Installation and Operation

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February 17, 2025

Qualified Persons

⚠ WARNING

Only qualified persons knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone 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 special precautionary techniques, personal protective equipment, insulated 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

NOTICE

Thoroughly and carefully read this instruction sheet and all materials included in the product's instruction handbook before installing or operating a TripSaver II Cutout-Mounted Recloser. Become familiar with the Safety Information on pages 4 through 5 and Safety Precautions on page 6. The latest version of this publication is available online in PDF format at **sandc.com/en/contact-us/product-literature/**.

Retain this Instruction Sheet

This instruction sheet is a permanent part of the TripSaver II Cutout-Mounted Recloser. Designate a location where users can easily retrieve and refer to this publication.

Proper Application

⚠ WARNING

TripSaver II Cutout-Mounted Recloser is only intended for a specific application. The application must be within the ratings furnished for the equipment. Ratings for the TripSaver II Cutout-Mounted Recloser are listed in the ratings table in Specification Bulletin 461-33 and are laser-etched on the recloser.

Application Note

NOTICE

When retrofitting TripSaver II reclosers in an existing cutout mounting: To ensure proper performance, TripSaver II reclosers must only be installed in a present-production ("-R10" or "-R11") S&C-provided cutout mounting. See the example in Figure 1. An example of an earlier-production S&C cutout mounting is shown in Figure 2.

The TripSaver II Cutout-Mounted Recloser, selected for a specific application, should have a maximum voltage rating equal to or greater than system line-to-line voltage when used in phase-to-phase applications. TripSaver II reclosers rated 25 kV, 150 kV BIL can be applied to protect single-phase-to-neutral circuits only in solidly grounded-neutral (multigrounded-neutral) 34.5-kV systems where leakage distance meets the user's requirement. These models use a 25-kV, 150-kV BIL mounting.

Video

A video of the installation and operation procedures in this instruction sheet is available at **sandc.com/videos/install-ts2**. The goal of the video is to provide a clear and simple visual reference. In no way is the video meant as a complete replacement of these written instructions

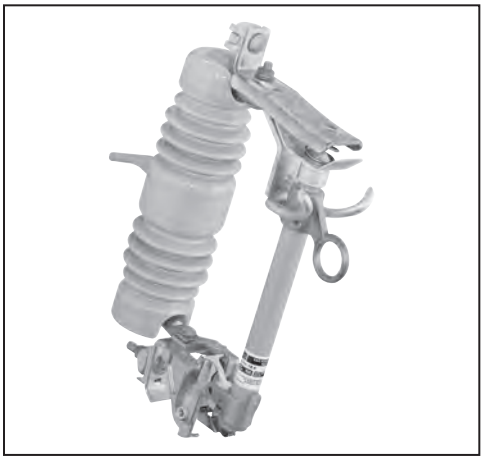


Figure 1. Present-production ("-R10" or "-R11") S&C-provided cutout mounting.

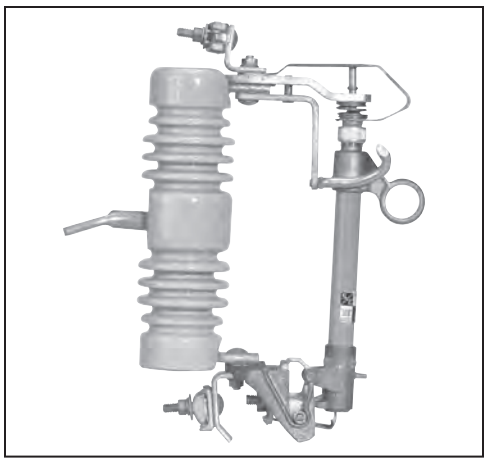


Figure 2. Earlier-production ("-R9") S&C cutout mounting. "-R8" and earlier versions have a similar upper contact.

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the product. Become familiar with these types of messages and the importance of these signal words:

⚠ 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 if instructions, including recommended precautions, are not followed.

NOTICE

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

Following Safety Instructions

If any portion of this instruction sheet is unclear and assistance is needed, contact the nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C's website **sandc.com**, or call the S&C Global Support and Monitoring Center at 1-888-762-1100.

NOTICE

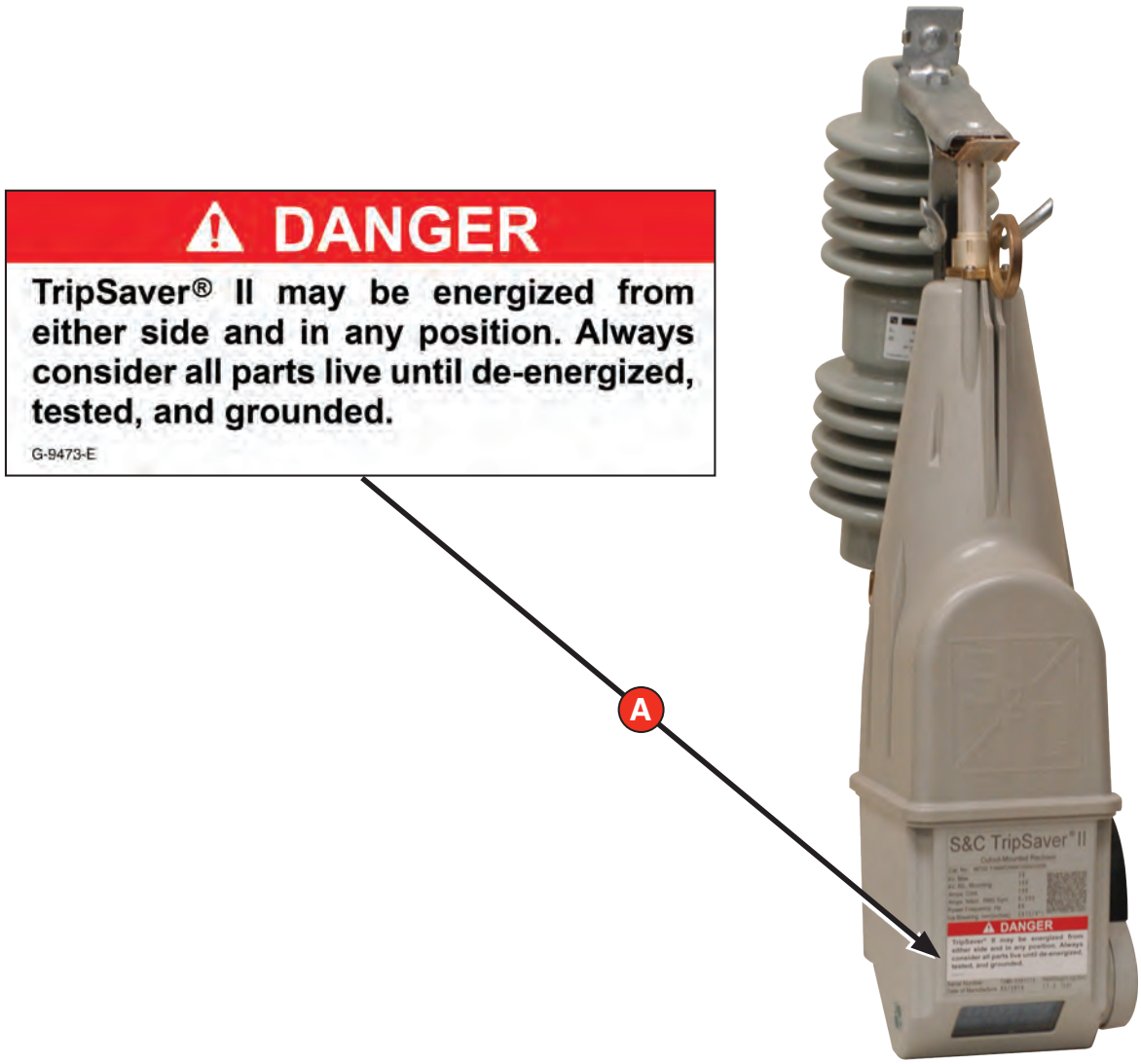
Read this instruction sheet thoroughly and carefully before installing and operating a TripSaver II Cutout-Mounted Recloser.

Replacement Instructions and Labels

If additional copies of this instruction sheet are required, contact the 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 the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

Location of Safety Labels



Reorder Information for Safety Labels

Location	Safety Alert Message	Description	Part Number
A	DANGER	TripSaver II may be energized from either side and in any position. Always consider all parts live until de-energized, tested, and grounded.	G-9473-E

⚠ DANGER

The TripSaver II Cutout-Mounted Recloser 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 your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to TripSaver II Cutout-Mounted Reclosers must be restricted only to qualified persons. See the "Qualified Persons" section 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.** 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 TripSaver II Cutout-Mounted Recloser, use a conventional insulated hotstick or S&C Universal Pole and Pole Extension fitted with a Talon™ Handling Tool or distribution prong. An extendo stick also can be used after proper training and practice. The TripSaver II Cutout-Mounted Recloser can be opened using Loadbuster®—The S&C Loadbreak Tool attached to a conventional insulated hotstick or S&C Universal Pole.
7. **MAINTAINING PROPER CLEARANCE.** Always maintain the proper clearance from energized components.

⚠ WARNING

Do not disassemble a TripSaver II recloser. The control module inside the TripSaver II recloser housing is only intended for use inside the TripSaver II recloser and has not been approved for any other use. There are no customer-serviceable parts inside the recloser, and disassembling the recloser voids the warranty. If disassembling a TripSaver II recloser, never power it with the power module included with the service center configuration kit when the inside of the recloser is exposed. **Unsafe high voltage can be present on the connectors on the outside of the internal control box assembly, resulting in serious injury or death**.

⚠ WARNING

The TripSaver II Cutout-Mounted Recloser must be de-energized and removed from the utility pole before attaching the corded power module (power module with ac adapter and extension cord) to the base of the TripSaver II recloser. The corded power module is only intended to be used for set-up and data collection when the TripSaver II recloser is de-energized and removed from the utility pole. (To provide power to a TripSaver II recloser while it is mounted to the pole, use the cordless power module, S&C catalog number 5954.) **Failure to remove the TripSaver II recloser from the utility pole before connecting the corded power module can cause arcing, burns, electric shock, and death.**

Packing

A complete TripSaver II Cutout-Mounted Recloser for a new installation consists of two shipping containers. They include the following:

- A single-pole TripSaver II Cutout-Mounted Recloser
- A mounting and miscellaneous mounting hardware for securing the TripSaver II recloser to the pole

Inspection

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 the listed shipping containers are present:

If there is visible loss and/or damage:

1. Notify the delivering carrier immediately.
2. Ask for a carrier inspection.
3. Note the 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.

Handling

NOTICE

Do not drop a TripSaver II recloser or subject any of its parts to undue stress during installation. Only remove a TripSaver II recloser from the carton when you are ready for installation.

Storage

TripSaver II Cutout-Mounted Reclosers are shipped on pallets banded with plastic wrap. This packaging is designed to protect the TripSaver II reclosers from freight damage. This packaging is not suitable for outdoor storage as it can pool water and damage TripSaver II reclosers. After receipt, TripSaver II reclosers should be stored indoors in their shipping packaging. Storing TripSaver II reclosers outdoors in the shipping packaging will void the warranty.

Returning

If for any reason a TripSaver II recloser is to be returned, place the TripSaver II recloser in the original shipping carton to prevent damage during shipping. If additional shipping cartons are needed, contact the nearest S&C Sales Office, S&C Authorized Distributer, or S&C Headquarters.

Battery Shelf Life

This applies to the extended open-interval option "-O." S&C rates the battery as having a two-year shelf life if stored in a 20°C to 32°C (68°F to 90°F) temperature environment.

Installing a TripSaver II Cutout-Mounted Recloser

Follow these steps to install a TripSaver II Cutout-Mounted Recloser:

STEP 1. ***For the Overhead Pole-Top Style TripSaver II recloser:*** Attach the mounting to its mounting bracket, as illustrated in Figure 3. A mounting bracket—suitable for crossarm, pole, or wall mounting—is furnished only if specified through the addition of suffix "-B" or "-C" to the TripSaver II recloser catalog number.

Note the placement of the external-tooth lockwasher between the mounting bracket and the center insert of the mounting. Pivot the mounting to a position that will provide maximum ease of operation, and then securely tighten the carriage-bolt nut.

STEP 2. Make electrical connections to the mounting. If aluminum conductors are used, make sure to wire-brush them and then apply a coating of oxidation inhibitor before inserting them into the connectors.

Confirm the TripSaver II recloser's drop-open mechanism is latched. If the mechanism is unlatched, the trunnion will be loose and can be pushed into the body of the TripSaver II recloser. The drop-open mechanism can be reset by following the instructions shown in the "Manually Resetting a TripSaver II Recloser After an Icing Event" section on page 35.

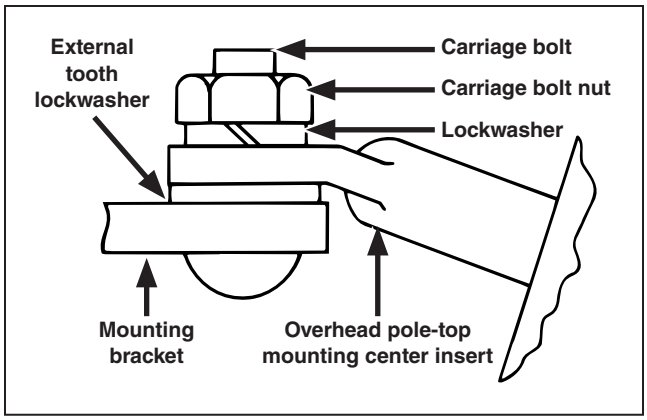


Figure 3. Attaching an overhead pole-top style TripSaver II recloser mounting to the mounting bracket.

STEP 3.

(a) ***For a TripSaver II recloser rated 15 kV:*** Attach a Talon Handling Tool or a distribution prong to a short hotstick. Insert the curled prong of the Talon tool or the distribution prong into the lifting eye of the trunnion, and raise the TripSaver II recloser into the mounting. See Figure 4. If a Talon tool is used, rotate the hotstick counter-clockwise 180° to disengage it.

(b) Guide the trunnion into the hinge of the cutout mounting. Alternately, insert the TripSaver II recloser into a 110-kV BIL-rated mounting with gloved hands, as shown in Figure 5 and Figure 6.

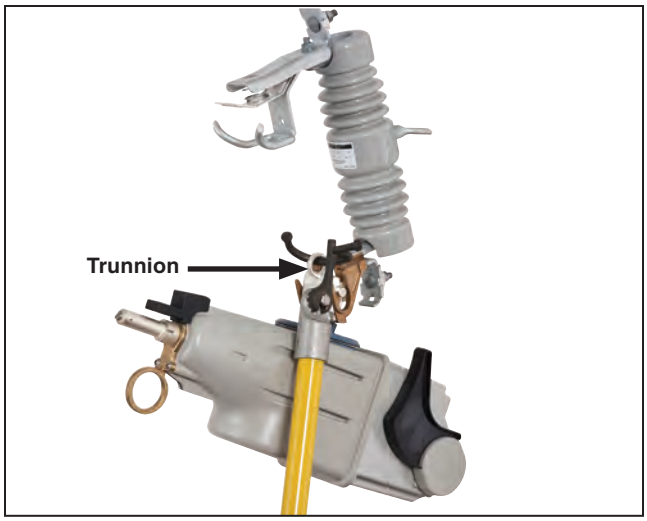


Figure 4. Inserting a 15-kV TripSaver II recloser into its mounting with a Talon Handling Tool.

Figure 5. Inserting a 15-kV TripSaver II recloser into its mounting with gloved hands.

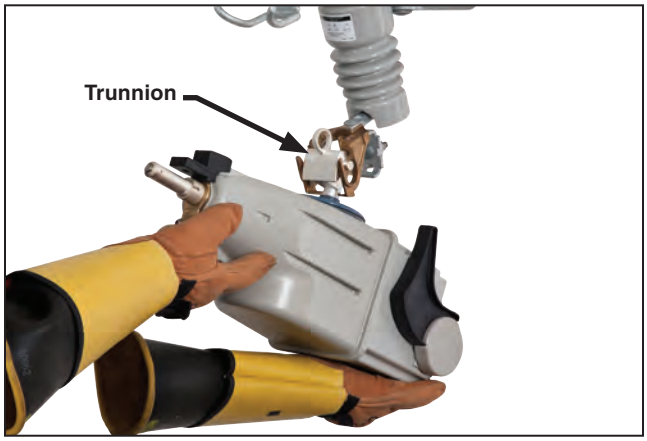


Figure 6. Guiding the trunnion into the hinge of the cutout mounting.

(c) ***For a TripSaver II recloser rated 25 kV:*** Attach a Talon Handling Tool or a distribution prong to a short hotstick. Insert the curled prong of the Talon tool or the distribution prong into the lifting eye of the trunnion, and raise the TripSaver II recloser into the mounting. See Figure 7. If a Talon tool is used, rotate the hotstick counterclockwise 180° to disengage it.

Alternately, insert the TripSaver II recloser into a 125-kV BIL or 150-kV BIL-rated mounting with gloved hands, as shown in Figure 8 and Figure 9. Guide the trunnion into the hinge of the cutout mounting as shown in Figure 9.

⚠ WARNING

The TripSaver II Cutout-Mounted Recloser is different from other cutout-mounted devices, such as fuses. **Therefore, before using a TripSaver II recloser, installation training using both a hotstick and an extendo stick must be provided so line crews know how to correctly install the recloser in the field to avoid potential serious injury or death.**

⚠ WARNING

Do not use the curled prong of a Talon Handling Tool to close a TripSaver II recloser. **Using the curled prong of a Talon tool to close a TripSaver II recloser can prevent full closure, resulting in arcing, equipment damage, serious injury, or death.**

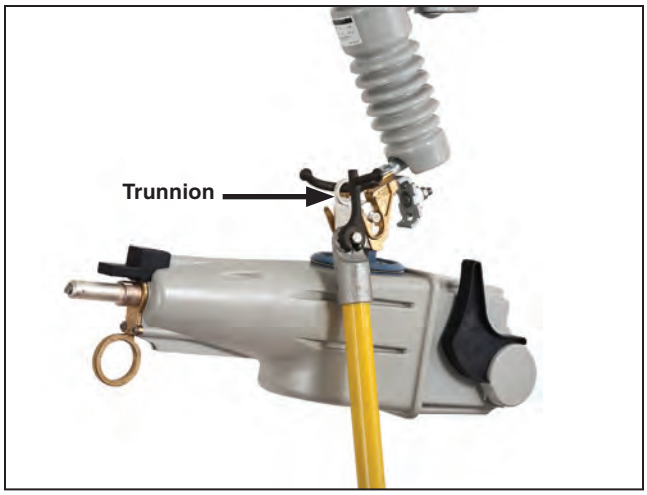


Figure 7. Inserting a 25-kV TripSaver II recloser into its mounting with a Talon Handling Tool.

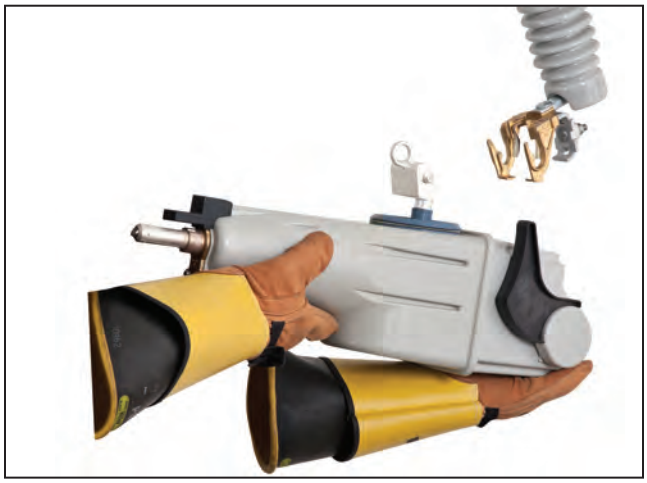


Figure 8. Inserting a 25-kV TripSaver TripSaver II recloser into its mounting with gloved hands.

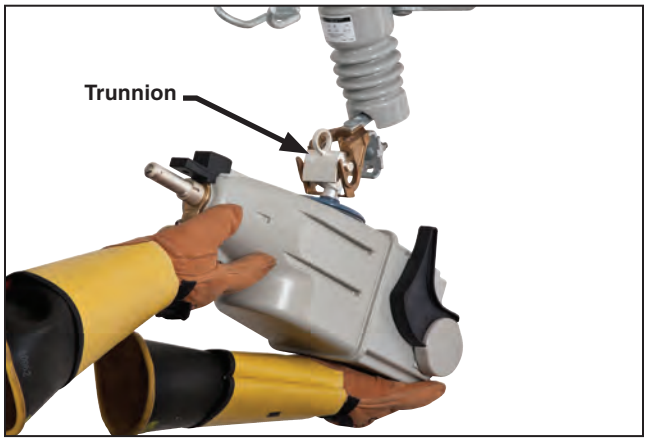


Figure 9. Guiding the trunnion into the hinge of the cutout mounting.

STEP 4. ***To close a TripSaver II recloser into the mounting:***

(a) Stand firmly in front of and in line with the cutout mounting. Do not operate directly underneath the TripSaver II recloser. Insert the straight prong of a Talon Handling Tool or a distribution prong into the pull-ring.

(b) To close a TripSaver II recloser using an extendo stick, stand between 12 to 15 feet (3.7 to 4.6 m) away from the pole.

(c) Swing the TripSaver II recloser to within approximately 45 degrees of the fully **Closed** position, as shown in Figure 10.

(d) While firmly gripping the stick, drive the TripSaver II recloser closed with forward force. Maintain the forward force until the recloser properly closes and latches into the cutout mounting.

(e) Disengage the prong from the pull ring, taking care to avoid pulling open the TripSaver II recloser.

STEP 5. Verify the MODE SELECTOR lever is in the desired position. Figure 11 shows the MODE SELECTOR lever in the **Auto** position, and Figure 12 shows the MODE SELECTOR lever in the **NR (Non-Reclose)** position.

Note: The MODE SELECTOR lever can be placed in either the **Auto** position or **NR** position before closing the TripSaver II recloser into the mounting. The TripSaver II recloser has a **Transformer-Magnetizing Inrush Restraint** feature that is always on. It is not susceptible to inrush current and will not nuisance trip on inrush when closed into the mounting.

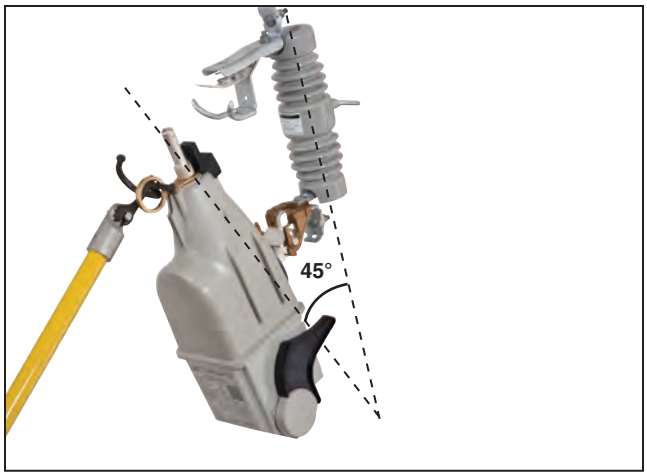


Figure 10. Swing the TripSaver II recloser to within 45 degrees of the fully Closed position before final closing.

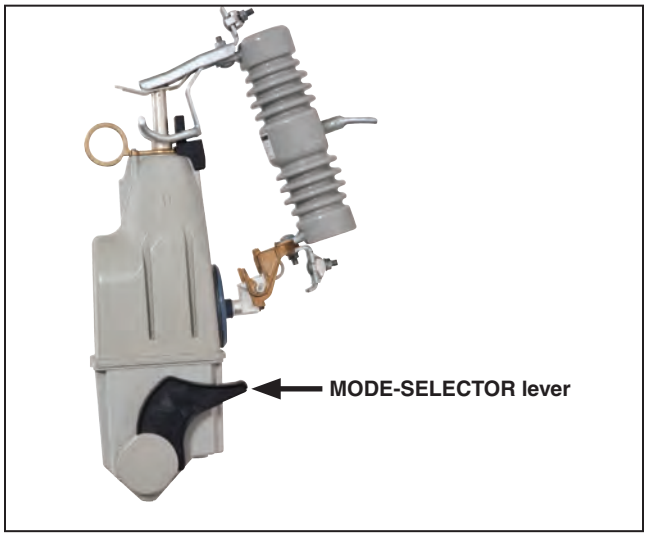


Figure 11. The MODE SELECTOR lever in the Auto position.

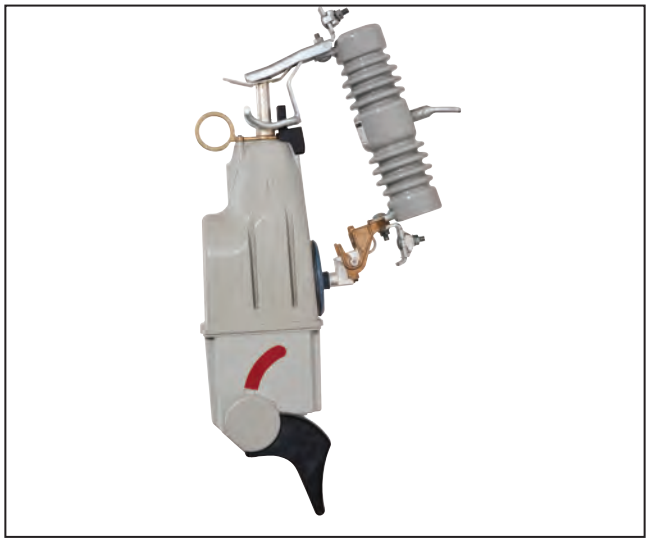


Figure 12. The MODE SELECTOR lever in NR position.

If the MODE SELECTOR lever is not in the desired position: Reposition the lever using the straight prong of a Talon Handling Tool or a distribution prong. See Figure 13 and Figure 14. Springs help guide the MODE SELECTOR lever to the desired position, and labels provide visual guidance. For the **Auto** position, the upper curved label must be completely covered. For the **NR** position, the label on the lever must align with the label on the lower body. See Figure 15 and Figure 16.

About the MODE SELECTOR Lever

When the MODE SELECTOR lever is toggled, the operational status of a TripSaver II recloser is indicated on a nonvolatile liquid-crystal display (LCD) screen. When the TripSaver II recloser is energized and the control is powered up, the display screen will show the most recent status information.

Note: To power a TripSaver II recloser from its **Sleep** state, there must be enough load current available (1 A for 40-A continuous reclosers, 4 A for 100-A continuous reclosers, and 8 A for 200-A continuous reclosers). When powered, the control can stay on when the power does not fall below the "stay on" threshold (0.5 A for 40-A continuous reclosers, 1.5 A for 100-A continuous reclosers, and 3 A for 200-A continuous reclosers).

For customers with lower than the "power on" load current, the TripSaver II recloser will still respond properly should a fault occur, however, it will take a small but finite amount of time for the control to power up and issue a trip signal. This power up time only affects TCC curves selected to respond quickly at high levels of current.

When the MODE SELECTOR lever is in the **Auto** position, the TripSaver II recloser supports up to three reclosing operations (four tripping operations in total) before it drops open. The open interval between tripping operations is user configurable in the range of one-half second to 5 seconds (or 30 seconds for the **Extended Open Interval** option "-O"). The factory default is 5 seconds. The vacuum interrupter resets 2 seconds after the TripSaver II recloser drops open.

Figure 13. Place the prong above the lever and pull down to enter NR mode.

Figure 14. Place the prong under the lever and push up to enter Auto mode.

Figure 15. The lever locks into position and points downward when in NR mode.

Figure 16. Labels align when in NR mode.

If a temporary fault is cleared before the TripSaver II recloser reaches the end of its operating sequence, the TripSaver II recloser will revert to its setting defined in the initial trip operation (first TCC curve) after the user-configurable sequence reset time has elapsed following the last **Reclosing** operation. The factory default is 15 seconds.

Removing a TripSaver II Recloser from Its Mounting

When the TripSaver II recloser is in the **Dropped Open** position, follow these steps to remove it from the mounting:

Using a Hotstick

Attach a Talon Handling Tool or a distribution prong to a short hotstick. Insert the curled prong of the Talon tool or the distribution prong into the lifting eye of the trunnion. The hotstick should be positioned vertically as close to the body of the TripSaver II recloser as possible. Exert an upward force to lift the TripSaver II recloser out of the mounting. See Figure 17.

Using gloved hands

Alternately, in the **Dropped Open** position, lift the TripSaver II recloser out of the mounting with gloved hands. See Figure 18.

Installing Multiple TripSaver II Reclosers on a Utility Pole

When installing multiple TripSaver II reclosers on a crossarm, a minimum of 2 feet (61 cm) between the center of each TripSaver II recloser must be maintained to avoid electromagnetic interference between adjacent reclosers.

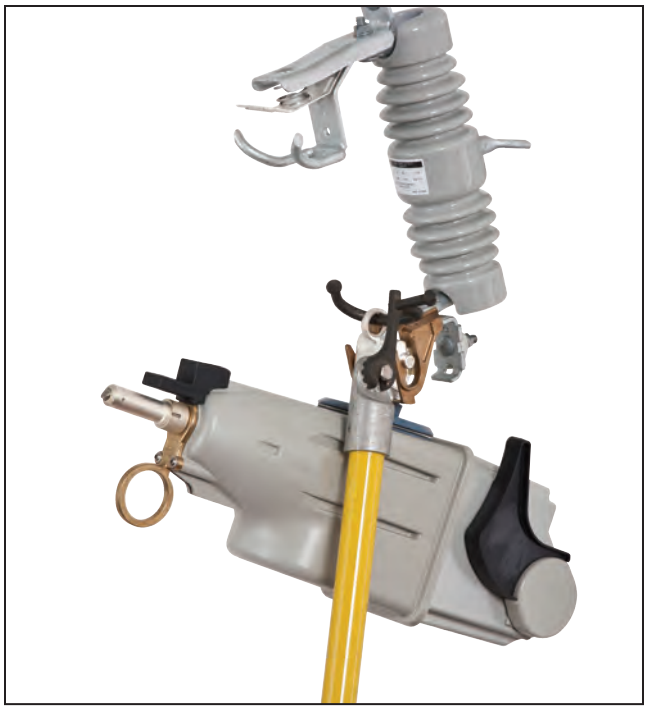


Figure 17. Lifting the TripSaver II recloser out of the mounting using a hotstick.

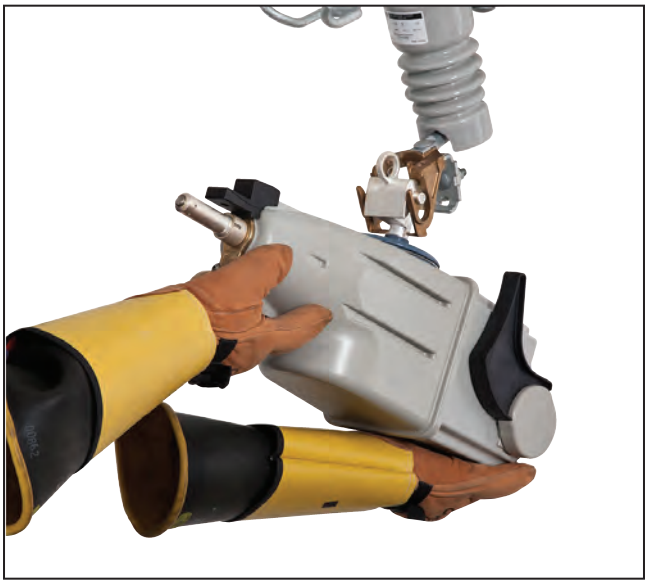


Figure 18. Lifting the TripSaver II recloser out of the mounting using gloved hands.

If the TripSaver II Recloser Has Dropped Open

Follow these steps if the TripSaver II recloser has dropped open:

STEP 1. Determine and resolve the cause of the fault with assistance from the information on the display screen. Refer to the "Display Screen" section on page 16 through 17.

STEP 2. After the cause of the fault has been resolved and any necessary repairs completed, repeat Step 4 and Step 5 on page 11 and page 12 to close the TripSaver II recloser back into the mounting.

If Line Work Is to Be Performed Downstream of a TripSaver II Recloser

Follow these steps if line work is to be done downstream of the TripSaver II recloser:

STEP 1. Place the MODE SELECTOR lever in the **NR** position. Rotate the MODE SELECTOR lever downward using the straight prong of a Talon Handling Tool or a distribution prong, as shown in Figure 19, until the lever locks into the vertical position, as shown in Figure 20. Springs help guide the MODE SELECTOR lever to the **NR** position, and labels provide visual guidance. The label on the lever must align with the label on the body. See Figure 21.

Note: With the MODE SELECTOR lever in the **NR** position, the TripSaver II recloser will operate using the NR Curve and then drop open. It will not go through the reclosing sequence.

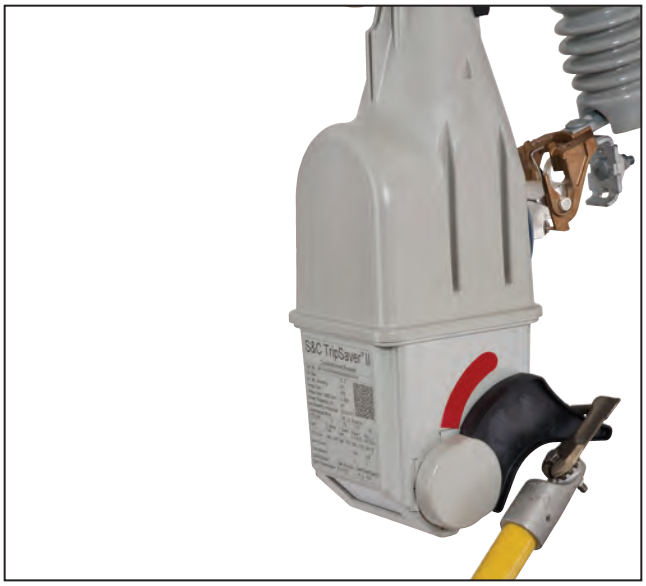


Figure 19. A TripSaver II recloser entering NR mode.

Figure 20. A TripSaver II recloser with the MODE SELECTOR lever locked in the vertical position.

Figure 21. Align the lever with the label on the body.

STEP 2. After line work has been completed, return the MODE SELECTOR lever to the **Auto** position by rotating it all the way up using the straight prong of a Talon Handling Tool or a distribution prong attached to a hotstick. The lever must completely cover the curved label on the body. Springs help guide the MODE SELECTOR lever to the desired position. See Figure 22 and Figure 23.

Figure 22. Place the prong under the lever and push it up.

Figure 23. The curved label must be completely covered.

Display Screen

When the TripSaver II recloser is energized, operational information will be shown on the nonvolatile LCD screen. The display screen supports messaging in English, Spanish, Portuguese, French, Chinese, and Arabic. The display shows the *Primary Normal* screen most of the time. Additional display screens are available by toggling the MODE SELECTOR lever. The screens to be displayed are user selectable using TripSaver® II Service Center Configuration Software.

Note: To power a TripSaver II recloser from its sleep state, there must be enough load current available (1 A for 40-A continuous reclosers, 4 A for 100-A continuous reclosers, and 8 A for 200-A continuous reclosers). When powered, the control can stay on as long as the power does not fall below the **Stay On** threshold (0.5 A for 40-A continuous reclosers, 1.5 A for 100-A continuous reclosers, and 3 A for 200-A continuous reclosers). If less than the **Stay On** threshold load current is available, the LCD screen will not refresh.

Normal screen mode

The factory default normal screen is the *Primary Normal* screen. See Figure 24. (The *Secondary Normal* screen can be selected using TripSaver II Service Center Configuration Software). The *Primary Normal* screen displays the following information, and it refreshes whenever a change in the status of the following items is detected:

- **Mode: AUTO** or **NR** mode. In **AUTO** mode, the TripSaver II recloser will perform **Open** or **Reclose** operations according to the preselected TCC curves. In **NR** mode, the TripSaver II recloser will not reclose; it will trip once and then drop open.
- **Vacuum Interrupter Status: Open or Closed** mode. If "OPEN" is displayed, the vacuum interrupter contacts are open. If "CLOSED" is displayed, the vacuum interrupter contacts are closed.
- **Overload indicator:** An "X" symbol in the lower left corner indicates the TripSaver II recloser has dropped open because of an overload. The vacuum interrupter is reset, and the drop-open mechanism is also reset, ready for the operator to close the TripSaver II recloser into the mounting. This indicator will stay on until the next fault event occurs.

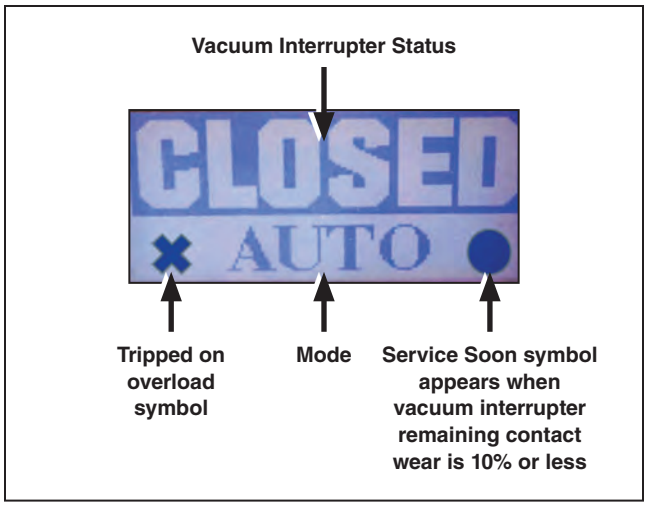


Figure 24. Illustration of the *Primary Normal* screen.

- **Service Soon:** A "●" symbol in the lower right corner indicates the vacuum interrupter has reached 10% of its remaining contact wear.

Note: When the temperature is below –30°C (–22°F), the *Normal* screen will show updated information at the end of the operating sequence or when the MODE SELECTOR lever changes position. The Overload symbol will not be updated when the recloser drops open because of an overload, and the Service Soon symbol will not be updated when the recloser drops open because of a permanent fault. Information on the screen can be read after refreshing the LCD screen with a 9-Volt Lithium L522 battery. Refer to the "Troubleshooting" section on page 35.

Display screen mode

The *Display* screen can be selected by toggling the MODE SELECTOR lever down and then up again when the recloser is energized and the control is powered up.

When the *Display* screen is activated, the TripSaver II recloser scrolls through the user-selected *Display* screen items; it repeats these items the user-specified number of times before returning to the *Primary Normal* screen. The length of time, in seconds, that each display screen item is displayed before the screen scrolls to the next item is also user configurable.

The *Display* screen will automatically stop and the screen will revert to **Normal** mode updated with the most recent status information when the control is powered down or a fault event occurs.

Twenty-four different display-screen items can be selected for display. The factory default comes with the following eight screens:

Primary Normal: The most-recent operational information is shown. See Figure 24 on page 16.

Load Current: The instantaneous fundamental-frequency RMS load current in amperes is shown. See Figure 25.

Last Fault Magnitude: The fundamental-frequency RMS magnitude of the last fault current in primary amperes, measured just before the opening of the vacuum interrupter is shown. See Figure 26. The fault current unit is in amperes for faults below 1000 amperes and in kiloamps (kA) for faults larger than 1000 amperes.

Figure 25. The *Load Current* screen.

Figure 26. The *Last Fault Magnitude* screen.

Number of Open Operations: The number of vacuum interrupter open operations registered is shown. See Figure 27. The counter will return to 0 after it displays 9,999.

Remaining Contact Wear in %: The percentage of remaining vacuum interrupter contact wear is shown. See Figure 28.

LCD Screen Temperature: The LCD screen temperature is shown, in degrees Celsius. See Figure 29.

Sectionalizing Mode Counts: This screen displays the preset number of source-side circuit breaker or recloser operations that TripSaver II recloser will count up to before dropping open. This screen is automatically skipped if **Sectionalizing** mode is disabled. See Figure 30.

Software Versions: Three pieces of information about the software version are displayed: Application; Bootloader; and Radio Frequency Microcontroller Unit. See Figure 31.

Figure 27. The *Number of Open Operations* screen.

Figure 28. The *Remaining Contact Wear in %* screen.

Figure 29. The *LCD Screen Temperature* screen.

Figure 30. The *Sectionalizing Mode Counts* screen.

Figure 31. The *Software Versions* screen.

Table 1 on pages 19 through 20 shows additional screens that can be added to the display screens using the TripSaver II Service Center Configuration Software.

The LCD states listed in the table are the normal operation of a TripSaver II recloser. TripSaver II reclosers can be programmed to display user-configured LCD states in sequence by toggling the LMO lever or by powering up.

Table 1. Normal Operation Screens (Default setting)

Screen	Name	Description
	Primary Normal Screen	For standard TripSaver II reclosers, four operating parameters are displayed: Vacuum interrupter status (**Open** or **Closed**), Mode selector status (**Auto** or **NR**)
	Load current	The load current in primary amperes is displayed.
	Last Fault Magnitude	The fundamental-frequency magnitude of the last fault current in primary amperes, as measured just before the vacuum interrupter opens, is displayed. The fault current unit is amperes for faults smaller than 1000 A and kiloamps with two decimals for faults greater than or equal to 1000 A. This was done because of the limited horizontal space on the LCD screen.
	Number of Open Operations	The total number of vacuum interrupter **Open** operations is displayed.
	Remaining Contact Wear in %	The remaining vacuum interrupter contact wear, in percent, is displayed.
	The LCD *Temperature* screen.	The temperature is shown, in degrees Celsius.

TABLE CONTINUED ▶

Table 1. Normal Operation Screens (Default setting)—Continued

Screen	Name	Description
	Sectionalizing mode counts:	This screen displays the preset number of source-side circuit breaker or recloser operations the TripSaver II recloser will count up to before dropping open. This screen is automatically skipped if **Sectionalizing** mode is disabled.
	Software Versions	Three pieces of information about software version are displayed: Application, Bootloader, and Radio Frequency Microcontroller Unit.
 **Cycles back to Closed | Auto screen**	Transceiver ID	This is the communication ID.

TripSaver II Cutout Mounted Reclosers built before 8-30-2024 may include Alternate Normal screens.

Table 2. *Alternate Normal* screens

Screen	Name	Description
	Alternate Normal Screen (Secondary Normal Screen) Vacuum Interrupter State—Open	The vacuum interrupter is in an **Open** state.
	Alternate Normal Screen (Secondary Normal Screen) Vacuum Interrupter State—Close	The vacuum interrupter is in a **Closed** state.
	Alternate Normal Screen (Secondary Normal Screen) Vacuum Interrupter State—Unknown	This is an unknown vacuum interrupter state.

Table 3. Other Available Screens to Configure for Normal Operation

Screen	Name	Description
	Mode Selector Status	The mode of operation–either **Auto**, **NR**, or **R-NR**–is displayed.
	TCC#0 (Initial Trip)	The short name for the initial trip curve is displayed.
	SC #0 (Initial SC) TCC#1 (Test 1)	The short name for the Test 1 curve (2nd TCC curve) is displayed. This screen is automatically skipped if the **Test 1** operation is disabled.
	TCC#2 (Test 2)	The short name for the Test 2 curve (3rd TCC curve) is displayed. This screen is automatically skipped if the **Test 2** operation is disabled.
	TCC#3 (Test 3)	The short name for the Test 3 curve (4th TCC curve) is displayed. This screen is automatically skipped if the **Test 3** operation is disabled.
	NR #0 (NR/Remote NR TCC)	This is the standard NR TCC curve.
	NR #1 (Post fault TCC)	This is the Post-Fault Wakeup NR TCC curve.

TABLE CONTINUED ▶

Table 3. Other Available Screens—Continued

Screen	Name	Description
	NR #2 (Cold Wake up TCC)	This is the Cold Wakeup NR TCC curve.
	Interrupting Rating	The interrupter rating of the recloser, in kA, is displayed.
	Max Rated Voltage	The rated maximum voltage of the recloser; either 15.5 kV or 29 kV is displayed.
	System Frequency	The frequency of the electrical system the TripSaver II recloser is configured for, in Hz, is displayed.

Table 4. Fault Interruptions

Screen	Name	Description
	Temporary Fault	This is the number of fault interruptions from a transition from a **Closed** position to an **Open** position.
	Dropped-out Screen	This is the normal option selected shown during a permanent fault.
	Dropped-out Screen Inverted	This is the inverted option selected shown during a permanent fault.

Table 5. Local Manual Open (LMO)—Operation

Screen	Name	Description
	LMO—Local Manual Open	The LMO is enabled with the operations count and time window.
	LMO—Cancel?	The prompt screen for cancellation of the **LMO** feature.
	LMO—Cancelled	The confirmation screen that the **LMO** feature is cancelled.
	LMO—Aborted	The confirmation screen that the **LMO** feature is aborted.
	LMO—XXXXX	The *Suspicious Attempt* screen.
	Walk away	The *Walk Away* screen.

Table 6. Error Conditions

Screen	Name	Description
	Overload	The OVERLOAD indicator at the bottom left corner (symbol “X”).
	Battery Abnormality	This BATTERY ABNORMALITY indicator at the bottom right corner (Symbol “!”) is only valid for the 30s reclosers that come with a rechargeable battery. The indicator shows when the battery is discharged. If the battery is still in good health, it can charge when the TripSaver II recloser is connected with a load that is at least 4% of the normal load of the recloser (e.g. 4 A for a 100-A recloser) for 20 hours or more.
	Service Soon	The SERVICE SOON indicator at the bottom right corner (symbol “•”).
SERVICE NOW • If the LCD screen shows the exclamation mark, the unit is in **Service Now** mode and will not perform any protection actions. • The unit must be removed from operation. Even if the unit is in the cutout mounting (not dropped out) in the **Service Now** condition, it will not perform any protection actions. The vacuum interrupter may be in an **Open**, **Closed**, or **Unknown** state. • In a “normal” vacuum interrupter end-of-life situation, the unit will drop out and stay with the vacuum interrupter open and the trunnion disengaged (the unit will not stay in the cutout mounting in the **Vertical** position).		
	Service Now	The vacuum interrupter state is unknown.
	Service Now	The position of the vacuum interrupter is in an **Open** state.
	Service Now	The position of the vacuum interrupter is in a **Closed** state.

Factory Default Settings

All TripSaver II reclosers are shipped with the factory default settings shown below. These settings will protect the overhead power line in case an unconfigured TripSaver II recloser is installed. Use the configuration kit and the TripSaver II Service Center Configuration Software to properly configure a TripSaver II recloser before putting it in use.

NOTICE

Failure to properly configure a TripSaver II recloser in accordance with applicable codes and standards can result in slow or no response to a fault level and miscoordination. Settings should be determined and approved by qualified persons who are familiar with the principles of selective coordination and system protection.

Default TCC Curve Settings

- **Initial Trip (1st curve):** Microprocessor recloser: S&C 104 curve; minimum trip current: 100 A; time multiplier: x1
- **Open Interval After Initial Trip**: 5 seconds
- **Sequence Coordination** (disabled by default): Microprocessor recloser: S&C 133 curve; minimum trip current: 100 A; time multiplier: x2
- **Coordination Reset Time**: 120 seconds●
- **Test 1 (2nd curve)**: Microprocessor recloser: S&C 104 curve; minimum trip current: 100 A; time multiplier: x1
- **Open Interval After Test 1**: 5 seconds
- **Test 2 (3rd curve)**: Microprocessor recloser: S&C 133 curve; minimum trip current: 100 A; time multiplier: x2
- **Open Interval After Test 2**: 5 seconds
- **Test 3 (4th curve)**: Microprocessor recloser: S&C 133 curve; minimum trip current: 100 A; time multiplier: x2
- **Sequence Reset Time**: 15 seconds

Default NR Curve Settings

- **Standard NR: Microprocessor recloser**: Definite time; minimum trip current: 100 A; time: 0 seconds
- **Post-Fault Wakeup NR Curve:** Microprocessor recloser: definite time; minimum trip current: 100 A; time: 0 seconds
- **Cold Wakeup NR Curve**: Microprocessor recloser: definite time; minimum trip current: 100 A; time: 0 seconds

Default LCD Screen Settings

- **Screen to display when recloser is dropped-open:** *Primary Normal* screen
- **Language**: English
- **Normal screen**: *Primary Normal* screen
- **Number of times the display screen sequence repeats**: 2 times
- **Duration of each display screen item**: 3 seconds
- **Display screen items**: *Primary Normal* screen; load current; last fault magnitude; number of **Open** operations; remaining contact wear in %; temperature; software versions

Default Communications Settings

- **Communication Mode: Non-Gateway** mode
- **Side-magnet Radio Enabling Function**: Enabled

Default Local Manual Open Settings

- **Function**: Disabled

NOTICE

The TripSaver II Cutout-Mounted Recloser does not detect direction of power flow. TCC settings apply for both directions.

● The **Sequence Coordination** feature uses the same **Open Interval After Trip** setting as the Initial Trip TCC curve.

Operation with Loadbuster®— The S&C Loadbreak Tool

The Loadbuster tool provides low-cost, positive, and convenient live-switching capability for overhead distribution switching and protection devices such as the TripSaver II recloser. Following an opening operation using a Loadbuster tool, the TripSaver II recloser can be lifted out of the mounting using an insulated hotstick or an S&C Universal Pole equipped with a suitable fuse-handling fitting, such as a Talon Handling Tool or a distribution prong.

⚠ WARNING

DO NOT attempt to open a TripSaver II recloser without using a loadbreak tool such as the Loadbuster tool. **An arc started by opening a TripSaver II recloser under load without a loadbreak tool can cause equipment damage, serious injury, or death.**

Follow these steps when using the Loadbuster tool:

STEP 1. Check for proper resetting of the Loadbuster tool by extending the tool about 3 inches (76 mm) by hand. Throughout this travel, an increasing spring resistance should be felt.

STEP 2. Fasten the Loadbuster tool to an S&C Universal Pole with the frame in line with the tool. The pole should be no less than 6 feet (183 cm) long. (When using Loadbuster tool catalog number 5400R3, the pole should not be less than 8 feet (244 cm) long.) As shown in Figure 32 or Figure 33, the Loadbuster tool must be attached so it reaches *across in front of* the TripSaver II recloser. That is, the Loadbuster anchor must be hooked to the attachment hook on the far side of the recloser.

Figure 32. A correct fastening approach.

Figure 33. A correct fastening approach.

The Loadbuster tool should *never* be attached with its anchor hooked on the closest side of the recloser, as shown in Figure 34 or Figure 35. Attaching the tool in this manner will not only obscure the operator's line of vision but also result in bending stress on the tool, causing improper disengagement.

Swing the Loadbuster tool toward the TripSaver II recloser and pass the Loadbuster tool's pull-ring hook through the pull-ring on the TripSaver II recloser. 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 Loadbuster tool is now connected across the upper contacts of the TripSaver II recloser.

Proper attachment of the Loadbuster tool to a TripSaver II recloser is shown in Figure 36.

⚠ WARNING

DO NOT attempt to use a Loadbuster tool to open a TripSaver II recloser while climbing the pole. **Engagement of a Loadbuster tool in this position is difficult and can result in an improper opening operation, leading to arcing, faults, equipment damage, serious injury, or death.**

⚠ WARNING

When operating from a bucket truck, stay at least 5 feet (152 cm) below the recloser. **Operating the Loadbuster tool from less than 5 feet away is difficult and can result in an improper opening operation, leading to arcing, faults, equipment damage, serious injury, or death.**

Figure 34. An incorrect fastening approach.

Figure 35. An incorrect fastening approach.

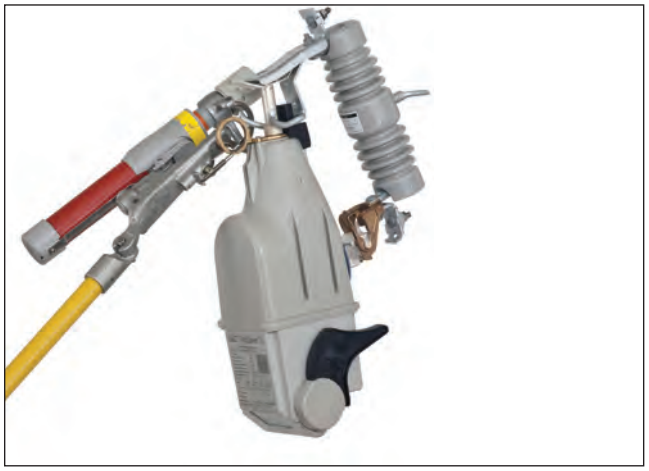


Figure 36. The Loadbuster tool attached to a TripSaver II Cutout-Mounted Recloser.

STEP 3. To open the circuit, operate the Loadbuster tool with a firm, steady pull until it is extended to its maximum length. A downward pull to open the TripSaver II recloser extends the Loadbuster tool and charges an internal spring.

At a predetermined point in the opening stroke, a trigger inside the tool trips, releasing the charged spring—thus separating the internal contacts and interrupting the circuit. Successful operation is independent of the speed with which the Loadbuster tool is opened. See Figure 37.

Avoid jerking and hesitation. The resetting latch will keep it open. Generally, there is no indication of circuit interruption. The only sound is that of a Loadbuster tool tripping.

STEP 4. To detach the Loadbuster tool after circuit interruption, first raise it slightly and disengage the anchor from the attachment hook.

⚠ WARNING

Careless manipulation of the Loadbuster tool can decrease the open gap to the point where a flashover will occur. **This can result in arcing, electrical shock, serious injury, or death.**

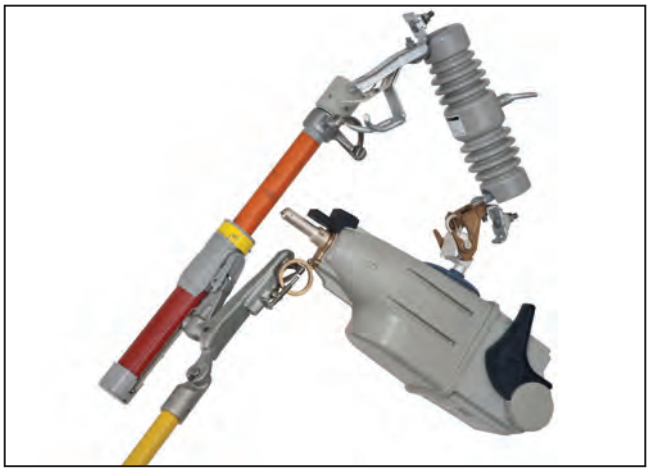


Figure 37. A Loadbuster tool in the Tripped position.

Next, bring the TripSaver II recloser toward its fully **Open** position, as shown in Figure 38. Then, remove the Loadbuster tool from the pull-ring by rotating the pole. This will deflect the pull-ring latch to release the pull-ring.

Because the TripSaver II recloser will drop fully open by gravity, it may be preferable to remove the Loadbuster tool by "rolling" it off both the attachment hook and pull-ring at the same time by twisting the pole after the Loadbuster tool has been tripped and fully extended.

To perform this operation easily and smoothly, always roll the Loadbuster tool so it rotates in an upward direction.

STEP 5. To reset the Loadbuster tool for the next operation, hold it as shown in Figure 39. Extend the tool slightly and lift the resetting latch with your thumb. With the latch up, telescope the tool completely so the trigger can reset itself. Depress the telescoping tube until the orange paint on the inner tube assembly is no longer visible. Check for proper resetting by extending the tool about 3 inches (76 mm). Throughout this travel, an increasing spring resistance should be felt.

When the TripSaver II recloser is opened with a Loadbuster tool, the vacuum interrupter in the TripSaver II recloser will not be triggered open and will remain closed. The drop-open mechanism will not operate.

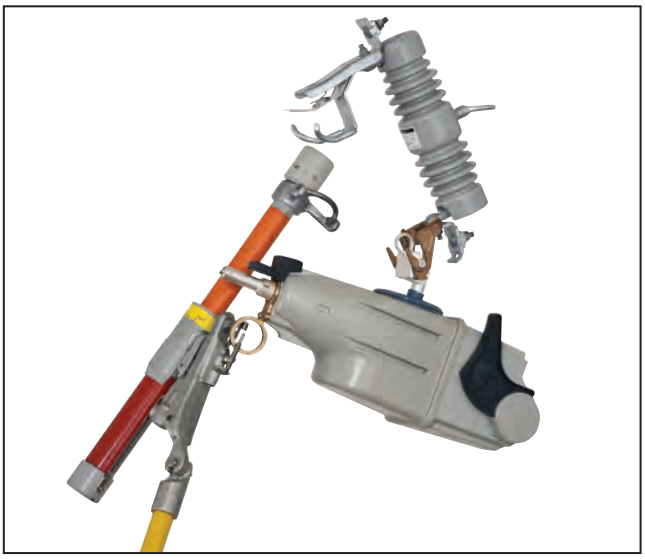


Figure 38. Detaching a Loadbuster tool from a TripSaver II recloser.

Figure 39. Resetting a Loadbuster tool.

Local Manual Open

NOTICE

When using firmware version 1.7 or 1.6, DO NOT attempt to test the TripSaver II recloser's **Local Manual Open** feature with the recloser in the horizontal or dropout position. For the **Local Manual Open** feature to function properly, the recloser MUST be installed vertically in the **Closed** position in a cutout mounting. Repeated use of the **Local Manual Open** feature to open the recloser when it is in the horizontal or **Dropout** position may cause it to enter the **Service Now** state after 5 **Local Manual Open** operations, rendering the recloser inoperable.

TripSaver II reclosers with firmware versions 1.6 and later have a **Local Manual Open (LMO)** feature for loadbreaking without the use of a Loadbuster tool when this feature is enabled. (A label is placed inside each TripSaver II recloser shipping carton for users to label their reclosers that already have the **LMO** feature enabled.) This feature provides a **Manual Operation** sequence that commands the TripSaver II recloser to open the vacuum-interrupter contacts and drop open. A TripSaver II recloser must be powered for the **LMO** feature to work.

The MODE SELECTOR lever controls the **LMO** feature. The **Open Command** state is triggered by operating the MODE SELECTOR lever X number of times within a Y-second window when the TripSaver II recloser is in the vertical position.

Note: The trigger values for X *(***Operations** count) and Y (Operation Time window) are user-configurable using the TripSaver II Service Center Configuration Software. Confirm the values of X and Y with your utility.

When the triggering condition has been met, the TripSaver II recloser starts the open **Time Delay** sequence. For the next 10 seconds, an "LMO Cancel?" prompt will appear on the LCD screen for cancellation. The **LMO** command can be canceled by any operation of the MODE SELECTOR lever. If the MODE SELECTOR lever is operated during this time, an "LMO Canceled" message will briefly appear on the LCD screen to indicate the user has canceled the operation.

If the command is not canceled within 10 seconds, a "WALK AWAY" message will display on the LCD screen, indicating the start of the 20-second operation timer intended to allow the operator to comply with any operating-distance requirements specified by the utility work practices.

During the walk-away period, the operator can no longer cancel the **Open** operation. At the end of the walk-away period, the TripSaver II recloser will open the vacuum-interrupter contacts to interrupt the load current, then drop open and reclose the contacts after the tilt sensor indicates a completed **Drop Open** function. See Figure 40 for a flowchart of the **LMO** feature sequence.

Note: For information on multi-phase local manual open, refer to S&C Instruction Sheet 461-509, "TripSaver II Cutout Mounted Recloser: *TripSaver II Communication via Gateway.*" This feature is only supported with the communication gateway.

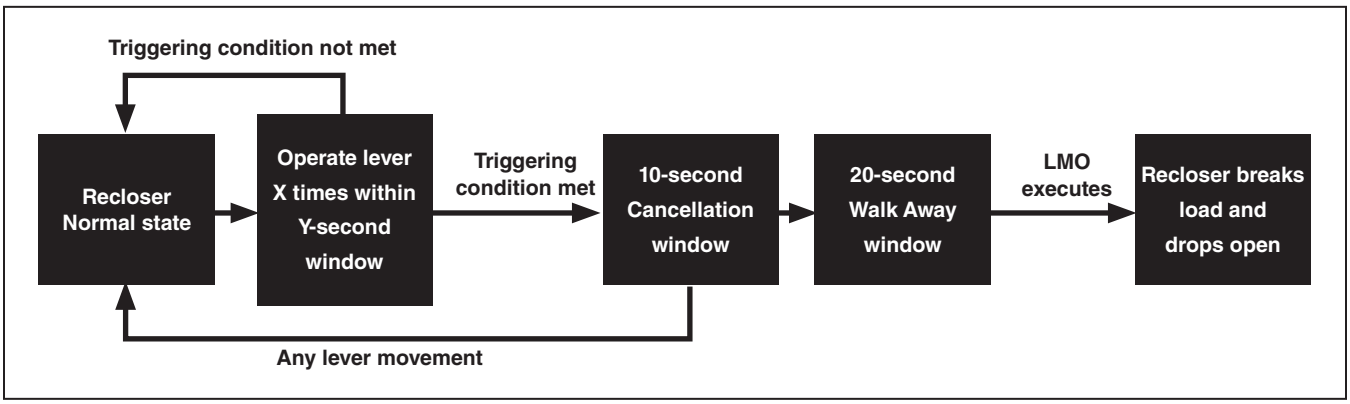


Figure 40. How the LMO feature works.

It is important to keep in mind the following:

- When the **LMO** feature is enabled, a new LCD screen titled "LMO" will be automatically displayed under the LCD scrolling screen sequence as its first scrolling screen, with the X value shown on the left and the Y value shown on the right. This screen is not displayed when the **LMO** feature is disabled.
- The **Mode Selector Operation** counter registers a single movement starting either in the **Up** or **Down** position of the lever as an operation. Moving the lever down and then back up is counted as two operations.
- If the operation time window (Y) expires before X lever operations are completed, the **Command** sequence is terminated. The **Operation** counter will reset to zero; any additional lever operations will begin the count toward a new **Command** sequence.
- If the TripSaver II recloser detects a fault while a user is performing the **LMO** command, the **Command** sequence will reset before the recloser trips, and the **Protection** sequence of the TripSaver II recloser will operate as normal. The **Reclose/Non-Reclose** function will be selected based on the operating lever position at the time the TripSaver II recloser trips. Figure 41 , Figure 42, Figure 43, and Figure 44 show how new LCD screens appear.
- LMO events will be recorded in the Event log.
- When there is not enough charge in the TripSaver II recloser's capacitor to trip the vacuum interrupter, the LCD screen will display an "LMO Aborted" message which will stay on for 3 minutes after the LMO attempt. See Figure 45.

When the **LMO** feature is disabled, the TripSaver II recloser will not drop open, no matter how many times the MODE SELECTOR lever is operated. However, if 10 MODE SELECTOR lever operations are detected within a 60-second time frame when the mode is disabled and the recloser is in the vertical position, the recloser will display a screen showing "LMO XXXXX" to remind the line crew the **LMO** feature is disabled. See Figure 46.

At the same time, to maximize system security, the recloser will consider that as a suspicious attempt, and if the TripSaver II recloser is connected to a communication gateway, the recloser will send an unsolicited alert. This activity will also be recorded in the Event log.

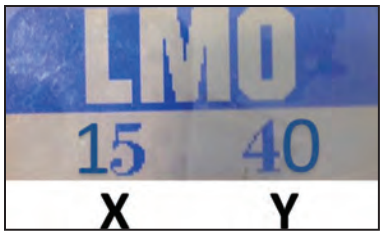


Figure 41. Screen showing LMO is enabled, with the operations count and time window.

Figure 42. *Prompt* screen for LMO cancellation.

Figure 43. *Confirmation* screen that LMO has been canceled.

Figure 44. *Walk Away* screen.

Figure 45. *LMO Aborted* screen.

Figure 46. *Suspicious Attempt* screen.

Understanding the Active TCC Curve When the TripSaver II Recloser is in Remote Non-Reclose (R-NR) Mode

A SCADA communication can place a TripSaver II recloser with the **Extended Open Interval** option (option "-O") into **Remote Non-Reclose** (R-NR) mode if remote communications are enabled via the TripSaver® II Communications Gateway. After the recloser drops open under **R-NR** mode, the recloser will operate in **Auto** mode if it is closed into its mounting with the MODE SELECTOR lever in the **Up** position for a period of 5 minutes after re-energization. This is called **Temporary Auto** mode.

With the addition of the new NR-Standard, Cold Wakeup, and Post Fault Wakeup curves available with TripSaver II Cutout-Mounted Recloser firmware versions 1.7 and later, and with the ability to turn off the **Temporary Auto** mode, the TripSaver II recloser may behave differently from what is expected. Table 7 explains which curve is active depending on the MODE SELECTOR lever position, the **R-NR** mode, the conditions the switch is "waking up" from when being closed into its mounting, and whether the **Temporary Auto** mode has been disabled under the **R-NR Functions** menu.

Table 7. Active TCC Curve when TripSaver II Recloser is in R-NR mode

Settings and Conditions				Active TCC Curve				
MODE SELECTOR Lever Position	R-NR Mode①	Condition During Wakeup	Temporary Auto Feature Setting in R-NR Feature Menu	Auto	Temporary Auto	Standard NR	Cold Wakeup NR	Post Fault Wakeup NR
Up	Off	Warm●	–	X				
		Cold		X				
		Post-fault		X				
	On	Warm●	–			X		
		Cold					X	
		Post-fault	Off■					X
			On■		X			
Down	Off	Warm●	–			X		
		Cold					X	
		Post-fault						X
	On	Warm●	–			X		
		Cold					X	
		Post-fault						X

① When the TripSaver II recloser is set to the **Remote Non-Reclose** (R-NR) state via SCADA.

● TripSaver II Recloser is "Warm" when the control is awake. (i.e., seen the appropriate "wake up" current and has not dropped below the "stay on" threshold current.

■ The **Temporary Auto** mode can be enabled or disabled using the **Disable Temporary Auto Post-Fault Wakeup** mode in **Remote-NR** button found in the **R-NR Functions** menu of the service center configuration software. This ONLY disables **Temporary Auto** mode when the switch is in **R-NR** mode with the lever in the **Up** position.

Continuous Current of TripSaver II recloser	Wake Up Current	Stay On Current
40 A	1 A	0.5 A
100 A	4 A	1.5 A
200 A	8 A	3 A

Understanding Gang Operation Feature When a TripSaver II Recloser is Connected to a Communication Gateway

The TripSaver II Communications Gateway uses SCADA to provide unsolicited alerts, GPS time and coordinate information, device heartbeat, and remote mode (**Auto** to **R-NR**) change capability to connected TripSaver II reclosers via the DNP3 protocol.

The communications gateway also allows up to three configured TripSaver II reclosers to be configured for local **Gang** operation. When a TripSaver II recloser and its associated communications gateway have been configured for **Gang** operation, labels with the **Gang** operation symbol will be supplied to be affixed by the user to both the TripSaver II recloser and the communications gateway cabinet. See Figure 47.

A **Gang** operation can be initiated when one TripSaver II recloser opens in response to an overcurrent event, when the **Local-Manual Open** feature is used, and/or when the TripSaver II recloser experiences an orientation change, such as when it is removed from its mounting using the Loadbuster tool.

Special note should be taken when performing maintenance on one member of a **Gang** operation group that may change the recloser's orientation: The other configured TripSaver II reclosers in the **Gang** operation group will also trip and dropout in response.

Gang operation can be disabled by connecting to the TripSaver II Communications Gateway. For more information on the **Gang Operation** feature, refer to S&C Instruction Sheet 461-509, "TripSaver® II Cutout Mounted Recloser: *TripSaver® II Communications via Gateway.*"

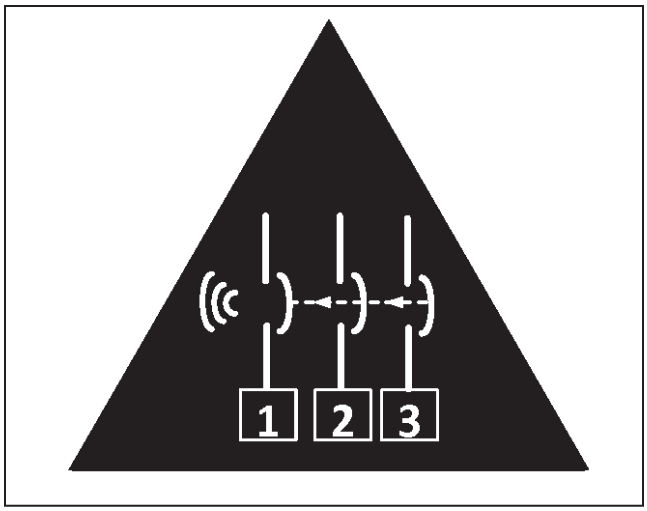


Figure 47. The Gang operation label.

Understanding Remote Drop Open Feature When a TripSaver II Recloser is Connected to a Communication Gateway

The TripSaver II Communication Gateway interfaces the paired TripSaver II reclosers with the user's SCADA network via the DNP 3.0 protocol. To enable the **Remote Drop Open** feature, the following are required:

- The TripSaver II recloser must be ordered with the "-O" option to enable it to pair and work properly with the communication gateway.
- The TripSaver II recloser must also be ordered with the **Remote Drop Open** "-D" option.
- The TripSaver II recloser and communication gateway must be properly configured to perform a **Remote Drop Open** command issued by DNP 3.0.

TripSaver II reclosers without the **Remote Drop Open** option "-D" cannot be configured for **Remote Drop Open** operation.

Note: The TripSaver II recloser does not have a LOCAL REMOTE operation selector mechanism, and users should follow utility protocols when doing local work on a TripSaver II recloser configured with a communication gateway for a device that can be operated remotely.

In Mounting with Contacts Open

The TripSaver II recloser is capable of dropping open under ¾–inch (19 mm) of ice formation. If the TripSaver II recloser does not drop open at the end of its operating sequence because of excessive ice build-up or for any other reason, it will remain in the upright position, with the vacuum interrupter in the **Open** position and the drop-open mechanism unlatched.

The interrupter and drop-open mechanism will not reset automatically. The LCD screen will show the vacuum interrupter with an **Open** state. Use a Loadbuster tool to open the TripSaver II recloser and remove it from the mounting. The operating mechanism and vacuum interrupter must then be manually reset. See the next section for the resetting procedure.

Note: When the ambient temperature is below -30°C (-22°F), the LCD screen will not refresh (complete LCD screen information can be read after refreshing the LCD screen with a 9-volt Lithium L522 battery).

Manually Resetting a TripSaver II Recloser After an Icing Event

⚠ DANGER

The TripSaver II recloser MUST be removed from the pole before a manual reset is attempted.

Attempting to manually reset a TripSaver II recloser that has not dropped open will reset the vacuum interrupter but NOT the drop-open mechanism. In this state, the TripSaver II recloser can swing out of the mounting if the icing is removed or if it is manually operated, potentially causing arcing.

Remove the TripSaver II recloser from the pole, place it in the **Horizontal** position, and manually reset both the vacuum interrupter AND the drop-open mechanism at the same time.

Failure to remove the recloser from the pole before manually resetting will lead to arcing, equipment damage, personal injury, or death.

If a TripSaver II recloser does not drop open when it should, usually because of icing that holds the recloser closed into the cutout mounting, the vacuum interrupter will be locked in the **Open** position; it will not reset automatically. This state can be confirmed by toggling the MODE SELECTOR lever down and then up again to cycle the display screen.

If the *Display* screen is set to display the status of the TripSaver II recloser's vacuum interrupter, it will display the vacuum interrupter status as "OPEN" even though the TripSaver II recloser is upright and closed into the mounting.

To manually reset the TripSaver II recloser:

STEP 1. Open the TripSaver II recloser using a Loadbuster tool or the **Local Manual Open** feature. Remove the TripSaver II recloser from its mounting using a gloved hand, the Talon tool, or a distribution prong as described in the "Removing a TripSaver II Recloser from its Mounting" section on page 13.

STEP 2. Place the recloser horizontal on a flat surface with the trunnion pointing up. See Figure 48.

STEP 3. Connect a 9-Volt Lithium L522 battery to the battery-reset contacts located on the bottom of the recloser. In about 5 to 7 seconds, the *Primary Normal* screen will refresh, and the drop-open latch will reset with a clicking sound. Polarity of the battery does not matter. See Figure 48.

STEP 4. With the battery still connected, pull outward on the trunnion firmly.

STEP 5. With the battery still connected, wait an additional 25 seconds until the vacuum interrupter resets. This is indicated by a louder clicking sound. The *Primary Normal* screen will refresh again after a successful reset and show the present status.

The TripSaver II recloser can now be installed and closed back into its mounting.

Note: When using an old 9-Volt battery, it may take longer than 5 to 7 seconds for the LCD screen to refresh and for the drop-open latch to reset. It also may take longer than 25 seconds for the vacuum interrupter to reset. If power in the battery is too low, the battery will not reset the drop-open latch or the vacuum interrupter, but merely refresh the *Normal Display* screen. In this case, the status of the vacuum interrupter cannot be displayed.

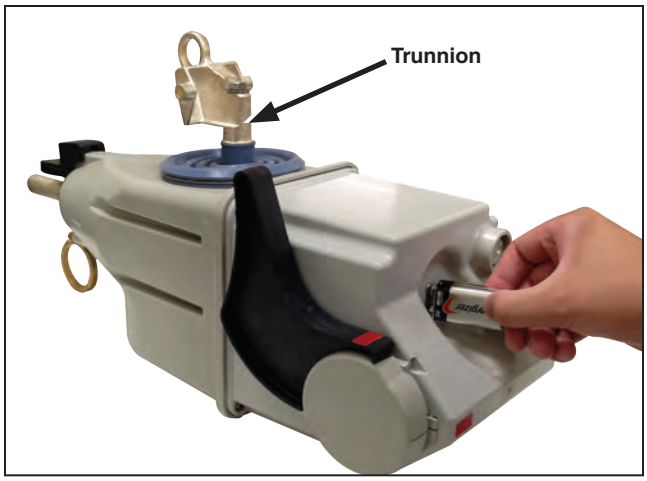


Figure 48. Manually resetting a TripSaver II Cutout-Mounted Recloser.

Initiating Display Screen Using a 9-Volt Battery

Connect a new 9-Volt Lithium L522 battery to the battery-reset contacts located on the bottom of the recloser. The *Normal* screen will refresh first and, usually after 10 seconds, the recloser will be charged with sufficient energy to power up the display screen.

Change the position of the MODE SELECTOR lever to initiate the scrolling of the display screens. If the battery is removed before the refresh of any screen is completed, the LCD screen image will freeze at the point the battery was removed.

End of Interrupting Capability: Service Now Mode

When a TripSaver II recloser is no longer capable of interrupting a fault (i.e., its remaining contact wear is at 0%), it will go into **Service Now** mode. It will drop open and will not reset, locking the vacuum interrupter in the **Open** position and the operating mechanism in the **Dropped-Open** position.

The LCD screen will display a special *Service Now* screen. The right side of the screen will display the vacuum interrupter status "O" for the **Open** position, "I" for the **Closed** position, and "X" when the position cannot be determined, and the left side of the screen will display an "!" symbol, indicating immediate attention is needed. See Figure 49.

Rotating the MODE SELECTOR lever, applying 9-Volt Lithium L522 batteries, or applying the service center configuration kit power module will not unlock the screen. Refer to the "Clearing the Service Now Screen" section in S&C Instruction Sheet 461-504 for instructions on how to clear the *Service Now* LCD screen.

TripSaver II reclosers with firmware version 1.7 or earlier can enter the **Service Now** mode when tested or operated in the improper orientation. Causes of the **Service Now** mode are:

Figure 49. The *Service Now* screen showing the vacuum interrupter in the Open position.

When installed in a cutout mounting if any combination of the following occurs five consecutive times:

- If the TripSaver II recloser end of protection sequence drop open is blocked
- If the TripSaver II recloser LMO drop open is blocked
- If the **Gang** operation drop open is blocked

Note: Blocked means iced to the cutout mounting or held upright by some other means.

During testing on a bench with the TripSaver II recloser in a horizontal position:

- If the TripSaver II recloser is tested to drop open using the features on the *Functional Test* screen five consecutive times with the trunnion pointing to the side or pointing down
- If a test current is applied to the TripSaver II recloser five consecutive times to simulate a permanent fault drop open with the trunnion pointing to the side or pointing down

Note: The only proper horizontal bench testing orientation is with the trunnion pointing up.

These orientation issues are not present in TripSaver II recloser firmware version 1.8 or later.

Unable to Close a TripSaver II Recloser Into Its Mounting

If a TripSaver II recloser cannot be closed into the mounting when it has not reached the end of its useful life, manually reset the drop-open mechanism using the procedure described on page 35. If a TripSaver II recloser still cannot be closed into the mounting, this may indicate that the recloser is in an operational **Error** state. The TripSaver II recloser must be removed and returned to S&C for service.

LCD Screen Performance at Extremely Low Temperatures

The LCD screen used in a TripSaver II recloser does not refresh at temperatures below -30°C (-22°F). At even lower temperatures, the contrast of the LCD screen will degrade; eventually it will turn completely blue. However, information displayed is not lost and the LCD screen will recover when the temperature rises above -30°C (-22°F).

Battery Abnormality LCD Screen

This screen is only applicable for the **Extended Open Interval** option "-O." When the battery used to support the **Extended Open Interval** option experiences an abnormality, the following new warning indicator on the LCD screen will be displayed on the *Primary Normal* screen as an exclamation point. See Figure 50.

⚠ WARNING

The battery is not user replaceable and should only be serviced by S&C Electric Company with battery assembly FDA-1960. **Attempting to open the recloser and replace the battery will void the manufacturer's warranty and can cause injury or electric shock.**

Figure 50. Exclamation point indicator for a battery abnormality.

Regulatory and Compliance Statements

This document contains statements required for compliance with the rules and policies of various national and international regulatory agencies. The information is current as of the date of this publication but may be subject to change without notice. For the most recent version of this instruction sheet with the most up-to-date regulatory information, contact S&C Electric Company.

United States of America—FCC (Federal Communication Commission)

This device complies with part 15 of the FCC rules and regulations regarding unlicensed transmissions. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference.

Important! Changes or modifications not expressly approved by S&C Electric Company could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada—ISED (Innovation, Science & Economic Development Canada)

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme aux normes Industry Canada exemptes de licence RSS standard(s). Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas provoquer d'interférences et (2) cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable.

The changes or modifications not expressly approved by the S&C Electric Company could void the user's authority to operate the equipment.

CAN ICES-3 (A)/NMB-3(A)

Brazil (ANATEL)

Atendimento à Regulamentação Anatel

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.

Este produto está homologado pela ANATEL, de acordo com os procedimentos regulamentados pela Resolução 242/2000, e atende aos requisitos técnicos aplicados.

Para maiores informações, consulte o site da ANATEL. **www.anatel.gov.br**

Thailand

This radiocommunication equipment is exempted to possess license, user license, or radiocommunication station license as per NBTC notification regarding radio-communication equipment, and radiocommunication station has been exempted for license according to radio communication act B.E.2498