

# Instructor Guide



## 302: Troubleshooting and Repair of Switches and Derails Module 1: Principles of Troubleshooting

# Signals – Principles of Troubleshooting

*Instructor's Guide*



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Signals Training Consortium Use Only

# Signals – Principles of Troubleshooting

Instructor's Guide



## Icons Used In This Guide



REVIEW slides



ASK



CLASSROOM ACTIVITY



SMALL GROUP ACTIVITY



INDIVIDUAL ACTIVITY



WRITE



Multimedia



REFER participants to

## Agenda

Topic #	Topic Title	Duration
1	Overview	30 Minutes
2	The Process of Troubleshooting	10 Minutes
3	Four Steps in Troubleshooting	30 Minutes
4	Best Practices for Troubleshooting	20 Minutes
5	Charts & Diagrams Troubleshooting	10 Minutes
6	Field Trip	60 Minutes
7	Summary	20 Minutes
	<b>Total Time:</b>	180 Minutes

# Signals – Principles of Troubleshooting

## Instructor's Guide



### Overview

**Purpose** The purpose of this module is to:

provide an overview to troubleshooting signal systems equipment and machinery within the context of general troubleshooting and best practices.

### **Objectives**

At the end of this lesson, the signal maintainer trainee will be able to:

- Examine the importance of troubleshooting
- Restate the troubleshooting process
- Identify troubleshooting steps
- Identify troubleshooting best practices
- Apply troubleshooting principles to some common signal systems problems and causes.

### **Materials**

**Mandatory** Make sure you have the following

- PowerPoint Presentation
- Coursebook
- Quizzes
- Pencils
- Handouts:

### **Optional**

You may also want the following for optional activities:

- Chalk board with chalk, large paper with marker, etc.
- Internet connection
- Lab, simulator

# Signals – Principles of Troubleshooting

## Instructor's Guide



Module Length: 180 min

Time remaining: 180 min

This section: 30 min (6 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** introduction slides

**In your own words:**

Welcome to the course on Principles of Signals Troubleshooting.

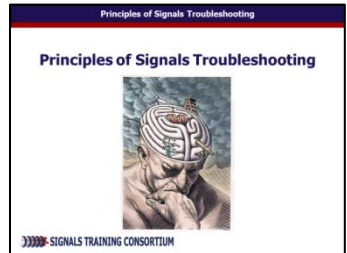
**Advance slide**

Riders depend on us.  
You have just arrived home to find that one light above your front door is fluctuating between being very bright to very dim. You go inside to find that your refrigerator is also not running.  
Assuming that you may need to ultimately consult with an electrician, what other questions would you ask or what steps would you take to begin the troubleshooting process in order to begin to find a solution to this problem?

**Discuss possible questions to ask and potential steps to take.**

**Advance slide**

✓ PPT slides 1, 2



### Instructor's Notes

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# Signals – Principles of Troubleshooting

## Instructor's Guide



Module Length: 180 min

Time remaining: 180 min

This section: 30 min (6 slides)

Section start time: \_\_\_\_\_

Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** module objectives

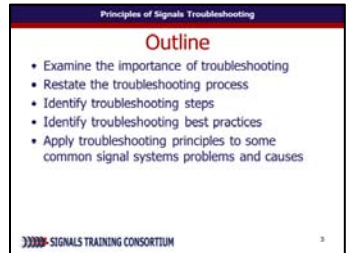
#### In your own words:

Today we will

- Examine the importance of troubleshooting
- Restate the troubleshooting process
- Identify troubleshooting steps
- Identify troubleshooting best practices
- Apply troubleshooting principles to some common signal systems problems and causes

**Advance slide**

✓ PPT slide 3



### Instructor's Notes

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# Signals – Principles of Troubleshooting

## Instructor's Guide



Module Length: 180 min

Time remaining: 140 min

This section: 30 min (10 slides) Section start time: \_\_\_\_\_ Section End Time: \_\_\_\_\_

### DO

### SAY

### Materials Needed



**REVIEW** slides

### Instructor's Notes

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#### In your own words:

**Test.** Some may want to jump to this step right away and skip other steps. However, a good troubleshooter will go through the previous steps of documentation & taking notes, establishing the problem, collecting information sorting what is related and what is not, looking at the whole picture, and developing a theory prior to any testing. These previous steps will help determine what tests are appropriate for the situation and therefore save time, resources, and frustration in the long run. Also, be sure to consider all the symptoms and information you collected and test accordingly.

Do not ignore a symptom and be sure to keep the documentation & note taking process going since recording those test results will help in the deciding if you've found the solution. If a solution is not found, recorded test results will be beneficial for further consideration of the problem.

**Advance Slide.**

✓ PPT slide 11

