



TREE I.V. Micro-Infusion™ System

Training Manual

Revision Date: 07/24/15



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Introduction to Arborjet's TREE I.V. Micro-infusion™

Arborjet's TREE I.V. 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 TREE I.V. utilizes 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.

VIPER
Best
For:

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



STINGER – "Stick-Inject-Remove" (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.

STINGER
Best
For:

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



Single TREE I.V. Unit
(070-0020)

For customer assistance, call from 8AM to 4:30PM EST Monday through Friday at 781-935-9070 or visit the website at www.arborjet.com.
www.arborjet.com. We welcome your comments, questions and suggestions concerning Arborjet's TREE I.V. and injectable products. 3

Parts of the TREE I.V. Kit (2-pack)

TREE I.V. 2-Pack Kit: (070-0010)



As of June 2015 – no DVD will be included in kits.

3 Easy Steps for the TREE I.V.



1. DRILL



2. PLUG



3. INJECT

SAFETY REMINDER

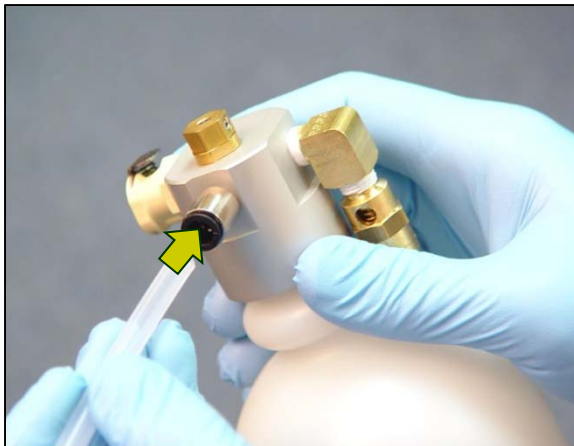


Always wear safety glasses and gloves when handling equipment and products.

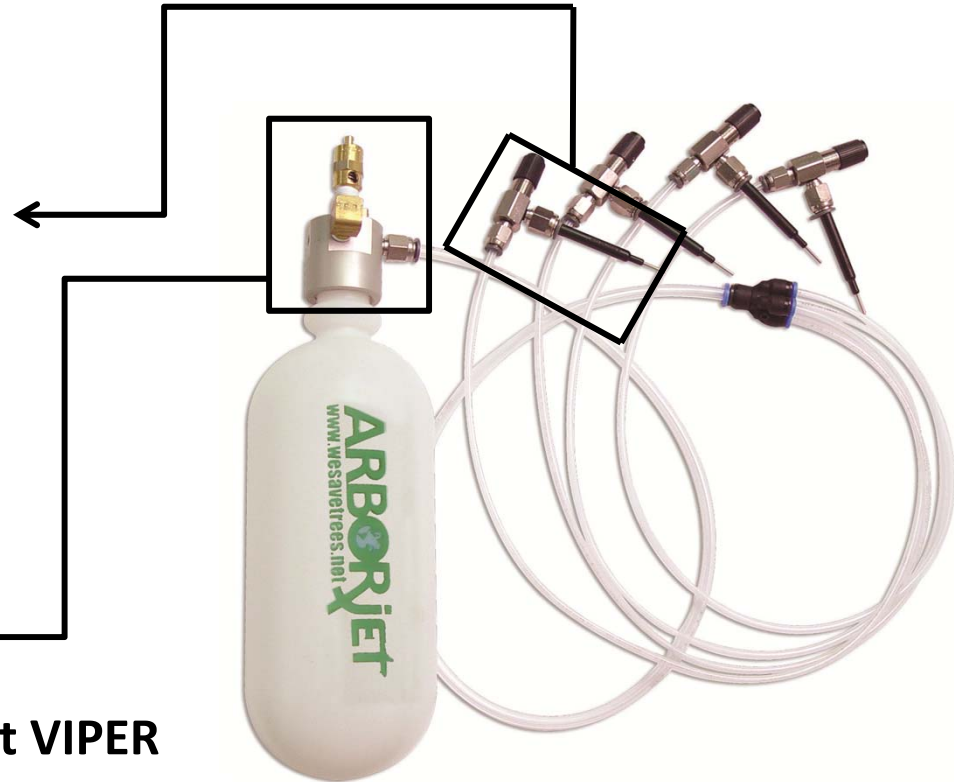


TREE I.V. in use

How to Assemble the TREE I.V.



*** Insert VIPER
Needles and
tubing firmly into
PTC (Push To
Connect) fittings.**



**To Remove:
Compress PTC
plastic ring and
pull tubing or
VIPER Needle.**

Prepare the TREE I.V. for Micro-infusion™



1. 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 1 liter bottle has 600ml capacity.



3. Measure volume in graduated cylinder.

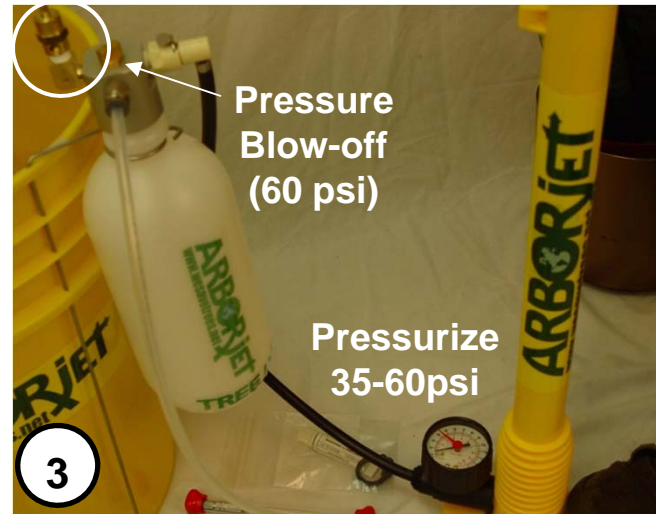
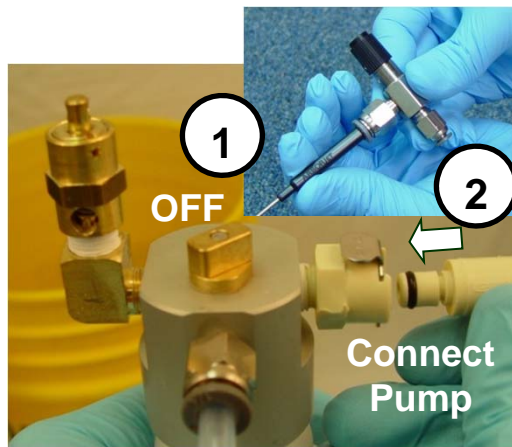


4. Pour into TREE I.V. bottle(s) using funnel.

!! IMPORTANT!! 600 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

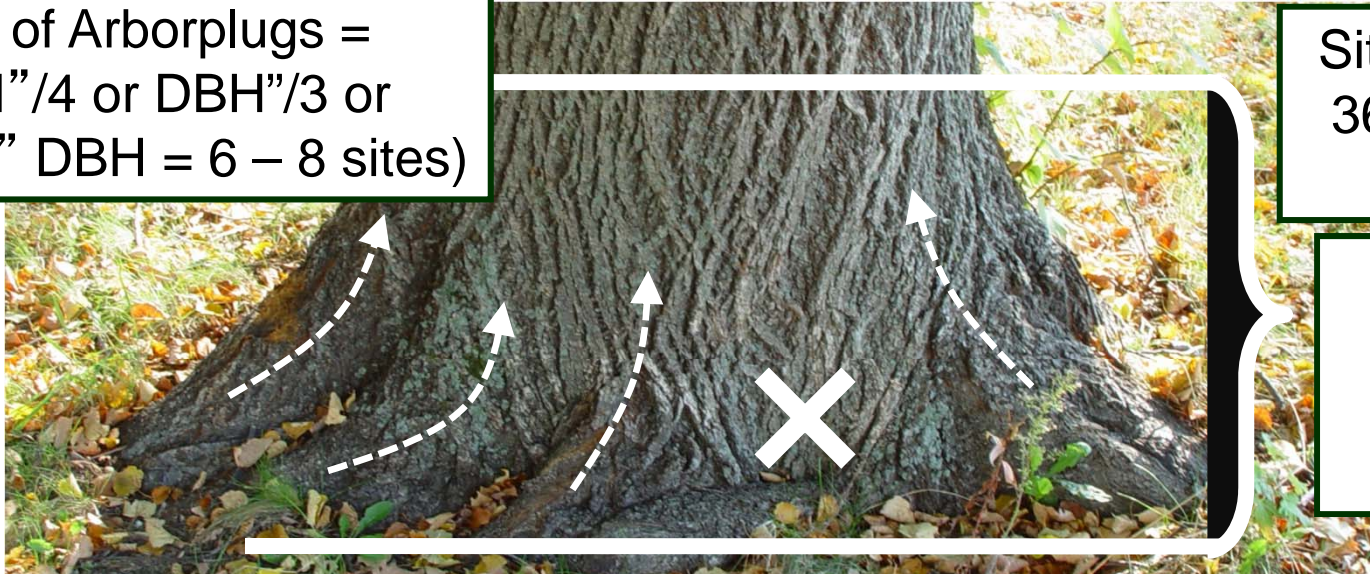


- 1.) Make sure TREE I.V. bottle top and SMC Valves are OFF before Pressurizing.
- 2.) Connect the Pressure Pump to the Pressure Quick Disconnect on the bottle top.
- 3.) Pressurize between 35 – 60 psi. For safety: Blow-off valve will release at 60psi (maximum).
- 4.) Turn ON the TREE I.V. Deluxe Valve Cartridge (top 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 18
“Conifers vs Deciduous”

Select Arborplug™ Sites

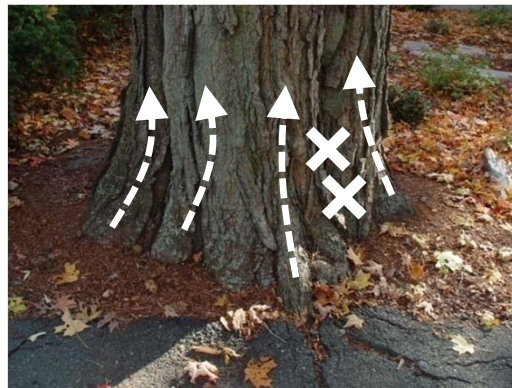
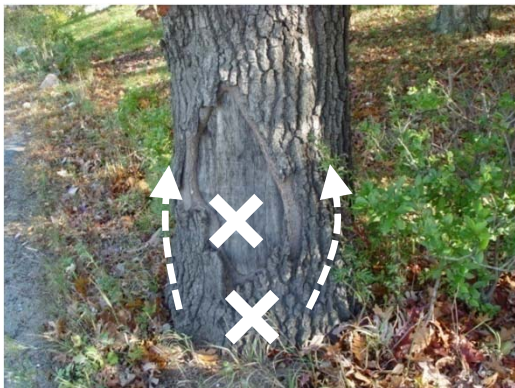
No. of Arborplugs =
DBH"/4 or DBH"/3 or
(ex. 24" DBH = 6 – 8 sites)



Sites are within
36" above the
soil line.

The Best
Arborplug
Injection
Zone

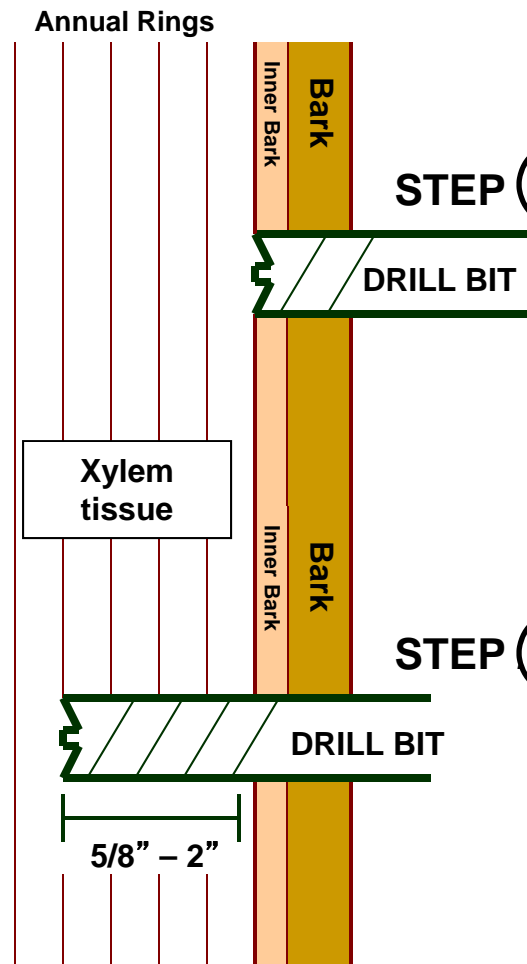
Root Flares show best uptake and formulation distribution to the canopy.
Choosing good Arborplug sites result in faster injections.



Drill Sites for Arborplugs

- Use sharp, high-helix brad-point drill bits (included in kit).
- **For Beginners:**
Drilling in 2 Steps:
 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.
 2. Use quick heavy pressure to drill into the Xylem.

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



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.

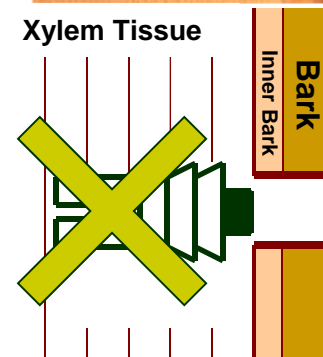
2. Make sure the barbs on the Arborplug make a seal between the xylem and the inner bark as illustrated.

Too Deep



Xylem Tissue

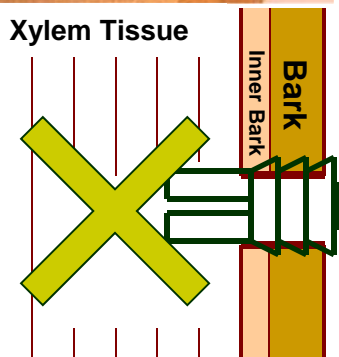
INCORRECT



Too Shallow



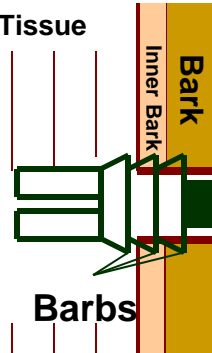
Xylem Tissue



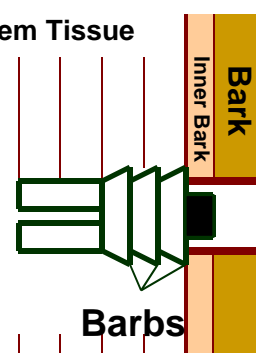
2

Xylem Tissue

CORRECT

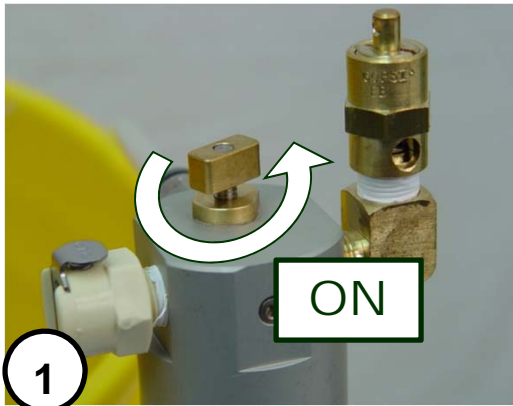


Xylem Tissue



CORRECT

Micro-infusion™ with the TREE I.V.



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 TREE I.V. unattended. Pesticide applications should always be attended and monitored.

Using Multiple TREE I.V.'s



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

Use the TREE I.V. Stands to support the TREE I.V. Bottles.



Large Tree Micro-infusion™

600mL is the maximum fill capacity.

If more than 600mL is used, the TREE I.V. requires RE-PRESSURIZING during Micro-infusion.

More than 1 TREE I.V. can be used on the same tree.

Examples:

-If dose is 1000mL, put 500mL in 2 TREE I.V. bottles.

-If dose is 1350mL, put 450mL in 3 TREE I.V. bottles.

Or Use the Expansion Kit: 010-7016
This includes the Expansion Manifold, 4 VIPER Valve Assemblies, and 5/32" 4-line Manifold.

This allows you to have 8, 12, or 16 injection sites per tree with only 1 TREE I.V. bottle.

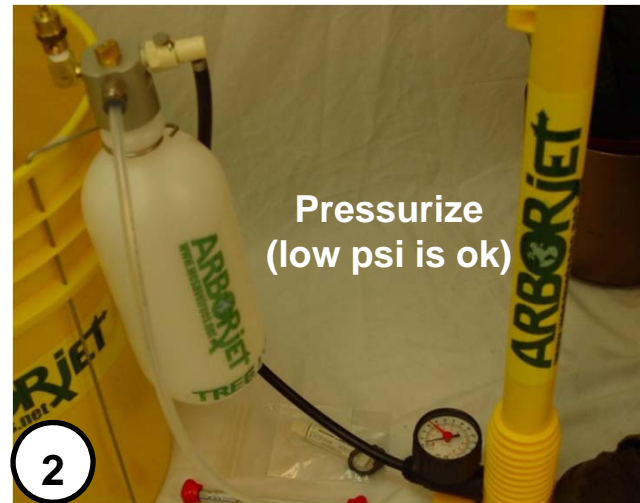


Expansion Manifold connects to bottle top



Additional 4 line manifold(s) are connected

Clean Out the TREE I.V.



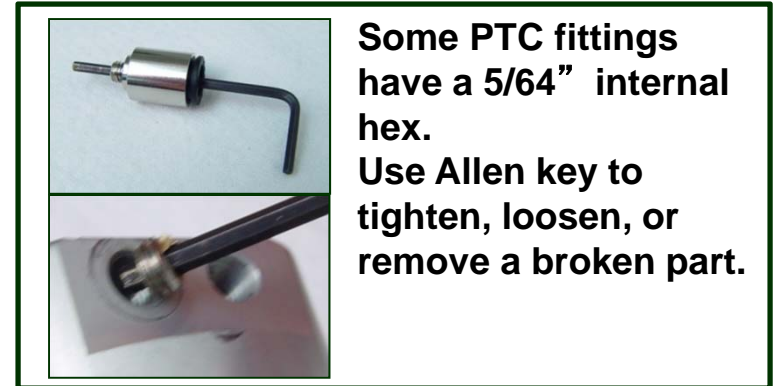
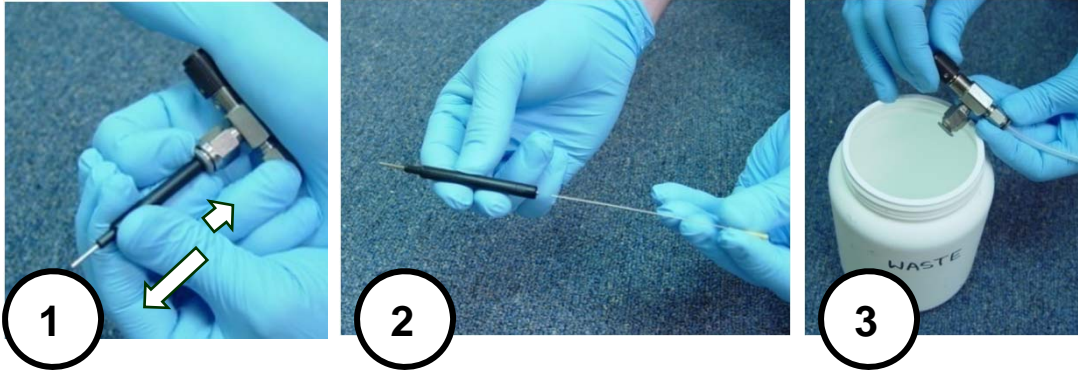
Before Clean-out: Make sure all product is out of TREE I.V. bottle and lines.
CLEAN-jet is for rinsing formulation residues to keep your TREE I.V. operating smoothly.

1. Remove bottle top to release pressure, then add 20-30mL CLEAN-jet
 2. Apply TREE I.V. 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



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.

Make sure to keep device clean by using **CLEAN-jet**



Keep o-rings lubricated as needed.

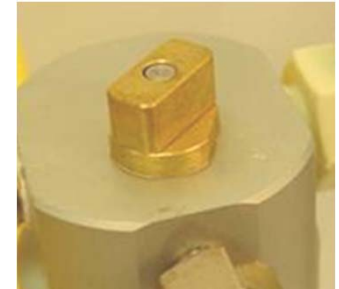
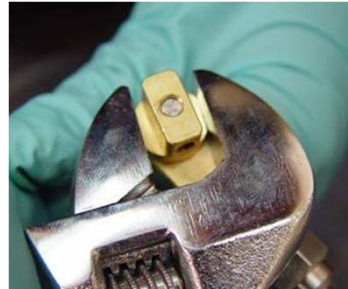


Maintenance: Deluxe Valve Cartridge & PTC

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

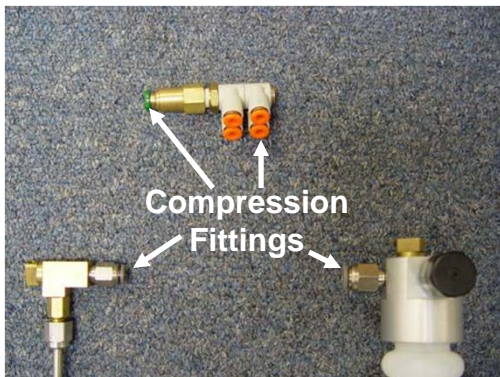
**Deluxe Valve Cartridge
2pack (070-0110)**

#10 O-ring →
(2) #4 O-ring →



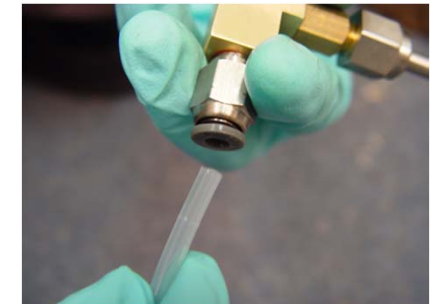
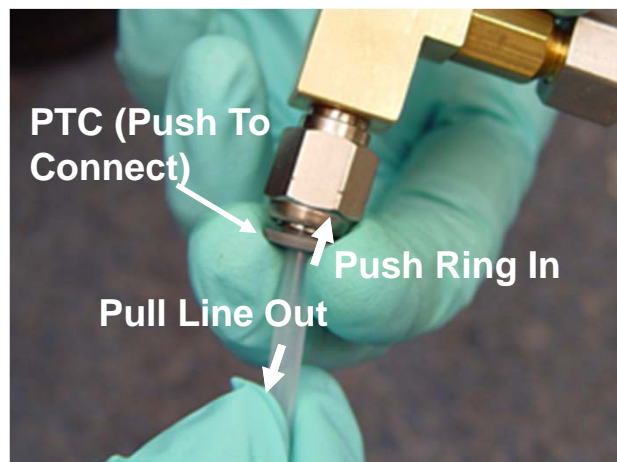
To restore on/off valve to like new operation, replace O-rings on deluxe valve cartridge (2 #4 O-rings, and 1 #10 O-ring).

PTC fittings quickly connect/disconnect supply lines to other components



Compress the plastic rings to remove tubing.

To connect line, push the end of line all the way into fitting.



It could be necessary to re-cut ends of tubing for best fit..

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 TREE I.V. 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:

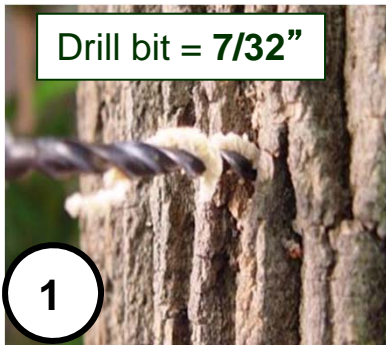
No sap flows from deciduous trees after drilling.
For best results, we recommend:

1. Pressurize TREE I.V. 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.

STINGER Method for TREE I.V.

The STINGER Method is only recommended for use in Faster Uptake Trees.
The STINGER Method does not use Arborplugs, however the injection may take longer.



1. Drill 5/8" into sapwood (bark depth + 5/8").



2. Pressurize TREE I.V. Make sure valves are OFF.



3. Attach the Tip Guard. Turn each STINGER **ON, and OFF** to Prime Supply Lines.



4. Turn each STINGER OFF when Primed.



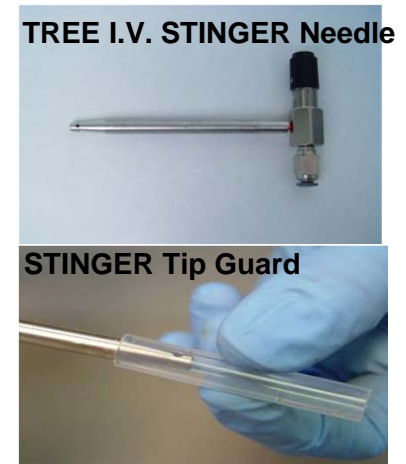
5. Push STINGER Tips into drilled holes.

Note: Always twist clockwise when inserting or removing.



6. Turn the STINGER ON

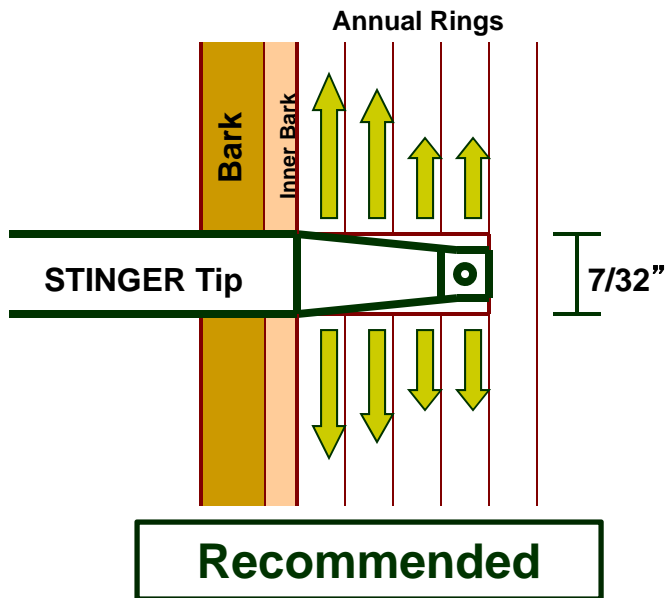
TO CLEAN:
Add **CLEAN-jet** then push through the system.



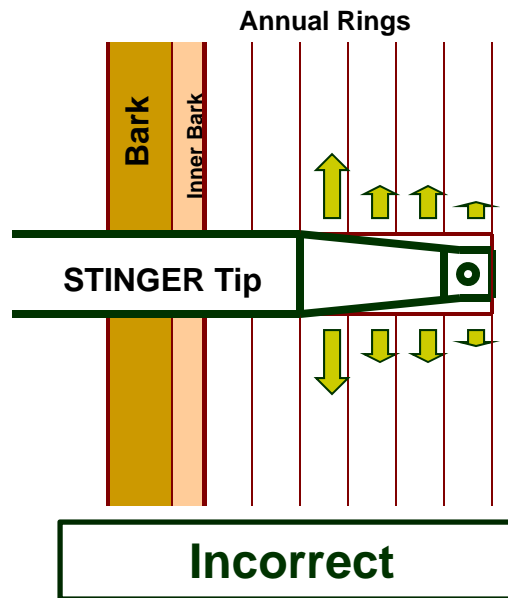
Place the STINGER Tip Guard on the STINGER Tip and point the STINGER Tip into a waste container to catch clean-out waste. Dispose of waste according to local regulations.

STINGER Method for TREE I.V.

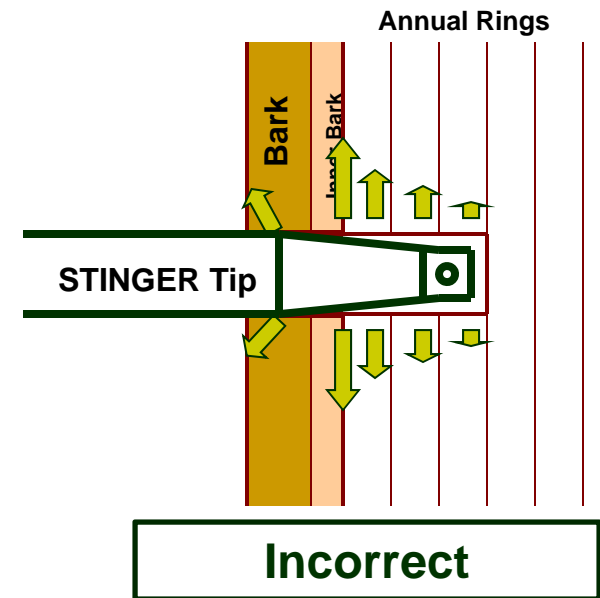
This is the recommended placement of the STINGER tips in the tree.



✓ Fast Product Uptake



• Slow Product Uptake



• Slow Product Uptake
• Possible Bark Separation or Leakage

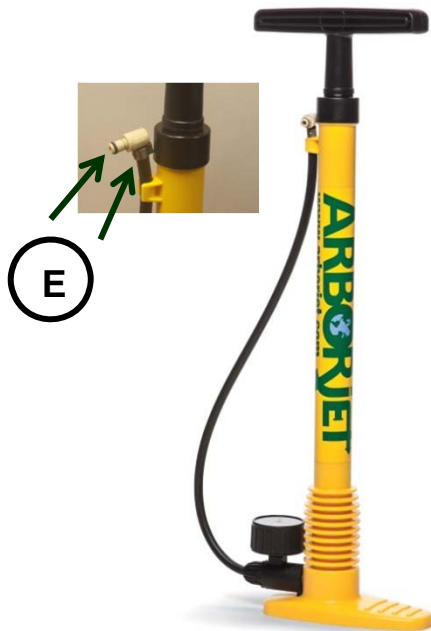
TREE I.V. Replacement Parts

Item #	Description	Kit Components
010-9024	TREE I.V. Bottle and Cap Assembly	TREE I.V. bottle and bottle top assembly
070-0501	VIPER Needle 4-Pack	4 Needles, No Valves
070-0500	VIPER Valve Assembly 2- Pack	2 VIPER Valve Assemblies
010-3055	TREE I.V. O-Ring Rebuild Kit	1 Med Bottle Washer, 1 #10 o-ring, 2 #4 o-rings, 1 #8 o-ring, 4 #5 o-rings
010-4018	TREE I.V. Tool Kit	Adjustable/Allen Wrench, Clean out Tool, 3/8" Drill Bit, Plug Setter
070-0110	Deluxe Valve Cartridge 2-Pack	2 Deluxe Valve Cartridges
010-5005	STINGER Needle Ass'y 4-Pack	4 Needles w/ Valves
070-0106	Pressure Quick Disconnect Kit	Discon., 90 degree Aapter/ Clamp
070-0100	PTC 10/32" to 1/4" Push 4-Pack	(4) 10/32" to 1/4" PTC
070-0101	PTC 10/32" to 5/32" Push 4-Pack	(4) 10/32" to 5/32 PTC
010-7006	TREE I.V. 5/32"Manifold 4-line	1/4" tubing, 1/4" to 5/32" Banjo, (4) 5/32" tubing lines
010-7016	TREE I.V. Expander Kit	5/32" Manifold 4-line, 4 VIPER Valve Assemblies, Expansion Manifold
070-0104	Mixing and Measuring Kit	Funnel, Graduated Cyl, Mixing Container
070-0105	TREE I.V. Stand 4-Pack	Wire Stands 4 per Package
070-0107	Spray Shield 4-Pack	4 per package
975-00113	5 Gallon Bucket - Yellow	Yellow 5 gallon carrying bucket
070-0108	TREE I.V. Expansion Manifold	TREE I.V. Expansion Manifold
070-0109	TREE I.V. Internal Bottle Parts	Ball check, Barbs , Base washer, Supply Tubes
070-0120	Arborplug Setter 2-Pack	2 Pack
070-2000	Drill Bit 2-Pack	2 Pack of 3/8" Drill Bit
070-0130	VIPER Needle Clean-out Tool 2-Pack	2 Pack

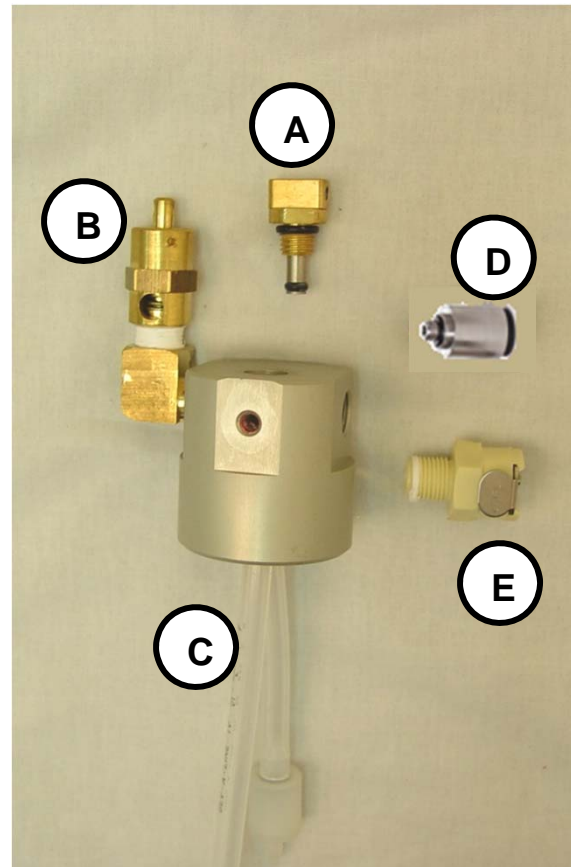
TREE I.V. Replacement Parts



**TREE I.V. Bottle 1 liter
(010-9023)**



**Pressure Pump w/ Gauge
(010-7081)**



**TREE I.V. Bottle Top Assembly
010-1081**

**A. Deluxe Valve Cartridge 2-Pack
(070-0110)**

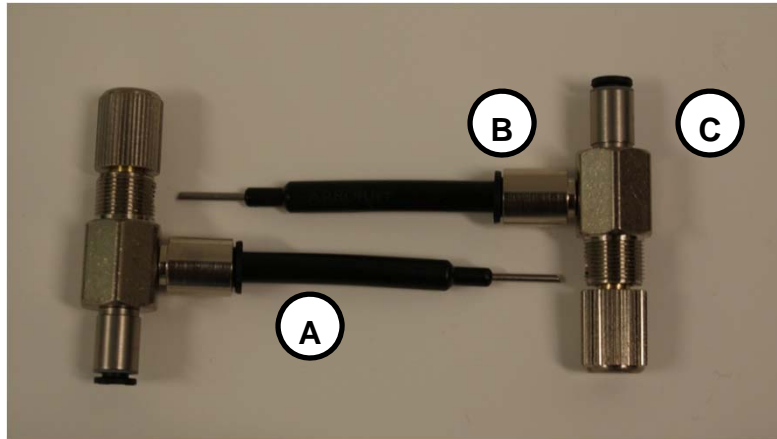
**B. 60psi Blowoff Assembly
(010-1150)**

**C. Internal Bottle Parts
(070-0109)**

**D. 1/4" PTC 4-Pack
(070-0100)**

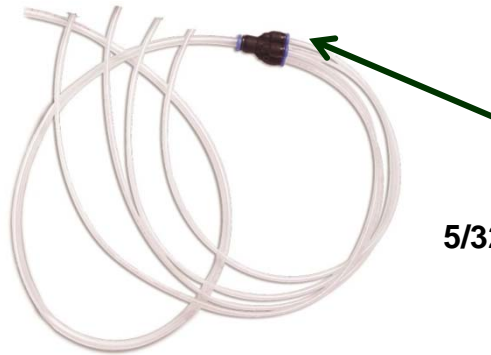
**E. Pressure Quick Disconnect
Kit
(070-0106)**

TREE I.V. Replacement Parts



VIPER Valve Assembly (2-Pack)
070-0500

- A. VIPER Needle
4-Pack
(070-0501)
- B. PTC 10/32 to 1/4" Push
4-Pack
(070-0100)
- C. PTC 10/32 to 5/32" Push
4-Pack
(070-0101)



TREE I.V. 5/32" Manifold
4-line (010-7006)



5/32" Plug Orange 8-pack
070-0165



1/4" Plug Orange 8-pack
(070-0160)

(Orange Plugs are used to "cut off"
additional lines)



TREE I.V. Expansion
Manifold (070-0108)

TREE I.V. Replacement Parts

Med Bottle Washer



#10 O-Ring



#4 O-Ring



#8 O-Ring



#5 O-Ring



TREE I.V. O-ring Rebuild Kit (010-3055)

Includes:

- (1) Med Bottle Washer
- (1) #8 O-rings
- (1) #10 O-rings
- (2) #4 O-rings
- (4) #5 O-rings

NOTE: TREE I.V. O-ring Rebuild Kit (010-3055) will rebuild 1 Single TREE I.V. unit.