

3M™ Cold Shrink Splice Kit QS-III 5458A-WG

for Jacketed Concentric Neutral (JCN),
Flat Strap Neutral and Concentric Neutral Cable

Instructions

IEEE Std. 404

25/28 kV Class

200 kV BIL

CAUTION

Working around energized systems may cause serious injury or death. Installation should be performed by personnel familiar with good safety practice in handling electrical equipment. De-energize and ground all electrical systems before installing product.

Kit Selection Table

Kit Number	Cable Insulation O.D. Range	Conductor Size Range
5458A-WG	1.24" to 2.07" (31,5 to 52,6 mm)	500–1000 kcmil* (240–500 mm ²)

*Splices (including size transitions) can be made to smaller or larger conductors (but larger conductors may require special neutral handling), provided both cables are within the Insulation O.D. Range and the connector meets the dimensional requirements shown below.

Connector Dimensional Requirements

	Minimum Inches (mm)	Maximum Inches (mm)
Outside Diameter	1.05" (26,7 mm)	2.07" (52,6 mm)
Length Aluminum (Al/Cu) Compression	—	7.50" (191 mm)
Length Copper Compression and 3M™ Shearbolt Connector QCI 500-1000	—	8.25" (210 mm)

1.0 Kit Contents

- a. 3M™ Cold Shrink Splice Body 5458A-WG (1 ea.)
- b. Cold Shrink Adapter Tube (1 ea.)
- c. Red Compound Tubes (non-silicone grease) (2 ea.)
- d. Scotch® Mastic Sealing Strips 2230, 6" length (4 ea.)
- e. Cable Preparation Template (2 ea.)
- f. Instruction Booklet (1 ea.)

Note: *Do not use knives to open plastic bags.*

Note: *Connector not shown, but if included, it is indicated on the packaging label.*

Note: *Item “B,” Cold Shrink Adapter Tube, may not be included in all kits.*

Note: *Kits may contain 1 or 2 of item “E,” Cable Preparation Template, as needed per conductor size.*

2.0 Prepare Cables

- 2.1 Check to be sure the cable fits within the kit ranges as shown on the cover page.
- 2.2 Prepare cables according to standard procedures. Refer to template provided or illustration below for proper dimensions. **Additional distance is required on one cable to provide extra neutral wire length for connecting the neutrals.** (Figure 1).

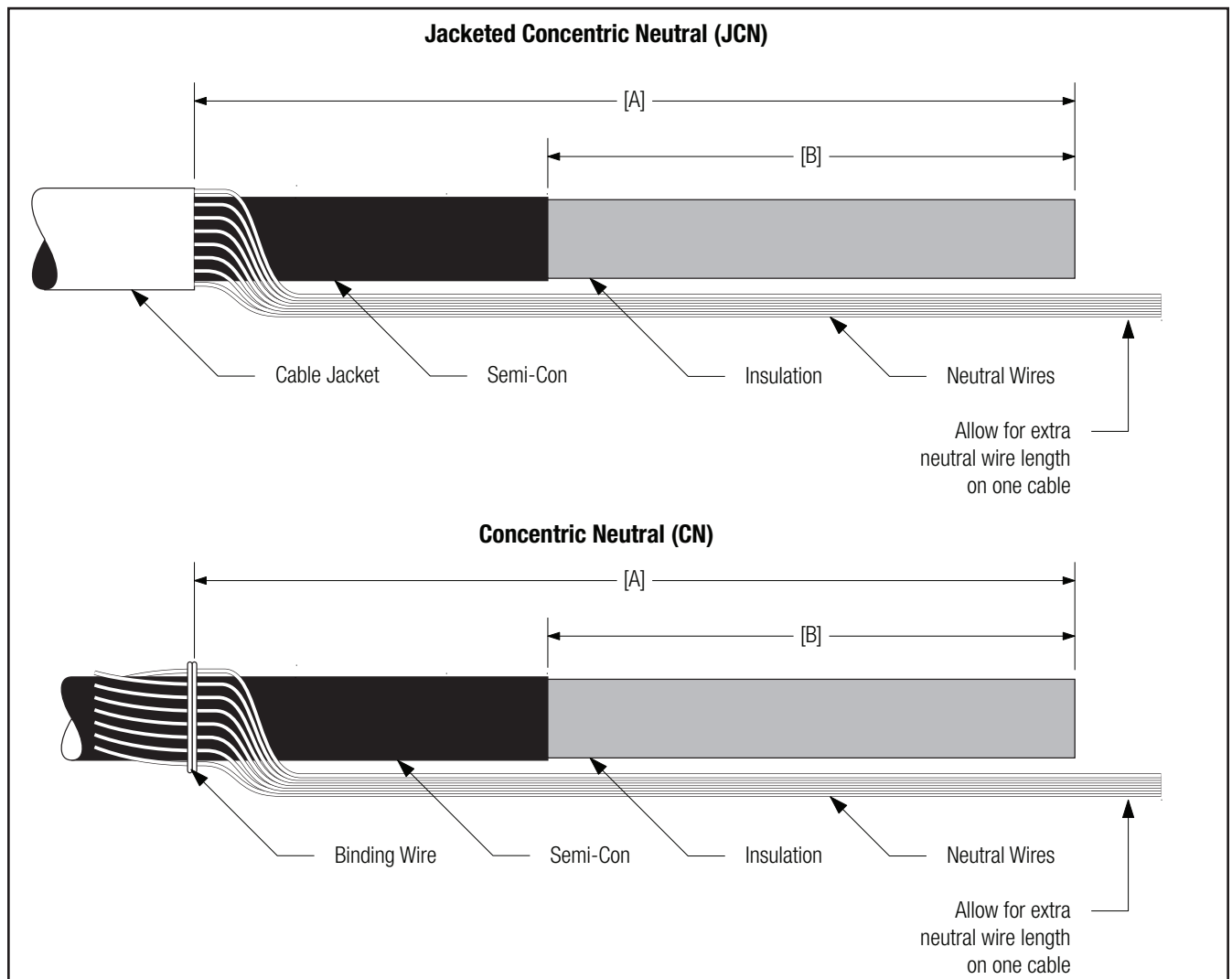


Figure 1

Typical Conductor Size* kcmil (mm ²)	Insulation OD Range Inches (mm)	Jacket Cutback [A] Inches (mm)	Semi-Con Cutback [B] Inches (mm)
500**–750 (240–400)	1.24–1.70 (31,5–43,2)	13 3/4 (349)	9 1/4 (235)
1000** (500)	1.59–2.07 (40,4–52,6)	13 1/4 (337)	8 3/4 (222)

*For 100% and 133% insulation levels, insulation OD is the final determining factor.

**Cables must be within the insulation O.D. range of the splice kit and the connector must meet the dimensional requirements shown on the front page.

- 2.3 Carefully bend the neutral wires back over the edge of the cable jackets (JCN) or binding wire or tape (CN). Press them against the cable and temporarily secure/cover the end of the wires with vinyl tape (*Figure 2*).

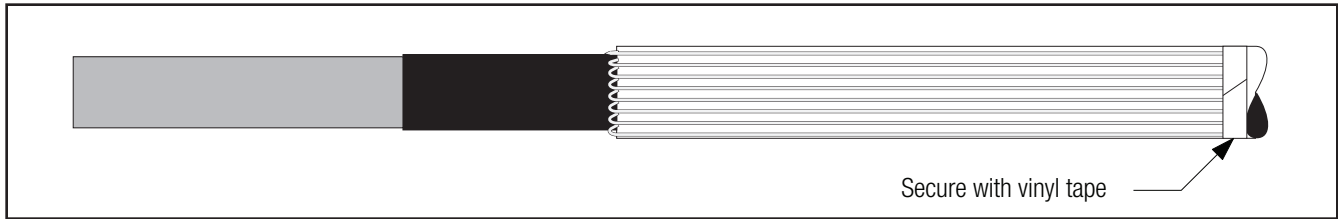


Figure 2

- 2.4 Clean or cover cable jacket if necessary, for cold shrink parking position. Slide splice body onto cable, loose core end first. (*Figure 3*).

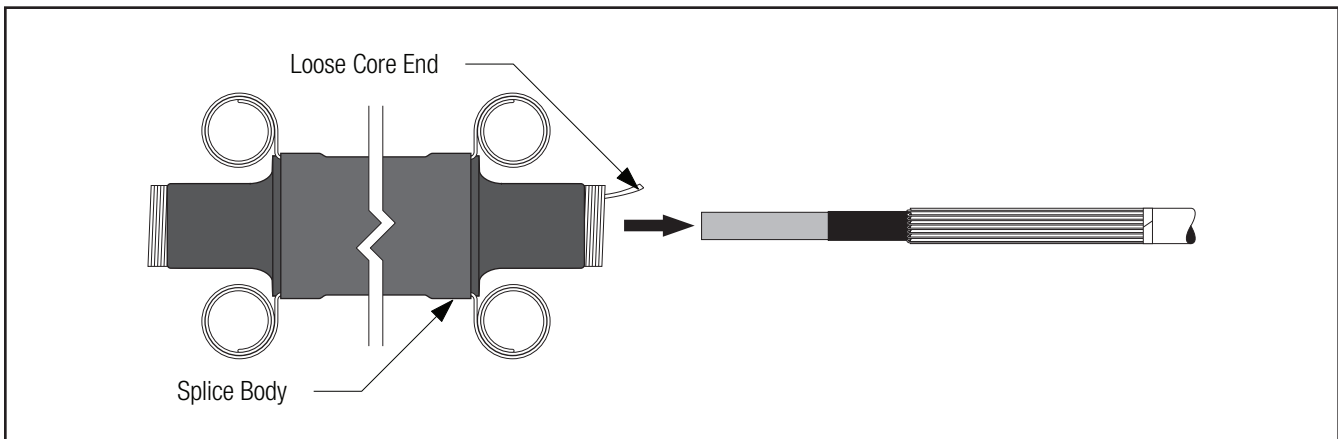


Figure 3

3.0 Install Connector

Note: *If using a crimp-type connector, go to step 3.3.*

- 3.1 If using a 3M™ Shearbolt Connector QCI 500-1000, refer to the instructions included with the connector for insulation cut-back dimension. Insulation removal length shall not exceed 3 3/4" (95 mm) from conductor end (*Figure 4*).

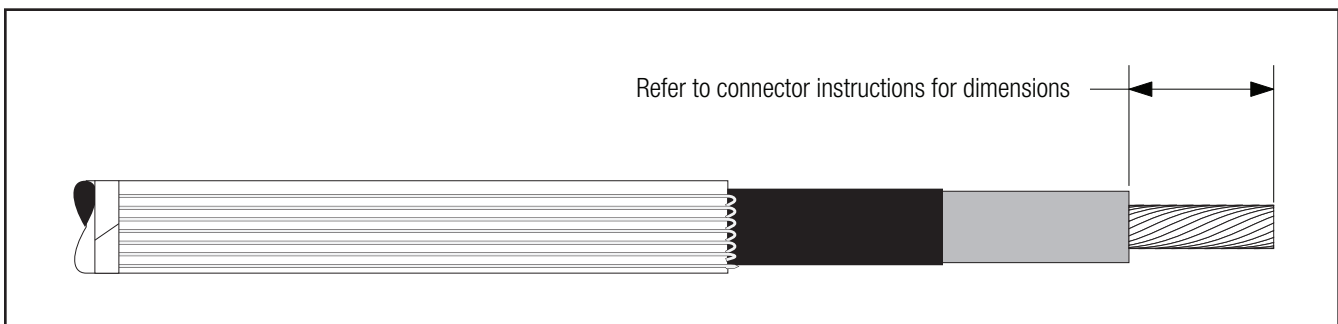


Figure 4

3.2 Install 3M™ Shearbolt Connector QCI 500-1000 according to the instructions included with the connector (Figure 5).

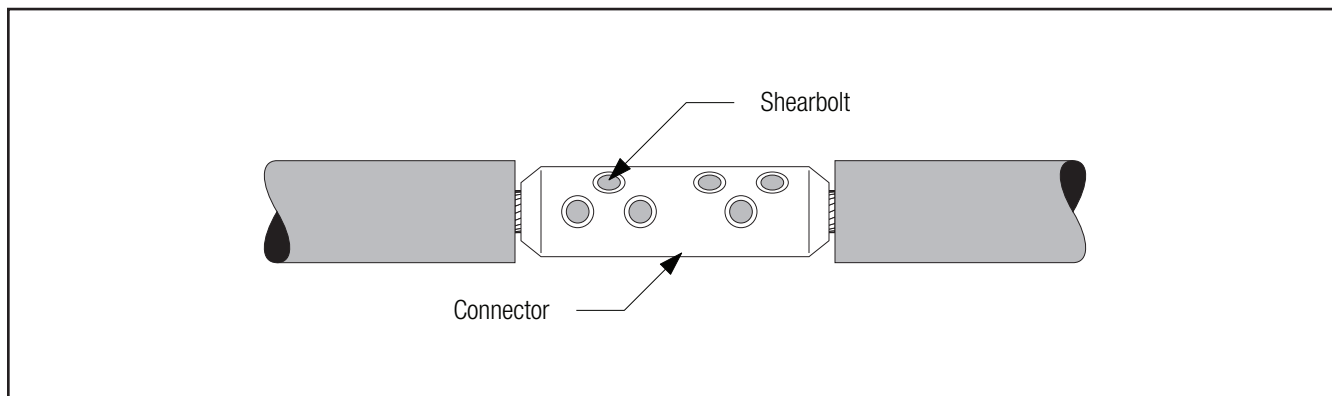


Figure 5

Go to section 4.0 “Install Splice.”

3.3 If using a crimp type connector, remove cable insulation for 1/2 connector length plus an allowance* for increases in connector length due to crimping. Insulation removal length shall not exceed 4 1/8" (105 mm) from conductor end. **Do not install connector now** (Figure 6).

**Note: This assumes that the installer has determined the increased length of an aluminum connector crimped with a specific tool and die.*

Aluminum (Al/Cu) Crimp Connector Growth Chart

Conductor Size	Typical growth allowance (per end)
500 kcmil	1/4" (6 mm)
750–1000 kcmil	3/8" (10 mm)

***Note: 1) Copper connectors do not require a length change allowance.
2) Maximum aluminum connector crimped length allowed is 8.25" (210 mm).***

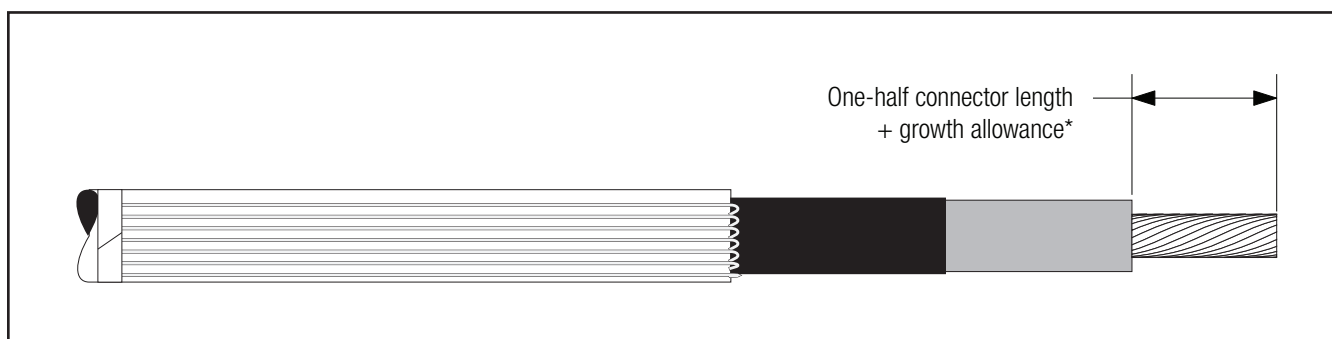


Figure 6

- 3.4 For 500 kcmil copper connectors, or connectors with an O.D. between 1.05–1.24" (26,7–31,5 mm): Slide the cold shrink adapter tube onto the insulation with the loose core ribbon end going on first, away from the cable end.

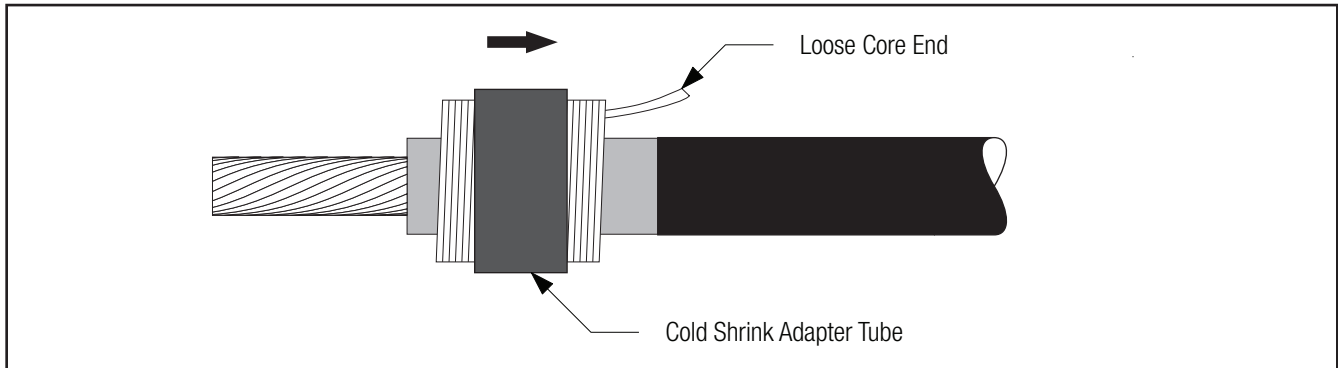


Figure 7

- 3.5 Install connector. See table (on cover) for proper connector dimensions. (For standard 3M™ Connectors, refer to table at the end of this instruction for crimping information). Remove any excess oxidation inhibitor from connector ends if aluminum connector is used. File sharp connector flashing if necessary, taking care to remove all metal filings from splice area (Figure 8).

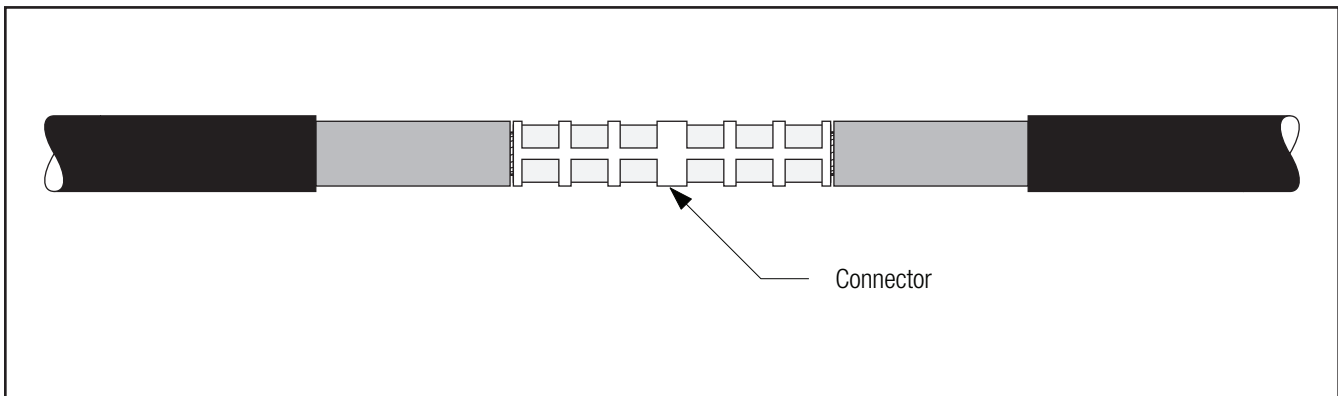


Figure 8

4.0 Install Splice

- 4.1 Apply a tape marker to semi-con insulation shield on cable which does not contain splice. Measure 11 1/2" (292 mm) from center of connector (Figure 9).

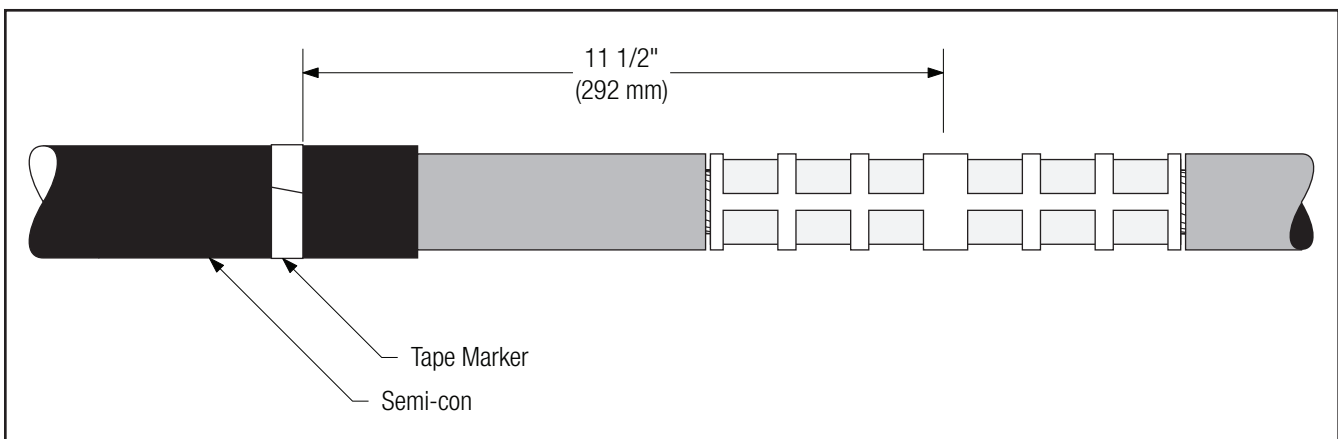


Figure 9

- 4.2 **If using cold shrink adapter tube:** Position adapter tube over the connector. Shrink adapter near center of connector by pulling and unwinding the loose core end in a counter-clockwise direction (*Figure 10*).

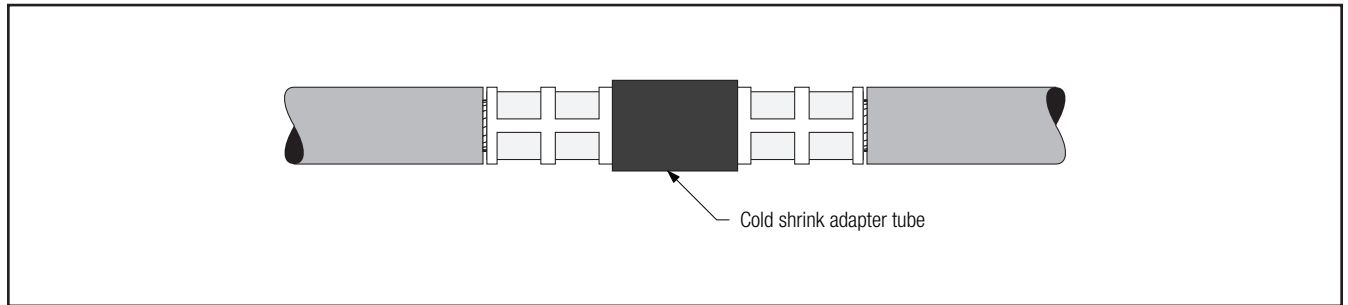


Figure 10

- 4.3 Clean cables using standard practice:

- Do not allow solvent or abrasive to contact the cable semi-conductive insulation shield.
- Do not reduce cable insulation diameter below 1.24" (31,5 mm) specified for the splice.
- The insulation surface must be round, smooth and free of cuts/voids. Sanding may be necessary, finish sanding should be done with a 300 grit or higher electrical grade abrasive.
- Make certain that the cable insulation is smooth, clean and dry before continuing.

- 4.4 Apply red compound on cable insulations, making certain to fill in edge of cable semi-con. **Do not use silicone grease** (*Figure 11*).

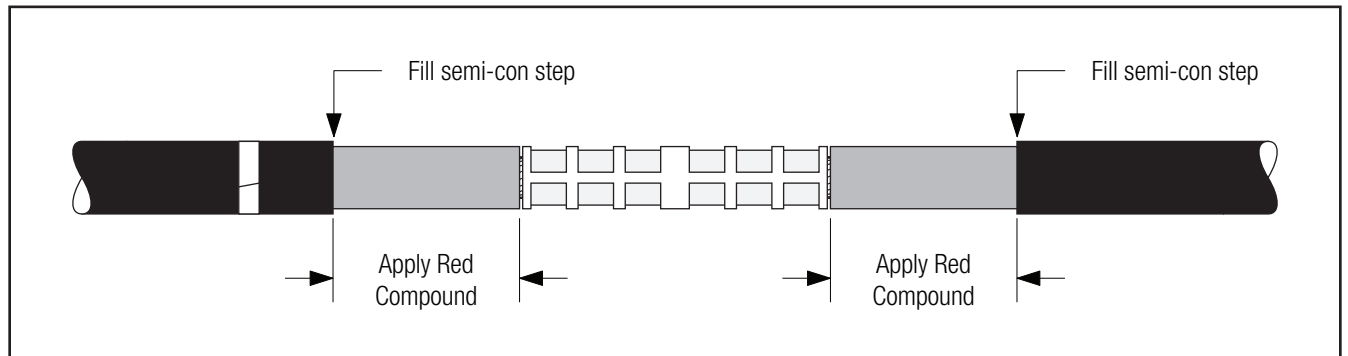


Figure 11

- 4.5 Position the splice body over connector area, aligning end of the splice body (not the core) at the center of the tape marker. Slowly start to remove the splice core by pulling and unwinding the loose core end counterclockwise, allowing only ¼" (6 mm) of the splice to shrink onto the tape marker. Carefully slide the splice body off the tape marker by pulling and twisting until the entire tape marker is exposed. Continue removing the core to complete the splice body installation (*Figure 12*).

Note: The splice body ends must overlap onto the semi-con of each cable by at least 1/2" (13 mm).

Note: Do not push the splice body toward the tape marker as this may cause the end to roll under. If the end does roll under, DO NOT use sharp-edged tools to pull it out as this could cut and damage the splice.

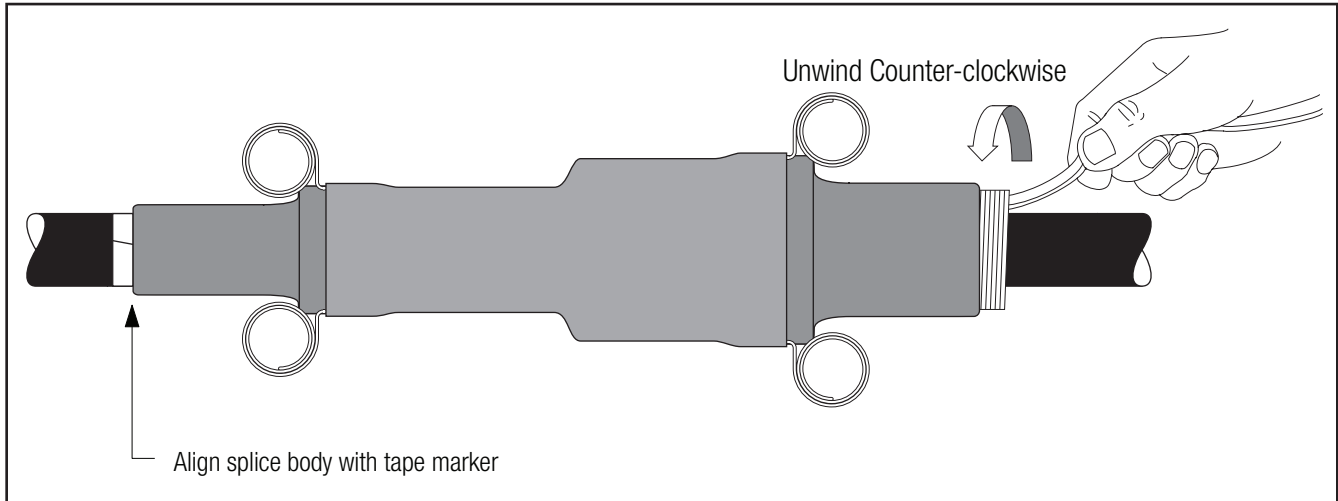


Figure 12

5.0 Sealing Jacket on JCN Cables (Optional)

- 5.1 Wrap a mastic sealing strip against the neutral wires at the end of cable jacket (*Figure 13*).

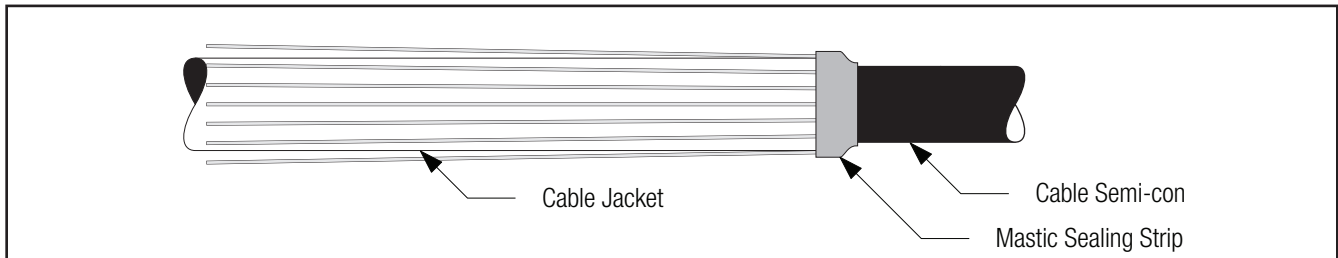


Figure 13

- 5.2 Fold neutral wires over splice body and wrap another mastic sealing strip over the cable jacket end and the first mastic sealing strip (*Figure 14*).

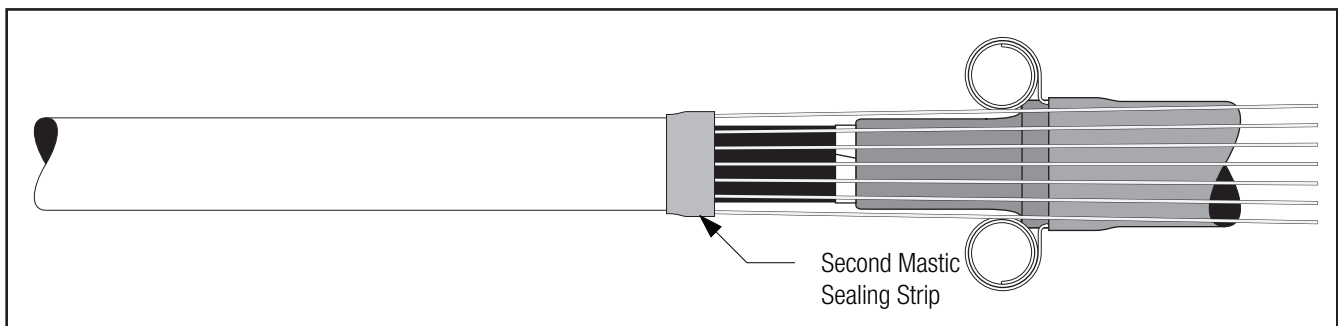


Figure 14

5.3 Cover mastic seals at each cable jacket with two wraps of vinyl tape (*Figure 15*).

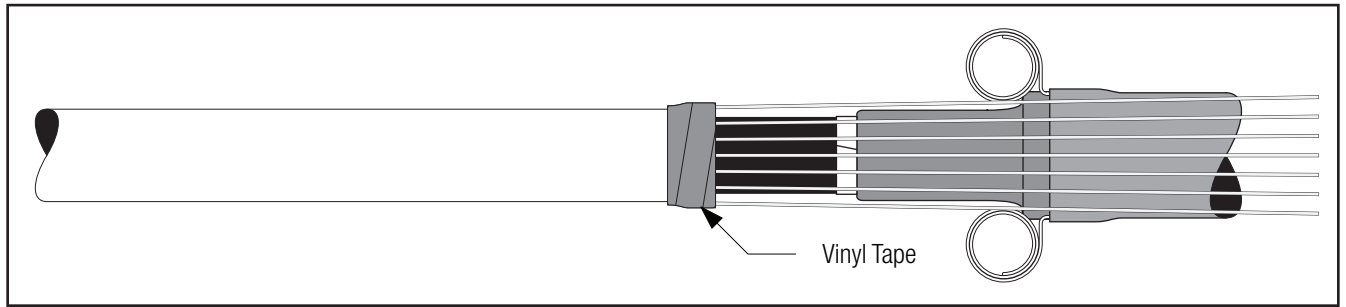


Figure 15

6.0 Additional Protection for Splice Body (Optional)

6.1 To further enhance protection of splice body from physical damage cover the splice body end seals with Scotch® Rubber Mastic Tape 2228 (not supplied with kit). Beginning 2" (25 mm) on splice wire cover tube apply one half-lapped layer onto the cable semi-con (*Figure 16*).

6.2 Overwrap mastic with two half-lapped layers of vinyl tape.

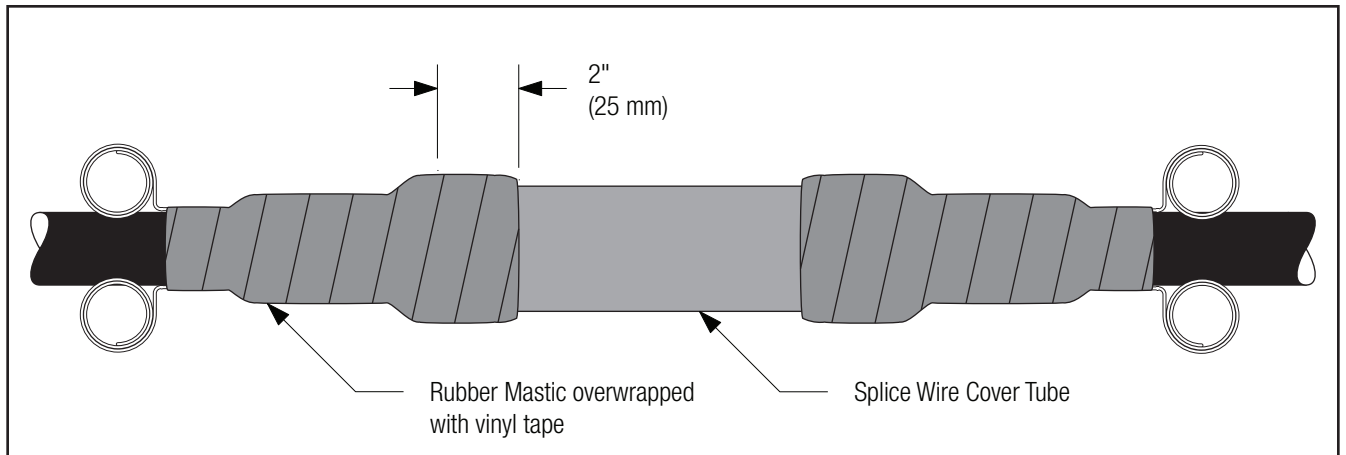


Figure 16

7.0 Connect Neutral Wires

7.1 Connect neutral wires and splice wires together using an appropriate “C,” “H” or butt type connector (*Figure 17*).

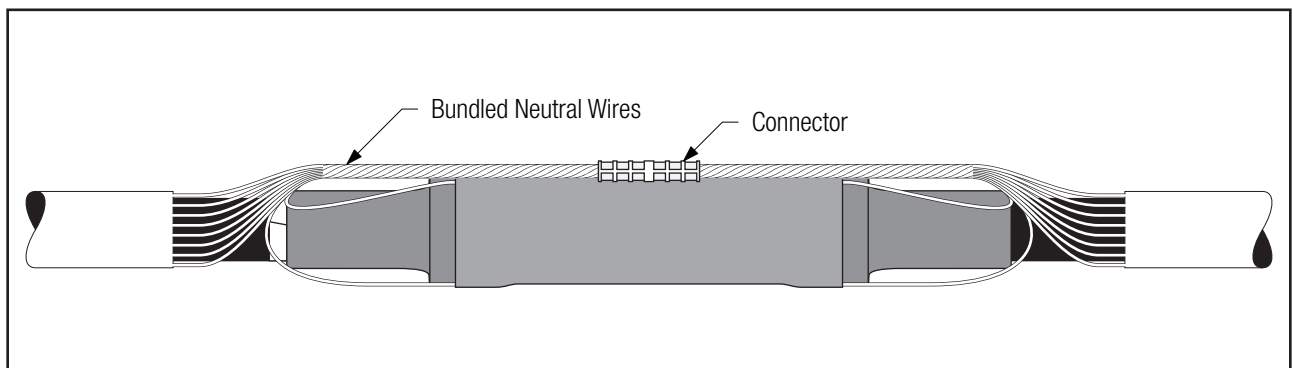


Figure 17

7.2 Splice is complete.

Crimping Tool - Die Sets (number of crimps/end)

3M™ Connector Number	Conductor Size (kcmil)	Burndy			Thomas & Betts Corp.			Square D Co. Anderson Div.	
		Y34A	Y35, Y39 Y45*, Y46*	Y1000**	TBM 8	TBM 12	TBM 15	VC6-3** VC6-FT**	VC8C**
10014 (Cu)	500	A34R (2)	U34RT (2)	—	Brown (3)	—	87H (3)	(2)	—
20014 (Al/Cu)	500	—	U34ART (4)	(1)	—	106H (3)	106H (4)	(2)	(2)
11014 (Cu)	500	A34R (4)	U34RT (3)	—	Brown (4)	—	87H (4)	(3)	—
CI-500 (Al/Cu)	500	—	U34ART (3)	—	—	—	106H (3)	(3)	—
20016 (Al/Cu)	600	—	U36ART (4)	(1)	—	—	115H (3)	(3)	(3)
10019 (Cu)	750	—	U39RT (3)	—	—	—	106H (3)	—	—
20019 (Al/Cu)	750	—	U39ART (4)	—	—	—	125H (5)	(3)	(3)
11019 (Cu)	750	—	U39RT (5)	—	—	—	106H (4)	—	—
CI-750 (Al/Cu)	750	—	S39ART (3)	—	—	—	140H (3)	(3)	—
10024 (Cu)	1000	—	S44RT, P44RT (4)	—	—	—	125H (3)	—	—
20024 (Al/Cu)	1000	—	S44ART, P44ART (4)	—	—	—	140H (4)	—	—
11024 (Cu)	1000	—	S44RT, P44RT (4)	—	—	—	125H (4)	—	—

*Y45 and Y46 accept all Y35 dies ("U Series"). For Y45, use PT6515 adapter. For Y46, use PUADP adapter.

**Anderson VC6-3, VC6-FT, VC8C and Burndy Y1000 require no die set.

3M is a trademark of 3M Company. Scotch is a registered trademark of 3M Company.

All other trademarks are property of their respective owners.

Important Notice

All statements, technical information, and recommendations related to 3M's products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product which are not contained in 3M's current publications, or any contrary statements contained on your purchase order shall have no force or effect unless expressly agreed upon, in writing, by an authorized officer of 3M.

Warranty; Limited Remedy; Limited Liability.

This product will be free from defects in material and manufacture for a period of one (1) year from the time of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.**



Electrical Markets Division

6801 River Place Blvd.
Austin, TX 78726-9000
800-245-3573
Fax 800-245-0329
www.3M.com/electrical

Please Recycle. Printed in USA.
© 3M 2010. All Rights Reserved.
78-8126-0339-3-C