

3M™ Cold Shrink QT-III Silicone Rubber Indoor Termination Kit With High-K Stress Relief

For 3-Conductor Copper Tape Shield Cables without Ground Wires

7600-T-3W Series

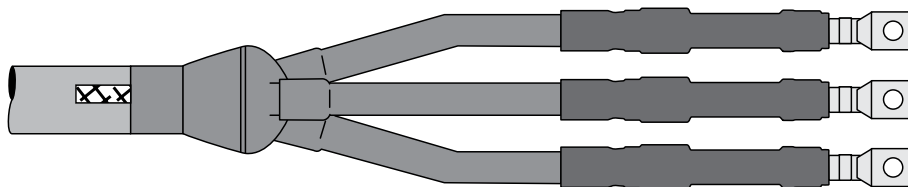
Instructions

IEEE Std. No. 48

Class 1 Termination

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 Contents

- 1 Cold Shrink Silicone Rubber Breakout Boot Assembly
- 3 Silicone Rubber Phase Rejacketing Sleeve Assemblies
- 3 Cold Shrink Silicone Rubber Termination Assemblies
- 1 Tinned Copper Ground Braid Assembly
- 3 Constant Force Springs (Small)
- 1 Constant Force Spring (Large)
- 3 3M™ EMI Copper Foil Shielding Tape 1181 Strips, 1/2" x 10"
- 8 Strips Scotch® Mastic Strip 2230 (2 per termination bag & 2 per breakout boot bag)
- 1 Roll Scotch® Super 33+™ Vinyl Electrical Tape - 3/4"
- 1 3M™ Cable Cleaning Preparation Kit CC-2
- 1 Instruction Sheet

Note: Do Not use knives to open plastic bags.

Termination Application Ranges

(Final determining factor is cable insulation diameter. Listed insulation ranges allow +0.10" (2.54 mm) for shielding.)

| Kit Number | BIL (kV) | Cable Insulation Range [inch (mm)] | 3.3 kV (mm²) IEC | 3.3 kV (mm²) JIS | 5.0 kV (AWG) AEIC | 6.6 kV (mm²) JIS | 6.6 kV (mm²) IEC | 8 kV (AWG) AEIC | 10 kV (mm²) IEC | 15 kV (mm²) IEC | 15 kV (AWG) AEIC | 20 kV (mm²) IEC | 25/28 kV (AWG) AEIC | 35 kV (AWG) AEIC |
|---------------|----------|------------------------------------|------------------|------------------|-------------------|------------------|------------------|-----------------|-----------------|-----------------|------------------|-----------------|---------------------|------------------|
| 7620-T-95-3W | 95 | 0.33–0.50 (8.40–12.7) | 16–35 | 8–22 | 8–2 | — | 16–25 | 6–4 | — | — | — | — | — | — |
| 7621-T-95-3W | 95 | 0.50–0.70 (12.7–17.8) | 50–95 | 38–60 | 1–3/0 | — | 35–70 | 2–2/0 | 10–50 | 16–25 | — | — | — | — |
| 7623-T-95-3W | 95 | 0.70–0.92 (17.8–23.4) | 120–185 | 100–150 | 4/0–400 | — | 95–150 | 3/0–350 | 70–150 | 35–95 | — | — | — | — |
| 7624-T-95-3W | 95 | 0.92–1.18 (23.4–30.0) | 240–300 | 200–250 | 500–750 | — | 185–300 | 400–600 | 185–300 | 120–185 | — | — | — | — |
| 7625-T-95-3W | 95 | 1.18–1.52 (30.0–38.6) | — | 300–325 | 800–1000 | — | — | 750–1000 | — | 200–325 | — | — | — | — |
| 7621-T-110-3W | 110 | 0.50–0.70 (12.7–17.8) | 50–95 | 38–60 | 1–3/0 | 14–38 | 35–70 | 2–2/0 | 10–50 | 16–25 | 2–1 | — | — | — |
| 7622-T-110-3W | 110 | 0.70–0.92 (17.8–23.4) | 120–185 | 100–150 | 4/0–400 | 60–100 | 95–150 | 3/0–350 | 70–150 | 35–95 | 1/0–4/0 | — | — | — |
| 7624-T-110-3W | 110 | 0.92–1.18 (23.4–30.0) | 240–300 | 200–250 | 500–750 | 150–250 | 185–300 | 400–600 | 185–300 | 120–185 | 250–450 | — | — | — |
| 7625-T-110-3W | 110 | 1.18–1.52 (30.0–38.6) | — | 300–325 | 800–1000 | 300–325 | — | 750–1000 | — | 200–325 | 500–750 | — | — | — |
| 7625-T-125-3W | 125 | 1.18–1.52 (30.0–38.6) | — | 300–325 | 800–1000 | 300–325 | — | 750–1000 | — | 200–325 | 500–750 | 240–300 | — | — |
| 7693-T-150-3W | 150 | 0.70–0.92 (17.8–23.4) | 120–185 | 100–150 | 4/0–400 | 60–100 | 95–150 | 3/0–350 | 70–150 | 35–95 | 1/0–4/0 | 25–70 | 2–1/0 | — |
| 7694-T-150-3W | 150 | 0.92–1.18 (23.4–30.0) | 240–300 | 200–250 | 500–750 | 150–250 | 185–300 | 400–600 | 185–300 | 120–185 | 250–450 | 95–185 | 2/0–250 | 1/0–3/0 |
| 7695-T-150-3W | 150 | 1.18–1.52 (30.0–38.6) | — | 300–325 | 800–1000 | 300–325 | — | 750–1000 | — | 200–325 | 500–750 | 240–300 | 300–500 | 4/0–500 |

Table 1

1.0 Prepare Cable

- 1.1 Determine cable jacket removal length required for correct phase spacing and bolted terminal lug connections ($[A] + [B]$ Figure 1, based on the longest phase to be connected). Allow for dimension $[C]$ as needed.

Note: Individual phase length and separation dimensions vary according to specific installation and equipment design requirements. They must, therefore, be determined by the installer and must conform to accepted engineering practices.

- 1.2 Remove cable jacket, armor, bedding (inner sheath) and core fillers according to Figure 1 dimensions. Secure each copper tape shield end with a temporary band of vinyl tape (① Figure 1).
- 1.3 Using light tension, wrap a Scotch® Mastic Strip 2230 strip around cable jacket 1.0" (25 mm) below the cut edge (② Figure 1).

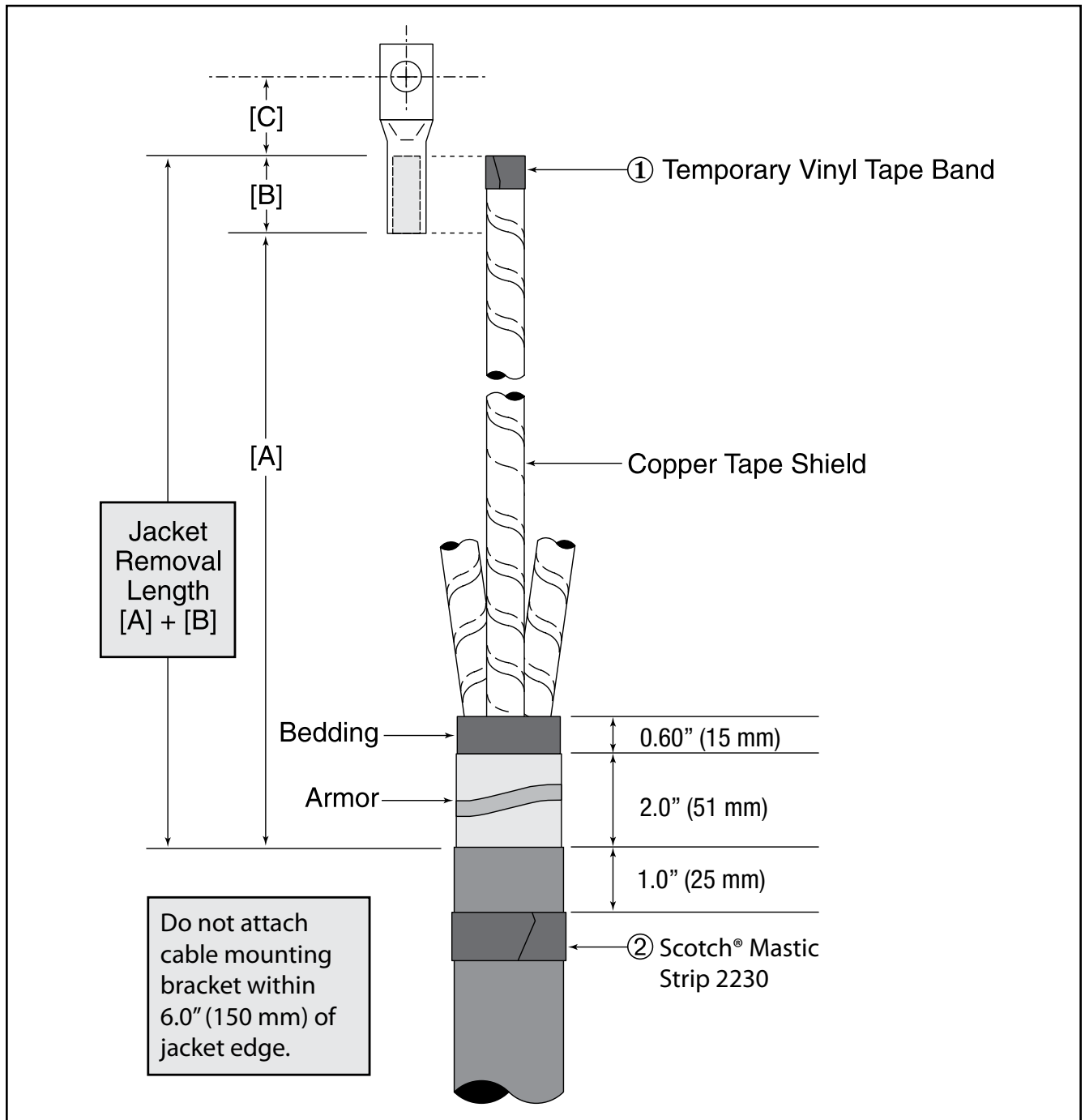


Figure 1

2.0 Attach Metallic Shield Grounding Braids

- 2.1 Cut supplied tinned copper grounding braid into three equal 2' (610 mm) lengths. Expand each braid end for a distance of 12" (305 mm) (② Figure 2).

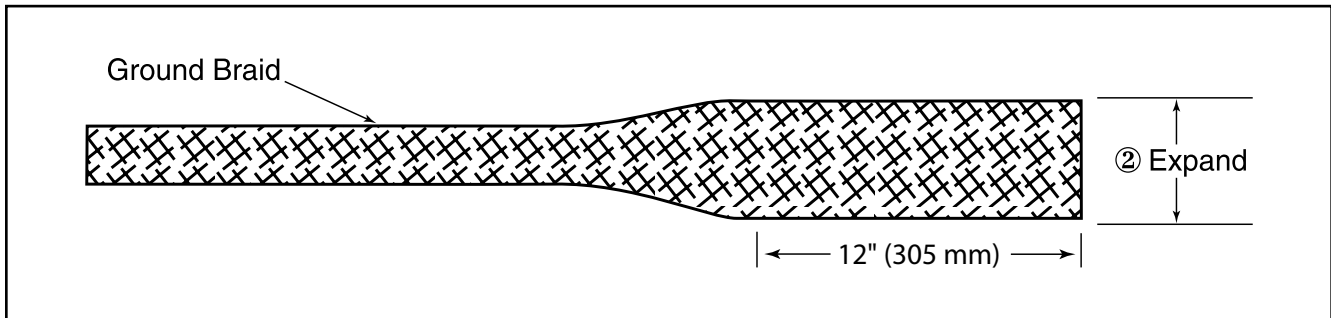


Figure 2

- 2.2 Position each expanded ground braid end over cable as shown in Figure 3. Using Scotch® Super 33+™ Vinyl Electrical Tape bands, secure upper braid end to copper tape shielding 8.0" (203 mm) beyond armor edge (jacket edge for non-armored cable) (④ Figure 3). Secure to cable jacket 0.60" (15 mm) below Scotch® Mastic Strip 2230 (⑤ Figure 3).

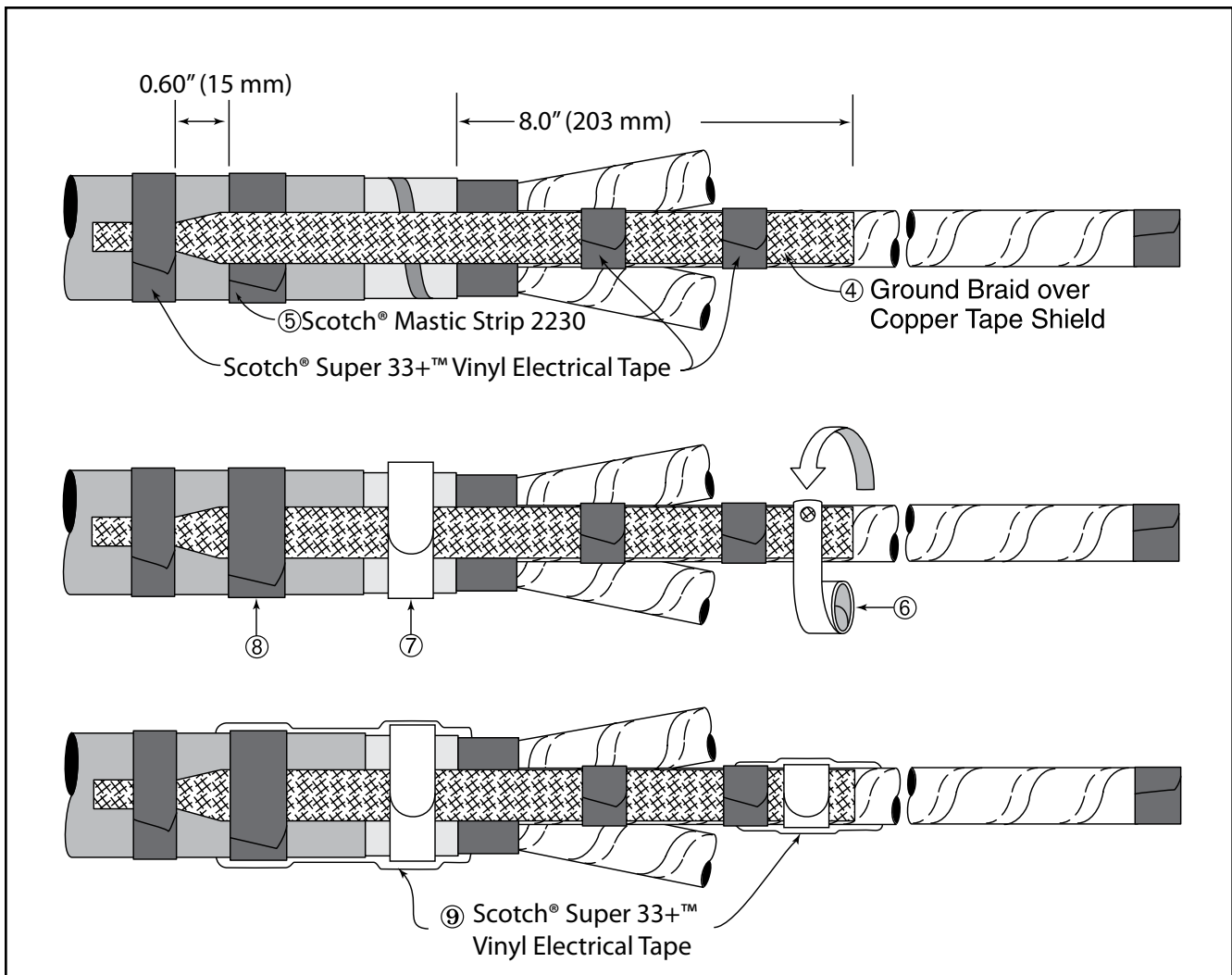


Figure 3

- 2.3 Connect ground braid upper ends to copper tape shield using small constant force spring (⑥ *Figure 3*). **Armored cables:** Connect three ground braids to cable armoring using one large constant force spring (⑦ *Figure 3*). Following application, cinch (twist with hand) each spring to tighten.
- 2.4 Apply a second Scotch® Mastic Strip 2230 over ground braids and previously-applied mastic strip (⑧ *Figure 3*).
- 2.5 Apply two highly stretched half-lapped layers of Scotch® Super 33+™ Vinyl Electrical Tape over Scotch® Mastic Strip 2230 strips and constant force springs (⑨ *Figure 3*).

3.0 Install Cold Shrink Silicone Rubber Breakout Boot Assembly

- 3.1 Inspect boot assembly and confirm that all loose plastic core ends are free as shown (① and ② *Figure 4*).

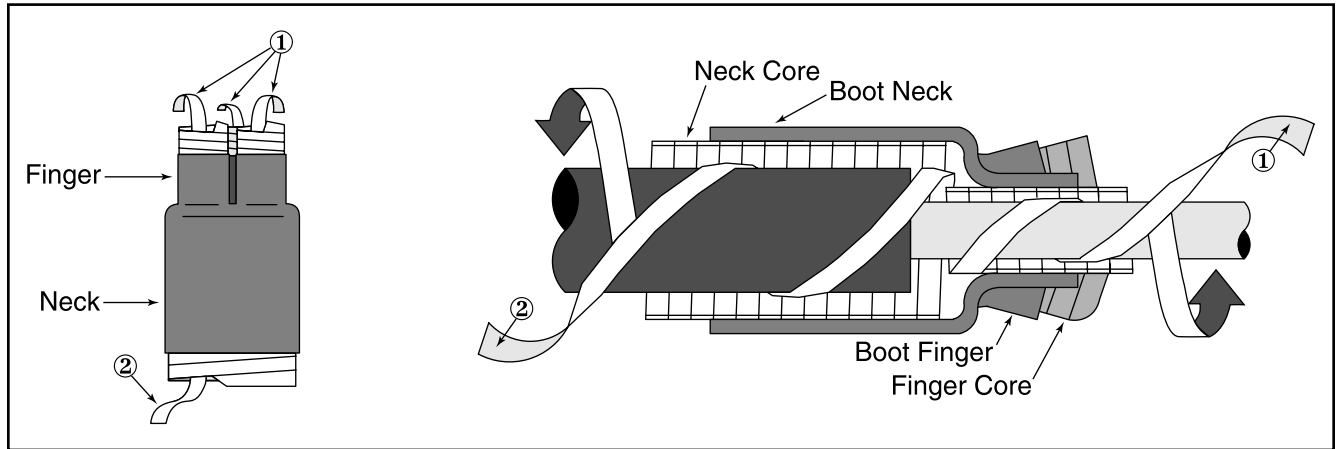


Figure 4

- 3.2 To ensure that the breakout boot can be fully seated into the breakout area of the cable, it will be necessary to unwind a few turns of each finger core.

Caution: *Do not unwind too far such that boot fingers begin to collapse.*

- 3.3 Hold loose neck-end core ribbon ② to one side so that it can not become trapped between cable phases. Slide boot assembly over cable end, guiding individual cable cores through boot assembly fingers.

Hint: *View end of cable through finger cores to ease cable phase insertion.*

- 3.4 Slide breakout boot assembly onto cable as far as it will go. Large neck-end should fully extend over cable jacket.

Hint: *Spread cable phases while sliding boot assembly to ease the installation.*

- 3.5 Remove large neck-end core. Grasping loose core ribbon end ②, pull and unwind counter-clockwise around cable.
- 3.6 Remove each finger core. Grasping loose core ribbon end ①, pull and unwind counter-clockwise around each cable phase leg.

4.0 Install Silicone Rubber Rejacketing Sleeves

4.1 From the chart below, determine the correct [A] dimension for the termination product being installed.

| Kit Number | Dimension [A] |
|---------------|----------------|
| 7620-T-95-3W | 6.75" (171 mm) |
| 7621-T-95-3W | 5.50" (140 mm) |
| 7623-T-95-3W | |
| 7624-T-95-3W | |
| 7625-T-95-3W | |
| 7621-T-110-3W | |
| 7622-T-110-3W | |
| 7624-T-110-3W | |
| 7625-T-110-3W | |
| 7625-T-125-3W | 7.0" (178 mm) |
| 7693-T-150-3W | 12.0" (305 mm) |
| 7694-T-150-3W | |
| 7695-T-150-3W | |

4.2 Place a vinyl tape marker on each cable phase leg at dimension X (① Figure 5).

Note: $[X] = [A] \text{ (From chart above)} + [B] \text{ (Lug barrel depth)}$. Allow for crimp growth when using aluminum lugs.

| Aluminum Lug and Connector Growth Allowance | | | |
|---|--------------|--------------|------------------|
| 2 - 350 | 400 - 650 | 750 - 1000 | 1250 - 2000 |
| 1/4" (6 mm) | 1/2" (13 mm) | 3/4" (19 mm) | Field Determined |

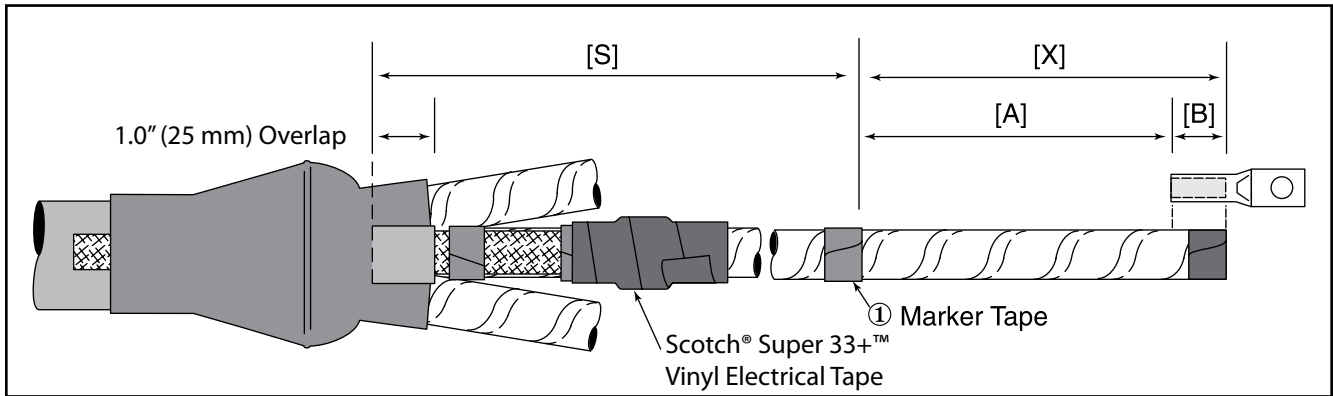


Figure 5

4.3 Determine required phase rejacketing sleeve length ([S] Figure 5).

4.4 Using scissors, trim rejacketing sleeve assembly to length required (Figure 6). Cut tubing and inner braid together.

Note: Inner polyester braid should extend approximately 3" (76 mm) beyond rejacketing tube end before cutting. There is no need for termination-end braid exposure.

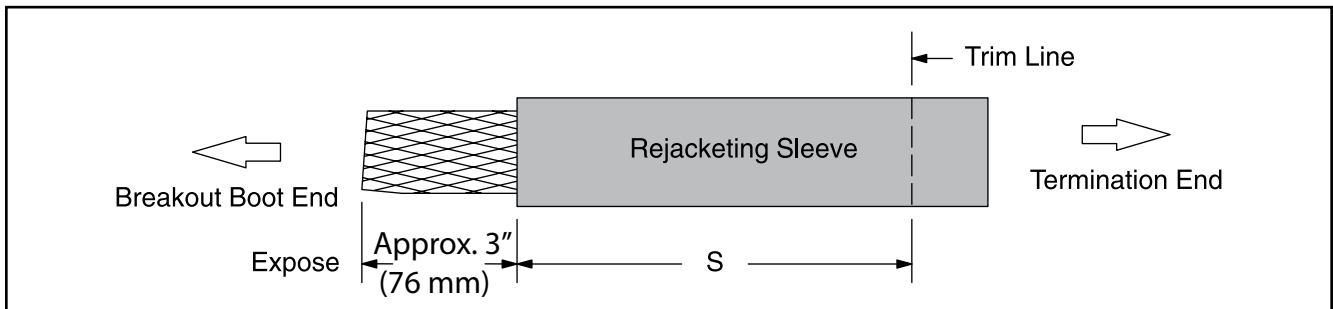


Figure 6

- 4.5 Guide one re-jacketing sleeve assembly over each cable phase leg (Figure 7). **Push sleeve assembly from above. Continuously guide the free end maintaining sleeve-to-cable-core alignment.**

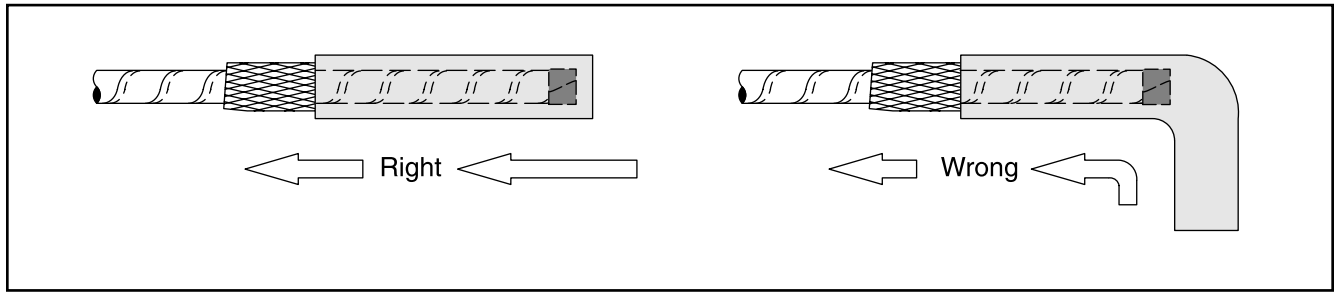


Figure 7

- 4.6 Slide re-jacketing sleeve until inner polyester braid is adjacent to breakout boot finger (② Figure 8).

- 4.7 Fold outer silicone tubing back on itself for 1" (25 mm) and trim off exposed polyester braid (③ Figure 8).

Note: Do not damage silicone tubing while cutting. Sleeve assembly may be rotated to ease trimming. When doing so, rotate in the direction of the cable copper tape shield wrap.

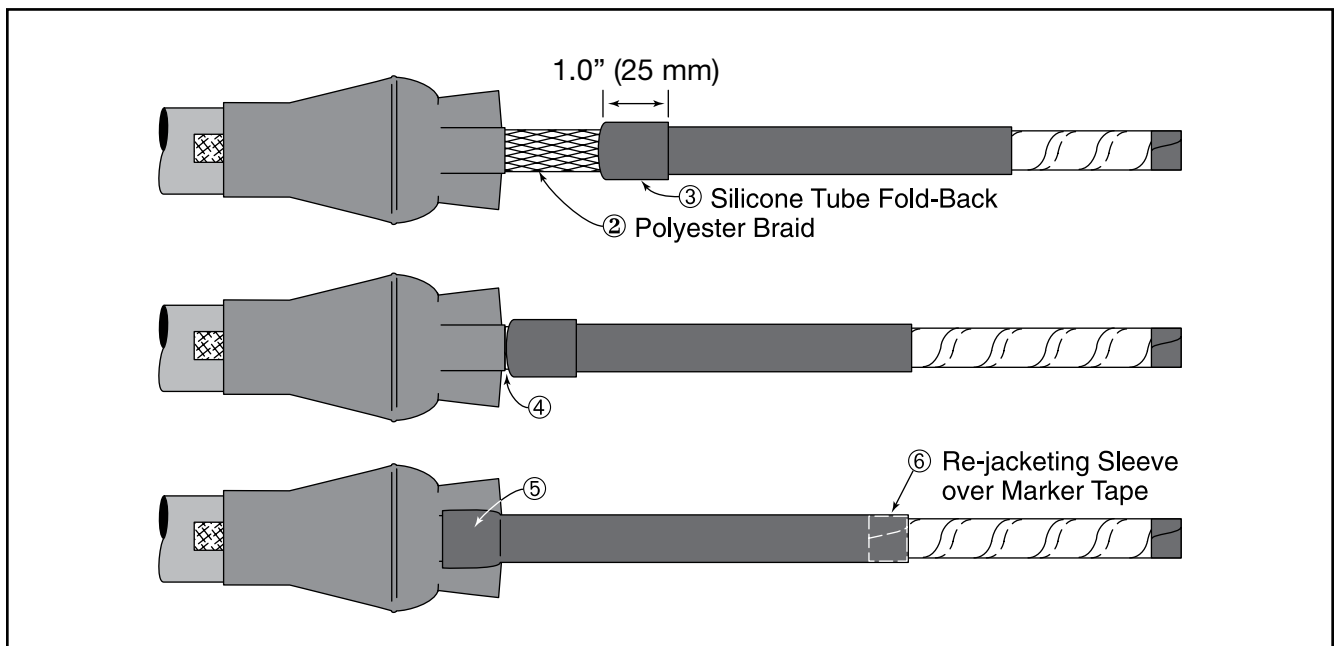


Figure 8

- 4.8 Slide re-jacketing sleeve assembly down until folded tube contacts edge of breakout boot finger (④ Figure 8).

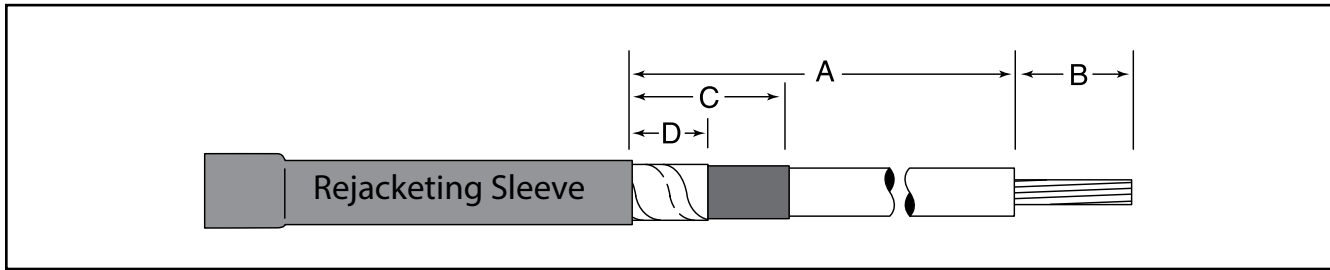
- 4.9 Pull folded silicone tube section down onto breakout boot finger (⑤ Figure 8).

Note: Re-jacketing tube end should align with upper edge of installed marker tape (⑥ Figure 8). Minor tube adjustments can be made as needed.

5.0 Install 3M™ Cold Shrink QT-III Termination Assemblies

5.1 Prepare cable phase legs according to dimensions shown (*Figure 9*).

NOTE: It is imperative to remove all remnants of the semi-con layer, even if the semi-con layer comes off as one layer. There should not be any remaining black areas, or particles, on the cable insulation layer.



| Kit Number | Dimension A | Dimension B | Dimension C | Dimension D |
|--|----------------|-------------|--------------|---------------|
| 7620-T-95-3W | 6.75" (171 mm) | Lug Depth* | 2.0" (51 mm) | 1.0" (25 mm) |
| 7621-T-95-3W 7623-T-95-3W 7624-T-95-3W 7625-T-95-3W | 5.50" (140 mm) | Lug Depth* | 2.5" (64 mm) | 1.25" (32 mm) |
| 7621-T-110-3W 7622-T-110-3W 7624-T-110-3W 7625-T-110-3W | 8.5" (216 mm) | Lug Depth* | 2.5" (64 mm) | 1.25" (32 mm) |
| 7625-T-125-3W | 7.0" (178 mm) | Lug Depth* | 1.5" (38 mm) | 0.75" (19 mm) |
| 7693-T-150-3W 7694-T-150-3W 7695-T-150-3W | 12.0" (305 mm) | Lug Depth* | 2.5" (64 mm) | 1.25" (32 mm) |

*Allow for crimp growth when using aluminum lugs and connectors.

Figure 9

| Aluminum Lug and Connector Growth Allowance | 2 - 350 1/4" (6 mm) | 400 - 650 1/2" (13 mm) | 750-1000 3/4" (19 mm) | 1250-2000 Field Determined |
|---|------------------------|---------------------------|--------------------------|-------------------------------|
|---|------------------------|---------------------------|--------------------------|-------------------------------|

5.2 Secure cable copper tape shield ends with 3M™ EMI Copper Foil Shielding Tape 1181 Strips (*Figure 10*).

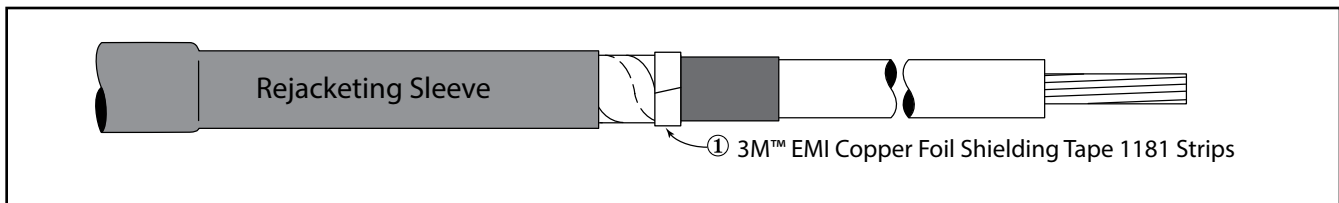


Figure 10

5.3 Secure rejacketing sleeve with two half-lapped layers of Scotch® Super 33+™ Vinyl Electrical Tape (*Figure 11*). Start taping 0.75" (19 mm) over rejacketing sleeve, extend 0.25" (6 mm) over cable metallic shield and return to starting point.

Note: Do not cover 3M™ EMI Copper Foil Shielding Tape 1181 Strips.

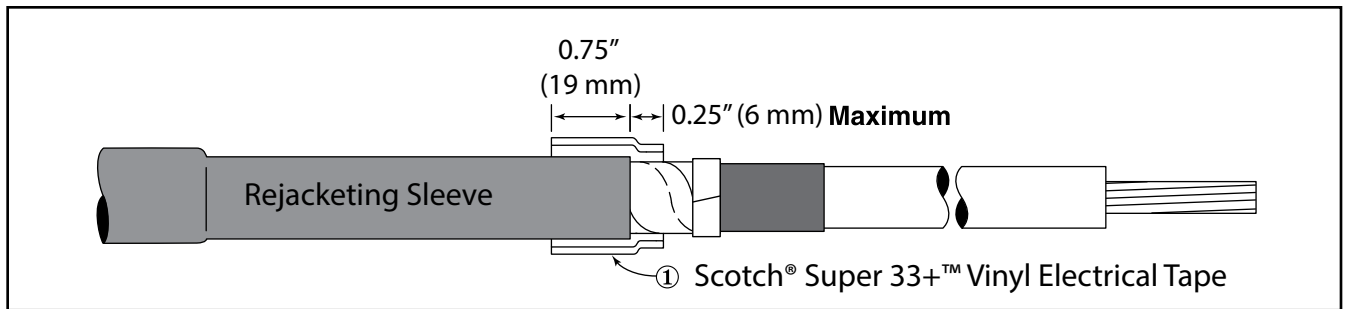


Figure 11

5.4 Place a termination installation marker tape at position [M] (Figure 12).

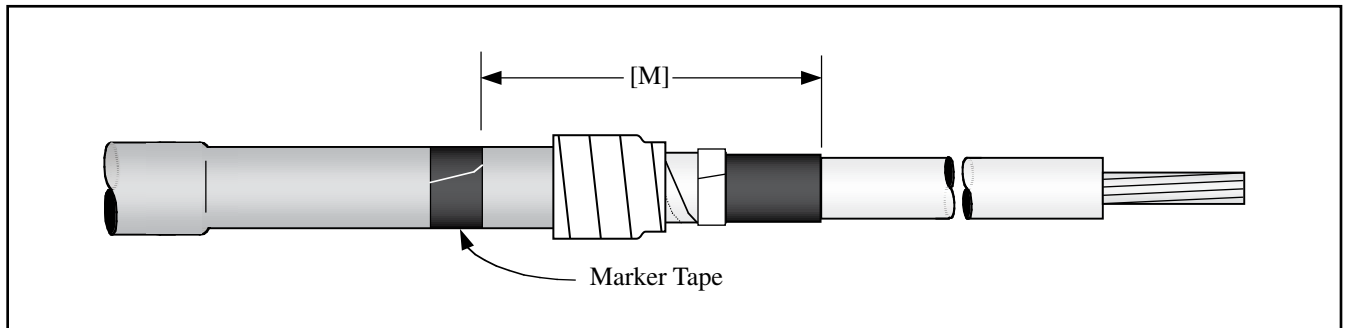


Figure 12

| Kit Number | Dimension M |
|---------------|---------------|
| 7620-T-95-3W | 4.0" (102 mm) |
| 7621-T-95-3W | 5.0" (127 mm) |
| 7623-T-95-3W | |
| 7624-T-95-3W | |
| 7625-T-95-3W | |
| 7621-T-110-3W | 5.0" (127 mm) |
| 7622-T-110-3W | |
| 7624-T-110-3W | |
| 7625-T-110-3W | |
| 7625-T-125-3W | 4.0" (102 mm) |
| 7693-T-150-3W | 5.0" (127 mm) |
| 7694-T-150-3W | |
| 7695-T-150-3W | |

5.5 Install terminal lugs.

Note: Special Case – When lug spade dimension is larger than inside diameter of white plastic termination core, position termination assemblies over cable phase legs prior to installing lugs.

Remove inner red shipping core from each termination assembly by pulling and unwinding the loose red core ribbon. Position one termination over each cable phase leg. Each termination assembly must be positioned with its loose white core ribbon end directed toward the open (cut) end of the cable. Continue with lug installations.

- (a.) **For Aluminum Conductors - Thoroughly wire brush conductor strands to remove aluminum oxide layer. Immediately insert conductor into terminal lug barrel as far as it will go.**
- (b.) **Ensure that each lug face is parallel to equipment bushing or lug connection interface (Figure 13).**

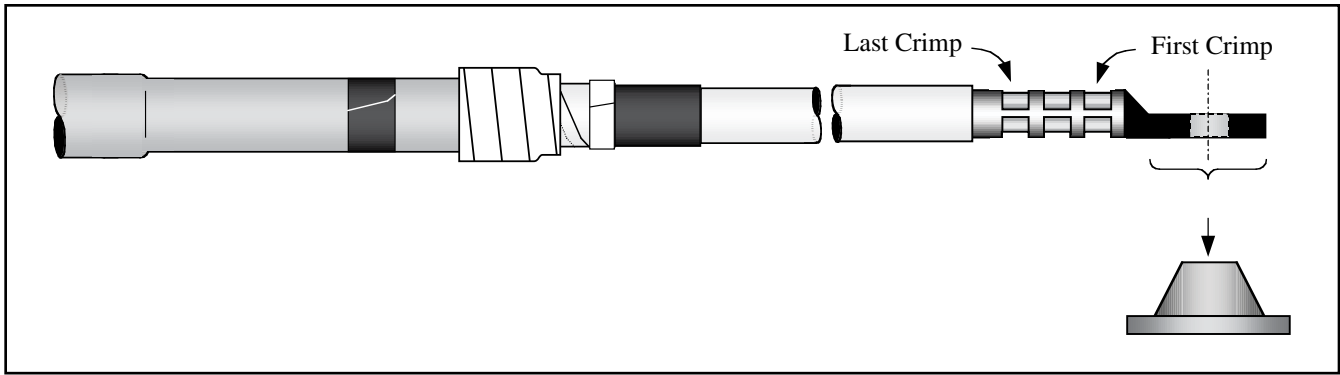


Figure 13

- (c.) Crimp terminal lug according to manufacturer recommendations. Start at the upper end as shown (Figure 13). Remove all traces of oxide inhibitor that may have come out of lug barrel during crimping.
- (d.) If abrasive must be used:
 1. Use on insulation only. **DO NOT USE ABRASIVE ON SEMI-CON INSULATION SHIELD!**
 2. Use only aluminum oxide abrasive; grit 120 or finer.
 3. Be careful not to reduce the cable insulation diameter below that allowed by the kit.
- (e.) Thoroughly clean primary insulation and lug barrel area using solvent wipe from supplied 3M™ Cable Cleaning Preparation Kit CC-2.

NOTE: DO NOT ALLOW SOLVENT TO TOUCH SEMI-CON INSULATION SHIELD!

5.6 Install 3M™ Cold Shrink QT-III Termination assemblies.

- (a.) Remove the inner red shipping core from the termination assembly by pulling and unwinding the loose red core end.
- (b.) Position the termination assembly with the loose white core ribbon directed toward the terminal lug.
- (c.) Align the base of the termination (not the plastic core) with the installation marker tape as shown (Figure 14).
- (d.) Grasp the loose white core ribbon. Pull and unwind counter-clockwise around cable end (Figure 14).

NOTE: Once the termination body makes contact, there is no need to continue supporting the assembly. DO NOT PUSH OR PULL ON THE TERMINATION ASSEMBLY WHILE UNWINDING THE CORE.

- (e.) Remove the installation marker tape.

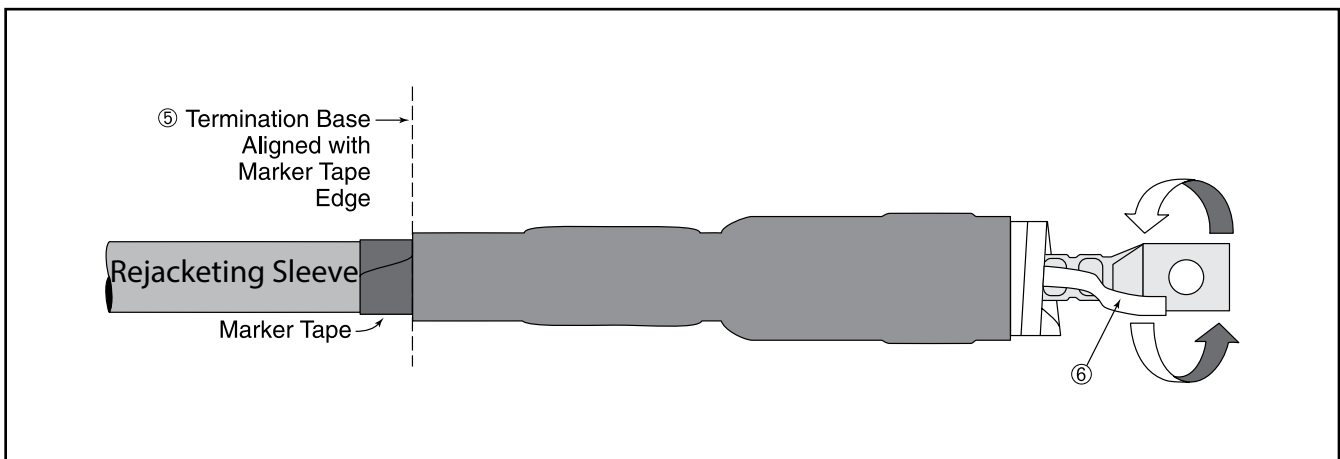


Figure 14

5.7 Collect shield-grounding braids together and connect to system ground (earth) according to standard practice.

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