



3M™ Fiber Optic Splice Closure 2178-XL & 2178-XL/FR

3M™ Cable Addition Kit 2181-XL and 2181-XL/FR

Instructions

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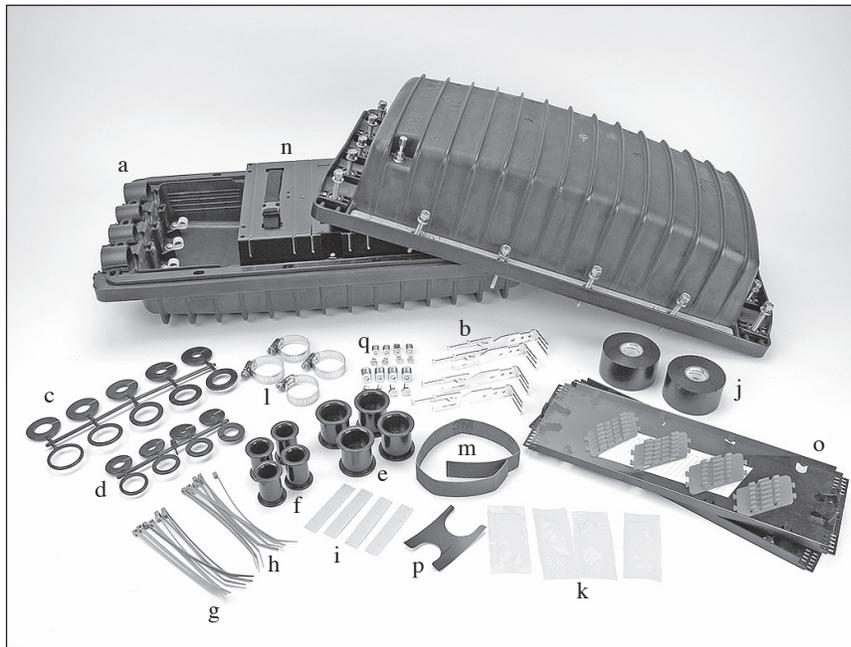
1.0 General

- 1.1 The 3M™ Fiber Optic Splice Closure 2178-XL and Flame Retardant Splice Closure 2178-XL/FR have been developed to accommodate up to 576 single fusion splices and 1728 mass fusion splices. The closures have two 1.0" ports and two 1.4" ports on each end. New larger trays have been developed, providing more room for ribbon fibers and splices.

2.0 Kit Contents

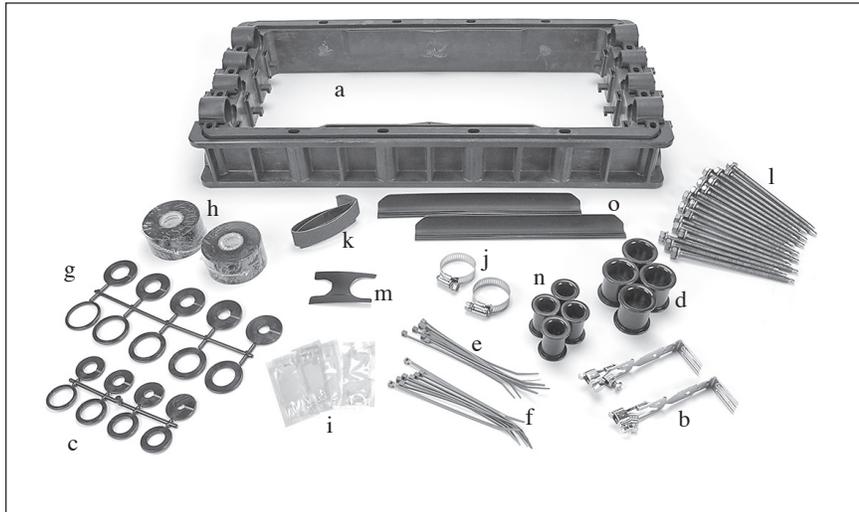
Visually inspect all components. If any component is missing or appears damaged, do not install. Call customer service at 1-800-426-8688 for a replacement product.

- 2.1 3M™ Fiber Optic Splice Closure 2178-XL and 2178-XL/FR kit contents:



- | | |
|---|--|
| a) 1 - 2178-XL closure body with bolts | j) 2 - Rolls Scotch® Linerless Rubber Splicing Tape 130C |
| b) 4 - Strain relief/strength member brackets | k) 4 - Packets of silicone lubricant |
| c) 4 - 1.4" washer trees | l) 4 - 1.5" hose clamps |
| d) 4 - 1" washer trees | m) 1 - Sheath scuff |
| e) 4 - 1.4" plugs | n) 1 - Tray support with straps |
| f) 4 - 1" plugs | o) 2 - 3M™ Splice Trays 2527 with inserts |
| g) 8 - Cable ties (blue) | p) 1 - Tape collar gauge |
| h) 8 - Cable ties (green) | q) 8 - K-connectors & screws |
| i) 4 - 3M™ Dual Lock™ Fasteners | |

2.2 3M™ Cable Addition Kit 2181-XL and 2181-XL/FR Kit Contents



- | | |
|--|-------------------------------------|
| a) 1 - 2181-XL and 2181-XL/FR adapter with gasket | i) 4 - Packet of silicone lubricant |
| b) 2 - Sheath retention inserts | j) 2 - 1" hose clamps |
| c) 4 - 1" washer trees | k) 1 - Sheath scuff |
| d) 4 - 1.4" plug | l) 18 - Bolts |
| e) 8 - Cable ties (blue) | m) 1 - Tape collar gauge |
| f) 8 - Cable ties (green) | n) 4 - 1" plugs |
| g) 4 - 1.4" washer trees | o) Slack storage retainers |
| h) 2 - Roll Scotch® Linerless Rubber Splicing
Tape 130C | |

2.3 Additional materials required:

For armored sheath cable, use 3M™ Scotchlok™ Shield Bond Connector 4460-D/DS. To branch splice in unused ports, order 3M™ Cable Strain Relief/Strength Member Bracket 2178-XL-XSB-SR-SMC, part no. 80-6113-2343-9.

3.0 Cable Preparation

- 3.1 Determine amount of cable needed for storage and splicing.
- 3.2 Remove sheath and clean fiber per company practice.
- 3.3 Scuff 6" of cable sheath, starting at end of sheath.



Figure 1

- 3.4 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.*

- 3.4.1 Place cable retention clamp on cable so that hose clamp will be 1" (25 mm) from end of sheath.

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

- 3.4.3 If cable has no central strength member, break off the three prongs using pliers and use only the strain relief bracket as shown in Figure 3.

- 3.4.4 Install hose clamp and tighten.

- 3.4.5 For armored cables (Figure 5), use 3M™ Scotchlok™ Shield Bond Connector 4460-D or 4460-DS.

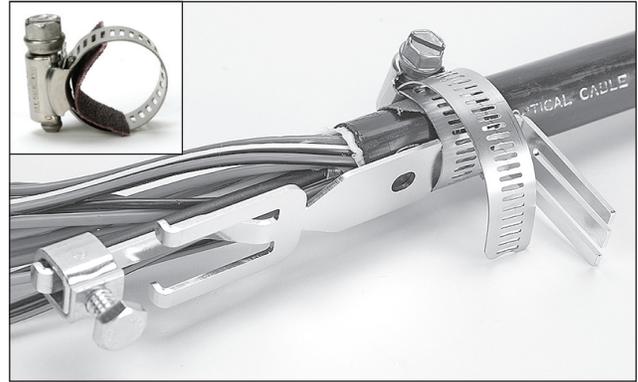


Figure 2

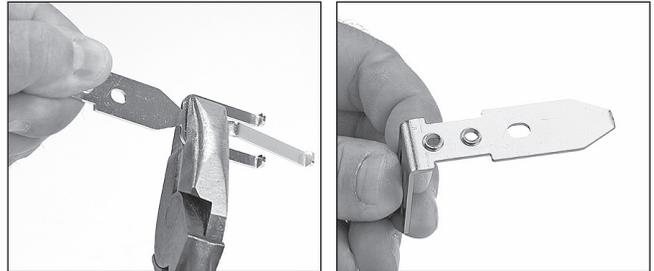


Figure 3



Figure 4



Figure 5

- 3.5 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, as shown in Figure 6.
- 3.6 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. Washers may be split and placed onto cable.
- 3.6.1 If diameter of cable is close to either end of the marked washer diameter range try both sizes and choose the snuggest fit available.

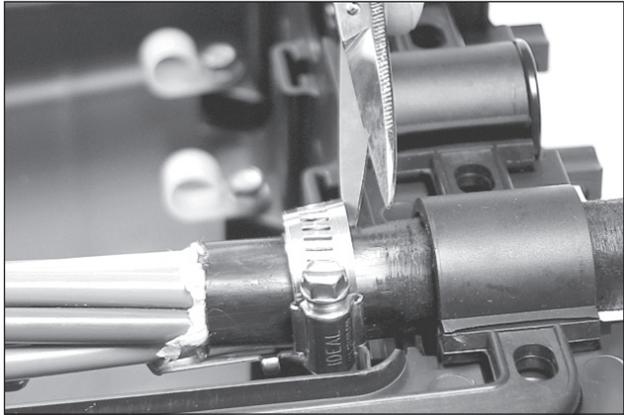


Figure 6

For example, if cable diameter measures 1.12,” try both the 1.0-1.1 and 1.1-1.2 marked washers. Select the washer with the snuggest fit around the cable diameter, allowing the washer to close at the split.

- 3.7 Split washers and place onto cable on either side of the area marked for tape collar build up, as shown in Figure 7.

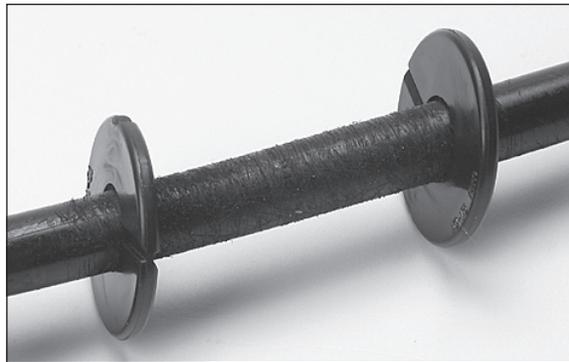


Figure 7

- 3.8 Using the supplied Scotch® Linerless Rubber Splicing Tape 130C, build up the collars to the appropriate diameter.

- 3.8.1 Stretch tape slightly to fit between marked collar area as best as possible.



Figure 8

3.8.2 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.

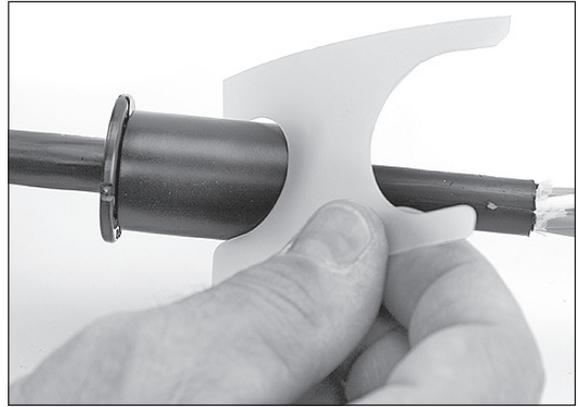
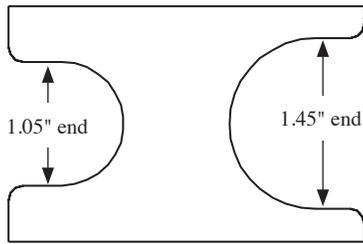


Figure 9

3.9 Coat 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: Insure 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.

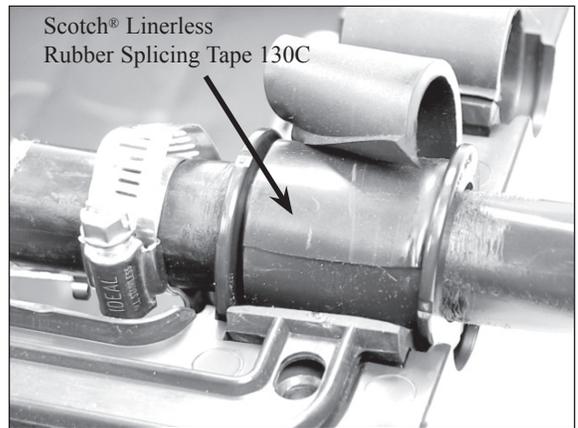


Figure 10

3.10 Using two (2) black cable ties, retain cables in ports by placing ties both inside and outside the base as shown in Figure 11 and 12. (White cable ties used for picture clarity only.)

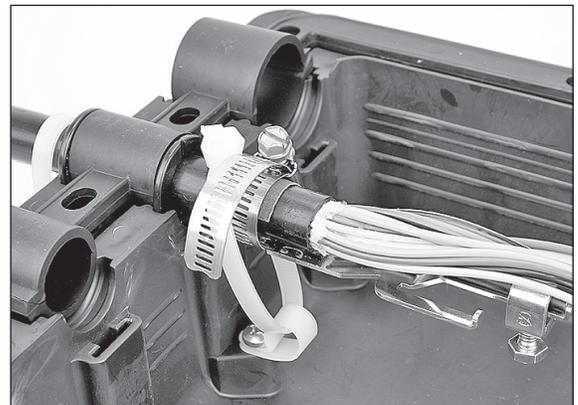


Figure 11

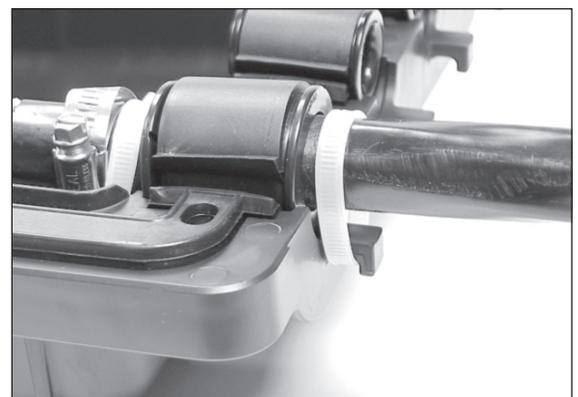


Figure 12

4.0 Drop Cable Preparation

- 4.1 Determine how many drop cables will be passing through 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.

- 4.4 Grease approximately 2" of cable drop jacket.
- 4.5 Insert drop 1"-2" into multiport grommet and then pull back out.
- 4.6 Insert drop the entire length of multiport grommet.
- 4.7 Repeat steps 4.3–4.6 for the blank plugs as well.

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

- 4.8 Place a small amount of lubricant on the gasket inside diameter in the area where it seals with multiport grommet.

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

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



Figure 13



Figure 14

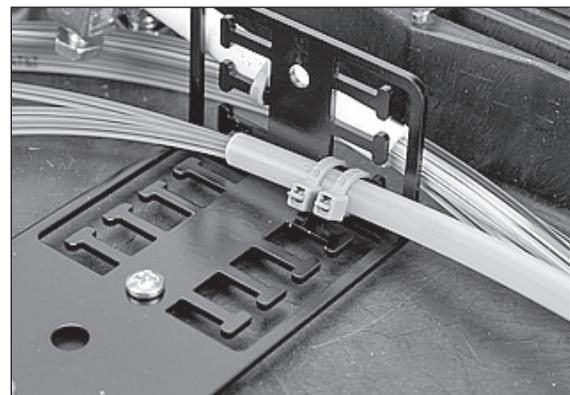


Figure 15

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

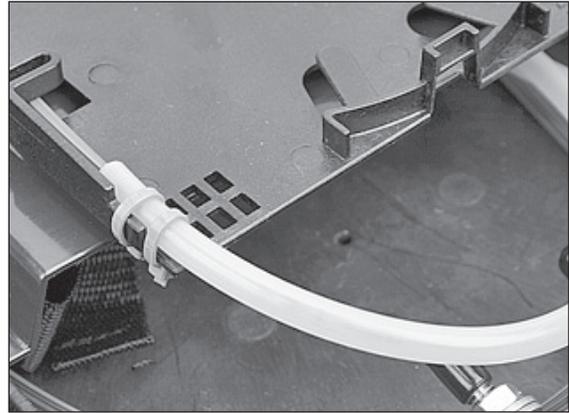


Figure 16

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



Figure 17

- 4.12 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

- 4.13 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.*

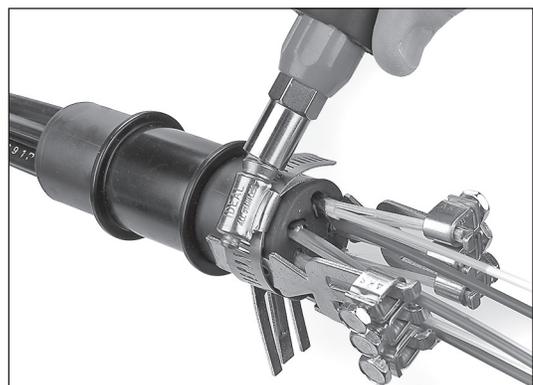


Figure 19

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

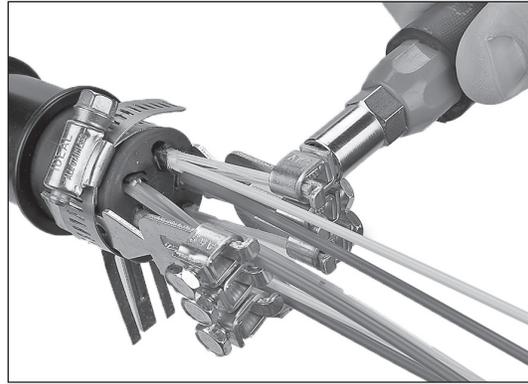


Figure 20

- 4.15 Place cable strain relief and 3M™ Multiport Grommet assembly into closure.
- 4.16 Place cable ties around multiport grommet assembly inside and out as shown in Figure 21.

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

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

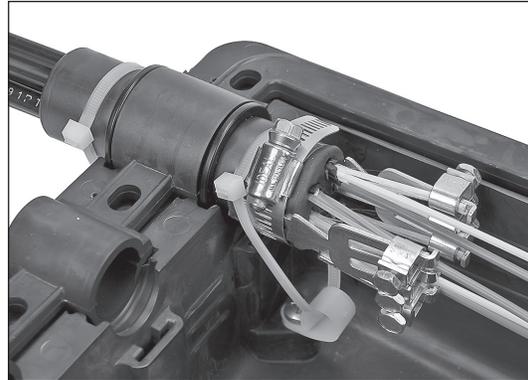


Figure 21

5.0 Tray Installation and Splicing

- 5.1 Once cables have been anchored, place tray support in position and tighten two (2) screws.
- 5.2 Remove liner. Place two pieces of 3M™ Dual Lock™ Fastener 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. (See Figure 22)

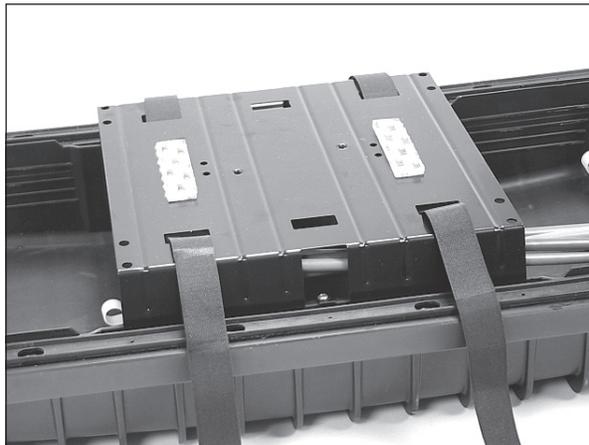


Figure 22

- 5.3 Route the fibers into the tray. Secure buffer tube with cable tie. (See Figure 23)
- 5.4 Splice per company practice.

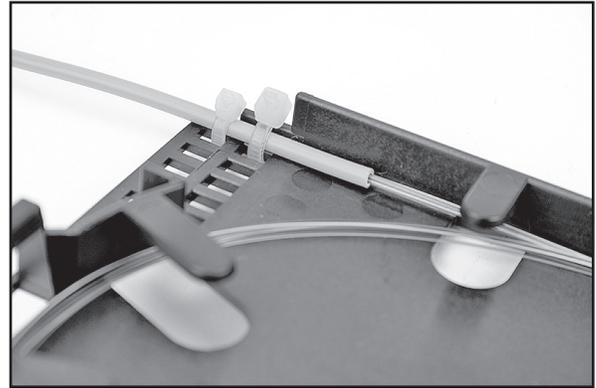


Figure 23

6.0 Splice Closure Assembly

- 6.1 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.*

- 6.2 Place cover on base and **hand start all bolts**. Using tightening sequence (Figure 28), torque all bolts to 240 in-lbs. **Torque -FR Closures to 50 in./lbs.**
- 6.3 Closure may be flash tested by pressurizing closure to a maximum of 10 PSI. Check for leaks and then **release air pressure**.

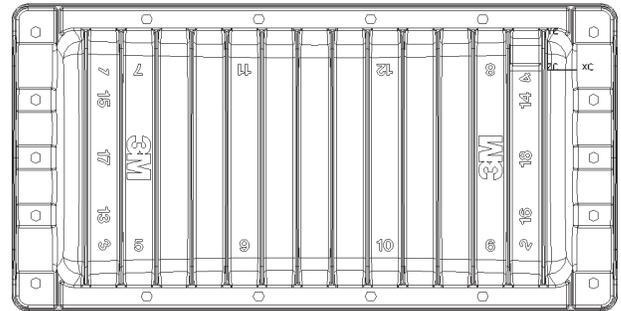


Figure 24

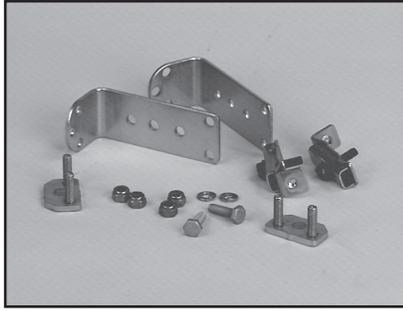
7.0 3M™ Cable Addition Kit 2181-XL/XLFR

- 7.1 Follow steps 3.0–4.0 to prepare cables.
- 7.2 The tray support can be installed in either the 3M™ Fiber Optic Splice Closure 2178 -XL or 2178-XL/FR or the 2181 adapter. Install the tray support onto the desired level by placing it into the slots on the closure base or adapter and tightening the screws until snug.
- 7.3 Install the 2181 adapter between the halves of the 2178 closure using the longer bolts included with the adapter. Follow step 6.0 for assembly.

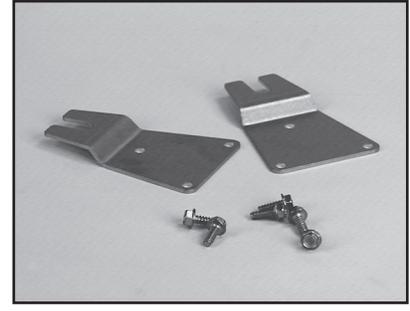
8.0 Closure Accessories



3M™ External Ground Isolation Kit 2178-EGI



3M™ Universal Aerial Hanger Kit 2183-UHB



3M™ Wall Mount Bracket 2198



3M™ Cable Fanout Kit 2519 and 2519-X



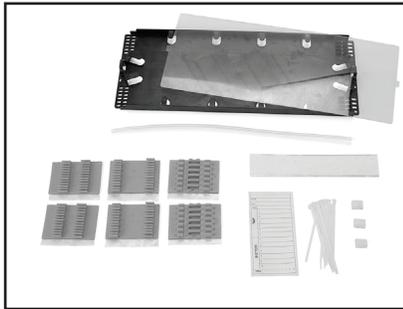
3M™ 4-Port Grommet 2178-4PGA



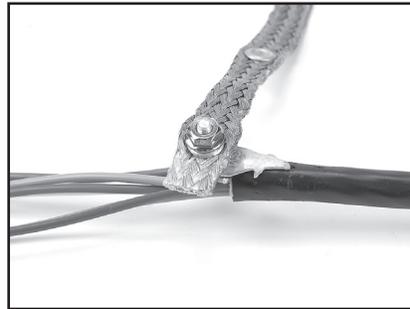
3M™ 6-Port Grommet 2178-6PGA



3M™ Cable Branch Port Kit 2178-XL-XSB



3M™ Fiber Optic Splice Tray 2543



3M™ Scotchlok™ Shield Bond Connector Assembly 4460-D/FO

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