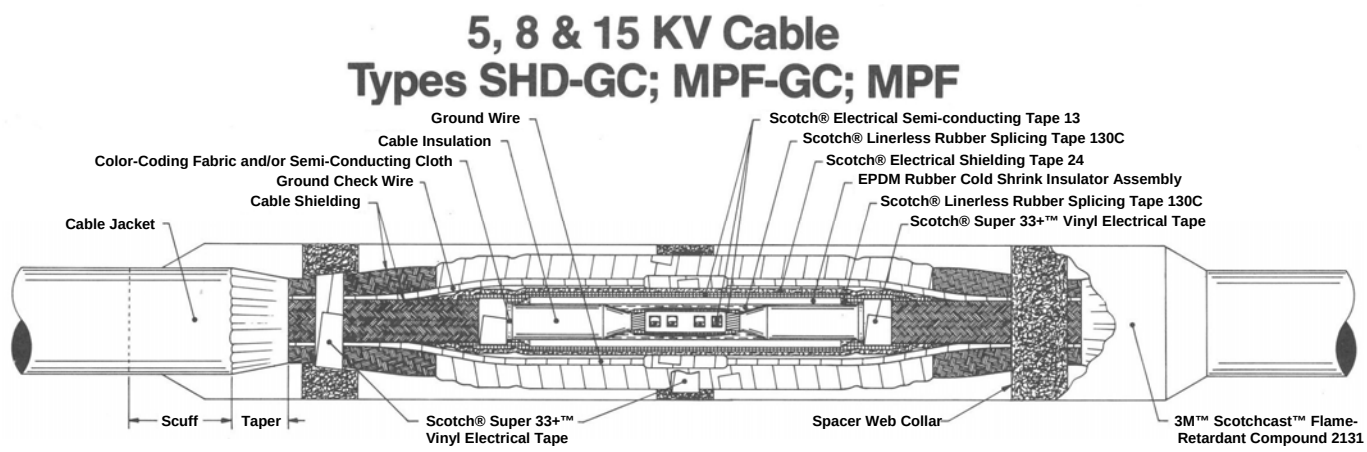
3M™ Scotchcast™ Mine and Portable Cable Splice Kit 8096-2

Installation Instructions

1.0 Kit Contents:

- 2 Funnels
- 1 Wrap-around Splice Mold
- 2 Rubber Mold Straps
- 2 Funnel Supports
- 3 Spacer Webs
- 1 Strip 3M™ Three-M-Ite™ Eleck-Tro-Cut™ Abrasive Cloth, 80J Grit
- 5 Size C Bags, Scotchcast™ Flame-Retardant Compound 2131
- 3 EPDM Rubber Cold Shrink Insulator Assemblies
- 1 Roll Scotch® Super 33+™ Vinyl Electrical Tape
- 2 Rolls Scotch® Electrical Shielding Tape 24
- 1 3M™ Cable Cleaning Preparation Kit CC-2
- 1 Roll Scotch® Electrical Semi-conducting Tape 13
- 1 Roll Scotch® Linerless Rubber Splicing Tape 130C



NOTE: *On large 15 kV cables, additional Scotch® Tape 130C, Scotch® Tape 13 and Scotch® Tape 24 may be required.*

DANGER: BEFORE ATTEMPTING ANY CABLE REPAIRS, MAKE SURE THAT THE PROPER CABLE IS DISCONNECTED, LOCKED OUT AND SUITABLY TAGGED.

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.

Technical Information:	3M™ Scotchcast™ Mine and Portable Cable Splice Kit 8096-2
For use on three conductor mine and portable cables: 5 & 8kV Type SHD-GC: 4 AWG to 1/0 AWG Type MPF-GC & MPF: 4 AWG to 3/0 AWG 15 kV Type SHD-GC: 2 AWG Type MPF-GC & MPF 2 AWG to 1/0 AWG Mine Safety and Health Administration Acceptance: 07-KA060007-MSHA	78-8126-9792-4

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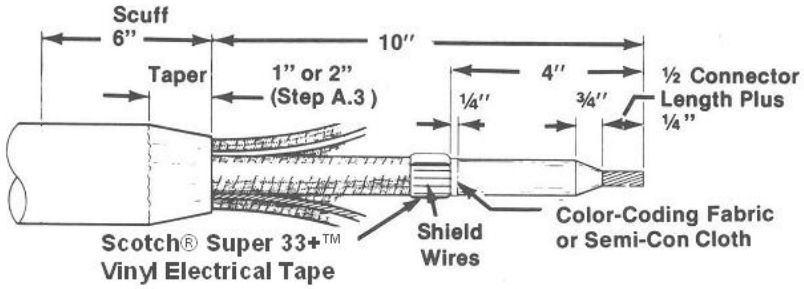
2.0 Prepare Cables

Figure 1



2.1. Position cables and cut so conductor ends butt squarely.

2.2 Remove cable jackets for 10" (250 mm). (Figure 1)

2.3 **FULLY** taper jacket ends: 1" (25 mm) for jackets less than 3/16" (5 mm) thick
2" (50 mm) for jackets of 3/16" (5 mm) and thicker

2.4 Scuff jacket ends for 6" (150 mm) with coarse #80 abrasive provided. Clean dust from scuffed area. (Figure 1)

2.5 Remove cable fillers back to jackets.

2.6 Apply 2 wraps of tightly stretched Scotch® Super 33+™ Vinyl Electrical Tape around each conductor, 4" (100 mm) from end. (Figure 1)

2.7 Bend shielding back over the Scotch® Super 33+ Tape. *USE CARE TO EVENLY DISTRIBUTE WIRES.* (Figure 1)

NOTE: *FOR RIBBON (TAPE) SHIELDING, CUT SHIELDING OFF AT Scotch® Super 33+ TAPE AND PROCEED TO STEP 2.9.*

2.8 Trim shielding to 3/4" (20 mm) and overwrap with a layer of Scotch® Super 33+ Tape. (Figure 1)

2.9 Remove cable color-coding fabric and /or semi-conducting cloth, leaving 1/4" (6 mm) exposed beyond shielding. (Figure 1)

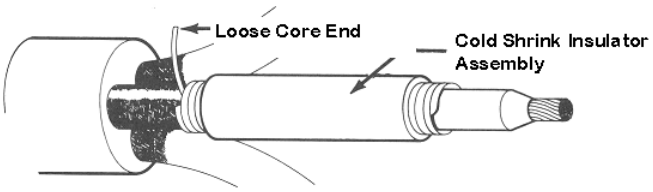
2.10 Remove insulation from ends of conductors for 1/2 connector length plus 1/4" (6 mm). *CONNECTOR LENGTH SHOULD NOT EXCEED 2 1/2" (60 mm).*

2.11 Clean and smooth exposed insulations using 3M™ Cable Cleaning Preparation Kit CC-2 provided. (Figure 1)

2.12 Pencil insulations for 3/4" (20 mm); buff *SMOOTH AND EVEN* with fine #120 abrasive from CC-2 Kit. (Figure 1)

3.0 Connect Power Conductors

Figure 2



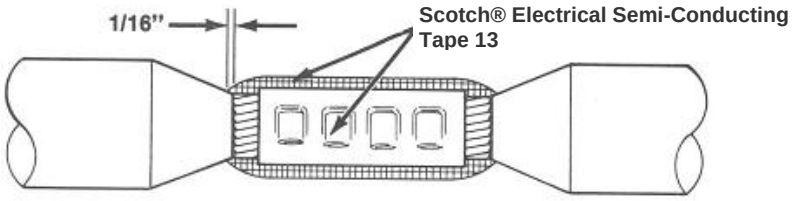
3.1 Select one cable end and slide a cold shrink insulator assembly onto each power conductor, putting the loose core ends on first. (Figure 2)

3.2 Phase match conductors to appropriate color codes.

3.3 Join power conductors with proper connectors and appropriate crimping tool and die. *MAKE CERTAIN CONDUCTORS BUTT INDENTS IN CENTER OF CONNECTORS.*

NOTE: *GROUND WIRES AND GROUND CHECK WILL BE JOINED LATER.*

Figure 3

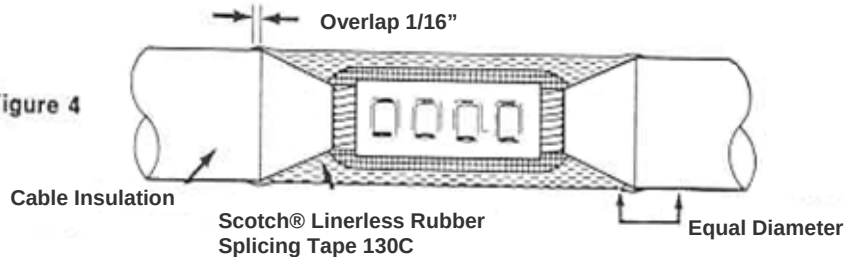


3.4 Fill connector indents with Scotch® Semi-Conducting Tape 13; smoothly apply 2 half-lapped layers, highly elongated over exposed conductor and connector area, *OVERLAPPIING 1/16" (2 mm) ONTO INSULATION PENCILS.* (Figure 3)

4.0 Apply Primary Insulation

NOTE: *On large 15 kV cables, additional Scotch® Linerless Rubber Splicing Tape 130C, Scotch® Tape 13 and Scotch® Electrical Shielding Tape 24 may be needed.*

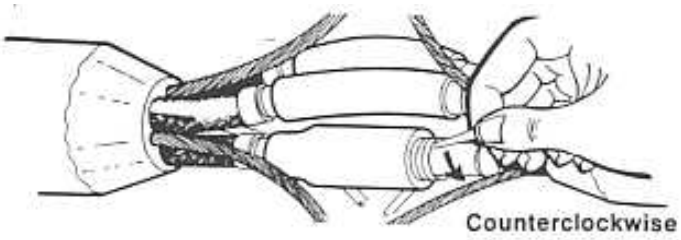
Figure 4



4.1 Smoothly fill in connector area with half-lapped, highly elongated Scotch® Tape 130C; *BUILD UP TO DIAMETER OF CABLE INSULATION,* overlapping 1/16" (2 mm) beyond pencils. (Figure 4)

SUPPLEMENT FOR 4, 2 and 1 AWG, TYPE MPF-GC AND MPF CABLES ONLY: Apply Scotch® Tape 130C half-lapped over taped connector area and exposed cable insulation, extending to 1/4" (6 mm) from cable color-coding fabric and/or semi-conducting cloth. Build up to 1/8" (3 mm) thick.

Figure 5

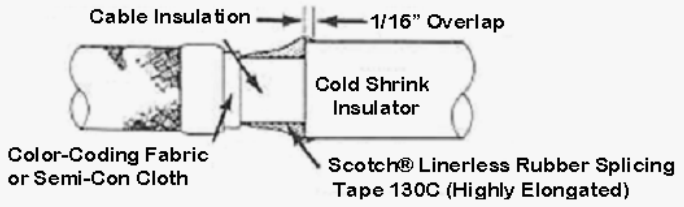


4.2 Slide cold shrink insulator assembly over taped connection. As the core is removed, the rubber tube will elongate approximately 1/4". Position the insulator so tube is centered over connection when core is removed.

4.3 Remove cores by UNWINDING COUNTERCLOCKWISE. (Figure 5)

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

Figure 6



4.4 Apply highly elongated Scotch® Linerless Rubber Splicing Tape 130C to cable insulation at ends of cold shrink insulators, forming tapers to insulators. Extend tapers from cable color-coding fabric and/or semi-conducting cloth to 1/16" (2 mm) onto insulators. (Figure 6)

FOR 15 kV ONLY: Extend tapers from cable color-coding fabric and/or semi-conducting cloth to cold shrink insulators. Wrap an additional 2 half-lapped layers of Scotch® Tape 130C over cold shrink insulators.

4.5 Wrap 1 half-wrapped layer of Scotch® Electrical Semi-Conducting Tape 13 over previously applied Scotch® Tape 130C and cold shrink insulators extending 1/2" (12 mm) onto exposed cable metallic shielding. (Main illustration – front page)

4.6 Wrap 1 half-lapped layer of Scotch® Electrical Shielding Tape 24 over the semi-conducting tape, extending 1/2" (12 mm) onto exposed cable metallic shielding. Secure ends with 2 wraps of tightly applied Scotch® Super 33+™ Vinyl Electrical Tape. (Main illustration – front page)

5.0 Connect Ground Wires

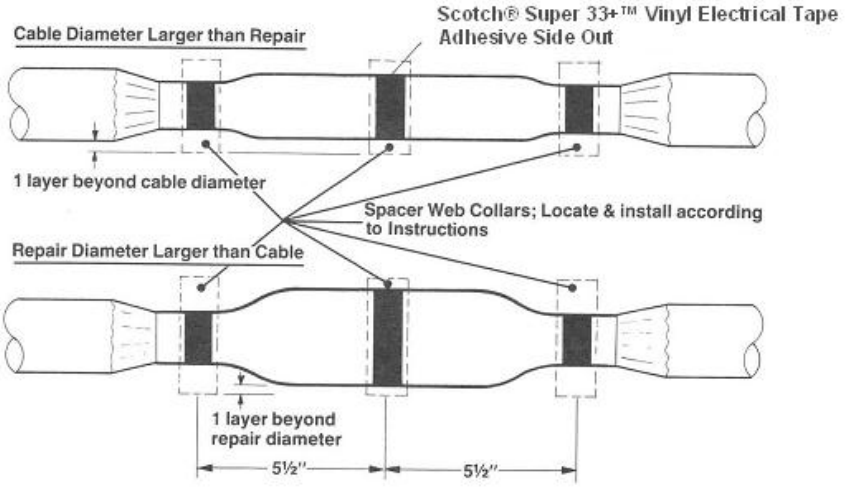
5.1 Join ground wires with proper connectors and appropriate crimping tool and die.

5.2 *GROUND CHECK* (if present)*:* remove conductor insulation for 1/2 connector length. Join wires with proper connector. Insulate connection with 2 half-lapped layers of Scotch® Super 33+ Tape, extending 1" (25 mm) onto conductor insulations. Half-lap or overwrap remaining exposed ground check insulation with Scotch® Super 33+ Tape.

5.3 Bundle all conductors, grounds and ground check (if present) by overwrapping entire length with 2 half-lapped layers of Scotch® Super 33+ Tape, extending ¼" (6 mm) onto jacket taper at each end.

6.0 Install Spacer Web

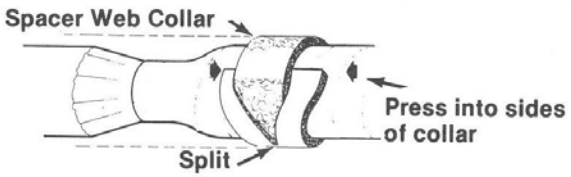
Figure 7



6.1 Wrap *INVERTED* Scotch® Super 33+ Tape (adhesive side out) around bundled conductors at 5½" (140 mm) spacing as shown in Figure 7.

6.2 Wrap on spacer web over inverted Scotch® Super 33+ Tape to form collars; build *EQUAL* diameters to 1 layer greater than repair or cable diameter, whichever is larger. (Figure 7)

Figure 8

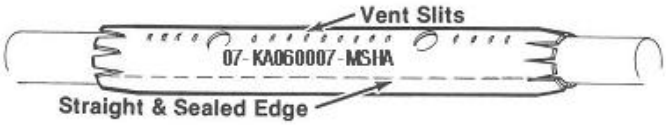


6.3 Split ends of spacer web and press into sides of collars. (Figure 8)

7.0 Install Mold

7.1 Inspect Mold: On previously used mold, make certain vent slits are clear of resin.

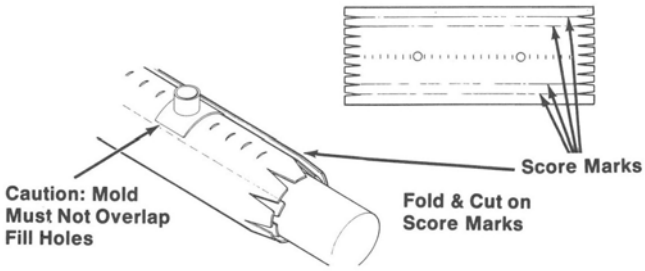
Figure 9



7.2 With cable straight, center mold over repair area with vent slits on top (printing on mold should be readable). Wrap snuggly around, tucking one edge under. (Figure 9)

NOTE: *TUCKED EDGE MUST BE STRAIGHT TO FORM A SEAL.*

Figure 10



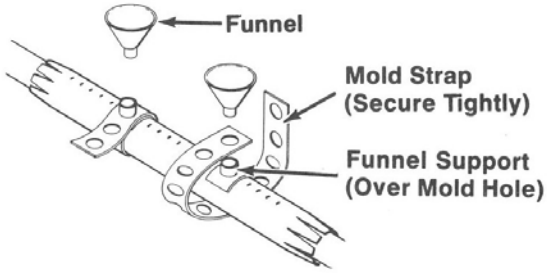
7.3 On small cables, where mold overlaps mold fill-holes, reduce mold width by folding, then cutting on appropriate score marks. (Figure 10)

7.4 Reposition mold according to Step 7.2.

NOTE: *IF NECESSARY, SLIGHTLY ADJUST MOLD POSITION SO SPACER WEB COLLARS ARE NOT BLOCKING MOLD FILL-HOLES.*

Caution: Mold must not overlap fill-holes.

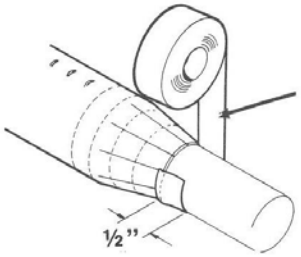
Figure 11



7.5 Position Funnel Supports over mold holes and secure tightly with Mold Straps. (Figure 11)

NOTE: *MOLD, FUNNEL SUPPORTS AND MOLD STRAPS MAY BE MOVED AROUND AT THIS TIME, TO ADJUST FOR FINAL POSITION.*

Figure 12



7.6 Bundle mold's notched ends evenly around cable, maintaining cable centering. Starting 1/2" (12 mm) on cable jacket, apply 1 half-lapped layer of Scotch® Super 33+™ Vinyl Electrical Tape over notches. (Figure 12)

NOTE: *TENSION Scotch® Super 33+ TAPE ONLY ENOUGH TO CONFORM TO MOLD.*

7.7 Install Funnels into Funnel Support holes. (Figure 11)

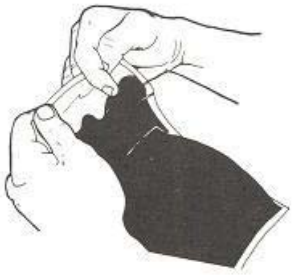
8.0 Pour Resin

8.1 Premix BLACK side of 3M™ Scotchcast™ Flame-Retardant Compound 2131 pouch by squeezing to a smooth consistency and uniform color.

Figure 13

8.2 Firmly grasp each flat side of the closed mixing pouch near the center barrier; at the same time, pull sides of barrier apart and roll sides of thumbs through barrier. Break the barrier all the way across to the side seals. (Figure 13)

Figure 14



8.3 Alternately squeeze ends of pouch forcing compound rapidly back and forth, strip compound from corners of pouch between fingers. Mix until color is completely uniform – 30 to 40 VIGOROUS SQUEEZES. *DO NOT EXCEED 1 MINUTE.* (Figure 14)

8.4 Clip off a corner of pouch and immediately pour into funnels, alternating back and forth between them.

8.5 Fill mold until compound fills funnels to 1/2 full.

8.6 Allow compound to cure.

8.7 Check compound in Funnels for curing.

NOTE: *REPAIR MAY BE DE-MOLDED WHEN COMPOUND IS NO LONGER TACKY.*

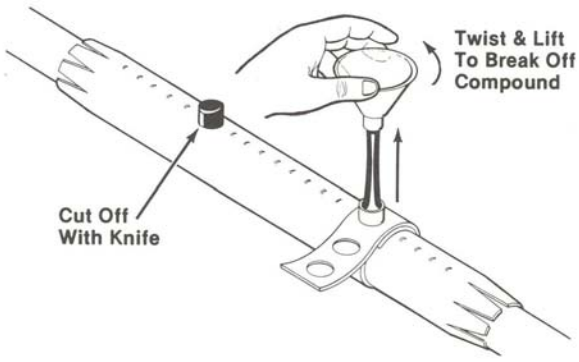
Typical Cure Time: 16 – 24 hrs. @ 70ºF (21ºC)
24 – 30 hrs. @ 50ºF (10ºC)
36 hrs. @ 32ºF (0ºC)

Typical De-mold Time: 1.5 hrs. @ 70ºF (21ºC)
4 hrs. @ 50ºF (10ºC)
6 – 8 hrs. @ 32ºF (0ºC)

NOTE: *Values are typical, not to be considered minimum or maximum. Always confirm based on tack and hardness of compound.*

9.0 De-mold

Figure 15



9.1 Remove Funnels by twisting and lifting, breaking off from compound. (Figure 15)

9.2 Remove Mold Straps and Funnel Supports. (Figure 15)

9.3 Carefully cut off spout compound protrusions from repair, using a knife. (Figure 15)

9.4 Remove Scotch® Super 33+™ Vinyl Electrical Tape from mold ends.

9.5 Remove mold from cable repair, working from ends toward center.

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