OEM Equipment
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COOPER POWER SERIES

600 A, 15, 25, & 35 kV class deadbreak PUSH-OP apparatus bushing installation instructions

Powering Business Worldwide

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Contents

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.

CAUTION

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

Product information

Introduction
Eaton's Cooper Power™ series deadbreak PUSH-OP® apparatus bushings are used on deadfront pad-mounted switchgear and large transformers where the terminators will be operated frequently. It allows for live testing and moving of the terminator while the terminator is fully grounded. This system also provides a mechanical advantage for easy one-person operation.

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, please contact your Eaton representative.

Acceptance and initial inspection
Each deadbreak PUSH-OP apparatus bushing is in good condition when accepted by the carrier for shipment. Upon receipt, inspect the shipping container for signs of damage. Unpack the deadbreak PUSH-OP apparatus bushing and inspect it thoroughly for damage incurred during shipment. If damage is discovered, file a claim with the carrier immediately.

Handling and storage
Be careful during handling and storage of the deadbreak PUSH-OP apparatus bushing to minimize the possibility of damage. If the deadbreak PUSH-OP apparatus bushing is to be stored for any length of time prior to installation, provide a clean, dry storage area.

Quality Standards
ISO 9001 Certified Quality Management System

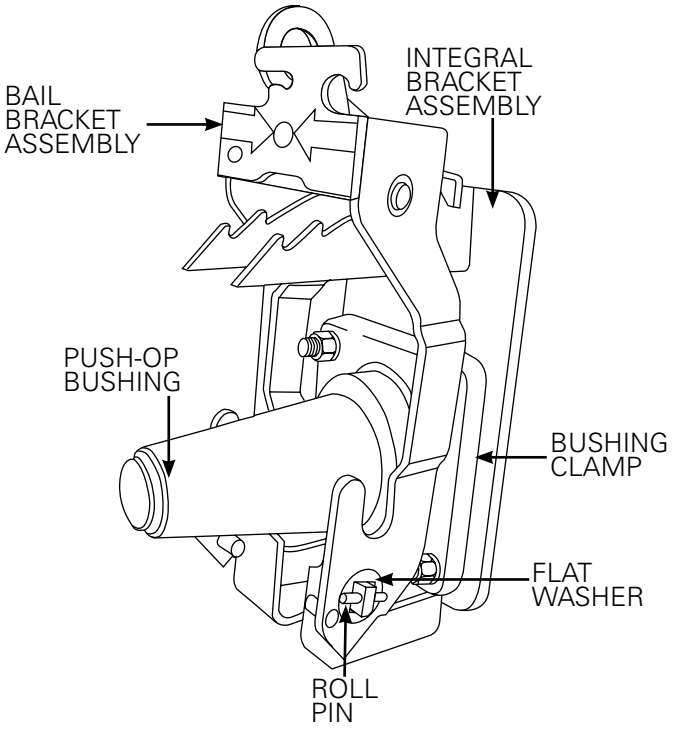


Figure 1. Line illustration of deadbreak BUSH-OP apparatus bushing.

Installation instructions

Equipment required

- PUSH-OP Integral Bracket Assembly Kit including:
  1 – Integral Bracket Assembly
  1 – Bail Bracket Assembly
  2 – Flat Washers
  4 – Special Washers
  2 – Roll Pins
  1 – Decal
- Additional materials required (not included in the assembly kit):
  1 – PUSH-OP Bushing
  1 – Bushing Clamp
  1 – Bushing Gasket
  1 – Alignment Fixture
- Tools
  1 – 9/16 inch Wrench
  1 – Torque Wrench
  8 – Lock Washers
  8 – 3/8 - 16 UNC Stainless Steel Hex Nuts

Installation of alignment fixture

⚠ DANGER

Do not disconnect or engage while energized: Deadbreak device only. Separating or engaging deadbreak connectors when energized can cause serious injury or death. Refer to operating instructions for proper de-energizing procedures.

Step 1

Install integral bracket assembly

- Place the integral bracket assembly over the four welded studs, with latch teeth up.

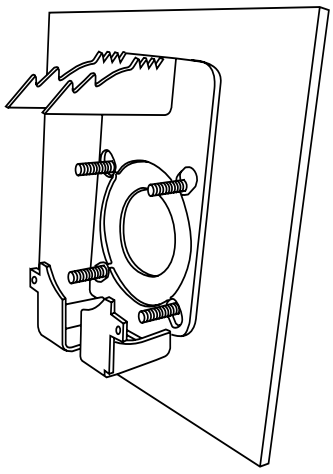


Figure 2. Line illustration of installation alignment fixture.

Step 2

Install alignment fixture

- Holding the eye of the alignment fixture, install it over two of the welded studs.
- Make sure that the fixture is completely in the bushing hole. This will center the integral bracket assembly.

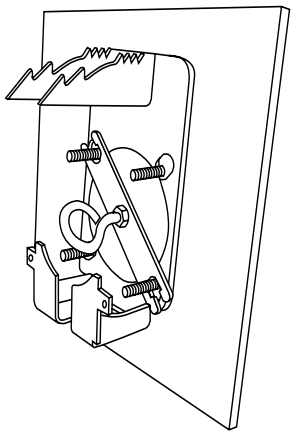


Figure 3. Line illustration of installation of alignment fixture.

Step 3

Install hardware

- Install hardware over the two studs not covered by the alignment fixture's legs.
- Install the special washer so that it does not overlap the bushing hole as shown.
- Place a lock washer and a hex nut over the special washer.
- Torque each nut to 40 ft-lbs.

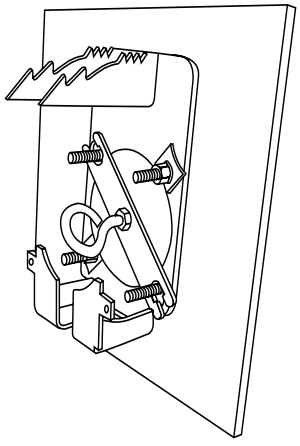


Figure 4. Line illustration of installation of hardware.

Step 4

Remove alignment fixture

- Remove the alignment fixture.
- Repeat step three for the remaining two studs.

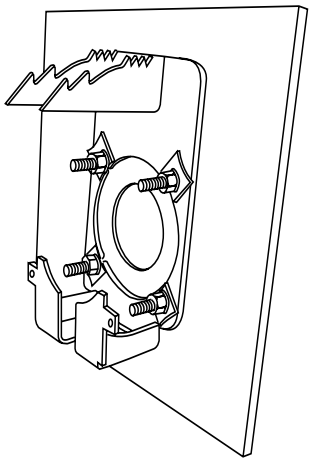


Figure 5. Line illustration of removing alignment fixture.

Insert bushing

Step 5

Insert PUSH-OP bushing

- Insert the PUSH-OP bushing through the tank hole and place the clamp over the welded tank studs against the bushing flange.
- Mounting studs should be free of nicks, paint, dirt and weld spatter. They must also be correctly positioned to avoid binding on the clamp flange.
- Hold clamping flange against the bushing and install a lock washer, then a nut onto each stud.
- Tighten nuts in a diagonal sequence to a torque value of 40 to 60 in-lbs.

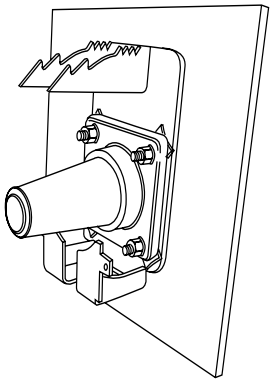
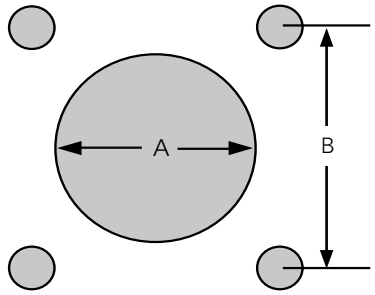


Figure 6. Line illustration of inserting PUSH-OP bushing.

Table 1. 600 A Deadbreak Bushing Clamp

kV Class	A Tank Hole Size	B Stud (C-C)
15, 25 & 35	2.56″ (65.02mm)	3.43″ (87.12mm)



Clearances

Oil level and bushing clearance to other internal components to be suitable for voltage class of equipment and components.

Table 2. Minimum Under-Oil Clearances

kV BIL	Clearance to Ground or Between Phase
95	1.1″ (27.9 mm)
125	1.5″ (38.1 mm)
150	2.5″ (63.5 mm)

Internal (under-oil) connection

Step 6

Tightening of connection onto internal (under-oil) bushing stud

- Brass nuts are recommended for copper threads and aluminum nuts for aluminum threads.
- Nuts for internal bushing studs should be tightened as follows:

  3/8-16 Brass Nuts 16 ft-lbs

  5/8-11 Brass Nuts 75 ft-lbs

  5/8-11 Aluminum Nuts 60 ft-lbs
- Install nut on to the internal bushing stud.
- Place high voltage lead terminal with crimped ring torque terminal on to the bushing stud against the nut.
- Place a second nut on to bushing stud and tighten to the recommended torque.
- An optional locking nut may also be placed on to the stud and tightened to the recommended torque.

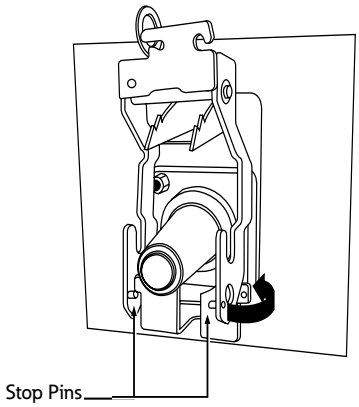


Figure 7. Illustration of assembling bail bracket to the integral bracket.

Assembly of bail bracket

Step 7

Assemble the bail bracket to the integral bracket

- With the stamp, push plate facing away from the tank wall, place the left leg hole on the ear of the integral bracket.
- Firmly grasp the right leg of the bail bracket and place the right hole over the right ear. The bracket will snap into place.
- Make sure the stop pins are in front of the integral bracket assembly.
- Place the flat washer on the ears through the hole in the bail bracket arms.

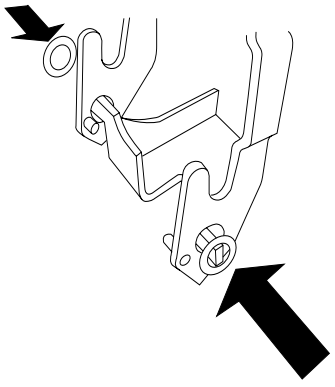


Figure 8. Line illustration of flat washer placement.

Step 8

Flat washer replacement

- Place the flat washer on the ears through the hole in the bail bracket arms.

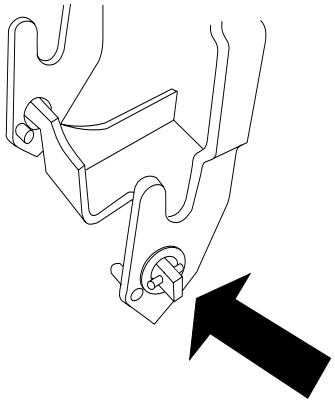


Figure 9. Illustration of securing bail bracket arm.

Step 9

Secure bail bracket arm

- Secure the bail bracket arm by inserting the roll pins into the integral bracket ear.
- Drive the roll pin into the bracket ear holes until the roll pins span the holes in the washer.

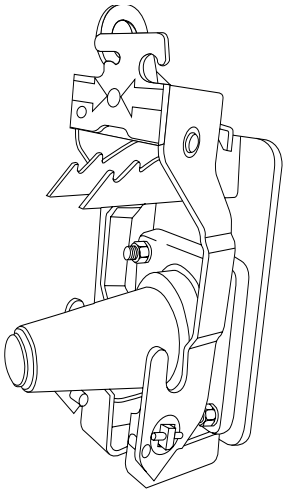


Figure 10. Line illustration of bail bracket assembly secured to the integral bracket assembly, after the PUSH-OP bushing has been installed.

Step 10

Position warning decal

- Place the warning decal above the integral bracket assembly, for easy view by the operator.

Figure 11. Line illustration of warning decal.

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