

Installation & Operating Instructions 167DELR/168DELR Loadbreak Repair Direct Test Elbow Connectors

CONTENTS: *Elbow Connector Housing, Compression Lug, Probe, Probe Wrench, Lubricant (Do Not Substitute), Installation/Operating Instructions.*

The 167DELR is designed to terminate UD cable having concentric neutral and semi-con shielding and provide a direct test port to allow a direct voltage measurement with appropriate direct voltage test port adapter and meter. The elbow provides an operating interface for connecting to an Elastimold 15kV class (8.3kV phase-to-ground and 14.4kV phase-to-phase) 200 ampere loadbreak bushing or accessory device with fault close ratings of 10,000 amperes RMS, symmetrical. When other types of UD cable are to be terminated an appropriate Elastimold cable shield or grounding device must be used.

DANGER

All apparatus must be de-energized during installation or removal of part(s) except for test point caps and indicators that can be installed and operated energized.

After installation loadbreak products can be operated energized per operating instructions. All deadbreak connectors must be de-energized before operating.

All apparatus must be installed and operated in accordance with individual user, local, and national work rules. These instructions do not attempt to provide for every possible contingency.

Do not touch or move energized products.

"Loadbreak connectors must be operated with a full insulated "hotstick" type live-line tool." Consult the company's safe work practices for the required live-line tool length.

Excess distortion of the assembled product may result in its failure.

Inspect parts for damage, rating and compatibility with mating parts.

This product should be installed only by competent personnel trained in good safety practices involving high voltage electrical equipment. These instructions are not intended as a substitute for adequate training or experience in such safety practices.

Failure to follow these instructions will result in damage to the product and serious or fatal injury.

If this product is supplied with a protective shipping cover(s), remove this shipping cover(s) and replace with the appropriate HV insulated cap(s) or connector(s) before submerging or energizing the circuit.

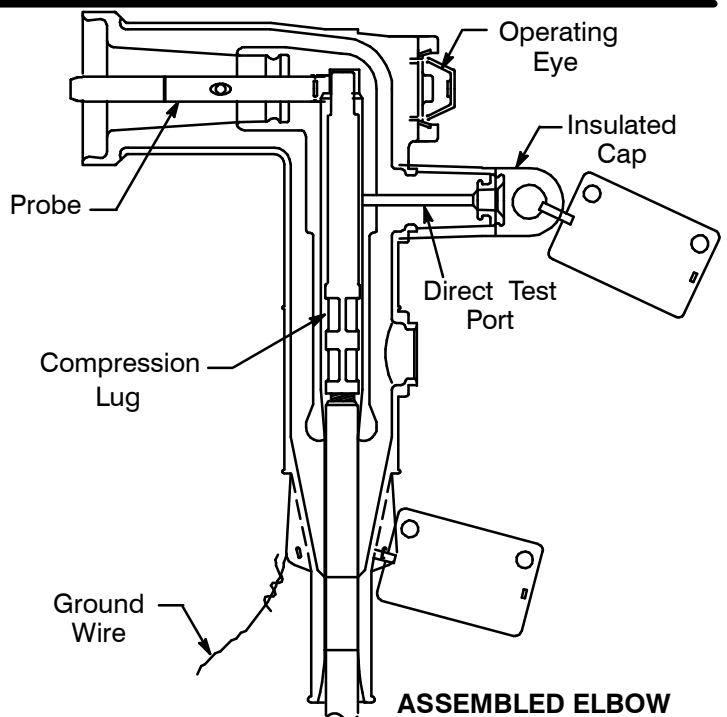
FOR MORE INFORMATION ON PARTS, INSTALLATION RATINGS AND COMPATIBILITY, CALL THE NEAREST ELASTIMOLD OFFICE.

IMPORTANT

1. Check contents of package to ensure they are complete and undamaged.
2. Check all components to ensure proper fit with cable and/or mating products. Compression lug must be either 02200XXX, 02500XXX or 02509XXX type contact.
3. Check threads by threading probe into compression lug. If resistance is encountered prior to full assembly, check for damage and replace damaged component.
4. Read entire installation instructions before starting.
5. Have all required tools at hand and maintain cleanliness throughout the procedure.

CAUTION

The elbow direct test port provides direct access to the cable conductor. Contact with the uncovered port or insertion of objects other than the insulated cap or direct voltage test port adapter can cause serious or fatal injury. Removal of the insulated cap and installation of the direct voltage test port adapter must be done with a hotstick tool following instructions packaged with the direct voltage test port adapter.

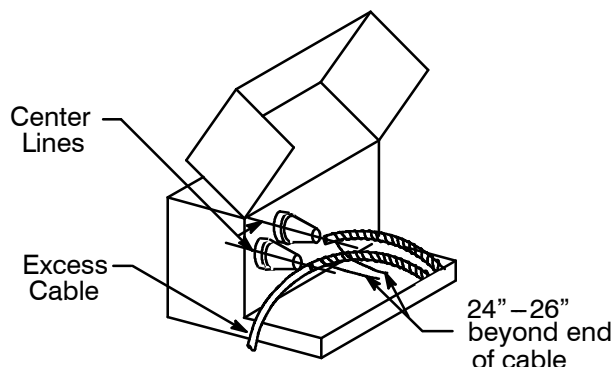


NEW INSTALLATION AND TOTAL REPLACEMENT OF ELBOW HOUSING AND COMPRESSION LUG

(For elbow housing replacement without changing compression lug see page 3 Steps 1a and 2a)

STEP 1 CABLE TRAINING

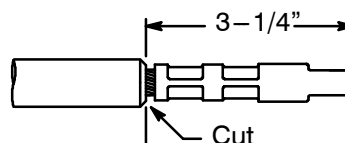
- Train cable as shown to ease operation.
- To facilitate connection of the neutral to the tank ground and hotstick operation, an extra length of concentric neutral wires or grounding braid wire is required. One method is the pull extra cable to 24-26" beyond the centerline of the bushing, place a tape mark at the centerline of the bushing. Then remove outer jacket 7-3/4" to 8" further back from the tape mark. Another method is to proceed to "D" and connect the neutral wires to the tank ground with a jumper or braid.
- Unwrap the neutral wire back past the bushing centerline.
- Cut excess cable squarely at the centerline of the bushing.



Pad Mount Transformer

For replacement:

- Using pin wrench remove probe from elbow and discard probe.
- With a twisting motion, pull the elbow off the cable.
- Cut off old compression lug as shown.

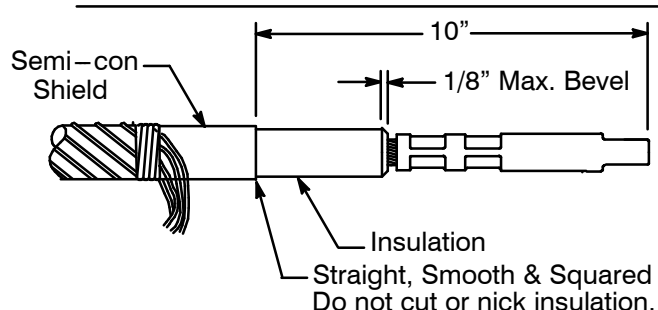
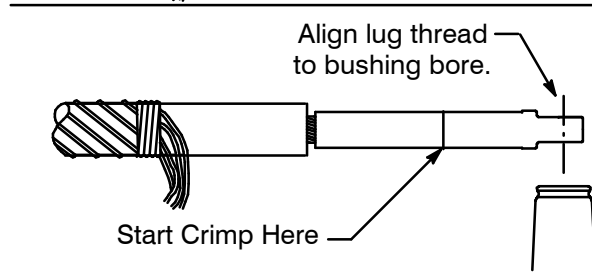
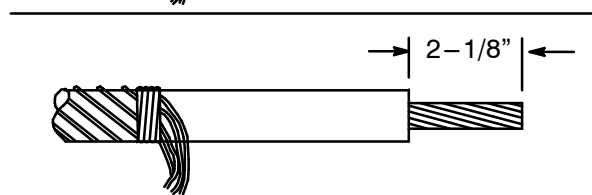
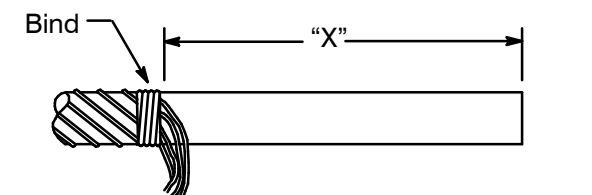


STEP 2 CABLE PREPARATION

- Unwrap and bind concentric neutral wires "X" back from end of cable.

Compression Lug	X Dimension
02200XXX	13
02500XXX	13
02509XXX	9-1/2"

- Remove shield and insulation from the cable end. Cut squarely taking care not to nick conductor.
- Wire brush bare aluminum conductors and immediately install compression lug. Rotate to spread inhibitor. Position compression lug so the CONTACT THREADED HOLE ALIGNS WITH THE BUSHING BORE. (Refer to crimp chart packaged with compression lug for recommended crimp tool information.) Start crimp at the crimp line mark. Rotate 180° each successive crimp. Carefully wipe excessive inhibitor from the outside of the lug and cable.
- Remove semi-con shield as shown. Bevel insulation end 1/8" max.
- Thoroughly clean insulation to remove all traces of conductive residue.



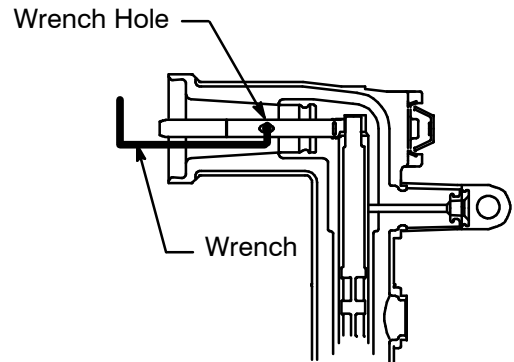
PROCEED TO STEP 3

FOR ELBOW HOUSING REPLACEMENT WITHOUT CHANGING COMPRESSION LUG

(for new installation see page 2 Steps 1 and 2)

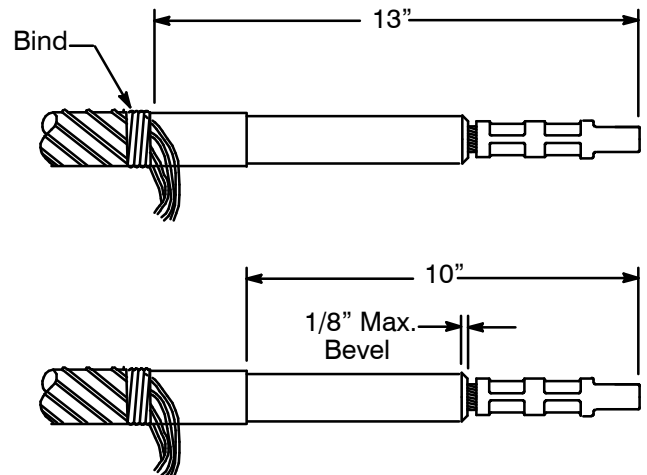
STEP 1a REMOVE ELBOW

- A. Using pin wrench remove probe from elbow and discard probe.
- B. With a twisting motion, pull the elbow off the cable.



STEP 2a CABLE PREPARATION

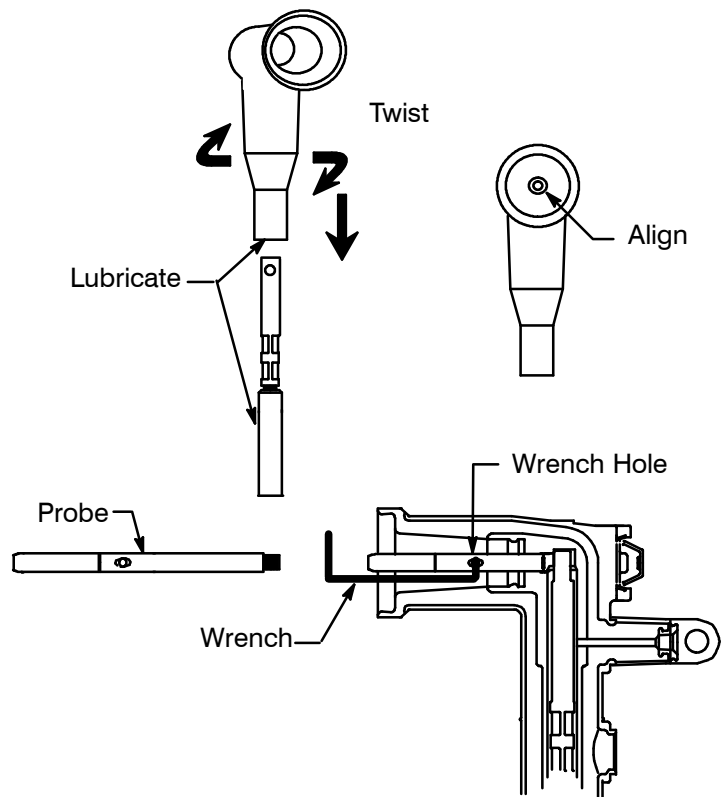
- A. Unwrap and bind concentric neutral wires 13" back from end of connector.
- B. Remove semi-con shield as shown.
- C. Bevel the insulation end 1/8" max.
- D. Thoroughly clean insulation to remove all traces of conductive residue.



PROCEED TO STEP 3

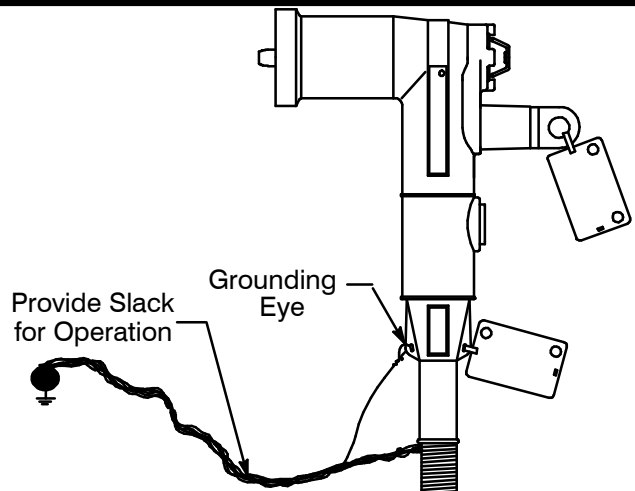
STEP 3 ELBOW ASSEMBLY

- A. Lubricate the cable insulation and inside the elbow housing with the lubricant supplied. **DO NOT SUBSTITUTE.** Other lubricants may be harmful to this product or its mating product(s). Keep insulation clean of dirt and grime. Do not use excess grease and do not introduce any grease into the gap between the lug and the insulation.
- B. Slide the elbow connector onto the cable with a back and forth twisting motion. Wipe off all excess grease.
- C. Align elbow with compression lug's threaded hole.
- D. Do not get lubricant on threaded end. Thread probe into lug by hand, taking care not to cross-thread. The probe **must** turn freely for approximately four turns before becoming snug. Tighten with wrench until wrench bends.



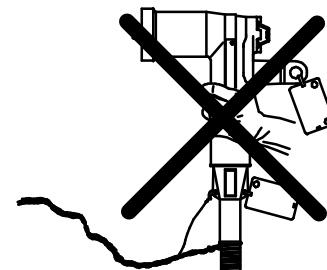
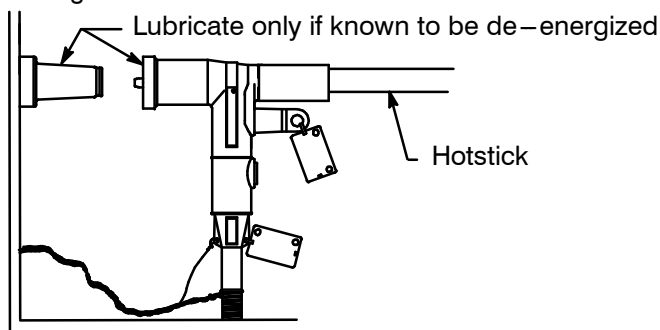
STEP 4 CONCENTRIC NEUTRAL CONNECTION

- A. Using a separate copper wire (No. 14 AWG / 2.5mm) or equivalent, insert one end through the grounding eye on the elbow. Twist tight taking care not to damage the eye.
- B. Twist all neutral wires and connect to ground using appropriate connector. Provide adequate slack in wires for elbow operation.



STEP 5 CONNECT ELBOW AND BUSHING PLUG

- A. Lubricate the receptacle portion of the elbow connector and the mating bushing with the lubricant supplied. **LUBRICATE ONLY IF THE TRANSFORMER ON EQUIPMENT AND ELBOW ARE KNOWN TO BE DE-ENERGIZED.**
- B. Operate per following instructions. **DO NOT OPERATE BY HAND.**



OPERATING INSTRUCTIONS

Before Loadmake or Loadbreak Operation:

Loadbreak connectors must be operated with a full insulated "hotstick" type live-line tool. Consult the company's safe work practices for the required live-line tool length.

Remove Voltage Test Adapter and install Insulated Cap following instructions packaged with these parts.

Area must be clear of obstructions or contaminants that would interfere with the operation of the connector. This position should allow you to establish firm footing and enable you to grasp the hotstick tool securely, maintaining positive control over the movement of the loadbreak connector before, during and directly after the operating sequence. Because of the control, speed and force required to engage or disengage the elbow, certain operating positions are more advantageous than others. If there is some question as to proper operating position, it is recommended that the connectors be operated de-energized. Do not connect two different phases of a multiple-phase system. Before closing a single-phase loop, make certain both ends of the loop are the same phase.

LOADMAKE OPERATION

Check appropriate accessory device operating instructions to be sure that the device is rated for energized operation.

1. Area must be clear of obstructions or contaminants that would interfere with the operation of the connector.
2. In preparing bushing for elbow connector, remove insulated cap by attaching hotstick tool to the insulated cap pulling eye, and following the instructions for this accessory, remove from bushing.
3. Securely fasten a hotstick to the loadbreak connector pulling eye.
4. After establishing firm footing and positive control of the elbow connector, withdraw the elbow from the accessory device on the apparatus parking stand with a fast, straight, firm motion being careful not to place the elbow connector near a ground plane.
5. Place the elbow connector receptacle area over the bushing plug, inserting the elbow male contact (arc follower portion) into the bushing until the first slight resistance is felt. Resistance is felt when the arc follower portion of the male contact first meets the female contact of the bushing (at this point the contacts are approximately 2" apart).

DO NOT HOLD IN THIS POSITION BUT IMMEDIATELY PUSH THE ELBOW HOME WITH A FAST, FIRM, STRAIGHT MOTION, which will engage the internal lock on the elbow and bushing interface.

Apply sufficient force to engage the internal lock on the elbow connector and bushing interface.

Fault Close

1. **It is not recommended that operations be made on known faults.**
2. If a fault is experienced, both the elbow connector and the bushing **must** be replaced.

LOADBREAK OPERATION

1. Place desired accessory device on apparatus parking stand.
Refer to appropriate operating instructions for accessory device to be used. Be certain it is rated for energized operation.
2. Firmly tighten a hotstick to the loadbreak connector pulling eye.
3. Without exerting any pulling force, slightly rotate the connector clockwise in order to break surface friction prior to disconnection.
4. Withdraw the connector from the bushing with a fast, firm, straight motion, being careful not to place the connector near a ground plane.
5. Place connector on appropriate accessory device, following the operating instructions for that accessory.

DIRECT VOLTAGE TEST

DANGER: Insertion of any object, other than the appropriate direct voltage test port adapter and meter, into the direct test port or in close proximity to it can result in electric shock which will cause serious or fatal injury.

The direct test port elbow provides access to the cable conductor for the purpose of a direct voltage test with the following direct voltage test port adapter and meters.

Direct Voltage Test Port Adapter

Voltage Meter / Indicator

200TC-1

H/D Electric Co. Mark I Three Mark IX Voltmeter/Phaser

200TC-2

Ross Meter Hi-ZVM™ 25SE-A/VM25B

200TC-4

CHANCE® Auto-Ranging Voltage Indicator, Catalog No. C403-3374

It is important to read and understand the separate operating instructions for the Direct Voltage Test Port Adapter and the Voltage Meter/Indicator
