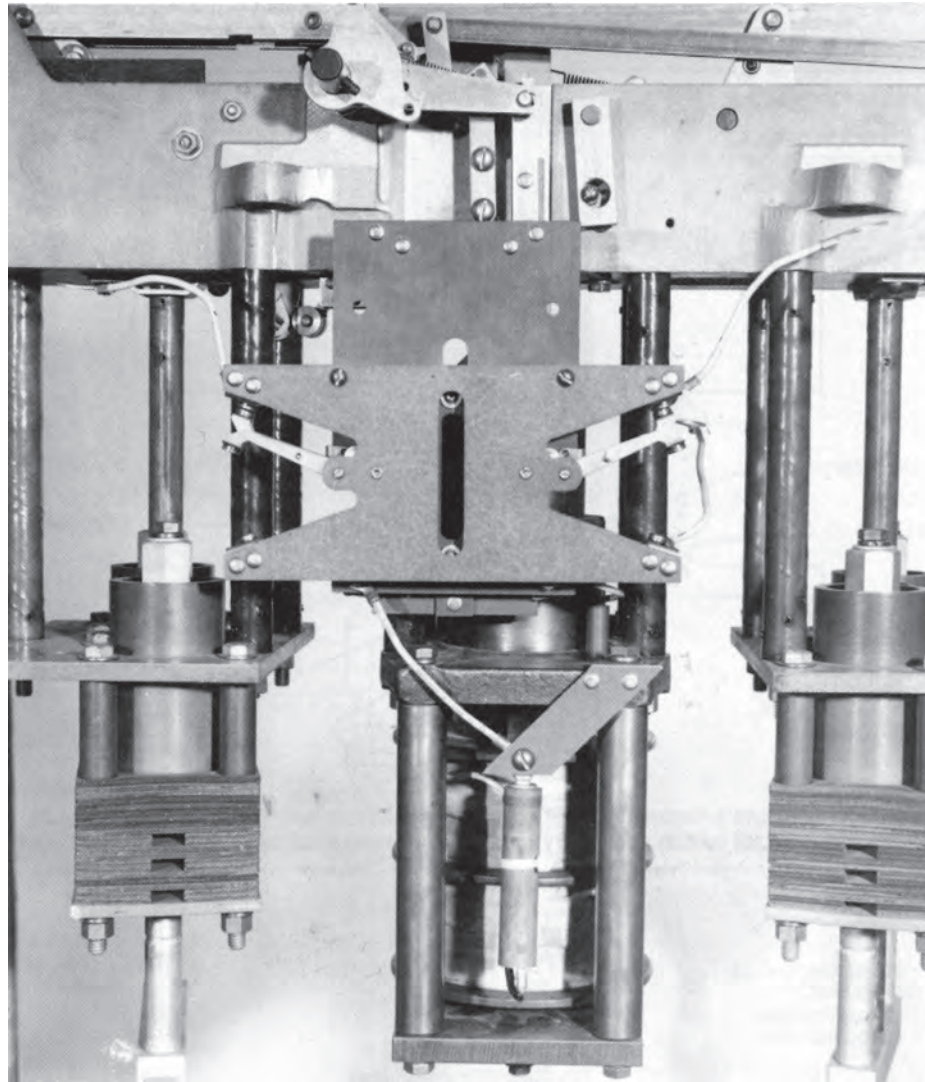


KA1169R Closing Coil Transfer-Switch Accessory Operation



DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY

The information, recommendations, descriptions and safety notations in this document are based on Eaton Corporation's ("Eaton") experience and judgment and may not cover all contingencies. If further information is required, an Eaton sales office should be consulted. Sale of the product shown in this literature is subject to the terms and conditions outlined in appropriate Eaton selling policies or other contractual agreement between Eaton and the purchaser.

THERE ARE NO UNDERSTANDINGS, AGREEMENTS, WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, OTHER THAN THOSE SPECIFICALLY SET OUT IN ANY EXISTING CONTRACT BETWEEN THE PARTIES. ANY SUCH CONTRACT STATES THE ENTIRE OBLIGATION OF EATON. THE CONTENTS OF THIS DOCUMENT SHALL NOT BECOME PART OF OR MODIFY ANY CONTRACT BETWEEN THE PARTIES.

In no event will Eaton be responsible to the purchaser or user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information, recommendations and descriptions contained herein. The information contained in this manual is subject to change without notice.

Contents

DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY	ii
SAFETY FOR LIFE	iv
SAFETY INFORMATION	iv
Safety instructions	iv
INTRODUCTION	1
Read this manual first	1
Additional information	1
DESCRIPTION	1
Ratings	1
OPERATION	2
When the source side is energized	2
When the source side is de-energized and the load side is energized	2
When both the source and the load sides are de-energized	2
VERIFICATION OF OPERATION	3
Hydraulically-controlled reclosers	3
Electronically-controlled reclosers	3



Safety for life



Eaton meets or exceeds all applicable industry standards relating to product safety in its Cooper Power™ series products. We actively promote safe practices in the use and maintenance of our products through our service literature, instructional training programs, and the continuous efforts of all Eaton employees involved in product design, manufacture, marketing, and service.

We strongly urge that you always follow all locally approved safety procedures and safety instructions when working around high voltage lines and equipment, and support our “Safety For Life” mission.

Safety information

The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it.

A competent technician has these qualifications:

- Is thoroughly familiar with these instructions.
- Is trained in industry-accepted high- and low-voltage safe operating practices and procedures.
- Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.
- Is trained in the care and use of protective equipment such as arc flash clothing, safety glasses, face shield, hard hat, rubber gloves, clampstick, hotstick, etc.

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

Hazard Statement Definitions

This manual may contain four types of hazard statements:

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in equipment damage only.

Safety instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.

DANGER

Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high- and low-voltage lines and equipment.

G103.3

WARNING

Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling, or maintenance can result in death, severe personal injury, and equipment damage.

G101.0

WARNING

This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury, and equipment damage.

G102.1

WARNING

Power distribution and transmission equipment must be properly selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures. Failure to properly select, install, or maintain power distribution and transmission equipment can result in death, severe personal injury, and equipment damage.

G122.2

Introduction

Read this manual first

Read and understand the contents of this manual and follow all locally approved procedures and safety practices before operating this equipment.

Additional information

These instructions cannot cover all details or variations in the equipment, procedures, or process described, nor provide directions for meeting every possible contingency during installation or operation. When additional information is desired to satisfy a problem not covered sufficiently for the user's purpose, contact your Eaton representative.

Description

The closing coil contactor-and-transfer-switch accessory (Figure 1) allows Eaton Cooper Power series three-phase reclosers, which use a high-voltage solenoid for closing, to be energized directly from either side without the use of bulky and costly closing equipment (stepdown, low-voltage closing, etc.). The transfer switch provides a simple, self-contained, automatic means of switching the connection for the closing solenoid coil from the source side to the load side when a closing operation is initiated while source-side power is de-energized.

The accessory consists of a mechanically-operated DPST closing contactor and DPDT transfer switch. It is an alternative to the standard closing solenoid contactor of the recloser. It mounts in the same position and is operated in a similar manner.

Accessory catalog numbers applicable to specific Eaton Cooper Power series reclosers and applications are shown in Table 1.

Table 1. Accessory catalog numbers

	Recloser Type	Accessory Catalog No.
Electronically-Controlled Recloser*	RVE**	KA1169R5
	RXE	KA1169R6
	WE	KA1169R7
	WVE**	KA1169R8
	VWE	KA1169R11
	VWVE	KA1169R12
Hydraulically-Controlled Recloser	RV**	KA1169R1
	RX	KA1169R2
	W	KA1169R3
	WV**	KA1169R4
	VW	KA1169R9
	VWV	KA1169R10

* When this accessory is used with electronically-controlled reclosers, it is recommended that the electronic control be equipped with the control fuse elimination accessory, KA531ME3.

** Transfer switch can be used on 2.4- to 24.9-kV distribution systems. Switch has 27-kV max design and 125-kV BIL ratings.

Ratings

The closing coil transfer switch accessory is applicable for 2.4- to 14.4/24.9-kV distribution systems. It has a rated maximum voltage of 27 kV and a BIL rating of 125 kV.

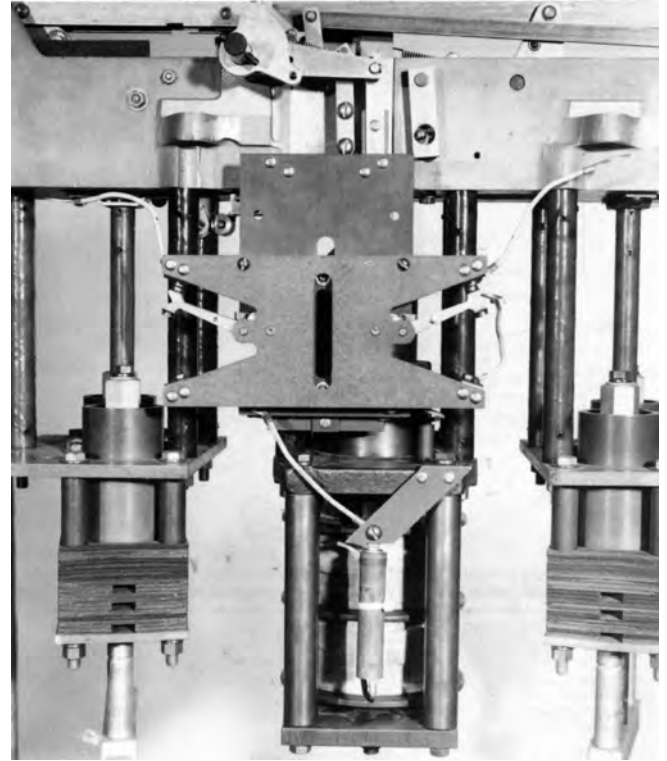


Figure 1. Closing solenoid coil contactor- and transfer-switch accessory mounted on recloser mechanism in place of standard closing solenoid contactor

Operation

When the source side is energized

When the recloser is locked open or when the recloser is closed, the circuit to the closing coil is opened by the DPST contactor (Figure 2).

When a closing operation is initiated, the offset T-bar begins its upward travel and closes the DPST contactor which connects the closing solenoid coil across Phases B and C on the source side of the recloser (Figure 3). Since the source-side lines are energized, the closing operation is completed. As the recloser closes, the T-bar drops down to open the DPST contactor and de-energize the solenoid coil (Figure 2). Note that under these conditions, the operation is the same as the closing operation with a standard closing-coil contactor. The accessory DPDT transfer switch has not operated and is not involved in the operation of the recloser.

When the source side is de-energized and the load side is energized

If the source side is not energized when the closing operation is initiated, the T-bar closes the DPST contactor and continues its upward movement to operate the DPDT transfer switch. This connects the closing coil across the load-side bushings (Figure 4) and completes the closing operation. As the recloser closes, the T-bar starts its downward travel and opens the DPST contactor to de-energize the closing coil before the DPDT transfer switch operates (Figure 5). As the T-bar completes its downward movement, the transfer switch returns to its original (at rest) position, ready for the next closing operation (Figure 2). Note that the closing-coil circuit is interrupted by the DPST contactor (Figure 5).

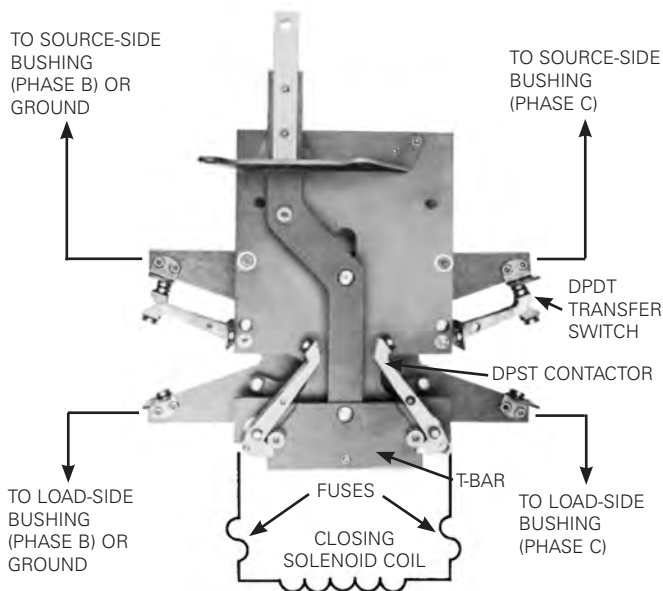


Figure 2. Contactor-transfer switch accessory in normal (at-rest) position

When both the source and the load sides are de-energized

Upward movement of the T-bar closes the DPST contactor (Figure 3). Since source-side lines are de-energized, the T-bar continues its upward travel to operate the DPDT switch and transfer the closing-coil connections to the load side of the recloser (Figure 4). Since no load-side voltage is present, the closing solenoid contactor and transfer switch will remain in this position and the recloser will remain open.

For electronically controlled reclosers, after five seconds, this condition will result in blowing the control fuse to interrupt the closing signal. The T-bar will then drop back to its at-rest position (Figure 2). This can be eliminated by equipping the control with the KA531ME3 fuse elimination accessory. Approximately two seconds after transfer to the load side, the fuse elimination accessory will interrupt the closing signal and the T-bar will drop down to its starting position (Figure 2). Then, after a 50-second pause, the fuse elimination accessory will reestablish the closing signal and the transfer switch will again interrogate both sides of the line. This cycle will be repeated until either source-side or load-side power is reestablished and the recloser closes.

For hydraulically controlled reclosers, the sequence of operation of the closing coil contactor-and-transfer switch is the same as for the electronically controlled reclosers, except that the DPDT transfer switch will stay in the transferred position (DPST contactor also closed; Figure 5) until the yellow operating handle on the recloser is operated. When the yellow handle is pulled down, the contactor and switch will drop back to their at-rest positions (Figure 2). Therefore, when both source and load side are de-energized, the yellow handle of the recloser should be pulled down and left in the down position until either side of the line is energized. Then, the handle can be raised to initiate the closing operation.

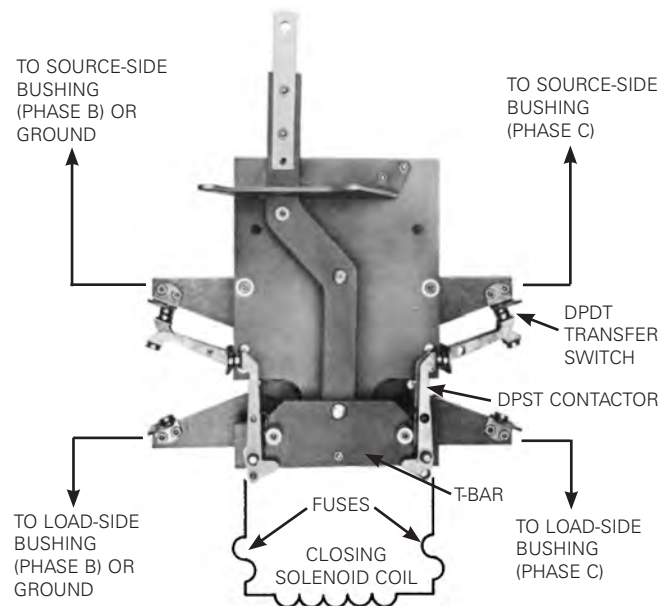


Figure 3. When closing sequence is initiated, closing coil is connected across source side of recloser

Verification of operation

Hydraulically-controlled reclosers

Refer to Recloser Installation Instructions, *Service Information MN280021EN*, paragraph "Operation of the Closing Solenoid" in the TEST PROCEDURES section.

With the high-voltage transformer connected to the source side of the recloser (bushings 5 and 3) and the yellow operating handle of the recloser up in the CLOSED position, energize the high-voltage transformer T3. The recloser should close immediately.

Manually open the recloser and reconnect the high-voltage transformer to the load side (bushings 6 and 4). Return the yellow operating handle up to the CLOSED position and energize the high-voltage transformer T3. The recloser should close immediately, indicating proper operation of the accessory.

Electronically-controlled reclosers

Refer to the Recloser Installation Instructions, *Service Information MN280060EN*, paragraph "OPERATION, Manual, From Control Panel".

With the high-voltage lines connected to the source side of the recloser (bushings 5 and 3) and energized, move the manual control switch on the control panel to CLOSE. The recloser should close immediately.

Manually open the recloser at the control panel and reconnect the high-voltage lines to the load side (bushings 6 and 4). Energize the high-voltage lines and again move the manual control switch on the control panel to CLOSE. The recloser should close immediately indicating proper operation of the accessory.

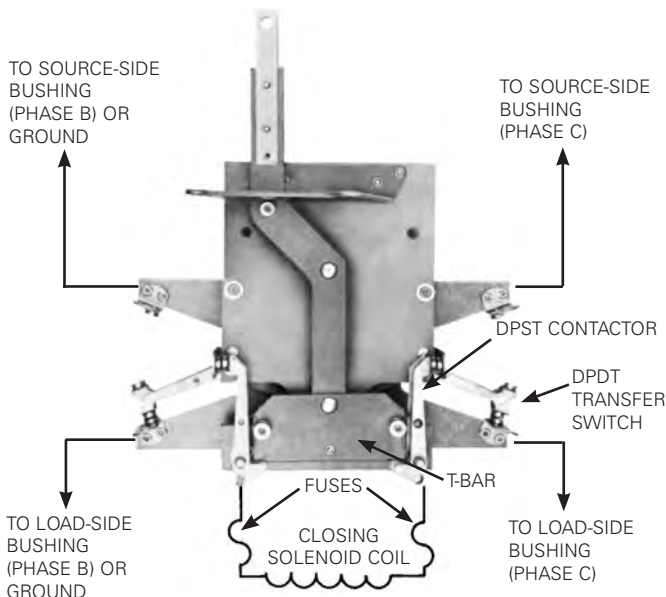


Figure 4. If source side is de-energized, continued travel of T-bar will transfer closing coil to load side of recloser

CAUTION

At times, a recloser on a radial feed system may be equipped with the transfer switch accessory to permit closing from the load side during emergency backfeed operations or simply for interchangeability with other reclosers used in dual-feed applications. For an application where the load side will not normally be energized, loss of source-side power during the instant a closing signal is initiated (due to a backup device trip, for example) could result in a false recloser lockout.

For electronically controlled reclosers, the fuse elimination accessory will prevent blowing the control fuse and locking out the control. The fuse elimination accessory will cycle the closing signal in a two-second-on, 50-second-off sequence until the source-side voltage is reestablished and the recloser closes. This cycling can continue for as long as 15 hours before a fully charged control battery is discharged.

For hydraulically-controlled reclosers, this problem can be eliminated by reversing the recloser installation (connecting the source to the load-side bushings). With this type of installation, the transfer switch would first connect the system load side to the closing coil and then transfer to the source side, remaining in that position until source voltage is restored.

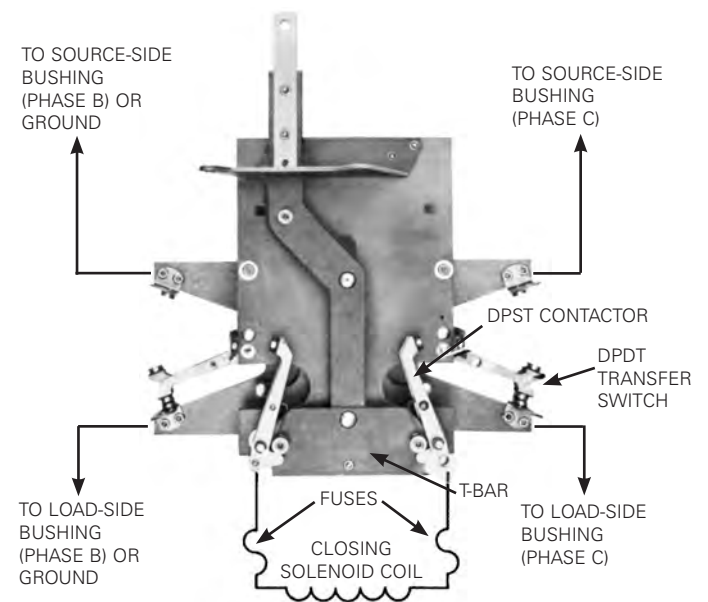


Figure 5. Contact-de-energized closing coil before transfer contacts operate



Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

Eaton's Power Systems Division
2300 Badger Drive
Waukesha, WI 53188
United States
Eaton.com/cooperpowerseries

© 2017 Eaton
All Rights Reserved
Printed in USA
Publication No. MN280069EN
KA2048-0197 REV 01
April 2017

Eaton is a registered trademark.

All trademarks are property
of their respective owners.

For Eaton's Cooper Power series product
information call 1-877-277-4636 or visit:
www.eaton.com/cooperpowerseries.