3M™ Cold Shrink QS-III Splicing Kit 5788A-MT

Three-Conductor Splice Kit for use on Armor and Non-Armor Cables

Instructions

IEEE Std. 404
25/28 kV Class
200 kV BIL

Cable Range Requirements

Kit Number	Cable Insulation O.D. Range	Conductor Size Range
5788A-MT	1.24" to 2.07" (31,5 mm to 52,6 mm)	500 - 1000 kcmil* (240 - 500 mm^2)

* Splices (including size transitions) can be made to smaller or larger conductors, 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)	------	7.50" (191 mm)
Length Copper (Cu)	------	8.25" (210 mm)



3M™ Cold Shrink
QS-III Splicing Kit
5788A-MT

78-8126-0437-5-D

⚠CAUTION

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

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1.0 Kit Contents:

1.1 Kit Contents are as follows:

3 .....3M™ Cold Shrink QS-III 5458A Silicone Rubber Splice Bodies
6 .....Tubes, 3M™ Red Compound P55/R
3 .....Metallic Shield Sleeves
6 .....Constant Force Spring Shield Connectors (1.31" I.D.)
1 .....Armor to Armor Continuity Braid
1 .....3M™ Cable Preparation Kit CC-2
9 .....Rolls Scotch® Vinyl Electrical Tape Super 88 (1 1/2" x 44')
1 .....Roll Scotch® Super 33+ Vinyl Electrical Tape (3/4" x 76')
10 .....Rolls 3M™ Scotch-Seal™ Mastic Tape 2229 (3 3/4" x 10')
1 .....Roll Scotch® Electrical Shielding Tape 24 (1" x 15')
8 .....Rolls, 3M™ Sheath Wrap (4" x 15')
3 .....Cold Shrink Adapter Tubes
1 .....Instruction Sheet
6 .....Copper Foil Tape (1/2" x 10")
16 .....Gloves

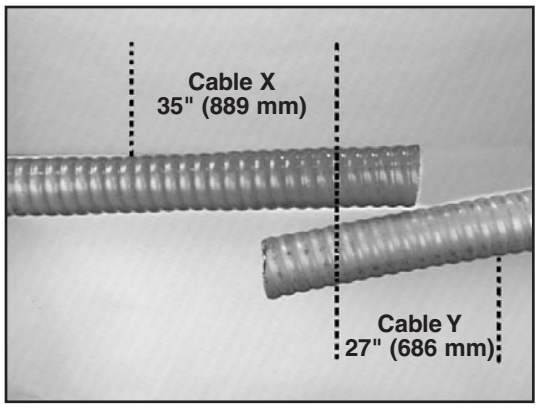
2.0 Prepare Cable

2.1 Prepare the cable according to your company's standard procedures. Allow cable ends to overlap as much as 10" (254 mm).

Remove 35" (889 mm) of cable jacket, plus half of the overlap from **Cable X**.

Remove 27" (686 mm) of cable jacket, plus half of the overlap from **Cable Y**.

Keep a 24" (610 mm) piece of cable jacket removed from **Cable X** and a 16" (406 mm) piece of jacket from **Cable Y** for use later in these instructions.

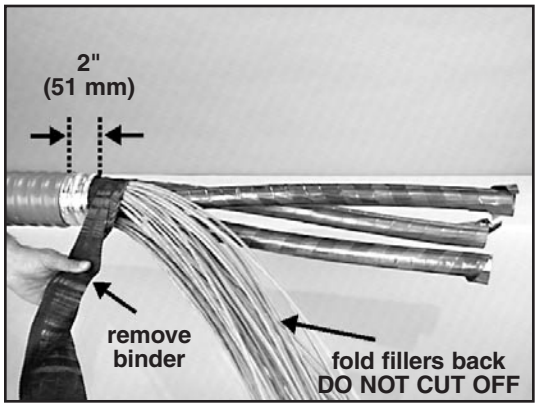


2.2 If cable is armored, remove cable armor leaving 2" (51 mm) armor exposed beyond jacket end.

Remove cable binder, if present, at the end of the jacket or armor and discard.

Fold cable fillers and ground wire(s) back over cable jacket end. Do not cut off.

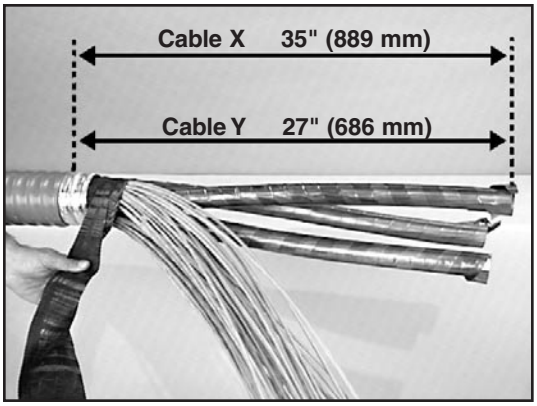
Temporarily hold the fillers and ground wire(s) back by banding them to the cable jacket using Scotch® Super 33+ Vinyl Tape.



2.3 Cut the phase cores to the appropriate length.

Cores of **Cable X** should be 35" (889 mm) when measured from the cable jacket end or 33" (838 mm) when measured from end of the armor.

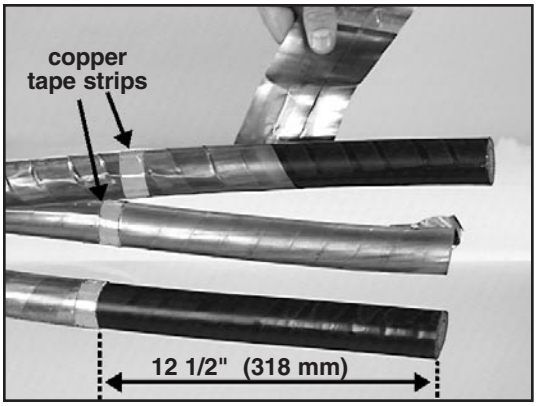
Conductors of **Cable Y** should be 27" (686 mm) when measured from the cable jacket end or 25" (635 mm) when measured from end of the armor.



2.4 Bind the metallic shields of both **Cable X** and **Cable Y** cores with a copper tape strip at a point 12 1/2" (318 mm) from the end of each conductor.

Remove the metallic shields to the copper tape binding.

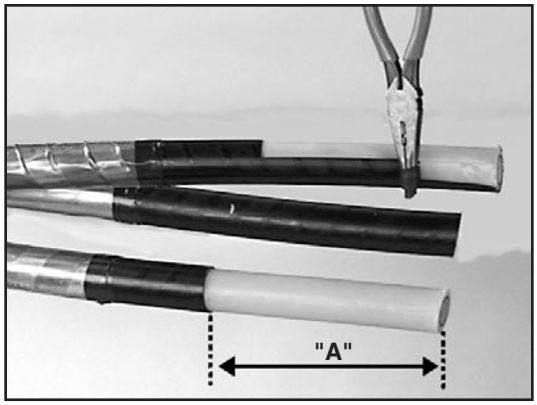
If the phase cores are individually jacketed, remove the individual jackets a distance of 15 3/4" (400 mm) from the end of each conductor.



2.5 Remove cable semi-conductive insulation screen from cores of both **Cable X** and **Cable Y** for a distance of "A" from the end of each conductor.

Typical Conductor Size* kcmil (mm²)	Insulation OD Range Inches (mm)	Semi-con Cutback "A" Inches (mm)
500** - 750 (240** - 400)	1.24 - 1.70 (31,5 - 43,2)	9 1/4 (235)
1000** (500**)	1.59 - 2.07 (40,4 - 52,6)	8 3/4 (222)

* For 100% and 133% insulation levels, **Insulation OD is the final determining factor.**
** Cables must be within Insulation OD Range of splice kit.



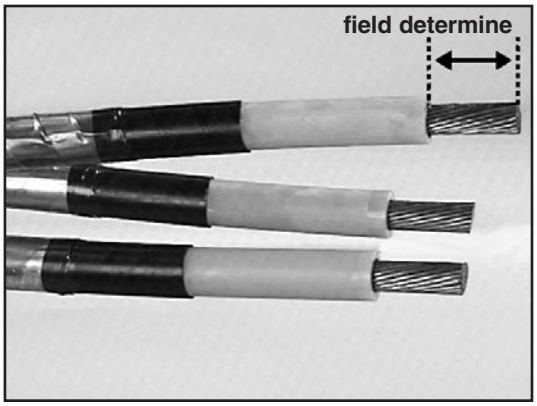
2.6 Remove cable insulation from conductors ends of both **Cable X** and **Cable Y**.

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 connectors now.

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

Aluminum Connector Size	Typical Growth allowance per end
500 kcmil	1/4" (6 mm)
750 kcmil	3/8" (10 mm)
1000 kcmil	3/8" (10 mm)

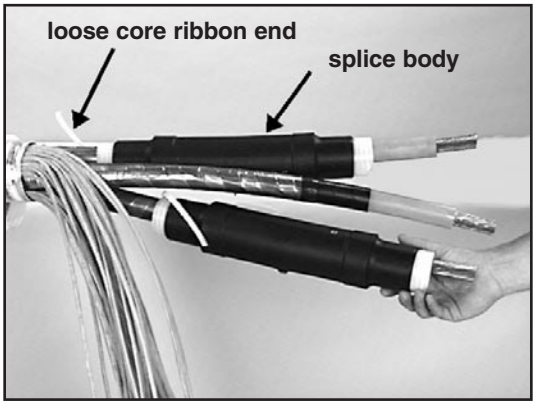


Notes:** **1. Copper connectors do not require a length change allowance.

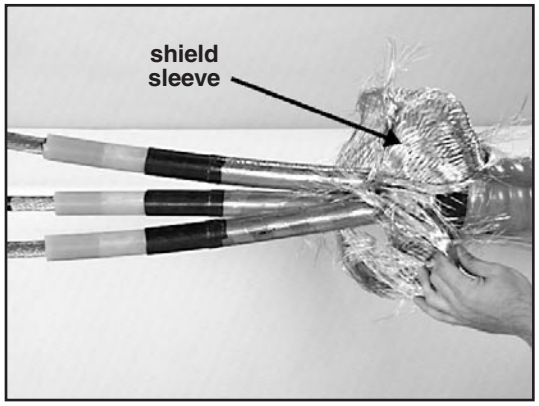
2. Maximum aluminum connector crimped length allowed is 8.25" (210 mm).

3.0 Place Components on Cable

3.1 Slide a 3M™ cold shrink splice body onto each core of **Cable X** with the loose core ribbon end going on the cable first, away from cable end.

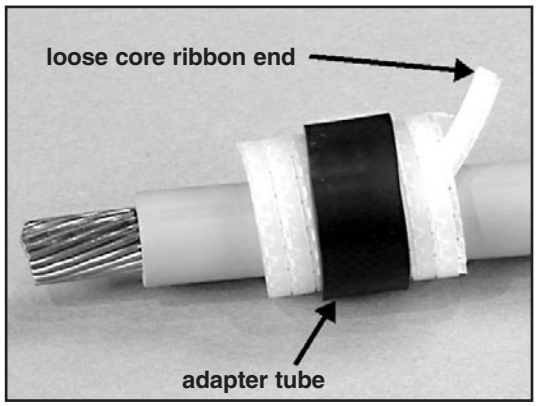


3.2 Expand metallic shield sleeves and slide one onto each core of **Cable Y**. Compress the ends of each shield sleeve together next to the cable armor or jacket, away from the prepared conductor ends.



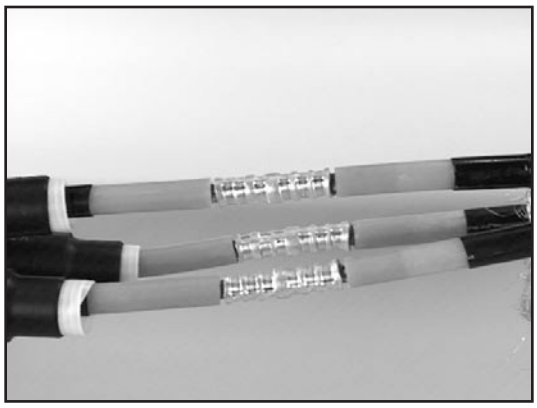
3.3 **For 500 kcmil copper connectors or connectors with an O.D. between 1.05" - 1.24" (26,7 mm - 31,5 mm):**

Slide cold shrink adapter tube onto each conductor of **Cable Y** with the loose core ribbon end going on first, away from cable end.

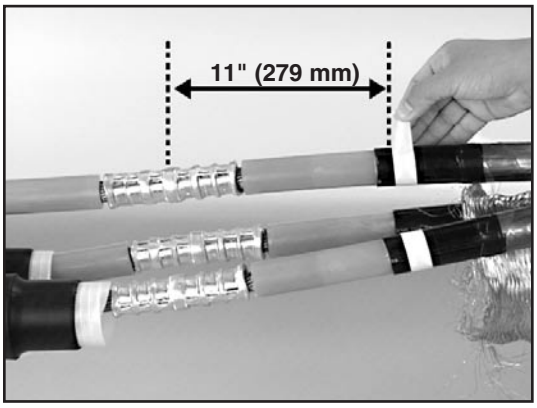


4.0 Install Splice

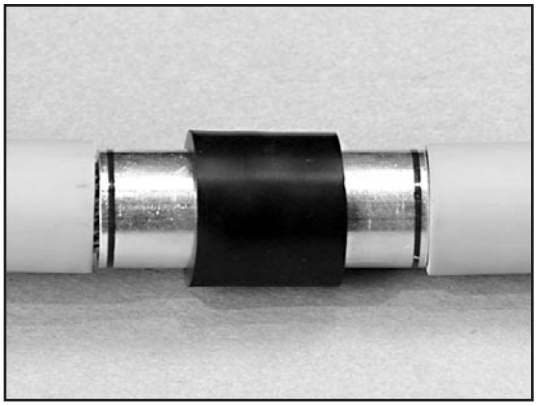
4.1 Install connectors. See Table on front cover of this instruction for proper connector dimensions. Crimp connectors per recommendations from connector manufacturer. For standard 3M™ Connectors, refer to the table at the end of this instruction for crimping information.



4.2 Apply a tape marker to core semi-con insulation screens of **Cable Y** (cable side which does not contain splice body) **at a distance of 11" (279 mm) measured from the CENTER of connectors.**



4.3 **If using Cold Shrink adapter tube:** Position cold shrink copper connector adapter **over CENTER of connector.** Shrink the adapter near center of connector by pulling and unwinding the loose core ribbon end in a counter-clockwise direction.

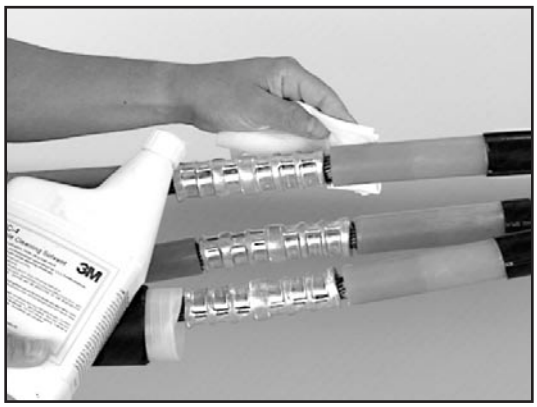


4.4 Remove any excess oxidation inhibitor from connector ends if aluminum connectors are used.

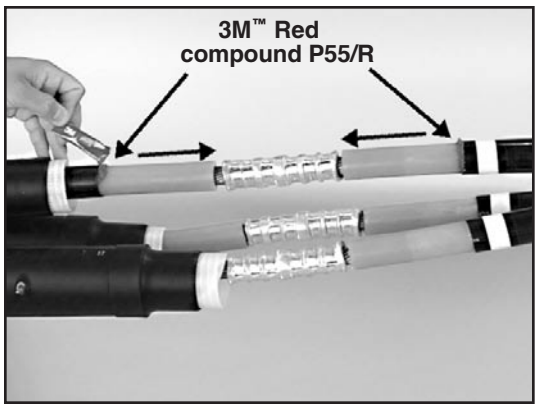
Clean cable using standard practice:

a. Do not use solvent or abrasive on cable semi-conductive insulation shield.

b. If abrasive is used on cable insulation, do not reduce diameter below the 1.24" (31,5 mm) minimum specified for the splice.



4.5 Apply red compound on cable insulation, making certain to fill in edge of cable semi-cons.

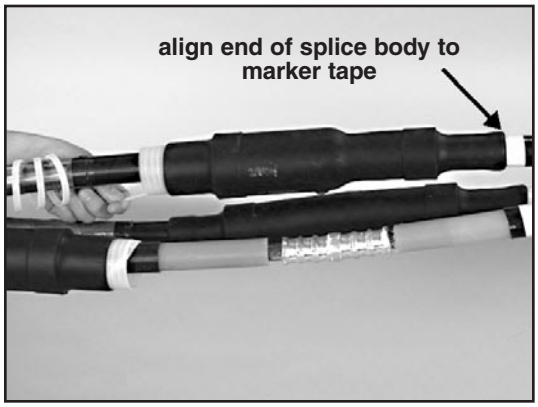


Note: DO NOT use silicone grease.

4.6 Position each splice body over the connector and align the leading end of the rubber part with the center of the marker tape.

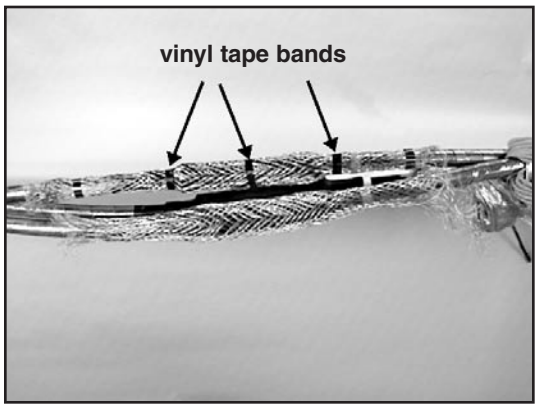
Slowly begin to remove the inner support core by pulling, while unwinding, the loose ribbon end in a counterclockwise direction. Allow only 1/4" (6 mm) of the splice to shrink onto the marker tape.

Carefully slide the splice body off the marker tape until its leading edge is aligned with the marker tape edge. Continue removing the core to complete splice body installation.



Note: The splice body ends must overlap onto the semi-conducting layer of each cable by at least 1/2" (12,7 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.



4.7 Apply copper shield sleeves:

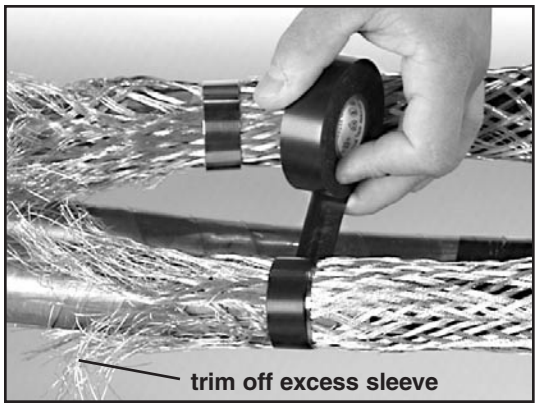
a) Center one shield sleeve over each splice body.
b) Starting at center, form sleeves to splice bodies using vinyl tape bands.

4.8 Connect sleeve ends to the cable metallic shield with constant force springs.

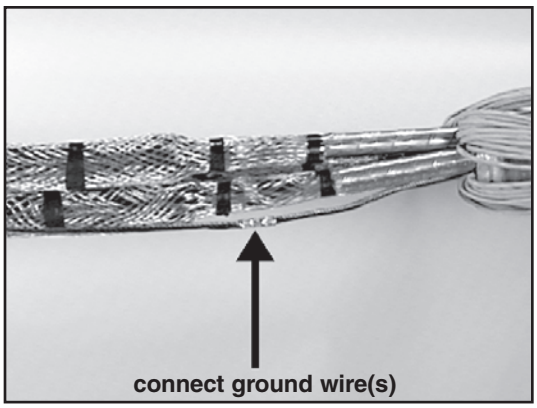
Install each spring by unwrapping and rewrapping the spring around itself over the shield sleeve end and cable metallic shield.

Trim off excess shield sleeve braid material.

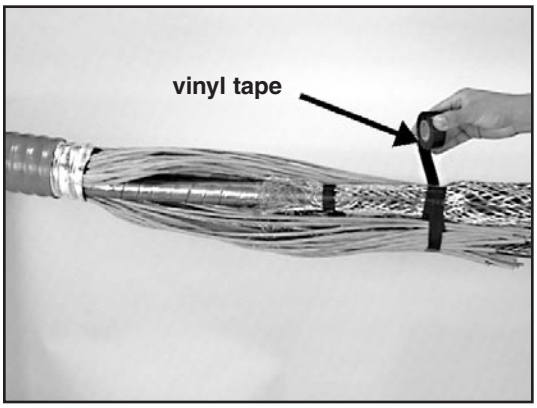
Cover springs and trimmed shield sleeve ends with one half-lapped layer of vinyl tape.



4.9 Connect the ground wires from **Cable X** to the ground wires from **Cable Y**. Make the connection away from the splice bodies.

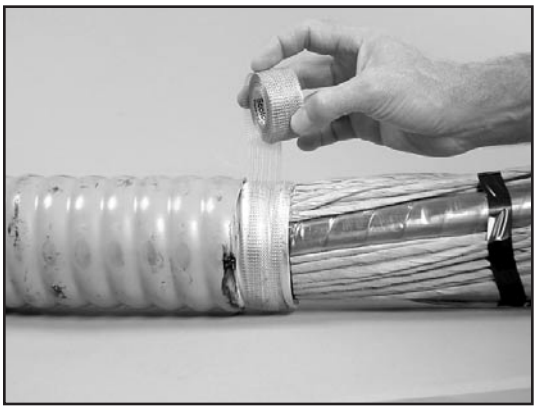


4.10 Unfold the cable fillers and re-establish their lay between the cable phase cores. Hold the fillers in place with a band of vinyl tape.



5.0 Install Armor Continuity (If Cable is Armored)

5.1 Apply multiple wraps of Scotch® Electrical Shielding Tape 24 around the exposed armor on both **Cable X** and **Cable Y** to fill a valley in the corrugated armor. Half hitch to tie off.

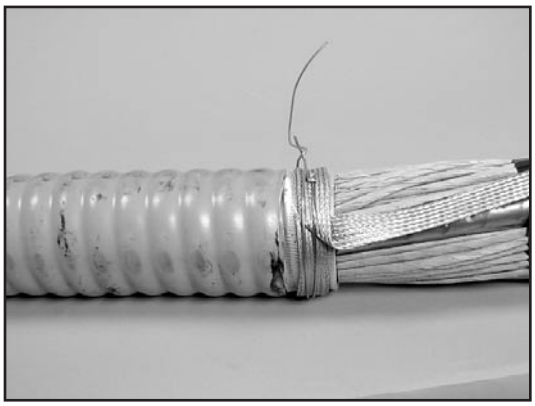


5.2 Wrap an end of the ground continuity braid around exposed armor and applied Scotch® Electrical Shielding Tape 24 on one cable end.

Wrap one wrap only and fold the braid at 90° with the long braid extending toward splice opening, Secure braid in place using copper binding wires (not included in kit). Spiral wrap the braid around the splice opening to the other cable armor.

Fold the braid 90° and wrap braid end around armor. Wrap braid end for one wrap only. Cut off and discard excess braid.

Secure braid by installing copper binding wires.

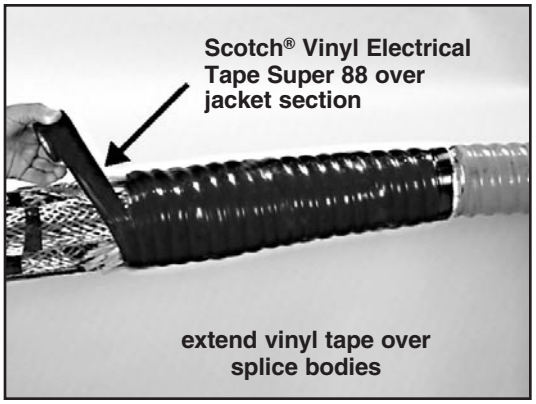


6.0 Install Splice Jacket

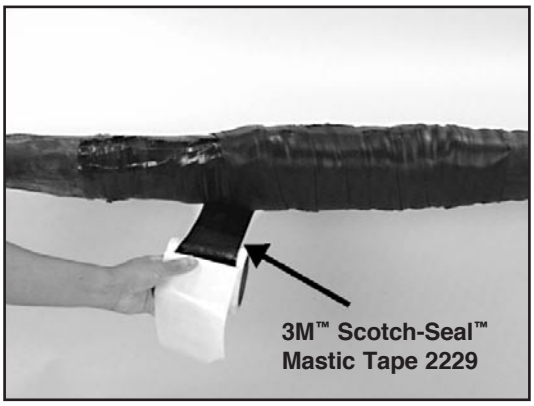
6.1 Over wrap the exposed conductors on each side of splice bodies with jacket pieces saved from step 2.1.

Bind the cable jacket pieces in place with one half-lapped layer of Scotch® Vinyl Electrical Tape Super 88 1 1/2" wide tape.

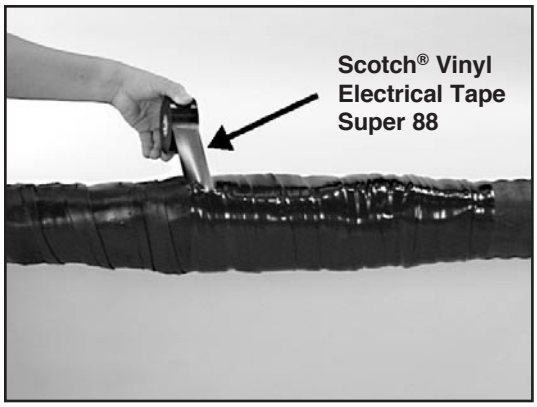
Extend vinyl tape wrapping to cover shielded splice bodies.



6.2 Cover entire splice opening with one half-lapped layer of 3M™ Scotch-Seal™ Mastic Tape 2229. Extend taping 2" (51 mm) over cable jacket on each side.



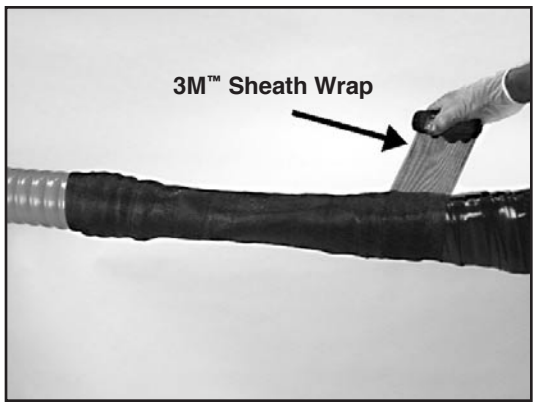
6.3 Cover applied 3M™ Scotch-Seal™ Mastic Tape 2229 with two half lapped layers of Scotch® Vinyl Electrical Tape Super 88. Extend vinyl tape wraps 2" (51 mm) over cable jacket on each side.



6.4 Overwrap the entire splice with a minimum of two half lapped layers of 3M™ Sheath Wrap.
Tear open the top end of the foil 3M™ Sheath Wrap container and fill foil container half full with water.

Squeeze the container four or five times allowing the water to penetrate the roll. Pour out water, remove roll from foil container and immediately apply to splice area.

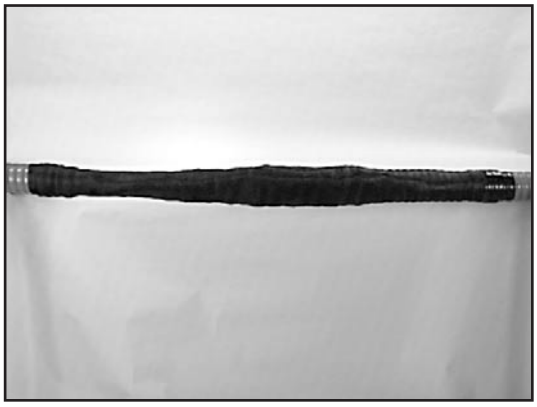
Bind the final wrap in place with vinyl tape.



Note: ***When handling 3M™ Sheath Wrap, wear the supplied gloves to avoid resin adhesion to the skin.***

3M™ Sheath Wrap can be applied first and then sprayed with water to activate the curing system. It will also cure from moisture in the air in humid conditions.

6.5 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	—	U39ART (3)	—	—	—	125H (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.

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78-8126-0437-5-D