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# TECHNICAL GUIDELINE

## PBT LOOSE TUBE CABLE MID-SPAN ACCESS FOR SPLICING

**Note:** These installation instructions have been written for qualified, experienced personnel. Please read them thoroughly before starting assembly work. Incab America disclaims any liability or responsibility for the result of improper or unsafe installation practices.

### GENERAL INFORMATION

- This procedure details the necessary steps mid-span access to an Incab America optical fiber cable featuring one or more PBT loose tubes.
- This procedure assumes that sufficient cable slack is available and is not intended for taut-line access.
- The procedure applies to cables featuring either “dry” or gel-filled tubes.
- This procedure does *not* include methods to prepare and splice the fiber itself or to perform splice testing.
- Cable access and splicing must be performed by personnel who are trained and familiar with handling optical fiber cables, cable components, and splicing accessories. Mishandling of fiber cables can cause damage to the fiber and result in cable length cuts or system degradation.

### GETTING STARTED

- Proper safety procedures must always be followed, whether these are from government agencies or your company. Incab specifically recommends that you wear protective eye gear and gloves during the installation steps to avoid the possibility of bodily injury.
- Ensure all required materials are on hand. It is recommended that the processes of mid-span access, fiber splicing, and splice closure assembly be performed from beginning to end with minimal interruption. If for any reason actions are interrupted, ensure fiber cable and fibers are adequately protected.

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### TOOLS AND MATERIALS REQUIRED



1. Tape measure
2. Electrical Tape
3. Paint Marker
4. Safety Glasses
5. Gloves
6. Hook blade Knife
7. Diagonal Cutters
8. Wire Stripper
9. Jonard Mid Span Slitter (See also below)
10. Needle nose Pliers
11. Cable Stripper
12. Heat Gun (Optional)

#### TOOLS TO OPEN LOOSE BUFFER TUBE:

- **For best results:** Jonard Mid Span Slitter 1.2-3.3mm or similar slitting type tool.
- **Alternatives:** Miller MSAT-5, Miller MSAT16, Draka Buffer Tube Access Tool, or similar shaving type tool.

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### Note:

- Polybutylene terephthalate (PBT) and polypropylene (PP) are the two materials commonly used to make dielectric buffer tubes. This guideline is for tubes made from PBT, although it could be used for PP tubes also.
- We advise you that PBT tubes are more rigid and less flexible than PP ones. Consequently, we recommend that you use a tool with a longitudinal blade that cuts directly into the tube (a slitting-type tool), such as the Jonard Mid Span Slitter 1.2-3.3mm mentioned above.
- We further advise you that you may encounter difficulties when using a tool with a blade that tracks along the surface of a tube like a razor (a shaving-type tool). If this happens, then you must either use a heat gun as described at Step 19 or switch to a slitting-type tool, such as Jonard's.

## PROCEDURE

1. Determine the location on the cable where the splice point is to be located and mark the spot with the paint marker.



2. In the center of this length of cable use a rotary cable jacket slitter to remove  $\pm 8$ -inches" (200 mm) of the outer jacket. Be careful not to cut the buffer tubes underneath. This is your window to access the ripcord.



3. Locate a ripcord below the jacket or armor.

**Note:** Incab's standard is two rip cords under the outer jacket and one rip cord under an inner jacket. You can confirm the number of rip cords and jackets on the datasheet for the cable that you are working with.



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4. Cut the ripcord in middle of this 8-inch (200 mm) window.



5. Pull the rip cord through the outer jacket approximately 12-inches (304 mm) to one side, and then repeat this process to the other side. Find the second rip cord and repeat this process. Then, remove this section of the cable's outer jacket.

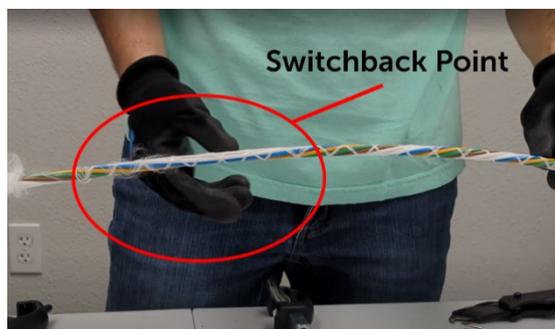


6. If the cable has an inner jacket, then it too must be removed by following steps 2 through 5 again.

7. After removing the outer jacket, use sharp scissors to cut and remove the binder threads. Take great care not to damage the tubes in the process.



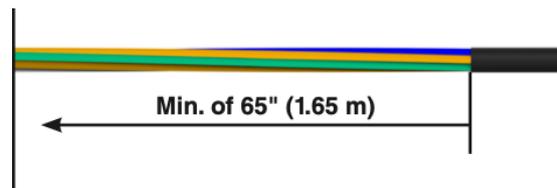
8. Locate the switchback point of the loose tubes (the center of the area where the loose tubes reverse the direction of wind around the cable axis). If necessary, use the rip cord(s) to expose more of the cable core until the switchback point is revealed. The switchback point is now the new center of the splice location.



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9. Determine the length of cable to be stripped according to the manufacturer's recommendations for the splice/termination system utilized. For reference, we have shown PLP's recommendation here.



(From PLP installation manual)

10. Measure and mark using electrical tape the recommended length of cable, centered around the switchback point located during the previous step. You will have two tape marks which we will refer to as "tape mark 1" and "tape mark 2."



**Making the first tape mark**

11. Pull the rip cord through the outer jacket, to tape mark 1 and repeat this process all the way up to tape mark 2. Now, this length of outer jacket can be removed.



12. If the cable has multiple jackets, they must be removed according to the previous step.

13. After removing the outer jacket, use sharp scissors to cut and remove the binder threads. Take great care not to damage the tubes in the process.

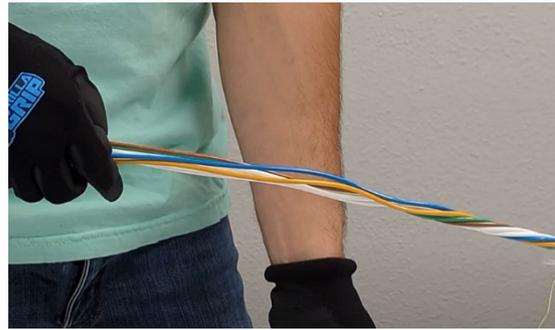


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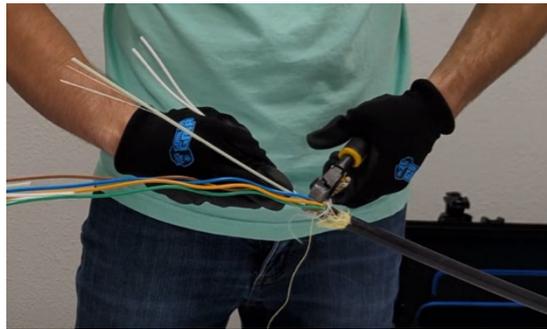
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14. Straighten the cable.  
Beginning at the switchback point, carefully unwind and separate the tubes from the core. Be careful not to kink the tubes during handling.



15. Cut and remove any filler rods or empty tubes.



16. Cut the center member approximately 1.5-inches (40 mm) from base of the exposed cable on both sides.



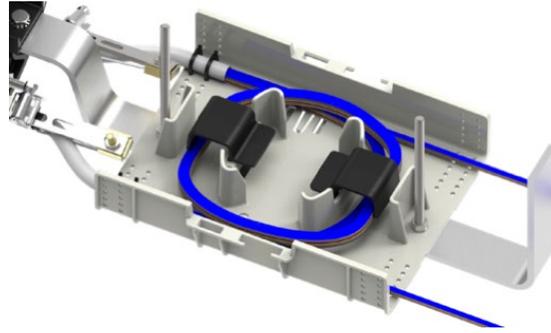
17. Review manufacturer's assembly instructions for the splice closure to be used. Follow the splice closure assembly instructions to build the closure unit, attach the cable ends, and fabricate the end seal around the cables to be spliced.

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18. Coil and pack away those tubes that will not be accessed (opened).



19. If using a slitting-type tool, the heat gun is optional, but helpful.

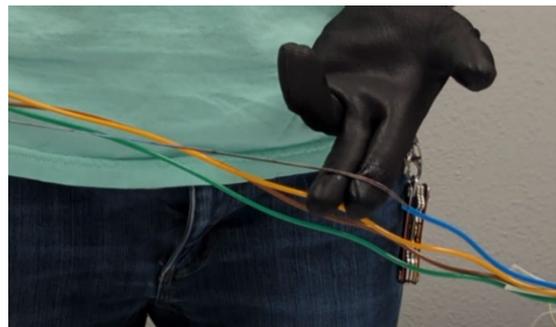
If using a shaving-type tool, the heat gun is required. When using, apply heat from the heat gun to the opening tube. Slowly and steadily transferring the gun along the desired length of the tube. It should take about 1 – 2 minutes to heat the tube sufficiently. The temperature of the tube should be 120-160°F (49 - 72°C). The tube should feel very warm or even a little hot, but not scorching.



20. Straighten the tube, then place the tube in a suitably sized insertion slot in the midspan access tool. Proceed with opening the tube by pulling the tool down the length of the tube. Always pull in a straight line, never at an angle or over a curve.



21. Remove all the fibers from the opened tube. Count the fibers to ensure that you have them all, before cutting and removing the now opened portion of the tube. If specified, install transportation tubing.

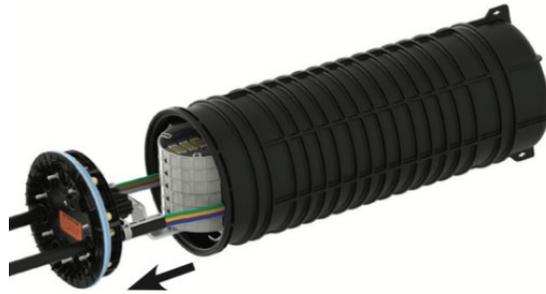


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22. Place the exposed fibers in the tray, which are now ready to be cut and spliced following the instructions of the splicer or splicing system that you are using.



23. After completion of the splicing operation, assemble the splice enclosure in accordance with the manufacturer's instructions.

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