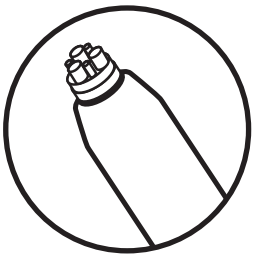
Tyco Electronics



HV-MSK
5-8kV Class

High Voltage Splice for Multiconductor Mining Cable Types
MP-GC and SHD-GC MSHA Approved (P-07-KA090013)

ENERGY DIVISION

Safety Instructions

⚠ DANGER *When installing electrical power system accessories, failure to follow applicable personal safety requirements and written installation instructions could result in fire or explosion and serious or fatal injuries.*

⚠ DANGER *No open flame shall be permitted in the underground area of any coal mine, except in "fireproof enclosures" and/or under the supervision of a qualified person who shall make a diligent search for fire during and after such operations and shall, immediately before and during such operations, continuously test for methane with an MSHA approved methane detector. No open flame shall be permitted in air that contains methane at concentrations of 1%, or more, by volume. Rock dust or suitable fire extinguishers shall be immediately available. See Title 30 of the Code of Federal Regulations § 75.1106.*

⚠ DANGER *To avoid risk of accidental fire or explosion when using gas torches, always check all connections for leaks before igniting the torch and follow the torch manufacturer's safety instructions.*

⚠ DANGER *To minimize any effect of fumes produced during installation, always provide good ventilation of confined work spaces.*

⚠ DANGER *As Tyco Electronics has no control over field conditions which influence product installation, it is understood that the user must take this into account and apply his own experience and expertise when installing product.*

⚠ DANGER *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.*

⚠ DANGER *Power distribution and transmission products must be properly selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures.*

⚠ DANGER *Read and understand the contents of these instructions before installation and follow all locally approved procedures and safety practices before installing or operating this equipment*

NOTICE *Upon receipt of a product, inspect it thoroughly for damage and loss of parts incurred during shipment. If damage or loss is discovered, file a claim with the carrier immediately or contact your Tyco Electronics representative.*

Safety Instructions

⚠ CAUTION *These instructions cannot cover all details or variations in the equipment, procedures, or processes described, nor provide directions for meeting every possible contingency during installation, operation, or maintenance. When additional information is desired to satisfy a problem not covered sufficiently for the user's purpose, please contact your Tyco Electronics sales representative. These instructions are not intended to supersede or replace existing safety and operating procedures.*

Recommended Tyco Electronics Torches

Install heat-shrinkable cable accessories with a "clean burning" torch, i.e., a propane torch that does not deposit conductive contaminants on the product.

Clean burning torches include the Tyco Electronics FH-2629, FH-2649 (uses refillable propane cylinders) and FH-2618A (uses disposable cylinder).

Adjusting the Torch

Adjust regulator and torch as required to provide an overall 12- inch bushy flame. The FH-2629 will be all blue, the other torches will have a 3- to 4-inch yellow tip. Use the yellow tip for shrinking.

Regulator Pressure

FH-2618A	Full pressure
FH-2649	25 psig
FH-2629	15 psig

General Shrinking Instructions

- Apply outer 3- to 4-inch tip of the flame to heat-shrinkable material with a rapid brushing motion
- Keep flame moving to avoid scorching
- Unless otherwise instructed, start shrinking tube at center, working flame around all sides of the tube to apply uniform heat

To determine if a tube has completely recovered, look for the following, especially on the back and underside of the tube:

1. Uniform wall thickness
2. Conformance to substrate
3. No flat spots or chill marks
4. Visible sealant flow if the tube is coated

NOTICE *When installing multiple tubes, make sure that the surface of the last tube is still warm before positioning and shrinking the next tube. If installed tube has cooled, re-heat the entire surface.*

Customer Service

For 24 hour customer service, call 800-327-6996.

Suggested Installation Equipment (not supplied with kit)

- Cable preparation tools
- Tyco Electronics P63 cable preparation kit or cable manufacturer approved solvent
- Clean, lint-free cloths
- Non-conducting abrasive cloth, 120 grit or finer
- Electrician's tape
- Connector(s) and installation tools
- Tyco Electronics recommended torch

Kit Contents

- Installation instructions
- Self-bonding semi-conductive tape
- Fine copper shield mesh
- Abrasive tape
- Outer tube: FCSM-90/30
- Small tube (3 pieces)
- Putty (6 pieces)
- Solvent wipes (5 pieces)
- Red separator tape
- Ground check insulation: FCSM 19/6

Installation Instructions

1. Product selection

Check kit selection with cable dimensions in Table 1.

Table 1: Power Conductor Size (AWG/kcmil)

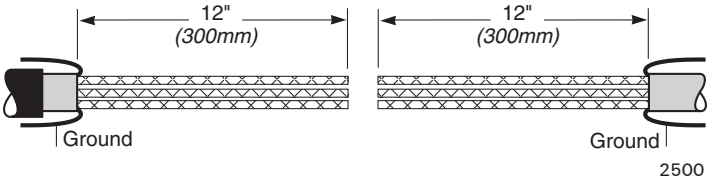
Kit	5kV 3/C MP-GC	5kV 3/C SHD-GC	8kV 3/C MP-GC	8kV SHD-GC
HV-MSK-3/C-581	#6-#1	#6-#4	#6-#4	
HV-MSK-3/C-582	1/0-350	#2-3/0	#2-4/0	#4-2/0
HV-MSK-3/C-584	400-750	4/0-350	250-750	3/0-350

2. Remove outer jacket; bind grounds; position outer tube

Remove the outer jacket from the cable as shown.

Fold back the ground(s) and ground check and temporarily secure to the cable jacket.

Slide plastic bag over cable to protect inside of outer sleeve. Slide outer sleeve over the plastic bag, then slide both down the cable to allow room for splicing.



NOTICE *Complete steps 3 through 11 working on one set of conductors at a time.*

3. Cut conductor

Refer to Figure 1 to cut conductor. Stagger connections to maintain the profile of the cable.

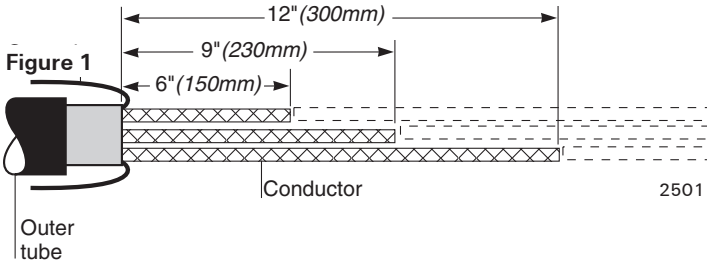
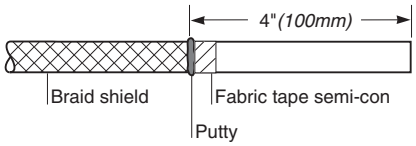


Figure 1

4. Apply putty; cut back shield

Remove braid shield and fabric tape semi-con as shown.

Apply a thin strip of putty around the shield as shown to prevent the shield from flaring.



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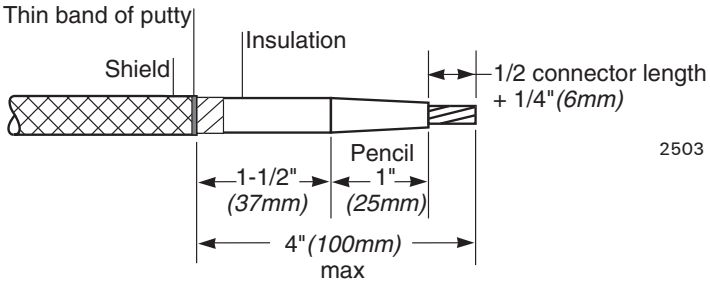
5. Remove insulation

Cut back and pencil the insulation as shown.

Repeat Steps 3-5 for the matching conductor on other side.



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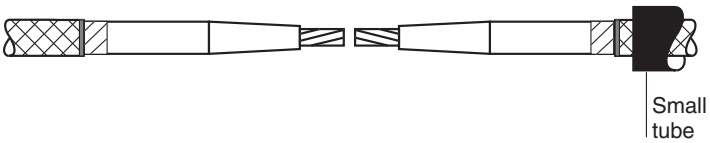
6. Position small tube

Place small tube over conductor and position as shown.



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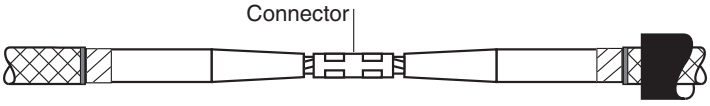
7. Install connector: apply semi-conductive tape across connector

Install connector.



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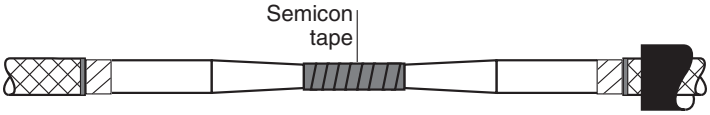
Apply one, 1/2-lapped layer of semi conductive tape across the connector and bare conductor.



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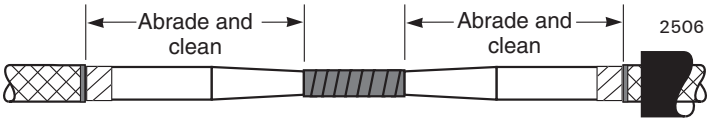
8. Abrade and clean insulation

Abrade the insulation, if necessary, to remove imbedded semi-con.

Clean connection area as shown.



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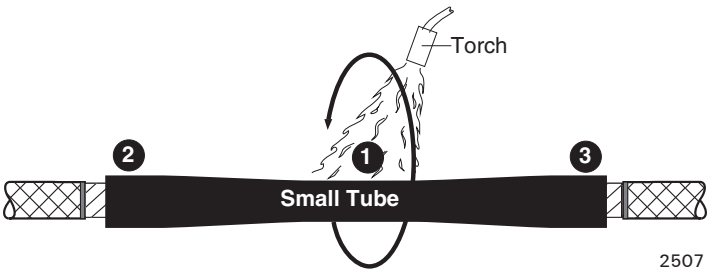
9. Position small tube; shrink in place

Center small tube over connection.

Shrink in place beginning at the center of the tube, working the torch with a smooth brushing motion around the tube.

After the center shrinks, work the torch as before toward each end. A small amount of adhesive will flow from both ends.



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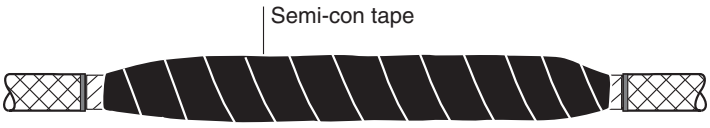
10. Apply semi-conductive tape across installed tube

Starting on the fabric tape semi-con, apply one, 1/2-lapped layer of semi-conductive tape across the installed tube finishing on the semi-con.



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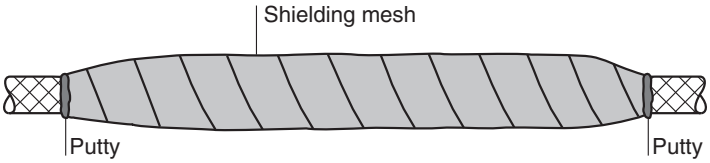
11. Apply shielding tape across connection

Apply one, 1/2-lapped layer of shielding tape across the tube overlapping the shield as shown.

Apply several wraps of shielding mesh at the edge of the shield to smooth the profile between the installed tube and shield. Secure end with putty.



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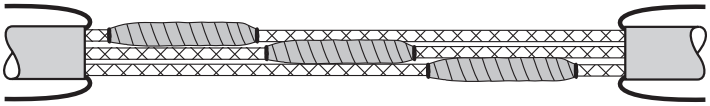
12. Repeat for remaining phases

Repeat Steps 3 through 11 to complete the remaining phases.



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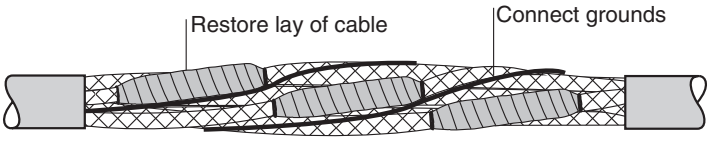
13. Connect ground(s) and ground check; restore lay of cable

Measure and join the ground and ground check conductors.

Use FCSM 19/6 tube to insulate ground check.

Re-establish lay of conductors by turning one side of the cable with respect to the other.



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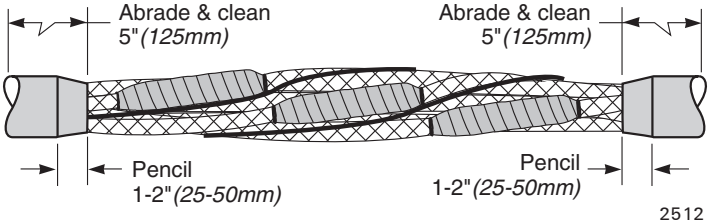
14. Abrade and clean jacket; pencil insulation

Abrade and clean the cable jacket as shown. Pencil insulation on both cable jackets as shown.



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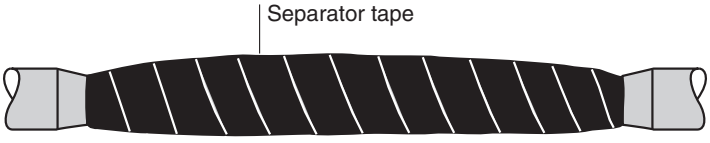
15. Apply separator tape

Apply one layer of separator tape across the splice as shown.



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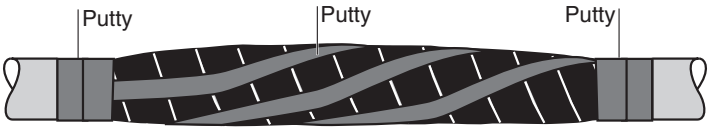
16. Apply putty to re-establish profile of cable

Fold strips of putty in half and press into low places between the conductors. Profile the step between the jacket cutback and splice.



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17. Position outer sleeve; shrink in place

Center the outer sleeve over the splice. Shrink in place beginning in the center of the sleeve, working the torch with a smooth brushing motion around the sleeve.

After the center shrinks, work the torch as before toward each end. Adhesive will flow from both ends.

Allow to cool before moving or placing in service.

Installation is complete.