



## **Table of Contents**

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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

Topic #	Topic Title	Duration
1	Overview	40 Minutes
2	Inspection and Maintenance	180 Minutes
3	Field Trip	80 Minutes
4	Sensory Inspection	15 Minutes
5	Operational Inspection	45 Minutes
6	Field Trip	80 Minutes
7	Summary	40 Minutes
	Total Time:	480 Minutes

#### Instructor's Guide



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

> Provide the participant with an overview of the inspection and maintenance requirements for car doors components and operation.

#### **Objectives**

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

- Identify the components of the car doors, which require inspection, cleaning and adjustment
- Clean, adjust, lubricate, and/or repair components as necessary
- Perform a sensory inspection of the door assembly
- Perform an operational inspection of the door assembly
- Perform an operational test on all safety devices on the doors
- Identify clearance parameters as per industry code



#### **Materials** Mandatory

Make sure you have the following

- PowerPoint Presentation
- Coursebook
- Quizzes
- **Pencils**
- Paper

#### **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
- **Elevator Maintenance**
- **ASME A17.1**
- **ASME A117.1**
- G.A.L. CD Installation Procedures

Instructor's Guide



Module Length: 480 min Time remaining: 480	min This section: 40 min (10 slides) Section start time:	Section End Time:
DO	SAY	Materials Needed
REVIEW introduction slides  Multimedia  Instructor's Notes	In your own words:  Welcome to the course on inspection and maintenance for elevator door operation.  Advance  Courtesy of Elevator Bob, what we see in this photo is what we hope to avoid with proper inspection and preventive maintenance for elevator door components and operation.  Click on movie camera for short video about safety and doors.  Video length: 44 seconds  Advance	PPT slides 1, 2  Door Operation    Door Operation   Door Operation

Instructor's Guide

Module Length: 480 min

Time remaining: 480 min



**Materials Needed** DO SAY In your own words: ✓ PPT slide 3 Today we will **REVIEW** module objectives Identify the components of the car · Identify the components of the car doors, which doors, which require inspection, require inspection, cleaning and adjustment · Clean, adjust, lubricate, and/or repair components as cleaning and adjustment · Perform an operational inspection of the door Clean, adjust, lubricate, and/or repair · Perform an operational test on all safety devices on the · Identify clearance parameters as per industry code components as necessary Transit Elevator/Escalator Consortiur Perform a sensory inspection of the **Instructor's Notes** door assembly Perform an operational inspection of the door assembly Perform an operational test on all safety devices on the doors Identify clearance parameters as per industry code Advance

Time remaining: 480 min



This section: 40 min (10 slides) Section start time: Module Length: 480 min **Materials Needed** DO SAY In your own words: ✓ PPT slide 4 Lets take a look at some of the key words **REVIEW** key terms we will be defining as move through this Clearance Parameters module: Hanger Roller Assembly · Door Clutch · Door Hanger Tracks Header · Door Operator · Hoistway Door Closers · Hoistway Door · Door Panels · Door Re-Opening Device Interlocks Clearance Parameters Hanger Roller · Hoistway Interlock Eccentric Rollers Force Gauge Door Clutch Measurements Hanger Roller · Gate Switch Nudging · Relating Cable **Door Hanger Tracks** Assembly Transit Elevator/Escalator Consortium **Door Operator**  Header **Instructor's Notes Door Panels**  Hoistway Door Door Re-Opening Closers Device Hoistway Door **Eccentric** Interlocks Force Gauge Hoistway Interlock Gate Switch Rollers Gibs Measurements Nudging Relating Cable Advance

Instructor's Guide



Module Length: 480 min Time remaining: 480 min This section: 40 min (10 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 5 Lets take a look at some of the key words **REVIEW** key terms we will be defining as move through this Key Terms Stop Roller · Relating Cable module: Strike Post · Release Roller · Strike Posts Bumpers · Resilient Stops · Safety Curtain Toe Guard · Type "A" Oiler · Safety Retainer Relating Cable · Sensory Inspection Stop Roller Sight Guard · Sill Area (aka Footer) Release Roller Strike Post Spirator · Spring Closer Resilient Stops Strike Posts Bumpers Transit Elevator/Escalator Consortiur Safety Curtain Toe Guard **Instructor's Notes** Safety Retainer Type "A" Oiler Sensory Inspection Sight Guard Sill Area (aka Footer) Spirator Spring Closer Advance

Instructor's Guide

Module Length: 480 min

Time remaining: 480 min

Section End Time:

**Materials Needed** 

# DO **ASK** participants what they remember about safety and elevators SMALL GROUP ACTIVITY **WRITE Instructor's Notes**

#### In your own words:

Thinking back to other courses or just in general, what do we know about elevator door systems?

This section: 40 min (10 slides) Section start time:

SAY

What do we know about inspection or maintenance for door systems and their operation?

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 6



- Chalk board or large paper
- Blank Paper
- Writing instruments

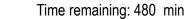
Instructor's Guide



Module Length: 480 min Time remaining: 480 min This section: 40 min (10 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slide 7 **REVIEW** slide Preventive maintenance has been defined as scheduled maintenance procedures at Scheduled maintenance at predetermined times predetermined time intervals. Procedures include - Cleaning - Inspecting **Advance** These procedures are performed - Adjusting - Lubricating - Replacing worn parts by cleaning, inspecting, adjusting, lubricating Advantages: increased life expectancy, mproved reliability, decreased costs and replacing worn parts before they fail. F Transit Elevator/Escalator Consortiur **Advance** The advantages of preventive Instructor's Notes maintenance are increased elevator life expectancy, improved elevator reliability, and decreased operating costs over the life of the elevator. Maintenance is required for the safe, efficient, and reliable operation of transit elevators. It is a primary responsibility of an efficient elevator technician. In this module we will focus on preventive. Advance

Instructor's Guide

Module Length: 480 min





DO	SAY	Materials Needed
REVIEW slide	In your own words:  The following text uses GAL door components as an example since these are common amongst all transit agencies which have elevators. Other manufacturers will be covered in the 300 Level Courseware.	✓ PPT slide 8  Greater Irrejection and Haintenance: Door Operation G.A. L.  Will. Transit Flevyator/Escalator Consortium  ### PPT slide 8
Instructor's Notes	As we are using GAL door systems as the model for this course, we will follow their recommendations. As per GAL there are no components in elevator door systems that require lubrication. The manufacturer recommends that the oilers on the door rollers be replaced annually. The replacement of the oiler is covered in the text to follow. There are no other scheduled lubrications for GAL door operators.  Advance	Jage Frankt Elevator Escantor Consortum

Instructor's Guide





Module Length: 480 min This section: 40 min (10 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 9 **REVIEW** slide A warning and safety precaution to always follow when working with door systems: Door Operation and Safety Remember to always wear proper PPE Warning: Safety Precautions! including safety vest, gloves and glasses. Remember to always wear proper PPE including safety vest, gloves and glasses Always follow transit authority safety Transit Elevator/Escalator Consortiur procedures. **Instructor's Notes** Advance

Instructor's Guide

Module Length: 480 min

Time remaining: 480 min



This section: 40 min (10 slides) Section start time: Section End Time:

DO	SAY	Materials Needed
REVIEW slide  REVIEW slide	In your own words:  Ask  What are the main areas or sections of an elevator door?  Discuss participant answers	✓ PPT slide 10  Revotor Inspection and Maintenance: Door Operation  Door Operation  HEADER
Instructor's Notes	Advance For the purposes of this manual, components are grouped according to how they work together from the top to the bottom of the elevator. As such, our review of how to inspect and perform required maintenance on door components will be sorted into the three main sections of a transit elevator door (Figure 2). At the top, the header which includes the door hanger assembly, door	POOTE S
	hanger tracks and the door operator which is mechanically linked to the <b>door panels</b> and at the bottom, the <b>sill area</b> or <b>footer</b> which consists of the door skills, gibs, etc. <b>Advance</b>	

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



Section End Time:

#### DO SAY **Materials Needed** In your own words: ✓ PPT slides 11, 12 Generally, preventative maintenance of doors **REVIEW** slides includes the inspection and testing the door Door Components Testing and Inspection operator, checking for loose parts, cleaning **REFER** participants to chains & gear reducer - Checking for loose - Checking motor the controls, cams, resistors, etc. as well as brushes - Cleaning controls Course book - Door hangers - Cams - Locks lubricating the drive chains and gear reducer - Resistors - Sliding doors and gates and checking motor brushes. In addition, door Transit Elevator/Escalator Consortion hangers, locks, sliding doors and gates must Instructor's Notes also be examined and tested. **Door Components** General Preventive Maintenance Checklis Advance While each authority has its own preventive maintenance checklist(s) there are several components which are common to many Transit Elevator/Escalator Consortiur authorities. This module will focus on Course book components of doors that require regular p.83 inspection and maintenance. A list of these components and a schedule of the different types of maintenance required is provided in the table on p. 84. Advance

Instructor's Guide



Module Length: 480 min Time remaining: 440 min This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slides 13, 14 Ask **REVIEW** slide What do we know about the door operator? Allow participants to discuss possible **ASK** answers. Advance Review photo with participants. Advance **Instructor's Notes** Header Components Door Operator · Examine for loose parts Examine the **door operator** for loose parts, · Clean dust > Cover > Motor including all fastenings. Clean the dust off the > Pulleys cover, motor, pulleys, belt and crank arms. Advance Transit Elevator/Escalator Consortium

Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

DO	SAY	Materials Needed
REVIEW slide	In your own words:  Door operator components to check include  ✓ Bearings  ✓ "V" belts  ✓ Drive pulleys	✓ PPT slide 15  Revator Inspection and Maintenance: Door Operation  Header Components  Door Operator Areas to Check  → Bearings  → "V" belts  → Drive pulleys  → Belt and chain  → Phot points and drive
Instructor's Notes	<ul> <li>✓ Belt and chain</li> <li>✓ Pivot points and drive</li> <li>✓ Set screws, keys, pulleys</li> <li>✓ Drive chains</li> <li>✓ Cam and switches</li> <li>✓ Controls board, cams, resistors</li> <li>✓ Sound isolation mounting</li> </ul> Advance	✓ Set screws, keys, pulleys ✓ Drive chains ✓ Cam and switches ✓ Corticols board, came, resistors ✓ Sound isolation mounting  3)  Transit Elevator/Escalator Consortium  14
	Advance	

Instructor's Guide

Time remaining: 440 min



Module Length: 480 min This section: 180 min (86 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slide 16, 17 **REVIEW** slide Check lubrication in bearings. Also, check the condition and tightness of "V" belts. Check the Header Components **Door Operator** drive pulleys to ensure they are aligned and ✓ Bearings - check lubrication ✓ "V" belts secured. - inspect condition and tightness of ✓ Drive pulleys - check for alignment and secure Advance Transit Elevator/Escalator Consorti Inspect the belt and chain for tension and Instructor's Notes condition. Be sure chain tension is +/- 1/2 inch Header Components Door Operator deflection. Adjust to proper tension and/or ✓ Belt and chain - inspect tension and condition - Chain tension is +/- 1/2 inch deflection replace if needed. Clean and lubricate all - Adjust or replace if needed ✓ Pivot points and drive - Clean and lubricate pivot points and drive. Also, determine if set ✓ Set screws, keys, pulleys - Ensure proper position screws, keys and pulleys are moved out of Transit Elevator/Escalator Consortium position. Advance



Module Length: 480 min Time remai	ning: 440 min	This section: 180 min (86 slides) Section start time:	Section End Time:
DO		SAY	Materials Needed
REFER participants to Course book  Instructor's Notes	Cleanec from con isola dam Adv	an and lubricate drive chains, as essary. Be sure to wipe excess lubricant noutside of the chain. Examine the dition of cam and switches and clean the trols board, cams, resistors, etc. If sound ation for mounting is used, check for nage.  Vance  The checklist chart in the course book add and review any additional authority ecific procedures or guidelines.  Vance	Levator Inspection and Haintenance: Door Operation  Header Components  Door Operator   Dor Operator  Dore Chains  Clean and lubricate  Levator Inspection and Haintenance: Door Operation  Command Sound, cames, resistors  Clean  Sound Isolation mounting  Check for damage  Clean  Sound Isolation mounting  Check for damage  Components  General Preventive Maintenance: Once Operation  Door Components  General Preventive Maintenance Checklist  Components  General Preventive Maintenance Checklist  Components  Com

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time:

DO	SAY	Materials Needed
REVIEW slide REVIEW slide REVIEW slide REVIEW slide	In your own words:  Ask What do we know about the operatorlinkages? Allow participants to discuss possible answers. Advance Review photo with participants. Advance	PPT slide 20  Levetor Inspection and Maintenance: Door Operation Header Components Operator Linkages What do we know about poerator linkages?  Junate Curros  State and Curros

Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

DO	SAY	Materials Needed
REVIEW slide	In your own words:  Preventive maintenance of operator linkages should start with a check for cleanliness and loose hardware. Operator linkages are replaced very infrequently.  Advance They will be replaced in the case of	✓ PPT slide 21  Devotor Inspection and Maintenance: Door Operation  Header Components  Operator Linkages  Check for cleanliness and loose hardware  Replace if bert arms, worn bearings, elongated hobies "(new replaced arthogungs))  Clean and lubricate equipment  Check and adjust door closing force  Use force gauge on edge of hoistway door  Consult manufacturer segrifications
Instructor's Notes	bent arms, worn bearings and/or elongated holes.  **Advance** Be sure to clean and lubricate the equipment and **Advance** check and adjust door closing force (not to exceed 30 pounds of force). For closing force use a force gauge on the edge of the hoistway door – as the sensor will detect an obstruction if it is measured on the inside of the car door, and will not close. Where this is measured on the door depends	- Consult manufacturer specifications - Kinelic Cosing energy measurements vary with door type  ))))) - Transit Elevator/Escalator Consortium  21
	on the manufacturer, so be sure to consult your manufacturer's specifications. <b>Do Not Advance</b>	

Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

#### DO SAY **Materials Needed** In your own words: ✓ PPT slides 21, 22 **REVIEW** slides Kinetic closing energy measurements vary depending on the type of door. Header Components Operator Linkages Advance · Check for cleanliness and loose hardware · Replace if bent arms, worn bearings, elongated · Clean and lubricate equipment · Check and adjust door closing force - Use force gauge on edge of hoistway door After attempting to close three times, the - Consult manufacturer specifications - Kinetic closing energy measurements vary with doors will go into **nudging**, this assures the Transit Elevator/Escalator Consortiur safety curtain is functioning and will operate Instructor's Notes the doors at a reduced closing force not be Header Components Operator Linkages · Check nudging & safety curtain exceed 7 pounds of force. In nudging, the - Safety curtain reduces closing force to 7 pounds - After attempting to close three times, buzzer door operator will sound a buzzer indicating sounds · Check door open time - Adjusts to 8-12 seconds that the operator is in nudging. - Adjust drive helt/chain as needed - Ensure fully open when open Transit Elevator/Escalator Consortiur **Advance** Be sure to check door open time (adjusts to 8-12 seconds) and adjust drive belt/chain as needed. Also, check and adjust door open/close limits to ensure full open. Advance

Instructor's Guide



Module Length: 480 min Time remaining: 440 min This section: 180 min (86 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slide 23 The code also specifies that elevator doors **REVIEW** slide shall remain fully open in response to a car Header Components Operator Linkages call for 3 seconds minimum (ANSI-Section · Code: doors shall remain open fully for 3 seconds **REFER** participants to minimum in response to car call Measure distance from center line of car doors to 407.3.5). ANSI 117.1 · Example: if distance is 12 feet, door must remain open for 18 seconds **Advance** To determine how long the door will Average wheelchair travels 1.5 feet per second See ANSI 117.1 – Door closing speed: 40 Door and Signal Timing and 407.3.5 Doo Delay remain open, you must measure the distance Transit Elevator/Escalator Consortium from the center line of the car doors to the Instructor's Notes farthest call button. **ANSI 117.1 Advance** For example, if you measured that distance to be 12 feet then the door must remain open for 18 seconds. **Advance** It is estimated that the average wheelchair travels 1.5 feet per second. Advance Refer participants to ANSI 117.1 section 407.3.4 and 4.7.3.5 Advance

Instructor's Guide





Module Length: 480 min This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 24 Use the checklist chart in the course book **REVIEW** slide to add and review any additional authority Header Components General Preventive Maintenance Checklist specific procedures or guidelines. **REFER** participants to Advance Course book Transit Elevator/Escalator Consortiun **Instructor's Notes** Course book p.83



Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

DO	SAY	Materials Needed
? ASK	In your own words:  Lets see what we have learned so far:  A door operator chain tension should be  deflection.  a. +/- 1/8 inch  b. +/- 1/4 inch  c. +/- 1/2 inch  d. +/- 1 inch	✓ PPT slide 25    Components   Components
Instructor's Notes	Call on participants for answer Advance once given the correct answer Answer: c.  Advance.	

DO



Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

SAY

Section End Time:

**Materials Needed** 

# **ASK Instructor's Notes**

#### In your own words:

Amri must complete a door linkage inspection. What should Amri do to check the door nudging and safety curtain?

Call on participants for answer Advance once given the correct answer

Answer:

#### **Ensure**

- Safety curtain reduces closing force to 7 pounds or less
- After attempting to close three times, buzzer sounds

Advance

#### ✓ PPT slide 26

	Header Components
	Knowledge Check
2.	Amri must complete a door linkage inspection. Wha should Amri do to check the door nudging and safet curtain?
	Answer.
1111	Transit Elevator/Escalator Consortium

Instructor's Guide

Time remaining: 440 min



Module Length: 480 min This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 27 Ask **REVIEW** slide What do we know about stop rollers? Header Components Stop Rollers/G.A.L. Allow participants to discuss possible What down a new and drive tabley from over travel rollers proper position when doors open/close **ASK** · Adjust and secure as required answers. - Should land on stop plate at reduced speed - If not adjusted properly, stop roller will shear off Advance You will recall its function is to prevent the Transit Elevator/Escalator Consortium drive pulley from over traveling. **Instructor's Notes** On G.A.L. door operators, verify that the **stop roller** is in the proper position when the doors are closing and opening. Adjust and secure the stop roller as required. The roller should land on the stop plate at a reduce speed. If not adjusted properly the stop roller will shear off. Advance

Instructor's Guide

Module Length: 480 min Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 28 Ask **REVIEW** slide What do we know about belts and chains? Header Components **Belts and Chains** Allow participants to discuss possible Warning: Safety Precautions! **ASK** answers. Advance Remember the safety precaution: Transit Elevator/Escalator Consortiur Always remove power from the elevator and **Instructor's Notes** perform appropriate LOTO procedures before examining or adjusting belts and chains. **Advance** 

Instructor's Guide

Module Length: 480 min Time remaining: 440 min



Section End Time:

DO	SAY	Materials Needed
REVIEW slide	In your own words:  Belt life is dependent on many factors, such as the operating speed, load, environment, run time alignment and radius of the sheaves.  With proper maintenance, drive belts on	PPT slide 29  Breator Inspection and Haintenance: Door Operation  Header Components  Belts  • Longevity depends on  - Operating speed  - Load  - Environment  - Run time alignment
Instructor's Notes	elevator equipment will provide many years of reliable service. The "V" belt is used most on G.A.L. operators.  **Advance**  Advance**	— Radius of sheaves — Proper maintenance • "\" belt is used on most G.A.L. operators  )))))  Transit Elevator/Escalator Consortium    3  3  3  3  3  3  3  3  3  3  3  3

Instructor's Guide

Module Length: 480 min Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time:

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

#### In your own words:

Examine belt drives for proper tension.

**Advance** Check the alignment of sheaves and whether or not the belt is seating in the sheave groove. In most cases, the top of the belt should be flush with the sheave groove. In multiple belt drives, all belts should seat to the same depth. The belt should never run in the bottom of the groove.

SAY

#### Advance

Also, check for damaged or worn sheaves, contamination of oil, grease, etc. and worn, cracked or damaged belts.

**Advance** Determine if the "V" belt is seating in the bottom of the "V" groove. If there is noise or squeaking this would indicate that there is slippage.

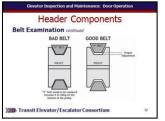
Advance

✓ PPT slides 30, 31, 32

**Materials Needed** 







Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



DO SAY **Materials Needed** In your own words: ✓ PPT slide 33 **REVIEW** slide Proper tension is essential for quiet, efficient and reliable operation. If a belt is too tight, Header Components **Belt Tension** the belt and bearing life will be reduced. Essential for proper operation Likewise, if the belt is too loose, slippage will - Prevents slippage under maximum load - No unnecessary load on bearing and sheaves Follow manufacturer tension specifications occur. Slippage will create noise and reduce Belt to drive nulley alignment measurement - Perform straight edge alignment test belt life as well as drive efficiency. The ideal Transit Elevator/Escalator Consortiur tension will prevent slippage under Instructor's Notes maximum load, but not place unnecessary load on the bearing and sheaves. The best source for belt tension adjustment criteria is the manufacturer of the equipment. **Advance** Measuring alignment of the belt to the drive pulley is straight forward. Simply perform a straight edge alignment test using a straight edge. If they are misaligned, the belt will ride off of the pulleys during operation. Advance

Instructor's Guide



This section: 180 min (86 slides) Section start time: Section End Time:

Module Length: 480 min Tim	e remaining: 440 min	This section: 180 min (86 slides) Section start time:	Section End Time:
DO		SAY	Materials Needed
REVIEW slide	Sha par	our own words:  are illustration for belt tension with ticipants.  vance	✓ PPT slide 34, 35  **Tevator Inspection and Maintenance: Door Operation  Header Components  Belt Tension  SPAN
Instructor's Notes	par Adv	are illustration for alignment test with ticipants. vance	Transit Elevator / Escalator Consortium  Header Components  Belt Tension  Alignment of Belt to Drive Pulley  Uso straight edge alignment test.  3)))  Transit Elevator / Escalator Consortium

Instructor's Guide



Module Length: 480 min Time remaining: 440 min This section: 180 min (86 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slide 36 **REVIEW** slide Belts must be examined and replaced when any of the following conditions exist. The belt Header Components Belt Replacement Criteria material is cracking and dry. - Belt material is cracking or dry Outer cords, covering or strips have separated form **Advance** The outer cords, covering or strips - Oil, grease or other contamination · Cleaning will not reduce deterioration process Bottom belt rides against sheave groove bottom of rubber have separated from the belt. . "V" side of belt must ride on both sides of sheave Inspect for damage to sheave or grooves **Advance** The belt has been contaminated Transit Elevator/Escalator Consortiun with oil, grease or other foreign substances. Instructor's Notes Note that even if these substances can be cleaned off, the deterioration of the belt material will continue and accelerate failure. The foreign substance may also cause slippage and accelerated wear. **Advance** If the bottom of the belt is riding against the sheave groove bottom, it must be replaced. The "V" side of the belt must ride on both sides of the sheave in a pinch-like method. **Advance** Check for damage to the sheave or worn sheave grooves. Advance

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



Section End Time:

DO	SAY	Materials Needed
REVIEW slide	In your own words:  It is best to replace the belt to avoid a failure of the elevator or a call-back. A broken belt may also damage other equipment such as wiring and controls. When it is necessary to replace a belt, it is best to copy the number from the old belt and obtain an exact	✓ PPT slide 37  **Elevator Inspection and Haintenance: Door Operation  **Header Components  **Belt Replacement**  • Best to replace with exact copy using number from old belt if possible  • Determining appropriate length  - Pitch diameter - effective diameter of sheave and slightly outside the midpoint  • Serrated belts: pitch diameter is midpoint of serration on pulley
Instructor's Notes	replacement. This may not be possible if the belt is damaged or the number is not legible.  **Advance** The pitch diameter is the effective diameter of the sheave and is slightly outside the midpoint that the belt runs in the sheave. Replace with a belt that has a standard length that is closest to the calculated length. For serrated belts, the pitch diameter is approximately the midpoint of the serration on the pulley.  **Advance**	)))))]-Transit Elevator/Escalator Consortium 37

Instructor's Guide



Time remaining: 440 min Module Length: 480 min This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 38 **REVIEW** slide Share the illustration for finding pitch diameter with participants. Header Components **Advance** Belt Replacement mr. Transit Elevator/Escalator Consorti **Instructor's Notes** 

Instructor's Guide





Module Length: 480 min Time remaining: 440	min This section: 180 min (86 slides) Section start time:	Section End Time:
DO	SAY	Materials Needed
REFER participants to Course book  Instructor's Notes	In your own words:  Use the checklist chart in the course book to add and review any additional authority specific procedures or guidelines.  Advance	PPT slide 39  Levator Impoction and Maintenance: Door Operation  Door Components  General Preventive Maintenance Checklist  Residents of the water of the state o



Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

DO	SAY	Materials Needed
Instructor's Notes	In your own words:  The ideal belt tension prevents slippage under:  a. Maximum load b. Minimum load c. Maximum noise d. Minimum noise  Call on participants for answer Advance once given the correct answer Answer:  a. Maximum load  Advance	✓ PPT slide 40  **The state of Maintenance   Electric Traction Noirtway**  **Header Components**  **Knowledge Check**  1. The ideal belt trasient prevents slippage under:  9. Maintenant load  1. Minimum load  1. Minimum load  2. Minimum noise  3. Minimum noise  3. Minimum noise  3. Minimum noise  4. Minimum noise





DO	SAY	Materials Needed
? ASK	In your own words: Yes or No. Belts should be replaced if contaminated with grease or oil.  Call on participants for answer Advance once given the correct answer Answer: Yes	✓ PPT slide 41  **Therator Inspection and Naintenance: Electric Traction Hostway  **Header Components  **Knowledge Check**  2. Yes or No. Belts should be replaced if contaminated with grease or oil.  **Jumps: Transit Elevator/Escalator Consortium**
Instructor's Notes	Advance	

Instructor's Guide



Module Length: 480 min Time remaining: 440	min This section: 180 min (86 slides) Section start time:	Section End Time:
DO	SAY	Materials Needed
REVIEW slide	In your own words:  Drive chains must have the proper tension to maintain good contact with the sprocket.  Advance	✓ PPT slide 42, 43, 44  Covered Impection and Maintenance: Door Operation  Header Components  Chain Tension  • Proper tension essential for sprocket contact  PROPER ADJUSTMENT ADJUSTMENT
Instructor's Notes	When examining take up force, do so while the chain is operating. If the links sag on the return side, the chain needs to be adjusted. <b>Advance</b>	Transit Elevator/Escalator Consortium  Clevator Impection and Haintonance: Door Operation  Header Components  Chain Tension  Examine take up force when chain is operating  Adjust if links sag on return side
	Chains must be kept clean to prevent dirt and grime from accelerating wear. Dirt and lint will also tend to wick the lubricant from the chain interior. When this occurs, fretting corrosion and rapid wear will result. Never clean chains with a solvent that will break down or wash	TAKE UP FORCE  TAKE UP FORCE  BETURN SIDE  BETURN SIDE  Chain Cleaning and Hantenance: Door Operation  Header Components  Chain Cleaning and Lubrication  • Chains must be kept clean  Never use solvent which interferes with lubricant  Use nylon brush for dust and lint
	away all of the lubricant. A nylon brush is the best method of cleaning lint and dust from chains on door operators.  Advance	))))))- Transit Elevator/Escalator Consortium 44

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time:

DO	SAY	Materials Needed
REVIEW slide	In your own words:  Proper chain lubrication is a challenging task partly due to their location and environment.  Chains require lubrication internally as well as where the rollers and sides contact the sprockets.	✓ PPT slide 45  Beautor Inspection and Heintenance: Door Operation  Header Components  Chain Cleaning and Lubrication  • Lubrication  • Lubrication  • Internal as well as contact between rollers, sides and sprockets  • Light chain oil or as specified according to environment or manufacturer  • Challenge: proper amount  • Always follow transit authority requirements
Instructor's Notes	Advance In most cases, a light chain oil will provide good lubrication. However, there are special chain lubricants formulated for particular environments and conditions. Where the manufacturer specifies a certain lubricant, it should be used.  Advance The challenge is often to keep the chain lubricated properly without contaminating other components or allowing oil to drip into the cab of the elevator. Always check your authority's requirements for oil and	)))))); Transit Elevator/Escalator Consortium
	lubrication. And, remember that oil and lubrication may change depending on the season of the year. <i>Advance</i>	

Instructor's Guide

Time remaining: 440 min



Module Length: 480 min This section: 180 min (86 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slide 46 **REVIEW** slide Chains should be examined for correct tension. Header Components Advance corrosion, Chain Examination · Correct tension · Wear of barrel/bushings and sprockets **Advance** the wear of the barrel/bushings and · Alignment of sprockets and loosene Lubrication · Accumulation of dirt and grime sprockets. · Stretching (aka elongation) Worn or weakened – replace **Advance** Check the alignment of sprockets · Looseness in links, wear on sprockets Transit Elevator/Escalator Consortiur and looseness. Instructor's Notes **Advance** Also, check the lubrication and accumulation of dirt and grime. **Advance** Examine for stretching, also known as elongation. **Advance** Both chains and sprockets should be replaced when they are worn and weakened. **Advance** Look for looseness in the links and wear on the sprockets. Advance

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time:

DO	SAY	Materials Needed
REVIEW slide	In your own words:  Share the photo of barrel bushings with participants.  Advance	✓ PPT slide 47, 48  Levator Impercition and Haintenunce: Door Operation  Header Components  Chain Examination
Instructor's Notes	When replacing a chain, measure the pitch of the chain to determine its length. The pitch of a chain is determined by measuring the distance between the center of the tooth and the center of the next tooth. Usually if the chain is replaced, it is necessary to replace the sprockets since their tooth profile will be worn to reflect the change in the pitch of the old chain. If a new chain is installed on a worn sprocket, the drive will often be rough, noisy and accelerate the chain and sprocket wear. <i>Advance</i>	Dischards    Dischards   Disch

Instructor's Guide



Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time:

DO	SAY	Materials Needed
REVIEW slide  Instructor's Notes	In your own words:  After an initial break-in period drive chain and belt tension of the door operator should be checked. Note that the break-in period will vary with frequency of usage. If adjustments are necessary, the chain should be adjusted first. Adjusting the chain will require readjusting the drive belt tension. Inconsistent or jerky door movements are indications that the drive chain needs to be adjusted. Check the chain by applying moderate pressure on the chain. The deflection should be approximately ½ inch. If the deflection is either more or less than ½ inch the drive chain must be adjusted. Once the drive chain is adjusted correctly, the drive belt can be adjusted. Note that the holes in the intermediate pulley bearing block are slotted to allow for lateral adjustment.	PPT slide 49  Levator Impoction and Naintenance: Doer Operation:  Header Components  Drive Chain Adjustment  • Chain is adjusted before belt  • Check adjustment  - After initial break-in period or inconsistent or jerky door movements  - Apply moderate pressure on chain, deflection should be ½ inch  • Holes in intermediate pulley bearing block are slotted for lateral adjustment   **Different Consortium**  **Transit Elevator/Escalator Consortium**  **Signal Consortium**  **Signa
	Advance	

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



Section End Time:

DO	SAY	Materials Needed
REVIEW slide	In your own words:  When needed, there are 3 steps to chain adjustment.  First, locate and loosen the double nutted stud on the rear of the door motor base to decrease the belt tension as shown here.  Advance	✓ PPT slide 50  Component Nainturance and Replacement  Header Components  3 Step Chain Adjustment - Step 1  Rear Motor Base Bosen double some stand.  Pulley Adjusting Angle Based to the Base Bosen double some stand.  **Transit Elevator/Escalator Consortium**  40
Instructor's Notes	Then loosen the four mounting bolts on the base of the intermediate pulley bearing block. <b>Advance</b>	
	Lastly, turn the bolt on the adjusting angle bracket so as to move the intermediate pulley away from the drive pulley. After the proper chain tension is obtained, check the two pulleys for alignment and tighten the four mounting bolts to secure the pulley.  **Advance**	

DO

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time: SAY **Materials Needed** ✓ PPT slides 51, 52 Header Components **Drive Belt Adjustment** · Improper tension results in slippage/erratic door operation - Floor level, heaviest hoistway door - Energize door open relay when door is few inches - Proper tension: door will open at slow speed without Transit Elevator/Escalator Consortiu Header Components Transit Elevator/Escalator Consorti

**REVIEW** slide

Instructor's Notes

Improper belt tension may result in belt slippage and erratic door operation.

Advance Proper belt tension can be checked at the floor level with the heaviest hoistway door by energizing the door open relay when the door is a few inches from open. If there is proper belt tension the door will open at this slow speed without belt slippage. If there is any slippage, the tension should be adjusted. Advance

Share the illustration for belt adjustment. Point out the double nutted stud on rear of motor base. Advance

Instructor's Guide

Module Length: 480 min Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slides 53 **REVIEW** slide Sometimes a belt may need further adjusting. If so, start with motor placement. **Advance** Loosen four mounting bolts and Further Belt Adjustments Loosen four mounting bolts and move as neede **Final Adjustments** move as needed. Check motor pulley for alignment with intermediate pulley and tighten four bolts Final Adjustments that may be needed: Allow door to cycle a few times checking that b in center of pulley groove If belt rides to edge of pulley or becomes twisted Advance Check for proper belt seating on echeck alignment of motor and intermediate pulleys Transit Elevator/Escalator Consortiun intermediate pulley. Instructor's Notes **Advance** Check motor pulley for alignment with intermediate pulley and tighten four bolts. **Advance** Allow door to cycle a few times checking that belt rides in center of pulley groove. **Advance** If belt rides to edge of pulley or becomes twisted, recheck alignment of motor and intermediate pulleys. Advance

Instructor's Guide





Module Length: 480 min **Materials Needed** DO SAY In your own words: ✓ PPT slide 54 Use the checklist chart in the course book **REVIEW** slide to add and review any additional authority **Door Components** General Preventive Maintenance Checklist specific procedures or guidelines. **REFER** participants to Advance Course book Transit Elevator/Escalator Consortiun **Instructor's Notes** Course book p.83

Instructor's Guide

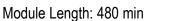




Module Length: 480 min	min This section: 180 min (86 slides) Section start time:	Section End Time:
DO	SAY	Materials Needed
? ASK	In your own words: Yes or No. Chains must never be cleaned with a solvent that interferes with lubrication.  Call on participants for answer Advance once given the correct answer Answer: Yes	✓ PPT slide 55  **Bevator Inspection and Halmtenance: Sective Traction Hoistway  **Header Components  **Knowledge Check**  1. Yes or No. Chains must never be cleaned with a solvent that interferes with lubrication.  **J
Instructor's Notes	Advance	

DO

Instructor's Guide



Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** SAY



**ASK** 

## **Instructor's Notes**

## In your own words:

Jim must complete a chain examination. What must Jim examine to complete this process?

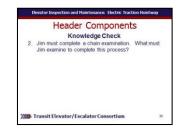
#### Call on participants for answer Advance once given the correct answer

#### Answer:

- Correct tension
- Corrosion
- Wear of barrel/bushings and sprockets
- Alignment of sprockets and looseness
- Lubrication
- Accumulation of dirt and grime
- Stretching (aka elongation)
- Worn or weakened replace
- Looseness in links, wear on sprockets

#### Advance

#### ✓ PPT slide 56



Instructor's Guide

Time remaining: 440 min



Module Length: 480 min This section: 180 min (86 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slides 57, 58 **REVIEW** slide Normally, the **hanger roller assembly** will not be replaced in its entirety, just the individual Header Components Hanger Roller Assembly components: hanger roller, eccentric, Normally just individual components are replaced upthrust safety retainer and type "A" oiler. Advance **Hanger Roller Replacement** Instructor's Notes Wedge door open Hanger Roller Replacement Wedge door open Loosen eccentric 3 Loosen one hanger bolt remove the other 3. Loosen one hanger bolt, remove the Swivel door hanger 90° Remove safety retaine Replace hanger roller Bolt new roller other Replace safety retainer Swivel door hanger 90° 4. Transit Elevator/Escalator Consortiu Remove safety retainer 5. Replace hanger roller Bolt new roller Replace safety retainer Advance

DO

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time: SAY **Materials Needed** 



**REVIEW** slide

Instructor's Notes

## In your own words:

The type "A" oiler should be changed annually as per G.A.L.'s suggested maintenance specifications. A properly installed oiler will keep the roller clean, preventing buildup of shaft debris and any excessive build up on lubricants, as well as reduce noise and extend its life.

#### Advance

Be sure to check and adjust the eccentric. It will only need to be replaced if it is missing or the bearing has failed. Proper adjustment is 1/64 of an inch between the eccentric and the hanger track.

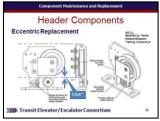
#### Advance

Share eccentric replacement illustration with participants. Advance

✓ PPT slides 59, 60, 61







Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



**Materials Needed** DO SAY In your own words: ✓ PPT slide 62 **REVIEW** slide If the entire hanger roller assembly has to be replaced due to vandalism or preventive **Header Components** maintenance, Hanger Roller Assembly Replacement Replace for vandalism, preventive maintenance or if frame is bent > Release eccentric roller on both hange **Advance** Start by releasing the eccentric > Remove door panel from track Remove door hanger bolts roller on both hanger assemblies. Replace door hanger assembly > Reverse steps **Advance** Next remove the door panel from W. Transit Flevator/EscalatorConsortium the track. Instructor's Notes **Advance** Then remove the door hanger assembly bolts. **Advance** Replace the door hanger assembly and reverse the steps Advance

Instructor's Guide

Time remaining: 440 min



Module Length: 480 min This section: 180 min (86 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slides 63, 64 **REVIEW** slide Be sure that the doors cannot be lifted off the hanger track. This is insured by properly **Header Components** adjusting the eccentric on each hanger roller Hanger Roller Assembly Replacement Ensure doors cannot lift of hanger track Proper adjustment of eccentric on each hand roller assembly assembly. inch of bottom of hanger track ✓ Hold position and tighten nut on back of **Advance** To adjust the eccentric, use a upthrust assembly ✓ Done for every hanger roller assembly slotted screwdriver to turn the eccentric to Transit Elevator/Escalator Consorti within 1/64 inch of the bottom of the hanger Instructor's Notes track **Header Components** Hanger Roller Assembly Replacement **Advance** While holding it in this position, tighten the nut on the back of the upthrust assembly. **Advance** Note that it is crucial that this be Transit Elevator/Escalator Consortiur done for every hanger roller assembly. Advance Share hanger roller assembly replacement photo with participants. **Advance** 

Instructor's Guide



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Module Length: 480 min Time remaining: 440	min This section: 180 min (86 slides) Section start time:	Section End Time:
DO	SAY	Materials Needed
REVIEW slide	In your own words:  During preventive maintenance, verify that the car door tracks are secured and clean.  Tighten all loose track hardware.  Advance Also check the car door hangers,	✓ PPT slide 65  Component Hamiterance and Replacement  Header Components  Hanger Roller Assembly Preventive Maintenance  • Verify door tracks are secure and clean  • Tighten loose track hardware  • Check for damage and defects  • Car door hangers  • Rollers  • Felt wicks (oiler)
Instructor's Notes	rollers, felt wicks (oiler) and relating cables for defects and damage.  **Advance** Ensure that the oiler/felt wick is lubricating the hanger roller. Lubricate as required.  **Advance** Check the car door eccentric rollers. Make sure that the gap between the upthrust rollers and track is 1/64 inch (0.39mm). As always, adjust, repair or replace as specified by your authority's procedures.  **Advance**	> Felt wicks (olier) > Relating cable by olier/felt wick - Check excenting rollers > Ensure gap between uptrust rollers and track is 1/64 inch )) Transft Elevator/Escalator Consortium  M

## Elevator – Door Operation Instructor's Guide

Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

#### DO SAY **Materials Needed** In your own words: ✓ PPT slide 66 **REVIEW** slide To ensure proper door panel adjustment, start by examining door hangers. Do this by Header Components manually open the door and allow it to close, Door Hangers First examine door hangers - Manually open door and then allow to close to observe any roughness in the roller bearing Observe any roughness in roller bearing track Listen for noise indicating dragging or binding Examine door skins for wear track. Also, listen for noise that may indicate Verify door panels are not scraping each other . Ensure leading door panel closes even with strike post · Re-install hanger cover where provided dragging or binding. Transit Elevator/Escalator Consortiun **Advance** Examine door skins for signs of Instructor's Notes wear, **Advance** Door panel scraping each other, **Advance** Verify that the leading the door panel closes even with the strike post. Advance Always re-install the **hanger cover** where provided. Most two-speed doors require hanger covers to maintain the code-required clearance between the car sill and hoistway. In all cases, the cover protects the track- and door-support mechanism from dirt. Advance

Instructor's Guide

Module Length: 480 min Time remaining: 440 min



Section End Time:

DO	SAY	Materials Needed
REVIEW slide  Instructor's Notes	In your own words:  To ensure proper door panel adjustment, start by examining door hangers. Do this by manually open the door and allow it to close, to observe any roughness in the roller bearing track. Also, listen for noise that may indicate dragging or binding.  Advance Examine door skins for signs of wear,  Advance Door panel scraping each other,  Advance Verify that the leading the door	PPT slide 66  Devator Inspection and Maintenance: Door Operation  Header Components  Door Hangers  • First examine door and then allow to dose • Observe ary roughness in roller bearing track • Listen for noise indicating dragging or binding • Examine door skins for weer • Verify door panels are not scraping each other • Ensure leading door panel closes even with strike post • Re-install hanger cover where provided  )))))) • Transit Elevator/Escalator Consortium  19
	panel closes even with the <b>strike post</b> . <b>Advance</b> Always re-install the <b>hanger cover</b> where provided. Most two-speed doors require hanger covers to maintain the code-required clearance between the car sill and hoistway. In all cases, the cover protects the track- and door-support mechanism from dirt. <b>Advance</b>	

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min

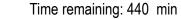


This section: 180 min (86 slides) Section start time: Section End Time:

DO	SAY	Materials Needed
REFER participants to Elevator Maintenance  Instructor's Notes	In your own words:  Refer participants to Elevator Maintenance, 2nd Edition  See Section 3.2 Maintenance Performed from the Top of the Car Examining door hangers, locks: p. 192-199 Figures 3.2.8.2.3 p. 199 and 3.2.8.2.2: p. 198 Advance  Use the checklist chart in the course book to add and review any additional authority specific procedures or guidelines. Advance	PPT slide 67, 68   Invator Inspection and Maintenance: Door Operation   Header Components

Instructor's Guide

Module Length: 480 min





**Materials Needed** DO SAY In your own words: Number in correct order the process for ✓ PPT slide 69 **ASK** replacing a hanger roller. Header Components Bolt new roller Knowledge Check Number in correct order the process for replacing a Loosen eccentric ☐ Bolt new roller ☐ Loosen eccentric ☐ Wedge door open ☐ Replace safety retainer Wedge door open ☐ Replace hanger roller
☐ Loosen one hanger bolt, remove the other ■ Replace safety retainer ☐ Remove safety retainer Transit Elevator/Escalator Consortiur Swivel door hanger 90° Replace hanger roller **Instructor's Notes** Loosen one hanger bolt, remove the other Remove safety retainer Call on participants for answer Advance once given the correct answer Answer: 7, 2, 1, 8, 4, 6, 3, 5 Advance

## Elevator – Door Operation Instructor's Guide



Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

#### **Materials Needed** DO SAY In your own words: When checking the eccentric rollers, Julie ✓ PPT slide 70 **ASK** must ensure the gap between the upthrust Header Components rollers and track is . Knowledge Check 2. When checking the eccentric rollers, Julie must ensure the gam between the upthrust rollers and 1/64 inch track is \_\_\_\_\_ a. 1/64 inch b. ¼ inch c. % inch d. 1 inch c. ¾ inch Transit Elevator/Escalator Consortium d. 1 inch **Instructor's Notes** Call on participants for answer Advance once given the correct answer Answer: a. Advance

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



Section End Time:

DO	SAY	Materials Needed
REVIEW slide	In your own words:  To ensure proper door panel adjustment, start by examining door hangers. Do this by manually open the door and allow it to close, to observe any roughness in the roller bearing track. Also, listen for noise that may indicate dragging or binding.	✓ PPT slide 71  Devotor Impection and Hambranace. Door Operation  Door Panel Components  Door Panels  First examine door hangers  Amoutly open door and then allow to close  Observe any roughness in roller bearing track  Listen for noise indicating dragging or binding  Examine door skins for wear  Verify door panels are not scraping each other  Ensure leading door panel closes even with strike post  Re-install hanger cover where provided
Instructor's Notes	<ul><li>Advance Examine door skins for signs of wear,</li><li>Advance Verify door panels are not scraping each other,</li></ul>	
	Advance Ensure that the leading the door panel closes even with the strike post. Advance	

## Elevator – Door Operation Instructor's Guide



Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

#### **Materials Needed** DO SAY In your own words: ✓ PPT slide 71 Always re-install the **hanger cover** where **REVIEW** slide provided. Most two-speed doors require Door Panel Components **Door Panels** hanger covers to maintain the code-required · First examine door hangers - Manually open door and then allow to close - Observe any roughness in roller bearing track clearance between the car sill and hoistway. - Listen for noise indicating dragging or binding · Examine door skins for wear In all cases, the cover protects the track- and · Verify door panels are not scraping each other · Ensure leading door panel closes even with strike · Re-install hanger cover where provided door-support mechanism from dirt. Transit Elevator/Escalator Consortium Advance **Instructor's Notes**

DO

**REVIEW** slide

Instructor's Notes

Instructor's Guide

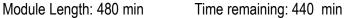
Module Length: 480 min

Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time: SAY **Materials Needed** In your own words: ✓ PPT slide 72 As per height of the hoistway door may need to be adjusted periodically Door Panel Components Door Panels When inspecting door panels, check the · Hoistway door height adjust periodically · Check overlap of door panels, door frame and multispeed panels overlap of door panels, door frame and multi-- Door is closed - At least one inch for new equipment - Worn or missing resilient stops, adjustment or relating speed panels devices can affect overlap, adjust or replace as needed Missing strike posts bumpers may cause incorrect - Overlap varies, check installation, for proper code **Advance** when the door is closed. Transit Elevator/Escalator Consortiun **Advance** It should be at least one inch for new equipment. Worn or missing resilient **stops** or adjustment or relating devices can affect the overlap. Adjust or replace resilient stops as needed. **Advance** Missing strike posts bumpers may cause incorrect operation. Advance Note: Overlap varies from installation to installation see when the elevator was installed to find the proper code for overlap. Advance

Instructor's Guide





This section: 180 min (86 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slide 73 Ask **REVIEW** slide What is a safety retainer? Door Panel Components Safety Retainer Allow participants to discuss answers. · Required to prevent displacement of panel by 3/4 inch if primary means fails **ASK** · Typically fastened to the panel adjacent to guiding The primary guiding means must engage the . Must engage sill by at least 1/4 inch · Examine for secure fastening and placement sill by at least ¼ inch. A safety retainer is · ASME A17.1 requires replacement components to be marked and included in manufacturer listing required to prevent displacement of the panel Transit Elevator/Escalator Consortiun by ¾ inch if the primary means fails. A typical **Instructor's Notes** safety retainer would fasten to the panel adjacent to the guiding means. **Advance** Examine the safety retainers for secure fastening and proper placement. Advance

## Elevator – Door Operation Instructor's Guide



Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

SAY

Section End Time:

**Materials Needed** 

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

## In your own words:

Examine the safety retainers for secure fastening and proper placement. Note that it is a code requirement ASME A17.1 that each replacement components must be plainly marked for identification. As such all replacement components must be included in the original manufacturer's listing of acceptable replacements parts as identified by an approved certifying agency. Advance

Discuss illustration of safety retainer with participants. Advance

✓ PPT slide 73, 74





Instructor's Guide

Time remaining: 440 min



Module Length: 480 min This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 75 Ask **REVIEW** slide What is a door closer? Door Panel Components Allow participants to discuss answers. **ASK** Advance to show a Spring Closer. Advance to show and Spirator. **Advance** Transit Elevator/Escalator Consorti **Instructor's Notes** 

## Elevator – Door Operation Instructor's Guide

Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

#### DO SAY **Materials Needed** In your own words: ✓ PPT slide 76 **REVIEW** slide At least one of two types of door closers are required on all hoistway door panels as per Door Panel Components Door Closers the code: spring closer or spirator G.A.L. · Spring Closer or Spirator required by code · G.A.L. manufacturers both manufactures have both types. > Examine hoistway door closers > Verify door is one inch from fully closed, released the closer is adjusted to close and lock door > Verify tight placement of all attaching hardware **Advance** Be sure to examine hoistway door Spring closers: lubricate pivot points Spirators: examine cables for signs of wear **closers**, verify that when the door is one inch Transit Elevator/Escalator Consortiur from fully closed and released the closer is Instructor's Notes adjusted to close and lock the door. Check to see that all the hardware that attaches the door closer is tight and in place. Note that the base of the spring closer is attached to the saddle/sill and the articulated arm is attached to the fast speed door. Spring closers have more exposed and moving parts, be sure to lubricate the pivot points. Advance

Instructor's Guide



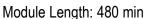
Module Length: 480 min	Time remaining: 440	min This section: 180 min (86 slides) Section start time:	Section End Time:
DO		SAY	Materials Needed
REVIEW slid	le	In your own words:  The spirator also known as a <i>reel closer</i> requires less maintenance if it is properly shielded from contaminants. Examine the cable for signs of wear. Note that the base reel closer/spirator is attached to the hanger roller assembly and the end of the cable is	✓ PPT slide 76  Door Panel Components  Door Closers  • Spring Closer or Sprintor required by code • G.A.L. manufacturers both  ➤ Examine hoistway door closers  ➤ Verify door is one inch from failly closed, released the closer is adjusted to close and lock door  ➤ Verify tight placement of all attaching hardware  - Spring closers: Idurical epivot points  - Spriators: examine cables for signs of wear   >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
Instructor's Not	tes	attached on the door lock assembly.  Advance	Jaggo Transic Elevator / Escalator Consortium

Instructor's Guide



Module Length: 480 min Time remaining: 440 min This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 77 Ask **REVIEW** slide What is a relating cable? Door Panel Components **Relating Cable** Allow participants to discuss answers. · Attach and keep in time multispeed doors · Verify secure attachment to fast speed door and slow **ASK** Advance · Examine for signs of wear, replace as needed In multispeed door configurations, the doors are attached and kept in time with the use of a Transit Elevator/Escalator Consortium relating cable. **Instructor's Notes Advance** Verify that the relating cable is securely attached to the fast speed door and the slow speed door. Examine the relating cable for signs of wear and replace as needed. Advance

Instructor's Guide





Time remaining: 440 min This section: 180 min (86 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slide 78 What is a door reopening device? **REVIEW** slide Allow participants to discuss answers. Door Panel Components Door Re-opening Device Advance > Verify doors return to fully open position > Lenses and reflector **ASK** Check the operation of the door re-opening - examine for alignment and secure mounting > Non-contact door-reopening device - Clean covers **device**. Verify that the doors return to the fully - Examine for defects · Code requires automatic re-opening device for each open position. Transit Elevator/Escalator Consortiur **Advance** Clean the lenses and reflector on Instructor's Notes photo devices and examine them for alignment and secure mounting. **Advance** Where the door opening is protected with a non-contact door-reopening device, the covers should be cleaned and examined for defects. **Advance** Be reminded that as per the code each car door should have an automatic reopening device. Advance

Instructor's Guide

Module Length: 480 min Time remaining: 440 min



**Materials Needed** SAY

**REVIEW** slide



**REFER** participants to <u>A17.3</u> A117.1

DO

## **Instructor's Notes**

#### In your own words:

Discuss illustration of the door re-opening device with participants. **Advance** 

#### Refer participants to

- A17.3 2002 Section 2.8.2
- **A117.1 2003** Section 4.0.7 for Code requirements on ADA compliance Advance

✓ PPT slide 79, 80





- A17.3 2002
- A117.1 2003

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min





#### DO SAY **Materials Needed** In your own words: ✓ PPT slide 81 **REVIEW** slide Ask What do we know about release rollers, door Door Panel Components Release Roller, Door Clutch, Car Guide Shoes **ASK** clutches, and car guide shoes? · Examine engagement of release roller and door clutch · Inspect car guide shoes for wear - Follow authority guidelines for procedures Allow participants to discuss answers. Figure 70 Two-speed sliding door clutch **REFER** participants to · Figure 71 Center-parting car door release roller to car clutch clearance Course book Advance Transit Elevator/Escalator Consortiur Examine the release roller and door clutch Instructor's Notes Course book p. engagement. Visually inspect the car guide 100 – figures shoes for wear. If they are worn, do not make 71 and 72 any adjustments, follow your authority's quidelines. Refer participants to Figure 71, 2A, 2B, 2C and 2D for door release roller to car clutch clearances for two-speed sliding doors. Figure 72, 5A, 5B, and 5C for door release roller to car clutch clearances on center-parting car doors Advance

DO

Instructor's Guide



Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time: SAY **Materials Needed** In your own words: ✓ PPT slide 82. 83 For center-opening car door leading edges, examine the astragals for wear and damage. Door Panel Components Release Roller, Door Clutch, Car Guide Shoes **Advance** Also, verify the strike post bumpers · Center-opening car door leading edges - examine astragals for wear, damage · Verify strike post bumpers are in good condition are installed and in good condition. Repair or - Follow transit authority procedures replace as required. If they are missing or damaged follow your authority's procedure. Transit Elevator/Escalator Consorti Door Panel Components Vision Panels > Inspect for broken glass, missing or damaged grills Examine all vision panels for broken glass, > Check sight guard for damage and secure fastening > Record and repair according to transit authority missing or damaged grills. Advance Also, check the sight guard(s) for damage and ensure it is securely fastened to Transit Elevator/Escalator Consortiur the door panel(s). Make repairs as required. Sight guards are required when the gap between the car door and hoistway door exceeds 51/2 inches. **Advance** After these checks record all

**REVIEW** slide

Instructor's Notes

Advance

defects or any missing items and again follow your authority's procedures. Advance

DO

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** SAY



**REVIEW** slide



**REFER** participants to Course book

**Instructor's Notes** 

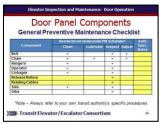
In your own words:

Share photo of sight guard with participants. **Advance** 

Use the checklist chart in the course book to add and review any additional authority specific procedures or guidelines. **Advance** 

✓ PPT slide 84, 85





Course book p.

## Elevator – Door Operation Instructor's Guide



Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

DO	SAY	Materials Needed
? ASK	In your own words: Yes or No. Code requires automatic reopening device for some cars.  Call on participants for answer Advance once given the correct answer Answer: No – required for all cars	✓ PPT slide 86  Berator Inspection and Maintenance: Electric Traction Hostway  Door Panel Components  Knowledge Check  1. Yes or No. Code requires automatic re-opening device for some casts.  )))))  Transit Elevator/Escalator Consortium
Instructor's Notes	Advance	

## Elevator – Door Operation Instructor's Guide



Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

SAY

Section End Time:

**Materials Needed** 

# DO **ASK Instructor's Notes**

#### In your own words:

Danny must inspect the relating cables. What should Danny verify and examine to complete this process?

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

#### Answer:

- Verify secure attachment to fast speed door and slow speed door
- Examine for signs of wear, replace as needed

#### Advance

#### ✓ PPT slide 87

Knowledge Check  2. Danny must inspect the relating cables. What should Danny verify and examine to complete this process?
should Danny verify and examine to complete this

Instructor's Guide

Time remaining: 440 min



Module Length: 480 min This section: 180 min (86 slides) Section start time: DO SAY **Materials Needed** In your own words: ✓ PPT slide 88 Ask **REVIEW** slide What do we know about the footer or sill Footer Components > Examine and tighten area? - Landing sills - Sill fasteners **ASK** > Remove all debris and clean sills Allow participants to discuss answers. > Inspect car platform toe guard - Secure loose hardware Advance Transit Elevator/Escalator Consorti Always examine and tighten each landing sill for defects and damage. Check and tighten all Instructor's Notes landing sills fasteners. Remove all debris from sills. Note that door sills should also be cleaned. As always, follow your authority's specific procedures. Also, inspect the car platform toe guard(s) for corrosion and loose hardware. Be sure to secure all loose hardware. Do Not Advance

DO

**REVIEW** slide

**Instructor's Notes** 

Instructor's Guide





This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** SAY ✓ PPT slide 88, 89 Footer Components > Examine and tighten - Landing sills - Sill fasteners > Remove all debris and clean sills > Inspect car platform toe guard - Secure loose hardware Transit Elevator/Escalator Consorti

Footer	1
Components	TOT GUARG
Toe Guard	
	1 10000
	N. Tallet

## In your own words:

Though rarely seen by elevator passengers, the sole purpose of the toe guard is to protect the passengers from accidentally sticking their foot under the platform if it is not level with the landing. True to its name, the toe guard is there to protect the passenger's toes.

#### Advance

Share and discuss photo of toe guard with participants. Advance

Instructor's Guide

Module Length: 480 min

Time remaining: 440 min



DO SAY **Materials Needed** In your own words: ✓ PPT slide 90 Ask **REVIEW** slide What do we know about gibs? Footer Components Allow participants to discuss answers. > Check hoistway gibs and safety retainers - Secure attachment **ASK Advance** - Repair or replace as needed > Ensure guides engage sill no less than 1/4 inch > Adjust door height as required Gibs - Code requires 3/8 inch (1/4 recommended) between · Multi-speed doors: true measurement or between When the doors open and close the door Transit Elevator/Escalator Consortiun panels ride along the door hanger track at the **Instructor's Notes** top of the door by use of the door hanger assembly. At the bottom of the door panel are a set of gibs which slide along the door sill found at each landing. Check the hoistway door guides/car door guides (gibs) and safety retainers for secure attachment and wear. Repair or replace as required. Advance

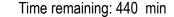
Instructor's Guide



Module Length: 480 min Time remaining: 440 min This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 90 Check that the guides engage the **REVIEW** slide corresponding sill by not less than ¼ inch. Footer Components Adjust door height as required. The code-> Check hoistway gibs and safety retainers - Secure attachment required space between the panel and the > Ensure guides engage sill no less than 1/4 inch jamb is 3/8 inch (1/4 inch is recommended). In > Adjust door height as required - Code requires 3/8 inch (1/4 recommended) between · Multi-speed doors: true measurement or between multi-speed doors this measurement should ))) Transit Elevator/Escalator Consortium be true or between the two panels. **Instructor's Notes** Advance

Instructor's Guide

Module Length: 480 min





This section: 180 min (86 slides) Section start time: Section End Time:

DO	
	In your owr
REVIEW slide  REFER participants to	In most case gibs will be in Advance If because it
Elevator Maintenance  Instructor's Notes	nylon guide the gib brack guide. Advance
	Refer particles  • Elevator  • Second
	Advance

Transit Elevator/Escalator Consortium

#### n words:

ses only the nylon guide on the replaced.

f the entire gib needs replacement it is bent, rusted, etc. – the new will still need to be connected to ket correctly. Use the old gib as a

SAY

#### cipants to

- or Maintenance
  - ection 3.2.9 Doors, Pages 197-01
  - ection 4.29 Doors, Pages 223-30

Share and discuss photo of gibs with participants. Advance

✓ PPT slides 91, 92

**Materials Needed** 



Elevator Maintenance



Instructor's Guide

Time remaining: 440 min



Module Length: 480 min This section: 180 min (86 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 93 Use the checklist chart in the course book **REVIEW** slide to add and review any additional authority Footer Components General Preventive Maintenance Checklist specific procedures or guidelines. **REFER** participants to Advance Course book Transit Elevator/Escalator Consortiun **Instructor's Notes** Course book p. 83

## Elevator – Door Operation Instructor's Guide



Module Length: 480 min

Time remaining: 440 min

This section: 180 min (86 slides) Section start time:

Section End Time:

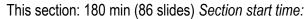
## **Materials Needed** DO SAY In your own words: Inspecting a car platform toe guard includes **ASK** checking for (check all that apply) Corrosion Loose hardware c. Bent tabs **Burning wires Instructor's Notes** Call on participants for answer Advance once given the correct answer Answer: a., b. Advance

✓ PPT slide 94

	Header Component	
checki (che a. C b. L c. B	ing for eck all that apply) corrosion cose hardware dent tabs	des
	checki (ch a. C b. L c. E	Inspecting a carplatform toe guard includenceking for

Instructor's Guide

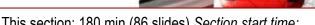


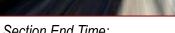




DO	SAY	Materials Needed
? ASK	In your own words: While code requires 3/8 inch between panel and jamb, is actually recommended. a. 1/8 inch b. ¼ inch c. ½ inch d. ¾ inch	✓ PPT slide 95  Iterator Inspection and Hamtenance: Electric Traction Hostway  Header Components  Knowledge Check  2. While code requires 3/8 inch between panel and jamb, a. 1/8 inch b. ½ inch c. ½ inch d. ½ inch J. ¼ inch J.
Instructor's Notes	Call on participants for answer Advance once given the correct answer Answer: b. Advance	

Instructor's Guide





Module Length: 480 min Time remaining: 440	min This section: 180 min (86 slides) Section start time:	Section End Time:
DO	SAY	Materials Needed
REFER participants to Elevator Maintenance & G.A.L. Installation Procedures Instructor's Notes	In your own words:  Refer participants to  • Elevator Maintenance pages 209 through 235 • G.A.L. Installation Procedures CD "Tune up and code compliance"  for a detailed review of transit elevator components that require inspection. Advance	VPPT slide 96  Iterator Inspection and Haintenance: Door Operation  Door Panel Components Door Panels  Elevator Maintenance, 2nd Edition p. 209 - 235  G.A.L. Installation Procedures CD  **Tune Up and Code Compilance**  VElevator  Maintenance  G.A.L. Installation  Procedures

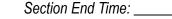
Instructor's Guide

Time remaining: 260 min Module Length: 480 min



SAY

Section start time:



**Materials Needed** 

# DO **ASK CLASSROOM ACTIVITY Instructor's Notes**

#### In your own words:

Take time to visit the field to provide an example demonstration and opportunities for participants to perform the following tests:

Clean, adjust, lubricate, and/or repair components as necessary

Advance

✓ PPT slide 97



Instructor's Guide

Module Length: 480 min Time remaining: 180 min



DO SAY **Materials Needed** In your own words: ✓ PPT slides 98, 99 During a **sensory inspection** a good elevator **REVIEW** slide technician relies on the physical senses of Door Operation Sensory Inspection sight, smell, hearing, and touch while **ASK** inspecting and maintaining the elevator emergency equipment. Advance Ask Instructor's Notes What may indicate a problem with elevator Sensory Inspection **Physical Senses** door operation as indicated by sight? Signs of scraping on metal, jerky Discuss answers Burning of electrical wires Advance for sample answers Seeing signs of scraping on the metal, seeing Transit Elevator/Escalator Consorti jerky movement/binding, door isn't closing completely Advance

Instructor's Guide

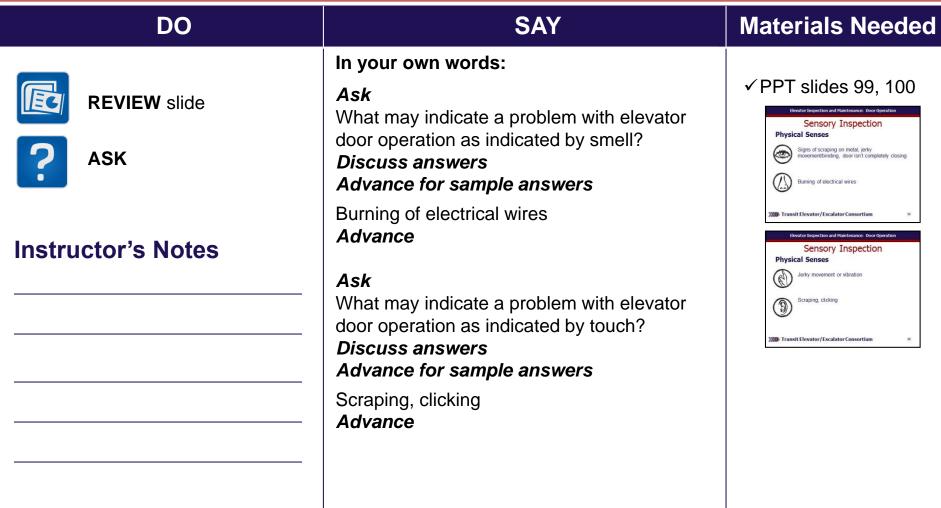
Module Length: 480 min

Time remaining: 180 min

This section: 15 min (4 slides)

Section start time:

Section End Time:



Instructor's Guide

Module Length: 480 min Time remaining: 180 min This section: 15 min (4 slides)

Section start time:

Section End Time:

#### **Materials Needed** DO SAY In your own words: ✓ PPT slide 100 Ask **REVIEW** slide What may indicate a problem with elevator Sensory Inspection **Physical Senses** door operation as indicated by hearing? Jerky movement or vibration **ASK** Discuss answers Advance for sample answers Jerky movement or vibration Transit Elevator/Escalator Consorti With more experience, you will become more **Instructor's Notes** familiar with the normal sights, smells, sounds and feel of the system. During a sensory inspection, check for deviations from this norm. Advance

Instructor's Guide

Module Length: 480 min Time remaining: 180 min



**Materials Needed** DO SAY In your own words: Jerky movement or vibration would be ✓ PPT slide 101 **ASK** detected by a \_\_\_\_\_ sensory inspection. Sensory Inspection a. sight Knowledge Check sensory inspection. b. smell c. hear d. touch Transit Elevator/Escalator Consortiu Call on participants for answer **Instructor's Notes** Advance once given the correct answer Answer: d. Advance

### Elevator – Door Operation Instructor's Guide

Module Length: 480 min

Time remaining: 165 min

This section: 45 min (13 slides) Section start time:

Section End Time:

#### DO SAY **Materials Needed** In your own words: ✓ PPT slide 102 When performing an operational inspection **REVIEW** slide check to make sure the doors' functions are Operational Inspection > Inspect for smooth/quiet door function smooth and quiet. Ensure careful adjustment of zone and speed while engaging/disengaging hoistway interlock rollers Inspect door speed at end of travel. **Advance** Wear and tear on the system can - Should not bounce at either jamb or opposing pan - Enough power without using momentum · Check by momentarily stalling doors near limit of be reduced by careful adjustment of zone and · Doors should reopen without hitting obstruction > Ensure proper nudging speed while engaging and disengaging the Transit Elevator/Escalator Consortiun hoistway interlock rollers. Instructor's Notes **Advance** Pay close attention to the speed at which doors approach the ends of travel (full open and full close). Doors should never strike the jamb (or opposing panel on center opening) and bounce. Doors should have enough power to reach full open and full close without relying on momentum. This can be checked by momentarily stalling the doors when they are near their limit of travel. In the presence of an obstruction in the door opening, the door should reopen without hitting the obstruction. Advance

DO

Instructor's Guide

Module Length: 480 min

Time remaining: 165 min



This section: 45 min (13 slides) Section start time: Section End Time: SAY **Materials Needed** ✓ PPT slides 102, 103 Operational Inspection > Inspect for smooth/quiet door function > Ensure careful adjustment of zone and speed while engaging/disengaging hoistway interlock rollers > Inspect door speed at end of travel - Should not bounce at either jamb or opposing panel Enough power without using momentum . Check by momentarily stalling doors near limit of · Doors should reopen without hitting obstruction > Ensure proper nudging Transit Elevator/Escalator Consortium Operational Inspection > Adjust door operator as needed - Smooth acceleration and deceleration > Listen for noises - Scrapes, rattles - Inspect possible causes such as hanger rollers - Repair as needed > Inspect car and hoistway door operation - Smooth movement transitions > Door opening restrictions - Try opening car doors from inside when car is outside Transit Elevator/Escalator Consortium

**REVIEW** slides

## Instructor's Notes

#### In your own words:

Make sure that nudging engages after the pre-set amount of time.

#### Advance

There should be no bouncing, slamming and hitting. If needed, adjust the door operator to achieve smooth acceleration and deceleration in both the open and closed direction.

**Advance** Listen for noises such as scraping and rattles. Determine the cause of such noise and eliminate it with repairs. Doors that bounce and rattle probably need new hanger rollers.

**Advance** Check both the car hoistway and car door operation. Make sure both doors operate without binding and dragging. Door movements should be without abrupt transitions.

Advance

Instructor's Guide



Time remaining: 165 min This section: 45 min (13 slides) Section start time: Module Length: 480 min Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slides 103, 104 Next, examine door opening restrictions. **REVIEW** slides When the car is outside the unlocking zone, Operational Inspection > Adjust door operator as needed try to open the doors from inside the car. - Smooth acceleration and deceleration > Listen for noises - Scrapes, rattles Verify that the car doors are so aligned that - Inspect possible causes such as hanger rollers - Repair as needed > Inspect car and hoistway door operation the car doors cannot be opened more than Smooth movement transitions > Door opening restrictions - Try opening car doors from inside when car is outside four inches Transit Elevator/Escalator Consortiun Advance Instructor's Notes Note that the door zone is defined in the Operational Inspection **ASME Code Door Zone**  18 inches above and below hoistway door sill ASME code as 18 inches above and below Door restrictor keeps the hoistway door sill and the elevator car sill. doors closed when car is not level with floor The purpose of a door zone lock is to prevent the doors from opening when the elevator is MF Transit Elevator/Escalator Consortiu not in the unlocking zone. G.A.L. manufacturing complies with this by the use of a zone locking device, more commonly called a **door restrictor**. The door restrictor keeps the doors from being able to be opened when the car is not on a floor level. Advance

Instructor's Guide





Time remaining: 165 min Module Length: 480 min This section: 45 min (13 slides) Section start time: Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slides 105, 106 The following check of the car door gate **REVIEW** slides switch should be performed using the Operational Inspection Gate Switch inspection station on top of the car. Verify that · Via inspection station on top of car · Verify car does not move with leading edge of door or gate open greater than 2 inches the elevator does not move with the leading edge of the door(s) or gate open greater than two inches Transit Elevator/Escalator Consortiu Advance Instructor's Notes Operational Inspection **Hoistway Door Interlocks** From outside of car at each landing Next, from the outside of the car, examine the Manually check interlocks cannot be released by pulling or lifting door panel Inspect and clean electrical contacts and MO keeper hoistway door interlocks by standing bridging block contact - Inspect free movement of interlock and assemblies - Lubricate linkages and pivot points outside at each landing and With hoistway door open, try to run car on inspection from top of car inspection station · Correct defects as needed **Advance** manually check that the hoistway Transit Elevator/Escalator Consortium door mechanical interlocks cannot be released by pulling or lifting the door panel(s). **Advance** Inspect and clean every landing, the interlock electrical contacts and the MO keeper bridging block contact. Advance

### Elevator – Door Operation Instructor's Guide



Module Length: 480 min

Time remaining: 165 min

This section: 45 min (13 slides) Section start time:

Section End Time:

#### DO SAY **Materials Needed** In your own words: ✓ PPT slide 106 Repair or replace as required. Also, inspect **REVIEW** slide for free movement of all interlock and Operational Inspection **Hoistway Door Interlocks** assemblies: From outside of car at each landing Manually check interlocks cannot be released by pulling or lifting door panel **Advance** lubricate linkages and pivot points. Inspect and clean electrical contacts and MO keeper bridging block contact - Inspect free movement of interlock and assemblies **Advance** At each landing with the hoistway - Lubricate linkages and pivot points With hoistway door open, try to run car on inspection from top of car inspection station door open, try to run the elevator on · Correct defects as needed Transit Elevator/Escalator Consortiur inspection from the top of the car inspection Instructor's Notes station. If the elevator runs you must correct the defect. As always, after each inspection step repair and replace in accordance with your authority's procedures. Advance

Instructor's Guide

Time remaining: 165 min

This section: 45 min (13 slides) Section start time: Module Length: 480 min Section End Time: DO SAY **Materials Needed** In your own words: ✓ PPT slides 107, 108 For Door Closers **REVIEW** slide **Advance** With the doors disengaged verify Operational Inspection that the hoistway door closer initiates closing Door Closers > Verify hoistway door closer initiates closing - With doors disengaged - At several positions of travel at several positions of travel to the locked > Check for proper tension - Open hoistway door about one inch - Ensure door fully closes to locked position position. **Advance** Check proper tension on the door Transit Elevator/Escalator Consorti closer by opening the hoistway door about Instructor's Notes one inch and ensure the door fully closes to Operational Inspection **Door Closing Force** > Ensure does not exceed 30 lbs force the locked position. - Check with force gauge . Stop with hand when hatch door is between 1/3 and 2/3 dosed Advance · Place scale against door edge and slowly release . Move test scale away from door, read door closing Measurements vary with door type Be sure to check that the door closing force, Transit Elevator/Escalator Consortiur making sure it does not exceed 30 lbs of force. This can be checked with a force gauge. **Advance** With the hatch door between 1/3 and 2/3 closed, stop it with your hand. Advance

Instructor's Guide

Module Length: 480 min

Time remaining: 165 min



DO SAY **Materials Needed** In your own words: ✓ PPT slide108 Put the scale against the door edge and **REVIEW** slide slowly release the door, allowing the closing Operational Inspection **Door Closing Force** force to be imposed on the scale, > Ensure does not exceed 30 lbs force - Check with force gauge · Stop with hand when hatch door is between 1/3 **Advance** then move the test scale away from and 2/3 dosed • Place scale against door edge and slowly release the door. At this point read the door closing . Move test scale away from door, read door closing - Take more than one reading force. Measurements vary with door type Transit Elevator/Escalator Consortiur **Advance** Always take more than one reading Instructor's Notes and record the average. **Advance** Kinetic closing energy measurements vary depending on the type of door. Advance

Instructor's Guide

Time remaining: 165 min



Module Length: 480 min This section: 45 min (13 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 109 Refer participants to **REVIEW** slide Operational Inspection **Door Closing Force** Elevator Maintenance page 236 **REFER** participants to Elevator Maintenance for a detailed review of Measuring kinetic closing energy. Transit Elevator/Escalator Consorti **Instructor's Notes** Advance Elevator Maintenance

Instructor's Guide

Module Length: 480 min

Time remaining: 165 min



	(	
DO	SAY	Materials Needed
REFER participants to ASME A17.1  Instructor's Notes	In your own words:  As always, follow your authority's specific requirements on preventive maintenance inspections.  Make sure that the belts and chains on the operator are properly adjusted. In addition, take the following measurements that are mandated as per code: Clearance parameters & Closing Force  Advance For clearance parameters (gaps), simply use a ruler to make sure that all spaces are within code specifications as per A17.1 - 2010 Section 2.11. et correctly. Use the old gib as a guide.  Refer participants to  ASME A17.1  Advance	✓ PPT slides 110    Control Importion and Haintenance: Door Operation

## Elevator – Door Operation Instructor's Guide



Module Length: 480 min

Time remaining: 165 min

This section: 45 min (13 slides) Section start time:

Section End Time:

**Materials Needed** 

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

## In your own words:

For closing force use a force gauge on the edge of the hoistway door -- as the sensor will detect an obstruction if it is measured on the inside of the car door and will not close. Where this is measured on the door depends on the manufacturer - be sure to consult your manufacturer's specifications.

SAY

Advance

#### ✓ PPT slide 111

Measurements	nspection
measurements	
· Code mandated measurement	S
<ul> <li>Closing force</li> </ul>	
<ul> <li>Use force gauge on edge</li> </ul>	of hoistway door
<ul> <li>Measure on inside</li> </ul>	
<ul> <li>Door should not close</li> </ul>	
<ul> <li>Consult manufacturer spe measure</li> </ul>	cifications for where to

Instructor's Guide

Time remaining: 165 min



Module Length: 480 min This section: 45 min (13 slides) Section start time: Section End Time: **Materials Needed** DO SAY In your own words: Yes or No. During a door inspection, Jerome ✓ PPT slide 112 **ASK** should ensure that door force does not Operational Inspection exceed 30 lbs force. Knowledge Check Yes or No. During a door inspection, Jerome should ensure that door force does not exceed 30 lbs force. Call on participants for answer Advance once given the correct answer Answer: Yes Transit Elevator/Escalator Consortiu Advance **Instructor's Notes** 

Instructor's Guide

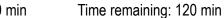
Module Length: 480 min

Time remaining: 165 min



**Materials Needed** DO SAY In your own words: When Phil is inspecting the gate switch, he ✓ PPT slide 113 **ASK** should verify the car does not move with the Operational Inspection leading edge of the door or gate open greater Knowledge Check When Phil is inspecting the gate switch, he should verify the car does not move with the leading edge of than the door or gate open greater than a. 1/64 inch 1/64 inch c. 1 inch d. 2 inches b. ½ inch Transit Elevator/Escalator Consorti 1 inch 2 inches **Instructor's Notes** Call on participants for answer Advance once given the correct answer Answer: d. Advance

Instructor's Guide







Module Length: 480 min This section: 80 min Section start time: Section End Time: **Materials Needed** DO SAY In your own words: ✓ PPT slide 114 **ASK** Take time to visit the field to provide an Time for a Field Trip example demonstration and opportunities for participants to perform the following **CLASSROOM** tests: **ACTIVITY** Perform a sensory inspection of the door assembly Perform an operational inspection of the **Instructor's Notes** door assembly Perform an operational test on all safety devices on the doors Advance

## Elevator – Door Operation Instructor's Guide

Module Length: 480 min

Time remaining: 40 min

This section: 40 min (4 slides)

Section start time:

Section End Time:

#### DO SAY **Materials Needed** In your own words: For each objective, briefly review what ✓ PPT slides 115, 116, **CLASSROOM** was learned in this module or ask 117 **ACTIVITY** participants to share what they have Conclusion learned for each learning objective and · Identify the components of the car doors, which require inspection, cleaning and adjustment · Clean, adjust, lubricate, and/or repair components as briefly discuss as a class. · Perform a sensory inspection of the door assembly · Perform an operational inspection of the door Advance · Perform an operational test on all safety devices on the · Identify clearance parameters as per industry code Lets take a look at some of the key words we Transit Elevator/Escalator Consortiur have defined as moved through this module. Instructor's Notes Read slide. Discuss definitions as a Conclusion · Clearance Parameters group. · Door Clutch · Hanger Roller Assembly Header Door Hanger Tracks Advance Door Operator · Hoistway Door Closers · Door Panels · Hoistway Door · Door Re-Opening Device Interlocks Read slide. Discuss definitions as a Eccentric · Hoistway Interlock Rollers Force Gauge Measurements · Gate Switch · Nudging group. · Relating Cable Transit Flevator/Escalator Consortium Advance Read slide. Discuss definitions as a Conclusion Stop Roller · Relating Cable group. · Release Roller Strike Post · Resilient Stops Strike Posts Bumpers Safety Curtain · Toe Guard Advance · Safety Retainer · Type "A" Oiler · Sensory Inspection Read slide. Discuss definitions as a · Sight Guard · Sill Area (aka Footer) Spirato

group. Advance

· Spring Closer

))))) Transit Elevator/Escalator Consortiu

Instructor's Guide

Time remaining: 40 min Module Length: 480 min

This section: 40 min (4 slides)

Section start time:

Section End Time:

