SCF-6 and SCF-8 Heat Shrink Canister Splice Closures



Figure 1

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1. General

1.1 This instruction describes the recommended procedures for loading fiber optic cable into the SCF-6 and SCF-8 Heat Shrink Canister Splice Closures (Figure 1). The closures accept a maximum of four Type 4S or two Type 2S Corning Cable Systems splice trays (purchased separately). Up to two stacker assemblies can be installed into each splice closure to double the quantity of splice trays. The closures provide environmental protection for optical cable splices.

1.2 Contact your customer service representative to purchase accessories that are sold separately.

1.3 This document is being reissued to:

- Add a reference to SRP 206-288 (Heatshrink End Cap Canister Closure Sealing Checklist).
- Change diameter of port "C" in the SCF-6 end cap.
- Add torque wrench, hand pump and air pressure gauge to tool list in Section 3.
- Illustrate the redesigned heat shrink strain-relief (HSSR) bracket and drop port strain-relief in Section 9.
- Remove aluminum tape application from Section 10.
- Remove references to combination wrench in Section 12.
- Illustrate lubricant application to sealing ring channel in Section 12.
- Remove instructions to remove tape from sealing ring channel in Section 13.
- Replace pipe sealant with lubricant in Sections 3, 11, 13 and 15.
- Detail flash test instructions.

NOTE: *Read and understand this procedure (as well as the instructions provided with all related assemblies) before beginning an installation.*

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 may 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 be suspected, arrange for an eye examination immediately.*

2.2 Safety Precautions

CAUTION: *The wearing of safety glasses to protect the eyes from accidental injury is strongly recommended when handling chemicals and cutting fiber. Pieces of glass fiber are very sharp and can damage the cornea easily.*

CAUTION: *The wearing of safety gloves to protect hands from accidental injury is strongly recommended when using sharp instruments.*

2.3 Glass Fiber Precautions

WARNING: *Cleaved glass fibers are very sharp and can pierce the skin easily. Do not let cut pieces of fiber stick to your clothing or drop in the work area where they can cause injury later. Use tweezers to pick up cut or broken pieces of the 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

NOTE: *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.*

2.5 Installer Precautions

WARNING: *Do not install this unit or work with telephone wiring during a lightning storm. Telephone lines can carry high voltages from lightning causing electrical shock resulting in severe injury or death.*

IMPORTANT: *Do not use power tools in any installation steps or when reentering the closure. Tighten the clamping ring with a torque value of more than 80 in-lb causes the hardware to crack and the clamping ring to become defective.*

2.6 Chemical Precautions

CAUTION: *Isopropyl alcohol is flammable with a flashpoint at 54 degrees 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 induce mild narcosis. In case of ingestion, consult a physician.*

CAUTION: *Use cable cleaner in a well-ventilated area to eliminate the possibility of dizziness and nausea. If cleaner comes in contact with skin or eyes, wash area immediately with soap and water to avoid irritation. Do not induce vomiting if cleaner is ingested.*

3. Tools and Materials

The following tools and materials are required to complete this installation:

- Tape measure
- Scissors
- Side cutters
- Cable knife
- 1/2-inch deep socket and ratchet
- 3/8-inch nut driver
- 7/16-inch nut driver
- 5/16-inch nut driver (to install sheath retention

  clamp)
- 11/32-inch nut driver
- 10 mm socket and ratchet
- Flat-tip screwdriver
- Phillips-head screwdriver
- Permanent marker pen
- Paint marker pen
- Electrical tape
- Heat gun
- Torque wrench
- Hand pump
- Air pressure gauge
- Soapy water (to verify leaks)

4. Carton Contents

Each carton contains the following:

- (1) Closure dome
- (1) Frame assembly
- (1) Slack basket (none in certain configurations)
- (1) Heat shrink end cap
- (2) Ground assembly
- (1) Clamping ring
- (1) End cap sealing ring
- (1) Accessory kit (containing express heatshink tube, branching clip and UCN lubricant)

5. Prepare the Cable

One express (mid-span) cable may be placed in the express port or up to two individual cables may be installed using the supplied 3-finger clip.

Step 1 Remove indicated length of cable sheath and armor (where applicable) according to cable manufacturer's instructions (Figure 2).

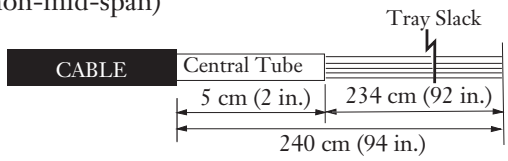
IMPORTANT: *Do not expose the bare fibers until after the cable has been placed in the closure end cap.*

Step 2 Cut the central member of each cable to 16 cm (6 inches) from the sheath using side cutters. Leave an excess length of yarn (approximately 6 inches) for additional strain-relieving.

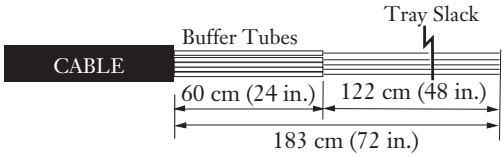
IMPORTANT: *To prevent damage to the fiber, remove all uncut express fiber from the tubing using the universal access tool (p/n UAT2-000 purchased separately).*

SCF-6C22-HS

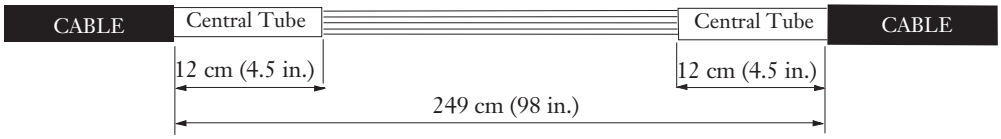
Ribbon Cable for Drop Cable (non-mid-span)



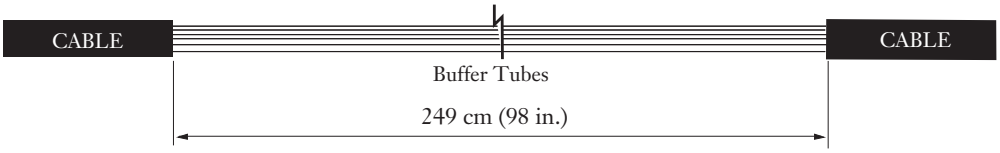
Loose Tube Drop Cable



Ribbon Cable in Express/Oval Port (Mid-span)

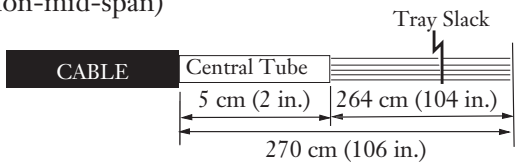


Loose Tube in Express/Oval Port (Mid-span)

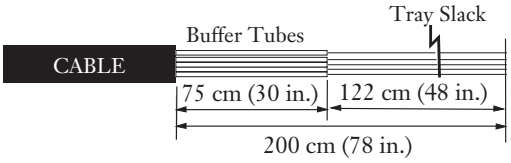


SCF-6C28-HS and SCF-8C28-HS

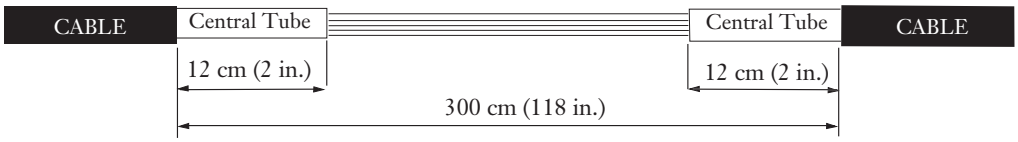
Ribbon Cable for Drop Cable (non-mid-span)



Loose Tube Drop Cable



Ribbon Cable in Express/Oval Port (Mid-span)



Loose Tube in Express/Oval Port (Mid-span)

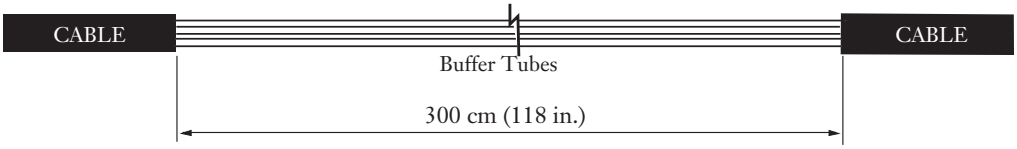


Figure 2

6. Install Grounding Hardware (Armored Cable Only)

Ground armored cables using the hardware in the accessory kit as shown in Figure 3. Armored drop cable must also be grounded using a grounding kit purchased separately from your customer service representative.

A) Cut a slit into opposite sides of the outer sheath and armor about 5 cm (2 inches). To do this, score the armor with a cable knife (being careful not to damage the inner sheath) and split the sheath by flexing it.

B) Position the grounding clamp base plate under the armor. The stops of the clamp should just touch the outside of the armor and sheath. Tap the sheath above the ground clamp base to drive the teeth on the plate into the cable sheath.

C) Position the top plate and lock nut on the outer sheath over the base plate. Tighten with a 10 mm wrench so that the teeth on the upper plate are driven into the sheath.

(When the cable has a metal strength member, attach the extension bracket to the base plate as shown in the inset before installing the top plate.)

D) Place the eyelet on the ground wire over the stud on the base plate. Add a second lock nut and tighten using a 10mm wrench.

E) Wrap the grounding clamp and split portion of the cable sheath with vinyl tape.

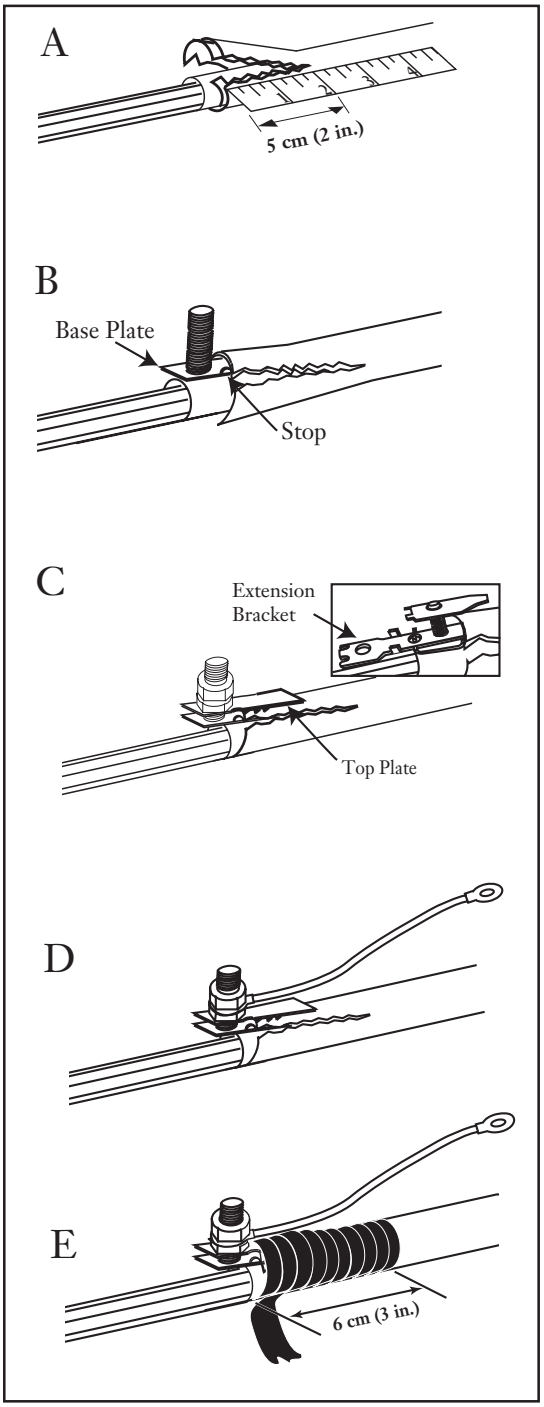
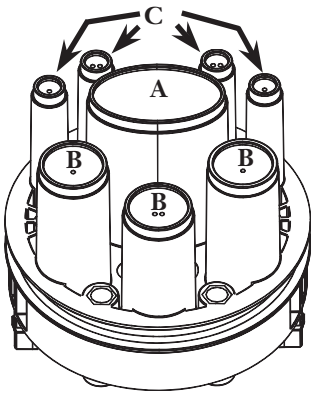


Figure 3

7. Prepare End Cap

7.1 Remove the frame from the end cap.

7.2 Open the appropriate cable port for your application based on the table in Figure 4 below. When using ports other than the oval port, use a taller port before using a shorter port.



Oval Port "A"		Round Port "B"		Round Port "C"	
One Cable	Two Cables	One Cable	Two Cables	One Cable	Two Cables
25 mm (1.0 in.) min.	10 mm (.40 in.) min.	11 mm (.43 in.) min.	8 mm (.32 in.) min.	7 mm (.28 in.) min.	N/A
41.4 mm (1.65 in.) max.	28 mm (1.10 in.) max.	32.5 mm (1.29 in.) max.	15.5 mm (.60 in.) max.	12.7 mm (.58 in.) max.	N/A

Figure 4

Step 1 Carefully tap the end using a punch or a nut driver (Figure 5).

Step 2 Clean the port opening with a file to remove any rough edges.

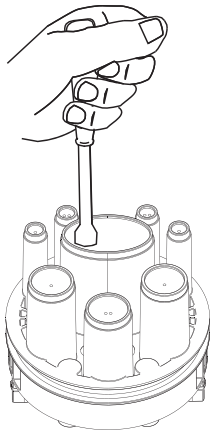


Figure 5

8. Prepare the Cable

8.1 Remove indicated length of cable sheath and armor (where applicable) according to Figure 2.

8.2 Slide the heatshrink tubing over the cable as shown in Figure 6.

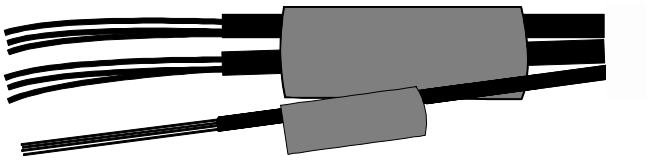


Figure 6

NOTE: *Heatshrink tubes for srop ports are purchased separately.*

8.3 Mark the cable 229 mm (9 inches) from sheath opening and slide it through the port.

8.4 Pull the cable through the end cap an additional 300 mm (12 inches) or until you pass the mark on the cable.

9. Install Strain-relief Hardware

NOTE: *There are two different types of strain-relief hardware. Use the hardware appropriate for the strength member diameter in the cable being installed. Determine cable and central/strength member type and proceed accordingly:*

- Central/strength members in single-tube cables must be separated by the restraint cap threaded stud.
- Secure single central/strength members in loose tube design cables in the cap.
- Cables (central tube) with sheath mounted GRP (Glass Reinforced Plastic) central/ strength members need only the central/ strength member(s) on one side of the cable secured in the cap.

9.1 Express Port Cable:

IMPORTANT NOTICE: *If an **armored cable** is used in the express port, refer to Section 6 and add ground hardware to the cable. Install strain-relief hardware appropriately as described.*

IMPORTANT NOTICE: *If the cable used is made with a **metal central/strength member,** use the grounding connector as for the armored cable, with the extension bracket to strain-relieve the central/strength member and ground it.*

Refer to SRP 206-288 (Heatshrink End Cap Canister Closure Sealing Checklist) to ensure all **critical** steps in Section 8 for sealing the closure have been performed accurately.

a) Wrap a large hose clamp around the bracket and cable approximately 6 mm (0.25 inches) below the sheath opening.

b) Position the hose clamp with the tensioning body opposite the threaded stud on the bracket (Figure 7). Tighten the hose clamp.

c) Tighten the hose clamp in the notch on the bracket.

NOTE: *Make sure the tensioning body on the hose clamp is positioned as shown in Figure 7.*

d) Insert a washer over the threaded stud.

e) Wrap the yarn twice, clockwise, around the threaded stud (Figure 7).

f) Install another washer and a nut and tighten securely.

g) Repeat for the second cable, when applicable.

h) Trim the central/strength member(s) flush with the top of the strain-relief bracket as shown in Figure 7 (not applicable for metal strength members).

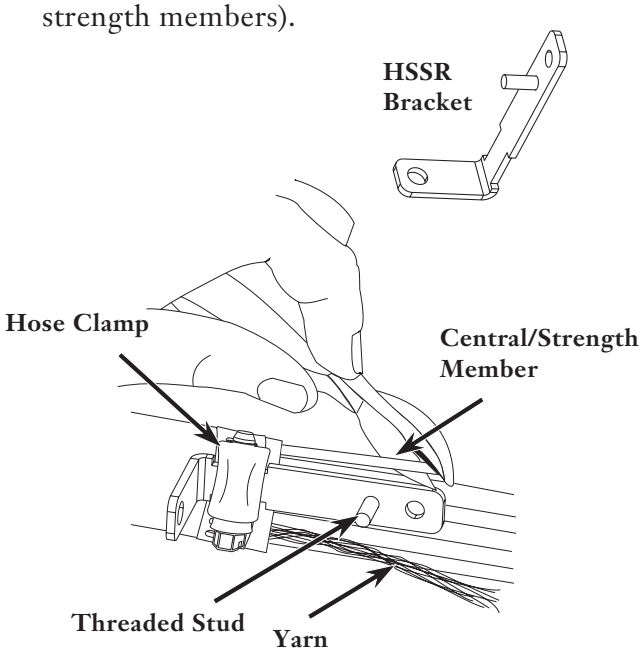


Figure 7

9.1.1 For small central/strength members less than 3mm in diameter (not applicable for metal strength members):

a) Insert the restraint cap stud through the hole in the bracket, capturing the strength member between the two.

b) With the strength member behind the bracket, install a nut on the restraint cap threaded stud (Figure 8) and tighten securely.

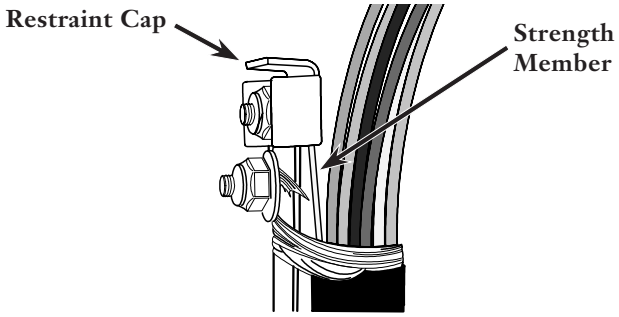


Figure 8

c) Secure the assembly to the end cap using the provided screw (Figure 9).

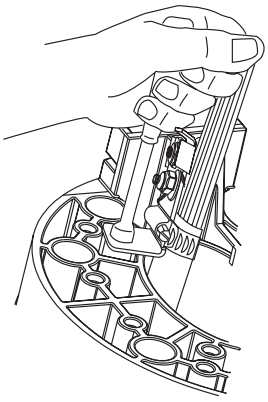


Figure 9

9.1.2 For large central/strength members greater than 3mm in diameter, use the supplied strain-relief kit, instead of the restraint caps (Figure 10):

a) Slide the metal tube over the end of the central member (Figure 10A).

b) Align the threads in the side of the tube with the hole in the strain-relief bracket (Figure 10B).

c) Install the supplied screw through the threaded hole in the tube and tighten.

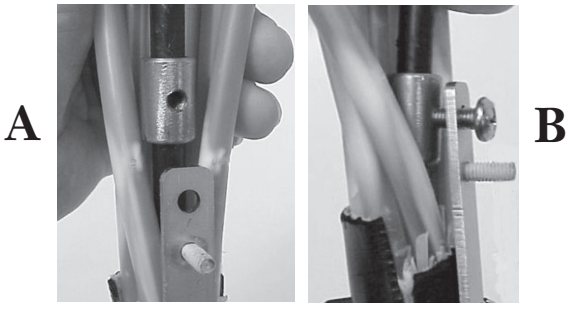


Figure 10

9.2 Drop Port Cables

IMPORTANT NOTICE: *If an **armored cable** is used in the drop port, refer to Section 6 and add ground hardware to the cable. Install strain-relief hardware appropriately as described.*

IMPORTANT NOTICE: *If the cable used is made with a **metal central/strength member**, use the grounding connector as for the armored cable, with the extension bracket to strain-relieve the central/strength member and ground it.*

Step 1 Remove nuts from the ground clamp.

Step 2 Attach the extension bracket, then the top plate (Figure 11). Tap the top plate to set the teeth into the cable.

Step 3 Tighten clamp using one nut.

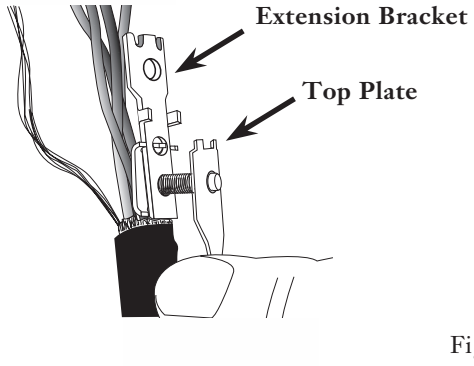


Figure 11

Step 4 Trim the central/strength member slightly shorter than the top of the extension bracket (Figure 12).

(When strength member is metal, bend it over the slots in the extension bracket as shown in the inset in Figure 12 and then trim excess strength member.)

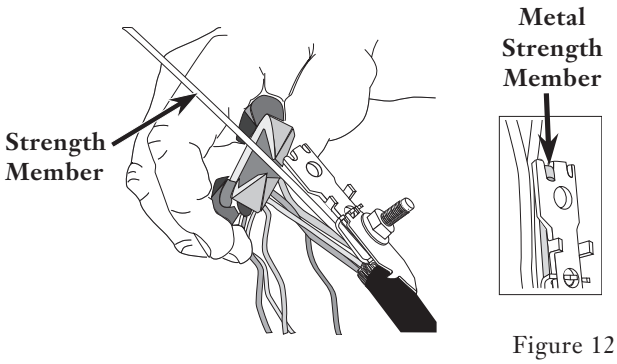


Figure 12

Step 5 Wrap the strength member yarn around the restraint cap stud (Figure 13A). Position the cap behind the extension bracket.

9.2.1 For small strength members (less than 3mm in diameter), repeat Section 9.2.

a) Insert the restraint cap threaded stud through the upper hole in the strain-relief bracket, capturing the strength member between the two.

b) With the strength member behind the bracket, install a nut on the restraint cap threaded stud (Figure 13B).

c) Secure the cap to the extension bracket using the supplied nut (Figure 13B). Confirm that all buffer tubes are clear of the strength members and tighten securely.

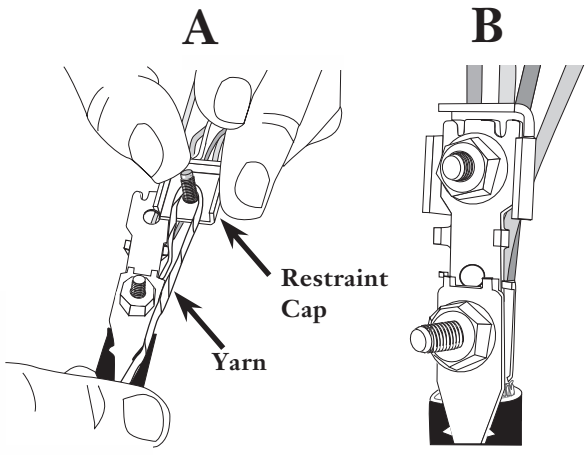


Figure 13

9.2.2 For large strength members (greater than 3mm in diameter), use the supplied strain-relief kit, instead of the restraint caps (Figure 14):

a) Slide the metal tube over the end of the central member (Figure 14A).

b) Align the threads in the side of the tube with the hole in the strain-relief bracket.

c) Install the supplied screw through the threaded hole in the tube and tighten (Figure 14B).

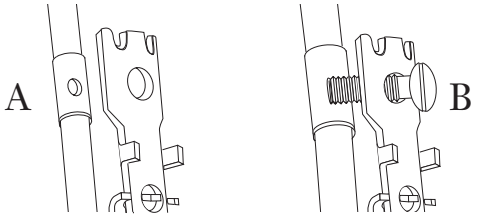


Figure 14

10. Install Cable

IMPORTANT: *Torches are not recommended for the application of the heatshrink tubes included with this kit. Certain combinations of cable sheath materials and torches may cause sheath blistering.*

Step 1 Clean and roughen the cable approximately 75 or 100 mm (3 or 4 inches) towards the end of the cable using the supplied sandpaper.

Step 2 Roughen the appropriate cable port to ensure heatshrink adhesion.

Step 3 Carefully preheat the port and cable with the heat gun.

Step 4 Slide the heatshrink tube over the port until it butts against the end cap.

Step 5 Pull the cable(s) back through the port.

Step 6 If more than one cable is being installed in the oval port, position the 3-finger clip between the two cables at the end of the heatshrink tube (Figure 15).

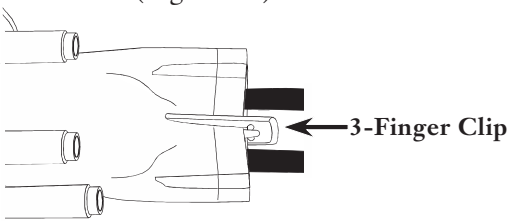


Figure 15

Step 7 Hold the cable while heating to prevent any movement.

Step 8 Beginning at the port, gradually move a heat gun down the tube (Figure 16). Allow this portion of the tube to cool before shrinking the rest of the tube onto the cable.

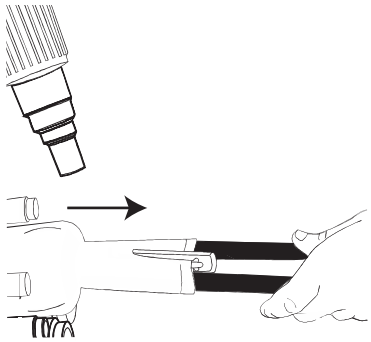


Figure 16

11. Ground Armored Cable to End Cap

Step 1 Install the vented grounding plug onto the grounding port facing the inside of the closure (Figure 17).

Step 2 Attach the end of the grounding wire to the vented grounding plug using the vented grounding screw (Figure 17).

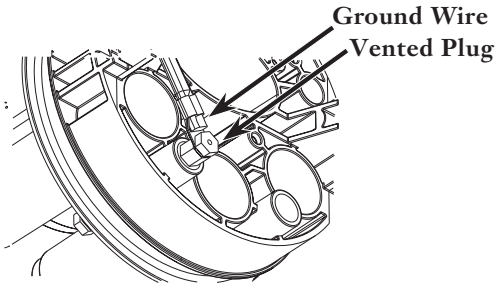


Figure 17

NOTE: *When multiple cables are used, link the cables together with the ground wires (Figure 18). Then secure the remaining cable to the ground plug.*

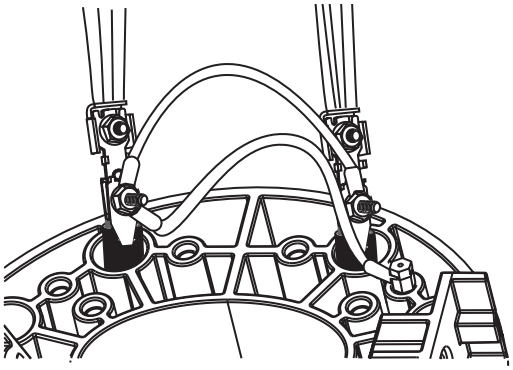


Figure 18

Refer to SRP 206-288 (Heatshrink End Cap Canister Closure Sealing Checklist) to ensure all **critical** steps in Sections 10 and 11 for sealing the closure have been performed accurately.

Step 3 Apply lubricant on the threads of the solid two-piece grounding plug.

Step 4 Install the grounding plug on the outside of the same ground location (Figure 19).

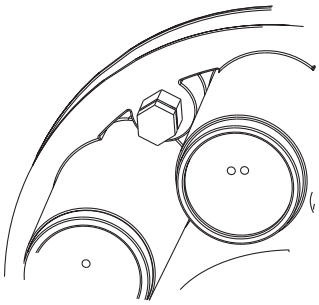


Figure 19

12. Splice Trays

12.1 Prepare fiber for splicing:

Step 1 Place an empty splice tray (purchased separately) into the stacker assembly with the tray butted against the fiber management assembly.

Step 2 Select the buffer tubes to be spliced in this splice tray and route the buffer tube(s) past the rear of the splice tray stacker.

Step 3 Curve past the inside of the adjuster bracket and place the buffer tube(s) next to the corner of the splice tray.

Step 4 Use a permanent marker to mark the buffer tube 19 mm (0.75 inches) from the corner of the splice tray (Figure 20).

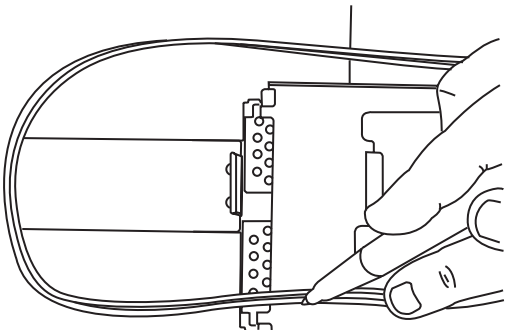


Figure 20

Step 5 Remove the buffer tube in 30 cm (12-inches) increments until reaching the mark made in the previous step.

Step 6 Clean fibers according to cable manufacturer's instructions.

Step 7 Secure the buffer tube to the tray per instructions provided with the splice tray.

Step 8 Prepare any other splice trays the same way.

Step 9 When all trays are prepared, splice per local practice.

12.2 Loop any unspliced (or express) buffer tubes inside the slack basket (Figure 21).

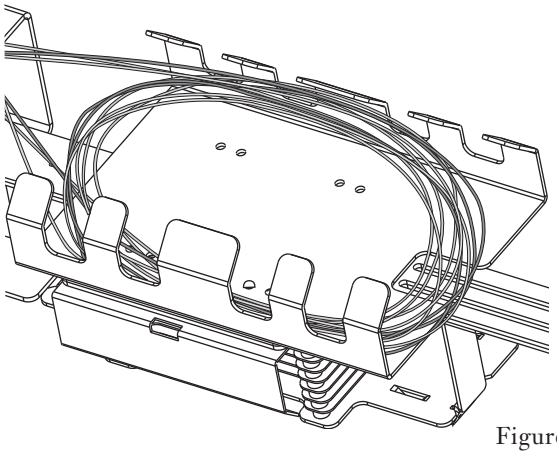


Figure 21

12.3 Secure spliced trays:

Step 1 Place the spliced trays into the tray stacker. Make sure the buffer tubes are within the flange on the tray stacker as shown (Figure 22).

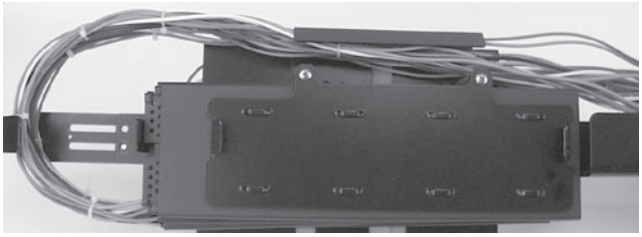


Figure 22

Step 2 Secure the buffer tubes using cable ties as needed.

NOTE: *The buffer tubes can be secured to the top of the tray stacker assembly as shown in Figure 23 using cable ties.*

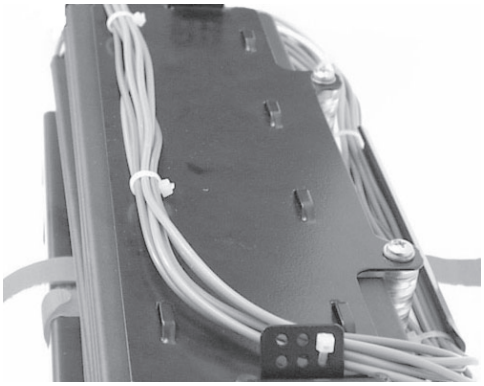


Figure 23

Step 3 Secure all buffer tubes and splice trays using the hook-and-loop straps.

Step 4 Reposition the adjuster bracket to keep the trays from moving, if necessary (Figure 24).

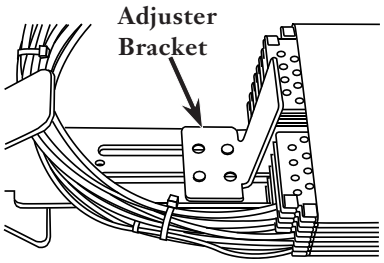


Figure 24

13. Seal the Closure

NOTE: *Do not use encapsulant in SCF closures.*

13.1 Install seal.

Step 1 Roll the sealing ring over frame (Figure 25) and up to the end cap.

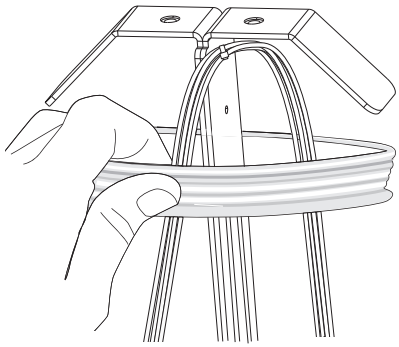


Figure 25

IMPORTANT: *The sealing ring must be installed in the orientation shown.*

Step 2 Use the supplied brush to apply a third of the tube of UCN lubricant to the sealing ring channel on the end cap (Figure 26).

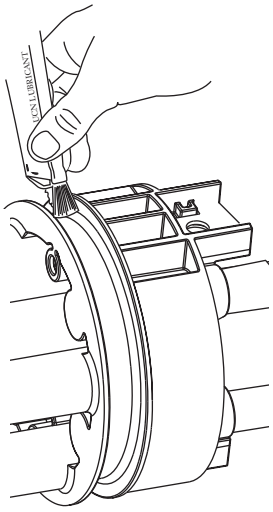


Figure 26

Step 3 Stretch the sealing ring over the channel (Figure 27).

Step 4 Fold the edge of the seal that overlaps the outside of the end cap until the seal seats in the channel as shown in Figure 27.

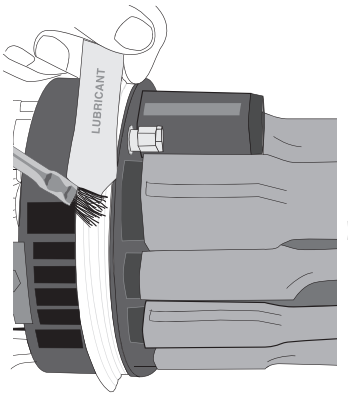


Figure 27

IMPORTANT: *The installed sealing ring must be oriented as shown toward the inside of the closure (Figure 27).*

Step 5 Retain a small amount of lubricant for use later. Apply the remaining UCN lubricant to all sides of the sealing ring (Figure 27).

13.2 Install the canister cover.

Step 1 Slide the canister over the closure assembly (Figure 28).

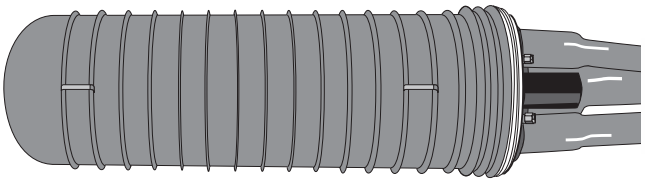


Figure 28

Step 2 Loosen bolt on the hinged side of the clamping ring.

Step 3 Apply a thin coat of UCN lubricant retained previously to the threads of the clamping ring latch bolts to prevent the bolts from seizing on reentry.

Step 4 Place the clamping ring over the flange of the canister and the sealing ring. Ensure that both the sealing ring and the canister flange are within the clamping ring (Figure 29).

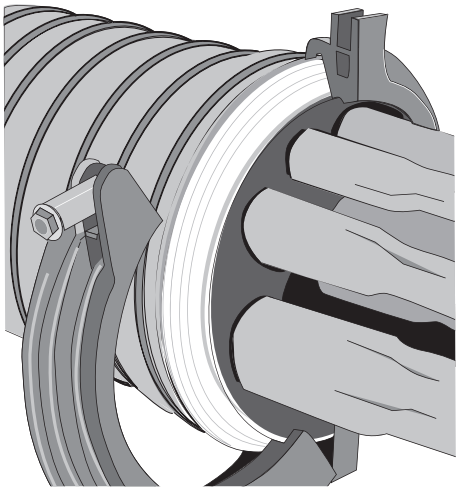


Figure 29

Step 5 Swing the clamping ring into closing position. Tighten the bolts of the clamping ring until the plastic touches, then tighten another quarter turn until the ring is completely closed (Figure 30).

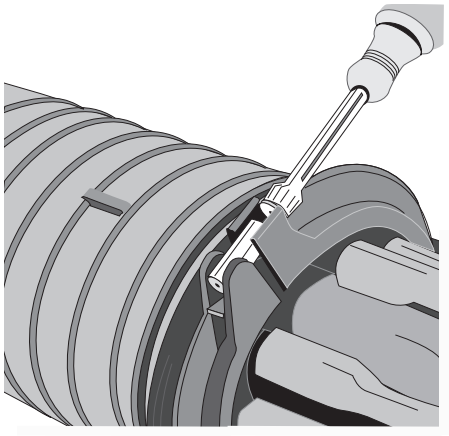


Figure 30

IMPORTANT: *A torque value of 25 to 50 in.-lb should be sufficient. Do not use power tools to tighten the clamping ring; a torque value of more than 0 in.-lb causes the hardware to crack and the clamping ring to become defective. If the clamping ring does not close properly, make sure the sealing ring and clamping ring are oriented correctly.*

14. Install a Flash Test Air Valve

14.1 Install valve stem (purchased separately):

Step 1 Apply a thin coat of UCN lubricant retained previously to the threads of the valve stem.

Step 2 Install the valve stem finger-tight, then another half turn into the grounding port as shown in Figure 31.

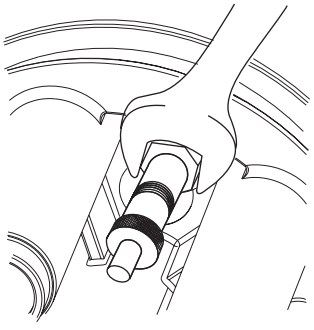


Figure 31

Refer to SRP 206-288 (Heatshrink End Cap Canister Closure Sealing Checklist) to ensure all **critical** steps in Sections 13 and 14 for sealing the closure have been performed accurately.

14.2 Perform flash test to a maximum of 14 psi:

Step 1 Inject 12 to 14 psi of air into the closure using a hand pump (Figure 32). Check pressure after each 25 pumps.

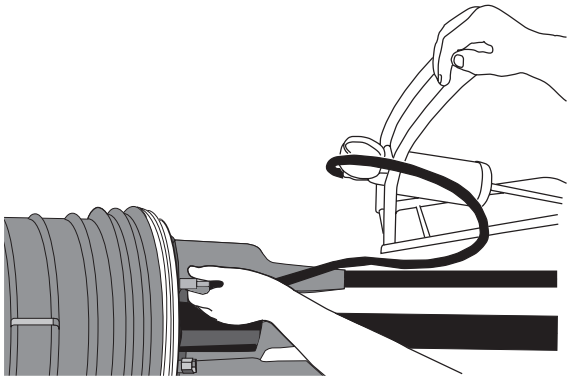


Figure 32

⚠WARNING: *To avoid a potentially hazardous situation that could result in death or serious injury, do not exceed 14 psi (100 kpa) gauge pressure. The closure could burst.*

Step 2 Apply soapy water to the seal points and watch closure for signs of leakage (bubbling of soap).

NOTE: *A correctly sealed closure maintains pressure with no leaks.*

14.3 After the flash test has been performed and the closure sealed correctly, carefully remove the air valve and allow air to escape.

15. Ground the Closure

Step 1 Apply a thin coat of UCN lubricant retained previously to the threads of a solid, two-piece nonvented grounding plug (Figure 33).

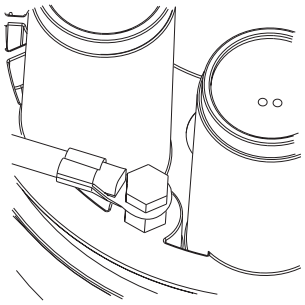


Figure 33

Step 2 Install the larger insert into the end cap from the outside of the end cap finger-tight, then another half turn (approximately 40 to 60 in.-lb).

Step 3 Connect a grounding cable (not supplied) to the plug.

Step 4 Screw the smaller insert into the plug.

Step 5 Tighten the insert using a small adjustable wrench.

Step 6 Terminate the other end of the ground per local practices.

Refer to SRP 206-288 (Heatshrink End Cap Canister Closure Sealing Checklist) to ensure all **critical** steps in Section 13 for sealing the closure have been performed accurately.

Corning Cable Systems welcomes your comments concerning this Standard Recommended Procedure. You may send your comments to the following address:
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