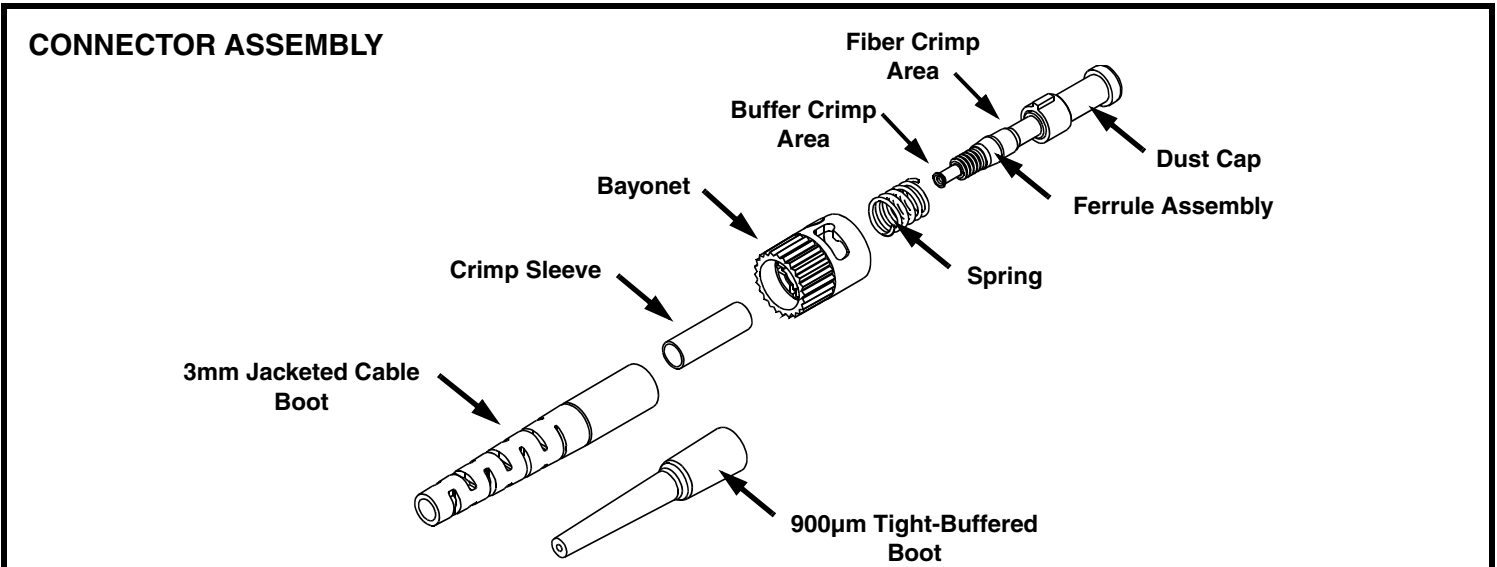


READ ALL INSTRUCTIONS COMPLETELY BEFORE PROCEEDING

COMPONENT IDENTIFICATION



ITEMS REQUIRED FOR TERMINATION

ITEM	PART NUMBER	DESCRIPTION
1	FVFLY	Visual Fault Locator
2	FVFLPCY	VFL Patch Cord
3	CST-115	Fiber Cable Jacket Stripper
4	FALC	Alcohol Bottle (empty)
5	FBFSP	Fiber Buffer Stripper
6	FCRP5	Universal Crimp Tool (hex sizes: .048, .100, .128, .151, .190)
7	FJQCVR	Fiber Cleaver
8	FGLS	Safety Glasses
9	FKS	Strength Member (Aramid Fiber) Cutters
10	FSCDVR	Screwdriver
11	FSTY	Safety Stickers for fiber scraps
12	FSWB-C	Cleaning Swabs
13	FWP-C	Cloth Wipes
14	PFX-0	Indelible Ink Marking Pen
15	--	Isopropyl Alcohol (Reagent Grade, 90% minimum concentration; not available from Panduit)
OPTIONAL	FS090*	ST Opti-Crimp Connector Stripping Template
OPTIONAL	FJQCVRB	Replacement Blade for Fiber Cleaver

* Denotes revision letter.

TABLE OF CONTENTS

	Page(s)
Safety Precautions	2
900µm Tight-Buffered Fiber Termination	3-6
3mm Jacketed Cable Termination	7-11

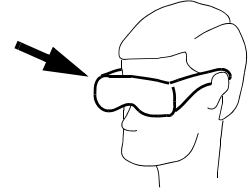
For Technical Support: www.panduit.com/resources/install_maintain.asp

** Denotes color.

SAFETY PRECAUTIONS

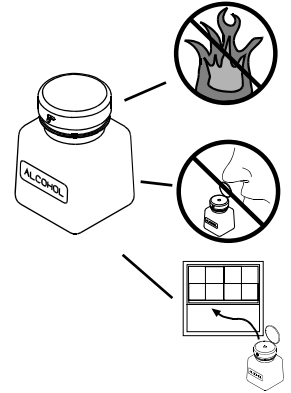
1. SAFETY GLASSES

WARNING: IT IS STRONGLY RECOMMENDED THAT SAFETY GLASSES BE WORN WHEN HANDLING BARE OPTICAL FIBER. THE BARE FIBER IS VERY SHARP AND CAN EASILY DAMAGE THE EYE.



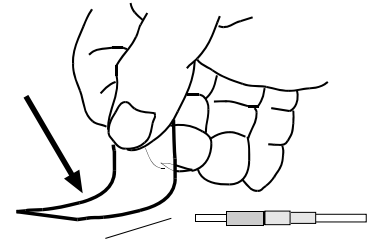
2. ISOPROPYL ALCOHOL

WARNING: ISOPROPYL ALCOHOL IS FLAMMABLE. CONTACT WITH THE ALCOHOL CAN CAUSE IRRITATION TO THE EYES. IN CASE OF CONTACT WITH THE EYES, FLUSH WITH WATER FOR AT LEAST 15 MINUTES. ALWAYS USE ISOPROPYL ALCOHOL WITH PROPER LEVELS OF VENTILATION. IN CASE OF INGESTION, CONSULT A PHYSICIAN IMMEDIATELY.



3. DISPOSAL OF BARE FIBERS

WARNING: PICK UP AND DISCARD ALL PIECES OF BARE FIBER WITH STICKY TABS. DO NOT LET CUT PIECES OF FIBER STICK TO CLOTHING OR DROP IN THE WORK AREA WHERE THEY ARE HARD TO SEE AND CAN CAUSE INJURY.

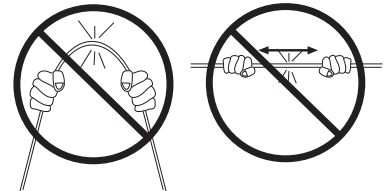
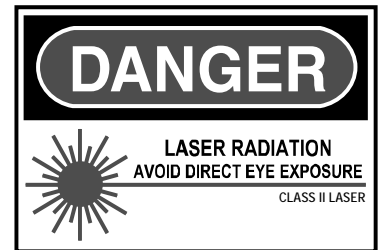


4. LASER LIGHT PROTECTION

WARNINGS:

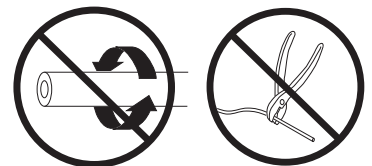
- LASER LIGHT CAN BE INVISIBLE. THE INVISIBLE LIGHT IS POWERFUL ENOUGH TO DAMAGE YOUR EYES. THE FVFLY VISUAL FAULT LOCATOR CONTAINS A CLASS II LASER PRODUCT THAT HAS A VISIBLE RED LASER. UNDER NORMAL CORRECT OPERATION, THE FVFLY VISUAL FAULT LOCATOR IS SAFE TO THE HUMAN BODY.
- NEVER LOOK INTO THE PATH OF THE FVFLY VISUAL FAULT LOCATOR OR ANY OTHER LASER BEAM.
- NEVER LOOK INTO THE END OF A FIBER WHICH MAY HAVE ANY VISUAL FAULT LOCATOR, OR ANY OTHER LASER, COUPLED TO IT.
- DIRECT EYE CONTACT WITH LASER BEAM MAY CAUSE SERIOUS EYE INJURY AND SHOULD BE AVOIDED AT ALL COSTS. IF DIRECT EYE EXPOSURE HAS BEEN SUSPECTED, SEEK MEDICAL ATTENTION IMMEDIATELY.
- NEVER LAUNCH ANY VISUAL FAULT LOCATOR INTO ACTIVE EQUIPMENT OR MICROSCOPE. MAKE SURE THAT THE END OPPOSITE THE FVFLY VISUAL FAULT LOCATOR IS NOT CONNECTED TO ANY ELECTRONICS OR ACTIVE EQUIPMENT DURING TERMINATION.

CAUTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in radiation exposure. Tampering with the visual fault locator or any labels in any way may also result in injury and voids warranty.



5. CABLE HANDLING

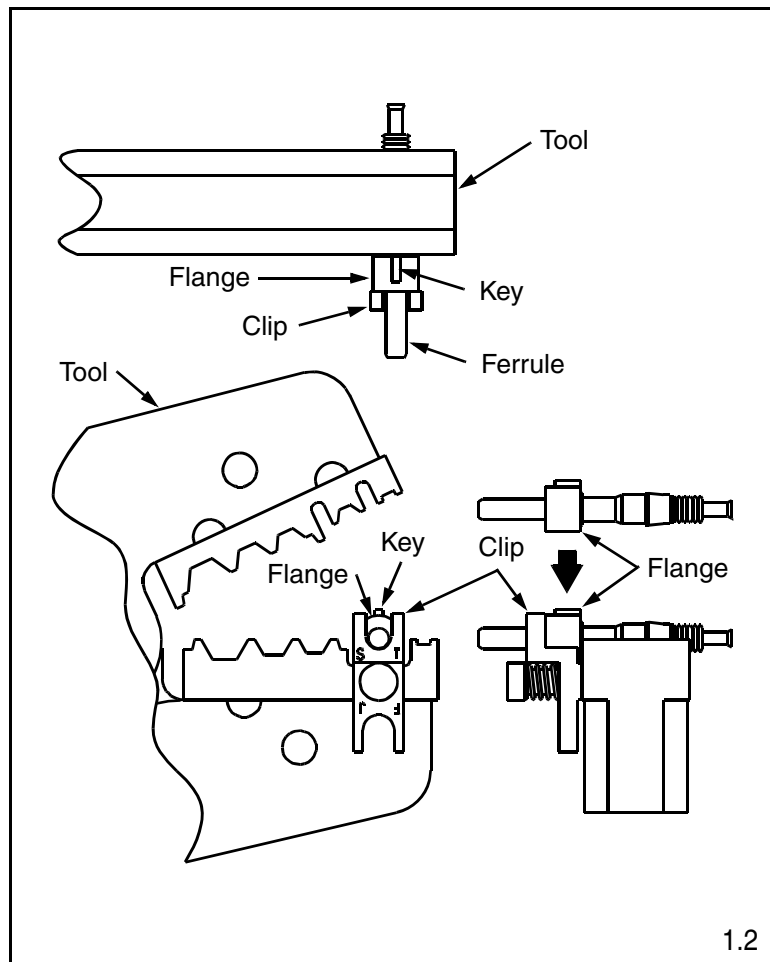
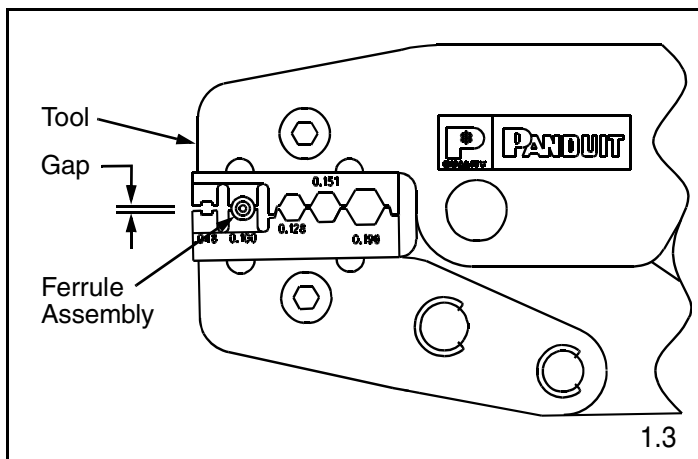
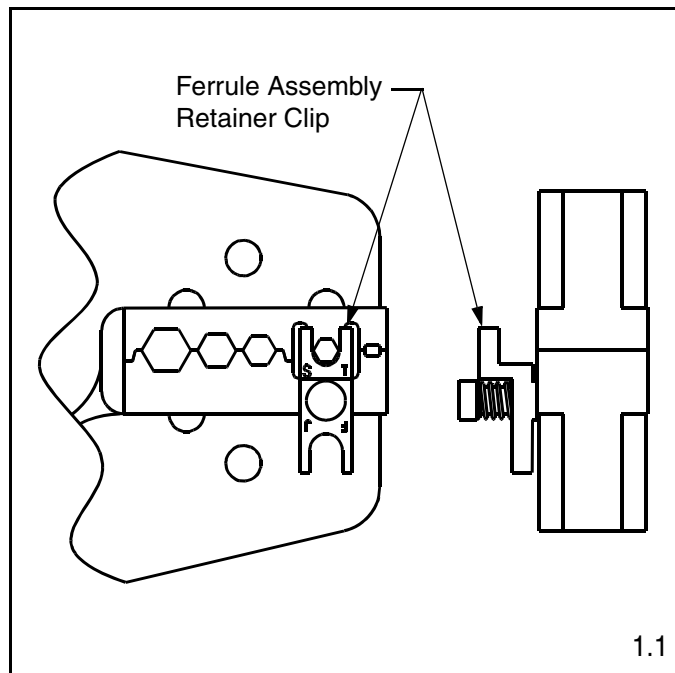
WARNING: FIBER OPTIC CABLE CAN BE DAMAGED BY EXCESSIVE PULLING, TWISTING, CRUSHING OR BENDING STRESSES. CONSULT THE APPROPRIATE SPECIFICATION SHEETS AS PROVIDED BY YOUR CABLE VENDOR. ANY DAMAGE MAY DECREASE OPTICAL PERFORMANCE.



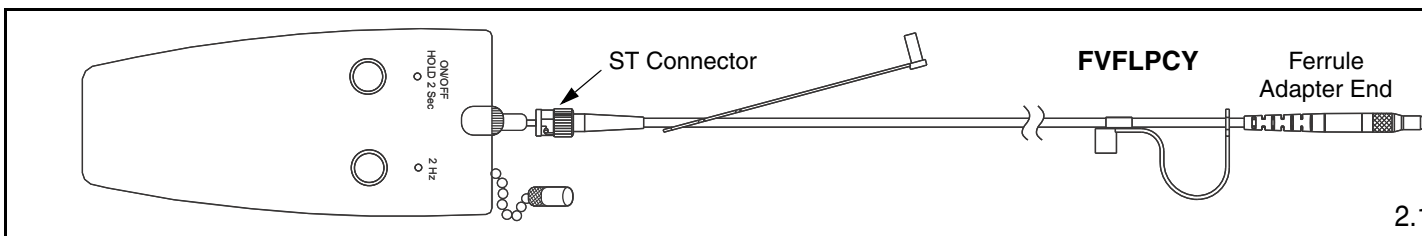
900µm Tight-Buffered Fiber Termination

1. LOADING FERRULE ASSEMBLY INTO FCRP5 CRIMP TOOL

- 1.1 Pull ferrule assembly retainer clip away from tool and rotate clip until the letters “ST” on the clip are closest to the .100 hex crimp pocket. (Die size numbers are on crimp die on opposite side of clip). Release clip.
- 1.2 Remove the dust cap from both ends of the ferrule assembly. Place the ferrule assembly in the .100 hex crimp pocket of the FCRP5 crimp tool. The flange of the ferrule assembly should be between the crimp die and the clip, with the key pointing away from the clip.
- 1.3 Partially close the tool to contain the ferrule assembly. **DO NOT CRIMP THE FERRULE ASSEMBLY.**



2. CONNECTING FVFLY TO FERRULE ASSEMBLY



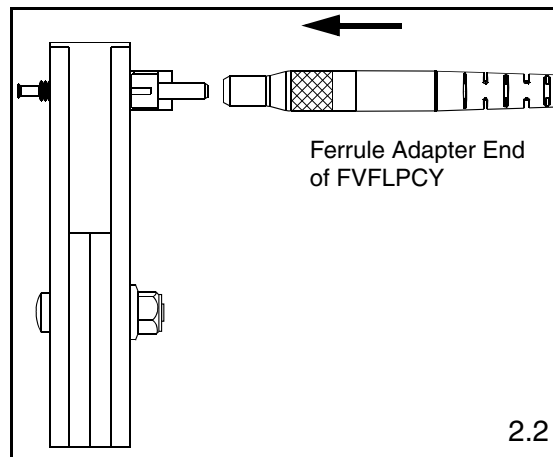
2.1 Verify that Visual Fault Locator (FVFLY) is “OFF” (green LED is off). Remove the metal dust cap from the FVFLY. Remove the dust cap from ST Connector on the Visual Fault Locator Patch Cord (FVFLPCY) and insert the ST Connector into the output end of the FVFLY until the ferrules touch. Remove the dust cap from the Ferrule Adapter end of the FVFLPCY.

Note: NEVER rotate the FVFLPCY when mated to the FVFLY or another connector. This will cause damage to the FVFLPCY, the FVFLY and the connector.

2.2 Remove the dust cap from the connector ferrule in the FCRP5 Crimp Tool. Mate the Ferrule Adapter end of the FVFLPCY to the connector ferrule.

Note: The connector ferrule assembly and the ferrule contained in the Ferrule Adapter should touch.

2.3 Turn the FVFLY “on” by pressing and holding the ON/OFF button for 2-3 seconds. Note that when the FVFLY is switched “on”, the connector ferrule glows red. Place the tool, FVFLY and FVFLPCY down gently on a clean surface. Be careful not to damage the ferrule assembly.



3. STRIPPING 900µm TIGHT-BUFFERED FIBER

3.1 Slide connector components onto the fiber in the following order:

1. The small end of the boot first,
2. Knurled end of the bayonet first, and
3. Spring

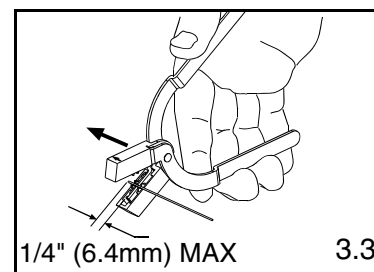
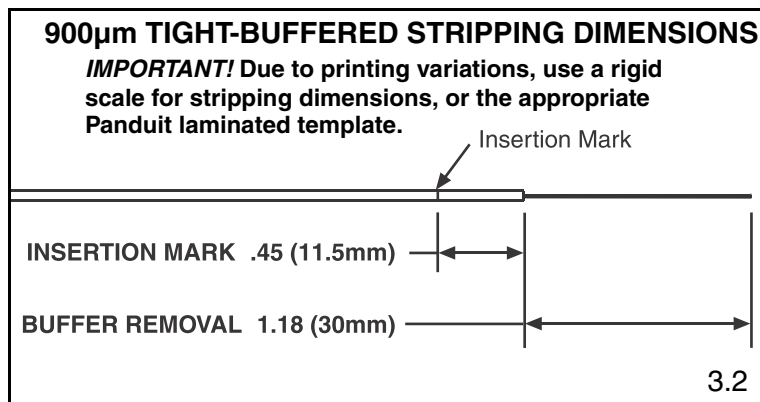
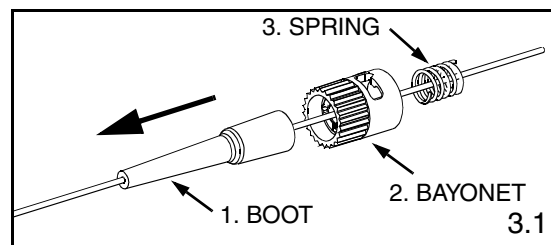
Slide them back out of the way.

3.2 Following the stripping dimensions, use the marking pen to place a mark 1.18" (30mm) from the end and place an insertion mark, 0.45" (11.5mm) back from the first mark.

3.3 Use the buffer stripper provided to strip the buffer to the buffer removal mark.

BUFFER STRIPPING GUIDELINES:

- Panduit recommends that you remove no more than 1/4" (6.4mm) of buffer at a time to avoid breaking the fiber. Refer to cable manufacturer's buffer stripping guidelines for specific recommendations.
- Hold the buffer stripper such that the arrow on the tool points in the direction of buffer removal.
- Noting the location of the tool's blades, position the fiber in the tool's V-notches. Squeeze the handles firmly, and pull tool in the direction of the arrow on the tool.
- Clean the buffer stripper blades after each strip by holding the handles open, pulling the casings back away from the blades, and letting them snap back against the blades.



4. CLEAVING 900 μ m TIGHT-BUFFERED FIBER

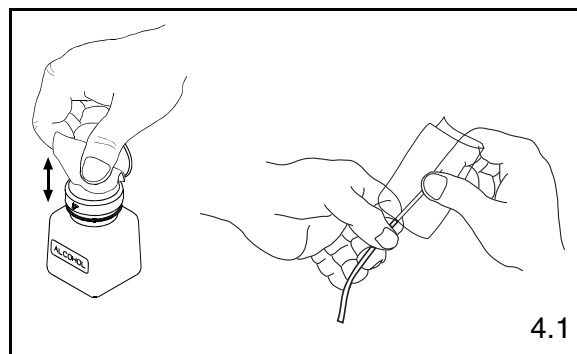
4.1 **IMPORTANT: INSPECT CLEAVER TO ENSURE THAT IT IS CLEAN AND IN GOOD WORKING CONDITION. CLEAN OR REPLACE IF NECESSARY.** Clean bare fiber using an isopropyl alcohol (90% minimum concentration) soaked lint-free wipe. The fiber should be free of all coating and residue. To prevent contamination, do not set fiber down or allow it to touch anything after cleaning.

4.2 Hold the cleaving tool in your hand and depress the Fiber Clamp lever to raise the fiber clamp. Insert the end of the fiber into the V-groove and under the fiber clamp. Release the fiber clamp lever when the end of the buffer is located at the 10mm mark (± 0.5 mm).

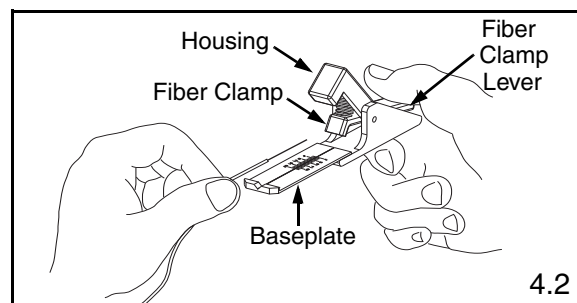
4.3 **This is a critical step for obtaining a successful termination.** Gently hold the buffered fiber against the groove in the base plate, using the thumb and forefinger of your free hand. With your other thumb, **gently** push down on the housing until the ceramic blade contacts the fiber and the end of the housing contacts the rubber coating on the base plate. **Do not cut the fiber with the ceramic blade. Release the housing so that the blade is no longer contacting the fiber.**

4.4 Holding the tool in one hand, and holding the fiber against the base plate, bend down the base plate until the fiber breaks. To prevent contamination, do not set fiber down or allow it to touch anything after cleaning.

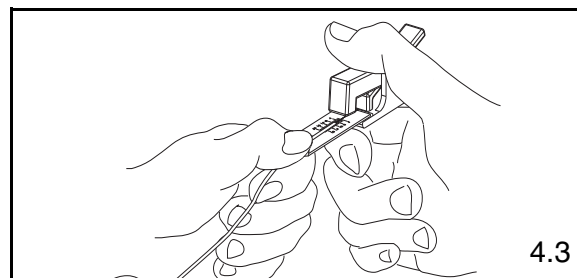
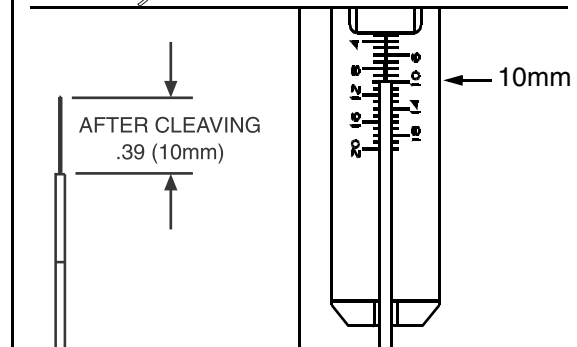
IMPORTANT: DO NOT CLEAN FIBER AFTER CLEAVING. REPLACE THE CERAMIC BLADE IN THE CLEAVING TOOL AFTER EVERY 1000 CLEAVES, OR IF INSTALLATION YIELD DECREASES. REPLACEMENT BLADE (FJQCVRB) IS AVAILABLE.



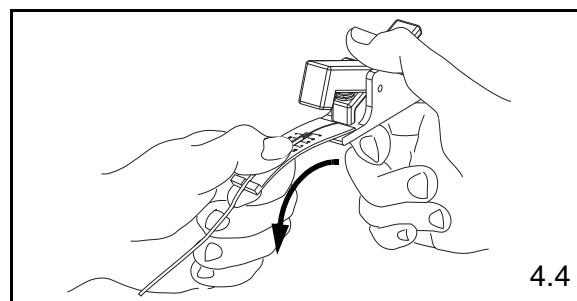
4.1



4.2



4.3

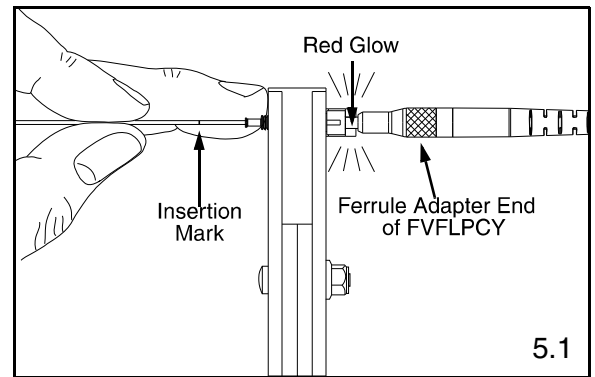


4.4

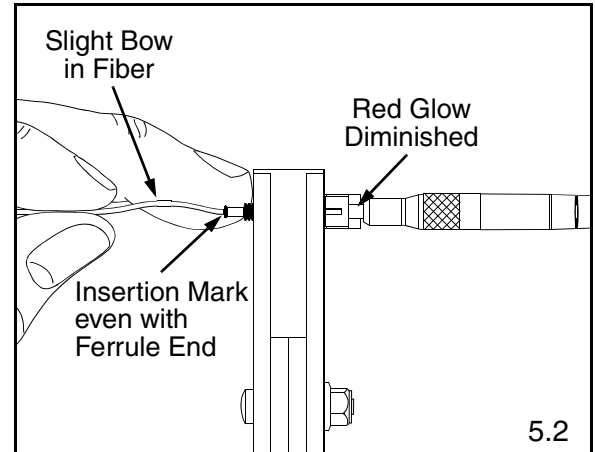
5. CRIMPING 900µm TIGHT-BUFFERED FIBER

The FVFLY verifies optical continuity only. Optical performance can only be verified by performing a link loss test or connector loss test using an optical test set or an OTDR.

- 5.1 Pick up the crimp tool containing the ferrule assembly. Carefully insert the fiber into the ferrule assembly using constant light pressure, as your middle finger stabilizes your hand against the tool. **Excessive force during insertion may break fiber.** The fiber should be guided in straight, not at an angle. Once the buffer has entered the ferrule assembly, grip the buffer 1" behind the insertion mark. Hold the crimp tool near the end of the handles for better mechanical advantage during crimping.

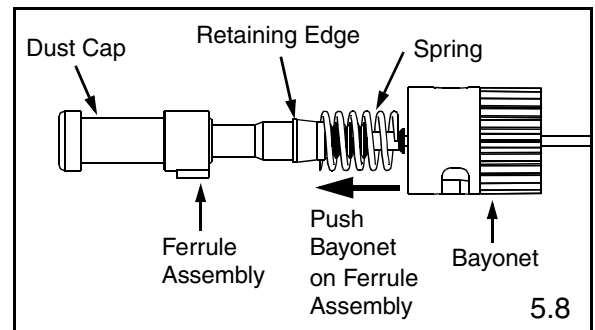


- 5.2 **This is a critical step for obtaining a successful termination.** Add forward light pressure. (A slight bow in the fiber behind the ferrule assembly will maintain pressure between the fiber end face and the pre-polished fiber. An excessive kink in the buffer behind the ferrule assembly may prevent the fiber end face from contacting the pre-polished fiber.) **Notice that the red glow of the ferrule has diminished so that it is barely noticeable or disappears.** This identifies that the cleaved end of the field fiber is in face-to-face contact with the pre-polished fiber end inside the ferrule assembly. The insertion mark is used as an additional visual aid to verify proper insertion depth. When the red glow diminishes, the insertion mark should be even with the back edge of the ferrule assembly.



Note: If the red glow has not diminished or diminishes only slightly (and the insertion mark is not even with the back edge of the ferrule assembly), then face-to-face contact has not yet occurred. Withdraw the field fiber slightly and rotate it while re-inserting. Do not rotate the fiber after it has bottomed out against the pre-polished fiber stub. If, after re-inserting, there is still a substantial glow at the ferrule then the fiber cleave may not be optimal. Return to section 3 on Page 4.

- 5.3 While maintaining light pressure and verifying that the red glow is barely noticeable, crimp the ferrule assembly **one time**. Squeeze handles together until the controlled cycle mechanism releases and handles open. At this point, the red glow should still be diminished.
- 5.4 Being careful not to pull on the fiber, remove the ferrule assembly by holding the assembly, not the fiber, from the .100 hex crimp pocket. Place buffer crimp area of the ferrule assembly (smallest diameter, see illustration on page 1) in the .048 crimp pocket.
- 5.5 Crimp the buffer crimp area **one time**. Squeeze handles together until the controlled cycle mechanism releases and the handles open.



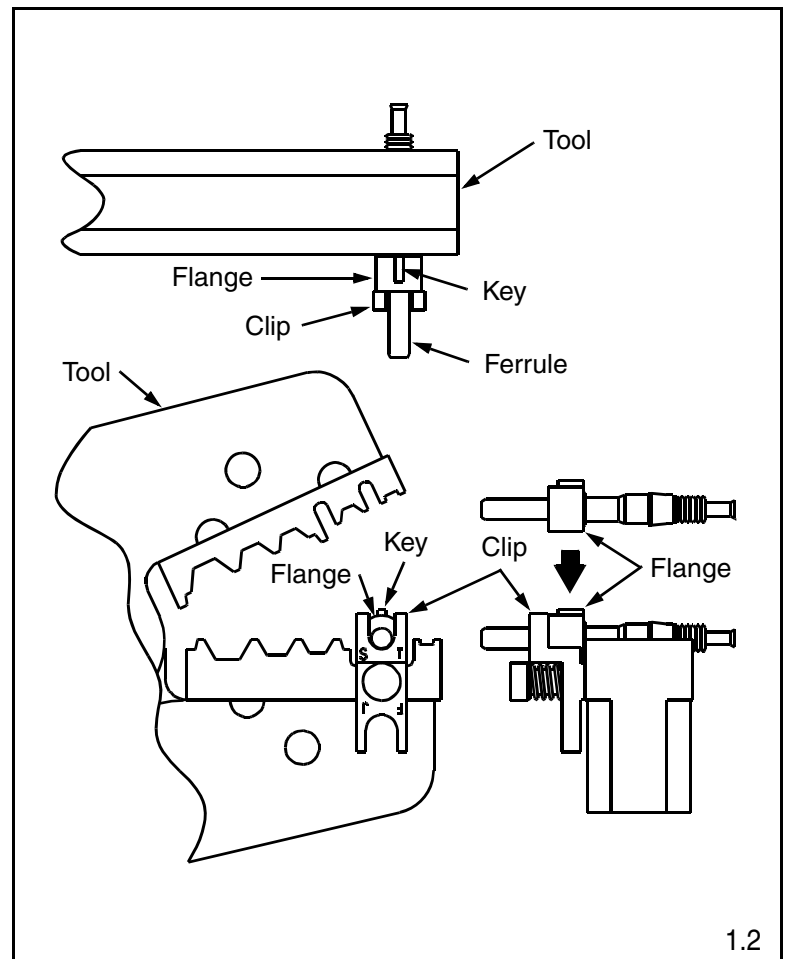
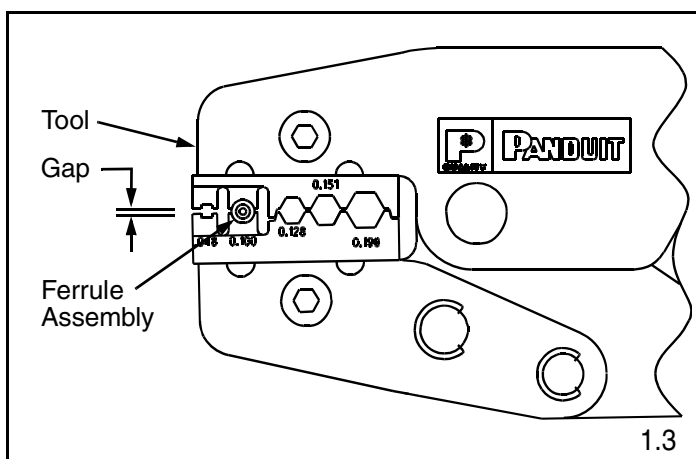
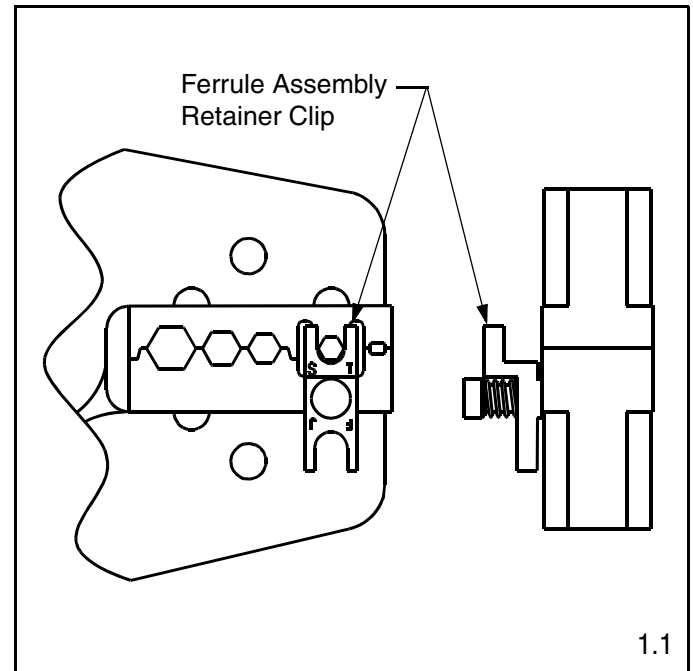
Note: Do not crimp on flared area of ferrule assembly.

- 5.6 Switch the FVFLY to the "OFF" position and remove the Ferrule Adapter end of the FVFLPCY patch cord from the connector. Set the Panduit Crimp Tool, FVFLY, and patch cord down carefully on a clean surface.
- 5.7 Clean ferrule endface with an alcohol soaked wipe and then with a dry wipe. Place dust cap over ferrule end.
- 5.8 While holding onto the ferrule dust cap, slide the spring and bayonet forward onto the ferrule assembly. Push the bayonet forward until it snaps over the retaining edge.
- 5.9 Slide the strain relief boot up to the back of the bayonet.
- 5.10 Remove fiber from cleaving tool. Depress the fiber clamp lever to release the fiber so that the fiber scrap can be removed and properly disposed.

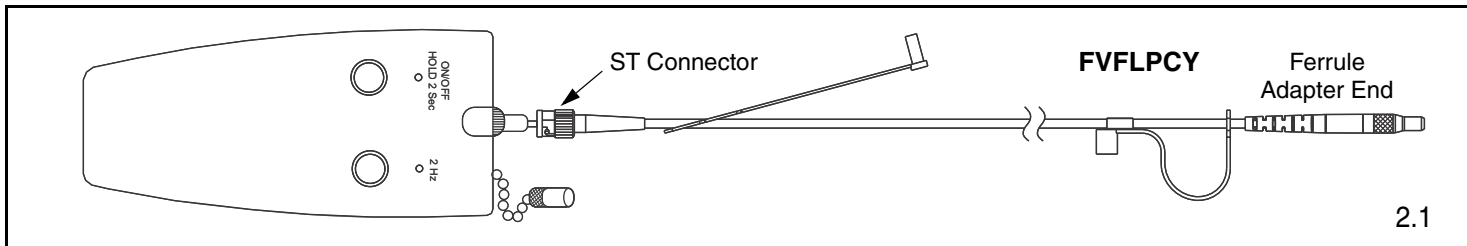
3mm Jacketed Cable Termination

1. LOADING FERRULE ASSEMBLY INTO FCRP5 CRIMP TOOL

- 1.1 Pull ferrule assembly retainer clip away from tool and rotate clip until the letters “ST” on the clip are closest to the .100 hex crimp pocket. (Die size numbers are on crimp die on opposite side of clip). Release clip.
- 1.2 Remove the dust cap from both ends of the ferrule assembly. Place the ferrule assembly in the .100 hex crimp pocket of the FCRP5 crimp tool. The flange of the ferrule assembly should be between the crimp die and the clip, with the key pointing away from the clip.
- 1.3 Partially close the tool to contain the ferrule assembly. **DO NOT CRIMP THE FERRULE ASSEMBLY.**



2. CONNECTING FVFLY TO FERRULE ASSEMBLY



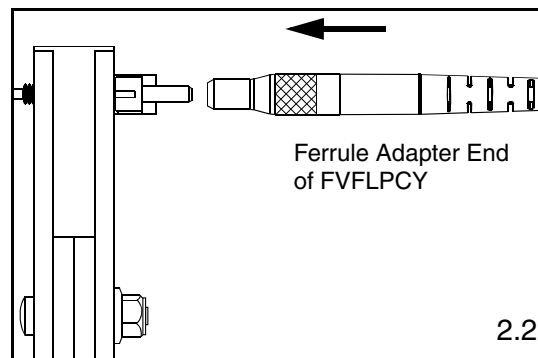
2.1 Verify that Visual Fault Locator (FVFLY) is “OFF” (green LED is off). Remove the metal dust cap from the FVFLY. Remove the dust cap from ST Connector on the Visual Fault Locator Patch Cord (FVFLPCY) and insert the ST Connector into the output end of FVFLY until the ferrules touch. Remove the dust cap from the Ferrule Adapter end of the FVFLPCY.

Note: NEVER rotate the FVFLPCY when mated to the FVFLY or another connector. This will cause damage to the FVFLPCY, the FVFLY and the connector.

2.2 Remove the dust cap from the connector ferrule in the FCRP5 Crimp Tool. Mate the Ferrule Adapter end of the FVFLPCY to the connector ferrule.

Note: The connector ferrule assembly and the ferrule contained in the Ferrule Adapter should touch.

2.3 Turn the FVFLY “on” by pressing & holding the ON/OFF button for 2-3 seconds. Note that when the FVFLY is switched “on”, the connector ferrule glows red. Place the tool, FVFLY and FVFLPCY down gently on a clean surface. Be careful not to damage the ferrule assembly.



3. STRIPPING 3mm JACKETED CABLE

3.1 Slide the connector components onto the fiber in the following order:

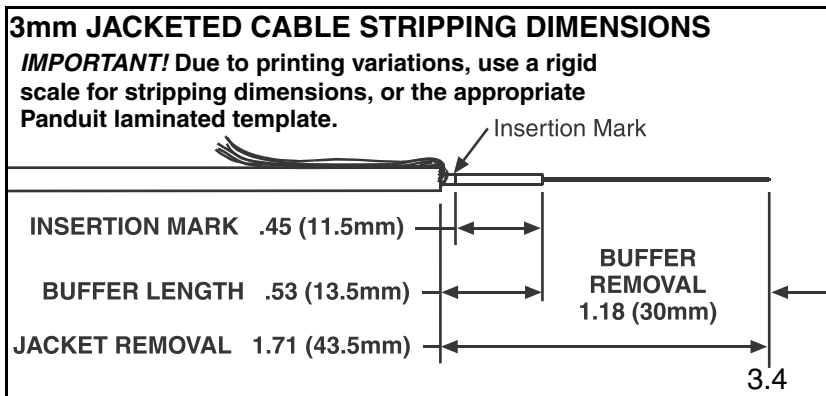
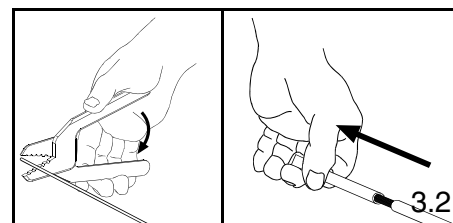
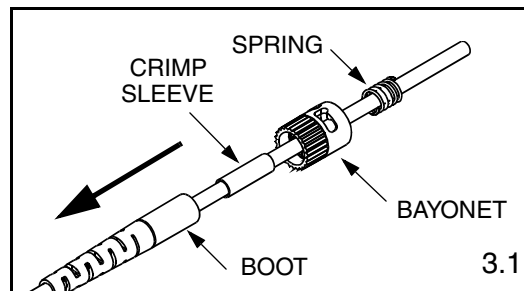
1. The small end of the boot first,
2. Crimp sleeve,
3. Knurled end of the bayonet first, and
4. Spring

Slide them back out of the way.

3.2 To reduce wear on the jacket stripper blades, do not slide the blades along the aramid yarn. Instead, use the tool to cut through the jacket, then pull off the jacket by hand. For 3.0mm jacketed fiber, use the third hole (marked “1.3mm” or #16AWG) from the tip of the jacket stripper. Using the cable jacket stripper, strip the required length of the jacket off of each fiber according to the stripping dimensions.

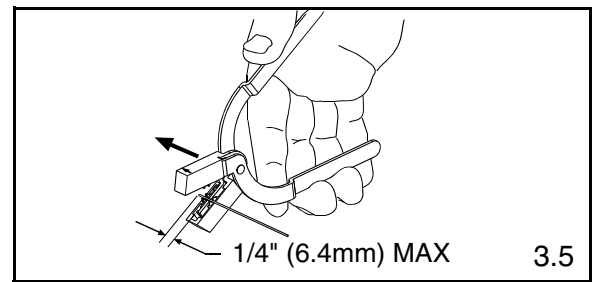
3.3 Following the stripping dimensions use the marking pen to mark each buffer 0.53" (13.5mm) from the edge of the jacket. Place an insertion mark 0.45" (11.5 mm) back from the first mark. Mark the buffer length by placing a mark on the buffer at the edge of the jacket.

3.4 Use the buffer stripper provided to strip the buffer to the buffer removal mark.

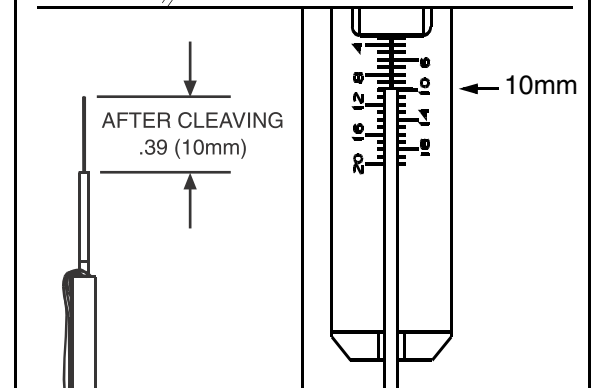
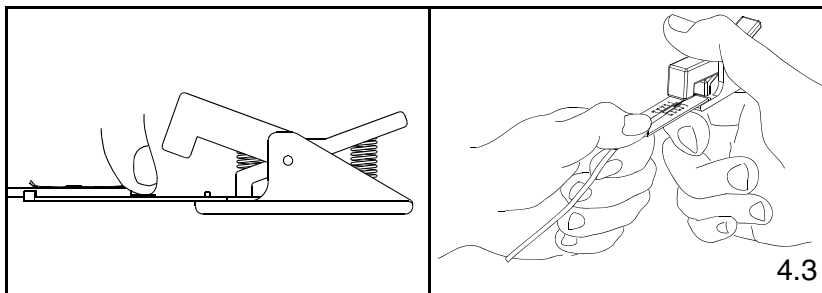
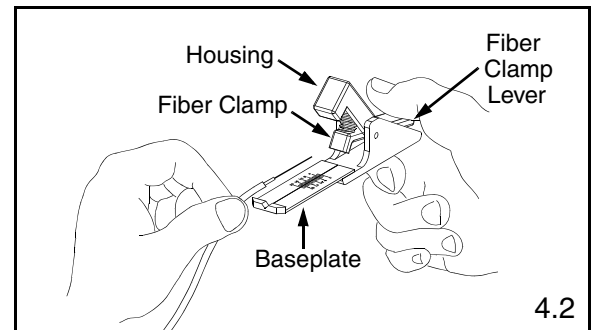
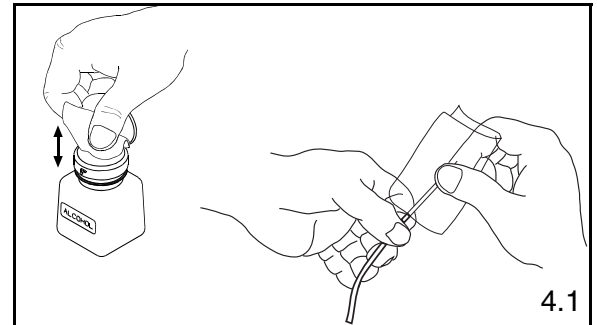


BUFFER STRIPPING GUIDELINES:

- Panduit recommends that you remove no more than 1/4" (6.4mm) of buffer at a time to avoid breaking the fiber. Refer to cable manufacturer's buffer stripping guidelines for specific recommendations.
- Hold the buffer stripper such that the arrow on the tool points in the direction of buffer removal.
- Noting the location of the tool's blades, position the fiber in the tool's V-notches. Squeeze the handles firmly, and pull tool in the direction of the arrow on the tool.
- Clean the buffer stripper blades after each strip by holding the handles open, pulling the casings back away from the blades, and letting them snap back against the blades.

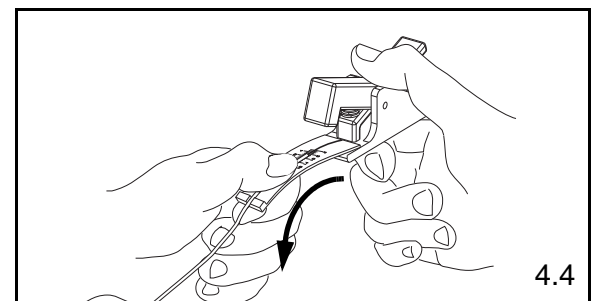
**4. CLEAVING 3MM JACKETED CABLE FIBER**

- 4.1 IMPORTANT: INSPECT CLEAVER TO ENSURE THAT IT IS CLEAN AND IN GOOD WORKING CONDITION. CLEAN OR REPLACE IF NECESSARY.** Clean bare fiber using an isopropyl alcohol (90% minimum concentration) soaked lint-free wipe. The fiber should be free of all coating and residue. To prevent contamination, do not set fiber down or allow it to touch anything after cleaning.
- 4.2** Hold the cleaving tool in your hand and depress the Fiber Clamp lever to raise the fiber clamp. Insert the end of the fiber into the V-groove and under the fiber clamp. Release the fiber clamp lever when the end of the buffer is located at the 10mm mark ($\pm 0.5\text{mm}$).
- 4.3 This is a critical step for obtaining a successful termination.** Gently hold the buffered fiber against the groove in the base plate, using the thumb and forefinger of your free hand. With your other thumb, **gently** push down on the housing until the ceramic blade contacts the fiber and the end of the housing contacts the rubber coating on the base plate. **Do not cut the fiber with the ceramic blade. Release the housing so that the blade is no longer contacting the fiber.**



- 4.4** Holding the tool in one hand, and holding the fiber against the base plate, bend down the base plate until the fiber breaks. To prevent contamination, do not set fiber down or allow it to touch anything after cleaning.

IMPORTANT: DO NOT CLEAN FIBER AFTER CLEAVING. REPLACE THE CERAMIC BLADE IN THE CLEAVING TOOL AFTER EVERY 1000 CLEAVES, OR IF INSTALLATION YIELD DECREASES. REPLACEMENT BLADE (FJQCVRB) IS AVAILABLE.



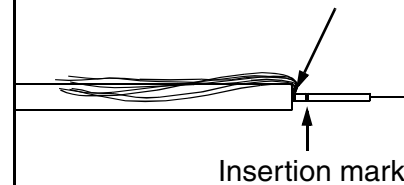
5. CRIMPING 3mm JACKETED CABLE

The FVFLKITY verifies optical continuity only. Optical performance can only be verified by performing a link loss test or connector loss test using an optical test set or an OTDR. Eliminating the movement of the buffer inside the jacket is critical to a successful termination. This is achieved by pinching the jacket tightly against the buffer.

IMPORTANT: SOME FIBER OPTIC CABLES HAVE STIFF (HARD) JACKET MATERIAL THAT MAY PREVENT THE JACKET FROM BEING PINCHED WELL ENOUGH TO ELIMINATE BUFFER MOVEMENT RELATIVE TO THE JACKET. THE INABILITY TO STOP THIS MOVEMENT (PISTONING OF THE BUFFERED FIBER) MAY CAUSE YOUR INSTALLATION YIELD TO DECREASE.

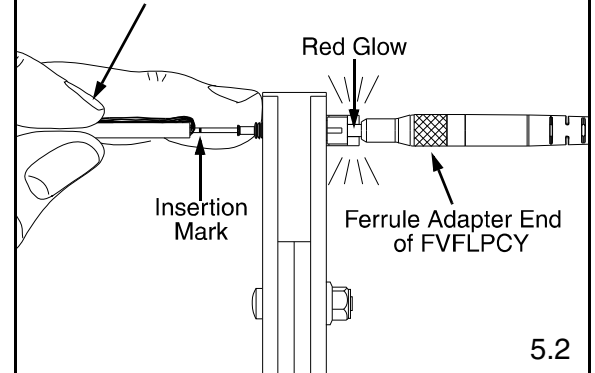
- 5.1 Check the location of the buffer length mark to make sure it is at the edge of the jacket. If necessary, carefully work the fiber back in until the mark is at the edge of the jacket.
 - 5.2 Pick up the crimp tool containing the ferrule assembly. Carefully insert the fiber into the ferrule assembly using constant light pressure, as your middle finger stabilizes your hand against the tool. **Excessive force during insertion may break fiber.** The fiber should be guided in straight, not at an angle. Once the buffer has entered the ferrule assembly, **grip the cable by pinching the jacket and buffer tightly 1" behind the insertion mark** so that buffer will not slide into jacket. Hold the crimp tool near the end of the handles for better mechanical advantage during crimping.
 - 5.3 **This is a critical step for obtaining a successful termination.** Add light forward pressure to the fiber. (An excessive kink in the buffer behind the ferrule assembly may prevent the fiber end face from contacting the pre-polished fiber.) **Notice that the red glow of the ferrule has diminished so that it is barely noticeable or disappears.** This identifies that the cleaved end of the field fiber is in face-to-face contact with the pre-polished fiber inside the ferrule assembly. The insertion mark is used as an additional visual aid to verify proper insertion depth. When the red glow diminishes, the insertion mark should be even with the back edge of the ferrule assembly.
- Note:** If the red glow has not diminished or diminishes only slightly (and the insertion mark is not even with the back edge of the ferrule assembly), then face-to-face contact has not yet occurred. Withdraw the field fiber slightly and then rotate it while re-inserting. **Do not rotate the fiber after it has bottomed out against the pre-polished fiber stub.** If, after re-inserting, there is still a substantial red glow at the ferrule the fiber cleave may not be optimal. Return to section 3 on page 8.
- 5.4 While maintaining light pressure and verifying that the red glow is barely noticeable, crimp the ferrule assembly **one time**. Squeeze handles together until the controlled cycle mechanism releases and the handles open. At this point, the red glow should still be diminished.
 - 5.5 Being careful not to pull on the fiber, remove the ferrule assembly by holding the assembly, not the fiber, from the .100 hex crimp pocket. Place buffer crimp area of the ferrule assembly (smallest diameter, see illustration on page 1) in the .048 crimp pocket.

If the buffer length mark has moved, carefully work the buffer back into the jacket until the mark is in its original position.



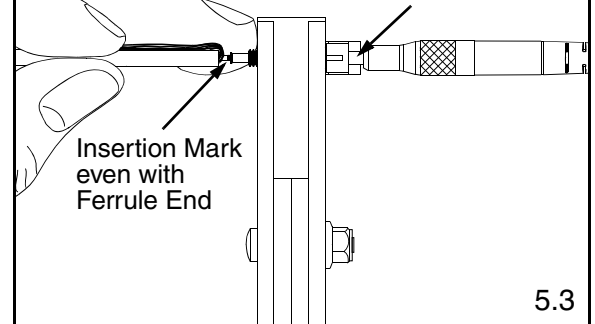
5.1

Pinch the jacket and buffer tightly



5.2

Red Glow Diminished



5.3

- 5.6 Crimp the buffer crimp area **one time**. Squeeze handles together until the controlled cycle mechanism releases and the handles open.

Note: Do not crimp on flared area of ferrule assembly.

- 5.7 Switch the FVFLY to the "OFF" position and remove the Ferrule Adapter end of the FVFLCPY patch cord from the connector. Set the Panduit Crimp Tool, FVFLY, and patch cord down carefully on a clean surface.

- 5.8 The fiber jacket should nearly touch the rear of the ferrule assembly.

Note: Do not press the cable jacket forward to touch the rear of the ferrule assembly. There should be a gap between the jacket and ferrule assembly.

- 5.9 Remove the ferrule assembly from the tool. Clean the ferrule end face with an alcohol soaked wipe and then with a dry wipe. Place dust cap over the ferrule end.

- 5.10 While holding onto the ferrule dust cap, slide the spring and bayonet forward onto the ferrule assembly. Pull aramid yarn back through spring and bayonet. Then push the bayonet forward until it snaps over the retaining edge.

- 5.11 Trim aramid yarn even with the bayonet.

- 5.12 Flare the aramid yarn evenly around the perimeter of the grooved area of the ferrule assembly.

- 5.13 Slide the crimp sleeve over the ferrule assembly until it stops, trapping the aramid yarn between the crimp sleeve and the grooved area of the ferrule assembly.

- 5.14 Using the .128 hex crimp pocket of the crimp tool, crimp the crimp sleeve **one time** over the ferrule assembly and the fiber jacket. Slide strain relief boot up to the back of the bayonet.

- 5.15 Remove fiber from cleaving tool. Depress the fiber clamp lever to release the fiber so that the fiber scrap can be removed and properly disposed.

