

A-01: Replace/Troubleshoot Breakers

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- A key and locking/blocking mechanism is built into the breaker.
- Use appropriate insulating gloves when working with high voltage equipment.

EQUIPMENT

- crank
- insulated gloves

RESOURCES

- none

Replace Breakers

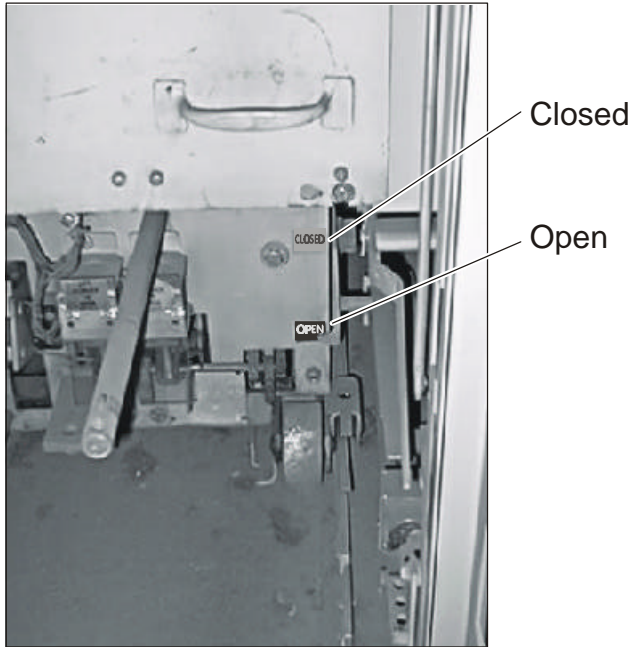
1. Remove the breaker.

Note: These steps apply to a Westinghouse 4160 volt breaker.

- Verify that equipment powered through the breaker is off, so that current through the breaker on all phases is zero.
- Set the control switch on the breaker to TRIP, and pull the handle out to lock it in place.
- Open the breaker rack door.

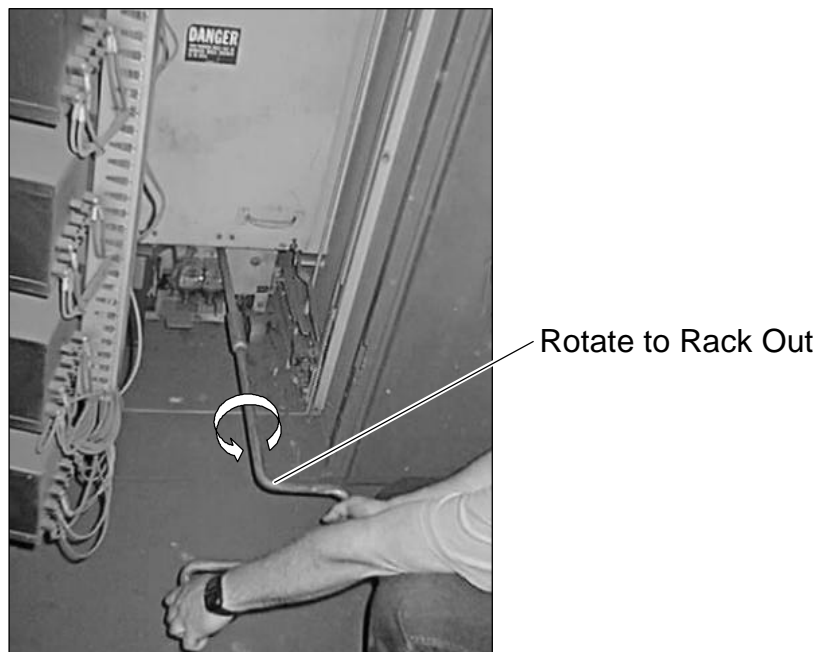


- Verify that the status indicator is in OPEN. See below.



Status Indicator

- Slip the crank over the screw shaft and turn the crank counterclockwise to rack out the breaker. See below.



Racking Out the Breaker



- Lift the locking/blocking mechanism, turn the key, and remove it to prevent the breaker from being racked in.
 - Release the catch and roll the breaker out of the rack, if the breaker is to be completely removed.
2. Reinstall the breaker.
- Confirm that circuits normally powered through the breaker are open (equipment is OFF).
 - Confirm that the breaker control handle is in the TRIP position.
 - Confirm that the status indicator is OPEN.
 - Align the breaker carefully with the rack and roll it in past the catch.
 - Insert the key in the lock and release the locking/blocking mechanism.
 - Engage the screw shaft in the threads.
 - Slip the crank over the screw shaft and turn the crank clockwise to rack in the breaker.
 - Close the breaker door.
 - Push the control handle in and turn it clockwise to CLOSE.
3. Verify that equipment powered through the breaker is energized, with normal supply voltage on all three phases.

Troubleshoot Breaker

Symptom: The breaker trips and all power to the production line is lost.

1. Follow the decision table below to troubleshoot the breaker.



If:	Recommended Action:
The breaker trips	Check for “flags” on the protective relays.
The “flags” are down	<ol style="list-style-type: none"> 1. Never close a breaker with instantaneous flags. 2. Check the line and/or load for a faulted line-to-line or line-to-ground.
There is a faulted line-to-line or line-to-ground	<ol style="list-style-type: none"> 1. Repair the fault. 2. Try to close the breaker.
The “flags” are not down	Try to close the breaker.
The breaker will not close	<ol style="list-style-type: none"> 1. Contact the appropriate line supervisor and have all equipment powered down. 2. Close the breaker.
The breaker trips with no load	Replace the breaker.
The breaker closes	Contact the appropriate line supervisor and have the equipment powered up one piece at a time.
The breaker trips	<ol style="list-style-type: none"> 1. Contact the appropriate line supervisor and have all equipment powered down. 2. Close the breaker. 3. Contact the appropriate line supervisor and have the equipment powered up, except for the piece that caused the breaker to trip.
The breaker closes and stays closed	Repair the defective piece of equipment.