

Limit switch replacement kits for polymer position indicator



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Contents

DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY I

SAFETY FOR LIFE III

SAFETY INFORMATION III

 Safety instructions iii

PRODUCT INFORMATION 1

 Introduction 1

 Read this manual first 1

 Additional information 1

 Acceptance and initial inspection 1

 Handling and storage 1

 Standards 1

 Product description 1

INSTALLATION PROCEDURES 2

 Removing existing limit switch assembly 2

 Installing new limit switch assembly 4

 Testing installation and operation 6



Safety for life



Eaton's Cooper Power series products meet or exceed all applicable industry standards relating to product safety. 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 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 may 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.

G122.3

Limit switch replacement kits for polymer position indicator

Product information

Introduction

Service Information MN225046EN provides instructions for the replacement of the right-hand/raise and left-hand/lower limit switches for Eaton Cooper Power series voltage regulators with polymer position indicators.

Read this manual first

Read and understand the contents of this manual and follow all locally approved procedures and safety practices before installing or operating this equipment. Read and understand the manuals detailing the installation and operation of the voltage regulator and the control used with the voltage regulator. Refer to document *MN225003EN, CL-7 Voltage Regulator Control Installation, Operation, and Maintenance Instructions* for information on the CL-7 voltage regulator control. Refer to document *MN225008EN, VR-32 Voltage Regulator with Quik-Drive™ Tap-Changer Installation, Operation, and Maintenance Instructions* for information on Eaton Cooper Power series voltage regulators.

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, operation, or maintenance. For additional information, contact your Eaton product representative.

Acceptance and initial inspection

This kit is thoroughly inspected at the factory and is in good condition when accepted by the carrier for shipment. Upon receipt of the limit switch assembly kit, a thorough inspection should be made for damage, evidence of rough handling, or shortages. Should this initial inspection reveal evidence of rough handling, damage, or shortages, it should be noted on the bill of lading and a claim should immediately be made with the carrier. Also, notify your Eaton representative.

Handling and storage

Be careful during handling and storage of the kit to minimize the possibility of damage. If the kit is to be stored for any length of time prior to installation, provide a clean, dry storage area.

Standards

ISO 9001 Certified Quality Management System



Figure 1. Right-hand/raise limit switch assembly



Figure 2. Left-hand/lower limit switch assembly

Product description

Kits 5792236A01 and 5792236A02 are designed for replacement of the right-hand/raise and left-hand/lower limit-switch and slider-arm assemblies in a polymer position indicator. Refer to Tables 1 and 2 for the part lists of the two available kits.

Tools Required

- Phillips screwdriver
- Standard screwdriver
- Needle-nose pliers
- AC voltmeter

Table 1. Kit 5792236A01 part list

Item	Description	Qty.
1	Right-Hand/Raise Limit Switch Assembly	1

Table 2. Kit 5792236A02 part list

Item	Description	Qty.
1	Left-Hand/Lower Limit Switch Assembly	1

Installation procedures

Removing existing limit switch assembly

1. Remove the voltage regulator from service following the instructions for **Removal from Service** found in Eaton publication MN225008EN, *VR-32 voltage regulator with Quik-Drive™ tap-changer installation, operation, and maintenance instructions*.

Important Note: The voltage regulator should be in the neutral position when performing the installation of position indicator limit switches. If the voltage regulator cannot be put into neutral, note the position indicated on the position indicator before proceeding.

2. Unlatch the hasp on the right-hand side of the position indicator to open the main cover. See Figure 3.



Figure 3. Main cover hasp

3. Using a standard screwdriver, loosen the thumbscrew on the drag-hand reset (DHR) solenoid module. See Figure 4.

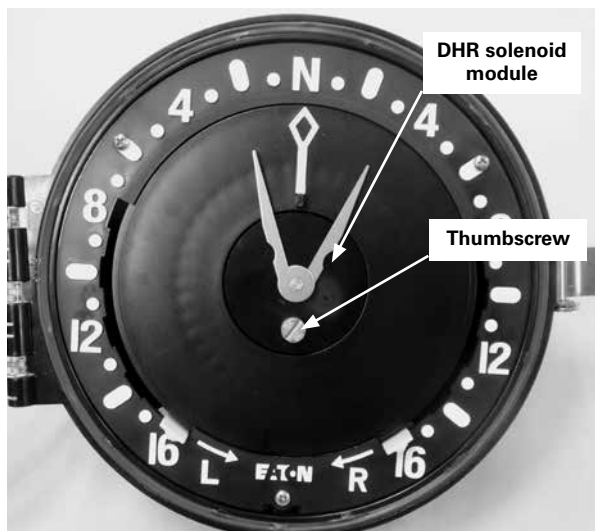


Figure 4. DHR solenoid module thumbscrew

4. With the thumb-screw fully loosened, pull on the DHR module to remove it from the position indicator face. See Figure 5.



Figure 5. Removing the DHR module

Limit switch replacement kits for polymer position indicator

5. Note the two wires that are connected to the solenoid with push-on terminals: an orange/black wire is connected to the inside terminal of the solenoid and a white wire is connected to the outside terminal. See Figure 6.

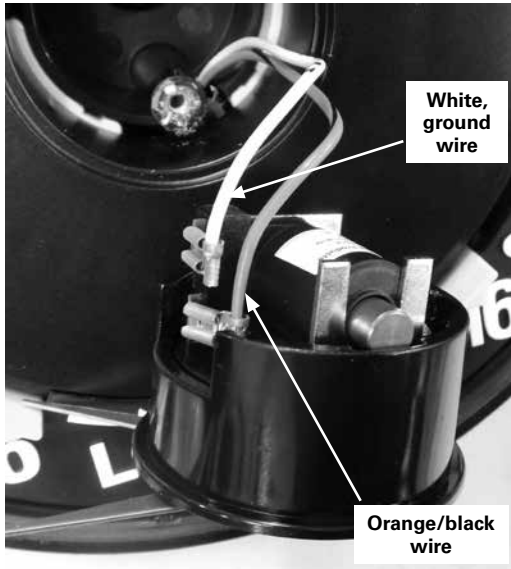


Figure 6. Solenoid terminal connections

CAUTION

Hazardous voltage. Insure that no voltage is present between the orange/black and the white ground wires connected to the DHR solenoid using a voltmeter. Failure to do so could result in an electric shock or equipment damage.

6. Using a pair of needle-nose pliers, remove the wires from the terminals on the solenoid module. Retain the solenoid module.
7. Remove and retain the three Phillips screws fastening the number dial ring to the position indicator. See Figure 7.

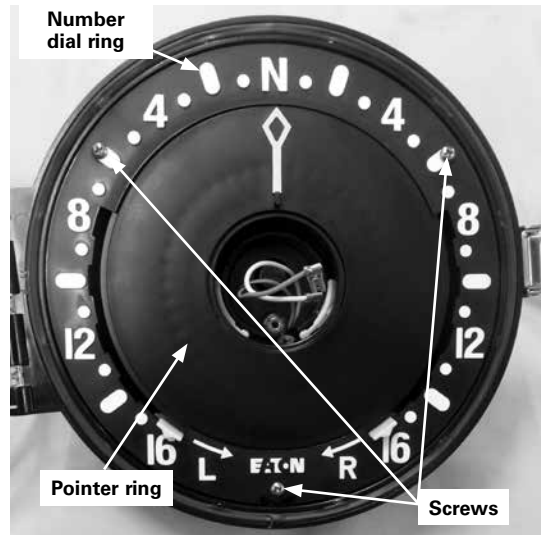


Figure 7. Number dial fastening

8. Remove and retain the number dial ring.
9. The pointer ring is held in by the number dial ring and will fall away once the number dial ring is removed. Retain the pointer ring.
10. Identify the raise and lower limit switches. The raise limit switch is marked with an A01 and is connected with blue wires. The lower limit switch is marked with an A02 and is connected with green wires. See Figure 8.

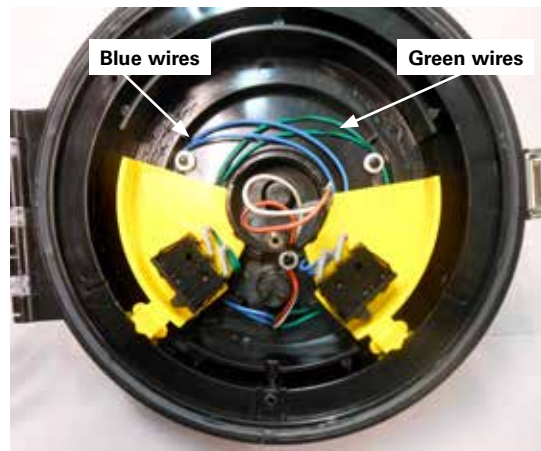


Figure 8. Limit switch assemblies and wiring

11. Using a pair of needle-nose pliers, disconnect the spade terminals of the switch to be replaced.
12. Remove the switch assembly from the position indicator.

Installing new limit switch assembly

1. Verify that the new limit switch assembly is the correct part. The right-hand assembly is marked with **A01** and the left-hand with **A02**.
2. Using needle-nose pliers, connect the wires to the switch - blue for the the right-hand/raise limit switch and green for the left-hand/lower limit switch. See Figure 8.
3. Locate the limit switches at the 16R and 16L positions. See Figure 9.

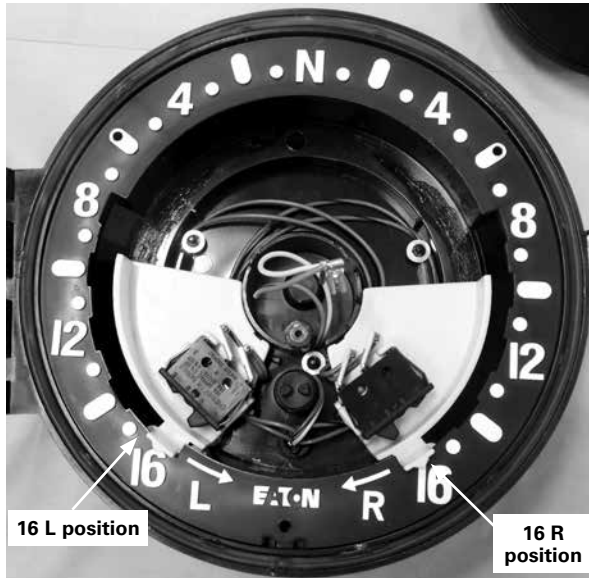


Figure 9. Positioning of the limit switch assemblies shown with number dial for reference.

4. Replace the pointer ring into the position indicator housing. Align the yellow pointer with the slot at the 12 o'clock position. See Figure 10.

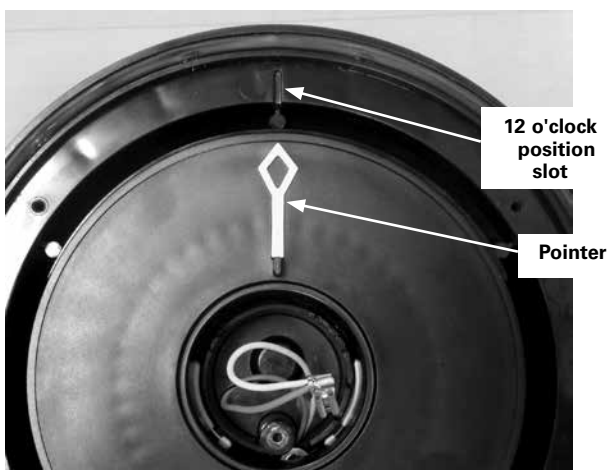


Figure 10. Pointer alignment

- Important Note:** The voltage regulator should be in the neutral position when replacing the pointer ring. If the voltage regulator is not in neutral, care must be taken to position the pointer toward the correct tap position or adjust the position indicator once it is installed by disengaging the drive cable and turning the position indicator manually to the correct position.
5. Replace the number dial ring in the position indicator, aligning the mounting holes in the dial with the position indicator base.

The letter "N" must be aligned over the elongated slot at the 12 o'clock position. See Figure 10.

When installed the yellow pointer must be aligned with "N" neutral if the regulator apparatus is in neutral. If the apparatus is not in neutral, make sure the pointer is pointed to the correct position. See Figure 11.

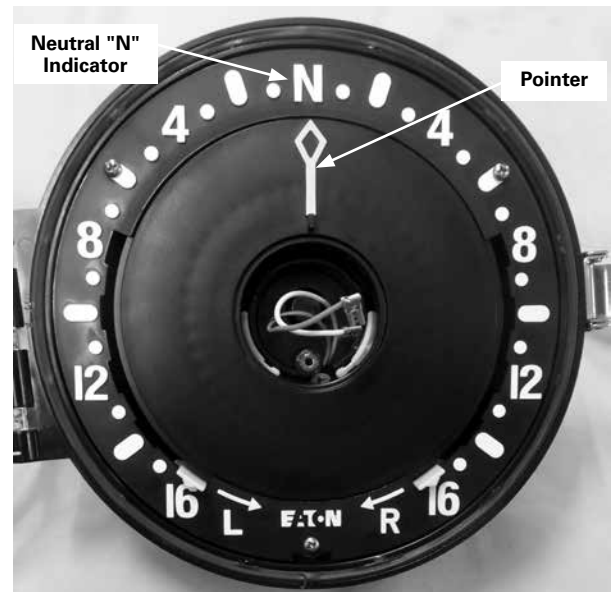


Figure 11. Pointer and neutral "N" alignment

6. Using a Phillips screwdriver, replace and tighten the screws securing the number dial ring.
7. Make the wire connections to the DHR solenoid module retained earlier.

Connect the orange/black wire to the inside terminal post.

Connect the white wire onto the outside terminal post. See Figure 12.

Limit switch replacement kits for polymer position indicator

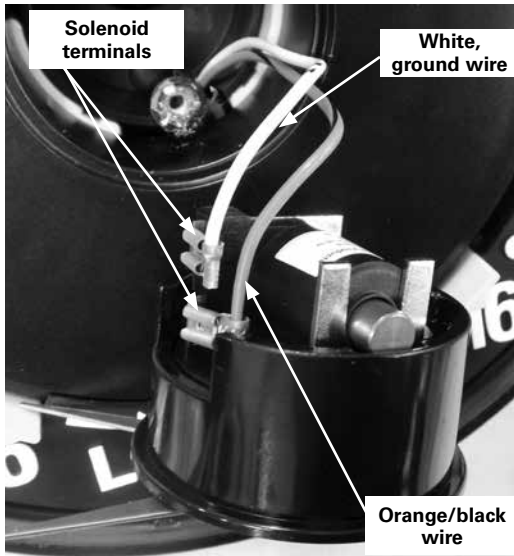


Figure 12. Solenoid terminal connections

- Open up the drag hands on the module so that the drag hands will fall on the proper sides of the pointer stop when it is installed, as shown in Figure 13. Note the position of the arc-shaped cutouts in the drag-hands shown in the figure.

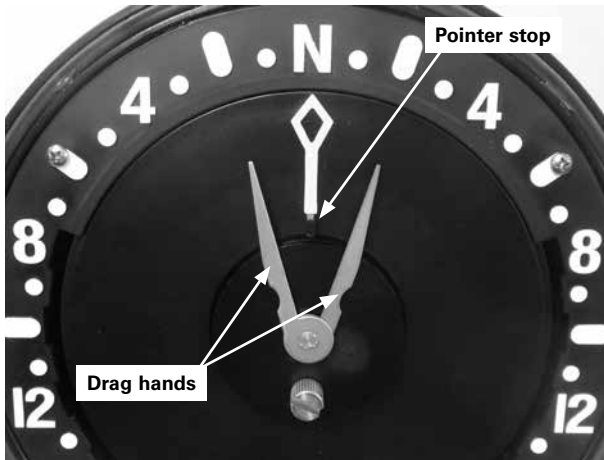


Figure 13. Drag-hand positioning

- Set the lower limit switch to 16L and the raise limit switch 16R; this will make it easier to insert the DHR solenoid module. See Figure 14.

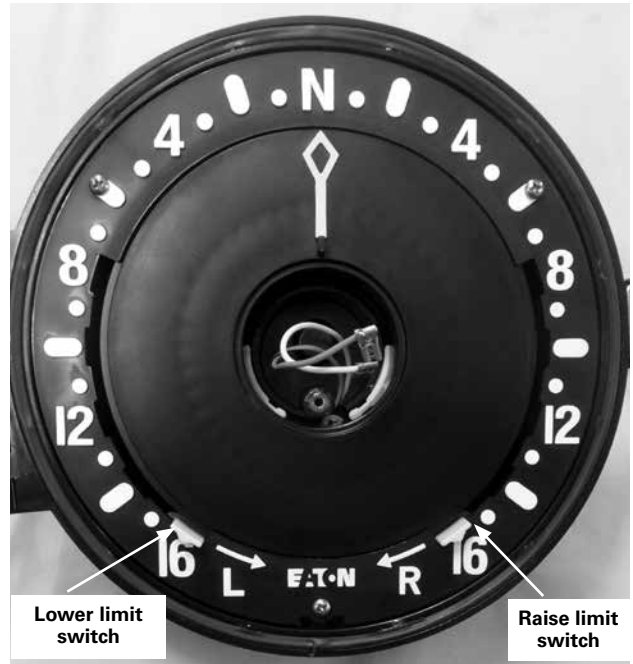


Figure 14. Limit switch positions

- Align the solenoid plunger of the DHR solenoid module with the cutout slot in the position indicator housing. See Figures 15 and 16.

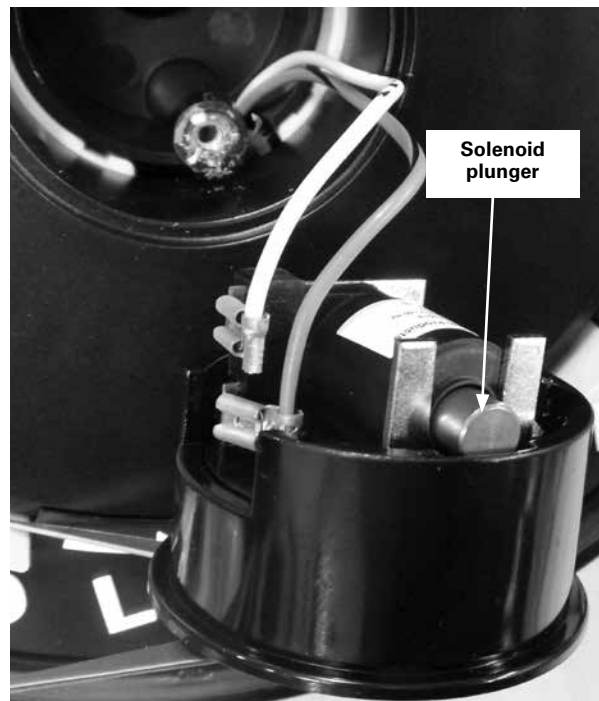


Figure 15. Solenoid plunger

Limit switch replacement kits for polymer position indicator

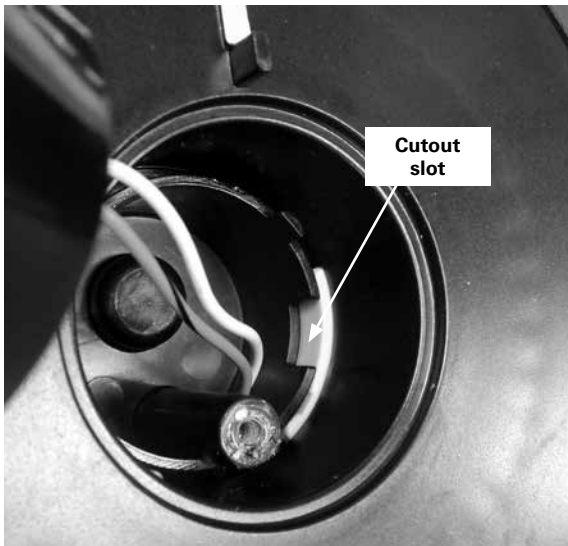


Figure 16. Solenoid plunger cutout slot

11. Insert the DHR solenoid module into the position indicator housing.
12. Align the thumbscrew with the screw mounting hole, press down on the module, and tighten the thumbscrew.

Testing installation and operation

1. Test the limit switches by positioning the limit switch tabs to 8, 10, 12, or 14 R/L and tap the tap-changer so that the pointer is at the limit switch setting. When the limit switch is working properly, the tap-changer will not step beyond the limit setting.
2. After testing the limit setting, tap the tap-changer back to neutral. Press the drag-hand reset switch on the control panel. The drag hands should return to the indicator pointer.
3. Makes sure that the neutral indication of the position indicator matches with the control neutral light and all other neutral indicators.

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