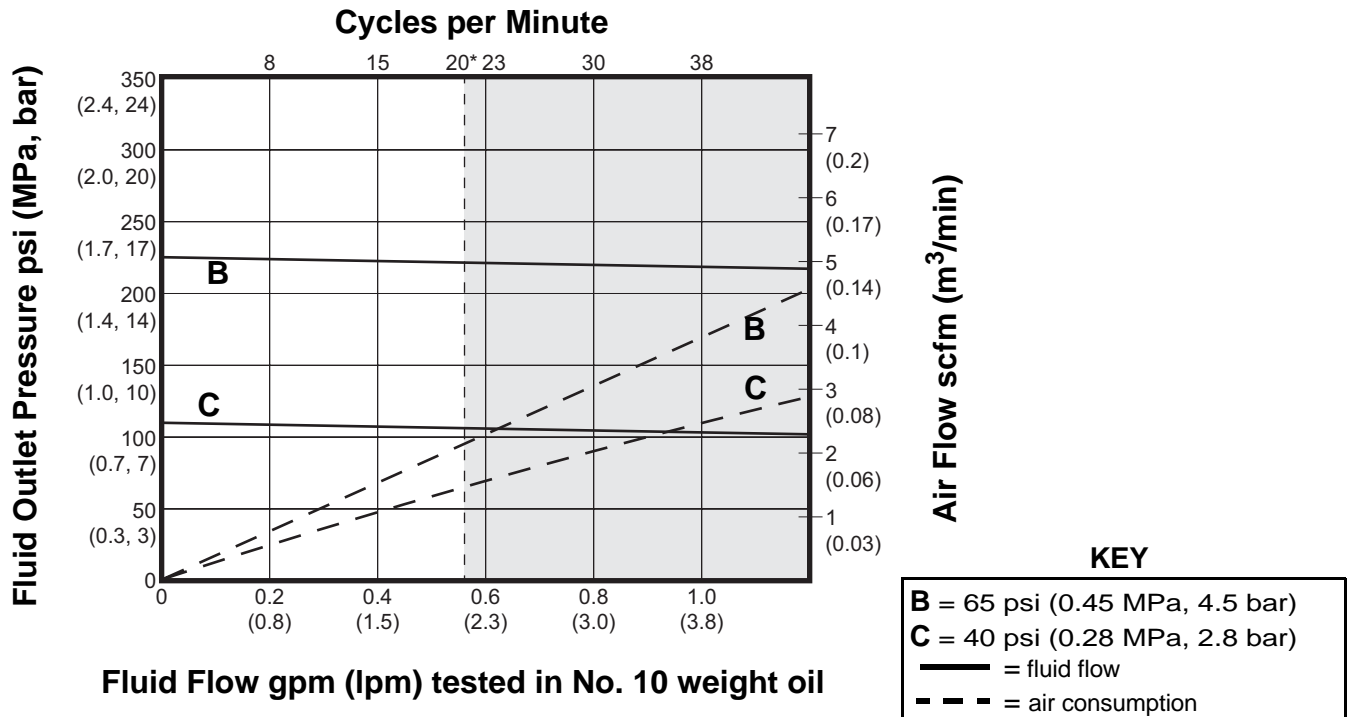
Problem	Cause	Solution
Pump does not cycle	Air supply pressure not "on"	Verify air supply is on and pressure set high enough to cycle pump
	Air supply pressure set too low	
	Mix manifold turned to off position	Place manifold in mix position
	Gun tip is plugged	Make sure that the Fluid lines are clear and open for mixed paint flow
	Mix manifold or mixed material hose plugged	
Pump does not load material	Suction hose is plugged	Make sure suction hose and tube are clear and free of caps or plugged strainers.
	Pump is vapor locked	Open a gun or drain valve to allow for air to escape the system while filling with paint or solvent.
	Paint viscosity is too high to siphon	Make sure paint is thin enough to siphon to the pump
Pump cycles erratically	Air supply is too restricted	The air supply hose should be a minimum of 3/8" id and a max of 50 ft in length.
	Pump packing's are dry	Check TSL level in wet cups. Verify pump is loading fully on up stroke
	Pump cavitation	
Fluid pressures are low	Air supply is too restrictive	Use a larger air hose
	Pump friction is high	Check TSL level in wet cup
	Fluid filters plugging	Clean fluid filters
Paint not mixed	Static mixer is not clean	Replace static mixer
Paint not at correct ratio	Pump cavitation	Suction tube and hose restricted
		Suction hose and tube fittings are loose allowing suction of air into pump
	Ball check in pump is not checking	Pump is contaminated with dried paint or foreign materials
System speeds up or runs erratically	Pump cavitation	Suction tube and hose restricted
	Pump checks are not checking consistently	Suction hose and tube fittings are loose allowing suction of air into pump
		Pump is contaminated with dried paint or foreign materials
A and B fluid pressures not equal	Very different viscosities	Can be OK. Should not exceed 10% differential with unit mounted mix manifold. Remote mounted mix manifold A and B pressures may have a greater differential, but greater than 20% can cause ratio errors.
	Mix manifold check valves and ports restricted by cured paint	Clean and repair mix manifold

Problem	Cause	Solution
A and B fluid pressures not consistent	Pump cavitation	Suction tube and hose restricted
	Suction inlet plumbing drawing air	Suction hose and tube fittings are loose allowing suction of air into pump
	Ball check in pump is not checking	Pump is contaminated with dried paint of foreign materials
A or B fluid pressure falls off after top change over	Pump cavitation	Suction tube restricted
A or B pressure changes after mix manifold is closed	External fluid leak	Fix hose and fitting leaks
	Internal leak of fluid pump seals or check valves causing loss of outlet pressure.	Clean or repair proportioning pump
Fluid relief valve opens allowing fluid out of bottom port. Fluid pressure in line exceeded system pressure rating	Pump fluid pressure set too high.	Reduce air supply pressure to proportioner
	Unbalanced load between A and B fluid pump.	Suction tube and hose restricted
		Suction hose and tube fittings are loose allowing suction of air into pump
		Pump is contaminated with dried paint of foreign materials
		Fix hose and fitting leaks
		Clean or repair proportioning pump
Filter plugged.	Clean filters	
Flush pump does not run	Air supply to flush pump turned off	Turn on air supply
	Air supply pressure to flush pump set too low	Increase air supply pressure
	Mix manifold solvent valves not "on"	Open flush valves and gun
	Gun not triggered	Trigger spray gun
	Mix Manifold or mixed material hose plugged	Repair and replace mix manifold and mixed material hoses

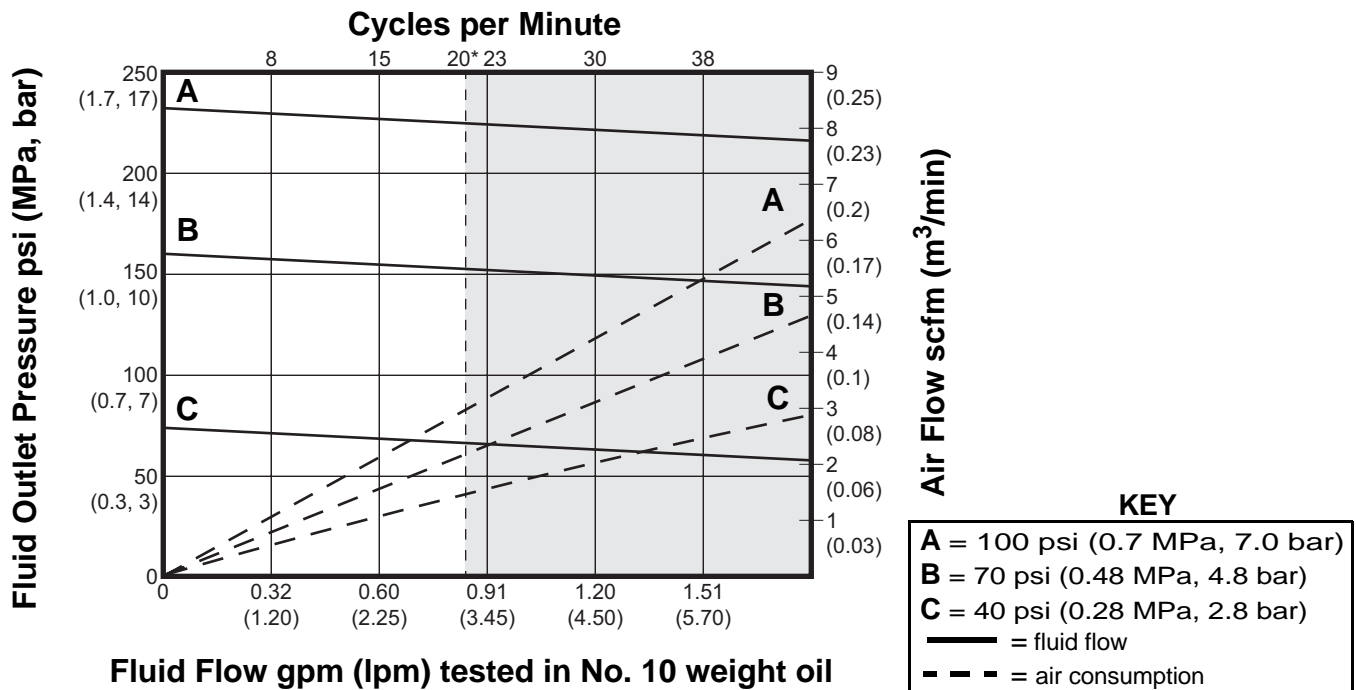
* To determine if the fluid hose or gun is obstructed, relieve the pressure. Disconnect the fluid hose and place a container at the pump fluid outlet to catch any fluid. Turn on the air just enough to start the pump. If the pump starts when the air is turned on, the obstruction is in the hose or gun.

Performance Charts

2.5" Air Motor with 1:1 and 3:1 Lower Pump Ratio
100 cc/cycle

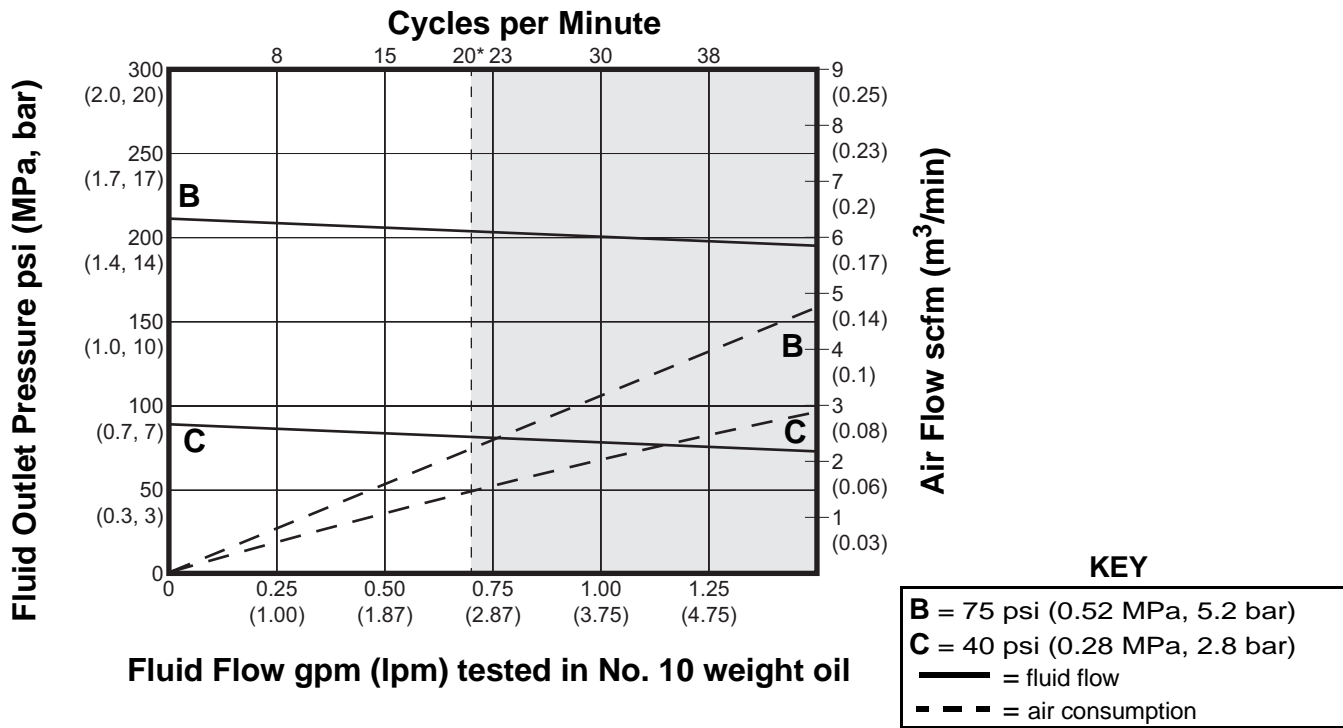


2.5" Air Motor with 2:1 and 5:1 Lower Pump Ratio
150 cc/cycle

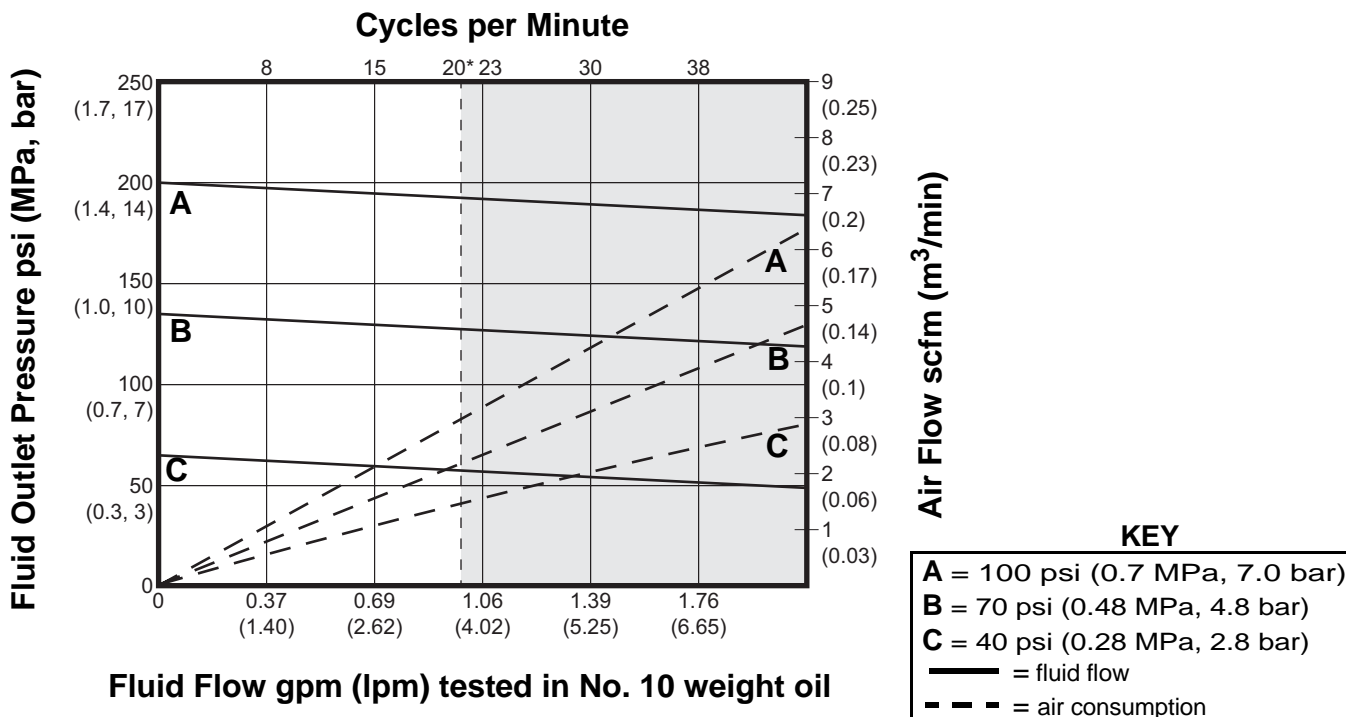


* See Note in Technical Data, page 52.

**2.5" Air Motor with 4:1 Lower Pump Ratio
125 cc/cycle**

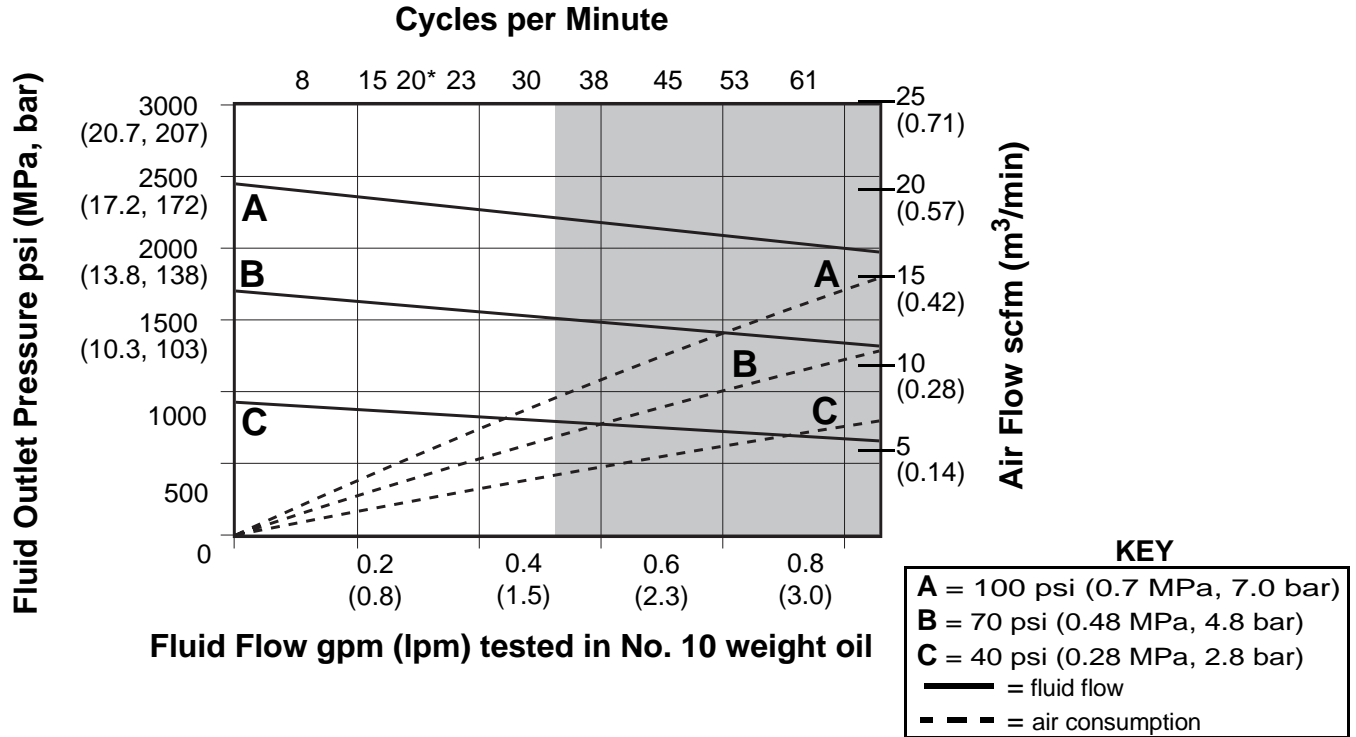


**2.5" Air Motor with 6:1 Lower Pump Ratio
175 cc/cycle**

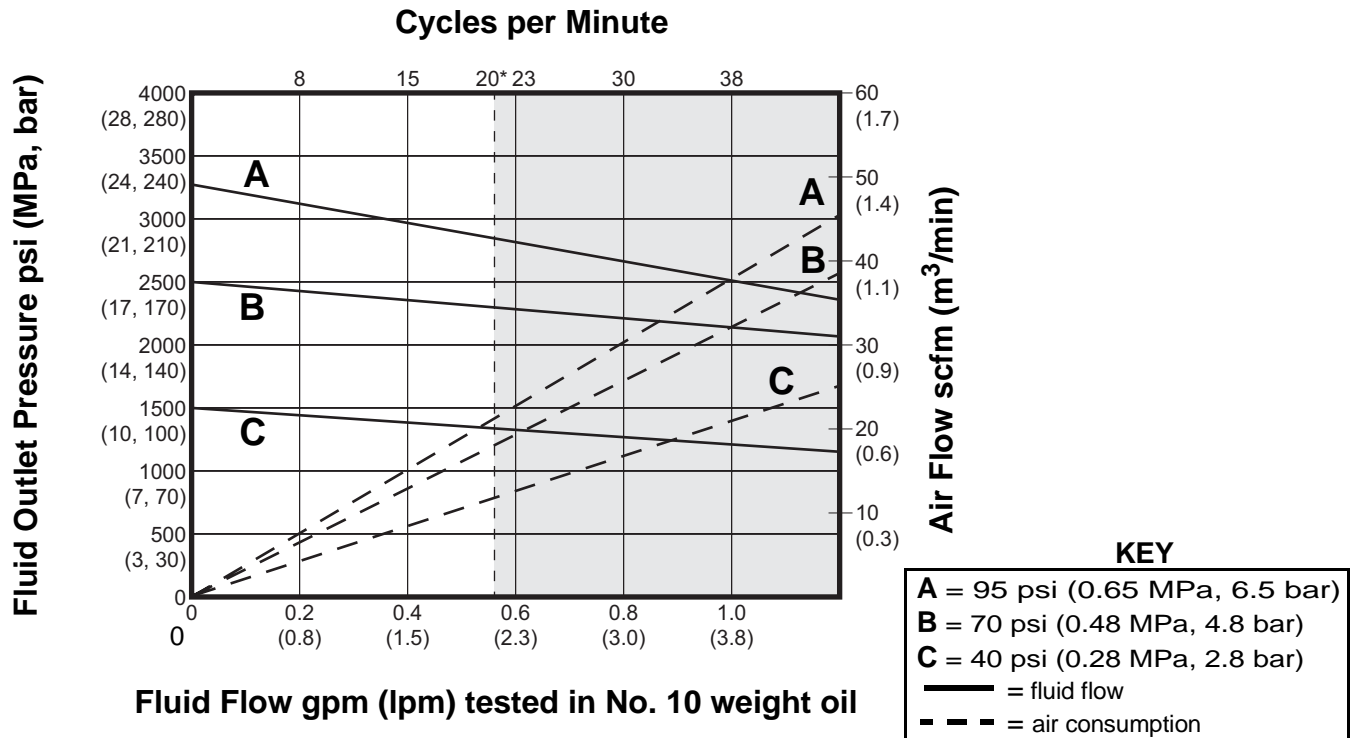


* See Note in Technical Data, page 52.

**4.5" Air Motor with 1:1 Lower Pump Ratio (for Polyester Model 24W609)
50 cc/cycle**

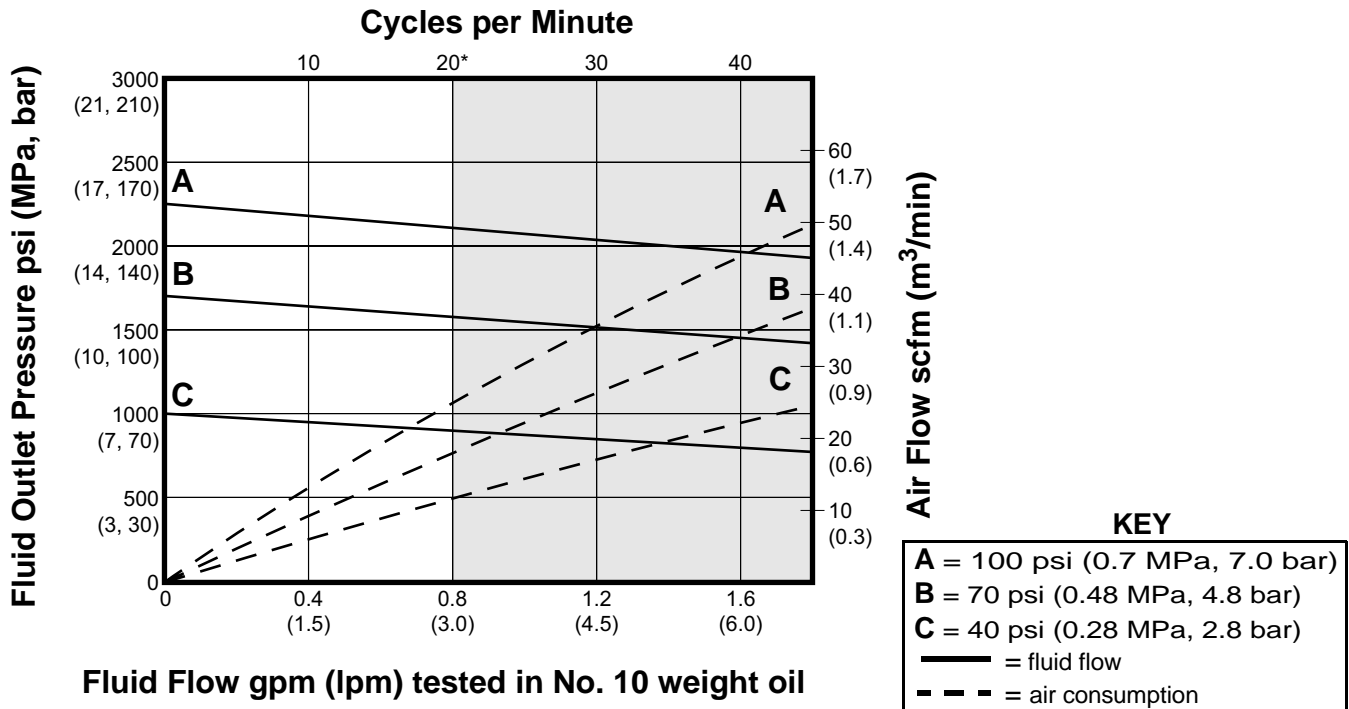


**7.5" Air Motor with 1:1 and 3:1 Lower Pump Ratio
100 cc/cycle**

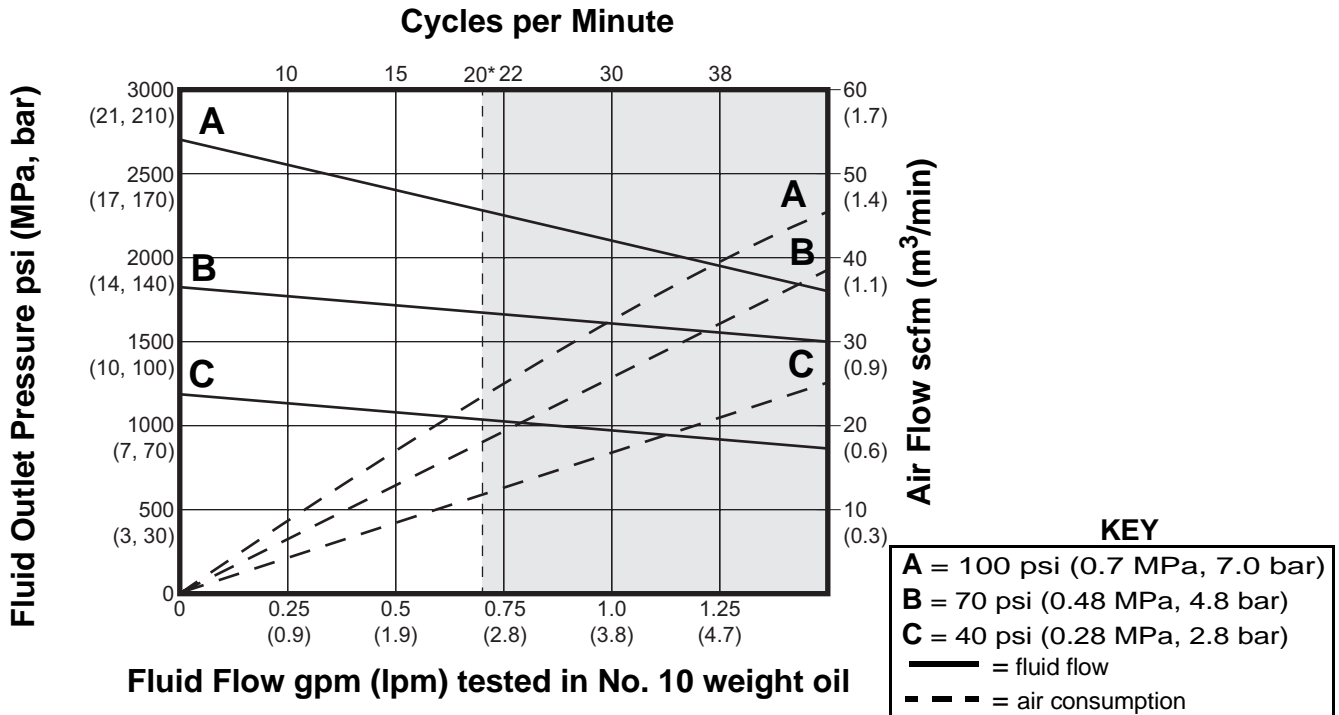


* See Note in **Technical Data**, page 52.

**7.5" Air Motor with 2:1 and 5:1 Lower Pump Ratio
150 cc/cycle**

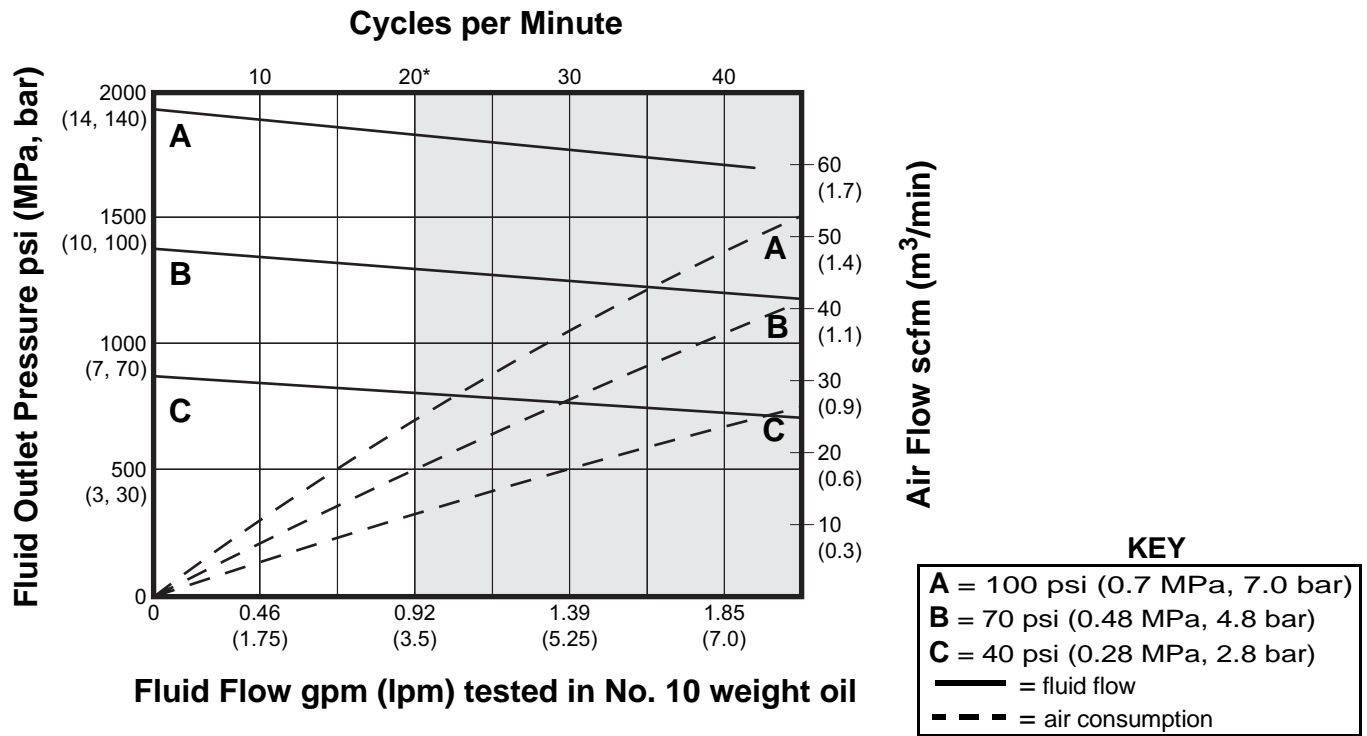


**7.5" Air Motor with 4:1 Lower Pump Ratio
125 cc/cycle**



* See Note in **Technical Data**, page 52.

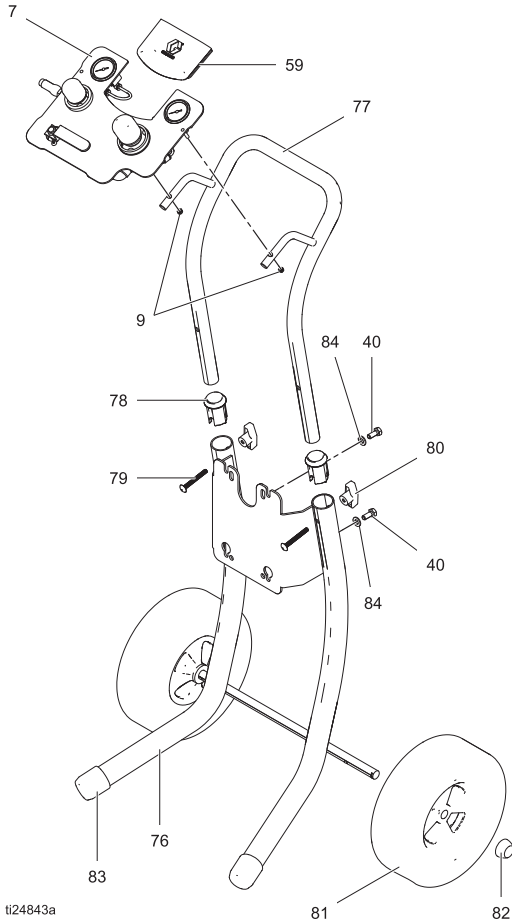
**7.5" Air Motor with 6:1 Lower Pump Ratio
175 cc/cycle**



* See Note in **Technical Data**, page 52.

Parts

Cart Mount

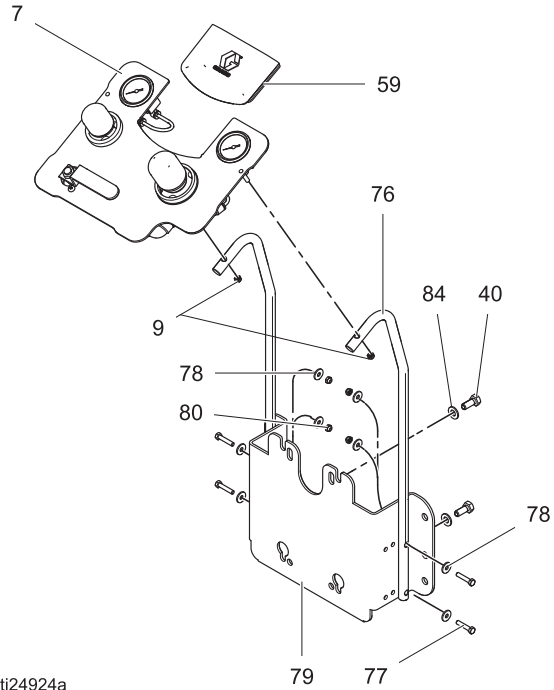


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Ref.	Part	Description	Qty.
7	See Air Control Assembly,	page 39	
9	105332	NUT, lock	2
40	113358	SCREW, cap, hex hd	4
59	277794	INSERT, control panel	1
76◆	-----	CART, frame. small	1
77◆	-----	HANDLE, cart, small P3	1
78◆	-----	SLEEVE, cart handle, SP3	2
79◆	116630	SCREW, carriage	2
80◆	115480	KNOB, T-handle	2
81◆	119451	WHEEL, semi-pneumatic	2
82◆	119452	CAP, hub	2
83◆	15C871	CAP, leg	2
84	108788	WASHER, flat	4

◆ Parts included in Cart Mount Kit 289694 (purchase separately).

Wall Mounting Bracket



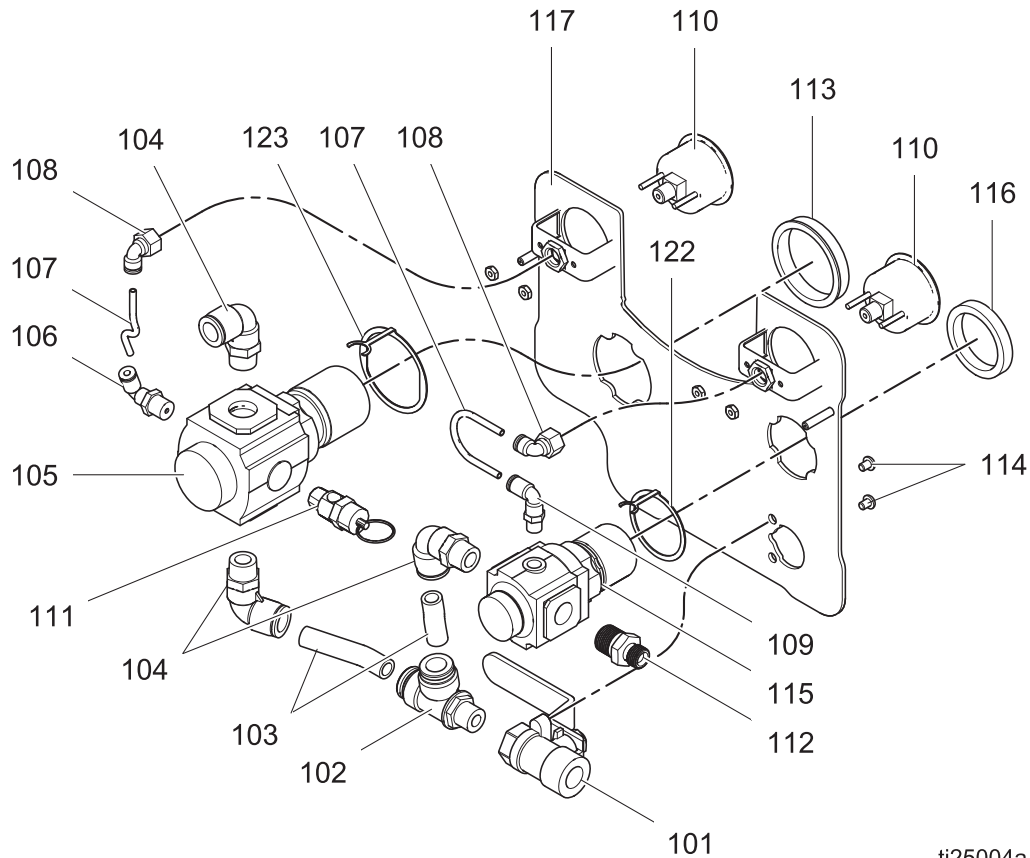
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Ref.	Part	Description	Qty.
7	See Air Control Assembly,	page 39	
9	105332	NUT, lock	2
40	113358	SCREW, cap, hex hd	4
59	277794	INSERT, control panel	1
76	17C945	BAR, control mounting	1
77	127965	SCREW, cap, hex hd	4
78	110170	WASHER	12
79	15T795	PLATE, wall mount, small	1
80	105332	NUT, lock	4
84	108788	WASHER, flat	4

Air Control Assembly

24W969 - Air Assisted Air Spray

Models 24V880, 24V881, 24V882, 24V883, 24V884, 24V885, 24V886, 24V887, 24V888, 24V889, 24V890, 24V891, 24W609

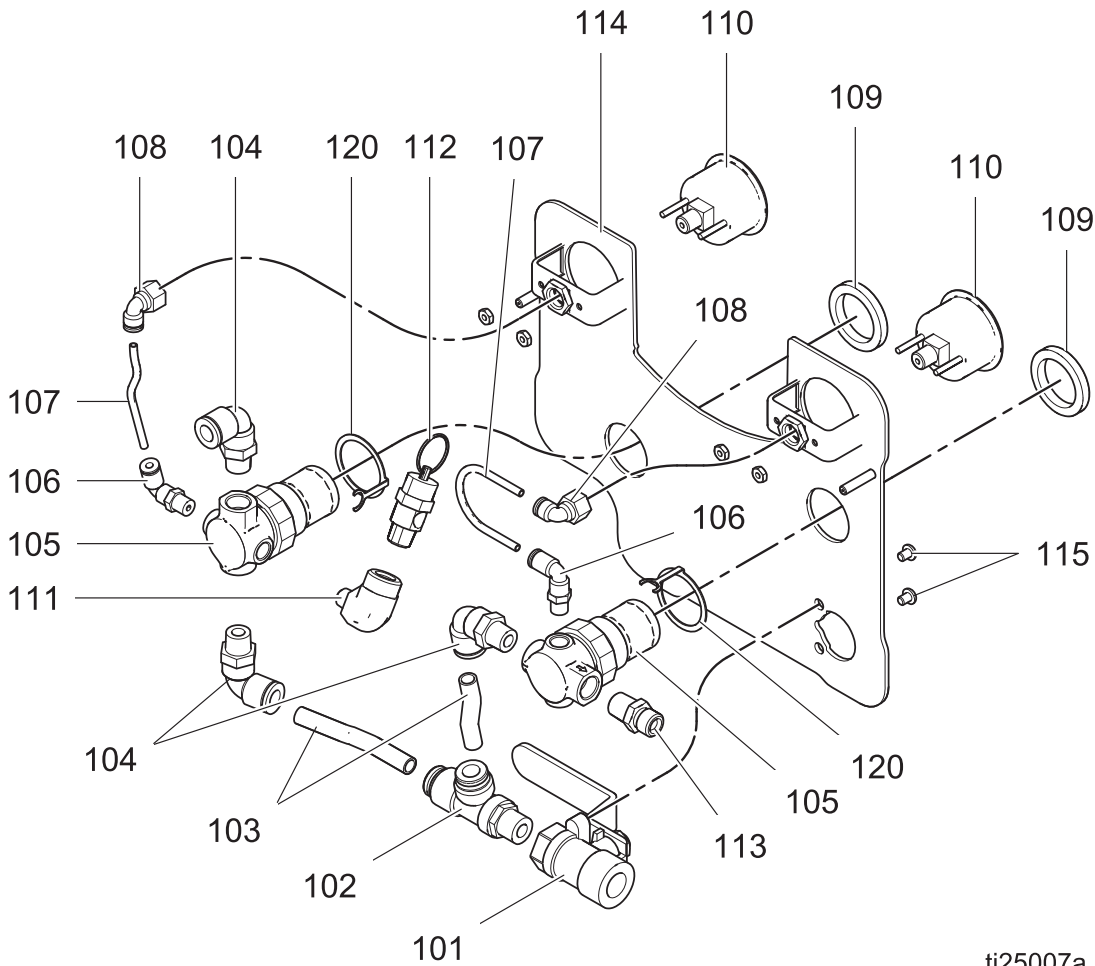


ti25004a

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
101	114362	VALVE, ball	1	111	113498	VALVE, safety	1
102	15T643	SWIVEL, tee, 3/8 npt(m) x 1/2T	1	112	164672	ADAPTER	1
103	◆-----	TUBE, nylon 1/2 OD, cut to fit	1	113	15T538	PANEL, nut (plastic) (R73)	1
104	121212	ELBOW, swivel, 1/2T x 3/8 npt(m)	3	114	114381	SCREW, cap, button HD	2
105	15T536	REGULATOR, air, pump, 3/8 npt(m)	1	115	15T539	REGULATOR, air, gun, 3/8 npt	1
106	15T937	FITTING, elbow, swivel, 1/4npt(m) x 5/32 npt(m)	1	116	116514	NUT, regulator mnt	1
107	◆-----	TUBE, nylon, rd, black	1	117	15T555	PANEL, mounting, w/gun, 4.5/6/7.5	1
108	15T498	FITTING, 90, swivel, 5/32T x 1/8 FNPT	2	122	16P423	CLIP, ground, regulator	1
109	15T866	FITTING, elbow, swivel, 1/8 npt x 5/32T	1	123	16P424	CLIP, ground, regulator	1
110	15T500	GAUGE, pressure	2	◆	<i>Parts included in Tubing Repair Kit 24D496 (purchase separately).</i>		

24W970 - Air Spray

Models 24V868, 24V869, 24V870, 24V871, 24V872, 24V873, 24V874, 24V875, 24V876, 24V877, 24V878, 24V879



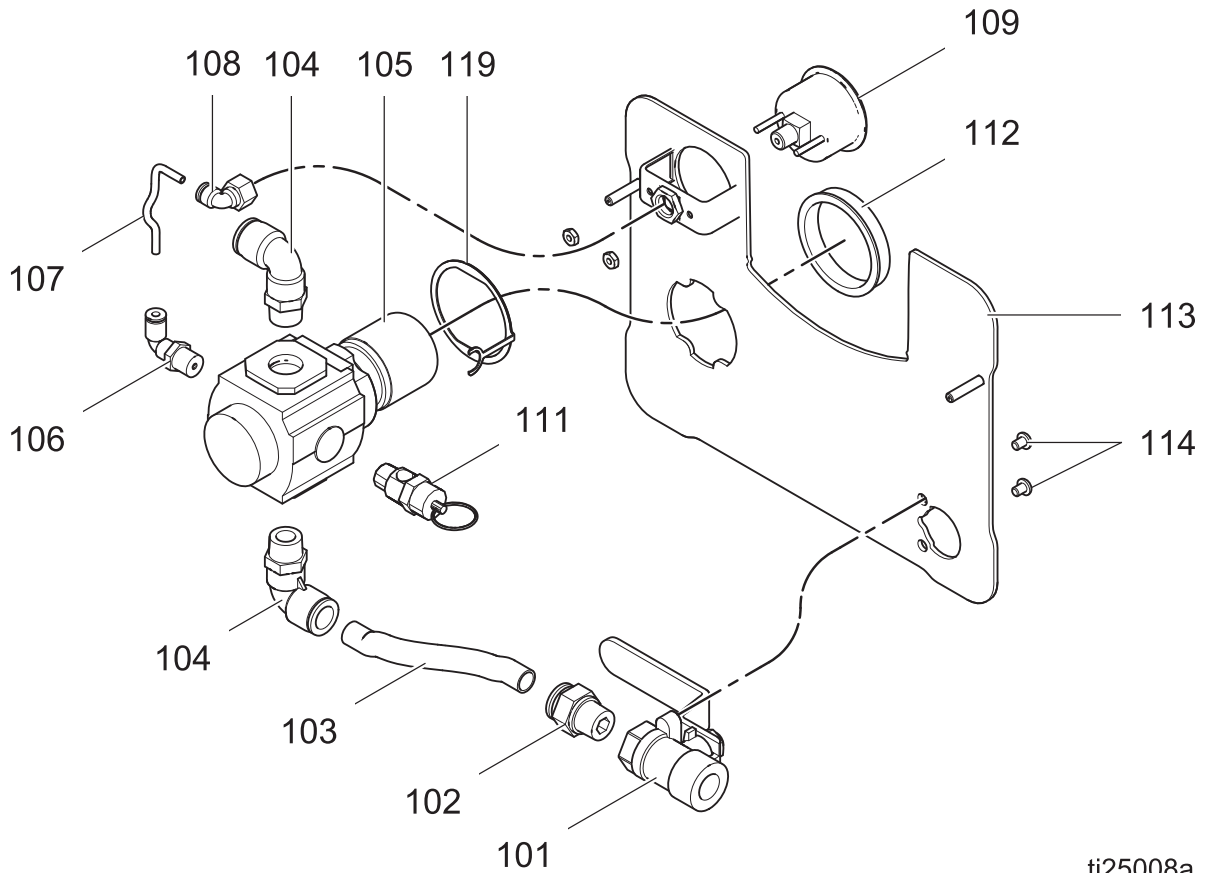
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Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
101	114362	VALVE, ball	1	110	15T500	GAUGE, pressure	2
102	15T638	SWIVEL, tee, 3/8 npt(m) x 3/8T	1	111	121150	FITTING, elbow, 1/4 npt(f)x1/8 npt(m)	1
103	◆	TUBING, nylon round (Air Spray)	1	112	113498	VALVE, safety, 110 psi	1
104	121141	ELBOW, swivel, 3/8T x 1/4 npt(m)	3	113	162453	FITTING, 1/4 mpsm	1
105	15T499	REGULATOR, air, pump, 1/4 npt(m)	2	114	15T556	PANEL, mounting, w/gun, datatrack (Air Spray)	1
106	15T866	FITTING, elbow, swivel, 1/8npt(m) x 5/32 npt(m)		115	114381	SCREW, cap, button HD	2
107	◆	TUBE, nylon, rd, black	1	120	16P421	CLIP, ground, regulator	2
108	15T498	FITTING, 90, swivel, 5/32T x 1/8 FNPT	2				
109	115244	NUT, regulator	2				

◆ Parts included in Tubing Repair Kit 24D496 (purchase separately).

24W971 - Airless Sprayer

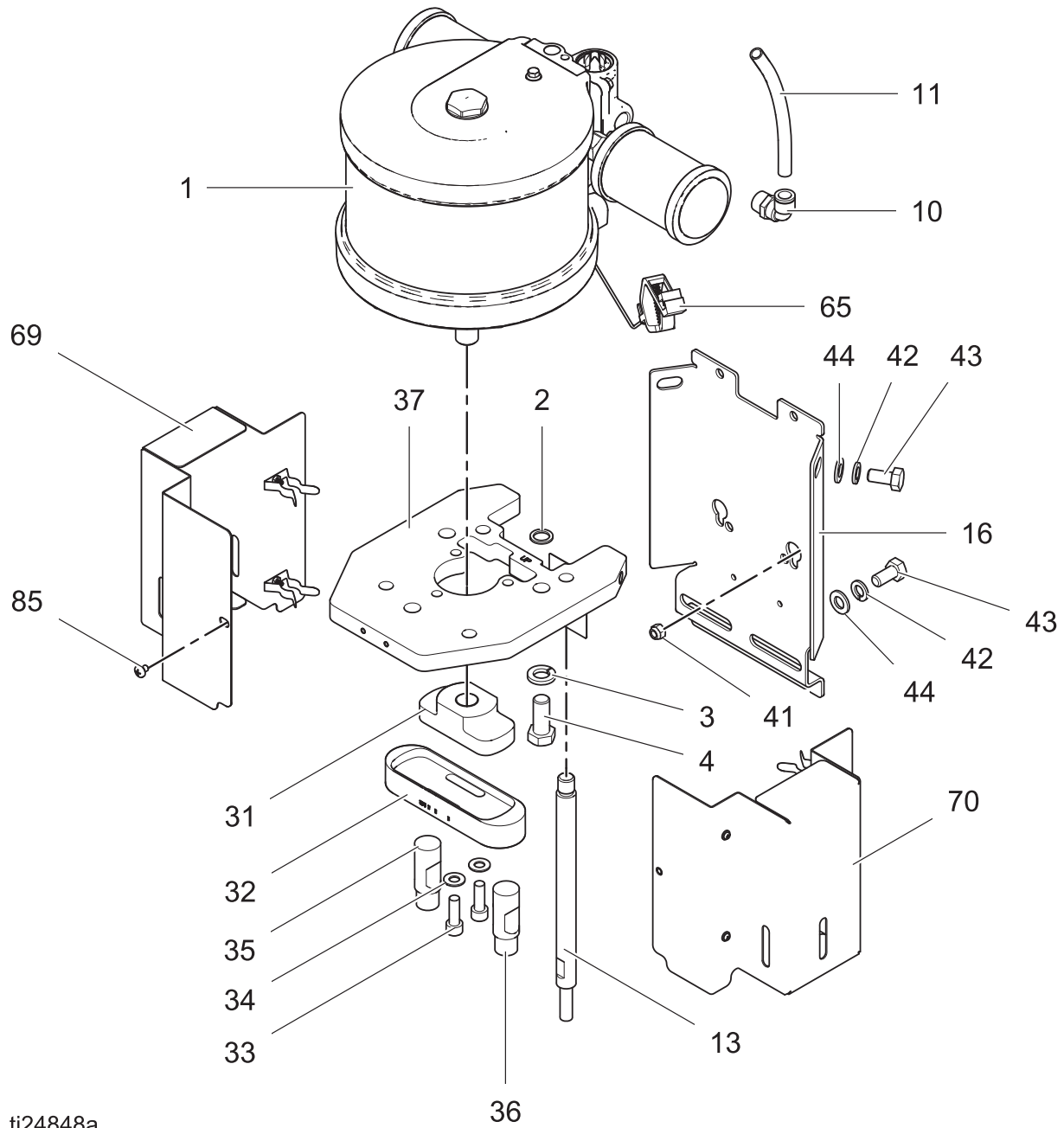
Models 24V892, 24V893, 24V894, 24V895, 24V896, 24V897, 24V898, 24V899, 24V901, 24V902, 24V903, 24V904



ti25008a

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
101	114362	VALVE, ball	1	114	114381	SCREW, cap, button HD	2
102	121210	FITTING, straight, 1/2T x 3/8 npt(m)	1	116	116514	NUT, regulator mnt (Air Assisted)	1
103	◆-----	TUBE, nylon 1/2 OD, cut to fit	1	119	16P424	CLIP, ground, regulator	1
104	121212	ELBOW, swivel, 1/2T x 3/8 npt(m)	3	◆ <i>Parts included in Tubing Repair Kit 24D496 (purchase separately).</i>			
105	15T536	REGULATOR, air, pump, 3/8 npt(m)	1				
106	15T937	FITTING, elbow, swivel, 1/4npt(m) x 5/32 npt(m)	1				
107	◆-----	TUBE, nylon, rd, black	1				
108	15T498	FITTING, 90, swivel, 5/32T x 1/8 FNPT	2				
109	15T500	GAUGE, pressure	2				
111	113498	VALVE, safety	1				
112	15T538	PANEL, nut (plastic) (R73)	1				
113	15T557	PANEL, control, no gun, 4.5/6/7.5	1				

Motor Assembly



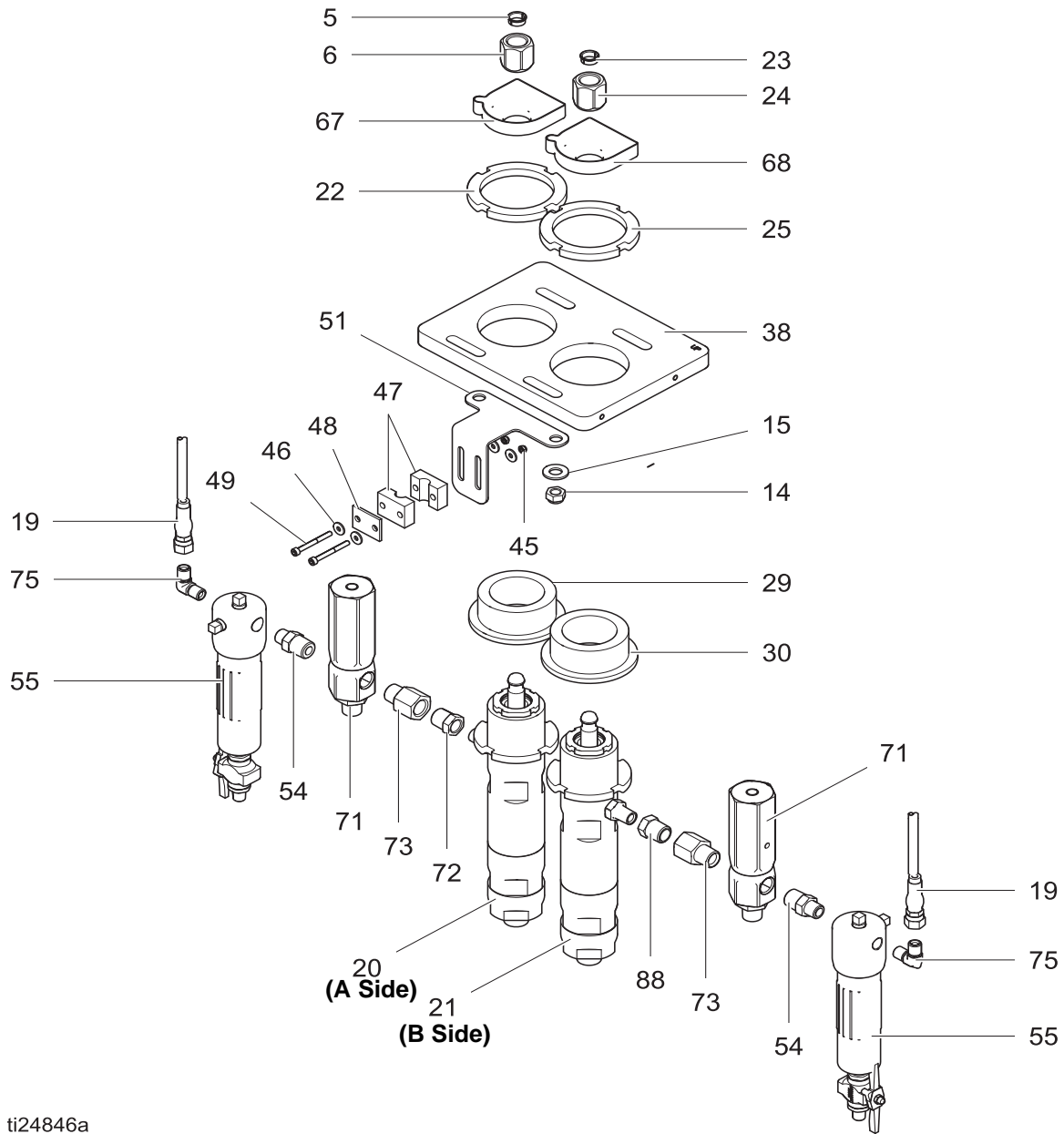
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Motor Assembly Parts List

Ref	Part	Description	Qty
1	M02LN0 M18LN0 M07LN0	MOTOR Low Pressure (Air Spray) High Pressure (Air Assisted and Airless, except Polyester Model 24W609) Polyester Model 24W609 (Air- less)	1
2	127865 186652	WASHER Air Spray Air Assisted and Airless	3
3	100133 100128	LOCK WASHER Air Spray Air Assisted and Airless	3
4	C20021 123208	SCREW Air Spray Air Assisted and Airless	3
10	121141 15V204	FITTING Air Spray Air Assisted and Airless	1
13	17D759	ROD, tie	4
16	17D751	BRACKET, mounting	1
31	17B290 17D752	CONNECTOR Air Spray Air Assisted and Airless	1
32	17D753	YOKE	1

Ref	Part	Description	Qty
33	127864	SCREW, cap, socket hd	2
34	100731	WASHER	2
35	16Y850	ROD, piston, A Side	1
36	17A253 16Y850	ROD, piston, B Side Packages with LW025A (25cc) lower Packages with any other lower	1
37	17D754	BASE, motor	
41	104541	LOCK NUT Air Spray Air Assisted and Airless	4 2
42	107541	WASHER, lock, spring	4
43	17B268	SCREW, hex hd, M12 x 25 LG	4
44	111449	WASHER, plain	4
49	15F744	LABEL, pinch hazard (not shown)	1
65	238909	WIRE, grounding assembly	1
69	17D756	GUARD, pinch, left	1
70	17D757	GUARD, pinch, right	1
85	551295	SCREW, mach, pan, hd	1
99	334665	Quick Start Guide (not used with polyester model 24W609)	1

Lower Assembly



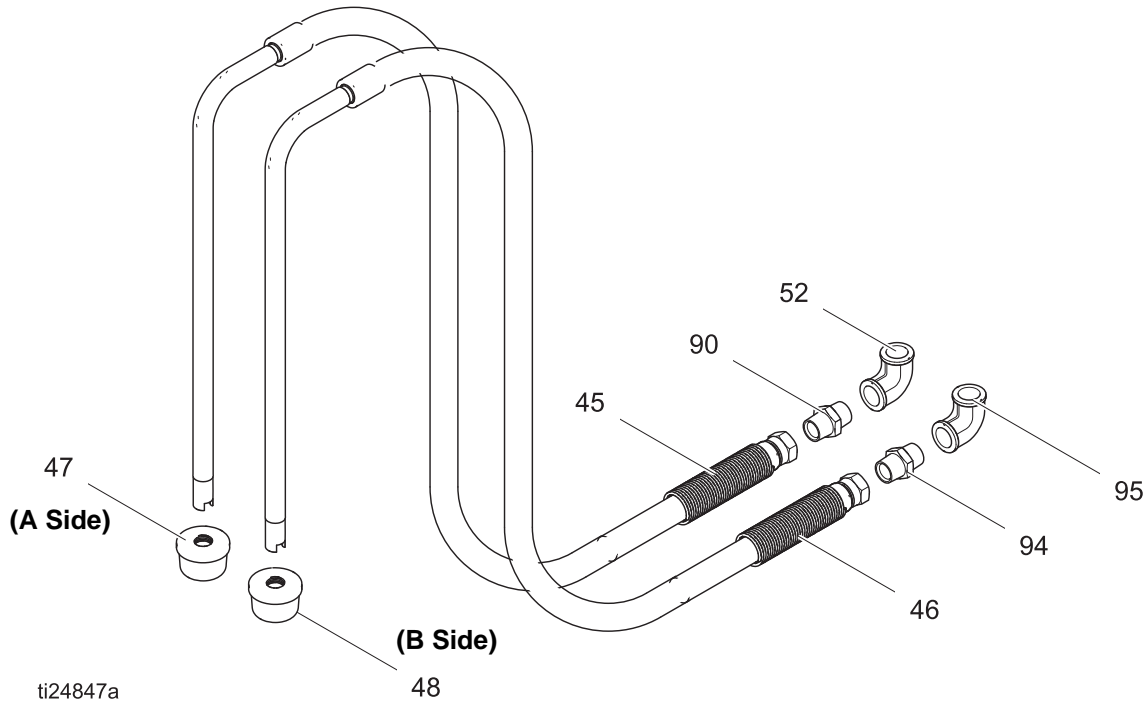
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Lower Assembly Parts List

Ref.	Part	Description	Qty.
5	184128	COUPLING COLLAR, A Side Used on all models except 24W609	2
	184132	Used on model 24W609	
6		COUPLING NUT, A Side	1
	15T311	Used on all models except 24W609	
	P01043	Used on model 24W609	
14	127938	NUT, nylon lock, M12 x 1.75	4
15	109570	WASHER, plain	4
20		LOWER (A Side)	1
	LW025A	25 cc, used for 1:1 polyester model 24W609	
	LW050A	50 cc, used for 1:1 ratio pump (except 24W609)	
	LW075A	75 cc, used for 3:1 ratio pump	
	LW100A	100 cc, used for 2:1 and 4:1 ratio pumps	
	LW125A LW150A	125 cc, used for 5:1 ratio pump 150 cc, used for 6:1 ratio pump	
21	LW025A	LOWER (B Side) 25 cc, used for 3:1, 4:1, 5:1, 6:1 ratio pump and 1:1 polyester model 24W609	1
	LW050A	50 cc, used for 1:1 (except 24W609) and 2:1 ratio pumps	
22	24A639	NUT, jam	1
23	184128	COUPLING COLLAR, B Side 1:1 (except 24W609) or 2:1 ratio pumps	2
	184132	3:1, 4:1, 5:1, 6:1 ratio pumps, and 1:1 ratio polyester model 24W609	
24	15T311	COUPLING NUT, B Side 1:1 (except 24W609) or 2:1 ratio pumps	1
	P01043	3:1, 4:1, 5:1, 6:1 ratio pumps and 1:1 ratio polyester model 24W609	
25		JAM NUT	1
	24A638 24A639	5:1 ratio pump 1:1, 2:1, 3:1, 4:1, 6:1 ratio pumps	
29		ADAPTOR, A side	1
	17D760	25 cc, used on 1:1 ratio polyester model 24W609	
	17D758	50 cc, used on 1:1 ratio pump (except 24W609)	
	17D770	75 cc, used on 3:1 ratio pump	
	17D761	100 cc, used on 2:1 and 4:1 ratio pumps	
	17D771	125 cc, used on 5:1 ratio pump	

Ref.	Part	Description	Qty.
30	17D758	ADAPTOR, B Side 50 cc, used on 1:1 (except 24W609) and 2:1 ratio pumps	1
	17D760	25 cc, used on 3:1, 4:1, 5:1, 6:1 ratio pumps and 1:1 polyester model 24W609	
38	17D755	BASE, lower	1
51	17C891	REGULATOR BRACKET; used on models 24V868, 24V869, 24V870, 24V871, 24V872, 24V873	
54	123724	NIPPLE; used on all models except 24W609	2
	16C633	NIPPLE; used on polyester model 24W609	
55	17D762	FILTER, fluid; used on all portable models except 24W609	2
67		TSL RESERVOIR, A Side	1
	15K127	25 cc, used on 1:1 polyester model 24W609	
	15M031	50 cc, used on 1:1 ratio pump (except 24W609)	
	15T339	100 cc, used on 2:1 and 4:1 ratio pump	
	15K945	75 cc, used on 3:1 ratio pump	
	15T340 15T341	125 cc, used on 5:1 ratio pump 150 cc, used on 6:1 ratio pump	
68		TSL RESERVOIR, B Side	1
	15M031 15K127	50 cc, used on 1:1 and 2:1 ratio pumps 25 cc, used on 3:1, 4:1, 5:1, 6:1 ratio pumps	
71		RELIEF VALVE	2
	24W475 237073	Air Spray Air Assisted and Airless (except 24W609)	
	237062	Polyester model 24W609 (Airless)	
72		BUSHING	1
	502265	1/2 x 3/8; used on 1:1, 2:1, 3:1, 4:1 ratio pumps	
	114499 15U426	1/2-14 npt; used on 5:1 ratio pump 3/4 npt(f) x 1/2 npt(m); used on 6:1 ratio pump	
73	114499	FITTING, adapter, 1/2-14 npt	2
74	102022	BUSHING, 3/8 x 1/4, not shown; used on wall-mount models	2
75	114342	ELBOW, (1/4-18 NPSM); not used on polyester model 24W609	2
88	502265	BUSHING, reducer, pipe 1/2 x 3/8	1

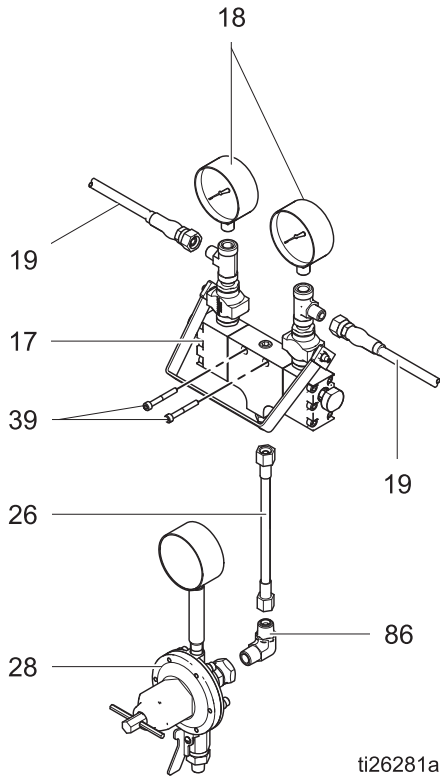
Fluid Inlet Assembly



Ref	Part	Description	Qty
45		SUCTION HOSE (A Side)	1
	255872	Used on 1:1 (except 24W609), 2:1, 3:1, 4:1 ratio pumps	
	256377	Used on 1:1 ratio polyester model 24W609	
	24A232	Used on 5:1 and 6:1 ratio pumps	
46		SUCTION HOSE (B Side)	1
	255872	Used on 1:1 (except 24W609) and 2:1 ratio pumps	
	256377	Used on 1:1 ratio polyester model 24W609	
	25640	Used on 3:1, 4:1, 5:1, 6:1 ratio pumps	
47		STRAINER (A Side)	1
	187146	Used on 1:1 (except 24W609), 2:1, 3:1, 4:1 ratio pumps	
	256426	Used on 1:1 ratio polyester model 24W609	
	187190	Used on 5:1 and 6:1 ratio pumps	
48		STRAINER (B Side)	1
	187146	Used on 1:1 (except 24W609) and 2:1 ratio pumps	
	256426	Used on 3:1, 4:1, 5:1, 6:1 ratio pumps and 1:1 ratio polyester model 24W609	

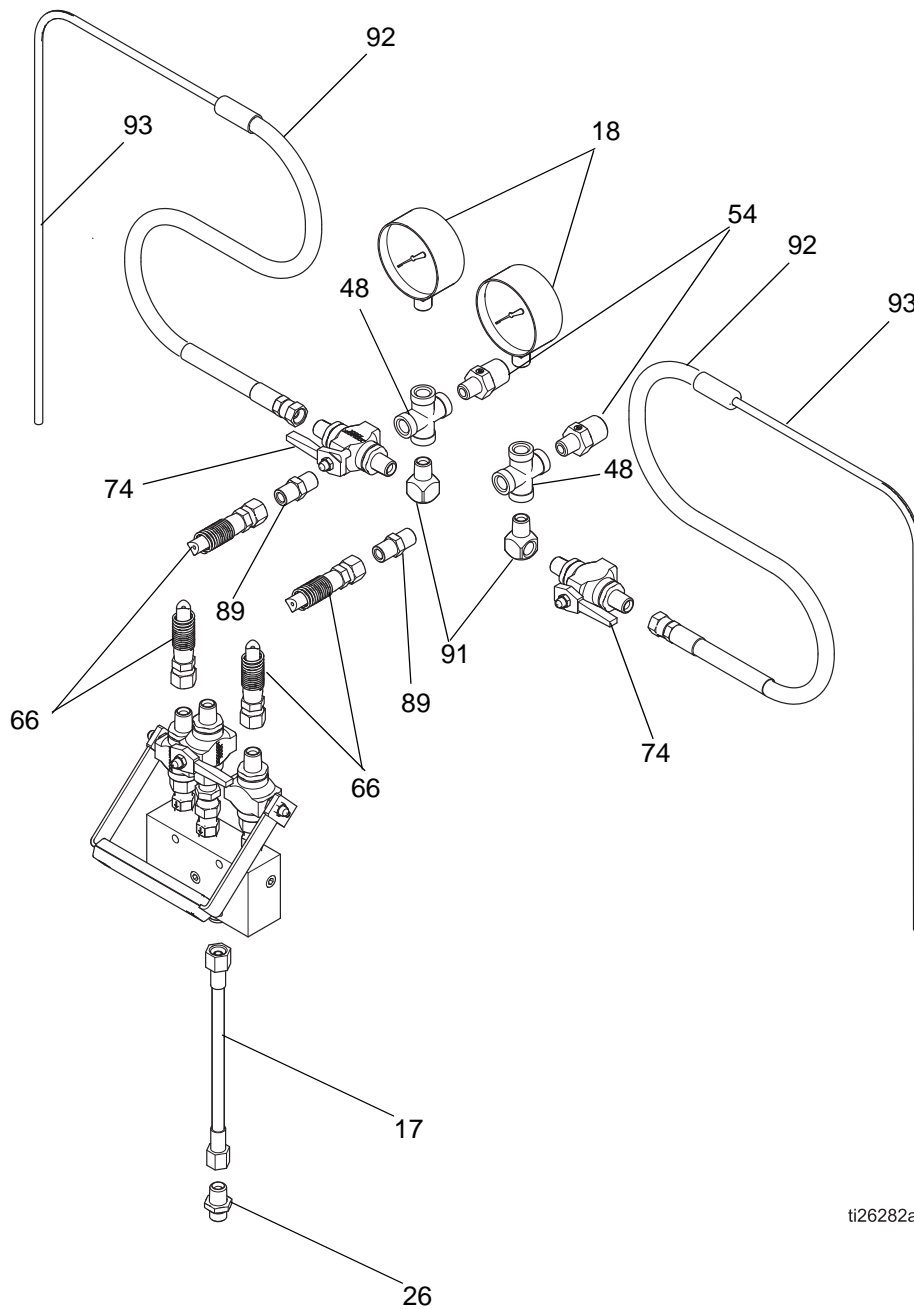
Ref	Part	Description	Qty
52		90° ELBOW (A Side)	1
	102325	Used on 1:1 (except 24W609), 2:1, 3:1, 4:1 ratio pumps	
	500947	Used on 1:1 ratio polyester model 24W609	
	500251	Used on 5:1 and 6:1 ratio pumps	
90		NIPPLE (A Side)	1
	190724	3/4 npt, used on 1:1 (except 24W609), 2:1, 3:1, 4:1 ratio pumps	
	114373	Used on 1:1 ratio polyester model 24W609	
	17D153	1 in. npt, used on 5:1 and 6:1 ratio pumps	
94		NIPPLE (B Side)	1
	190724	Used on 1:1 (except 24W609) and 2:1 ratio pumps	
	114373	Used on 3:1, 4:1, 5:1, 6:1 ratio pumps and 1:1 ratio polyester model 24W609	
95		90° ELBOW (B Side)	1
	102325	Used on 1:1 (except 24W609) and 2:1 ratio pumps	
	500947	Used on 3:1, 4:1, 5:1, 6:1 ratio pumps and 1:1 ratio polyester model 24W609	

Fluid Outlet Assembly (Except Model 24W609)



17		MANIFOLD, mix; see manual 334625	1
18	187876 C06323	GAUGE Air Spray Air Assisted and Airless	2
19	24N345	HOSE, coupled	2
26	24N291 16W563	STATIC MIXER HOSE Air Spray Air Assisted and Airless	1
28	214706	REGULATOR (used only with Air Spray guns)	1
39	114196	SCREW	2
86	114504 114504 166846	FITTING Air Spray, Wall Mount Air Spray, Cart Mount Air Assisted and Airless, Cart and Wall Mount	1

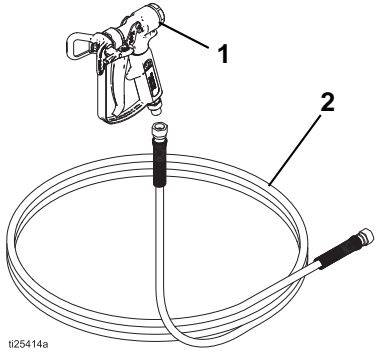
Fluid Outlet Assembly (for Polyester Model 24W609)



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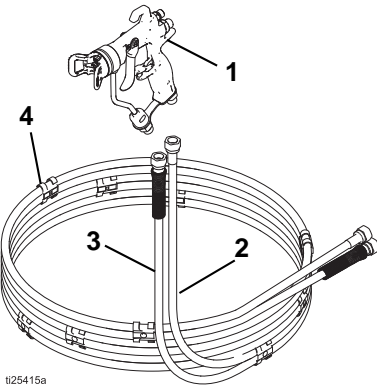
17	24W861	MANIFOLD, remote mix; see manual 334625	1	89	166421	NIPPLE, 5/8 hex x 1/1/2	2
18	C06323	GAUGE	2	91	166866	ELBOW, street	2
26	24N291'	STATIC MIXER HOSE	1	92	17D276	HOSE, return, sst	2
48	110191	CROSS, pipe	2	93	256377	HOSE, suction, assembly	2
54	16C633	NIPPLE, 1/2 x 1/4	2	96	166846	ADAPTER, 1/4 npt x 1/4 npsm	2
74	248271	VALVE, ball	2				

Spray Gun and Hose



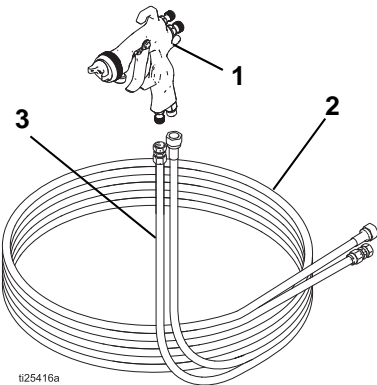
Airless Spray Gun

Ref. Part	Description	Qty.
1	XTR501 GUN, XTR 5	1
2	241812 HOSE, 25 ft. (7.6 m), 3/16 in. ID	1
▲ Hose warning label 15G026 is available at no cost		



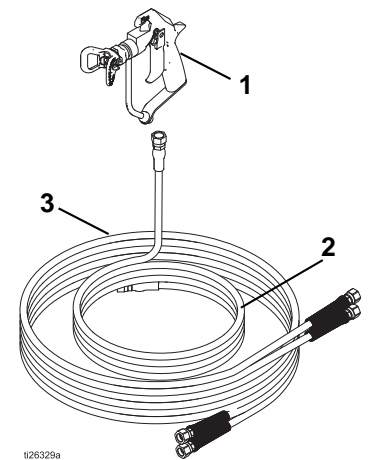
AA Spray Gun

Ref. Part	Description	Qty.
1	24C855 GUN, G40 air-assisted high-pressure spray gun	1
2	256390 AIR HOSE	1
3	241812 HOSE, 25 ft. (7.6 m), 3/16 in. ID	1
4	120706 T-CLIP	1
▲ Hose warning label 15G026 is available at no cost		



Air Spray Gun

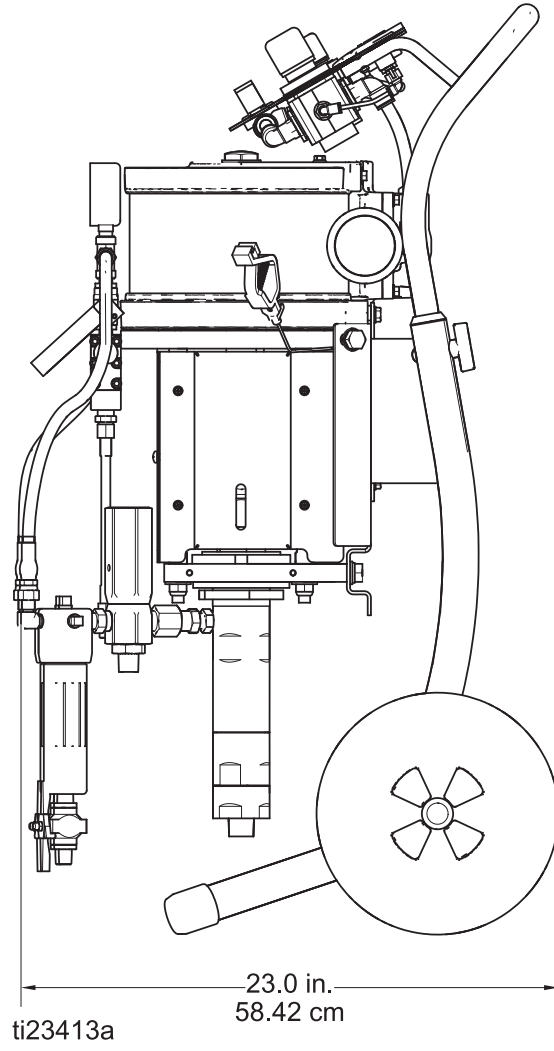
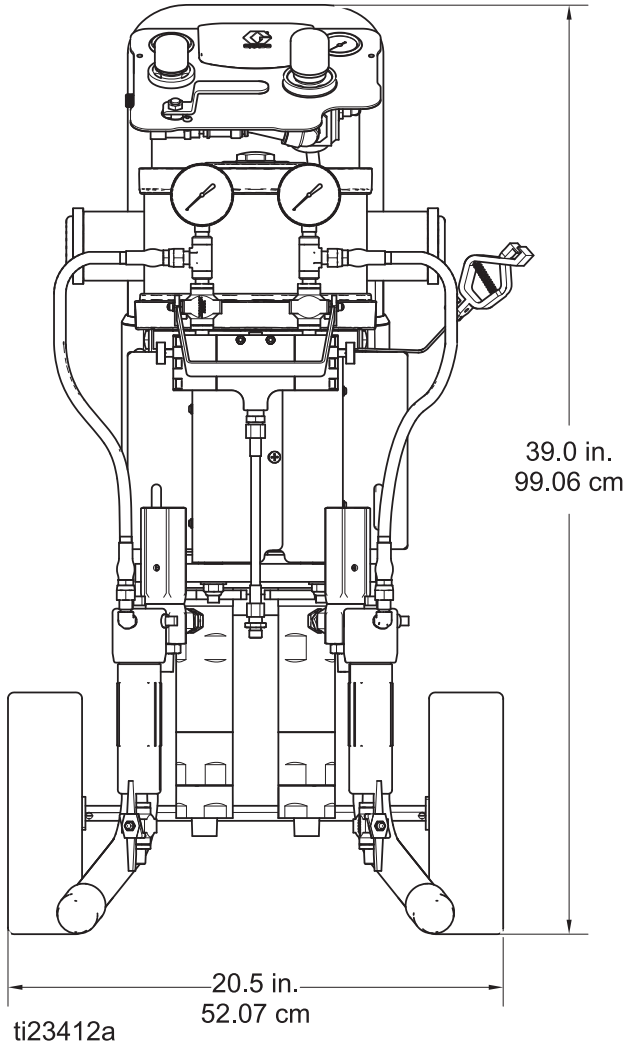
Ref. Part	Description	Qty.
1	288950 GUN, AirPro, conventional, stainless steel tip	1
2	205406 HOSE, coupled, 25 ft. (7.6 m)	1
3	256390 AIR HOSE	1
▲ Hose warning label 15G026 is available at no cost		



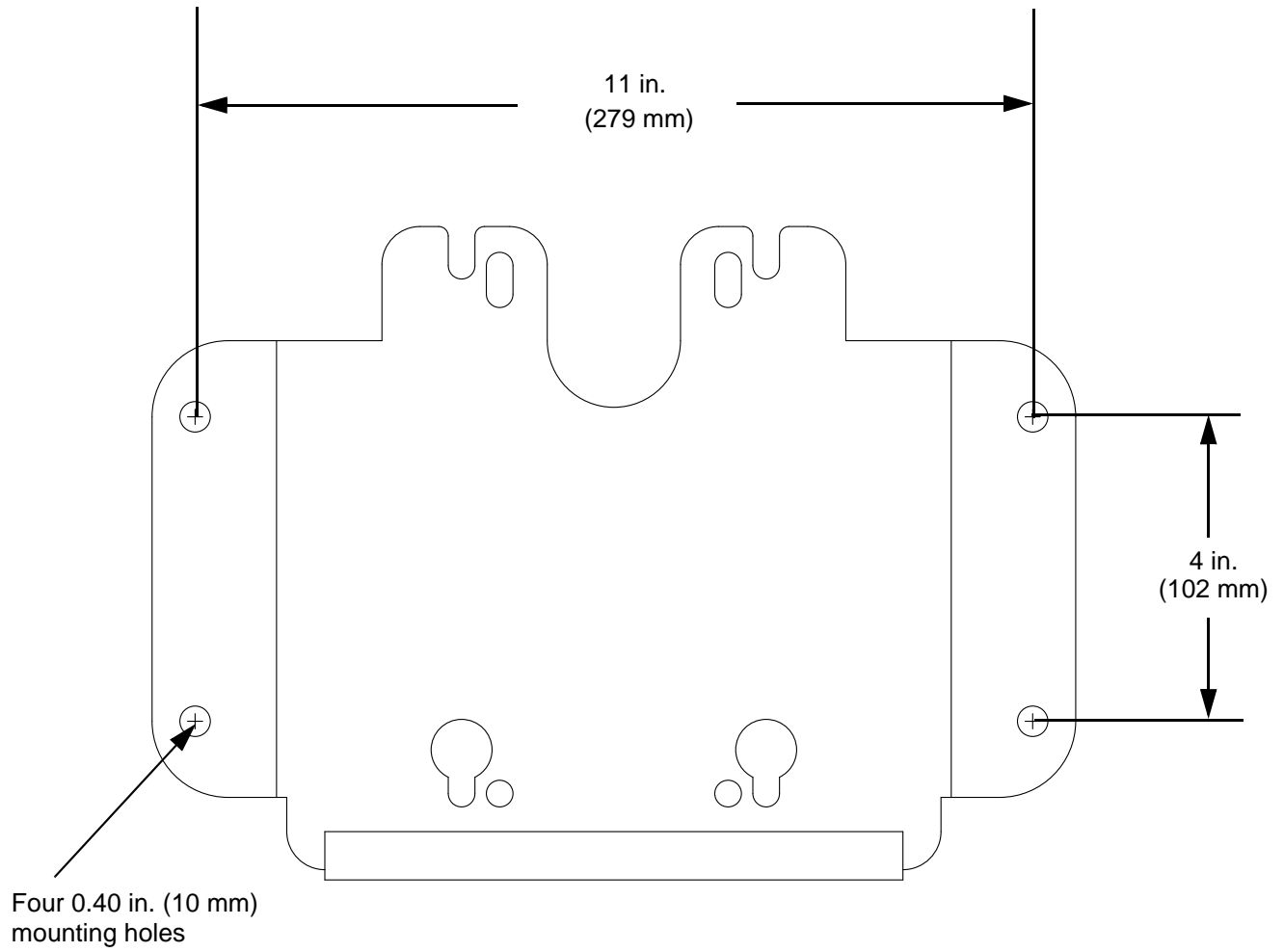
Airless Spray Gun and Hose (for Polyester Model 24W609)

Ref. Part	Description	Qty.
1	243283 GUN, Silver, RAC	1
2	826210 HOSE, 10 ft. (3 m), 3/16 in. ID, mix material	1
3	241812 HOSE, 25 ft. (7.6 m), 3/16 in. ID, A and B	2
▲ Hose warning label 15G026 is available at no cost		

Dimensions



Wall Bracket Mounting



Technical Data

M2K Spray Packages		
	US	Metric
Maximum fluid working pressure	Refer to Technical Data Matrix , page 53.	
Maximum flow rate	Refer to Technical Data Matrix , page 53.	
Maximum pump air pressure	Refer to Technical Data Matrix , page 53.	
Maximum spray gun pressure	See your gun manual for spray gun pressures.	
Pump air consumption (See gun manual for additional air consumption)	Refer to Performance Charts , page 33.	
Maximum free-flow delivery *NOTE: M2K proportioners are rated to 20 cycles per minute related flowrate to prevent cavitation and ensure complete pump loading, necessary to maintain ratio accuracy.		
Recommended cycle rate for continuous duty	20 cycles per minute	
Maximum viscosity	10,000 cps	
Ambient air temperature range	35°–120°F	2°–49°C
Maximum fluid temperature	160°F	71°C
Fluid flow per cycle	Refer to Technical Data Matrix , page 53.	
Noise (dBa)		
Maximum sound pressure	See Technical Data in air motor manual 312796.	
Inlet/Outlet Sizes		
Air inlet size	1/4 in. npt(f)	
Materials of Construction**		
Wetted materials on all models	Displacement pump: Stainless steel, tungsten carbide with 6% nickel, UHMWPE, PTFE, PEEK Spray gun: See Manual 312414 (Air Spray guns). 3A0149 (AA guns), or Manual 312145 (XTR guns). Fluid hoses: nylon 303/304 SST Suction assembly: stainless steel, nylon Relief valve, 304 SST, graphite-filled PTFE, tungsten carbide with nickel binder Fluid filter: See manual 307273. Drain valve: stainless steel, nylon	
Weight		
All models	Refer to Technical Data Matrix , page 53.	

Technical Data Matrix

Sprayer Type	Pump Mix Ratio	Model	Lower		Air Motor	Weight		Max Flow Rate at rated 20 cpm		Max Fluid Working Pressure		Fluid/Air Ratio	Max Pump Air Pressure						
			A	B		lb	kg	Gal/Min	L/min	Psi	Bar (MPa)		Psi	Bar (MPa)					
Air Spray	1:1	24V868	50cc	50cc	2.5"	153	69.5	0.5	1.9	225	15 (1.5)	4:1	65	4.5 (0.45)					
		24V874				122	55.5												
	2:1	24V869	100cc	50cc		158	72.0	0.8	3.0				2.6:1	100	7.0 (0.7)				
		24V875				127	57.9												
	3:1	24V870	75cc	25cc		154	70.1	0.5	1.9				4:1	65	4.5 (0.45)				
		24V876				123	56												
	4:1	24V871	100cc	25cc		158	71.6	0.7	2.6				3.2:1	75	5.2 (0.52)				
		24V877				127	57.5												
	5:1	24V872	125cc	25cc		160	72.8	0.8	3.0				2.7:1	100	7.0 (0.7)				
		24V878				129	58.7												
	6:1	24V873	150cc	25cc		161	73.1	0.9	3.4				2.3:1	100	7.0 (0.7)				
		24V879				130	59.0												
	Air Assisted Air Spray	1:1	24V880	50cc		50cc	7.5"	176	79.8				0.5	1.9	3000	204 (20.4)	35:1	95	6.5 (0.65)
			24V886					145	65.7										
2:1		24V881	100cc	50cc	181	82.2		0.8	3.0	24:1	100	7.0 (0.7)							
		24V887			150	68.1													
3:1		24V882	75cc	25cc	177	80.3		0.5	1.9	36:1	95	6.5 (0.65)							
		24V888			146	66.2													
4:1		24V883	100cc	25cc	180	81.8		0.7	2.6	29:1	100	7.0 (0.7)							
		24V889			149	67.7													
5:1		24V884	125cc	25cc	183	83.0		0.8	3.0	24:1	100	7.0 (0.7)							
		24V890			152	68.9													
6:1		24V885	150cc	25cc	181	82.5		0.9	3.4	20:1	100	7.0 (0.7)							
		24V891			150	68.4													
Airless		1:1	24V892	50cc	50cc	7.5"		173	78.6	0.5	1.9	3000	204 (20.4)	35:1				95	6.5 (0.65)
			24V898					142	64.5										
	2:1	24V893	100cc	50cc	178		81.1	0.8	3.0	24:1	100				7.0 (0.7)				
		24V899			147		67.0												
	3:1	24V894	75cc	25cc	174		79.2	0.5	1.9	36:1	95				6.5 (0.65)				
		24V901			143		65.1												
	4:1	24V895	100cc	25cc	178		80.7	0.7	2.6	29:1	100				7.0 (0.7)				
		24V902			147		66.6												
	5:1	24V896	125cc	25cc	180		81.9	0.8	3.0	24:1	100				7.0 (0.7)				
		24V903			149		67.8												
	6:1	24V897	150cc	25cc	179		81.3	0.9	3.4	20:1	100				7.0 (0.7)				
		24V904			148		67.2												
	1:1	24W609	25 cc	25 cc	4.5		135	61.2	0.2	0.9	3000				204 (20.4)	24:1	100	7.0 (0.7)	

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Original instructions. This manual contains English. MM 333309

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