Field Assembly and Installation

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February 26, 2024

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 Series 2000 Circuit-Switcher bypass accessory. Become familiar with the Safety Information and Safety Precautions on pages 4 through 8. 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 Series 2000 Circuit-Switcher bypass accessory. Designate a location where users can easily retrieve and refer to this publication.

Proper Application

⚠ WARNING

The equipment in this publication must be selected for a specific application. The application must be within the ratings furnished for the equipment. Ratings for this circuit-switcher are listed on the nameplate on the front of the switch operator. Additional application information can be found in Specification Bulletin 716-31.

Operating Considerations

Series 2000 Circuit-Switchers will perform as intended at temperatures within the range of –40°C (-40°F) to +40°C (104°F) at altitudes of up to 5000 feet (1524 m), and at wind loadings of up to 90 miles per hour (145 kmph). Further, Series 2000 Circuit-Switchers, when installed with the recommended S&C anchor bolts and with flexible-conductor connections at all six terminal pads, are capable of withstanding seismic loading of 0.2 g ground acceleration in any direction as well as performing as intended during such loading and afterward. For applications at temperatures not within the specified range, at higher altitudes, at higher wind loadings, or where higher seismic withstand capabilities are required, refer to the nearest S&C Sales Office.

Warranty

The warranty and/or obligations described in S&C's Price Sheet 150, "Standard Conditions of Sale—Immediate Purchasers in the United States," (or Price Sheet 153, "Standard Conditions of Sale—Immediate Purchasers Outside the United States"), 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 the immediate purchaser's or end user's exclusive remedy and a fulfillment of the seller's entire liability. In no event shall the seller's liability to the immediate purchaser or end user exceed the price of the specific product that gives rise to the 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 (or Price Sheet 153), 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 (OR PRICE SHEET 153) 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 (OR PRICE SHEET 153).

Warranty Qualifications

Warranty of Series 2000 Circuit-Switchers is contingent upon both of the following:

- Installation and adjustment of Series 2000 Circuit-Switchers in accordance with S&C's applicable instruction sheets
- Conformance with the inspection recommendations defined in S&C Instruction Sheet 716-590

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 various 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

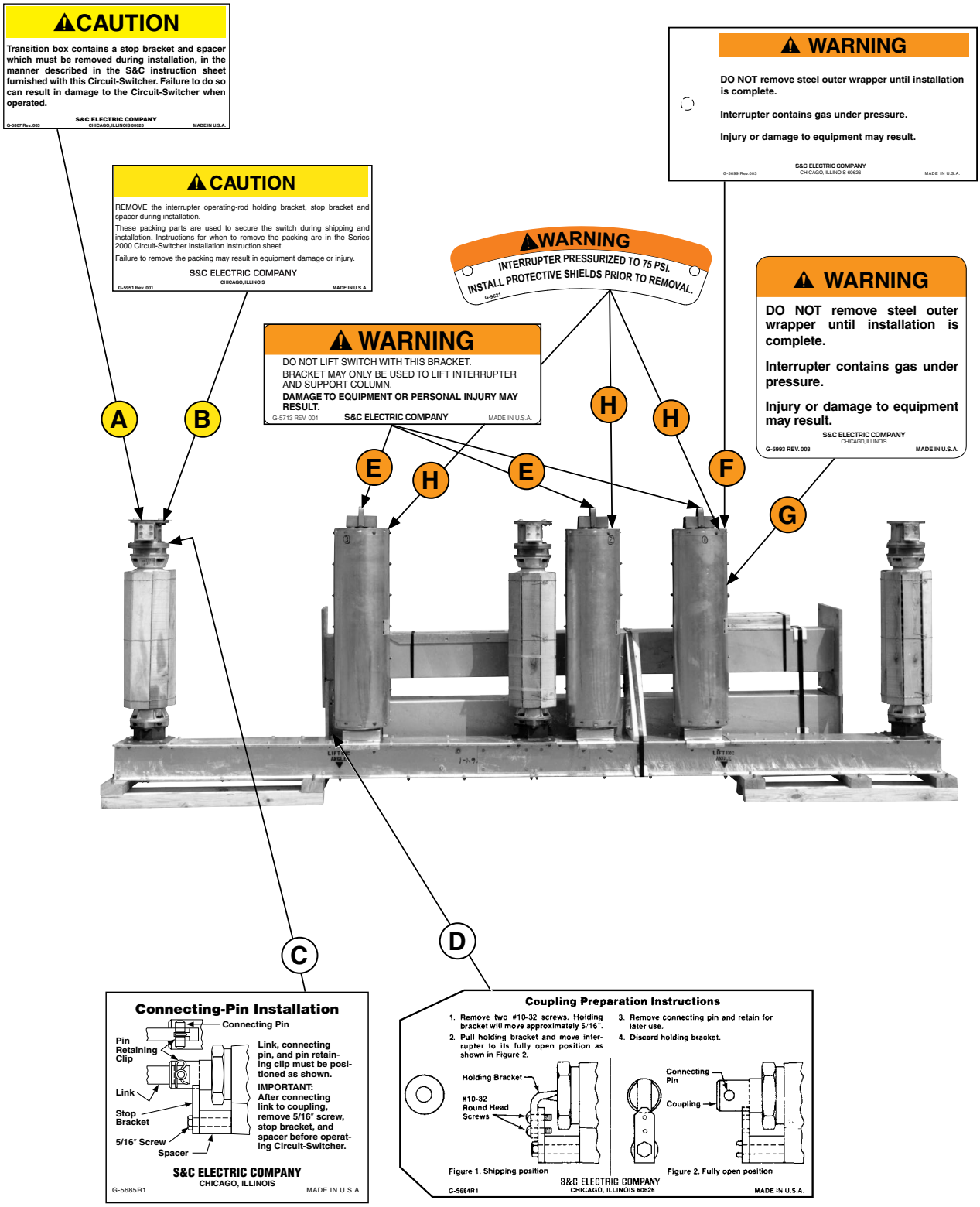
Read this instruction sheet thoroughly and carefully before installing a Series 2000 Circuit-Switcher bypass accessory.

Replacement Instructions and Labels

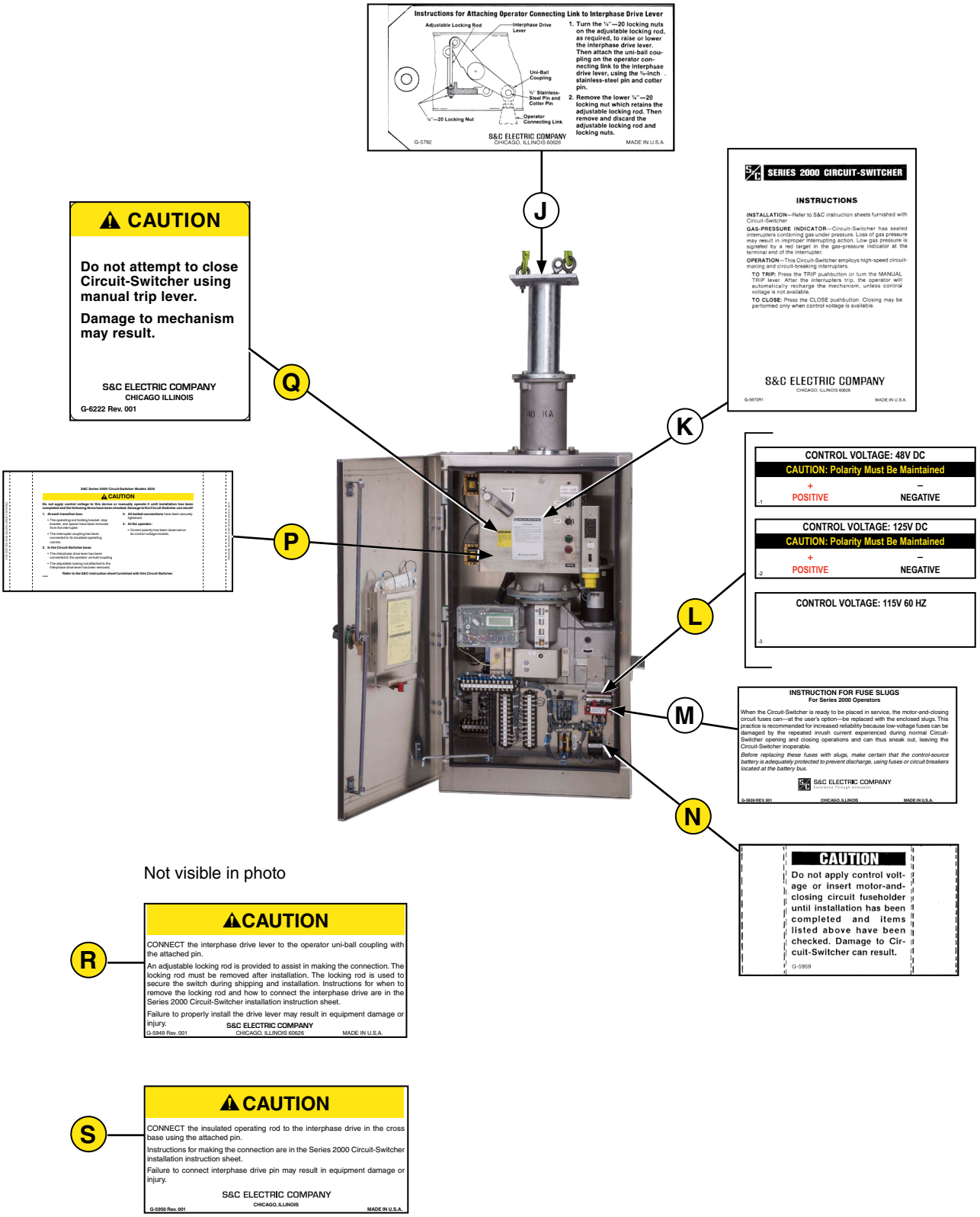
If additional copies of this instruction sheet are required, contact the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

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



Location of Safety Labels



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R

⚠CAUTION

CONNECT the interphase drive lever to the operator uni-ball coupling with the attached pin.

An adjustable locking rod is provided to assist in making the connection. The locking rod must be removed after installation. The locking rod is used to secure the switch during shipping and installation. Instructions for when to remove the locking rod and how to connect the interphase drive are in the Series 2000 Circuit-Switcher installation instruction sheet.

Failure to properly install the drive lever may result in equipment damage or injury.

S&C ELECTRIC COMPANY
G-5949 Rev. 001 CHICAGO, ILLINOIS 60626 MADE IN U.S.A.

S

⚠CAUTION

CONNECT the insulated operating rod to the interphase drive in the cross base using the attached pin.

Instructions for making the connection are in the Series 2000 Circuit-Switcher installation instruction sheet.

Failure to connect interphase drive pin may result in equipment damage or injury.

S&C ELECTRIC COMPANY
G-5950 Rev. 001 CHICAGO, ILLINOIS MADE IN U.S.A.

Reorder Information for Safety Labels

Location	Safety Alert Message	Description		Part Number
A	⚠ CAUTION	Transition box contains a stop bracket and spacer…		G-5807●
B	⚠ CAUTION	Remove the interrupter operating-rod holding bracket and spacer…		G-5951●
C	INFORMATION	Connecting-Pin Installation		G-5685■
D	INFORMATION	Instruction for Fuse Slugs		G-5684●
E	⚠ WARNING	Do not lift switch with this bracket…		G-5713▲
F	⚠ WARNING	Do not remove steel outer wrapper until installation is complete…		G-5699▲
G	⚠ WARNING	Do not remove…		G-5993▲
H	⚠ WARNING	Interrupter pressurized to 75 PSI…		G-9621▲
J	INFORMATION	Attaching Operator Connecting Link		G-5792●
K	INFORMATION	Instruction – Operation, Gas Pressure Indicator, and Manual Handle		G-5672■
L	⚠ CAUTION	Control Voltage	48Vdc	G-5948-1
			125Vdc	G-5948-2
			115 V 60 Hz	G-5948-3
M	INFORMATION	Coupling Preparation		G-5939●
N	⚠ CAUTION	Do not apply control voltage or insert motor-and-closing circuit fuseholder.		G-5959▲
P	⚠ CAUTION	Do not apply control voltage to this device…		G-5946▲
Q	⚠ CAUTION	Do not attempt to close Circuit-Switcher using manual trip lever…		G-6222
R	⚠ CAUTION	Connect the interphase drive lever…		G-5949●
S	⚠ CAUTION	Connect the insulated operating rod…		G-5950●

● This label contains important instructions and should be promptly replaced if illegible or missing.

■ This tag is to be removed and discarded after the switch is installed and adjusted.

▲ This label is affixed to the shipping package and will be removed and discarded after the switch is installed and adjusted.

⚠ DANGER

Series 2000 Circuit-Switchers 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 substation switching equipment 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. **CIRCUIT-SWITCHER POSITION.** Always confirm the circuit-switcher **Open/Close** position by visually observing the position of the switch position indicator located on the high-speed base. Switches may be energized from either side.
7. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.
8. **OPERATION.** Circuit-making and circuit-breaking are involved in the normal operation of this interrupter switch. To operate, follow the operating procedure as outlined in this Instruction Sheet starting on page 12.

These instructions are for field assembly and installation of the bypass accessory for Series 2000 Circuit-Switchers in ratings of 69 kV through 138 kV. This accessory permits the interrupters to be opened and closed for inspection of the circuit-switcher—and checkout of relaying equipment—without opening the high-voltage circuit. See Figure 1.

The bypass accessory consists of a set of three single-pole, stick-operated devices rated 900 amperes continuous, 40,000 amperes momentary. When furnished as original equipment with the circuit-switcher, inclusion of the accessory is designated by the addition of the suffix "-F1" to the circuit-switcher catalog number.

Install the bypass accessory only after the circuit-switcher has been completely installed.

⚠ DANGER

Conductors must be de-energized and grounded at all six terminals in accordance with standard system operating practice before installing the bypass accessory. **Failure to do so can result in serious injury or death.**

STEP 1. For shipping purposes, the hinge mounting plate on each bypass accessory blade-and-hinge assembly is bolted to an "L"-shaped auxiliary terminal pad (which, incidentally, will provide an alternate means for making the high-voltage connection at the circuit-switcher transition box). Loosen the two ½—13x1½-inch hex-head stainless steel cap screws, Belleville washers, flat washers, and nuts which attach the hinge mounting plate to the auxiliary terminal pad on each blade-and-hinge assembly.

Discard the flat washers and nuts but retain the cap screws and Belleville washers for re-use in Step 2 on page 10. Be careful not to contaminate the aluminum connector compound on the mating surfaces of the hinge mounting plate and the auxiliary terminal pad.

⚠ WARNING

If the circuit is energized, the Series 2000 Circuit-Switcher must be closed before operating the bypass accessory to either the **Open** or **Closed** position. If the bypass accessory is opened or closed while the circuit-switcher is in the **Open** position, personal injury and property damage may result.

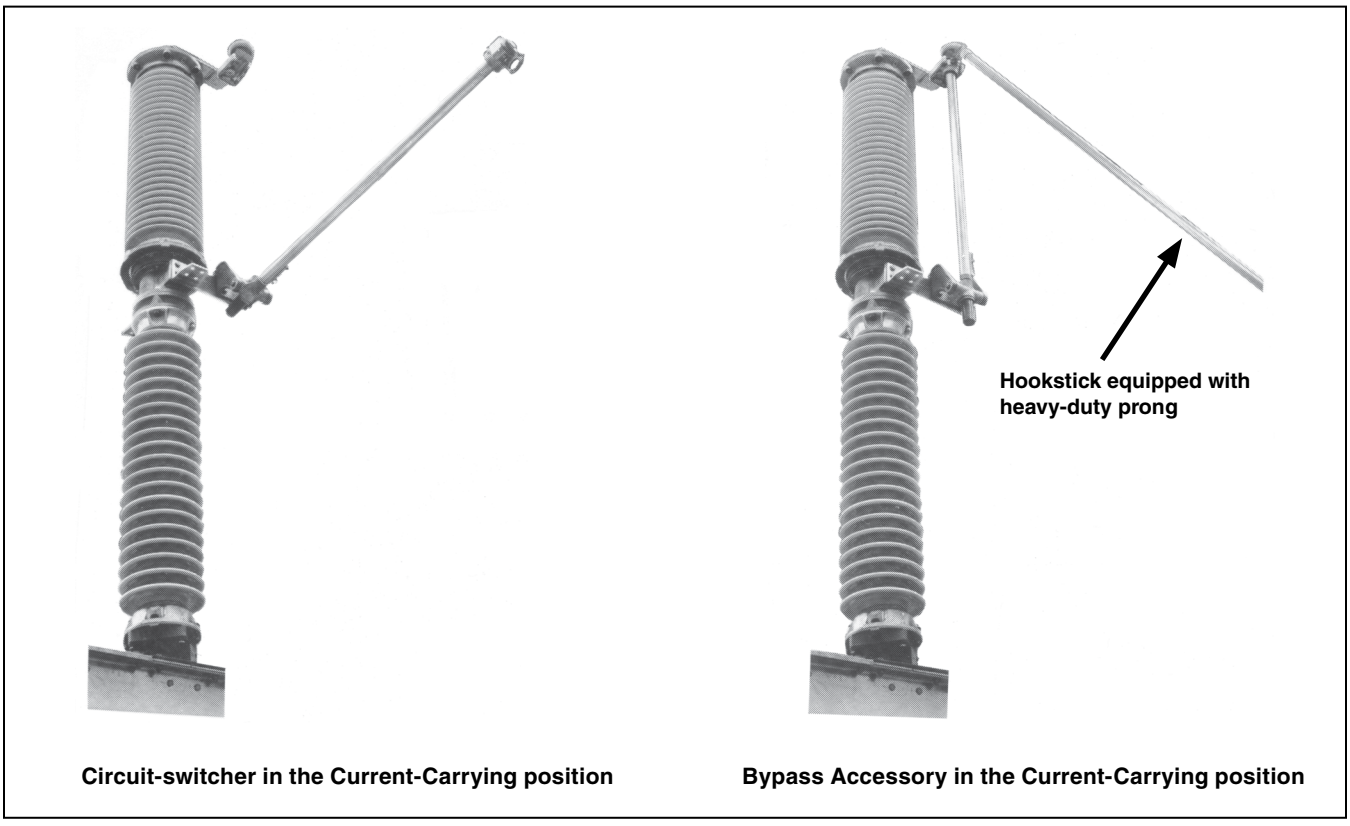

Figure 1. Bypass accessory for Series 2000 Circuit-Switcher Model 2030

STEP 2. Attach each bypass accessory blade-and-hinge assembly to its respective circuit-switcher transition box as follows. See Figure 2.

(a) Thoroughly wire-brush the raised surface on the back of the transition box and the mating surface on the auxiliary terminal pad, and immediately apply a liberal coating of Penetrox® A or other suitable aluminum connector compound to the brushed surfaces.

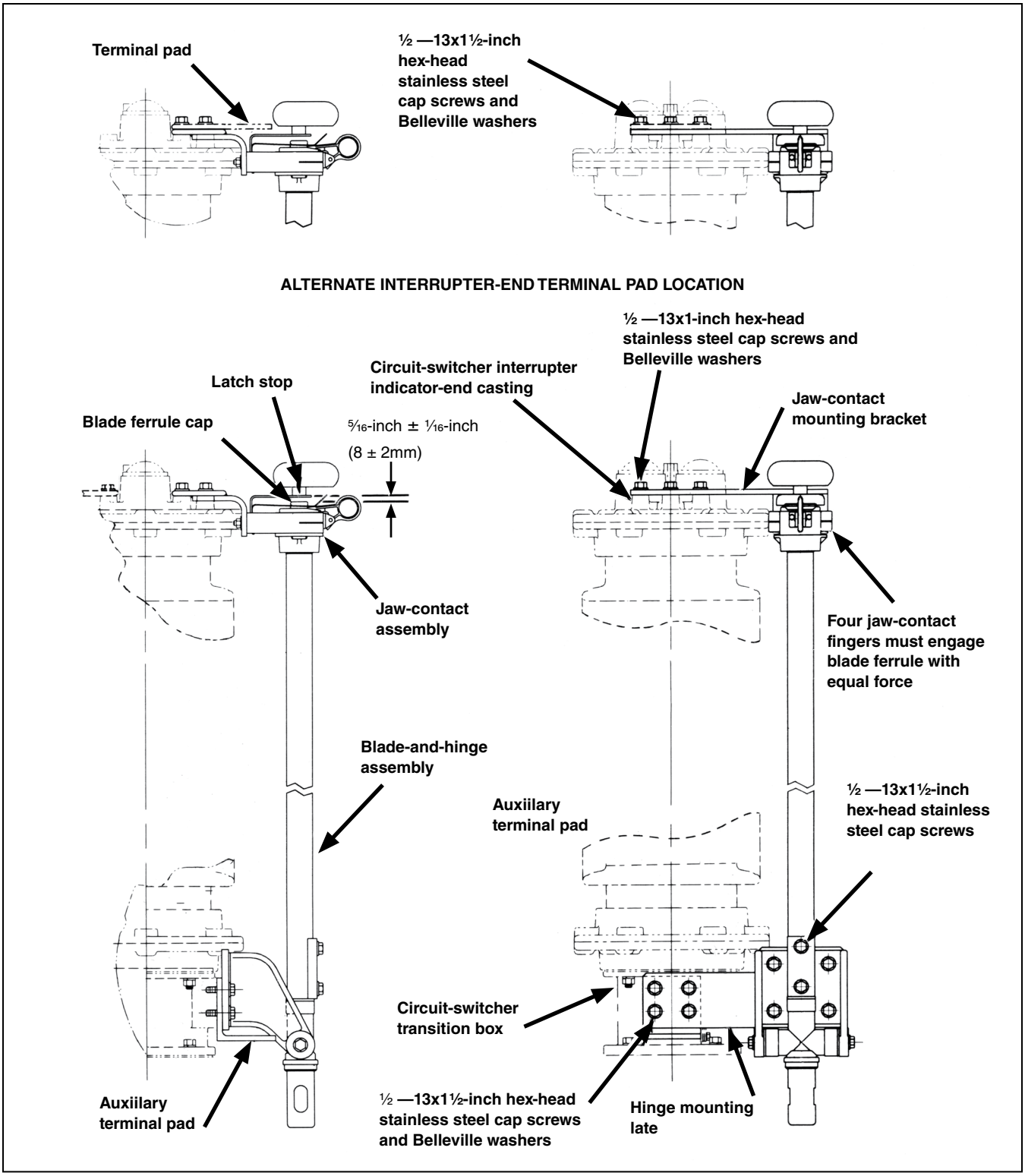

Figure 2. Installing and aligning a bypass accessory for a Series 2000 Circuit-Switcher.

(b) Loosely attach the auxiliary terminal pad and the hinge mounting plate to the transition box using the two ½—13x1½-inch hex-head stainless steel cap screws and Belleville washers retained from Step 1 on page 9, plus two additional cap screws and Belleville washers furnished. (The auxiliary terminal pad must be attached as shown even if the high-voltage connection at the transition box will be made to the cast-in terminal pad.)

STEP 3. Attach each bypass accessory jaw-contact assembly to its respective circuit-switcher interrupter indicator-end casting as follows. See Figure 2 on page 10.

(a) Thoroughly wire-brush the indicator-end casting where the jaw-contact mounting bracket is to be attached, as well as the mating surface on the mounting bracket, and immediately apply a liberal coating of Penetrox A or other suitable aluminum connector compound to the brushed surfaces.

(b) Securely attach the jaw-contact mounting bracket to the indicator-end casting using three ½—13x1-inch hex-head stainless steel cap screws and Belleville washers furnished or, if the interrupter-end terminal pad is to be attached at its alternate location, securely attach the terminal pad and the jaw-contact mounting bracket to the indicator-end casting using three ½—13x1½-inch hex-head stainless steel cap screws and Belleville washers furnished.

STEP 4. Align each bypass accessory blade-and-hinge assembly with its associated jaw-connect assembly as follows. See Figure 2 on page 10.

(a) Slowly close the blade assembly into the jaw-contact assembly. Make sure the blade makes an "on center" approach and the four jaw-contact fingers engage the blade ferrule with equal force. If adjustment is necessary, loosen the four ½—13x1½-inch hex-head stainless steel cap screws that attach the auxiliary terminal pad and hinge mounting plate to the circuit-switcher transition box and, using the blade assembly as a lever, bring the blade-and-hinge assembly into proper alignment.

(b) Slowly open the blade assembly. Verify that when the blade has just disengaged the jaw-contact fingers, the centerline of the blade assembly has not shifted left or right by more than ⅛-inch (3mm). If adjustment is necessary, loosen the four ½–13x1½-inch hex-head stainless steel cap screws and, using the blade assembly as a lever, bring the blade-and-hinge assembly into proper alignment.

(c) Securely tighten the four ½—13x1½-inch hex-head stainless steel cap screws.

STEP 5. Check on each bypass accessory that the blade ferrule properly engages the latch on its associated jaw-contact assembly as follows. See Figure 2 on page 10.

(a) Accurately measure the gap between the top of the blade ferrule cap and the bottom of the latch stop.

(b) If the dimension is not within the tolerance specified, loosen the two ½—13x1½-inch hex-head stainless steel cap screws at the bottom of the blade assembly and raise or lower the blade assembly as required. Then, securely tighten the cap screws.

⚠ WARNING

If the circuit is energized, the Series 2000 Circuit-Switcher must be closed before operating the bypass accessory to either the **Open** or **Closed** position. If the bypass accessory is opened or closed while the Circuit-Switcher is in the **Open** position, personal injury and property damage may result.

The bypass accessory blade assembly is to be opened by a downward pull on the pull-ring, using a conventional hookstick equipped with a heavy-duty prong, such as the S&C Station Prong, catalog number 4402R2. The blade assembly should be eased down, not permitted to drop freely.

The bypass accessory blade assembly is also to be closed using a conventional hookstick equipped with a heavy-duty prong. Engage the pull-ring with the prong and swing the blade assembly to within 2 or 3 inches (51 or 76 mm) of the jaw-contact assembly. Then move the blade assembly sharply to the **Closed** position.

To ensure continued proper performance of the bypass accessory, it should be inspected in accordance with S&C's recommended schedule and procedures contained in S&C Instruction Sheet 716-590.