

FusionTM CS

312666Z

EN

For plural component, impingement mix air purge spray gun with ClearShotTM Liquid technology. For professional use only.

For use with non-flammable foam and polyurea. Not for use in explosive atmospheres.

3500 psi (24.5 MPa, 245 bar) Maximum Fluid Working Pressure

80-130 psi (0.56-0.9 MPa, 5.6-9.0 bar) Air Inlet Pressure Range

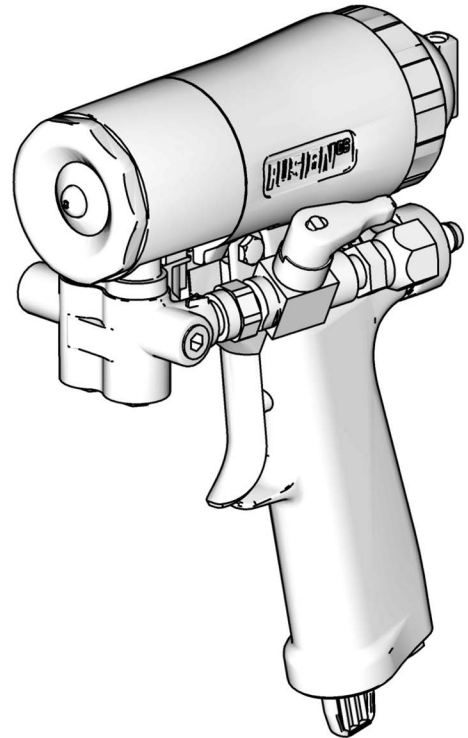
200° F (94° C) Maximum Fluid Temperature



Important Safety Instructions

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

See page 4 for model information.



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Related Manuals

The following manuals are for accessories used with the Fusion CS spray gun. Visit www.graco.com for the most current manual revisions.

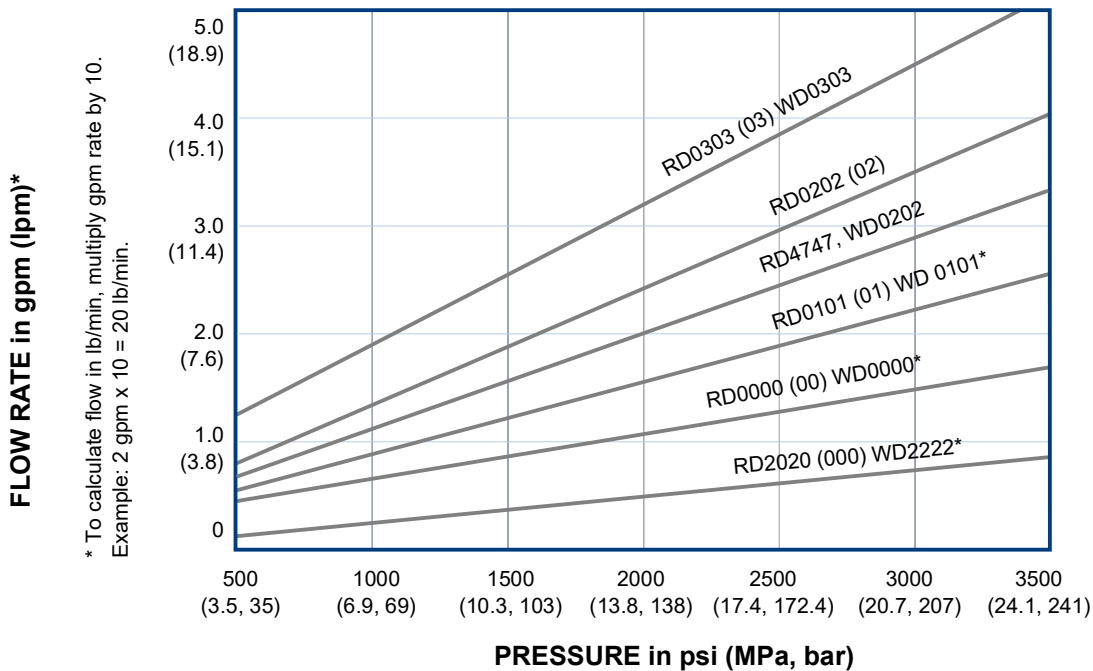
Manual in English	Description
309572	Power-Lock™ Heated Hose, Instructions - Parts Manual
309963	Solvent Flush Kits, Instructions - Parts Manual
313058	256566 Circulation Manifold Kit, Instructions - Parts Manual
313121	256569 TP100 Kit and 256570 Stud Wall Foam Kit, Instructions - Parts Manual
313129	256526 Cleanout Tool Kit, Instructions - Parts Manual
3A6242	Clearshot™ Liquid Refill Kit, Instructions - Parts Manual

Models/Mix Chamber Selection Guide

Round Pattern Guns

Gun Kit, Series	Mix Chamber			
	Part	Impingement Port Size in. (mm)	Equivalent Size	Seal Material
CS20RD, B	RD2020	0.020 (0.50)	-000	SST
CS00RD, B	RD0000	0.029 (0.70)	-00	SST
CS01RD, B	RD0101	0.042 (1.00)	-01	SST
CS02RD, B	RD0202	0.052 (1.30)	-02	SST
CS03RD, B	RD0303	0.060 (1.50)	-03	SST
---	RD4747	0.047 (1.19)	---	SST

Table 1: Round Pattern Gun Flow Rate



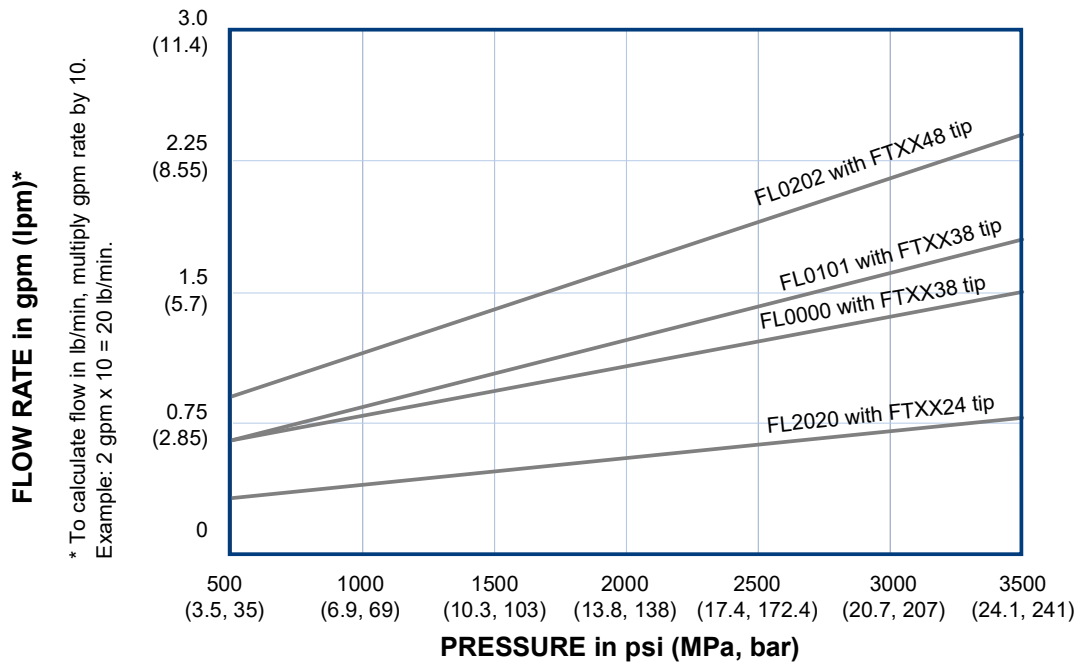
* To calculate flow in lb/min, multiply gpm rate by 10.
Example: 2 gpm x 10 = 20 lb/min.

*Accessory WD (wide pattern) mix chambers are available. See page 42.

Flat Pattern Guns

Gun Kit, Series	Mix Chamber			Flat Tip		
	Part	Impingement Port Size in. (mm)	Equivalent Size	Part	Pattern Size in. (mm)	Orifice Size in. (mm)
CS20F1, B	FL2020	0.020 (0.50)	-000	FT0424	8-10 (203-254)	0.024 (0.61)
CS20F2, B	FL2020	0.020 (0.50)	-000	FT0438	8-10 (203-254)	0.038 (0.97)
CS00F1, B	FL0000	0.029 (0.70)	-00	FT0424	8-10 (203-254)	0.024 (0.61)
CS00F2, B	FL0000	0.029 (0.70)	-00	FT0438	8-10 (203-254)	0.038 (0.97)
CS00F3, B	FL0000	0.029 (0.70)	-00	FT0624	12-14 (305-356)	0.024 (0.61)
CS00F4, B	FL0000	0.029 (0.70)	-00	FT0638	12-14 (305-356)	0.038 (0.97)
CS00F5, B	FL0000	0.029 (0.70)	-00	FT0838	16-18 (406-457)	0.038 (0.97)
CS00F6, B	FL0000	0.029 (0.70)	-00	FT0848	16-18 (406-457)	0.048 (1.22)
CS01F1, B	FL0101	0.042 (1.00)	-01	FT0424	8-10 (203-254)	0.024 (0.61)
CS01F2, B	FL0101	0.042 (1.00)	-01	FT0438	8-10 (203-254)	0.038 (0.97)
CS01F3, B	FL0101	0.042 (1.00)	-01	FT0624	12-14 (305-356)	0.024 (0.61)
CS01F4, B	FL0101	0.042 (1.00)	-01	FT0638	12-14 (305-356)	0.038 (0.97)
CS01F5, B	FL0101	0.042 (1.00)	-01	FT0838	16-18 (406-457)	0.038 (0.97)
CS01F6, B	FL0101	0.042 (1.00)	-01	FT0848	16-18 (406-457)	0.048 (1.22)
CS02F1, B	FL0202	0.052 (1.30)	-02	FT0424	8-10 (203-254)	0.024 (0.61)
CS02F2, B	FL0202	0.052 (1.30)	-02	FT0438	8-10 (203-254)	0.038 (0.97)
CS02F3, B	FL0202	0.052 (1.30)	-02	FT0624	12-14 (305-356)	0.024 (0.61)
CS02F4, B	FL0202	0.052 (1.30)	-02	FT0638	12-14 (305-356)	0.038 (0.97)
CS02F5, B	FL0202	0.052 (1.30)	-02	FT0838	16-18 (406-457)	0.038 (0.97)
CS02F6, B	FL0202	0.052 (1.30)	-02	FT0848	16-18 (406-457)	0.048 (1.22)

Table 2: Flat Pattern Gun Flow Rate












Wide Round Pattern Gun

Gun Kit, Series	Mix Chamber			Pattern Diameter at 24 in. (610 mm) to Target in. (mm)	Equivalent Flow to Mix Chamber Size Reference Part
	Part	Impingement Port Size in. (mm)	Equivalent Size		
CS22WD, B	WD2222	0.022 (0.56)	N/A	8-9 (203-229)	4.5 lb/min at 1000 psi
CS00WD, B	WD0000	0.028 (0.71)	-00	15 (381.0)	RD0000
CS01WD, B	WD0101	0.039 (0.99)	-01	16 (406.4)	RD0101
CS02WD, B	WD0202	0.046 (1.17)	-02	18 (457.2)	RD0202
CS03WD, B	WD0303	0.057 (1.45)	-03	18 (457.2)	RD0303

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.

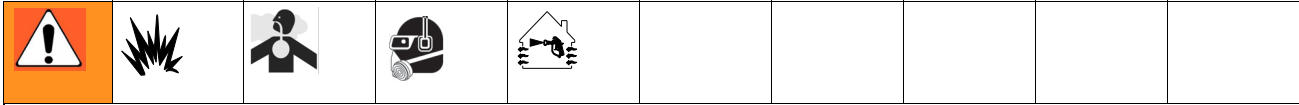
 WARNING	
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>Always wear appropriate personal protective equipment and cover all skin when spraying, servicing equipment, or when in the work area. Protective equipment helps prevent serious injury, including long-term exposure; inhalation of toxic fumes, mists or vapors; allergic reaction; burns; eye injury and hearing loss. This protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • 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.
 	<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. • Engage trigger lock when not spraying. • Follow Pressure Relief Procedure in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.
	<p>BURN HAZARD</p> <p>Equipment surfaces and fluid that's heated can become very hot during operation. To avoid severe burns, do not touch hot fluid or equipment. Wait until equipment/fluid has cooled completely.</p>
	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Ground all equipment in the work area. See Grounding instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. • If there is static sparking or you feel a shock, stop operation immediately. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.

 WARNING	
	<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 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. • 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>PRESSURIZED ALUMINUM PARTS HAZARD</p> <p>Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in pressurized aluminum equipment. Such use can cause serious chemical reaction and equipment rupture, and result in death, serious injury, and property damage.</p>

Important Isocyanate (ISO) Information

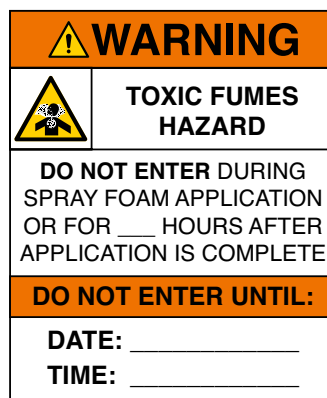
Isocyanates (ISO) are catalysts used in two component materials.

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 Sheet (SDS) 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 SDS.
- Use of incorrectly maintained or mis-adjusted equipment may result in improperly cured material, which could cause off gassing and offensive odors. 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 SDS.
- 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.
- Hazard from exposure to isocyanates continues after spraying. Anyone without appropriate personal protective equipment must stay out of the work area during application and after application for the time period specified by the fluid manufacturer. Generally this time period is at least 24 hours.
- Warn others who may enter work area of hazard from exposure to isocyanates. Follow the recommendations of the fluid manufacturer and local regulatory authority. Posting a placard such as the following outside the work area is recommended:



Material Self-ignition

				
Some materials may become self-igniting if applied too thick. Read material manufacturer's warnings and Safety Data Sheet (SDS).				

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:				
<ul style="list-style-type: none"> • Never interchange component A and component B wetted parts. • Never use solvent on one side if it has been contaminated from the other side. 				

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.				
<ul style="list-style-type: none"> • 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.



Foam Resins with 245 fa Blowing Agents

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

Changing Materials

NOTICE				
Changing the material types used in your equipment requires special attention to avoid equipment damage and downtime.				
<ul style="list-style-type: none"> • 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. 				

ClearShot Liquid

				
Read material MSDS to know specific hazards and precautions related to ClearShot Liquid.				

Overall View

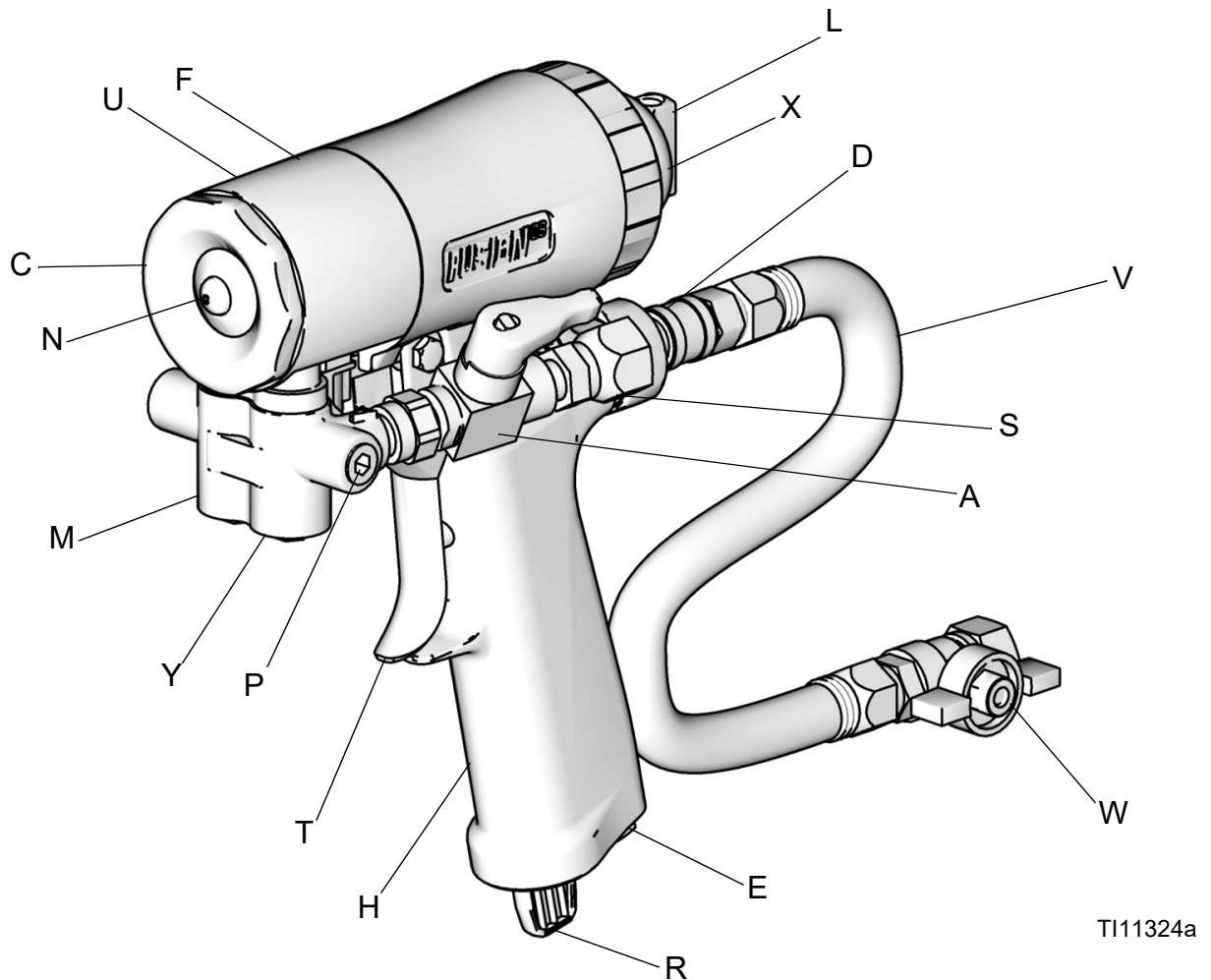
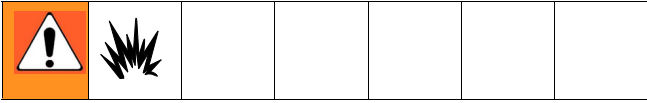


FIG. 1

Key:

- | | | | |
|---|--|---|---|
| A | A Side Fluid Valve (ISO) | U | Front Cover |
| B | B Side Fluid Valve (RESIN) (not shown) | V | Gun Air Whip Hose |
| C | Front Cover Retainer | W | Air Valve |
| D | Air Line Quick Coupler | X | Variable Flow Adjustment Knob |
| E | Breather Plug | Y | Manifold Check Valve/Inlet Screen Housing |
| F | Fluid Housing (under cover) | | |
| H | Handle | | |
| L | Piston Safety Lock/Flow Selector Knob | | |
| M | Gun Fluid Manifold | | |
| N | Mix Chamber Nozzle | | |
| P | Optional Fluid Inlets (A Side Shown) | | |
| R | ClearShot Liquid Cartridge | | |
| S | Fluid Inlet Swivels (A Side Shown) | | |
| T | Trigger | | |

Grounding

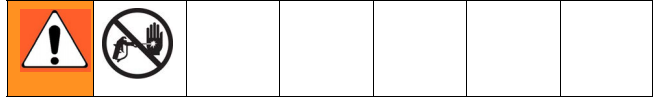


Check your local electrical code and proportioner manual for detailed grounding instructions.

Ground the spray gun through connection to a Graco-approved grounded fluid supply hose.

Piston Safety Lock

Engage piston safety lock whenever you stop spraying to avoid accidental triggering.



Engage

To engage piston safety lock, push knob in and turn clockwise. If engaged, gun will not actuate.

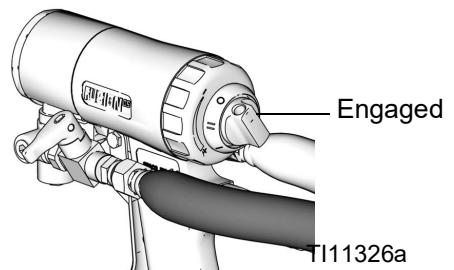


FIG. 2

Disengage

To disengage piston safety lock, push knob in and turn counterclockwise until it pops out. There will be a gap between knob and gun body.

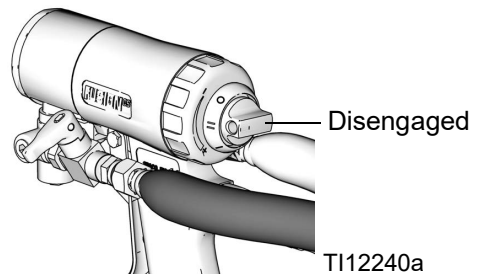
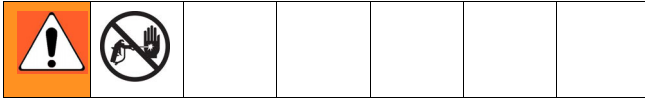
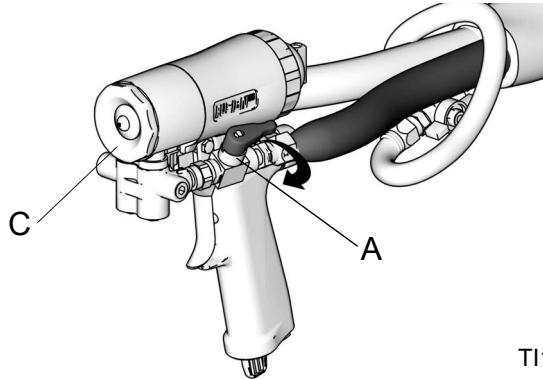


FIG. 3

Remove Front Cover



1. Follow **Pressure Relief Procedure**, page 16.
2. Ensure fluid valves A and B are closed before turning front cover retainer (C).



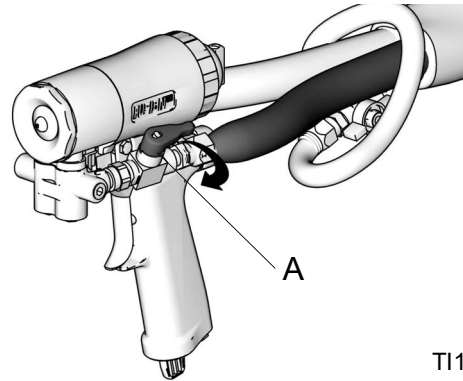
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FIG. 4

Loss of Air Pressure

In event of loss of air pressure, gun will continue to spray. To shut off gun, do one of the following:

- Push in piston safety lock, see page 12.
- Close fluid valves A and B.



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FIG. 5

Setup

1. Close fluid valves A and B.

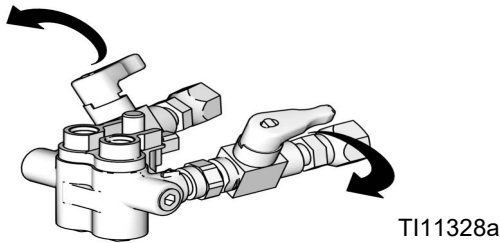


FIG. 6

2. Connect A (ISO) and B (RESIN) fluid hoses to fluid manifold.

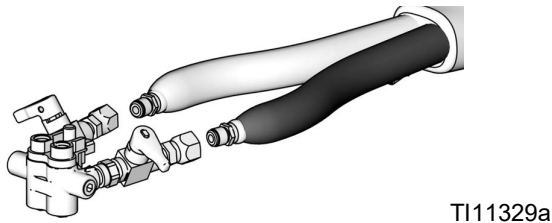


FIG. 7

3. Purge air from fluid lines using feed pump pressure only (less than 500 psi (3.5 MPa, 35 bar)).
 - a. Ensure fluid valves are closed. Open fluid manifold check valves 2 to 2-1/2 turns.
 - b. Open fluid valves and wait for all air to bleed from fluid hoses.
 - c. Close fluid valves and retighten fluid manifold check valves.

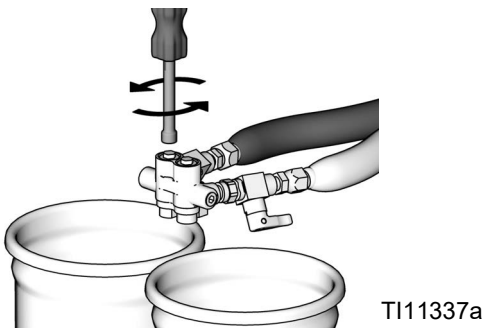


FIG. 8

4. Engage piston safety lock, page 12.
5. Install ClearShot Liquid cartridge. See **ClearShot Liquid Cartridge Installation/Removal**, page 20.

6. Connect gun air whip hose (V) air valve (W) to main air hose. Assemble fluid manifold (M) to gun by hand, and then tighten bolt.
7. Connect air line to quick coupler (D). Turn on air. Open air valve (W). Air should flow from nozzle (N).

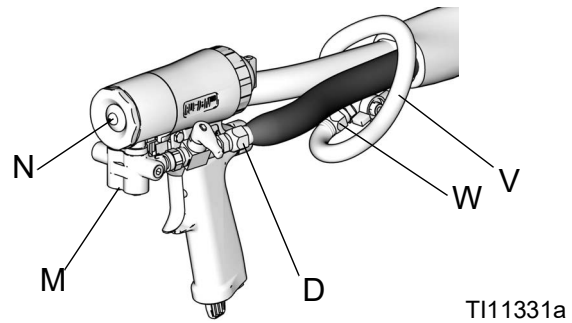


FIG. 9

8. Apply layer of lubricant over front cover of gun and front cover retainer, or use gun cover to prevent overspray buildup and ease disassembly.
9. Disengage piston safety lock, page 12.

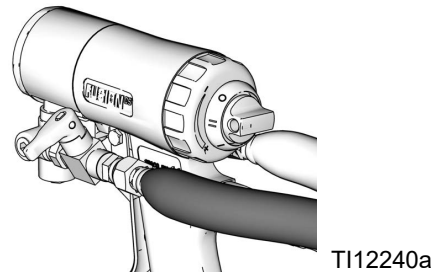


FIG. 10

10. Trigger gun to check for full mix chamber travel and to prime ClearShot Liquid dosing pump. See **ClearShot Liquid Cartridge Installation/Removal**, page 20.

11. Engage piston safety lock, page 12.

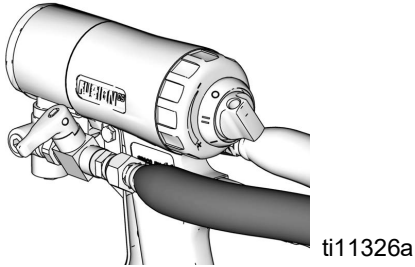


FIG. 11

12. Turn on proportioner.

13. Open B (RESIN) fluid valve. Then open A (ISO) fluid valve.

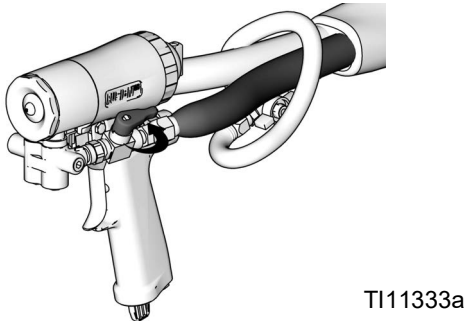


FIG. 12

14. Disengage piston safety lock, page 12.

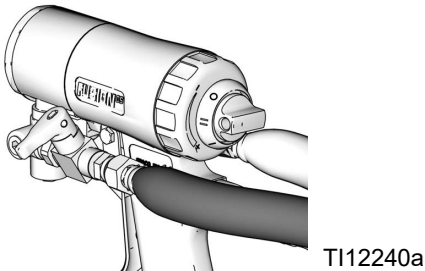


FIG. 13

15. Test spray onto cardboard. Adjust pressure and temperature to get desired results.

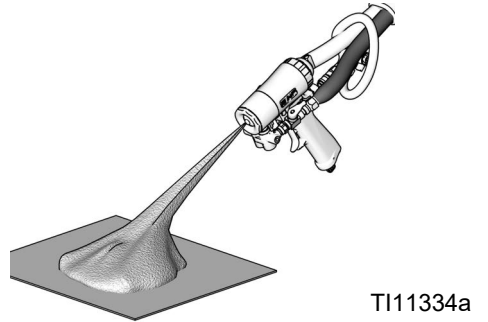


FIG. 14

16. The gun is now ready to spray.

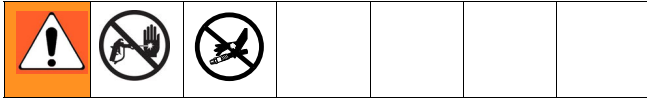
<p>NOTICE</p> <p>Air supply is required for gun actuation. Do not disconnect gun air supply until fluid pressure is relieved, page 16.</p>

Shutdown

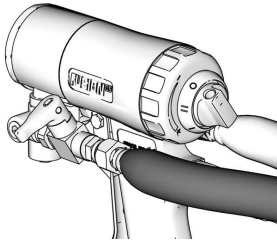
Overnight Shutdown

1. Follow **Pressure Relief Procedure**, page 16.
2. See **Maintenance**, page 22.

Pressure Relief Procedure



1. Engage piston safety lock, page 12.



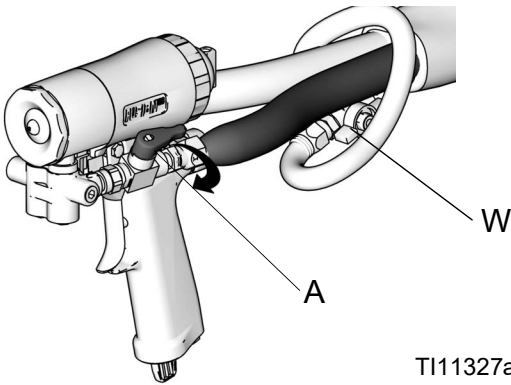
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FIG. 15

NOTICE

Air supply is required for gun actuation. Do not disconnect gun air supply until fluid pressure is relieved.

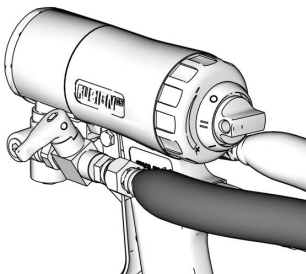
2. Close fluid valves A and B. Leave air valve (W) open.



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FIG. 16

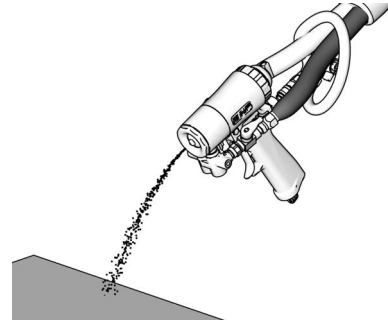
3. Disengage piston safety lock, page 12.



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FIG. 17

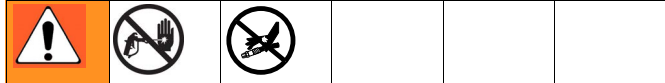
4. Trigger gun onto cardboard or into waste container to relieve pressure.



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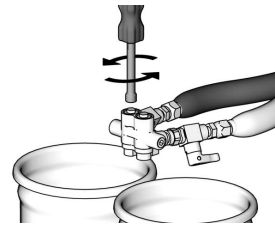
FIG. 18

5. Engage piston safety lock, page 12.



Fluid in the hose and proportioner is still under pressure. Follow the Pressure Relief Procedure in the proportioner manual.

To relieve pressure in the hose manifold after the gun is removed, place the fluid manifold over containers, facing away from you. Ensure fluid valves are closed. Very slowly open fluid manifold check valves 2 to 2-1/2 turn. Under high pressure, fluid will spray sideways from the fluid ports.



T111337a

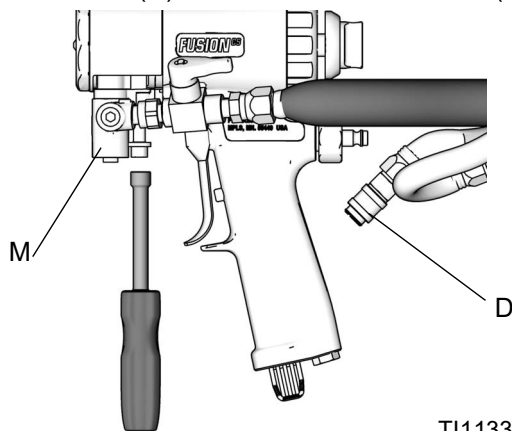
Optional Hose Position

Fluid inlet swivel fittings point to rear. If desired, these positions can be changed so hoses point downward.

NOTICE

To prevent cross-contamination of gun's wetted parts, do not interchange A component (isocyanate) and B component (resin) parts.

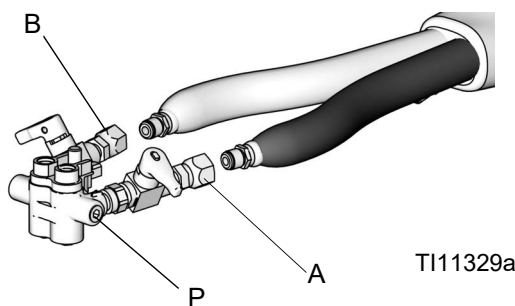
1. Follow **Pressure Relief Procedure**, page 16. Also relieve system pressure, see proportioner manual.
2. Disconnect air (D) and remove fluid manifold (M).



TI11330a

FIG. 19

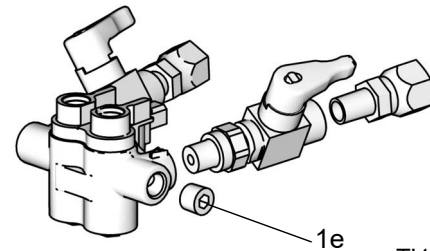
3. Disconnect fluid hoses from inlet swivels (A, B). Remove fluid valve assemblies. Remove plugs from optional inlets (P).



TI11329a

FIG. 20

4. Apply thread sealant to plugs (1e), elbows (35), and male threads of fluid valve assemblies. Install elbows (35) in optional inlets, facing down. Install fluid valve assemblies in elbows. Be sure to install A fluid assembly in A side. Install plugs where swivels had been. Torque all parts to 235-245 in-lb (26.6-27.7 N•m).



TI12085a

FIG. 21

5. Connect A and B hoses to A and B swivels.
6. Attach fluid manifold. Connect air. Return gun to service.

Flat Spray Tips

1. Follow **Pressure Relief Procedure**, page 16.
2. Unscrew and remove front cover retainer (C).
3. Remove front cover (U) and o-ring (2b). Inspect o-ring.
4. Remove tip retainer (46) and tip (21). Inspect o-ring (47).
5. Remove fluid housing (F). Loosen A and B side seals. Slide flat mix chamber (14) out rear of fluid housing.

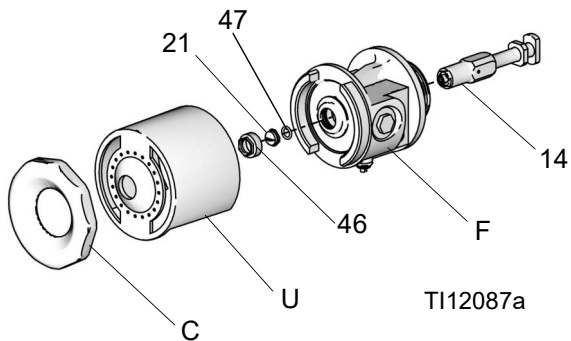


FIG. 22

NOTE: If tip is stuck, pry off with small screwdriver or pull off with pliers. Tip is hardened to resist damage.

6. To clean, soak tip in compatible solvent. Clean gently with tip cleanout tool 15D234; page 49 for details of tool.
7. Reassemble in reverse order.
 - a. Insert mix chamber (14) from rear of fluid housing.
 - b. Tighten A and B side seals on fluid housing.
 - c. Assemble o-ring (47), tip (21), and tip retainer (46) to front of mix chamber (14).

8. Reposition tip horizontally or vertically, or install different tip size.

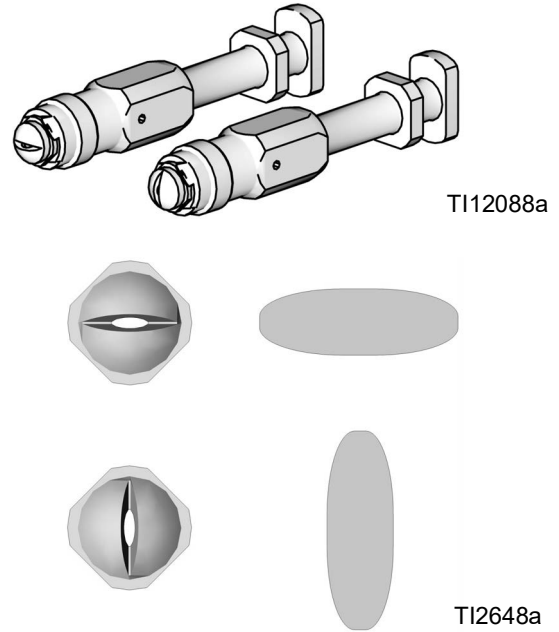


FIG. 23

NOTE: Tips marked on back with last three digits of part number. See **Flat Tip Kits**, page 43.

9. Reinstall fluid housing (F) to handle.
10. Reinstall front cover (U) and front cover retainer (C).

Variable Flow

Operation

NOTE: The variable flow feature is designed to provide immediate adjustment between a full flow pattern (determined by mix chamber size) and a user defined reduced flow pattern.

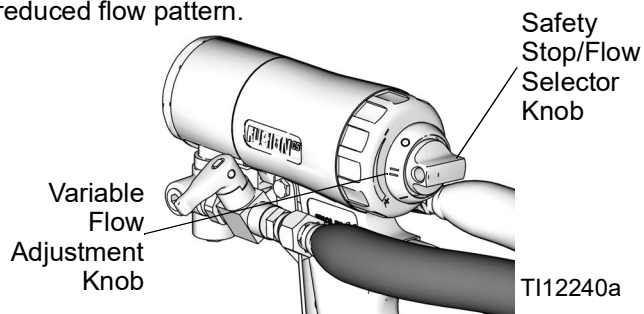


FIG. 24

Reduced Flow

To spray a reduced flow pattern, push in and turn flow selector knob to variable flow position. See FIG. 25.

Full Flow

To return to a full flow pattern, push in and turn flow selector knob to full flow position. See FIG. 25.

Change Variable Flow Adjustment Knob

1. Turn air valve (W) OFF.
2. Turn flow selector knob to variable flow position. See FIG. 25.

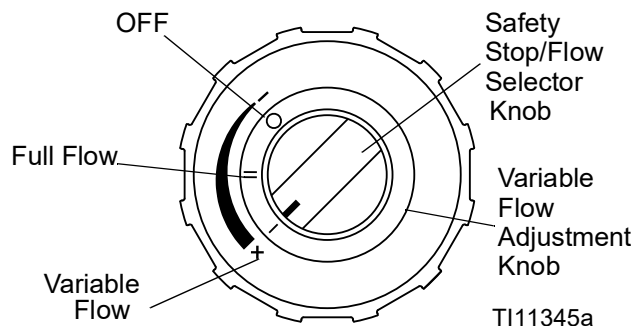


FIG. 25

3. **To increase variable flow:** push in and turn variable flow knob counterclockwise.

To decrease variable flow: push in and turn variable flow knob clockwise.

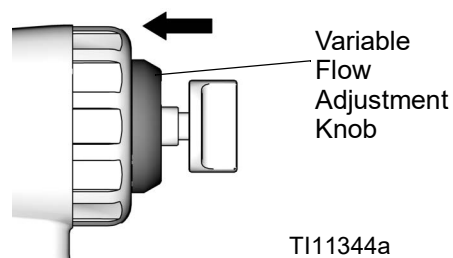


FIG. 26

NOTE: The variable flow adjustment knob cannot be adjusted when the flow selector knob is in the safety stop position. See FIG. 25.

The variable flow adjustment knob locks into detents every 15°. Ensure knob is locked into a detent before proceeding to step 5.

4. Turn air valve ON, and open fluid valves. Verify that flow selector knob is set to the variable flow position. See FIG. 25.
5. Test spray pattern on cardboard. Repeat steps 1 through 6 until desired spray pattern is reached.

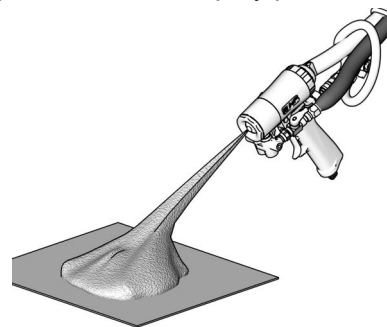


FIG. 27

ClearShot Liquid Cartridge Installation/Removal

NOTE: If ClearShot Liquid cartridge removal or installation is difficult, lubricate cartridge o-rings and/or cartridge bore with a few drops of ClearShot Liquid. Water-based lubricants can be used as well.

NOTE: Do not use Fusion grease or other petroleum- or vegetable-based lubricants. They will cause cartridge o-rings to swell and stick inside gun handle.

Install ClearShot Liquid Cartridge

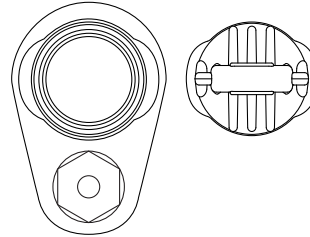
1. Follow **Pressure Relief Procedure**, page 16.
2. Remove plastic cap from new ClearShot Liquid cartridge.



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FIG. 28

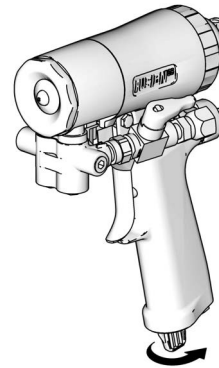
3. Insert cartridge into gun handle. Ensure cartridge tabs are aligned correctly with cartridge tab recesses in gun handle.



TI113341a

FIG. 29

4. After cartridge is fully inserted, turn cartridge 1/4 turn clockwise to lock it into gun handle.



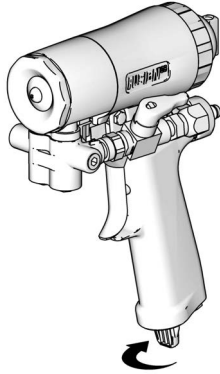
TI113342a

FIG. 30

5. Turn air valve ON and prime ClearShot Liquid dosing pump.
 - a. Trigger gun 20 times to prime dosing pump.
 - b. Trigger gun onto cardboard to see dosed ClearShot Liquid.
6. Resume spraying.

Remove ClearShot Liquid Cartridge

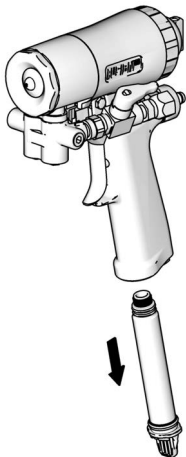
1. Follow **Pressure Relief Procedure**, page 16.
2. Turn air valve (W) OFF.
3. Push in and turn cartridge 1/4 turn counterclockwise (viewed from bottom).



T111338a

FIG. 31

4. Pull cartridge out of gun handle.



T111339a

FIG. 32

Troubleshooting

For ClearShot Liquid cartridge troubleshooting, see **Troubleshooting** on page 26.

Maintenance

Supplied Tool Kit

- Hex Nut Driver; 5/16
- Screwdriver; 1/8 blade
- Nozzle Drill Bit; various sizes depending on nozzle size. See Table 1.
- Impingement Port Drill Bit; various sizes depending on port size. See Table 3.
- 117661 Pin Vise; dual reversible chucks

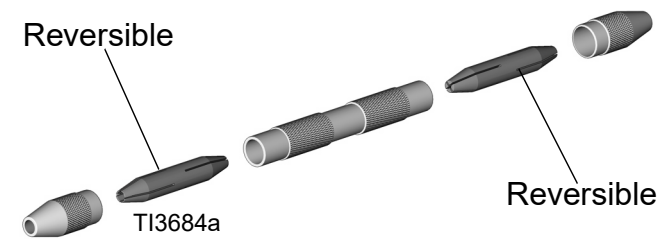


FIG. 33

- 15B817 Flush Manifold

Keep Gun Clean

Keep gun clean with accessory gun cover, page 48.

Applying a light coat of lubricant will make cleaning easier.

As Needed

1. **Clean Outside of Gun**, page 22.
2. **Clean Mix Chamber Nozzle**, page 24, a minimum of once a day.
3. **Clean Breather Plug**, page 23.
4. **Clean Fluid Manifold**, page 23.
5. **Clean Passages**, page 24.
6. **Clean Impingement Ports**, page 25.
7. **Adjust Fluid Valve Packings**, page 23.

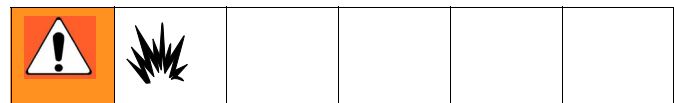
Daily

Follow **Shutdown**, page 15.

Weekly to Monthly

1. Clean **Mix Chamber and Side Seal Assemblies**, page 33. Check o-rings.
2. Clean **Check Valves**, page 35. Check o-rings and filters.

Flush Gun



1. Follow **Pressure Relief Procedure**, page 16.
2. Flush with compatible solvent into a grounded metal pail, holding a metal part of fluid manifold firmly to side of pail. Use lowest possible fluid pressure when flushing.
3. Follow **Pressure Relief Procedure**, page 16.

NOTE: For a more thorough flush, a solvent flush kit (256510 248229) is available as an accessory.

Clean Outside of Gun

Wipe off outside of gun with compatible solvent. Use N-Methylpyrrolidone (NMP), Dynasolve CU-6, Dzolv, or an equivalent to soften cured material.

NOTICE

These solvents are not recommended for flushing; use only for cleaning.

Clean or Replace Front Cover and Retainer

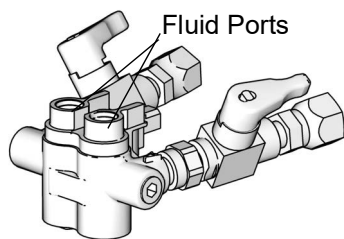
Soak front cover retainer (C) and front cover (U) in compatible solvent. Brush or wipe clean. Replace as needed.

Clean Breather Plug

Remove and clean breather plug with compatible solvent.

Clean Fluid Manifold

Clean fluid manifold fluid ports with compatible solvent and brush whenever removed from gun. Do not damage the internal sealing surfaces. Fill fluid ports with grease if left exposed, to seal out moisture.

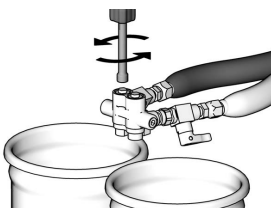


TI12089a

FIG. 34:

Clean or Replace Fluid Screens

1. Follow **Pressure Relief Procedure**, page 16.
2. Relieve pressure in hose manifold after gun is removed.
 - a. Place the fluid manifold over containers, facing away from you.
 - b. Ensure fluid valves are closed.
 - c. Very slowly open fluid manifold check valves 2 to 2-1/2 turn. Under high pressure, fluid will spray sideways from the fluid ports.



TI11337a

FIG. 35

3. Remove fluid screens by unthreading them from fluid manifold.

NOTICE

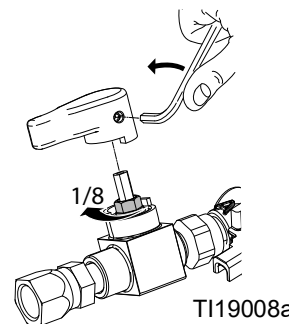
To prevent cross-contamination of the check valves, do not interchange A component and B component parts. The A component check valve is marked with an A.

4. Clean or replace fluid screens. See **Accessories**, page 48.
5. Carefully inspect o-rings and fluid screen surfaces. Replace if worn or damaged.
6. Liberally lubricate o-rings and reassemble. Use a hex nut driver to tighten.

Adjust Fluid Valve Packings

Periodic adjustment may be necessary to stop fluid leakage. If fluid valve is leaking, adjust the packings:

1. Follow **Pressure Relief Procedure**, page 16.
2. Loosen set screw and remove valve handle.
3. Turn valve packing nut clockwise in 1/8-turn increments until leak is corrected.
4. Re-pressurize system then check for leaks. Repeat procedure as necessary.

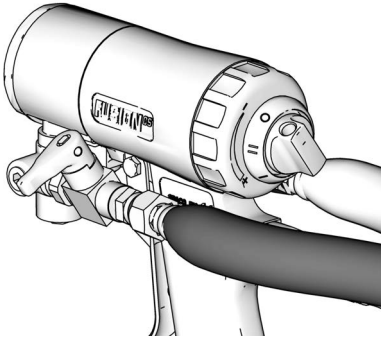


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FIG. 36

Clean Mix Chamber Nozzle

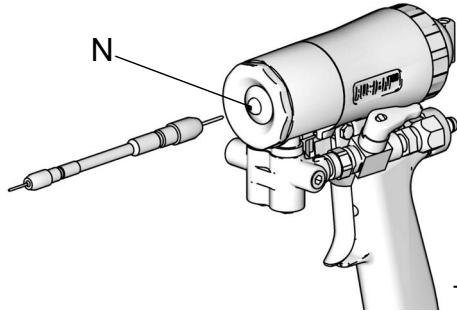
1. Engage piston safety lock, page 12.



T111326a

FIG. 37

2. Refer to Table 1. Also see identification chart under **Drill Bit Kits**, page 46. Use appropriate size drill bit to clean mix chamber nozzle (N).



T112090a

FIG. 38

Table 1: Nozzle Drill Bit Sizes

Round Spray		Flat Spray	
Mix Chamber	Drill Size in. (mm)	Mix Chamber	Drill Size in. (mm)
RD2020	#58, 0.042 (1.00)	FL2020	3/32, 0.094 (2.35)
RD0000	#55, 0.052 (1.30)	FL0000	3/32, 0.094 (2.35)
RD0101	#53, 0.060 (1.50)	FL0101	3/32, 0.094 (2.35)
RD4747	0.045 (1.15)		
RD0202	#50, 0.070 (1.75)	FL0202	3/32, 0.094 (2.35)
RD0303	#44, 0.086 (2.15)		

Clean Passages

If necessary, clean out passages in fluid housing and handle with drill bits. All drill bits are available in an accessory kit. Order kit 256526 for ClearShot Handle Drill Kit; see **Accessories**, page 48.

Clean Impingement Ports

1. Follow **Pressure Relief Procedure**, page 16.
2. Disconnect air (D) and remove fluid manifold (M).

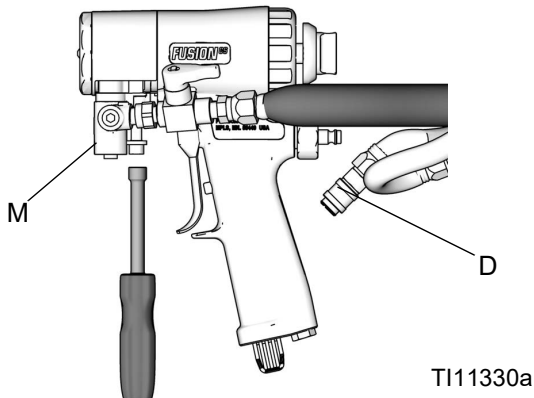


FIG. 39

3. **Flush Gun**, page 22. If gun will not flush, see **Mix Chamber and Side Seal Assemblies**, page 33.
4. **Remove Front End**, page 31.
5. Loosen A and B side seals two turns.
6. Pull out mix chamber from back of fluid housing. See Table 2 for appropriate size drill to clean ports. Also see identification chart under **Drill Bit Kits**, page 46.

NOTE: Some mix chambers have counter bored holes and require two drill sizes to clean impingement ports completely.

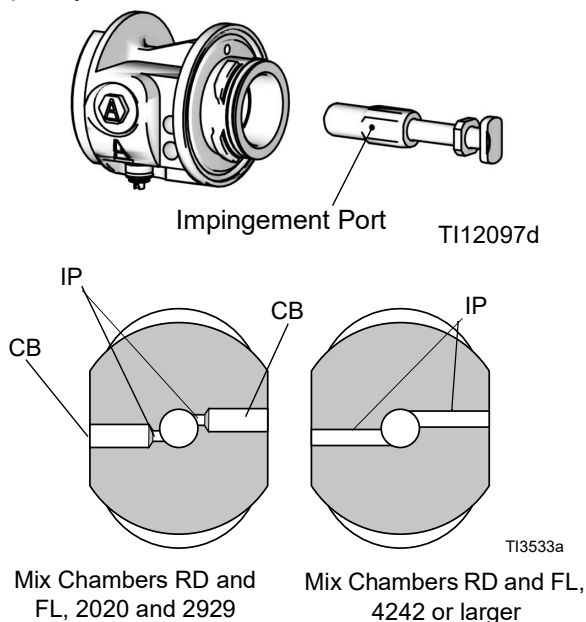


FIG. 40

Table 2: Impingement Port Drill Bit Sizes

Mix Chamber	Impingement Port (IP) Drill Bit Size in. (mm)	Counter-bore (CB) Drill Bit Size in. (mm)
RD2020	#76, 0.020 (0.50)	#53, 0.060 (1.50)
RD0000	#69, 0.029 (0.70)	#53, 0.060 (1.50)
RD0101	#58, 0.042 (1.00)	N/A
RD4747	0.045 (1.15)	N/A
RD0202	#55, 0.052 (1.30)	N/A
RD0303	#53, 0.060 (1.50)	N/A
FL2020	#76, 0.020 (0.50)	#53, 0.060 (1.50)
FL0000	#69, 0.029 (0.70)	#53, 0.060 (1.50)
FL0101	#58, 0.042 (1.00)	N/A
FL0202	#55, 0.052 (1.30)	N/A

7. Push mix chamber back into position.
8. Tighten A and B side seals.
9. **Attach Front End**, page 32.
10. Attach fluid manifold (M). Connect air (D). Return gun to service.

Troubleshooting

1. Follow **Pressure Relief Procedure**, page 16, before checking or repairing gun.
2. Check all possible problems and causes before disassembling gun.

NOTICE
To prevent cross-contamination of gun's wetted parts, do not interchange A component (isocyanate) and B component (resin) parts.

PROBLEM	CAUSE	SOLUTION
Gun does not fully actuate when triggered.	Safety lock engaged.	Disengage piston safety lock. See Piston Safety Lock , page 12.
	Plugged breather plug (9).	Clean Breather Plug , page 23.
	Damaged air valve o-rings (15).	Replace. See Air Valve , page 37.
Fluid does not spray when gun is fully actuated.	Closed fluid valves (1b).	Open.
	Plugged impingement ports.	Clean Impingement Ports , page 25.
	Plugged check valves (44,45).	Clean. See Check Valves , page 35.
Gun actuates slowly.	Plugged breather plug (9).	Clean Breather Plug , page 23.
	Damaged piston o-rings (4a, 4c).	Replace. See Piston , page 36.
	Dirty air valve, or damaged o-rings (15).	Clean air valve or replace o-rings. See Air Valve , page 37.
Gun delays, then actuates abruptly.	Cured material around side seals (42, 43).	Inspect side seals (42c) and mix chamber (14) for scratches. Replace; see Mix Chamber and Side Seal Assemblies , page 33.
Loss of round pattern.	Dirty mix chamber (14) nozzle.	Clean Mix Chamber Nozzle , page 24.
	Empty ClearShot Liquid cartridge.	Replace. See ClearShot Liquid Cartridge Installation/Removal , page 20.
	ClearShot Liquid dosing pump is not primed.	Prime dosing pump. See ClearShot Liquid Cartridge Installation/Removal , page 20.
Loss of flat pattern.	Plugged spray tip.	Clean in compatible solvent.
	Worn tip.	Replace. See Flat Spray Tips , page 18.
	Empty ClearShot Liquid cartridge.	Replace. See ClearShot Liquid Cartridge Installation/Removal , page 20.
	Dirty mix chamber (14) nozzle.	Clean Mix Chamber Nozzle , page 24.

PROBLEM	CAUSE	SOLUTION
Leakage between flat tip and mix chamber.	Tip not seated properly.	Reassemble. See Flat Spray Tips , page 18.
	Damaged/missing o-ring (47).	Replace. See Flat Spray Tips , page 18.
Pressure imbalance.	Plugged impingement ports.	Clean Impingement Ports , page 25.
	Plugged check valves (44, 45).	Clean. See Check Valves , page 35.
	Viscosities not equal.	Adjust temperature to compensate.
	Plugged fluid screens.	Clean. See Clean or Replace Fluid Screens , page 23.
A and/or B fluid in gun air section.	Damaged side seals (42, 43).	Replace. See Mix Chamber and Side Seal Assemblies , page 33.
	Damaged mix chamber (14).	Replace. See Mix Chamber and Side Seal Assemblies , page 33.
	Damaged side seal o-rings (42d, 42e).	Replace. See Mix Chamber and Side Seal Assemblies , page 33.
	Tightened flat tip retainer with fluid valves (1b) open.	Close valves first.
Fluid mist from mix chamber.	Damaged side seals (42, 43).	Replace. See Mix Chamber and Side Seal Assemblies , page 33.
	Damaged side seal o-rings (42d, 42e).	Replace. See Mix Chamber and Side Seal Assemblies , page 33.
	Damaged mix chamber (14).	Replace. See Mix Chamber and Side Seal Assemblies , page 33.
	Dosed ClearShot Liquid normal.	No action required.
Rapid buildup of material on air cap.	Plugged front cover holes.	Clean or Replace Front Cover and Retainer , page 23.
	Damaged/missing fluid housing o-ring (2b or 2c).	Replace. See Parts , page 38.
	Damaged front o-ring (2b).	Replace. See Parts , page 38.
Reduced cleanoff air.	Damaged fluid housing o-ring (2d).	Replace. See Parts , page 38.
Excessive purge air when fluid valves are closed and gun is de-triggered.	Damaged/missing fluid housing o-ring (2c).	Replace. See Parts , page 38.
Fluid does not shut off when fluid valves are closed.	Damaged fluid valves (1b).	Replace. See Parts , page 38.
Burst of air from muffler when gun is triggered.	Normal.	No action required.

PROBLEM	CAUSE	SOLUTION
Steady air leakage from muffler.	Damaged air valve o-rings (4d).	Replace. See Air Valve , page 37.
	Damaged piston o-rings (4a, 4c).	Replace. See Piston , page 36.
Air leakage from front air valve.	Damaged air valve o-rings (4d).	Replace. See Air Valve , page 37.
Air leak between handle and fluid housing.	Damaged o-ring (2c or 2d).	Replace. See Parts , page 38.
Cannot tighten front cover retainer (20) until it bottoms out.	Installing round mix chamber front cover on a flat tip gun.	Inspect front cover for flat tips 256416 and for round tips 256414.
Gun does not dose ClearShot Liquid.	Empty ClearShot Liquid cartridge.	Replace. See ClearShot Liquid Cartridge Installation/Removal , page 20.
	ClearShot Liquid dosing pump is not primed.	Prime dosing pump. See ClearShot Liquid Cartridge Installation/Removal , page 20.
	Damaged cartridge o-rings.	Replace. See ClearShot Liquid Cartridge Installation/Removal , page 20.
	Damaged or cracked cartridge.	Replace. See ClearShot Liquid Cartridge Installation/Removal , page 20.
	Damaged dosing piston.	Repair. See Piston , page 36.
Excessive ClearShot Liquid dosing; producing less than 1000 doses per cartridge.	Non-regulated air supply to gun.	Regulate air supply to gun.
	Excessive air pressure at gun.	Regulate air supply to 80 psi (0.56 MPa, 5.6 bar).
	Damaged or dirty o-rings on air piston and/or dosing piston.	Repair or clean o-rings. See Piston , page 36.
ClearShot Liquid cartridge installation or removal is difficult.	Friction between cartridge o-rings and cartridge bore.	Lubricate cartridge o-rings and/or cartridge bore with a few drops of ClearShot Liquid. See, page 20.
ClearShot Liquid cartridge is pressure locked in cartridge bore.	Cartridge is empty. Temporary cartridge pressure lock.	Engage piston safety lock and trigger gun 20 times to bleed pressure in cartridge. See ClearShot Liquid Cartridge Installation/Removal , page 20.

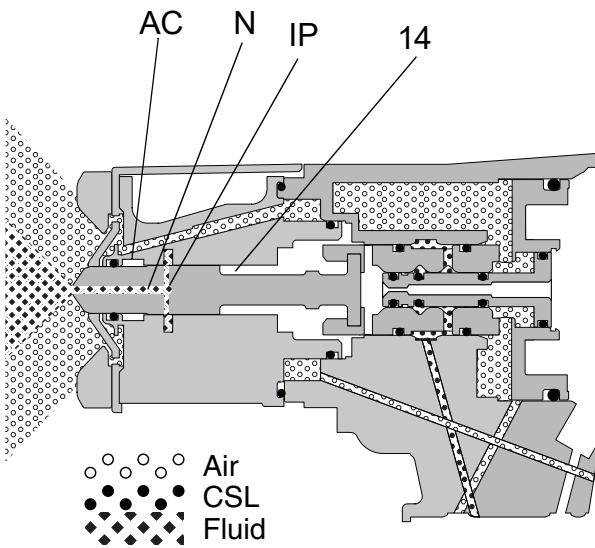
Theory of Operation

Gun Triggered (Fluid Spraying)

Mix chamber (14) moves back, shutting off purge air flow. Impingement ports (IP) align with fluid ports of side seals (42, 43), allowing fluid to flow through mix chamber nozzle (N).

NOTE: Flow paths are not shown to scale, for clarity.

CSL is dosed into purge air.



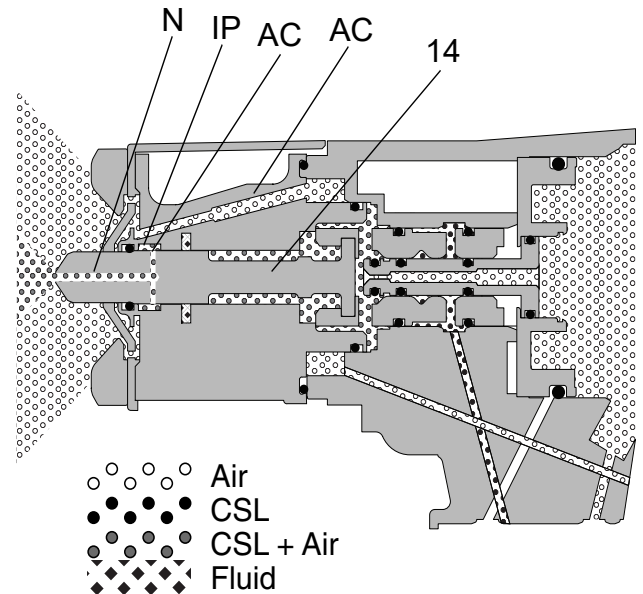
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Gun Detriggered (Air Purging)

Mix chamber (14) moves forward, shutting off fluid flow. Impingement ports (IP) open to air chamber (AC), allowing purge air to flow through mix chamber nozzle (N).

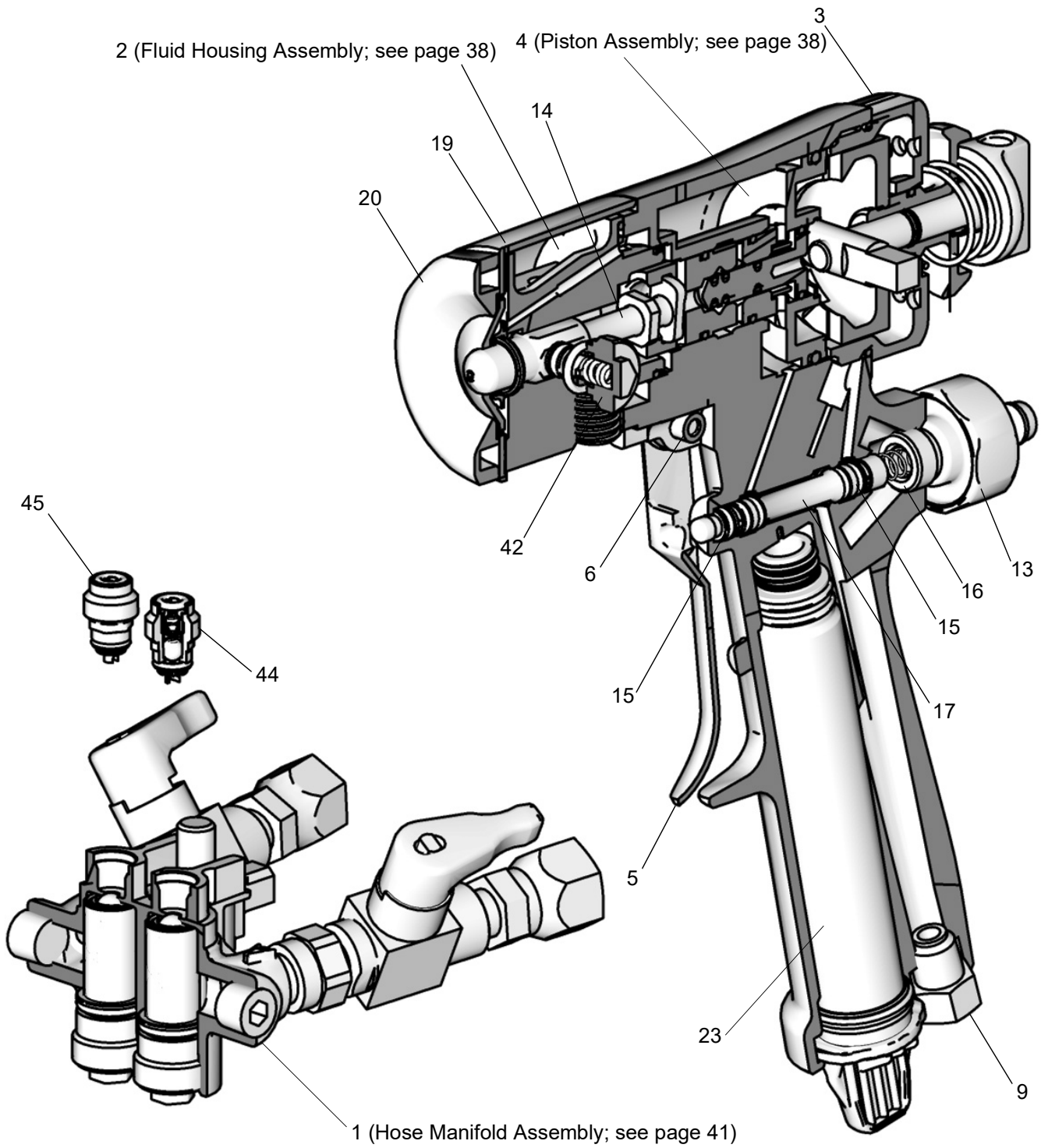
NOTE: Flow paths are not shown to scale, for clarity.

CSL is dosed into purge air.



T112124a

Cutaway View



T112091a

Repair

Tools Required

Tools required to complete gun repair procedures:



- adjustable wrench
- flat head screwdriver (included)
- 5/16 hex nut driver (included)

Lubrication

See page 48 to order lubricant. Liberally lubricate all o-rings, seals, and threads.

NOTE: Do not lubricate o-ring, seals, and threads on ClearShot Liquid cartridge.

Remove Front End

						
Proper attachment of front end is critical. Do not operate gun if front end is loose or not snug against handle.						

1. Follow **Pressure Relief Procedure**, page page 16.
2. **Flush Gun**, page 22.

NOTICE

If front cover retainer (C) and front cover (U) are stuck due to material buildup, do not force it by turning entire front end. Soak front of gun in solvent to soften cured material and free front cover and front cover retainer.

3. Use hex nut driver to remove fluid manifold (M).
4. Unscrew and remove front cover retainer (C).

5. Remove front cover (U).

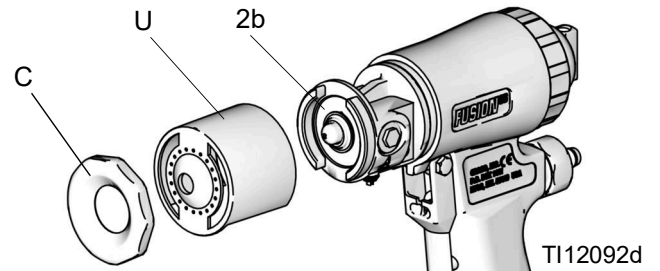


FIG. 41

6. Turn fluid housing (F) 1/4 turn counterclockwise to disengage slots. Remove fluid housing.

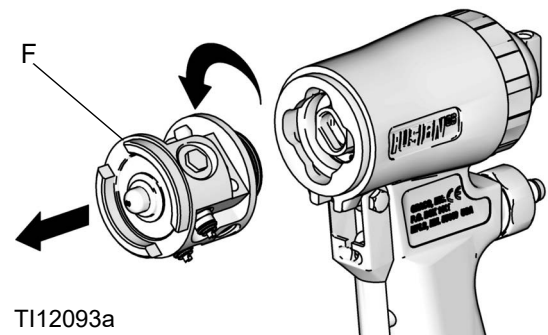


FIG. 42

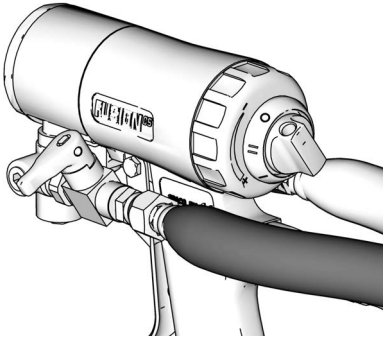
7. Inspect fluid housing o-rings for wear or damage. Replace if necessary.

Attach Front End



Proper attachment of front end is critical. Do not operate gun if front end is loose or not snug against handle.

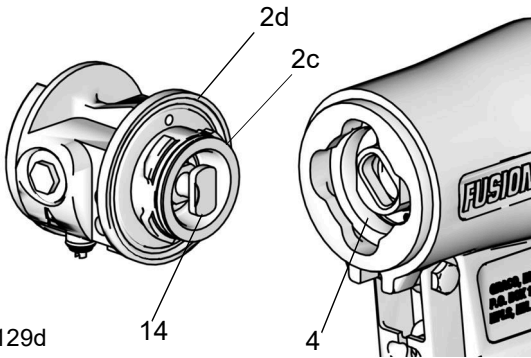
1. Engage piston safety lock, page 12.



TI11326a

FIG. 43

2. Liberally lubricate o-rings (2c, 2d) and reassemble on fluid housing. Insert keyed end of mix chamber (14) in socket of piston assembly (4).



TI12129d

FIG. 44

3. Push fluid housing (F) flush to handle.

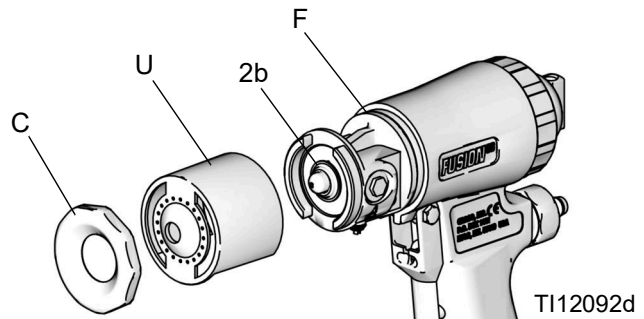
4. Turn fluid housing 1/4 turn clockwise to engage slots.



TI12094d

FIG. 45

5. Replace front cover (U).
6. Screw on front cover retainer (C).



TI12092d

FIG. 46

Mix Chamber and Side Seal Assemblies

See **Models/Mix Chamber Selection Guide**, page 4, for available mix chamber sizes.

1. Follow **Pressure Relief Procedure**, page 16.
2. Remove fluid manifold (M). Leave air connected.

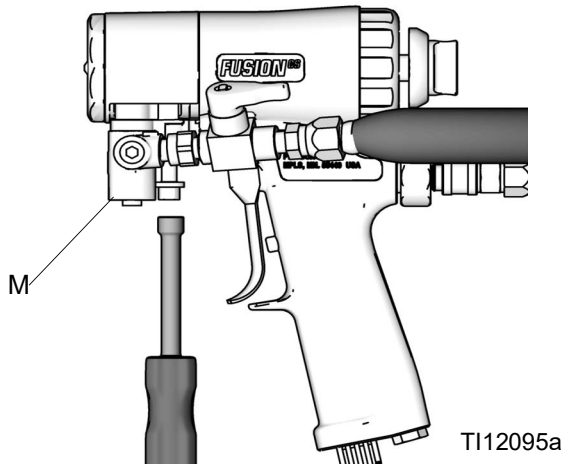


FIG. 47

3. Flush gun to remove residual A and B components. See **Flush Gun**, page 22. Follow **Pressure Relief Procedure**, page 16.
4. Disconnect air (D).

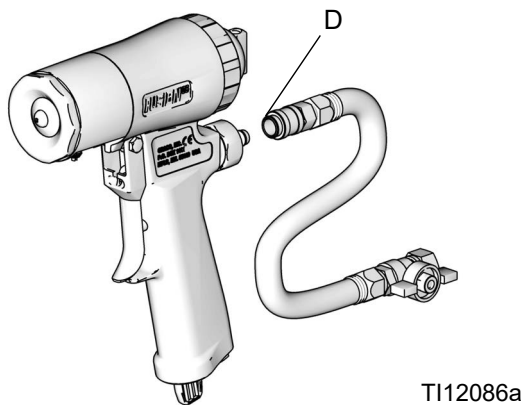


FIG. 48

5. **Remove Front End**, page 31.

NOTICE

To prevent cross-contamination of side seal assemblies, do not interchange A component and B component parts. The A component assembly is marked with an A.

6. Use hex nut driver to remove side seal assemblies (42, 43).

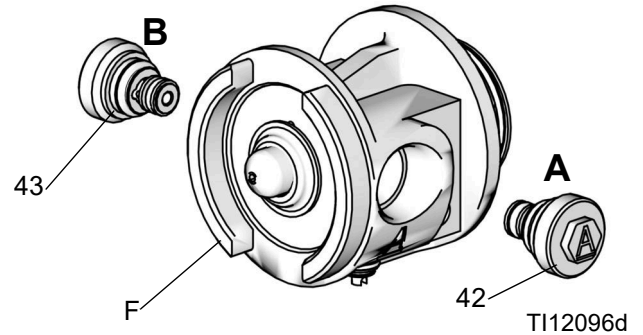


FIG. 49

7. Push on front of mix chamber (14) to loosen. Pull mix chamber out rear of fluid housing (F). Inspect for damage and **Clean Impingement Ports**, page 25.

NOTICE

To prevent cross-contamination of the gun's wetted parts, mix chamber is marked with an A and a notch on back edge. Be sure the A side of mix chamber is on the A side of gun.

8. Apply thin coat of lubricant to mix chamber (14). Install mix chamber. Etched **A** and notch must be on same side as **A** on fluid housing. Mix chamber is keyed to fit in fluid housing.

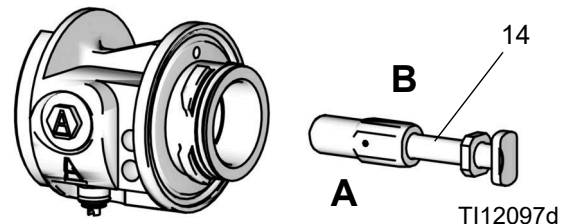


FIG. 50

NOTICE

To prevent cross-contamination of side seal assemblies, do not interchange A component and B component parts. The A component assembly is marked with an A.

9. Push down on seal housing (42a) and turn so side seal detents unlock and remove.
10. Carefully inspect side seal assembly o-rings and surfaces. Replace worn or damaged parts. Liberally lubricate o-rings (42d, 42e) and reassemble.

- Line up tabs on seal (42c) and seal housing (42a); insert seal into housing. Push down on seal and turn to lock in place.

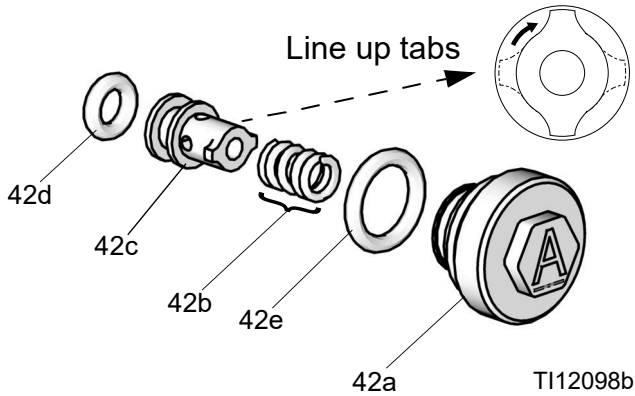
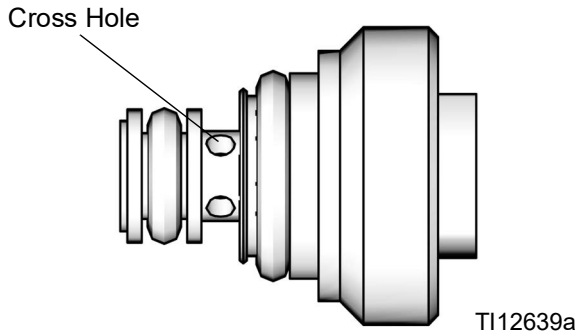


FIG. 51

- Check for proper spring (42b) operation, and that the seal (42c) rotates slightly in the seal housing (42a) detents.

When the seal is installed correctly the spring will be flexible and all four cross holes of the seal will be completely visible. See FIG. 52 for an example of the correct and incorrect seal installation.

Correct Seal Installation



Incorrect Seal Installation

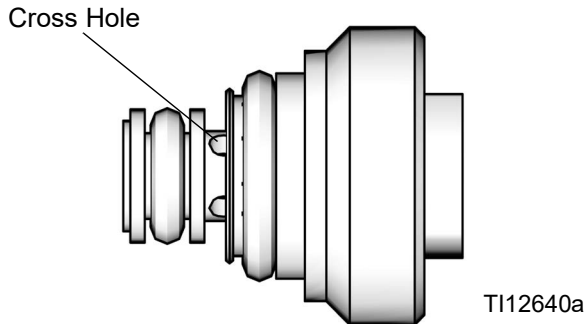


FIG. 52

- Liberalily lubricate and reinstall side seal assemblies (42, 43). Use hex nut driver to tighten.

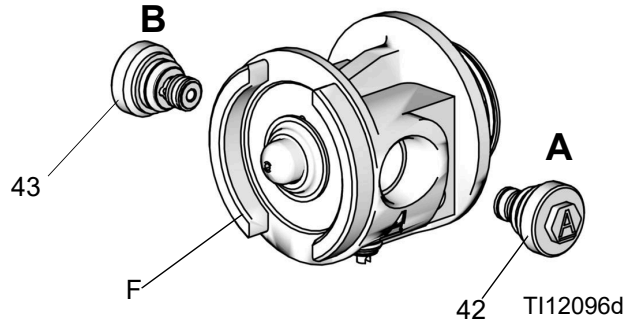


FIG. 53

- Attach Front End**, page 32.
- Connect air, and trigger the gun a few times to check for leaks. If purge air leaks from mix chamber nozzle when gun is triggered, inspect mix chamber and side seals. Correct the problem before attaching fluid manifold.
- Attach fluid manifold (F). Connect air. Return gun to service.

Check Valves

1. Follow **Pressure Relief Procedure**, page 16.
2. Remove fluid manifold (M). Leave air connected. **Clean Fluid Manifold**, page 23.

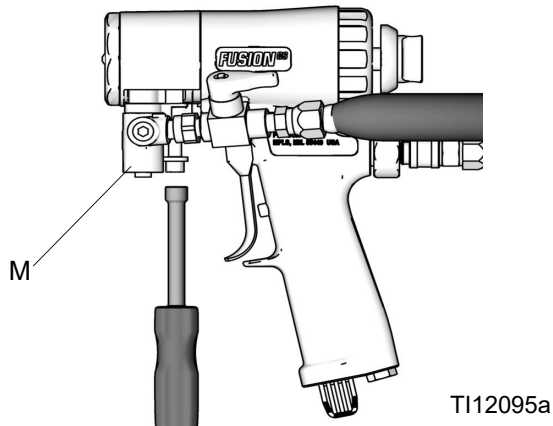


FIG. 54

3. Flush gun to remove residual A and B components. See **Flush Gun**, page 22. Follow **Pressure Relief Procedure**, page 16.
4. Disconnect air (D).

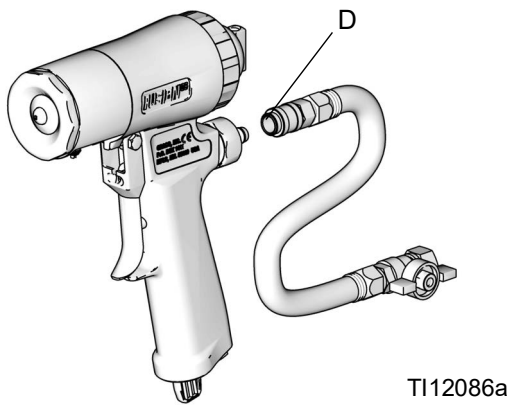


FIG. 55

NOTICE

To prevent cross-contamination of the check valves, do not interchange A component and B component parts. The A component check valve is marked with an A.

5. Use hex nut driver to remove check valves (44, 45).

6. Disassemble check valves using a flat head screwdriver.

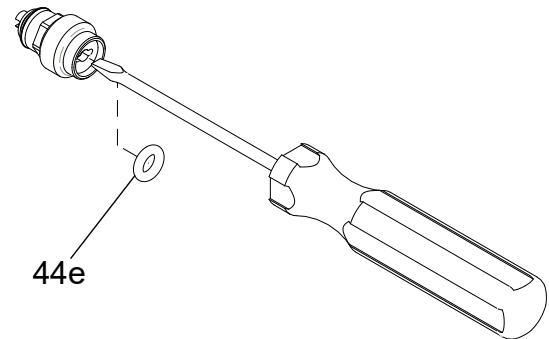


FIG. 56

NOTICE

Damaged check valve o-rings (44e, 44f) may result in external leakage. Replace o-rings if they are damaged.

7. Clean and inspect all parts. Thoroughly inspect o-rings (44e, 44f). Press on ball (44b) to test check valve for proper movement and spring action. Replace individual check valve parts as needed.

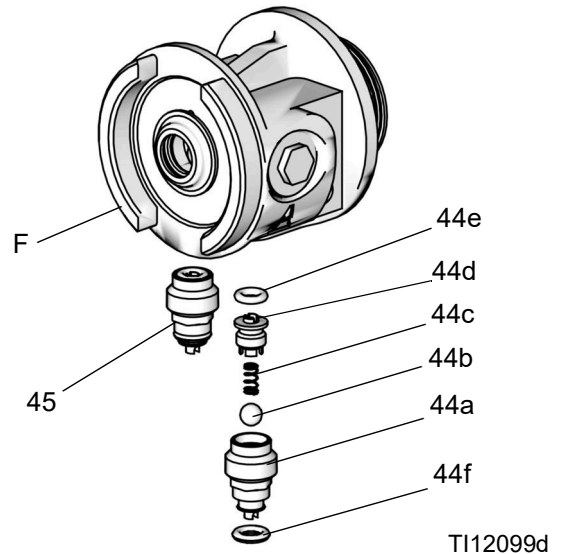


FIG. 57

8. Liberally lubricate o-rings (44e, 44f) and carefully reinstall in fluid housing (F). Use hex nut driver to tighten.
9. Attach fluid manifold (M). Connect air (D). Return gun to service.

Piston

1. Follow **Pressure Relief Procedure**, page 16.
2. Disconnect air (D) and remove fluid manifold (M).

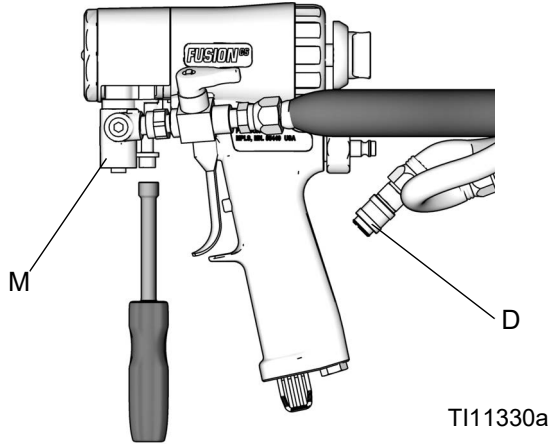


FIG. 58

3. **Remove Front End**, page 31.
4. Unscrew variable flow adjustment knob (X) and inspect o-ring (3a).

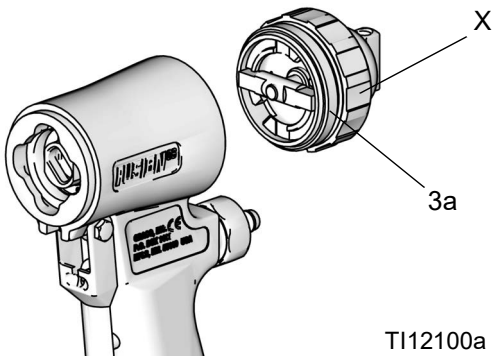


FIG. 59

5. Push piston shaft to remove piston (4b). Inspect piston o-ring (4c) and shaft o-rings (4a).

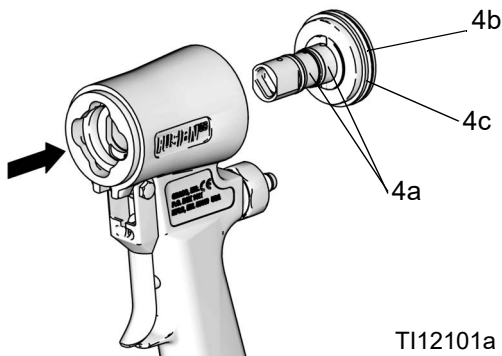


FIG. 60

6. Remove dosing piston.
 - a. Use supplied screw driver to remove spiral retaining ring (4g).
 - b. Use screw driver to push dosing piston (4e) out back of piston (4b) through access hole on front side.
7. Clean and inspect o-rings on dosing piston (4e). Clean dosing bore in piston (4b) with a nylon brush and compatible solvent.
8. Lubricate dosing piston (4e) o-rings with ClearShot Liquid prior to reassembly.
9. Liberally lubricate piston o-ring (4c) and lightly lubricate shaft o-rings (4a).
10. Reinstall retaining ring (4g). Press it into groove of dosing piston (4e).
11. Reinstall piston. Shaft is keyed for proper assembly. Push firmly to seat piston.

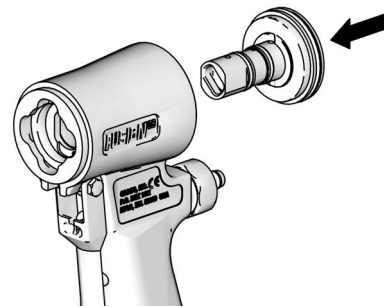


FIG. 61

12. Install variable flow adjustment knob (X).

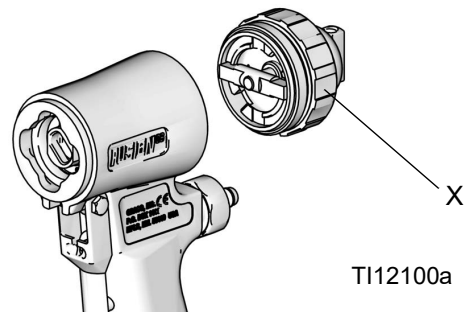
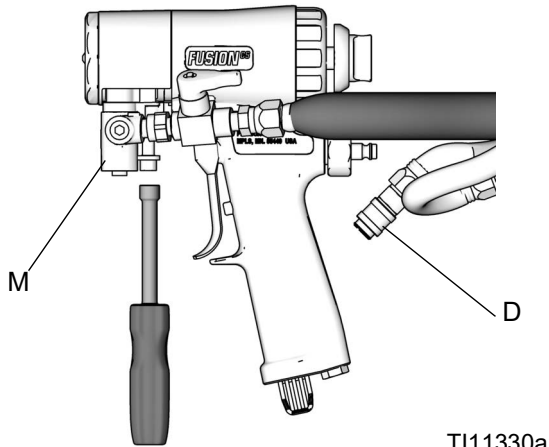


FIG. 62

13. **Attach Front End**, page 32.
14. Attach fluid manifold (M).
15. Install ClearShot Liquid cartridge. See **ClearShot Liquid Cartridge Installation/Removal**, page 20.
16. Connect air. Return gun to service.

Air Valve

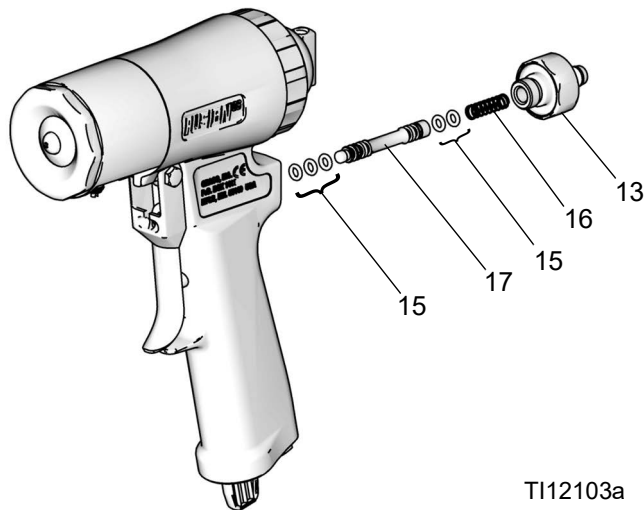
1. Follow **Pressure Relief Procedure**, page 16.
2. Disconnect air (D) and remove fluid manifold (M).



TI11330a

FIG. 63

3. Unscrew air valve plug (13) and remove spring (16). Using a small diameter tool, push spool (17) out from front. Inspect all five o-rings (15).

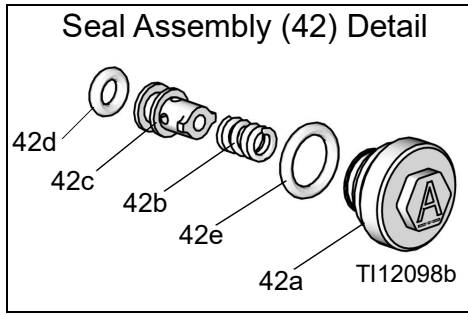


TI12103a

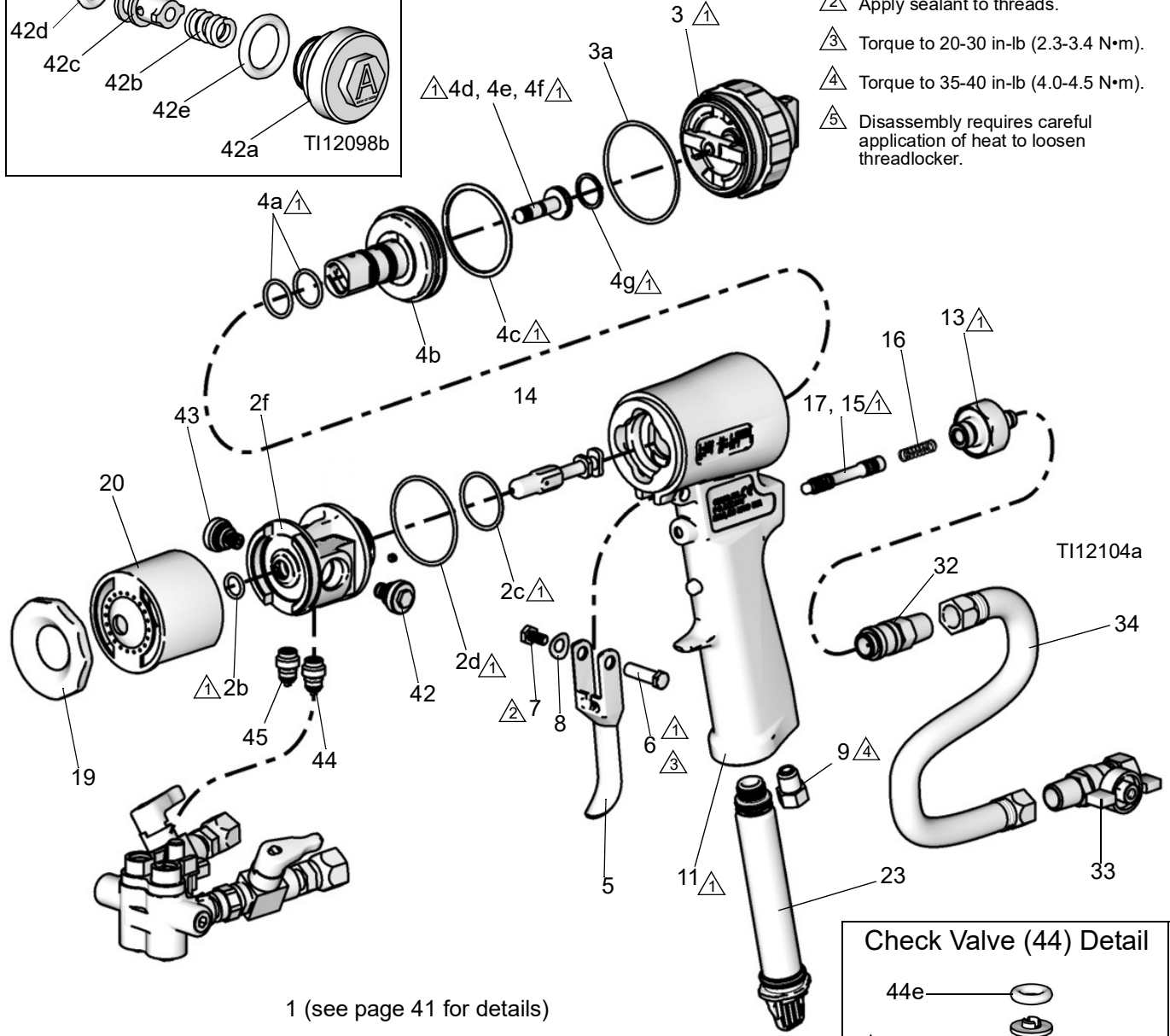
FIG. 64

4. Liberally lubricate o-rings and reassemble. Torque plug (13) to 25-135 in-lb (14-15 N•m).
5. Attach fluid manifold (M). Connect air (D). Return gun to service.

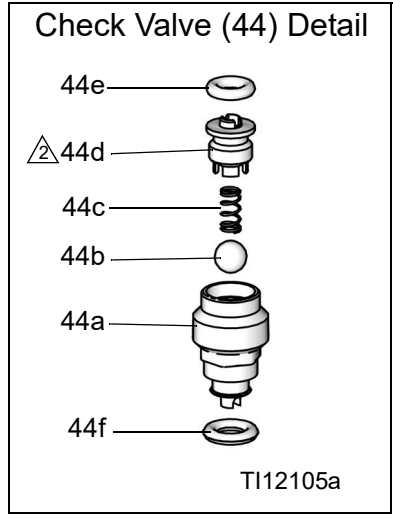
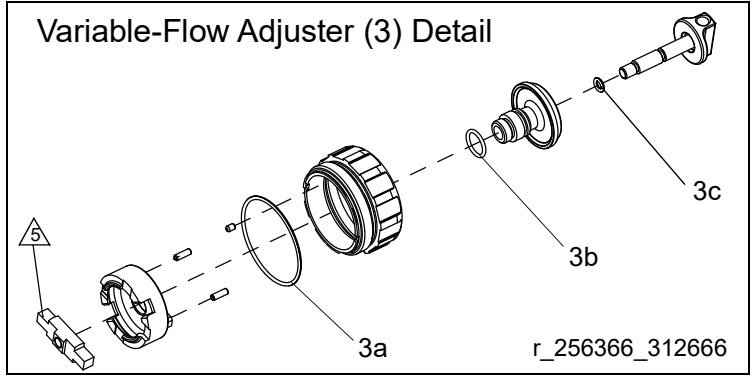
Parts



- ① Apply light coating of Fusion grease (31).
- ② Apply sealant to threads.
- ③ Torque to 20-30 in-lb (2.3-3.4 N•m).
- ④ Torque to 35-40 in-lb (4.0-4.5 N•m).
- ⑤ Disassembly requires careful application of heat to loosen threadlocker.



1 (see page 41 for details)



Parts

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1	256466	MANIFOLD, hose, assy.	1	43c*	256464	SEAL, side; includes 43d	1
1a	----	MANIFOLD	1	43d✓	256467	O-RING (pack of 6)	1
1d	15B221	BOLT; 5/16-24	3	43e✓	256468	O-RING (pack of 6)	1
1e	100139	PLUG, pipe	1	44♦	257422	KIT, valve, check, a side; includes 44a-44f	1
1f	117634	SWIVEL, union; #6 JIC	1	44a	257427	HOUSING, check valve, a side (pack of 10)	1
1g	117635	SWIVEL, union	1	44b	257420	BALL; carbide (pack of 10)	1
1h	256460	VALVE, ball, resin	1	44c	257419	SPRING, compression (pack of 10)	1
1j	256459	VALVE, ball, iso	1	44d	257421	RETAINER, ball (pack of 10)	1
1k	15U395	ADAPTER, male x female; 1/8 npt	2	44e✓	246354	O-RING (pack of 6)	1
1m‡	16G500	HANDLE, valve, shut-off, ISO	1	44f/	256771	O-RING (pack of 6)	1
1n‡	16G501	HANDLE, valve, shut-of, RES	1	45♦†	257423	KIT, valve, check, b side; includes 45a-45f	1
1p	118123	SCREW, set, socket with patch	1	45a	257428	HOUSING, check valve, b side (pack of 10)	1
1r	24W375	KIT, repair, handle, valve	1	45b	257420	BALL; carbide (pack of 10)	1
2	256457	HOUSING, fluid, assy; includes 2b-2f and 42-45	1	45c	257419	SPRING, compression (pack of 10)	1
2b✓	248648	O-RING (pack of 6)	1	45d	257421	RETAINER, ball (pack of 10)	1
2c✓	256773	O-RING (pack of 6)	1	45e✓	246354	O-RING (pack of 6)	1
2d✓	248132	O-RING (pack of 6)	1	45f/	256771	O-RING (pack of 6)	1
2f	----	HOUSING	1	46‡	256567	RETAINER, tip	1
3	256456	ADJUSTER, variable-flow	1	47‡*	246360	O-RING; PTFE (pack of 3)	1
3a✓	256774	O-RING (pack of 6)	1	49	100721	PLUG, pipe	1
3b	257426	O-RING (pack of 6)	1	50	117509	FITTING, air line; 1/4 npt	1
3c	257425	O-RING (pack of 6)	1	51•	25A677	VALVE, check, a side	1
4	256454	PISTON, assy.	1	51a	----	HOUSING, a side	1
4a✓	256772	O-RING (pack of 6)	2	51b✓	256469	O-RING (pack of 6)	1
4b	----	PISTON	1	51c	----	SCREEN, filter (see page 45)	1
4c✓	256775	O-RING (pack of 6)	1	51d	113876	SPRING	1
4d	----	O-RING	3	51e	25A679	BALL, check (pack of 10)	1
4e	257424	PISTON, dosing, assy; includes 4d and 4f	1	51f	25A680	RETAINER, ball check	1
4f	257426	O-RING (pack of 6)	1	52†	25A678	VALVE, check, b side	1
4g	121642	RING, retaining, internal spiral	1	52a	----	HOUSING, b side	1
5	15B209	TRIGGER	1	52b✓	256469	O-RING (pack of 6)	1
6	192272	PIN, pivot	1	52c	----	SCREEN, filter (see page 45)	1
7	203953	SCREW; 10-24 x 3/8 in. (10 mm)	1	52d	113876	SPRING	1
8	15C480	WASHER, wave	1	52e	25A679	BALL, check (pack of 10)	1
9	121540	PLUG, breather	1	52f	25A680	RETAINER, ball check	1
11	256458	HANDLE, kit; includes ref. 12	1				
13	15T897	PLUG, air valve	1	▲	Replacement Danger and Warning labels, tags, and cards are available at no cost.		
14❖	----	CHAMBER, mix	1	†	Not shown.		
15	----	O-RING	5	✕	Wide and round pattern models only.		
16	117485	SPRING, compression	1	+	Flat pattern models only.		
17	256455	VALVE, spool; includes 15	1	❖	See tables on page 40 for kit number.		
19	256414	RETAINER, cover (pack of 5)	1	✓	Also included in o-ring repair kit(s); see page 44.		
20	✕256415	COVER, front, round, tip (pack of 5)	1	★	ClearShot Liquid cartridges also available in packages of 50 and 100. See Accessories, page 48.		
	‡256416	COVER, front, flat, tip (pack of 5)	1	*	Side seals also available in packages of 2 and 20. See Accessories, page 48.		
21+*	----	TIP, spray	1	✳	Also included in Kits FL0000, FL0101, FL0202, and FL2020.		
23★	256385	KIT, clearshot cartridge (pack of 25)	1	◆	Parts included in kit 256461.		
25❖	----	TOOL, cleanout	1	*	See Flat Tip Kits, page 43, for part number.		
26❖	----	TOOL, cleanout	1	‡	Replacement handles are available in Kit 24W375.		
27❖	----	TOOL, cleanout, #69	1	•	Parts included in kit 256462.		
28	117661	PIN, vise	1	~	Parts included in kit 256463.		
31†	118665	GREASE, Fusion; 4 oz	1				
32	117510	COUPLER, line, air; 1/4 npt	1				
33	15B565	VALVE, ball	1				
34	15B772	HOSE, air; 18 in.	1				
35	112307	ELBOW, street	2				
36	117642	NUT DRIVER	1				
37	118575	SCREW DRIVER, 1/8 blade	1				
38▲	172479	TAG, instruction	1				
39▲	222385	TAG, warning	1				
40	256641	MANIFOLD, flush; includes 1d, 49, and 50.	1				
41	256642	KIT, inlet cap; includes 1d	1				
42 ~	257429	KIT, side seal, Fusion CS, ISO	1				
42a	----	HOUSING, seal, side	1				
42b	256923	SPRING, compression (pack of 10)	1				
42c*	256464	SEAL, side; includes 42d	1				
42d✓	256467	O-RING (pack of 6)	1				
42e✓	256468	O-RING (pack of 6)	1				
43 ~	257430	KIT, side seal, Fusion CS, RES	1				
43a	----	HOUSING, seal, side	1				
43b	256923	SPRING, compression	1				

Wide and Round Pattern Models Varying Parts Table

Model	Reference Number			
	14	25	26	27
CS00WD	Order Kit WD0000			
CS01WD	Order Kit WD0101			
CS02WD	Order Kit WD0202			
CS03WD	Order Kit WD0303			
CS22WD	Order Kit WD2222			
CS01RD	Order Kit RD0101			
17S890	Order Kit RD4747			
CS02RD	Order Kit RD0202			
CS03RD	Order Kit RD0303			
CS20RD	Order Kit RD2020			
CS00RD	Order Kit RD0000			

Flat Pattern Models Varying Parts Table

Model	Reference Number			
	14	25	26	27
CS00F1	Order Kit FL0000			
CS00F2	Order Kit FL0000			
CS00F3	Order Kit FL0000			
CS00F4	Order Kit FL0000			
CS00F5	Order Kit FL0000			
CS00F6	Order Kit FL0000			
CS01F1	Order Kit FL0101			
CS01F2	Order Kit FL0101			
CS01F3	Order Kit FL0101			
CS01F4	Order Kit FL0101			
CS01F5	Order Kit FL0101			
CS01F6	Order Kit FL0101			
CS02F1	Order Kit FL0202			
CS02F2	Order Kit FL0202			
CS02F3	Order Kit FL0202			
CS02F4	Order Kit FL0202			
CS02F5	Order Kit FL0202			
CS02F6	Order Kit FL0202			
CS20F1	Order Kit FL2020			
CS20F2	Order Kit FL2020			

Convert Round Pattern to Flat Pattern

To convert a round pattern gun to a flat pattern gun, order the following parts.

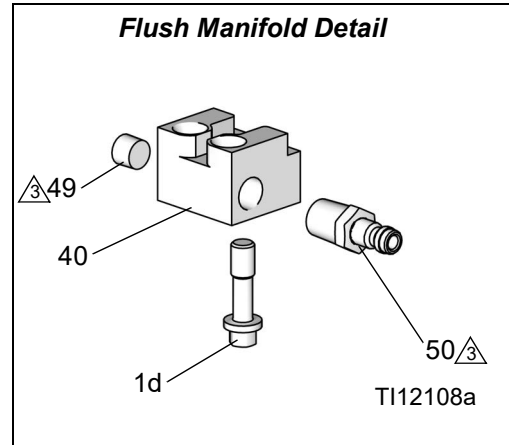
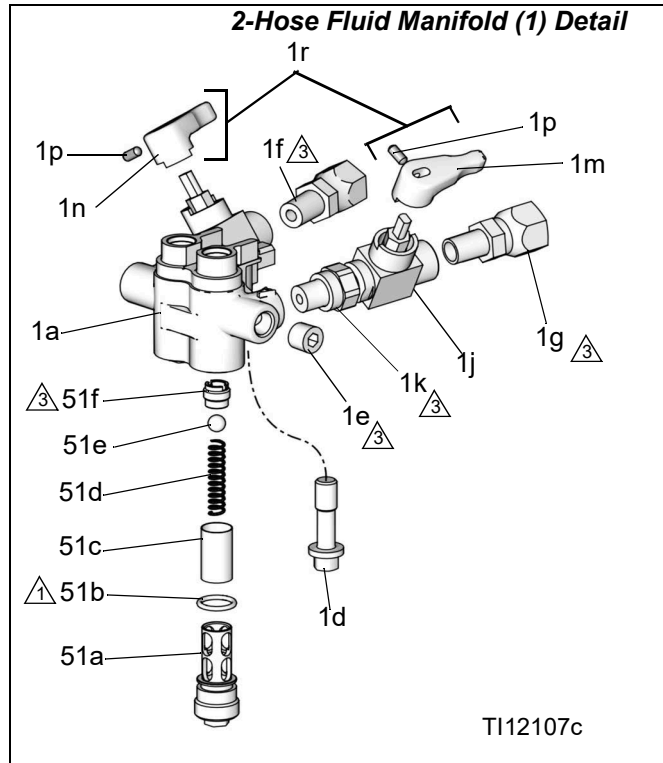
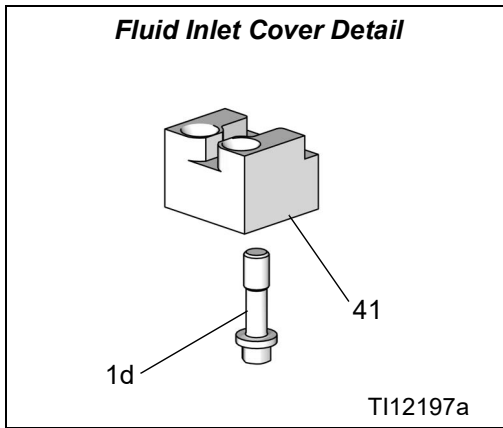
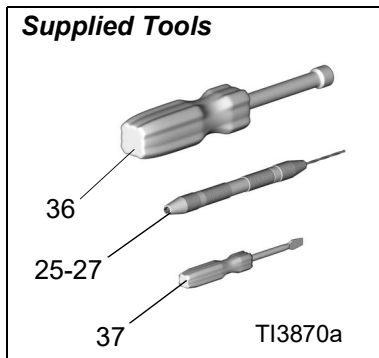
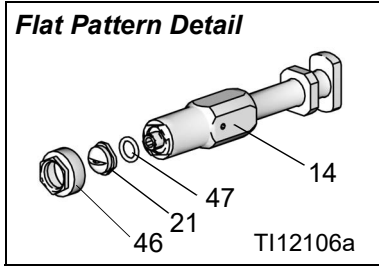
Ref.	Part	Description	Qty.
14	FLxxxx	CHAMBER, mix; see Flat Pattern Mix Chamber Kits , page 42	1
20	256416	COVER, front, flat, tip (pack of 5)	1
21	FTxxxx	TIP, spray; see Flat Tip Part Reference Guide , page 43	1
46	256567	RETAINER, tip	1

Convert Flat Pattern to Round Pattern

To convert a flat pattern gun to a round pattern gun, order the following parts.

Ref.	Part	Description	Qty.
14	RDxxxx	CHAMBER, mix; see Round Pattern Mix Chamber Kits , page 42	1
	WDxxxx	CHAMBER, mix; see Wide Pattern Mix Chamber Kits , page 42	
20	256415	COVER, front, round, tip (pack of 5)	1

Detail Views



- ① Apply lubricant to seals.
- ③ Apply sealant to threads.

Mix Chamber Kits

Round Pattern Mix Chamber Kits

Mix Chamber Kit (includes drill bits)	Pattern Diameter at 24 in. (609.6 mm) to target in (mm)	Nozzle Orifice Size	Nozzle Drill Bit Size, in. (mm)	Impingement Port Size	Impingement Port Drill Bit Size, in. (mm)	Counterbore Size	Counterbore Drill Bit Size, in. (mm)
RD2020	5 (127)	0.042	#58 (1.00)	0.020	#76 (0.50)	0.060	#53 (1.50)
RD0000	8 (203)	0.052	#55 (1.30)	0.029	#69 (0.70)	0.060	#53 (1.50)
RD0101	11 (279)	0.060	#53 (1.50)	0.042	#58 (1.00)	N/A	N/A
RD4747	11.5 (292)	0.0635	1/16 (1.55)	0.047	(1.15)	N/A	N/A
RD0202	12 (305)	0.070	#50 (1.75)	0.052	#55 (1.30)	N/A	N/A
RD0303	14 (356)	0.086	#44 (2.15)	0.060	#53 (1.50)	N/A	N/A

Wide Pattern Mix Chamber Kits

Kits include mix chamber and cleanout drills. To spray larger diameter patterns than standard mix chambers.

Kit Part	Pattern Diameter at 24 in. (609.6 mm) to target in (mm)	Equivalent flow to mix chamber size	Nozzle Drill Bit Size in (mm) *	Impingement Drill Bit Size in. (mm) *
WD2222	8 (203.2)	N/A	0.047 (1.20)	#74, 0.022 (0.56)
WD0000	15 (381.0)	Ref. RD0000	1/16, 0.062 (1.59)	#70, 0.028 (0.71)
WD0101	16 (406.4)	Ref. RD0101	#50, 0.070 (1.78)	#61, 0.039 (0.99)
WD0202	18 (457.2)	Ref. RD0202	0.085 (2.15)	#56, 0.046 (1.17)
WD0303	18 (457.2)	Ref. RD0303	#42, 0.089 (2.26)	1.45 mm, 0.057 (1.45)

Flat Pattern Mix Chamber Kits

Mix Chamber Kit (includes drill bits and o-ring)	Ref. 47†, O-ring	Nozzle Orifice Size	Nozzle Drill Bit Size, in. (mm)	Impingement Port Size	Impingement Port Drill Bit Size, in. (mm)	Counterbore Size	Counterbore Drill Bit Size, in. (mm)
FL2020	246360	0.094	3/32 (2.35)	0.020	#76 (0.50)	0.060	#53 (1.50)
FL0000	246360	0.094	3/32 (2.35)	0.029	#69 (0.70)	0.060	#53 (1.50)
FL0101	246360	0.094	3/32 (2.35)	0.042	#58 (1.00)	N/A	N/A
FL0202	246360	0.094	3/32 (2.35)	0.052	#55 (1.30)	N/A	N/A

† Available only in flat mix chamber kits or in 246360 multi-pack kit.

Mix Chamber Part Reference Guide

Sample part RD0101:

RD	01	01
RD= round pattern	A orifice size (0.042 in.)	B orifice size (0.042 in.)
FL= flat pattern		
WD = wide pattern		

Flat Tip Kits

Flat Pattern Model	Ref. 21, Spray Tip	Pattern Size, in. (mm)
CSxxF1	FT0424	low flow, 8-10 (203-254)
CSxxF2	FT0438	medium flow, 8-10 (203-254)
CSxxF3	FT0624	low flow, 12-14 (305-356)
CSxxF4	FT0638	medium flow, 12-14 (305-356)
CSxxF5	FT0838	medium flow, 16-18 (406-457)
CSxxF6	FT0848	high flow, 16-18 (406-457)

Flat Tip Part Reference Guide

Sample part FT0848:

FT	08	48
FT=Flat tip	x2=pattern length (8x2=16 in.)	Equivalent orifice diameter size (0.048 in.)

O-ring Repair Kits

The following table indicates the specific o-ring(s) reference number and quantity included in each o-ring kit.

Kit	Quantity by Reference Number										
	51b, 52b	2b	2c	2d	3a	4a	4c	42d, 43d	42e, 43e	44e, 45e	44f, 45f
256490 Complete Kit	2	1	1	1	1	2	1	2	2	2	2
256467 Side Seal								6			
278933 Side Seal Only								50			
256468 Side Seal Housing									6		
256640 Fluid Head Check Valves										6	6
256471 Fluid Head		1	1	1							
256470 Air Piston						2	1				
256472 Back Cap					1						
256469 Hose Manifold Check Valves	6										

Bulk O-ring Kits

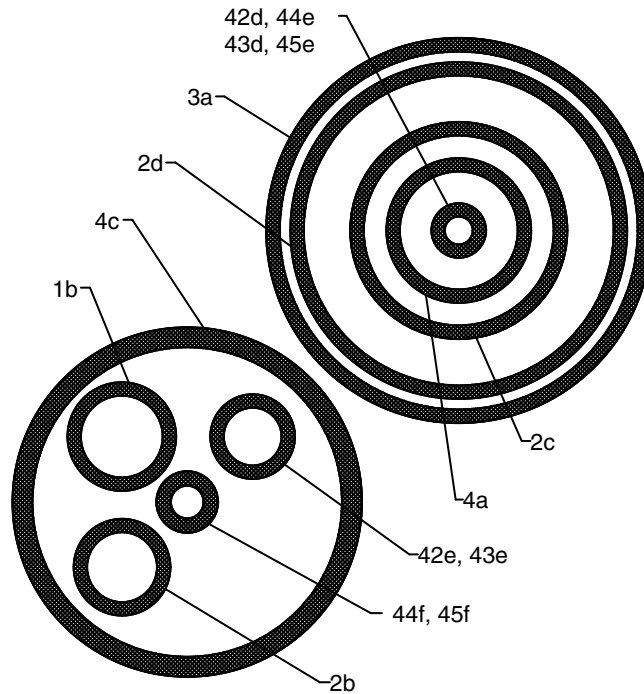
The following table indicates the specific o-ring(s) reference number and corresponding kit number. Each kit includes a quantity of six o-rings.

Kit	Reference Number										
	51b, 52b	2b	2c	2d	3a	4a	4c	42d, 43d	42e, 43e	44e, 45e	44f, 45f
	256469	248648	256773	248132	256774	256772	256775	*256467	256468	246354	256771

* Includes installation tools and side seal springs.

Complete O-ring Kit Placement Guide

Each o-ring in kit 256490 is labeled by the reference number. See the table entry for 256490 in **O-ring Repair Kits** on page 44 for the quantity of each.



Check Valve Filter Screen Kits

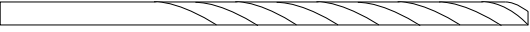
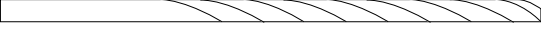
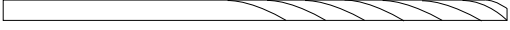
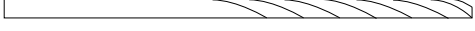
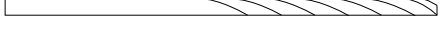
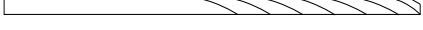
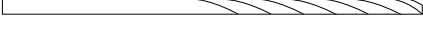
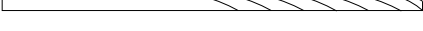
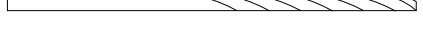
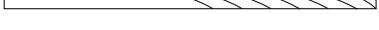
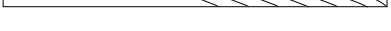
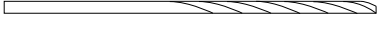
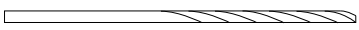
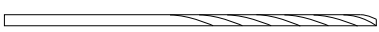
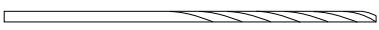
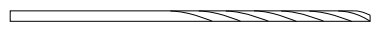
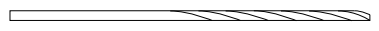

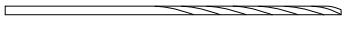
Kits include 10 filter screens.
The 80 mesh filter screen is standard with gun.














Part	Description
246357	40 mesh (0.015 in., 375 micron)
246358	60 mesh (0.010 in., 238 micron)
246359	80 mesh (0.007 in., 175 micron)

Drill Bit Kits

For cleaning gun ports and orifices. Illustrations are actual size for comparison.

NOTE: Not all sizes are used with every gun model.

Kit	Qty.	Drill Bit Size			Illustration
		nominal	in.	mm	
249115	6	1/8	0.125	3.18	
246623	3	#32	0.116	2.90	
246810	3	7/64	0.109	2.77	
246813	3	#39	0.099	2.51	
246624	3	3/32	0.094	2.39	
246812	3	#43	0.089	2.26	
246625	3	#44	0.086	2.18	
248639	6	2.15 mm	0.085	2.15	
249114	6	#45	0.082	2.08	
246811	3	2 mm	0.079	2.00	
246626	6	#50	0.070	1.78	
249113	6	#52	0.64	1.63	
248893	6	1/16	0.062	1.59	
246627	6	#53	0.060	1.52	
249112	6	1.45 mm	0.057	1.45	
246809	6	#54	0.055	1.40	
246628	6	#55	0.052	1.32	
249764	6	1.20 mm	0.047	1.20	
246814	6	#56	0.046	1.18	

Kit	Qty.	Drill Bit Size			Illustration
		nominal	in.	mm	
246629	6	#58	0.042	1.07	
246808	6	#60	0.040	1.02	
248640	6	#61	0.039	0.99	
248618	6	#63	0.037	0.94	
248891	6	#66	0.033	0.84	
246807	6	#67	0.032	0.81	
246630	6	#69	0.029	0.74	
248892	6	#70	0.028	0.71	
246815	6	#73	0.024	0.61	
276984	6	#74	0.023	0.57	
246631	6	#76	0.020	0.51	
246816	6	#77	0.018	0.46	
246817	6	#81	0.013	0.33	

ClearShot Handle Cleanout Drill Kit

256526

Kit includes all 7 drill bits of extra length needed to clean out all air passages in the Fusion CS gun handle and fluid housing. See **Clean Passages**, page 24.

Accessories

Stainless Steel Side Seal Kit

Kit 256464 includes 2 stainless steel side seals and 2 o-rings.

Polycarbally Side Seal Kits

Kits include a packing o-ring for each polycarbally side seal. The optional high wear, non-metallic polycarbally seals are for alternate fluids.

Flat Pattern Stud Wall Kits

Kit	Description	Qty.
256465	SEAL KIT, Polycarbally	2
256489	SEAL KIT, Polycarbally	20

Use to spray wall insulation foam into stud walls with a single pass.

Kit	Description
256569	Includes TP100
256570	Includes FTM979

Gun Cover

244914 Covers

Keeps gun clean while spraying. Pack of 10.

Lubricant for Gun Rebuild

248279, 4 oz (113 gram) [10]

High adhesion, water resistant, lithium-based lubricant. MSDS sheet available at www.graco.com.

Flushing Manifold

256641 Manifold Block

See page 41.

Fluid Inlet Cover

Kit 256642; includes 15R910 and 15B221. See page 41.

Gun Cleaning Kit

15D546

Kit includes 11 tools and brushes to clean the gun.

ClearShot Liquid Cartridges

See MSD060.

Kit	Description
256385	Package of 25 cartridges
256386	Package of 50 cartridges
256387	Package of 100 cartridges

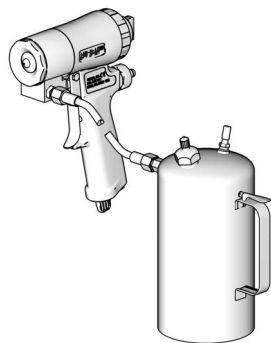
Front Cover Retainer

Kit	Description
256414	Package of 5 plastic covers
25M462	Package of 1 aluminum covers

Solvent Flush Canister Kit

256510, 1 qt (0.95 liter) Solvent Cup

Includes flushing manifold to flush gun with solvent. Portable for remote flushing. See manual 309963.

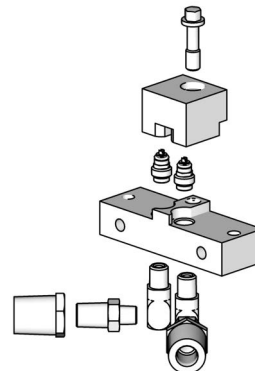


Tl12110a

Circulation Manifold

256566

Attach to gun fluid manifold to enable preheating of hose. See manual 313058.

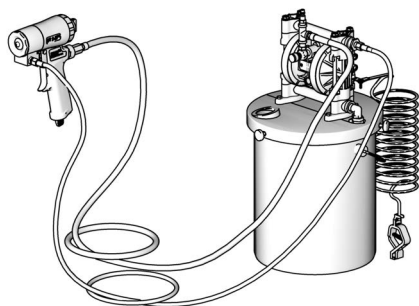


Tl12109a

Solvent Flush Pail Kit

248229 5.0 gal. (19 liter) Pail

Includes flush manifold with individual A and B shutoff valves, and air regulator. See manual 309963.

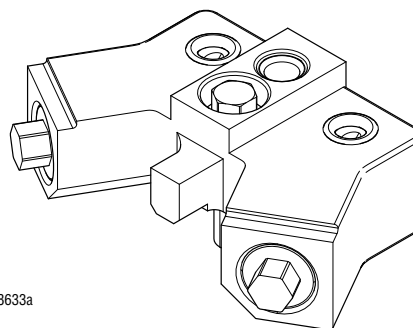


Tl12111a

Fusion AP Manifold Adapter

258996

Allows Fusion CS gun to fit onto existing Fusion manifold.

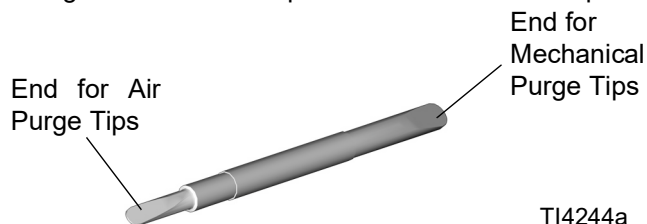


ti18633a

Tip Cleanout Tool

15D234

Designed to fit CeramTip internal dome and flat tip slits.



Tl4244a

Handle Replacement Kit

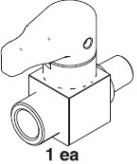
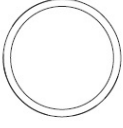
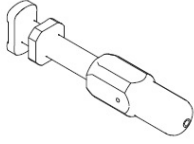

















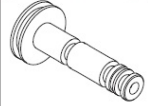

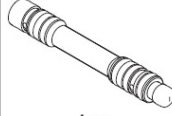


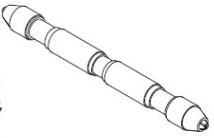




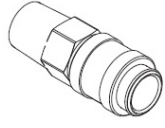
24W375

Kit Part	Description	Qty.
16G500	Handle, valve, a side, red, ISO	1
16G501	Handle, valve, b side, blue, RES	1
118123	Screw, set, Socket with patch	2

Repair Kit

24X573

Keep bulk spare parts on-hand to rebuild Fusion CS gun. Packaged in convenient carry case.

256460 - Shutoff Valve "B" 256459 - Shutoff Valve "A"  1 ea		256773 O-ring (6 pk) 	Mix Chamber 		256772 O-ring (6 pk) 	246357 #40 Mesh Screen  10 ea	256469 O-ring (6 pk) 	256462 House Manifold Check Valves (A & B)  1 ea		
256463 Side Seals Assemblies (A & B)  1 ea	256464 Side Seal Kit (2 pk) 	256467 O-ring, Side Seal + Springs 	256468 O-ring (6 pk) 	248132 O-ring (6 pk) 		248648 O-ring (6 pk) 	256774 O-rings (6 pk) 		256775 O-rings (6 pk) 	
257423 - Check Valve "B" 257422 - Check Valve "A"  1 ea		246354 O-ring (6 pk) 	256771 O-ring (6 pk) 	257420 Ball (10 pk) 	257419 Spring (10 pk) 	257424 Dosing Piston (Includes O-rings)  1 ea	257425 O-ring (6 pk) 	256455 Spool Valve (Includes O-ring)  1 ea	117485 Spool Valve Spring  6 ea	121642 Retaining Ring  6 ea
117661 - Drill Vise  		256526 - Handle Cleanout Kit Ø 1/8 Drill Ø 3/32 Drill Ø 1/16 Drill Ø 9/32 Drill Ø 5/16 Drill Ø 7/16 Drill .75 MM Drill				256414 Retaining Cover  5 ea	257426 O-ring (6 pk) 	121540 Breather Plug  1 ea	117510 Air Coupler  1 ea	

Repair Kit Contents

Technical Specifications

Fusion CS		
	US	Metric
Maximum Fluid Working Pressure	3500 psi	24.5 MPa, 245 bar
Minimum Air Inlet Pressure	80 psi	0.56 MPa, 5.6 bar
Maximum Air Inlet Pressure	130 psi	0.9 MPa, 9 bar
Air Flow Range	See chart below	
Maximum Fluid Temperature	200° F	94° C
Air Inlet Size	1/4 npt Quick Disconnect Nipple	
A Component (ISO) Inlet Size	-5 JIC	1/2-20 UNF
B Component (Resin) Inlet Size	-6 JIC	9/16-18 UNF
Dimensions	7.5 x 8.1 x 3.3 in.	191 x 206 x 84 mm
Weight	2.6 lb.	1.18 kg
Wetted Parts	Aluminum, stainless steel, carbon steel, carbide, chemically resistant o-rings	
Noise (dBa)		
Maximum sound pressure	75.27 dB(A), using RD0202 at 100 psi (0.7 MPa, 7 bar)	
Maximum sound power	73.45 dB(A), using RD0202 at 100 psi (0.7 MPa, 7 bar)	
<i>Sound power measured per ISO-9416-2.</i>		
Notes		
All trademarks or registered trademarks are the property of their respective owners.		

Air Flow Data

Air Pressure (detriggered) psi (MPa, bar)	Air Flow in scfm (m³/min) for all mix chambers
80 (0.56, 5.6)	2.1 (0.059)
100 (0.7, 7)	3.1 (0.088)
130 (0.9, 9)	5.2 (0.147)

California Proposition 65

CALIFORNIA RESIDENTS

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

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

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Graco Headquarters: Minneapolis

International Offices: Belgium, China, Japan, Korea

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