Voltage Regulators

COOPER Power Systems

Spring Drive Holding Switch Installation Instructions

Service Information
S225-50-2

Contents

PRODUCT INFORMATION

Introduction

Service Information S225-50-2 contains instructions for replacing the holding switch on a Cooper Power Systems spring drive tap changer.

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 process described nor provide directions for meeting every possible contingency during installation, operation, or maintenance. For additional information, contact your representative.

Acceptance and Initial Inspection

Each holding switch is in good condition when accepted by the carrier for shipment. Upon receipt, inspect the shipping container for signs of damage. Unpack the holding switch and inspect it thoroughly for damage incurred during shipment. If damaged is discovered, file a claim with the carrier immediately.

Handling and Storage

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

Standards

ISO 9001:2008 Certified Quality Management System

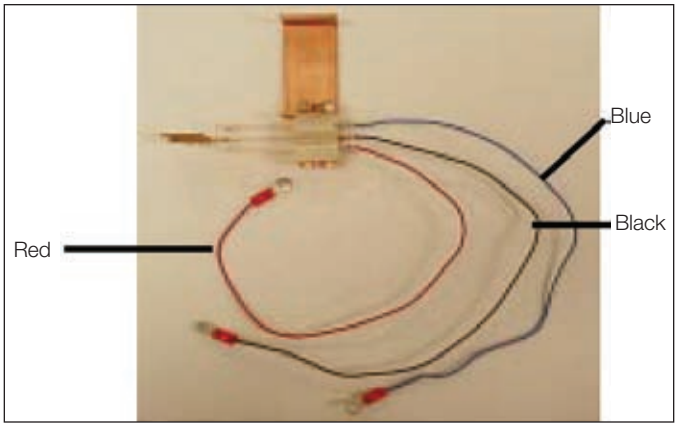

Figure 1.
Sprint Drive Tap Changer Holding Switch

PARTS SUPPLIED

Part Number	Description	Qty
22A13324200A	Holding Switch with leads and ring tongue terminals	1
S225502	Installation Instructions	1

TOOLS REQUIRED

Description		Qty
Screwdriver (Standard)		1
Needle Nose Pliers		1
Diagonal Side Cutters		1
Gauge Pins:		
Standard	**Metric**	
0.110 inch	2.794 mm	
0.122 inch	3.10 mm	
0.125 inch	3.175 mm	
Wrenches 7/16 inch (11 mm)		2

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, 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.

INSTALLATION PROCEDURES

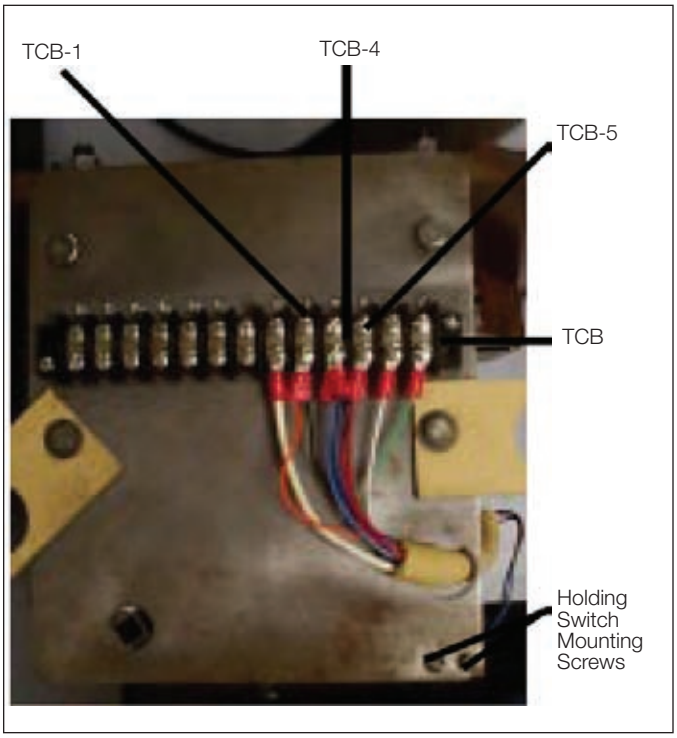

Figure 2.
Top Plate Assembly.

1. Remove holding switch leads from the terminal block located on top of the Top Plate Assembly. See Figure 2.

Holding Switch Leads	
Color	**Terminals**
Blue	TCB-4
Black	TCB-1
Red	TCB-5

2. Remove the two screws attaching the holding switch to the top plate located on the Top Plate Assembly. See Figure 2.
3. Remove the holding switch leads from the insulation tubing.
4. To install the replacement holding switch begin by routing the leads through the insulation tube.
5. Fasten the replacement holding switch to the top plate assembly using the two mounting screws. See Figure 2.
6. Connect the replacement holding switch leads to the terminal board TCB matching the wire colors to the TCB terminals as stated in Step 1.

HOLDING SWITCH ADJUSTMENTS

Once a holding switch is installed on the tap changer it is very important to the operation of the tap changer to have the holding switch properly adjusted. The following instruction describes how to make the proper adjustments.

	Standard	Metric
Blade Center Alignment	Center	Center
Blade Cam Spacing	0.125 inch	3.175 mm
Raise/Lower Contact Settings	0.122 inch	3.10 mm

Blade Center Alignment

1. The center blade of the holding switch must be aligned with the center line of the motor output shaft. This adjustment must be the first adjustment made after installation. To align the blade, use a pair of needle nose pliers to grip the center blade up against the holding switch insulators. See Figure 3. Adjust the blade to the center line of the motor by bending the blade up or down as necessary. Check the alignment by eyeing the blade, not the paddle, to the center line of the motor output shaft.

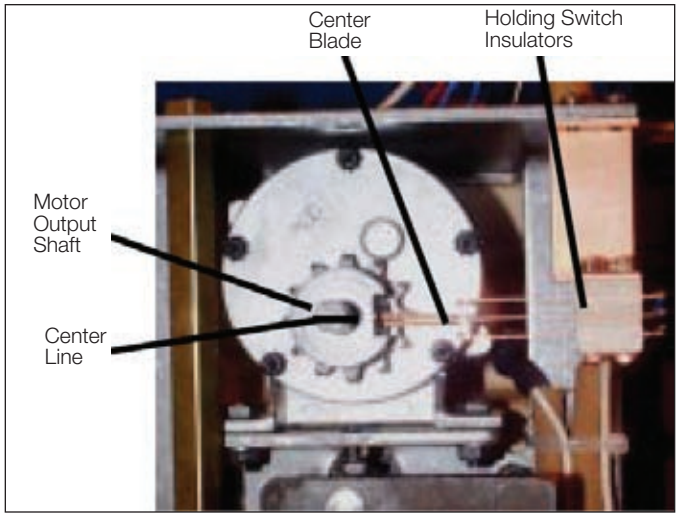

Figure 3.
Holding Switch and Motor.

Center Blade/Cam Spacing

2. The next adjustment to be made is the gap between the inside surface of the cam opening and the center blade paddle. See Figure 4. The gap requirement is 0.125 inch plus 0.015 minus nothing (metric 3.175 mm plus 0.381 minus nothing). One or both of the following methods may be used to adjust the gap.

Method 1

Loosen the holding switch mounting screws. See Figure 4. Move the holding switch bracket toward the motor and tighten the screws while holding the bracket in place. Check the gap with a 0.125 inch (3.175 mm) gauge pin. If there is not enough adjustment with the holding switch mounting by using this method, adjust using Method 2.

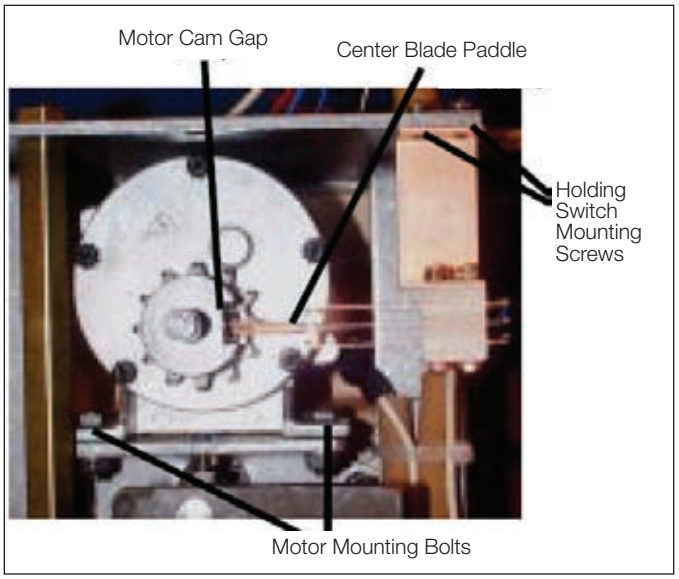

Figure 4.
Blade Alignment.

Method 2

This method requires the loosening of the motor mounting bolts. See Figure 4. Use two 7/16 inch (11 mm) wrenches to loosen the mounting bolts until the motor can be moved. Move the motor in towards or out from the center holding switch blade until the proper gap is obtained. Check the gap for proper fit, 0.125 inch plus 0.015 minus nothing (3.175 mm plus 0.381 minus nothing) and tighten the motor mounting bolts.

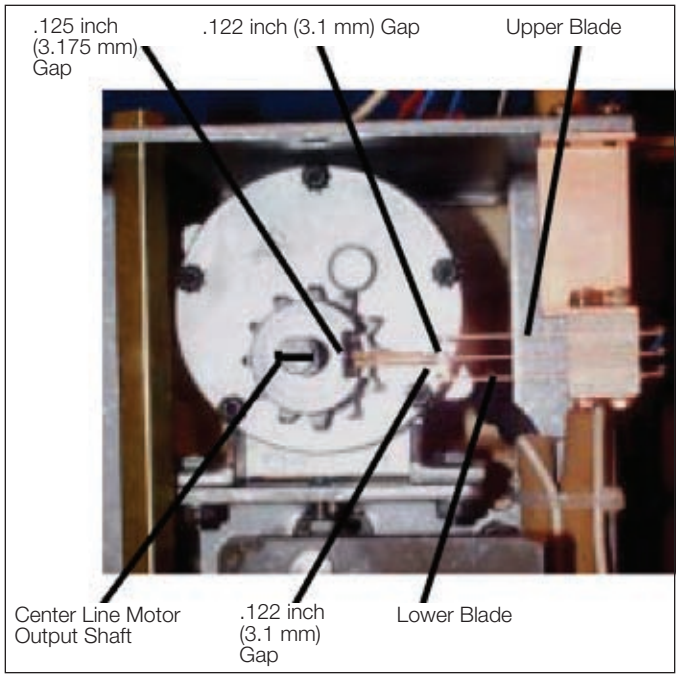

Figure 5.
Contact Settings.

Raise/Lower Contact Settings

3. The contacts between the center blade and the raise and lower contact blade needs to be adjusted to 0.122 inches (3.1 mm).
   - **a**. Place a gauge pin of 0.122 inch (3.1 mm) between the center contact button and the contact button of the upper holding switch blade.
   - **b**. Using a pair of needle nose pliers, place the pliers on the upper blade next to the holding switch insulators. See Figure 5. Bend the blade either up or down to adjust the gap to the gauge pin.
   - **c**. The contact button should touch the gauge pin so that there is a slide movement in one of the contact buttons when the gauge is passed between the contacts.
   - **d**. Use a 0.110 inch gauge pin (2.8 mm) and pass the gauge pin between the contact buttons. There should be no movement of the contacts and no touching of the contacts to the gauge pin.
   - **e**. Adjust the gap between the center blade and the lower blade contacts by repeating Steps 3.a and 3.d for the lower blade.

COOPER Power Systems

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