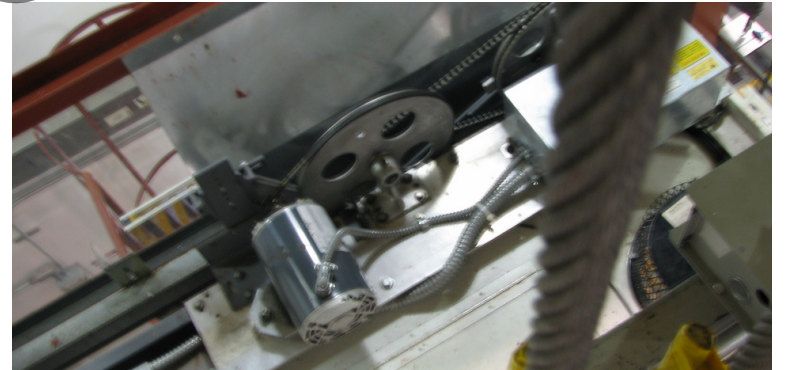
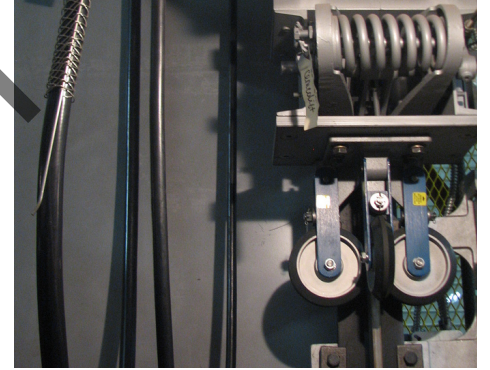


# Instructor Guide



## 220: Elevator: Other Systems Module 4: Material Lifts

# Elevator – Other Systems Material Lifts

*Instructor's Guide*



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PREVIEW ONLY

# Elevator – Other Systems Material Lifts

Instructor's Guide



## Icons Used In This Guide



**REVIEW** slides



**ASK**



**CLASSROOM ACTIVITY**



**SMALL GROUP ACTIVITY**



**INDIVIDUAL ACTIVITY**



**WRITE**



Multimedia



**REFER** participants to

## Agenda

Topic #	Topic Title	Duration
1	Overview	30 minutes
2	Safety & Basic Operation	25 minutes
3	Components	30 minutes
4	Controls	20 minutes
5	Drive Systems	20 minutes
6	Faults & Maintenance	25 minutes
7	Summary	30 minutes
	<b>Total Time:</b>	180 minutes

PREVIEW ONLY

# Elevator – Other Systems Material Lifts

## Instructor's Guide



### Overview

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

Provide the participant with an overview material lifts, and in particular material lifts used in the transit industry and their distinction from typical vertical transportation.

### **Objectives**

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

- Identify safety procedures for material lifts.
- Identify Drive System specific to material lifts.
- Identify major components of material lifts.
- Describe the basic operation of material lifts.
- Identify common faults and troubleshooting procedures specific to material lifts.
- Identify maintenance requirements for material lifts.
- Identify code requirements and weight limitations specific to material lifts.

### **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
- Authority specific procedures if applicable
- ASME Code A17.1
- Time for a field visit if applicable
- Elevator Industry Field Employee's Safety Handbook

# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 180 min

This section: 30 min ( 5 slides) Section start time: \_\_\_\_\_

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

DO	SAY	Materials Needed
<div data-bbox="34 464 144 571" data-label="Image"> </div> <p data-bbox="150 499 618 549"><b>REVIEW</b> module objectives</p> <p data-bbox="28 792 444 842"><b>Instructor's Notes</b></p> <hr/> <hr/> <hr/> <hr/> <hr/>	<p data-bbox="672 421 1023 471"><b>In your own words:</b></p> <p data-bbox="705 485 937 535">Today we will</p> <ul data-bbox="705 535 1400 1199" style="list-style-type: none"> <li>- Identify safety procedures for material lifts</li> <li>- Identify Drive System specific to material lifts</li> <li>- Identify major components of material lifts</li> <li>- Describe the basic operation of material lifts</li> <li>- Identify common faults and troubleshooting procedures specific to material lifts</li> <li>- Identify maintenance requirements for material lifts</li> <li>- Identify code requirements and weight limitations specific to material lifts</li> </ul> <p data-bbox="705 1199 879 1242"><b>Advance</b></p>	<p data-bbox="1497 471 1729 514">✓ PPT slide 3</p> <div data-bbox="1535 528 1854 763" data-label="Image"> </div>

# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 180 min

This section: 30 min ( 5 slides)

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

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

DO	SAY	Materials Needed
<div data-bbox="34 435 144 535"></div> <p><b>ASK</b> participants what they know about material lifts</p> <div data-bbox="34 556 144 664"></div> <p><b>SMALL GROUP ACTIVITY</b></p> <div data-bbox="34 678 144 792"></div> <p><b>WRITE</b></p> <p><b>Instructor's Notes</b></p> <hr/> <hr/> <hr/> <hr/> <hr/>	<p><b>In your own words:</b></p> <p>Thinking back to other courses or just in general, what might you know about material lifts?</p> <p><i>[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.]</i></p> <p><b>Advance</b></p>	<p>✓PPT slide 5</p> <div data-bbox="1535 528 1854 763"> </div> <p>✓Large Paper or chalk board</p>

# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 150 min

This section: 25 min ( 9 slides)

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

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

DO	SAY	Materials Needed
<div data-bbox="34 464 144 564" data-label="Image"> </div> <div data-bbox="164 492 415 535" data-label="Text"> <p><b>REVIEW</b> slide</p> </div> <div data-bbox="28 792 454 842" data-label="Section-Header"> <h3>Instructor's Notes</h3> </div> <hr/> <hr/> <hr/> <hr/> <hr/>	<div data-bbox="666 428 1033 471" data-label="Section-Header"> <p><b>In your own words:</b></p> </div> <div data-bbox="666 492 1342 621" data-label="Text"> <p>General safety practices to follow when operating and maintaining a material lift include:</p> </div> <div data-bbox="666 621 1381 749" data-label="Text"> <p><b>Advance</b> Never go under the material lift until the carriage is blocked and load is removed</p> </div> <div data-bbox="666 756 1400 842" data-label="Text"> <p><b>Advance</b> Ensure the lift and supports are stable thus eliminating the risk for tipping</p> </div> <div data-bbox="666 849 1439 978" data-label="Text"> <p><b>Advance</b> Follow all related basic field safety practices and OSHA regulations just as with other elevator systems</p> </div> <div data-bbox="666 978 1439 1063" data-label="Text"> <p><b>Advance</b> Do not leave the material lift gates open and unattended</p> </div> <div data-bbox="666 1071 1449 1156" data-label="Text"> <p><b>Advance</b> Do not operate the material lift with the gates open or interlocks bypassed</p> </div> <div data-bbox="666 1156 1381 1242" data-label="Text"> <p><b>Advance</b> Clean pit area with long broom and avoid going under the platform</p> </div> <div data-bbox="666 1242 840 1285" data-label="Text"> <p><b>Advance</b></p> </div>	<div data-bbox="1497 471 1729 514" data-label="Text"> <p>✓ PPT slide 7</p> </div> <div data-bbox="1535 528 1864 763" data-label="Image"> </div>

# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 150 min

This section: 25 min ( 9 slides)

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

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

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

#### In your own words:

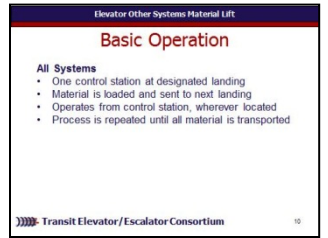
After unloading, the operator returns to the control station to recall the material lift and reload if necessary. If the control station is at the next landing, then the operator must first load the lift, proceed by other transportation (ie., stairs or passenger elevator) to the next level to operate the control station to call the loaded platform, and then unload the platform.

#### **Advance**

In this case, if additional material needs to be moved, after unloading the operator sends the platform back to the initial landing for reloading. **Advance**

### Materials Needed

✓ PPT slide 10





# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 130 min

This section: 30 min ( 14 slides) Section start time: \_\_\_\_\_

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

### DO



**REVIEW** slides

### Instructor's Notes

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### SAY

#### In your own words:

The hoistway is comprised of four vertical masts, also known as four posts, and the platform, or surface where the load is placed, is guided along these masts by guide wheels. Anchors, or bolts, secure the masts to the floor.

#### Advance

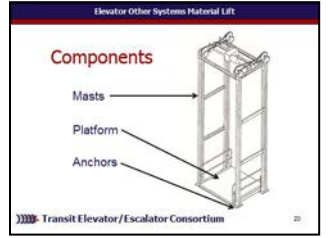
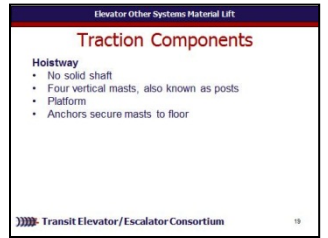
Here is an illustration of a traction type material lift.

***[Point out and discuss the four masts, the platform, and the anchors securing the lift in the illustration.]***

#### Advance

### Materials Needed

✓ PPT slides 19, 20



# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 130 min

This section: 30 min ( 14 slides) Section start time: \_\_\_\_\_

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

DO	SAY	Materials Needed
<div data-bbox="34 464 144 564" data-label="Image"> </div> <div data-bbox="164 492 434 535" data-label="Text"> <p><b>REVIEW</b> slides</p> </div> <div data-bbox="28 792 454 842" data-label="Section-Header"> <h3>Instructor's Notes</h3> </div> <hr/> <hr/> <hr/> <hr/> <hr/>	<div data-bbox="666 421 1033 471" data-label="Section-Header"> <p><b>In your own words:</b></p> </div> <div data-bbox="666 485 1449 799" data-label="Text"> <p>The pit area of a material lift requires no depth or buffer springs reducing the cost of installation, as seen in Figure 4. Also seen in Figure 4 is the counter weight. The weight does not equal the load but actually gives weight to the chain to ensure it stays engaged in the sprocket.</p> </div> <div data-bbox="666 799 840 842" data-label="Section-Header"> <p><b>Advance</b></p> </div> <div data-bbox="666 885 1420 1021" data-label="Text"> <p>Here is a photo of a pit in a material lift. You can see the pit is a non-conventional pit without depth and buffers.</p> </div> <div data-bbox="666 1021 840 1063" data-label="Section-Header"> <p><b>Advance</b></p> </div>	<div data-bbox="1487 471 1845 521" data-label="Text"> <p>✓ PPT slides 23, 24</p> </div> <div data-bbox="1535 528 1864 763" data-label="Image"> </div> <div data-bbox="1535 778 1864 1013" data-label="Image"> </div>

# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 100 min

This section: 20 min ( 9 slides) Section start time: \_\_\_\_\_

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

### DO



**REVIEW** slides

### Instructor's Notes

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### SAY

**In your own words:**

Because material lifts do not carry passengers and travel at slow speed only basic controls are required. This operational controller has an up and down relay, a transformer, and motor overloads. A PLC controller is not required because it travels in one speed either up or down similar to a garage door opener. This reduces the costs associated with a conventional freight elevator.

**Advance**

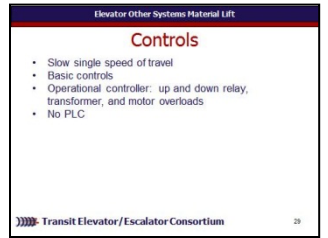
Here is a photo of a controller in a typical transit material lift.

**[Discuss the photo and controller with participants.]**

**Advance**

### Materials Needed

✓ PPT slides 29, 30



# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 100 min

This section: 20 min ( 9 slides)

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

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

### DO

### SAY

### Materials Needed



**ASK**

**In your own words:**

Lets see what we have learned so far:  
Safety controls in a material lift include

- a. ICR
- b. Masts
- c. Limit Switches
- d. Interlocks

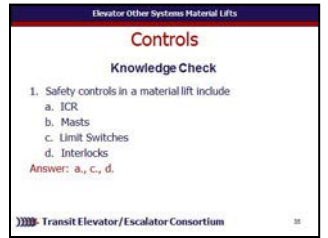
**Call on participants for answer**

**Advance once given the correct answer**

Answer: a., c., d.

**Advance**

✓PPT slide 35



### Instructor's Notes

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# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 80 min

This section: 20 min ( 9 slides)

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

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

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

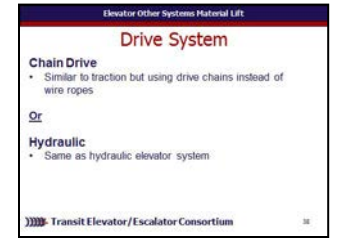
#### In your own words:

The drive system found in transit material lifts is either a chain drive system or a hydraulic system. In a chain drive system, drive chains drive the lifting chains similar to a traction system but again using the chains in place of the wire ropes. A hydraulic type material lift is similar to a hydraulic elevator system. For the purpose of this course and because there are some differences between a traction drive system and a chain drive system, we will focus on the chain drive system.

**Advance**

### Materials Needed

✓ PPT slide 38



# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 80 min

This section: 20 min ( 9 slides)

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

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

### DO



**REVIEW** slide

### Instructor's Notes

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### SAY

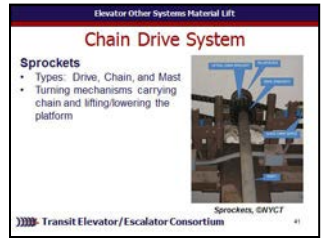
#### In your own words:

Sprockets are key components of a material lift. Types of sprockets include drive sprockets, chain sprockets, and mast sprockets. These sprockets are a turning mechanism which carries the chains that lift and lower the platform.

#### Advance

### Materials Needed

✓ PPT slide 41



# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 80 min

This section: 20 min ( 9 slides)

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

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

### DO

### SAY

### Materials Needed



**ASK**

**In your own words:**

Lets see what we have learned so far:  
Three types of sprockets on a chain driven material lift include

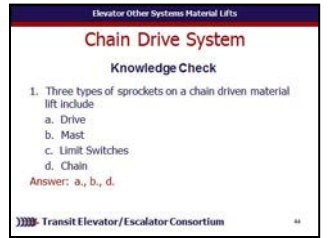
- a. Drive
- b. Mast
- c. Limit Switches
- d. Chain

**Call on participants for answer**  
**Advance once given the correct answer**

Answer: a., b., d.

**Advance**

✓PPT slide 44



### Instructor's Notes

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# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 60 min

This section: 25 min ( 7 slides)

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

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

### DO

### SAY

### Materials Needed



**REVIEW** slide

#### In your own words:

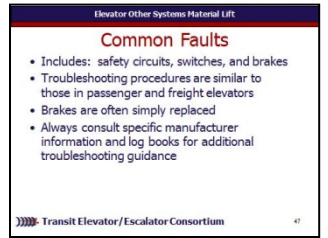
Troubleshooting items to be aware of for material lifts include safety circuits, switches, and brakes.

**Advance** In the case of safety circuits, these are similar to passenger elevator or freight cars and troubleshooting procedures are the same. Likewise, switches are also similar to passenger elevator troubleshooting procedures.

**Advance** Sometimes, the brake will need adjusting. However, adjustments can be problematic and most often the brake is simply replaced.

**Advance** For additional troubleshooting ideas, manufacturer information and equipment specific log books should be consulted. Common faults found in material lifts are the same as in hydraulic and electric traction elevator systems. **Advance**

✓ PPT slide 47



### Instructor's Notes

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# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 60 min

This section: 25 min ( 7 slides)

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

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

DO	SAY	Materials Needed
<div data-bbox="28 464 144 578" data-label="Image"> </div> <div data-bbox="173 499 270 549" data-label="Text"> <p><b>ASK</b></p> </div> <div data-bbox="28 792 454 842" data-label="Section-Header"> <h3>Instructor's Notes</h3> </div> <hr/> <hr/> <hr/> <hr/> <hr/>	<div data-bbox="666 421 1033 471" data-label="Section-Header"> <p><b>In your own words:</b></p> </div> <div data-bbox="666 471 1400 556" data-label="Text"> <p>Name the five maintenance checkpoints for material lifts.</p> </div> <div data-bbox="666 556 1236 606" data-label="Text"> <p><b>Call on participants for answer</b></p> </div> <div data-bbox="666 606 1391 649" data-label="Text"> <p><b>Advance once given the correct answer</b></p> </div> <div data-bbox="666 649 821 692" data-label="Text"> <p><b>Answer:</b></p> </div> <div data-bbox="666 692 966 735" data-label="Text"> <p>Chain lubrication</p> </div> <div data-bbox="666 735 994 778" data-label="Text"> <p>Sprockets greased</p> </div> <div data-bbox="666 778 1101 821" data-label="Text"> <p>Run gear reducer with oil</p> </div> <div data-bbox="666 821 1217 863" data-label="Text"> <p>Replace bolts with identical type</p> </div> <div data-bbox="666 863 1333 913" data-label="Text"> <p>Ensure chains are seated on sprockets</p> </div> <div data-bbox="666 913 840 956" data-label="Text"> <p><b>Advance</b></p> </div>	<div data-bbox="1487 471 1758 514" data-label="Text"> <p>✓PPT slide 52</p> </div> <div data-bbox="1535 528 1864 763" data-label="Image"> </div>

# Elevator – Other Systems Material Lifts

## Instructor's Guide



Module Length: 180 min

Time remaining: 35 min

This section: 35 min ( 3 slides) Section start time: \_\_\_\_\_

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

DO	SAY	Materials Needed
<div data-bbox="38 464 144 571" data-label="Image"> </div> <div data-bbox="173 492 425 571" data-label="Section-Header"> <h3>CLASSROOM ACTIVITY</h3> </div> <div data-bbox="28 792 444 835" data-label="Section-Header"> <h3>Instructor's Notes</h3> <hr/> <hr/> <hr/> <hr/> <hr/> </div>	<p>In your own words:  <i>[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.]</i>  <b>Advance.</b></p> <p>Lets take a look at some of the key words we have defined as moved through this module.  <i>Read slide. Discuss definitions as a group.</i>  <b>Advance.</b></p> <p><i>Read slide. Discuss definitions as a group.</i>  <b>Advance.</b></p>	<p>✓ PPT slides 54, 55</p> <div data-bbox="1535 528 1854 756" data-label="Image"> </div> <div data-bbox="1535 778 1854 1006" data-label="Image"> </div>