



**BUILDING SOLUTIONS  
THROUGH INNOVATION**

# MEGA FILL PRO RF

**Setup and Operating Manual**



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## **Introduction**

The TVM FD-2000 is the latest iteration of a long line of rugged and reliable polyurethane foam dispensers. Over time, TVM's technology and hardware have been refined to provide applicators dispensers that are easy to use, easy to maintain and extremely cost effective. The TVM FD-2000 is the culmination of these developments and refinements. The TVM FD-2000 is engineered for quick setup and shutdown, consistency from jobsite to jobsite and years of trouble-free service.

This manual describes the operating principles and best practices for using and maintaining the TVM FD-2000 polyurethane foam adhesive dispenser. It may be helpful to read it through first, to gain an overall understanding of the system, before trying to use the TVM FD-2000. It may also be helpful to study the exploded parts diagram to become accustomed to the part names and their locations so, when referenced in the text, the reader is already familiar. For clarity, the full part names are always given.

## **Safety Procedures**

Most people use chemicals every day without giving it much thought. Gasoline for your car, bleach for your laundry, household cleaning products or paints are examples of such chemicals. All chemicals can be handled safely if the proper safe handling procedures are used. There are some safe handling procedures that seem obvious. Most people know it is dangerous to smoke while filling their car with gas. Many people know that they should wear gloves while using household cleaning products. The purpose of this section is to teach safe handling procedures and protective equipment that should be used to safely handle Mega Fill Pro RF spray foam insulation.

Mega Fill Pro RF spray foam insulation is a two component system where two separate chemicals are mixed together as they are sprayed into a wall structure. Once sprayed, the two chemicals mix and begin to react, and as they react a polyurethane foam is formed. The two chemicals are:

1-An isocyanate compound called MDI.

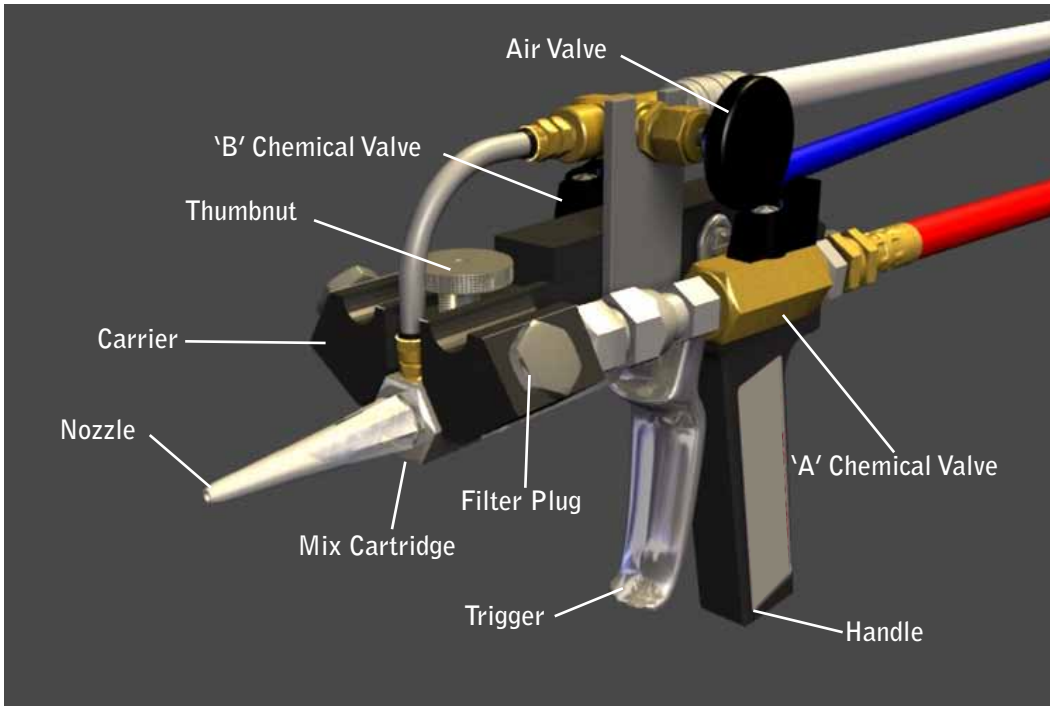
2-A mixture of polyol resins, expansion (blowing) agents and catalysts

As these two chemicals are mixed and sprayed, an aerosol is formed to provide coverage of Mega Fill Pro RF spray foam insulation on the wall structure. During the spraying process, some of the chemicals are dispersed into the air. It is important for the Mega Fill Pro RF spray foam applicator to protect himself and others from these chemicals that are present during the spray application process. A description of the potential hazards of these chemicals will help the spray applicator understand how to effectively protect himself from those hazards.

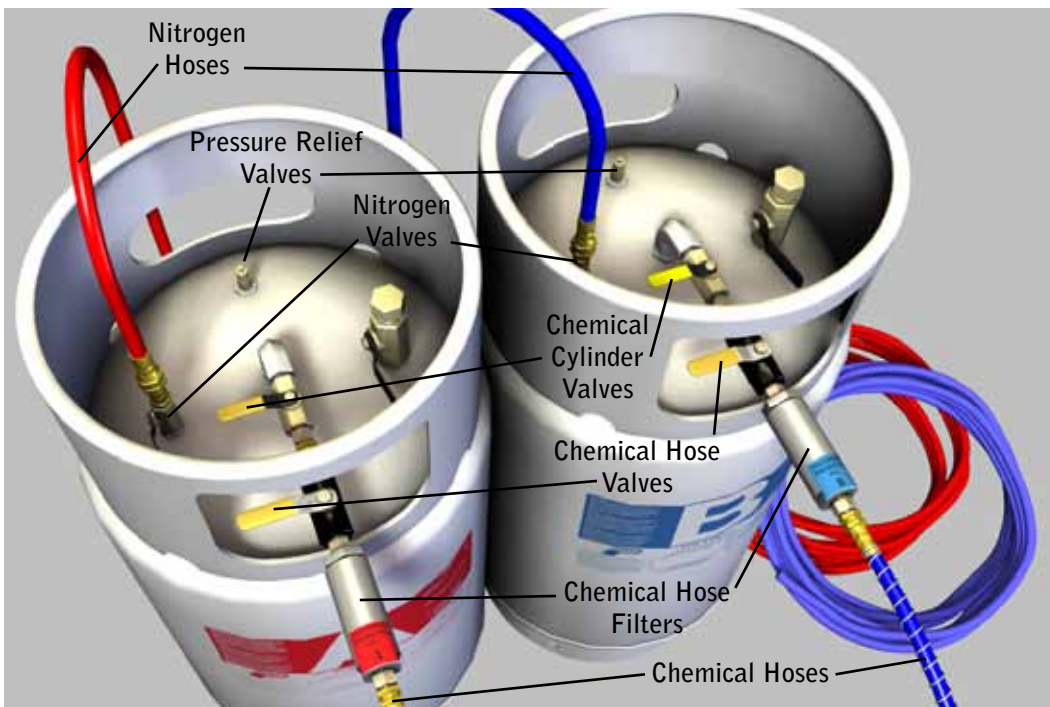
### **Isocyanate Mixture**

This is sometimes referred to as MDI, or "A" Component. Contact with MDI in vapor, particle or liquid forms can have effects on a person's health.

Inhaling MDI vapors can affect the lungs. These vapors can cause tightness in the chest, or labored breathing. Repeated exposure to MDI vapor at low concentration or even a single exposure to MDI at a high concentration can lead to a "sensitization" to the MDI. This can be described as an allergic or asthmatic type reaction.



**Figure 1**  
*The TVM FD-2000*



**Figure 2**  
*The chemical cylinders and hoses*



## **Safety Procedures (cont.)**

Once a person is sensitized to MDI they should avoid any future contact with MDI because even a small exposure can trigger sensitization. Repeated skin contact with MDI can also cause sensitization. Skin contact with MDI should always be avoided. If the skin is repeatedly exposed to MDI, sensitization can result. Further contact with MDI to the skin or by inhalation can trigger sensitization.

### **Polyol Resin Mixture**

Often referred to as “resin” or “B” Component, the polyol resin mixture contains different ingredients that help promote or control the foaming reaction of Mega Fill Pro RF spray foam insulation.

The main ingredients in this mixture are polyols. They pose a low level of health hazard, but can be slightly irritating to the lungs or eyes during the spraying process if the proper personal Protective equipment is not employed.

There are other ingredients in the polyol resin mixture that help promote or control the foaming reaction of Mega Fill Pro RF spray foam insulation. These ingredients are compounds such as catalysts to help promote the reaction between the MDI and the polyol resin, “blowing agents” to help in the rising or expansion of the foam, and other additives that help control the quality of the foam being sprayed. These ingredients in the polyol resin mixture also normally pose a low level of health hazard, but during the spraying process and can be irritating to the eyes, lungs or nose.

### **Material Safety Data Sheets (MSDS)**

MSDS sheets, or Material Safety Data Sheets, are a good way to learn more about how to make sure that proper safe handling procedures are followed when applying Mega Fill Pro RF spray foam insulation.

MSDS sheets provide detailed information regarding potential health hazards associated with the chemical, recommended worker exposure guidelines, first aid measures, handling and storage, spill cleanup and recommendations for personal protective equipment.

MSDS sheets are documents that all chemical suppliers provide to their customers. An MSDS sheet will be included with all Mega Fill Pro RF spray foam insulation orders. Copies of the MSDS will be attached to the Mega Fill Pro RF product containers in a plastic envelope. These MSDS sheets should always be kept available at the job site or wherever the Mega Fill Pro RF products are transported or stored.

### **Personal Protective Equipment (PPE)**

Proper use and maintenance of Personal Protective Equipment, or PPE is essential to safe handling practices while using Mega Fill Pro RF spray foam insulation.

### **Respirators**

Proper respiratory protection equipment is perhaps the most important part of the

PPE needed when applying Mega Fill Pro RF spray foam insulation. This protection is provided by using a respirator. A NIOSH approved supplied air respirator or an air purifying respirator is recommended if exposure limits may be exceeded. According to OSHA's Respiratory Protection Standard, 29 CFR 1910.134, workers must have a medical evaluation and medical approval before using a respirator. Fit testing of the respirator is also an OSHA requirement.

There are two basic types of respirators- air purifying respirators and supplied air respirators.

Supplied Air Respirator systems utilize an air pump to deliver fresh air to a respirator worn by the user. The air pump is positioned away from the work area, and a hose delivers the fresh air to the worker who will be wearing a full face mask respirator or a hood type respirator. Supplied air respirators offer the highest level of respiratory protection. TVM, Inc. recommends only two types of supplied air respirator systems for use when applying Mega Fill Pro RF spray foam insulation- the full face mask type or the hood type. Both of these systems provide not only respiratory protection but also eye protection. A supplied air respirator system would be required respiratory protection for spraying foam in poorly ventilated areas such as an attic or crawlspace.

Air purifying respirators are available in different designs such as half mask face piece or full facemasks. Both are equipped with cartridges that remove organic vapors and particulates from the air breathed into the respirator. An air purifying respirator is considered adequate respiratory protection when spraying foam in a well ventilated area. According to OSHA's Respirator Standard 29 CFR 1910.134, if an air purifying respirator is used for protection against MDI exposure, there are two requirements that must be met.

The standard requires that:

- The respirator cartridge/filter combination is appropriate for diisocyanates and
- Objective data are used to establish cartridge change schedules to prevent cartridges from being used past their service life. The respirator manufacturer may be able to help in the establishment of a cartridge change out schedule.

### **Protective Clothing and Gloves**

TVM, Inc. recommends the following PPE in addition to a supplied air respirator system when applying Mega Fill Pro RF spray foam insulation:

A chemically resistant full body suit with hood. Tyvek suits meet this requirement. The supplied air respirator may have it's own hood. If not the Mega Fill Pro RF applicator should protect their hair by using a separate hood or other means to prevent foam from getting onto his head or hair.

Chemical resistant gloves should also be worn to prevent skin contact. Nitrile gloves meet this requirement.

## ***Installation***

The TVM FD-2000 dispenser is usually shipped to customers with the hose assembly already connected to the dispenser. If your TVM FD-2000 dispenser is not connected to the hose assembly:

Attach the red “A” hose to the Hose Connection Fitting (H862) on the left side of the dispenser. (See Figure 3)

Attach the blue “B” hose to the Hose Connection Fitting (H862) on the right side of the dispenser. (See Figure 3)

Lay out the dispenser/hose assembly.

Place the cylinders of “A” chemical and “B” chemical in a position where the hoses can be connected without strain.

Be sure all valves on both of the cylinders, and the hoses are closed before connecting or disconnecting hoses, or removing caps or plugs from cylinder.

After checking to be sure all valves on the “A” chemical cylinder are closed, remove the cap from the outlet of the chemical valve. (See Figure 4) Keep the cap handy so that it can be refitted to the cylinder after the cylinder is empty.

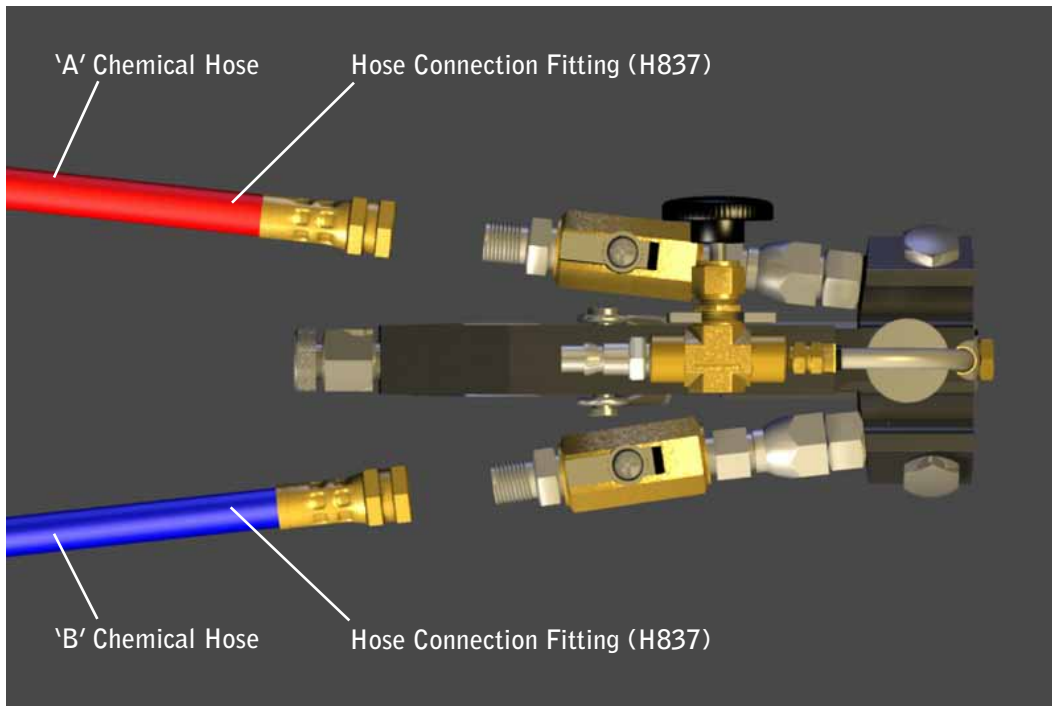
Remove the plug from the filter end of the red “A” hose. (See Figure 4) Keep the plug handy - it will be needed to reseal the hose after the hose is disconnected from the cylinder.

Connect the red “A” hose to the outlet of the chemical valve on the “A” component cylinder. (See Figure 4)

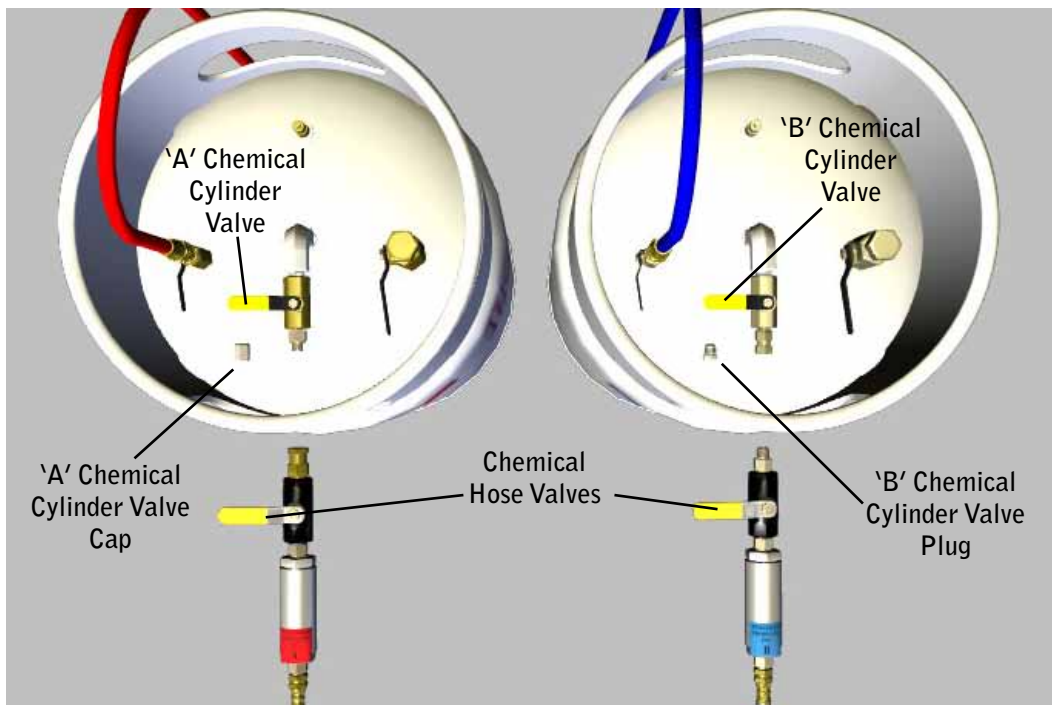
To connect the blue “B” hose to the “B” chemical cylinder: After checking to be sure that all valves on the cylinder are closed, remove the plug from the outlet of the chemical valve. Keep the plug handy so that it can be refitted to the cylinder after the cylinder is empty.

Remove the cap from the filter end of the blue “B” hose. (See Figure 4) Keep the plug handy - it will be needed to reseal the hose after the hose is disconnected from the cylinder.

Connect the blue “B” hose to the outlet of the chemical valve on the “B” chemical cylinder. (See Figure 4)



**Figure 3**  
*Connecting the  
 chemical hoses  
 to the TVM FD-2000*



**Figure 4**  
*Connecting the  
 chemical hoses  
 to the chemical cylinders*

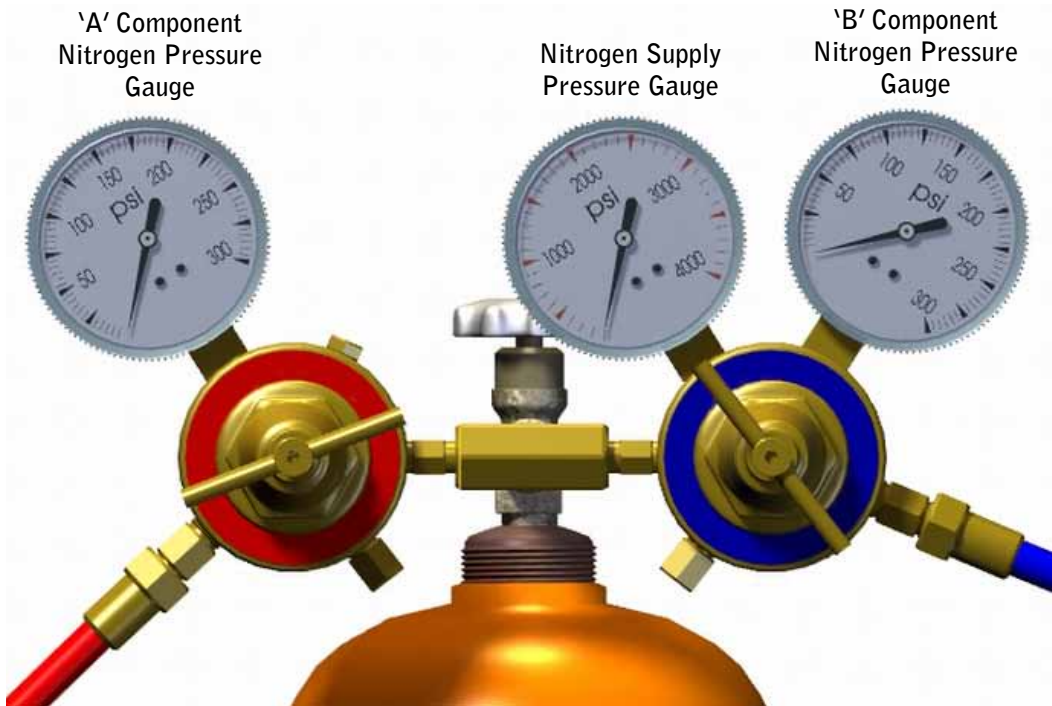


Place the nitrogen cylinder near the chemical cylinders, being sure to secure the nitrogen cylinder so that it cannot be accidentally knocked over.

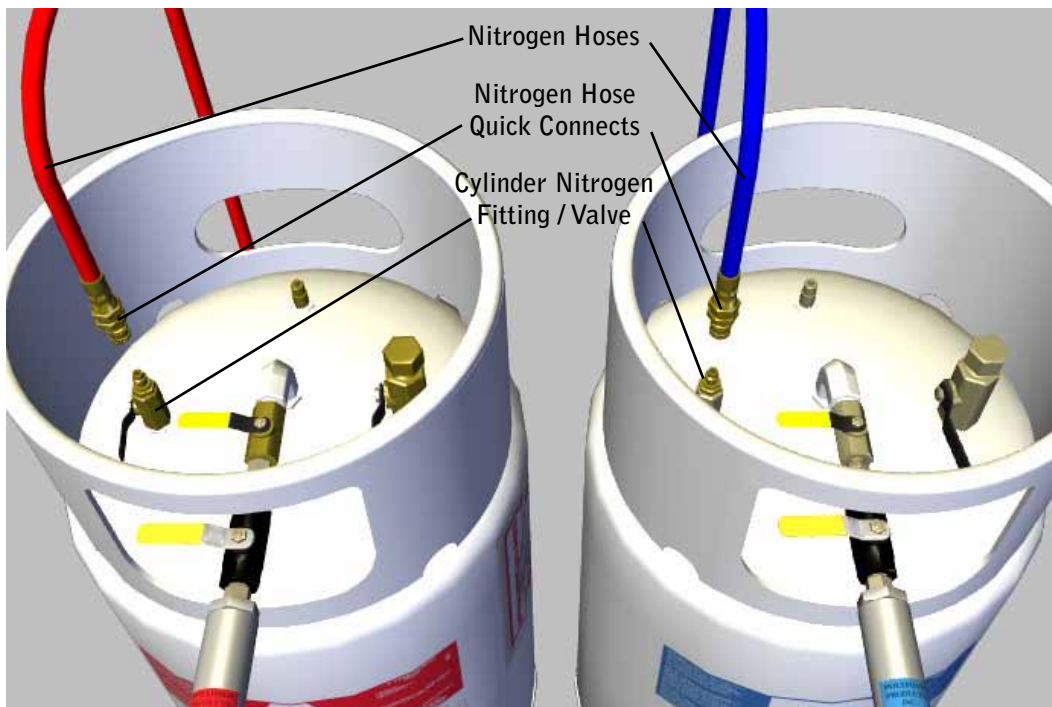
Connect the nitrogen regulator to the nitrogen cylinder using the threaded pressure fitting on the rear of the nitrogen regulator assembly.  
(See Figure 5)

Connect the red hose leading from the nitrogen regulator assembly to the nitrogen fitting on the “A” chemical cylinder. It will be fitted with a quick connect fitting that will simply snap into place. (See Figure 6)

Connect the blue hose leading from the nitrogen regulator assembly to the nitrogen fitting on the “B” chemical cylinder. It will be fitted with a quick connect fitting that will simply snap into place. (See Figure 6)



**Figure 5**  
*Connecting the nitrogen regulator and gauge assembly*



**Figure 6**  
*Connecting the nitrogen hoses to the chemical cylinders*

## **Startup**

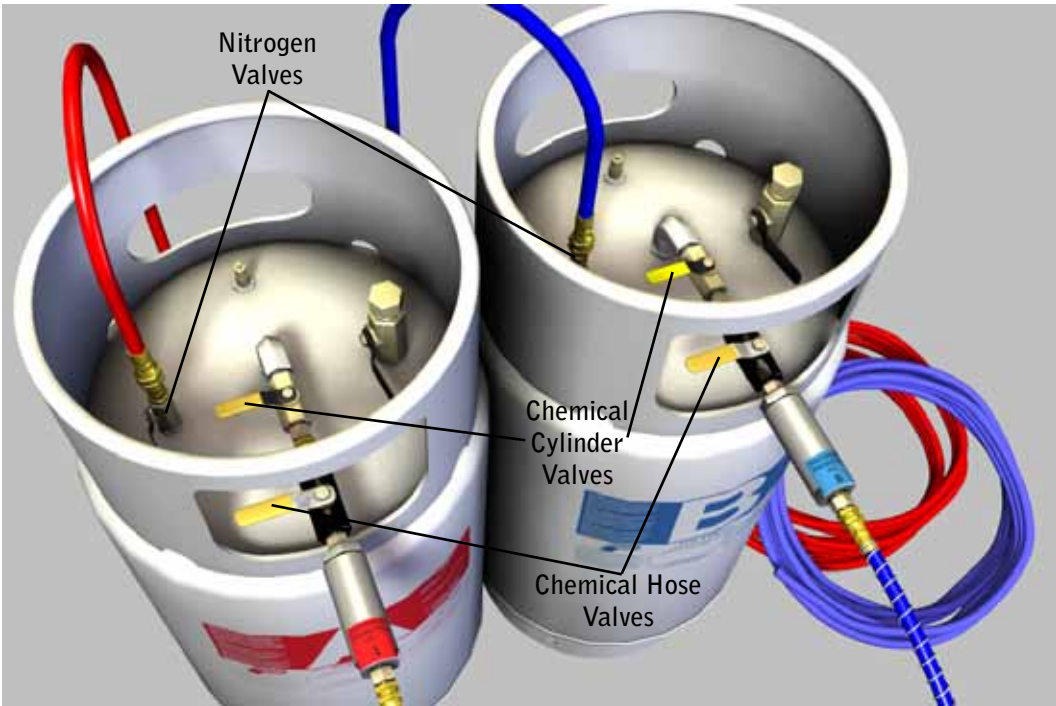
Make sure all installation steps have been completed prior to startup and calibration. Make sure that the chemicals are at the correct operating temperature, usually 70° to 90° F.

- 1 | Be sure that all valves are closed. (See figures for valve locations) This would include: The valve on top of the nitrogen cylinder. (See Figure 8) The nitrogen valve on top of both chemical cylinders (“A” Chemical and “B” Chemical). (See Figure 7) The chemical outlet valve on top of both chemical cylinders (“A” chemical and “B” chemical) (See Figure 7) The chemical valve on the filter end of both the red “A” component hose and the blue “B” component hose. (See Figure 7) Both the “A” chemical valve and the “B” chemical valve on the TVM FD-2000 dispenser (See Figure 8).
- 2 | Remove Mix Cartridge Plug (D620) if one is in place. Do not install a nozzle until calibration steps are completed.
- 3 | Turn the adjustment valves on both nitrogen regulators leading to the “A” chemical and the “B” chemical counterclockwise two full turns. (See Figure 8)
- 4 | Open the valve on top of the nitrogen cylinder, and check for leaks.
- 5 | Adjust the “A” component nitrogen regulator (with the red hose) to 150 psi (as a starting point) by turning clockwise (See Figure 8)
- 6 | Adjust the “B” component nitrogen regulator (with the blue hose) to 150 psi (as a starting point) by turning clockwise (See Figure 8)

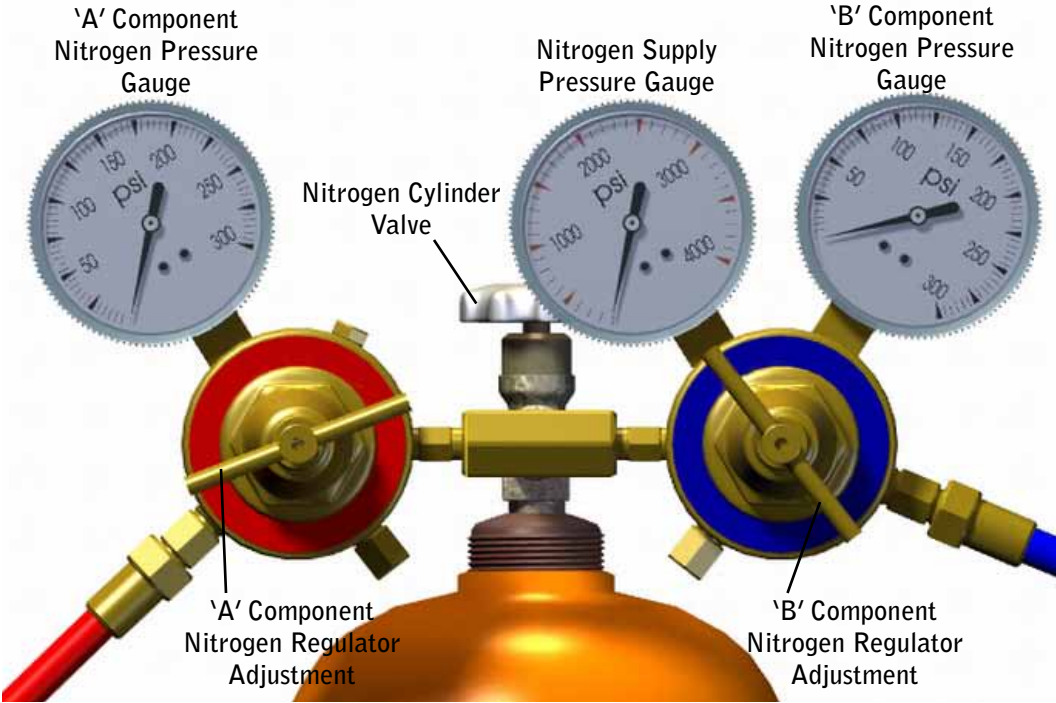
### **Note:**

**The chemical cylinders are equipped with a pressure overload relief valve that will open if the pressure of the cylinder exceeds approximately 200 psi. Do not adjust the nitrogen pressure on the chemical cylinders to approach 200 psi. Caution: Do not use any gas other than nitrogen to pressurize the chemical cylinders.**

- 7 | Open the nitrogen valves on both chemical cylinders (“A” component and “B” component). (See Figure 7)
- 8 | Open the chemical valves on both chemical cylinders (“A” component and “B” component). (See Figure 7) Check for leaks. Tighten any leaking fittings.
- 9 | Open the chemical valves on the filter end of the hose assembly for both the “A” component and “B” component. (See Figure 7) Check for leaks. Tighten any leaking fittings.
- 10 | Position a garbage can with a plastic liner at the work area.
- 11 | Make sure mixing cartridge plug is removed.
- 12 | Open the “A” valve and the “B” valve on the TVM FD-2000 dispenser.
- 13 | While aiming the TVM FD-2000 into the trash can, pull the trigger on the



**Figure 7**  
*Valve locations on the  
 chemical cylinders  
 and hoses*



**Figure 8**  
*Adjusting the nitrogen  
 pressure to the  
 chemical cylinders*

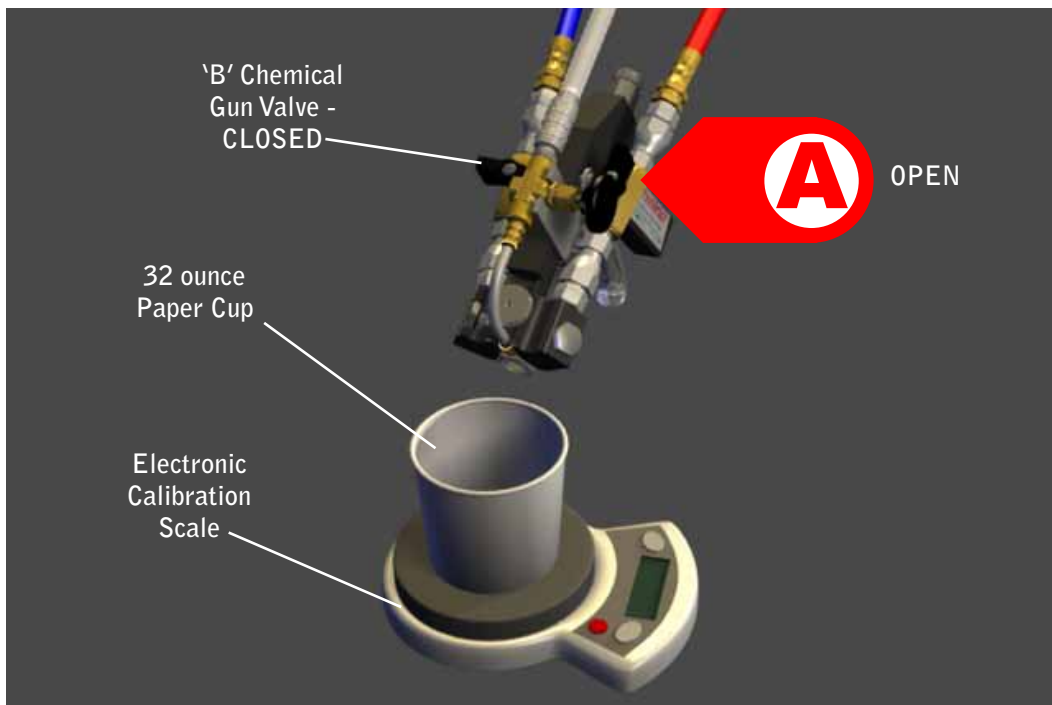
TVM FD-2000 dispenser for 10 seconds, dispensing the foam into the trash can liner. If your TVM FD-2000 is brand new, you may have to pull the trigger for a longer period to purge the air out of the hoses. If your TVM FD-2000 dispenser was put into storage with the hoses full of chemicals, you may have to dispense foam for longer than 10 seconds to be sure that the chemicals that were stored in the hoses are fully flushed out by fresh chemicals from the chemical cylinders.

## **Calibration**

Proper mixing of the “A” and “B” component chemicals in the correct proportions is important in producing foam. Foams produced with an improper proportion of “A” to “B” chemical can in some cases affect foam properties.

When and how often should the A:B ratio be checked?

- Just before Mega Fill Pro RF installation.
  - About halfway through the normal workday.
  - When a new cylinder of “A” or “B” component is installed.
  - When a new cylinder of nitrogen is installed.
  - When the temperature in the work area rises or falls by more than 10 degrees. If the chemical temperature changes, the viscosity also changes. This viscosity change can effect the A:B ratio.
  - When a noticeable change takes place in the foam being produced.
  - After any restriction in the chemical flow is removed. For example, cleaning the filter screens or the ports in the mixing cartridge in the TVM FD-2000 will likely increase the flow of chemical which in turn may change the A:B ratio.
  - When a new mixing cartridge is installed.
- 1 | Make sure that the TVM FD-2000 dispenser is correctly installed to the chemical cylinders and nitrogen cylinder as described in the Startup procedures above. Check all hose connections to be sure that there are no leaks. For calibration, remove the plastic nozzle.
  - 2 | Place a 32 oz. paper cup on a scale, tare the scale to read zero, then remove the cup. For high output applications, a larger cup may be needed.
  - 3 | Open the “A” chemical valve and close the “B” chemical valve on the TVM FD-2000 dispenser. (See Figure 9)
  - 4 | Using a stop watch, fully depress the trigger on the TVM FD-2000 dispenser for exactly 3 seconds, directing the flow of the “A” chemical into the paper cup, purge dispenser, then place the cup on the scale. Record the weight of “A” chemical dispensed.



**Figure 9**  
*"A" Chemical Timed Shot*

- 5 | **Critical Step - Purging the mix cartridge:** Before measuring the weight of the dispensed “A” chemical in step 4, open both the “B” chemical valve and the “A” chemical valve on the TVM FD-2000 dispenser. (See Figure 10) Then, while directing the flow of the dispenser into a trash can, trigger the TVM FD-2000 dispenser for a few seconds to dispense a mixture of “A” and “B” chemicals into the trash can. This step is important because it will reduce crossover within the mix cartridge.
- 6 | Open the Air Injection Valve (D703) to purge any chemicals from the air injection line.
- 7 | Flush the face of the Mix Cartridge (AD600WA) with solvent.
- 8 | Close the “A” chemical valve on the TVM FD-2000 dispenser, leaving the “B” chemical valve open. (See Figure 11)
- 9 | Place a 32 oz. paper cup on a scale, and tare the scale to read zero. For high output applications, a larger cup may be needed.
- 10 | Using a stop watch, or optional timer, fully depress the trigger on the TVM FD-2000 dispenser for exactly 3 seconds, directing the flow of the “B” chemical into the paper cup, purge dispenser, then place the cup on the scale. Record the weight of “B” chemical dispensed.
- 11 | Purge the mix cartridge once again as outlined in step 5 above.
- 12 | Open the Air Injection Valve (D703) to purge any chemicals from the air injection line.
- 13 | Flush the face of the Mix Cartridge (AD600WA) with solvent.
- 14 | Calculate the A:B chemical ratio by dividing the weight of the “A” chemical obtained from step 4 by the weight of the “B” chemical obtained in step 8.

**Example:**

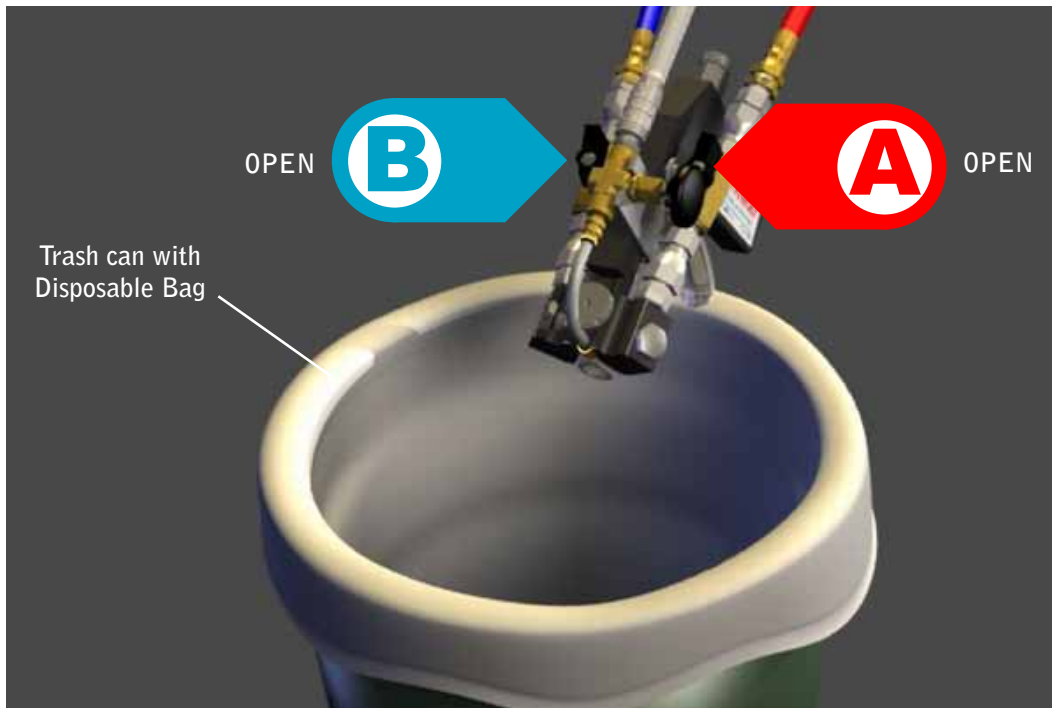
“A” chemical (3 second shot) weighs 62 grams

“B” chemical (3 second shot) weighs 52 grams

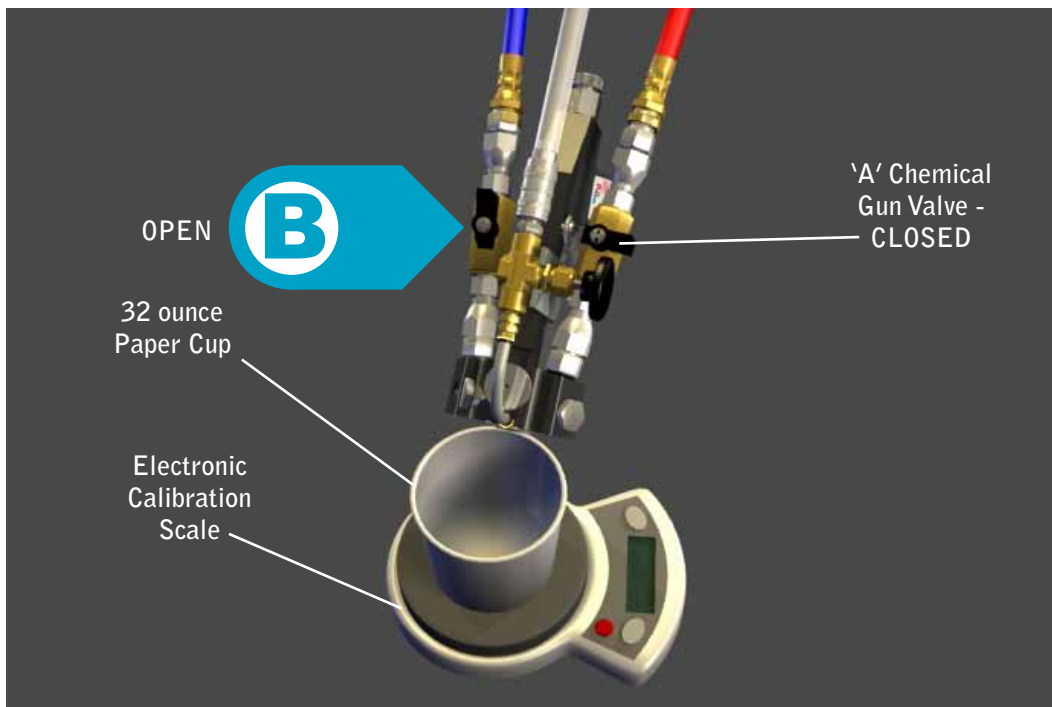
$62 \text{ grams} \div 52 \text{ grams} = 1.19 \text{ A:B ratio}$

Mega Fill Pro RF should be run with an A:B ratio in the range of 1.15 to 1.25. Consult the technical data sheet for the formulation you are running - it will list the best A:B ratio for that particular product (See Ratio Calibration Charts on pages 33 - 35).

- 15 | If the A:B chemical ratio obtained in step 10 is too high, ie above 1.25, adjust the nitrogen pressure on the “B” chemical up by 10 psi and repeat the calibration procedure starting at step 6. If the A:B ratio obtained in step 10 was too low, ie below 1.15, then adjust the nitrogen pressure on the “A” chemical up by 10 psi and repeat the calibration procedure. It may be necessary to make more than one adjustment to the nitrogen pressure before reaching the correct A:B



**Figure 10**  
*Purging the  
 Mixing Cartridge*



**Figure 11**  
*"B" Chemical  
 Timed Shot*



ratio.

- 16 | It may be necessary during the calibration process to reduce the nitrogen pressure on one of the chemical cylinders. This situation occurs when the proper A:B component ratio cannot be achieved without raising the pressure on one of the cylinders to its maximum pressure of 200 psi.

**REMEMBER:** Each of the chemical cylinders is equipped with a pressure relief valve that will automatically open if the nitrogen pressure on the cylinder exceeds 200 psi.

Use the following steps to reduce nitrogen pressure on the cylinder.

**FOLLOW SAFETY PROCEDURES ON PAGE 2.**

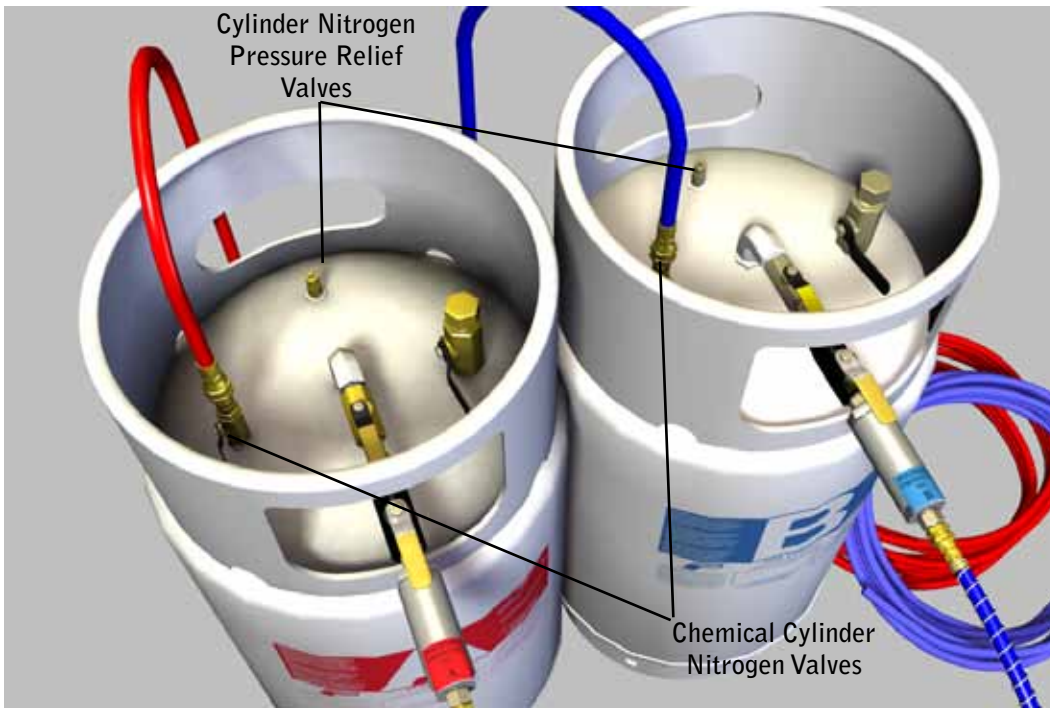
**Adjusting  
Chemical Cylinder  
Pressure**

- 1 | Close the nitrogen valve on the chemical cylinder. (See Figure 12)
- 2 | Remove nitrogen hose from cylinder.
- 3 | For the chemical cylinder being adjusted, turn the regulator adjustment valve counterclockwise one full turn.
- 4 | Make sure the Pressure Exhaust Valve (See Figure 13) is closed.
- 5 | Attach the Pressure Exhaust Valve to the chemical cylinder by placing it on the nitrogen fitting on the chemical cylinder.
- 6 | Open the nitrogen valve on the cylinder.
- 7 | Slowly open the Pressure Exhaust Valve (PVE100) to allow pressure to drop to the desired level.
- 8 | Close the Pressure Exhaust Valve (PVE100).
- 9 | Close the nitrogen valve on the chemical cylinder.
- 10 | Reconnect the nitrogen hose to the cylinder.
- 11 | Set nitrogen pressure on regulator to the desired pressure.
- 12 | Open nitrogen valve to adjust chemical cylinder pressure to the desired level.

Following steps 1 through 8 should result in a decrease in the pressure on the chemical cylinder.

The chemical cylinders are equipped with a pressure overload relief valve that will open if the pressure of the cylinder exceeds approximately 200 psi. Do not adjust nitrogen pressure on the cylinders to approach 200 psi.

Before using the TVM FD-2000 dispenser, you will need to install the plastic



**Figure 12**  
*Lowering the chemical  
cylinder nitrogen  
pressure by venting*



**Figure 13**  
*Pressure Exhaust Valve  
(PVE100)*

nozzle onto the Mix Cartridge. Before spraying, the Air Injection Valve (D703) must be opened and air must be flowing through the nozzle. The amount of air can be adjusted to produce the proper mix and desired spray pattern.

## **Maintenance**

The TVM FD-2000 can be easily disassembled by the user for all maintenance and repair tasks. The TVM FD-2000 is made up of three basic systems - the Air Assist System, the Chemical Flow System, and the Mechanical System.

The **Air Assist System** is comprised of the following parts: (See Figure 14)

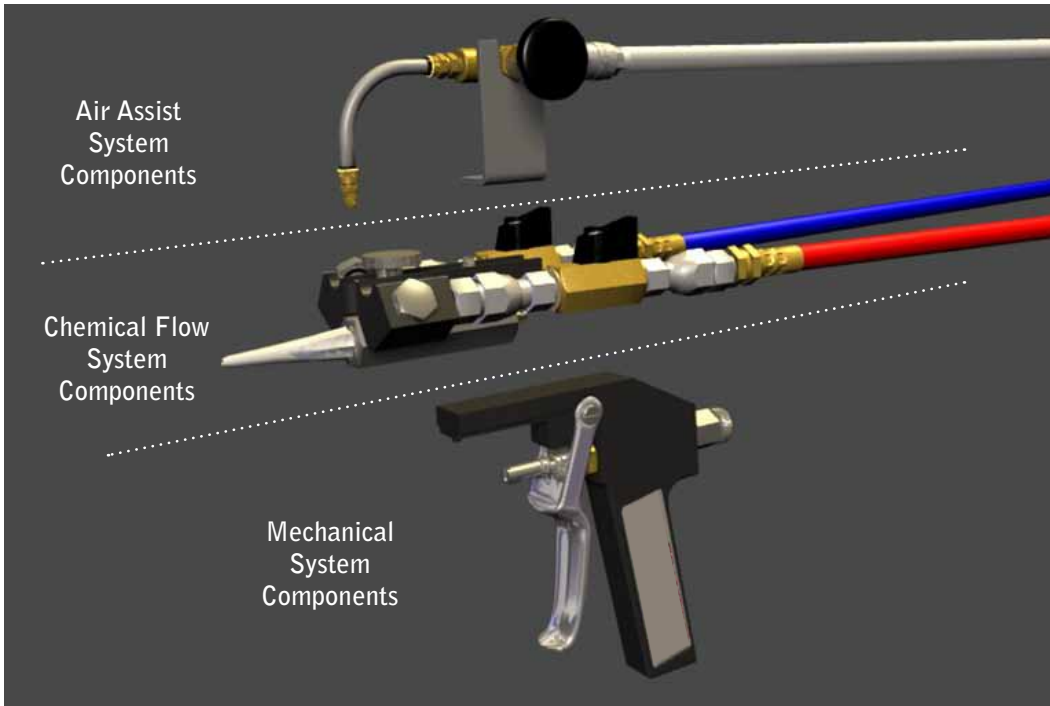
| <b>Part Description</b>        | <b>Part Number</b> |
|--------------------------------|--------------------|
| Air Assist Bracket             | D718               |
| 1/8 inch Needle Valve          | D703               |
| 1/16 inch Tubing Connector     | D706E              |
| 1/8 inch Tubing Connectors (2) | D707               |
| 1/4 inch Tubing                | D708               |
| Bracket Attachment Screws (2)  | D719               |

The **Chemical Flow System** is comprised of the following parts: (See Figure 14)

| <b>Part Description</b>                              | <b>Part Number</b> |
|--|--------------------|
| Carrier EZ   | D500EZ             |
| Attachment Screws (2)                                | D502               |
| Filter Screens (2)                                   | D504               |
| Filter Plugs (2)                                     | D505               |
| Filter Plug O-Rings (2)                              | D506               |
| Check Springs (2)                                    | D508               |
| Check Balls (2)                                      | D509               |
| 3/8 inch Hose Connectors (2)                         | D520               |
| Hose Connector O-Rings (2)                           | D506               |
| Airless Gun Mix Cartridge                            | AD600WA            |
| Cartridge O-Rings (2)                                | D602               |
| Thumbnut   | D510               |
| Nozzle   | N100, N200         |
| Mix Cartridge End Plug                               | D620               |
| ¼ inch Male NPT x 3/8 inch Female JIC Connectors (2) | H864               |
| EZ Valve Units (2)                                   | D503EZ             |
| 1/8 inch Male NPT x 3/8 inch Male JIC Connectors (2) | H837               |

The **Mechanical System** is comprised of the following parts: (See Figure 14)

| <b>Part Description</b>    | <b>Part Number</b> |
|----------------------------|--------------------|
| Airless Handle             | AL100              |
| Trigger                    | AL108              |
| Trigger Pivot Pin          | AL109              |
| Trigger Pivot Screw        | AL110              |
| Airless Gun Connecting Rod | AL106              |
| Connecting Rod Bushing     | AL107              |
| Inner Return Spring        | AL104              |
| Outer Return Spring        | AL105              |
| Spring Spacer              | AL103              |
| Tension Adjusting Nut      | AL102              |
| Tension Adjusting Knob     | AL101              |



**Figure 14**  
*The two functional sections of the TVM FD-2000*

## Symptoms of problems in the chemical flow system

No chemicals dispensed when gun is triggered

Only one chemical (only “A” Chemical or only “B” Chemical) dispensed when gun is triggered

Difficulty in adjusting the proper “A”/”B” Chemicals ratio

Inconsistent flow of chemicals

### Corrective Actions:

Verify nitrogen, cylinder and dispenser valves are open

Check if nitrogen cylinder or chemical cylinders are empty

Check Nozzle (N100) for blockage

Ensure Mix Cartridge End Plug (D620) is not installed

If problem still exists, proceed to the next section, “Cleaning the Mix Cartridge”.

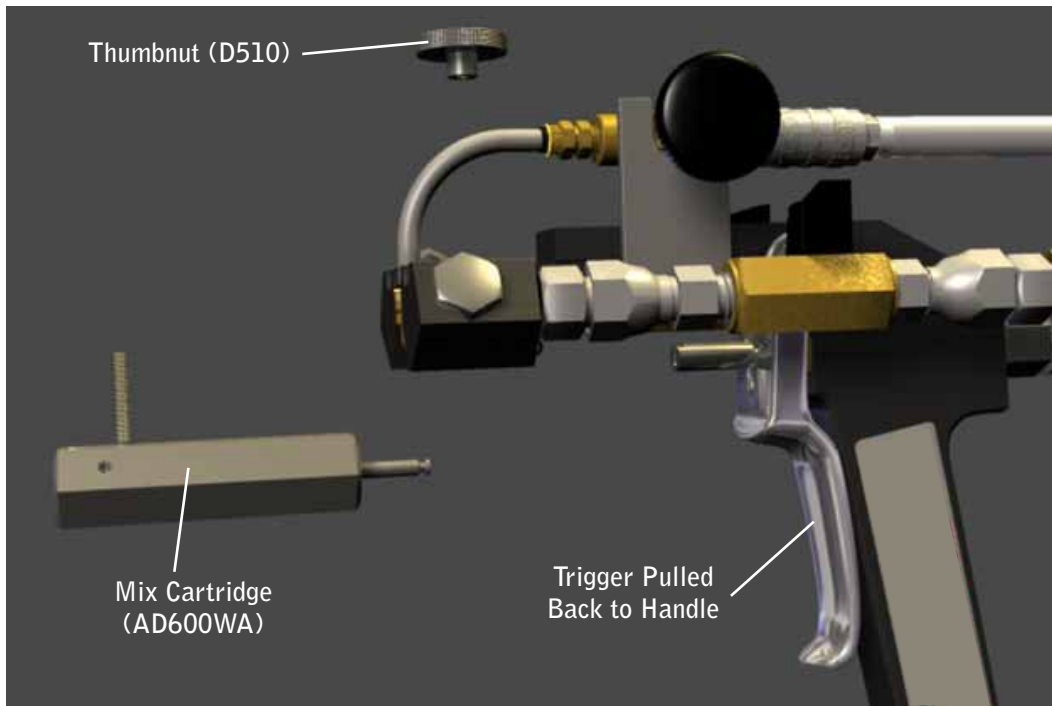
## **Chemical Flow System**

**IMPORTANT - Prior to servicing the Mix Cartridge (AD600WA), close all Chemical Valves on “A” and “B” Chemical Cylinders and “A” and “B” Chemical Hoses. (See Figure 2, page 3)**

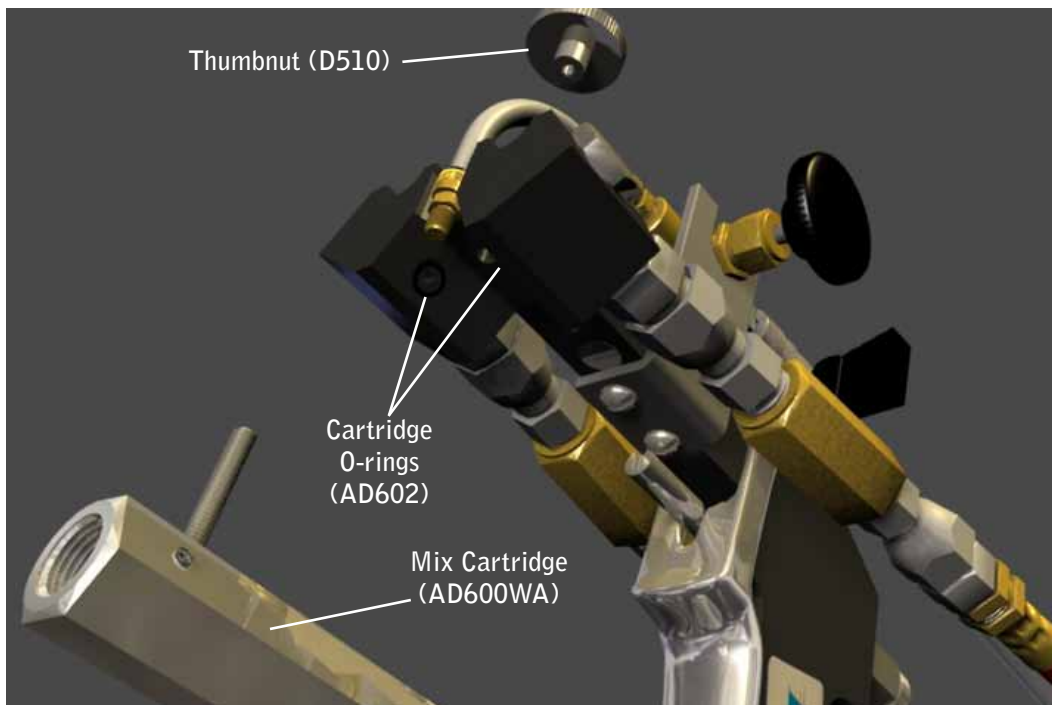
**CRITICAL - Prior to servicing the Mix Cartridge (AD600WA), close both EZ Valve Units (D503EZ) on the TVM FD-2000. (See Figure 1, page 3)**

## **Cleaning the Mix Cartridge**

- 1 | Disconnect air line (D708) from the Air Injection Needle Valve (D703).
- 2 | Loosen, but do not fully remove, Thumbnut (D510) using a pair of pliers.
- 3 | Holding the Trigger (AL108) in the triggered (pulled) position, lightly tap on top of Thumbnut (D510) to separate the Mix Cartridge (AD600WA) from Carrier (D500EZ).
- 4 | The Air Injection line (D708) can now be removed from the Mix Cartridge (AD600WA) for cleaning, if desired.
- 5 | Continue holding the Trigger (AL108) in the triggered (pulled) position while removing Thumbnut (D510). Set aside Thumbnut (D510) for reassembly later.
- 6 | Continue holding the Trigger (AL108) in the triggered (pulled) position while removing the Mix Cartridge (AD600WA). Remove the Mix Cartridge (AD600WA) from the Carrier (D500EZ). Trigger can now be released.
- 7 | The Mix Cartridge (AD600WA) should have the center rod extended. DO



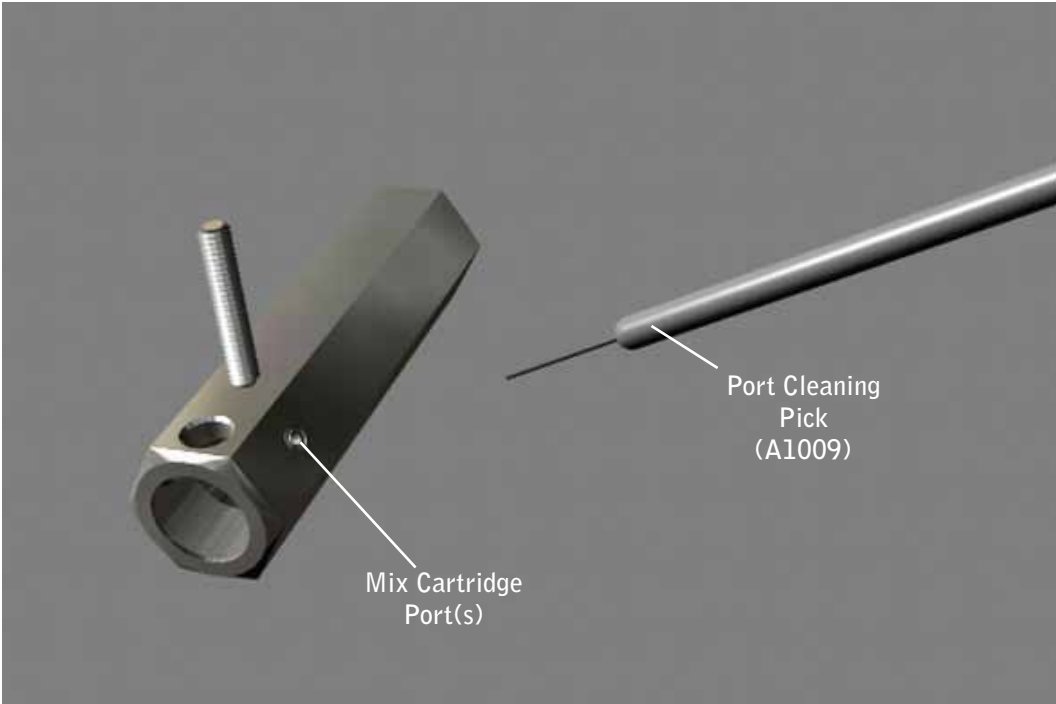
**Figure 15**  
*Removing the Mix Cartridge for cleaning*



**Figure 16**  
*Cleaning the surfaces of the Carrier and inspecting the O-rings*

NOT remove the center rod. Removing the center rod will damage the Mix Cartridge (AD600WA). There are no user serviceable parts inside the Mix Cartridge (AD600WA). DO NOT remove the chemical ports on the side of the Mix Cartridge (AD600WA). Removal of the chemical ports will damage the Mix Cartridge (AD600WA).

- 8 | Using a Port Cleaning Pick (A1009), clean any debris from each small port on the sides of the Mix Cartridge (AD600WA).
- 9 | Holding the Mix Cartridge (AD600WA) vertically with the threaded opening on the front of the Cartridge pointed straight up, pour some solvent into the threaded opening. This should rinse the inside of the cartridge and solvent should exit the small ports.
- 10 | Check the small ports again and make sure they are clean.
- 11 | Remove the two Cartridge O-Rings (D602) on the Carrier (D500EZ).
- 12 | Clean the surfaces of the Carrier (D500EZ) where it comes into contact with the Mix Cartridge (AD600WA).
- 13 | Replace the two Cartridge O-Rings (D602) on the Carrier (D500EZ).
- 14 | If the Air Injection Line (D708) was disconnected, reconnect to the Mix Cartridge (AD600WA).
- 15 | Holding the Trigger (AL108) in the triggered (pulled) position, reinstall the Mix Cartridge (AD600WA) onto the Carrier (D500EZ), making sure that the notch in the center rod of the Mix Cartridge mates correctly with the notch in the Connecting Rod (AL106).
- 16 | Release the Trigger (AL108). The center rod of the Mix Cartridge (AD600WA) should return to its forward (inward) position.
- 17 | Replace the Thumbnut (D510). Tighten by hand, then snug into place 1/4 turn using a pair of pliers. DO NOT overtighten the Thumbnut (D510). Doing so will cause damage to the Mix Cartridge (AD600WA).
- 18 | Reconnect the Air Injection Line (D708) to the Air Injection Needle Valve (D703).
- 19 | Check the TVM FD-2000 for proper chemical flow. If chemical flow problems persist, or difficulty is encountered in achieving proper "A" to "B" chemical ratio, cleaning the two Filter Screens (D504) in the Carrier EZ (D500 EZ) is recommended. The procedure to perform this cleaning is detailed in the next step, "Cleaning the Filter Screens (D504)" outlined on page 26.



**Figure 17**  
*Cleaning the orifices  
of the Mix Cartridge*



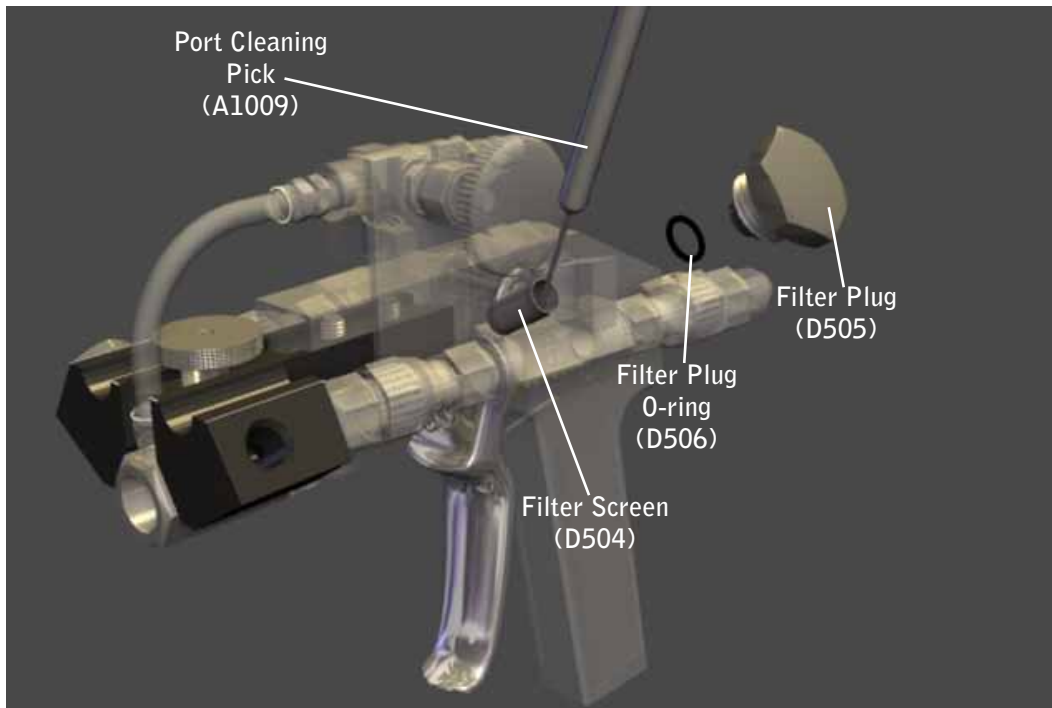
**IMPORTANT - Prior to replacing the Mix Cartridge (AD600WA), close all Chemical Valves on “A” and “B” Chemical Cylinders and “A” and “B” Chemical Hoses. (See Figure 2, page 3)**

**CRITICAL - Prior to replacing the Mix Cartridge (AD600WA), close both EZ Valve Units (D503EZ) on the TVM FD-2000. (See Figure 1, page 3)**

## ***Replacing the Mix Cartridge***

- 1 | Disconnect Air Injection Line (D708) from the Air Injection Needle Valve (D703).
- 2 | Loosen, but do not fully remove, Thumbnut (D510) using a pair of pliers.
- 3 | Remove the Mix Cartridge (AD600WA) from Carrier (D500EZ).
- 4 | Check the small ports on the Carrier (D500EZ) and make sure they are clean.
- 5 | Remove the two Cartridge O-Rings (D602) on the Carrier (D500EZ).
- 6 | Clean the surfaces of the Carrier (D500EZ) where it comes into contact with the Mix Cartridge (AD600WA).
- 7 | Install the Air Injection Line (D708) into the Mix Cartridge (AD600WA).
- 8 | Before installing the Mix Cartridge (D600WA), aim the dispenser into a trash can and slowly open the “A” valve to check the chemical flow through the “A” port on the Carrier (D500EZ). Close the “A” valve. Repeat this step for the “B” side. Flush chemical residue from the ports. Replace the two Cartridge O-Rings (D602) on the Carrier (D500EZ).
- 9 | Install the Mix Cartridge (AD600WA) onto the Carrier (D500EZ), making sure that the notch in the center rod of the Mix Cartridge mates correctly with the notch in the Connecting Rod (AL106).
- 10 | Connect the Air Injection Line (D708) to the Air Injection Needle Valve (D703).
- 11 | Replace the Thumbnut (D510). Tighten by hand, then snug into place 1/4 turn using a pair of pliers. DO NOT overtighten the Thumbnut (D510). Doing so will cause damage to the Mix Cartridge (AD600WA).
- 12 | Check the TVM FD-2000 for proper chemical flow. If chemical flow problems persist, or difficulty is encountered in achieving proper “A” to “B” chemical ratio, cleaning the two Filter Screens (D504) in the Carrier EZ (D500 EZ) is recommended. The procedure to perform this cleaning is detailed in the next step, “Cleaning the Filter Screens (D504)” outlined as on page 26.

**IMPORTANT - Prior to servicing the two Filter Screens (D504), close all Chemical Valves on “A” and “B” Chemical Cylinders and “A” and “B” Chemical Hoses. (See Figure 2, page 3)**



**Figure 18**  
*Cleaning the  
Filter Screens*

**CRITICAL - Prior to servicing the two Filter Screens (D504), close both EZ Valve Units (D503EZ) on the TVM FD-2000. (See Figure 1, page 3)**

(See Figure 18 for this procedure)

## ***Cleaning the Filter Screens***

- 1 | Using a wrench, remove the Filter Plug (D505). The Filter Screen (D504) is pressed onto the end of the Filter Plug (D505). Upon inspection, the Filter Screen (D504) should be clean and free of dirt or debris. Clean the Filter Screen (D504) with solvent if necessary. The Filter Screen (D504) is pressed onto the end of the Filter Plug (D505). The Filter Screen (D504) can be rinsed with solvent without removing it from the Filter Plug (D505). If the Filter Screen (D504) is damaged, it can be removed from The Filter Plug (D505) and replaced by pressing a new Filter Screen (D504) onto the Filter Plug (D505).

**Note:** Remove and clean the Filter Plug (D505) and Filter Screen (D504) one side/component at a time to avoid cross-contamination.

- 2 | Inspect the Filter Plug O-Ring (D506). Replace if necessary.
- 3 | Making sure that the Filter Screen (D504) is set in place on the Filter Plug (D505), and that the Filter Plug O-Ring (D506) is in place, point “A” side of the Carrier toward the trash can, then open “A” side chemical valve to check for chemical flow. Repeat for “B” side. If proper flow is achieved, reinstall the Filter Plug Assembly into the Carrier (D500EZ) and tighten with a wrench. Flush filter housing with solvent before installing new filter (D500).

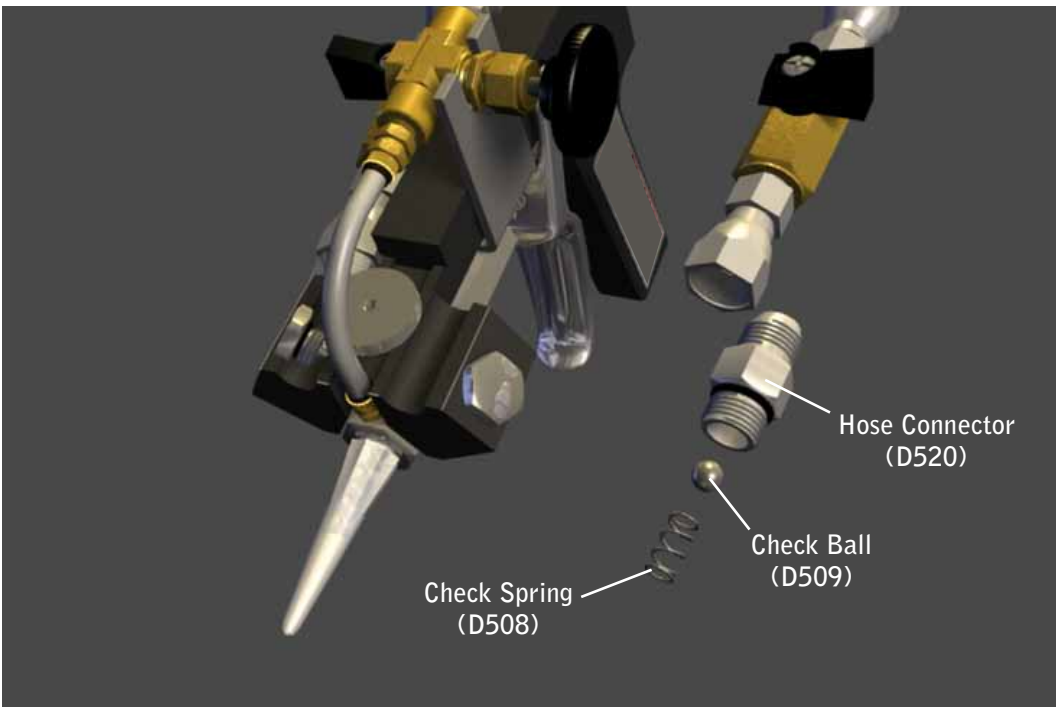
**IMPORTANT - Prior to servicing the two Check Ball / Spring Assemblies (D508, D509), close all Chemical Valves on “A” and “B” Chemical Cylinders and “A” and “B” Chemical Hoses. (See Figure 2, page 3)**

**CRITICAL - Prior to servicing the two Check Ball / Spring Assemblies (D508, D509), close both EZ Valve Units (D503EZ) on the TVM FD-2000. (See Figure 1, page 3)**

(See Figure 19 for this procedure)

## ***Check Ball and Check Spring Assemblies***

- 1 | Make sure both of the EZ Valve Units (D503EZ) are closed.
- 2 | Using a wrench, loosen and remove the ¼” male NPT x 3/8” female JIC Connector (H864) from the 3/8” Hose Connector (D520).
- 3 | Using a wrench, remove the 3/8” Hose Connector (D520) from the Carrier (D500EZ). Inspect the Hose Connector O-Ring (D506), and replace if necessary.
- 4 | Remove the Check Ball (D509) and Check Spring (D508) from the 3/8” Hose Connector (D520). Clean the Check Ball (D509) and Check Spring (D508) and inspect for damage. Replace parts if necessary.



**Figure 19**  
*Servicing the  
Check Ball*

- 5 | Clean and inspect the 3/8" Hose Connector (D520). Clean and inspect the Hose Connector O-Ring (D506). Replace if necessary.
- 6 | Clean and inspect the port holes on the Carrier (D500EZ) before reinstalling the Check Ball (D509) and Check Spring (D508).
- 7 | To reassemble, place the Check Ball (D509) inside the 3/8" Hose Connector (D520). The Check Ball (D509) should fit inside the 3/8" Hose Connector (D520), but should be loose enough to be able to move back and forth. If the Check Ball (D509) fits too tightly in the 3/8" Hose Connector (D520), replace both of these parts. Place the Check Spring (D508) on top of the Check Ball (D509) inside the 3/8" Hose Connector (D520).
- 8 | Thread the 3/8" Hose Connector (D520) containing the Check Ball (D509) and Check Spring (D508) into the Carrier (D500EZ). Tighten with a wrench.
- 9 | Reconnect the 1/4" male NPT x 3/8" female JIC connector (H864).

**NOTE:** Prior to removing the Handle (AL100) / Trigger (AL108) Assembly, the Mix Cartridge (AD600WA) must be removed from the TVM FD-2000 gun. To do so, follow Steps 1 and 2 in "Cleaning the Mix Cartridge" on page 20.

## ***Mechanical System***

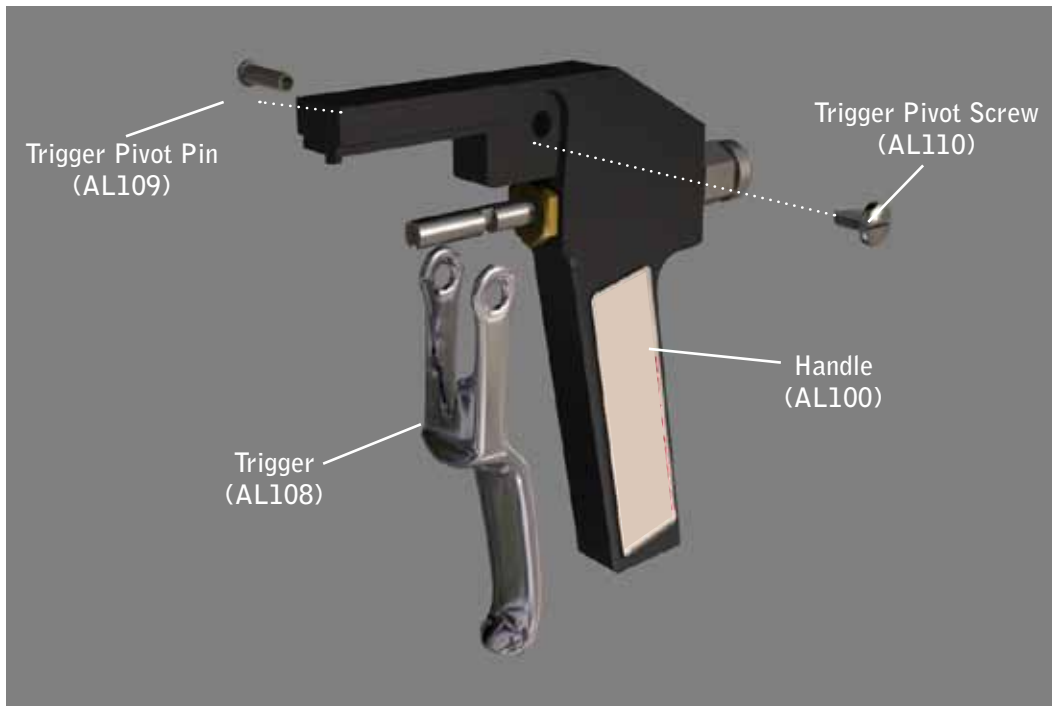
**IMPORTANT - Prior to servicing the Mix Cartridge (AD600WA), close all Chemical Valves on "A" and "B" Chemical Cylinders and "A" and "B" Chemical Hoses. (See Figure 2, page 3)**

**CRITICAL- Prior to servicing the Mix Cartridge (AD600WA), close both EZ Valve Units (D503EZ) on the TVM FD-2000. (See Figure 1, page 3)**

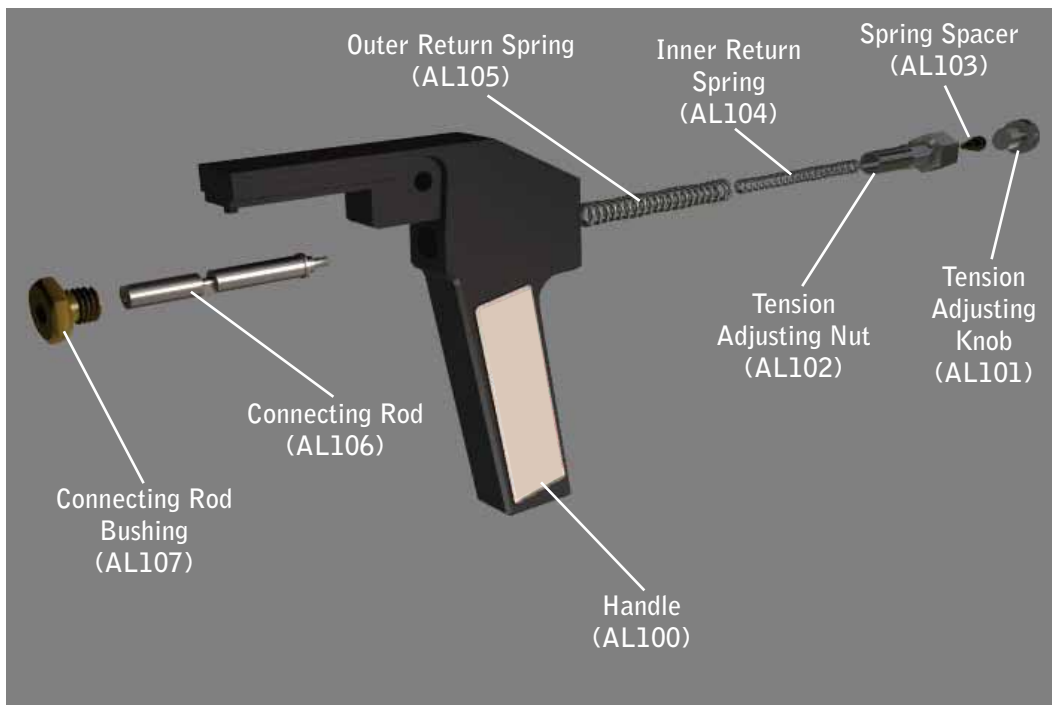
## ***Servicing the Trigger***

(See Figure 20 for this procedure)

- 1 | Close both EZ Valve Units (D503EZ) on the TVM FD-2000.
- 2 | Remove the Trigger Pivot Screw (AL110) from the Trigger Pivot Pin (AL109) using a screwdriver. The Trigger Pivot pin (AL109) can then be removed from the Handle (AL100).
- 3 | The Trigger (A108) can then be removed from the Handle (AL100).
- 4 | To reinstall or replace the Trigger (AL108), slide the Trigger (AL108) back into position, making sure that the notch in the Trigger (AL108) is positioned correctly with the notch in the Connecting Road (AL106).
- 5 | Reinstall the Trigger Pivot Pin (AL109) in the Handle (AL100). Install the Trigger Pivot Screw (AL110) into the Trigger Pivot Pin (AL109).



**Figure 20**  
*Servicing the Trigger Assembly*



**Figure 21**  
*Servicing the Trigger Return Springs*

## ***Servicing the Return Springs, Connecting Rod and Connecting Rod Bushing***

- 1 | Close both EZ Valve Units (D503EZ) on the TVM FD-2000. Remove Trigger (AL108) by performing Steps 1 through 3 in “Servicing the Trigger”.
- 2 | Replace the Mix Cartridge (AD600WA) by performing Steps 1 and 2 in “Cleaning the Mix Cartridge” above.
- 3 | Using a wrench, remove the Tension Adjusting Nut (AL102). Leave the Tension Adjusting Knob (AL101) in place.
- 4 | Remove the Connecting Rod (AL106) from the Handle (AL100) by pushing the Connecting Rod backward through the Connecting Rod Bushing (AL107). The Outer Return Spring (AL105), the Inner Return Spring (AL104), and the Spring Spacer (AL103) should also be pushed out of the Handle (AL100) at the same time.
- 5 | The Connecting Rod Bushing (AL107) can be removed if necessary by unscrewing it from the Handle (AL100) using a pair of pliers. Reinstall the Connecting Rod Bushing (AL107) by screwing it back into the Handle (AL100). Tighten with pliers.
- 6 | To reassemble the Return Springs (AL104, AL105)/ Connecting Rod (AL106) Assembly, first make sure that the Connecting Rod Bushing (AL107) is in place in the Handle (AL100).
- 7 | Lightly grease the Connecting Rod (AL106), and insert it in the Handle (AL100), making sure that it passes through the Connecting Rod Bushing (AL107). Make sure that the slot in the front of the Connecting Rod (AL106) is pointed down.
- 8 | Lightly grease the Outer Return Spring (AL105) and Inner Return Spring (AL104). Place the Inner Return Spring (AL104) inside the Outer Return Spring (AL105).
- 9 | Place the Spring Spacer (AL103) on the end of the Inner Return Spring (AL104).
- 10 | Hold the Tension Adjusting Nut (AL102) / Tension Adjusting Knob (AL101) Assembly vertically with the opening pointed upward. Place the Springs / Spacer Assembly described in Step 7 above into the Tension Adjusting Nut (AL102), being careful that the Spring Spacer (AL103) remains in place.
- 11 | Install the Assembly performed in Step 1 above into the Handle (AL100) using a wrench to tighten. NOTE: It will be easier to perform this step if the Tension Adjusting Knob (AL101) is loosened (but not fully removed) first.
- 12 | Reinstall the Mix Cartridge (AD600WA) as outlined in Steps 3 through 8 of “Replacing the Mix Cartridge” above.
- 13 | Reinstall the Trigger Pivot Pin (AL109) in the Handle (AL100). Install the Trigger Pivot Screw (AL110) into the Trigger Pivot Pin (AL109).





## Ratio Calibration Chart

*Target Ratio: 1.15 to 1.25 A:B*

### 3 Second Shot (A and B)

| <b>'A' Chemical Wt. (g)</b> | <b>'B' Chemical Target Wt. (g)</b> | <b>Flow Rate (lbs/min)</b> |
|-----------------------------|------------------------------------|----------------------------|
| 30                          | 24-26                              | 2.4                        |
| 31                          | 25-27                              | 2.5                        |
| 32                          | 26-28                              | 2.6                        |
| 33                          | 26-29                              | 2.7                        |
| 34                          | 27-30                              | 2.7                        |
| 35                          | 28-30                              | 2.8                        |
| 36                          | 29-31                              | 2.9                        |
| 37                          | 30-32                              | 3.0                        |
| 38                          | 30-33                              | 3.1                        |
| 39                          | 31-34                              | 3.1                        |
| 40                          | 32-35                              | 3.2                        |
| 41                          | 33-36                              | 3.3                        |
| 42                          | 34-37                              | 3.4                        |
| 43                          | 34-37                              | 3.5                        |
| 44                          | 35-38                              | 3.6                        |
| 45                          | 36-39                              | 3.6                        |
| 46                          | 37-40                              | 3.7                        |
| 47                          | 38-41                              | 3.8                        |
| 48                          | 38-42                              | 3.9                        |
| 49                          | 39-43                              | 4.0                        |
| 50                          | 40-43                              | 4.0                        |
| 51                          | 41-44                              | 4.1                        |
| 52                          | 42-45                              | 4.2                        |
| 53                          | 42-46                              | 4.3                        |
| 54                          | 43-47                              | 4.4                        |
| 55                          | 44-48                              | 4.4                        |
| 56                          | 45-49                              | 4.5                        |
| 57                          | 46-50                              | 4.6                        |
| 58                          | 46-50                              | 4.7                        |
| 59                          | 47-51                              | 4.8                        |
| 60                          | 48-52                              | 4.8                        |
| 61                          | 49-53                              | 4.9                        |
| 62                          | 50-54                              | 5.0                        |
| 63                          | 50-55                              | 5.1                        |
| 64                          | 51-56                              | 5.2                        |
| 65                          | 52-57                              | 5.2                        |
| 66                          | 53-57                              | 5.3                        |
| 67                          | 54-58                              | 5.4                        |
| 68                          | 54-59                              | 5.5                        |
| 69                          | 55-60                              | 5.6                        |
| 70                          | 56-61                              | 5.7                        |
| 71                          | 57-62                              | 5.7                        |
| 72                          | 58-63                              | 5.8                        |
| 73                          | 58-63                              | 5.9                        |
| 74                          | 59-64                              | 6.0                        |
| 75                          | 60-65                              | 6.1                        |

## Ratio Calibration Chart

### Target Ratio: 1.15 to 1.25 A:B

#### 3 Second Shot (A and B)

| <b>'A' Chemical Wt. (g)</b> | <b>'B' Chemical Target Wt. (g)</b> | <b>Flow Rate (lbs/min)</b> |
|-----------------------------|------------------------------------|----------------------------|
| 76                          | 61-66                              | 6.1                        |
| 77                          | 62-67                              | 6.2                        |
| 78                          | 62-68                              | 6.3                        |
| 79                          | 63-69                              | 6.4                        |
| 80                          | 64-70                              | 6.5                        |
| 81                          | 65-70                              | 6.5                        |
| 82                          | 66-71                              | 6.6                        |
| 83                          | 66-72                              | 6.7                        |
| 84                          | 67-73                              | 6.8                        |
| 85                          | 68-74                              | 6.9                        |
| 86                          | 69-75                              | 6.9                        |
| 87                          | 70-76                              | 7.0                        |
| 88                          | 70-77                              | 7.1                        |
| 89                          | 71-77                              | 7.2                        |
| 90                          | 72-78                              | 7.3                        |
| 91                          | 73-79                              | 7.3                        |
| 92                          | 74-80                              | 7.4                        |
| 93                          | 74-81                              | 7.5                        |
| 94                          | 75-82                              | 7.6                        |
| 95                          | 76-83                              | 7.7                        |
| 96                          | 77-83                              | 7.8                        |
| 97                          | 78-84                              | 7.8                        |
| 98                          | 78-85                              | 7.9                        |
| 99                          | 79-86                              | 8.0                        |
| 100                         | 80-87                              | 8.1                        |
| 101                         | 81-88                              | 8.2                        |
| 102                         | 82-89                              | 8.2                        |
| 103                         | 82-90                              | 8.3                        |
| 104                         | 83-90                              | 8.4                        |
| 105                         | 84-91                              | 8.5                        |
| 106                         | 85-92                              | 8.6                        |
| 107                         | 86-93                              | 8.6                        |
| 108                         | 86-94                              | 8.7                        |
| 109                         | 87-95                              | 8.8                        |
| 110                         | 88-96                              | 8.9                        |
| 111                         | 89-97                              | 9.0                        |
| 112                         | 90-97                              | 9.0                        |
| 113                         | 90-98                              | 9.1                        |
| 114                         | 91-99                              | 9.2                        |
| 115                         | 92-100                             | 9.3                        |
| 116                         | 93-101                             | 9.4                        |
| 117                         | 94-102                             | 9.4                        |
| 118                         | 94-103                             | 9.5                        |
| 119                         | 95-103                             | 9.6                        |
| 120                         | 96-104                             | 9.7                        |
| 121                         | 97-105                             | 9.8                        |

**Ratio Calibration Chart**  
**Target Ratio: 1.15 to 1.25 A:B**

**3 Second Shot (A and B)**

| <b>'A' Chemical Wt. (g)</b> | <b>'B' Chemical Target Wt. (g)</b> | <b>Flow Rate (lbs/min)</b> |
|-----------------------------|------------------------------------|----------------------------|
| 122                         | 98-106                             | 9.9                        |
| 123                         | 98-107                             | 9.9                        |
| 124                         | 99-108                             | 10.0                       |
| 125                         | 100-109                            | 10.1                       |
| 126                         | 101-110                            | 10.2                       |
| 127                         | 102-110                            | 10.3                       |
| 128                         | 102-111                            | 10.3                       |
| 129                         | 103-112                            | 10.4                       |
| 130                         | 104-113                            | 10.5                       |
| 131                         | 105-114                            | 10.6                       |
| 132                         | 106-115                            | 10.7                       |
| 133                         | 106-116                            | 10.7                       |
| 134                         | 107-117                            | 10.8                       |
| 135                         | 108-117                            | 10.9                       |
| 136                         | 109-118                            | 11.0                       |
| 137                         | 110-119                            | 11.1                       |
| 138                         | 110-120                            | 11.1                       |
| 139                         | 111-121                            | 11.2                       |
| 140                         | 112-122                            | 11.3                       |
| 141                         | 113-123                            | 11.4                       |
| 142                         | 114-123                            | 11.5                       |
| 143                         | 114-124                            | 11.5                       |
| 144                         | 115-125                            | 11.6                       |
| 145                         | 116-126                            | 11.7                       |
| 146                         | 117-127                            | 11.8                       |
| 147                         | 118-128                            | 11.9                       |
| 148                         | 118-129                            | 12.0                       |
| 149                         | 119-130                            | 12.0                       |