HIGH VOLTAGE SAFETY

SAFETY

History shows safety measures don't always produce accident-free performance.

Accidents don't just happen! Most are caused by unquestionably avoidable incidents. There are steps to take to ensure your safety while repairing electrical equipment.

First, eliminate the hazard. This implies that all-electrical equipment be de-energized before work on the equipment proceeds. Disconnect the equipment or secure them from unauthorized use. Lock/Out Tag/Out procedures are to be used at all times. Before beginning work, test all voltage sources with an appropriate meter to verify they are de-energized.

Second, you must consider hand tools, flashlights, keys, metal rules and anything else that could provide a path for electricity. Do not wear metallic jewelry, watchbands, or rings. If you use insulated tools, is the insulation intact and oil-free? Ensure you have another person who remains in sight and within earshot to render assistance in an emergency.

To help overcome safety mistakes, consider these two statements: **"Determine existing conditions by an inspection or a test before starting work. Consider electric equipment and lines to be energized until you determine otherwise by testing."**

"You don't warn if you can guard. You don't guard if you can eliminate the exposure."

These few words, as simple as they are, summarize the very foundation of established safety manuals. **“Safety is everybody's business. Safety is your business!”**

3-PHASE ELECTRIC

This article is technical and intended for electricity troubleshooting. You should know and understand safety and follow normal safety and OSHA guidelines when working with industrial electricity.

Why 3-Phase?

Single phase 110V and 220V is like a big strong fellow who is driving in a tent pin. At some point, the amount of work that has to be done can be tougher than what the big fellow can do. With 3-phase, it's like having three guys with sledgehammers, working together, each hitting the tent pin in a rhythm. While each may not be doing as much work as the big fellow, together the three of them can drive in the tent faster. That’s because they are hitting it with three small blows for every one the big guy is hitting and the total amount of work being accomplished is much greater when added up.

For traditional reasons, 110V/220V are used, but the actual voltage may be 120V/240V or 125V/250V. The supply voltage should match the equipment voltage specification. The standard difference can be +5% / -10%

TESTING PHASE VOLTAGE

When you test live circuits, energize the circuit under test from the power source. Generally, you will test with a voltmeter. Make certain that the voltmeter is designed for the type of current to be tested and has a scale of adequate range.

WARNING: Be extremely careful not to touch the hot conductors when you use this method of testing because these live points of the circuit are exposed when the junction box covers are removed.

To perform phase test let's use (Fig. 1). Place one lead of the voltmeter on **A** and the second lead on **B** and read the voltage. It should read approximately the full supply voltage. After you have taken this reading, move the second lead to **C** and take the reading. After this reading, move the first lead to **B** and take the reading. You have now read between all phases and a lower than normal reading indicates an open phase.

Which phase is dead? Assume that phase **C** has a blown fuse. Take your reading between top of **A** and the bottom of **B** (Fig.2) it reads normal. Your next reading, between phases top of **A** and bottom of **C**, reads low. But the next reading, between top of **B** and bottom of **A**, reading is normal. The low reading on **C** indicates that **C** is open. Another way to determine which phase is open is to place one voltmeter lead on the top of the fuse and the other lead on the bottom of the same fuse. If you get a voltage reading across the fuse, the fuse is open.

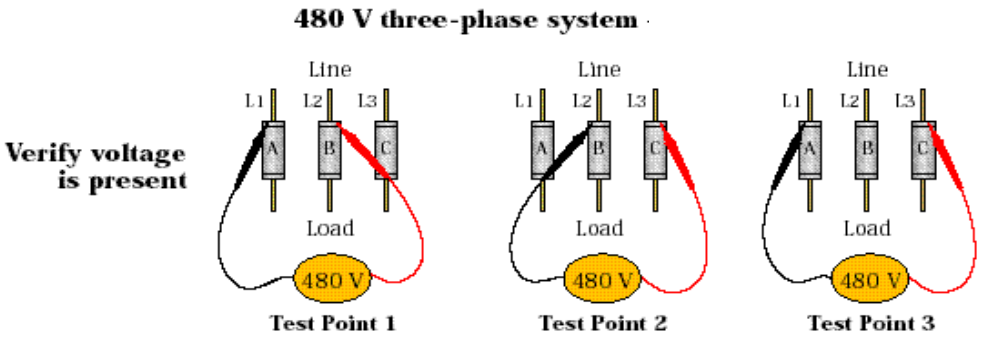

Fig. 1

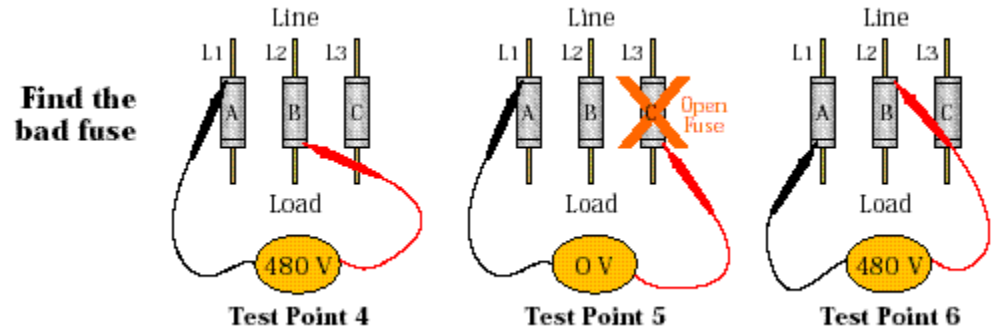

Fig.2