

# Mix Manifold

3A0590G

EN

For mixing two component reactive materials with plural-component sprayers.  
For professional use only.

Approved for use in explosive atmospheres.

## Part No. 262807

Mix Manifold, Single Flush

## Part No. 24M398

Quickset Mix Manifold, Dual Flush with Carriage, Gauges, and Static Mixers

*7250 psi (50 MPa, 500 bar) Maximum Working Pressure*

*5000 psi (34.5 MPa, 345 bar) Maximum Flush Inlet Pressure*

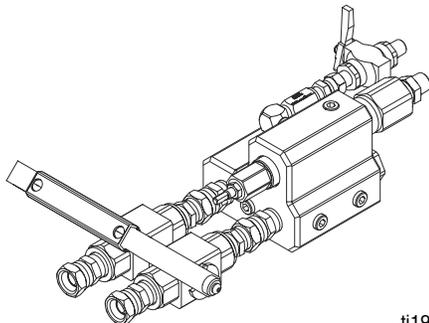
*160 °F (71 °C) Maximum Fluid Temperature*



### Important Safety Instructions

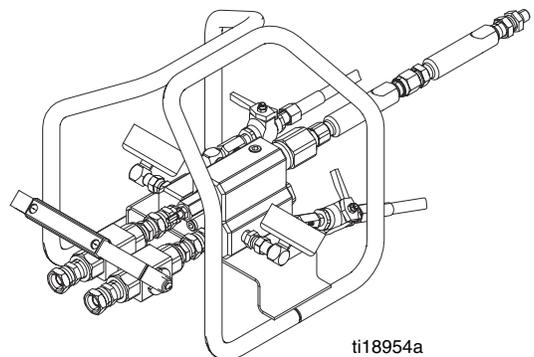
Read all warnings and instructions in this manual. Save these instructions.

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## Related Manuals

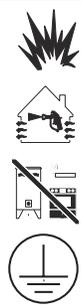
Manuals are available at [www.graco.com](http://www.graco.com)

Component Manuals in English:

Manual	Description
3A0420	XP Sprayer, Instructions-Parts
3A0421	Ratio Check Kit, Instructions-Parts
306861	Ball Valves, Check Valves, and Swivels, Instructions-Parts
339361	High Pressure Hose and Accessories Brochure

# Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 <b>WARNING</b>	
	<p><b>FIRE AND EXPLOSION HAZARD</b></p> <p>Flammable fumes, such as solvent and paint fumes, in <b>work area</b> can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> <li>• Use equipment only in well ventilated area.</li> <li>• Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc).</li> <li>• Keep work area free of debris, including solvent, rags and gasoline.</li> <li>• Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present.</li> <li>• Ground all equipment in the work area. See <b>Grounding</b> instructions.</li> <li>• Use only grounded hoses.</li> <li>• Hold gun firmly to side of grounded pail when triggering into pail.</li> <li>• If there is static sparking or you feel a shock, <b>stop operation immediately</b>. Do not use equipment until you identify and correct the problem.</li> <li>• Keep a working fire extinguisher in the work area.</li> </ul>
	<p><b>EQUIPMENT MISUSE HAZARD</b></p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> <li>• Do not operate the unit when fatigued or under the influence of drugs or alcohol.</li> <li>• Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See <b>Technical Data</b> in all equipment manuals.</li> <li>• Use fluids and solvents that are compatible with equipment wetted parts. See <b>Technical Data</b> in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.</li> <li>• Do not leave the work area while equipment is energized or under pressure. Turn off all equipment and follow the <b>Pressure Relief Procedure</b> when equipment is not in use.</li> <li>• Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.</li> <li>• Do not alter or modify equipment.</li> <li>• Use equipment only for its intended purpose. Call your distributor for information.</li> <li>• Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.</li> <li>• Do not kink or over bend hoses or use hoses to pull equipment.</li> <li>• Keep children and animals away from work area.</li> <li>• Comply with all applicable safety regulations.</li> </ul>

# ! WARNING



## SKIN INJECTION HAZARD

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.**

- 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.



## THERMAL EXPANSION HAZARD

Fluids subjected to heat in confined spaces, including hoses, can create a rapid rise in pressure due to the thermal expansion. Over-pressurization can result in equipment rupture and serious injury.

- Open a valve to relieve the fluid expansion during heating.
- Replace hoses proactively at regular intervals based on your operating conditions.



## PRESSURIZED EQUIPMENT HAZARD

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

- Follow 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, tubes, and couplings daily. Replace worn or damaged parts immediately.



## TOXIC FLUID OR FUMES HAZARD

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

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

**WARNING****PRESSURIZED ALUMINUM PARTS HAZARD**

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

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

**PERSONAL PROTECTIVE EQUIPMENT**

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

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

# Important Two-Component Material Information

## Isocyanate Conditions

						
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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.

## Material Self-ignition

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

## Keep Components A and B Separate

						
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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 component A (isocyanate) and component B (resin) parts.

## Moisture Sensitivity of Isocyanates

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

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

To prevent exposing ISO to moisture:

- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. **Never** store ISO in an open container.
- Keep the ISO pump wetcup or reservoir (if installed) filled with Graco Throat Seal Liquid (TSL™), Part 206995. The lubricant creates a barrier between the ISO and the atmosphere.
- Use moisture-proof hoses specifically designed for ISO.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Never use solvent on one side if it has been contaminated from the other side.
- Always lubricate threaded parts with TSL or grease when reassembling.

## Foam Resins with 245 fa Blowing Agents

Some foam blowing agents will froth at temperatures above 90°F (33°C) when not under pressure, especially if agitated. To reduce frothing, minimize preheating in a circulation system.

## Changing Materials

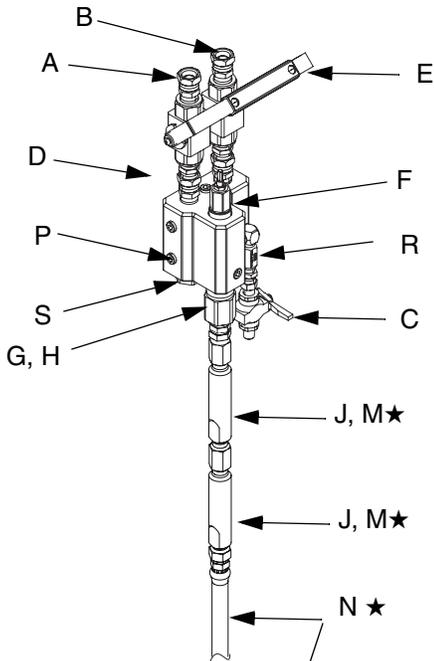
- Changing material types used in your sprayer requires special attention to avoid equipment damage and downtime.
- Always clean the fluid inlet strainers after flushing.
- When changing between epoxies and urethanes or polyureas, disassemble and clean all fluid components and changes hose sets.
- Check with your material manufacturer for chemical compatibility.
- Most materials use ISO on the A side, but some use ISO on the B side.
- Epoxies often have amines on the B (hardener) side. Polyureas often have amines on the B (resin) side.

## A and B Component Designations

Material suppliers and markets refer to plural component materials differently. The table below summarizes the different designations for the components used in various machines.

Market	Equipment	Designations	Machine Left Side	Machine Right Side
Foam and Polyurea Urethane Pour	All Reactors, HFR™, and VRM™	Letter	A	B
		Color	Red	Blue
		Component Names	ISO, Hardener, Catalyst	Polyol, Resin, Base
		Major or Minor Component (when not 1:1 mix)	Low Volume Side	High Volume Side
Epoxy and Urethane Protective Coatings	Hydra-Cat® <sup>®</sup> , Xtreme-Mix™, XM™, XP, and PR70™	Letter	A	B
		Color	Blue	Green
		Component Names	Resin, Base	Hardener, Catalyst
		Major or Minor Component (when not 1:1 mix)	High Volume Side	Low Volume Side
Epoxy, Silicone, Urethanes, and other materials	PR70 and PR	Letter	A	B
		Color	Red	Blue
		Component Names	Polyol, Resin, Base	ISO, Hardener, Catalyst
		Major or Minor Component (when not 1:1 mix)	High Volume Side	Low Volume Side

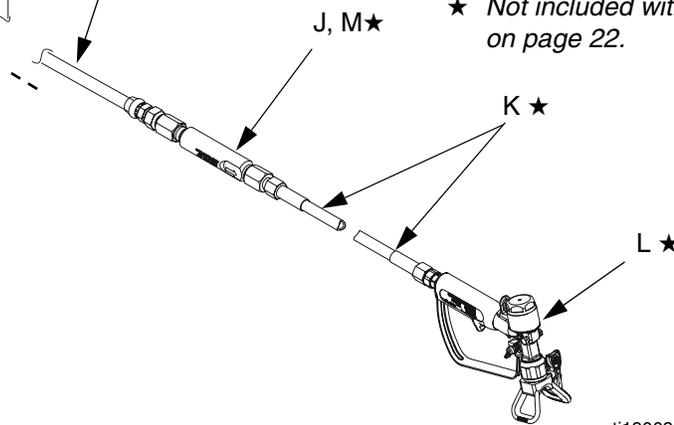
# Component Identification



**Key:**

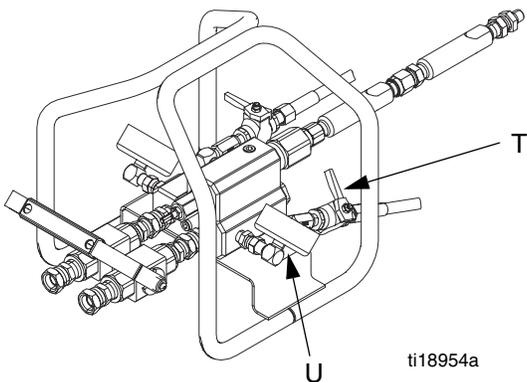
- A Resin (High Volume) Inlet (A material)
- B Hardener (Low Volume) Inlet (B material)
- C Solvent Inlet Valve, 1/4 npt(m)
- D Manifold
- E Dual Shutoff Handle
- F Hardener Restrictor Adjustment
- G Hardener Center Inject Tube (not shown; inside outlet H)
- H Mix Manifold Outlet, 1/2 npt(f) with 3/8 npt(m) adapter
- J Static Mix Housing
- K Fluid Whip Hose
- L Airless Spray Gun
- M Static Mixing Element (not shown; inside J)
- N Fluid Mix Hose
- P Accessory Ports (see **Accessory Ports**, page 26)
- R B Side Flush Inlet Check Valve
- S A Side Check Valve Cartridge (B side not shown)
- T A Side Solvent Inlet Valve (Quickset Manifold)
- U A Side Solvent Check Valve (Quickset Manifold)

★ Not included with mix manifold. See **Parts**, starting on page 22.



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**Quickset Manifold**



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**FIG. 1: Typical Installation**

# Overview

The left side of the mix manifold is intended for the major volume material, or the higher viscosity material if using a 1:1 volume mix. This side is referred to throughout the manual as the resin side or "A" side.

The right side is referred to as the Hardener side or "B" side. The "B" side incorporates an adjustable restrictor for balancing the system back pressure and flow.

See FIG. 2 to view flow of "A" and "B" material inside the Mix Manifold.

The resin and hardener enter the mix manifold through the manifold inlet ports and spring loaded carbide ball checks. The "A" material flows through the manifold to the material outlet port. The injector tube creates a hollow stream of "A" material for the "B" material to fill once the hardener exits the injector tube. The resin and hardener material mix after they have left the mix manifold block (B).

When the manifold is mounted remote from the proportioner, adjust the "B" side restrictor (F) to balance the system back pressure and flow.

On the standard mix manifold, mixed material is flushed out by sending a flush solvent through the B side center tube. On the quickset mix manifold, solvent is also flushed across the A side fluid check valve.

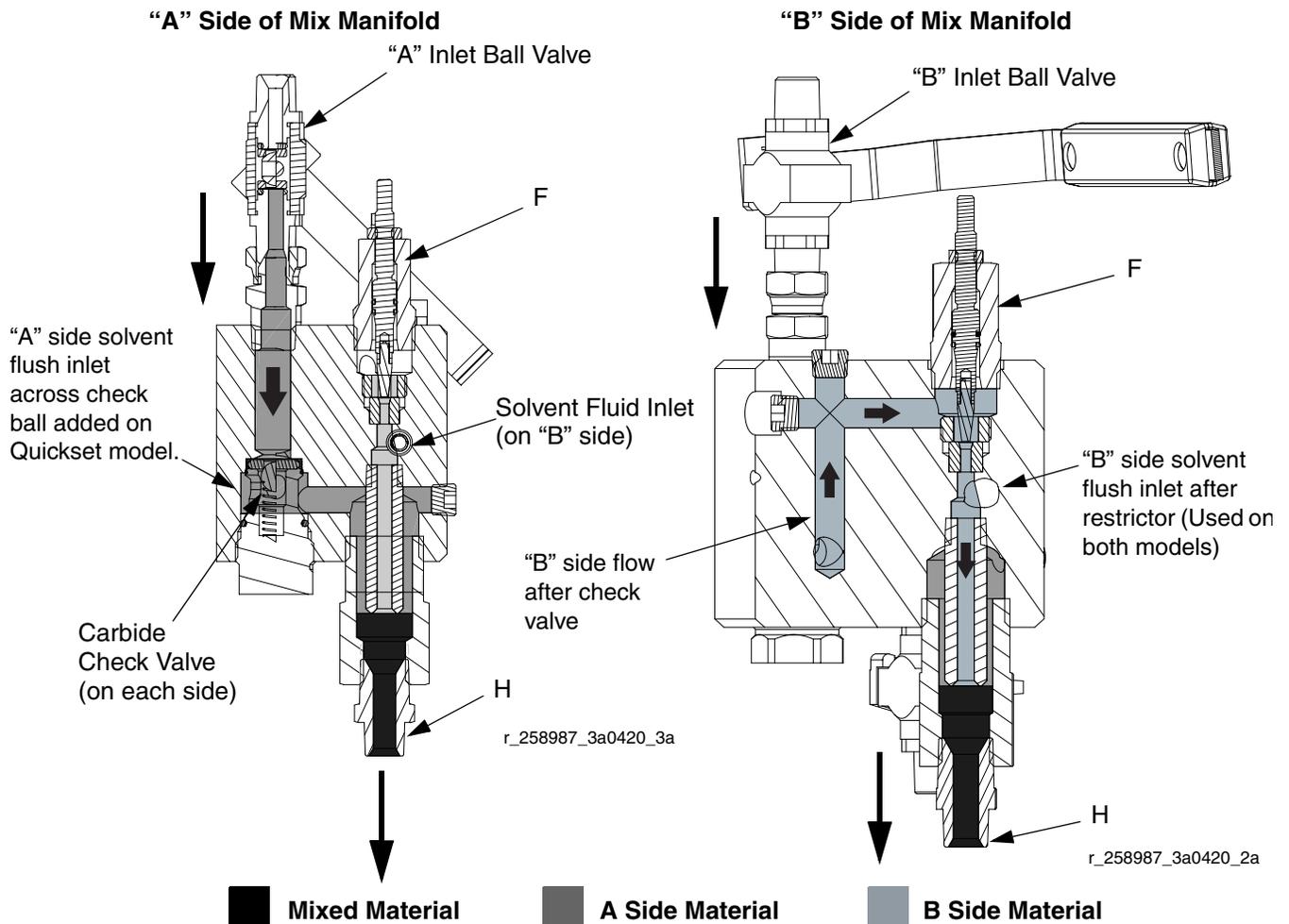


FIG. 2: Cross-Section Side Views of A and B Flow

# Installation

For assistance in setting up a plural component sprayer, contact your Graco distributor, to ensure that you select the proper type and size equipment for your system.

See illustration in FIG. 1 on page 8.

## Fluid Inlets

The A and B fluid inlets (A and B) are equipped with 1/2 npt(f) ball valves. Connect 1/2 in., 3/8 in., or 1/4 in. npsm(f) fluid hoses with adapter nipples as needed. See brochure 339361 for high pressure hose and fitting part numbers.

**NOTE: If the manifold is remote, the hoses must be properly sized and balanced. See Volume Balancing the Mix Manifold on page 15 for more remote setup information.**

## Solvent Inlet

Connect the solvent supply line (D) from the solvent pump to the 1/4 npt(m) solvent inlet valve (C), or inlet tee on the Quickset model.

**NOTE: Use a Graco approved grounded hose rated to withstand the maximum fluid working pressure of the solvent pump. The hose core must be chemically compatible with the solvent being used, such as nylon or PTFE.**

## Fluid Outlet

Connect the outlet to two primary static mixer tubes (J), with mixer elements (M), to the mix hose (N), cleanup mixer (J), whip hose (K), and spray gun (L).

**NOTICE**  
To prevent creating a flare on the mixer tube, do not use a union swivel end on the mix tube inlet.

Add mixed material hose as necessary between the mix hose and cleanup mixer.

**NOTICE**  
Never split the flow to multiple guns until the two fluids are mixed after the mix manifold assembly.

## Mounting

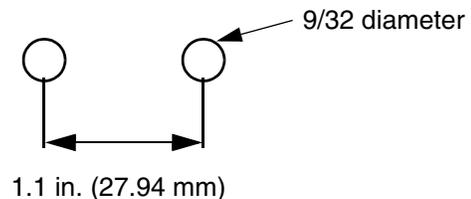
### Remote Mix Manifold

The mix manifold can be removed from the proportioner and mounted closer to the gun. This reduces the volume of mixed material and flush solvent for quick setting materials (less than 10 minute pot life). See **Volume Balancing the Mix Manifold** on page 15 for more remote setup information.

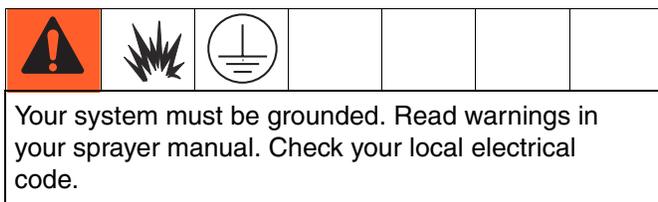
Use Remote Mix Manifold Carriage 262522 for in-line hose mount locations. The carriage protects the manifold and valves from accidental operation which could cause a plugged line.

### Bare Manifold

To mount the bare manifold, drill two holes in the mounting surface, and secure with the two 1/4-20 screws (28).



## Grounding



- **Pump:** use ground wire and clamp as instructed in your sprayer manual.
- **Air and fluid hoses:** use only electrically conductive hoses. with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity. Check electrical resistance of hoses. If total resistance to ground exceeds 29 megohms, replace hose immediately.
- **Air compressor:** follow manufacturer's recommendations.
- **Spray gun:** ground through connection to a properly grounded fluid hose and pump.
- **Fluid supply container:** follow local code.
- **Object being sprayed:** follow local code.
- **Solvent pails used when flushing:** follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a non-conductive surface, such as paper or cardboard, which interrupts grounding continuity.
- **To maintain grounding continuity when flushing or relieving pressure:** hold metal part of the spray gun firmly to the side of a grounded metal pail, then trigger the gun.

## Flush Before Using Equipment

The equipment was tested with lightweight oil, which is left in the fluid passages to protect parts. To avoid contaminating your fluid with oil, flush the equipment with a compatible solvent before using the equipment. See **Flushing**, page 13.

## Ratio Check

Perform the ratio check procedure after any changes to the proportioning system. Use Ratio Check Kit 24F375 to check the ratio at the mix manifold. See manual 3A0421 for instructions and parts.

### NOTICE

To prevent an inaccurate ratio check when feed pumps are used in your system, the feed pressure cannot be more than a maximum of 25% of the proportioner outlet pressure while dispensing. High feed pressure can float the proportioner pump check balls, resulting in an inaccurate ratio check.

# Operation

## Pressure Relief Procedure

						
Follow pressure relief procedure when you stop spraying or dispensing; and before cleaning, checking, servicing, or transporting equipment.						

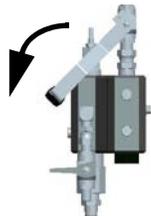
### Relieve A and B Fluid Pressure

1. Engage the trigger lock.

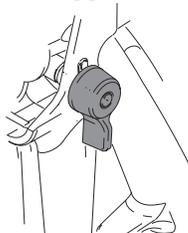


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2. Turn off the sprayer.
3. Close the bleed-type master air valve.
4. Open the dual shutoff handle (E).

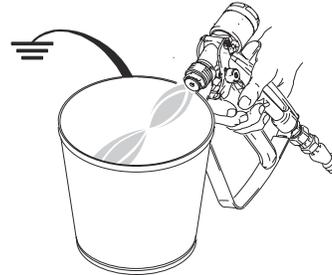


5. Shut off fluid heaters, if used on your sprayer.
6. Shut off feed pumps, if used.
7. Disengage the trigger lock.



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8. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun to relieve pressure.



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9. Engage the trigger lock.



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10. Open all fluid drain valves in the system, having a waste container ready to catch drainage. Leave drain valves open until you are ready to spray again.
11. If you suspect the spray tip or hose is clogged or that pressure has not been fully relieved after following the steps above, **VERY SLOWLY** loosen tip guard retaining nut or hose end coupling to relieve pressure gradually, then loosen completely. Clear hose or tip obstruction.

## Trigger Lock

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

# Flushing

<p>Read warnings and grounding instructions in your sprayer manual. If your system uses heaters, shut off the main power to the heaters and heated hose control before flushing.</p>						

**NOTICE**

To prevent fluid from setting up in the dispensing equipment, flush the system frequently. Be sure there is an adequate amount of solvent in the solvent supply before spraying.

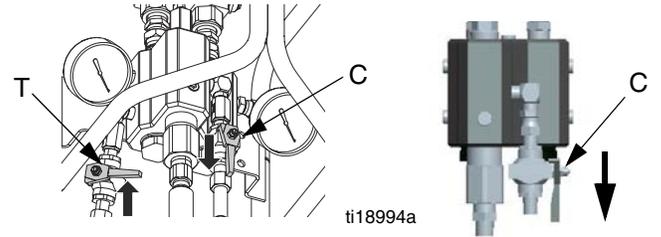
**NOTE:**

- **Ensure flushing fluid is compatible with dispense fluid and the equipment wetted parts.**
- **Use a solvent that dissolves the material you are mixing.**
- **Solvent may channel through viscous fluids and leave a coating of mixed fluid on the inner tube of your hose. Be sure all fluid is thoroughly flushed from the hose after each use.**
- **Remove spray tip for more thorough cleaning of the whip hose and static mixers.**
- **Always leave equipment filled with fluid to avoid drying and scaling.**
- **Frequently remove, clean and replace the static mixer elements**

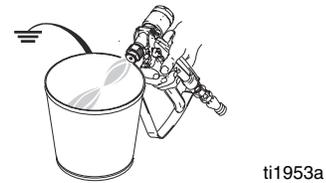
1. Follow **Pressure Relief Procedure**, page 12.
2. Remove the spray tip and soak in solvent.
3. Close the dual shutoff handle (E).



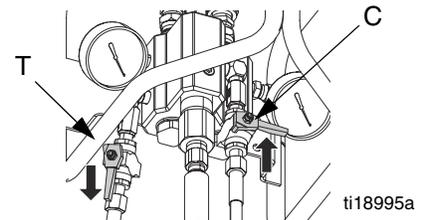
4. Open the solvent inlet valve (C). For the quickset manifold, close the A side flush valve (T).



5. Place the siphon tube in a grounded metal pail containing cleaning fluid.
6. Set pump to the lowest possible fluid pressure, and start pump.
7. Trigger the gun into a grounded metal pail with lid. Use a lid with a hole to dispense through to avoid splashing. Trigger the gun until clean solvent dispenses.



- a. For the standard mix manifold, go to step 8.
- b. For the quickset mix manifold, after briefly flushing with the B side valve, close the B side flush valve (C) and open the A side flush valve (T). Repeat step 7 until clean.



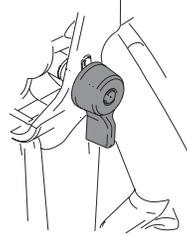
8. Turn off the solvent pump air supply.
9. Hold the metal part of the gun firmly to a grounded metal pail with lid in place. Trigger the gun until all fluid pressure is relieved.

- Engage the trigger lock.



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- Disengage the trigger lock.



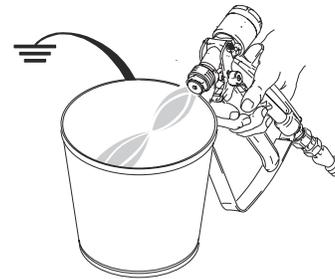
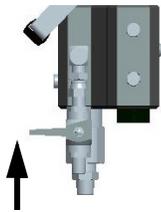
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- Close solvent inlet valve (C).
- Remove the gun from the hose. See gun manual to further clean the gun.

- Hold the metal part of the gun firmly to a grounded metal pail with a lid to avoid splashing. Trigger the gun until mixed coating material is evident and purge solvent is gone.

## Dispensing and Spraying

- Close the solvent inlet valve (C) and A side solvent valve (T) if equipped.



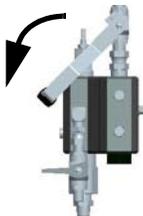
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- Proceed spraying.

- Open the dual shutoff handle (E).

### NOTICE

To prevent damage to the valve balls and seats, always fully open or fully close the dual shutoff handle. Also increase the fluid pressure after opening the ball valves to allow valves to last longer.



- Turn on sprayer. See sprayer operation manual.

# Volume Balancing the Mix Manifold

If the mix manifold is mounted on the machine, you do not need to adjust the restrictor (F). Leave open two turns minimum.

When the manifold is remote, two things must be done to reduce momentary ratio errors that can occur due to the compressible nature of paint hoses.

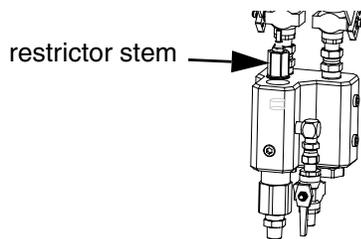
- Adjust Restriction
- Select correct sized hoses

## Adjust Restriction at the Mix Manifold

The B side restrictor (F) in the mix manifold is only used when the mix manifold is positioned remote from the machine with a short mix hose to the spray gun.

The restrictor (F) controls “lead/lag” ratio errors of the A and B flow into the static mixer tubes. These errors occur momentarily when the gun opens. The error is caused by differences in viscosity, volume, and hose expansion between the proportioner outlets and the mix point.

Adjust the restrictor (F) stem clockwise while spraying until you see a slight rise in the B side pressure gauge. The point where the pressure starts to rise is a good adjustment setting.



**NOTE: Unless you are dispensing directly out of the mix manifold and mixer, this an approximate adjustment.**

For low viscosity fluids, an optional 40 mesh screen can be installed in the mix manifold, in front of the restrictor. This keeps the carbide tapered stem and seat from plugging.

For high viscosity 1:1 applications, the entire restrictor assembly and seat can be removed and replaced by a high pressure 3/4 npt plug.

## Hose Selection for Feeding A Remote Mix Manifold

The mix manifold can be removed from the machine and used closer to the spray gun to minimize the mixed material in the hoses and reduce flush solvent with the following restrictions.

- Only one mix manifold can be used on a proportioner.
- Splitting flow to two or more guns can only be done after the two fluids are mixed.

**NOTE: This applies to applications that are not 1:1 ratio, and don't have near balanced viscosities.**

Balance the hoses inside area sizes in relation to the mix ratio by volume. This is most important when the mix manifold gets close to the spray gun.

The proportioner will put out the two materials in the exact ratio by volume. If the hose sizes are not balanced to the ratio, one hose will always come up to pressure first. This ratio error at the mix point can occur anytime that there is a change in pressure. Balance the hose sizes by effective area, not by inside diameter.

Area = (3.1416 \* radius<sup>2</sup>) or see Table 1.

**NOTE: For balancing purposes, it is always assumed that the A side is the high volume side.**

**Table 1: Volume Ratio of “A” to “B” Hose**

Mix Ratio	Hose Selection “A” x “B”	Volume Ratio
1:1	1/2 x 1/2	1.0:1
	3/8 x 3/8	
1.5:1, 2:1	1/2 x 3/8	1.78:1
2:1	3/8 x 1/4	2.25:1
2.5:1	3/8 x 1/4	2.25:1
3:1		
4:1	1/2 x 1/4	4.0:1

**Example:** At a 4:1 mix ratio, a 1/2 in. ID resin hose and a 1/4 in. ID hardener hose matches the 4:1 volume ratio.

Use Table 2 and the examples provided to approximate how much pressure drop you can expect for every 50 ft (15.2 m) of hose at 1 gpm flow in that particular hose for a 1000 cps viscosity material. Adjust for your applications flow rate and viscosity.

**NOTE: Typical flow rates are usually 0.4-0.8 gpm (1.5-3 l/mn) per gun depending on tip size and viscosity.**

**Table 2: Hose Selection by Pressure Drop**

Hose ID (in.)	Pressure drop per 50 ft section per 1000 cps at 1 gal/min. (psi)	Pressure Drop per 15.24 meter section per 1000 cps at 1 liter/min. (Bar)
1/8	55910	1018
3/16	11044	201
1/4	3494	64
3/8	690	13
1/2	218	4
5/8	89	1.62
3/4	43	0.78

**Reference Formula**

$$\text{Pressure drop} = 0.0273 \text{ QVL/D}^4$$

**Key:**

- Q = Viscosity (centipoise/100)
- V = Gallons per minute
- L = Length (ft)
- D = Inside diameter (in.)

**#1 Example:** What is the pressure loss of a 2000 cps material through 150 ft of 3/8 in. ID hose at 0.75 gpm?

$$690 \text{ psi (from chart)} \times 2 \text{ (viscosity factor } 2 \times 1000 \text{ cps)} \times 3 \text{ (3 x 50 ft hoses)} \times 0.75 \text{ (% of gpm)} = 3105 \text{ psi loss}$$

That is a lot of pressure loss before the spray gun. Let's try 1/2 in. hose. See example #2.

**#2 Example:** What is the pressure loss of a 2000 cps material through 150 ft of 1/2 in. ID hose at 0.75 gpm?

$$218 \text{ psi (from chart)} \times 2 \text{ (viscosity factor } 2 \times 1000 \text{ cps)} \times 3 \text{ (3 x 50 ft hoses)} \times 0.75 \text{ (% of gpm)} = 981 \text{ psi loss}$$

**NOTE: Avoid under sizing the high volume side. Pressure drop during flow conditions will increase momentary hose induced ratio errors. See Table 2.**

# Maintenance

## Clean Static Mixers

See FIG. 1 on page 8. Typically, two static mixer housings are connected to the mix manifold outlet (H). These housings use plastic mix elements, available in a package of 25 (Part No. 248927).

### NOTICE

Never use a swivel union on the mixer inlets. The union will compress the tube and make it impossible to remove the mix element.

To clean the housing and replace the mix element:

1. Relieve pressure, see page 12. Remove mixer housings (J) from whip hose (K).
2. Place flats of mixer housing (J) in a grounded vise. Push mix element (P) out of the inlet end.
3. If necessary, use a 1/2 in. drill bit to drill out old material and the mix element from the inlet end, down to the internal shoulder at the outlet end.
4. Use a brush to clean any debris in housing (J).
5. Insert new mix element, wide end first.

## Clean “B” Side Screen

**NOTE:** The following instructions apply only when using the strainer accessory for low viscosity fluids. See Accessories on page 26.

1. Loosen swivels (19) and remove shutoff handle (21) and valves (20). See FIG. 3.
2. Remove “B” inlet union (19) from manifold block (1).
3. Pull “V” screen (17) and retainer o-ring (18) straight up and out with a needle nose pliers.
4. Clean or replace screen (17).
5. Reinstall screen (17) and o-ring (18) with accessory tool 15T630.

**NOTE:** The o-ring (18) is used as a retainer ring, not a seal. It may be scratched or deformed from pushing the screen (17) back in.

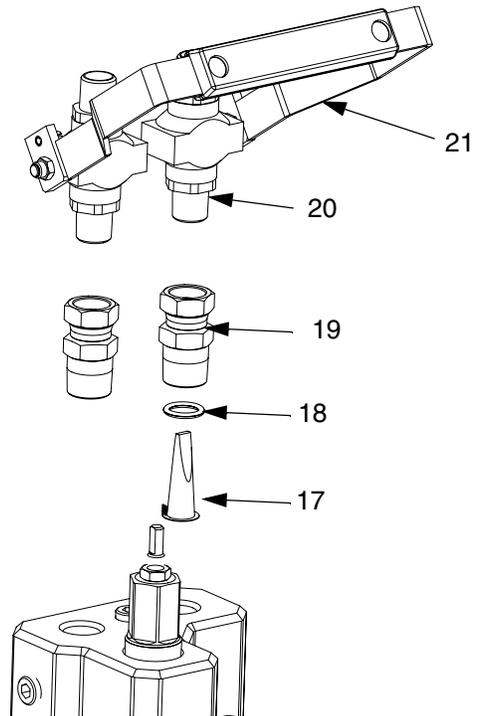
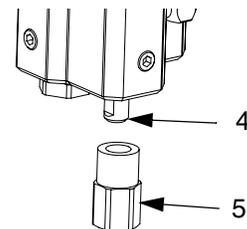


FIG. 3: “B” Side Screen

6. Install “B” inlet union (19) from manifold block (1).

## Clean Mix Manifold Outlet

1. Remove outlet fitting (5) to expose “B” center injection tube (4).
2. Clean any build-up on, around, or inside the tube (4).
3. Reinstall outlet fitting (5).



# Troubleshooting

1. Relieve the pressure before you check or service any system equipment.
2. Check all possible causes and solutions in the troubleshooting chart before disassembling the manifold.

Problem	Cause	Solution
Little or no resin output.	Fluid inlet is plugged.	Clean inlet; remove obstruction.
	Fluid container is empty.	Refill.
Little or no hardener output.	Fluid inlet is plugged.	Clean inlet; remove obstruction.
	Fluid container is empty.	Refill.
	Hardener screen (18) is plugged.	Clean hardener screen. See <b>Clean “B” Side Screen</b> , page 17.
Mixed fluid will not flush out.	Fluid is hardened in static mixers or whip hose.	Clean with compatible solvent. See <b>Maintenance</b> , page 17. Replace as necessary.
	Solvent supply container is empty.	Refill.
	Solvent is not compatible with fluid.	Change to compatible solvent.
Hardener pressure higher than normal.	Hardener is cold.	Correct heat problem.
	Restrictor or screen plugging up.	Open restrictor or clean screen. See <b>Clean “B” Side Screen</b> , page 17.
Hardener pressure lower than normal.	Resin is cold. Flow rate is low.	Correct heat problem.
	Worn hardener restrictor.	Adjust restrictor. See <b>Adjust Restriction at the Mix Manifold</b> , page 15.
Spray pattern developing tails.	Static mixer and/or whip hose plugging up.	<b>Clean Static Mixers</b> , page 17.
		Clean spray gun and tip. See gun manual.
	Low pressure from sprayer.	Check air supply pressure. Check inlet air gauges while spraying.
	Cold material.	Increase heat.
	Too much pressure drop.	Use larger hoses or more heat.
	Not enough air supply. Gauge drops while spraying.	Air hose is too small.
		Compressor is too small.
	Motor is icing.	Use De-Ice Bleed Air on motor. Dry or cool air before use.
Wait for motor to thaw.		
Dirty filter in pumps or spray gun.	Clean filters.	
Resin or hardener does not shut off.	Damaged ball or seat or seal in valve (20).	Replace or rebuild valve (2). See manual 306861.
Off ratio condition after increasing spray pressure in spray mode with a remote mix manifold.	Hoses not volume balanced.	Volume balance A and B remote material hoses closer to volume mix ratio. See <b>Hose Selection for Feeding A Remote Mix Manifold</b> , page 15 and <b>Maintenance</b> , page 17.

# Repair

						
Follow pressure relief procedure when you stop spraying or dispensing; and before cleaning, checking, servicing, or transporting equipment.						

## NOTICE

Be sure to label all fluid parts “resin” or hardener” when disassembling them. Doing so prevents interchanging resin and hardener parts during reassembly and prevents contamination of the materials and fluid path through the equipment.

Color-coded chemically resistant tape may be used to label the parts. Use blue for resin and green for hardener.

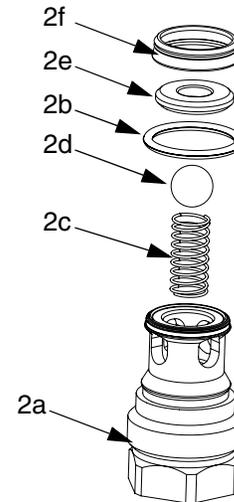
## Cartridge Assemblies

1. Follow **Pressure Relief Procedure**, page 12.
2. Use a wrench to remove the cartridge assemblies (2) from the manifold.
3. Use a 90° allen wrench to pop the seat (2e) and seal (2f) out of the housing, or tap them out from the “A” and “B” inlet side.

**NOTE:** Seat retainer seal (2f) normally splits into two pieces when it is fully torqued into the housing. The lip is meant to retain the seat, spring, and ball during assembly. The seat retainer seal (2f) must always be replaced once it is disassembled.

4. Use a soft bristle brush to clean the manifold passageways.

5. Remove the seat (2e), ball (2d), spring (2c), and o-ring (2b) from housing (2a).

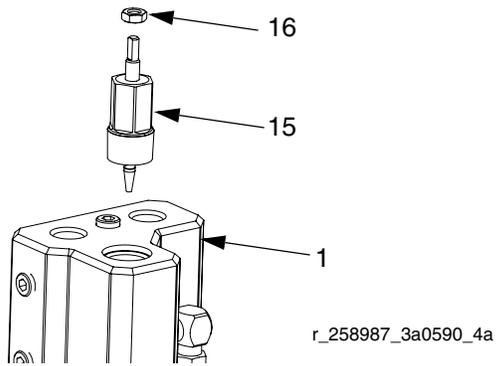


6. Inspect parts for damage and replace as necessary.
7. Assemble parts in reverse order from steps above. Press the assembly against a flat clean surface until seal (2f) snaps into place on the end of housing (2a). The seal (2f) will hold the spring (2c), ball (2d), seat (2e), and o-ring (2b) in place during assembly.
8. Apply lubricant to o-ring (2b) and end seal (2f).
9. Apply anaerobic sealant to external threads of cartridge.
10. Install cartridge assemblies in manifold and torque to 125 ft-lbs (170 N•m).

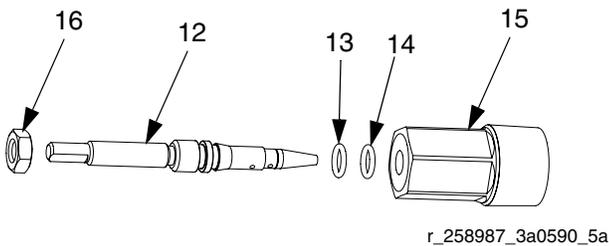
**NOTE:** The high torque crushes the seal (2f) for a reliable seal up to 7250 psi (50 MPa, 500 bar).

## Remove Restrictor

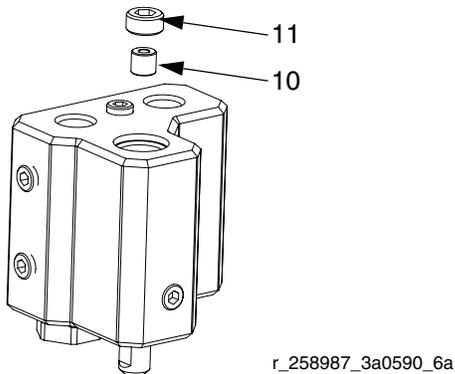
1. Note number of turns from open to closed position. Remove restrictor housing (15) from manifold (1).
2. Place restrictor housing (15) in a vice and remove nut (16).



3. Unscrew stem (12) clockwise and remove from restrictor housing (15).

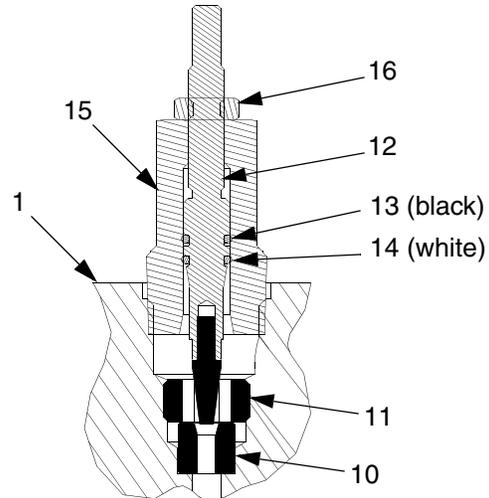


4. Remove and replace o-rings (13, 14).
5. Remove set screw (11) and seat (10) from manifold.



## Assemble Restrictor

1. Insert seat (10) with larger tapered end facing up in manifold (1).



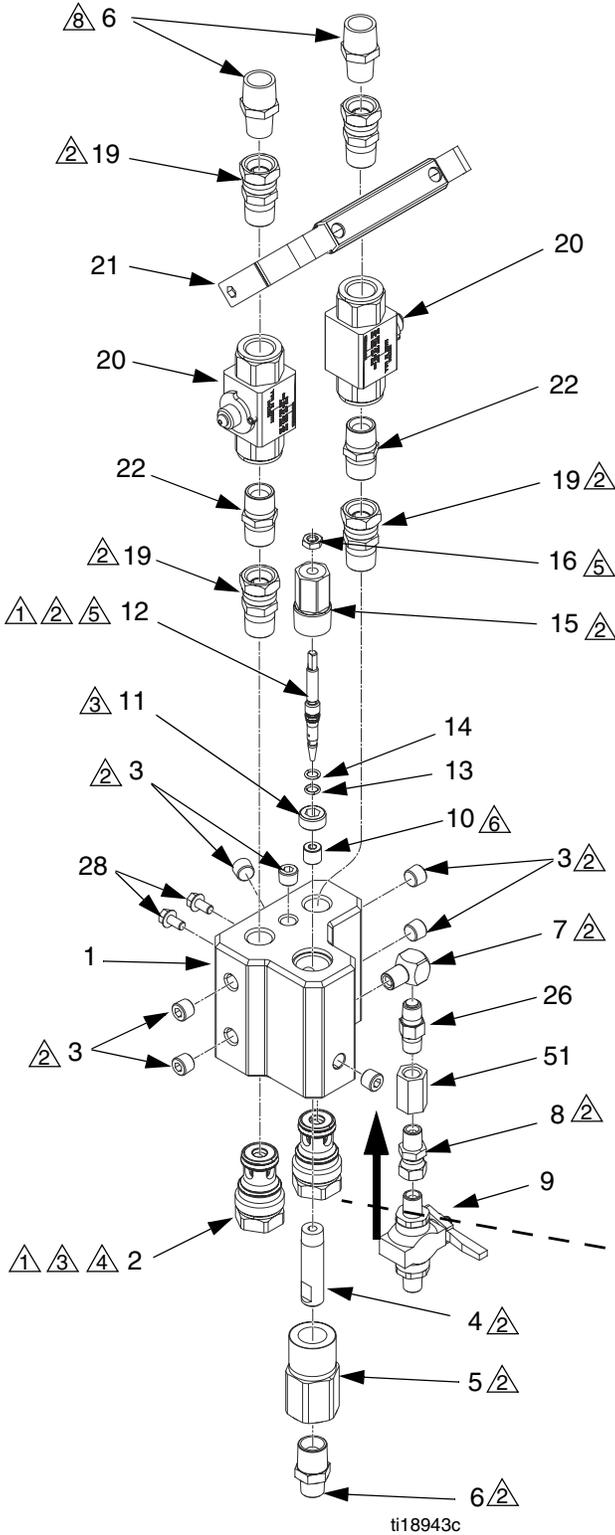
2. Apply blue thread lock to external threads to set screw (11) and install in manifold.
3. Install o-rings (13, 14) and insert stem (12) into restrictor housing (15). Turn stem (12) counter-clockwise until in open position.
4. Loosely install lock nut (16) on stem (12).
5. Tighten restrictor housing (15) into manifold (1).
6. Tighten stem (12) down until it bottoms on seat (10). Then back stem out to previously noted position or two full turns and lock in place with lock nut (16).

**NOTE: For high volume or high viscosity "B" side applications, the restrictor parts can be replaced by a high pressure 3/4 npt plug.**

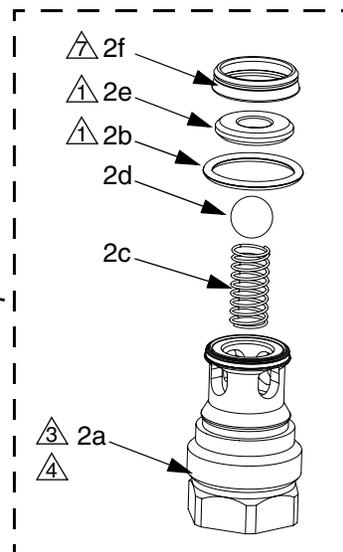


# Parts

## 262807 Mix Manifold



- ① Apply lubricant to o-rings and cartridge o-ring and end seal.
- ② Apply taper thread pipe sealant to all non-swiveling threads except cartridge (2) and needle (12).
- ③ Apply anaerobic medium thread locker to external threads.
- ④ Torque to 125 ft-lbs (70 N•m).
- ⑤ Turn stem fully into manifold. Then back out two turns and lock in place.
- ⑥ Large end of inside taper faces out.
- ⑦ Push assembly hard against a flat surface to snap retainer seal (2f) in place.
- ⑧ *Shipped loose. Use when a mix manifold is replaced on a Series A XP Plural-Component Sprayer.*



**262807 Mix Manifold**

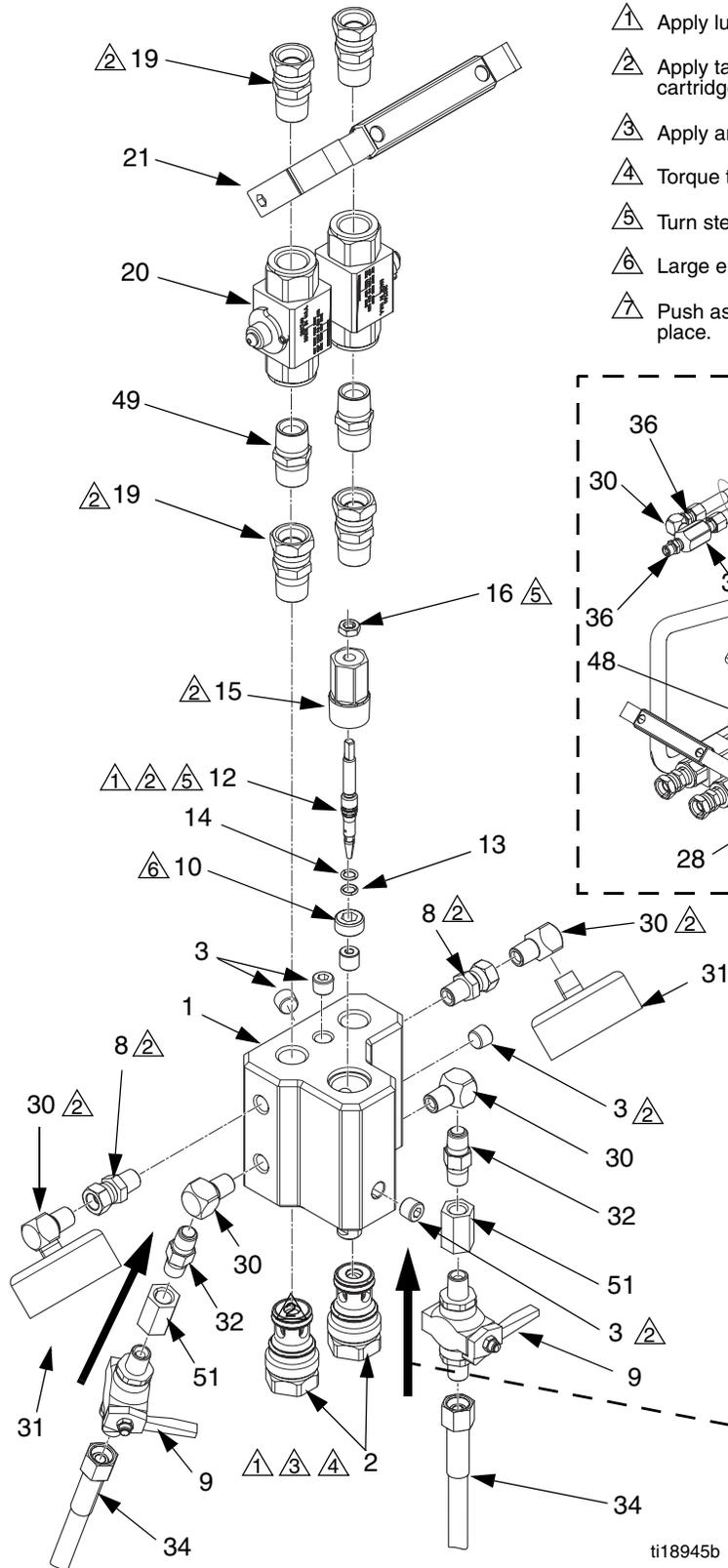
Ref.	No.	Part No.	Description	Qty.
	1	24P869	BLOCK, manifold, mix	1
	2	258986	CARTRIDGE, valve, check; includes items 2a-2f	2
	2a	16D614	HOUSING, check valve	1
	2b★	121138	O-RING, PTFE, white	1
	2c★	15M530	SPRING, check valve	1
	2d★	116166	BALL	1
	2e★	15A968	SEAT, foot valve	1
	2f★	15K692	SEAL, retainer	1
	3	100721	PLUG, pipe; 1/4 npt	7
	4	15R378	TUBE, injector, hardener	1
	5	15R067	PIPE, outlet, mixer manifold	1
	6	159239	FITTING, nipple, pipe, reducing	3
	7	100840	ELBOW, street, lapped	1
	8	156823	UNION, swivel; 1/4 m x f	1
	9	214037	VALVE, ball, solvent; 1/4-18 npt; see manual 306861	1
	10	183951	SEAT, valve, carbide	1
	11	15R382	SCREW, set, hollow, 3/4-16	1
	12	235205	STEM, valve	1
	13★	110004	O-RING, PTFE, white	1
	14★	113137	O-RING, solvent resistant, black	1
	15	15M969	NUT, packing, restrictor	1
	16	110005	NUT, jam, hex	1
	19	156684	UNION, swivel; 1/2 npt m x f	4
	20	262740	VALVE, ball; 1/2 npt (f); see manual 306861	2
	21	24M421	LEVER, valve	1
	22	158491	NIPPLE, 1/2-14 npt	2
	26†	501867	VALVE, check, mxm, 1/4 npt	1
	28	113161	SCREW, flange, hex hd; 1/4-20 x 1/2 in. (12.7 mm)	2
	50✘	126786	TOOL, restrictor	1
	51	113093	COUPLING, 1/4 npt	

★ *Provided in mix manifold repair kit 258992. See **Repair Kits**, page 25.*

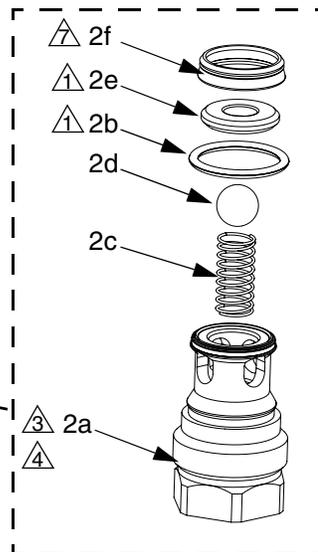
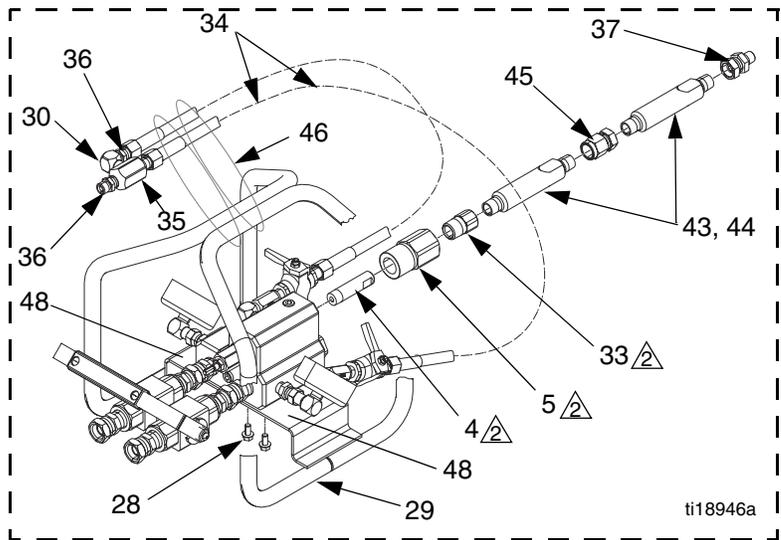
✘ *Not shown.*

† *Older models used mxm solvent check valves. If replacing the mxm check valve (563210) with mxm check valve (32), you must also order coupling (51).*

### 24M398 Quickset Mix Manifold



- ▲ Apply lubricant to o-rings and cartridge o-ring and end seal.
- ▲ Apply taper thread pipe sealant to all non-swiveling threads except cartridge (2) and needle (12).
- ▲ Apply anaerobic sealant to external threads.
- ▲ Torque to 125 ft-lbs (70 N•m).
- ▲ Turn stem fully into manifold. Then back out two turns and lock in place.
- ▲ Large end of inside taper faces out.
- ▲ Push assembly hard against a flat surface to snap retainer seal (2f) in place.



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**24M398 Quickset Mix Manifold**

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
				28	113161	SCREW, flange, hex hd; 1/4-20 x 1/2 in. (12.7 mm)	2
1	24P866	BLOCK, manifold, mix	1	29	262522	CARRIAGE, remote manifold	1
2	258986	CARTRIDGE, valve, check; includes items 2a-2f	2	30	100840	ELBOW, street	5
2a	16D614	HOUSING, check valve	1	31	114434	GAUGE, pressure, fluid, sst	2
2b★	121138	O-RING, PTFE, white	1	32†	501867	VALVE, check, mxm, 1/4 npt	2
2c★	15M530	SPRING, check valve	1	33	121433	BUSHING, 1/2 x 3/8, 7250 psi	1
2d★	116166	BALL	1	34	H42503	HOSE, coupled, 1/4 ID, 3 ft	2
2e★	15A968	SEAT, foot valve	1	35	15R875	TEE, 1/4 (m x f x f)	1
2f★	15K692	SEAL, retainer	1	36	162453	FITTING, 1/4 npsm x 1/4 npt	2
3	100721	PLUG, pipe; 1/4 npt	4	37	157705	UNION, swivel, 1/4 m x 3/8 f	1
4	15R378	TUBE, injector, hardener	1	43	262478	HOUSING, mixer	2
5	15R067	PIPE, outlet, mixer manifold	1	44	248927	MIXER, 1/2-12 element (bag of 25)	1
8	156823	UNION, swivel; 1/4 m x f	2	45	156173	UNION, swivel, 3/8 fbe	1
9	214037	VALVE, ball, solvent; 1/4-18 npt; see manual 306861	2	46	114958	STRAP, tie	2
10	183951	SEAT, valve	1	47	119400	SEALANT, pipe, sst	1
11	15R382	SCREW, set, hollow, 3/4-16	1	48	15U654	LABEL, identification, A/B	1
12	235205	STEM, valve	1	49	158491	NIPPLE, 1/2 in. npt	2
13★	110004	O-RING; PTFE, white	1	50✘	126786	TOOL, restrictor	1
14★	113137	O-RING; solvent resistant, black	1	51	113093	COUPLING, 1/4 npt	1
15	15M969	NUT, packing, restrictor	1				
16	110005	NUT, jam, hex	1				
19	156684	UNION, swivel; 1/2 npt m x f	4				
20	262740	VALVE, ball; 1/2 npt (f); see manual 306861	2				
21	24M421	LEVER, valve	1				
22	158491	NIPPLE, 1/2-14 npt	2				

★ *Provided in mix manifold repair kit 258992. See Repair Kits.*

✘ *Not shown.*

† *Older models used mxm solvent check valves. If replacing the mxm check valve (563210) with mxm check valve (32), you must also order coupling (51).*

**Repair Kits****258992 Mix Manifold Repair Kit**

Ref. No.	Part No.	Description	Qty.
2b	121138	O-RING, PTFE, white	2
2c	15M530	SPRING, check valve	2
2d	116166	BALL, carbide	2
2e	15A968	SEAT, foot valve	2
2f	15K692	SEAL, retainer	2
13	110004	O-RING, PTFE, white	1
14	113137	O-RING, solvent resistant, black	1
38✘	113500	ADHESIVE, anaerobic	1

✘ *Not shown.*

**217560 Flush Valve (9) Repair Kit****24M601 Inlet Ball Valve (20) Repair Kit**

# Accessories

## 10,000 psi Fluid Pressure Gauge (2.5 in)

114434 - 1/4 npt(m) back mount pressure gauge can be used in ports as gun pressure gauge.

551387 - 1/4 npt bottom mount version.

## High Pressure Hoses and Accessory Fittings

See brochure 339361 for parts and accessories.

## 262522, Remote Mix Manifold Carriage

The carriage holds and protects the mix manifold assembly. Use two screws (28) to mount the mix manifold to the carriage.

## 15E592, 7250 psi Static Mixer Housing

3/8 npt(m) holds 1/2 in. 12 element plastic sticks.

## 511352, Mixer

Stainless 3/8 npt(m) pipe with 12 element stainless welded stick; 7250 psi (50 MPa, 500 bar).

## 248927, Plastic Mix Elements

25 pack of 1/2 in. x 12 element plastic sticks.

## B-side screen

40 mesh strainer for low viscosity fluids only.

Ref. No.	Part No.	Description	Qty.
17	185416	STARINER, 40 mesh	1
18	121410	PACKING, screen retainer; PTFE	1

## 15T630, Screen Installation Tool

Use to reinstall B-side screen.

## 24F375, Ratio Check Kit

Use to check ratio at mix manifold. See manual 3A0421 for instructions.

# Accessory Ports

### P1 and P2:

These 1/4 npt ports are located after “A” and “B” shutoff handle.

Can be used for an inlet pressure gauge. These are before the fluid check valves and hardener restrictor.

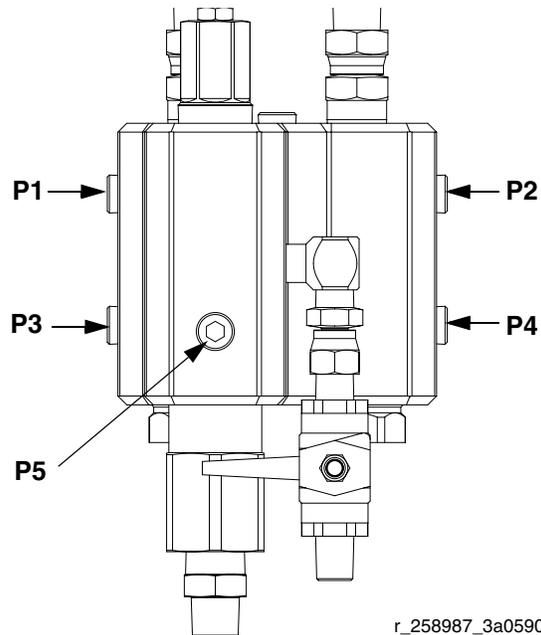
### P3 and P5:

Can be used for a pressure gauge to measure outlet pressure or check ratio with the 24F375 kit. These ports are downstream of the check valve.

The **P3** port is used as the second flush inlet on the quickset model of the mix manifold. It flushes across the resin check ball, but not through it.

### P4:

Can be used for a pressure gauge to measure hardener pressure before the restrictor, but after the check valve.



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FIG. 4: Accessory Ports

# Technical Data

<b>Mix Manifolds</b>		
	<b>US</b>	<b>Metric</b>
Maximum A, B, and mix working pressure	7250 psi	50 MPa, 500 bar
Maximum fluid temperature	160° F	71° C
Fluid inlet	1/2 npt(f) ball valves	
Fluid outlet	1/2 npt(f) with 3/8 npt(m) adapter nipple	
Solvent inlet valve	1/4 npt(m)	
Maximum working pressure at solvent inlet	5000 psi	34.5 MPa, 345 bar
<b>Wetted parts</b>		
Manifold block and internal parts	302 and 303 stainless steel, PTFE, tungsten carbide, electroless nickel plated steel, zinc plated steel, UHMWPE	
Flush valves and fittings	440 stainless steel, plated carbon steel, hardened alloy steel, acetal, PTFE, aluminum	

# 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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