

XMTM Mix Manifold Kits

312749K
EN

***For mixing two component reactive materials with XM plural-component proportioners.
Not for use on mechanical proportioners.***

For professional use only.



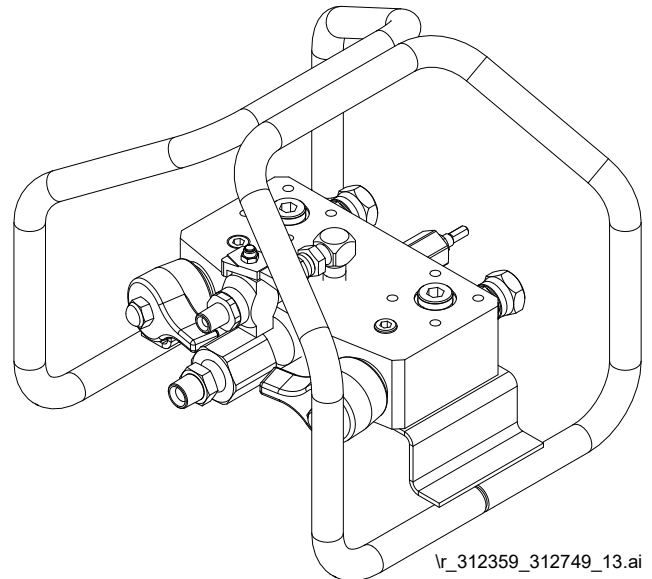
Important Safety Instructions

Read all warnings and instructions in this manual before using the equipment.
Save these instructions.

*7250 psi (50 MPa, 500 bar) Maximum Working Pressure
160°F (71°C) Maximum Fluid Temperature*

For Model information and Agency Approvals, see page 2.

Mix Manifold and Remote Carriage



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Related Manuals

Manuals are available at www.graco.com.

Manual in English	Description
312359	XM Operation
313289	XM Repair
313292	XM OEM, Instructions-Parts
313342	Dosing Valve, Instructions-Parts
313343	High Flow Severe Duty Shutoff Check Valve, Instructions-Parts
306861	Ball Valves, Check Valves, and Swivels, Instructions-Parts
310797	Mix Manifold Kits, Instructions-Parts
307892	Back Pressure Valve Instructions-Parts

Agency Approvals

Part	Description	Approvals
255684	Mix manifold	  II 2G EX h T5 Gb
256980	Remote mix manifold conversion kit with carriage for use with 255684	
273185	Remote recirculation kit for use with 256980	

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 or on warning labels, 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.

 WARNING	
   	FIRE AND EXPLOSION HAZARD Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion: • Use equipment only in well-ventilated area. • Eliminate all ignition sources, such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking). • Ground all equipment in the work area. See Grounding instructions. • Never spray or flush solvent at high pressure. • 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. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive. • Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
 	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 Specifications in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Specifications in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer. • 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. • 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.



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.



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 Safety Data Sheets (SDSs) for handling instructions and to know the specific hazards of the fluids you are using, including the effects of long-term exposure.
- When spraying, servicing equipment, or when in the work area, always keep work area well-ventilated and always wear appropriate personal protective equipment. See Personal Protective Equipment warnings in this manual.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.



BURN HAZARD

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

- Do not touch hot fluid or equipment.



PERSONAL PROTECTIVE EQUIPMENT

Always wear appropriate personal protective equipment and cover all skin when spraying, servicing equipment, or when in the work area. Protective equipment helps prevent serious injury, including long-term exposure; inhalation of toxic fumes, mists or vapors; allergic reaction; burns; eye injury and hearing loss. This protective equipment includes but is not limited to:

- A properly fitting respirator, which may include a supplied-air respirator, chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority.
- Protective eyewear and hearing protection.

Important Isocyanate (ISO) Information

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

Isocyanate Conditions

				
Spraying or dispensing fluids that contain isocyanates creates potentially harmful mists, vapors, and atomized particulates. • Read and understand the fluid manufacturer's warnings and Safety Data Sheets (SDSs) to know specific hazards and precautions related to isocyanates. • Use of isocyanates involves potentially hazardous procedures. Do not spray with this equipment unless you are trained, qualified, and have read and understood the information in this manual and in the fluid manufacturer's application instructions and SDSs. • Use of incorrectly maintained or mis-adjusted equipment may result in improperly cured material. Equipment must be carefully maintained and adjusted according to instructions in the manual. • To prevent inhalation of isocyanate mists, vapors, and atomized particulates, everyone in the work area must wear appropriate respiratory protection. Always wear a properly fitting respirator, which may include a supplied-air respirator. Ventilate the work area according to instructions in the fluid manufacturer's SDSs. • Avoid all skin contact with isocyanates. Everyone in the work area must wear chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority. Follow all fluid manufacturer recommendations, including those regarding handling of contaminated clothing. After spraying, wash hands and face before eating or drinking.				

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 crystal that 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

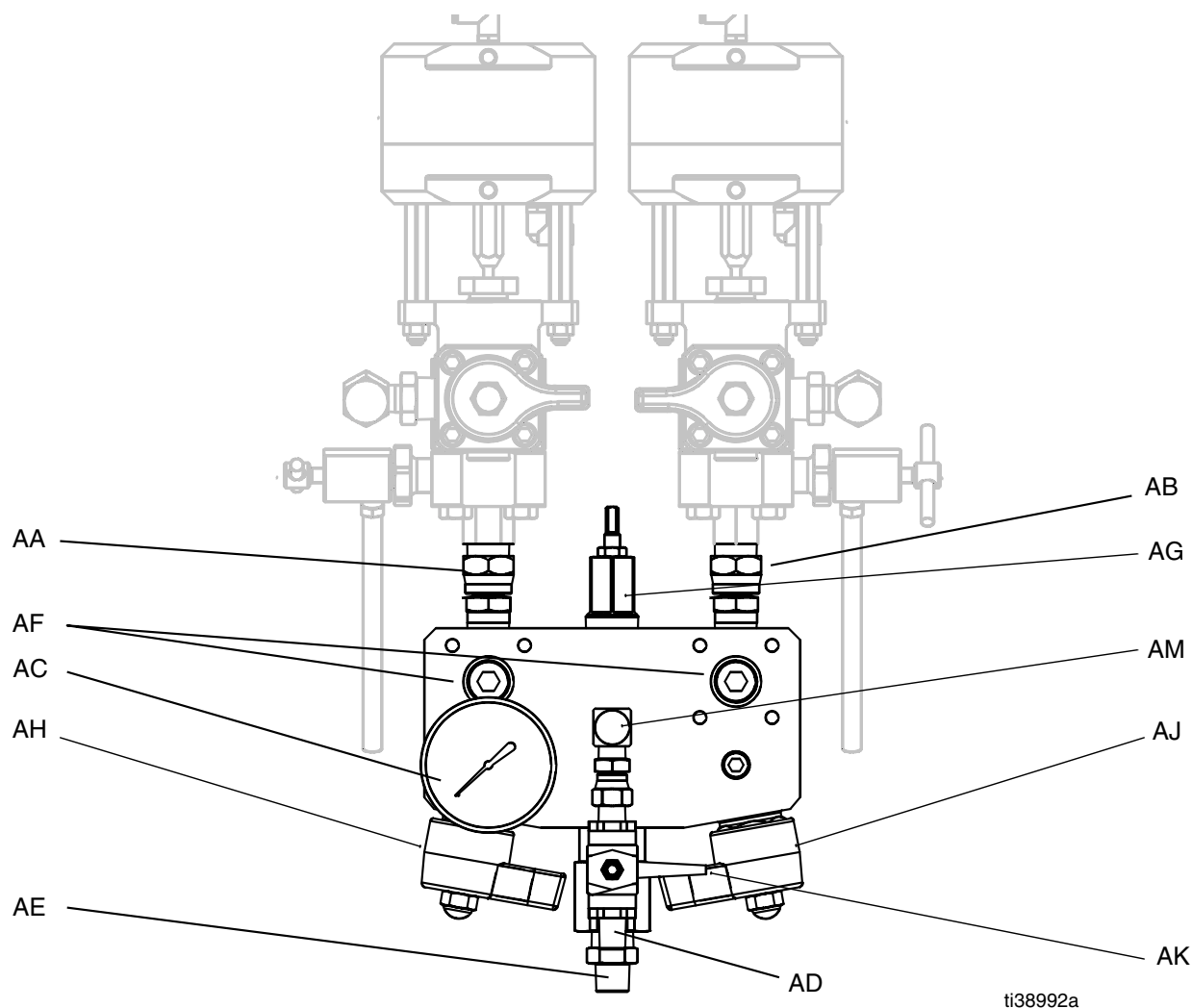
Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime.

- 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.

Component Identification

Manifold 255684

(shown mounted on an XM proportioner)



ti38992a

FIG. 1: Typical Installation

Ref.	Description
AA	A Material Inlet
AB	B Material Inlet
AC	Pressure Gauge
AD	Solvent Inlet
AE	Mix Manifold Outlet
AF	Remote Recirculation Ports
AG	Restriction Valve
AH	A Shutoff Valve
AJ	B Shutoff Valve
AK	Solvent Shutoff Valve
AM	Solvent Check Valve

Remote Mix Manifold Conversion Kit 256980

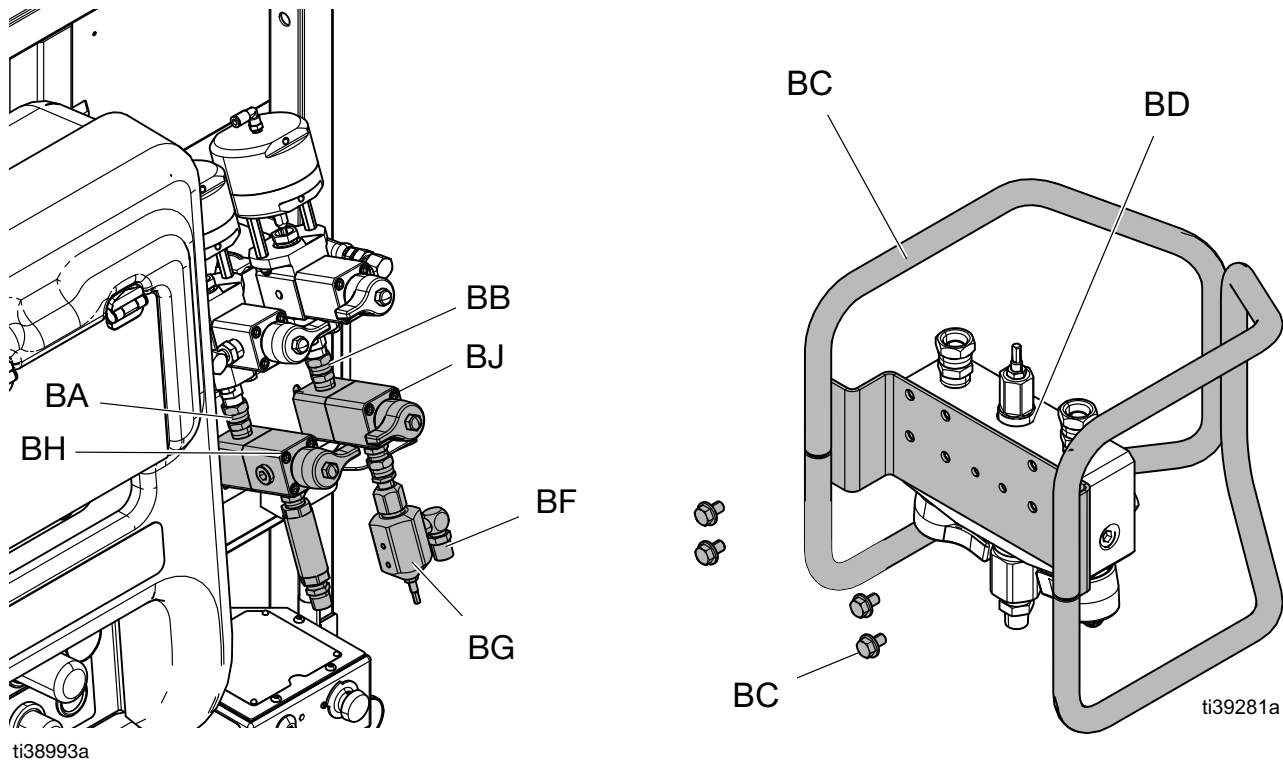


FIG. 2: Typical Installation

Ref.	Description
BA	A Check Valve Inlet
BB	B Check Valve Inlet
BC	Remote Manifold Carriage
BD	Mix Manifold (sold separately)
BE	Mounting Fasteners
BF	Adapter Fittings (shipped loose)
BG	Proportioner Mounted Restrictor Valve

Remote Recirculation Kit 273185

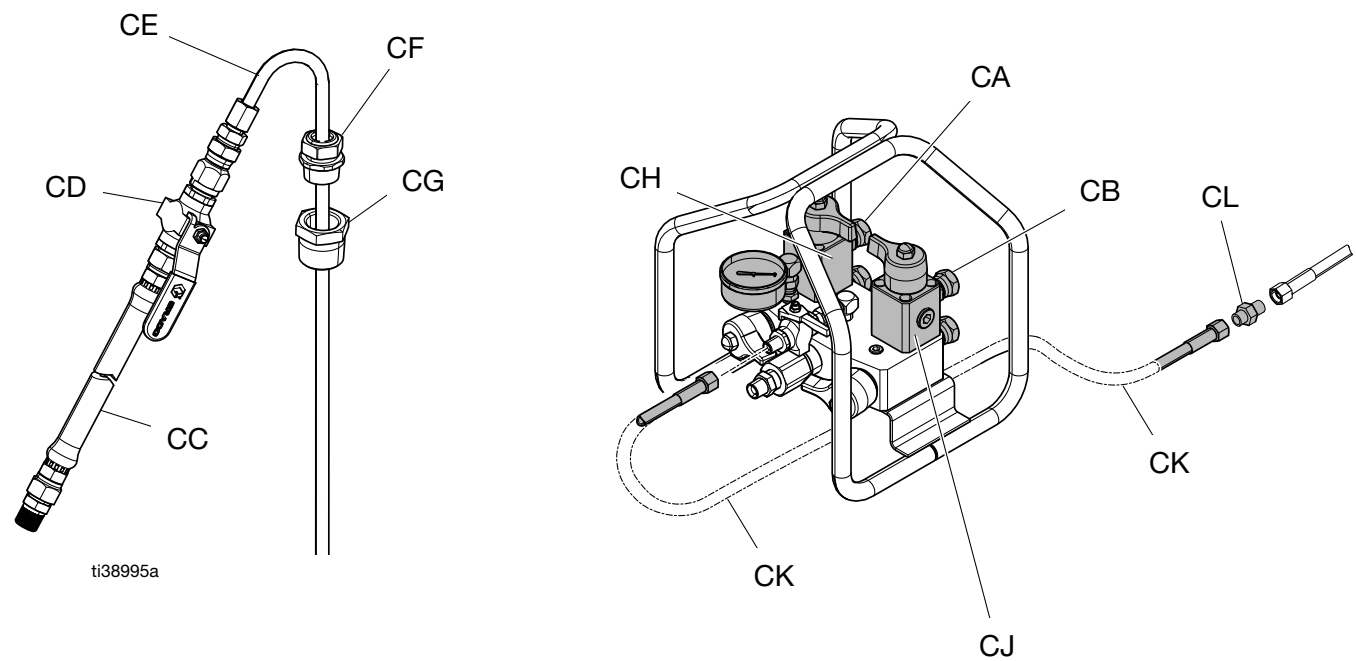


FIG. 3: Typical Installation

Ref.	Description	Ref.	Description
CA	A Material Recirculation Outlet	CG	Adapter Fitting (shipped loose)
CB	B Material Recirculation Outlet	CH	A Remote Recirculation Valve
CC	Recirculation Hose Extension	CJ	B Remote Recirculation Valve
CD	Recirculation Hose Shutoff Valve	CK	Solvent Hose Extension
CE	Recirculation Tube	CL	Hose Adapter Fitting
CF	Bushing (shipping loose)		

Typical Installation

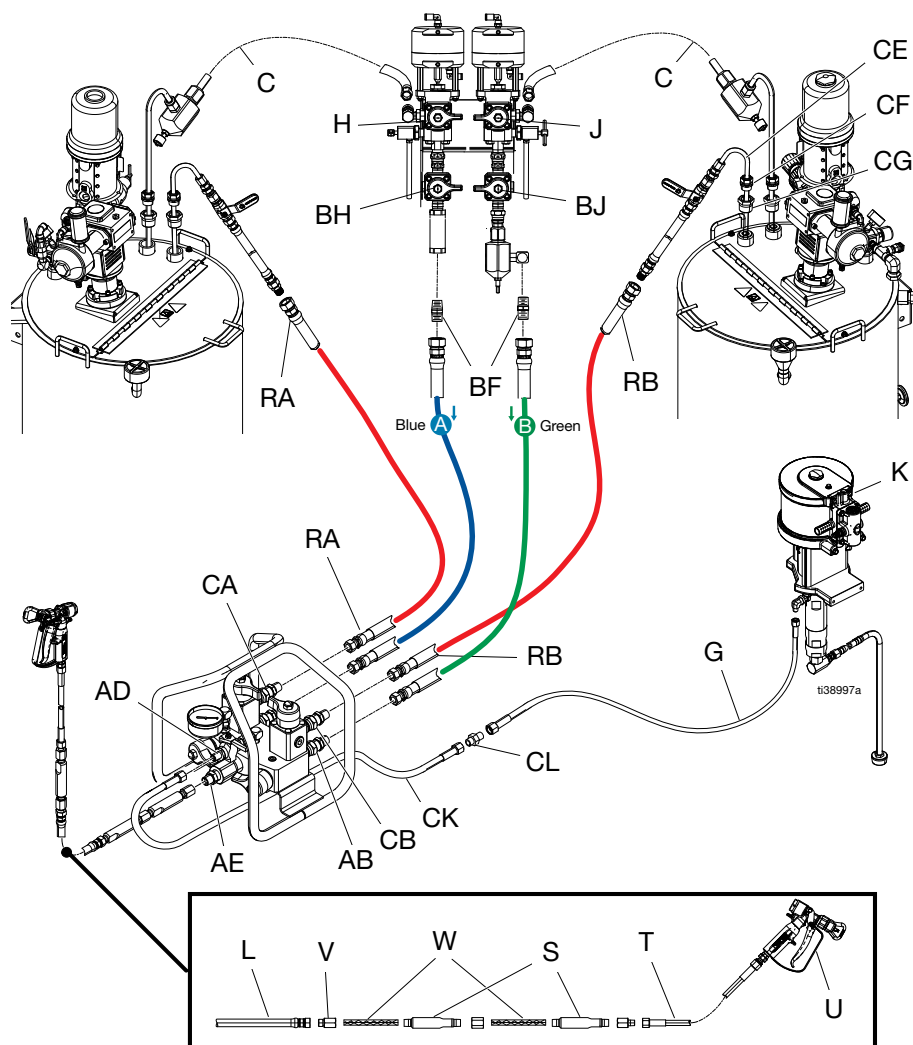


FIG. 4: Typical Installation

Ref.	Description
C	Recirculation Hose
G	Solvent Hose
H	A Recirculation Valve
J	B Recirculation Valve
K	Solvent Pump
L	Integrator Hose
S	Static Mixer Housing
T	Fluid Whip Hose
U	Airless Spray Gun
V	Static Mixer Adapter
W	Static Mixing Element
AB	B Material Inlet
AD	Solvent Inlet
AE	Mix Manifold Outlet

Ref.	Description
CA	A Material Recirculation Outlet
CB	B Material Recirculation Outlet
CE	Recirculation Tube
CF	Bushing (shipped loose)
CG	Adapter Fitting (shipped loose)
CK	Solvent Hose Extension
CL	Hose adapter Fitting
BF	Adapter Fittings (shipped loose)
BH	A Outlet Check Valve
BJ	B Outlet Check Valve
RA	A Material Recirculation Hose
RB	B Material Recirculation Hose

Overview

XM plural-component sprayers can mix most two component epoxy and urethane protective coatings. When using quick-setting materials (less than 10 minute pot life) a remote mix manifold must be used.

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 a 40 mesh strainer and an adjustable restrictor for balancing the system back pressure and flow.

See FIG. 5 to view flow of A and B material inside the XM Mix Manifold.

The resin and hardener enter the manifold through the manifold inlet ports. 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 mixed resin and hardener material enters the mix manifold outlet (R) before the mixed material enters the integrator fluid hose. Adjust the restrictor housing to balance the system back pressure and flow.

Always use the integration hose, supplied with your XM plural-component sprayer, after the mix manifold.

Please follow these recommendations for setup:

- Use at least a 3/8 in. (10 mm) x 25 ft. (7 m) integrator hose.
- Install at least 24-elements of static mixer after the integration hose and before the spray gun whip hose.

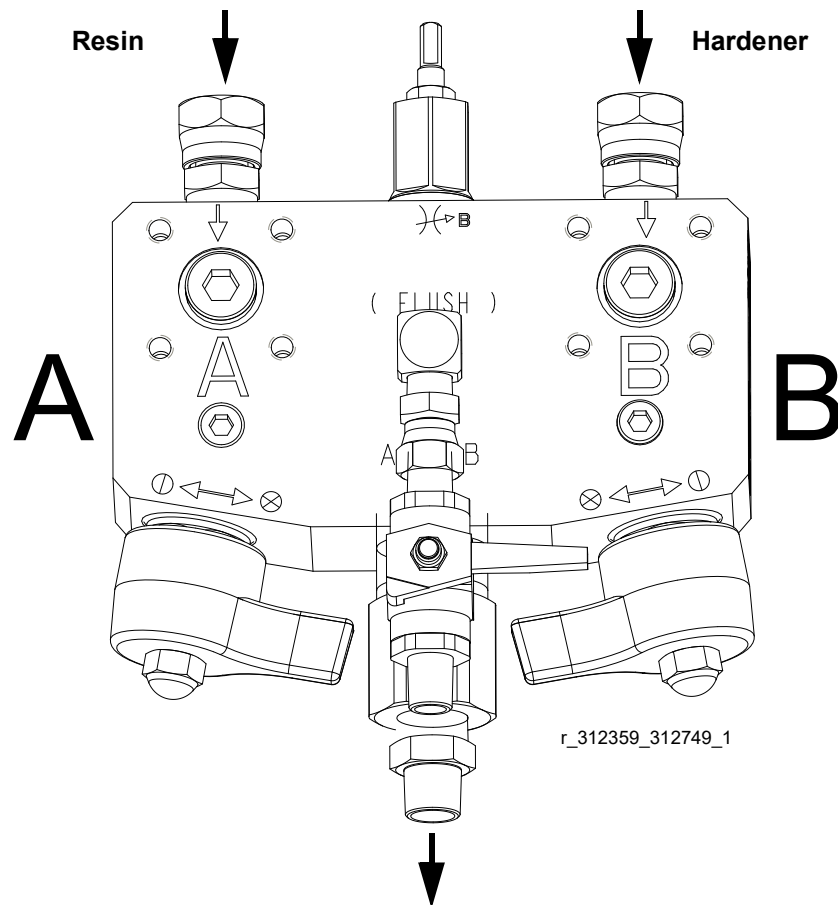
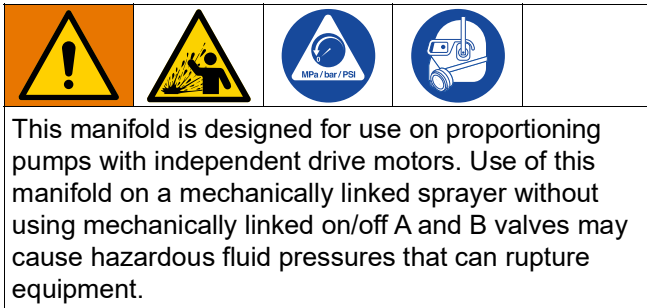


FIG. 5: Manifold View

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.

Mix Manifold (255684)

A and B Material Inlets

The A and B fluid inlets are equipped with 1/2 in. npsm unions in 1/2 in. npt(f) ports. Connect 1/2 in., 3/8 in., or 1/4 in. npsm(f) fluid hoses using the two adapter nipples (provided).

Solvent Inlet

Connect the solvent hose extension (CK) to the solvent inlet (G). Connect the solvent hose extension to the solvent inlet (AD). 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.

Mixed Material Outlet

Connect a 3/8 in. ID x 25 ft. (minimum) integrator hose (L) to the fluid outlet. Then connect the static mixer housing (S) and fluid whip hose (T) to the 3/8 npt(f) integrator hose (L). Two static mixers are often used, in series.

Converting to Remote Mounted Mix Manifold (256980)

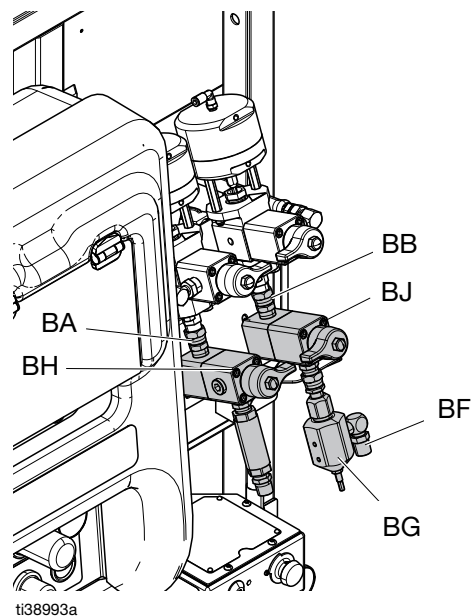
A and B Outlet Check Valves

1. Loosen the swivel fittings of the A and B material inlets (AA, and AB) and remove the mix manifold (BD).
2. Use the mounting fasteners (BE) to mount the mix manifold (BD) to the remote carriage (BC).
3. Tighten the swivel fittings of the A and B check valve inlets (BA, BB) to install the A and B outlet check valves (BH, BJ).

NOTE: See **Mounting Without Carriage** on page 13 if not using the remote carriage.

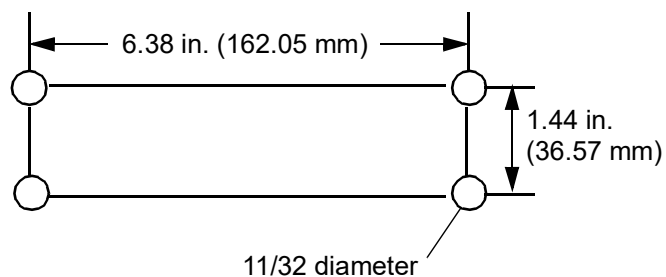
NOTE: The XM proportioner must have outlet check valves in order to accurately measure pump outlet flow.

4. Install the restrictor valve (BG) on B check valve (BJ). The restrictor valve is required at the proportioner to set the bar graph on the ratio mode screen (see your XM operation manual).

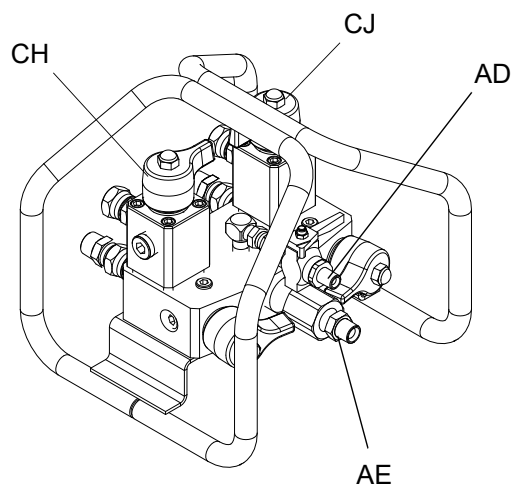


Mounting Without Carriage

To mount the bare manifold, drill four holes in the mounting surface, and secure with four 5/16-18 x 1/2 in. (50 mm) screws. See the following illustration for details and dimensions.



Remote Recirculation Kit (273185)



Parts are provided on the "A" and "B" sides for recirculating the material back to the proportioner.

To install the remote recirculation kit, install remote recirculation valves (CH, CJ) on front of remote mix manifold assembly.

If the recirculation valves leak while you are spraying, you will be off ratio with no indication. See your XM proportioner operation manual for more information.

Grounding

				
Your system must be grounded to reduce the risk of static sparking. Static sparking can cause fumes to ignite or explode. Grounding provides an escape wire for the electric current. Read the warnings in your proportioner manual.				

- **Pump:** use a ground wire and clamp as instructed in your sprayer operation 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.
- **Mix manifold and solvent flush system:** use only a Graco approved grounded solvent hose. Not all heated hoses are grounded, and the mix manifold primary ground is through the solvent hose. Ensure that the solvent pump is properly grounded, as instructed in your solvent pump manual. Ensure there is electrical continuity from the spray tip to the grounded solvent hose.
- **Air compressor:** Follow manufacturer's recommendations.
- **Spray gun/dispense valve:** ground through connection to a properly grounded fluid hose and pump.
- **Fluid supply container:** follow local code.
- **Object being sprayed:** follow local code.
- **Solvent pails used when flushing:** follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.
- **To maintain grounding continuity when flushing or relieving pressure:** hold metal part of the spray gun/dispense valve firmly to the side of a grounded metal pail, then trigger the gun/valve.

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 **Dispensing and Spraying**, page 17.

Operation

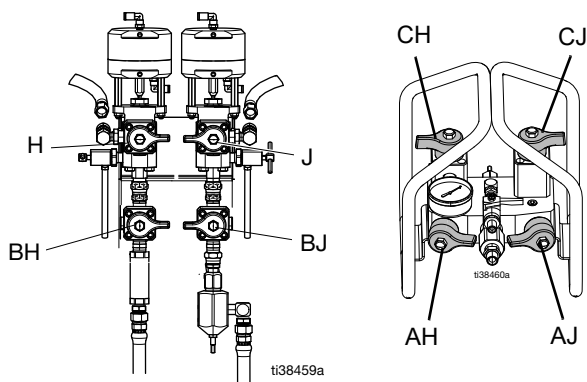
Prime Remote Mix Manifold

Prime A and B Material Hoses



To help prevent injury from solvents and heated fluids, wear gloves when using solvents and/or if the fluid temperature exceeds 110 °F (43 °C).

1. Follow steps in your XM proportioner manual to prime the proportioner.
2. Close the recirculation valves (H, J) and close the shutoff valves (AH, AJ).



3. Open check valves (BH, BJ) and open the remote recirculation valves (CH, CJ).

NOTE: If a remote recirculation kit is not installed, disconnect the material hoses at the material inlets (AA) and (AB). Prime the material hoses over grounded metal pails, then reconnect the material hoses.

4. Use manual pump run mode to run “A” side. See your XM operation manual.

5. Press  and  as needed to prime. If a remote recirculation kit is not installed, monitor the container to avoid overflow.

6. Repeat steps for “B” side.

Recirculate with Remote Mix Manifold

If using a system that does not require heat, recirculation is still required prior to spraying. Recirculation ensures that any settled fillers are mixed in, the pump lines are fully primed and the pump check valves are operating smoothly.

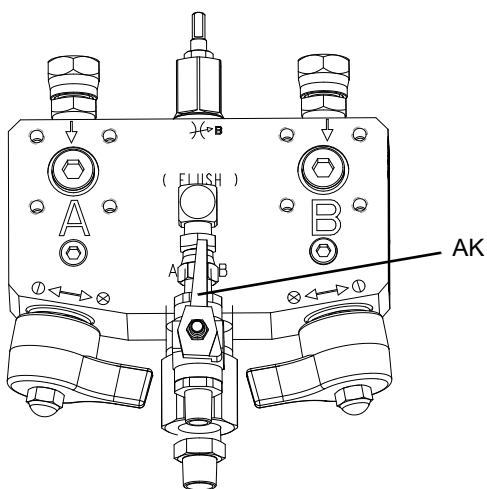
1. Follow the recirculation procedure in your XM manual to recirculate the proportioner.
2. Follow the Prime Remote Mix Manifold procedure.
3. Close the recirculation valves (H, J) and close the shutoff valves (AH, AJ).
4. Ensure the recirculation hoses are in the correct hoppers.
5. Open check valves (BH, BJ) and open the remote recirculation valves (CH, CJ).
6. Run the pumps until the material has reached the desired temperature.
7. Close the remote recirculation valves (CH, CJ).

Prime Solvent Hose

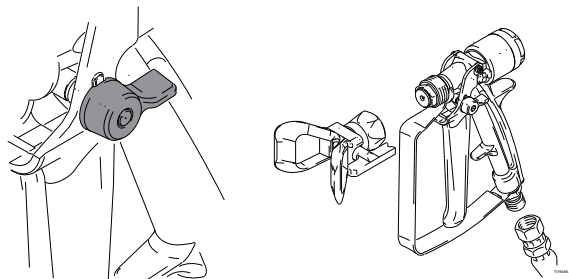
Prime A and B Material Hoses



1. Connect ground wire to a metal pail of solvent.
2. Dispense solvent to the remote mix manifold. See your XM manual for operation instructions.
3. Open solvent flush valve (AK) on the mix manifold.

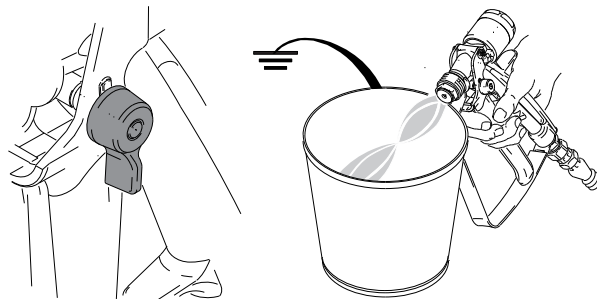


4. Make sure the trigger lock is engaged. Remove the spray tip.

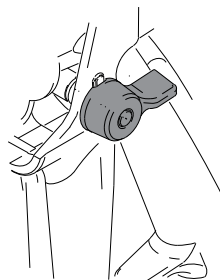


5. Disengage the trigger lock and trigger the gun into a grounded pail. Use a pail lid with a hole to dispense through.

NOTE: To prevent splash back, use a rag to seal around the hole and gun. Be careful to keep fingers away from the front of the gun.

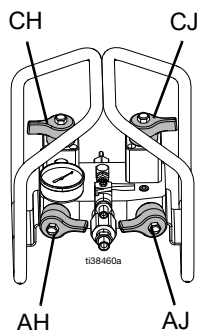


6. Close the solvent flush valve (AK) and trigger the gun to relieve pressure. Engage the trigger lock.

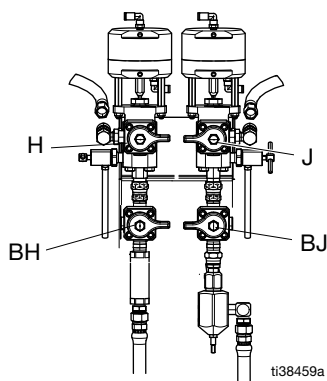


Dispensing and Spraying

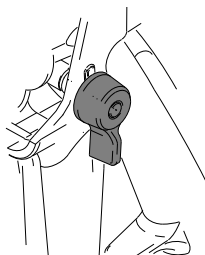
1. Close the solvent shutoff valve (AK). Close the remote recirculation valves (CH, CJ) if equipped.



2. Close the recirculation valves (H, J) and open check valves (BH, BJ).



3. Open the shut off valves (AH, AJ).
4. Ensure the proportioner is in Spray mode and push start.
5. Disengage spray gun trigger lock.



6. 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.
7. Proceed spraying.

Pressure Relief Procedure



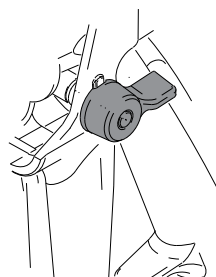
Follow the Pressure Relief Procedure whenever you see this symbol.



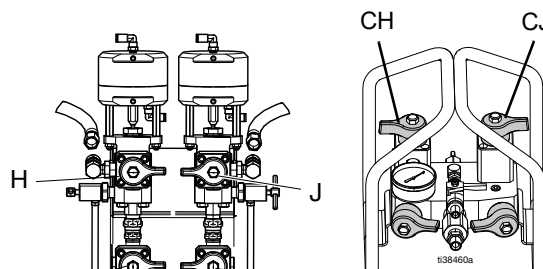
This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection and splashing fluid, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

Relieve A and B Fluid Pressure

1. Engage the trigger lock.

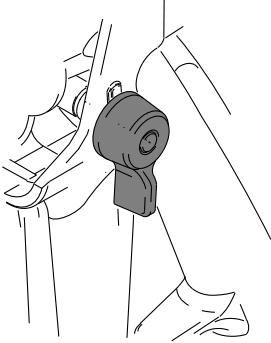


2. Press stop  to turn off the proportioner.
3. Close all air motor supply valves or any source of fluid pressure.
4. If fluid heaters are used, shut them off using the controls on the heater control box.
5. Shut off feed pumps, if used.
6. Open recirculation valves (H, J) and remote recirculation valves (CH, CJ) if equipped.

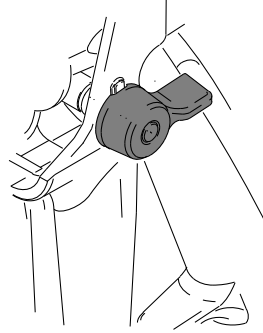


Operation

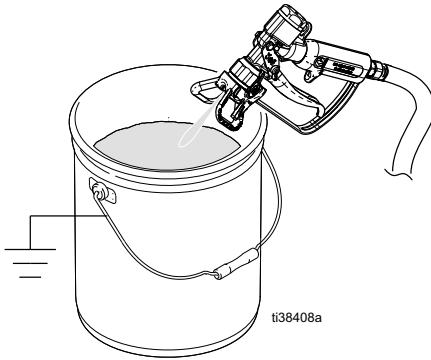
7. Disengage trigger lock.



9. Engage the trigger lock.



8. Hold a metal part of the gun firmly to a grounded metal pail with a splash guard in place. Trigger gun to relieve pressure in material hoses.



10. Flush mixed material hoses, mixer, and gun. See **Flush Mixed Material** on page 19.

Flush Mixed Material

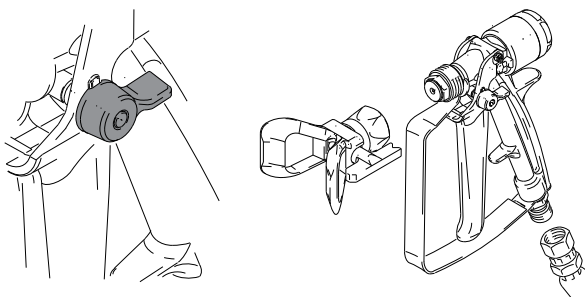


To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure. Read warnings and grounding instructions in your proportioner manual. If your system uses heaters, shut off the main power to the heaters and heated hose control before flushing.

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.

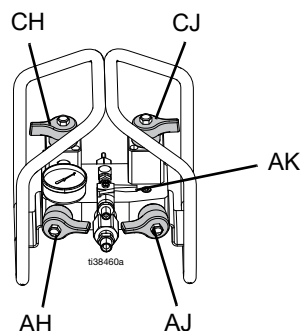
- Ensure flushing fluid is compatible with dispense fluid and the equipment wetted parts.
 - Solvent may channel through viscous fluids and leave a coating of mixed fluid on the inner tube of your hose. Be sure all fluid is thoroughly flushed from the hose after each use.
 - Remove spray tip for more thorough cleaning of the whip hose and static mixers.
 - Use a solvent that dissolves the material you are mixing.
 - Always leave equipment filled with fluid to avoid drying and scaling.
1. Follow the Pressure Relief Procedure on page 17.
 2. Engage trigger lock. Remove spray tip.



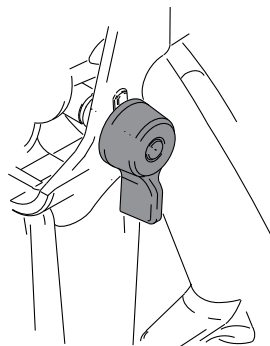
3. Make sure shutoff handles (AH, AJ) and remote recirculation valves (CH, CJ) are closed.

NOTE: The valve handles point at each other in the closed position.

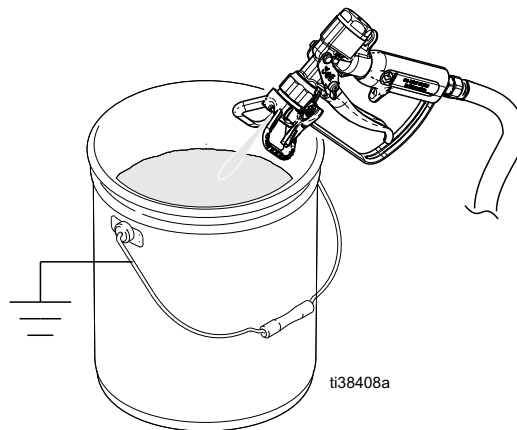
4. Open solvent shutoff valve (AK).



5. Turn on solvent flush pump.
6. Disengage spray gun trigger lock.

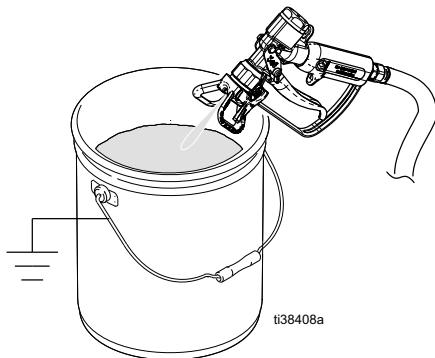


7. Trigger gun into a grounded metal pail with lid. Use a lid with a hole to dispense through to avoid splashing. Be careful to keep fingers away from front of gun. Flush out mixed material until clean solvent dispenses.

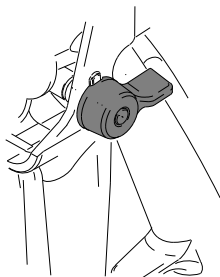


8. Turn off solvent pump air supply.

9. Hold the metal part of the gun firmly to a grounded metal pail with lid in place. Trigger gun until all fluid pressure is relieved.



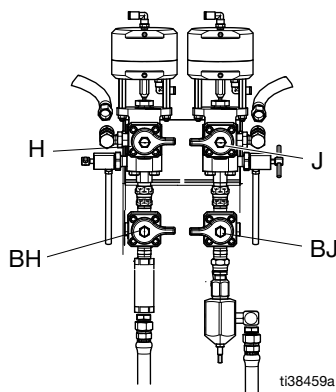
10. Engage the trigger lock.



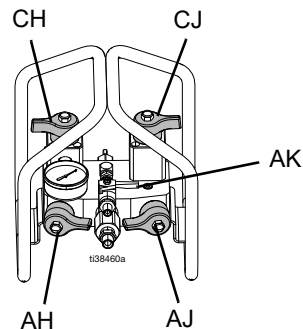
11. Close the solvent shutoff valve (AK).

Empty and Flush Remote Mix Manifold

1. Follow the Flushing procedure in your XM proportioner manual.
2. Close the recirculation valves (H, J) and open check valves (BH, BJ).



3. Close the shutoff valves (AH, AJ) and open the remote recirculation valves (CH, CJ) if equipped. If remote recirculations valves are not equipped, disconnect the material hoses at the inlets (AA, AB).
4. Run pumps until the A and B material in the hose has dispensed. Salvage the material in separate clean containers.



5. Wipe the reservoirs clean, then add solvent to each. Move circulation lines to waste containers.
6. Repeat steps to flush through each side until clean solvent exits the recirculation hose.
7. Stop the proportioner (see your XM proportioner manual) and move the recirculation hoses back to the reservoirs. Continue recirculating until the proportioner is thoroughly flushed.
8. Close the remote recirculation valve (CH, CJ), if equipped.
9. Dispense fresh solvent through the mix manifold valves and through the gun, then close the solvent shutoff valve (AK).
10. Close the shutoff valves (AH, AJ).

Volume Balancing the Mix Manifold

When the mix manifold is remote mounted ratio errors can occur between the proportioner and the mix manifold; even when the proportioner output ratio is accurate.

The following can occur when the hoses are not volume balanced to the mix ratio:

- Hoses fill to high pressure while metering on ratio.
- Only the “A” material hose comes up to spray pressure.
- Off ratio at the mix point until hose pressures equalize.

Lead/Lag Imbalance

When resin and hardener volume requirements (ratio) and/or viscosities are different an imbalance can occur each time the gun is triggered. This occurs because the fluids can rush out of the manifold near a 1:1 ratio before the proportioner starts.

To avoid this imbalance:

- Add restriction on the hardener (low volume) side to balance the flow at the mix manifold.
- If the mix manifold is remote, pressurize hoses to spray pressure before starting spray mode when mix manifold is remote.
- If the mix manifold is remote, size the fluid delivery hose volume to nearly match the mix ratio. See Table 1.

Adjust B Mix Manifold Restriction on XM Proportioners While Spraying

Proportioner Mounted Mix Manifold

Adjust the restriction stem on the mix manifold to optimize the B side dosing control window. The goal is to create a constant flow on the A side and frequent dosing or a near constant flow on the B side. See the XM operation manual for instructions.

Remote Mounted Mix Manifold

Set Proportioner Restriction

With the restriction stem on the remote mix manifold open counter clockwise, adjust the restriction stem (222200) on the outlet of the proportioner to optimize the B side dosing control window. The goal is to create constant flow on the A side and frequent dosing or near constant flow on the B side. See the XM operation manual for instructions.

Set Mix Manifold Restriction

1. Adjust the restriction stem clockwise until the bar graph on the Ratio Mode screen starts moving to the left. The “B” dosing valve (blue) light will get brighter and the “B” dosing valve will open further.
2. Turn the restriction valve counter clockwise a half turn, and then lock the adjustment by tightening the nut.

Adjust Restriction on Early Xtreme Mix Proportioner

To check if the system is balanced watch the “B” dosing valves. The valve should be open (up) most of the time when the gun is triggered. If the “B” valve is giving only short “on” shots, adjust the restrictor in further. “B” fluid should flow most of the time, making only short “off” corrections.

Hose Selection for Feeding a Remote Mix Manifold

Hoses should be sized to match the hose volume ratio to the mix ratio. The hose size should also allow for minimum pressure drop on the major volume side to meet your flow requirements.

Use Table 1 to match mix ratio, hose selection, and volume ratio. Use Table 2 on page 22 to reference amount of pressure drop for 50 ft lengths of different hose sizes.

Size remote mix manifold hoses to:

- Minimize pressure drop on the high volume and often higher viscosity resin side to achieve higher flow and pressure at the gun while spraying.

Allow both A and B material hoses to come up to spray pressure together when A and B fluids are metered into the hoses on ratio.

Balance the inherent stall pressure between the resin “A” and hardener “B” sides when the gun closes and also when triggered. This reduces the lead/lag error at the mix point when the spray gun is triggered.

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

Mix Ratio	Hose Selection “A” x “B”	Hose Volume Ratio
1:1	1/2 x 1/2	1.0:1
	3/8 x 3/8	
2:1	1/2 x 3/8	1.78:1
	3/8 x 1/4	2.25:1
3:1	3/8 x 1/4	2.25:1
4:1 to 6:1	1/2 x 1/4	4.0:1
6:1 to 10:1	1/2 x 3/16	7:1

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 = Vis poise

V = Gallons per minute

L = Length

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?

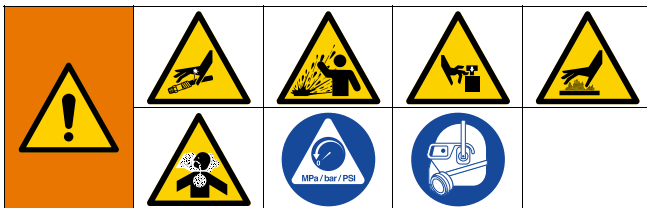
$$218 \text{ psi (from chart)} \times 2 \text{ (viscosity factor } 2 \times 1000 \text{ cps)} \times 3 \text{ (3 x 50 ft hoses)} \times 0.75 \text{ (\% of gpm)} = 981 \text{ psi loss}$$

Troubleshooting

1. Follow the **Pressure Relief Procedure** on page 17.
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. See Clean Mix Manifold Outlet , page 26.
	Fluid container is empty	Refill fluid container.
Little or no hardener output	Fluid inlet is plugged	Clean inlet; remove obstruction. See Clean Mix Manifold Outlet , page 26.
	Fluid container is empty	Refill fluid container.
	Hardener screen (28) is plugged (only applies if it is installed)	Clean inlet; remove obstruction. See Clean Mix Manifold Outlet , page 26.
Mixed fluid will not flush out	Fluid is hardened in static mixers or whip hose	Clean inlet; remove obstruction. See Clean Mix Manifold Outlet , page 26.
	Solvent supply container is empty	Refill solvent supply container.
	Solvent is not compatible with fluid	Change to compatible solvent.
Hardener pressure higher than normal	Hardener is cold	Correct heat problem. See fluid heater section of your XM Plural-Component Proportioner Repair manual.
	Restrictor or screen plugging up	Open restrictor or clean screen. See Clean Mix Manifold Outlet , page 26.
Hardener pressure lower than normal	Resin is cold. Flow rate is low.	Correct heat problem. See fluid heater section of your XM Plural-Component Proportioner Repair manual.
	Worn hardener	Adjust restrictor. See Adjust B Mix Manifold Restriction on XM Proportioners While Spraying , page 21.
Spray pattern developing tails	Static mixer and/or whip hose plugging up	Replace restrictor.
		See Clean Static Mixers , page 26.
		Clean spray gun and tip. See gun manual.
	Low pressure from proportioner	Check air supply pressure. Check inlet air gauges while spraying.
	Cold material	Increase heat. See your XM Plural-Component Proportioner Operation manual.
Resin or hardener does not shut off	Too much pressure drop	Use larger hoses or more heat.
		Replace or rebuild valve (11). See repair section of your High Flow Severe Duty Shutoff Check Valve manual.
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 Volume Balancing the Mix Manifold , page 21.

Repair



Follow the **Pressure Relief Procedure** on page 17 when you stop spraying and before cleaning, checking, servicing, or transporting equipment. To avoid injury due to unexpected machine operation initiated by a remote controller, disconnect the customer I/O cable from the system prior to troubleshooting.

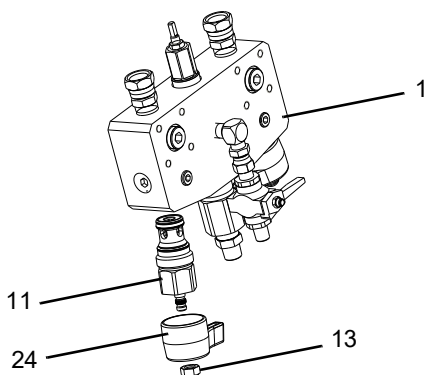
Follow the Shutdown Entire System procedure in your XM manual before servicing fluid components if the service time may exceed the pot life time.

NOTICE

Be sure to label all fluid parts “resin” or “hardener” when disassembling them. Doing so prevents interchanging resin and hardener parts during reassembly, which will contaminate the materials and the 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.

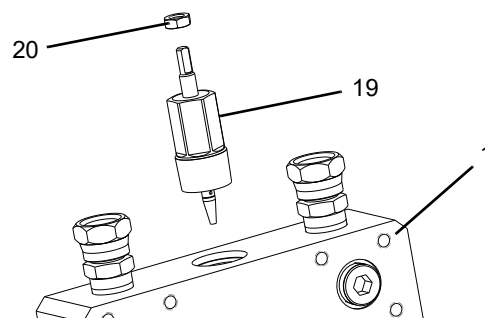
1. Follow the **Pressure Relief Procedure** on page 17.
2. Follow **Clean “B” Side Screen** on page 26.
3. Remove cap nut (13) and handle (24) from cartridge assembly (11). Use wrench to remove cartridge assemblies from manifold (1). See manual 313343 for repair instructions.



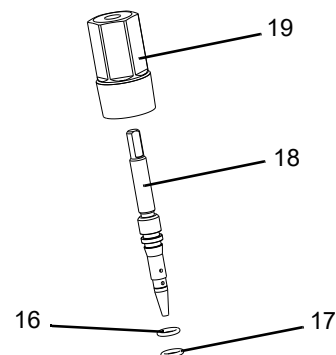
4. Clean all parts thoroughly in a compatible solvent. Use a soft bristle brush to clean the manifold passageways.

Remove Restrictor

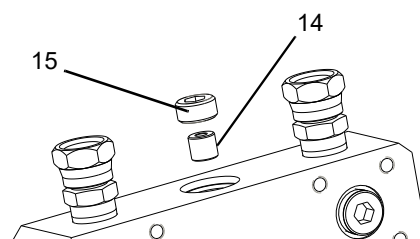
1. Note number of turns from open to closed position. Remove restrictor housing (19) from manifold (1).
2. Place restrictor housing (19) in a vice and remove nut (20).



3. Unscrew stem (18) clockwise and remove from restrictor housing (19).

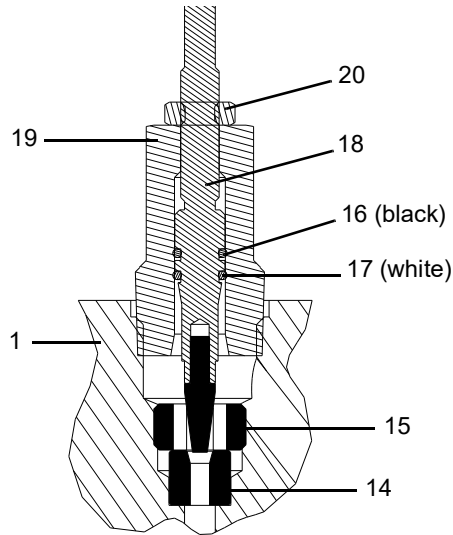


4. Remove and inspect o-rings (16, 17). Replace as necessary.
5. Remove set screw (15) and seat (14) from manifold (1).

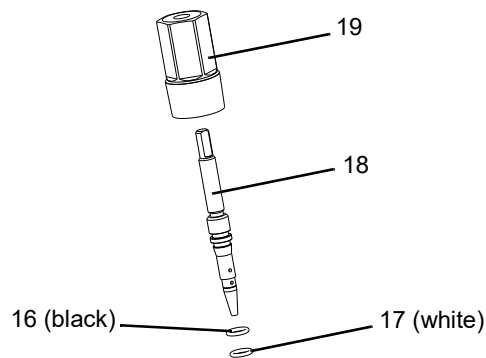


Assemble Restrictor

1. Insert seat (14) with larger tapered end facing up in manifold (1).



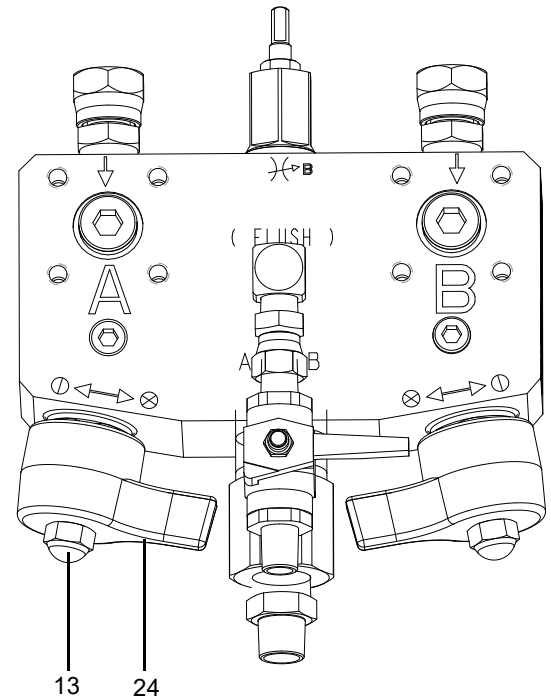
2. Apply blue thread lock to external threads of set screw (15) and install in the manifold.
3. Install o-rings (16, 17) on stem (18) and insert stem into restrictor housing (19). Turn stem (18) counter-clockwise until in the open position.



4. Loosely install locknut (20) on stem (18).
5. Tighten restrictor housing (19) into the manifold (1).
6. Tighten stem (18) down until it bottoms on seat (14). Then back the stem out to previously noted position or two full turns and lock in place with locknut (20).

Assemble Cartridge Assembly

1. Apply blue thread lock to external threads of cartridges (11) and install in manifold with stem backed out fully counter-clockwise. Place wrench on cartridge flats and torque to 125 ft-lbs (170 N•m).
2. Install handle (24) and cap nut (13) on cartridge so that the handles point toward each other when closed.



Maintenance

Clean Static Mixers

Typically, two static mixer housings (S, Part No. 262478) are connected to the static mixer adapter (V) on the integrator hose (L). These housings use plastic mix elements, available in a package of 25 (W, Part No. 248927).

NOTICE

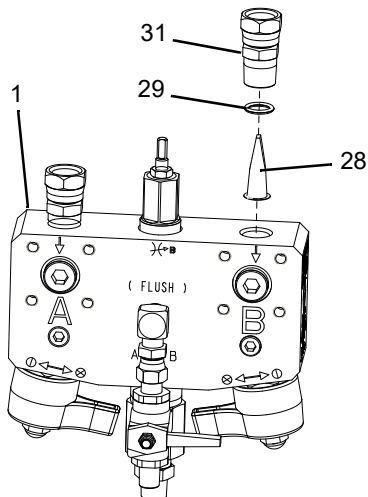
Never use a swivel union on the mixer inlets. The union will compress the tube and make it possible to remove the mix element.

1. Follow the **Pressure Relief Procedure** on page 17. Remove mixer housings (S) from integrator hose (L) and from whip hose (T).
2. Place flats of mixer housing (S) in a grounded vise. Push mix element (W) out of the inlet end.
3. If necessary, use a 1/2 in. drill bit to drill out old material and clean 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 (S).
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 32.

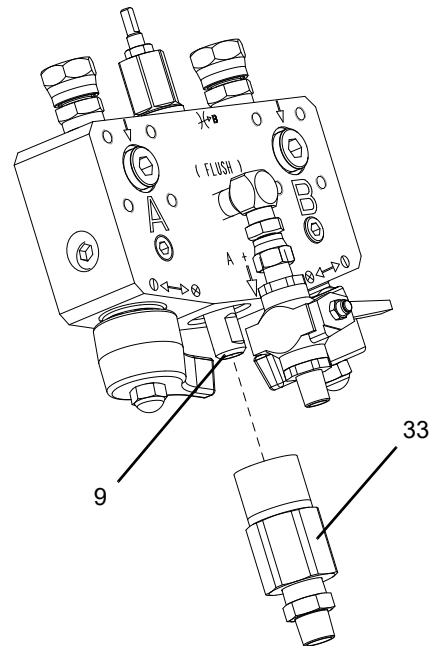
1. Remove “B” inlet union (31) from manifold block (1).



2. Pull “V” screen (28) and retainer o-ring (29) straight up and out with a needle nose pliers.
 3. Clean or replace screen (28). Reinstall screen (28) and white plastic o-ring (29) with tool 15T630 (included in repair kit 256238).
- NOTE:** The o-ring (29) is used as a retainer ring, not a seal. It may be scratched or deformed from pushing the screen (28) back in.
4. Install “B” inlet union (31) on manifold block (1).

Clean Mix Manifold Outlet

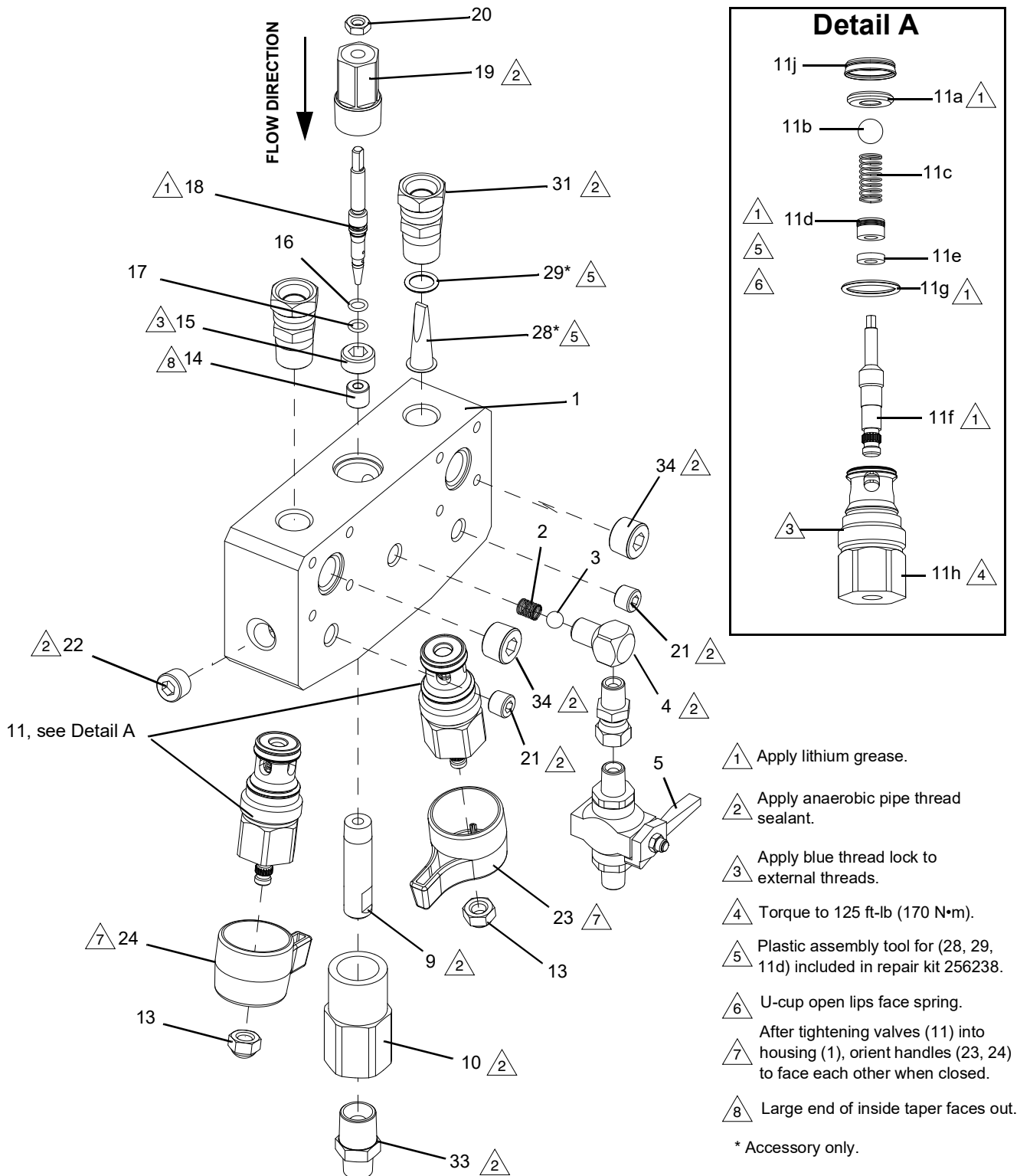
1. Remove outlet fitting (33) to expose “B” center injection tube (9).



2. Clean any build-up on, around, or inside the tube (9).
3. Reinstall outlet fitting (33).

Part

255684 Mix Manifold



255684 Mix Manifold Parts List

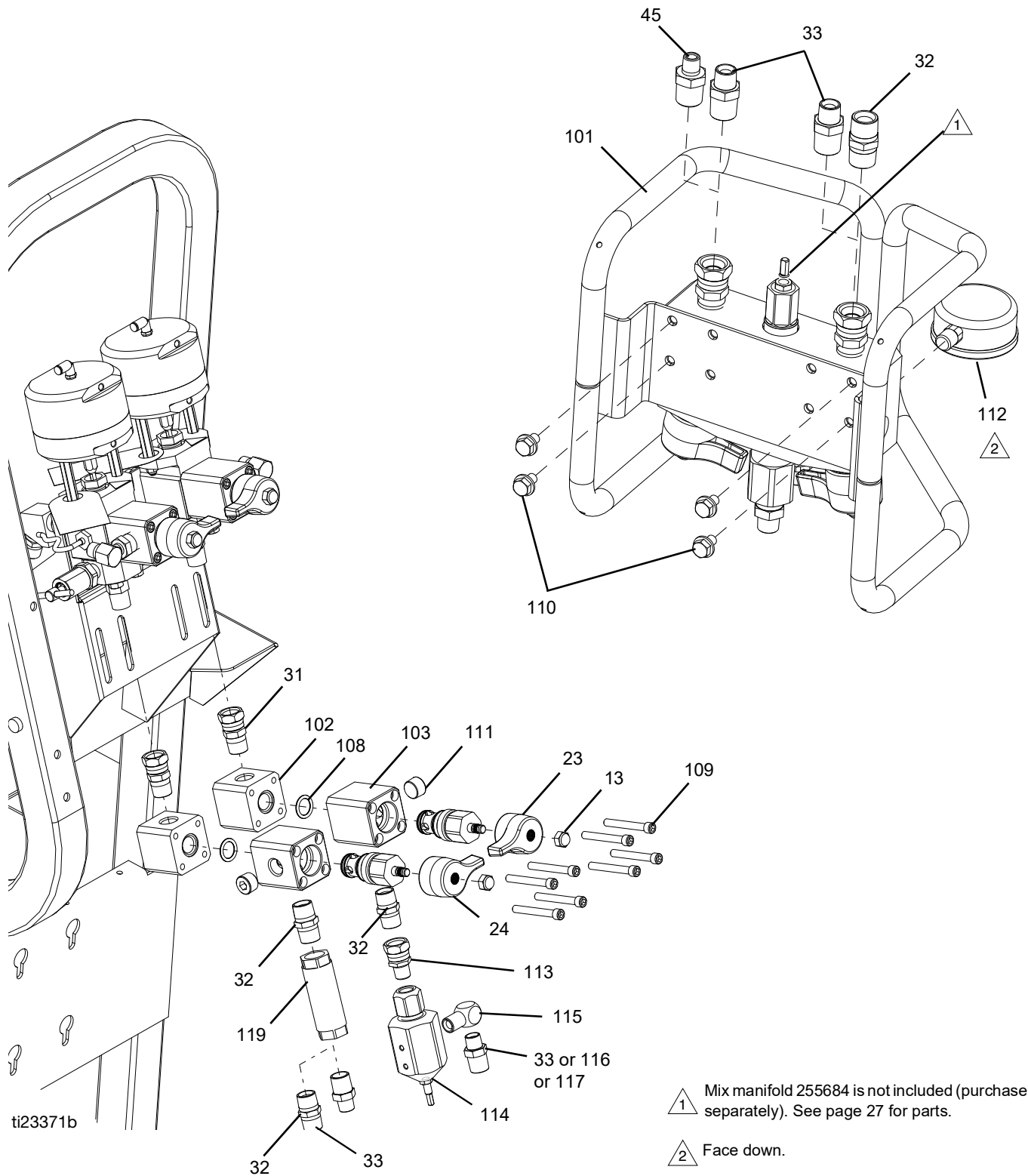
Ref.	Part	Descriptions	Qty.
1	15M229	BLOCK, manifold	1
2†	117558	SPRING, compression	1
3†	101947	BALL, solvent check	1
4	15E367	ELBOW, street, lapped	1
5	214037	VALVE, ball; see manual 306861	1
9	15R378	TUBE, injector, hardener	1
10	15R067	PIPE, outlet, mixer manifold	1
11*	255747	CARTRIDGE, valve, shutoff check; includes 11a-11j	2
11a†	15A968	SEAT, foot valve, carbide	1
11b†	116166	BALL, carbide	1
11c†	15M530	SPRING	1
11d†	15M529	SEAL, u-cup UHMWPE	1
11e†	15M189	SPACER, backup, seal	1
11f†	15K347	STEM	1
11g†	121138	PACKING, o-ring; PTFE, white	1
11h	15K199	HOUSING, top, check valve	1
11j†	15K692	SEAL, seat retainer	1
13	117623	NUT, cap; 3/8-16	2
14	183951	SEAT, valve, carbide	1
15	15R382	SCREW, set, hollow, 3/4-16	1
16†	113137	PACKING, o-ring, black solvent resist	1
17†	110004	PACKING, o-ring, white, PTFE	1
18	235205	STEM, valve, carbide	1
19	15M969	HOUSING, restrictor	1
20	110005	NUT, jam, hex; 5/16-24 unf	1
21	100721	PLUG, pipe; 1/4 npt(f)	2
22	101754	PLUG, pipe; 3/8 npt(f)	1
23	15R380	HANDLE, green	1
24	247789	HANDLE, blue	1
31	156684	UNION, adapter; 1/2 npt	2
32☼	158491	NIPPLE; 1/2 npt	2
33☼	159239	NIPPLE, pipe; 1/2 x 3/8 npt	3
34	100361	PLUG, pipe; 1/2 in. - 14 npt	2
35	156823	UNION, swivel; 2 x 1/4-18 npt	1
45☼	162449	NIPPLE, 1/2 x 1/4 npt	2
118☼	126786	WRENCH, restrictor	1

☼ Not Shown.

* See manual 313343 for repair instructions.

† Provided in mix manifold repair kit 256238.

256980 Remote Mix Manifold Conversion Kit



256980 Remote Mix Manifold Kit Parts List

Ref.	Part	Descriptions	Qty.
13	117623	NUT, cap 3/8-16 unc	2
23	15R380	HANDLE, green	1
24	15J916	HANDLE, blue	1
31	156684	UNION, adapter	2
32 $\equiv\ddagger$	158491	NIPPLE, 1/2 npt	3
33 $\equiv\ddagger$	159239	NIPPLE, pipe; 1/2 x 3/8 npt	5
45 $\equiv$	162449	NIPPLE; 1/2 x 1/4 npt	2
101	262522	CARRIAGE, remote manifold	1
102	15R529	BLOCK, fluid distribution	2
103*	255278	VALVE shutoff/check; (includes 11, see page 28)	2
108†	121139	PACKING, o-ring	2
109	121295	SCREW, cap, sch	8
110	111801	SCREW, cap, hex hd; 5/16-18	4
111	100361	PLUG, pipe	2
112	551387	GAUGE, pressure, fluid	1
113‡	162505	UNION; 3/8 male x 1/2 female	1
225‡	222200	VALVE, restrictor	1
115‡	155699	ELBOW, street; 3/8-18 npt	1
116‡	156849	NIPPLE, pipe; 2 x 3/8-18 npt	1
117‡	164672	ADAPTER; 3/8-18 npt x 1/4-18 npsm	1
118 $\otimes$	126786	WRENCH, restrictor	1
119	16N367	COUPLING, 1/2 x 3.5 in.	1

$\otimes$ Not Shown.

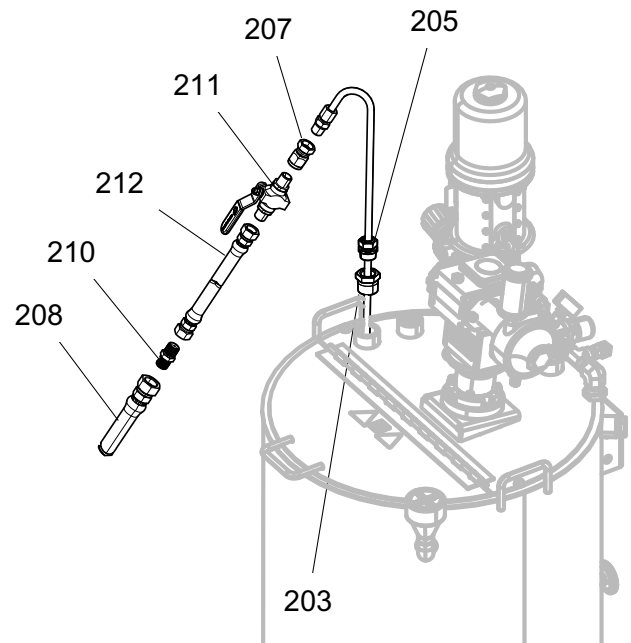
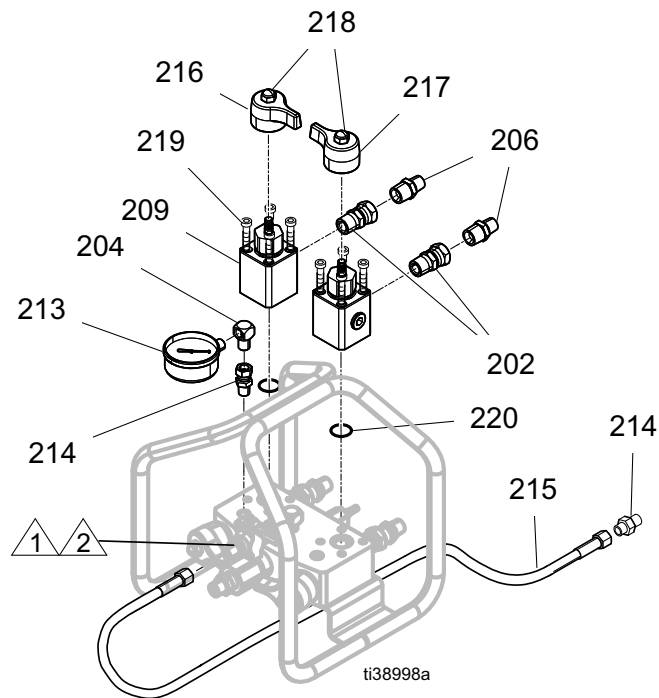
* See manual 313343 for repair instructions.

† Provided in mix manifold repair kit 256238.

‡ Included in remote manifold restrictor kit 24F824.

$\equiv$ Use to adapt to any combination of one 1/2 in., two 3/8 in, and one 1/4 in. hoses.

273185 Remote Recirculation Kit



273185 Remote Recirculation Kit Parts List

Ref.	Part	Descriptions	Qty.
201	156684	FITTING, union, adapter	2
202	156823	FITTING, union, swivel	1
203	129347	BUSHING, strain relief, 3/4-npt	2
204	100840	FITTING, elbow, street	1
205	158586	FITTING, bushing	2
206	159239	FITTING, nipple, pipe, rdcg	2
207	15T396	TUBE, recirculation	2
208	162485	ADAPTER, nipple	2
209	255278	VALVE, complete, shutoff/check	2
210	H73810	HOSE, cpd, 7250 psi, .375 id, 10 ft	2
211	156173	UNION, swivel	2
212	237304	VALVE, ball	2
213	551387	GAUGE, pressure, fluid	1
214	156971	FITTING, nipple, short	2
215	H42506	HOSE, cpd, 4500 psi, 0.25 id, 6 ft	1
216	15R380	HANDLE, green	1
217	15J916	HANDLE, blue	1
218	117623	NUT, cap	2
219	121295	SCREW, cap	8
220	121139	PACKING, o-ring	2

1 Mix Manifold 255684 is not included (purchase separately).

2 Remote Mix Manifold 256980 is not included (purchase separately).

Accessories

255747, Shutoff Check Valve Cartridge Assembly

See manual 313343 for parts.

255278, Complete High Flow Sever Duty Shutoff Check Valve

Includes housing, screws, and o-ring for recirculation or proportioner with outlet valves. See manual 313343 for parts.

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

114434 - 1/4 npt(m) back mount pressure gauge can be used in port (AR) as gun pressure gauge. Includes 316 stainless steel wetted.

551387 - 1/4 npt bottom mount version.

262522, Remote Mix Manifold Carriage

The carriage holds and protects the mix manifold assembly. This requires four 5/16-18 x 1/2 in. screws.

262478, 7250 psi Static Mixer Housing

3/8 npt(m) holds 1/2 in. 12 element stick from 25 pack 248927.

248927, Plastic Mix Elements

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

511352, Mixer

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

15B729, Adapter Mixer Inlet

3/8 npt m x f; 7250 psi (50 MPa, 500 bar).

162024, Adapter Between Mix Tubes

3/8 npt f x f; 7250 psi (50 MPa, 500 bar).

B-side Screen

For low viscosity fluids only.

185416 - STRAINER, 40m

121410 - PACKING, screen retainer

Accessory Ports

(AF) Inlet Side - 1/2 in. npt(f)

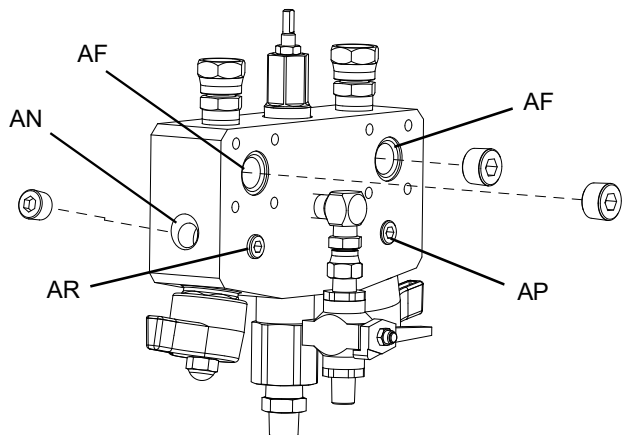
These ports are located before “A” and “B” shutoff check valves. Use these ports for inlet gauges or recirculation. They also are equipped to manifold face mount 255278 circulation valves.

(AN/AR) “A” Side After Shutoff - 1/4 in. npt(f)

These ports are located after “A” and “B” shutoff check valves. Use these ports as an outlet pressure gauge or as a second flush inlet for materials that require dual, separate flushing for complete flush material isolation.

(AP) “B” Side After Shutoff, Before Restrictor - 1/4 in. npt(f)

This port can be used as an alternate flush coming in before the restrictor on the “B” side.



Technical Specifications

XM Remote Mix Manifold Kit, XM Remote Recirculation Kit		
	US	Metric
Maximum working pressure	7250 psi	50 MPa, 500 Bar
Maximum fluid temperature	160 °F	71 °C
A and B Material Inlet	1/2 in. npsm union with nipple adapters for 1/2 in., 3/8 in., or 1/4 in. hoses	
A and B check Valve Inlet	1/2 npsm union	
Remote recirculation size	1/2 in. npsm union with nipple adapters for 1/2 in., 3/8 in., or 1/4 in. hoses	
Mixed Material Outlet	3/8 npt(m)	
Wetted Parts		
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	
Notes		
All trademarks or registered trademarks are the property of their respective owners.		

California Proposition 65

CALIFORNIA RESIDENTS

 **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

Graco Standard Warranty

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

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

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

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

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

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

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS

The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

Graco Information

For the latest information about Graco products, visit www.graco.com.

For patent information, see www.graco.com/patents.

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

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

*All written and visual data contained in this document reflects the latest product information available at the time of publication.
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