Installation and Operation

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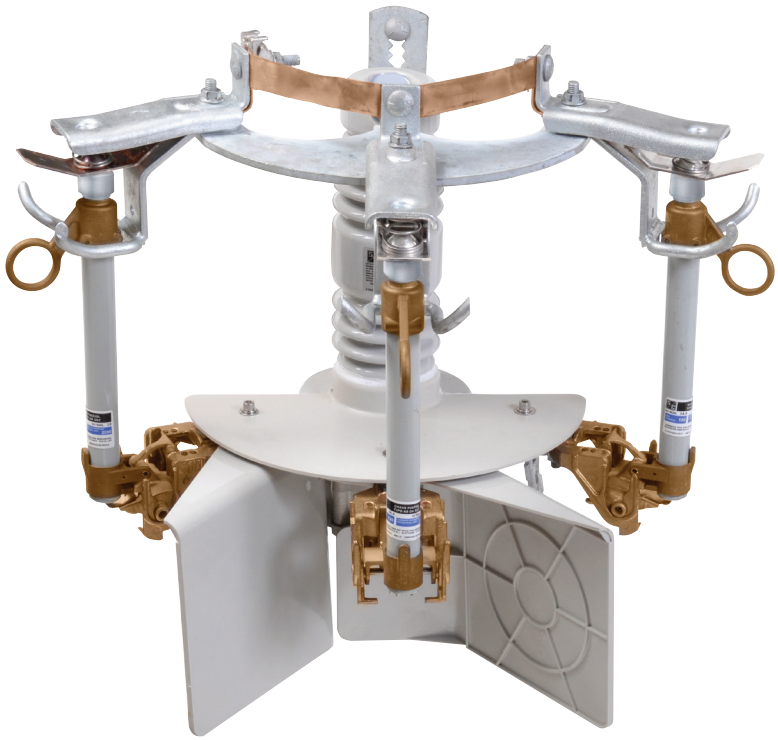

Qualified Persons

⚠ WARNING

The equipment covered by this publication must be installed, operated, and maintained by qualified persons who are knowledgeable in the installation, operation, and maintenance of primary distribution fusing equipment along with associated hazards. A qualified person is one who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment.
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed.
- The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment.

These instructions are intended only for such qualified persons. They are *not* intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

Thoroughly and carefully read this instruction sheet before installing or operating your S&C Three-Shot Type XS Fuse Cutout. Familiarize yourself with the Safety Information on pages 4 and 5. The latest version of this publication is available online in PDF format at **sandc.com/Support/Product-Literature.asp**

Retain this Instruction Sheet

This instruction sheet should be available for reference whenever fuse cutouts are used. Retain this instruction sheet in a location where you can easily retrieve and refer to it.

Proper Application

⚠ CAUTION

Three-Shot Type XS Fuse Cutouts must only be used for specific fusing applications that are within the ratings of the model selected. Three-Shot Type XS Fuse Cutout ratings are listed on a ratings label attached to the unit.

Warranty

The warranty and/or obligations described in S&C's standard conditions of sale, as set forth in Price Sheet 150, plus any special warranty provisions, as set forth in the applicable product-line specification bulletin, are exclusive. The remedies provided in the former for breach of these warranties shall constitute immediate purchaser's or end user's exclusive remedy and a fulfillment of all seller's liability. In no event shall seller's liability to immediate purchaser or end user exceed the price of the specific product that gives rise to immediate purchaser's or end user's claim. All other warranties, whether express or implied or arising by operation of law, course of dealing, usage of trade, or otherwise, are excluded. The only warranties are those stated in Price Sheet 150, and THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY EXPRESS WARRANTY OR OTHER OBLIGATION PROVIDED IN PRICE SHEET 150 IS GRANTED ONLY TO THE IMMEDIATE PURCHASER AND END USER, AS DEFINED THEREIN. OTHER THAN AN END USER, NO REMOTE PURCHASER MAY RELY ON ANY AFFIRMATION OF FACT OR PROMISE THAT RELATES TO THE GOODS DESCRIBED HEREIN, ANY DESCRIPTION THAT RELATES TO THE GOODS, OR ANY REMEDIAL PROMISE INCLUDED IN PRICE SHEET 150.

Warranty Qualifications

The standard warranty contained in seller's standard conditions of sale (as set forth in Price Sheet 150) does not apply to S&C Three-Shot Type XS Fuse Cutouts, Outdoor Distribution, when installed in conjunction with fuse tubes of other than S&C manufacture.

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet as well as on labels and tags attached to the Three-Shot Type XS Fuse Cutout. Familiarize yourself with these types of messages and the importance of the various signal words, as explained below:

⚠ DANGER

"DANGER" identifies the most serious and immediate hazards that *will likely* result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ WARNING

"WARNING" identifies hazards or unsafe practices that *can* result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ CAUTION

"CAUTION" identifies hazards or unsafe practices that *can* result in minor personal injury or product or property damage if instructions, including recommended precautions, are not followed.

NOTICE

"NOTICE" identifies important procedures or requirements that, if not followed, *can* result in product or property damage if instructions are not followed.

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact your nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C's website **sandc.com**. Or call S&C Headquarters at (773) 338-1000; in Canada, call S&C Electric Canada Ltd. at (416) 249-9171.

NOTICE

Thoroughly and carefully read this instruction sheet before operating your S&C Three-Shot Type XS Fuse Cutout.

Replacement Instructions and Labels

If you need additional copies of this instruction sheet, contact your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

⚠ DANGER

Three-Shot Type XS Fuse Cutouts operate at high voltage. Failure to observe the precautions below will result in serious personal injury or death.

Some of these precautions may differ from company operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to Three-Shot Type XS Fuse Cutout must be restricted only to qualified persons. See "Qualified Persons" on page 2.
2. **SAFETY PROCEDURES.** Always follow safe operating procedures and rules.
3. **PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and flash clothing, in accordance with safe operating procedures and rules.
4. **SAFETY LABELS AND TAGS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "*NOTICE*" labels and tags. Remove tags ONLY if instructed to do so.
5. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded.
6. **OPERATING TOOLS.** To close a Three-Shot Type XS Fuse Cutout, use a conventional insulated hookstick or S&C Universal Pole and Pole Extension fitted with an S&C Talon™ Handling Tool or a distribution prong. To open the Three-Shot Type XS Fuse Cutout, use Loadbuster®—The S&C Loadbreak Tool, attached to a conventional insulated hookstick or S&C Universal Pole.
7. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.

Shipping and Handling

Inspection

⚠ WARNING

Energizing a Three-Shot Type XS Fuse Cutout damaged during transport and handling could result in serious death or injury.

Examine the shipment for external evidence of damage as soon after receipt as possible, preferably before removal from the carrier's conveyance. Check the bill of lading to make sure shipping pallets and/or cartons are present.

If there is visible loss and/or damage:

1. Notify the delivering carrier immediately.
2. Ask for a carrier inspection.
3. Note condition of shipment on all copies of the delivery receipt.
4. File a claim with the carrier.

If concealed damage is discovered:

1. Notify the delivering carrier within 15 days of receipt of shipment.
2. Ask for a carrier inspection.
3. File a claim with the carrier.

Also notify S&C Electric Company in all instances of loss and/or damage.

Storage (if needed)

NOTICE

To prevent damage during transport and handling, keep the Three-Shot Type XS Fuse Cutout in its carton until you are ready to install it.

Mounting the Three-Shot Type XS Fuse Cutout

The following steps describe how to mount the Three-Shot Type XS Fuse Cutout:

Step 1

Attach the fuse cutout to a suitable mounting bracket as illustrated in Figure 1.

Note: A mounting bracket suitable for cross-arm, pole, or wall mounting is furnished only if so specified on the order form by adding suffix "-B" or "-C" to the catalog number of the fuse cutout.

Step 2

Mount the fuse cutout on the mounting bracket, as shown in Figure 1, with the carriage bolt nut snug but loose enough for a pivot adjustment. Note the placement of the external tooth lockwasher between the Three-Shot Type XS Fuse Cutout center insert and the mounting bracket. See Figure 1.

Step 3

Pivot the fuse cutout to a position that will provide maximum ease of operation, and securely tighten the carriage bolt nut.

Step 4

Make electrical connections. Be sure to wire-brush any aluminum conductors and apply a coating of oxidation inhibitor before inserting such conductors into the Three-Shot Type XS Fuse Cutout connectors. Tighten connector hardware to 20 ft.-lbs.

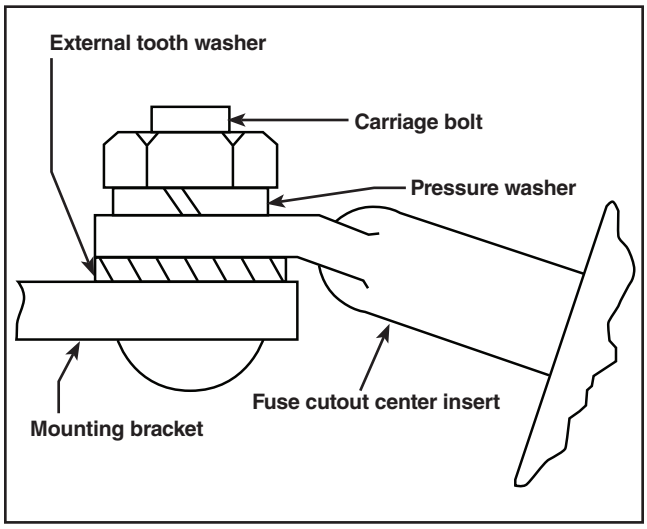

Figure 1. Detail of attachment of Three-Shot Type XS Fuse Cutout to mounting bracket.

Installing the Fuse Link

Three-Shot Type XS Fuse Cutouts Without an Arc-Shortening Rod

The following steps describe how to install the fuse link for a Three-Shot Type XS Fuse Cutout without an arc-shortening rod:

Step 5

Hand tighten the removable contact button on the fuse link by rotating clockwise, and *carefully* straighten the cable.

Step 6

Remove the cap from the upper ferrule of the fuse-tube assembly. Slide the fuse link by rotating clockwise, cable end first, into the top of the fuse-tube assembly, and retrieve it at the lower end.

Step 7

Replace the fuse-tube cap on the fuse-tube upper ferrule and tighten the cap securely using a wrench. Loosen the cable clamping nut on the trunnion. See Figure 2a.

Step 8

Rotate the flipper fully about its pivot until it reaches its stop (firm resistance is felt). See Figure 2a.

Hold the flipper in this position, and feed the cable through the flipper channel and around the threaded stud in a clockwise direction, as shown in Figure 2b.

Maintain tension on the fuse-link cable, and firmly tighten the cable clamping nut using a wrench. Do not overtighten the cable clamping nut.

Step 9

Clip excess cable to within a ½ inch (13 mm) of the nut. See Figure 2b.

Three-Shot Fuse Type XS Cutouts With Arc-Shortening Rod

Fuse cutouts having an arc-shortening rod that requires the use of removable buttonhead fuse links. Follow these steps for installation:

Step 10

Remove and discard the contact button (and washer, for fuse links so equipped), and *carefully* straighten the cable.

Step 11

Unscrew the cap on the upper ferrule of the fuse-tube assembly, and retract the arc-shortening rod (attached to the cap).

⚠ CAUTION

Do not use a standard cap in place of a cap with an arc-shortening rod. Use of the arc-shortening rod is required to achieve the full interrupting rating.

Failure to use the proper cap could result in misoperation of the unit.

Step 12

Screw the arc-shortening rod onto the fuse link and hand tighten. Slide this assembly, cable first, into the top of the fuse tube, and retrieve the cable at the lower end. Continue with Steps 7, 8, and 9 above.

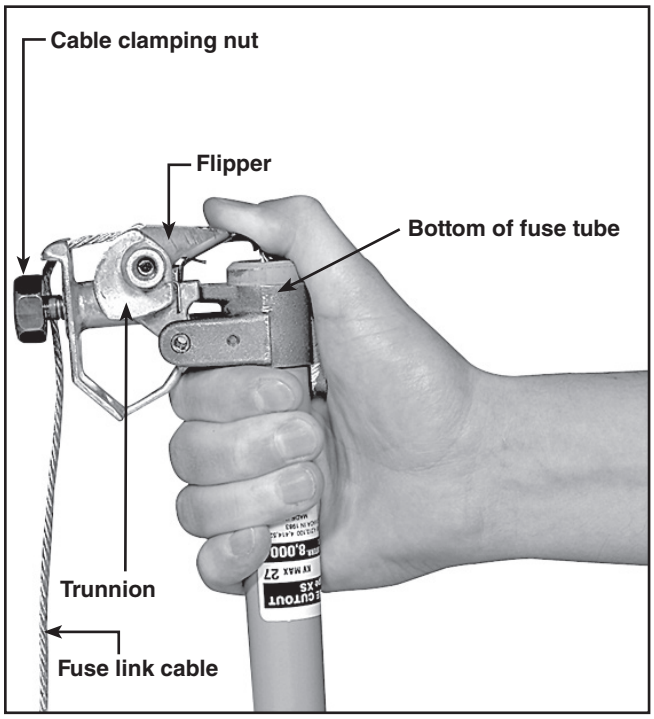

Figure 2a. Installing the fuse link into the fuse tube.

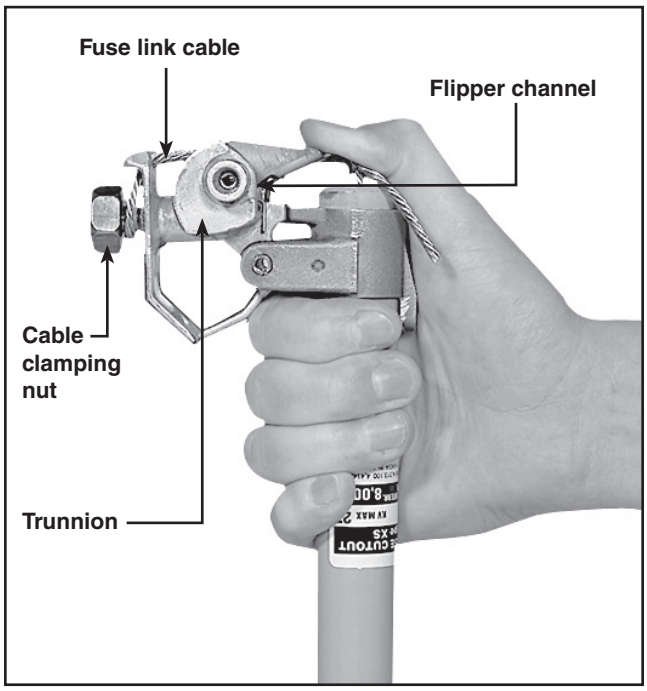

Figure 2b. Cable under tension around cable clamping nut.

Installing and Closing the Fuse Tubes

⚠ WARNING

Hot gases and fuse link particles can be expelled at high velocity during interruption. When closing a Three-Shot Fuse Cutout, all personnel should be positioned well clear of its exhaust.

Following are the steps required to install and close the fuse tubes:

Step 13

After installing the fuse link, as described in the previous sections, insert the hookstick prong into the opening under the trunnion casting band. Or, as an alternative, insert the prong in the keyhole opening in the trunnion casting band.

Step 14

Guide the first fuse tube into its hinge located at the left end of the Three-Shot Fuse Cutout and aligned with the Number 1 label of the mounting lower cap. See Figure 3a. Leave the fuse tube hanging from the hinge without closing it.

Step 15

Install the second and third fuse tubes in a similar fashion in their corresponding hinges, as indicated in Figures 3b and 3c, respectively.

Step 16

Insert the hookstick prong into the pull-ring on the upper ferrule of the fuse tube, and swing the fuse tube to within approximately 45° of the fully closed position. See Figure 4a. Then, while looking away from the Three-Shot Fuse Cutout, drive the fuse tube to the closed position using a vigorous thrust. Carefully disengage the hookstick prong, taking care to avoid opening the fuse tube.

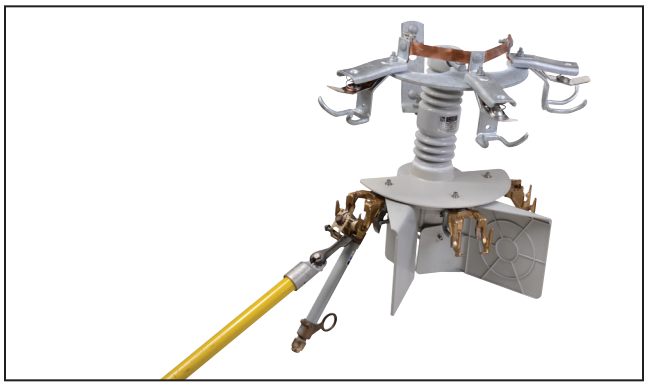

Figure 3a. Installing the first fuse tube.

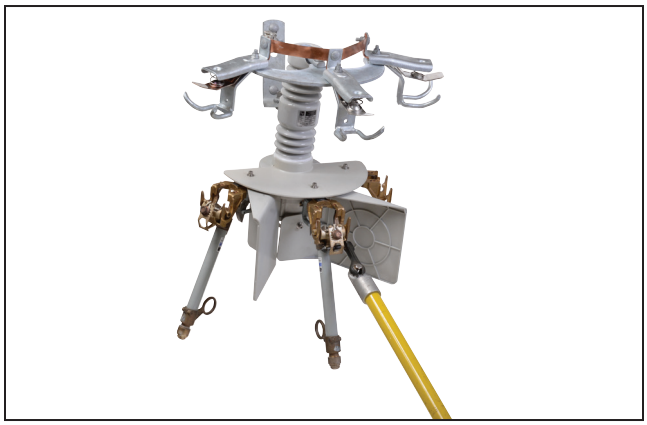

Figure 3b. Installing the second fuse tube.

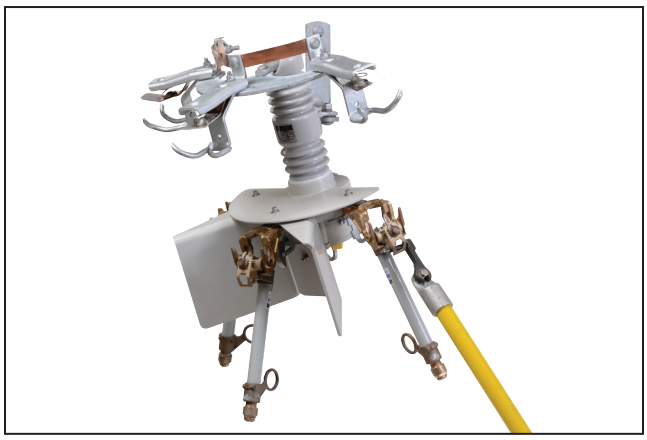

Figure 3c. Installing the third fuse tube.

Figure 4a. Closing the first fuse tube.

Step 17

To close fuse tubes in positions 2 and 3, repeat the procedure described in Step 16 on page 8. See Figures 4b and 4c.

Step 18

After all three fuse tubes are closed in, make sure the yellow side of the resetting ring points to Position 1 in the lower cap of the equipment. See Figure 8 on page 10. If necessary, insert a distribution prong into the resetting ring and turn the resetting ring until its yellow end reaches Position 1 in the Three-Shot Fuse Cutout lower cap. See Figure 7 on page 10.

Restoring the Three-Shot Cutout When *Three* Fuse Tubes Have Dropped Open

Use the following steps to restore the Three-Shot Type XS Fuse Cutout when three fuse tubes have dropped open:

Step 19

Remove the first dropped-open fuse tube from the Three-Shot Fuse Cutout mounting for the first fuse tube. See Figure 5. The second and third fuse tubes are removed in a similar fashion.

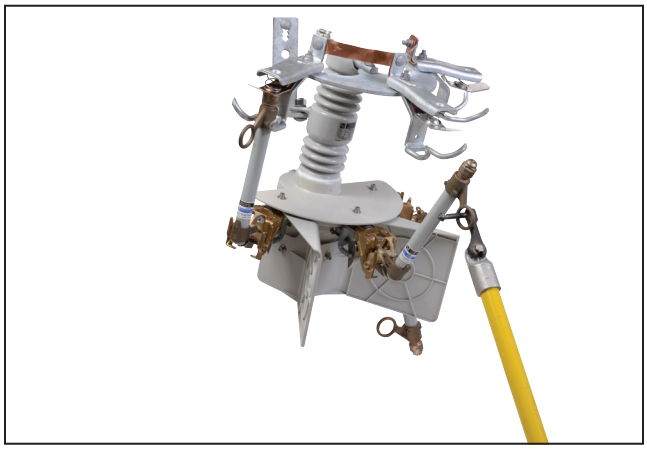

Figure 4b. Closing the second fuse tube.

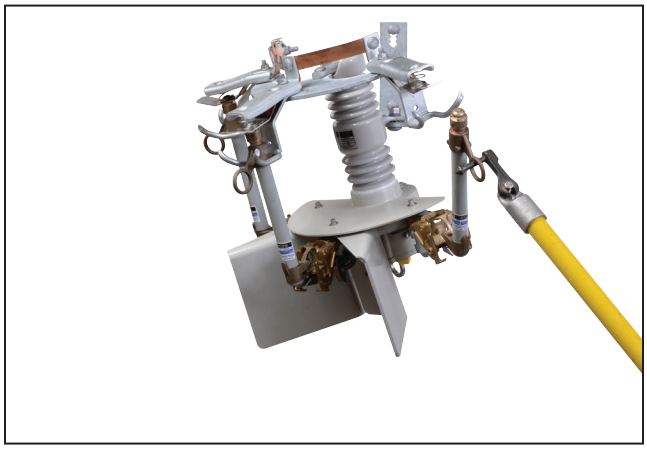

Figure 4c. Closing the third fuse tube.

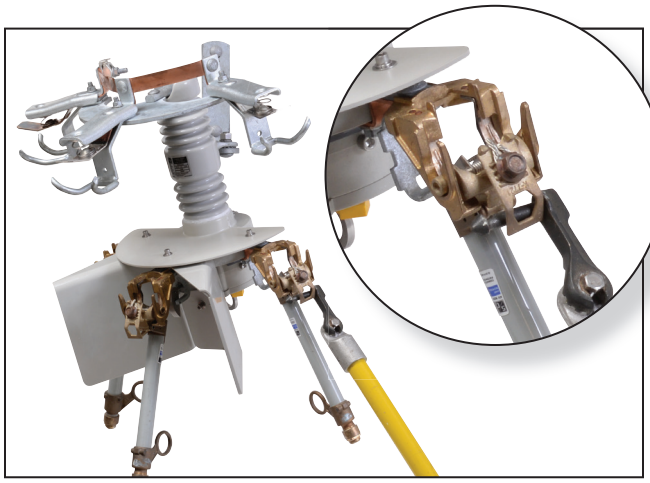

Figure 5. Removing the fuse tube when the fuse tube has dropped open.

Step 20

Replace the fuse link in each fuse tube as indicated in the "Installing the Fuse Link" section on pages 6 and 7.

Step 21

Insert the first fuse tube and close it as indicated in the "Installing and Closing the Fuse Tubes" section on pages 8 and 9.

Step 22

Insert the second and third fuse tube, and close them, as indicated in the "Installing and Closing the Fuse Tubes" section on pages 8 and 9.

⚠ DANGER

DO NOT move the resetting ring before installing and closing the Position 1 fuse tube. Failure to install and close the Position 1 fuse tube before moving the resetting ring will cause electrical arcing that may result in serious damage to the cutout and protected equipment, as well as death or serious injury to operating personnel.

Step 23

Insert a distribution prong into the resetting ring. See Figure 6. Turn the resetting ring until its yellow end reaches Position 1 in the Three-Shot Fuse Cutout lower cap. See Figure 7. Figure 8 shows how the unit appears when it is properly reset.

Restoring the Three-Shot Cutout When *Two* Fuse Tubes Have Dropped Open

The following steps describe how to restore the Three-Shot Type XS Fuse Cutout when two fuse tubes have dropped open:

Step 24

Remove the two dropped-open fuse tubes from the Three-Shot Fuse Cutout Mounting. See Figure 5 on page 9.

Step 25

Replace the fuse link in both fuse tubes. See the "Installing the Fuse Link" section on pages 6 and 7.

Step 26

Insert the first fuse tube in the mounting, and close it. See the "Installing and Closing the Fuse Tubes" section on pages 8 and 9.

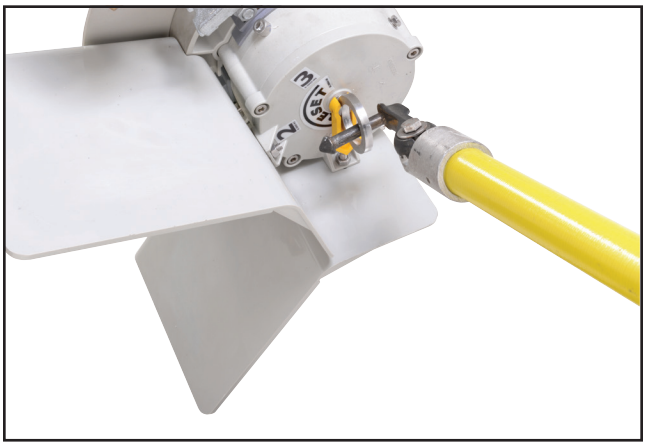

Figure 6. Inserting hookstick prong into resetting ring.

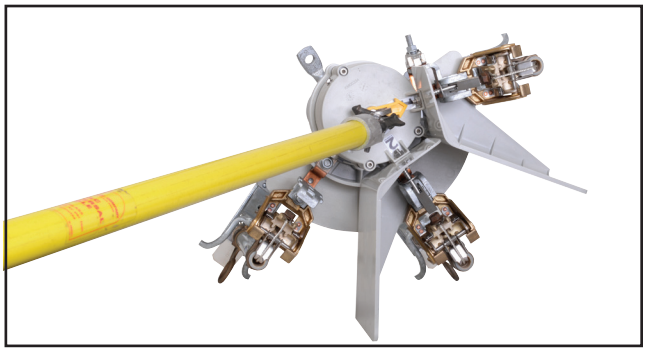

Figure 7. Turning resetting ring to position 1.

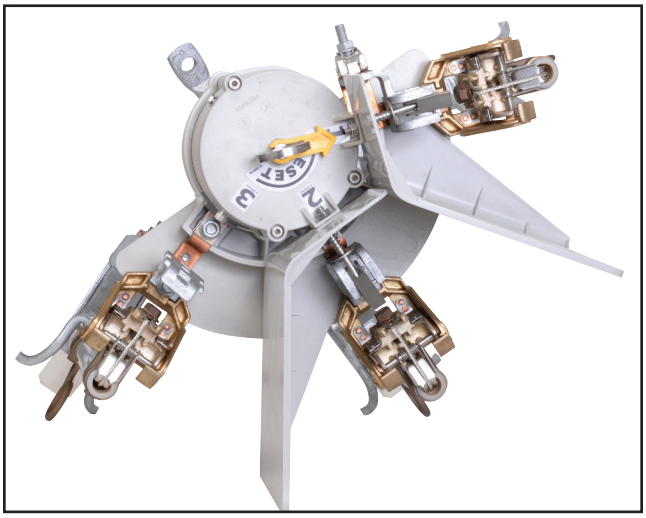

Figure 8. Indication of properly reset unit.

Step 27

Insert the second fuse tube and close it. See the "Installing and Closing the Fuse Tubes" section on page 8 and 9.

⚠ DANGER

DO NOT move the resetting ring before installing and closing the Position 1 fuse tube. Failure to install and close the Position 1 fuse tube before moving the resetting ring will cause electrical arcing that may result in serious damage to the cutout and protected equipment, as well as death or serious injury to operating personnel.

Step 28

Insert a distribution prong into the resetting ring. See Figure 6 on page 10. Turn the resetting ring until its yellow end reaches Position 1 in the Three-Shot Fuse Cutout lower cap. See Figure 7 on page 10.

Restoring the Three-Shot Cutout When *One* Fuse Tube Has Dropped Open

The following steps describe how to restore the Three-Shot Type XS Fuse Cutout when one fuse tube has dropped open:

Step 29

Remove the dropped-open fuse tube from the Three-Shot Fuse Cutout Mounting. See Figure 5 on page 9.

Step 30

Replace the fuse link in the fuse tube. See the "Installing the Fuse Link" section on page 6.

Step 31

Insert the fuse tube in the mounting and close it. See the "Installing and Closing the Fuse Tubes" section on pages 8 and 9.

⚠ DANGER

DO NOT move the resetting ring before installing and closing the Position 1 fuse tube. Failure to install and close the Position 1 fuse tube before moving the resetting ring will cause electrical arcing that may result in serious damage to the cutout and protected equipment, as well as death or serious injury to operating personnel.

Step 32

Insert a distribution prong into the resetting ring. See Figure 6 on page 10. Turn the resetting ring until its yellow end reaches Position 1 in the Three-Shot Fuse Cutout lower cap. See Figure 7 on page 10.

Opening the Fuse Tube

⚠ DANGER

Do not attempt to open S&C Three-Shot Type XS Fuse Cutouts to interrupt load current without the use of a loadbreak tool such as Loadbuster®—S&C's Loadbreak Tool. An arc started by opening a fuse cutout under load without a loadbreak tool could damage the equipment and result in death or serious injury.

Loadbuster—The S&C Loadbreak Tool is ideally suited for use in opening the fuse tube of S&C Three-Shot Type XS Fuse Cutouts (or other fuse cutouts and disconnects designed for use with the tool). The Loadbuster tool is S&C's unique method of providing low-cost, positive, and convenient live-switching capability for such devices. Instructions for use of the Loadbuster tool with S&C Three-Shot Type XS Fuse Cutouts are shown on pages 13 and 14.

Following an opening operation using the Loadbuster tool, the fuse tube can be lifted out of the fuse cutout hinge using the prong of a hookstick. See Figure 3a on page 8.

NOTICE

S&C Three-Shot Type XS Fuse Cutout fuse tubes already installed should not be left in the open position for an extended period of time. Doing so could cause water damage to the tube lining.

Operating with Loadbuster—The S&C Loadbreak Tool

Check for proper resetting of the Loadbuster tool by extending it about three inches by hand. Throughout this travel, an increasing spring resistance should be felt.

Use the following steps to operate Loadbuster—The S&C Loadbreak Tool:

Step 33

Reach across in front of the Three-Shot Fuse Cutout with the Loadbuster tool and hook the anchor, located at the top of the tool, over the attachment hook on the far side of the fuse tube you wish to open. See Figure 9.

Step 34

Swing the Loadbuster tool toward the fuse tube, and pass the tool's pull-ring hook through the pull-ring on the fuse tube. The pull-ring latch will deflect and, upon complete entry of the pull-ring, will spring back, locking the Loadbuster tool to the pull-ring. The tool is now connected across the upper contact of the Three-Shot Fuse Cutout. See Figure 9.

Step 35

To open the circuit, operate the Loadbuster tool with a firm, steady pull until it is extended to *its maximum length*. See Figure 10. Avoid jerking and hesitation. The resetting latch will keep it open. Generally, there will be no indication of circuit interruption, but commutation arcing may be noted at the pull-ring hook and at the anchor, particularly when interrupting load currents are approaching the rating of the tool. The only sound will be that of the Loadbuster tool tripping.

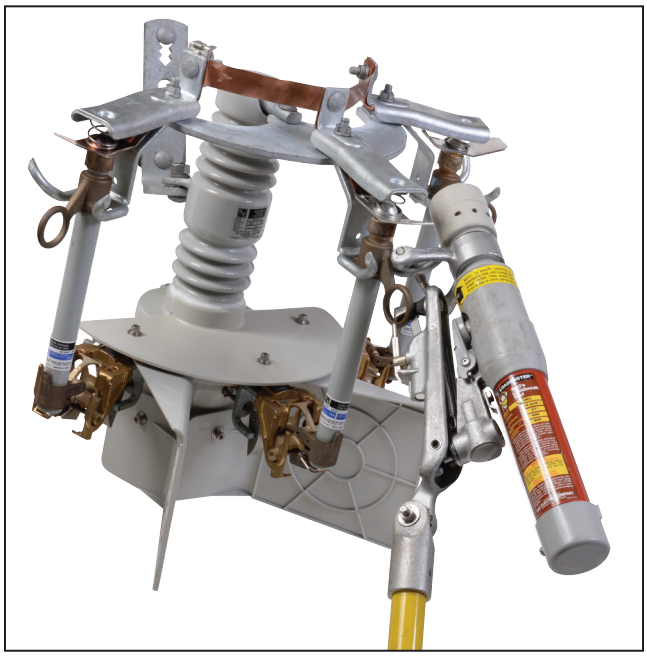

Figure 9. Loadbuster tool connected to S&C Three-Shot Type XS Fuse Cutout, Outdoor Distribution.

Figure 10. Loadbuster tool in tripped position.

Step 36

To detach the Loadbuster tool after circuit interruption, first raise it slightly, and disengage the anchor from the attachment hook.

Next, bring the fuse tube toward its fully open position. See Figure 11. Remove the Loadbuster tool from the pull-ring by turning the pole. This will deflect the pull-ring latch to release the pull-ring. Because the fuse tube will drop fully open by gravity, it may be preferred to remove the Loadbuster tool by "rolling" it off both the attachment hook and pull-ring at the same time merely by twisting the pole after the tool has been tripped and fully extended. To perform this operation easily and smoothly, always roll the Loadbuster tool so that it rotates in an upward direction.

Step 37

To reset the Loadbuster tool for the next operation, hold as shown in Figure 12. Extend the tool slightly, and lift the resetting latch with the thumb. With the latch up, telescope the tool completely so the trigger can reset itself. Check for proper resetting by extending the tool about three inches. Throughout this travel an increasing spring resistance should be felt.

Figure 11. Detaching the Loadbuster tool from Three-Shot Fuse Cutout.

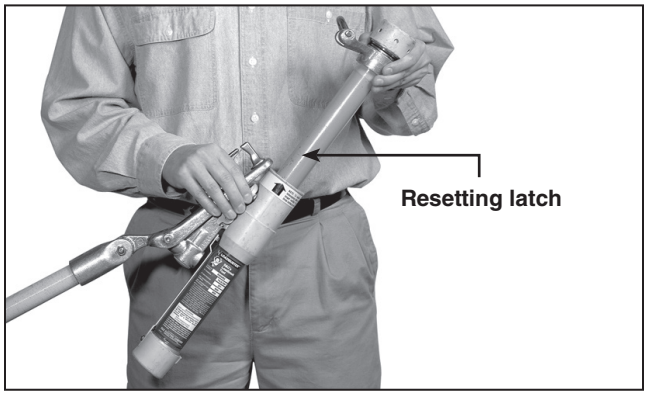

Figure 12. Resetting the Loadbuster tool.