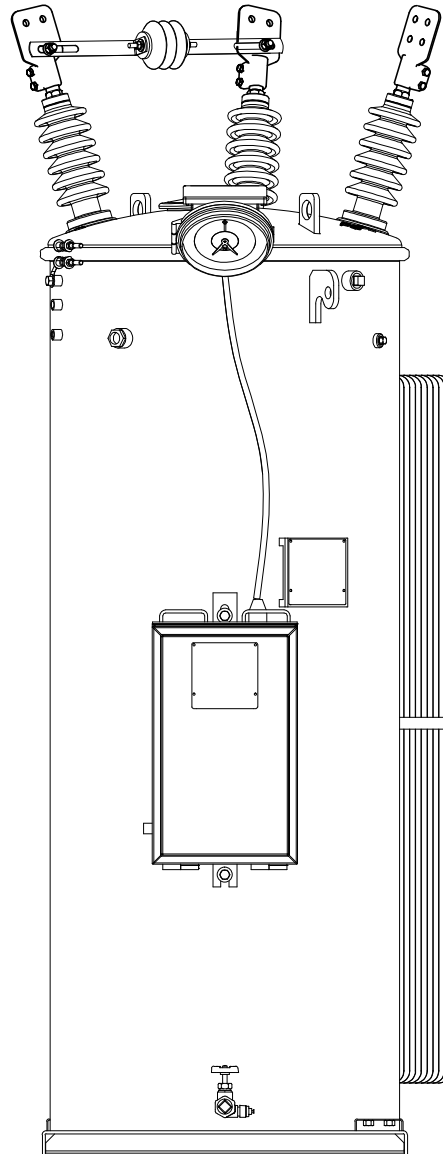


Procedure to free a stalled voltage regulator tap-changer



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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 a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

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

CAUTION

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

CAUTION

Indicates a hazardous situation which, if not avoided, could 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 high voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high- and low-voltage lines and equipment.

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.

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.

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.

Procedure to free a stalled tap-changer

Product information

Introduction

Service Information *MN225062EN* provides instructions to free a voltage regulator tap-changer stalled between positions with the holding switch closed.

Refer to *MN225008EN, VR-32 voltage regulator with Quik-Drive™ tap changer installation, operation, and maintenance instructions* and *MN225008EN CL-7 voltage regulator control installation, operation, and maintenance instructions* for detailed service information on Eaton's Cooper Power series voltage regulators and controls.

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.

Additional Information

These instructions cannot cover all details or variations in the equipment, procedures, or processes described nor provide directions for meeting every possible contingency during installation, operation, or maintenance. For additional information, contact your Eaton representative.

Standards

ISO 9001 Certified Quality Management System

Procedure instructions

- Determine if the tap-changer is stalled between tap positions with the holding switch closed.
 - Measure the voltage between ground and the L3 and R3 terminals on the control back panel.
 - One terminal will measure approximately 120 Vac; this is the direction the tap-changer was moving when stalling occurred. There will be a floating capacitive voltage greater than 120 Vac on the other terminal.
 - Once it has been determined that the tap-changer is stalled, proceed with the steps below to reverse the direction of the tap-changer and free the mechanism.
- Place the CONTROL FUNCTION switch into the OFF position.
- Place the POWER switch into the OFF position.
- Close the C shorting switch on the back panel.
- Open the V1 disconnect switch on the back panel to remove power to the control.
- Disconnect the orange wiring harness lead from the HS terminal on the bottom of terminal board located on the back panel to remove power from the tap-changer holding switch circuit.
- Close the V1 disconnect switch.
- Place the POWER switch on Internal.
- Place the CONTROL FUNCTION switch on Manual.

WARNING

Explosion Hazard. Bypass a regulator with the line energized only if the position indicator, the neutral light, and the control tap position indicate neutral and the voltage measured between the source and the load bushings using an approved voltmeter is zero. If all indications of neutral do not agree, the line should be de-energized to avoid shorting part of the series winding and resultant high circulating current. Failure to comply can result in death or personal injury and equipment damage.

WARNING

Explosion Hazard. To insure a complete tapping operation when returning the tap changer to the neutral position, the CONTROL FUNCTION switch must be placed in the OFF position before the POWER switch is placed in the OFF position. Failure to comply can result in the tap changer stepping off of neutral immediately upon being energized which can result in death or severe personal injury and equipment damage.

WARNING

Explosion Hazard. After placing the regulator in the neutral position for bypass switching, always disable the motor to prevent a tap change during bypassing which can result in the tap-changer stepping off of neutral. Failure to comply can cause death or severe personal injury and equipment damage.

- Jog the Raise/Lower switch in the direction the capacitive voltage was observed. This should allow the tap-changer to free itself.
- If the tap changer is freed from the stall, manually run the tap-changer one or two steps in the direction away from the stall position.
- Inspect the position indicator to verify that the pointer is directly over a tap position mark. If the pointer is not directly over a tap position mark, jog the Raise/Lower switch in the same direction as done previously. This should put the pointer in the correct position.
- Place the CONTROL FUNCTION switch on OFF.
- Place the POWER switch into the OFF position.
- Open V1 disconnect switch.
- Reconnect the orange lead to the HS terminal restoring power to holding switch circuit.
- Close the V1 disconnect switch.
- Open the C shorting switch.
- Place the POWER switch on Internal.
- Turn CONTROL FUNCTION switch to Manual.
- Manually step the regulator to the neutral position.
- It is recommended that the unit be removed from service for repair since the stall is likely to reoccur. Refer to the document *MN225008EN, VR-32 Voltage Regulator with Quik-Drive Tap-Changer Installation, Operation, and Maintenance Instructions* for detailed instructions on safely removing a voltage regulator from service.

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