

LOADBREAK ELBOW OPERATION

⚠ CAUTION

The Operator should always use personal protective equipment as designated by internal company standards or safe operating practices.

⚠ CAUTION

Do not connect two different phases of a multiple-phase system. Make sure both ends of the loop are the same phase before closing a single-phase loop.

NOTE: It is recommended to operate loadbreak connectors with an 8' long, fully insulated hotstick tool, commonly called a "shotgun."

NOTE: Operating area should have stable footing and be free of obstructions so that the operator can have full control of the loadbreak elbow during and immediately after operation.

LOADMAKE

1. The mating part must be prepared for loadmake operation following applicable instructions for the device.
2. Use an insulated hotstick tool for all operations. Attach the tool to the loadbreak elbow operating eye and tighten firmly. Avoid any off-axis operation.
3. Establish an operating position that will provide firm footing and secure grasp on the hotstick tool throughout the range of movement required for the operation sequence.
4. Place the loadbreak elbow receptacle area over the mating part interface and insert the probe tip (white arc follower) into the mating part chamber until the first slight resistance is felt. This dwell point is when the probe tip first encounters the finger contacts of the mating part. Immediately thrust forward with a firm, quick motion to lock the elbow on the mating part. Test for proper locking by gently pulling on the elbow to ensure a secure connection. If the elbow has not made a proper connection, pull elbow from mating part and repeat this step until the connectors are properly locked.

LOADBREAK

1. Use an insulated hotstick tool for all operations. Attach the tool to the loadbreak elbow operating eye and tighten firmly. Avoid any off-axis operation.
2. Establish an operating position that will provide firm footing and secure grasp on the hotstick tool throughout the range of movement required for the operation sequence.
3. Twist the hotstick tool clockwise until the loadbreak elbow rotates slightly on the bushing. Then pull the loadbreak elbow straight away from the mating part with a firm, quick motion until it is clear of any ground planes.

FAULT CLOSE

1. It is not recommended that operations be made on known faults.

HUBBELL
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**CABLE
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NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

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IS200LEJ



Installation & Operating Instructions

Integral Seal Loadbreak Connector 200A, 15kV & 25/28 kV Class

DESCRIPTION

Hubbell Integral Seal Elbows are designed to terminate underground cables and provide a plug-in connection to transformers, switches, and sectionalizing cabinets. Additionally, they provide a quick and simple method to seal cable jackets. These elbows mate with the matching class of loadbreak interfaces and meet the requirements of IEEE Std. 386 – latest revision.

- 15 kV class: 200A 8.3 kV and 8.3/14.4 kV
- 28 kV class: 200A 16.2 kV and 16.2/28.0 kV

NOTES

- Check contents to ensure that they are complete and components are not damaged
- 15kV elbow used as model for instruction sheet figures

CONTENT OF PACKAGE

- (1) Elbow Housing
- (1) Compression Connector
- (1) Probe
- (1) Lubricant (DO NOT SUBSTITUTE)
- (1) Instruction Sheet
- (1) Probe Assembly Wrench
- (3) Mastic Strips

INSTALLATION TOOLS

- Insulating Hotstick
- Crimp Tools & Dies
- Hand Tools



15kV elbow used as model for figures

Important: Read these instructions thoroughly before operating the system. Be sure that the connectors are rated for their intended energized use. (See Hubbell catalog for selecting the correct mating product.) For additional information, you may want to reference IEEE Std. 1816, Guide for Preparation Techniques of Extruded Dielectric, Shielded Cables Rated 2.5 kV through 46 kV and the Installation of Mating Accessories.

⚠ CAUTION

The equipment covered by these instructions should be installed, operated and serviced only by competent personnel familiar with safety practices. This instruction is written for such personnel and is not intended as a substitute for adequate training and experience in safe procedures for this type of equipment.

⚠ CAUTION

Optional Capacitive Test Point- When making voltage measurements, the area of and around the voltage test point must be dry and free of contaminants. The voltage test point is not intended for actual voltage measurements or phasing operations and has no direct connection to the conductor. It uses an impedance capacitance tap and only voltage indicating instruments designed for this application to establish the presence of voltage should be used. A voltage reading will indicate the presence of voltage, but a reading of no voltage is not sufficient to establish a de-energized circuit before touching the connector. Other procedures should be implemented to establish a de-energized circuit.

⚠ DANGER

All associated apparatus must be de-energized before performing any installation. Do not touch or move energized product by hand. Be sure that the connectors are rated for the intended application. Failure to follow this instruction may result in serious or fatal injury, as well as damage to the product.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to Hubbell Power Systems, Inc.

CABLE PREPARATION

Step 1. Train & Remove Jacket

A. Train the cable into the final assembled position per transformer standard practices. Allow sufficient slack in the cable to pull the elbow connector at least one foot away from, and in line with, the center line of the mating part during loadbreak operation. See Figure 1.

B. To provide sufficient length of concentric neutral conductor for grounding after installation, measure 8" down the cable from the centerline of the bushing interface and remove the outer jacket to this distance. Care should be taken not to damage neutral wires. See Figure 2.

C. Cut the excess cable off square and even with the center line of the bushing. See Figure 3.

Step 2. Cable Preparation

A. Apply one mastic strip onto the end of the cable jacket. Do not stretch mastic. Bend neutral wires straight back and press into mastic. See Figure 4.

B. Apply second mastic strip over neutral wires and first mastic strip. Do not stretch. See Figure 5.

C. Apply third mastic strip half lapped over the mastic and bare neutrals to form a ramp. Do not stretch. See Figure 6.

D. Apply one-half lapped layer of vinyl tape beginning on the semi-con jacket and continuing up over the first half of the mastic. Do not cover all, but leave approximately 1/4" mastic exposed. Continue taping back down to semi-con jacket. See Figure 7.

Step 3. Connector Installation

A. Measure 2 1/8" down from the end of the cable and remove shield and insulation to expose bare conductor. Cut squarely making sure not to nick the conductor. See Figure 8.

NOTE: Preassemble probe into lug to verify proper threading before the lug is crimped to the conductor.

B. Use a wire brush to clean the exposed conductor. Place the compression lug on the conductor and rotate to spread inhibitor. Make sure to align flat threaded side with bushing interface. See Figure 9.

C. Crimp the lug to the conductor starting just below the knurled line and rotating successive crimps to prevent bowing. (Refer to crimp chart) See Figure 10.

NOTE: Wipe excess inhibitor at base of lug and smooth any sharp edges on crimps of lug.

D. Measure 6 7/8" down from the end of the lug (see template) and remove cable insulation shield. Cut squarely making sure not to nick the insulation. Bevel the insulation end 1/8". See Figure 11.

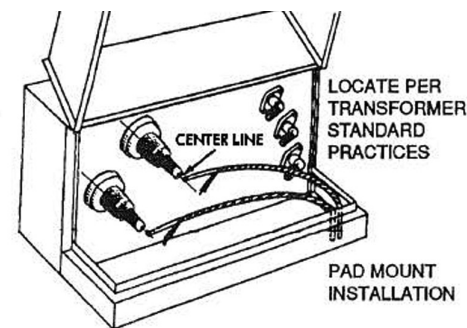


Fig. 1 - Train Cables

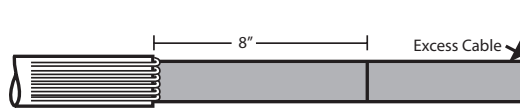


Fig. 2 - Jacket & Neutral Prep

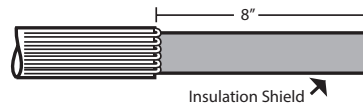


Fig. 3 - Cut Cable

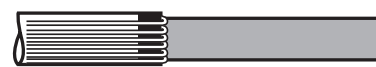


Fig. 4



Fig. 5



Fig. 6

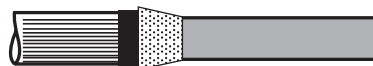


Fig. 7

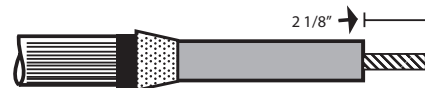


Fig. 8 - Expose Conductor



Fig. 9 - Align Lug

Align lug thread to bushing interface



Fig. 10 - Crimp Lug

Rotate crimps below knurl

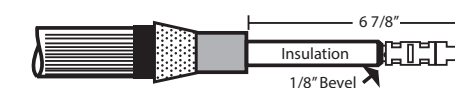


Fig. 11 - Remove Semicon



LOADBREAK ELBOW INSTALLATION

Step 4. Assemble Elbow to Cable

A. Clean and lubricate cable insulation vinyl tape and cable entrance of elbow making sure that each are free of contaminants. Use supplied lubricant as other lubricants can be harmful to products. DO NOT SUBSTITUTE.

B. Slide the elbow onto the cable, using a back and forth twisting motion. The final seating of the elbow should align elbow and threaded portion of lug. Wipe off excess lubricant that may form at bottom of elbow. See Figure 12.

C. Slide the sealing boot down until it covers the vinyl tape.

D. Hand thread the probe into the lug to avoid cross threading. Once the probe has been properly started, use the supplied wrench to fully tighten probe into the lug. The probe will be fully mated when the wrench permanently deforms at approximately 100-120 inch/lbs of force. See Figure 13.

NOTE: Use care to keep the probe clean of dirt and grime during installation.

NOTE: If a Probelok® lug is used the probe will appear to become tight before it is fully seated. At this time the wrench must be used to complete the insertion of the probe into the lug. The normal "thread-in" force of the Probelok® lug averages 40 to 50 inch/lbs of force. Continue tightening with the wrench until the wrench permanently deforms.

NOTE: If other tightening tools are used, they should produce a torque exceeding a minimum recommended 110 inch/lbs of force.

E. Using the hooks, slide the boot down and over the mastic.

F. Attach a #14 AWG copper wire (or equivalent) to the grounding eye of the elbow. Twist the wire at least two turns. Attach the free end to system ground. See Figure 14.

G. Twist neutral wires into a braid and connect to ground with appropriate connector. Make sure to provide sufficient slack in ground braid for elbow operation.

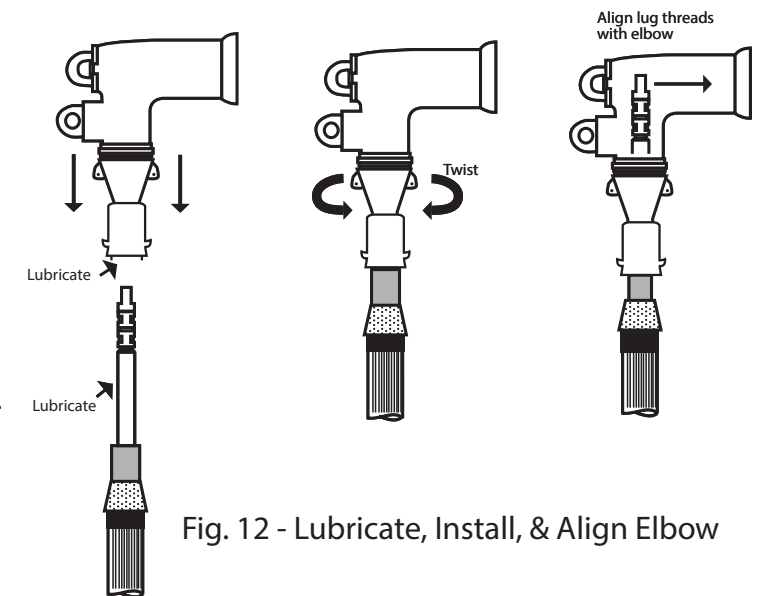


Fig. 12 - Lubricate, Install, & Align Elbow

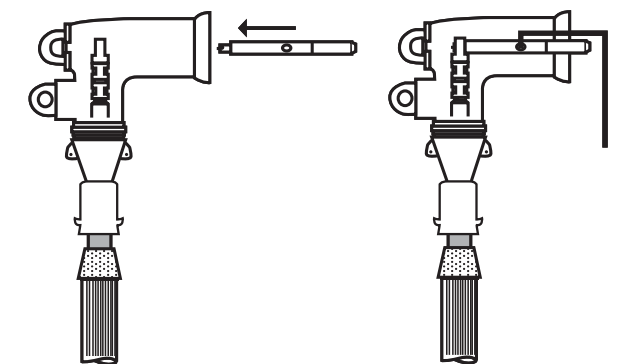


Fig. 13 - Assemble & torque probe with wrench

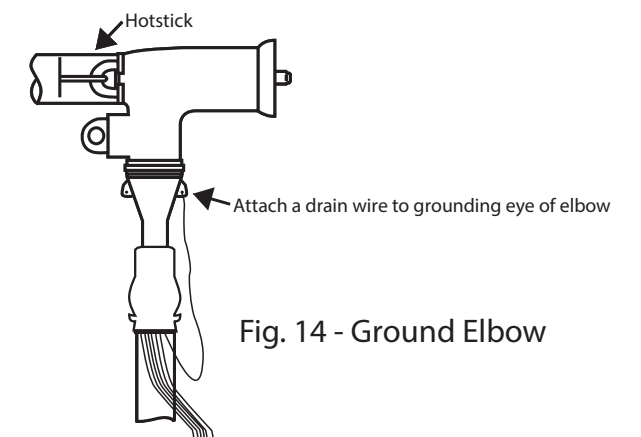


Fig. 14 - Ground Elbow