Cold Shrink™

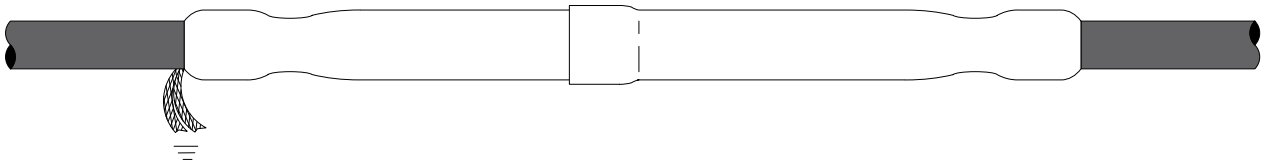
QS2011T Splice Kit 15kV

PILC to PILC

Instruction Sheet

IEEE Std. No. 404

15 kV Class
110 kV BIL



Application Chart

PILC Cable	**Insulation O.D. Range**	**Conductor Size (AWG)**
	0.56 – 0.88 in. (14,2 – 22,4 mm)	#4 – 2/0 (25 – 70 mm^2)
Connector	**O.D. Range ✳**	**Length Range ✳**
	0.70 – 1.02 in. (17,8 – 25,8 mm)	3.50 – 5.25 in. (89 – 133 mm)

✳ **NOTE: If 2000T connector is not used and connector O.D. and/or length is less than minimum, a metallic shielding braid tape is required in addition to kit contents ie; Scotch™ 24 Electrical Shielding Tape.**

PILC Cable
(paper insulated lead covered)

3M Cold Shrink™

PILC Splice Kit

for splicing PILC Cable to PILC Cable

QS 2011T

78–8096–4523–3

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Kit Contents

1 Cold Shrink™ Splice Body
2 Cold Shrink™ Oil Stop Tubes (thin-wall)
2 Cold Shrink™ Jacket Tubes
1 Shielding Sleeve (3 ft.)
3 Constant Force Springs (shield connectors)
1 Ground Braids
1 Roll White Restricting Tape
1 Roll, Scotch™ 13 Semi-Conducting Tape
1 Roll, Scotch™ 23 Tape
1 Roll, Scotch™ Rubber Mastic (unmarked)
2 Tubes, 3M P55/R Compound (red)
6 Strips, Sealing Mastic
2 Cable Preparation Templates
2 Instruction Booklets

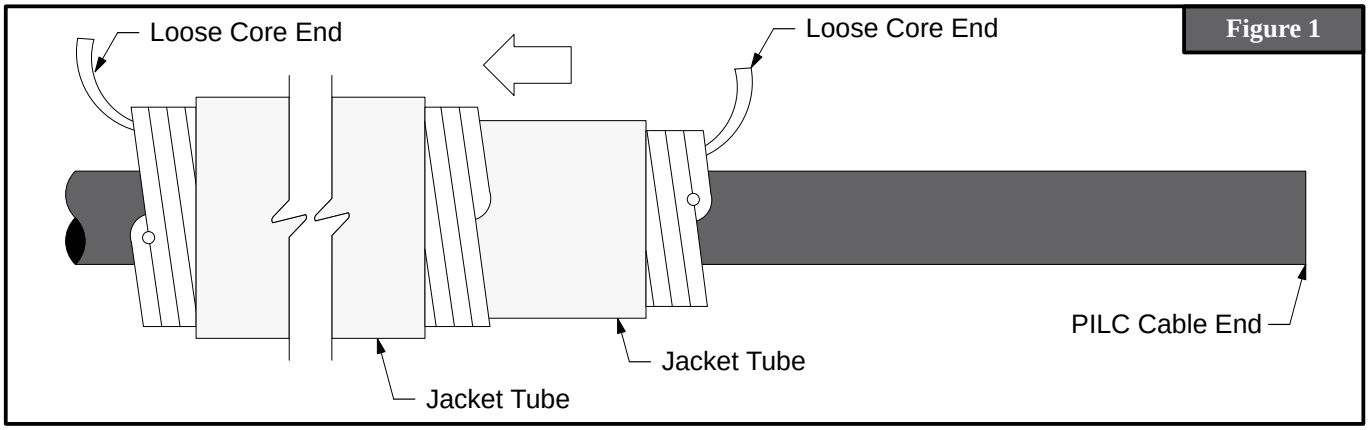
✻ NOTE: Vinyl Tape is required, NOT INCLUDED in kit.

A. Position Components on Cable

1. Slide 2 Cold Shrink™ Jacket Tubes onto PILC cable (largest Cold Shrink™ assemblies) with loose core ends facing opposite directions as shown in *(Figure 1)*.

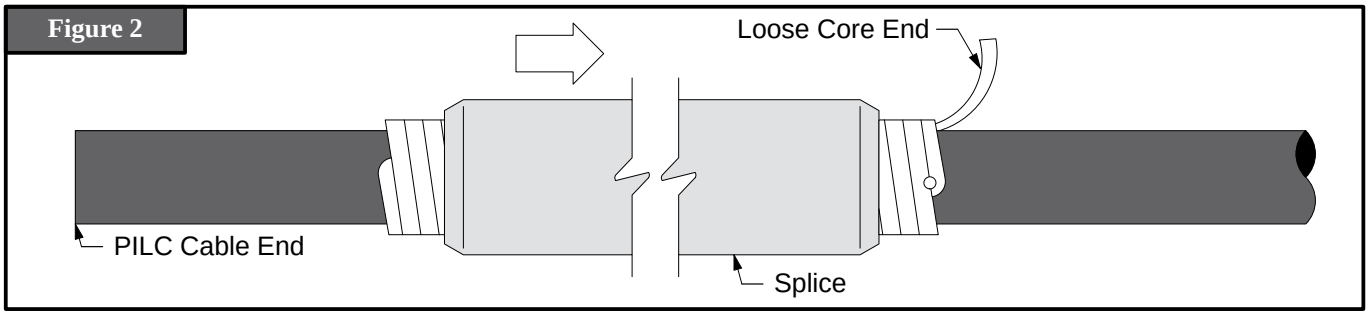
NOTE: Cold Shrink™ components may be telescoped to save space *(Figure 1)*.

Figure 1



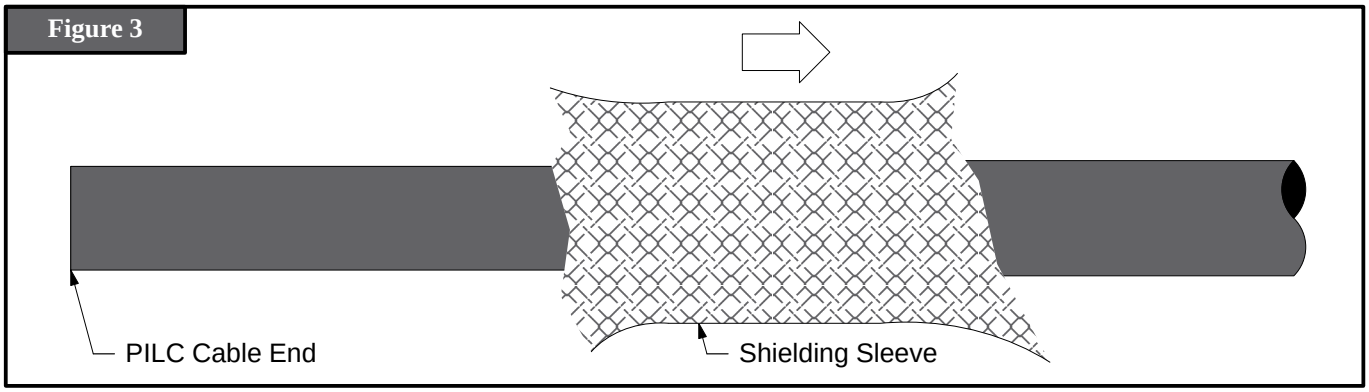
2. Slide Cold Shrink™ heavy wall splice body onto other PILC cable, with loose core end leading, facing away from cable end *(Figure 2)*.

Figure 2



3. Expand diameter of Shielding Sleeve by pushing in at ends (to shorten) and slide onto one PILC cable *(Figure 3)*.

Figure 3

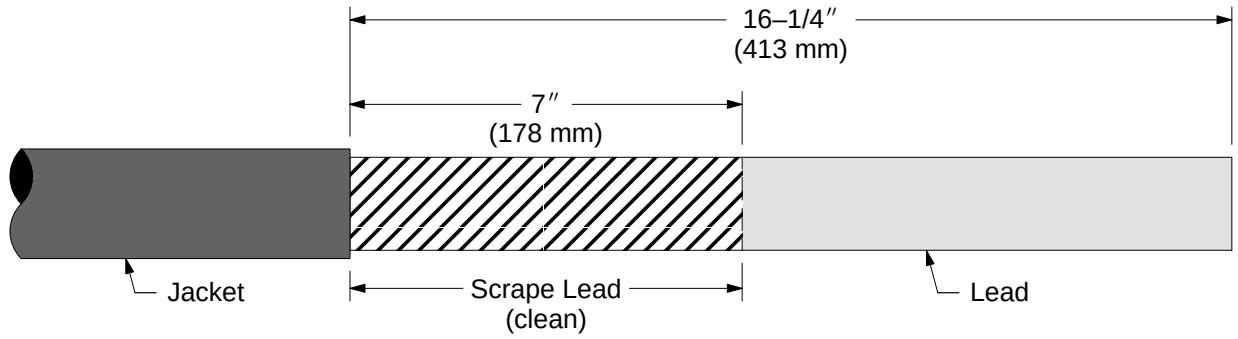


B. Prepare PILC Cables

1. Prepare cables according to *figures 4 and 5*.

NOTE: For non-jacketed cable, place a tape marker on lead sheath to mark where a jacket would end (as reference for measuring).

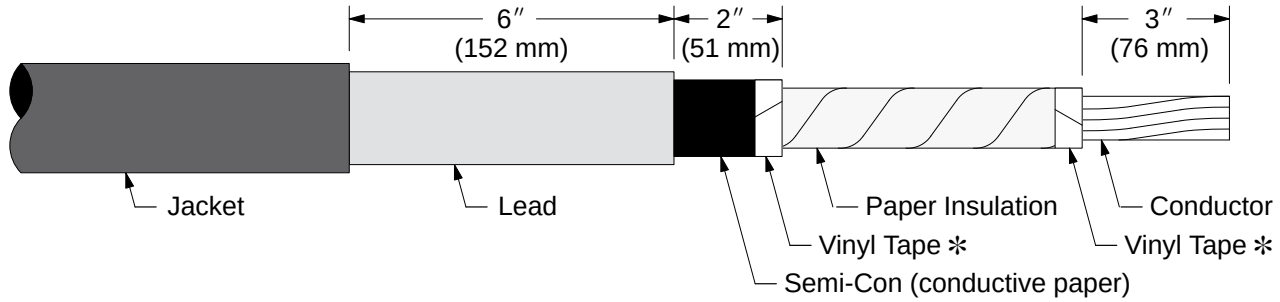
Figure 4



2. To accommodate long connectors, the insulation cutback dimension of 3″ (76 mm) may be increased to 3–1/2″ (89 mm) maximum. To obtain oil stop, the cutback dimension should include 1/2″ (13 mm) exposed conductor between connector end and insulation end (with connector installed). **DO NOT change any other dimensions**.

*** NOTE: Vinyl tape need not be removed. DO NOT EXCEED 2 WRAPS OF TAPE PER BAND.**

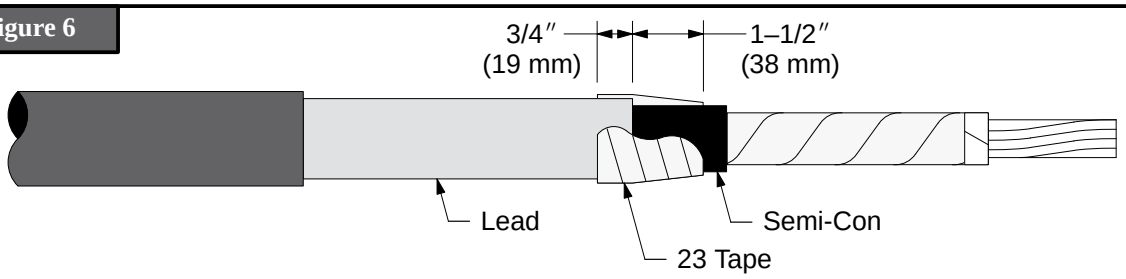
Figure 5



C. Install Oil Stop

1. On both cables fill the step at the edge of the lead with 23 tape. Build a smooth taper for a distance of 1–1/2″ (38 mm) from lead to semi-con, over-lapping 3/4″ (19 mm) onto lead with 2 highly stretched layers *(Figure 6)*.

Figure 6



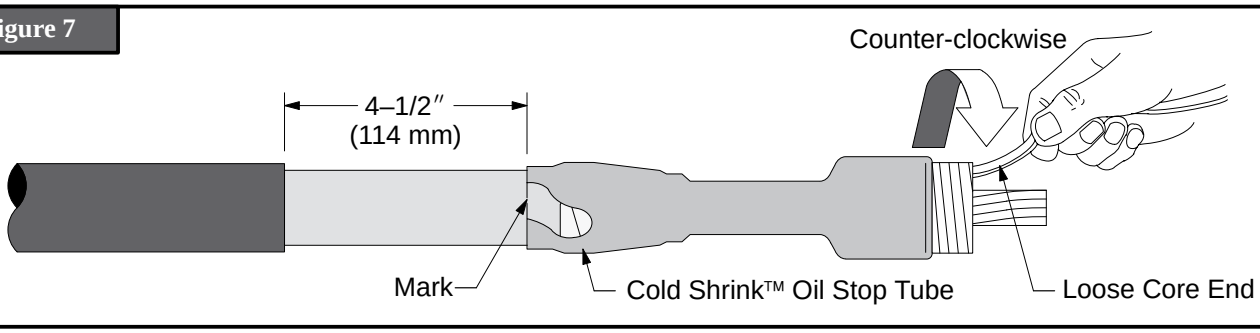
2. Mark lead 4–1/2″ (114 mm) from jacket end. Position Cold Shrink™ Oil Stop Tubes (THIN WALL, SMALL DIAMETER) over prepared cables, aligning end of tube (not core) with mark *(Figure 7)*.

NOTE: Loose core end should face cable end.

3. Install Oil Stop Tubes by unwinding loose core ends counter-clockwise, carefully maintaining alignment with mark *(Figure 7)*.

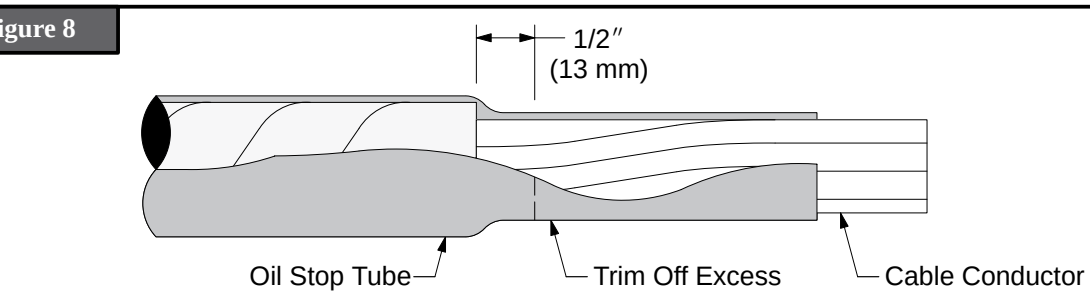
NOTE: An occasional tug of the core strand while unwinding will aid core removal.

Figure 7



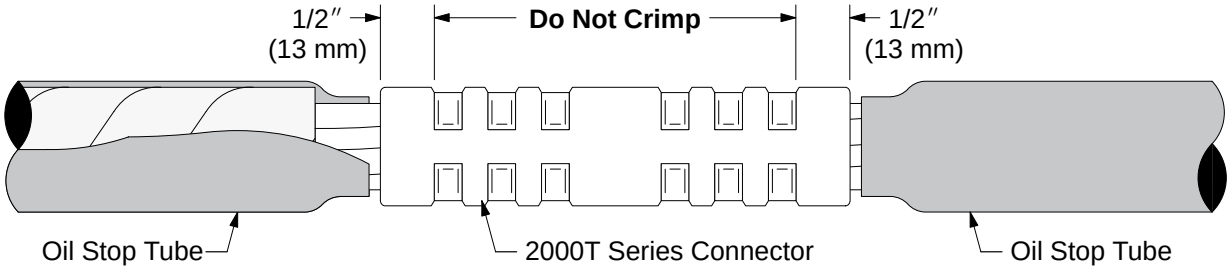
4. Trim off excess Oil Stop Tube, over lapping conductor more than 1/2″ (13 mm) *(Figure 8)*.

Figure 8



5. Join cables with appropriate size connector. If 2000T Series connector is used, **DO NOT crimp closer than 1/2″ (13 mm) from connector ends *(Figure 9)***. Crimping information specific to 2000T Series connectors can be found on *(pages 12 and 13)*.

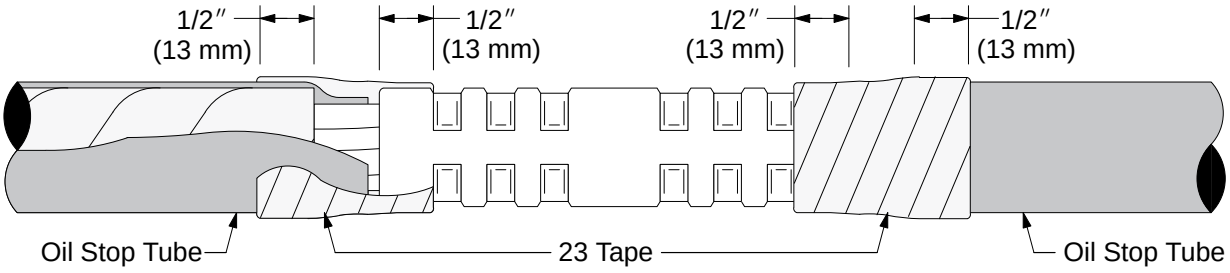
Figure 9



C. Install Oil Stop (continued)

6. Fill-in depression formed between end of oil/paper cable insulation and connector with highly stretched 23 Tape. Apply so final 2 half-lapped layers extend 1/2″ (13 mm) onto cable insulation and connector *(Figure 10)*. If connector O.D. is smaller than cable insulation O.D. apply multiple wraps of 23 Tape at connector end to the approximate diameter of cable insulation.

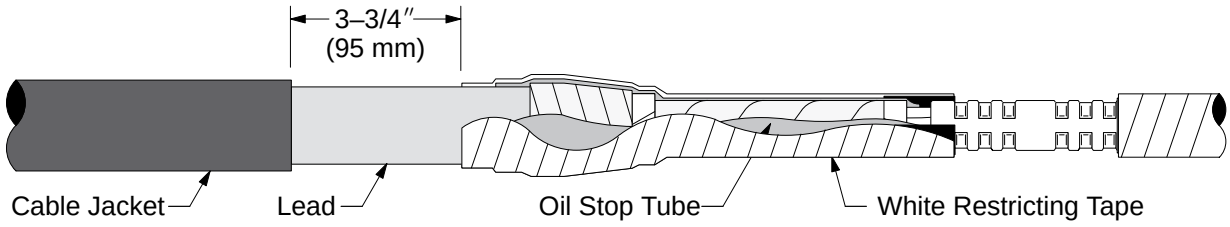
Figure 10



7. Apply 4 half-lapped layers of White Restricting Tape over the applied 23 Tape and Cold Shrink™ Oil Stop Tubes, installed on oil/paper insulation starting and ending on lead, 3–3/4″ (95 mm) from end of cable jacket *(Figure 11)*.

NOTE: This tape does not stretch, but should be applied with CONSTANT TENSION TO AVOID WRINKLING.

Figure 11

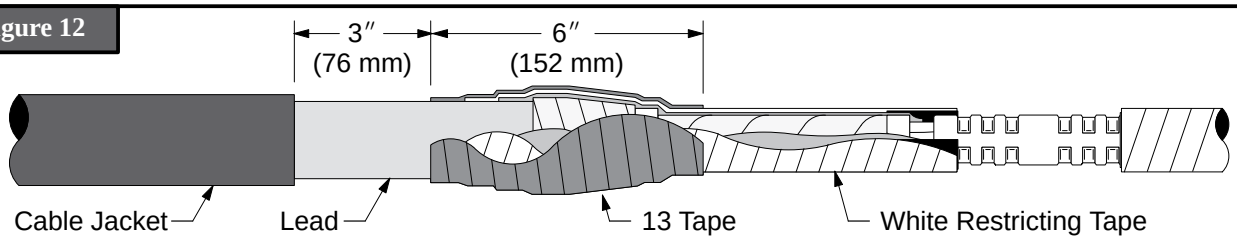


NOTE: When applying White Restricting Tape over uneven surfaces, thumb may be used to smooth it as it is applied. Apply the tape as smooth as possible.

D. Install Splice

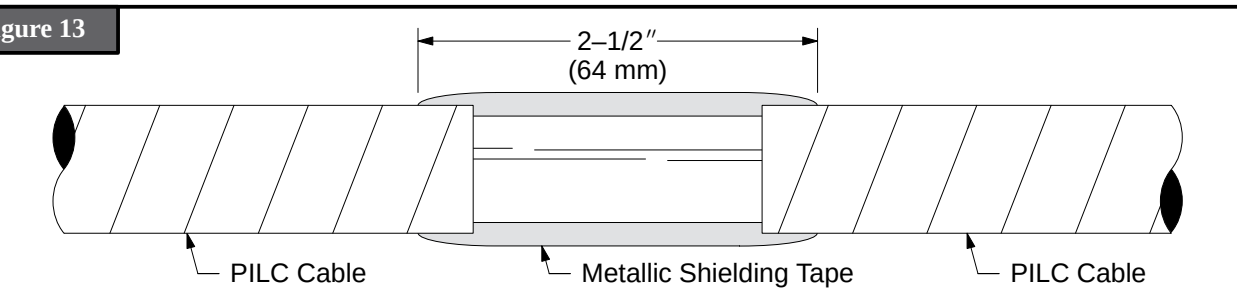
1. Apply 2 half-lapped layers of 13 Semi-Conducting Tape from the lead onto the White Restricting Tape. Start 3″ (76 mm) from end of cable jacket and apply for 6″ (152 mm) *(Figure 12)*.

Figure 12



2. If a connector other than a 2000T Series is used, and the O.D. is less than 0.70″ (17,8 mm) and /or length is less than 3–1/2″ (89 mm) increase the connector diameter to 3/4″ (19 mm) by applying successive half-lapped layers of metallic shielding tape (ie; Scotch™ 24 Electrical Shielding tape) over connector center for a distance of 2–1/2″ (64 mm). Secure end of shielding tape with solder *(Figure 13)*.

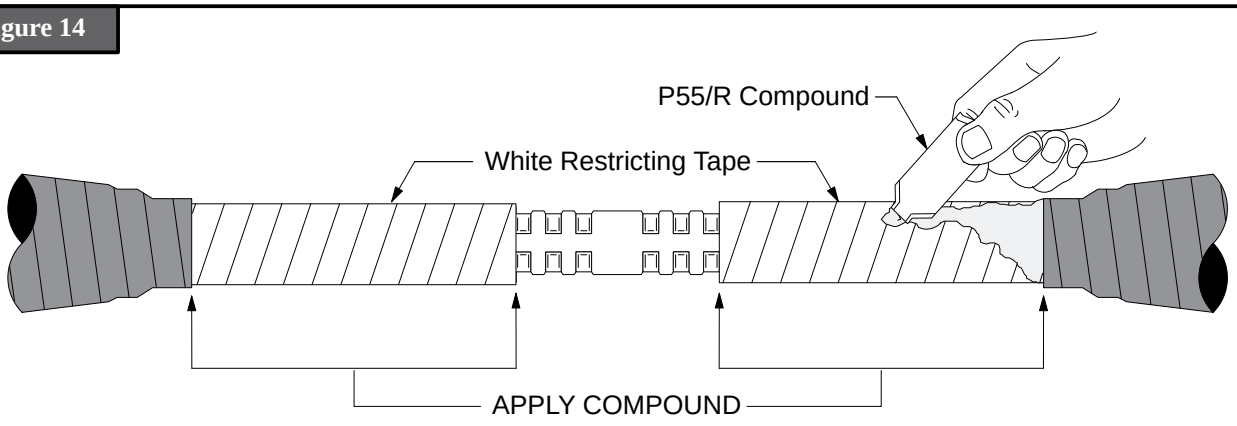
Figure 13



3. Apply a liberal amount of P55/R Compound over the exposed White Restricting Tape, extending onto the edges of semi-conducting tape *(Figure 14)*.

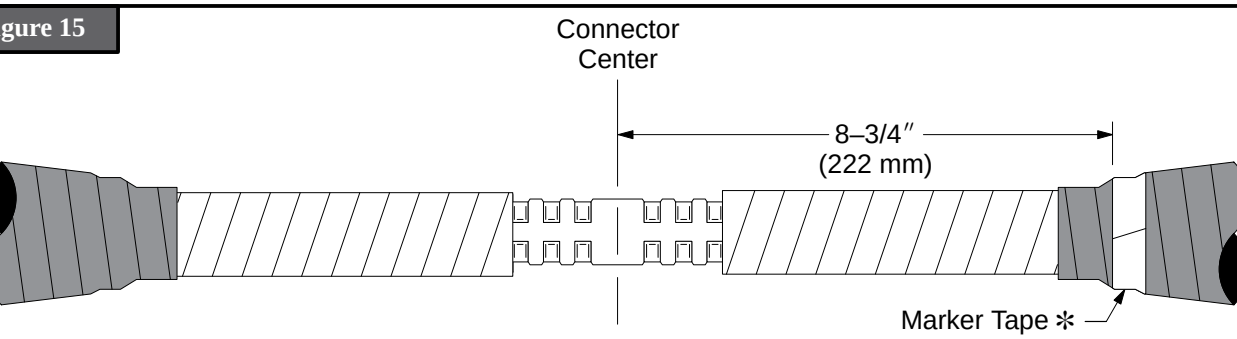
CAUTION: DO NOT USE SILICONE GREASE

Figure 14



4. On cable opposite of where splice body is parked, apply a wrap of vinyl tape to serve as a "marker", 8–3/4″ (222 mm) from connector center *(Figure 15)*.

Figure 15



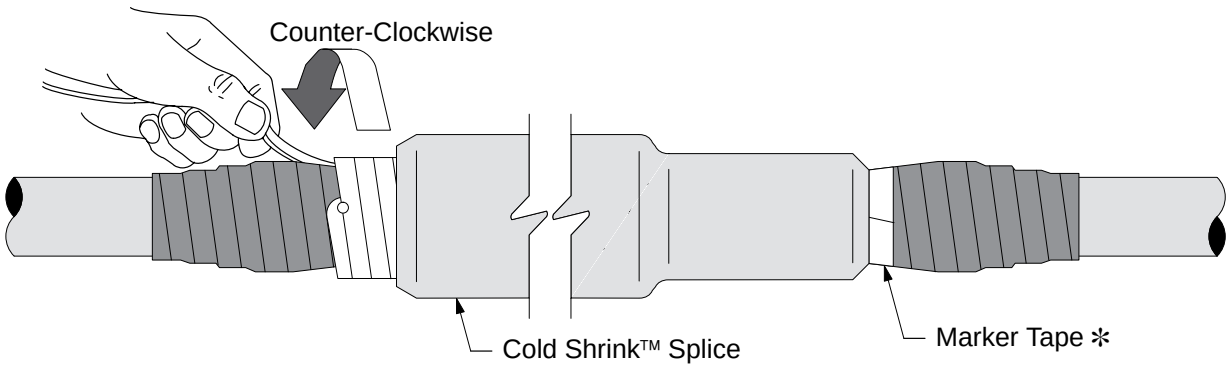
D. Install Splice (continued)

5. Position Cold Shrink™ Splice so leading edge of splice (not core) aligns with tape "marker" previously applied *(Figure 16)*.

6. Install splice by removing core, unwinding counter-clockwise *(Figure 16)*.

TIP: An occasional tug of the core strand while unwinding will aid core removal.

Figure 16

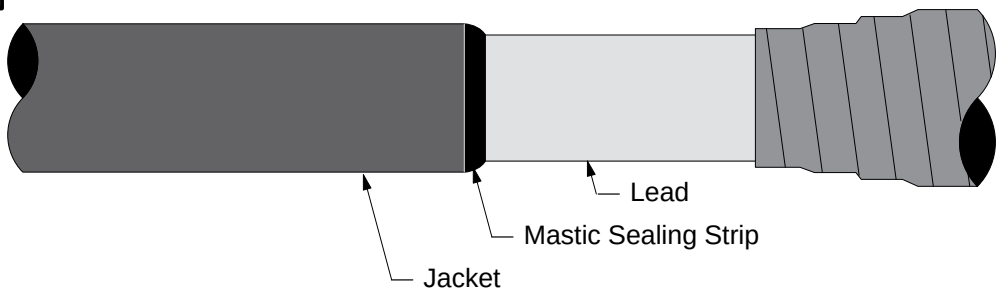


E. Install Ground Braid

1. Apply a Mastic Sealing Strip at edge of PILC cable jackets, forming a seal to the cable lead *(Figure 17)*.

NOTE: This step does not apply to non-jacketed PILC cable.

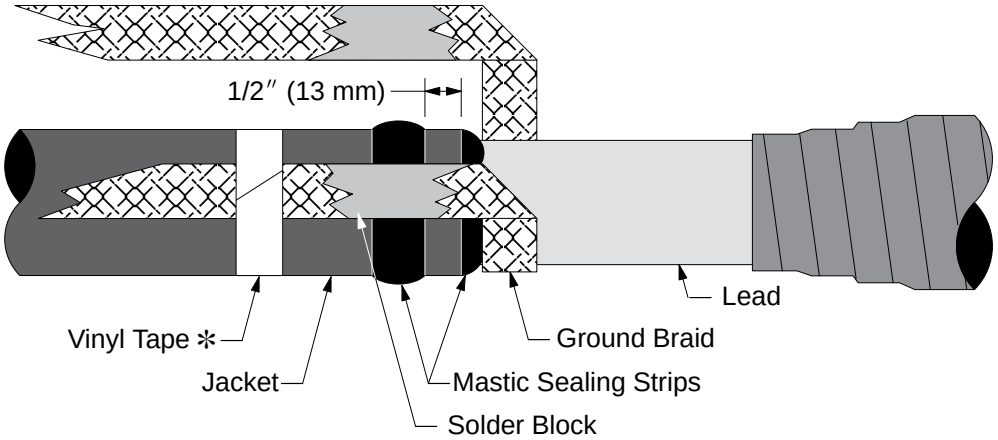
Figure 17



2. At one end of splice apply a Mastic Sealing Strip around cable jacket, 1/2″ (13 mm) from jacket edge *(Figure 18)*.

3. Position Ground Braid with one leg along PILC cable jacket, centering solder-block on Mastic Sealing Strip as shown in *Figure 18*. Secure the braid to the cable jacket with vinyl tape *(Figure 18)*.

Figure 18



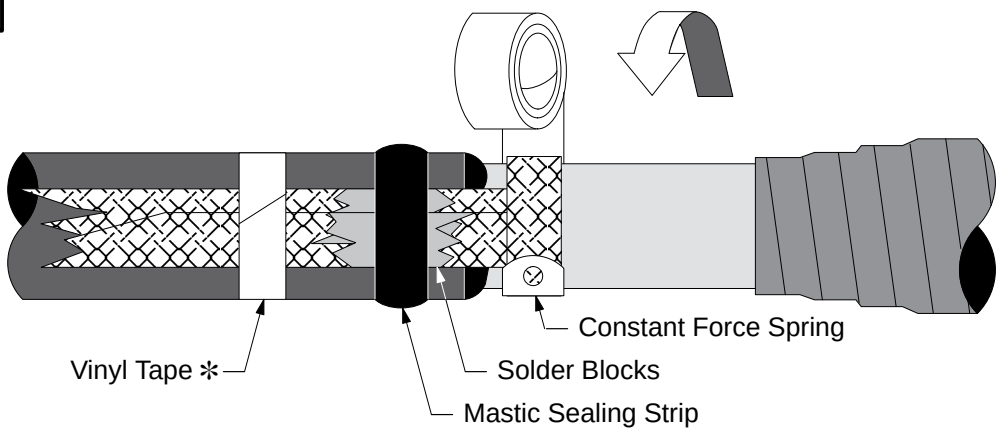
4. Wrap braid around cable lead and secure with Constant Force Spring. Wrap spring in the same direction as the ground strap and cinch (tighten) the final wrap *(Figure 19)*.

5. Hold 2ND leg in place with an application of vinyl tape *(Figure 19)*.

6. Press solder blocks into mastic. Apply another Mastic Sealing Strip over solder-blocks and previous Mastic Seal *(Figure 19)*.

NOTE: If solder-blocks overlap at Mastic Seal, apply a short length of mastic between them.

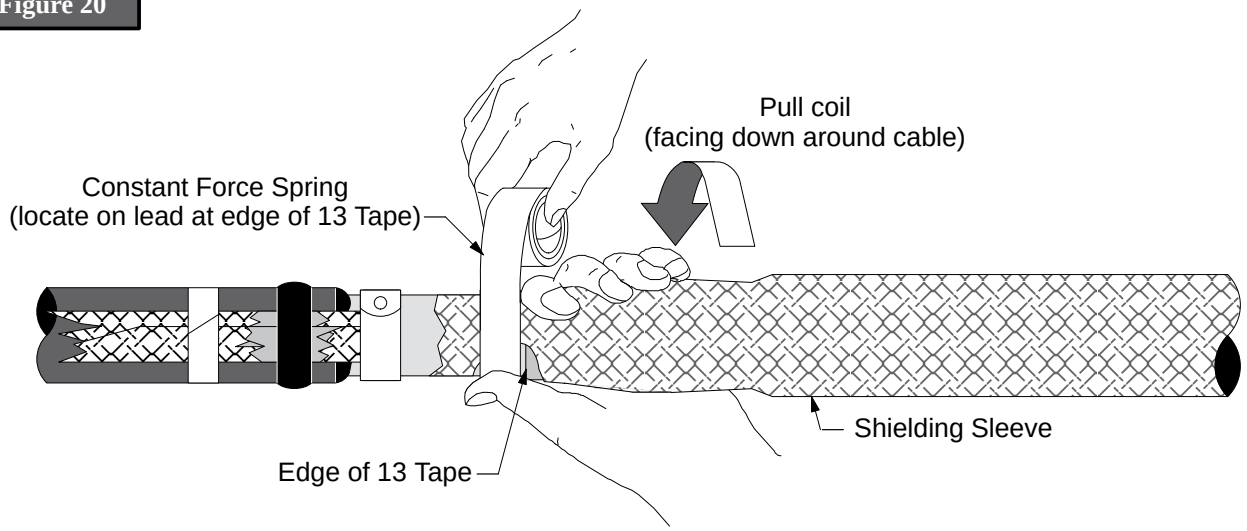
Figure 19



F. Install Shielding Sleeve

1. Center Shielding Sleeve over splice. Use hands to lengthen sleeve, conforming it to surface of splice and cables *(Figure 20)*.
2. Secure sleeve to PILC cable's exposed lead. Install a Constant Force Spring for 1 wrap only, around the sleeve and lead, just beyond edge of 13 tape *(Figure 20)*.

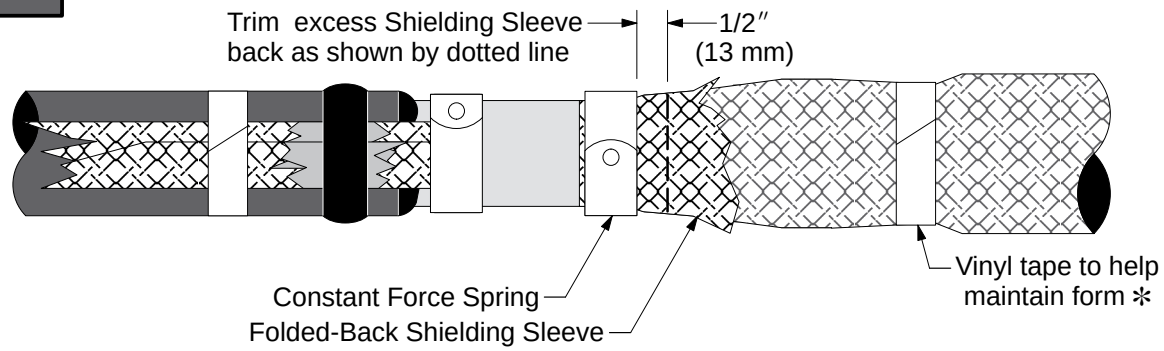
Figure 20



3. Fold end of Shielding Sleeve back over the single wrap of spring, then continue installing spring over the folded-back sleeve. Trim folded-back sleeve at 1/2″ (13 mm) from spring *(Figure 21)*.

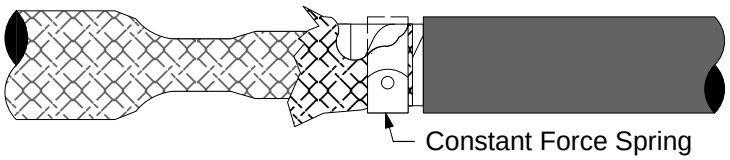
   NOTE: Make certain that Shielding Sleeve is snug against splice. Securing with vinyl tape will help maintain form across splice body *(Figure 21)*.

Figure 21



4. Secure opposite end of sleeve, using same method descibed in *Steps 2 and 3 (Figure 22)*.

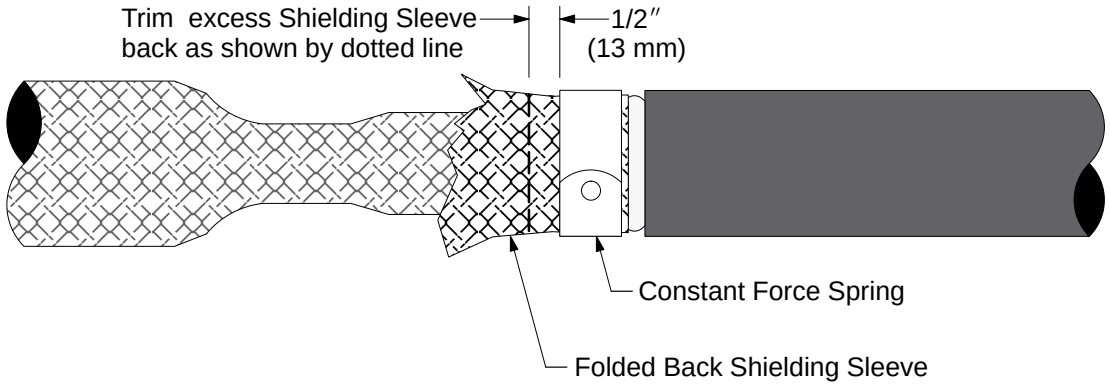
Figure 22



F. Install Shielding Sleeve (continued)

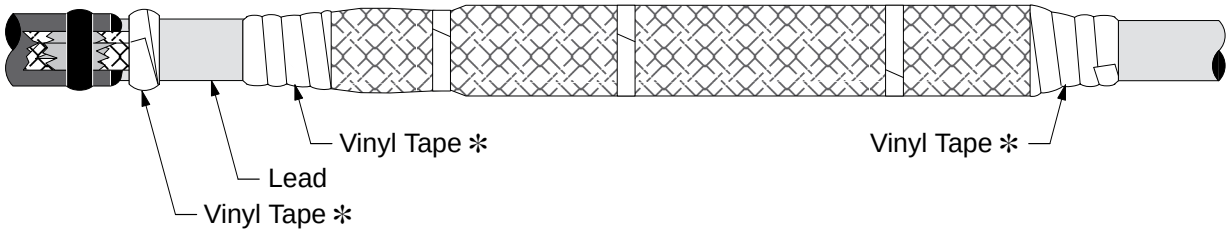
5. Trim folded-back Shielding Sleeve at 1/2″ (13 mm) from spring *(Figure 23)*.

Figure 23



6. Apply vinyl tape, over all springs and folded-back Shielding Sleeve *(Figure 24)*.

Figure 24



G. Install Splice Jacket

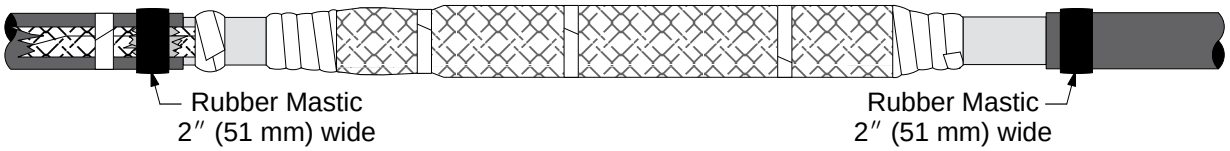
1. Apply Rubber Mastic (2″ [51 mm] wide unmarked roll), mastic side down, over ends of cable jackets. Build up the thickness to the diameter listed in *Table 1* below and *(Figure 25)*.

Cable Conductor Size (AWG)	Rubber Mastic	
	Number of Wraps	Minimum Mastic O.D.
4 – 1/0 (25 – 60 mm^2)	6*	1–5/8″ (41 mm)
2/0 – 3/0 (61 – 70 mm^2)	5*	

Table 1

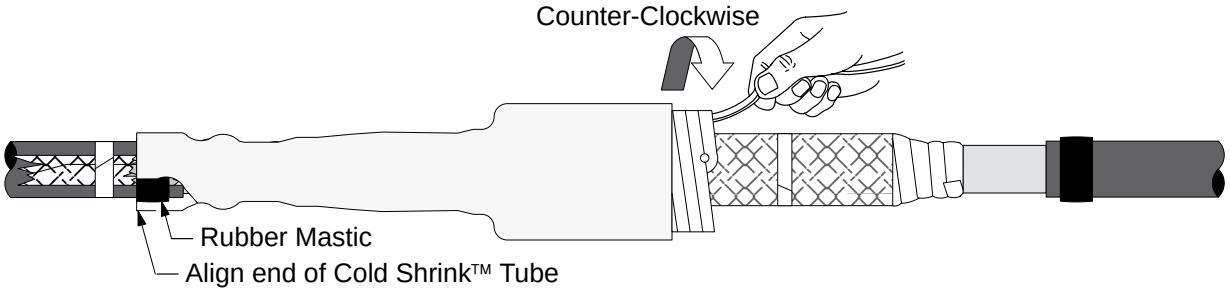
***NOTE: Highly stretch first and last wraps, to aid in forming a tight seal.**

Figure 25



2. Slide smaller diameter Cold Shrink™ Jacket tube into position over splice. Align end of tube (not core) so that previously applied Rubber Mastic is completely covered and install by removing core *(Figure 26)*.

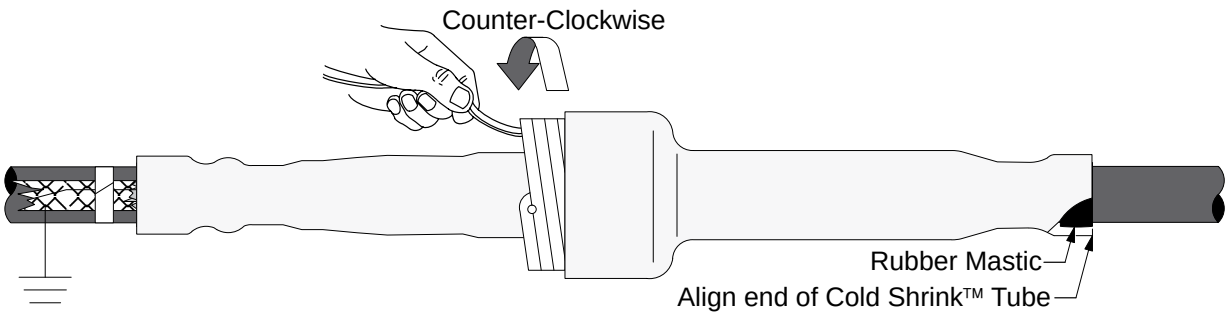
Figure 26



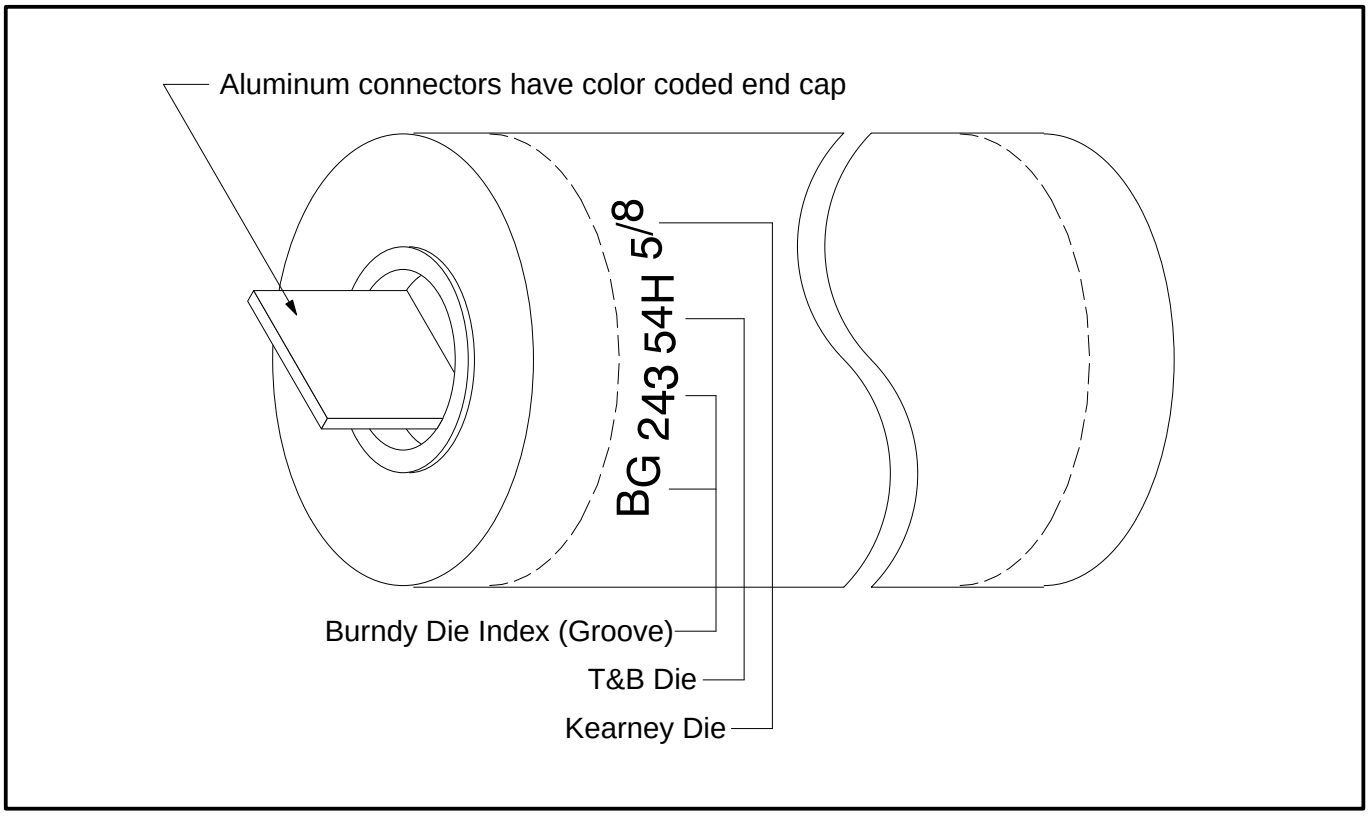
3. Slide larger diameter Cold Shrink™ Jacket Tube into position over opposite end of splice, aligning tube to cover Rubber Mastic and install by removing core *(Figure 27)*.

4. If ground braid was attached *(Figures 17 – 19)* connect braid to ground.

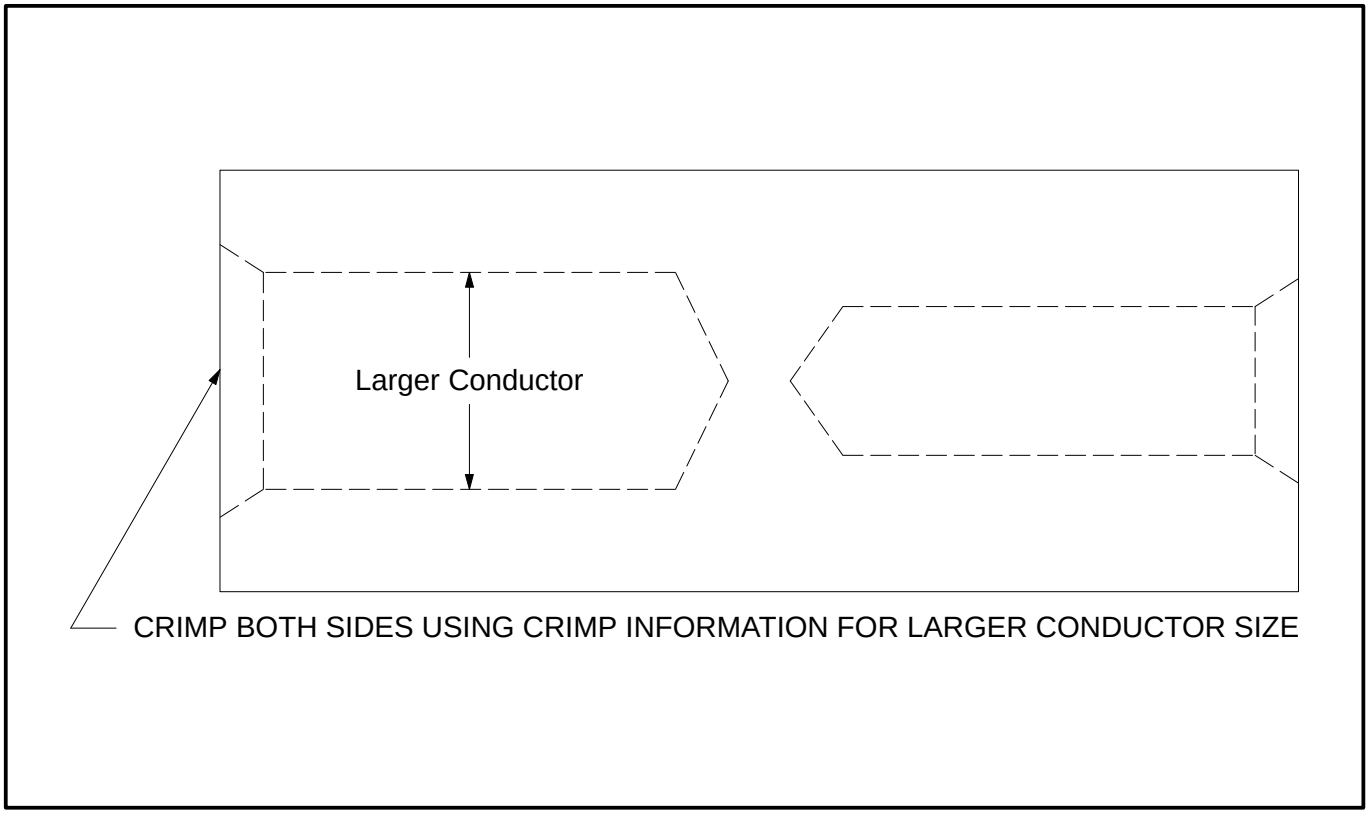
Figure 27



Connector Crimping Information – Scotchlok™ 2000T Series



Conductor Size Transition
Aluminum Connectors (Copper/Aluminum)



Aluminum Connectors (Copper/Aluminum)

Conductor Size (AWG)	CRIMPING TOOL–DIE SETS (NO. OF CRIMPS/END)								
	Burndy		Kearney			Thomas & Betts			Anderson
	MD6	Y35, Y39, Y45*, Y46*	0–52, 0–51	WH–1, WH–2 WH–3, PH15	PH25	TBM 5 TBM 8	TBM 12	TBM 14M TBM 15	VC6
4 3 2 1 1/0	BG (5) WBG (2)	UBG (2) U25ART (2) U243 (2)	5/8 to 1 (5)	5/8 to 1 (4)	5/8 to 1 (3)	Olive (2)**	54 (2)**	54H (4)**	Universal (2)
2/0 3/0	W249 (3)	U28ART (2)	840 (4)	840 (3)	840 (2)	Red (3)**	71H (3)**	71H (3)**	Universal (2)

*** Y45 and Y46 accept all Y35 dies (“U” series). For Y45 use PT6515 adapter. For Y46 use PUADP adapter.**
**** Excess flash must be filed off to round out connector.**

Copper Connectors

Conductor Size (AWG)	CRIMPING TOOL–DIE SETS (NO. OF CRIMPS/END)							
	Burndy				Thomas & Betts			Anderson
	MD6	MY29	Y34A	Y35, Y39, Y45*, Y46*	TBM 5 TBM 8	TBM 12	TBM 14M TBM 15	VC6–3, VC6–FT**
4	W161 (1)	4 AWG (1)	A4CR (1)	U4CRT (1)	Grey (1)	29 (1)	29 (1)	Universal (1)
2	W162 (2)	2 AWG (1)	A2CR (1)	U2CRT (2)	Brown (1)	33 (1)	33 (1)	Universal (1)
1	W1CRT (2)	1 AWG (1)	A1CR (1)	U1CRT (2)	Green (1)	37 (1)	37 (1)	Universal (1)
1/0	W163 (2)	1/0 (1)	A25R (1)	U25RT (1)	Pink (2)	42 (1)	42H (2)	Universal (1)
2/0	W241 (2)	2/0 (1)	A26R (1)	U26RT (2)	Black (2)	45 (1)	45 (1)	Universal (1)
3/0	W243 (2)	3/0 (1)	A27R (1)	U27RT (2)	Orange (2)	50 (1)	50 (1)	Universal (1)

*** Y45 and Y46 accept all Y35 dies (“U” series). For Y45 use PT6515 adapter. For Y46 use PUADP adapter.**
**** Anderson VC6–3 and VC6–FT require no die.**

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