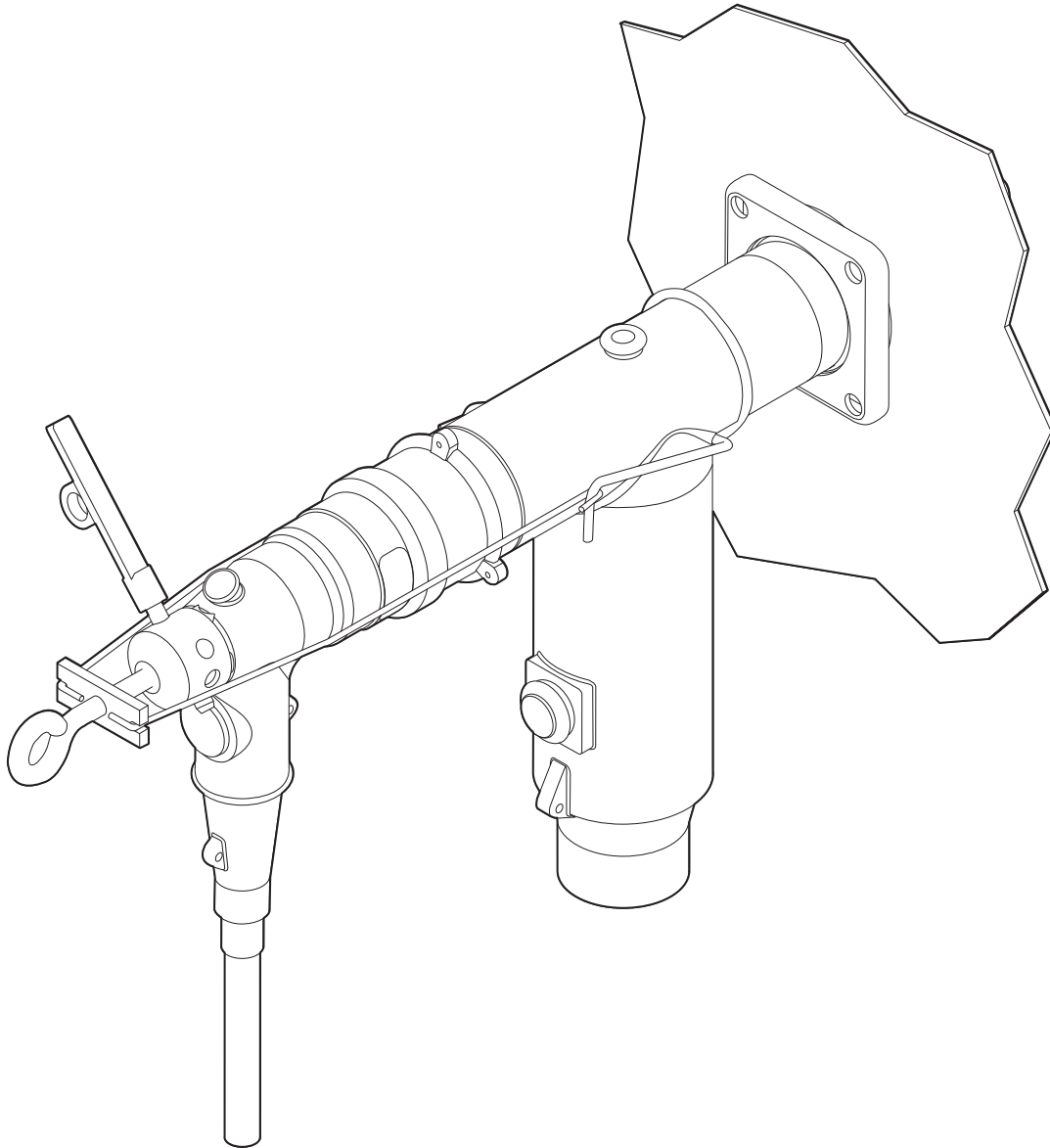


15, 25, and 35kV Cleer Bail Installation Instructions



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Safety for life



Eaton meets or exceeds all applicable industry standards relating to product safety in its Cooper Power™ series products. We actively promote safe practices in the use and maintenance of our products through our service literature, instructional training programs, and the continuous efforts of all Eaton employees involved in product design, manufacture, marketing, and service.

We strongly urge that you always follow all locally-approved safety procedures and safety instructions when working around high-voltage lines and equipment, and support our “Safety For Life” mission.

Safety information

The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it.

A competent technician has these qualifications:

- Is thoroughly familiar with these instructions.
- Is trained in industry-accepted high- and low-voltage safe operating practices and procedures.
- Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.
- Is trained in the care and use of protective equipment such as arc flash clothing, safety glasses, face shield, hard hat, rubber gloves, clampstick, hotstick, etc.

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

Hazard Statement Definitions

This manual may contain four types of hazard statements:

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

Indicates a potentially hazardous situation which, if not avoided, may result in equipment damage only.

Safety instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.

DANGER

Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally-approved safety procedures when working around high- and low-voltage lines and equipment.

G103.3

WARNING

Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling, or maintenance can result in death, severe personal injury, and equipment damage.

G101.0

WARNING

This equipment is not intended to protect human life. Follow all locally-approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury, and equipment damage.

G102.1

WARNING

Power distribution and transmission equipment 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. Failure to properly select, install, or maintain power distribution and transmission equipment can result in death, severe personal injury, and equipment damage.

G122.2

WARNING

CLEERBAIL and CLEERCHAIN are required when a Cleer 4/0 grounding elbow (GE6354) is mated with a Cleer Insert (LBI635) on a 35kV Tee (DT635) in locations where available fault currents are in excess of 16kA RMS symmetrical to 25kA RMS symmetrical. The CLEERCHAIN and CLEERBAIL work together to securely hold the grounding elbow on the bushing during a momentary through fault.

CAUTION

The Eaton Cooper Power series 600 A Cleer Grounded Elbow is designed to be operated in accordance with normal safe operating procedures. These instructions are not intended to supersede or replace existing safety and operating procedures. The grounding elbow should be installed and service only by personnel knowledgeable of good safety practices and fully trained on the installation and application of high voltage electrical equipment. For product applications that require ratings or characteristics not shown, contact Eaton for specific recommendations.

Product information

Introduction

The Eaton Cooper Power series Cleer™ grounding elbow is a tool used to provide a visible ground on Eaton Cooper Power series 600 A, 15, 25 and 35 kV Cleer Loadbreak Connector Systems. It is designed to be installed directly on the 600 A loadbreak interfaces after the circuit is verified to be de-energized. A Cleer grounding elbow installed on the loadbreak bushing interfaces on each end of the cable will isolate and ground the cable. The grounding elbow has a 16 kA through fault rating without the use of CLEERBAIL and CLEERCHAIN. For systems with available fault currents from 16kA to 25kA, CLEERBAIL and CLEERCHAIN is required. All grounding elbow sets supplied with a factory installed ferrule and clamp conform to the latest requirements of ASTM F855. When grounding elbow is ordered without clamp, it does not meet ASTM F855. It is the user's responsibility to install an approved ferrule and clamp. For all kits not conforming to the latest ASTM F855 Edition, the cable will be terminated with a blunt cable end.

Read this manual first

Read and understand the contents of this manual and follow all locally approved procedures and safety practices before installing or operating this equipment. Additional information. These instructions cannot cover all details or variations in the equipment, procedures, or process 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, contact your Eaton representative.

Acceptance and initial inspection

Each grounding elbow is completely inspected and tested at the factory. It is in good condition when accepted by the carrier for shipment. Upon receipt of a grounding elbow, inspect the grounding elbow thoroughly for damage and loss of parts incurred during shipment. If damage or loss is discovered, file a claim with the carrier immediately.

Handling and storage

Grounding elbows and accessories should be stored and handled in a manner as to prevent contamination to the interfaces. When not in use, grounding elbows should be stored installed on a mating accessory, such as a standoff bushing. Quality standards ISO 9001 Certified Quality Management System.

CLEERBAIL & CLEERCHAIN Installation Instructions

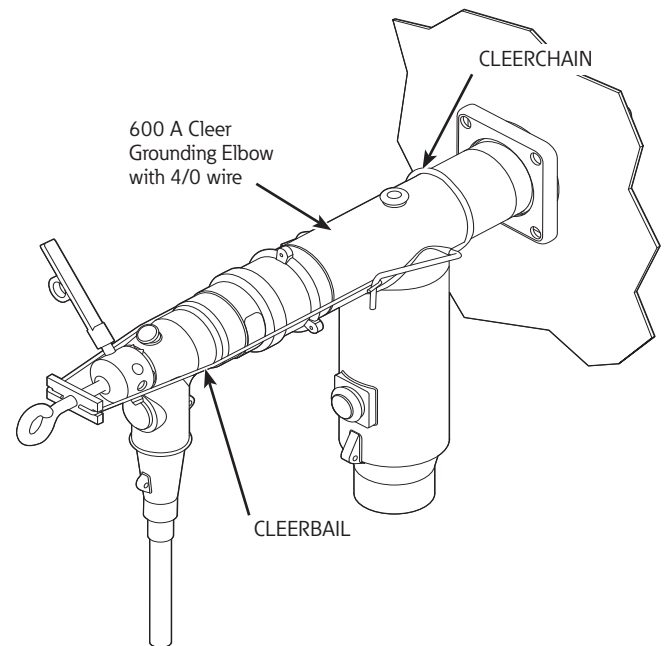


Figure 1. Installed Cleer Bail assembly

⚠ WARNING

Visibly inspect grounding elbows, cables, ferrules, and clamps prior to installation to ensure they are complete, undamaged, and there is no corrosion or breakage. Damaged or worn grounding equipment can result in equipment failure that could cause death or personal injury.

⚠ WARNING

All associated apparatus must be de-energized during installation or maintenance.

⚠ WARNING

Do not ground energized cable.

Step 1

Install 600A grounding elbow

- Install grounding elbow onto Cleer bushing according to the instructions included with the Cleer grounding elbow (MN650056EN).

WARNING

CLEERBAIL and CLEERCHAIN are required when a Cleer 4/0 grounding elbow (GE6354) is mated with a Cleer Insert (LBI635) on a 35kV Tee (DT635) in locations where available fault currents are in excess of 16kA RMS symmetrical to 25kA RMS symmetrical. The CLEERCHAIN and CLEERBAIL work together to securely hold the grounding elbow on the bushing during a momentary through fault.

Step 2

Connect CLEERCHAIN with CLEERBAIL

- Turn the eyebolt counterclockwise until the back of the aluminum cup is seated against the welded steel bar of the bail. Verify the cup is centered on the back of the elbow.
- CLEERCHAIN consists of 25 links. The final installed chain should be as tight as possible. Fewer links of the supplied chain may be needed for proper installation.
- Insert one hook of CLEERBAIL through link #1. (Refer to **Figure 2**).

WARNING

Using the incorrect number of links can result in serious damage to equipment or fatal injury.

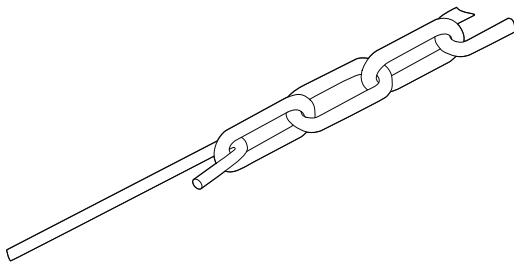


Figure 2. Hook of CLEERBAIL through first link of CLEERCHAIN

Step 3

Install CLEERBAIL onto grounding elbow

- Place CLEERBAIL onto the back of the grounding elbow, ensuring the cup covers the operating eye of the grounding elbow.
- Pull CLEERCHAIN behind the Tee, so CLEERCHAIN is under the Tee apparatus bushing interface. (Refer to **Figure 3**).

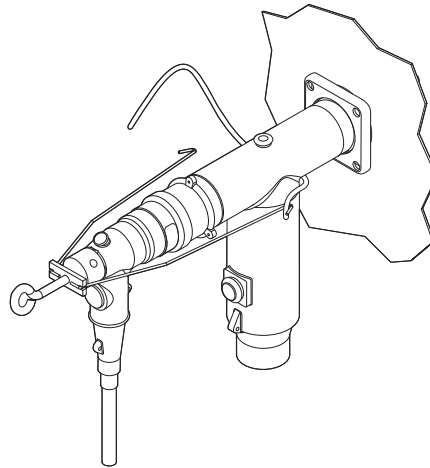


Figure 3. CLEERCHAIN pulled behind and under deadbreak t-body

Step 4

Loop CLEERCHAIN

- Pull CLEERCHAIN up and over the Tee apparatus bushing interface. CLEERCHAIN should now be hanging over the Tee apparatus bushing interface, on the same side as the attached bail hook. (Refer to **Figure 4**).

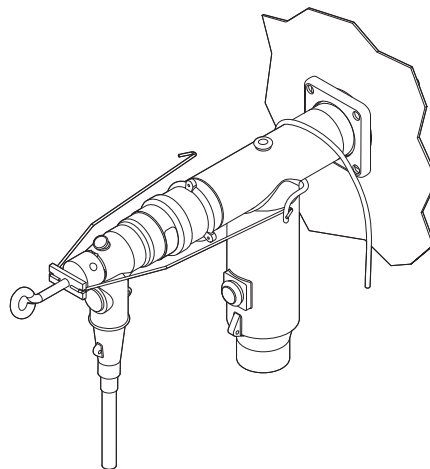


Figure 4. Loose end of CLEERCHAIN pulled over t-body

Step 5

Bring CLEERCHAIN around the back

- Pull the loose side of CLEERCHAIN under the Tee apparatus bushing interface to the opposite side, creating a full circle of chain around the Tee apparatus bushing interface. (Refer to **Figure 5**).
- Pull CLEERCHAIN as tight as possible during this process.

WARNING

CLEERCHAIN should be pulled as tight as possible. There should be no slack on CLEERCHAIN. Failure to do so could result in serious injury or death.

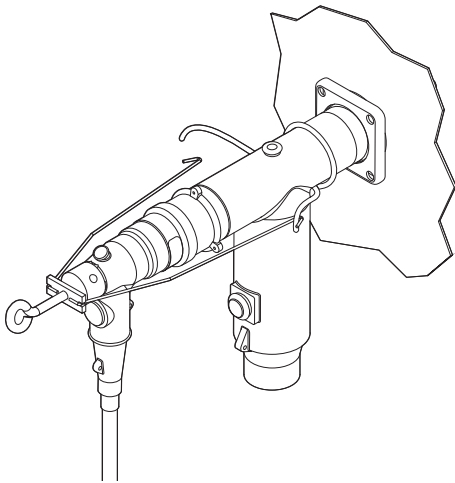


Figure 5. CLEERCHAIN looped around t-body arm pulled as tight as possible

Step 6

Connect CLEERCHAIN with CLEERBAIL

- Pull the loose end of CLEERCHAIN as tight as possible.
- Insert the open finger of CLEERBAIL into the tightest link in from the end of the chain.
- One or two links may be free if using an Eaton Tee. More or fewer links may be needed if using competitor Tee. (Refer to **Figure 6**). Be sure any free links are hanging free as shown in **Figure 6**; not lodged between the bail hook and the hooked link.

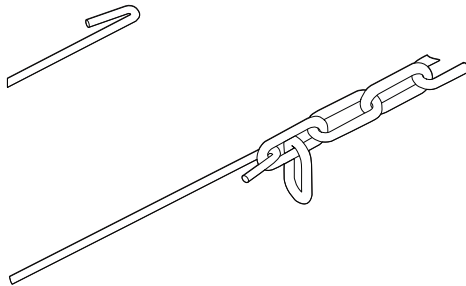


Figure 6. Tightest possible CLEERCHAIN link through open arm of CLEERBAIL

⚠ WARNING

CLEERCHAIN should be pulled as tight as possible. There should be minimal slack on CLEERCHAIN. Failure to do so could result in serious injury or death.

- Insert the provided locking pin into the eye of CLEERBAIL's eyebolt, and tighten. (Refer to **Figure 7**).
- The bail and chain should be very tight on the elbow. Verify that the cup is centered over the grounding elbow operating eye and the eyebolt is co-axial with the grounding elbow probe.
- To check tightness of CLEERBAIL, the cup should completely encapsulate the operating eye's pad, and the legs of CLEERBAIL should be substantially straight and rigid.

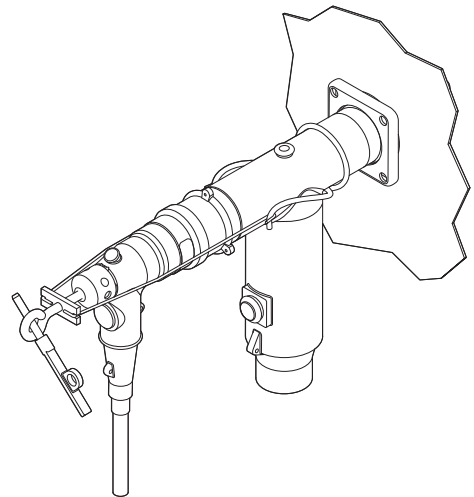


Figure 7. Locking pin inserted through eyebolt of CLEERBAIL to tighten

Step 7

Insert locking pin

- Insert the locking pin into the cup of CLEERBAIL to prevent unthreading of the eyebolt. The locking pin will pass through the grounding elbow's operating eye, and exit the cup on the opposite side of entry. (Refer to **Figure 8**).

⚠ WARNING

The locking pin must pass through the grounding elbow's operating eye and must exit the opposite side of entry. Failure to do so can result in the detaching of the grounding elbow during through fault.

⚠ WARNING

CLEERBAIL is rated for one (1) 25kA through fault occurrence. CLEERBAIL must be replaced prior to a second through fault occurrence.

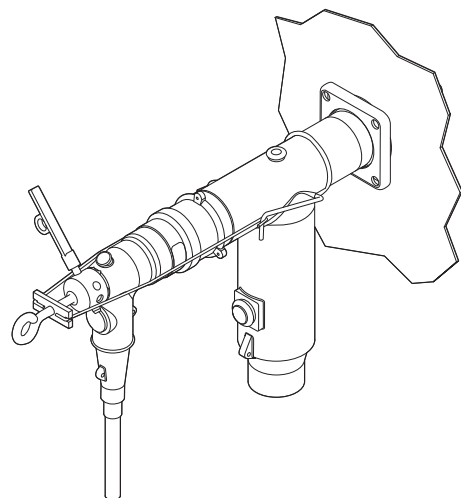


Figure 8. Lockin pin inserted into cup of CLEERBAIL. Locking pin passes through elbow's operating eye



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