## **Instructor Guide**



218: Elevator: Hydraulic Elevator

Module 1: Safety Procedures



## Elevator – Hydraulic Safety Procedures Instructor's Guide



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Instructor's Guide

#### Icons Used In This Guide



**REVIEW** slides



INDIVIDUAL ACTIVITY



**ASK** 



WRITE



**CLASSROOM ACTIVITY** 



Multimedia



**SMALL GROUP ACTIVITY** 



**REFER** participants to

### Agenda

Agenda		
Topic #	Topic Title	Duration
1	Overview	15 minutes
2	Safe Maintenance	40 minutes
3	Effective Communication	10 minutes
4	Safety Under the Car	30 Minutes
5	Summary	15 Minutes
	Total Time:	120 Minutes

### Elevator – Hydraulic Safety Procedures Instructor's Guide



### **Overview**

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

> Provide the participant with an overview of basic safety practices to be used when maintaining hydraulic elevators.

#### **Objectives**

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

- Discuss specific precautions necessary to perform elevator maintenance
- Identify effective communication techniques according to a distance situation
- Identify proper safety methods for working in the pit

#### **Materials** Mandatory

Make sure you have the following

- PowerPoint Presentation
- Coursebook
- Quizzes
- Pencils
- Elevator Industry Field Employees' Safety Handbook

#### Optional

You may also want the following for optional activities:

- Personal Protective Equipment
- Chalk board with chalk, large paper with marker, etc.
- Internet connection
- Lab, simulator or out of service elevator



Instructor's Guide

Module Length: 120 min Time remaining: 120 min

DO

This section: 15 min (8 slides)

Section start time:

**Materials Needed** 

Section End Time:

# **REVIEW** introduction slides

Instructor's Notes

#### In your own words:

Welcome to the course on elevators and our module on general safety procedures.

SAY

#### Advance.

Safety and hydraulic elevators involves some key principles and relies on specific approaches to ensure not only the safety of passengers, but also the safety of our technicians. We depend on us.

Advance.

✓ PPT slides 1, 2





Instructor's Guide

Module Length: 120 min Time remaining: 120 min This section: 15 min (8 slides)

Section start time:



Section End Time:

# DO **REVIEW** and key terms 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: Buffers, Bump Cap Catch Basin, Cleanliness, Communication, Electrical Shock, Hard Hat, Landing The Car, Lockout/Tagout (LQTO)

SAY

#### Advance.

Material Safety Data Sheet, Overhead Clearance, Pinch Points, Repetition, Scavenger Pump, Slipping Hazard, Standing Water, Stop Switch, Top Of Car Control Box, and Up Call Advance.

Key Terms		
Buffers     Bump Cap     Catch Basin     Cleanliness     Communication     Electrical Shock     Hard Hat     Landing The Car     Lockout/Tagout (LOTO)	Material Safety Data Sheet Overhead Clearance Pinch Points Repetition Scavenger Pump Slipping Hazard Standing Water Stop Switch Top Of Car Control Box Up Call	

Instructor's Guide

Module Length: 120 min Time remaining: 120 min

DO

This section: 15 min (8 slides)

Section start time:



Section End Time:

**REVIEW** slides

### Instructor's Notes

#### In your own words:

Safety around hydraulic elevators requires much the same attitude and many of the same procedures as working safely around traction elevators. This course focuses on the unique safety requirements of hydraulic elevators, safety involving elevators in general are covered in the introductory course on elevators (213 Module 1) and the specific safety requirements around traction elevators are discussed in the course on traction elevators (217 Module 1).

SAY

Advance.

The features of hydraulic elevators that make the safety requirements different revolve around the use hydraulic fluid to supply the lifting force and the location of much of the equipment used to power and control the units. Advance.

✓ PPT slides 6, 7





Instructor's Guide

Module Length: 120 min Time remaining: 105 min

DO

This section: 40 min (32 slides)

Section start time:

Section End Time:

**Materials Needed** 

**REVIEW** objective

**Instructor's Notes** 

#### In your own words:

Lets take another look at our first objective for hydraulic elevator safety.

SAY

Discuss specific precautions necessary to perform elevator maintenance.

Advance.



Instructor's Guide

Module Length: 120 min Time remaining: 105 min

DO

This section: 40 min (32 slides)

Section start time:



**Materials Needed** 

**REVIEW** slides

### Instructor's Notes

Advance.

#### In your own words:

And, another safety precaution to remember: Never use your hand to check for a leak, but instead a piece of cardboard, wood or other substance.

SAY

Advance.

Cleanliness is always an excellent habit to be in with regard to safety as a clean and orderly workspace is inherently safer than one that is cluttered. When dealing with hydraulic elevators cleanliness takes on an additional dimension. Hydraulic fluid spilled on the floor is a slipping hazard. Modern hydraulic elevator systems are efficient and have reduced seepage around the cylinder and other components, however the systems still do leak.

✓ PPT slides 14, 15





Instructor's Guide

Module Length: 120 min Time remaining: 105 min

DO

This section: 40 min (32 slides)

Section start time:

Section End Time:

**Materials Needed** 

#### **REVIEW** slide

## Instructor's Notes

### In your own words:

**Advance.** Catch basins are a passive system of basins located in places that routinely leak. Advance. These basins also must be emptied regularly to insure that the fluid does not contaminate the floor. Advance. The amount of fluid in the containers should be measured, the amount of fluid recorded to track the rate of fluid loss, **Advance.** And the fluid disposed of according to authority guidelines. Advance.

SAY



Instructor's Guide

Module Length: 120 min Time remaining: 105 min This section: 40 min (32 slides)

Section start time:

**Materials Needed** 

Section End Time:

# DO **REVIEW** slide Instructor's Notes

#### In your own words:

Overhead clearance in the hoistway of a hydraulic elevator varies. The space may be very spacious but depending on conditions the available space can be very limited. All the lifting equipment is either located under the unit or in an associated machine room. This means that since there is little equipment on top of the unit the distance between the top of the car and the ceiling of the hoistway may be too small to allow room for personnel when the unit is taken to the top floor. Before getting on top of and operating the car verify the space available and take the steps necessary to insure your safety.

SAY

With as little as 18 to 20 inches clearance when extended to the top floor these units are required by code to be clearly labeled.

[Direct participants to See A17.1 Sections 1 and 2.4.7.1, A17.2 Section 3.4.1 and A17.3 Sections 1 and 2.4, for a detailed review of code requirements for overhead clearance] Advance.

✓ PPT slide 20



✓ ASME Code – A17.1. A17.2 and A17.3

Instructor's Guide

Module Length: 120 min Time remaining: 105 min This section: 40 min (32 slides)

Section start time:



# DO **REVIEW** slide Instructor's Notes

### In your own words:

Advance. Keeping the top of the car clear of debris is important to reduce the chance of slipping or tripping. This can be particularly dangerous when multiple units are in the same hoistway. Advance. As you enter the car top you should also follow all fall protection procedures that apply the location.

SAY

**Advance.** In some locations a platform is built onto the side of the elevator car to provide technicians a location to inspect the operation of the elevator. When inspecting The operation of the unit be sure to follow procedures involving riding outside the car including fall protection.

Advance. A hard hat or bump cap should be worn when working near the top of the hoistway to reduce the chances of head injury.

Advance.



Instructor's Guide

Module Length: 120 min

Time remaining: 105 min

This section: 40 min (32 slides)

Section start time:

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

Materials Needed

# DO **REVIEW** slide Instructor's Notes

#### In your own words:

Hydraulic elevators have both electrical energy available and mechanical energy stored in the extended hydraulic cylinder and car. The unit must be locked and tagged out to remove the electrical power and mechanically support the car and cylinder.

SAY

Advance. Follow your Authority's LOTO procedures carefully as a minimum protection. Advance. Make sure that main power to the unit is securely disabled and locked out before beginning work. Advance. Also remember that though main power to the unit is locked out auxiliary power is still on in most cases. Outlets, lighting and other equipment will still have power. Advance. Take care around powered equipment as much of it will still be a shock or mechanical hazard. Advance.

#### ✓ PPT slide 26



25

Instructor's Guide

Module Length: 120 min Time remaining: 105 min

DO

This section: 40 min (32 slides)

Section start time:



Section End Time:



**ASK** 

Instructor's Notes

#### In your own words:

Lets see what we have learned so far: Hydraulic elevator safety concerns include

> Highly pressurized hydraulic fluid a.

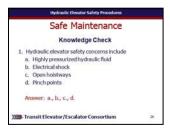
SAY

- Electrical shock
- Open hoistways
- Pinch points

Call on participants for answer Advance once given the correct answer

Answer: a., b., c., d.

Advance.



Instructor's Guide

Module Length: 120 min

Time remaining: 105 min

DO

This section: 40 min (32 slides)

Section start time:





**ASK** 

Instructor's Notes

Advance.

#### In your own words:

True or False. The hydraulic system would have to have its stored energy discharged (car lowered to bumpers) and the pump locked out when working on the pump, piping or cylinder.

SAY

Call on participants for answer Advance once given the correct answer

Answer: True



Instructor's Guide

Module Length: 120 min Time remaining: 65 min

This section: 10 min (9 slides)

Section start time:



Section End Time:

# DO **REVIEW** slide Instructor's Notes

#### In your own words:

Once a definite communication link is established the next step is to insure clarity of communication. What one technician says should be what the other technician hears. All discussions should be done using an established set of "commands".

SAY

#### Advance.

The technicians should use Authority approved terms for any action that would result in equipment moving or becoming energized.

#### Advance.

If Authority approved terms are not available the technicians should discuss and agree on the terms to be used before beginning work.

DO NOT Advance.

#### ✓ PPT slide 36

#### Hydraulic Elevator Safety Procedures Effective Communication

#### Be Clear

- Ensure clarity and establish set of "commands"
- Use Authority approved terms
   When Authority approved terms are not available, technicians should discuss and
- agree on terms to use <u>before</u> work begins

  Face car from platform to establish left and right side of car

))))): Transit Elevator/Escalator Consortium

Instructor's Guide

Module Length: 120 min Time remaining: 55 min

This section: 30 min (24 slides)

Section start time:

Materials Needed

Section End Time:

# DO **REVIEW** slide Instructor's Notes

### In your own words:

One simple but effective thing that can be done when working under the car is to put an up call on the unit.

SAY

#### Advance.

If for some reason the elevator becomes energized the first move will be up.

#### Advance.

This will give technicians in the pit time to either leave the pit or deal with the elevator in another manner.

Advance.



Instructor's Guide

Module Length: 120 min Time remaining: 55 min

DO

This section: 30 min (24 slides)

Section start time:

Section End Time:

**REVIEW** slides

**ASK** 

### Instructor's Notes



### In your own words:

Lets look at some photos of this process. Here we have pipes already selected. What did we need to do first before selecting pipes?

SAY

#### [Call on participants for answer.]

Answer: Move car to slightly above the desired position.

Then, select appropriate pipes for that particular installation.

Next?

[Call on participants for answer.]

Answer: Remove the buffer spring.

Advance.

And here is a photo of a buffer spring before and after removal.

Advance.

**Materials Needed** 

✓ PPT slides 54, 55





Instructor's Guide

Module Length: 120 minutes Time remaining: 25 minutes

DO

This section: 15 minutes

Section start time:

Section End Time: **Materials Needed** 

**ASK** 



**CLASSROOM ACTIVITY** 

**Instructor's Notes** 

In your own words:

[At instructor's discretion, take time to visit the field and look for examples of hydraulic elevator safety and related information.] Advance.

SAY



Instructor's Guide

Module Length: 120 min

Time remaining: 10 min

This section: 10 min (3 slides)

SAY

Section start time:

Section End Time:

**Materials Needed** 

**CLASSROOM ACTIVITY** 



INDIVIDUAL ACTIVITY

DO

**Instructor's Notes** 

In your own words:

Administer quizzes.

- ✓ PPT slides 68
- ✓ Quizzes
- ✓ Pencils

