

# CORNING

## OSE Splice Trays

P/N 001-285  
Issue 4

related literature | Search [www.corning.com/opcomm](http://www.corning.com/opcomm). Click on “Resources.”

### 1. General

This document describes the installation of optical fiber with both single fiber and/or ribbon fiber splices into Optical Splice Enclosure (OSE) metal splice trays (Figure 1).

Make sure you read and understand this instruction as well as instructions provided with related assemblies before beginning an installation. This document should be used in conjunction with instructions provided with the cables, splicing components, and hardware being used.

Contact your Corning Customer Care representative for assistance in purchasing items that are sold separately.

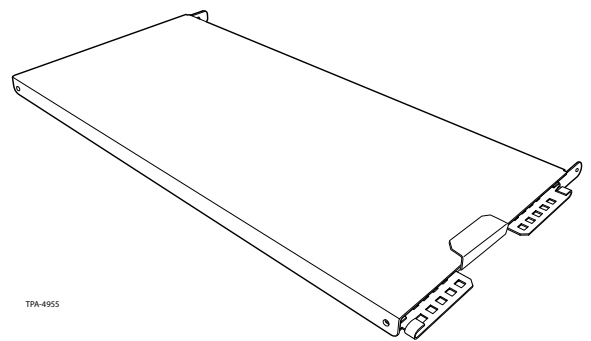


Figure 1

### 2. Precautions

#### 2.1 Laser Handling Precautions



**WARNING:** Never look directly into the end of a fiber that may be carrying laser light. Laser light can be invisible and can damage your eyes. Viewing it directly does not cause pain. The iris of the eye will not close involuntarily as when viewing a bright light. Consequently, serious damage to the retina of the eye is possible. Should accidental eye exposure to laser light be suspected, arrange for an eye examination immediately.



**WARNING:** DO NOT use magnifiers in the presence of laser radiation. Diffused laser light can cause eye damage if focused with optical instruments. Should accidental eye exposure to laser light be suspected, arrange for an eye examination immediately.

#### 2.2 Safety Precautions



**CAUTION:** Recommend the use of safety glasses (spectacles) conforming to ANSI Z87 for eye protection from accidental injury when handling chemicals, cables, or working with fiber. Pieces of glass fiber are very sharp and have the potential to damage the eye.



**CAUTION:** The wearing of cut-resistant safety gloves to protect your hands from accidental injury when using sharp-bladed tools and armored cable is strongly recommended. Use extreme care when working with severed armor. There will be a sharp edge where armor is cut. To minimize the chance of injury from the cut armor, cover the exposed edge with a wrap of electrical tape. To minimize the chance of injury from sharp-bladed tools, always cut away from yourself and others. Dispose of used blades and armor scrap properly.



**CAUTION:** Isopropyl alcohol is flammable with a flashpoint at 54°F. It can cause irritation to eyes on contact. In case of eye contact, flush eyes with water for at least 15 minutes. Inhaling fumes may cause mild dizziness. In case of ingestion, consult a physician..

## 2.3 Glass Fiber Precautions



**CAUTION:** Cleaved or broken glass fibers are very sharp and can pierce the skin easily. Do not let these pieces of fiber stick to your clothing or drop in the work area where they can cause injury later. Use tweezers to pick up cleaved or broken pieces of glass fibers and place them on a loop of tape kept for that purpose alone. **Good housekeeping is very important.**

## 2.4 Cable Handling Precautions



**CAUTION:** Fiber optic cable is sensitive to excessive pulling, bending, and crushing forces. Consult the cable specification sheet for the cable you are installing. Do not bend the cable more sharply than the minimum recommended bend radius. Do not apply more pulling force to the cable than specified. Do not crush the cable or allow it to kink. Doing so may cause damage that can alter the transmission characteristics of the cable; the cable may have to be replaced.

# 3. Tools And Materials

In addition to the standard tools and materials required for sheath removal and splicing, the following may be required:

- Cable crimping tool (P/N M67-020) to anchor buffer tubes under splice tray crimping tabs.
- Cable preparation tool kit and a spatula when using ribbon fiber.
- Single-fiber heat-shrink splice protectors for OSE-ST-1 (purchased separately, P/N 2806031-01 [60 mm long], 2806032-01 [40 mm long]).
- Mass fusion heat-shrink splice protectors for OSE-ST-3 (purchased separately, P/N 2806031-4 [2- or 4-fiber ribbon], 2806031-012 [6- or 12-fiber ribbon]).

# 4. Stripping Fiber

Strip buffer tube to expose 182 cm (72 in) of fiber. This length will allow two loops of fiber around the inside perimeter of the tray.

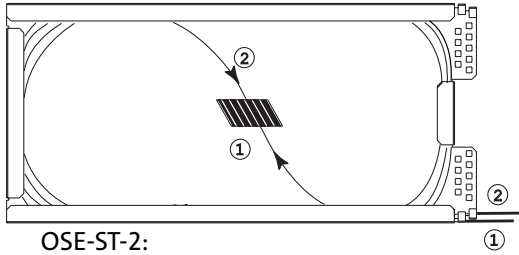
**NOTE:** *Detailed fiber stripping instructions are found in splicing documentation. Do not expose the bare fiber until ready to splice it.*

## 5. Routing Fiber

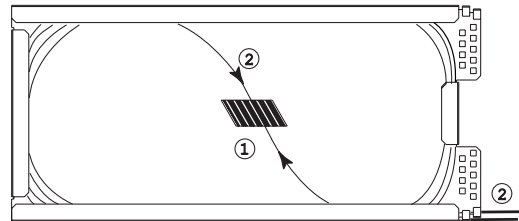
The recommended ribbon/fiber routing configurations are illustrated in Figure 2.

Loop the fiber twice around the inside perimeter of the tray (once for the OSE-ST-3-TQ and OSE-ST-9 trays).

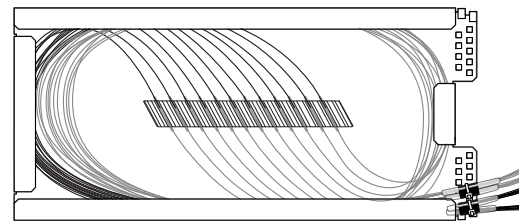
### Single-fiber Splice Trays



OSE-ST-2:  
36 Fusion splices using Crimp & Go® splice protectors or RTV compound

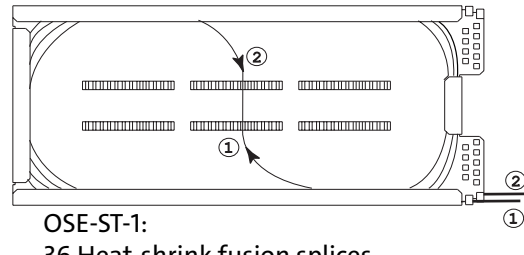


OSE-ST-3:  
6 Heat-shrink mass fusion splices  
(12-fiber ribbon, 72 total fibers)

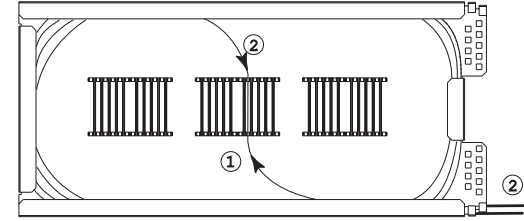


OSE-ST-3-TQ:  
12 Heat-shrink mass fusion splices  
(12-fiber ribbon, 144 total fibers)

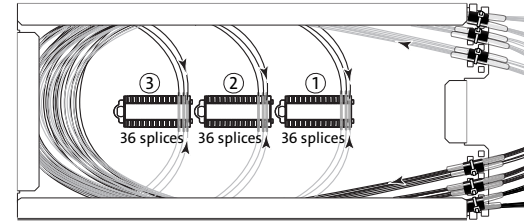
### Ribbon Fiber Splice Trays



OSE-ST-1:  
36 Heat-shrink fusion splices



OSE-ST-4:  
36 Mechanical splices



OSE-ST-9:  
108 Heat-shrink fusion splices  
(12-fiber ribbon, 108 total fibers)

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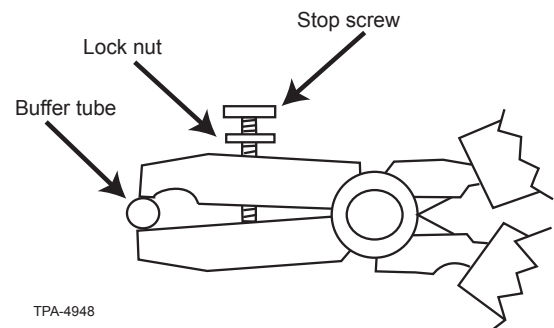
Figure 2

**IMPORTANT:** The fibers must enter/exit the tray at the same corner as shown in Figure 2. Strain-relieve the buffer tubes appropriately as detailed in Sections 6-8. Fiber #1 enters the splice organizer from the bottom and fiber #2 enters the splice organizer from the top.

## 6. Securing Loose Tube Cable

**Step 1:** Use a crimp tool (P/N M67-020) to secure buffer tubes to the tray.

- Adjust the stop screw on the crimp tool until the jaws of the tool are equal to the outer diameter of the buffer tube (Figure 3).
- Tighten the lock nut.



TPA-4948

Figure 3

**Step 2:** Use the inner tab on the splice tray first. Position the buffer tube approximately 1 cm (3/8 in) beyond the tab (Figure 4). Crimp the buffer tube under the tab using the crimp tool.

**IMPORTANT:** Do not crush the buffer tubes.

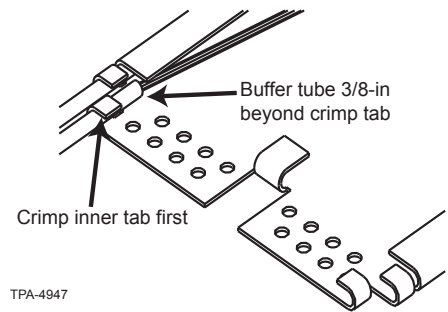


Figure 4

## 7. Securing Tight Buffered Cable

Secure tight buffered cables using cable ties threaded through holes in the tray (Figure 5).

**IMPORTANT:** Multiple pigtails may be secured with a single cable tie. Wrap 1.5 in of vinyl tape around the pigtails as protection. Position cable tie buckles inside the tray and to one side of the cable bundle to avoid interference with the cover (Figure 6).

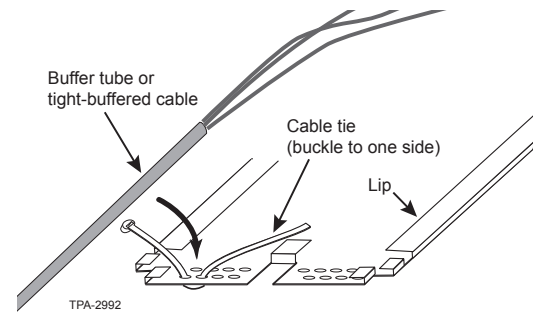


Figure 5

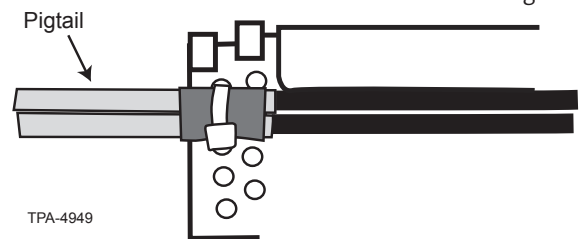


Figure 6

## 8. Securing Ribbon Fibers

**Step 1:** Orient the buffer tube/transport tubing with the ribbons on edge and the aqua (#12) fiber facing upward.

**IMPORTANT:** Verify that the ribbons are placed in the vertical plane and are not lying flat in the tray. To prevent damage to the ribbon fibers, they must be routed without twisting the fiber. Avoid crossing the ribbons over each other.

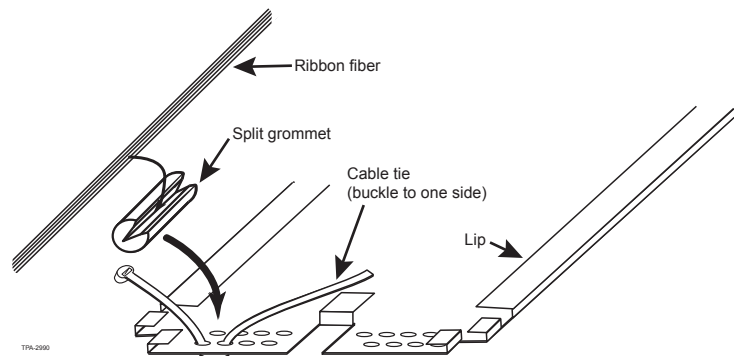


Figure 7

**NOTE:** A ribbon strain-relief kit is required to secure and transition ribbon fibers without tubing to the splice tray (Figure 7). This kit is provided with the OSE-ST-3 splice tray. Follow the instructions in the kit.

**Step 2:** Secure ribbon buffer tubes using cable ties threaded through holes in the tray (Figure 7).

Alternatively, the ribbon fiber can be secured using 3/8-in braided tubing as shown in Figure 8.

- Cut a section of buffer tube 1 inch in length.
- Slide the buffer tube section inside the braided tubing as shown in Figure 8.
- Wrap with vinyl tape to secure the tube to the tubing.

Alternatively, (for OSE-ST-3TQ tray applications) the ribbon fiber can be secured using clear transport tubing as shown in Figure 9.

- Wrap the last inch or two of the transport tube with friction tape (this will help the tube adhere to the tray).
- Group the incoming tubes into two sets of two tubes (the first being the incoming pair, and the second being the outgoing) as shown in Figure 9.
- Secure the tubes to the tray using cable ties (Figure 9).

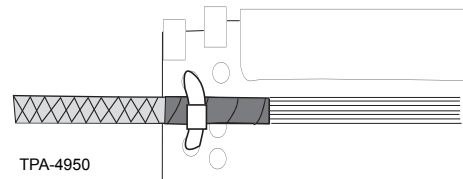
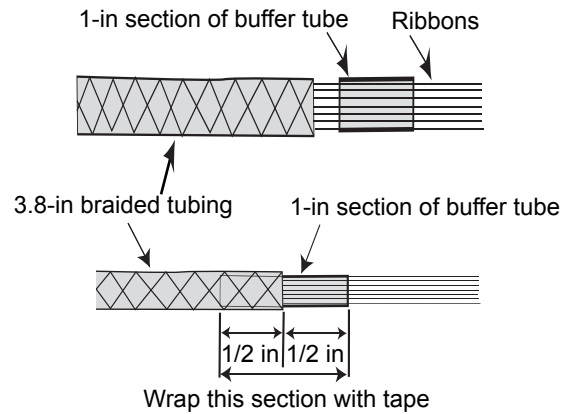


Figure 8

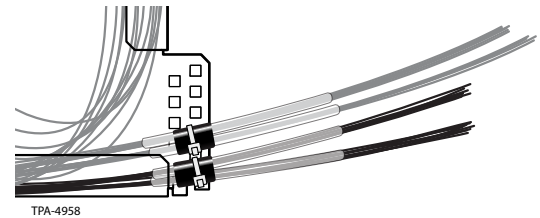


Figure 9

## 9. Splicing Ribbon Fibers

**NOTE:** Place the tray as close to the splicing equipment as possible. This reduces the possibility of broken fibers while transferring them from the tray to the splicer.

**Step 1:** Identify the #1 ribbon from each buffer tube. Loop both ribbons twice around the inside perimeter of the splice tray. Make sure the ribbons are under the inside lip of the tray.

**IMPORTANT:** Avoid twisting the ribbon so it will lie neatly in the tray. Twisting the fiber can lead to high attenuation. Avoid crossing the ribbons over each other.

**Step 2:** Remove just enough ribbon from the tray to reach the splicing equipment. Do not remove the entire length of ribbon from the tray or twist ribbons as they are removed.

**Step 3:** Place one ribbon in the splice organizer in the slot on the far left side of the organizer, entering from the top. Loop the other ribbon another half loop and place it on the right side of the organizer.

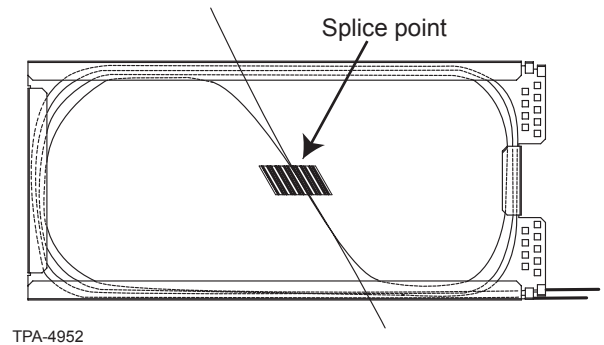


Figure 10

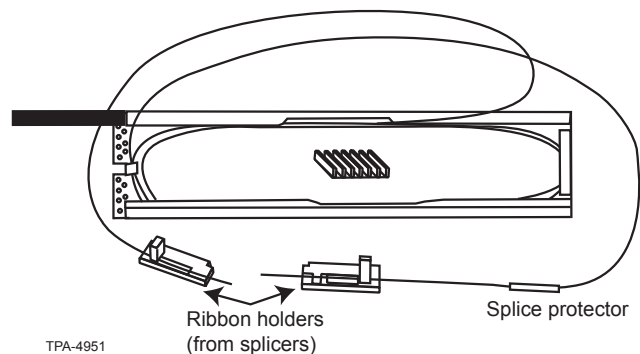


Figure 11

- a. Determine the splice point (Figure 10). Allow another 2.5 cm (1 in) of ribbon for stripping and cleaving, cut the ribbon and place it into the left holding fixture on the mass fusion splicer with 2.5 cm (1 in) exposed.
- b. Loop the other ribbon one-half loop and bring it to the same splice organizer slot from below (Figure 10).

**IMPORTANT:** *When using heat-shrink splice protection (OSE-ST-3), place the mass fusion heat-shrink splice protector over the fibers. The splice protector must be installed onto the ribbon/fiber BEFORE the fiber is spliced (Figure 11).*

- c. Slide a heat-shrink splice protector over the ribbon.
- d. Note the mid-point of the splice and allow another 3.8 cm (1.5 in) for stripping and cleaving. Cut the ribbon and place it into the right holding fixture on the mass fusion splicer with 2.5 cm (1 in) of ribbon exposed.
- e. Strip, cleave, and splice the ribbons according to the fusion splicer instruction. Be sure not to add any twists to the ribbon during this process to ensure that the ribbon can be routed neatly in the tray.

**NOTE:** *If resplicing is necessary:*

- a. The ribbon must be recleaved.
- b. Before recleaving, position the ribbons in the second slot of the splice holder and verify the length is sufficient to avoid a bend radius violation.
- c. The ribbons must be pushed out toward the inner walls of the splice tray as much as possible.
- d. If necessary, cut the ribbons to ensure only one inch of excess length.
- e. Place the ribbons back into their respective holding fixtures, while making sure that the splice protector is still on the ribbon.

**IMPORTANT:** *If this happens more than twice, however, an entire loop of ribbon slack must be removed. The ribbons must be spliced in the correct order to prevent crossing the fibers over one another when routing them.*

**Step 4:** Carefully route the ribbons back into the tray and place the splice into the organizer.

**Step 5:** Repeat until all ribbons are spliced. Each ribbon must be spliced consecutively. Always use the planned position of the ribbon in the splice holder to determine the length of ribbon required. Do not place the splices in the organizer randomly.

**Step 6:** Make sure all ribbons are below the fiber retaining tabs. Align the hole in the cover with the hole in the tray. Snap the cover onto the tray (Figure 12).

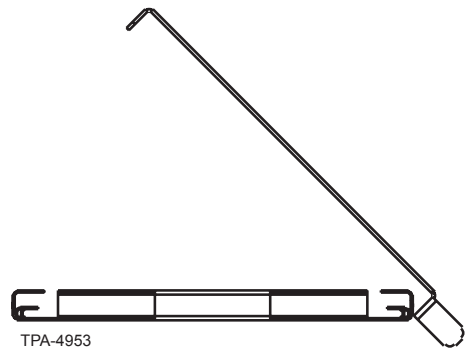


Figure 12

## 10. Splicing Single Fibers

**NOTE:** *Place the tray as close to the splicing equipment as possible. This reduces the possibility of broken fibers while transferring them from the tray to the splicer.*

**Step 1:** Route all fibers into the tray as described in Section 5. Make the largest circles possible to avoid attenuation from tight bends. Make sure the fiber is under the inside lip of the tray.

**Step 2:** Remove just enough fiber from the tray to reach the splicing equipment. Do not remove the entire length of fiber from the tray or twist fibers as they are removed.

**IMPORTANT:** *When using heat-shrink splice protection (OSE-ST-1), slide the splice protector onto the fiber before the fiber is spliced. When splicing into OSE-ST-2 splice trays, proceed to Section 11.*

- Step 3:** Slide the splice protector over the splice. Splice per manufacturer's instructions.
- Step 4:** Carefully route the fibers back into the tray and place the protected splice into the organizer.
- Step 5:** Repeat until all fibers are spliced. Each fiber must be spliced consecutively.
- Step 6:** Make sure all fibers are below the fiber retaining tabs. Align the hole in the cover with the hole in the tray. Snap the cover onto the tray (Figure 12).

## 11. Using the Step-Slot Splice Organizer

**Step 1:** Spliced fibers in the OSE-ST-2 splice tray are stored in the step-slot organizer. This organizer accepts 250 and 900  $\mu\text{m}$  fibers (Figure 13). The 250  $\mu\text{m}$  fibers are secured in the lower grooves in the organizer while the 900  $\mu\text{m}$  fibers fit into the surface slots.

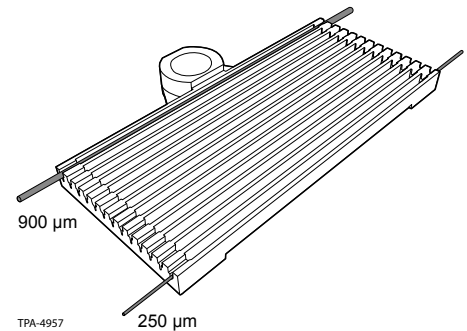


Figure 13

**Step 2:** When splicing 250  $\mu\text{m}$  fibers, protect the splices using the Crimp & Go<sup>®</sup> splice protectors provided with the OSE-ST-2 splice tray. Refer to the splicing documentation, if necessary, for detailed instructions on the use of these protectors.

- a. Place the splice protector over the splice point with the opening in the Crimp & Go<sup>®</sup> splice protector facing down towards the organizer.
- b. Squeeze the protector closed and insert into the organizer.

**IMPORTANT:** *Avoid twisting the fiber as you insert it into the organizer.*

- If using Crimp & Go splice protectors with 250  $\mu\text{m}$  fiber, do not use the RTV silicone compound (RTV).
- If splicing 900  $\mu\text{m}$  fiber, do not use Crimp & Go splice protectors.
- RTV can be used on 250  $\mu\text{m}$  fibers, however, Crimp & Go splice protectors are the preferred method.

**Step 3:** When splicing 900  $\mu\text{m}$  fibers, protect the fibers using RTV.

- a. Place the splices in the organizer in consecutive order.
- b. Fill the slots holding splices with RTV as shown in Figure 14. Do not overfill and avoid the empty slots.
- c. Place a piece of waxed paper, cut to size, over the RTV to prevent the RTV from sticking to the tray cover.

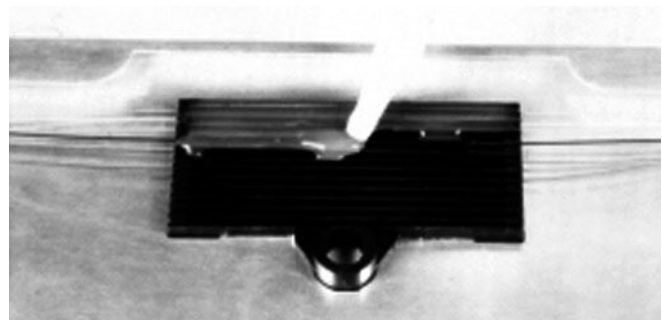


Figure 14

## 12. Torsional Forces

**IMPORTANT:** *Avoid putting torsional force on 900  $\mu\text{m}$  fibers being mechanically spliced (OSE-ST-4). Torsional, or twisting, forces can cause transmission failure at the connection after some time. The torsional force occurs when the splice is turned and the fiber is twisted as it is moved from the splice area and routed in a figure-eight layout in the splice tray. Rotate the fiber as little as possible when installing it into the tray (Figure 15).*

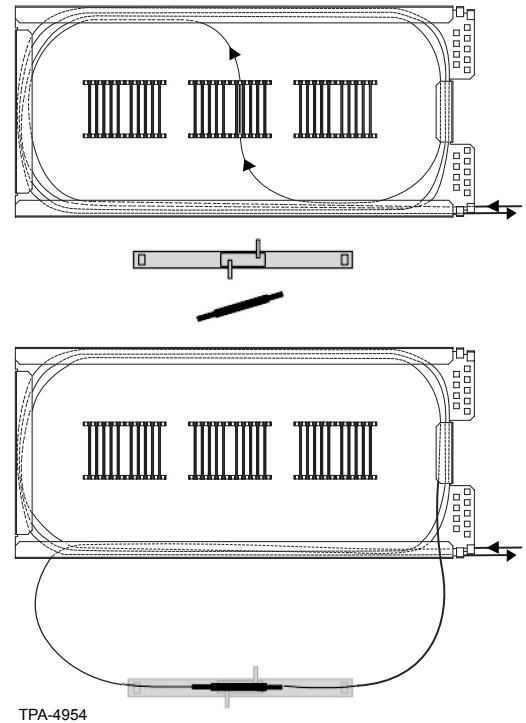


Figure 15