

23 and 38 kV sidewall-mounted and 23 kV cover-mounted Bay-O-Net fuse assembly 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.

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.

G122.3

⚠ WARNING

The sidewall-mounted and cover-mounted Bay-O-Net Assembly should be installed only by personnel familiar with good safety practice and the handling of high voltage equipment.

Product Information

Introduction

Eaton protects transformers and distribution systems with its Cooper Power™ series Bay-O-Net fuse assemblies. They are designed for use in pad-mounted or subsurface distribution transformers filled with transformer oil or approved equivalent. The assemblies combine the ease of hotstick operation with the safety of deadfront construction.

Removal of the fuse holder from the assembly indicates that the apparatus is electrically disconnected. It also allows convenient fuse element inspection and replacement. When typical safety practices are followed, the assemblies can be loadbreak-operated for working on the transformer secondary; changing distribution voltage with dual voltage switches or tap changers; or disconnecting the apparatus from the line.

Eaton's optional Cooper Power series Flapper™ valve Bay-O-Net fuse assembly (available as sidewall-mounted only) includes a flapper valve inside the housing which closes when the fuse holder is removed, thus minimizing oil spillage.

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. For additional information, contact your representative.

Acceptance and Initial Inspection

Each fuse is in good condition when accepted by the carrier for shipment. Upon receipt, inspect the shipping container for signs of damage. Unpack the fuse 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 fuse to minimize the possibility of damage. If the fuse is to be stored for any length of time prior to installation, provide a clean, dry storage area.

Standards

ISO 9001 Certified Quality Management System

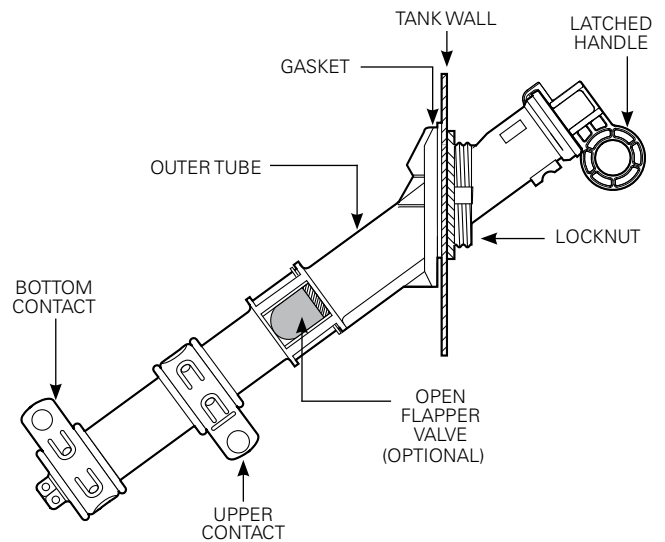


Figure 1. Line illustration of sidewall-mount assembly with optional Flapper valve.

Installation procedure

Installation instructions

The 23 kV Bay-O-Net assembly is designed for use inside the transformer tank at maximum operating temperatures (in oil) at 130 °C, and (air exposure) at 65 °C through 34.5 Grd Y/21.1 kV. The 38 kV Bay-O-Net assembly is designed for use inside the transformer tank at maximum temperature (in oil) at 130 °C, and (air exposures) at 65 °C above 23 kV line-line with a maximum of 38 kV line-line voltage. The housing will have a yellow 38 kV decal near the top of the housing. The sidewall-mounted assembly uses a 2 1/4" (57 mm) hole with keyed slot, Figure 2, and the cover-mounted assembly uses a 1 3/8" (35 mm) hole with slot, Figure 3. All assemblies use a gasket inside the tank and an external lock nut. All inner gasket surfaces of the tank must be free of burrs.

Dimensional information for the assemblies is shown in Figures 4 and 5. Adequate mechanical clearance is required for shotgun stick operation. Refer to Table 2 for dielectric clearances.

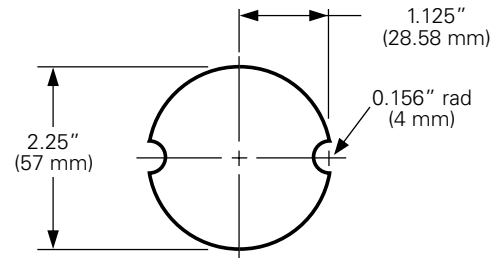


Figure 2. Tank mounting hole for sidewall-mounted assembly.

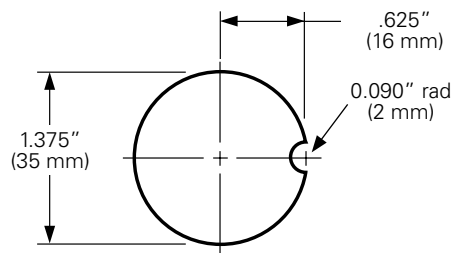


Figure 3. Tank mounting hole for cover-mounted assembly.

Table 1. Ratings and Characteristics 23 kV Assembly

kV	Electrical Ratings
150	BIL and Full Wave Crest
50	60 Hz, AC, 1 minute withstand
kV	Maximum Single-Phase Interrupting Ratings in Mineral Oil*
8.3	3,500 A rms symmetrical Cover Mount 3,500 A rms symmetrical Sidewall Mount
15.5	2,500 A rms symmetrical Cover Mount 2,500 A rms symmetrical Sidewall Mount**
23.0	1,000 A rms symmetrical Cover Mount 1,000 A rms symmetrical Sidewall Mount
kV	Loadbreak Ratings (at 80% pf)
10.0	160 A
15.5	150 A
26.7	80 A
34.5	50 A

* With Eaton's Cooper Power series Bay-O-Net fuse links only. Check Bay-O-Net fuse catalog sections for ratings in Envirotemp™ FR3™ fluid.

** Except with high ampere overload Bay-O-Net links, which is 2000 A rms symmetrical.

Table 3. Dielectric Clearances

kV	Clearance to Ground or Between Phases	Clearance Behind Lower End of Housing
95	1.1" (27.9 mm)	3" (76.2 mm)
125	1.5" (38.1 mm)	3" (76.2 mm)
150	2.5" (63.5 mm)	3" (76.2 mm)
200	3.0" (76.2 mm)	3.5" (88.9 mm)

Table 2. Ratings and Characteristics 38 kV Assembly

kV	Electrical Ratings
200	BIL and Full Wave Crest
70	60 Hz, AC, 1 minute withstand
kV	Maximum Single-Phase Interrupting Ratings
38	900 A rms symmetrical for 10-40 A Integral Cartridge Link 1000 A rms symmetrical for 65 A Integral Cartridge Link
kV	Loadbreak Ratings (at 80% pf)
38	50 A

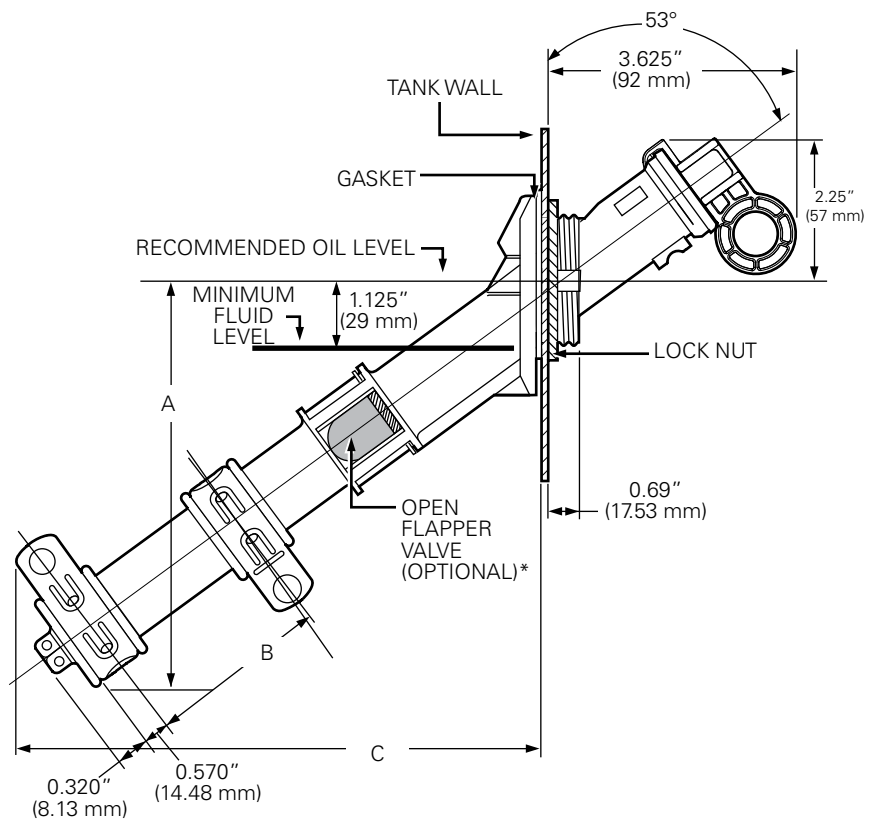


Figure 4. Sidewall-mounted assembly dimensions and fluid level.

Note: Dimensions are for reference only. Optional Flapper Valve assembly is shown, dimensions for the sidewall-mounted assembly without a Flapper valve are the same.

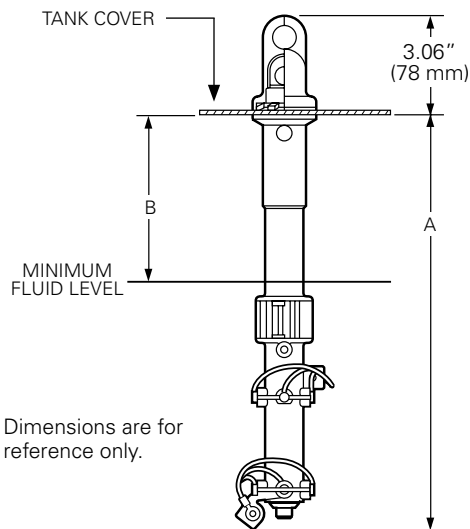


Figure 5. Cover-mounted assembly dimensions are fluid level (23 kV maximum line-line voltage).

Table 4. Sidewall-Mounted Assembly Dimensional Information (Figure 4)

kV Rated Assembly	Length in./(mm)		
	A	B	C
23	7.07 (180)	3.125 (80)	9.125 (232)
38	7.66 (195)	4.125 (105)	9.95 (253)

Table 5. Cover-Mounted Assembly Dimensional Information (Figure 5)

Type	Length in./(mm)	
	A	B
Short	13.62 (346)	4.19 (107)
Long	16.37 (416)	6.94 (177)

⚠ CAUTION

It is recommended that the accompanying decals be prominently displayed at or near location of Bay-O-Net as a warning to service personnel. *Failure to do so will constitute a waiver of all warranty and indemnity obligations which may be attributable to Eaton.*

Installation of assembly

Tightening requirements to seal

- Sidewall-Mounted Assembly: It is recommended that a Bay-O-Net locknut wrench (catalog #0838983B01) be used with a standard 3/8" drive socket wrench to tighten the locknut. Sealing requirements are attained by first hand-tightening the locknut and then continuing an additional 1/4 to 1/2 revolution (180-220 in-lb). The locknut has two grooved lines on each side (180 apart) to help determine the relative rotation that the locknut has been turned. The two sides of the locknut have been labeled "A" and "B" to ensure proper engagement. When installing the Bay-O-Net assembly on tanks with wall thickness of 1/4" or greater, the "A" side of the lock should face out from the tank. For tank wall thicknesses less than 1/4", either side "A" or "B" can face out from the tank.
- Cover-Mounted Assembly: Sealing requirements are attained by first hand-tightening the locknut and then continuing an additional 1/4 - 1/3 revolution.

Lead training

- Connect voltage source to bottom contact of the Bay-O-Net Assembly through isolation link or energy limiting fuse, as shown in Figure 6, with 1/4" x 20 stud on the isolation link. Recommended Bay-O-Net fuse and isolation link combinations are listed in Table 4. Connect upper contact of the Bay-O-Net Assembly to the transformer coil.

⚠ CAUTION

All leads should remain below the oil level.

⚠ CAUTION

The Bay-O-Net fuse element is designed to interrupt internal and external faults and overloads as well as switching transformer load current. It must be used in series with an isolation link or energy limiting fuse.

⚠ CAUTION

The 38 kV Bay-O-Net fuse element is designed to interrupt internal and external faults and overloads as well as switching transformer load current. It must be installed in a 38 kV rated Bay-O-Net housing assembly and must be used in series with a 38 kV rated energy limiting fuse.

Table 6. Bay-O-Net Fuse and Isolation Link Combination (23 kV Maximum Line-Line Voltage)

Bay-O-Net Fuse	Isolation Link*
Current Sensing Type	
4000353C04	3001861A01M
4000353C06	3001861A02M
4000353C08	3001861A02M
4000353C10	3001861A03M
4000353C12	3001861A03M
4000353C14	3001861A05M
4000353C16	3001861A05M
4000353C17	3001861A05M
Dual Sensing Type	
4000358C03	3001861A01M
4000358C05	3001861A02M
4000358C08	3001861A03M
4000358C10	3001861A05M
4000358C12	3001861A06M
4000358C14	3001861A07M
4000358C16CB	3001861A07M
4000358C18CB	3001861A07M
Dual Element Type	
4038108C03	3001861A01M
4038108C04	3001861A01M
4038108C05	3001861A02M
4038108C06	3001861A02M
4038108C07	3001861A02M
4038108C09	3001861A03M
4038108C11	3001861A03M
4038108C12	3001861A03M
4038108C14	3001861A03M
High Ampere Overload Type	
4038361C03CB	3001861A05M
4038361C04CB	3001861A05M
4038361C05CB	3001861A06M

* Isolation link is not required if the Bay-O-Net fuse is used in series with a back-up energy limiting fuse.

Retrofitting Equipment

- If retrofitting and equipment tank with a Bay-O-Net fuse assembly, follow normal installation procedures. However, if the tank does not have a pressure relief device, one should be installed.

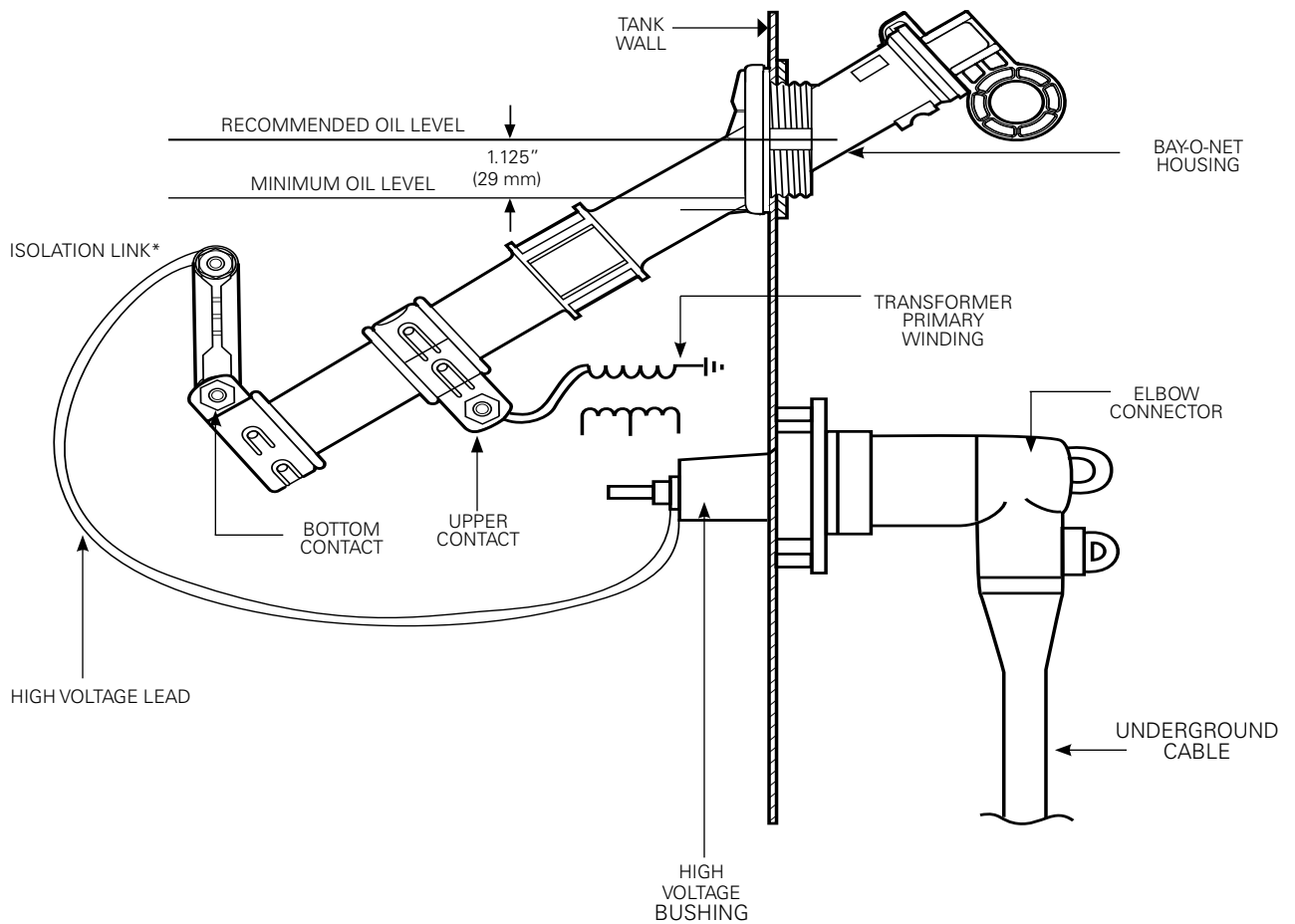


Figure 6. Line illustration of Bay-O-Net assembly with isolation link.**

* For 23 kV maximum rated application 23 kV maximum Bay-O-Net link, cartridge, and housing assembly must be used. Isolation Link is not required if the Bay-O-Net fuse is used in series with a 23 kV maximum back-up energy limiting fuse.

** For 38 kV maximum rated, 38 kV Bay-O-Net integral fuse cartridge must be used in a 38 kV Bay-O-Net housing in series with a 38 kV maximum rated ELSP back-up energy limiting fuse.

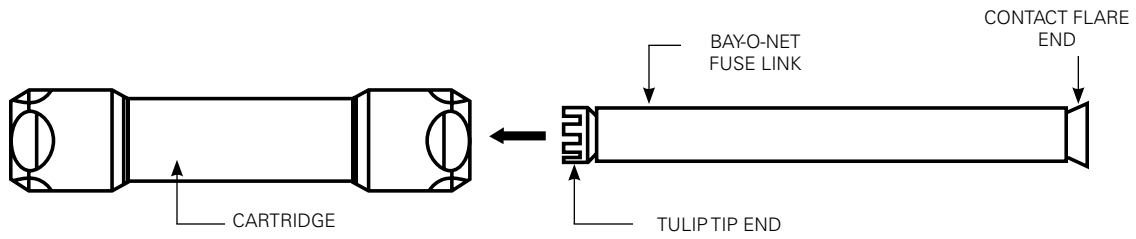


Figure 7. Insertion of Bay-O-Net link into cartridge.

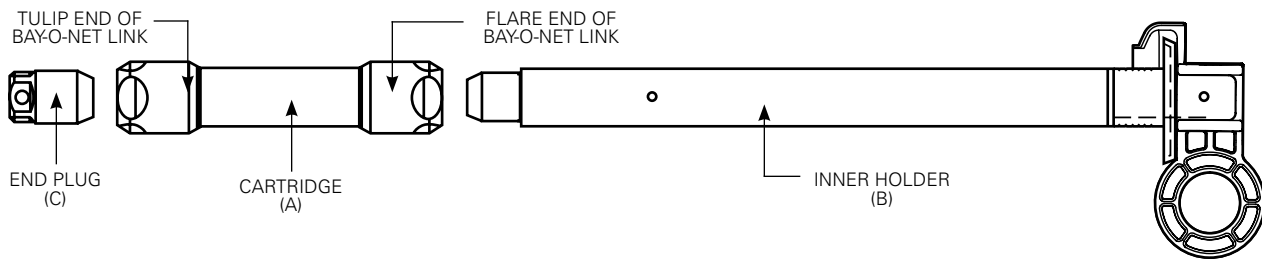


Figure 8. Assembly of cartridge with fuse onto inner holder.

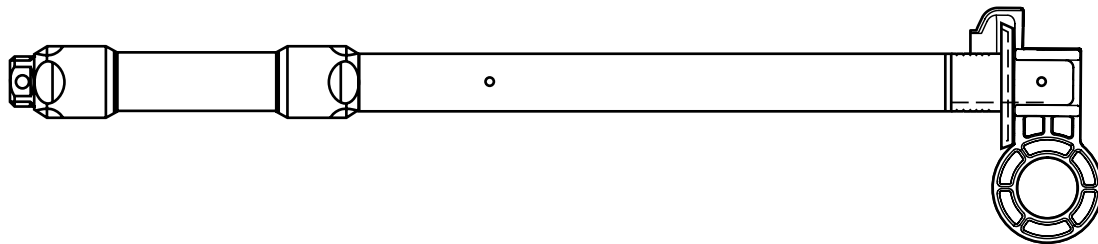


Figure 9. Inner holder with fuse link, cartridge and end plug assembly.

Installation of fuse element

For ALL Bay-O-Net Fuse Links, except for 23 kV maximum rated 4000358C16CB, 4000358C18CB, 4038361C03B, 4038361C04CB, 4038361C05CB, 4038361C10CB, and for 38 kV maximum rated 4000380C06CB, 4000380C08CB, 4000380C10CB, 400038C11CB, 4000380C12CB and 4000380C14CB

- Insert new fuse link (element) into cartridge from either end (a slight resistance may occur). (Refer to Figure 7.)
- Be sure contact flare end is secured in place between fuse cartridge (a) and the inner holder (b) and tighten cartridge against the inner holder applying 50 to 70-in-lbs of torque. (Refer to Figure 8.)
- Spread tulip tip of fuse link and place end plug (c) on the end of the fuse cartridge by tightening to 50 to 70 in-lbs of torque. Remove end plug and ensure the leaves of tulip tip have spread uniformly. Failure to do so can cause malfunction. Replace end plug applying 50 to 70 in-lbs torque to both connections. (Refer to Figure 9.)

For Bay-O-Net Fuse Links, 400358C16CB, 4000358C18CB, 4038361C03CB, 4038361C04CB, 4038361C05CB, Solid Link 4038361C10CB, 4000380C06CB, 4000380C08CB, 4000380C10CB, 400038C11CB, 4000380C12CB and 4000380C14CB

- For 23 kV rated fuse links 4000358C16CB, 4000358C18CB, 4038361C03CB, 4038361C04CB, 4038361C05CB and solid link 4038361C10CB are a pre-assembled link/cartridge/end plug.
- For 38 kV rated fuse links 4000380C06CB, 4000380C08CB, 4000380C10CB, 400038C11CB, 4000380C12CB and 4000380C14CB are a pre-assembled link/cartridge/end plug.
- For installation, tighten cartridge against the holder applying 50 to 70 in-lbs of torque.

Latching fuse holder

To latch and seal, the holder shall be completely inserted before latching the handle. Fingers of handle must be under the top ledge of housing.



CAUTION

Remove end plug and ensure the leaves of tulip tip have spread uniformly. Failure to do so can cause malfunction.

CAUTION

Equipment damage. For 23 kV integral cartridge. The length (including end plug) will be 4.72" long.

For 38 kV integral cartridge the length (including end plug) will be 5.73" long.

Failure to use the correct length integral cartridge will result in poor electrical contact between the cartridge and the Bay-O-Net housing terminals, resulting in possible equipment damage.



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