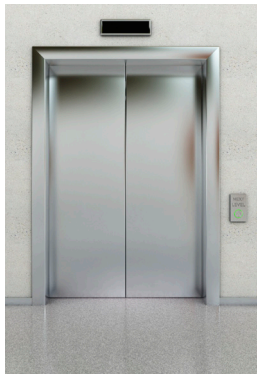
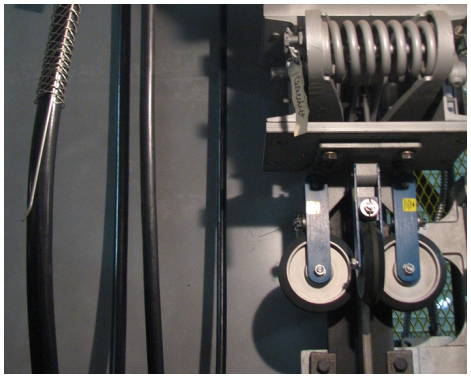
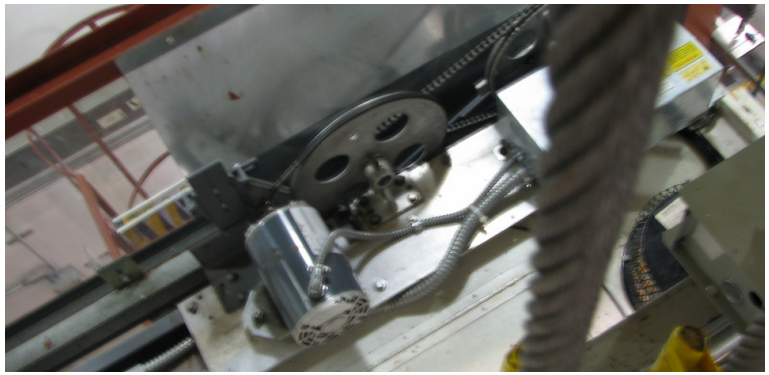
Instructor Guide







217: Elevator: Traction Elevator
Module 4: Hoistway

TRANSIT ELEVATOR/ESCALATOR CONSORTIUM

Table of Contents

.

Icons Used In This Guide

REVIEW slides

INDIVIDUAL ACTIVITY

ASK

WRITE

CLASSROOM ACTIVITY

Multimedia

SMALL GROUP ACTIVITY

REFER participants to

Agenda

Topic #	Topic Title	Duration
1	Overview	20 minutes
2	Hoistway	20 minutes
3	Hoistway Overhead Components	40 minutes
4	Length of Hoistway Components	50 minutes
5	Pit Area Components	45 minutes
6	Car Components	15 Minutes
7	Common Issues	60 minutes
8	Summary	30 Minutes
9	Field Trips (Four)	200 Minutes
	Total Time:	480 Minutes

Overview

Purpose The purpose of this module is to:

- The purpose of this unit is to provide a more in depth explanation of components within the hoistway of electric traction transit elevators. The key concepts discussed will aid the trainee in their future applications of elevator concepts and terminology.

Objectives

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

- Identify areas and associated components of the hoistway
- List common areas in the hoistway which would require repair or replacement

Materials

Mandatory Make sure you have the following

- PowerPoint Presentation
- Course book
- Quizzes
- Pencils
- Paper
- Elevator's 101 2nd Edition
- "Common Issues Worksheet" in Course book for authority specific notes

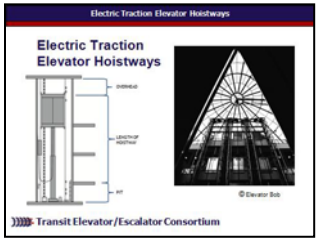
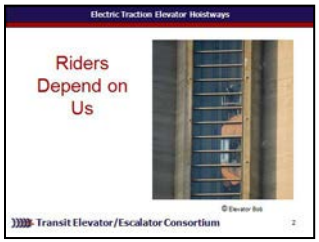
Optional You may also want the following for optional activities:

- Chalk board with chalk, large paper with marker, etc.
- Internet connection
- Lab, simulator or out of service elevator
- ASME A17.1 Code Book
- Elevator Industry Field Employees' Safety Handbook

Elevator – Electric Traction Hoistways

Instructor's Guide

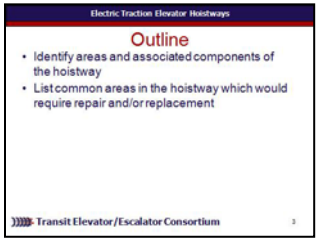
Module Length: 480 min Time remaining: 480 min This section: 20 min (5 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW introduction slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Welcome to the module for electric traction elevator hoistways. ***Advance.*** Hoistways come in all styles and varieties. Here is an example of an electric traction hydraulic elevator hoistway at Canada's National Tower from Elevator Bob. In this course, we will take a closer look at hoistways in electric traction elevator systems. ***Advance.***	✓PPT slides 1, 2  

Elevator – Electric Traction Hoistways

Instructor's Guide

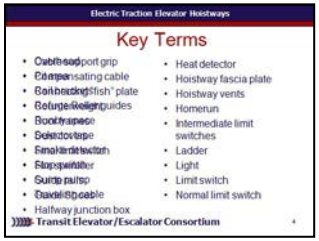
Module Length: 480 min Time remaining: 480 min This section: 20 min (5 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW module objectives **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** In doing so, we will… -Identify areas and associated components of the hoistway and -List common areas in the hoistway which would require repair or replacement All as related to electric traction elevator systems. ***Advance.***	✓PPT slide 3 

Elevator – Electric Traction Hoistways

Instructor's Guide

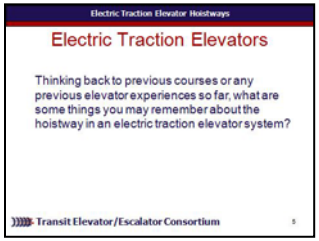
Module Length: 480 min Time remaining: 480 min This section: 20 min (5 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Lets take a look at some of the key words we will be defining as move through this module. Cable support grip, Compensating cable, Connecting "fish" plate, Counterweight, Door frames, Dust covers, Final limit switch, Fire sprinkler, Guide rails, Guide Shoes, Halfway junction box ***Advance.*** Heat detector, Hoistway fascia plate Hoistway vents, Homerun, Intermediate limit switches, Ladder, Light, Limit switch Normal limit switch ***Advance.*** Overhead, Pit area, Rail brackets, Refuge Roller guides, Runby space, Selector tape, Smoke detector, Stop switch, Sump pump, Traveling cable ***Advance.***	✓PPT slide 4 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 480 min This section: 20 min (5 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
ASK participants what they remember about traction elevator hoistways **SMALL GROUP ACTIVITY** **WRITE** **Instructor's Notes**	**In your own words:** Thinking back to previous courses or any previous elevator experiences so far, what are some things you may remember about the hoistway in an electric traction elevator system? ***[Allow participants to think for a minute and perhaps discuss with a partner ideas as well as write down any ideas. Discuss participant responses and if possible list them on a chalk board or similar.]*** ***Advance.***	✓PPT slide 5  **Optional:** Chalkboard/chalk or Paper/marker

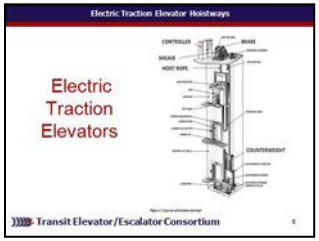
Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 460 min This section: 20 min (8 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides	**In your own words:** We have looked at some of the major components in a electric traction elevator system in course 213, and some of the major components associated with the operation of this elevator system. ***Advance.*** Lets start this module by looking reviewing what the hoistway as defined and the areas in the hoistway you will need to know. ***Advance.***	✓PPT slides 6, 7

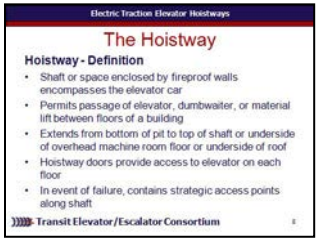
Instructor's Notes



Elevator – Electric Traction Hoistways

Instructor's Guide

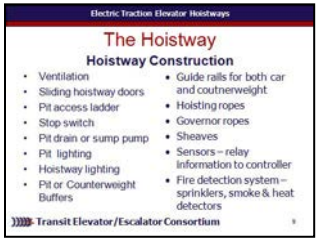
Module Length: 480 min Time remaining: 460 min This section: 20 min (8slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** A hoistway by definition ***Advance.*** is a shaft or space typically enclosed by fireproof walls to ***Advance.*** permit passage of an elevator, dumbwaiter, or material lift between the floors of a building. ***Advance.*** A more simplistic definition for the hoistway is the shaft that encompasses the elevator car. ***Advance.*** The hoistway extends from the bottom pit to the top of the shaft, which is generally the underside of the overhead machine room floor or the underside of the roof. ***Advance.*** Hoistway doors on each floor provide access to the elevator. ***Advance.*** Many hoistways are constructed with strategic access points along the shaft in the event of a mechanical failure. ***Advance.***	✓PPT slide 8 

Elevator – Electric Traction Hoistways

Instructor's Guide

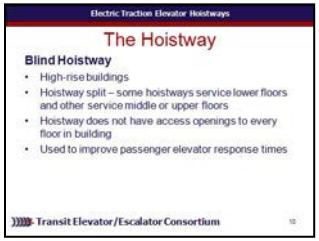
Module Length: 480 min Time remaining: 460 min This section: 20 min (8 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** The construction of a hoistway will typically include ventilation, sliding hoistway doors, pit access ladder, pit stop switch, pit drain or sump pump, pit or hoistway lighting, pit or counterweight buffers, ***Advance.*** guide rails for both the car and counterweight, hoisting ropes, governor ropes, sheaves, sensors mounted in the shaft to relay information to the controller concerning the position of the car within the hoistway, and usually a fire detection system which may or may not include sprinkler heads or smoke and heat detectors.. ***Advance.***	✓PPT slide 9 

Elevator – Electric Traction Hoistways

Instructor's Guide

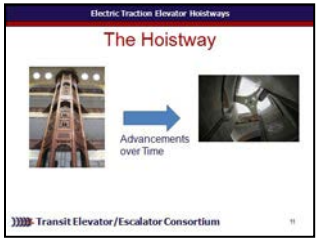
Module Length: 480 min Time remaining: 460 min This section: 20 min (6 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Generally the hoistways will service all floors of the building. ***Advance.*** However in high-rise buildings, ***Advance.*** the hoistways may be arranged with certain hoistways servicing only the lower floors and others servicing only middle or upper floors. This type of arrangement will often use what is known as *blind hoistways*. ***Advance.*** With this design, the hoistway does not have access openings to every floor in the building. ***Advance.*** This arrangement is mainly used in buildings to improve passenger elevator response times. ***Advance.***	✓PPT slide 10 

Elevator – Electric Traction Hoistways

Instructor's Guide

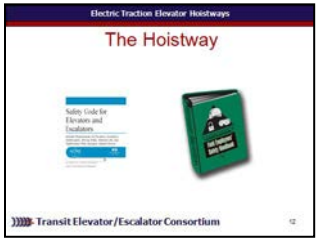
Module Length: 480 min Time remaining: 460 min This section: 20 min (8 slides) *Section start time:* _____ *Section End Time:* _____

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Even though the basic design of the hoistway has remained constant for years, advances in technology have made it easier to monitor the condition and status of the equipment contained in the shaft. Maintenance tasks for elevator systems, including conducting safety checks, are now easier to accomplish than in decades past. ***Advance.***	✓PPT slide 11 

Elevator – Electric Traction Hoistways

Instructor's Guide

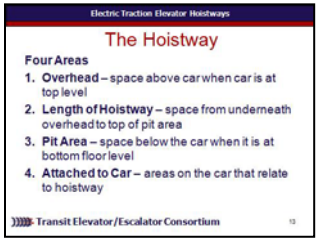
Module Length: 480 min Time remaining: 460 min This section: 20 min (8 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **REFER** participants to *Elevator Industry Field Employees' Safety Handbook 2010 and A17.1*. **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** All transit authorities have strict guidelines for working in an elevator hoistway. These guidelines are within ASME A17.1, *Safety Code for Elevators and Escalators*, and all applicable local jurisdiction codes that govern the operation of passenger elevators. All elevator technicians, such as the participants in this course, should adhere to the guidelines of ASME A17.1 as well as the *Elevator Industry Field Employees' Safety Handbook*, particularly Section 8. ***Advance.***	✓PPT slide 12  **Optional**: A17.1 and Employees' Safety Handbook – to show participants

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 460 min This section: 20 min (8 slides) *Section start time:* _____ *Section End Time:* _____

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** The hoistway in an electric traction elevator system may be divided into four areas ***Advance.*** Overhead - this is the space above the car when it is at the top floor level ***Advance.*** Length of hoistway - this is the space from underneath the overhead to the top of the pit area ***Advance.*** Pit area - this is the space below the car when it is at the bottom floor level ***Advance.*** Attached to the car - areas on the car that relate to hoistway ***Advance.***	✓PPT slide 13 

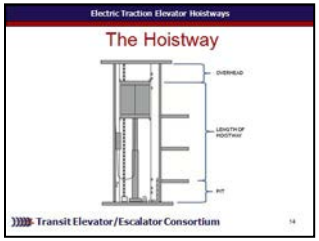
Elevator – Electric Traction Hoistways

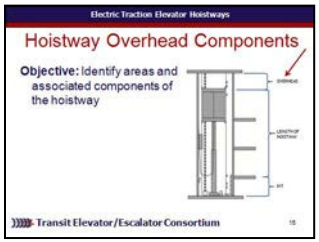
Instructor's Guide

Module Length: 480 min Time remaining: 440 min This section: 40 min (16 slides) *Section start time:* _____ *Section End Time:* _____

DO	SAY	Materials Needed
REVIEW slides	**In your own words:** Here is a diagram showing the first three areas, the Overhead where the space is above the car when it is at the top floor level, the Length of hoistway where the space is from underneath the overhead to the top of the pit area, the Pit area where the space is below the car when it is at the bottom floor level. ***Advance.*** Lets work from top to bottom and begin by looking at the components in the ***Advance.*** overhead hoistway area.	✓PPT slides 14, 15

Instructor's Notes

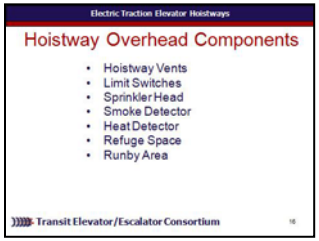




Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 440 min This section: 40 min (16 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Components found in the hoistway overhead of an electric traction transit elevators include: Hoistway Vents, Limit Switches, Sprinkler Head, Smoke Detector, Heat Detector, Refuge Space, and the Runby Area. ***Advance.*** In order to dissipate, or get rid of, excess heat in the hoistway, transit elevators have hoistway vents installed at the top of the overhead. Here is a photo of hoistway vents in a Washington Metro Transit Authority system. ***Advance.***	✓PPT slides 16, 17  

Elevator – Electric Traction Hoistways

Instructor's Guide

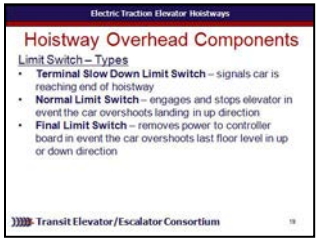
Module Length: 480 min Time remaining: 440 min This section: 40 min (16 slides) *Section start time:* _____ *Section End Time:* _____

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** A limit switch ***Advance.*** is a mechanical device that is activated by movement of the elevator. ***Advance.*** It mechanically opens a contact and limits the operation of the car. ***Advance.*** When activated, limit switches send signals to the controller regarding the position of the elevator car in the hoistway. ***Advance.***	✓PPT slide 18 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 440 min This section: 40 min (16 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide	**In your own words:** Typically in an electric traction elevator system there are three limit switches located in the hoistway overhead and pit area: terminal slow down, normal, and final. ***Advance.*** The terminal slow down limit switch signals the controller that the car is reaching the end of the hoistway. ***Advance.*** If the elevator overshoots the landing in the up direction, the normal limit is engaged and removes power to the elevator. ***Advance.*** If the elevator overshoots the last floor level in either the upward or downward direction, the final limit switch is engaged. The final limit removes power to the controller board. ***Advance.***	✓PPT slide 19 

Instructor's Notes

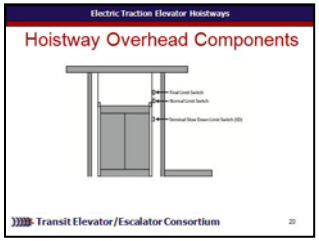
Elevator – Electric Traction Hoistways

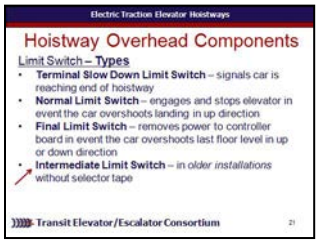
Instructor's Guide

Module Length: 480 min Time remaining: 440 min This section: 40 min (16 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides	**In your own words:** Here are the locations of the final, normal, and terminal slow down limit switches. ***Advance.*** In older installations where there is no selector tape, ***Advance.*** there are other intermediate limit switches along the length of the hoistway to signal to the controller the location of the car is in the hoistway. Discussion on the function of the elevator's selector tape occurs later in the module. ***Advance.***	✓PPT slides 20, 21

Instructor's Notes





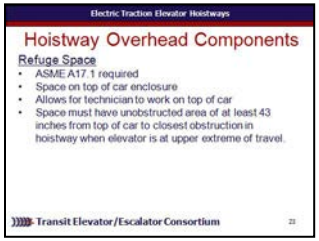
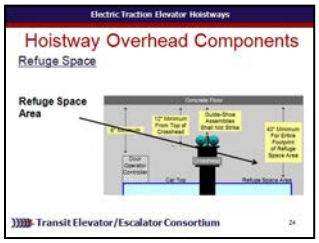
Module Length: 480 min Time remaining: 440 min This section: 40 min (16 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Fire safety devices are also located in the hoistway overhead. ***Advance.*** A heat detector is a fire alarm device that is activated when the temperature of a heat sensitive element has detected a rapid rate also known as a *"rate-of-rise"* or is above a fixed temperature gauge. ***Advance.*** Other devices such as a smoke detector and a fire sprinkler are required by code to be installed in elevator hoistways. ***Advance.*** Here is a hoistway smoke detector. ***Advance.***	✓PPT slide 22 

Elevator – Electric Traction Hoistways

Instructor's Guide

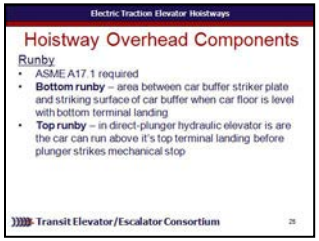
Module Length: 480 min Time remaining: 440 min This section: 40 min (16 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** ***Advance.*** ASME A17.1 Safety Code requires ***Advance.*** refuge space on top of the elevator car enclosure so that, if required, ***Advance.*** an elevator technician can work on top. ***Advance.*** This refuge space must have a clear unobstructed area of at least 43 inches from the top of the car to the closest obstruction in the hoistway when the elevator is at its upper extreme of travel. ***Advance.*** Here is a diagram showing the refuge space area as directed by the Code. ***Advance.***	✓PPT slides 23, 24  

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 440 min This section: 40 min (16 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Also required by ASME code ***Advance.*** are minimal distances for the runby areas (top and bottom) of the hoistway. ***Advance.*** The bottom runby is that area that is between the car buffer striker plate and the striking surface of the car buffer when the car floor is level with the bottom terminal landing. ***Advance.*** ASME code also defines the bottom runby in a traction elevator system as "the distance between the counterweight buffer striker plate and the striking surface of the counterweight buffer when the car floor is level with the top terminal landing." ***Advance.***	✓PPT slide 25 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 440 min This section: 40 min (16 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide	**In your own words:** ***Advance.*** Here is a diagram showing the refuge and runby space areas. Other components we have looked at are also shown here and highlighted. ***[Point out other components to participants.]*** ***Advance.***	✓PPT slide 26

Instructor's Notes

_____

_____

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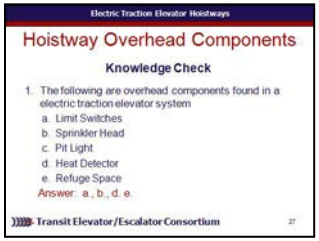
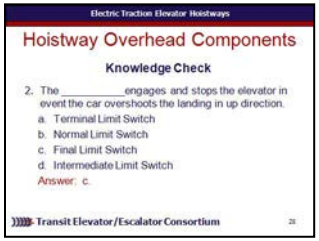
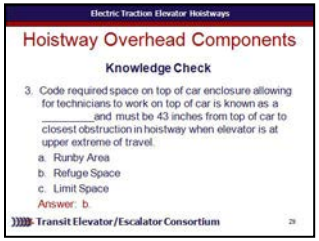
DO	SAY	Materials Needed
ASK **Instructor's Notes**	**In your own words:** Lets see what we have learned so far: The following are overhead components found in an electric traction elevator system a. Limit Switches b. Sprinkler Head c. Pit Light d. Heat Detector e. Refuge Space ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: a., b., d., e. ***Advance.***	✓PPT slide 27 

DO	SAY	Materials Needed
ASK **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** The _____engages and stops the elevator in event the car overshoots the landing in up direction. a. Terminal Limit Switch b. Normal Limit Switch c. Final Limit Switch d. Intermediate Limit Switch ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: c. ***Advance.***	✓PPT slide 28 

DO	SAY	Materials Needed
ASK **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Code required space on top of car enclosure allowing for technicians to work on top of car is known as a _____ and must be 43 inches from top of car to closest obstruction in hoistway when elevator is at upper extreme of travel. a. Runby Area b. Refuge Space c. Limit Space ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: b. ***Advance.***	✓PPT slide 29 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 minutes Time remaining: 400 minutes This section: 50 minutes *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
CLASSROOM ACTIVITY	**In your own words:** Okay, now it's time to see how this works in the real world. Please get your stuff together for a trip to the lab. ***[At instructor's discretion, take time to visit the field and look for electric traction hoistway overhead components and related information.]*** ***Advance.***	✓PPT slide 30

Instructor's Notes

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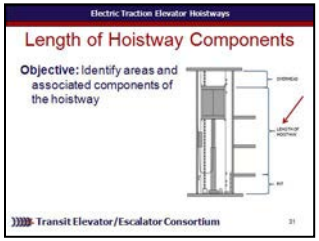
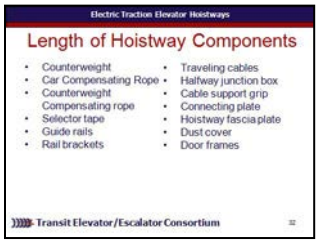
Elevator – Electric Traction Hoistways

Instructor's Guide

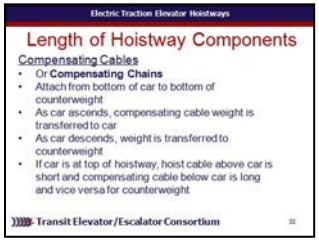
Module Length: 480 min Time remaining: 350 min This section: 50 min (22 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Lets move on and look at the components in the ***Advance.*** Length of the hoistway area. ***Advance.*** Components which run the length of the hoistway of an electric traction transit elevators include: Counterweight, Elevator car compensating rope, Counterweight Compensating Rope, Selector tape, Guide rails, Rail brackets, Traveling cables, Halfway junction box, Cable support, grip, Connecting plate, Hoistway fascia plate, Dust cover, Door frames ***Advance.***	✓PPT slides 31, 32  

Elevator – Electric Traction Hoistways

Instructor's Guide

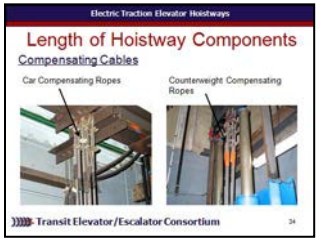
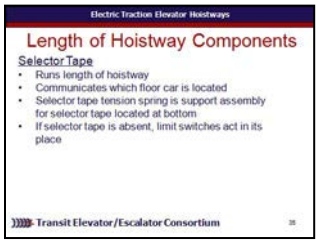
Module Length: 480 min Time remaining: 350 min This section: 50 min (22 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Traction elevators exceeding 100 feet (30 m) of travel require compensating cables ***Advance.*** or chains, that are ***Advance.*** attached from the bottom of the car to the bottom of the counterweight. ***Advance.*** As the elevator car ascends the hoistway, the compensating cable weight is transferred to the car. ***Advance.*** Likewise, as the elevator car descends the hoistway, weight is transferred to the counterweight. ***Advance.*** If the elevator cab is at the top of the hoistway, there is a short length of hoist cable above the car and a long length of compensating cable below the car and vice versa for the counterweight. ***Advance.***	✓PPT slide 33 

Elevator – Electric Traction Hoistways

Instructor's Guide

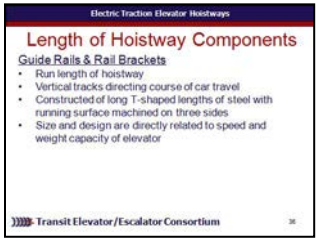
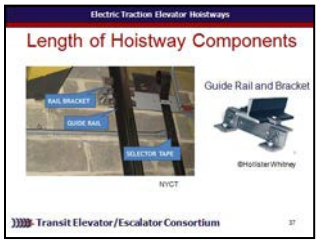
Module Length: 480 min Time remaining: 350 min This section: 50 min (22 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Here is a photo of each type of compensating cable. ***[Discuss photos.]*** ***Advance.*** The selector tape ***Advance.*** must run the entire length of the hoistway as ***Advance.*** it is needed to communicate to the selector regarding which floor the car is located at any given point. ***Advance.*** At the bottom part of the selector is a selector tape tension spring which is the support assembly for the selector tape. ***Advance.***	✓PPT slides 34, 35  

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min | Time remaining: 350 min | This section: 50 min (22 slides) | *Section start time: _____* | *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Guide rails and rail brackets ***Advance.*** also run the length of the hoistway. ***Advance.*** Guide rails function as vertical tracks to direct the course of travel of an elevator up and down the hoistway. ***Advance.*** They are constructed of long lengths of steel, which are T-shaped with the running surface machined on three sides. ***Advance.*** Their size and design are directly related to the speed and weight capacity of the elevator. ***Advance.*** Here is a selector tape, guide rails and rail brackets at the top of the hoistway as well as a Guide rail and brackets by Hollister Whitney. ***Advance.***	✓PPT slides 36, 37  

Elevator – Electric Traction Hoistways

Instructor's Guide

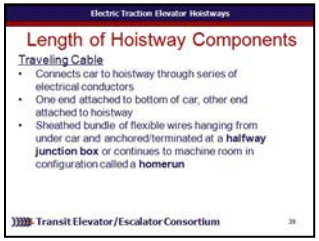
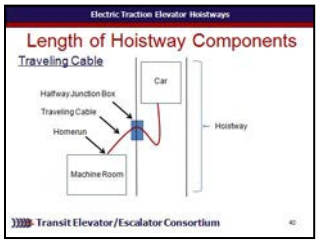
Module Length: 480 min | Time remaining: 350 min | This section: 50 min (22 slides) | *Section start time: _____* | *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** In some places two sections of guide rail may be joined together. The rails are milled with a tongue and groove that accepts the sections of rail and provides a stable seamless surface for the roller to ride over. This is known as a connecting plate also known as a *"fish plate."* ***Advance.***	✓PPT slide 38 

Elevator – Electric Traction Hoistways

Instructor's Guide

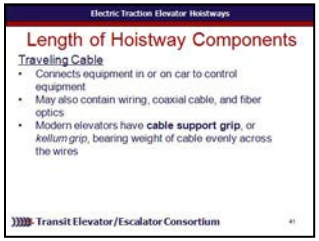
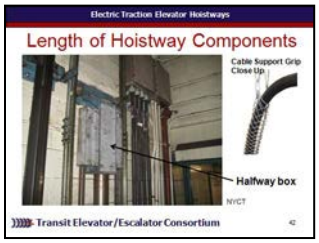
Module Length: 480 min Time remaining: 350 min This section: 50 min (22 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Traveling cables ***Advance.*** connect the car to the hoistway through a series of electrical conductors. ***Advance.*** One end is attached to the bottom of the car and one is attached to the hoistway. ***Advance.*** A traveling cable is a sheathed bundle of flexible wires hanging from under the elevator car at one end while anchored at a *junction* box located halfway up the hoistway. There, they can be terminated at a terminal strip in the halfway junction box or continue directly to the machine room in a configuration called a homerun. ***Advance.*** Here is a diagram of the traveling cable and its termination points. ***Advance.***	✓PPT slides 39, 40  

Elevator – Electric Traction Hoistways

Instructor's Guide

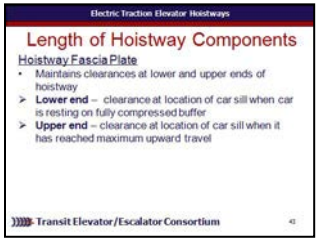
Module Length: 480 min | Time remaining: 350 min | This section: 50 min (22 slides) | *Section start time: _____* | *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** The travelling cable connects equipment in or on the car (buttons, lights, switches, door operator, etc.) to the control equipment in the machine room. Traveling cables may also contain shielded wiring, coaxial cable and, possibly fiber optics. Modern elevators have a cable support grip also known as a *kellum grip* which bears the weight of the cable evenly across the wires. This even distribution of weight is accomplished by tension caused by the cable support grip which functions much like a Chinese finger trap. ***Advance.*** Here are some photos showing the traveling cable, the cable support grip ***Advance***. And the halfway box. ***Advance.***	✓PPT slides 41, 42  

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 350 min This section: 50 min (22 slides) *Section start time: _____* *Section End Time: _____*

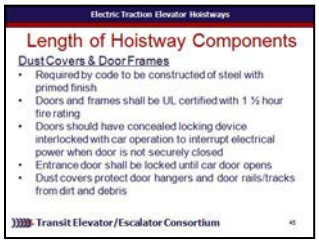
DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Located in the length of the hoistway is the hoistway fascia plate. These are normally provided to maintain clearances at the lower and upper ends of the hoistway. ASME A17.1 provides that these clearance measurements should be taken at the following hoistway locations: ***Advance.*** At the lower end of the hoistway, the specified clearance must be maintained to the location of the car sill when the car is resting on its fully compressed buffer. ***Advance.*** At the upper end of the hoistway, the clearance must be maintained to the location of the car sill when it has reached its maximum upward travel. ***Advance.***	✓PPT slide 43 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 350 min This section: 50 min (22 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides	**In your own words:** Here is a hoistway fascia plate. ***Advance.*** Elevator dust covers and door frames are required ***Advance.*** by ASME code to be constructed of steel with a primed finish. ***Advance.*** Doors and frames shall be UL certified with a 1½ hour fire rating. ***Advance.*** Doors shall have a concealed locking device, interlocked with the car operation to interrupt electrical power when the door is not securely closed. ***Advance.*** The entrance door shall be locked until car door opens. ***Advance.*** Dust covers are used to protect the door hangers and door rails/tracks from dirt and debris. ***Advance.***	✓PPT slides 44, 45



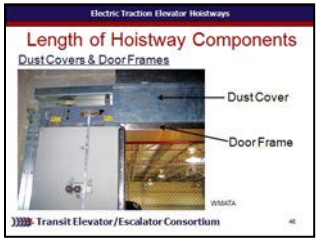
Instructor's Notes

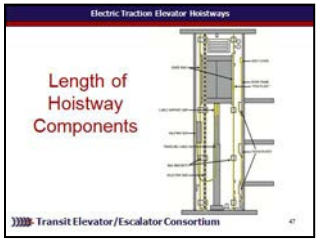
Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min | Time remaining: 350 min | This section: 50 min (22 slides) | *Section start time: _____* | *Section End Time: _____*

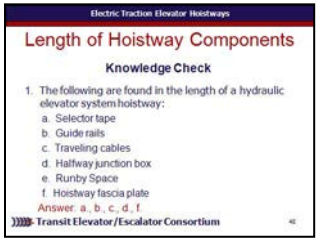
DO	SAY	Materials Needed
REVIEW slides	**In your own words:** This photo from WMATA is showing a dust cover and door frame. ***Advance.*** Here is a diagram showing all of the components of a hydraulic hoistway and their locations. ***[Point out the components to participants.]*** ***Advance.***	✓PPT slides 46, 47



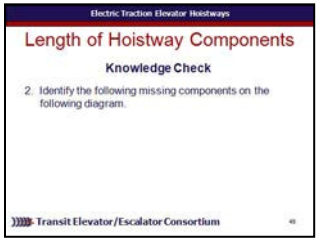
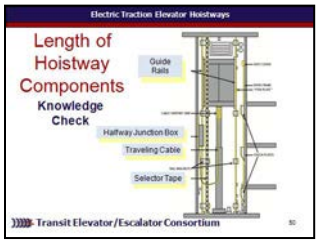


Instructor's Notes

Module Length: 480 min Time remaining: 350 min This section: 50 min (22 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: The following are components in the length of the hoistway in a hydraulic elevator system a. Selector tape b. Guide rails c. Traveling cables d. Halfway junction box e. Runby Space f. Hoistway fascia plate ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: a., b., c., d., f. ***Advance.***	✓PPT slide 48 

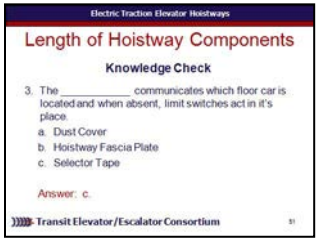
Module Length: 480 min Time remaining: 350 min This section: 50 min (22 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
ASK **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Name the following missing components on the following diagram. ***Advance.*** ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: guide rails ***Advance.*** ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: halfway junction box ***Advance.*** ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: traveling cable ***Advance.*** ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: selector tape ***Advance.***	✓PPT slides 49, 50  

Elevator – Electric Traction Hoistways

Instructor's Guide

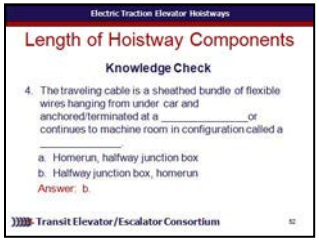
Module Length: 480 min | Time remaining: 350 min | This section: 50 min (22 slides) | *Section start time: _____* | *Section End Time: _____*

DO	SAY	Materials Needed
ASK **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** The _____ communicates which floor car is located and when absent, limit switches act in it's place. a. Dust Cover b. Hoistway Fascia Plate c. Selector Tape ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: c. ***Advance.***	✓PPT slide 51 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min | Time remaining: 350 min | This section: 50 min (22 slides) | *Section start time: _____* | *Section End Time: _____*

DO	SAY	Materials Needed
ASK **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** The traveling cable is a sheathed bundle of flexible wires hanging from under car and anchored/terminated at a _____or continues to machine room in configuration called a _____. a. Homerun, halfway junction box b. Halfway junction box, homerun ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: b. ***Advance.***	✓PPT slide 52 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 minutes Time remaining: 300 minutes This section: 50 minutes *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
CLASSROOM ACTIVITY	**In your own words:** Okay, now it's time to see how this works in the real world. Please get your stuff together for a trip to the lab. ***[At instructor's discretion, take time to visit the field and look for electric traction length of hoistway components and related information.]*** ***Advance.***	✓PPT slide 53 

Instructor's Notes

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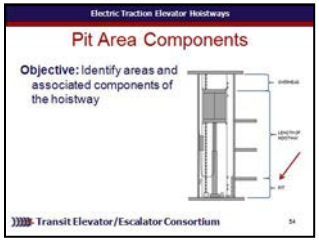
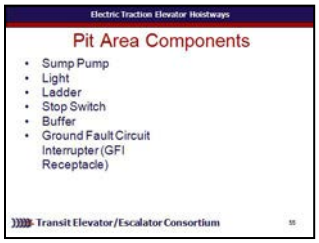
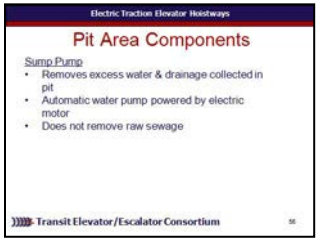
Elevator – Electric Traction Hoistways

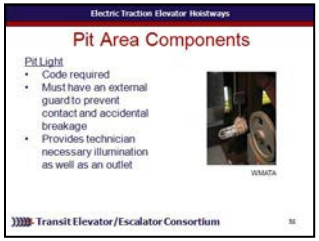
Instructor's Guide

Module Length: 480 min Time remaining: 250 min This section: 45 min (12 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Lets move on and look at the components in the ***Advance.*** Pit area. ***Advance.*** Important components found in the pit of a transit hydraulic elevator include: Sump Pump, Light, Ladder, Stop Switch, Buffer, and Ground Fault Circuit Interrupter (GFI Receptacle). ***Advance.***	✓PPT slides 54, 55  

Module Length: 480 min Time remaining: 250 min This section: 45 min (12 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Because transit elevators are often exposed to weather elements, water can collect in the elevator pit ***Advance.*** and a sump pump is necessary to remove this excess water. ***Advance.*** A sump pump is an automatic water pump powered by an electric motor for the removal of drainage, ***Advance.*** except raw sewage, from the pit area. ***Advance.*** Here is a photo showing a sump pump in a WMATA system. ***Advance.***	✓PPT slides 56, 57  

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** As required by ASME code, elevator pits must be equipped with a light, ladder, and stop switch. ***Advance.*** The light, ***Advance.*** which must have an external guard to prevent contact and accidental breakage, ***Advance.*** gives the technician the necessary illumination as well as an outlet to power other devices. ***Advance.*** Pit ladders are required in all pits that ***Advance.*** extend more than 35 inches below the bottom landing sill. ***Advance.*** The pit ladder must extend 48 inches above the landing entrance ***Advance.*** and the ladder rungs must be at least 16 inches wide unless obstructions prevent this, and in that case it can be no less than 9 inches wide. ***Advance.***	✓PPT slides 58, 59  

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 250 min This section: 45 min (12 slides) *Section start time: _____* *Section End Time: _____*

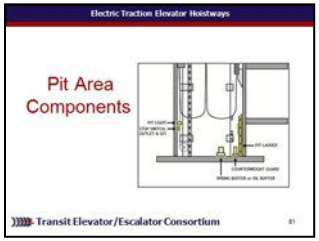
DO	SAY	Materials Needed
REVIEW slide **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Experienced mechanics will agree that the most important of these three components is the pit stop switch, ***Advance.*** which, in emergency situations inside the pit, gives the technician the ability to stop the car from moving. ***Advance.*** ASME code indicates that the pit stop switch will have red operating handles or buttons and should be permanently marked "STOP" indicating the stop and run positions. ***Advance.*** ASME code also indicates that the pit stop switch shall be located within reach of the access floor, adjacent to the pit ladder and located about 18" above the landing in order to be accessible before stepping onto the pit ladder. ***Advance.***	✓PPT slide 60 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 250 min This section: 45 min (12 slides) *Section start time:* _____ *Section End Time:* _____

DO	SAY	Materials Needed
REVIEW slide	**In your own words:** Here are the components and their locations in the pit area of an electric traction elevator system. ***[Point out the components to participants.]*** ***Advance.***	✓PPT slide 61



Instructor's Notes

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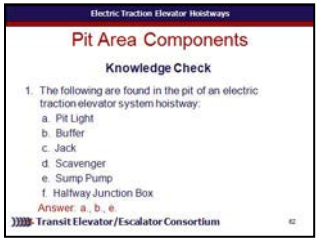
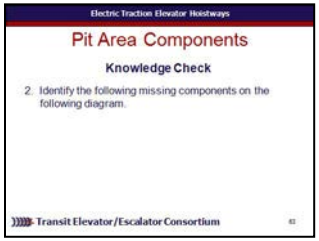
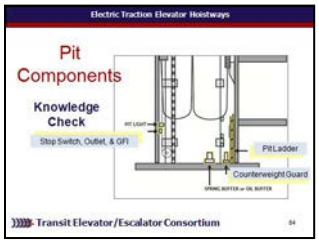
Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min | Time remaining: 250 min | This section: 45 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: The following are found in the pit of a hydraulic elevator system hoistway: a. Pit Light b. Buffer c. Jack d. Scavenger e. Sump Pump f. Halfway Junction Box ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: a., b., e. ***Advance.***	✓PPT slide 62 

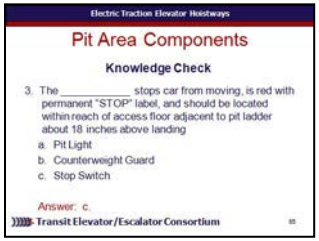
Module Length: 480 min Time remaining: 250 min This section: 45 min (12 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
ASK **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Name the following missing components on the following diagram. ***Advance.*** ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: Stop Switch, outlet, and GFI ***Advance.*** ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: Pit Ladder ***Advance.*** ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: Counterweight Guard ***Advance.***	✓PPT slides 63, 64  

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 250 min This section: 45 min (12 slides) *Section start time: _____* *Section End Time: _____*

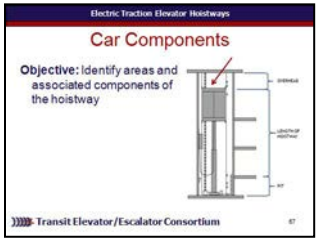
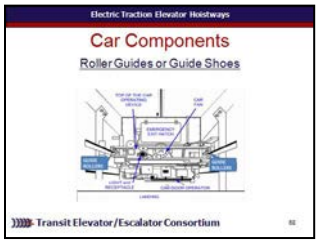
DO	SAY	Materials Needed
ASK **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** The _____ stops car from moving, is red with permanent "STOP" label, and should be located within reach of access floor adjacent to pit ladder about 18 inches above landing. a. Pit Light b. Counterweight Gaurd c. Stop Switch ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: c. ***Advance.***	✓PPT slide 65 

DO	SAY	Materials Needed
CLASSROOM ACTIVITY **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Okay, now it's time to see how this works in the real world. Please get your stuff together for a trip to the lab. ***[At instructor's discretion, take time to visit the field and look for electric traction pit area components and related information.]*** ***Advance.***	✓PPT slide 66 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 155 min This section: 15 min (7 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Lets move on and look at the car ***Advance.*** components. ***Advance.*** On electric traction elevators, the only components attached to the car is either a roller guide or a guide shoe and an undercar safety device . The elevator car travels the length of the hoistway by rolling along the guide rails. This is done by either roller guides or guide shoes attached to the elevator car. ***Advance.***	✓PPT slides 67, 68  

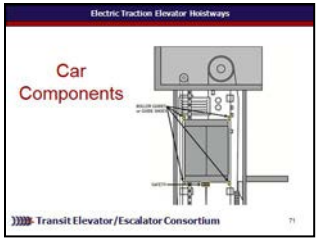
Elevator – Electric Traction Hoistways

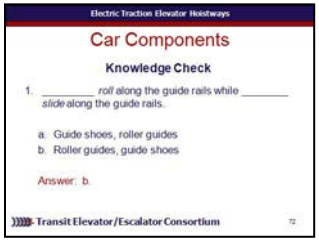
Instructor's Guide

Module Length: 480 min Time remaining: 155 min This section: 15 min (7 slides) *Section start time: _____* *Section End Time: _____*

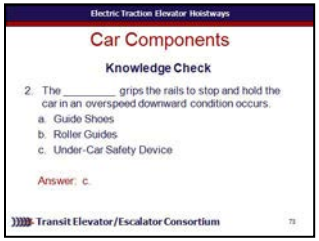
DO	SAY	Materials Needed
REVIEW slides	**In your own words:** Roller guides *roll* along the guide rails while guide shoes *slide* along the guide rails. ***Advance.*** The under-car safety device, when activated, grips the rails to stop and hold the elevator car if overspeed occurs in the down direction. ***Advance.*** The locations for the roller guide, guide shoes, and under-car safety device can be seen on this diagram. ***Advance.***	✓PPT slides 69, 70, 71

Instructor's Notes



DO	SAY	Materials Needed
ASK **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Lets see what we have learned so far: Roller guides *roll* along the guide rails while guide shoes *slide* along the guide rails. a. Guide shoes, roller guides b. Roller guides, guide shoes ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: b. ***Advance.***	✓PPT slide 72 

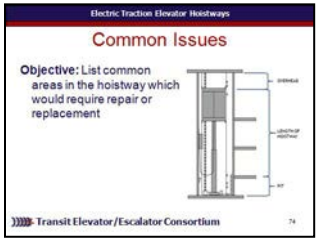
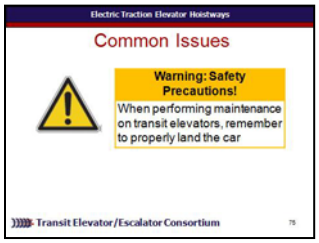
Module Length: 480 min | Time remaining: 155 min | This section: 15 min (7 slides) | *Section start time: _____* | *Section End Time: _____*

DO	SAY	Materials Needed
ASK **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** The _____ grips the rails to stop and hold the car in an overspeed downward a. condition occurs. Guide Shoes b. Roller Guides c. Under-Car Safety Device ***Call on participants for answer.*** ***Advance for correct answer.*** Answer: c. ***Advance.***	✓PPT slide 73 

Elevator – Electric Traction Hoistways

Instructor's Guide

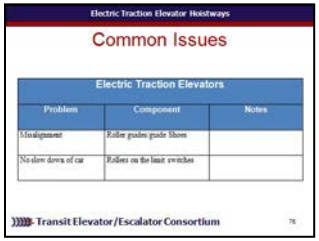
Module Length: 480 min Time remaining: 140 min This section: 60 min (4 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Lets move on to our last objective. You will need to use the handout for notes for your specific authority information. For our last objective, we want to look at common areas in the hoistway which require maintenance or replacement. ***Advance.*** Before we discuss any specific information, the one rule to always follow first when performing maintenance on transit elevators, remember to properly land the car. ***Advance.***	✓PPT slides 74, 75  

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 140 min This section: 60 min (4 slides) *Section start time: _____* *Section End Time: _____*

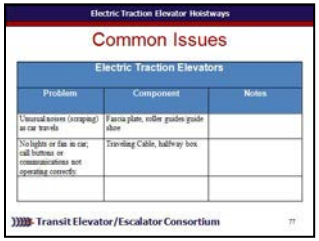
DO	SAY	Materials Needed
REVIEW slides **SMALL GROUP ACTIVITY** **WRITE** authority specific notes **Instructor's Notes**	**In your own words:** Once the elevator car is properly secured and all work safety guidelines are followed, the experienced elevator technician can perform required maintenance. While it is beyond the scope of this course to present the participant with a detailed list of maintenance requirements for a electric traction elevator system, there are some common problems in the hoistway that the course participant should note. Make sure you have your note sheet now as well as a writing instrument for note taking. ***[Review the problem, component, and authority specific instructions to apply.] Advance.***	✓PPT slide 76 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 140 min This section: 60 min (4 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **SMALL GROUP ACTIVITY** **WRITE** authority specific notes **Instructor's Notes**	**In your own words:** ***[Review the problem, component, and authority specific instructions to apply.]*** ***[Use the last area to add any other common component requiring maintenance or replacement for your specific authority.]*** ***Advance.***	✓PPT slide 77



Elevator – Electric Traction Hoistways

Instructor's Guide

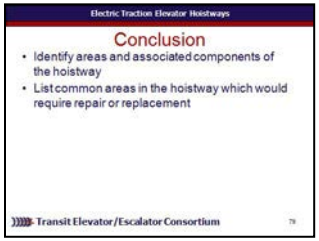
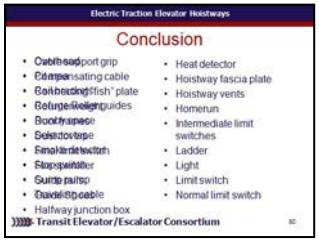
Module Length: 480 minutes Time remaining: 80 minutes This section: 50 minutes *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
CLASSROOM ACTIVITY **Instructor's Notes** _____ _____ _____ _____ _____	**In your own words:** Okay, now it's time to see how this works in the real world. Please get your stuff together for a trip to the lab. ***[At instructor's discretion, take time to visit the field and look for electric traction common hoistway components, and related information.]*** ***Advance.***	✓ PPT slide 78 

Elevator – Electric Traction Hoistways

Instructor's Guide

Module Length: 480 min Time remaining: 30 min This section: 30 minutes (3 slides) *Section start time: _____* *Section End Time: _____*

DO	SAY	Materials Needed
REVIEW slides **ASK** **Instructor's Notes** _____ _____ _____ _____ _____	**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.*** 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.*** ***[Read slide. Discuss definitions as a group.]*** ***Advance.*** ***[Read slide. Discuss definitions as a group.]*** ***Advance.***	✓ PPT slides 79, 80  

Module Length: 480 min Time remaining: 30 min This section: 30 minutes (3 slides) *Section start time:* _____ *Section End Time:* _____

DO	SAY	Materials Needed
CLASSROOM ACTIVITY	**In your own words:** ***Administer quiz.***	✓ PPT slide 81

Instructor's Notes

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