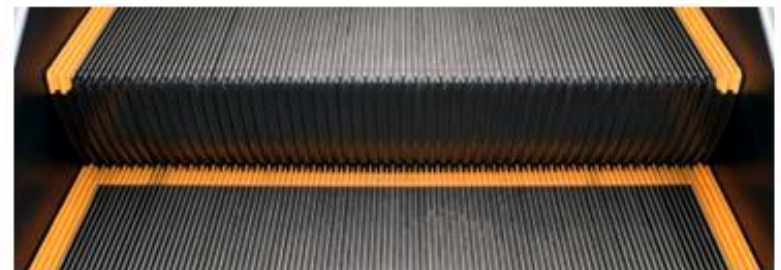


# Instructor/Participant Guide



## 212: Escalator-Inspection & Basic Maintenance

### *Module 4: Handrails*



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PREVIEW ONLY



## Icons Used in This Guide

Throughout the Instructor's Guide, the following icons indicate the type of content being presented.



**Refer To**



**PowerPoint**



**Multimedia**



**Web based Training**



**Write**



**Ask**



**Individual Activity**



**Small Group Activity**



**Classroom Activity**



**Duration**

## Agenda

Topic No.	Topic Title	Duration
1	Introduction	5 minutes
2	Preventive Maintenance Procedures <ul style="list-style-type: none"> <li>• Preventive Maintenance Inspection</li> <li>• Inspection and Servicing Schedules</li> <li>• Inspection and Servicing Documents</li> </ul>	20 minutes
3	Safety Precautions <ul style="list-style-type: none"> <li>• General Safety Precautions</li> <li>• Commencement of Work</li> <li>• Completion of Work</li> </ul>	20 minutes
4	Handrails <ul style="list-style-type: none"> <li>• Handrail Inspection</li> <li>• Handrail Tension Check</li> <li>• Handrail Tension Adjustment</li> </ul>	30minutes
5	Handrail Drive System <ul style="list-style-type: none"> <li>• Handrail Drive Inspection</li> <li>• Handrail Speed Check</li> <li>• Handrail Monitor Check</li> <li>• Idler Roller Inspection</li> </ul>	30 minutes
6	Handrail Tracking System <ul style="list-style-type: none"> <li>• Handrail Guide Inspection</li> </ul>	20 minutes

## Handrails



	<ul style="list-style-type: none"><li>• Handrail Roller Inspection</li></ul>	
7	Handrail Safety Devices <ul style="list-style-type: none"><li>• Handrail Inlet Safety Device Inspection</li><li>• Handrail Breakage Monitor Check</li><li>• Handrail Throw-off Monitor Check</li></ul>	20 minutes
8	Summary	5 minutes
<b>Total Time:</b>		<b>2.5hours</b>

PREVIEW ONLY



## Instructor's Notes

### Handrails



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### Handrails

#### Outline

- Identify components of the handrail drive and tracking system.
- State typical problems which would require repair or replacement.
- Perform a visual inspection of handrail for smooth operation, tension, and excessive wear/damage.
- Complete a visual inspection of the handrail drive assembly.
- Complete applicable maintenance documentation.

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### Slide 1

**GAIN** audience attention by introducing yourself.



**WELCOME** the participants to the handrails module.



**ASK** *what two purposes handrails serve.*

**DIRECT** participants to the objectives on slide 2.



**REVIEW** the objectives on Slide 2.

## Introduction

Welcome to the Handrails Module.

*What are the two purposes that handrails serve?*

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## Instructor's Notes

### Handrails

#### Inspection and Servicing Schedules

Influence the running characteristics and wear of an escalator:

1. Indoor/outdoor installation
2. Operating time per week
3. Degree of dirt accumulation
4. Frequency of use

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### Slide 5



**REVIEW** slide 5 in the PowerPoint presentation to discuss the details of Inspection and Servicing Schedules.

**CONTENT:** Direct participants to describe in their own words the basics of Preventative Maintenance.



**ASK:** participants to describe what factors form the basis for determining maintenance intervals.

## Inspection and Servicing Schedules

What factors form the basis for determining maintenance intervals?

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## Instructor's Notes

Handrails

### General Safety Precautions

- Only properly trained and authorized personnel shall be permitted to operate or service any portion of the equipment.
- Suitable protective equipment, warning notices, and accessories must be available and maintained in a serviceable condition.



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### Slide 8



**REVIEW** slide 8 and discuss some general safety precautions.



**ASK:** participants to describe what comprises PPE.

## General Safety Precautions

*Describe what comprises PPE.*

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## Instructor's Notes

Handrails

### Completion of Work

- Remove all tools, maintenance signage, and safety devices.
- Follow proper transit agency protocol.



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### Slide 10



**REVIEW** slide 10 and review the process of completing the designated work.

**CONTENT:** Direct participants to describe in their own words the general safety precautions to be used while working on any escalator.

**APPLICATION FEEDBACK:** now that we have discussed a little about safety precautions, have the participants answer the following question.



**ASK** *once your work is complete, what should you do with the maintenance signage?*

## Completion of Work

*Once your work is complete, what should you do with the maintenance signage?*

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## Instructor's Notes

Handrails

### Handrail Drive Inspection

- Inspect the handrail drive and idler sheaves for any damage or abnormal wear.
- Inspect the bearings for excessive wear and ensure they operate freely.
- Inspect the drive chain and sprockets for abnormal wear.
- Check the drive chain for proper tension
- Check the drive sprockets for evidence of side movement.



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### Slide 15



**REVIEW** slides 15 and review how to inspect a handrail drive.



**ASK** the participants to describe how to properly inspect a handrail drive for damage.

## Handrail Drive Inspection

Describe how to inspect a handrail drive for damage.

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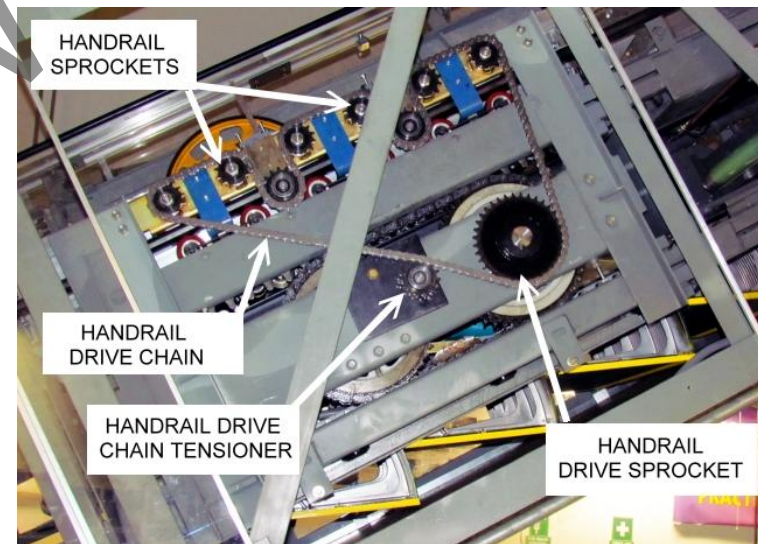


Figure 2 Handrail Drive



## Instructor's Notes

Handrails

### Handrail Speed Monitor Check

- Clean and inspect handrail speed sensor or broken handrail device for wear and tear.
- Adjust and or replace if necessary.
- Clean magnetic sensor monitoring surface, check mounting and connector.
- Check to ensure that the magnetic sensor distance from the surface of the spokes is 1/8 inch.
- Check for handrail slippage.

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### Slide 17



**REVIEW** slide 17 and discuss how to check and monitor the speed of a handrail.



**ASK** *how handrail slippage is detected.*

## Handrail Speed Monitor Check

*How is handrail slippage detected?*

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## Instructor's Notes

### Handrails

#### Handrail Inlet Safety Device Inspection

- Clean and inspect the handrail inlet safety device.
- Ensure all safety devices are present where handrail enters the balustrade.
- Clean all surfaces around the moving mechanism of the safety guard.
- Check that all hand guards are in good condition and properly sized.
- Check and manually activate each handrail inlet safety switch.
- Check all clearances between the handrail and guard.

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### Slide 22



**REVIEW** slide 22 and review the inspection process for the inlet safety device.

**CONTENT:** Direct participants to describe in their own words how to inspect the inlet safety device.



**ASK** *what is the purpose of the handrail inlet safety device?*

## Handrail Inlet Safety Device Inspection

*What is the purpose of the handrail inlet safety device?*

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Figure 4 Handrail Inlet Monitor

## Handrail Throw-off Monitor Check

### Handrail Throw-off Monitor Check

- Mounted to the deck support channels at the lower radius.
- If the handrail were to disengage from the handrail guide, an actuating arm would drop and trip a safety switch causing the escalator to stop.
- To test the device, peel the handrail off the handrail guide from the lower radius.
  - Verify that the escalator will not run and the fault is properly indicated.

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## Slide 24



**REVIEW** slide 24 and describe the purpose of the handrail throw-off monitor.

**APPLICATION FEEDBACK:** now that we have discussed a little about handrail safety devices, have the participants answer the following question.



**ASK** participants to describe how to test the throw-off monitor.

*Describe how to test the throw-off monitor.*

ONLY