

## QD8 Quik-Drive tap-changer main movable contact replacement kit 5740785B16 installation instructions



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## 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:

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#### DANGER

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

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#### WARNING

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

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#### CAUTION

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

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#### 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.

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#### 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

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#### 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

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#### 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

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#### 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

## Product information

### Introduction

Eaton's Cooper Power™ series QD8 Quik-Drive tap-changer main movable contact replacement kit provides the parts and installation instructions for replacing the motor on the polymer version of the QD8 Quik-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.

### Acceptance and initial inspection

Each kit is in good condition when accepted by the carrier for shipment. Upon receipt, inspect the shipping container for signs of damage. Unpack the kit 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 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.

### Quality standards

ISO 9001 Certified Quality Management System

### 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.

### Parts supplied

<b>Table 1. QD8 Quik-Drive tap-changer main movable contact replacement kit 5740785B16</b>			
<b>Item</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty</b>
1	0740785B16	Main Movable Contact Assembly	2
2	0800073753Z	Screw, 1/4-20 X 1.7	4
3	0800070894Z	Flat Washer	8
4	0803935A18	Belleville Washer	4
5	0891663A10	Teflon Washer	1
6	0800073777Z	Locknut 1/4-2	4

### Tools required

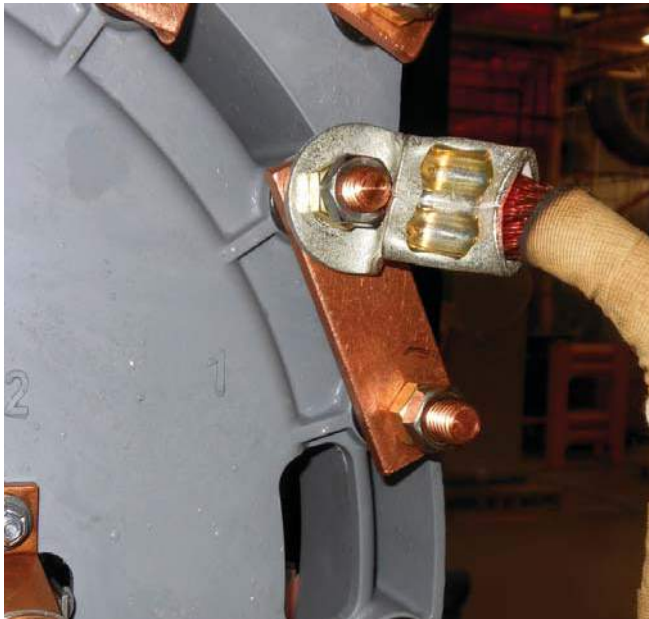
- 3/8 inch ratchet wrench
- 3/8 inch ratchet extension
- 3/8 inch socket
- 3/4 inch deep-well socket
- 9/64 inch Allen wrench
- 5/32 inch Allen Wrench
- Torque Wrench for in-lbs.
- Phillips Screwdriver
- Loctite® 243 Threadlocker



Figure 1. Main movable contact kit

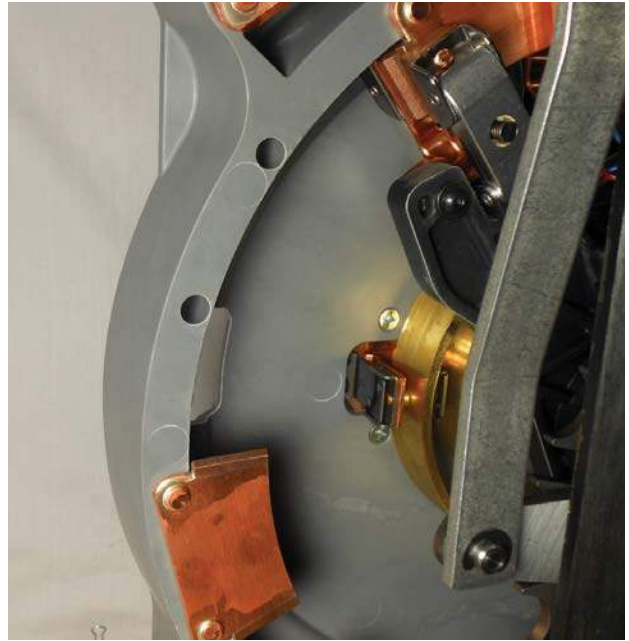
## Installation procedure

1. This procedure may be completed without removal of the tap changer from the voltage regulator. Carefully follow the procedures for partially un tanking a voltage regulator in *Service Information MN225008EN, VR-32 Voltage Regulator with Quik-Drive Tap-Changer Installation, Operation, and Maintenance Instructions*.
2. It is recommended to start this procedure with the tap changer in the neutral position. See the section "Placing tap-changer into neutral" located after the installation procedure.
3. Using a 3/4" wrench, remove the nuts and jam nuts holding the lead and copper bar from the number 1 contact and then remove the connections. See Figure 2.



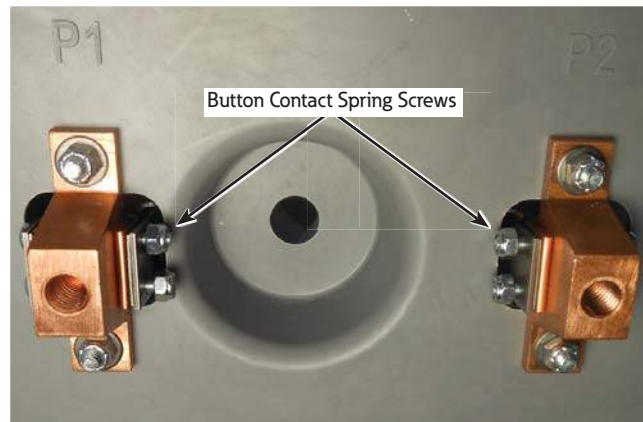
**Figure 2. Removal of connections to number 1 stationary contact**

4. Remove the number 1 stationary contact from the polymer contact board using a 3/4" deep-well socket. See Figure 3.



**Figure 3. Removal of number 1 stationary contact**

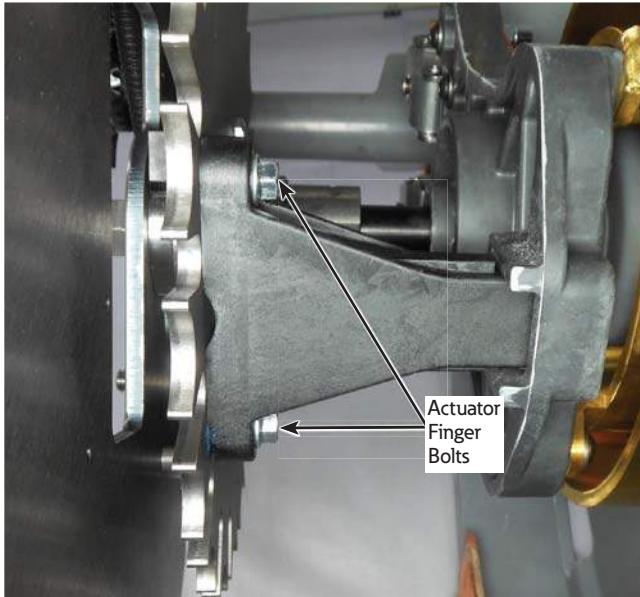
5. Loosen, but do not remove the two screws and nuts on the P1 and P2 terminals on the back of the contact board using a Phillips screwdriver and 3/8" wrench. This will loosen the P1 and P2 button contact springs. See Figure 4.



**Figure 4. Loosening the button contact springs**

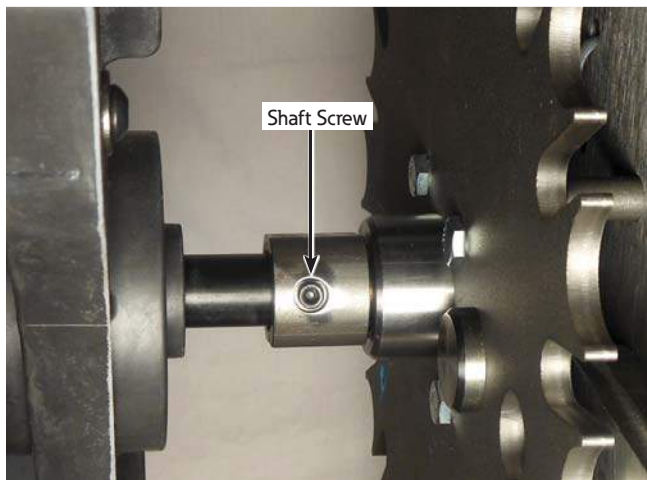


6. Remove the two bolts that mount the actuator finger using a 3/8" wrench and then remove the actuator by tilting it up. See Figure 5.



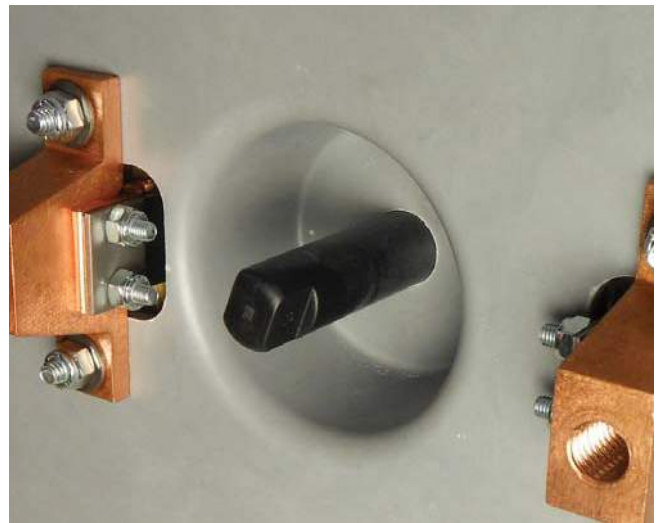
**Figure 5. Actuator finger removal**

7. Using a 9/64" Allen wrench, remove the screw holding together the two sections of the main shaft. See Figure 6.



**Figure 6. Remove screw from main shaft**

8. Pull the black polymer portion of the main shaft from the rear and remove it. See Figure 7.



**Figure 7. Removal of the polymer portion of main shaft**

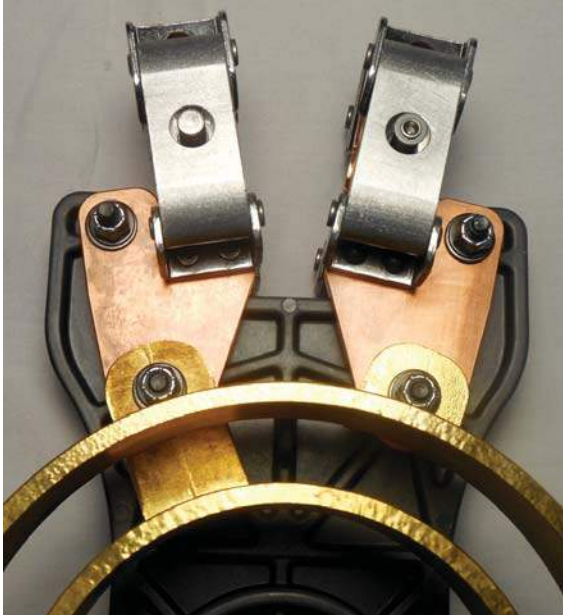
9. Rotate the main movable contact panel toward the space created when the number 1 stationary contact was removed (Figure 8) and then pull the movable contact board to free it from the collector rings. Carefully remove the assembly from inside the tap changer.



**Figure 8. Rotating and removing the movable contact panel assembly**

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10. Remove the two screws, nuts, washers, and Belleville washers that secure each contact to the movable contact panel using a 5/32" Allen wrench and a 7/16" socket. See Figure 9 and Figure 10.

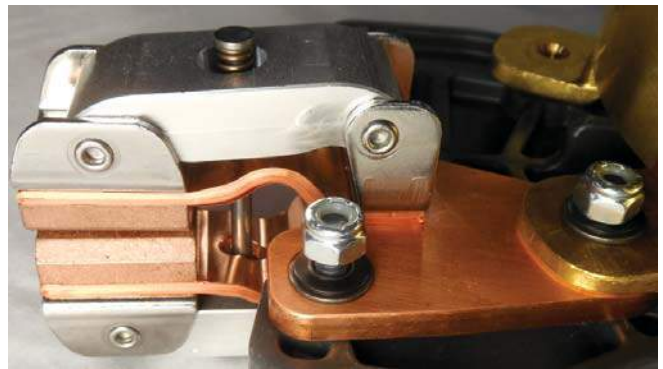


**Figure 9. Movable contact removal from contact panel and collector rings**



**Figure 10. Use 5/32" Allen wrench for screw removal**

11. The two movable contact assemblies are identical and can be installed in either position on the movable contact panel. Position one of the replacement movable contact assemblies between the contact ring and the movable contact panel and align the holes. Insert a screw with flat washer through each hole from the contact panel side (Figure 10). Place a flat washer, Belleville washer (cupped side down) and nylon locknut onto each screw (Figure 11). Tighten the nuts to 65 to 75 in-lbs. (7.3–8.5 Nm) using a 7/16" deep well socket while holding the screw in place with the 5/32" Allen wrench. Repeat this procedure for the second movable contact assembly. The assembly should look like Figure 10 and Figure 11 when completed.



**Figure 11. Installing the hardware to attach the movable contacts to the contact panel**

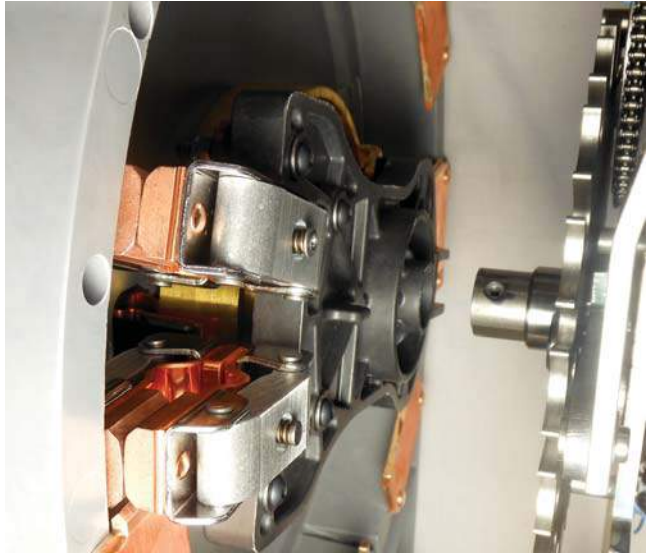
12. Place the new Teflon washer in the recess on the back of the movable contact panel as shown in Figure 12.



**Figure 12. Teflon washer placed in contact panel recess**



13. Position and center the movable contact panel assembly in the molded panel cavity with the contact rings facing the molded panel locating the movable contacts in the area of the removed number 1 stationary contact as shown in Figure 13. Take care that the Teflon washer does not fall out of place. The collector rings will slip between the P1 and P2 button contacts.



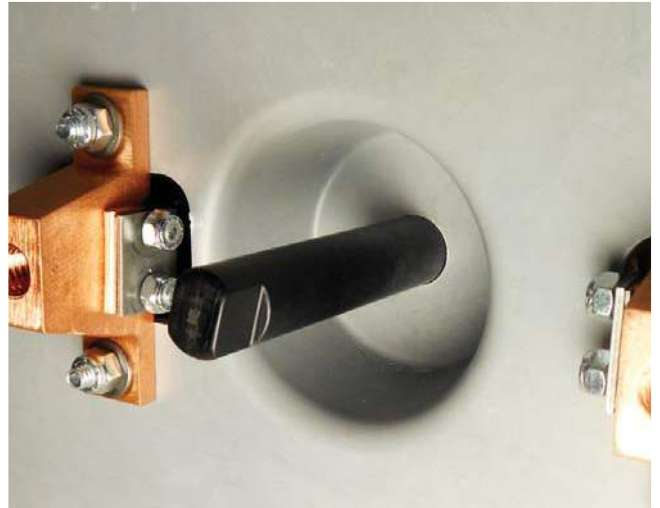
**Figure 13. Movable contacts in tap-changer cavity**

14. Rotate the movable contacts over the neutral stationary contact (Figure 14).

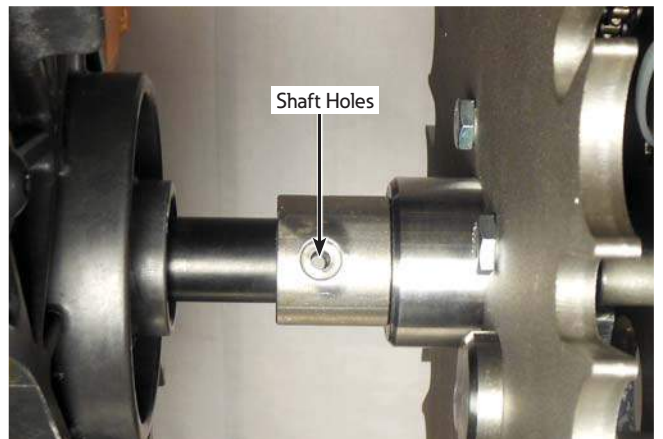


**Figure 14. Movable contacts rotates over the neutral stationary contact**

15. Insert the polymer portion of the main shaft through the back of the contact board (Figure 15). Push it all the way through until it inserts into the metal portion of the main shaft. Rotate the polymer shaft to line up the holes in both parts of the shaft (Figure 16).



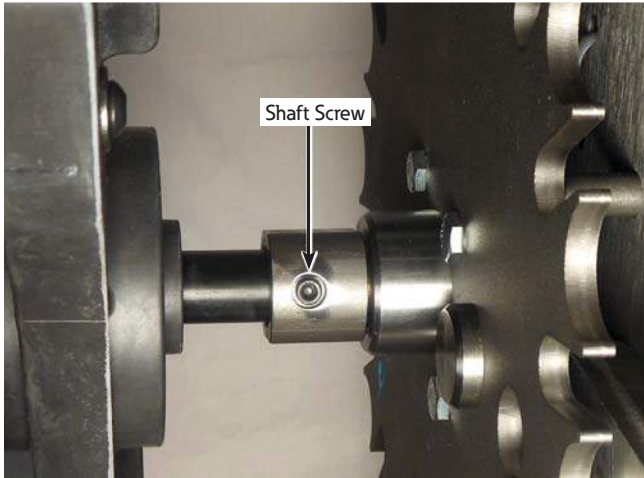
**Figure 15. Inserting the polymer shaft into the contact board**



**Figure 16. The holes in the two shafts line up**

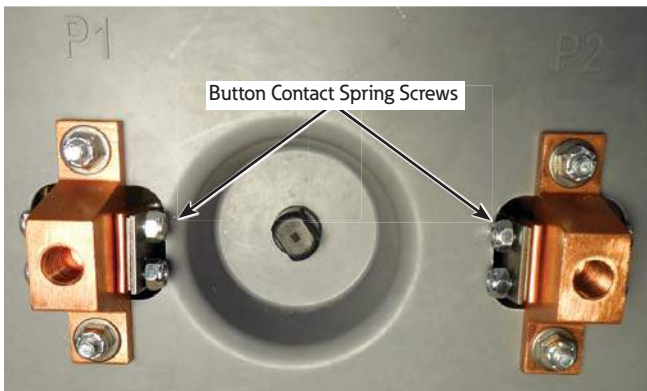
## QD8 Quik-Drive tap-changer main movable contact replacement kit 5740785B16

16. Install the screw to attached the two parts of the main shaft and tighten to a torque of 10–15 in-lbs. (1.3–1.7 Nm). See Figure 17.



**Figure 17. Screw installed to attached two sections of the main shaft**

17. Use a 3/8" wrench and Phillips screwdriver to tighten the screws and nuts on the rear of the P1 and P2 contacts to a torque of 45–55 in-lbs. See Figure 18.



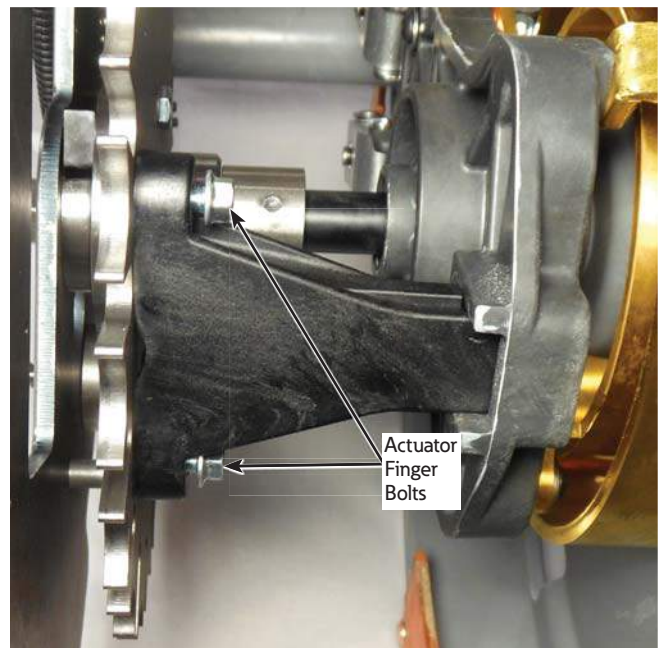
**Figure 18. Tighten the screws on the P1 and P2 terminals**

18. Apply Loctite® 243 Threadlocker to the two actuator finger bolts (Figure 19).



**Figure 19. Actuator finger bolts with Loctite® Threadlocker**

19. Install the actuator finger and bolts. Tighten the bolts using a 7/16" socket to a torque of 65–75 in-lbs. (7.3–8.5 Nm). It may be necessary to reposition the movable contact panel slightly if the bolt holes in the finger and Geneva gear do not quite line up. See Figure 20.

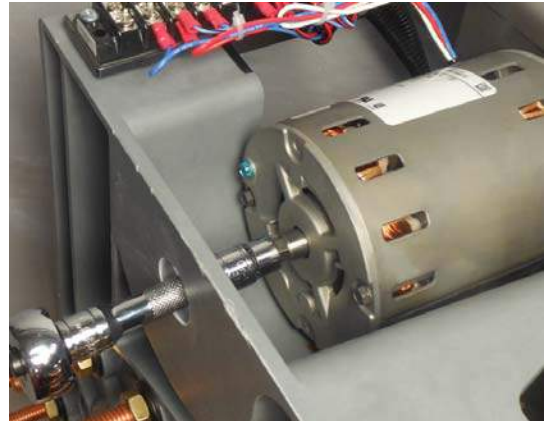


**Figure 20. Positioning the actuator finger and tightening the bolts**

20. Insure that the tap changer has remained in the neutral position. See the next section for instruction on how to confirm that the tap-changer in the neutral position.
21. Reinstall the number 1 stationary contact. Place a Belleville washer with the cupped face in and a nut onto each contact stud and tighten the nuts to a torque of 180–192 in-lbs (20.3–21.7 Nm).
22. Reinstall the copper bar and lead to the number 1 stationary contact to reverse the process from step 3. These nuts should also be tightened to a torque of 180–192 in-lbs (20.3–21.7 Nm).

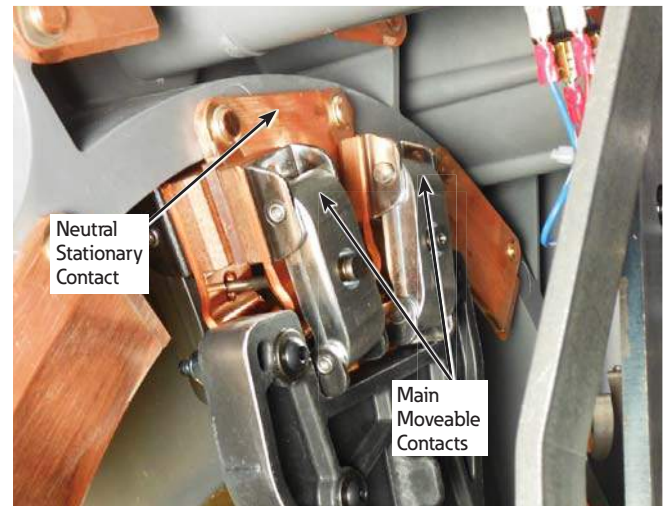
### Placing tap-changer into neutral

1. Place a 3/8" socket with extension and ratchet on the output shaft of the motor; rotate the motor until the contacts and other components are aligned in the neutral position. See Figure 21.



**Figure 21. Rotating the motor shaft**

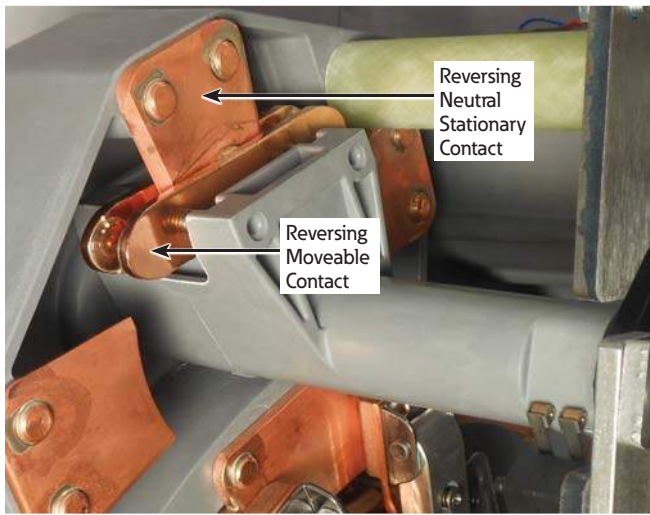
2. Confirm that the regulator is in the neutral position:
  - A. Main movable contacts are located on the neutral stationary contact, which is located at the 11 o'clock position. See Figure 22.



**Figure 22. Neutral stationary contact position for main movable contacts**

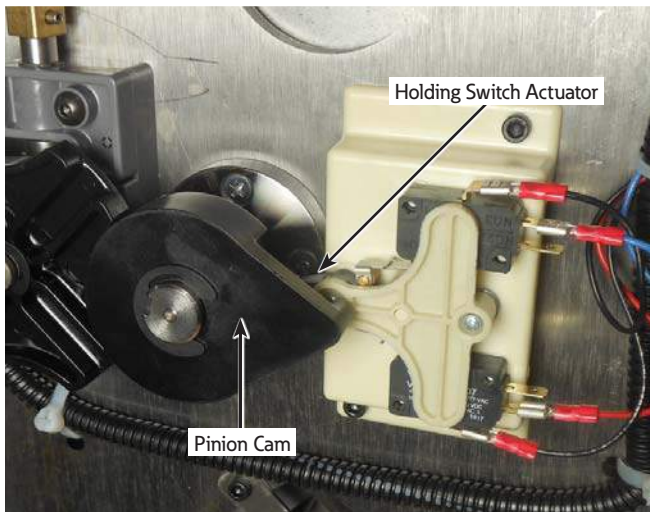


B. The reversing movable contact is located on the reversing neutral stationary contact. See Figure 23.



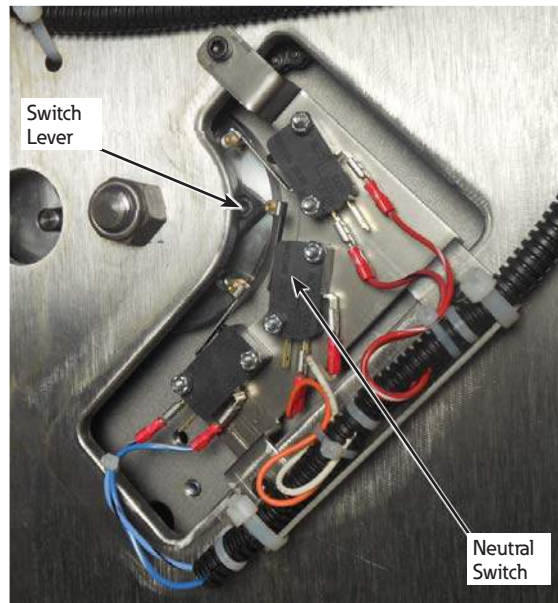
**Figure 23. Neutral position for reversing movable**

C. The pinion cam is pointing to the right over the holding switch actuator. See Figure 24.



**Figure 24. Neutral position for position indicator pinion cam and holding switch**

D. The neutral switch will be depressed with the switch lever. See Figure 25.



**Figure 25. Neutral switch is depressed**



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