

Voltage Regulators

Service Information

Tapping to Neutral and Verifying Neutral Tap Position if Front Panel is Completely Inoperable

S225-60-8

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PRODUCT INFORMATION

Introduction

Service Information S225-60-8 provides instructions to tap to neutral and verify neutral tap position if front panel is completely inoperable.

When a voltage regulator becomes inoperable because of a faulty control and it is not in the neutral position, the ability to operate the tap changer and return the unit to neutral is important. Under this circumstance a replacement control would be your first option, but if one is not immediately available, it is possible to tap the regulator back to neutral without the use of a control. This is possible if the identification of the control winding, motor, and neutral light switch wires are known. The following procedure can be used to accomplish this on any Cooper Power Systems voltage regulator which has a CL1 or newer control. Refer to any schematic diagrams included in the appropriate operating manual as needed.

For the latest Cooper Power Systems equipment, refer to S225-11-1, *CL-6 Series Control Installation, Operation, and Maintenance Instructions*, S225-10-30, *VR-32 Voltage Regulator with Quik-Drive Tap Changer Installation, Operation and Maintenance Instructions* or the documentation appropriate for your equipment for detailed service information on Cooper Power Systems 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 representative.

Standards

ISO 9001 Certified Quality Management System

PROCEDURE INSTRUCTIONS

 **CAUTION:** Electrical Shock Hazard. Contact with terminals in the control box may expose the operator to hazardous voltages. Such exposure will result in an electric shock.

1. Open knife switch to V1 and V6, (if present) and close knife switch C.
2. Set the Control Function and Power switches (located on the front panel) to "Off" and remove the front panel.
3. Install a jumper from the lower V1 knife switch contact (contact #2) to terminal TB1-L1 (lower command) or TB1-R1 (raise command).
4. Momentarily close V1 long enough to allow the tap change to complete. Verify that the position indicator pointer moved one tap position in the appropriate direction.
5. Repeat step four until the position indicator shows the unit to be in the neutral position.
6. With V1 open, measure the voltages present between TB2-HS and TB2-G (ground) and TB2-NL and TB2-G. These voltages should read approximately zero (this is done to verify that the continuity meter used in the next step will not be damaged).
7. Check continuity between TB2-HS and TB2-NL. Continuity indicates that the neutral switch is closed and the tap changer is in the neutral position.
8. Use an appropriate method to determine the voltage across the source (S) and load (L) bushings. A unit is in neutral if all three of the following conditions are met.
 - A. There is no Differential Voltage present between the (S) and load (L) bushings.
 - B. The position indicator pointer is at "0".
 - C. There is continuity from terminals TB2-HS to TB2-NL.



SAFETY FOR LIFE



Cooper Power Systems 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 Cooper Power Systems 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.



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S225608 Rev. 0 (Replaces R225608 Rev. 0)

The logo for Cooper Power Systems. It features a black parallelogram tilted to the right, positioned above the word "COOPER" in a bold, black, sans-serif font. To the right of "COOPER" is the text "Power Systems" in a smaller, black, sans-serif font.

COOPER Power Systems

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