



Power Break® II Circuit Breaker Accessories

Mechanical Interlock for Draw-Out Breakers, 800–2000 A Frames

Introduction

The Mechanical Interlock accessory, catalog number SPDOWB20, is shown in Figure 1 and can be installed in 800–2000 ampere frame Power Break® II draw-out circuit breakers. This accessory is for use only with circuit breakers, draw-out substructures, and shutters with a manufacture date code later than E640= (where E represents the plant where manufactured, 6 is the year, 40 is the week of that year, and = is the decade code—in this case, the 90s).

When two breakers in adjacent compartments are connected with an interlock rod, as shown in Figure 2, this accessory prevents the simultaneous closing of both breakers. When either breaker is ON, the other will immediately trip if an attempt is made to turn it ON also.

When both breakers are OFF, either breaker may be turned ON. However, when one breaker is ON, an attempt to close the second breaker causes its closing springs to discharge without moving the contact arms.

An override feature is provided in case of a race condition (both breakers turned ON simultaneously), so that the breaker designated as primary turns ON and the secondary breaker trips.

Either or both circuit breakers may be CHARGED at any time, but the interlock operation activates only when one of the breakers is ON.

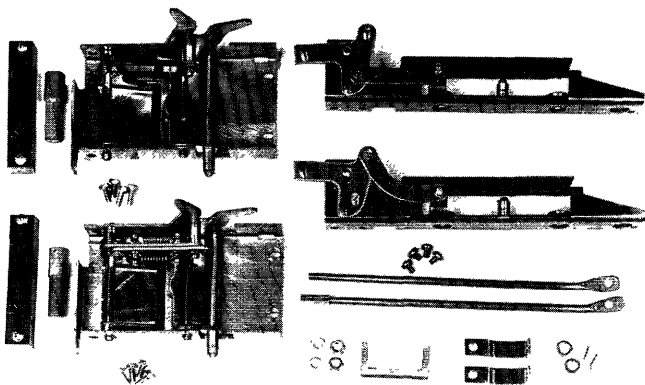
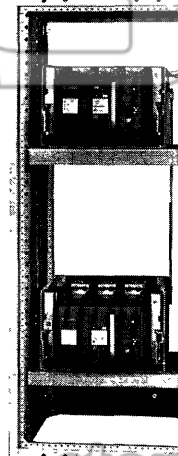


Figure 1. Mechanical Interlock accessory components.



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Figure 2. Mechanical Interlock attached to Power Break II draw-out circuit breakers.

Horizontal or Vertical Connection

The interlocked breakers can be mounted and connected either vertically (one breaker above the other) or horizontally (breakers mounted side by side). The connecting rod can be installed in either of two positions for the desired action. All end connectors are provided, so the customer need only supply a 1/4-20 threaded rod of the appropriate length.

Installation

WARNING: Before installing any accessories, turn the breaker off, disconnect it from all voltage sources, and discharge the closing springs.

AVERTISSEMENT: Avant d'installer tout accessoire, mettre le disjoncteur en position OFF, le déconnecter de toute tension d'alimentation, et décharger les ressorts d'armement.

If shutters have been installed in the draw-out substructure, they must be removed before the mechanical interlock can be installed. Reinstall the shutters after completing installation of the interlock.

Breaker Unit

The primary breaker unit has a solid operating link and the secondary breaker unit has a spring-loaded override link. In the event of a race condition, in which both breakers are turned ON simultaneously while both are OFF, the primary unit turns ON and the secondary unit trips. Either the primary or secondary breaker may be installed in the top or right compartment.

Use the following procedure to install the interlock units on each circuit breaker.

1. Remove the knockout on the rear of the breaker, as shown in Figure 3. Be sure to clean the edges of the hole, so that the interlock plunger can move freely in and out.
2. Install the interlock plunger in the hole made in step 1, as shown in Figure 4.
3. Install the support block, as shown in Figure 4, with two #10-32 Philips-head screws tightened to 15 in-lb.
4. Install the interlock mechanism, as shown in Figure 5, so that the interlock plunger fits in the hole in the frame and the roller goes into the slot in the trip claw. Secure with four #10-32 hex-head screws tightened to 15 in-lb.
5. Check that the fork on the interlock mechanism moves freely. Rotating it counterclockwise should actuate the trip plunger. Closing the breaker should move it clockwise, while tripping the breaker should return it to the center position.

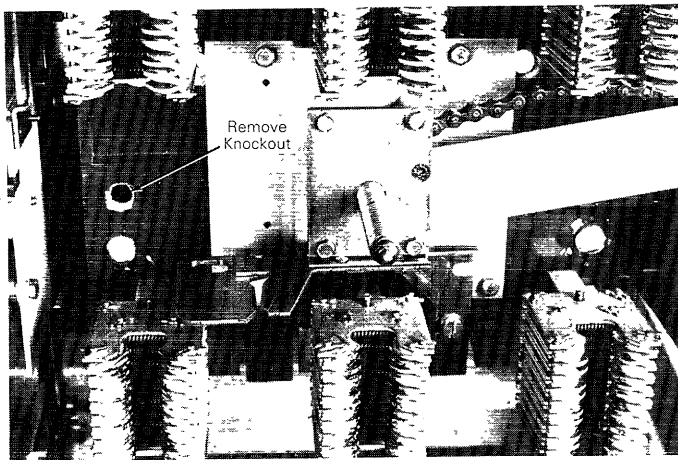


Figure 3. Knockout removed for installation of the interlock plunger.

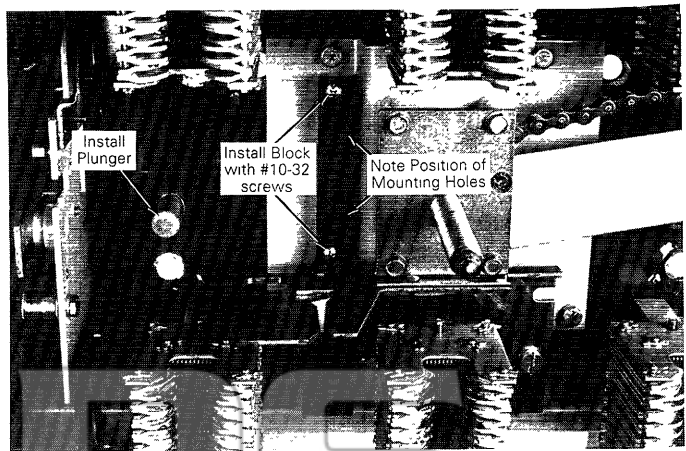


Figure 4. Interlock plunger and block installed in the breaker.

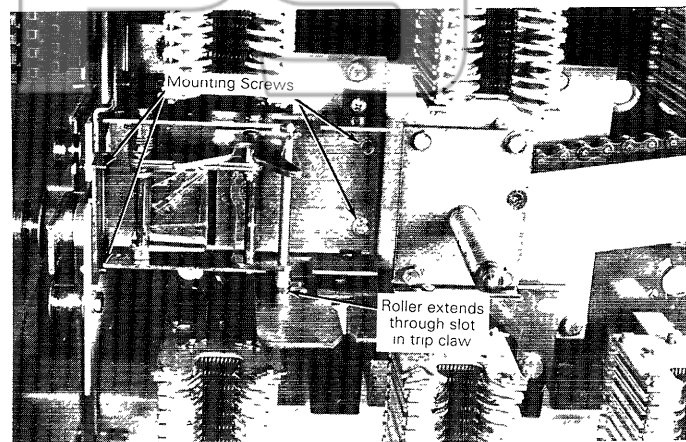


Figure 5. Interlock installed on the breaker.

Substructure Unit and Interconnection

Use the following procedure to install the interconnect components into the draw-out substructures and to connect the breakers. The type A unit has a link attached to the bottom tee connection, while the type B unit has the curved link attached to the top tee connection. The two units thus operate in opposite directions to provide the interlock function.

The type A unit must be installed in the top compartment for a vertical installation or in the right compartment for a horizontal installation. This provides a "pull" operation so that the rod connecting the compartments does not buckle.

After performing step 1, which is identical for both vertical and horizontal connections, go to the appropriate step 2 to continue the installation

1. Install the units to the breaker mounting supports as shown in Figure 6. Attach with two Philips-head #10-32 screws in each compartment, tightened to 15 in-lb. If the breakers are mounted one above the other (vertical connection), the type A unit must be installed in the upper compartment and the type B in the lower. If the breakers are mounted side by side (horizontal connection), the type A unit must be installed in the right compartment and the type B in the left.

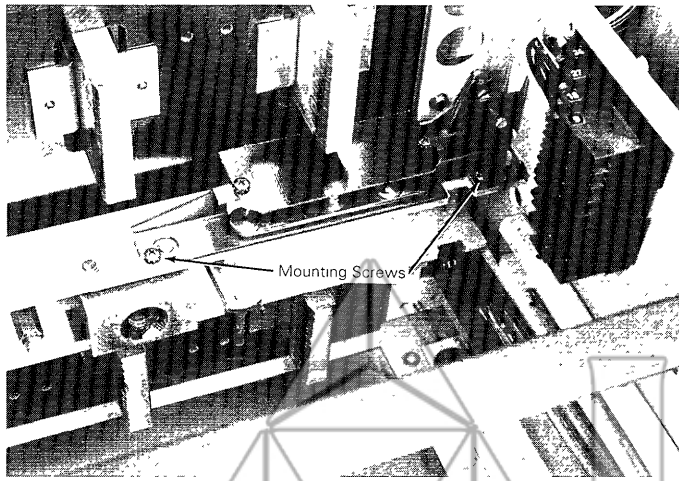


Figure 6. Interlock mechanism installed in the compartment.

Vertical Interconnection

- For a vertical installation, attach the rod ends to the pivots as shown in Figure 7. The rod ends are provided in the Mechanical Interlock kit; the 1/4-20 threaded rod is supplied by the customer.
- Adjust the length of the rod so that the pivot-to-pivot distance is equal to the distance between the two compartments.

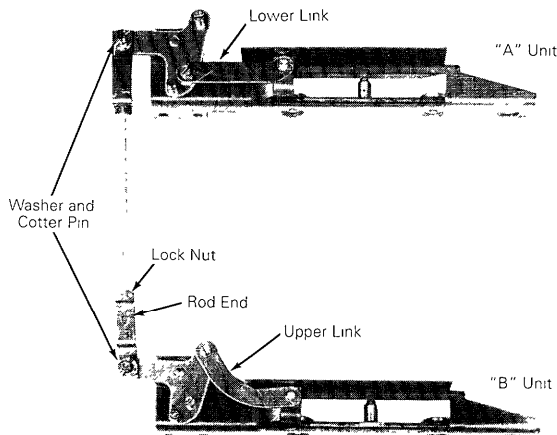


Figure 7. Attachment of the interconnection rod to the compartment units for a vertical installation. The view is from the rear of the compartment

Horizontal Interconnection

- For a horizontal installation, attach the long rod ends to the pins on the pivots as shown in Figure 8. A variety of connecting hardware is provided in the Mechanical Interlock kit; the 1/4-20 threaded rod is supplied by the customer.
- Slip the provided heat-shrink tubing over the rod so that it provides insulation within the compartment through which the rod passes (right-side unit). Shrink the tubing in place with a hot air source of 100–300° C (212–572° F).

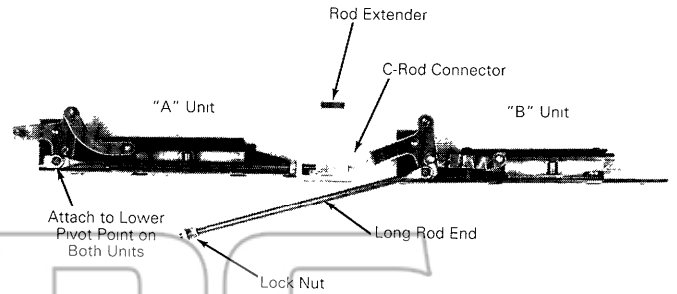


Figure 8. Attachment of the interconnection rod to the compartment units for a horizontal installation. The view is from the rear of the compartment

- Adjust the length of the rod so that the pivot-to-pivot distance is equal to the center-to-center distance between the two compartments.

Installation Testing

Before installing the breakers, verify that the rod linkage is centered and free to move in either direction.

After installing the breakers in the compartments, charge the closing springs on both breakers. Close one of the breakers, then attempt to close the other. The second breaker should immediately trip. Repeat the test with the breakers in the opposite order. If the second breaker does not trip in either case, check that the rod connecting the breakers is free to move in both directions when the breakers are sequenced from OFF to ON. If the rod is adjusted too short, one of the breakers will nuisance trip even when the other breaker is off. If the rod is adjusted too long, the interlock mechanism will not operate properly. A good length is one that eliminates the slack between the compartment linkages.

Trouble-Shooting

The following guide is provided for trouble-shooting and isolating common problems. It does not cover every possible situation. Contact the ED&C Customer Support Center at 800-843-3742 if any problem is not resolved by these procedures.

Symptom	Possible Cause	Corrective Action
1. The circuit breaker will not close and trips when an attempt is made to turn it ON.	The rack is not fully inserted in the substructure.	Check the rack position and, if necessary, fully seat the breaker.
	The second breaker is turned ON.	Normal operation. The first breaker is prevented from closing when the second breaker is already ON.
	The rod that links the two compartments is adjusted too short.	Check the length of the connecting rod and verify that it is adjusted to the exact distance between the breakers. If the condition persists, lengthen the rod adjustment.
	The interlock unit is not correctly installed.	Verify that the rod linkage is centered and free to move in either direction when both circuit breakers are turned OFF.
2. Both circuit breakers can be turned ON at the same time.	The interlock was improperly installed or the plunger was not installed.	Verify that the breaker plunger is installed and that the knockout was removed without ragged burrs that would prevent the plunger from sliding in and out of the breaker when it is turned ON and OFF. The fork should move from left to right when the breaker is turned ON.
	The rod connecting the two breakers is not free to move.	Verify that the rod linkage is centered and free to move in either direction when both circuit breakers are turned OFF.
	The rod connecting the two breakers is adjusted too long.	Check the length of the connecting rod and verify that it is adjusted to the exact distance between the breakers. If the condition persists, shorten the rod adjustment.
3. The rod connecting the breaker compartments bends or buckles when either breaker is turned ON.	The type A and B devices are reversed, so that the interlock is operating in a "push" rather than a "pull" mode.	Reverse the installation of the A and B units on the circuit breakers. Vertical interlock: A unit on top and B unit on bottom; horizontal interlock: A unit on right and B unit on left.

These instructions do not cover all details or variations in equipment nor do they provide for every possible contingency that may be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise that are not covered sufficiently for the purchaser's purposes, the matter should be referred to the GE Company.



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