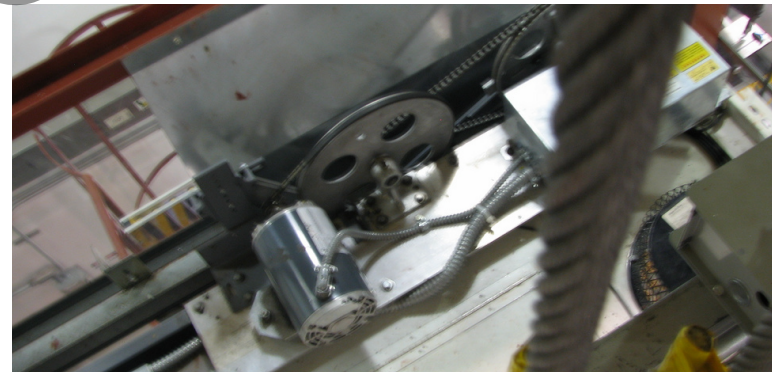
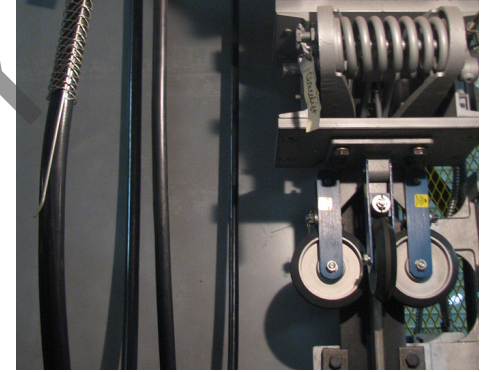
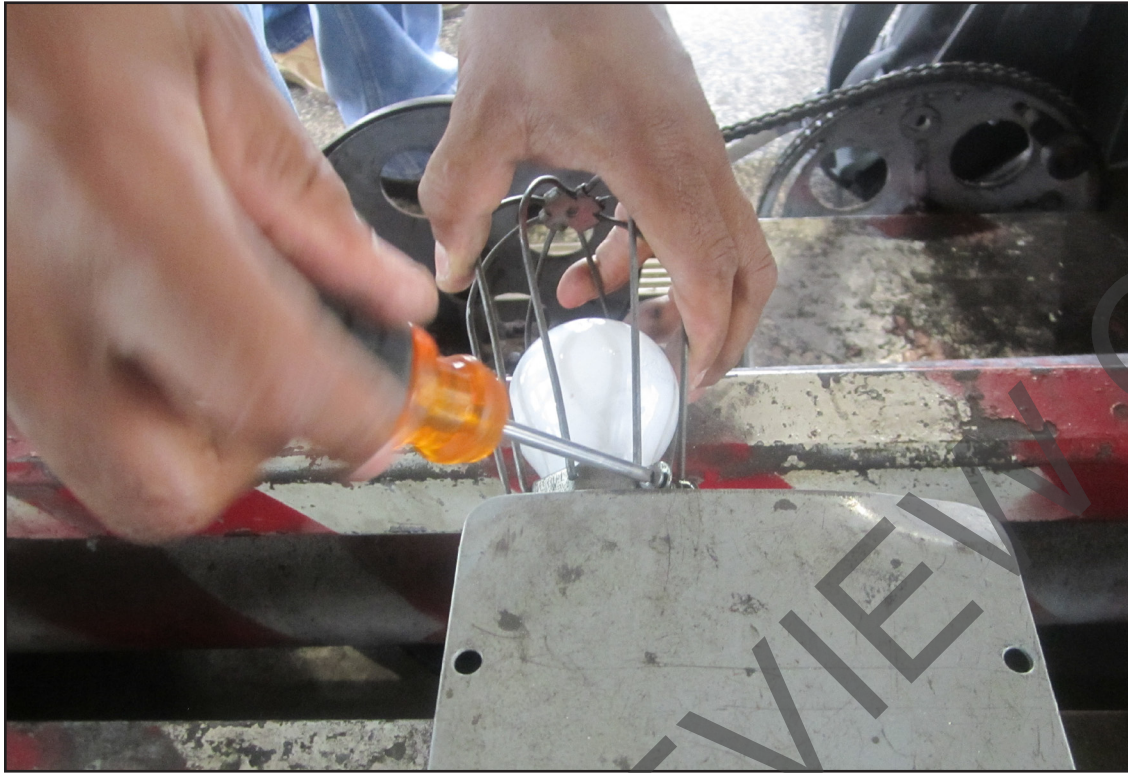


Instructor Guide



219: Elevator: Inspection and Basic Maintenance
Module 8B: Electric Traction Machine Room



Table of Contents

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Operational Inspection & Maintenance.....	20
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Elevator – Electric Traction Machine Room

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	30 Minutes
2	Sensory Inspection	30 Minutes
3	Inspection & Maintenance	90 Minutes
4	Field Trip	120 Minutes
5	Summary	30 Minutes
	Total Time:	300 Minutes

Elevator – Electric Traction Machine Room

Instructor's Guide



Overview

Purpose The purpose of this module is to:

Provide the participant with an overview of the tasks involved in inspecting and maintaining the machine room in a traction elevator system.

Objectives

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

- Identify the areas and equipment in a traction elevator machine room where cleaning is required.
- Identify the areas and equipment in a traction elevator machine room where lubrications is required.
- Identify the areas and equipment in a traction elevator machine room where inspection is required.
- List unacceptable conditions which require corrective action.
- Perform a sensory inspection of a machine room.
- Perform an inspection of traction elevator machine room.
- Perform an operational test on all safety devices in the machine room.

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
- Bethlehem Elevator Rope® Technical Bulletin 3 on rouging which accompanies Module 7B: Traction Hoistway.
- Bethlehem Elevator Rope® Technical Bulletin 6 on lubricant build-up on ropes which accompanies Module 7B: Traction Hoistway.

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 300 min

This section: 30 min (12 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW introduction slides

Instructor's Notes

SAY

In your own words:

Welcome to the course on inspection and maintenance of the electric traction machine room.

Advance

Machine rooms and their equipment can be modern like we saw in the previous slide, or older like we see here. This is a Otis geared machine from 1926 in Brussels, Belgium.

Advance

Materials Needed

✓ PPT slides 1, 2



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 300 min

This section: 30 min (12 slides) Section start time: _____

Section End Time: _____

DO



REVIEW module objectives

Instructor's Notes

SAY

In your own words:

Today we will

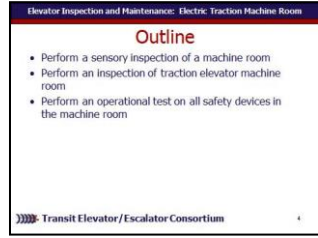
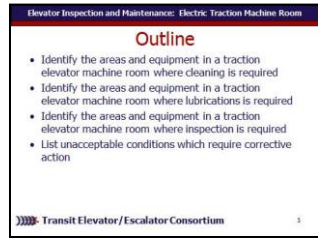
- Identify the areas and equipment in a traction elevator machine room where cleaning is required
- Identify the areas and equipment in a traction elevator machine room where lubrications is required
- Identify the areas and equipment in a traction elevator machine room where inspection is required
- List unacceptable conditions which require corrective action

Advance

- Perform a sensory inspection of a machine room
- Perform an inspection of traction elevator machine room
- Perform an operational test on all safety devices in the machine room **Advance**

Materials Needed

✓ PPT slides 3, 4



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 300 min This section: 30 min (12 slides) Section start time: _____ Section End Time: _____

DO



REVIEW key terms

Instructor's Notes

SAY

In your own words:

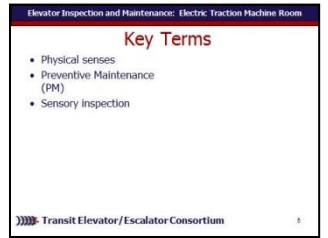
Lets take a look at some of the key words we will be defining as move through this module:

- Physical senses
- Preventive Maintenance (PM)
- Sensory inspection

Advance

Materials Needed

✓ PPT slide 5



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 300 min

This section: 30 min (12 slides) Section start time: _____ Section End Time: _____

DO



ASK participants what they remember about safety and elevators



SMALL GROUP ACTIVITY



WRITE

Instructor's Notes

SAY

In your own words:

Thinking back to other courses or just in general, what do we already know about electric traction machine room?

Possible maintenance requirements for these machine rooms?

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

Materials Needed

✓ PPT slide 6



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

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 300 min

This section: 30 min (12 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide

Instructor's Notes

In your own words:

A traction elevator's machine room is typically located at the top of the structure, directly over or adjacent to the shaft or hoistway.

Advance The machine room must be constructed and laid out within the guidelines of ASME and jurisdictional codes and these cover a myriad of guidelines including room door configuration, lighting, ventilation, fire safety equipment, identification of equipment, to name a few!

Advance As such, it is the task of the elevator technician to make sure the machine room meets these code requirements.

Advance

✓ PPT slide 7



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 300 min

This section: 30 min (12 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slides



ASK

Instructor's Notes

SAY

In your own words:

Again, within the electric traction elevator system there are four main areas: we have already covered overhead, length of hoistway, and pit. Now we will cover the machine room.

Advance

Ask

What types of equipment can be found in a machine room?

Allow participants to discuss possible answers.

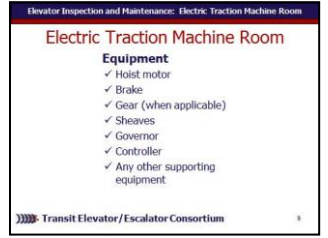
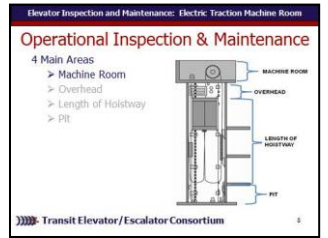
Advance for answers.

The elevator technician can expect to spend much of the work day in the machine room where the hoist motor, brake, gear (where applicable), sheaves, governor, controller, as well as other equipment that supports these major machinery are located.

Do Not Advance

Materials Needed

✓ PPT slides 8, 9



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 300 min

This section: 30 min (12 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slides



ASK

Instructor's Notes

In your own words:

This equipment must be regularly maintained and serviced to keep the elevators working. The technician generally does preventive maintenance, such as lubricating and greasing moving parts, replacing worn parts, and adjusting equipment for optimal performance.

Advance

Every transit agency has a system whereby it documents all inspection and maintenance of elevator equipment.

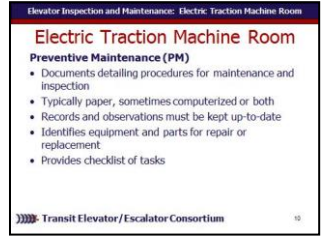
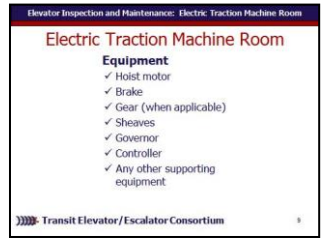
Ask

What do we know about preventive maintenance?

Allow participants to discuss possible answers.

Advance for answers.

✓ PPT slides 9, 10



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 300 min

This section: 30 min (12 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide



ASK

Instructor's Notes

In your own words:

The technician is provided with a checklist of **Preventive Maintenance (PM)** procedures that is typically in a paper form but may also be computerized checklist or a combination of both. Recording maintenance work and observations is an essential part of maintenance and such records must be kept up to date. Good records help in identifying equipment or parts that may need to be repaired or replaced. The checklist also provides a means whereby tasks and procedures are not skipped or forgotten.

Advance

✓ PPT slide 10



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slides

Instructor's Notes

In your own words:

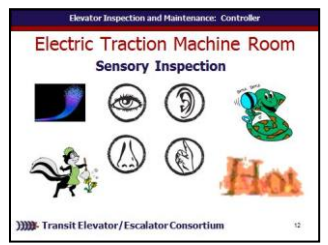
A traction elevator's machine room is typically Every technician working in a transit environment must follow two published guidelines for working safely around elevator equipment: one, the *Elevator Industry Field Employees' Safety Handbook* published by National Elevator Industry, Inc., and, two, the safety policy of the transit authority with which the technician works.

Advance

Lets look at what a sensory inspection of an electric traction machine room might turn up first.

Advance

✓ PPT slides 11, 12



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW slide



ASK

Instructor's Notes

SAY

In your own words:

During a **sensory inspection** a good elevator technician relies on the **physical senses** of sight, smell, hearing, and touch while inspecting and maintaining the elevator.

Ask What may indicate a problem within an electric traction machine room as indicated by sight?

Discuss possible answers

Advance for sample answers

Outside Machine Room: Clutter blocking access, signage

Inside Machine Room: dim/no lighting, items that should not be in the machine room, dust/dirt, overflowing drip pans (geared only), clearly identified which machines go with which elevator where applicable, scoring on the brake drum, missing guards, clarity of oil.

Advance

Materials Needed

✓ PPT slide 13



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW slide



ASK

Instructor's Notes

SAY

In your own words:

Ask What may indicate a problem within an electric traction machine room as indicated by smell?

Discuss possible answers

Advance for sample answers

Inside Machine Room: excessive oil, burnt oil, burning coils, overheating brakes, burnt components or overheating electrical wires

Advance

Materials Needed

✓ PPT slide 14



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide



ASK

Instructor's Notes

In your own words:

Ask What may indicate a problem within an electric traction machine room as indicated by hearing?

Discuss possible answers

Advance for sample answers

Outside Machine Room: sound of sliding, clicking

Inside Machine Room: rattling, knocking (geared only), noises from the sheaves, dragging on the brake drum. Brush chatter.

Advance

✓ PPT slide 15



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide



ASK

Instructor's Notes

In your own words:

Ask What may indicate a problem within an electric traction machine room as indicated by touch?

Discuss possible answers

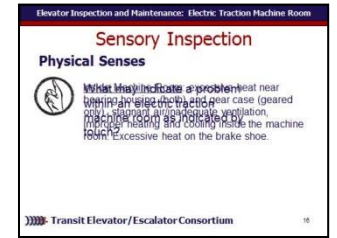
Advance for sample answers

Inside Machine Room: excessive heat near bearing housing (both) and gear case (geared only), stagnant air/inadequate ventilation, improper heating and cooling inside the machine room. Excessive heat on the brake shoe.

With more experience, you will become more familiar with the normal sights, smells, sounds and feel of the system. During a sensory inspection, check for deviations from this norm.

Advance

✓ PPT slide 16



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

Instructor's Notes

In your own words:

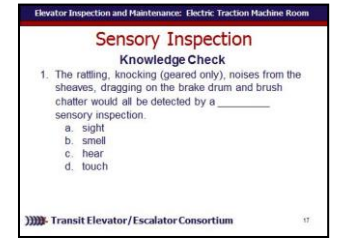
Lets see what we have learned so far:
 The rattling, knocking (geared only), noises from the sheaves, dragging on the brake drum and brush chatter would all be detected by a _____ sensory inspection.

- a. sight
- b. smell
- c. hear
- d. touch

Call on participants for answer
Advance once given the correct answer
Answer: c. hear

Advance

✓PPT slide 17



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

Instructor's Notes

In your own words:

Dim lighting, dust, clutter, missing guards, scoring on the brake drum, missing signs, and overflowing drip pans would be all detected by a _____ sensory inspection.

- a. sight
- b. smell
- c. hear
- d. touch

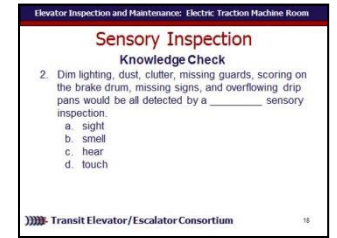
Call on participants for answer

Advance once given the correct answer

Answer: a. sight

Advance

✓PPT slide 18



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

In your own words:

Describe a possible brake problem which would be indicated by touch.

Call on participants for answer

Advance once given the correct answer

Answer:

Inside Machine Room: excessive heat near bearing housing (both) and gear case (geared only), stagnant air/inadequate ventilation, improper heating and cooling inside the machine room. Excessive heat on the brake shoe.

Advance

✓PPT slide 19



Instructor's Notes

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slide



REFER participants to Course book

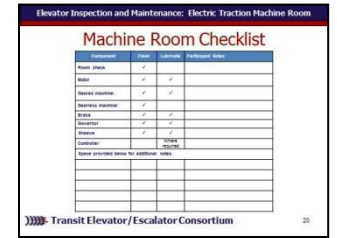
Instructor's Notes

SAY

In your own words:
Have participants turn to page in their course book.
Instruct participants to take additional notes for each component on this page.
Advance

Materials Needed

✓ PPT slide 20



✓ Course book

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

Lets look at the areas and equipment we will want to focus on for maintenance and inspection of an electric traction machine room.

- ✓Room Check
- ✓Motor
- ✓Gear
- ✓Brake
- ✓Sheaves
- ✓Governor
- ✓Controller

Advance

We'll start with a room check.

Advance

Materials Needed

✓PPT slides 21, 22



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide

Instructor's Notes

In your own words:

Among the tasks that an elevator technician must take care of in the machine room are: Make sure that the machine room floor is free of oil, grease and dirt.

Advance Empty trash cans, remove debris and sweep floor. The elevator machine room must be cleaned to prevent the hazards of slipping, tripping, fire, and contamination of equipment.

Advance Check for any water infiltration.

Advance Check that all maintenance fluids are sealed, identified and stored in an inflammable storage cabinet. Only equipment and materials necessary for operating and maintaining the elevator is allowed to be stored in the machine room.

Advance

✓ PPT slide 23



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

Check that communications equipment is working as designed.

Advance Check that a fire extinguisher is clearly identified in the machine room and is fully charged.

Advance Check that all machine room lighting is adequate and receptacles are operational.

Check that all equipment guards and covers are in place.

Advance

Here is a photo of an electric traction machine room and items to be checked.

Review photo and indicated items with participants.

Advance

Materials Needed

✓ PPT slides 23, 24



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slide



REFER participants to Course book

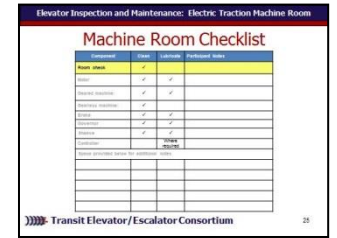
Instructor's Notes

SAY

In your own words:
Have participants turn to page in their course book.
Instruct participants to add any additional notes as per specific transit authority procedures related to electric traction machine room check at this time.
Advance

Materials Needed

✓ PPT slide 25



✓ Course book

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slides

Instructor's Notes

In your own words:

Lets move on and look at the motor.

Advance

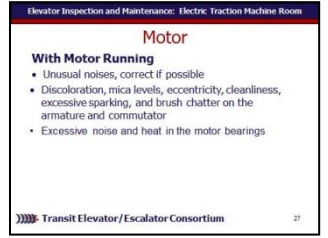
With the elevator running, listen and observe the hoist motor for:
Unusual noises. Correct the defect if possible.

Advance Discoloration, mica levels, eccentricity, cleanliness, excessive sparking, and brush chatter on the armature and commutator.

Advance Excessive noise and heat in the motor bearings.

Advance

✓ PPT slides 26, 27



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slide

Instructor's Notes

SAY

In your own words:

With Power Off:

Grease bearings on hoist motor.

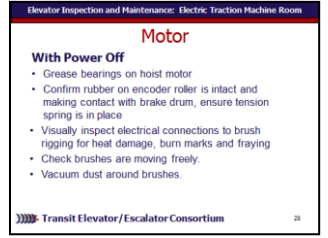
Advance Confirm that the rubber on the encoder roller is intact and is making contact with the brake drum, and that the tension spring is in place. Correct defect if possible.

Advance Visually inspect electrical connections to the brush rigging for heat damage, burn marks and fraying, due to over current or loose connections. Correct defect if possible. Check that the brushes are moving freely in the brush holder.

Advance

Materials Needed

✓ PPT slide 28



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

Check the wear on the brushes and replace as required. Use the correct brush as replacement.

Advance Ensure that the brush is properly seated with the correct pressure against the commutator.

Advance

Inspect the field coils and interpoles (where applicable) for damage, insulation breakdown and loose connections. Tighten loose connections where indicated.

Advance

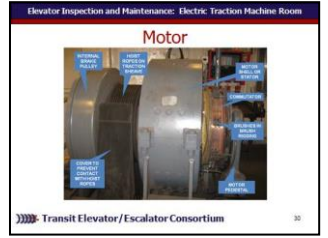
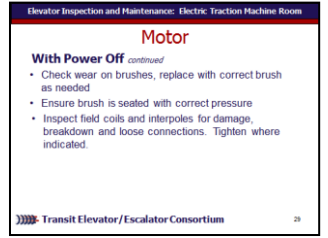
Here is a photo of an electric traction motor and areas to be checked.

Review photo and indicated items with participants.

Advance

Materials Needed

✓ PPT slides 29, 30



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

If Motor Generator is present and with the elevator running, listen and observe the motor generator set for:

Unusual noises. Correct defect if possible.

Advance Discoloration, mica levels, eccentricity, cleanliness, excessive sparking, and brush chatter on the armature and commutator.

Advance Excessive noise and heat in the motor bearings.

Advance

With Power Off:

Grease bearings on hoist motor.

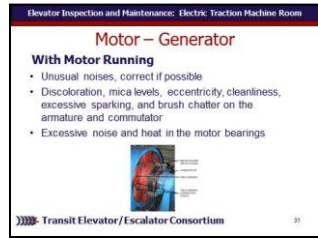
Confirm that the rubber on the encoder roller is intact and is making contact with the brake drum, and that the tension spring is in place.

Correct defect if possible.

Advance

Materials Needed

✓ PPT slides 31, 32



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide

Instructor's Notes

In your own words:

Visually inspect electrical connections to the brush rigging for heat damage, burn marks and fraying, due to over current or loose connections. Correct defect if possible.

Advance Check that the brushes are moving freely in the brush holder.

Advance Check the wear on the brushes and replace as required. Use the correct brush as replacement.

Advance Ensure that the brush is properly seated with the correct pressure against the commutator.

Advance Inspect the field coils and interpoles (where applicable) for damage, insulation breakdown and loose connections. Tighten loose connections where indicated.

Advance

✓ PPT slide 32



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slide

Instructor's Notes

SAY

In your own words:

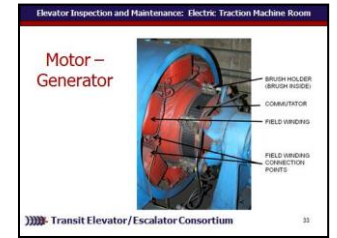
Here is a photo of an electric traction motor - generator and areas to be checked.

Review photo and indicated items with participants.

Advance

Materials Needed

✓ PPT slide 33



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

Instructor's Notes

In your own words:

Lets see what we have learned so far:
 Describe what should happen in a room
 check of an electric traction machine room.

Call on participants for answer

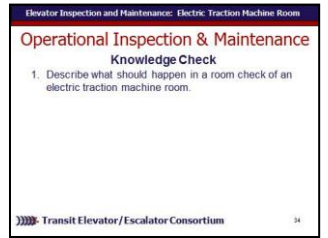
Advance once given the correct answer

Answer:

- Floor is free of oil, grease and dirt
- Empty trash cans, remove debris and sweep
- Check for water infiltration
- Ensure all maintenance fluids are sealed, identified and stored properly
- Communication equipment is working as Designed
- Fire extinguisher is identified and charged
- Machine room lighting is properly operating
- All equipment guards and covers are in place

Advance

✓PPT slide 34



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

In your own words:

Describe a difference between inspection and maintenance of a motor and a motor-generator.

Call on participants for answer

Advance once given the correct answer

Answer:

On a motor with the power off, confirm rubber on encoder roller is intact and making contact with brake drum, ensure tension spring is in place. This does not need to be conducted with a motor generator.

Advance

✓ PPT slide 35



Instructor's Notes

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slide



REFER participants to Course book

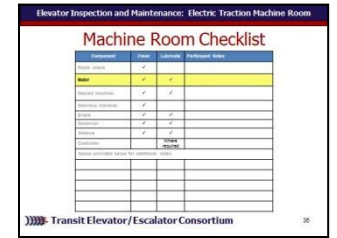
Instructor's Notes

SAY

In your own words:
Have participants turn to page in their course book.
Instruct participants to add any additional notes as per specific transit authority procedures related to electric traction machine room check at this time.
Advance

Materials Needed

✓ PPT slide 36



✓ Course book

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

Lets move on and look at the Gear.

Advance

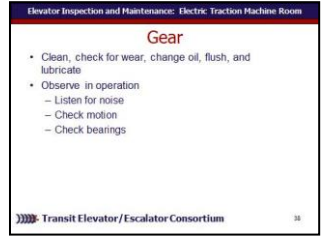
Gear

Inspection and maintenance of the gear machinery means that the technician should clean, check for wear, change oil, flush, and lubricate. Observe in operation, listen for noise, check motion, and check bearings.

Advance

Materials Needed

✓ PPT slides 37, 38



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

With the car running, observe the operation of the gearbox:

Advance

Check the worm shaft for excessive play or backlash, leaking seals, noise and excessive heat.

Observe and verify through access covers that the helical gear is carrying oil and being lubricated.

Check the oil level of the gear case and add lubricant as required.

With Power Off:

Advance

Grease bearings.

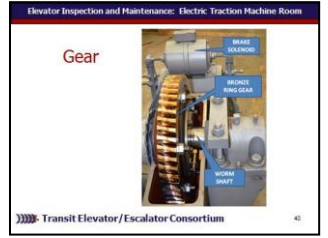
Advance

Here is a photo of an electric traction gear unit and areas to be checked.

Review photo and indicated items with participants. Advance

Materials Needed

✓ PPT slides 39, 40



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slide



REFER participants to Course book

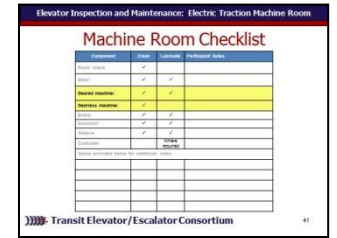
Instructor's Notes

SAY

In your own words:
Have participants turn to page in their course book.
Instruct participants to add any additional notes as per specific transit authority procedures related to electric traction machine room check at this time.
Advance

Materials Needed

✓ PPT slide 41



✓ Course book

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

Lets move on and look at the Brake.

Advance

For the Drive Machine Brake and with the elevator running:
Check that the brake lifts and sets, without delay.

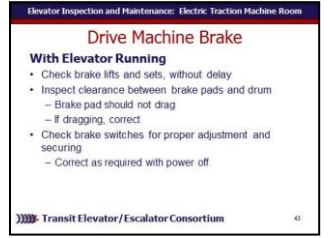
Advance Visually inspect for clearance between the brake pads and drum. The brake pad should not be dragging. If it is dragging, correct the defect.

Advance Check that the brake switches are properly adjusted and secured. Correct the defect as required with the power off.

Advance

Materials Needed

✓ PPT slides 42, 43



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



REVIEW slides

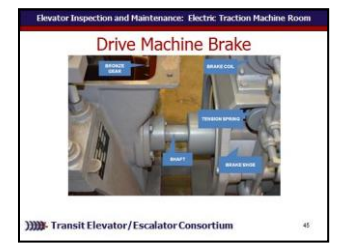
Instructor's Notes

In your own words:

With Power Off:
 Verify that all fasteners are in place (e.g. springs, pivot pins, cotter pins, nuts, etc).
Advance Examine the brake lining for uneven wear.
Advance Clean the brake assembly and lubricate brake pivot points.
Advance Inspect the brake coil for damage, insulation breakdown (if possible) and loose connections. Tighten loose connections, if required.
Advance

Here is a photo of an drive machine brake and areas to be checked.
Review photo and indicated items with participants.
Advance

✓ PPT slides 44, 45



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide

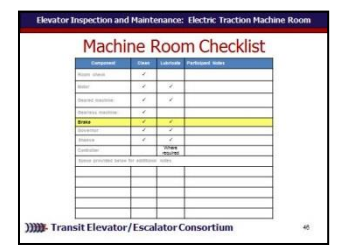


REFER participants to Course book

Instructor's Notes

In your own words:
Have participants turn to page in their course book.
Instruct participants to add any additional notes as per specific transit authority procedures related to electric traction machine room check at this time.
Advance

✓ PPT slide 46



✓ Course book

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



ASK

Instructor's Notes

In your own words:

Lets see what we have learned so far:
 Checking worm shaft for excess play and checking for leaking seals should be done with _____ for the inspection and maintenance of gears..

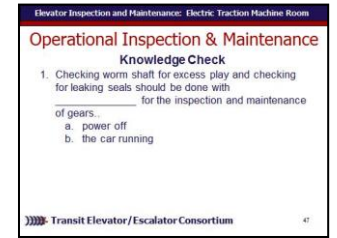
- a. power off
- b. the car running

Call on participants for answer
Advance once given the correct answer

Answer: b. the car running

Advance

✓PPT slide 47



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



ASK

In your own words:

Check brake lifts and sets without delay with

_____.

- a. power off
- b. elevator running

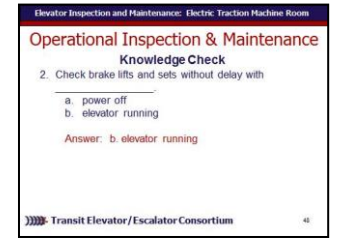
Call on participants for answer

Advance once given the correct answer

Answer: b. elevator running

Advance

✓PPT slide 48



Instructor's Notes

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



REVIEW slides

Instructor's Notes

In your own words:

Lets take a look at sheaves.

Advance

Typically the drive sheave and sometimes a secondary sheave are located in the elevator machine room.

Advance Grease all sheave bearings in machine room. Although not in the machine room, there are other sheaves that must also be greased.

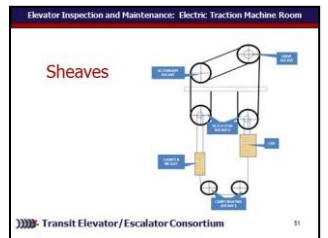
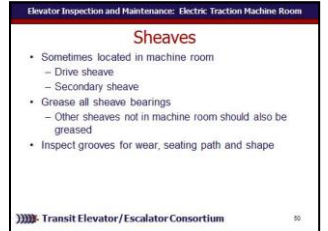
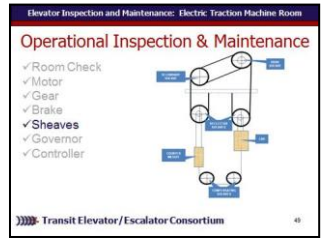
Advance The elevator technician must also check grooves for wear and seating path and shape.

Advance

Here is a illustration of sheaves and areas to be checked.

Review photo and indicated items with participants. Advance

✓ PPT slides 49, 50, 51



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slide

Instructor's Notes

SAY

In your own words:

Look for wear, breakage, rust (**rouging**) and fraying ropes. Check that terminating ends are securely fastened. Make sure they are not dragging on the pit floor. If they are dragging this means that runby space may be inadequate.

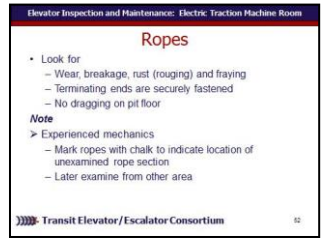
Advance

Experienced mechanics will mark the ropes with chalk to indicate the location of the unexamined section of ropes, later examining them from the machine room or other areas such as the overhead machinery space or from the pit.

Advance

Materials Needed

✓ PPT slide 52



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



REVIEW slide

Instructor's Notes

In your own words:

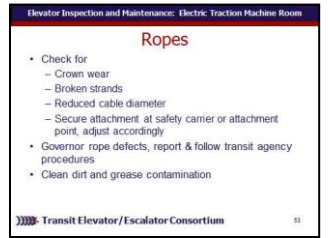
Check for crown wear, broken strands, or reduced cable diameter. Some transit agencies provide their mechanics with a pocket-sized gauge to check rope diameter and whether or not the diameter may be worn beyond allowable specifications.

Advance Report defects with the governor rope and follow the standard maintenance procedures of the transit agency. Check that there is a secure attachment at the safety carrier or safety attachment point and adjust accordingly.

Advance Clean dirt and grease contamination.

Advance

✓ PPT slide 53



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slide



REFER participants to **Bethlehem Elevator Rope Technical Bulletin 3 & 6**

Instructor's Notes

SAY

In your own words:

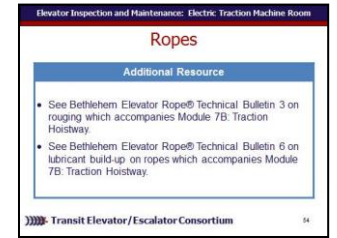
Direct attention and share with participants:

- Bethlehem Elevator Rope® Technical Bulletin 3 on rouging which accompanies Module 7B: Traction Hoistway.
- Bethlehem Elevator Rope® Technical Bulletin 6 on lubricant build-up on ropes which accompanies Module 7B: Traction Hoistway.

Advance

Materials Needed

✓ PPT slide 46



✓ **Bethlehem Elevator Rope Technical Bulletin 3 & 6**

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slide



REFER participants to Course book

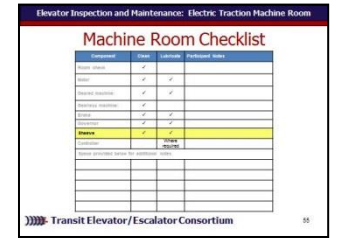
Instructor's Notes

SAY

In your own words:
Have participants turn to page in their course book.
Instruct participants to add any additional notes as per specific transit authority procedures related to electric traction machine room check at this time.
Advance

Materials Needed

✓ PPT slide 54



✓ Course book

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

Lets move on and look at the Governor.
Advance

Electrically trip the governor switch and confirm that the elevator does not operate. Reset the switch and clean as required. If the switch is not functioning as designed, correct the defect as required.

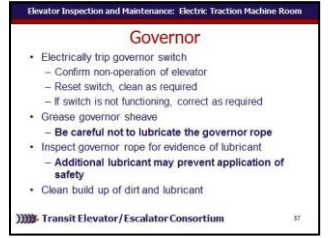
Advance Grease the governor sheave bearing **being careful not to lubricate the governor rope.**

Advance Inspect the governor rope for any evidence of lubricant. **The additional lubricant may interfere with the ability of the governor to retard the governor rope and apply the safety.**

Advance

Materials Needed

✓ PPT slides 56, 57



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



REVIEW slides

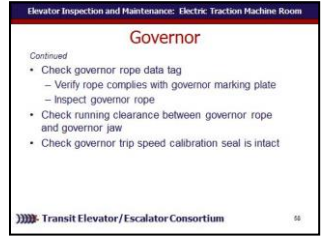
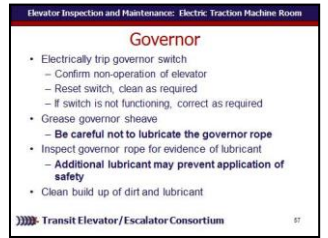
Instructor's Notes

In your own words:

Clean any build up of dirt and lubricant.
Advance

Check the governor rope data tag and verify that the rope complies with the specification on the governor marking plate. Inspect the governor rope.
Advance Check the running clearance between the governor rope and the governor jaw.
Advance Check that the governor trip speed calibration seal is intact.
Advance

✓ PPT slides 57, 58



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min Time remaining: 240 min This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO



REVIEW slide



REFER participants to Course book

Instructor's Notes

SAY

In your own words:
Have participants turn to page in their course book.
Instruct participants to add any additional notes as per specific transit authority procedures related to electric traction machine room check at this time.
Advance

Materials Needed

✓ PPT slide 58



✓ Course book

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO



REVIEW slides

Instructor's Notes

SAY

In your own words:

Controllers will be addressed in Module 9.

So the last part we want to review for machine room inspection is other equipment. Any other equipment will require the following:

Lubricate bearings

Advance Clean and examine fan blades and related equipment. Replace machine room exhaust fan belt as required.

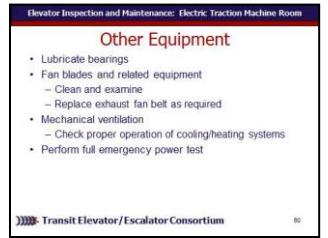
Advance Check that the mechanical ventilation, cooling and heating systems are operating properly.

Advance Perform a full emergency power test.

Advance

Materials Needed

✓ PPT slides 60



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



ASK

In your own words:

Lets see what we have learned so far:
Yes or No. When greasing governor sheave, be careful not to lubricate the governor rope.

Call on participants for answer
Advance once given the correct answer
Answer: Yes.

Advance

✓PPT slide 61



Instructor's Notes

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 240 min

This section: 90 min (43 slides) Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



ASK

In your own words:

When inspecting ropes, what extra step does an experienced mechanic take?

Call on participants for answer

Advance once given the correct answer

Answer: Experienced mechanics

- Mark ropes with chalk to indicate location of unexamined rope section
- Later examine from other area

Advance

✓PPT slide 62



Instructor's Notes

Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 150 min

This section: 120 min

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



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:

- Perform a sensory inspection of a machine room
- Perform an inspection of traction elevator machine room
- Perform an operational test on all safety devices in the machine room

Advance

✓PPT slide 63



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 30 min

This section: 30 min (4 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



CLASSROOM ACTIVITY

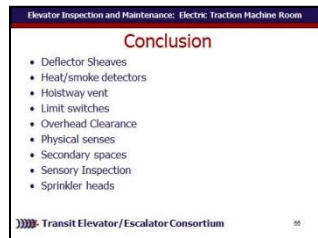
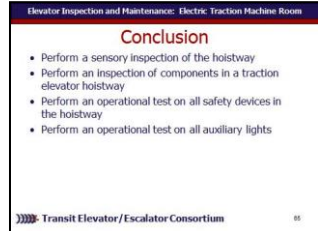
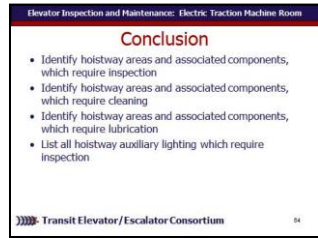
Instructor's Notes

In your own words:
*[Read slide.
 For each objective, briefly review what was learned in this module or ask participants to share what they have learned for each learning objective and briefly discuss as a class.]*

Advance
*Read slide.
 For each objective, briefly review what was learned in this module or ask participants to share what they have learned for each learning objective and briefly discuss as a class.]*

Advance
 Lets take a look at some of the key words we have defined as moved through this module.
Read slide. Discuss definitions as a group.
Advance

✓ PPT slides 64, 65, 66



Elevator – Electric Traction Machine Room

Instructor's Guide



Module Length: 300 min

Time remaining: 30 min

This section: 30 min (4 slides)

Section start time: _____

Section End Time: _____

DO

SAY

Materials Needed



**CLASSROOM
ACTIVITY**



INDIVIDUAL ACTIVITY

Instructor's Notes

In your own words:

Administer quizzes.

- ✓ PPT slides 67
- ✓ Quizzes
- ✓ Pencils

