Instructor Guide



217: Elevator: Traction Elevator

Module 6: Maintenance Requirements





Table of Contents

Overview	4
Maintenance Control	6
Viscosity	23
Additives	31



Elevator - Electric Traction Elevator Maintenance

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	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	

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

Module Length: 360 min

Instructor's Notes

Time remaining: 360 min

This section: 30 min (5 slides)

In your own words:

Section start time:



Materials Needed

DO

REVIEW introduction slides

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

SAY

Advance.

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

Advance.

✓ PPT slides 1, 2





Module Length: 360 min

Time remaining: 360 min

This section: 30 min (5 slides)

Section start time:



Materials Needed

ASK participants what they remember about hydraulic elevators

DO







WRITE

Instructor's Notes

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.

SAY

✓ PPT slide 5



Optional: Chalkboard/chalk or paper/marker

Module Length: 360 min

Time remaining: 330 min

This section: 30 min (17 slides)

Section start time:

Section End Time: **Materials Needed**

REVIEW slides

DO

Instructor's Notes

In your own words:

[Share humorous slide and quote.]

SAY

Advance.

Advance.

Breakdown Maintenance. Advance. This involves allowing the equipment to operate until it malfunctions. Advance. Usually, there is no maintenance performed. Advance. Repairs are made to restore the equipment, Advance. but the equipment will not function as well as before the malfunction. Advance. The problems with this type of maintenance are costs and safety. Long term costs are expensive, the repairs typically are insufficient, and overall the machine is not as safe as it should be.

✓ PPT slides 8, 9



General Maintenance Control

- · Equipment operates until a malfunction
- Technically, not maintenance
- · Repairs made to restore
- · Not typically restored to most efficient and
- Disadvantages: long term costs are expensive, unsafe, repairs often insufficient

Transit Elevator/Escalator Consortium

Module Length: 360 min

Time remaining: 330 min

This section: 30 min (17 slides)

Section start time:

Section End Time:

Materials Needed

REVIEW slides

DO

Instructor's Notes

Advance.

In your own words:

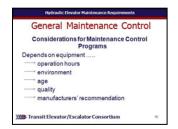
Considerations for Maintenance Control Program Depend on equipment, operation hours, environment, age, quality, and manufacturers' recommendation

SAY

Advance.

Preventative Maintenance Control Program includes things like Equipment description, Maintenance activities, Work and schedule checklist, Manual with required Work and technical data, Callback log, Qualified personnel and supervisors, Regular checks by, supervisors, Ongoing training, Replacement parts and materials, Source for special tools and instruments, and Technical support.

✓ PPT slides13, 14





Module Length: 360 min

Time remaining: 300 min

This section: 30 min (17 slides)

Section start time:

Section End Time:

Materials Needed

REVIEW slides



SMALL GROUP ACTIVITY

DO

Instructor's Notes

Advance.

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.

SAY

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.

✓ PPT slides 21, 22





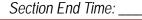
Elevator Maintenance Manual

Module Length: 360 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time:



Materials Needed

REVIEW slide

DO

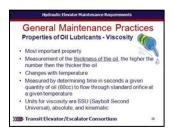
Instructor's Notes

Advance.

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.

SAY



Module Length: 360 min

Time remaining: 270 min

This section: 30 min (8 slides)

Section start time:



Materials Needed

REVIEW slide

DO

Instructor's Notes

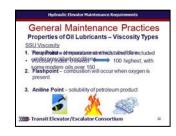
Advance.

petroleum product.

In your own words:

SSU viscosity include the temperature of the measurement. 0 is the lowest viscosity on this scale, and 100 is the highest. Some modern oils may have a rating over 150. Advance. Advance. The pour point of ssu viscosity is the temperature where oil will flow under normal and prescribed conditions. **Advance.** Flashpoint is the point at which combustion will occur when oxygen is present. Advance. And, apiline point is the solubility of a

SAY



Module Length: 360 min

Time remaining: 240 min

This section: 30 min (5 slides)

Section start time:

Section End Time:

Materials Needed

REVIEW slide

Instructor's Notes

DO

In your own words:

Lubrication oils contain additives to improve their performance, enhance their properties., and keep equipment and parts in optimum condition.

SAY

[Share photo with participants and read quote.]

Advance.



Module Length: 360 min

Time remaining: 240 min

This section: 30 min (5 slides)

Section start time:



Materials Needed

REVIEW slide



REFER participants to Elevator Maintenance Manual 2nd Edition

DO

Instructor's Notes

In your own words:

Common additives also include -Rust and Corrosion Inhibitors neutralize acids that may form in extended use

Friction Modifiers – improve the frictionreducing qualities of the oil Pour Point Depressants - reduces the formation of wax crystals at low temperatures and thus reduces the pour point

SAY

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.

✓ PPT slide 32



Elevator Maintenance Manual

Module Length: 360 min

Time remaining: 240 min

DO

This section: 30 min (5 slides)

Section start time:

Materials Needed

Section End Time:

ASK



Instructor's Notes

In your own words:

[Refer participants to Elevators Maintenance Manual 2nd Edition p., 40 for this section.}

SAY

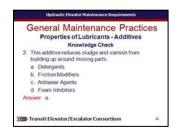
This additive reduces sludge and varnish from building up around moving parts.

- a. Detergents
- b. Friction Modifiers
- **Antiwear Agents**
- Foam Inhibitors

Call on participants for answer. Advance for correct answer.

Answer: a. Advance.

✓ PPT slide 34



✓ Elevator Maintenance Manual

Module Length: 360 min

Time remaining: 240 min

This section: 30 min (5 slides)

Section start time:

Section End Time: **Materials Needed**



ASK



REFER participants to Elevator Maintenance Manual 2nd Edition

DO

Instructor's Notes

Answer: b. Advance.

In your own words:

[Refer participants to Elevators Maintenance Manual 2nd Edition p., 40 for this section.}

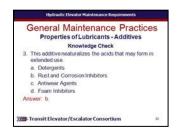
SAY

This additive neaturalizes the acids that may form in extended use.

- a. Detergents
- b. Rust and Corrosion Inhibitors
- **Antiwear Agents**
- Foam Inhibitors

Call on participants for answer. Advance for correct answer.

✓ PPT slide 35



✓ Elevator Maintenance Manual

Module Length: 360 min

Time remaining: 210 min

This section: 20 min (5 slides)

Section start time:

Section End Time: ____

Materials Needed

DO **ASK** Instructor's Notes

In your own words:

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

SAY

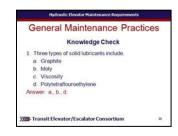
- a. Graphite
- b. Moly
- c. Viscosity
- d. Polytetraflouroethylene

Call on participants for answer.

Advance for correct answer.

Answer: a., b., d.

Advance.



Module Length: 360 min

Time remaining: 190 min

This section: 30 min (11 slides)

Section start time:

Section End Time:

Materials Needed

REVIEW slide

DO

Instructor's Notes

In your own words:

Proper Lubrication is most important part of elevator maintenance. Over lubrication and/or use of wrong lubricant or application may do more harm than good. Always use:

SAY

- Correct application procedure
- Correct frequency & amount
- Correct type of lubricant

Advance.



Module Length: 360 min

Time remaining: 190 min

This section: 30 min (11 slides)

Section start time:

Section End Time:

Materials Needed

REVIEW slides

DO

Instructor's Notes

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.

SAY

Advance

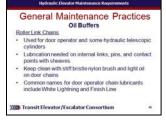
Roller Link Chains are Advance. used for door operator and some hydraulic telescopic cylinders. Advance.

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





Module Length: 360 min

Time remaining: 190 min

DO

This section: 30 min (11 slides)

Section start time:

Section End Time:

Materials Needed

ASK

Instructor's Notes

In your own words:

True or False. Lubrication of governor ropes after installation unless recommended by manufacturer is prohibited. Call on participants for answer.

SAY

Advance for correct answer.

Answer: True.

Advance.



Module Length: 360 minutes

Time remaining: 130 minutes This section: 90 minutes

Section start time:

Section End Time:

Materials Needed

DO CLASSROOM **ACTIVITY**

Instructor's Notes

SAY

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



Module Length: 360 min

Time remaining: 40 min

This section: 40 minutes (3 slides)

SAY

Section start time:

Section End Time:

Materials Needed

DO

CLASSROOM

ACTIVITY

Instructor's Notes

In your own words:

Administer quiz.



PPT slide 56



47