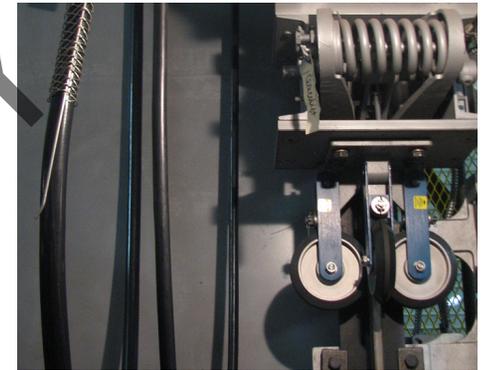
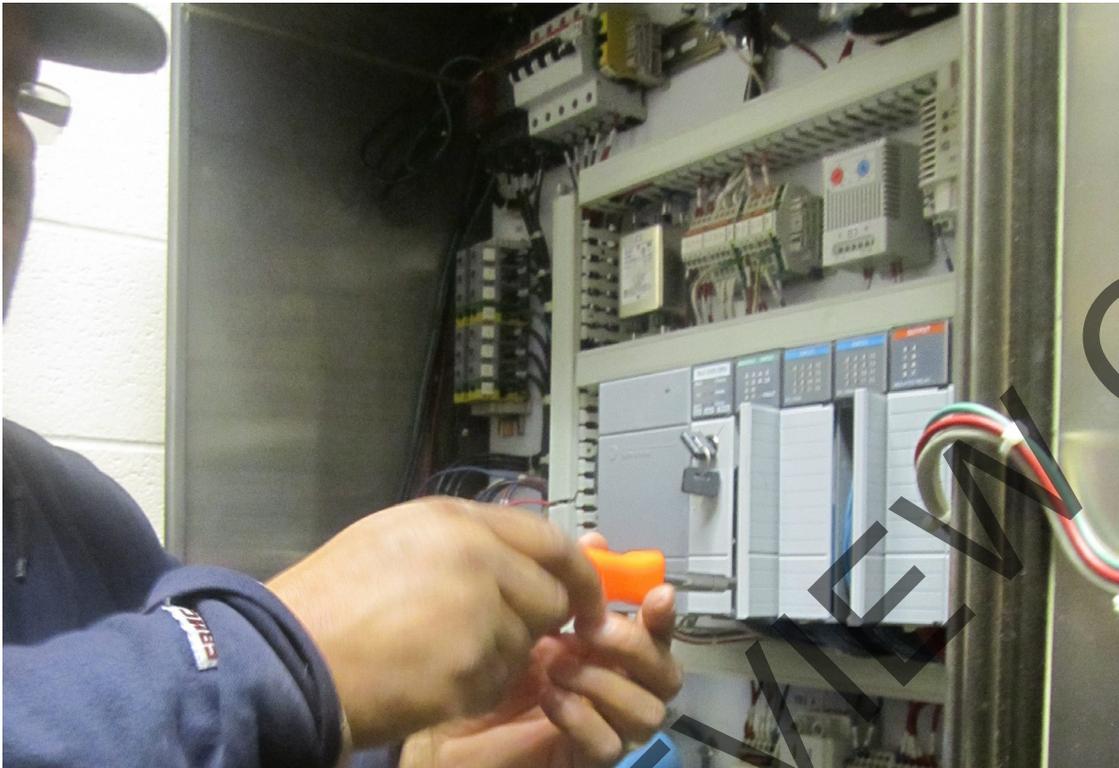


Instructor Guide



301: Electrical/Electronic Systems Module 4: Setup and Operation

Elevator-Escalator – Setup & Operation

Instructor's Guide



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PREVIEW ONLY

Elevator-Escalator – Setup & Operation

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 | Installing Circuit Boards | 40 Minutes |
| 3 | Installing Drive Units | 40 Minutes |
| 4 | Exercises 1 & 2 | 100 Minutes |
| 5 | Field Trip | 120 Minutes |
| 6 | Summary | 30 Minutes |
| | Total Time: | 360 Minutes |

PREVIEW ONLY

Elevator-Escalator – Setup & Operation

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Overview

Purpose The purpose of this module is to:

- Provide an overview on how to safely install and set up circuit boards and drive units for transit elevators and escalators.

Objectives

At the end of this lesson, the transit elevator/escalator trainee will be able to:

- List common safety precautions when mechanically installing circuit boards
- List procedures for electro-mechanically installing circuit boards
- Demonstrate procedures for electro-mechanically installing circuit boards, in an instructional setting after seeing an instructor perform this procedure
- List procedures for electro-mechanically installing drive units
- List common safety precautions when mechanically installing drive unit

Materials

Mandatory Make sure you have the following

- PowerPoint Presentation
- Coursebook
- Quizzes
- Pencils
- Handouts: Drive Unit Installation Part 1, Drive Unit Installation Part 2

Optional

You may also want the following for optional activities:

- Chalk board with chalk, large paper with marker, etc.
- Internet connection
- Lab, simulator or out of service elevator
- Transit authority related safety procedures
- Transit authority specific OEM with drive unit installation procedures

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Module Length: 360 min

Time remaining: 360 min

This section: 30 min (5 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW introduction slides

Instructor's Notes

SAY

In your own words:

Welcome to the course on Setup and Operation for Electronica Electrical Testing.
Advance

We depend on us.
 Here is a photo of a controller. Who can identify the parts?

Call on various participants to name different parts of the controller.

Advance
 Today we will be looking at two specific areas of the controller, the circuit board and the drive unit.

Advance

Materials Needed

✓ PPT slides 1, 2



Elevator-Escalator – Setup & Operation

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Module Length: 360 min

Time remaining: 330 min

This section: 40 min (17 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slides



ASK

Instructor's Notes

In your own words:

Before starting a circuit board installation job the elevator technician should:

Make sure that they have the proper PPE, **ASK:** What would be proper PPE for this situation?

Allow participants to discuss answers.

Make sure to wear a **wrist strap** or **ground bracelet** and to properly ground it as this will get rid of the risk of damage from any static electricity.

Make sure all power has been removed from the system by powering down the system at the mainline disconnect and perform proper LOTO procedures. Where applicable, make sure to discharge capacitors. This can be done using a **digital multimeter** (DMM).

Advance

✓ PPT slide 6



Elevator-Escalator – Setup & Operation

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Module Length: 360 min

Time remaining: 330 min

This section: 40 min (17 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

Make sure the replacement circuit board matches the current circuit board exactly by comparing the model numbers on both boards. Once the technician is sure that of the replacement board is correct, the old board can be placed in a static free bag and labeled. The technician should follow their authority's procedures on the disposal of faulty circuit boards.

Advance

Here is a photo showing the disposal of a circuit board into a plastic bag. Remember the bag should be labeled and to follow your transit authority instructions for disposal.

Advance

Materials Needed

✓ PPT slides 13, 14



Elevator-Escalator – Setup & Operation

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Module Length: 360 min

Time remaining: 330 min

This section: 40 min (17 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

When placing the new circuit board, make sure the board is going into the correct slots and that dipswitches and/or jumpers are set to the correct positions as noted in the maintenance manual and/or on the equipment itself.

And remember, if you are unable to adjust switches with your fingers, make sure to use a nonconductive tool. Never use a metal screwdriver or similar!

Advance

You can see here the circuit board showing the correct positioning of dipswitches.

Advance

Materials Needed

✓ PPT slides 15, 16



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Module Length: 360 min

Time remaining: 330 min

This section: 40 min (17 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide

In your own words:

Once the new board is in place, place the retainers back in their secure positions. Power the system back up and ensure that the system is operating correctly. From the control room, check that the correct LED lights are lit. From the field, check the appropriate area of the elevator or escalator for proper operation. For example, if the circuit board was for door operation of an elevator, make sure the doors now operate properly.

Advance

✓ PPT slide 17



Instructor's Notes

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Module Length: 360 min

Time remaining: 330 min

This section: 40 min (17 slides)

Section start time: _____

Section End Time: _____

| DO | SAY | Materials Needed |
|--|--|--|
| <div data-bbox="28 464 144 578" data-label="Image"> </div> <div data-bbox="173 499 270 542" data-label="Text"> <p>ASK</p> </div> <div data-bbox="28 792 444 835" data-label="Section-Header"> <h3>Instructor's Notes</h3> </div> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> | <p>In your own words: Identify and describe the photo. Call on participants for answer Advance for the correct answer Answer: Discharging the capacitor if needed Advance Correctly order the following steps for removing a circuit board. _____ Place old board in static free bag & label _____ Remove retainers holding circuit board in place _____ Compare model numbers _____ Hold by edge to eject and remove _____ Follow transit authority procedures for disposal Call on participants for answer Advance for the correct answer Answer: 4., 1., 3., 2., 5. Advance</p> | <p>✓PPT slides 19, 20</p> <div data-bbox="1535 528 1854 763" data-label="Image"> </div> <div data-bbox="1535 778 1854 1013" data-label="Image"> </div> |

Elevator-Escalator – Setup & Operation

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Module Length: 360 min

Time remaining: 330 min

This section: 40 min (17 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

In your own words:

Bobby had correctly removed and disposed of the circuit board according to transit authority procedures. What should Bobby do next?

Call on participants for answer
Advance for the correct answer

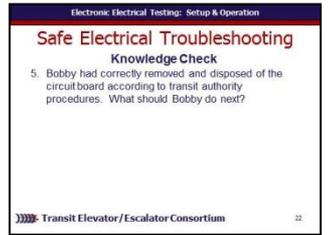
Answer:

Ensure new board:

- Is placed in correct slots
- Dipswitches and/or jumpers are set to correct positions (manual)
- Secure in original position with retainers
- Power system back up
- Check for proper operation
 - ✓ Control Room: check for correct LED lights
 - ✓ Field: Check proper equipment operation

Advance

✓ PPT slide 22



Instructor's Notes

Elevator-Escalator – Setup & Operation

Instructor's Guide



Module Length: 360 min

Time remaining: 290 min

This section: 40 min (12 slides) Section start time: _____

Section End Time: _____

| DO | SAY | Materials Needed |
|----|-----|------------------|
|----|-----|------------------|



REVIEW slides

Instructor's Notes

In your own words:

Examine the drive and its accompanying hardware checking that all items are available.

Advance

If necessary, mark places where the inverter will be installed before actual installation.

For example: **MCE Instructions:**

For best high frequency grounding, install the inverter on a bare metal sub-panel, i.e. zinc plated steel or galvanized steel.

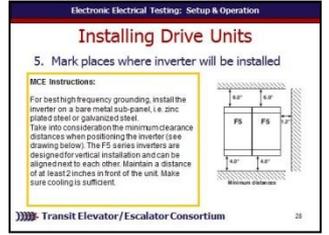
Take into consideration the minimum clearance distances when positioning the inverter (see drawing below). The F5 series inverters are designed for vertical installation and can be aligned next to each other.

Maintain a distance of at least 2 inches in front of the unit. Make sure cooling is sufficient.

Advance

Materials Needed

✓ PPT slides 27, 28



Elevator-Escalator – Setup & Operation

Instructor's Guide



Module Length: 360 min

Time remaining: 290 min

This section: 40 min (12 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

Instructor's Notes

In your own words:

Lets see what we have learned so far:
Correctly order the following steps for installing a drive unit.

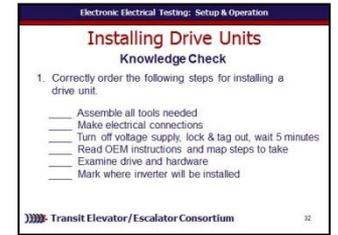
- ___ Assemble all tools needed
- ___ Make electrical connections
- ___ Turn off voltage supply, lock & tag out, wait 5 minutes
- ___ Read OEM instructions and map steps to take
- ___ Examine drive and hardware
- ___ Mark where inverter will be installed

Call on participants for answer
Advance for the correct answer

Answer: 3., 6., 2., 1., 4., 5.

Advance

✓PPT slide 30



Elevator-Escalator – Setup & Operation

Instructor's Guide



Module Length: 360 min

Time remaining: 290 min

This section: 40 min (12 slides)

Section start time: _____

Section End Time: _____

| DO | SAY | Materials Needed |
|---|---|--|
| <div data-bbox="34 471 139 571" data-label="Image"> </div> <div data-bbox="173 499 260 542" data-label="Text"> <p>ASK</p> </div> <div data-bbox="28 792 444 835" data-label="Section-Header"> <h3>Instructor's Notes</h3> </div> <hr/> <hr/> <hr/> <hr/> <hr/> | <div data-bbox="676 428 1023 464" data-label="Section-Header"> <p>In your own words:</p> </div> <div data-bbox="676 471 1381 556" data-label="Text"> <p>Possible tools needed for installing a drive unit may include: <i>(check all that apply)</i></p> </div> <div data-bbox="772 578 1168 928" data-label="List-Group"> <ul style="list-style-type: none"> a. Screwdriver(s) b. Tape measure c. Rope d. Wire stripper e. Mounting hardware f. Drill </div> <div data-bbox="676 935 1236 1021" data-label="Text"> <p>Call on participants for answer Advance for the correct answer</p> </div> <div data-bbox="676 1028 1052 1063" data-label="Text"> <p>Answer: a., b., d., e., f.</p> </div> <div data-bbox="676 1071 840 1106" data-label="Text"> <p>Advance</p> </div> | <div data-bbox="1497 471 1748 506" data-label="Text"> <p>✓ PPT slide 32</p> </div> <div data-bbox="1535 528 1854 763" data-label="Image"> </div> |

Elevator-Escalator – Setup & Operation

Instructor's Guide



Module Length: 360 min

Time remaining: 150 min

This section: 120 min

Section start time: _____

Section End Time: _____

| DO | SAY | Materials Needed |
|--|---|---|
| <div data-bbox="48 464 164 571" data-label="Image"> </div> <div data-bbox="173 485 270 528" data-label="Text"> <p>ASK</p> </div> <div data-bbox="48 585 164 699" data-label="Image"> </div> <div data-bbox="173 614 434 699" data-label="Text"> <p>CLASSROOM ACTIVITY</p> </div> <div data-bbox="28 792 454 842" data-label="Section-Header"> <h3>Instructor's Notes</h3> </div> <hr/> <hr/> <hr/> <hr/> <hr/> | <p>In your own words: <i>At instructor's discretion, take time to visit the field or lab and allow participants to demonstrate procedures for electro-mechanically installing circuit boards, in an instructional setting after seeing an instructor perform this procedure.</i></p> <p><i>Advance</i></p> | <p>✓ PPT slide 37</p> <div data-bbox="1535 528 1864 763" data-label="Image"> </div> |

Elevator-Escalator – Setup & Operation

Instructor's Guide



Module Length: 360 min

Time remaining: 30 min

This section: 30 min (3 slides)

Section start time: _____

Section End Time: _____

| DO | SAY | Materials Needed |
|---|---|--|
| <div data-bbox="34 456 144 571" data-label="Image"> </div> <div data-bbox="173 485 425 571" data-label="Section-Header"> <h3>CLASSROOM ACTIVITY</h3> </div> <div data-bbox="28 792 444 842" data-label="Section-Header"> <h3>Instructor's Notes</h3> </div> <hr/> <hr/> <hr/> <hr/> <hr/> | <p>In your own words: Read slide. For each objective, briefly review what was learned in this module or ask participants to share what they have learned for each learning objective and briefly discuss as a class. Advance</p> <p>Lets take a look at some of the key words we have defined as moved through this module. Read slide. Discuss definitions as a group. Advance</p> | <p>✓PPT slides 38, 39</p> <div data-bbox="1535 528 1854 763" data-label="Image"> </div> <div data-bbox="1535 778 1854 1013" data-label="Image"> </div> |

Elevator-Escalator – Setup & Operation

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Module Length: 360 min

Time remaining: 30 min

This section: 30 min (3 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



**CLASSROOM
ACTIVITY**



INDIVIDUAL ACTIVITY

Instructor's Notes

In your own words:

Administer quizzes.

- ✓ PPT slides 40
- ✓ Quizzes
- ✓ Pencils

