

XM Mix Manifold Kits

312749G

EN

*For mixing two component reactive materials with XM plural-component sprayers.
Not for use on mechanical proportioners.
Approved for use in explosive atmospheres.*

For professional use only.

Part No. 255684

Mix Manifold

Part No. 256980

Remote Mix Manifold Conversion Kit with protective guard

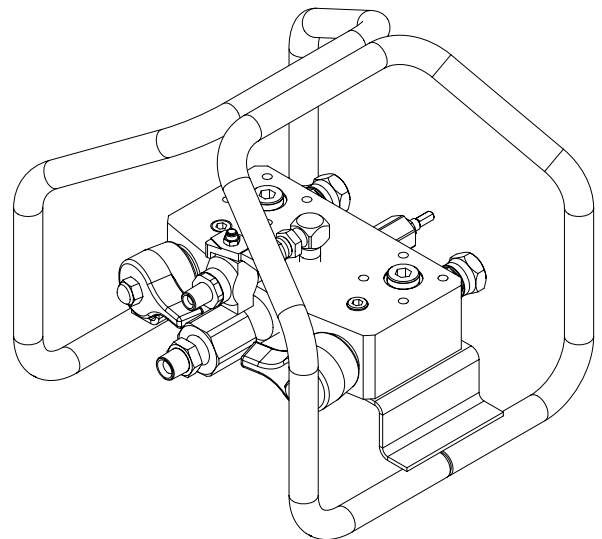
7250 psi (50 MPa, 500 bar) Maximum Working Pressure
160°F (71°C) Maximum Fluid Temperature



Important Safety Instructions

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

Mix Manifold and Remote Mix Manifold Conversion Kit



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Related Manuals





Manuals are available at www.graco.com.

Component Manuals in U.S. English:





Manual	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

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 symbol refers to procedure-specific risk. Refer back to these warnings. Additional, product-specific warnings may be found throughout the body of this manual where applicable.

 WARNING	
	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • When flammable liquid is sprayed or used for flushing or cleaning, keep sprayer at least 20 feet (6 meters) away from explosive vapors. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Ground all equipment in the work area. See Grounding instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. • If there is static sparking or you feel a shock, stop operation immediately. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS 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. • 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.
	<p>SKIN INJECTION HAZARD</p> <p>High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment.</p> <ul style="list-style-type: none"> • Do not 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. • Do not spray without tip guard and trigger guard installed. • Engage trigger lock when not spraying. • Follow Pressure Relief Procedure in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.





! WARNING

	<p>PRESSURIZED EQUIPMENT HAZARD</p> <p>Fluid from the gun/dispense valve, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</p> <ul style="list-style-type: none"> • Follow Pressure Relief Procedure in this manual, 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.
	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS 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. • 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.
	<p>TOXIC FLUID OR FUMES HAZARD</p> <p>Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.</p> <ul style="list-style-type: none"> • Read MSDS's to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines. • Always wear impervious gloves when spraying or cleaning equipment.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear • Clothing and respirator as recommended by the fluid and solvent manufacturer • Gloves • Hearing protection

Isocyanate Hazard

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

Material Self-Ignition

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

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 lube pump reservoir 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, such as those supplied with your system.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Never use solvent on one side if it has been contaminated from the other side.
- Always park pumps when you shutdown.
- Always lubricate threaded parts with Part 217374 ISO pump oil or grease when reassembling.

Keep Components A and B Separate

NOTICE

To prevent cross-contamination of the equipment's wetted parts, **never** interchange component A (isocyanate) and component B (resin) parts. The gun is shipped with the A side on the left. The fluid manifold, fluid housing, side seal assembly, check valve cartridge, and mix chamber are marked on the A side.

Changing Materials

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

Component Identification

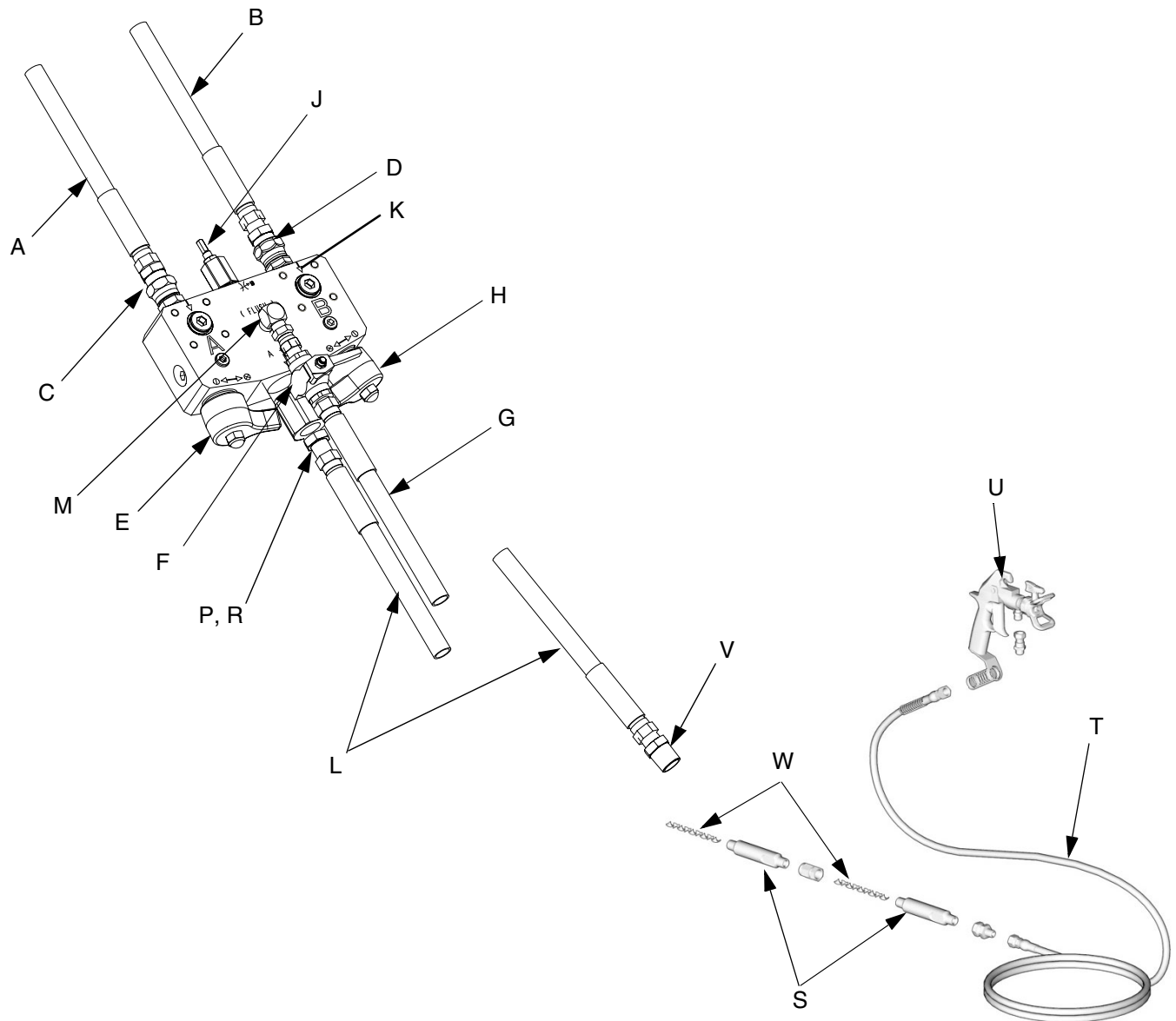


FIG. 1: Typical Installation

Key:

- | | |
|--|---|
| A Resin (High Volume) Supply Hose (A material) | M Solvent Check Valve |
| B Hardener (Low Volume) Supply Hose (B material) | P Hardener Injector (not shown; inside outlet R) |
| C Resin Adapter Nipple | R Mix Manifold Outlet, 1/2 npt(f) with 3/8 npt(m) adapter |
| D Hardener Adapter Nipple | S Static Mixer Housing |
| E Resin Shutoff Handle (blue; A material) | T Fluid Whip Hose |
| F Solvent Inlet Valve, 1/4 npt(m) | U Airless Spray Gun |
| G Grounded Solvent Hose | V Static Mixer Adapter |
| H Hardener Shutoff Handle (green; B material) | W Static Mixing Element |
| J Hardener Restrictor Adjustment | |
| K Hardener Screen (inside) | |
| L Integrator 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.

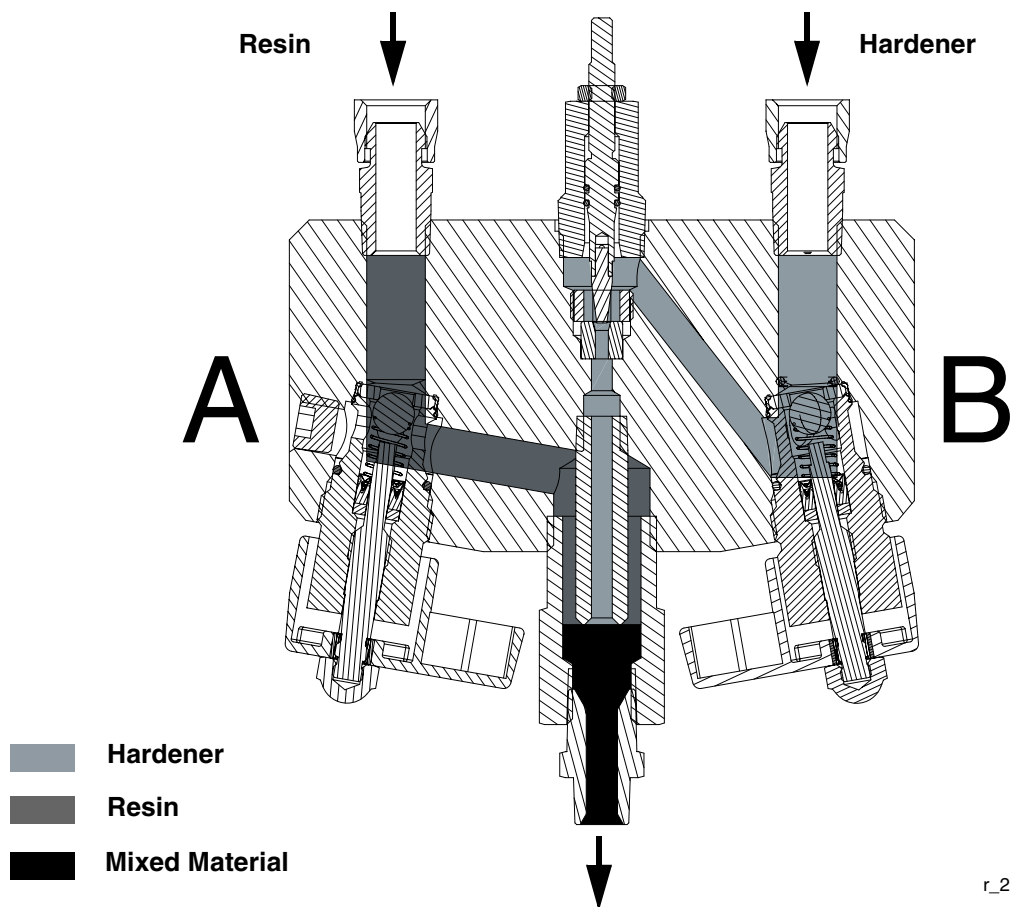
See FIG. 2 to view flow of A and B material inside the XM Mix Manifold.

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.

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

NOTE: 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.



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FIG. 2: Cutaway View

Installation

						
<p>This manifold is designed for use on proportioning pumps with independent drive motors. Use of this manifold on a mechanically linked sprayer without using mechanically linked on/off A and B valves may cause hazardous fluid pressures that can rupture equipment.</p>						

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.

Fluid Inlets

The A and B fluid inlets are equipped with 1/2 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).

Remote Mounted Manifolds

Machine Outlet Check Valves

The XM sprayer must have outlet check valves (CV) in order to accurately measure pump outlet flow. These check valves are provided in the mix manifold when it is mounted on the sprayer.

When the mix manifold is removed and used remotely, you must add outlet check valves on the machine. Use shutoff check valves 255278 as the outlet check valves as provided in conversion kit 256980. The valves act as severe duty check valves when the check valve handle is open. They act as manual shutoff valves when the handle is closed.

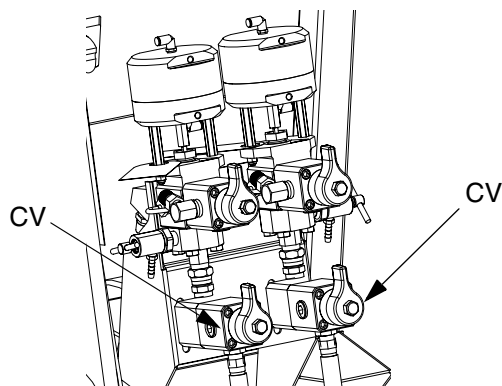


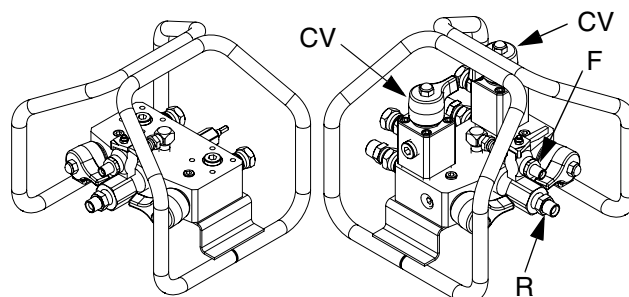
FIG. 3: Machine Outlet Check Valves

Machine Mounted Restrictor Valve

When the mix manifold is used remotely a restrictor valve (222200) is added to the B side outlet of the proportioner. This configuration requires that the machine outlet restrictor be used to set the bar graph on the Ratio Mode screen.

Remote Circulation Control Valves

Shutoff check valves (CV) may also be face-mounted on the remote mix manifold to circulate heated material before spraying.



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FIG. 4: Remote Mix Manifold Options on Carriage

Solvent Inlet

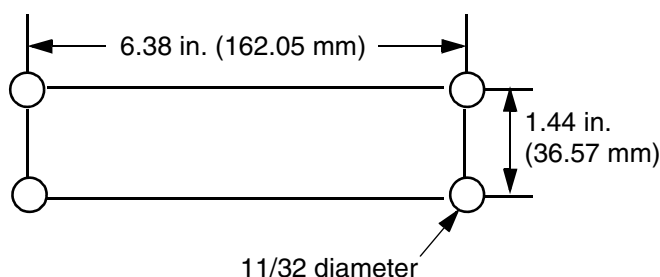
Connect the solvent supply line (G) from the solvent pump to the 1/4 npt(m) solvent inlet valve (F). Use a Graco approved grounded hose rated to withstand the maximum fluid working pressure of the solvent pump. The hose core must be chemically compatible with the solvent being used such as nylon or PTFE.

Fluid Outlet

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

Mounting

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.



Grounding



Your system must be grounded. Read warnings in your sprayer manual. Check your local electrical code.

- **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 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/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 **Flush**, page 12.

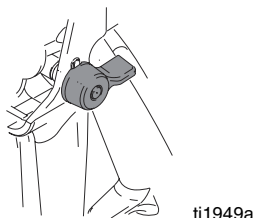
Operation


Pressure Relief Procedure

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

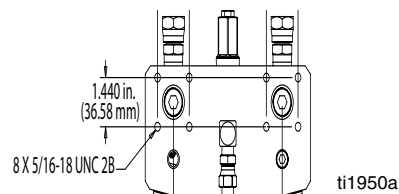
Relieve A and B Fluid Pressure

1. Engage trigger lock.

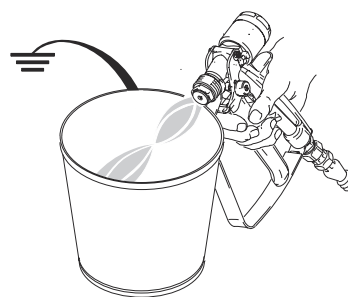


2. Press Stop  to turn off sprayer.
3. Close all air motor supply valves or any source of fluid pressure.
4. Open A and B circulation valves if equipped. See FIG. 3 and FIG. 4 on page 9.
5. If fluid heaters are used, shut them off using the controls on the heater control box.
6. Shut off feed pumps, if used.

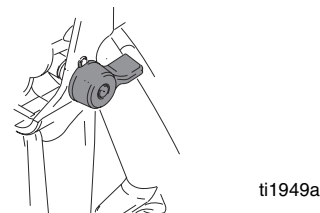
7. Disengage trigger lock.



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.








9. Engage trigger lock.



10. Flush mixed material hoses, mixer, and gun. See **Flush** on page 12.

Flush

						
<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
<p>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.</p>

NOTE:

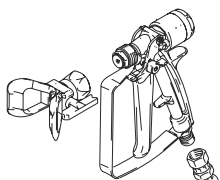
- Ensure flushing fluid is compatible with dispense fluid and the equipment wetted parts.
- Solvent may channel through viscous fluids and leave a coating of mixed fluid on the inner tube of your hose. Be sure all fluid is thoroughly flushed from the hose after each use.
- Remove spray tip for more thorough 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. Relieve pressure; see page 11.

2. Engage trigger lock. Remove spray tip.



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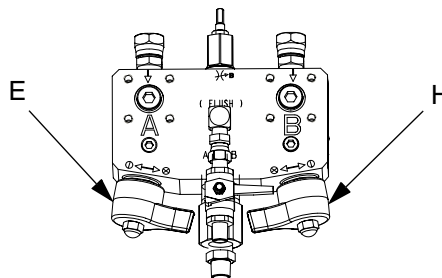


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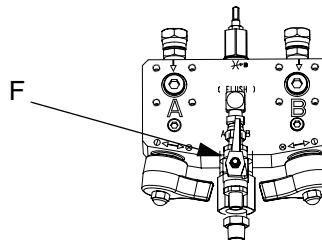
3. Close blue (E) A material and green (H) B material supply valves.

NOTE:

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



4. Open solvent inlet valve (F).



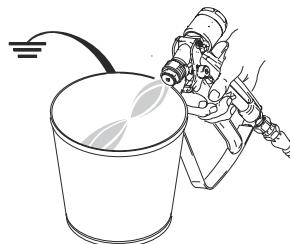
5. Turn on solvent flush pump.

6. Disengage spray gun trigger lock.



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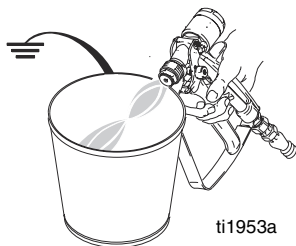
7. Trigger gun into a grounded metal pail with lid. Use a lid with a hole to dispense through to avoid splashing. Be careful to keep fingers away from front of gun. Flush out mixed material until clean solvent dispenses.



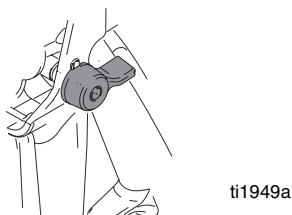
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8. Turn off solvent pump air supply.

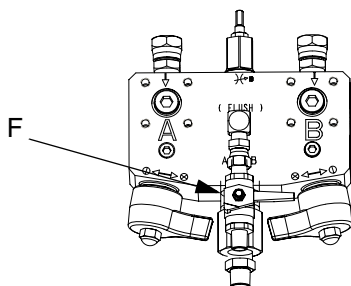
9. Hold the metal part of the gun firmly to a grounded metal pail with lid in place. Trigger gun until all fluid pressure is relieved.



10. Engage trigger lock.

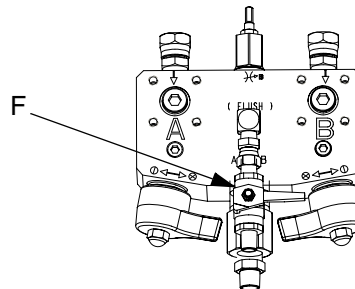


11. Close solvent inlet valve (F).

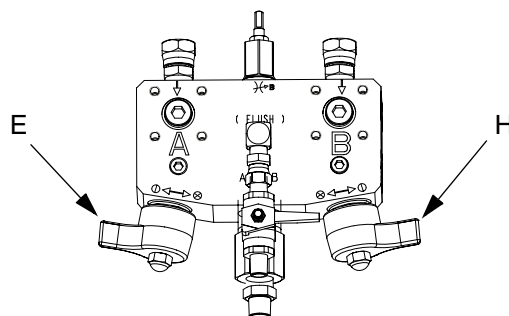


Dispensing and Spraying

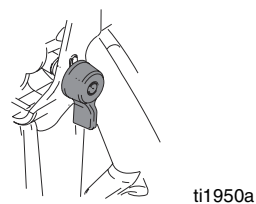
1. Close solvent inlet valve (F).



2. Open blue (E) A material and green (H) B material valves.



3. Ensure sprayer is in "Spray Mode" and push start.
4. Disengage spray gun trigger lock.



5. 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.
6. Proceed spraying.

Volume Balancing the Mix Manifold

When the mix manifold is remote mounted ratio errors can occur between the sprayer and the mix manifold; even when the sprayer 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 sprayer 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 Sprayers While Spraying

Machine 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 Machine 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 Sprayers

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 15 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.

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.

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 (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 psi (from chart) x 2 (viscosity factor 2 x 1000 cps) x 3 (3 x 50 ft hoses) x 0.75 (% of gpm) = 3105 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?

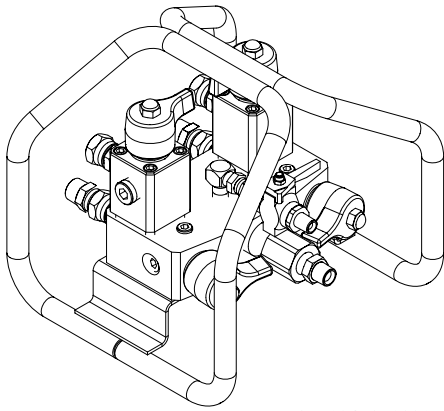
218 psi (from chart) x 2 (viscosity factor 2 x 1000 cps) x 3 (3 x 50 ft hoses) x 0.75 (% of gpm) = 981 psi loss

Optional Recirculation

Ports are provided on the “A” and “B” sides for recirculating the material hoses back to the machine supplies.

To add remote recirculation, install shutoff check valves 255278 on front of mix manifold assembly. This is a high quality carbide ball and seat valve designed to close and be leak free when in spray mode.

Use adjustable restrictor valves 222200 to control the flow rate back into the supply.



r_255684_256980_312749_4

FIG. 5: Remote Mix Manifold Recirculation

NOTE:

When recirculation valves are moved remote downstream of the dosing valves, the machine can no longer automatically check that the recirculation valves are closed and leak free when going into Spray Mode.

If the recirculation valves leak while you are spraying, you will be off ratio with no indication. See XM sprayer operation manual 312359 for more information.

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. See Clean Mix Manifold Outlet , page 20.
	Fluid container is empty.	Refill.
Little or no hardener output.	Fluid inlet is plugged.	Clean inlet; remove obstruction. See Clean Mix Manifold Outlet , page 20.
	Fluid container is empty.	Refill.
	Hardener screen (28) is plugged. (Only applies if it is installed.)	Clean hardener screen. See Clean Mix Manifold Outlet , page 20.
Mixed fluid will not flush out.	Fluid is hardened in static mixers or whip hose.	Clean with compatible solvent. See Maintenance , page 20. 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. See fluid heater section of XM Plural-Component Sprayer Repair manual 313289.
	Restrictor or screen plugging up.	Open restrictor or clean screen. See Clean Mix Manifold Outlet , page 20.
Hardener pressure lower than normal.	Resin is cold. Flow rate is low.	Correct heat problem. See fluid heater section of XM Plural-Component Sprayer Repair manual 313289.
	Worn hardener restrictor.	Adjust restrictor. See Adjust B Mix Manifold Restriction on XM Sprayers While Spraying , page 14.
Spray pattern developing tails.	Static mixer and/or whip hose plugging up.	Replace restrictor.
		Clean Static Mixers , page 20.
		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. See XM Plural-Component Sprayer Operation manual 312359.
	Too much pressure drop.	Use larger hoses or more heat.
Resin or hardener does not shut off.	Damaged ball or seat or seal in valve (11).	Replace or rebuild valve (11). See repair section of High Flow Severe Duty Shutoff Check Valve manual 313343.
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 14.

Repair

<p>Follow Pressure Relief Procedure when you stop spraying and before cleaning, checking, servicing, or transporting equipment. Read warnings in your sprayer manual.</p>						

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. Relieve the pressure, see page 11.
2. Clean “B” side screen. See page 20.
3. Remove cap nut (CN) and handle (CH) from cartridge assembly (11). Use wrench to remove cartridge assemblies from manifold (1). See manual 313343 for repair instructions.

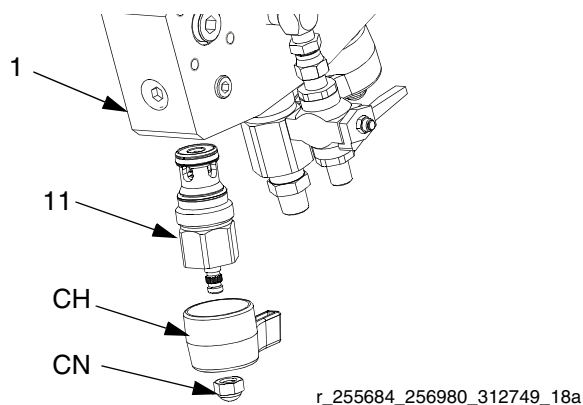


FIG. 6

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).

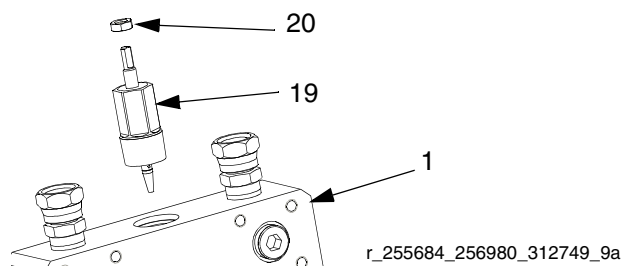


FIG. 7

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

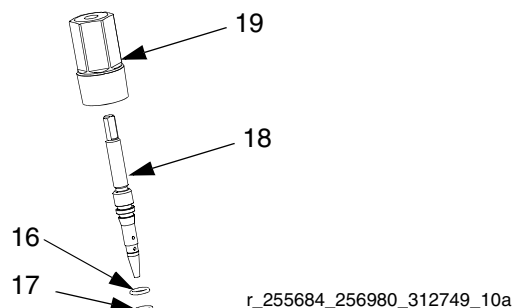


FIG. 8

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

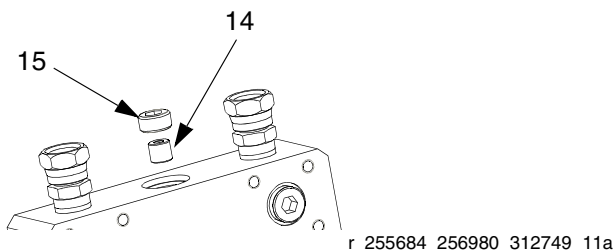


FIG. 9

Assemble Restrictor

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

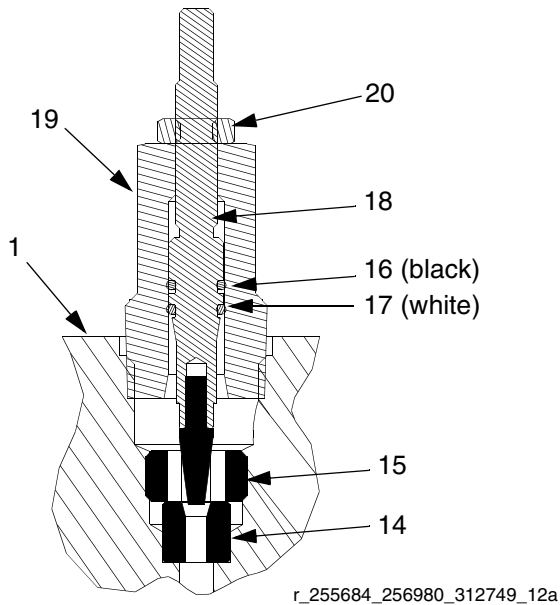


FIG. 10

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

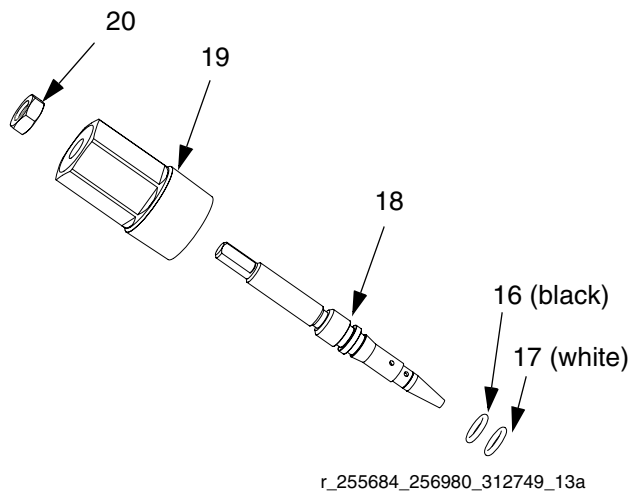


FIG. 11

4. Loosely install lock nut (20) on stem (18).
5. Tighten restrictor housing (19) into manifold (1).
6. Tighten stem (18) down until it bottoms on seat (14). Then back stem out to previously noted position or two full turns and lock in place with lock nut (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). See FIG. 6 on page 18.
2. Install handle (CH) and cap nut (CN) on cartridge so that the handles point toward each other when closed.

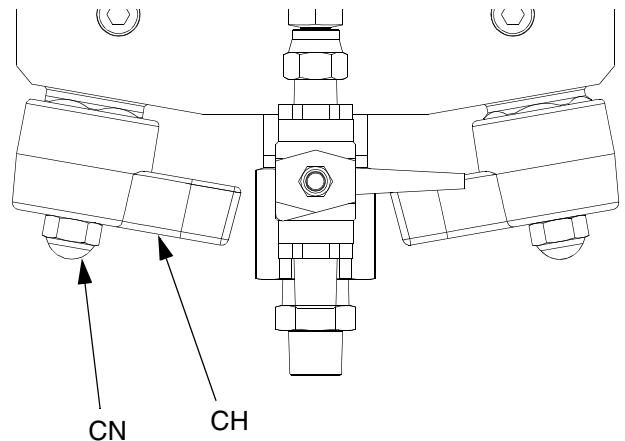


FIG. 12

Maintenance

Clean Static Mixers

See FIG. 1, page 7. 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 impossible to remove the mix element.

To clean the housing and replace the mix element:

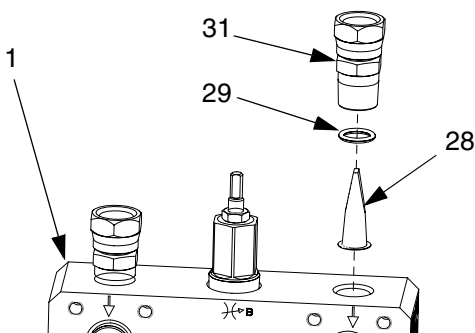
1. Relieve pressure, see page 11. Remove mixer housings (S) from integrator hose (L) and from whip hose (T).
2. Place flats of mixer housing (S) in a grounded vise. Push mix element (W) out of the inlet end.
3. If necessary, use a 1/2 in. drill bit to drill out old material and clean the mix element 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 26.

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).
4. Reinstall screen (28) and white plastic o-ring (29) with tool 15T630 (included in repair kit 256238).

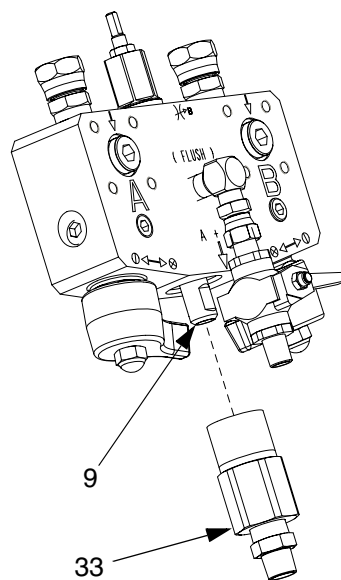
NOTE:

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.

5. Install “B” inlet union (31) on manifold block (1).

Clean Mix Manifold Outlet

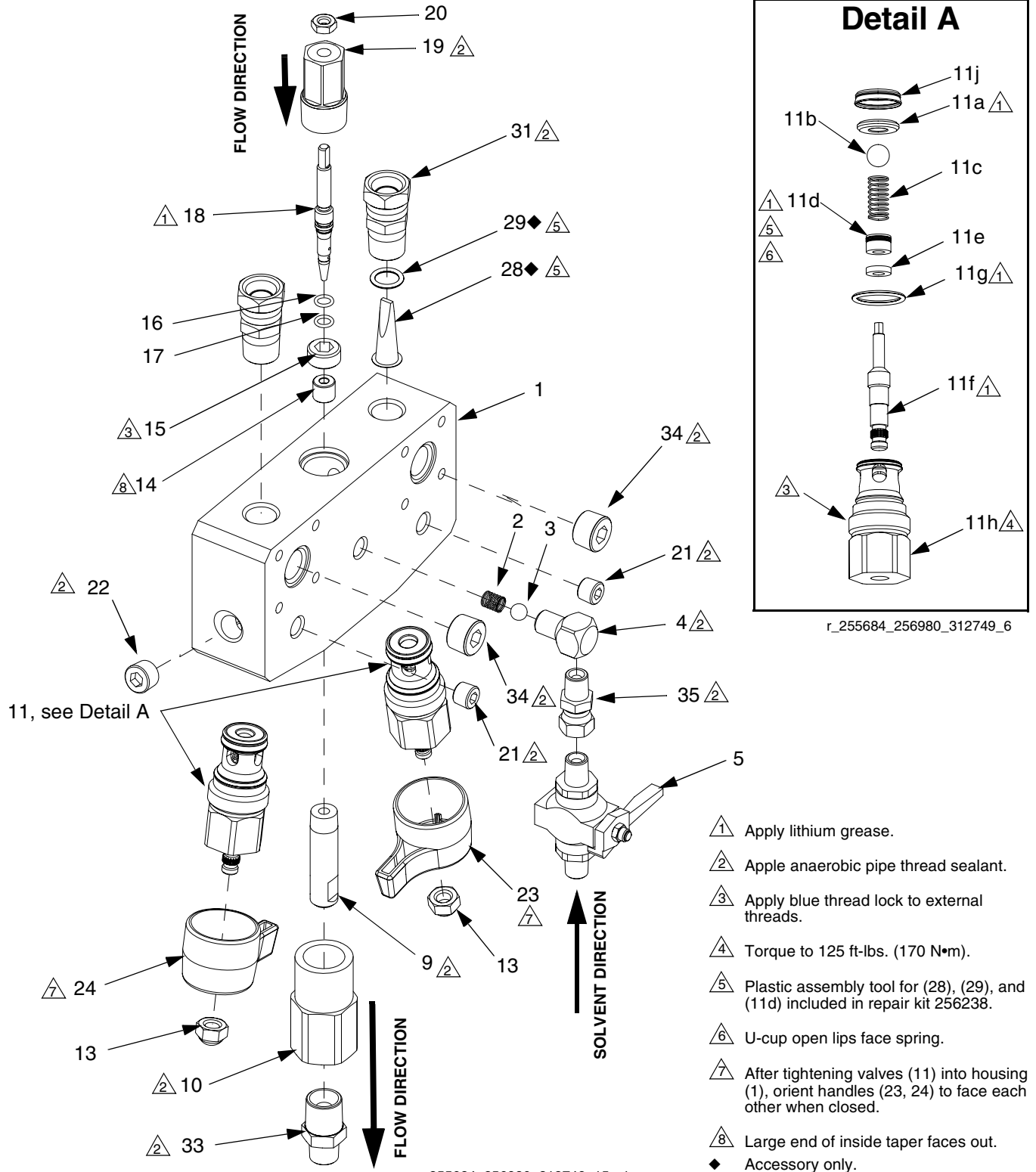
1. Remove outlet fitting (33) to expose “B” center injection tube (9).



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

Parts

255684 Mix Manifold



255684 Mix Manifold

Ref.	Part	Description	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	2
		check; includes 11a-11j	
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, see page 23	2
33♣	159239	NIPPLE, pipe; 1/2 x 3/8 npt, see page 23	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, see page 23	2
118♣	126786	WRENCH, restrictor	1

† Provided in mix manifold repair kit 256238.

* See manual 313343 for repair instructions.

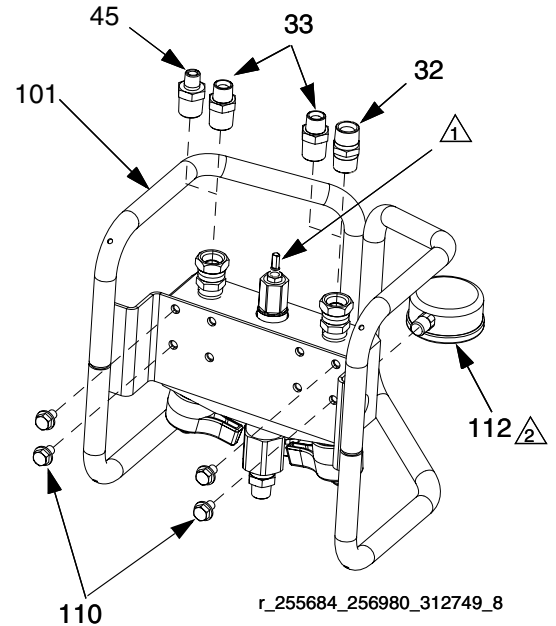
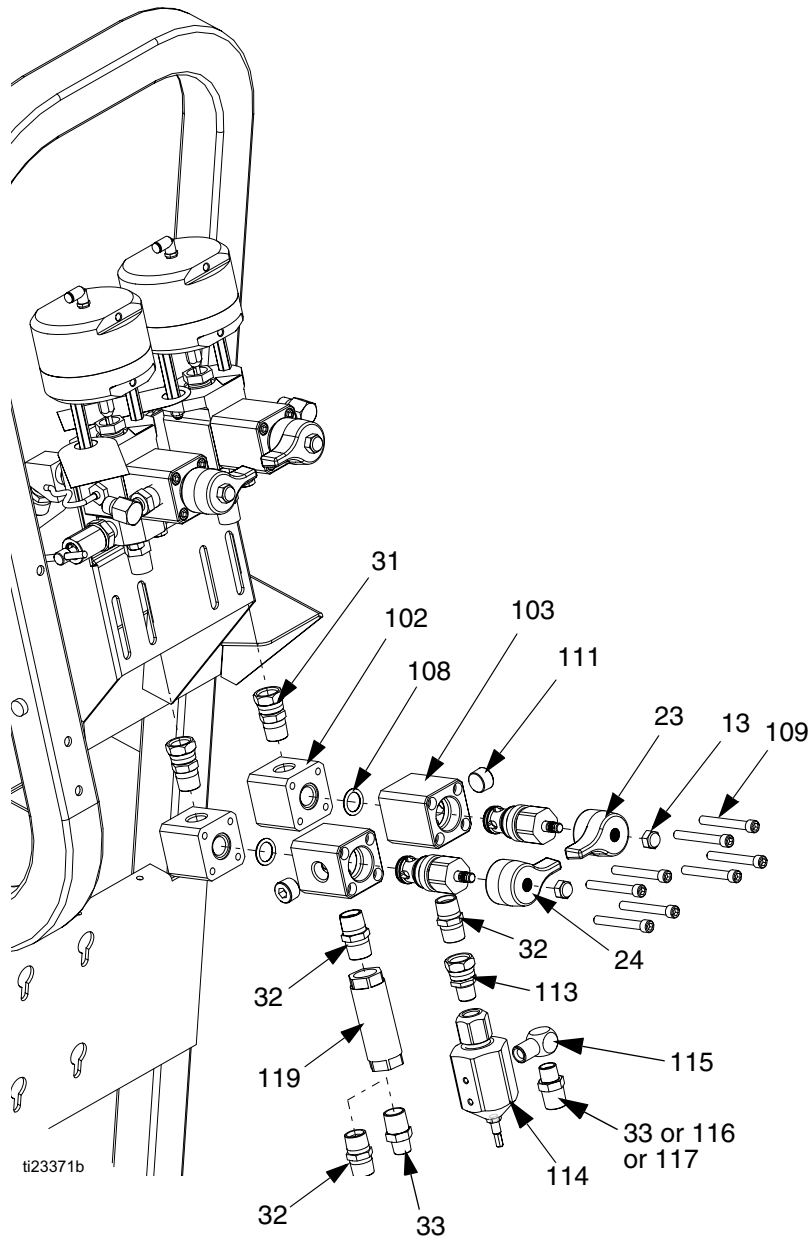
♣ Not shown.

256980 Remote Mix Manifold Conversion Kit

(with outlet check/shut off valves and machine mounted restrictor valve)

Shutoff check valves must be used when using the mix manifold remote on an XM sprayer. Includes everything needed to move the existing mix manifold remote, except the A and B fluid hoses which should be chosen according to the guidelines starting on page 14.

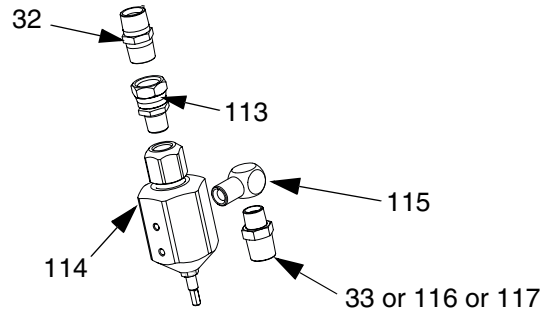
NOTE: Extra hose nipples are included to accommodate 1/2 in. or 3/8 in. "A" hose and 1/2 in., 3/8 in., or 1/4 in. "B" hose.



- ⚠ 1 Mix manifold 255684 is not included (purchase separately). See page 21 for parts.
- ⚠ 2 Face down.
- ⚠ 3 "B" outlet to hose.

256980 Remote Mix Manifold Kit Parts

Ref.	Part No.	Description	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★	158491	NIPPLE, 1/2 npt	3
33★	159239	NIPPLE, pipe; 1/2 x 3/8 npt	5
45★	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 22)	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
114	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✿	126786	WRENCH, restrictor	1
119	16N367	COUPLING, 1/2 x 3.5 in.	1



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

† Provided in mix manifold repair kit 256238.

* See manual 313343 for repair instructions.

✿ Not shown.

24F284 Remote Manifold Restrictor Kit

Ref.	Part No.	Description	Qty
		.	
32★	158491	NIPPLE, 1/2 npt	1
33★	159239	NIPPLE, pipe; 1/2 x 3/8 npt	1
113	162505	UNION; 3/8 male x 1/2 female	1
114	222200	VALVE, restrictor	1
115	155699	ELBOW, street; 3/8-18 npt	1
116	156849	NIPPLE, pipe; 2 x 3/8-18 npt	1
118✿	126786	WRENCH, restrictor	1

Repair Kit

256238, XM Mix Manifold without Circulation Repair Kit

See parts lists on pages 22 and 23.

Ref.	Part	Description	Qty
			.
2	117558	SPRING, compression	1
3	101947	BALL, solvent check	1
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
11j	15K692	SEAL, seat retainer	1
16	113137	PACKING, o-ring, black solvent resist	1
17	110004	PACKING, o-ring, white, PTFE	1
108	121139	PACKING, o-ring	2
120✿	15T630	TOOL, u-cup and manifold	1
121✿	113500	ADHESIVE, anaerobic	1

✿ Not shown.

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 machine 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 (AB) as gun pressure gauge. Includes 316 stainless steel wetted.

551387 - 1/4 npt bottom mount version.

262522, Remote Mix Manifold Carriage (101)

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 STAINER; 40m

121410 PACKING, screen retainer

Accessory Ports

See FIG. 13.

(AA) 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.

(AB) “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.

(AC) “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.

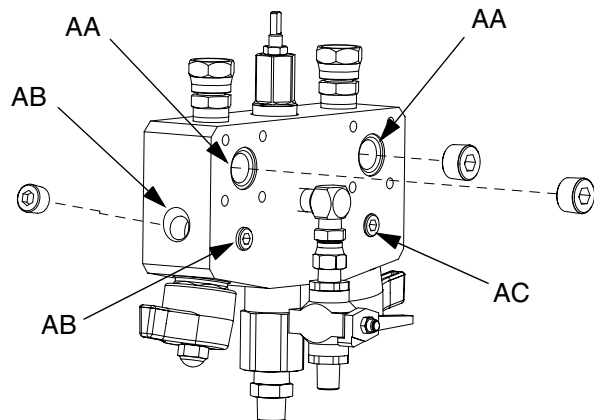


FIG. 13: Accessory Ports

Technical Data

Maximum working pressure	7250 psi (50 MPa, 500 bar)
Maximum fluid temperature	160° F (71° C)
Fluid inlet	1/2 in. npsm union with nipple adapters for 1/2 in., 3/8 in., or 1/4 in. hoses
Fluid outlet size	1/2 npt(f) with 3/8 npt(m) adapter nipple
Solvent inlet valve	1/4 npt(m)
Wetted parts	<i>Manifold block and internal parts:</i> 302 and 303 stainless steel, PTFE, tungsten carbide, electroless nickel plated steel, zinc plated steel, UHMWPE <i>Flush valves and fittings:</i> 440 stainless steel, plated carbon steel, hardened alloy steel, acetal, PTFE

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