

# K-11a

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## ELECTRICIAN TRAINING

### SKILL CHECK GUIDE

Duty K: PLC (Allen-Bradley)  
K-11a: Troubleshoot PLC-Controlled Machine

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## **Rationale**

This Skill Development Guide provides the knowledge needed to troubleshoot a PLC-controlled machine. At Caterpillar, typical PLC problems occur which are hardware-related, such as a bad device or card. Electricians need to know how to locate inputs and outputs to check machine status. Extreme caution must be exercised when troubleshooting. Modifying the ladder logic incorrectly could result in unexpected movement of the machinery or damage to a part..

## **Skill Check Set-Up**

Select a PLC-controlled machine for the Skill Check. Contact the Operator where the PLC is located to schedule a convenient time for the Skill Check. Set up a problem by inserting a fault in the hardware or software that would cause the machine to stop during the machine cycle. As a part of the troubleshooting task, ask the Operator to provide the Learner with information about where in the machine cycle the machine stopped. Ask the Learner to identify the problem and to recommend corrective action(s).

You must make available the tools, materials, and resources needed to demonstrate the task.

## What The Learner Will Need

This section contains the safety information, tools, and resources you will need before troubleshooting a PLC controlled machine.



- Follow all Caterpillar Facility Safety Standards when performing this task in the plant.
- You will perform this task online. Perform the steps carefully; mistakes could result in injury to personnel or damage to the equipment.
- Visually check to ensure no physical problems are present before attempting to cycle the machine.
- Use caution when working around the PLC; high voltage is present on the inside of the PLC cabinet door and near the I/O chassis.
- Be careful when working near moving or rotating machinery.
- Wear safety glasses and hearing protection in assembly and production areas.



- PC equipped with PLC software
- Interconnect cable
- Basic electrical hand tools
- Voltmeter
- PLC location



- Electrical Schematics
- Ladder Diagram printout
- Diagnostic screens (Marquee, Display)
- Safe Job Procedures



## Skill Check

Upon receiving a request from an Operator, Electrical Technician, or Electrical Engineer to troubleshoot a PLC-controlled machine, troubleshoot the machine.

Needs  
Mastered Practice

### Safe Work Practices

- |       |       |   |
|-------|-------|---|
| _____ | _____ | 1. Follow all Caterpillar Facility Safety Standards when performing this task in the plant.   |
| _____ | _____ | 2. You will perform this task online. Perform the steps carefully; mistakes could result in injury to personnel or damage to the equipment. |
| _____ | _____ | 3. Visually check to ensure no physical problems are present before attempting to cycle the machine.  |
| _____ | _____ | 4. Use caution when working around the PLC; high voltage is present on the inside of the PLC cabinet door and near the I/O chassis.         |
| _____ | _____ | 5. Be careful when working near moving or rotating machinery.   |
| _____ | _____ | 6. Wear safety glasses and hearing protection in assembly and production areas.   |

### Task Standards

- |       |       |  |
|-------|-------|--|
| _____ | _____ | 1. The problem device is identified.                   |
| _____ | _____ | 2. The appropriate corrective actions are recommended. |



## Evaluator's Sign-Off

The Learner has demonstrated safe work practices and competent performance of the task.

Evaluator: \_\_\_\_\_ Date: \_\_\_\_\_

Learner: \_\_\_\_\_ Clock No: \_\_\_\_\_