



# User Manual

REV: 03/17

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# Introduction to FSeries Micro-infusion™ System

Arborjet's FSeries Micro-infusion™ system was developed to effectively deliver high volumes of injectable product into the sapwood of any type of tree. It enables the applicator to precisely deliver an accurate, measured dose of insecticide, fertilizer or fungicide into the xylem tissue in a safe and environmentally friendly way.

The FSeries can utilize either **VIPER** or **STINGER** micro-infusion interface technology.

## VIPER - "Volume-Injection Pressure-Enhanced Reservoir"

- Uses Arborplug
- Arborplug is the plug inserted into the Sapwood
- VIPER Needle is the name of the Micro-infusion™ Needle
- VIPER Method is the procedure for the Micro-infusion™ using Arborplug and VIPER needle.

### When to use VIPER:

- Faster Uptake
- Closed Infusion Site
- No leakage
- Faster Wound Closure
- Conifers
- Infection Prone Trees



## STINGER – "Stick-Inject-Remove" (Does not use Arborplug)

- Does not use Arborplug
- STINGER Needle is the name of the Micro-infusion™ needle and tip.
- STINGER Method is the procedure for the Micro-infusion™ using STINGER needle.

### When to Use STINGER:

- Faster Set Up
- Simpler process
- Ring Porous Trees
- Non-Arborists



# Parts of the F12 Kit (070-0010)

**Bottle & Cap  
Assembly**  
**(070-0075)**

**Pressure Pump**  
**(070-0090)**

**F-Series Tool Kit:**  
**(070-0240)**

**Mixing and  
Measuring Kit:**  
**(070-0104)**  
Includes:  
Graduated Cylinder  
Funnel  
Carrying Cup



**6 Gallon Bucket**  
**(070-0215)**

**F-Series Stand  
4-Pack:**  
**(070-0210)**

**Hex PDS (070-0085)**

**CLEAN-jet**  
**½ L (030-2035)**  
Reorder:  
**1 L (030-2030)**

# 3 Easy Steps for the F-Series

## 1. DRILL



## 2. PLUG



## 3. INJECT



### SAFETY REMINDER

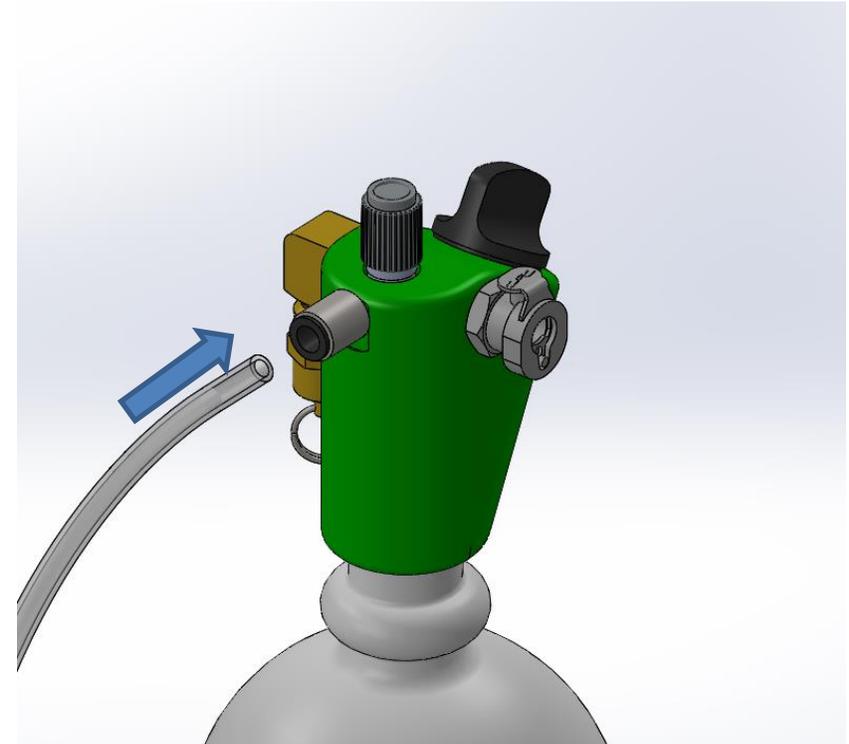
Always wear safety glasses and gloves when handling equipment and products.



# How to Assemble the F-Series



Insert VIPER needle into ball valve assembly



Insert tubing firmly into PTC (Push To Connect) fittings.

# Prepare the F-Series for Micro-infusion™

**Determine the DBH”  
(Diameter at Breast Height  
in inches).**

Measure tree diameter in inches, at breast height by using a diameter tape, OR measure circumference and divide by Pi (3.1415).

**2. Read product label** and use DBH” to determine total injection volume for entire treatment application and how many bottles will be needed for application.

**Each 650 ml bottle has 400 ml capacity; each 1.5 liter bottle has 1 liter (1000 ml) capacity.**

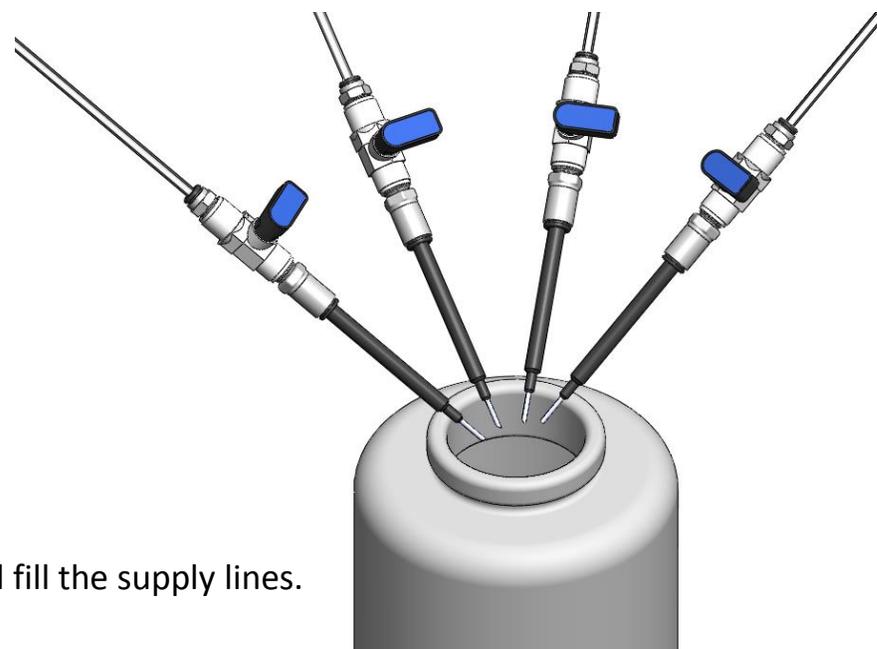
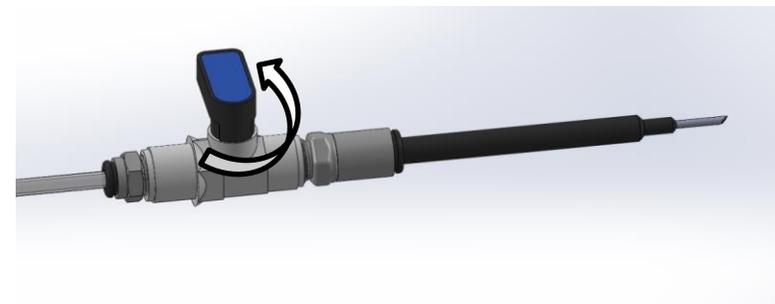
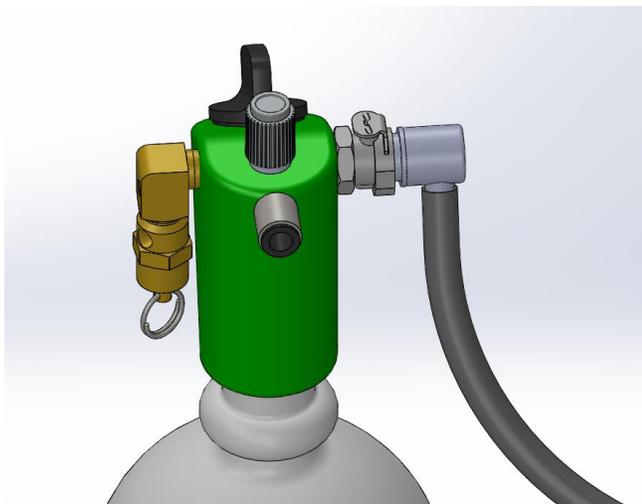
**3. Measure** volume in graduated cylinder.

**4. Pour** into FSeries bottle(s) using funnel.

***IMPORTANT - 400 ml or 1000 ml capacity- There must be air space in the bottle for air pressure, otherwise you may need to re-pressurize during the micro-infusion.***

WARRANTY VOID WITH USE OF NON-ARBORJET APPROVED FORMULATIONS

# Pressurize and Prime Supply Lines

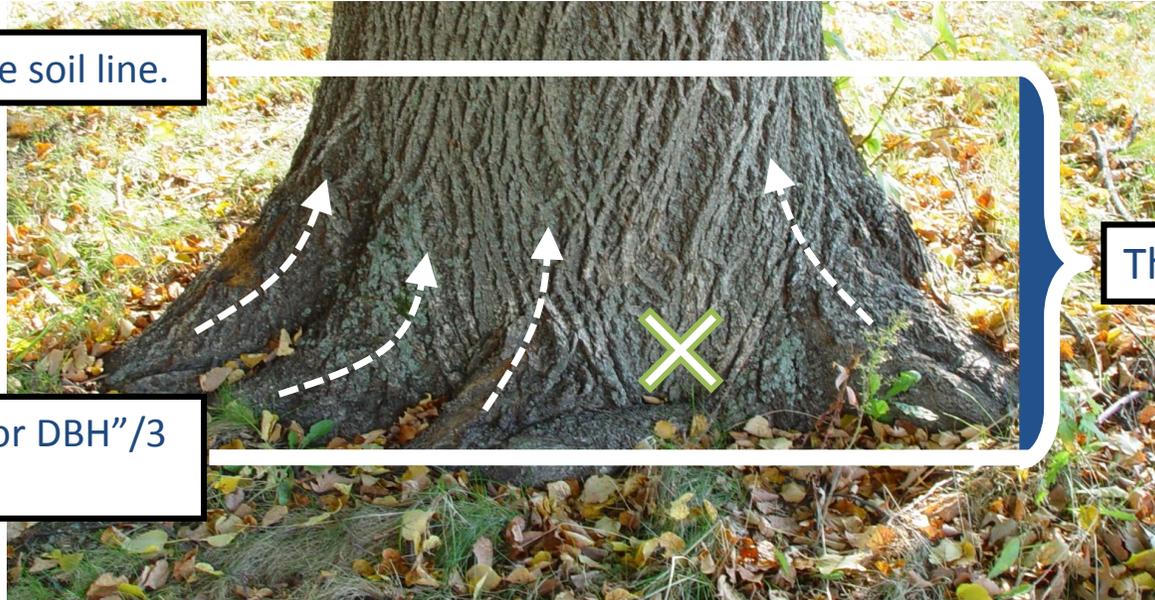


- 1.) Make sure F-Series 3 turn main bottle cap valve and ¼ turn Ball Valves are **OFF** before Pressurizing.
- 2.) Connect the Pressure Pump to the Pressure Quick Disconnect on the bottle top.
- 3.) Pressurize between 35 – 120 psi. For safety: Blow-off valve will release at 120psi (maximum).
- 4.) Turn ON the F-Series 3 turn main bottle cap valve and product will flow into the supply lines.
- 5.) To prime the supply lines, open each Needle Valve to release any air in the lines. Product will fill the supply lines. This is recommended for best uptake results.

***NOTE: Before you begin treating Conifers, please see pg 15 “Conifers vs Deciduous”***

# Select Arborplug™ Sites

Sites are within 36" above the soil line.



The Best Arborplug Injection Zone

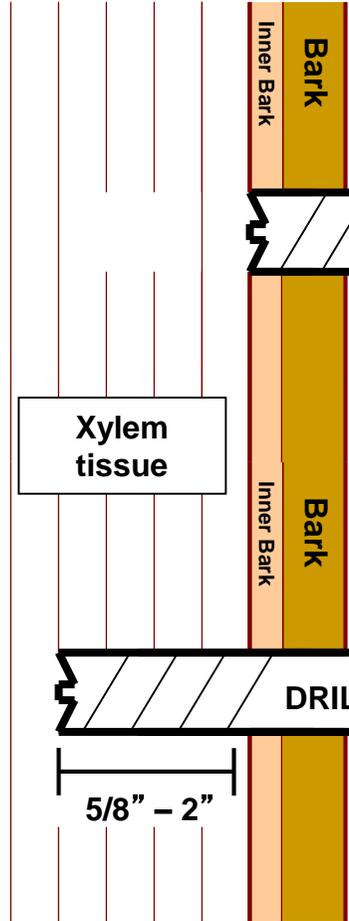
No. of Arborplugs =  $DBH''/4$  or  $DBH''/3$   
(ex. 24" DBH = 6 – 8 sites)



Root Flares show best uptake and formulation distribution to the canopy. Choosing good Arborplug sites result in faster injections.

# Drill Sites for Arborplugs

Annual Rings



Estimated Drill Depth into Xylem:  
 Hardwoods – 5/8” – 1 5/8” deep  
 Conifers – 1 5/8” – 2” deep

## STEP 1

Use very light pressure to drill through outer bark and inner bark. The drill bit will stop at the Xylem. You can remove drill bit to note the bark thickness.

## STEP 2

Use quick heavy pressure to drill into the Xylem.

Use sharp, high-helix brad-point drill bits (included in kit).



**Drill Bit Sizes:**  
 9/32” for #3 Arborplugs  
 3/8” for #4 Arborplugs

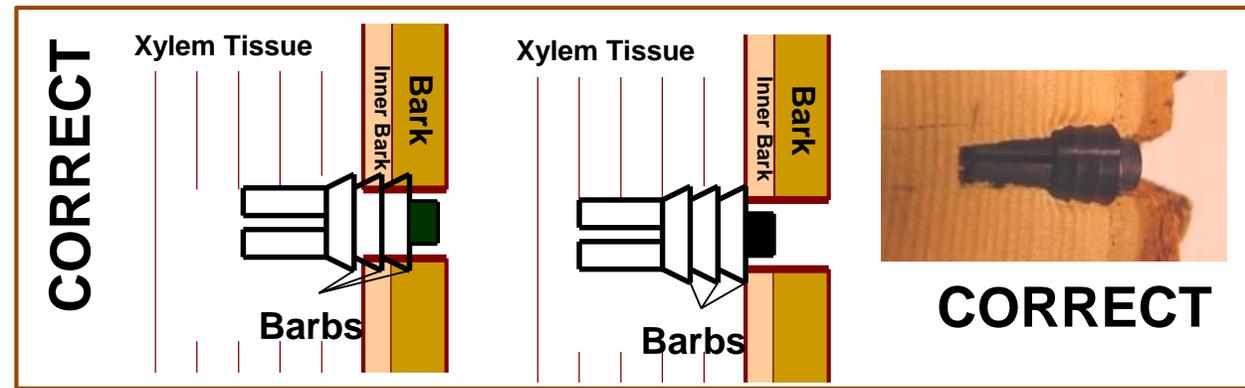
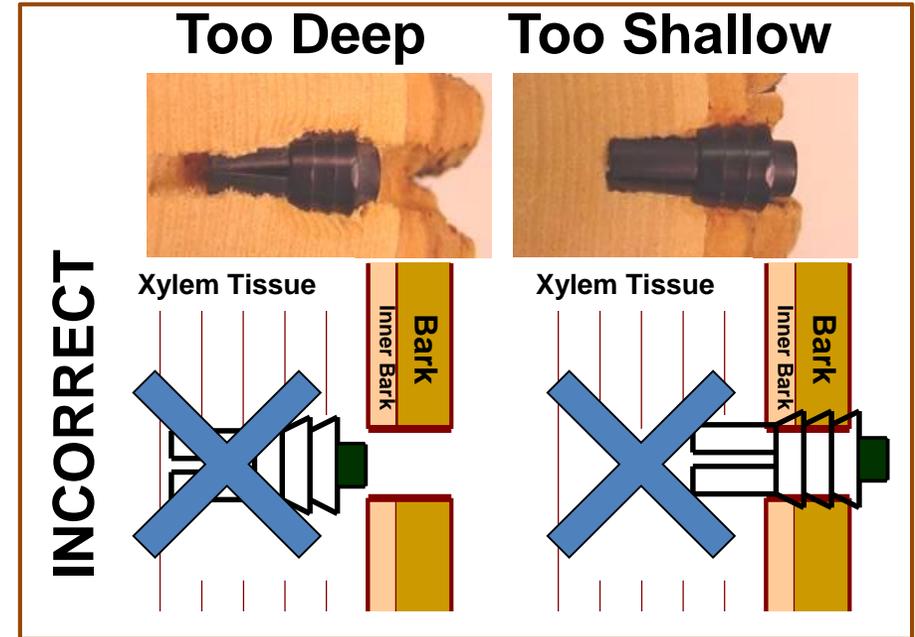
# Set the Arborplugs



1. Set Arborplugs into drilled holes using set tool (from kit) and hammer.



2. Make sure the barbs on the Arborplug make a seal between the xylem and the inner bark as illustrated.



# Micro-infusion™ with the FSeries



1. Turn bottle top valve ON (counter-clockwise).
2. Set VIPER Needle into the Arborplug.
3. Turn VIPER Needle valve ON (counter-clockwise).
  - Repeat for each needle.
4. Turn OFF each VIPER Needle as it finishes, and remove.

**Caution!!**  
Do not leave Arborjet F-Series unattended. Pesticide applications should always be attended and monitored.

# Treating Multiple Trees with the F-Series

When treating several trees in one area, multiple F-Series' work very well. Set up your first F-Series then the second then the third. By then the first tree is complete. Remove the first F-Series and set it up on the next tree and continue to "leap-frog" the F-Series'. This method is efficient. Fast uptake "ring-porous" trees may only need 2 F-Series to "leapfrog." Conifers and some diffuse porous trees take longer to treat and may require more F-Series' for maximum efficiency.

# Large Tree Micro-infusion™

400 mL is the maximum fill capacity for the smaller 650 ml bottle.

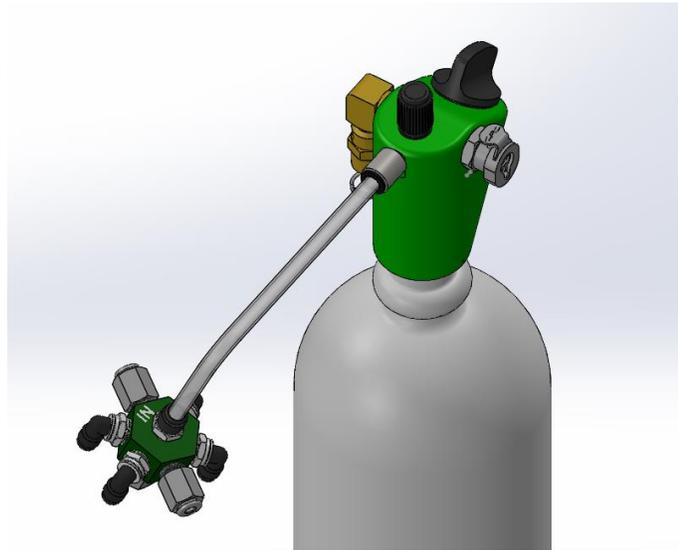
If more than 400 mL is used, the FSeries requires RE-PRESSURIZING during Micro-infusion.

More than 1 FSeries can be used on the same tree.

Examples:

-If dose is 800 mL, put all in 1-1.5 liter bottle or 400mL in each of 2 - 650 mL FSeries bottles.

-If dose is 1200mL, put 400mL in 3 FSeries bottles or 600mL in each of 2-1.5 liter bottles



Hex PDS connects to bottle top



Additional 4 line manifold(s) are connected

# Procedure: Conifers vs. Deciduous

## Important Note For Conifer Injections:

Sap flows out of conifers as a protective response to drilling.

For best results, we recommend:

1. Pressurize F-Series and prime each supply line.
2. Drill and set 1 Arborplug
3. Insert 1 VIPER needle and turn on the SMC Valve.
4. Repeat steps 2 and 3 for each injection sites.

***Insert VIPER needle and turn on valves right after each Arborplug is set. If too much time has passed between Arborplug setting and micro-infusion, sap may flow into your injection site, and make your uptake slower.***

## Important Note For Deciduous Injections:

No sap flows from deciduous trees after drilling.

For best results, we recommend:

1. Pressurize F-Series and prime each supply line.
2. Drill and Set All Arborplugs.
3. Insert All Primed VIPER needles and turn on each SMC Valve.
4. Turn All Primed VIPER needles ON (same time)

***Deciduous tree micro-infusion occurs very rapidly. You can open all VIPER needle valves then open the bottle top valve. This will ensure that even distribution of product occurs at each injection site.***

# Clean Out the FSeries

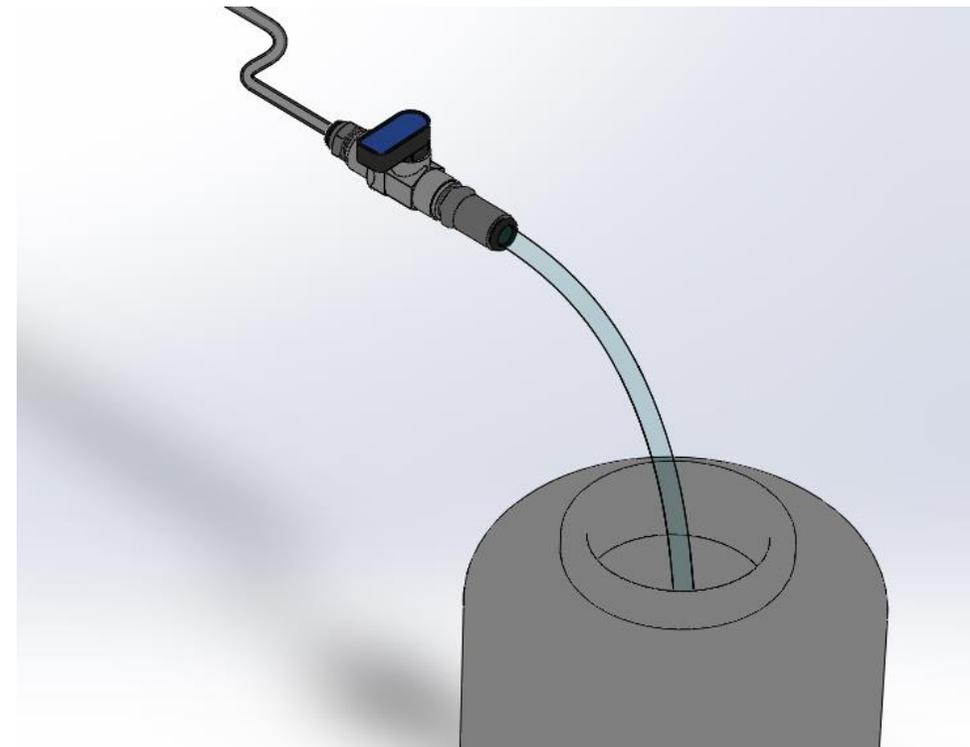
Before Clean-out: Make sure all product is out of FSeries bottle and lines.

**CLEAN-jet is for rinsing formulation residues to keep your FSeries operating smoothly.**

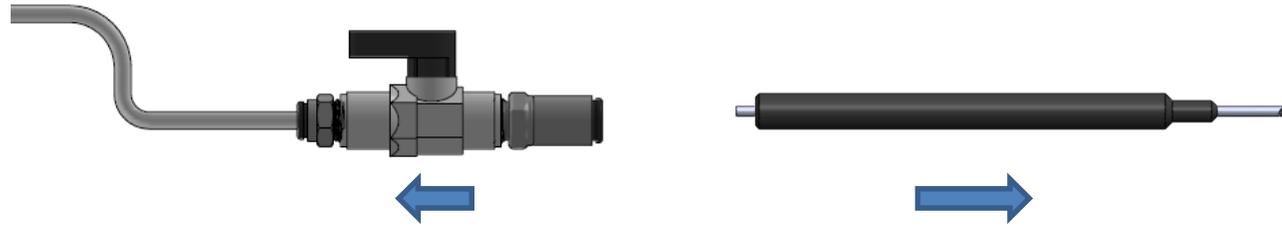
1. Remove bottle top to release pressure, then add 20-30mL CLEAN-jet
  2. Apply FSeries bottle top and pressurize.
  3. OPEN and close each Needle Valve to clean out all lines.
- CLEAN-jet rinse can be squirted in the soil at the base of the tree, unless near ground water or waterways.
  - Rinse all CLEAN-jet out of the bottle, line, and device.

\*CLEAN-jet should not be mixed with other formulations.

\* Dispose of waste according to local and state regulations.



# Maintenance: Deluxe Needle Valve Cartridge & PTC

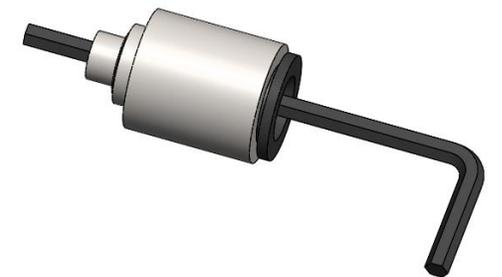


## To Clean out any debris in VIPER Needles:

1. Remove VIPER Needle by pushing the PTC fitting in and pulling on the Needle.
2. Push the **VIPER Needle Cleanout Tool** into the **VIPER Needle**.
3. Remove in-line debris without VIPER needle attached.

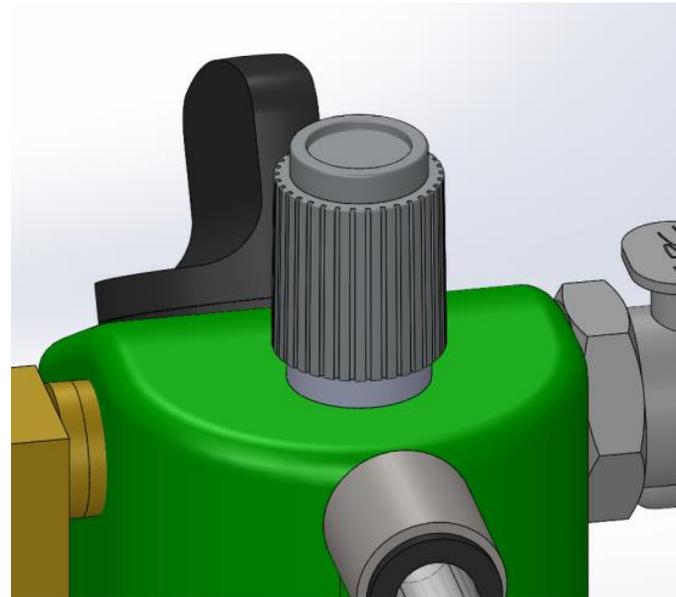
Some PTC fittings have a 5/64" internal hex.

Use Allen key to tighten, loosen, or remove a broken part.



# Maintenance: Deluxe Needle Valve Cartridge & PTC

Deluxe Needle Valve may need periodic cleaning or O-ring replacement.



To restore on/off valve to like new operation, replace O-rings on deluxe valve cartridge

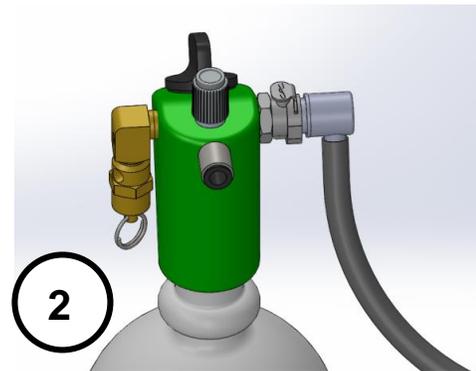
# Maintenance: Deluxe Needle Valve Cartridge & PTC

The Plugless STINGER Method is only recommended for use in Faster Uptake Trees (including, but not limited to red and black oaks, elms, sycamore, poplar, birch, sweetgum, tulip poplar and flowering apple).

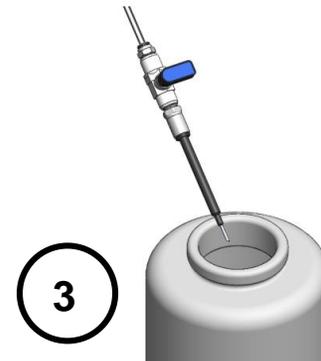
The STINGER Method does not use Arborplugs, thus the injection may take longer.



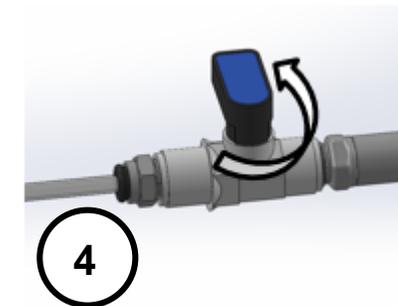
1. **Drill 1"** into sapwood (bark depth + 1") at slight downward angle.



2. **Pressurize** F-Series. Make sure valves are OFF.



3. Turn each STINGER **ON**, and **OFF** to prime supply lines.



4. Turn each STINGER **OFF when primed**.



5. **Push** STINGER Tips into drilled holes until snug.



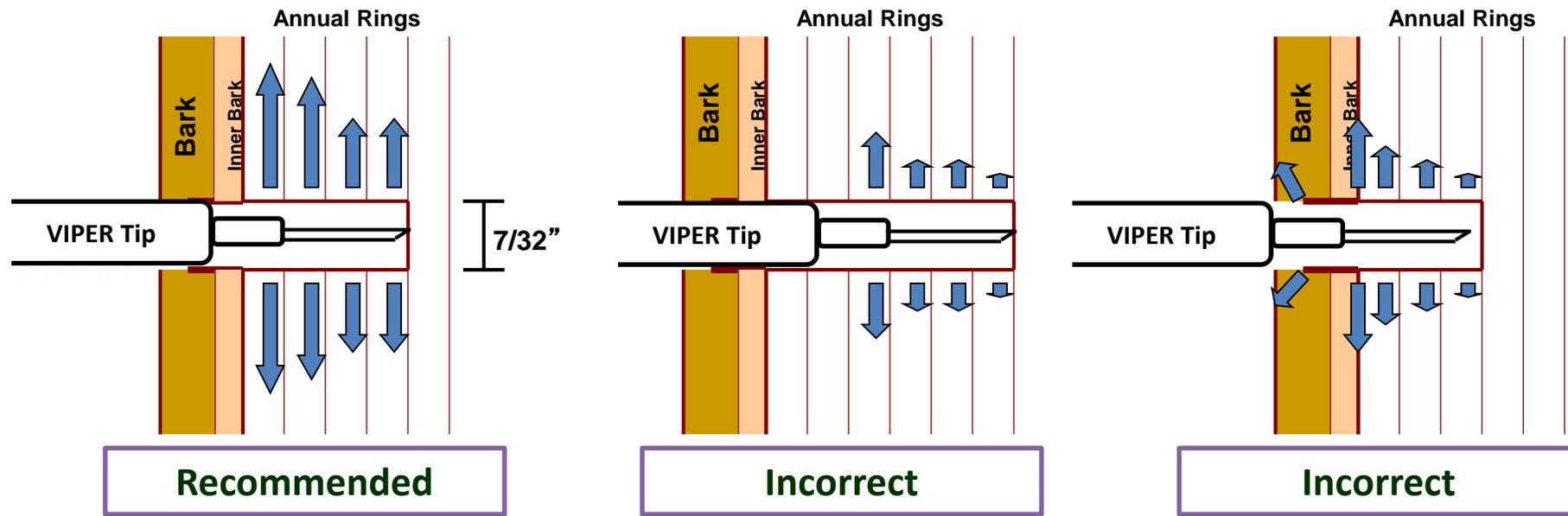
6. Turn the STINGER **ON**



7. **Turn OFF** valve after tubing has emptied of product. Then wait 10-15 seconds before removing STINGER needle from drill hole.

# Plugless VIPER Method for F-Series

This is the recommended placement of the VIPER tips in the tree.



✓ Fast Product Uptake

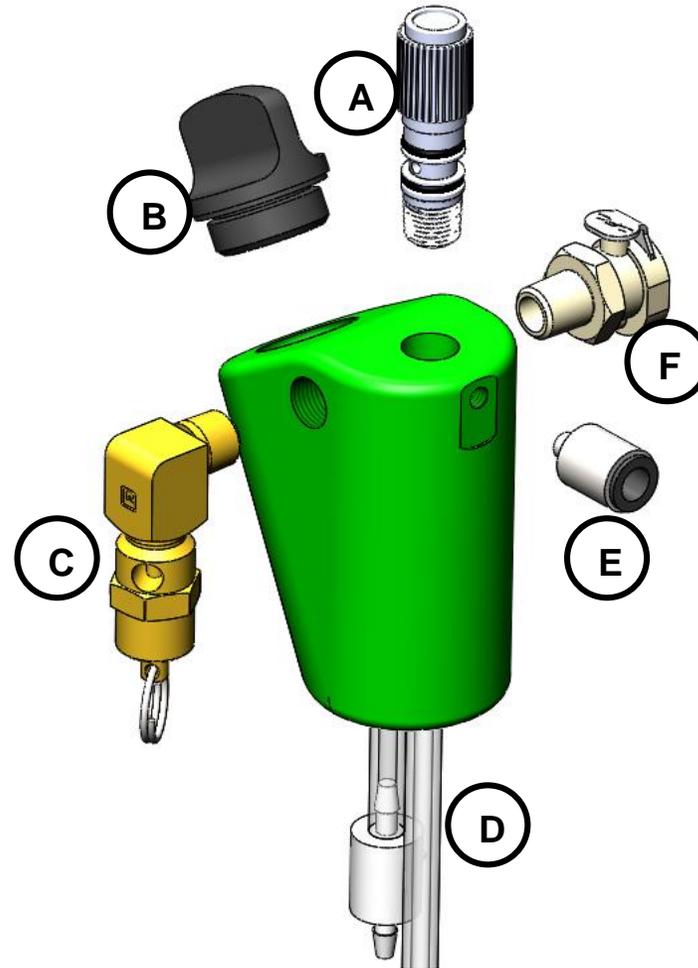
• Slow Product Uptake

• Slow Product Uptake

• Possible Bark Separation or Leakage

# F-Series Replacement Parts

## F-Series Cap Assembly 070-0076



A. Pressure Relief Valve 2 pack  
(070-0220)

B. Fill Cap w/ Washer  
(070-0230)

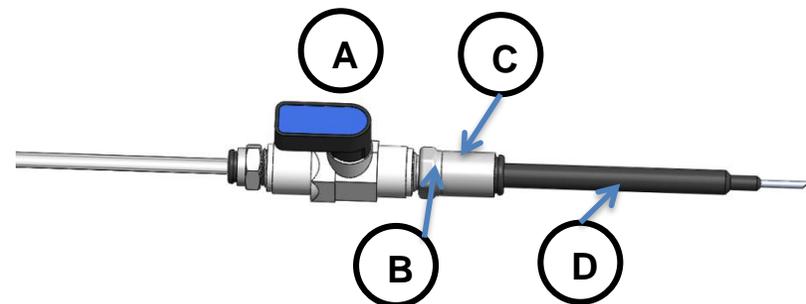
C. 120 PSI Blow-off Assembly  
(070-0225)

D. FS Internal Bottle Parts  
(070-0235)

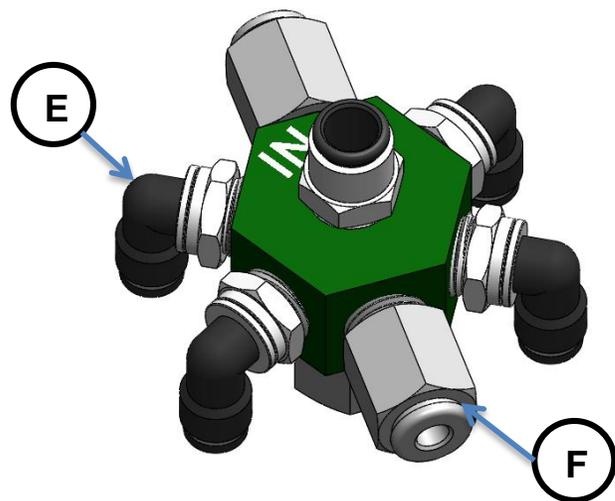
E. ¼" PTC 4-Pack  
(070-0100)

F. FS Pressure Quick Disconnect Kit  
(070-0205)

# F-Series Replacement Parts



**FS Needle Ball Valve Assembly 2 pack  
070-0094**



**FS Hex PDS w/ Connectors  
(070-0080)**

- A. FS Ball Valve Assembly  
(070-0086)
- B. 1/8" Male x 10-32 Adapter  
(975-1124)
- C. PTC 10/32 to 1/4" Push 4-Pack  
(070-0100)
- D. VIPER Needle 4-Pack  
(070-0501)
- E. FS 90 degree swivel PTC 4 pack  
(070-0087)
- F. FS 1/8 NPT to 5/32" QD NC 2 pack  
(070-0088)

# F-Series Replacement Parts

<b>Item #</b>	<b>Description</b>	<b>Kit Components</b>
070-0075	FS Single Tree I.V.	Cap Assy., 1.5L Bottle, 16" Stand, Hex PDS, (6) Valve Assy. w/ tubing
070-0078	FS Tree IV Bottle 1.5 Liter	1.5 Liter Bottle w/ cap and washer
070-0079	FS Tree IV Bottle .650 Liters	.65 Liter Bottle w/ cap and washer
070-0085	FS Hex PDS Complete	Hex PDS, ¼" Tubing, (6) 5/32" Tubing
070-0090	FS High Pressure Pump	Pressure pump w/ adapter
070-0091	FS Expansion Kit	Expansion adapter, ¼" Tubing
070-0092	¼" HP Tubing 5 feet	¼" Tubing
070-0093	5/32" HP Tubing 10 feet	5/32" Tubing
070-0104	Mixing & Measuring Kit	Funnel, Graduated Cylinder, Mixing Container
070-0120	Arborplug Setter 2-Pack	2 Pack
070-0130	VIPER Needle Clean-out Tool 2-Pack	2 Pack
070-0210	F-Series Stand 4-Pack	16" Wire Stands (4 per package)
070-0215	F-Series 6 Gallon Bucket – Black	6 Gallon Bucket
070-0240	FS Tree I.V. Tool Kit	Adj. Wrench, Plug setter, cleanout tool 2pk, 3/8" bit, 9/32" bit, 5/64" allen wrench, 3/16" allen wrench
070-0655	FS O-Ring Rebuild Kit	(1) Med Bottle Washer, (1) Re-fill Cap Washer, (1) #6 O-Ring, (1) #8 O-Ring, (2) #12 O-Ring
070-0660	Deluxe Drill Bit Kit (2 Bits)	(1) 3/8" Drill Bit, (1) 9/32" Drill Bit
070-0665	Deluxe Drill Bit 3/8" #4 – 2 pack	(2) 3/8" Deluxe Drill Bit
070-0670	Deluxe Drill Bit 9/32" #3 – 2pack	(2) 9/32" Deluxe Drill Bit

# F-12 O-Ring Kit – (Comes in Kit)



Med Bottle Washer



Re-fill Cap gasket  
(Flat end facing away)



#12 O-Ring



#6 O-Ring



#8 O-Ring



For replacement parts, order:  
**F-Series O-Ring Rebuild Kit**  
**(070-0655)**

- (1) Med Bottle Washer
- (1) Re-fill cap gasket
- (2) #12 O-Ring
- (1) #6 O-Ring
- (1) #8 O-Ring

**NOTE: The O-Ring rebuild kit will rebuild one F-Series unit.**