Two-way rod interlock kit for Magnum fixed circuit breaker

⚠️WARNING

(1) ONLY QUALIFIED ELECTRICAL PERSONNEL SHOULD BE PERMITTED TO WORK ON THE EQUIPMENT.
(2) ALWAYS DE-ENERGIZE PRIMARY AND SECONDARY CIRCUITS IF A CIRCUIT BREAKER CANNOT BE REMOVED TO A SAFE WORK LOCATION.
(3) ALL CIRCUIT BREAKERS SHOULD BE SWITCHED TO THE OFF POSITION AND MECHANISM SPRINGS DISCHARGED.
FAILURE TO FOLLOW THESE STEPS FOR ALL PROCEDURES DESCRIBED IN THIS INSTRUCTION LEAFLET COULD RESULT IN DEATH, BODILY INJURY, OR PROPERTY DAMAGE.

Section 1: General information

A family of mechanical interlocks is available to interlock the closing of two or three Magnum® circuit breakers. A lever assembly is mounted on each breaker that interfaces with the pole shaft and the tripper bar. The lever assemblies in this instance are interconnected with rods. Rods can be used only when the circuit breakers to be interlocked are vertically stacked. This mechanical interlock connects two breakers so that only one can be closed at any time. Closing one breaker holds the other breaker in a tripped condition.

Required tools

• 10 mm socket and 1/4-inch drive socket
• 10 mm open end wrench
• 11/16-inch open end wrench
• 3/8-inch open end wrench
• 0.5 mm feeler gauge
• 4 mm Allen wrench
• Drive extension

Kit parts identification

Refer to Figure 1 for visual identification of the parts listed below:

(A) M6 x 12 mm hex bolt (eight)
(B) M6 x 25 mm flat-head screw (two)
(C) M6 lock washer (12)
(D) M6 x 20 mm hex bolt (four)
(E) Drive arm (two)
(F) M6 square nut (six)
(G) Interlock assembly (two)
(H) M6 x 0.75 O.D. spacer washer (four)
(I) Mounting plate (two)
(J) Driven coupling (two) ⚠️
(K) Drive coupling (two) ⚠️
(L) M6 jam nut (four) ⚠️
(M) M6 threaded rod (two) ⚠️

⚠️ This part provided in Kit 2A11859601.

Figure 1. Contents of Kit
Section 2: Installation of two-way rod cable interlock

Proceed with the following 11 steps:

Step 1: Remove the front cover by unscrewing the hex-head captive bolts (four for three-pole, six for four-pole) that join the cover to the breaker housing using a 10 mm 1/4-inch drive socket. Then hold the charge handle down approximately 45 degrees to pull off the cover.

Step 2: Remove the knockout from the right side of the front cover using pliers to break out the U-shaped tab. Carefully file any excess material from broken edge.

Step 3: Install the drive arm (E) to the right end of the pole shaft with the drive arm lever extending downward as shown. Use an M6 x 25 mm flat head screw (B) to make the connection and torque to 65–85 in-lbs (7.3–9.6 Nm).

Notes:
1. If the end of the pole shaft is not machined as shown, contact Eaton for instructions.
2. If an M6 square nut is not located in the slot as shown, remove the bracket's top bolt and loosen the two bottom bolts seven turns. While holding the trip lever in the position shown, slide the top part of the bracket away from the breaker, and insert a square nut (F) into the slot with the flat face toward the outside. Refasten all three bolts.

Step 4: Attach the interlock lever assembly (G) to the mounting plate (I). The interlock assembly is attached to the mounting plate using three M6 x 12 hex bolts (A) and lock washers (C). Torque to 40–50 in-lbs (4.5–5.6 Nm).
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Step 5: Attach the interlock assembly from Step 4 to the right side of the breaker. Start by removing the M6 hex bolt, nut, lock washer, and grounding (earthing) wire installed in the lower front corner of the mounting foot. This bolt assembly will be re-installed through the adapter plate near the end of this step.

Slide an M6 square nut (F) into the slot in the upper rear part of the case with the flat face toward the outside. The nut may have to be tapped to fully seat it into the slot. Install an M6 x 20 hex bolt (D), lock washer (C), and flat spacer washer (H) into the square nut a few turns. Locate another captive square nut in a slot in the upper part of the case, forward of the square nut just installed. Install another M6 x 20 hex bolt, lock washer, and spacer washer combination in this square nut. Slide the spacer washers fully against the case and the lock washers fully against the heads of the bolts. This creates a space into which the open slots in the top of the mounting plate will slide.

Now insert the mounting bracket slots onto the upper bolts and rotate the bracket down against the side of the breaker. Make sure that the drive paddle slides in behind the wireform tripper bar, and the follower slides in behind the drive arm pin.

Re-install the lower front bolt assembly (removed earlier), making sure to re-connect the ground (earth) wire. Tighten the upper bolts to stabilize the plate. Now insert an M6 x 12 hex bolt and M6 lock washer through the rear plate and mounting foot, retaining it with square nut on the inside of the mounting foot. Torque to 65–85 in-lbs (7–9 Nm).

⚠️ IMPORTANT


Step 6: Reinstall front cover removed in Step 1.

Step 7: The threaded rods (M) are cut in this step. Measure the vertical distance (H) between the bottoms of the mounted breakers. Cut one threaded rod 1.68 inches (43.0 mm) less than the measured distance. Cut the second threaded rod 7.06 inches (180.0 mm) less than the measured distance.

Figure 6. Step 5

Step 8: The driven couplings (J) and the drive couplings (K) are attached to the threaded rods in this step. After the threaded rods are cut to the appropriate lengths, thread one jam nut (L) and one driven coupling onto one end of each threaded rod. Thread the remaining jam nuts and the drive couplings onto the other end of the threaded rods. The rods should be threaded into each of the couplings approximately 1.00 inch (25.0 mm).

Figure 7. Step 7—Dimensions in Inches (mm)

Figure 8. Step 8
**Step 9:** Connection and adjustment of the rods are described in this step. Connect the rods between the interlock assemblies. Connect the drive coupling end **first** by removing the locknut and spring, and then inserting through swivel fitting on drive lever assembly. Then replace the removed spring and locknut.

Connect the other end to the driven lever assembly by removing the nut, and then inserting through swivel fitting. Then replace the removed nut.

With both breakers OPEN, adjust the length of both drive rods by threading into or out of the couplings until the locknut just touches the driven swivel fitting surface. Tighten all jam nuts against the couplings.

![Figure 9. Step 9](image)

**Check 2:** Now check the function of the **upper** driven lever and trip lever. With the breaker OPEN, the upper left-hand corner of the driven lever should be held in contact with the mounting bracket flange by the return spring, and the inner arm that operates the trip lever should protrude a few millimeters beyond the right edge of the mounting bracket. With the breaker CLOSED, grasp and slowly rotate the driven (upper) lever counterclockwise. At approximately 30 degrees of rotation (with the lever approximately horizontal), the breaker should trip. If the breaker does not trip before the upper right-hand corner of the driven lever is within 3.0 mm of the mounting bracket flange (see **Figure 10** Breaker OPEN), the driven lever and/or trip lever are out of specification. **Do not continue the installation.** Consult Eaton for additional instructions.

![Figure 10. Step 10](image)

**Step 10:** At this point in the process, check the functioning of the lever assemblies by performing the two following checks in conjunction with provided graphics:

**Check 1:** With the breaker OPEN, check the adjustment of the **lower** drive lever. The gap between the lower right-hand corner of the drive lever and the mounting bracket flange should be from 0.0 to 2.0 mm (see **Figure 10** Breaker Open). Now CLOSE the breaker. The drive lever should rotate approximately 60 degrees counterclockwise. There should be a minimum gap of 1.0 mm and a maximum gap of 4.0 mm between the lower left-hand corner of the lever and the mounting bracket flange (see **Figure 10** Breaker CLOSED). If either of these gaps are out of specification, the installation should not continue. Consult Eaton for additional instructions.
Step 11: The final step is to test the completed assembly.

1. CHARGE and CLOSE Breaker A. Inspect the driven lever on Breaker B. It should be rotated against its stop (the mounting bracket). CHARGE Breaker B and attempt to CLOSE it. It should not respond to the CLOSE attempt (no noise, no spring discharge, no contact motion). If the breaker does not respond as described, review Steps 7 through 10.

2. OPEN Breaker A. The interlock should release. CLOSE Breaker B. Verify that it closes with the OPEN/CLOSED indicator. Breaker A should now be held in the OPEN condition. Repeat the above checks on Breaker B (lever position, attempt to CLOSE).

The mechanical interlock is now properly installed and adjusted.

Figure 11. Step 11
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