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## Elevator – General Safety and Maintenance

### Instructor’s Guide

### Icons Used In This Guide

- **REVIEW slides**
- **INDIVIDUAL ACTIVITY**
- **ASK**
- **WRITE**
- **CLASSROOM ACTIVITY**
- **Multimedia**
- **SMALL GROUP ACTIVITY**
- **REFER participants to**

### Agenda

<table>
<thead>
<tr>
<th>Topic #</th>
<th>Topic Title</th>
<th>Duration</th>
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<tbody>
<tr>
<td>1</td>
<td>Overview</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>2</td>
<td>Types of Maintenance</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>3</td>
<td>Barricades</td>
<td>30 Minutes</td>
</tr>
<tr>
<td>4</td>
<td>Fall Protection</td>
<td>10 Minutes</td>
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<tr>
<td>5</td>
<td>Landing the Car</td>
<td>30 Minutes</td>
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<tr>
<td>6</td>
<td>Documentation</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>7</td>
<td>Field Trip</td>
<td>80 Minutes</td>
</tr>
<tr>
<td>8</td>
<td>Summary</td>
<td>30 Minutes</td>
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</table>

**Total Time:** 240 Minutes
Elevator – General Safety and Maintenance

Instructor’s Guide

Overview

Purpose
The purpose of this module is to:

Provide the participant with a conceptual understanding of safety practices for elevator inspection and maintenance.

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

• Identify general safety practices
• Relate safe work practice to elevator maintenance
• Explain safe practices related to the use of scaffolding
• Identify protocol for authority PM documentation

Materials

Mandatory
Make sure you have the following
• PowerPoint Presentation
• Coursebook
• Quizzes
• Pencils

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
• Specific transit authority related procedures and guidelines
• Transit authority preventative maintenance checklist
• Elevator Industry Field Employees’ Safety Handbook
In your own words:
Welcome to the course on Elevator Safety Procedures for Inspection and Maintenance.

Advance

We’ve seen this earlier, but it doesn’t hurt to look again.

- Elevators kill 27 & seriously injure 10,200 each person year
- 20 of those deaths are those working on or near elevators
- Elevator workers have the sixth-highest rate of work-related deaths of all construction trades
- Main causes of deaths: being caught in or between elevators and elevator shafts, falls, being struck by objects, and collapses

Advance
### Elevator – General Safety and Maintenance

#### Instructor’s Guide

Module Length: 240 min    Time remaining: 240 min    This section: 20 min (9 slides)    Section start time:    Section End Time: 

<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
<th>Materials Needed</th>
</tr>
</thead>
</table>
| In your own words: | - Identify general safety practices  
- Relate safe work practice to elevator maintenance  
- Explain safe practices related to the use of scaffolding  
- Identify protocol for authority PM documentation  
Advance | | ✓ PPT slide 3 |

### Instructor’s Notes

- [Blank line]
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### Materials Needed

- PPT slide 4
- Instructor's Guide
- Key Terms:
  - Barricade
  - Buffers
  - Corrective Maintenance
  - Fall Protection
  - Landing The Car
  - Log Books
  - Lubrication
  - Maintenance Management Software (MMS)

### 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:

  - Barricade
  - Buffers
  - Corrective Maintenance
  - Fall Protection
  - Landing The Car
  - Log Books
  - Lubrication
  - Maintenance Management Software (MMS)

**Advance**
### Elevator – General Safety and Maintenance

**Instructor’s Guide**

Module Length: 240 min  
Time remaining: 240 min  
This section: 20 min (9 slides)  
Section start time:  
Section End Time:  

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<tbody>
<tr>
<td></td>
<td>In your own words:</td>
<td>✓ PPT slides 4, 5</td>
</tr>
<tr>
<td></td>
<td>As well as:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Original Equipment Manufacturers’ (OEMs)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Personal Fall Arrest System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Planned Maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- PM Checklist</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Predictive Maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Preventive Maintenance (PM)</td>
<td></td>
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<tr>
<td></td>
<td><strong>Advance</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>And</td>
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<tr>
<td></td>
<td>- Preventive Maintenance Plan</td>
<td></td>
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<tr>
<td></td>
<td>- Reactive Maintenance</td>
<td></td>
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<tr>
<td></td>
<td>- Scaffold</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Testing</td>
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<tr>
<td></td>
<td><strong>Advance</strong></td>
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</tr>
</tbody>
</table>

**Instructor’s Notes**

- REVIEW key terms

---

- Original Equipment Manufacturers (OEMs)
- Personal Fall Arrest System
- Planned Maintenance
- PM Checklist
- Predictive Maintenance
- Preventive Maintenance (PM)

**Advance**

- Preventive Maintenance Plan
- Reactive Maintenance
- Scaffold
- Testing

**Advance**
**Elevator – General Safety and Maintenance**

**Instructor’s Guide**

Module Length: 240 min  
Time remaining: 240 min  
This section: 20 min (9 slides)  
Section start time:  
Section End Time:  

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</table>
| ASK | **In your own words:**  
Thinking back to other courses or just in general, who can recall some important aspects regarding safety along with the maintenance and inspection of elevators?  

**[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 |
| SMALL GROUP ACTIVITY |  
| WRITE |

**Instructor’s Notes**

- [PPT slide 6]
- **Materials Needed**
  - PPT slide 6
  - Paper
  - Chalk board or large paper
In your own words:

Follow your transit agency’s procedures regarding proper Preventive Maintenance (PM) and regular inspections. **Advance** Each agency will have its own rules regarding the period for preventive maintenance procedures that will be based on **Advance** original equipment manufacturers’ (OEMs) recommendations, **Advance** weather conditions, **Advance** number of riders, and **Advance** amount of run time for each unit. **Advance** Preventive maintenance is **Advance** the minor adjustments and minor repairs due to wear and everyday usage. Preventive maintenance includes
**Instructor’s Notes**

- ...

**DO** | **SAY** | **Materials Needed**
--- | --- | ---
**REVIEW** slide | In your own words:

....The lubrication of the components as require. This module will cover safety as it pertains specifically to preventive maintenance of transit elevators. For more general safety training please refer to the previous safety modules found within Courses 200 and 213, Overview of Vertical Transportation in the Public Transit Industry and Elevator – Principles of Operation.

*Advance*

✓ PPT slide 7
### Materials Needed

- ✓ PPT slides 8, 9

### Instructor’s Notes

- REVIEW slides

### DO | SAY

<table>
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<th>In your own words:</th>
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<tbody>
<tr>
<td><strong>Warning:</strong></td>
</tr>
<tr>
<td>The following should always be taken before inspecting and maintaining elevator equipment:</td>
</tr>
<tr>
<td>- Notify proper personnel, such as station attendants</td>
</tr>
<tr>
<td>- Set up the barricades on all landings (even if hoistway door is closed)</td>
</tr>
</tbody>
</table>

**Advance**

Here is a transit technician notifying the station attendants before performing preventative maintenance. Notice he has already begun to take other precautions as well such as wearing proper PPE.

**Advance**
### Elevator – General Safety and Maintenance

**Instructor’s Guide**

*Module Length: 240 min  Time remaining: 220 min  This section: 30 min (16 slides)  Section start time: ________  Section End Time: ________*

<table>
<thead>
<tr>
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<th>SAY</th>
<th>Materials Needed</th>
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</thead>
</table>
| ![REVIEW](image) | **In your own words:**  
| ![ASK](image) | **Ask**  
Who can remember or who knows the three types of maintenance?  
**Advance for correct answer**  
Reactive Maintenance  
Predictive Maintenance  
Preventative Maintenance  
**Advance**  
Lets talk about **reactive maintenance** first. Reactive maintenance is “run it till it breaks.”  
**Advance**  
No action or effort is taken to maintain the equipment as the OEM intended.  
**Advance**  
The advantages of reactive maintenance are minimal incidents of failure of new equipment, limited manpower as the manpower is not used until something breaks, and no one sees any associated maintenance cost.  
**Advance**  

| ![PPT](image) | **✓ PPT slides 10, 11** |
| ![Types of Maintenance](image) | **Types of Maintenance**  
3 Approaches for Maintenance  
- Reactive Maintenance  
- Predictive Maintenance  
- Preventative Maintenance  

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**Instructor’s Notes**

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- 

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Transit Elevator/Escalator Consortium
In your own words:
The disadvantages of reactive maintenance are decreased equipment life expectancy, increased labor costs for repairs because failures will most likely be more extensive, and increased capital cost for premature equipment replacement. Additionally, the lack of maintenance will increase the probability of accidents and lawsuits.

Advance

Reactive maintenance could, unfortunately, lead to this.
"The elevators just stopped working...we didn't do anything!"
Michigan Central Station in Detroit, Michigan, U.S.A.

Advance
The second type is **predictive maintenance**.

**Advance** Predictive maintenance is maintenance based on the actual condition of the elevator, rather than on a preset schedule.

**Advance** The advantages of predictive maintenance are decreased costs for parts and labor, allows for preemptive corrective actions, and decreased downtime used for unneeded maintenance.

**Advance** The disadvantages of predictive maintenance are increased investment in diagnostic equipment, increased investment in staff training, and savings potential not easily seen by management.
### Materials Needed

- PPT slide 14

### Instructor’s Notes

- The third type of maintenance is **preventive maintenance** (PM).
  **Advantage** Preventive maintenance is scheduled maintenance procedures at predetermined time intervals. These procedures are performed by cleaning, inspecting, adjusting, lubricating and replacing worn parts before they fail.

- **Advantage** The advantages of preventive maintenance are increased elevator life expectancy, improved elevator reliability, and decreased operating costs over the life of the elevator.

- **Advantage** The disadvantages of preventive maintenance are very labor intensive, includes performance of unneeded maintenance, and potential for incidental damage to components in conducting unneeded maintenance. **Advance**
**In your own words:**

A good **preventive maintenance plan**

**Advance** is a structured approach to making sure that any equipment used in a system is functioning with the highest possible degree of efficiency.

**Advance** The goal is to minimize opportunities for the equipment to break down and adversely affect the riding public.

**Advance** While a plan of this type will vary based on the nature of the transit authority’s approach, there are a few basics that are likely to be part of any ongoing preventive maintenance strategy. These include regular testing, periodic adjustments, lubrication of parts, replacement of worn parts before they fail, and routine cleaning. Properly performed preventive maintenance increases reliability and reduces breakdowns.

**Advance**
In your own words:
A preventive maintenance plan is NOT “IF IT’S NOT BROKEN OR NOISEY, LET IT ALONE”. Preventive maintenance is NOT OPTIONAL. Preventive maintenance is required by code, industry standards, and equipment manufacturers’. The code book states it is mandatory.

Advance
Testing is a basic part of the preventive maintenance plan which involves examination of the equipment to ensure that each device is functioning properly as designed. It is not unusual for testing of this type to be conducted at regular scheduled intervals such as monthly, quarterly or annually. In transit systems that operate around the clock, the testing may occur near the off-peak hours of operation, making it possible to have no more than minimal impact on transportation outcomes. Often, running these periodic tests helps to identify potential issues that could, over time cause the equipment to become inoperable, and provide the chance to address those issues now rather than later.

Advance
In your own words:
The process of preventive maintenance can be divided into two separate sub-categories: planned maintenance and corrective maintenance. **Planned maintenance** includes scheduled overhauls as well as scheduled equipment replacement (individual component or block systems).

**Advance**

**Corrective maintenance** occurs during the process when a fault, or unsafe condition, is encountered during the PM process. Here, the maintenance personnel performing the PM perform routine service to the equipment, as well as using the opportunity to correct problems that they may encounter. The PM process helps to identify any differences between the actual and the expected behavior of the systems.

**Advance**
In your own words:

**Ask**
Why is elevator preventive maintenance important?

**Allow participants to discuss possible answers.**

From the first day an elevator is put into service, everyday normal operation begins to deteriorate its components. Environmental issues like dirt, snow, rain/water, temperature extremes can accelerate this deterioration. Deterioration can also be accelerated by overloading, accidents and misuse Preventive maintenance is important because elevators not receiving regularly scheduled maintenance will have components that fail prematurely.

**Advance**

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**Materials Needed**

- ✓ PPT slide 19

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**Instructor’s Notes**

- [Add notes here]
- [Add notes here]
- [Add notes here]
- [Add notes here]
- [Add notes here]
- [Add notes here]
### Elevator – General Safety and Maintenance

**Instructor’s Guide**

Module Length: 240 min  
Time remaining: 220 min  
This section: 30 min (16 slides)  
Section start time: ________  
Section End Time: ________

<table>
<thead>
<tr>
<th>DO</th>
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<tbody>
<tr>
<td>REVIEW slide</td>
<td>In your own words:</td>
</tr>
<tr>
<td></td>
<td>The goals of preventive maintenance are:</td>
</tr>
<tr>
<td></td>
<td>• Avoid equipment failure</td>
</tr>
<tr>
<td></td>
<td>• Perform regularly scheduled procedures to clean, inspect, adjust and lubricate components (which will reduce failures)</td>
</tr>
<tr>
<td></td>
<td>• Improve overall safety for the workers, riders, and working environment by properly maintaining elevators</td>
</tr>
<tr>
<td></td>
<td>• Increase workforce efficiency</td>
</tr>
<tr>
<td></td>
<td>• Reduce the number of elevator failures and shutdowns</td>
</tr>
<tr>
<td></td>
<td>• Allow more time to perform scheduled preventive maintenance</td>
</tr>
<tr>
<td></td>
<td>• Improve equipment reliability by having an effective preventive maintenance plan</td>
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<td></td>
<td>Do Not Advance</td>
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</table>

**Materials Needed**

- PPT slide 20
**Materials Needed**

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<tbody>
<tr>
<td>REVIEW slides</td>
<td>In your own words:</td>
</tr>
<tr>
<td>ASK</td>
<td>• Fewer elevator repairs and shutdowns result in decreased costs for parts and labor</td>
</tr>
<tr>
<td></td>
<td>• Preventive maintenance extends the useful life of an elevator by controlling degradation and minimizing failures.</td>
</tr>
<tr>
<td>Instructor’s Notes</td>
<td><strong>Advance Ask</strong></td>
</tr>
<tr>
<td></td>
<td>Why is lubrication important?</td>
</tr>
<tr>
<td></td>
<td>Allow participants to discuss possible answers.</td>
</tr>
<tr>
<td></td>
<td>Proper lubrication is perhaps the most important part of any preventive maintenance plan. Lubrication of the correct type, at the right location, along with the proper amount extends the life of moving parts.</td>
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<td><strong>Do Not Advance</strong></td>
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</table>

- PPT slides 20, 21
### Instructor’s Notes

- Proper lubrication reduces friction and wear, forms a film barrier between moving components to prevent or reduce metal-to-metal contact, reducing operating temperature by absorbing and dissipating heat. In addition, proper lubrication will protect against corrosion by setting up a film barrier and neutralizing chemical products. Lubrication keeps components clean by suspending contaminants and keeping them from adhering to parts (i.e., limits damage caused by dust, dirt, and water). Finally, lubrication helps dampen and cushion parts against mechanical shock or vibrations. Lubrication is not an option and is required by code, industry standards, and equipment manufacturers.

**Advance**
In your own words:

It is recommended that a team approach be used whenever two individuals are performing inspections and/or basic maintenance. This approach varies by transit agencies. The team should review proper communications and safety practices as required by your transit agencies, manufacturer, and governmental agencies. Follow local rules regarding barricades, signs, and informing proper personnel before beginning inspection or maintenance.

Advance
### Instructor’s Notes

- The following are basic recommendations regarding inspections and maintenance. Use your five senses (sight, hearing, feel, smell and limited taste) when inspecting and performing maintenance. Look not only at the part you are working on but at the big picture (i.e., look around when in the pit to see anything that appears to be not right or abnormal). Finally, and most importantly, use your knowledge, past experience and basic physics (i.e., gravity, mechanics, and electricity, etc.). If you have any doubts, always ask. Everyone is learning every day.

**Advance** Think safety first.

**Advance**
### Elevator – General Safety and Maintenance

#### Instructor’s Guide

**In your own words:**

Let’s see what we have learned so far: A good preventative maintenance plan includes everything except:

- a. Regular testing
- b. Letting it run until it breaks
- c. Replacing worn parts before failure
- d. Routine cleaning
- e. Lubrication

**Instructor’s Notes**

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**Ask**

- Call on participants for answer
- Advance for correct answer

**Answer:** b. Letting it run till it breaks

**Advance**

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**Materials Needed**

- PPT slide 23

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**DO**

**Materials Needed**

- **SAY**
  
  **In your own words:**
  Name at least 5 goals of preventative maintenance.

  **Call on participants for answer**
  **Advance for correct answer**
  
  Possible answers:
  - Avoid equipment failure
  - Perform scheduled procedures
  - Improve safety
  - Increase worker efficiency
  - Reduce failures and shutdowns
  - Allow more PM time
  - Preventative Maintenance Plan
  - Decreased labor and parts costs
  - Extends life of elevator

**Advance**
### Elevator – General Safety and Maintenance

**Instructor’s Guide**

**Module Length:** 240 min  
**Time remaining:** 220 min  
**This section:** 30 min (16 slides)  
**Section start time:**  
**Section End Time:**

<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
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</thead>
</table>
| ![ASK] | **In your own words:** Basic recommendations for maintenance and inspection include all except  
  a. Use your five senses  
  b. Look at the big picture  
  c. When in doubt, never ask  
  d. Use your knowledge, experiences, and basic physics  |
| ![ASK] | **Call on participants for answer**  
**Advance for correct answer**  
**Answer:** c. When in doubt, never ask  
- ALWAYS ask  
  **Advance**  |

- PPT slide 25

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**Instructor’s Notes**

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### Instructor’s Notes

- When maintenance is being performed on a machine, the area in which you are working may need to be secured. For instance, a portion of a floor plate or side panel may need to be removed to gain access in order to perform maintenance or inspection on the machine. In this case, a hazardous condition has been created. The area needs to be barricaded so that patrons and other employees are aware of the hazard and its location.
- Securing the area will help prevent people from entering the hazardous area. Securing an area can also prevent curious people from getting too close to you and the equipment.
- Your undivided attention is required when you are working on a machine or a piece of equipment.

**Do Not Advance**
### Elevator – General Safety and Maintenance

**Instructor’s Guide**

<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
<th>Materials Needed</th>
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</table>
| REVIEW slides | **In your own words:**

Any distractions could prove to be dangerous and even fatal. Securing the work zone keeps these distractions at a safe distance, allowing you to focus on the task at hand. **Advance**

Refer participants to the Elevator Industry Field Employees’ Safety Handbook Sections 4.3 and 4.4 for additional information on barricades. | ✓ PPT slides 26, 27 |

**Instructor’s Notes**

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## Elevator – General Safety and Maintenance

**Instructor’s Guide**

<table>
<thead>
<tr>
<th>Module Length: 240 min</th>
<th>Time remaining: 190 min</th>
<th>This section: 10 min (4 slides)</th>
<th>Section start time:</th>
<th>Section End Time:</th>
</tr>
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</table>

### DO

### SAY

- **In your own words:**

**General Safety Reminders and Highlights**

Secure workplace when creating a hazardous condition (for example, removing floor plate or side panel).

**BARRICADES**

**Advance** Barricades are a crucial element in maintaining a safe inspection and maintenance area.

- **Advance** Must be rigid and surround the work area.
- **Advance** Minimum of 42 inches tall.
- **Advance** All sections must be connected.
- **Advance** Must surround elevator to prevent public access.
- **Advance** Must be in place before any work is started on the elevator.

**Advance**

### Materials Needed

- ✓ PPT slide 28

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**Instructor’s Notes**

- [Image: Instructor’s Notes]

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**Transit Elevator/Escalator Consortium**

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Elevator – General Safety and Maintenance

*Instructor’s Guide*

<table>
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<tr>
<th>DO</th>
<th>SAY</th>
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<tbody>
<tr>
<td>REVIEW slide</td>
<td><strong>In your own words:</strong> Must be securely connected and attached so that it cannot be moved easily. <strong>Advance</strong> Methods of attachment vary with location. <strong>Advance</strong> Follow each transit property’s procedure regarding sign procedures for directing riders. <strong>Advance</strong></td>
</tr>
</tbody>
</table>

**Materials Needed**

- PPT slide 28

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**Instructor’s Notes**

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DO

Instructor’s Notes

SAY

In your own words:
Let's see what we have learned so far:
Safety reminders for barricades include all except:

- 42 inches tall
- Rigid
- Allows for public access
- Securely connected to prevent easy movement
- In place before work starts

Call on participants for answer
Advance for correct answer
Answer: c. Allows for public access

Advance

Materials Needed

✓ PPT slide 29
When performing maintenance in the hoistway, falls are among the most common causes of serious work-related injuries and deaths. Inspections and maintenance performed along the length of the hoistway are generally performed from the top of the car. The top of the car acts as a moving platform from which the technician works. The car can be moved up or down in the hoistway to facilitate inspections and repairs to any of the various switches, safety devices, or door mechanisms.

Advance
### DO

<table>
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<th>REUSE slide</th>
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### SAY

In your own words:
OSHA requires a **personal fall arrest system** if any risk exists that a worker may fall from an elevated position of six feet or more.

**Advance**

A personal fall arrest system consists of three components: anchorage, body harness, and connector/lanyard and may also include a lanyard, deceleration device or lifeline. The full-body harness distributes the forces throughout the body, and the shock-absorbing lanyard decreases the total fall arresting forces. Workers must be trained in the proper wear and use of the body harness. They are not a one size fits all component. Proper sizing is critical to preventing injuries.

**Do Not Advance**

### Instructor’s Notes

- [ ]
- [ ]
- [ ]

### Materials Needed

- ✓ PPT slides 31, 32
### DOSAY

**Materials Needed**

- PPT slides 32, 33

**In your own words:**

The harness must fit snugly across the chest and around the thighs and the D-ring must be positioned in the center of the back between the shoulder blades. **Advance**

**Warning:** If you need to tie your harness off to something consult with a competent or qualified person. Make sure to tie off to a secure component like a bracket for the guiderail - not to the scaffolding. **Advance**
**Elevator – General Safety and Maintenance**

**Instructor’s Guide**

Module Length: 240 min  
Time remaining: 180 min  
This section: 20 min (7 slides)  
Section start time:  
Section End Time: __________

<table>
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<th>DO</th>
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| ![Review Slides Icon] **REVIEW** slides  | **In your own words:** Any distractions could prove to be dangerous and even fatal. Securing the work zone keeps these distractions at a safe distance, allowing you to focus on the task at hand.  
**Advance**  
*Refer participants to the Elevator Industry Field Employees’ Safety Handbook*

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<table>
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<tbody>
<tr>
<td>✓ PPT slide 34</td>
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<tr>
<td>✓ Elevator Industry Field Employees’ Safety Handbook</td>
</tr>
</tbody>
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Instructor’s Notes

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### Elevator – General Safety and Maintenance

*Instructor’s Guide*

**Module Length:** 240 min  
**Time remaining:** 180 min  
**This section:** 20 min (7 slides)  
**Section start time:**  
**Section End Time:**  

<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
<th>Materials Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASK</td>
<td><strong>In your own words:</strong> Lets see what we have learned so far: Name 3 components of a personal fall arrest system.</td>
<td>✓ PPT slide 35</td>
</tr>
</tbody>
</table>

**Call on participants for answer**

**Advance for correct answer**

**Answer:**
- Anchorage
- Connector/lanyard
- Body harness

**Advance**

**Instructor’s Notes**

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### Elevator – General Safety and Maintenance

#### Instructor’s Guide

**Module Length:** 240 min  
**Time remaining:** 180 min  
**This section:** 20 min (7 slides)  
**Section start time:**  
**Section End Time:**

<table>
<thead>
<tr>
<th>DO</th>
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</table>
| ![Ask] | **In your own words:**  
Yes or No. A body harness must fit snugly across chest and around thighs, and the d-ring should be between should blades in center back.  
**Call on participants for answer**  
**Advance for correct answer**  
**Answer:** Yes  
**Advance** |

<table>
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<th>Materials Needed</th>
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<tr>
<td>✓ PPT slide 35</td>
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**Instructor’s Notes**

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### DO

**In your own words:**

Landing the car basically means resting the elevator car on pipe stands, landing blocks or buffers to ensure that it does not move. **Buffers** are the springs mounted in the pit, pipe stands are installed in the pit frequently in place of the buffer, and landing blocks are attached to the rails anywhere they are needed in the hoistway. It is especially needed to land the car when work is being performed on components of the hydraulic system where pressure loss is very possible. The only thing normally supporting a hydraulic elevator is the column of fluid in the cylinder. Should something happen to one of the hydraulic components the pressure will escape and the elevator may drop to the bottom of the hoistway.

### SAY

- **In your own words:**
- **Landing the car** basically means resting the elevator car on pipe stands, landing blocks or buffers to ensure that it does not move. **Buffers** are the springs mounted in the pit, pipe stands are installed in the pit frequently in place of the buffer, and landing blocks are attached to the rails anywhere they are needed in the hoistway. It is especially needed to land the car when work is being performed on components of the hydraulic system where pressure loss is very possible. The only thing normally supporting a hydraulic elevator is the column of fluid in the cylinder. Should something happen to one of the hydraulic components the pressure will escape and the elevator may drop to the bottom of the hoistway.

### Materials Needed

- **PPT slide 37**

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** Instructor’s Notes **

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### Elevator – General Safety and Maintenance

**Instructor’s Guide**

**Module Length:** 240 min  
**Time remaining:** 160 min  
**This section:** 30 min (15 slides)  
**Section start time:**  
**Section End Time:**  

<table>
<thead>
<tr>
<th><strong>DO</strong></th>
<th><strong>SAY</strong></th>
<th><strong>Materials Needed</strong></th>
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</thead>
</table>
| REVIEW slides | **In your own words:**  
When landing a car, two maintenance personnel should be present at all time, equipped with the proper PPE. Be sure to use the appropriate pipes when supporting the car. The pipe must be strong enough to support the car.  
**Advance**  
**ASK**  
Who can recall the steps for landing the car?  
*Allow participants to discuss possible answers* | ✓ PPT slides 37, 38 |

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**Instructor’s Notes**

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**Transit Elevator/Escalator Consortium**
DO

REVIEW slide

In your own words:

**Review steps for landing the car using pipes.**

1. Move the car slightly above desired position.
2. Select pipes.
3. Pull buffer spring.
4. Place pipes on buffer stand.
5. Lower car to rest on pipes.
6. Perform LOTO.

**Advance**

So, after the car is moved slightly above desired position, select piping. Pipes are either provided by the manufacturer for the installation or provided by the Authority for that installation, to the location for use. Here you can see different length pipes. **Advance**
## Elevator – General Safety and Maintenance

### Instructor’s Guide

**Instructor’s Notes**

- REVIEW slide

<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
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</thead>
</table>
| In your own words: | Pull off the buffer spring
- Advance |
| Next place the pipes on the buffer stand | Advance |
| Finally lower the car so that it sits on the pipes. | Advance |

### Materials Needed

- PPT slides 42, 43, 44
In your own words:
The process for landing a car on landing blocks, also called rail clamps, is very similar to that of installing stand pipes, except that landing blocks can be used at any point in the hoistway. This allows a car to be placed where it is needed and mechanically supported at that point. As with pipes, first raise the car slightly above the desired position. Install the blocks to the rails using all the included hardware and following the directions of the manufacturer and appropriate authority procedures. Lower the car gently to the blocks.

Advance

If only the pressure on the hydraulic system needs to be relieved, simply rest the car directly on the buffers.

Advance
Stand pipes and landing blocks are also a form of Lockout/Tagout and are absolutely critical for protecting workers from the potential energy contained in the elevator car and cylinder. Installation of the stand pipes or landing blocks will vary depending on the stand pipes or landing block used and on the specific conditions of the location. Care must be taken to ensure that the stand pipes or landing blocks are installed properly and securely.

**Advance**
Given the relatively small space of a hoistway, construction of an adequate platform can be a tricky undertaking. Specific training on constructing a scaffold and putting in the proper safety features is outside the scope of this course and the work generally done by transit elevator maintainers.

**Advance**

OSHA regulations include specific requirements for planking, fall protection, ladders, and other important safety considerations. Personnel constructing must be fully trained and those working on scaffolding should be trained in scaffold procedures and hazards. Planking must be of the correct grade (if wood) or strength. Fall protection is required based on height, railing height, and other considerations.

**Do Not Advance**
Elevator – General Safety and Maintenance

**Instructor’s Notes**

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**DO**

**SAY**

In your own words:

Ladders have specific limitations and methods of attachment. The requirements are in some cases very detailed and covered in OSHA and other regulatory materials. If any safety concerns are noted then they should be referred to qualified personnel for review and if needed reconciliation.

The regulations further require that the scaffolds be designed by a qualified person and constructed and loaded in accordance with that design. When constructing and using a scaffold for work on an elevator make sure the scaffolding was constructed as designed and that all the components fit properly and all fasteners are in place.

**Advance**

**Materials Needed**

☑ PPT slide 48

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**Instructor’s Guide**

Module Length: 240 min  
Time remaining: 160 min  
This section: 30 min (15 slides)  
Section start time: ________  
Section End Time: ________
**Elevator – General Safety and Maintenance**

**Instructor’s Guide**

Module Length: 240 min  
Time remaining: 160 min  
This section: 30 min (15 slides)  
Section start time: ________  
Section End Time: ________

<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
<th>Materials Needed</th>
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</table>
| REVIEW slides | In your own words:  
Any distractions could prove to be dangerous and even fatal. Securing the work zone keeps these distractions at a safe distance, allowing you to focus on the task at hand.**Advance**

Refer participants to the Elevator Industry Field Employees’ Safety Handbook Sections 10 & 11 page 29 for additional information and guidelines on portable ladders, scaffold, and working platforms. | PPT slide 49 | Elevator Industry Field Employees’ Safety Handbook |

**Instructor’s Notes**

[Transit Elevator/Escalator Consortium](https://example.com)

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### Elevator – General Safety and Maintenance

**Instructor’s Guide**

<table>
<thead>
<tr>
<th>DO</th>
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<tbody>
<tr>
<td>❓</td>
<td><strong>In your own words:</strong></td>
</tr>
<tr>
<td></td>
<td>Lets see what we have learned so far:</td>
</tr>
<tr>
<td></td>
<td>Name 6 steps for landing the car.</td>
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<tr>
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<td><strong>Call on participants for answer</strong></td>
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<tr>
<td></td>
<td><strong>Advance for correct answer</strong></td>
</tr>
<tr>
<td>1.</td>
<td>Move the car slightly above desired position.</td>
</tr>
<tr>
<td>2.</td>
<td>Select pipes.</td>
</tr>
<tr>
<td>3.</td>
<td>Pull buffer spring.</td>
</tr>
<tr>
<td>4.</td>
<td>Place pipes on buffer stand.</td>
</tr>
<tr>
<td>5.</td>
<td>Lower car to rest on pipes.</td>
</tr>
<tr>
<td>6.</td>
<td>Perform LOTO.</td>
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<td></td>
<td><strong>Advance</strong></td>
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**Instructor’s Notes**

- [ ]
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<td>✓ PPT slide 50</td>
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**ASR**

**Module Length:** 240 min  
**Time remaining:** 160 min  
**This section:** 30 min (15 slides)
### Materials Needed
- Yes or No. Personnel constructing must be fully trained and those working on scaffolding should be trained in scaffold procedures and hazards.

**Call on participants for answer**

**Advance for correct answer**

**Answer:** Yes

**Advance**
## Elevator – General Safety and Maintenance
### Instructor’s Guide

<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
<th>Materials Needed</th>
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<tbody>
<tr>
<td>?</td>
<td>In your own words:</td>
<td>✓ PPT slide 52</td>
</tr>
<tr>
<td>ASK</td>
<td>Ask How does your transit agency complete documentation? Allow participants to discuss possible answers. Advance</td>
<td></td>
</tr>
<tr>
<td>REVIEW slide</td>
<td>Instructor’s Notes</td>
<td></td>
</tr>
</tbody>
</table>

**Instructor’s Notes**

- [Note 1]
- [Note 2]
- [Note 3]
- [Note 4]
- [Note 5]
- [Note 6]
- [Note 7]
- [Note 8]
- [Note 9]
- [Note 10]
- [Note 11]
- [Note 12]
- [Note 13]
- [Note 14]
- [Note 15]
- [Note 16]
- [Note 17]
- [Note 18]
- [Note 19]
- [Note 20]

**Module Length:** 240 min  
**Time remaining:** 130 min  
**This section:** 20 min (6 slides)  
**Section start time:** __________  
**Section End Time:** __________
### Elevator – General Safety and Maintenance

**Instructor’s Guide**

<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
<th>Materials Needed</th>
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</table>
| ![REVIEW slide](Image) | **In your own words:**
Here are two examples of documentation:
Here is example of a computer software documentation system.
*Advance*
And here is a log book that a technician would have to write information regarding inspection and maintenance performed.
*Advance*

| | | ✓ PPT slides 53, 54 |
| | | ![Image](Image) |

**Instructor’s Notes**

- In most instances **PM checklists** are used to track preventive maintenance done to a transit elevator. These checklists vary from agency to agency but frequently contain the following information:
  - Location of the Unit
  - Frequency
  - Date/Time
  - Employee name or ID#

*Advance*
### Elevator – General Safety and Maintenance

**Instructor’s Guide**

<table>
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<tr>
<th>DO</th>
<th>SAY</th>
<th>Materials Needed</th>
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</table>

**REVIEW** slide

**In your own words:**

Remember to always follow your authorities procedures on documentation of Preventive maintenance.

*Advance*

Here is an example of a PM checklist from BART.

*Advance*

**Instructor’s Notes**

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

✓ PPT slides 54, 55
In your own words:
Let's see what we have learned so far:
Name two possible ways to document maintenance and inspection.

Call on participants for answer
Advance for correct answer
Answer: log book and computer software
Advance

Materials Needed

✓ PPT slide 56
## Elevator – General Safety and Maintenance

### Instructor’s Guide

**Module Length:** 240 min  
**Time remaining:** 130 min  
**This section:** 20 min (6 slides)  
**Section start time:**  
**Section End Time:**

### Materials Needed

- PPT slide 57

### DO | SAY

| ASK | In your own words: Describe what type of information may be found on a preventive maintenance checklist, **Call on participants for answer**  
**Advance for correct answer**  
**Answer:**  
- Unit location  
- Frequency  
- Date/Time  
- Employee name or ID#  

<table>
<thead>
<tr>
<th>Instructor’s Notes</th>
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**Advance**
### Elevator – General Safety and Maintenance

**Instructor’s Guide**

- **Module Length:** 240 min
- **Time remaining:** 110 min
- **This section:** 80 min

**Section start time:** ________  **Section End Time:** ________

<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
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<tbody>
<tr>
<td>ASK</td>
<td>In your own words:</td>
</tr>
</tbody>
</table>

**In your own words:**

>[At instructor’s discretion, take time to visit the field and look for examples safety related to inspection and maintenance.]

*Advance.*

**Instructor’s Notes**

- ____________________________________________
- ____________________________________________
- ____________________________________________
- ____________________________________________

**Materials Needed**

- ✓ PPT slide 58
<table>
<thead>
<tr>
<th>DO</th>
<th>SAY</th>
<th>Materials Needed</th>
</tr>
</thead>
</table>
| CLASSROOM ACTIVITY | **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* |

  ✓ PPT slides 59, 60 |
### Elevator – General Safety and Maintenance

**Instructor’s Guide**

<table>
<thead>
<tr>
<th>Module Length: 240 min</th>
<th>Time remaining: 30 min</th>
<th>This section: 30 min (3 slides)</th>
<th>Section start time:</th>
<th>Section End Time:</th>
</tr>
</thead>
</table>

#### Materials Needed
- PPT slides 60
- Quizzes
- Pencils

#### DO
- CLASSROOM ACTIVITY
- INDIVIDUAL ACTIVITY

#### SAY
- In your own words:

  *Administer quizzes.*

#### Instructor’s Notes

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