

B-05: Rack In/Rack Out Breakers

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- Explosive hazard can result if a breaker is improperly sized or wired.
- Electrical hazard exists whenever lock and tag is removed. Stand to the side when opening or closing the breaker.
- OSHA regulations require wearing insulated safety gloves when working on energized circuits over 50 VAC.

EQUIPMENT

- breaker cranking mechanism
- Electrician hand tools

RESOURCES

- Substation one line diagram

Rack In/Rack Out Breakers

Note: The following steps are performed on a Westinghouse Breaker. Some steps may not apply to the ITE breakers.

1. Communicate with the Electrician reporting the problem.

- Determine what machine(s) are affected and which feeder branch(es) need to be racked out.
- Use the required substation one-line diagram to identify the required feeder branch.

2. Go to the required substation.

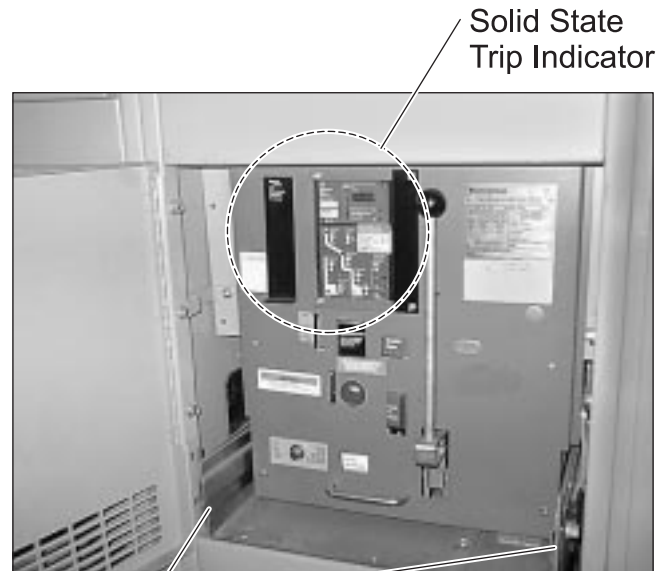
- Identify the corresponding feeder number and/or machine number on the breaker door. See the figure below.

**Substation Breaker Identification****3. Open the feeder circuit breaker door.****4. Check the breaker status indicator.**

- The indicator should display “Closed” if it has not tripped or “Breaker Open” if the breaker has been tripped. See the figure below.

**Breaker Status Indicator****Note the Breaker Status**

5. Check the solid-state trip indicator device for a warning signal. See the figure below.



Drawer Rails

Indicates the Nature of a Fault

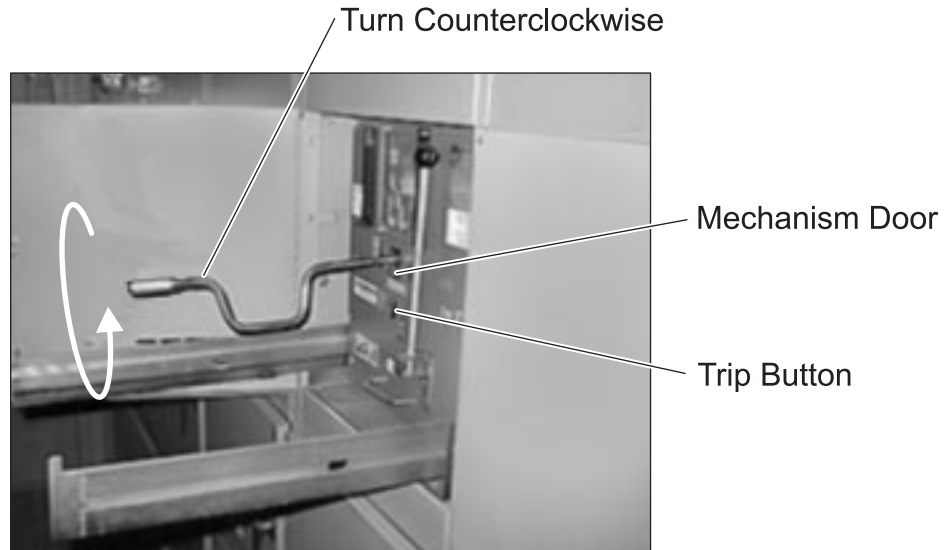
- Check for an illuminated red indicator light on the device.
- Determine the nature of the fault: Long Time, Short Time, Instantaneous, or Ground.

WARNING: IF A GROUND FAULT OR INSTANTANEOUS TRIP IS INDICATED, YOU MUST DETERMINE WHAT CAUSED THE TRIP BEFORE CLOSING THE BREAKER AGAIN.

6. Slide out the drawer rails at the bottom of the breaker. Pull out until it drops down.

7. Rack out the breaker.

- Push the trip button and hold it to install the cranking mechanism. Slide the mechanism door up and place the wrench end of the mechanism on the bolt head. See the figure below.

**Breaker Cranking Mechanism**

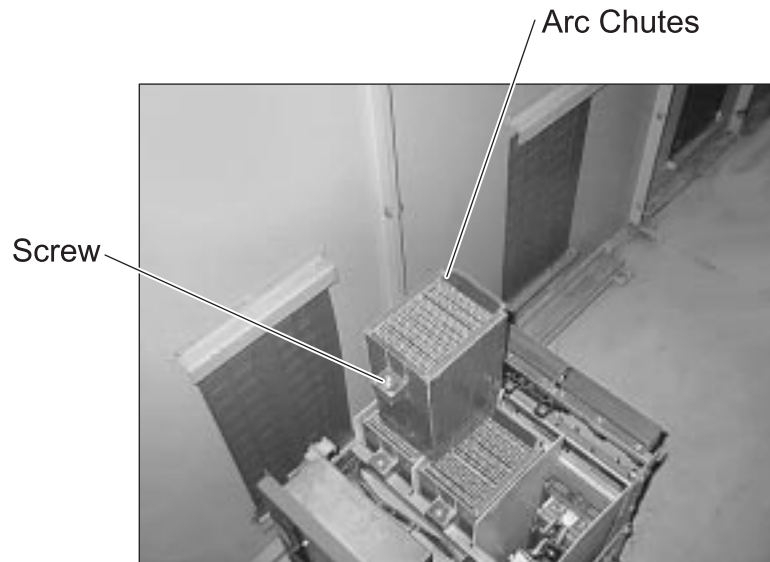
- Turn the cranking mechanism counterclockwise until it stops to loosen the breaker.
- Pull out on the breaker handle.
- The breaker should slide easily away from the rack.

8. Visually inspect the breaker.

Caution! Voltage is present at the top set of electrical contacts in the cubicle.

- Loosen the screws. Next, lift the arc chutes.
- Check the breaker contacts for signs of arcing, such as discoloration or smoke.
- Check all wiring for discoloration or disconnection.

- Check the arc chutes for signs of arcing. See the figure below.



Suppressors on a Westinghouse Breaker

- Perform any maintenance indicated by the visual inspection.

9. Tag the racked-out breaker.

- Put a Warning tag on the breaker if it is to be left racked-out. See the figure below.



10. Verify that any fault on the line has been corrected.

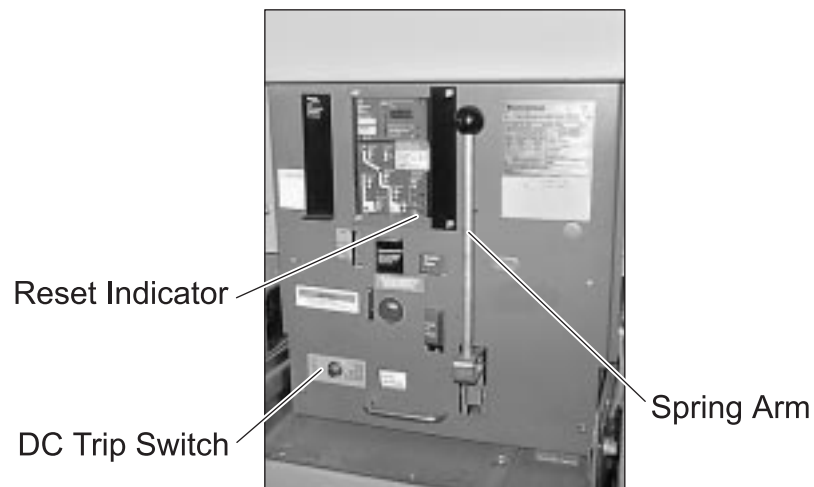
11. Rack in the breaker.

- Alert all Operators, Electricians, and other personnel that the line will be reenergized.
- Push the breaker back into the cell.
- Push the drawer rails back in.
- Crank the mechanism clockwise until it stops and the indicator shows that the breaker is connected.

Note: Indicator settings include “Remove”, “Disc”, “Test”, and “Conn.”

12. Reset the trip indicator on the solid-state device.

- Use a small pointed device, such as a screwdriver, to press the <Reset> button.



Solid-State Indicator Reset Button

13. Reset the DC trip switch.

- Press the metal reset pushbutton once.
- The button is located on the bottom left of the breaker face.

14. Recharge the spring and close the breaker.

- Standing to the side of the breaker, pull the spring arm down once to charge the springs.
- Push the <Push to Close> button to close the breaker.
- On an ITE breaker, pull down the Tee handle to close the breaker.

15. Close the feeder circuit breaker door.
16. Document the work history.

