

Field Replacement

Table of Contents

Section	Page	Section	Page
Introduction		Safety Precautions	4
Qualified Persons	2	Overview	5
Read this Instruction Sheet	2	Removing the Type AT	
Retain this Instruction Sheet	2	Source-Transfer Control	6
Proper Application	2	Installing the Micro-AT	
Warranty	2	Source-Transfer Control	10
Safety Information			
Understanding Safety-Alert Messages	3		
Following Safety Instructions	3		
Replacement Instructions and Labels	3		



Introduction

Qualified Persons

WARNING

Only qualified persons who are 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 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 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 your Power-Operated Metal-Enclosed Switchgear. Familiarize yourself with the Safety Information and Safety Precautions on pages 3 and 4. The latest version of this publication is available online in PDF format at sandc.com/en/support/product-literature/.

Retain this Instruction Sheet

This instruction sheet is a permanent part of your Power-Operated Metal-Enclosed Switchgear. Designate a location where you can easily retrieve and refer to this publication.

Proper Application

WARNING

The equipment in this publication is only intended for a specific application. The application must be within the ratings furnished for the equipment.

Warranty

The warranty and/or obligations described in S&C 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).**

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the Power-Operated Metal-Enclosed Switchgear. Familiarize yourself 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 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 the S&C Global Support and Monitoring Center at 1-888-762-1100.

NOTICE	
Read this instruction sheet thoroughly and carefully before installing the Power-Operated Metal-Enclosed Switchgear.	

Replacement Instructions and Labels

If additional copies of this instruction sheet are needed, 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



Power-Operated Metal-Enclosed Switchgear operates 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 Power-Operated Metal-Enclosed Switchgear 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.
5. **OPERATING MECHANISM.** Power-Operated Metal-Enclosed Switchgear contain fast-moving parts that can severely injure fingers. Do not remove or disassemble operating mechanisms or remove access panels unless directed by S&C Electric Company.
6. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded. Voltage levels can be as high as the peak line-to-ground voltage last applied to the unit. Units that have been energized or installed near energized lines should be considered live until tested and grounded.
7. **GROUNDING.** The Power-Operated Metal Enclosed Switchgear must be connected to a suitable earth ground, or to a suitable building ground for testing, before energizing the switchgear, and at all times when energized.

The ground wire(s) must be bonded to the system neutral, if present. If the system neutral is not present, proper precautions must be taken to ensure the local earth ground, or building ground, cannot be severed or removed.
8. **SWITCH POSITION.** Always confirm the **Open/Close** position of each switch.
 - Switches and terminal pads may be energized from either side.
 - Switches and terminal pads may be energized with the switches in any position.
9. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.

⚠ WARNING

The equipment covered by this publication must be selected for a specific application and it must be installed, operated, and maintained by qualified persons who are thoroughly trained and who understand any hazards that may be involved. This publication is written only for such qualified persons and is not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

This publication provides instructions for field removal of the Type AT-2 or Type AT-3 control originally furnished in Power-Operated Metal-Enclosed Switchgear, and its replacement with Micro-AT Source-Transfer Control, catalog number 39050-A1.

These instructions apply only in instances where the metal-enclosed switchgear was furnished with one of the following Type AT Source-Transfer Controls:

- Type AT-2, catalog number 38881 or 38883
- Type AT-3, catalog number 38891 or 38893

These instructions may also apply in instances where the metal-enclosed switchgear was furnished with a special Type AT-2 or Type AT-3 Source-Transfer Control, where the above-listed catalog number includes an “-SXXX” suffix. Such applications must be reviewed and approved by S&C to verify their suitability for retrofitting. Each metal-enclosed switchgear application likewise must be reviewed and approved by S&C to verify its suitability for retrofitting.

Refer to S&C Instruction Sheet 515-500 for instructions on field programming and operation of the Micro-AT Source-Transfer Control.

Key Interlocks

Metal-enclosed switchgear furnished with optional key interlocks on the entrance bays (and bus-tie bay, if applicable) is not compatible with the Micro-AT Source-Transfer Control. Such switchgear does not have wiring from the key interlocks that can report their positions.

Retrofit Kit

Retrofit Kit, catalog number CMA-1102, is required for installing the Micro-AT Source-Transfer Control in Power-Operated Metal-Enclosed Switchgear.

Tools Required

- An $1\frac{1}{32}$ -inch open-end wrench for #8–32 hex nuts
- A $\frac{3}{8}$ -inch ratchet-type socket wrench and open-end wrench for #10–32 hex-head cap screws and hex nuts
- A $\frac{7}{16}$ -inch ratchet-type socket wrench and open-end wrench for $\frac{1}{4}$ –20 hex-head cap screws and hex nuts
- A $\frac{1}{8}$ -inch hex wrench for #10-32 socket-head machine screws
- A $\frac{1}{4}$ -inch flat-blade screwdriver
- Long-nose pliers
- An electric drill with a $\frac{1}{4}$ -inch bit
- A voltmeter having an input impedance of at least 5,000 ohms per volt

Removing the Type AT Source-Transfer Control

STEP 1. Place the MANUAL/AUTOMATIC OPERATION selector switch on the Type AT control faceplate in the **Manual** position. See Figure 1.

STEP 2. Decouple the Type MS-2 or Type AS-30 Switch Operators. Refer to the S&C instruction sheet furnished for the switch operators.

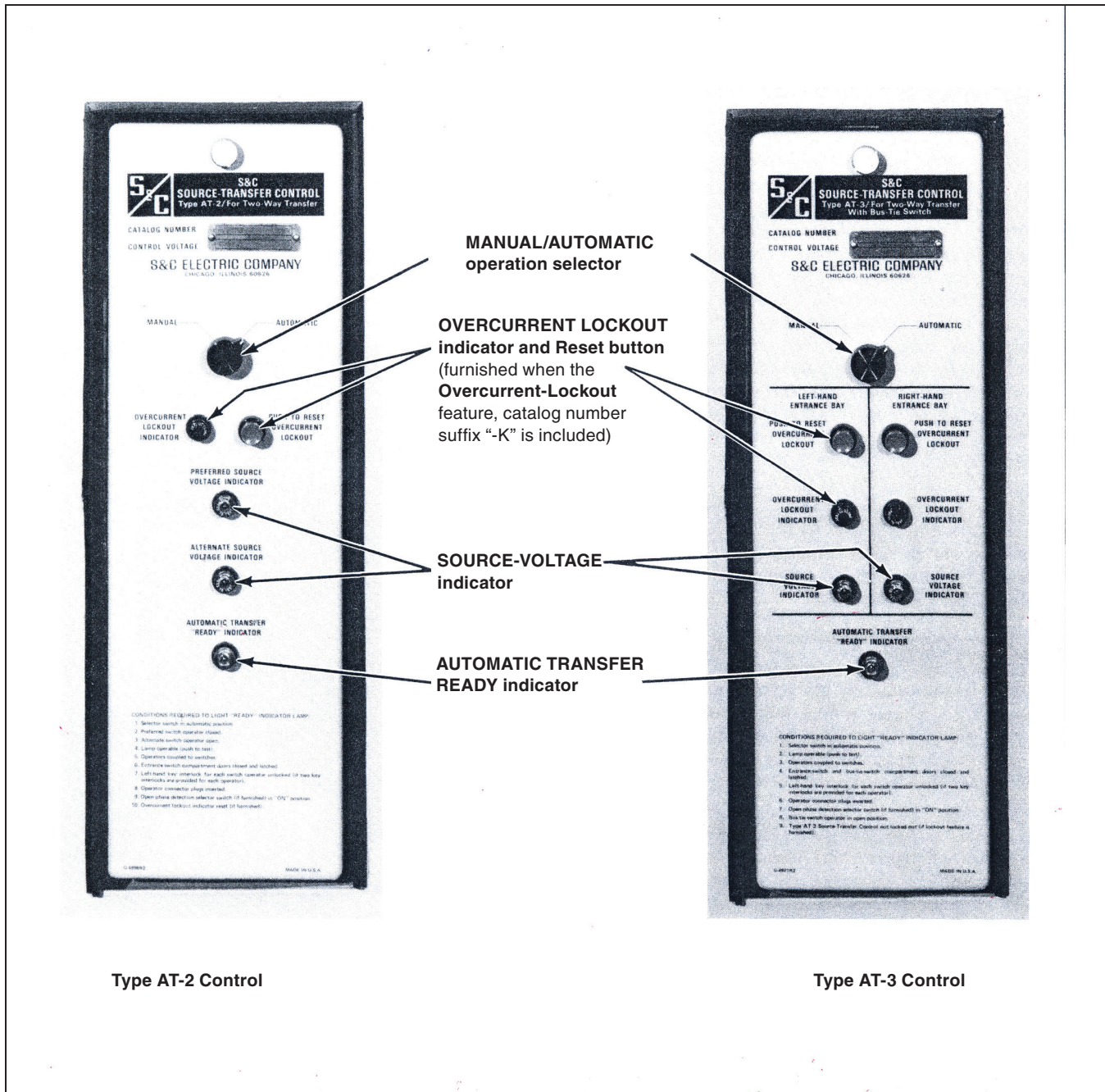


Figure 1. The front-panel features of Type AT-2 and Type AT-3 Source-Transfer Controls.

- STEP 3.** Loosen the screw fastener and pull the Type AT control from the switchgear-bay stile until the latch at the rear of the control locks. See Figure 2.
- STEP 4.** If the switchgear was furnished with a Type AT-2 Source-Transfer Control, catalog number 38883 or a Type AT-3 Source-Transfer Control, catalog number 38893, for use with two S&C Indoor Voltage Sensors and one voltage transformer per source, measure and record the difference in voltage-sensor signals between Phase 1 of the left-hand source and Phase 1 of the right-hand source by inserting the voltmeter test probes into the appropriate test jacks on the programming panel. See Figure 3 on page 8. Similarly, measure and record the difference in voltage-sensor signals between Phase 3 of the left-hand source and Phase 3 of the right-hand source. If either measurement exceeds 0.75 Volts, the sequence of rotation of the two signal sources is different; refer to Drawing RD-3638 (furnished in the retrofit kit) and make the necessary voltage-sensor signal input change to the wiring harness of Relay Panel Assembly, part number CMA-1103 (also furnished in the retrofit kit).
- STEP 5.** Remove the input plug from the input receptacle located on the programming panel at the rear of the control and immediately transfer it to the shorting receptacle. See Figure 3 on page 8.

NOTICE

Failure to immediately place the input plug into the shorting receptacle may result in damage to the voltage sensors and voltage limiters that will render the automatic-transfer scheme inoperative.

This procedure short-circuits and isolates the secondaries of the voltage sensors (if furnished), isolates the voltage transformers, and also isolates the current sensors used with the optional **Overcurrent Lockout** feature (catalog number suffix “-K”), if furnished.

- STEP 6.** Remove the left-hand entrance bay plug and the right-hand entrance bay plug from their receptacles on the programming panel. See Figure 3 on page 8. On Type AT-2 controls, make note of which source is the preferred and which is the alternate so the Micro-AT Source-Transfer Control can be set accordingly. If the control was furnished with the optional **Remote Indication** feature (catalog number suffix “-A1”), also remove the remote-indication output plug from its associated receptacle on the programming panel. See Figure 3 on page 8.

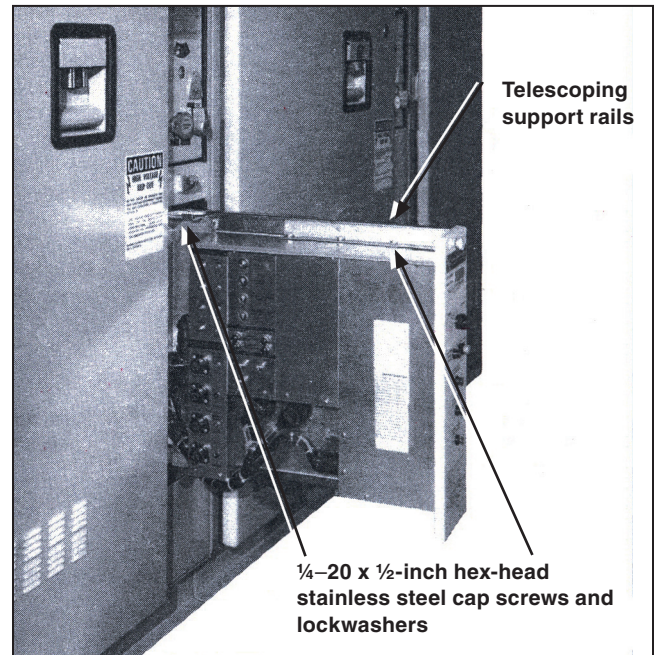


Figure 2. The Type AT control in drawout position.

Removing the Type AT Source-Transfer Control

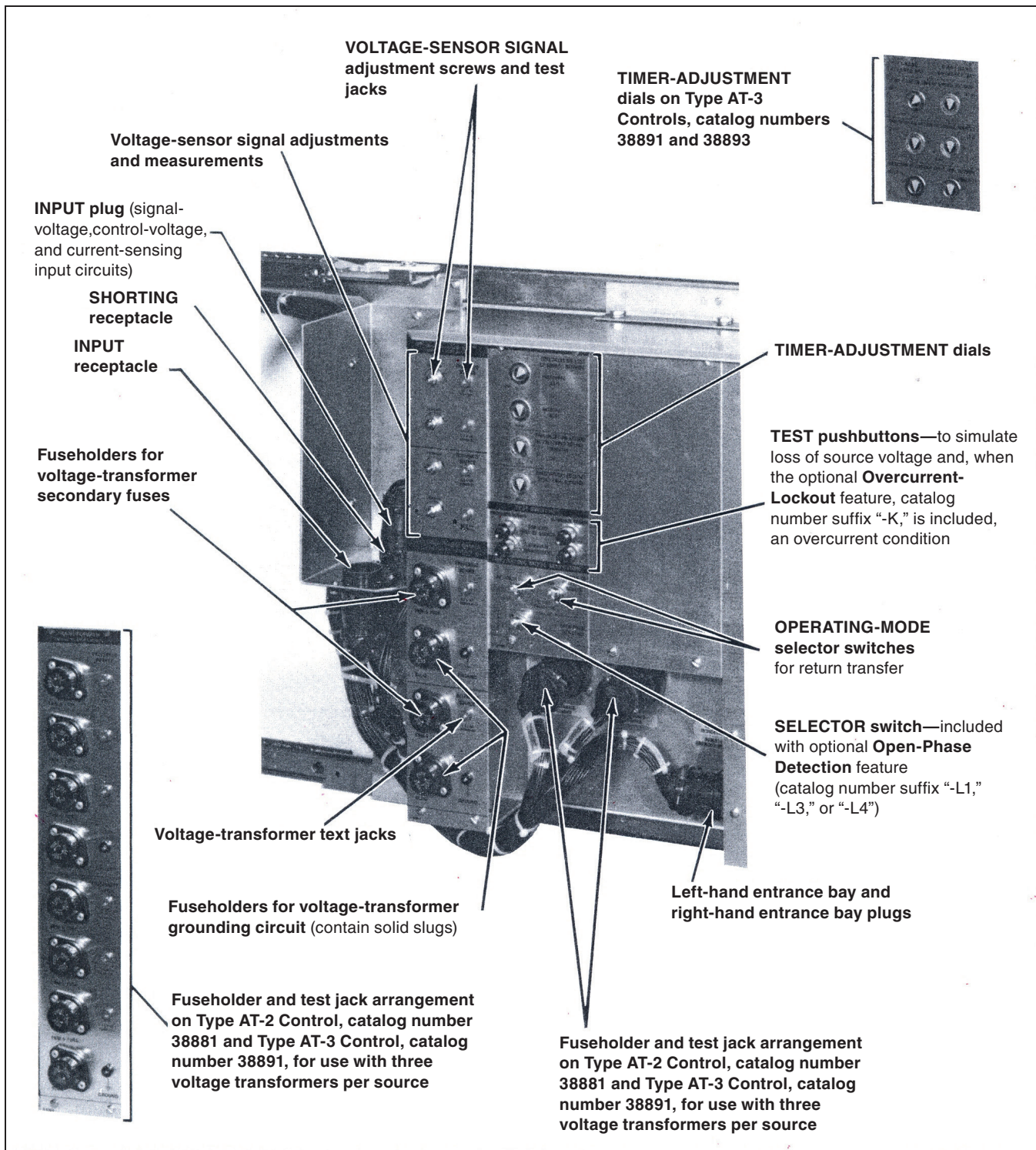


Figure 3. Adjustment, testing, and programming features at the rear of a Type AT-2 Source-Transfer Control, catalog number 38883, for use with two S&C Indoor Voltage Sensors and one voltage transformer per source. Insets show construction differences on other models.

- STEP 7.** Make note of the TIMER-ADJUSTMENT dial settings on the programming panel as well as the settings of the OPERATING-MODE selector switches on the programming panel so the Micro-AT Source-Transfer Control can be set accordingly. See Figure 3 on page 8.
- STEP 8.** Disconnect the ground wire from the underside of the Type AT control enclosure. See Figure 4.
- STEP 9.** Remove the four ¼-20 x ½-inch hex-head stainless steel cap screws and lockwashers at the top and bottom of the Type AT control enclosure that secure the control to the telescoping support rails. See Figure 2 on page 7. Then, remove the Type AT control. Discard the hardware.

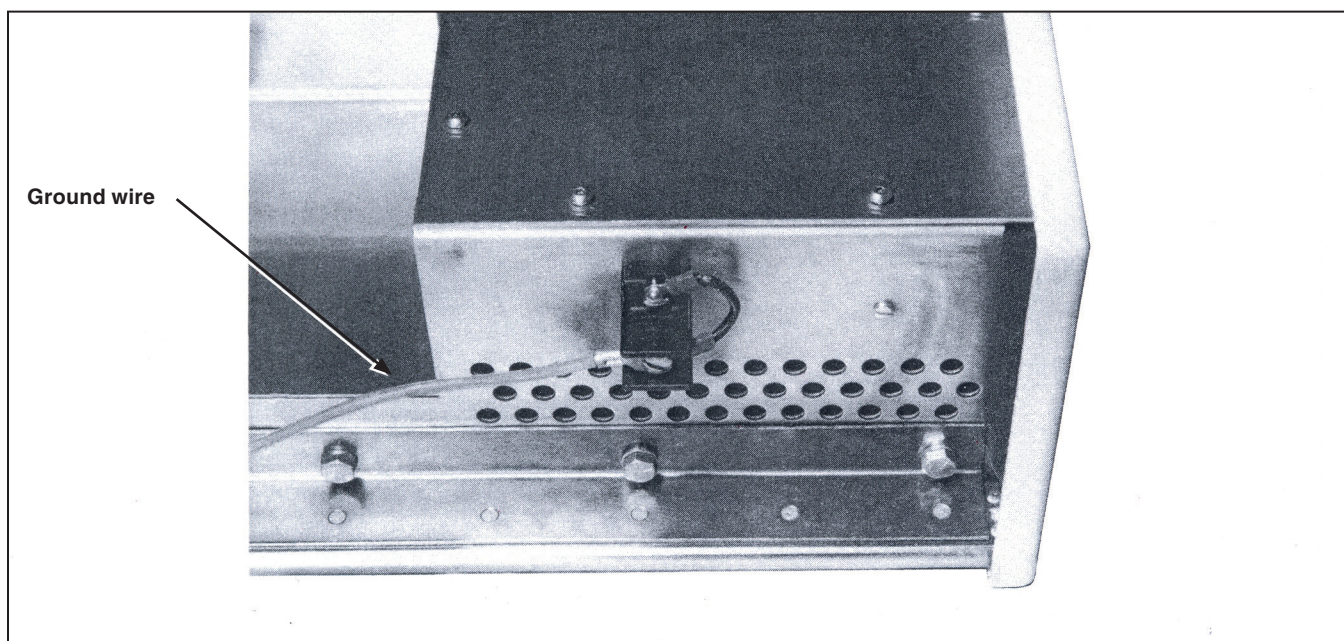


Figure 4. Disconnecting ground wire from underside of a Type AT control.

Installing the Micro-AT Source-Transfer Control

STEP 1. Attach the Top Support, part number CM-1151 (furnished in the retrofit kit) to the upper telescoping support rail using two #10-32 x 1/2-inch hex-head stainless steel cap screws, flat washers, and self-locking hex nuts (furnished in the retrofit kit). See Figure 5. **The hardware**

must be assembled as shown in Detail A. Securely tighten the hardware. If the necessary holes are not present in the upper telescoping support rail, use the holes in the Top Support as a template and drill two 1/4-inch (6-mm) holes at the positions shown.

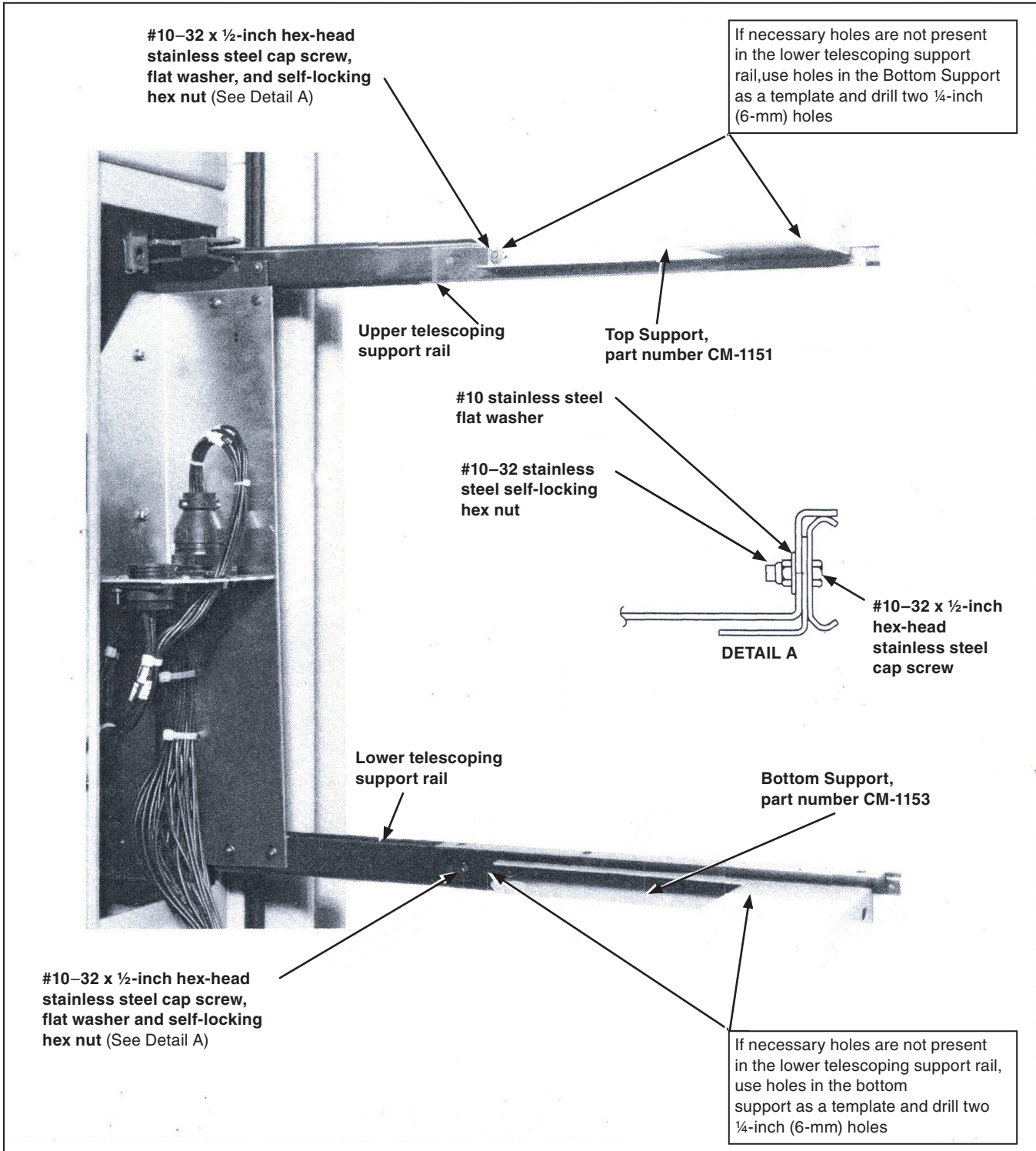


Figure 5. Attaching top and Bottom Supports to telescoping support rails.

STEP 2. Attach the Bottom Support, part number CM-1153 (furnished in the retrofit kit), to the lower telescoping support rail using two #10-32 x 1/2-inch hex-head stainless steel cap screws, flat washers, and self-locking hex nuts (furnished in the retrofit kit). See Figure 5 on page 10. **The hardware must be assembled as shown in Detail A.** Securely tighten the hardware. If the necessary holes are not present in the lower telescoping support rail, use the holes in the Bottom Support as a template and drill two 1/4-inch (6-mm) holes at the positions shown in Figure 5 on page 10.

STEP 3. Remove and discard the top and bottom mounting brackets attached to the Micro-AT Source-Transfer Control enclosure. Attach the top mounting bracket, part number CM-1152-1 (furnished in the retrofit kit), to the top of the enclosure using four #10-32 x 3/8-inch socket-head stainless steel machine screws (furnished in the retrofit kit). See Figure 6. Attach the bottom mounting bracket, part number CM-1152-2 (furnished in the retrofit kit), to the bottom of the enclosure using four #10-32 x 3/8-inch socket-head stainless steel machine screws (furnished in the retrofit kit).

NOTICE

Apply Loctite® threadlocker adhesive (furnished in the retrofit kit) to the screws. Make certain the top mounting bracket and the bottom mounting bracket are installed square with the front of the Micro-AT Source-Transfer Control enclosure. Then securely tighten the #10-32 x 3/8-inch socket-head machine screws.

STEP 4. Attach to the top mounting bracket, screw fastener, part number 0825-152; Neoprene washer, part number 5140-001; spring, part number S-84137; and flat washer, part number 1340-015, using the retaining washer, part number 0825-056 (furnished in the retrofit kit). See Figure 7 on page 12.

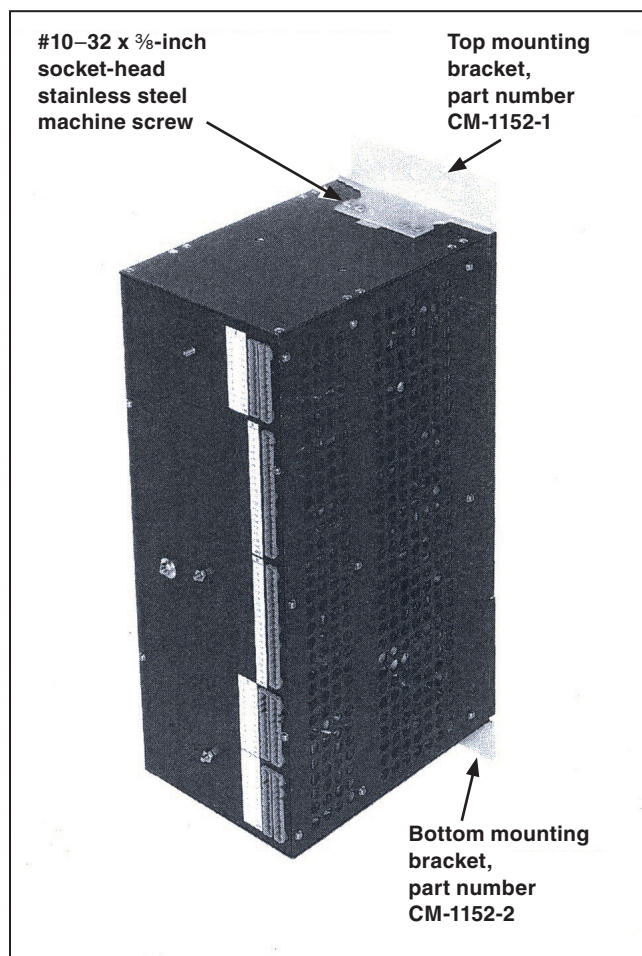


Figure 6. Attaching the top and bottom mounting brackets to the Micro-AT Source-Transfer Control enclosure.

Installing the Micro-AT Source-Transfer Control

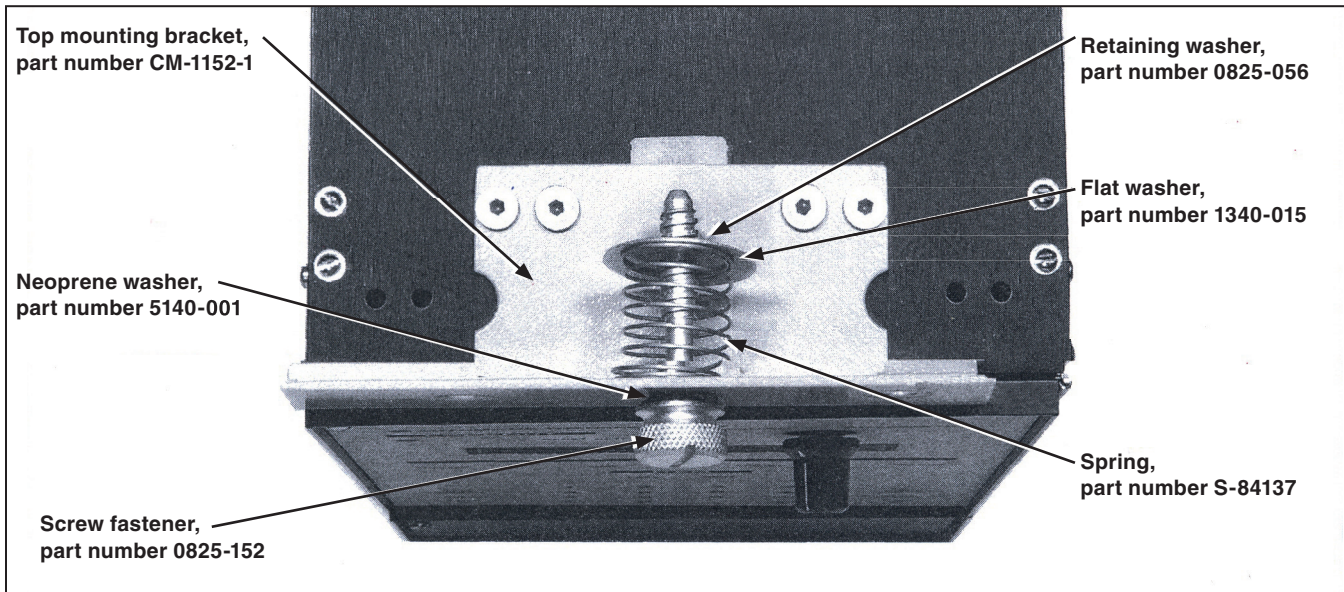


Figure 7. Attaching the screw fastener to the top mounting bracket.

STEP 5. Loosely attach two shock-mount bushings, part number 9931-198 (furnished in the retrofit kit), to the Top Support using two $\frac{1}{4}$ -20 zinc-plated serrated hex nuts (also furnished in the retrofit kit). See Figure 8 on page 13. Loosely attach two shock-mount bushings to the Bottom Support in the same manner.

Set the Micro-AT Source-Transfer Control into place and loosely attach the top mounting bracket and bottom mounting bracket to the shock-mount bushings using four $\frac{1}{4}$ -20 zinc-plated serrated hex nuts. See Figure 8 on page 13.

STEP 6. Attach relay panel assembly part number CMA-1103 to the upper and lower telescoping support rails using two $\frac{1}{4}$ -20 x $\frac{5}{8}$ -inch zinc-plated hex-head cap screws and serrated hex nuts. See Figure 8 on page 13. Securely tighten the cap screws.

STEP 7. Place the MANUAL/AUTOMATIC OPERATION selector switch on the Micro-AT Source-Transfer Control in the **Manual** position.

STEP 8. Attach the ground wire, which was previously connected to the Type AT Source-Transfer Control enclosure, to terminal 10 or terminal 11 of the terminal block on the relay panel assembly. Then, attach wiring harness ground wire G4 to the back of the Micro-AT Source-Transfer Control enclosure using a #8 stainless steel flat washer, #8 lockwasher, and #8-32 hex nut (furnished in the retrofit kit). See Figure 8 on page 13 and Drawing RD-3612 Sheet 2 of 2 (also furnished in the retrofit kit).

STEP 9. Install each rectangular connector of the wiring harness in its corresponding receptacle on the back of the Micro-AT Source-Transfer Control enclosure, starting at the bottom. Attach each of the three clamp wire ties on the wiring harness to the Micro-AT Control enclosure using a #8 stainless steel flat washer, #8 lockwasher, and #8-32 hex nut (furnished in the retrofit kit). See Figure 8 on page 13 and Drawing RD-3612 Sheet 2 of 2 (also furnished in the retrofit kit).

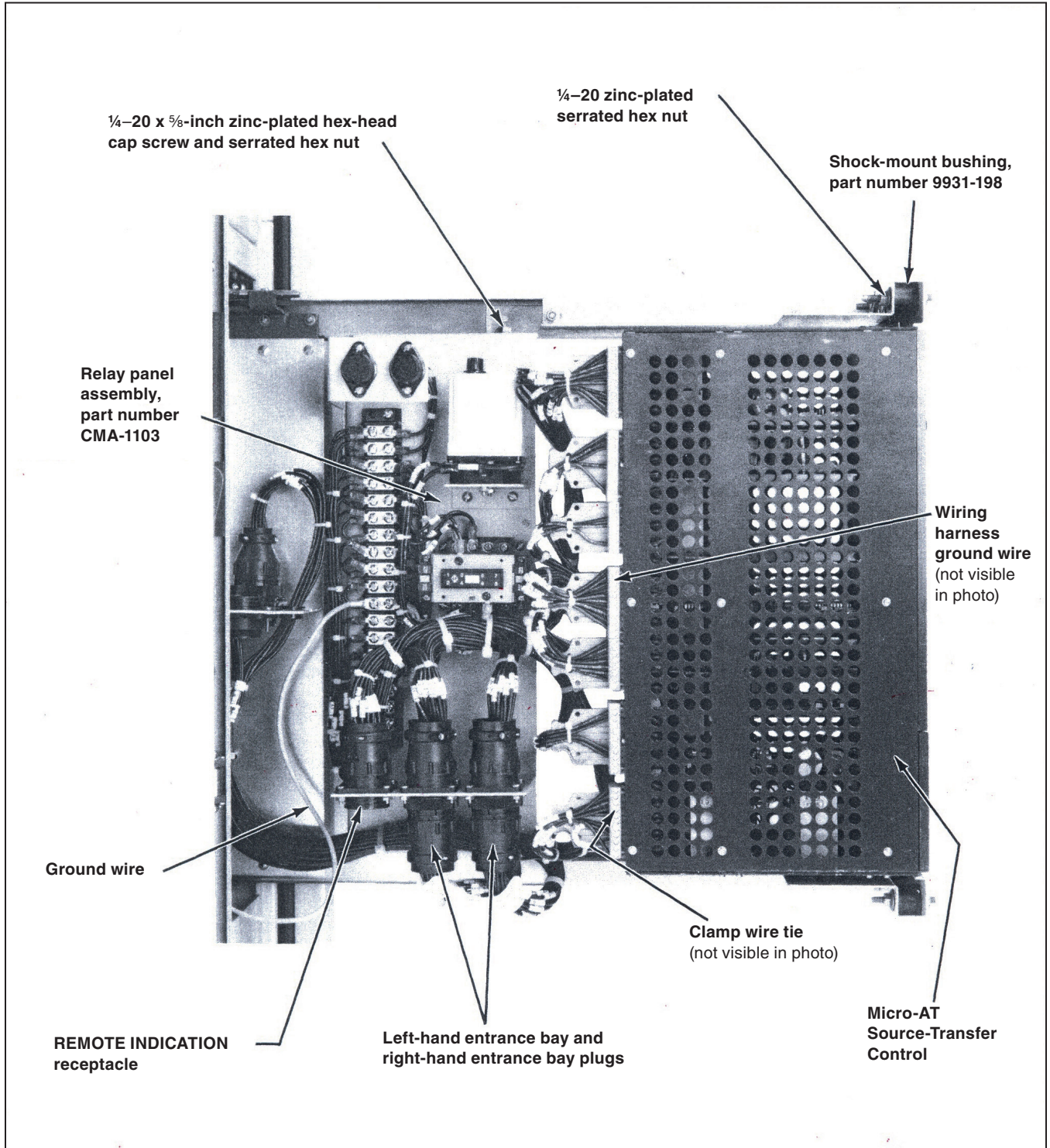


Figure 8. Installing a Micro-AT Source-Transfer Control and relay panel assembly.

Installing the Micro-AT Source-Transfer Control

- STEP 10.** *If the switchgear is furnished with a Type AT-3 Source-Transfer Control, catalog number 38891 or 38893:* The relay panel assembly has been pre-wired for application with Type AT-2 Source-Transfer Controls. Refer to Drawing RD-3612 Sheet 2 of 2 (furnished in the retrofit kit) and modify the wiring at the terminal block of the relay-panel assembly for application with Type AT-3 Source-Transfer Controls.
- STEP 11.** Refer to Drawing RD-3612 Sheet 2 of 2 (furnished in the retrofit kit) and perform the rewiring procedure indicated at the quick-disconnect connector plug of each Type MS-2 Switch Operator or Type AS-30 Switch Operator used in conjunction with the source-transfer control.
- STEP 12.** The left-hand and right-hand entrance-bay plugs each have a white plastic key inserted into one of the pins; these keys must be removed and discarded. Use a pair of long-nose pliers to remove the keys. Then, connect the left-hand entrance-bay plug to its receptacle on the relay panel assembly and connect the right-hand entrance-bay plug to its receptacle on the relay panel assembly. See Figure 8 on page 13.
- STEP 13.** *If the Type AT Source-Transfer Control was furnished with the optional Remote-Indication feature, catalog number suffix “-AI:”* Connect the remote indication plug to its receptacle on the relay panel assembly. See Figure 8 on page 13.
- STEP 14.** Remove the input plug from the shorting receptacle and immediately transfer it to the input receptacle. See Figure 9.

NOTICE

Failure to immediately place the input plug into the input receptacle may result in damage to the voltage sensors and voltage limiters that will render the automatic-transfer scheme inoperative.

- STEP 15.** Refer to S&C Instruction Sheet 515-500 and perform the field adjustment and programming procedures for the Micro-AT Source-Transfer Control as outlined. Then, perform the operational testing.
- STEP 16.** After operational testing has been completed on the Micro-AT Source-Transfer Control, again place the MANUAL/AUTOMATIC OPERATION selector switch on the Micro-AT Source-Transfer Control in the **Manual** position. If the EVENT lamp is lit, extinguish it by following the procedure discussed in the “Diagnostic Tools” section of S&C Instruction Sheet 515-500.

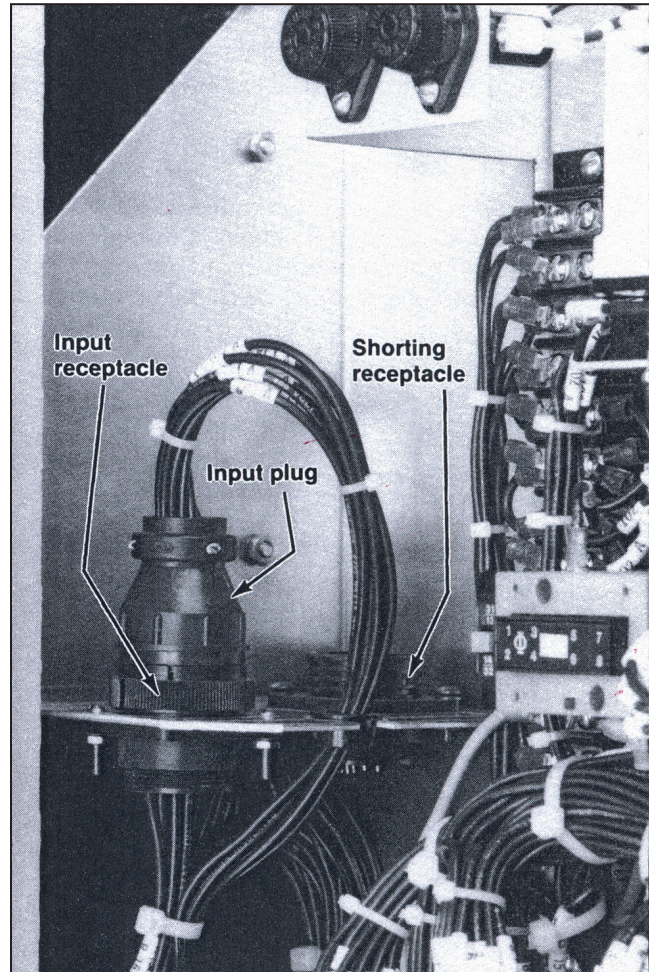


Figure 9. Connecting the input plug to the input receptacle.

- STEP 17.** For all switchgear except System II Modular Metal-Enclosed Switchgear, install a Rain Shield, part number CM-1157 (furnished in the retrofit kit), at the top of the switchgear-bay stile. See Figure 10.
- STEP 18.** Unlock the latch at the rear of the control and slowly push the control into the switchgear-bay stile. Adjust the mounting brackets as necessary so the control enters the stile on-center. Then, securely tighten all mounting hardware.
- STEP 19.** Secure the Micro-AT control in the stile by tightening the screw fastener at the top mounting bracket.
- STEP 20.** Couple the Type MS-2 or Type AS-30 Switch Operator. Refer to the S&C instruction sheet furnished for the switch operator.
- STEP 21.** Place the MANUAL/AUTOMATIC OPERATION selector switch on the Micro-AT Source-Transfer Control in the **Automatic** position and confirm the AUTOMATIC-TRANSFER READY lamp is illuminated.

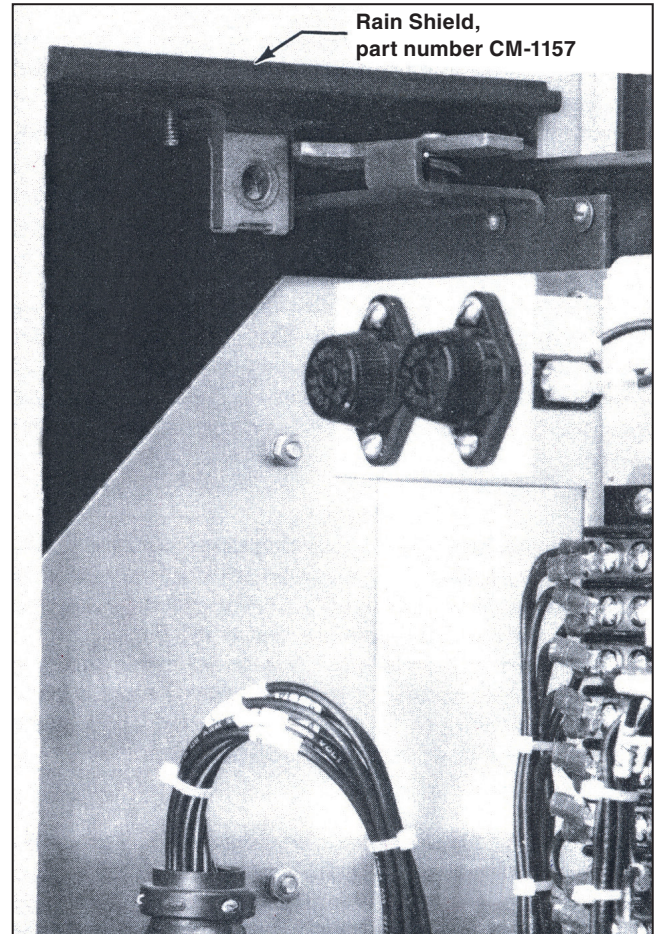


Figure 10. Installing the rain shield.