

B-03

ELECTRICIAN TRAINING

TRAINER'S GUIDE

Duty B: Power Distribution (600V and below)

B-03: Troubleshoot 480V System

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Instructions To The Trainer

1. The Learner will contact you when ready to practice troubleshooting a 480V power distribution system.
2. Be prepared to demonstrate the steps for this task.
3. Ask the Learner to contact the Evaluator when ready for the Skill Check.



Skill Objective

Given a problem in a 480V power distribution system, troubleshoot the system to identify the component at fault and the conditions that caused the problem.

Task Standards

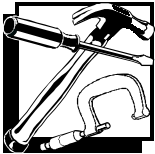
1. Power is restored to all circuits quickly.
2. All safety requirements are demonstrated.

What The Learner Will Need

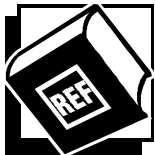
This section contains the safety information, tools, and resources you will need before troubleshooting a 480V power distribution system.



- Follow all Caterpillar facility safety standards when performing this task.
- Lock out and tag the power disconnect supplying a section of distribution equipment before testing it for ground and line faults.
- Appropriate electrician's gloves are required when working on live circuits of 50V or more.
- A ladder or manlift and harness is necessary to work on overhead distribution equipment.



- Electrician's pouch, with wiggy and DVM



- prints of power distribution equipment
- persons who may have been present and/or involved when the system problem occurred
- service records on tripped circuit breakers



Practice Set-Up

The Learner may perform the following practice exercises to help prepare for the Skill Check. Set up the practices for the Learner. Assist the Learner during the practice, if necessary; answer any questions concerning the task; and be prepared to demonstrate the task to the Learner. Make sure the Learner follows safe work practices while practicing the task.

Practice 1:

Specify a problem in a 480V distribution system, such as:

- no voltage between any phase pair in a large area;
- low voltage between one phase and the other two phases at one drop;
- no voltage to ground on one phase; phase-to-phase voltages normal;
- one fuse in a distribution bus is blown;
- the main circuit breaker in a motor control center repeatedly trips.

Ask the Learner to list the appropriate response steps to one or more of these (or other) possible problems.

Practice Objective 1:

The Learner's proposed steps must:

- be safe to perform;
- not damage any equipment;
- positively identify the responsible component with the fewest possible steps.

Practice 2:

Propose a set of symptoms in a 480V distribution system, and ask the Learner whether the problem is a blown fuse or a tripped circuit breaker.

Practice Objective 2:

The Learner must be able to state whether a fuse has blown or a circuit breaker has tripped, and to explain the reasons for that conclusion.

Practice 3:

Simulate a problem in a 480 Volt power distribution system. Choose a section of the system that is out of service or powers nonessential equipment. Trip a breaker or pull a fuse (possibly replacing it with a blown fuse). Provide system prints. Ask the Learner to use the symptoms and the prints to identify the blown fuse or tripped circuit breaker, and to demonstrate that the fuse or breaker is open.

Practice Objective 3:

The Learner must identify and find the correct open fuse or circuit breaker.

Practice 4:

Ask the Learner to test a section of a 480V distribution system for an overcurrent condition.

Practice Objective 4:

The Learner must be able to state whether the current in the section is too high for the overcurrent devices (fuses or circuit breakers) protecting the section.

Next Step

Allow the Learner to continue practicing and developing skills needed to demonstrate the task. The Learner should ask the Evaluator to schedule a Skill Check when ready to demonstrate the task unaided and meet all the task standards and safe work practices.