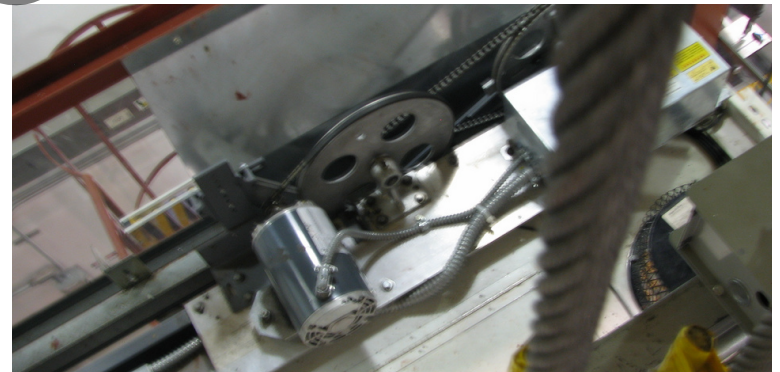
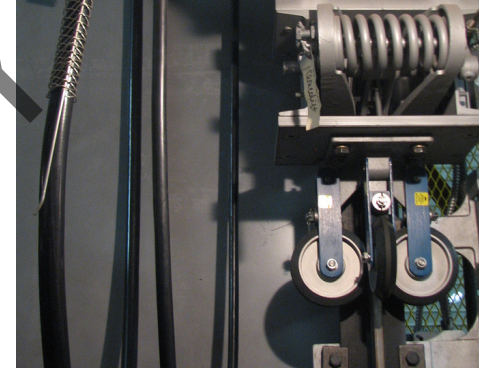


Instructor Guide



**217: Elevator: Traction Elevator
Module 6: Maintenance Requirements**



Table of Contents

Overview.....4

Maintenance Control.....6

Viscosity.....23

Additives.....31

Solid Lubricants.....36

Elevator Lubrication.....39

Maintenance Checklists.....54

Summary.....55

PREVIEW ONLY

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Icons Used In This Guide



REVIEW slides



ASK



CLASSROOM ACTIVITY



SMALL GROUP ACTIVITY



INDIVIDUAL ACTIVITY



WRITE



Multimedia



REFER participants to

Agenda

Topic #	Topic Title	Duration
1	Overview	30 minutes
2	Maintenance Control	30 minutes
3	Viscosity	30 minutes
4	Additives	30 minutes
5	Solid Lubricants	20 minutes
6	Elevator Lubrication	30 Minutes
7	Maintenance Checklists	30 minutes
8	Summary	40 Minutes
	Total Time:	270 Minutes

PREVIEW ONLY

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Overview

Purpose The purpose of this module is to:

- The purpose of this unit is to explain and discuss the principles electric traction elevator system maintenance. The key concepts discussed will aid the trainee in their future applications of elevator concepts and terminology.

Objectives

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

- Describe general maintenance practices for electric traction elevators
- Describe authority-specific maintenance requirements

Materials

Mandatory Make sure you have the following

- PowerPoint Presentation
- Course book
- Quizzes
- Pencils
- Paper
- Elevator Maintenance 2nd Edition by Zach McCain
- Authority specific guidelines

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
- Samples of various lubricants

PREVIEW ONLY

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 360 min This section: 30 min (5 slides) Section start time: _____ Section End Time: _____

DO

 **REVIEW** introduction slides

Instructor's Notes

SAY

In your own words:

Welcome to the introductory module for basic maintenance for electric traction elevator systems.

Advance.

Riders depend on us, and the efficient and safe operation of an elevator system depends on the maintenance of it's system.

Advance.

Materials Needed

✓ PPT slides 1, 2






Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 360 min This section: 30 min (5 slides) Section start time: _____ Section End Time: _____

DO

-  **ASK** participants what they remember about hydraulic elevators
-  **SMALL GROUP ACTIVITY**
-  **WRITE**

Instructor's Notes

SAY

In your own words:

Thinking back to previous courses or any previous elevator experiences so far, what are some things you may remember about the maintenance of electric traction elevator systems?

[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 5



Optional:
Chalkboard/chalk or paper/marker



Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 300 min This section: 30 min (17 slides) Section start time: _____ Section End Time: _____

DO

-  **REVIEW** slides
-  **SMALL GROUP ACTIVITY**

Instructor's Notes

SAY

In your own words:

Any special tools or instruments should be identified and a Source for technical support should be included in a PMP.

Advance.

Elevator Maintenance Manual 2nd Edition Appendix 1.3b page 21 or your authority's preventative program maintenance document and locate the following: Equipment data, Maintenance Activities, Checklist for Guidance Technician Qualifications, Technical Data, Location for Replacement Parts and Supplies, Special Tools and Instruments, and Technical Support Sources.

Advance.

Materials Needed

✓ PPT slides 21, 22



✓ Elevator Maintenance Manual

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW slide

Instructor's Notes

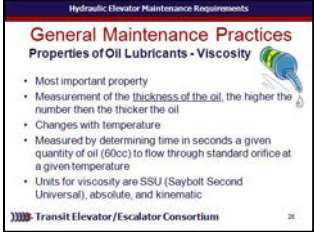
SAY

In your own words:

Of all the properties of oil, viscosity is the most important. **Advance.** It is measured by the thickness of the oil, **Advance.** and the higher the number the thicker the oil. **Advance.** Viscosity changes with temperature and is **Advance.** measured by time in seconds that a given quantity of oil will flow through a standard orifice at a given temperature. **Advance.** Units for viscosity include SSU or Sabyolt Second Universal, absolute, or kinematic. Lets look at the different units of viscosity. **Advance.**

Materials Needed

✓ PPT slide 26



Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 240 min This section: 30 min (5 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="19 442 125 542" data-label="Image"> </div> <p data-bbox="144 456 396 499">REVIEW slide</p> <p data-bbox="19 785 444 842">Instructor's Notes</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<p data-bbox="666 421 1023 464">In your own words:</p> <p data-bbox="695 485 1400 664">Lubrication oils contain additives to improve their performance, enhance their properties., and keep equipment and parts in optimum condition .</p> <p data-bbox="695 664 1333 749"><i>[Share photo with participants and read quote.]</i></p> <p data-bbox="695 792 879 835"><i>Advance.</i></p>	<p data-bbox="1487 464 1748 506">✓ PPT slide 31</p> <div data-bbox="1535 535 1854 763" data-label="Image"> </div>

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min

Time remaining: 240 min

This section: 30 min (5 slides)

Section start time: _____

Section End Time: _____

DO



REVIEW slide



REFER participants to *Elevator Maintenance Manual 2nd Edition*

Instructor's Notes

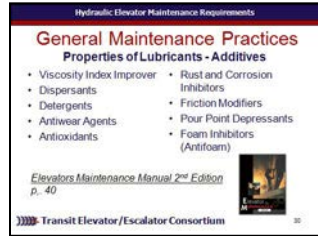
SAY

In your own words:

Common additives also include –
Rust and Corrosion Inhibitors –
neutralize acids that may form in
extended use
Friction Modifiers – improve the friction-
reducing qualities of the oil
Pour Point Depressants – reduces the
formation of wax crystals at low
temperatures and thus reduces the pour
point
Foam Inhibitors or Antifoam – collapses
air bubbles and enhances lubrication
Each lubrication supplier will use their
own proportions and chemical
composition of additives.
**[Refer participants to Elevator
Maintenance Manual 2nd Edition p.,. 40
for this section and for the next
slides.] Advance.**

Materials Needed

✓ PPT slide 32



✓ Elevator
Maintenance
Manual

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 240 min This section: 30 min (5 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="19 442 125 549" data-label="Image"></div> <p data-bbox="144 456 241 499">ASK</p> <div data-bbox="19 564 125 671" data-label="Image"></div> <p data-bbox="144 578 531 714">REFER participants to <u>Elevator Maintenance Manual 2nd Edition</u></p> <p data-bbox="19 792 454 835">Instructor's Notes</p> <hr/> <hr/> <hr/> <hr/> <hr/>	<p data-bbox="666 428 1033 464">In your own words:</p> <p data-bbox="666 478 1420 606"><u>[Refer participants to Elevators Maintenance Manual 2nd Edition p.,. 40 for this section.]</u></p> <p data-bbox="666 656 1449 742">This additive reduces sludge and varnish from building up around moving parts.</p> <ul data-bbox="763 749 1120 913" style="list-style-type: none"> a. Detergents b. Friction Modifiers c. Antiwear Agents d. Foam Inhibitors <p data-bbox="666 921 1246 963">Call on participants for answer.</p> <p data-bbox="666 963 1188 1006">Advance for correct answer.</p> <p data-bbox="666 1013 869 1049">Answer: a.</p> <p data-bbox="666 1056 850 1092">Advance.</p>	<p data-bbox="1487 471 1748 506">✓PPT slide 34</p> <div data-bbox="1535 535 1854 763" data-label="Image"> </div> <p data-bbox="1497 806 1845 885">✓ <u>Elevator Maintenance Manual</u></p>

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 240 min This section: 30 min (5 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="19 442 125 542" data-label="Image"> </div> <p data-bbox="144 456 241 499">ASK</p> <div data-bbox="19 564 125 664" data-label="Image"> </div> <p data-bbox="144 578 531 714">REFER participants to <u>Elevator Maintenance Manual 2nd Edition</u></p> <p data-bbox="19 792 454 835">Instructor's Notes</p> <hr/> <hr/> <hr/> <hr/> <hr/>	<p data-bbox="666 421 1033 464">In your own words:</p> <p data-bbox="666 471 1420 606"><u>[Refer participants to Elevators Maintenance Manual 2nd Edition p,. 40 for this section.]</u></p> <p data-bbox="666 649 1420 735">This additive neutralizes the acids that may form in extended use.</p> <ul data-bbox="763 742 1323 921" style="list-style-type: none"> a. Detergents b. Rust and Corrosion Inhibitors c. Antiwear Agents d. Foam Inhibitors <p data-bbox="666 963 1246 1049">Call on participants for answer. Advance for correct answer.</p> <p data-bbox="666 1056 879 1135">Answer: b. Advance.</p>	<p data-bbox="1497 471 1748 514">✓PPT slide 35</p> <div data-bbox="1535 535 1864 771" data-label="Image"> </div> <p data-bbox="1506 799 1845 885">✓ <u>Elevator Maintenance Manual</u></p>

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 210 min This section: 20 min (5 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



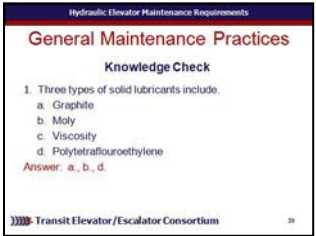
ASK

In your own words:
 Lets see what we have learned so far:
 Three types of solid lubricants include.

- a. Graphite
- b. Moly
- c. Viscosity
- d. Polytetraflouroethylene

Call on participants for answer.
Advance for correct answer.
 Answer: a., b., d.
Advance.

✓PPT slide 39



Instructor's Notes

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 190 min This section: 30 min (11 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



REVIEW slides

In your own words:

Properties for oil buffers are indicated on the buffer marking plate and include: viscosity, viscosity index, pour point, and maximum/minimum oil level. Roller Link Chains and Hydraulic Oil are included for this type of lubrication.

Advance

Roller Link Chains are **Advance**. used for door operator and some hydraulic telescopic cylinders. **Advance**.

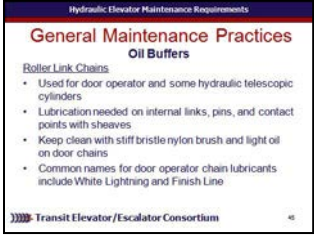
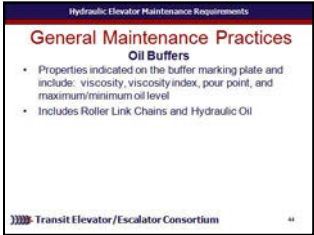
Lubrication is needed on internal links, pins, and contact points with sheaves

Advance. Be sure to keep the chains clean with stiff bristle nylon brush and light oil on door chains. **Advance**.

Common names for door operator chain lubricants include White Lightning and Finish Line.

Advance.

✓ PPT slides 48, 49



Instructor's Notes

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 190 min This section: 30 min (11 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="19 442 125 542" data-label="Image"> </div> <div data-bbox="144 456 241 499" data-label="Text"> <p>ASK</p> </div> <div data-bbox="19 792 454 835" data-label="Text"> <p>Instructor's Notes</p> <hr/> <hr/> <hr/> <hr/> <hr/> </div>	<p>In your own words: True or False. Lubrication of governor ropes after installation unless recommended by manufacturer is prohibited. Call on participants for answer. Advance for correct answer. Answer: True. Advance.</p>	<p>✓PPT slides 51</p> <div data-bbox="1535 535 1854 771" data-label="Image"> </div>

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 minutes Time remaining: 130 minutes This section: 90 minutes Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



**CLASSROOM
ACTIVITY**

In your own words:

Okay, now it's time to see how this works in the real world. Please get your stuff together for a trip to the lab.

[At instructor's discretion, take time to visit the field and look for electric traction elevator maintenance practices and related information.]

Advance.

✓ PPT slide 53




Instructor's Notes

Elevator – Electric Traction Elevator Maintenance

Instructor's Guide



Module Length: 360 min Time remaining: 40 min This section: 40 minutes (3 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
 <p>CLASSROOM ACTIVITY</p> <p>Instructor's Notes</p> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<p>In your own words:</p> <p><i>Administer quiz.</i></p>	<p>✓ PPT slide 56</p> 