



**3M™ Fiber Optic Splice Closure
2178-XSB/XSB-FR & 2178-XLB/XLB-FR**

**3M™ Cable Addition Kit
2181-XB/XB-FR**

Instructions

1.0 General

1.1 3M™ Fiber Optic Splice Closure 2178-XSB

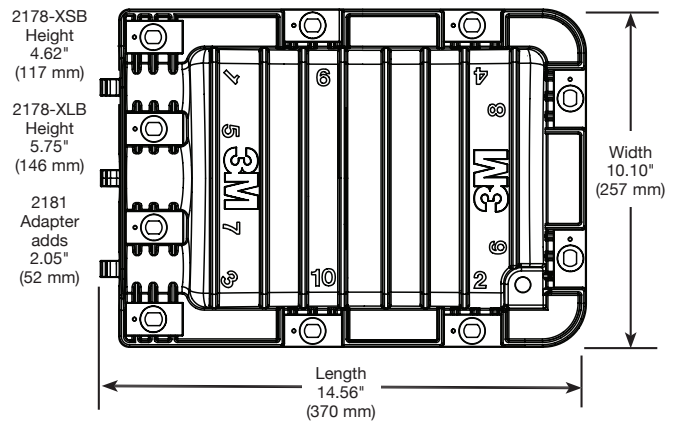
The 3M™ Fiber Optic Splice Closure 2178-XSB has been developed to accommodate up to 48 single fusion splices, and 144 mass fusion splices. The closure has two 1" ports and one 1.4" port in the center.

The 2178-XSB splice closure can accommodate two 3M™ Fiber Optic Splice Trays 2532. The 2532 splice tray can accommodate single fusion, single mechanical or 12-ribbon fiber.

1.2 3M™ Fiber Optic Splice Closure 2178-XLB

The 3M™ Fiber Optic Splice Closure 2178-XLB has been developed to accommodate up to 96 single fusion splices, and 288 mass fusion splices. The closure has two 1" ports and one 1.4" port in the center.

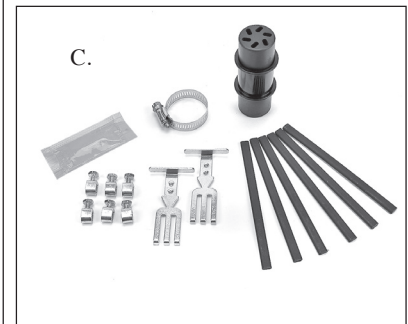
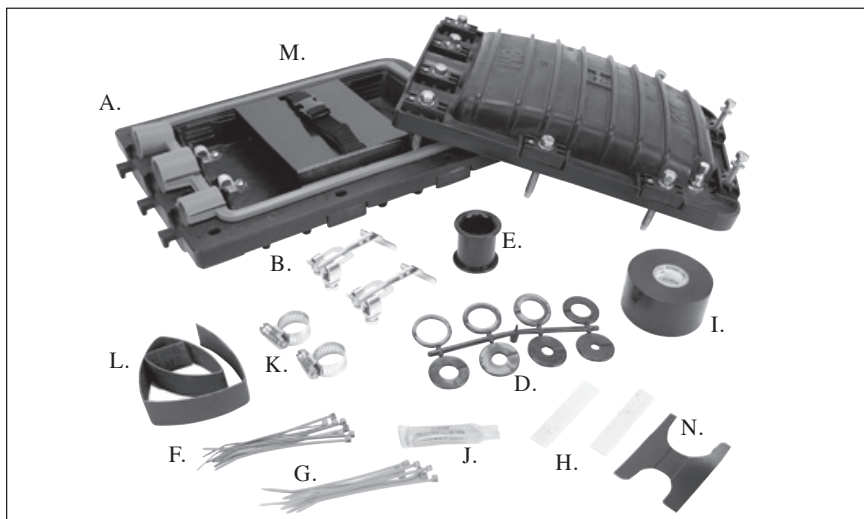
The 2178-XLB splice closure can accommodate four 3M™ Fiber Optic Splice Trays 2532. The 2532 splice tray can accommodate single fusion, single mechanical or 12-ribbon fiber.



2.0 Kit Contents

Visually inspect all components. If any component is missing or appears damaged, do not install. Call customer service at 1-800-426-8688 for a replacement product.

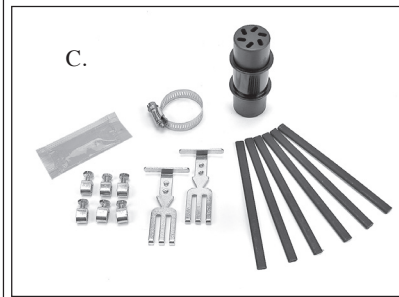
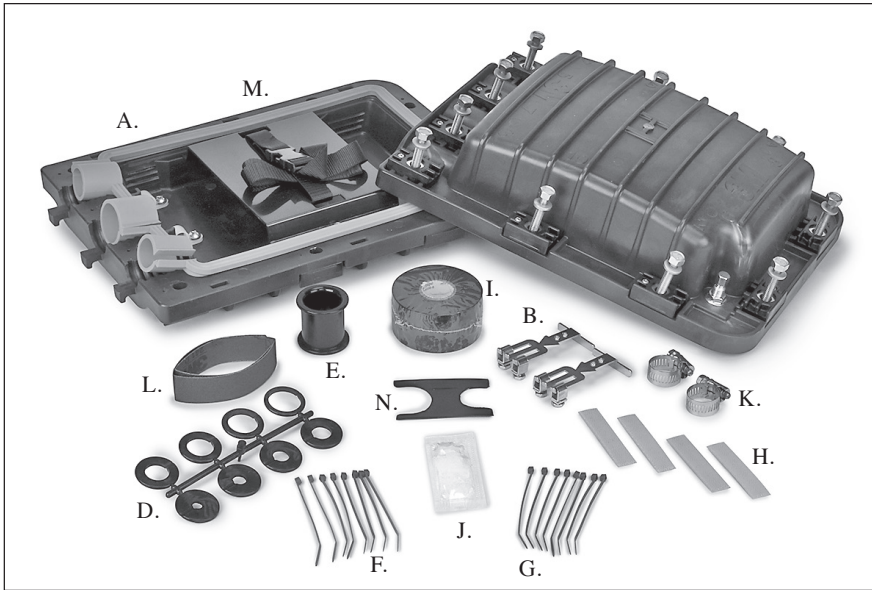
2.1 3M™ Fiber Optic Splice Closure 2178-XSB/XSB-FR Kit Contents



3M™ Multiport Grommet included in certain kits only.

- A. 1 - 2178-XSB closure body with bolts
- B. 2 - Sheath retention inserts
- C. 1 - 3M™ Multiport Grommet (certain kits only)
- D. 4 - 1" Washer trees
- E. 1 - 1.4" Plug
- F. 8 - Cable ties (blue)
- G. 8 - Cable ties (green)
- H. 2 - 3M™ Reclosable Dual Lock™ Fasteners
- I. 1 - Roll Scotch® Linerless Rubber Splicing Tape 130C
- J. 1 - Packet of silicone lubricant
- K. 2 - 1" Hose clamps
- L. 1 - Sheath scuff
- M. 1 - Tray support with strap
- N. 1 - Tape collar gauge
- O. 1 - Transition tube-tie-down. Bracket not shown.

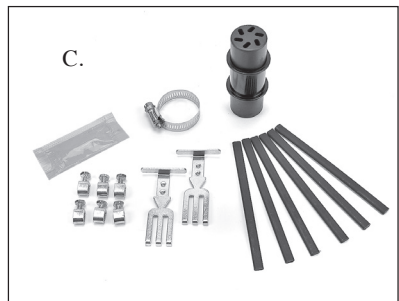
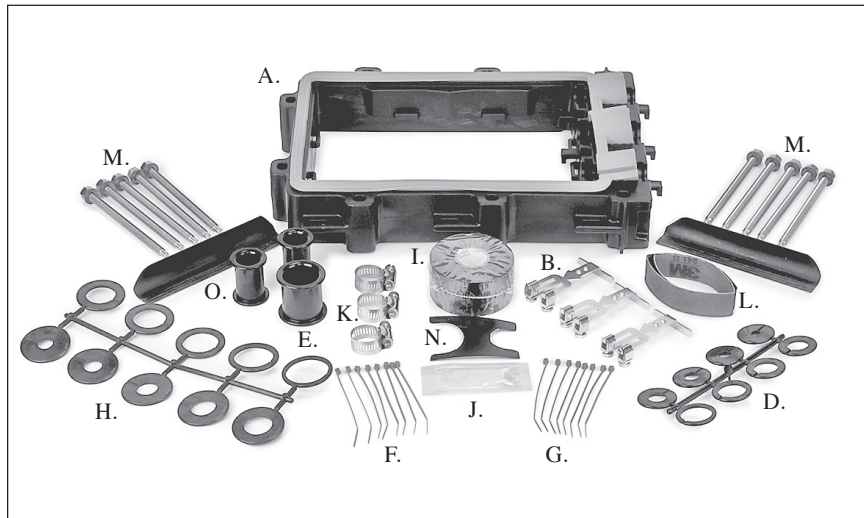
2.2 3M™ Fiber Optic Splice Closure 2178-XLB/XLB-FR Kit Contents



3M™ Multiport Grommet included in certain kits only.

- | | |
|--|---|
| A. 1 - 2178-XLB closure body with bolts | H. 2 - 3M™ Reclosable Dual Lock™ Fasteners |
| B. 2 - Sheath retention inserts | I. 1 - Roll Scotch® Linerless Rubber Splicing Tape 130C |
| C. 1 - 3M™ Multiport Grommet (certain kits only) | J. 1 - Packet of silicone lubricant |
| D. 4 - 1" Washer trees | K. 2 - 1" Hose clamps |
| E. 1 - 1.4" Plug | L. 1 - Sheath scuff |
| F. 8 - Cable ties (blue) | M. 1 - Tray support with strap |
| G. 8 - Cable ties (green) | N. 1 - Tape collar gauge |
| | O. 1 - Transition tube-tie-down. Bracket not shown. |

2.3 3M™ Fiber Optic Splice Closure Adapter 2181-XB/XB-FR Kit Contents



3M™ Multiport Grommet included in certain kits only.

- | | |
|--|---|
| A. 1 - 2181-XB adapter with gasket | H. 2 - 1.4" Washer trees |
| B. 3 - Sheath retention inserts | I. 1 - Roll Scotch® Linerless Rubber Tape 130-C |
| C. 1 - 3M™ Multiport Grommet (certain kits only) | J. 1 - Packet of silicone lubricant |
| D. 4 - 1" Washer trees | K. 3 - 1" Hose clamps |
| E. 1 - 1.4" Plug | L. 1 - Sheath scuff |
| F. 8 - Cable ties (blue) | M. 10 - Bolts |
| G. 8 - Cable ties (green) | N. 1 - Tape collar gauge |
| | O. 2 - 1" Plugs |

- 2.4 Additional materials required:
3M™ Fiber Optic Splice Tray 2532

To branch splice in the center port, order 3M™ 1.4" Cable Branch Port Kit, part no. 80-6113-1460-2.
For armored sheath cable, use 3M™ Scotchlok™ Shield Bond Connector 4460-D/FO.

Note: Closure can handle two trays.

3.0 Cable Preparation

- 3.1 Determine amount of cable needed for storage and splicing. The closure can store 8' (2.4 m) of buffer tube fiber.
- 3.2 Remove sheath and clean fiber per company practice.
- 3.3 Scuff 6" (150 mm) of cable sheath, starting at end of sheath.

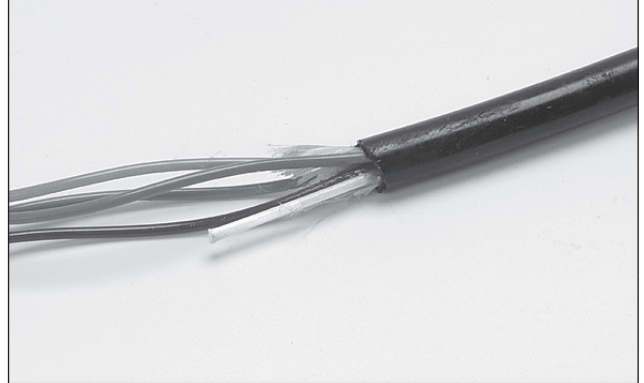


Figure 1

- 3.4 Secure the strength members.
- 3.4.1 If cable has central strength member, assemble strength member clamp onto strain relief bracket as shown in Figure 2. Mark and cut the central strength member at end of strength member clamp.

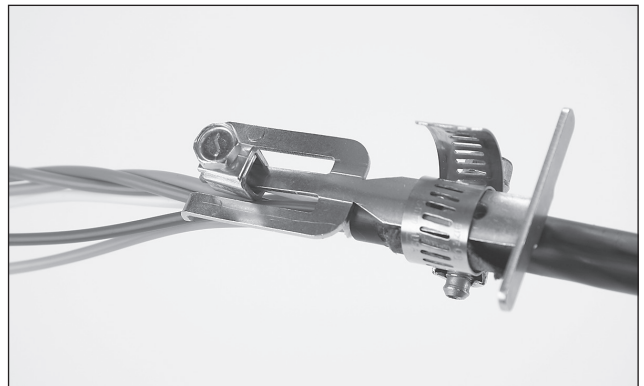


Figure 2

- 3.4.2 If cable has dual strength members, assemble strength member clamp onto strain relief bracket as shown in Figure 3.

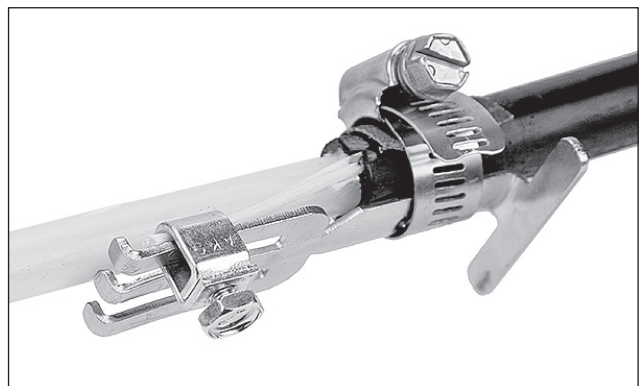


Figure 3

3.4.3 If securing the strength members is not required, the front half of the sheath retention inserts can be removed as shown in Figure 4.

3.4.4 Slide central strength member under retention lug and tighten bolt to 40 in-lbs \pm 5 in-lbs (4.6 N•m \pm 0.6 N•m).

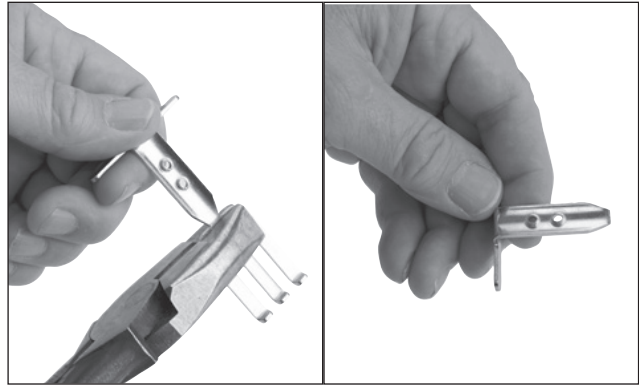


Figure 4

3.4.5 Cut a small length of the unused sheath scuff and place it grit side inward inside of the hose clamp.

Note: *The cut piece of sheath scuff should wrap at least halfway around the cable sheath, but not completely around the cable.*

Place cable retention clamp and sheath scuff onto the cable so that hose clamp will be 1" (25 mm) from end of sheath.

3.4.6 Install hose clamp and tighten to 40 in-lbs \pm 5 in-lbs (4.6 N•m \pm 0.6 N•m).

3.5 For armored cables (Figure 6), use 3M™ Scotchlok™ Shield Bond Connector 4460-D/FO Kit.



Figure 5



Figure 6

- 3.6 Place retention clamp into place in the closure and mark location of gasket edges on cable. This will be the area of the tape collar.
- 3.7 Determine the diameter of the scuffed area of the cable and choose two (2) appropriately sized washers for each cable. Washer inner diameters should be as close to the diameter of the cable as possible.
- 3.7.1 If diameter of cable is close to either end of the marked washer diameter range, try both sizes and choose the snugest fit available.
- 3.7.2 For example, if the cable diameter measures 1.12", try both the 1.0–1.1 and 1.1–1.2 marked washers. Select the washer with the snugest fit around the cable diameter, allowing the washer to close at the split.
- 3.8 Place washers onto cable on either side of the area marked for tape collar build up. Washers may be split if necessary to ease installation.

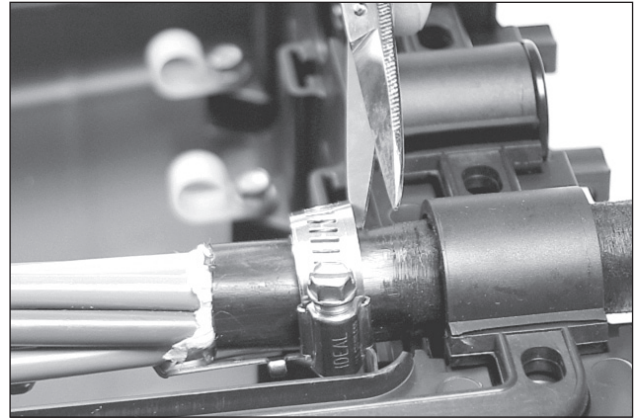


Figure 7

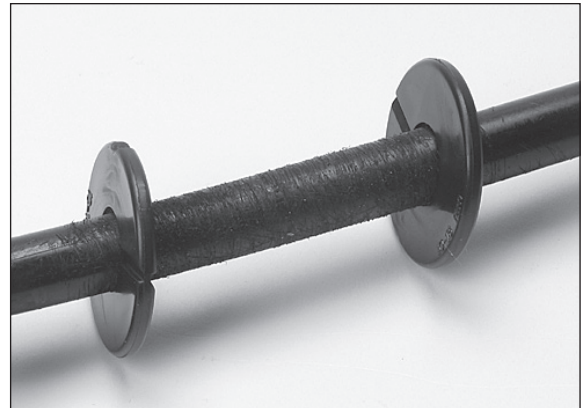


Figure 8

- 3.9 Using the supplied Scotch® Linerless Rubber Splicing Tape 130C, build up the collars to the appropriate diameter from approximately 1.5" (40 mm) from sheath opening.

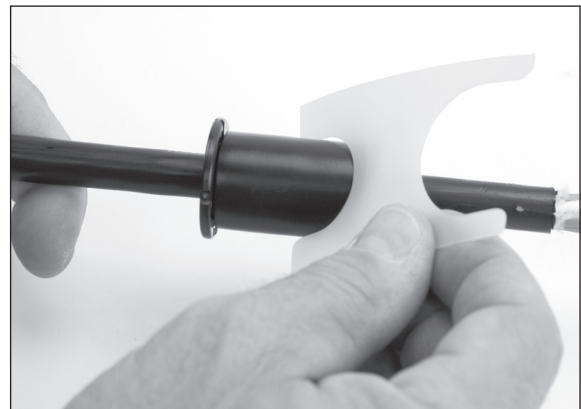


Figure 9

- 3.9.1 Collars should be built up to 1.45" diameter for large port and 1.05" diameter for the smaller port. Use the tape collar gauge provided in kit to measure for required diameter.

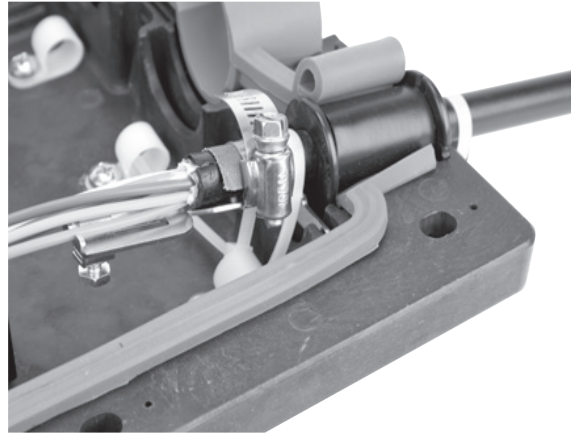
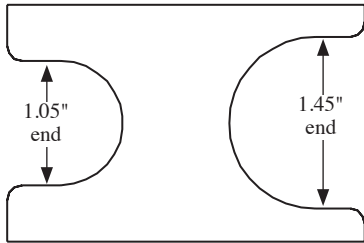


Figure 10

- 3.10 Thinly coat all surfaces of cable ports and tape collar with silicone lubricant and insert into gasket at the proper port. Insert cable retention clamp into slot at same time and push down until cable is in proper alignment.

Note: *Ensure that washers are properly seated in the grooves of the case on either side of the gasket.*

Note: *Carefully follow health and safety environmental instructions as given on Material Safety Data Sheet for the silicone lubricant.*

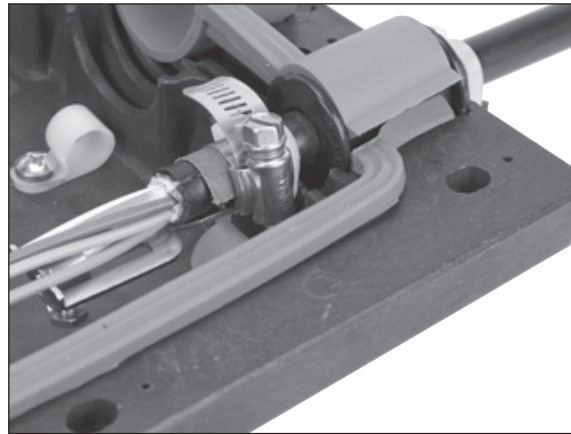


Figure 11

- 3.11 Using two (2) black cable ties, retain cables in ports by placing ties both inside and outside the base.

Note: *White cable ties are shown for clarity.*

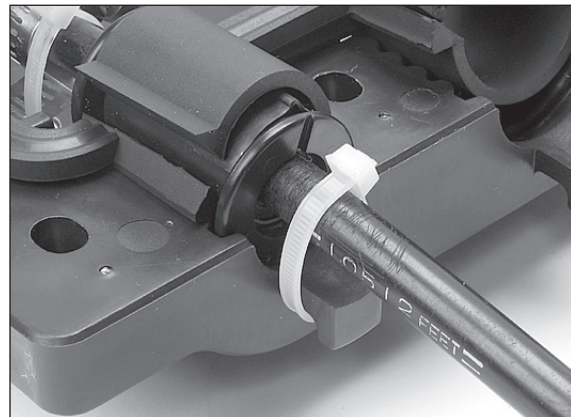


Figure 12

- 3.12 For ribbon transition to tray applications, secure the transition tube to the bracket mounted in base.

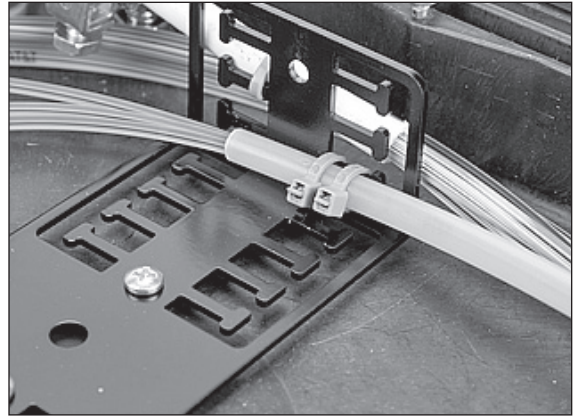


Figure 13

- 3.13 When tray support and tray are in place, mount the other end of the transition tube to the tray.

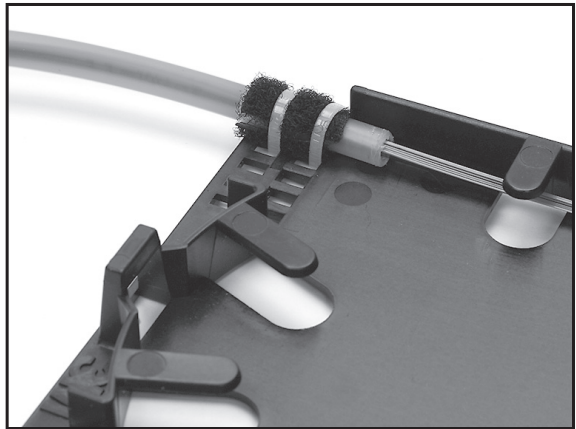


Figure 14

4.0 Drop Cable Preparation

- 4.1 Determine how many drop cables will be passing through the 3M™ Multiport Grommet.
- 4.2 Remove sheath on drops exposing buffer tubes to a length required per company practice.
- 4.3 Insert drops into multiport grommet first and then insert blank plugs last.

Note: A small amount of lubricant provided in kit may be placed on blank plugs and cable to allow for ease of installation into multiport grommet.

An additional method to ease installation is to take sheath scuff supplied in closure kits, and slightly sand the leading edge of the drop cable and blank plugs.



Figure 15

- 4.4 Grease approximately 2" (50 mm) of cable drop jacket.
- 4.5 Place a small amount of lubricant on the gasket inside diameter in the area where it seals with the 3M™ Multiport Grommet.

Note: *Carefully follow health and safety environmental instructions as given on Material Safety Data Sheet for the silicone lubricant.*

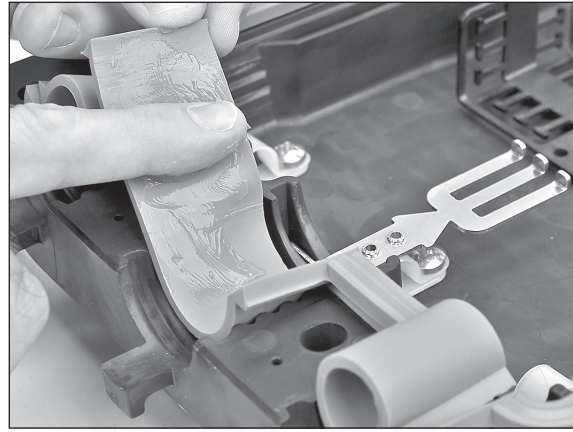


Figure 16

- 4.6 Insert drop 1"-2" (25 mm—50 mm) into multiport grommet and then pull back out.
- 4.7 Insert drop the entire length of multiport grommet.
- 4.8 Repeat steps 4.3–4.7 for the blank plugs as well.

Note: *Leave future ports orientated to top of closure for ease of future installations of drop.*

5.0 3M™ Multiport Grommet 6-Port (1.4") Installation

- 5.1 Break off the tab feature as shown on both cable strain relief brackets.



Figure 17

- 5.2 Place cable strain relief brackets on either side of the grommet, with three drops on either side as shown. Insert cable strength members into small K-connectors.



Figure 18

- 5.3 Secure cable strain relief brackets and the strain relief bracket from the closure to the grommet with the hose clamp as shown. Tighten the hose clamp to 40 in.-lbs. \pm 5 in.-lbs. (4.6 N•m \pm 0.6 N•m).

Note: *Ensure that extruded retention feature of strain relief has sufficient contact with surface of grommet.*

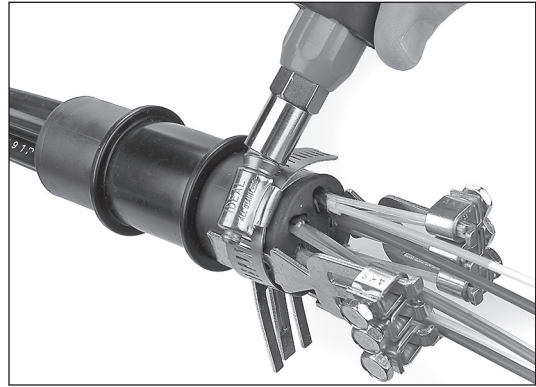


Figure 19

- 5.4 Tighten the six K-connector nuts to 40 in.-lbs. \pm 5 in.-lbs. (4.6 N•m \pm 0.6 N•m) each.

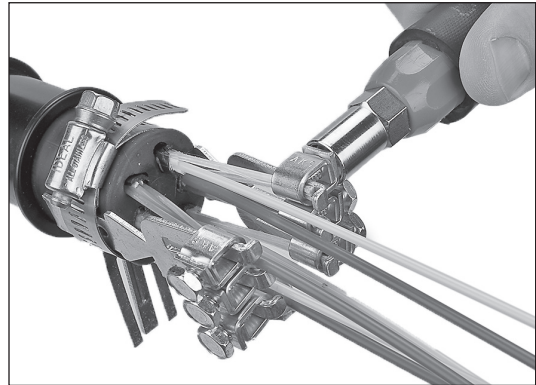
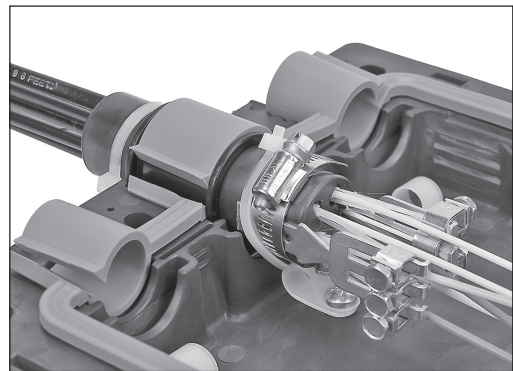


Figure 20

- 5.5 Place cable strain relief and the 3M™ Multiport Grommet assembly into closure.
- 5.6 Place cable ties around multiport grommet assembly inside and out as shown.

Note: *White cable ties are shown for clarity.*

- 5.7 Follow closure instruction for all other preparation leading up to and including sealing closure.



3M™ Fiber Optic Splice Closure 2178 XSB
3M™ Fiber Optic Splice Closure 2178 XLB

6.0 Tray Installation and Splicing

- 6.1 Once cables have been anchored, place tray support in position and tighten two (2) screws.
- 6.2 Cut two 3M™ Reclosable Dual Lock™ Fasteners in half. Remove liner from two pieces of fastener and place on tray support as shown. Mate second two pieces of fastener to the attached pieces. Remove liner from back of top pieces and attach first tray.

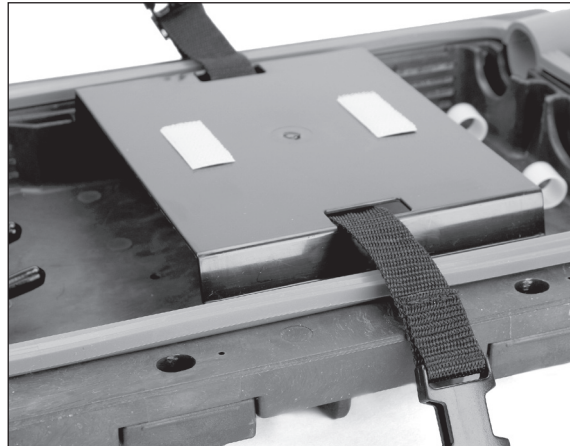


Figure 21

7.0 Fiber Management Inside Tray

- 7.1 Select appropriate splice holder based on type of splicing to be performed
- 7.2 Remove adhesive backing and position splice holders on tray.

Note: *Positioning of splice holders should be such that a minimum of 1.5" (40 mm) bend radius is maintained for each fiber to be spliced.*

Note: *In a dirty environment an alcohol wipe may be used to clean tray surface for better adhesion.*

Note: *Carefully follow safety, health and environmental information given on product label or the Material Safety Data Sheet for the cleaner.*

- 7.3 Route buffer tube or ribbon to desired tray corner.

Note: *Do not exceed minimum 1.5" (40 mm) bend radius during routing process.*

- 7.4 Secure loose buffer tube to tray using the supplied cable ties.

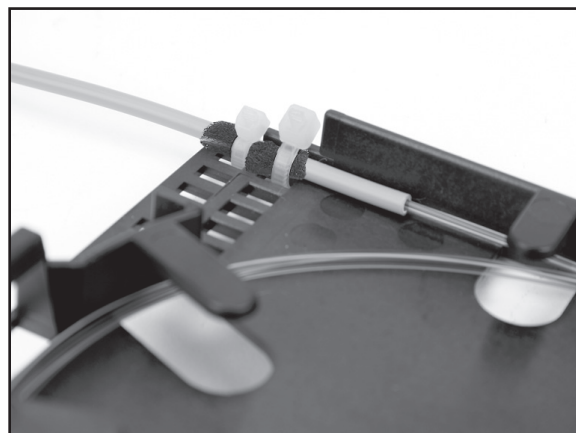


Figure 22

- 7.5 Place ribbon fiber into 1"-1.5" (25 mm–40 mm) of ribbon retention grommet (cut segments as needed from supplied length) and secure assembly into tray using supplied cable ties. Be sure to use two cable ties per each buffer tube. (A maximum of six ribbons can be loaded into each retention grommet segment.)

Note: Do NOT use pliers to tighten cable ties to tray. Cable ties should be hand tightened such that ribbon or buffer tube are immobilized. Over tightening can cause damage to buffer tube or ribbon.

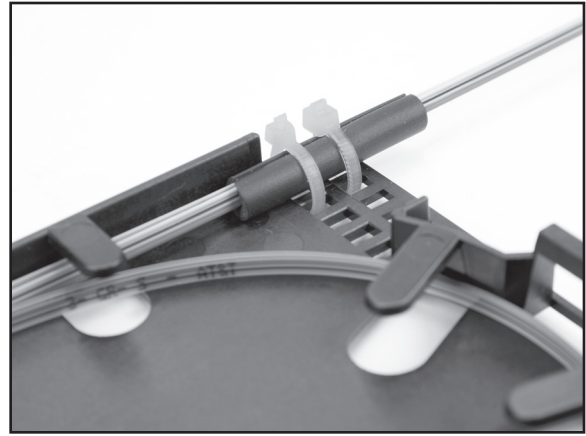


Figure 23

- 7.6 Splice per company practice and place sleeves into splice holders.

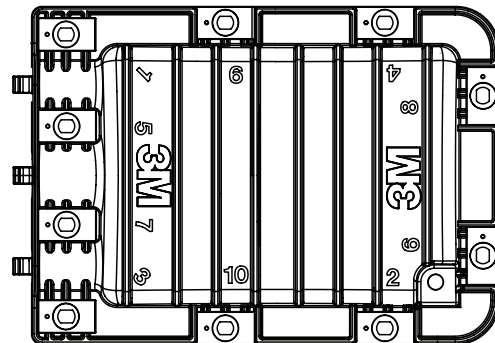
8.0 Splice Closure Assembly

- 8.1 Thinly coat all gasket surfaces with a light application of silicone lubricant to aid in gasket sealing.

Note: Carefully follow health and safety environmental instructions as given on Material Safety Data Sheet for the silicone lubricant.

- 8.2 Place cover on base and hand start bolts 1, 5, 7, and 3 in that order first. All others can be started in any order. Using tightening sequence, torque all bolts to 240 in-lbs. **Torque -FR Closures to 50 in-lbs.**

TORQUING SEQUENCE



- 8.3 Closure should be flash tested by pressurizing closure to a maximum of 5 PSI. Check for leaks and then **RELEASE AIR PRESSURE.**

- 8.4 On future opening and closing of closure, if leaks are detected, torque bolts or re-tape cable ports as needed.

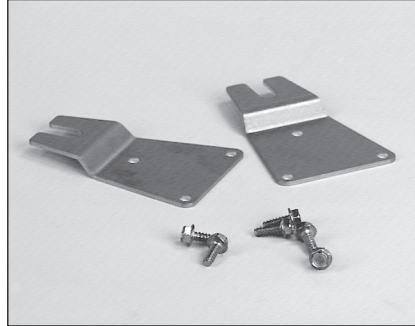
9.0 Opening Splice Closure

- 9.1 To re-enter splice closure, open bolt positions 5, 7, 1 and 3 in sequence. All other bolt positions can be opened randomly.

10.0 Closure Accessories



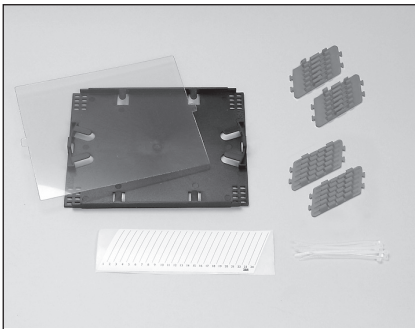
**3M™ Cable Branch Port Kit
2178-XSB-1.4B**



3M™ Wall Mount Bracket 2198



**3M™ Adjustable Aerial Hanger
Bracket Kit 2184**



**3M™ Fiber Splice Organizer
Tray 2532**



**3M™ 4-Port Grommet
4PGA**

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