

Class MR Elevating Devices Mechanic

PROGRAM OUTLINE



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SAFETY NOTICE

Disclaimer:

Please note that references to the Acts, Regulations, and Codes throughout this document may not reflect the most recent versions available.

Also, the references in this outline are by no means an exhaustive list of all the situations that may apply to a particular situation.

Therefore, the user should make sure that references are current and relevant to any particular situation that they are dealing with.



TABLE OF CONTENTS

Section 1: Introduction

Foreword.....	2
Acknowledgments.....	3
How to Use this Document.....	4

Section 2: Program Overview

Occupational Analysis Chart.....	6
Training Topics and Suggested Time Allocation.....	7

Section 3: Program Content

Line A Use Safe Work Practices	10
Line C Use Fundamental Skills.....	15
Line E Install Traction Elevators.....	16
Line F Install Hydraulic Elevators.....	17
Line G Apply the Principles of Electricity and Electronics.....	18
Line J Maintain Elevating Systems.....	19

Appendix A: References to Acts, Regulations, and Codes

Reference Materials.....	26
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Image has been edited for the purposes of this publication.



Section 1:

Introduction

FOREWORD

The Elevating Devices Mechanic (Class MR) Program Outline is intended as a guide for instructors, apprentices, and employers. It reflects the educational standards based on the BC's elevating devices industry and subject matter experts.

Practical instruction by demonstration and student participation should be integrated with classroom sessions. Safe working practices, even though not always specified in each operation or topic, are an implied part of the program and should be stressed throughout the training.

This Program Outline includes a list of recommended reference textbooks that are available to support the learning objectives.

The Program Outline was prepared with the advice and assistance of the Elevating Devices Mechanic (Class MR) Review Committee and will form the basis for further updating of the British Columbia Elevating Devices Mechanic (Class MR) Program and learning resources by BC Safety Authority.

Each competency is to be evaluated through the use of a written examination in which the individual must achieve a minimum of 70% in order to receive a passing grade. The types of questions used on these exams must reflect the cognitive level indicated by the learning objectives and the Learning Tasks listed in the related competencies.

Practical Workplace Achievement Criteria are included for those competencies that require a hands-on evaluation component.

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HOW TO USE THIS DOCUMENT

This Program Outline has been developed for the use of training providers, employers and learners.

The table below describes how each audience can use the document.

Section	Training Providers	Employers	Tradespersons/Learners
Occupational Analysis Chart	Communicate the competencies that industry has defined as representing the scope of the occupation	Understand the competencies that a learner is expected to demonstrate in order to achieve certification	View the competencies they will achieve as a result of program completion
Training Topics and Suggested Time Allocation	Shows the suggested proportion of time spent on each competency	Understand the scope of competencies covered in the technical training and the suggested proportion of time spent on each competency	Understand the scope of competencies covered in the technical training and the suggested proportion of time spent on each GAC
Program Content	Defines the objectives, learning tasks, high-level content that must be covered for each competency, as well as defining observable, measurable achievement criteria for objectives with a practical component	Identifies detailed program content and performance expectations for competencies with a practical component	Provides detailed information on program content and performance expectations for demonstrating competency



Section 2:

Program Overview

OCCUPATIONAL ANALYSIS CHART

ELEVATING DEVICES MECHANIC (CLASS MR)

Use Safe Work Practices A	Control Workplace Hazards A1	P							
	Comply with the OHS Regulation and WorkSafeBC Standards A2	P							
	Use WHMIS A3	P							
	Use Personal Protective Equipment A4	P							
	Apply Fire Prevention Practices A5	P							
Use Fundamental Skills C	Apply Troubleshooting Techniques C8		1						
	Describe the Fundamentals of Traction Systems E5		1						
Install Traction Elevators E	Install Pit Structures, Jacks, and Suspension Systems F2		1						
	Describe the Principles of Hydraulic Systems F1		1						
	Install Machine Room Equipment F3		1						
Install Hydraulic Elevators F	Install the Hydraulic Piping System F4		1						
	Troubleshoot Electrical Systems G12		1						
Apply the Principles of Electricity and Electronics G	Maintain Car Enclosures J6		1						
	Evacuate Trapped Passengers J3		1						
	Apply Basic Hoistway Maintenance J10		1						
Maintain Elevating Systems J	Apply Basic Maintenance to Machine Room Components or Control Spaces J11		1						
	Apply the Requirements of Class M/MR Contractor's Directive J12		1						
	Install the Hydraulic Piping System F4		1						

TRAINING TOPICS AND SUGGESTED TIME ALLOCATION SUMMARIZED BY GENERAL AREA OF COMPETENCY (GAC)

ELEVATING DEVICES MECHANIC (CLASS MR)

Line A	Use Safe Work Practices PREREQUISITES	Hours	% of Total
A1	Control Workplace Hazards	4	
A2	Comply with the OHS Regulation and WorkSafeBC Standards	4	
A3	Use WHMIS	3	
A4	Use Personal Protective Equipment	4	
A5	Apply Fire Prevention Practices	1	
	Total Line A	16	29%

Line C	Use Fundamental Skills	Hours	% of Total
C8	Apply Troubleshooting Techniques	8	
	Total Line C	8	14%

Line E	Install Traction Elevators	Hours	% of Total
E5	Describe the Fundamentals of Traction Systems	2	
	Total Line E	2	4%

Line F	Install Hydraulic Elevators	Hours	% of Total
F5	Describe the Fundamentals of Hydraulic Systems	2	
	Total Line F	2	4%

Line G	Apply the Principles of Electricity and Electronics	Hours	% of Total
G12	Troubleshoot Electrical Systems	8	
	Total Line G	8	14%

Line J	Maintain Elevating Systems	Hours	% of Total
J3	Troubleshoot Electrical Systems	4	
J6	Maintain Car Enclosures	4	
J9	Review Mandatory Maintenance	2	
J10	Apply Basic Hoistway Maintenance	4	
J11	Apply Basic Maintenance to Machine Room Components or Control Spaces	4	
J12	Apply the Requirements of the Class M/MR Contractor's Directive	2	
Total Line J		20	35%

Total Hours Class MR (including prerequisites)	56	100%
Minus safety prerequisite	16	
Total In-Class Hours	40	



Section 3:

Program Content

Line (GAC): A Use Safe Work Practices
Competency: A1 Control Workplace Hazards

Learning objectives:

- The learner will be able to describe workplace hazards.
- The learner will be able to apply strategies to minimize workplace hazards.
- The learner will be able to communicate workplace hazards to co-workers.

Learning Tasks		Content	
1	Describe general strategies to minimize workplace hazards and prevent workplace injuries	<ul style="list-style-type: none"> • Hazards <ul style="list-style-type: none"> - Identification - Reduction - Elimination - Isolation - Management 	<ul style="list-style-type: none"> • Horseplay • Personal protective equipment • Worker training • Housekeeping • Ergonomics • Material handling and storage • Code requirements
2	Describe strategies to help ensure the well-being of the general public	<ul style="list-style-type: none"> • Signage • Barricading access 	<ul style="list-style-type: none"> • Notification of elevating shutdown/return to service • Reasons for shutdown
3	Explain how environmental hazards pose a risk to a worker's health and safety	<ul style="list-style-type: none"> • Chemical materials • Physical materials 	<ul style="list-style-type: none"> • Biological materials • Toxic materials
4	Describe the issues relating to substance abuse	<ul style="list-style-type: none"> • Substance types • Effects • Contributing factors 	<ul style="list-style-type: none"> • Solutions • Policies
5	Describe strategies to minimize the risk of workplace accidents or illness	<ul style="list-style-type: none"> • Training • Communications • Hazard assessment • Hazard control 	<ul style="list-style-type: none"> • Site planning • Work procedures • Code requirements
6	Describe the dangers of exposure to hazardous materials	<ul style="list-style-type: none"> • Materials • Types • Hazards • Toxic effect 	<ul style="list-style-type: none"> • Types of exposure • Personal protective equipment • Responsibilities and procedures • Code requirements
7	Apply strategies to minimize workplace hazards	<ul style="list-style-type: none"> • Site orientation • Safety meetings • Worksite safety plan 	<ul style="list-style-type: none"> • Lockout procedures • Guards and barricades • Code requirements

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Line (GAC): A Use Safe Work Practices
Competency: A2 Comply with the OHS Regulation and WorkSafeBC Standards

Learning objectives:

- The learner will be able to locate the relevant parts of the Occupational Health and Safety Regulation and WorkSafeBC Standard as it applies to an Elevator Mechanic’s workplace.
- The learner will be able to integrate the Occupational Health and Safety Regulation and WorkSafeBC Standard into their day-to-day work practices.

Learning Tasks		Content	
1	Describe the general health and safety policies relevant to the elevator trade	<ul style="list-style-type: none"> • OHS Regulation • Other agencies 	<ul style="list-style-type: none"> • Company policies
2	Describe the rights and responsibilities of employers, managers, supervisors, and workers concerning health and safety in the workplace	<ul style="list-style-type: none"> • Due diligence 	<ul style="list-style-type: none"> • Code requirements
3	Describe the procedures for reporting workplace incidents and accidents	<ul style="list-style-type: none"> • WorkSafeBC requirements 	<ul style="list-style-type: none"> • Company requirements
4	Describe the core requirements of the Occupational Health and Safety Regulation.	<ul style="list-style-type: none"> • Regular inspections • Written instructions • Regular management meetings • Safety committees • Toolbox meetings 	<ul style="list-style-type: none"> • Accident/injury investigations • Records and statistics • Instruction and supervision of workers • Code requirements
5	Describe WorkSafeBC’s role in promoting workplace health and safety	<ul style="list-style-type: none"> • Awareness • Education 	<ul style="list-style-type: none"> • Inspection • Enforcement
6	Apply the General Hazard Requirements of WorkSafeBC Regulations	<ul style="list-style-type: none"> • Chemical and biological substances • Substance specific requirements • Noise, vibration, radiation, and temperature • Personal protective clothing and equipment • Confined spaces • De-energizing and lockout 	<ul style="list-style-type: none"> • Fall protection • Tools, machinery and equipment • Ladders, scaffolds, and temporary work platforms • Cranes and hoists • Rigging • Mobile equipment • Electrical safety • Code requirements
7	Describe how a workplace safety policy is established	<ul style="list-style-type: none"> • Hazard assessment • Conditions • Safety meeting requirements • Reporting hazards and incidents • Reporting injuries 	<ul style="list-style-type: none"> • Accident/incident investigations • Employee orientation • First aid • Records and statistics • Non-compliance procedures

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Line (GAC): A Use Safe Work Practices
Competency: A3 Use WHMIS

Learning objectives:

- The learner will be able to describe the purpose of the Workplace Hazardous Materials Information System (WHMIS) Regulations.
- The learner will be able to explain the contents of Material Safety Data Sheets (MSDS).
- The learner will be able to explain the content of a WHMIS label.
- The learner will be able to apply WHMIS regulations in the workplace.

Learning Tasks		Content	
1	Explain the primary goals of WHMIS	<ul style="list-style-type: none"> • Reducing injuries and disease • Communicating information 	<ul style="list-style-type: none"> • Reducing exposure to hazardous materials
2	Describe the rights and responsibilities of employers, suppliers, and workers under WHMIS legislation	<ul style="list-style-type: none"> • Recognition of rights <ul style="list-style-type: none"> - Workers - Employers - Suppliers • Legislation 	<ul style="list-style-type: none"> • Availability and location of information • Updating • Code requirements
3	Describe the six hazard classes of WHMIS	<ul style="list-style-type: none"> • Hazard classes 	
4	Describe the three main elements of WHMIS	<ul style="list-style-type: none"> • Labels • Material safety data sheets (MSDS) 	<ul style="list-style-type: none"> • Education and training programs
5	Explain the requirements for WHMIS labels	<ul style="list-style-type: none"> • Supplier labels 	<ul style="list-style-type: none"> • Workplace labels
6	Describe the primary information found on a Material Safety Data Sheet	<ul style="list-style-type: none"> • Product information • Hazardous ingredients • Physical data • Fire or explosion data 	<ul style="list-style-type: none"> • Reactive data • Toxicological properties • Preventative measures • First aid measures • Preparation information

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Line (GAC): A Use Safe Work Practices
Competency: A4 Use Personal Protective Equipment

Learning objectives:

To be competent in this area, the individual must be able to:

- Select appropriate personal protective equipment.
- Inspect and maintain personal protective equipment.
- Use personal protective equipment.

Learning Tasks		Content	
1	Select the proper personal protective equipment (PPE) for a specific task	<ul style="list-style-type: none"> • Footwear • Eye protection • Ear protection • Head protection • Respiratory protection • Protective clothing 	<ul style="list-style-type: none"> • Lifting protection • Hair and jewelery • Fall protection • Company policy • Code requirements
2	Use personal protective equipment	<ul style="list-style-type: none"> • Selection • Purpose • Fitting • Operating procedures • Training programs 	<ul style="list-style-type: none"> • Inspection • Maintenance • Storage • Code requirements
3	Use fall protection	<ul style="list-style-type: none"> • Types of equipment • Uses/purpose • Limitations 	<ul style="list-style-type: none"> • Certification • Code requirements

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Achievement Criteria:

Performance: The learner will attach a harness to a lifeline.

Conditions: The learner will be given:

- A lifeline
- A lanyard
- A harness

Criteria: The learner will:

- Inspect the equipment.
- Fit the equipment.
- Attach the harness to a lifeline.
- Store the equipment properly.
- Work safely and efficiently.

Line (GAC): A Use Safe Work Practices
Competency: A5 Apply Fire Prevention Practices

Learning objectives:

- The learner will be able to describe the chemical process of a fire.
- The learner will be able to select and use appropriate fire suppression equipment.
- The learner will be able to apply fire prevention procedures.
- The learner will be able to report fire incidents.

Learning Tasks		Content	
1	Describe the components necessary to sustain a fire	<ul style="list-style-type: none"> • Fuel • Heat 	<ul style="list-style-type: none"> • Oxygen
2	Describe the five classes of fire extinguishers	<ul style="list-style-type: none"> • Class A • Class B • Class C 	<ul style="list-style-type: none"> • Class D • Other
3	Outline strategies to reduce the risk of fire in the workplace	<ul style="list-style-type: none"> • Housekeeping • Inspection and maintenance of fire equipment • Electrical hazards • Storage of materials 	<ul style="list-style-type: none"> • Precautions to prevent ignition • Fire/smoke alarms • Hot permit • Code requirements
4	Describe the proper use of a fire extinguisher	<ul style="list-style-type: none"> • Selecting extinguisher • Notifying occupants, co-workers, and emergency services 	<ul style="list-style-type: none"> • Egress • Procedures/process

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Line (GAC): C Use Fundamental Skills
Competency: C8 Apply Troubleshooting Techniques

Learning objectives:

- The learner will be able to describe the process of troubleshooting.
- The learner will be able to troubleshoot problems.

Learning Tasks		Content	
1	Describe the process of troubleshooting	<ul style="list-style-type: none"> • Personal safety • Public safety • Safe work practices <ul style="list-style-type: none"> - Jumper policy - Precautions for multiple units • Investigative techniques • Collecting information <ul style="list-style-type: none"> - Witnesses - Leaving undisturbed - Note taking - History - Compare to working system - Consult resources - Consult others 	<ul style="list-style-type: none"> • Analyze the information <ul style="list-style-type: none"> - Overall system - Mechanical or electrical • Isolating cause • Repairs • Validate the repair • Start-up procedures • Documentation
2	Troubleshoot problems	<ul style="list-style-type: none"> • Check history • Use of senses • Use of diagnostic equipment • Use of information <ul style="list-style-type: none"> - Check cause and effect relationships - Isolation 	<ul style="list-style-type: none"> • Use of procedures/ flowcharts • Consult support resources • Repair • Validate the repair • Documentation

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Achievement Criteria:

Performance: The learner will troubleshoot a system fault.

Conditions: The learner will be given:

- A non-functioning elevating device.
- Tools
- Diagnostic equipment
- Documentation
- Access to parts

Criteria: The learner will be assessed on their ability to:

- Use a logical approach to solve the problem.
- Select and use the proper tools.
- Solve the problem.
- Document the repair.
- Work safely and efficiently.

Line (GAC): E Install Traction Elevators
Competency: E5 Describe the Fundamentals of Traction Systems

Learning objectives:

- The learner will be able to describe the purpose of a traction drive.
- The learner will be able to describe the components of a traction system.
- The learner will be able to describe the operating principles of a traction system.
- The learner will be able to describe the hazards of traction systems.

Learning Tasks		Content	
1	Describe the purpose of a traction drive	<ul style="list-style-type: none"> • Car • Counterweight 	<ul style="list-style-type: none"> • Sheave • Hoist ropes
2	Describe the components of a traction system	<ul style="list-style-type: none"> • Machine • Hoist ropes • Sheaves 	<ul style="list-style-type: none"> • Compensating chains/ropes • Car • Counterweight
3	Describe the operating principles of a traction system	<ul style="list-style-type: none"> • Weight of car • Weight of counter weight • Lubrication 	<ul style="list-style-type: none"> • Requirements for traction <ul style="list-style-type: none"> - Need for balance during construction - Final balance - Rope tension - Type of sheave (groove /diameter) - Type of rope - Size of sheave with respect to rope diameter
4	Describe the hazards of traction systems	<ul style="list-style-type: none"> • Safety 	<ul style="list-style-type: none"> • Hazard recognition

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Line (GAC): F Install Hydraulic Elevators
Competency: F5 Describe the Fundamentals of Hydraulic Systems

Learning objectives:

- The learner will be able to describe the purpose of a hydraulic system.
- The learner will be able to describe the components of a hydraulic system.
- The learner will be able to describe the operating principles of a hydraulic system.
- The learner will be able to describe the hazards of hydraulic systems.

Learning Tasks			
1	Describe the purpose of a hydraulic drive	<ul style="list-style-type: none"> • Advantages of using hydraulics 	<ul style="list-style-type: none"> • Types
2	Describe the components of a hydraulic system	<ul style="list-style-type: none"> • Jack assemblies 	<ul style="list-style-type: none"> • Power unit
3	Describe the operating principles of a hydraulic system	<ul style="list-style-type: none"> • Pumps • Valves 	<ul style="list-style-type: none"> • Pressures • Formulae
4	Describe the hazards of hydraulic systems	<ul style="list-style-type: none"> • Safety • • 	<ul style="list-style-type: none"> • Hazard recognition

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Line (GAC): G Apply the Principles of Electricity and Electronics
Competency: G12 Troubleshoot Electrical Systems

Learning Objectives:

- The learner will be able to describe the components of a safety circuit.
- The learner will be able to describe the components of a door lock and car gate switch circuit.
- The learner will be able to safely restore operations to an elevator based on interpreting basic fault codes and I/O codes.

Learning Tasks		Content	
1	Describe the components of a safety circuit	<ul style="list-style-type: none"> • Wiring diagrams • Safety components 	<ul style="list-style-type: none"> • Functions • Location
2	Describe the components of a door lock and car gate switch circuit	<ul style="list-style-type: none"> • Wiring diagrams • Components • Types of switches 	<ul style="list-style-type: none"> • Functions • Locations
3	The learner will be able to identify the location and cause of a component malfunction	<ul style="list-style-type: none"> • Use of drawings and other resources • Use of test equipment • Analyzing information • Isolating the cause 	<ul style="list-style-type: none"> • Flow charts • Use of senses • Log book history • Responsibilities
4	Restore operations to an elevator based on interpreting basic fault codes and I/O codes	<ul style="list-style-type: none"> • Repair • Validate the repair 	<ul style="list-style-type: none"> • Return to service as per codes and regulations • Record actions in logbook

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Achievement Criteria 1 & 2:

Performance 1: The learner will identify the cause and location of a component malfunction.

Performance 2: The learner will restore operations to a non-functioning elevating device.

Conditions 1 & 2: The learner will be given:

- A non-functioning elevating device
- A set of schematics
- Diagnostic equipment

Criteria 1& 2: The learner will be assessed on their ability to:

- Use a logical approach to solve the problem.
- Select and use the proper diagnostic equipment.
- Solve the problem.
- Document the repair.
- Work safely and efficiently.

Line (GAC): J Maintain Elevating Systems
Competency: J3 Evacuate Trapped Passengers

Learning objectives:

- The learner will be able to describe how to evacuate trapped passengers.
- The learner will be able to evacuate trapped passengers.

Learning Tasks		Content	
1	Describe how to evacuate trapped passengers	<ul style="list-style-type: none"> • Work procedures • Company procedures • Personal safety • Verifying passengers are trapped • Communications with trapped passengers • Returning elevator service 	<ul style="list-style-type: none"> • Emergency response procedures (911) <ul style="list-style-type: none"> - Fire - Medical - Police assistance - Top of car extrication procedures • Hazards when extricating passengers • Documentation procedures
2	Evacuate Trapped Passengers	<ul style="list-style-type: none"> • Procedures 	<ul style="list-style-type: none"> • Safety

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Achievement Criteria:

Performance: The learner will extract a passenger from a simulated entrapment.

Conditions: The learner will be given:

- A staged site
- Tools
- Company procedures

Criteria: The learner will be assessed on their ability to:

- Assess the situation
- Select and use tools
- Follow company procedures
- Extract trapped passenger
- Complete documentation
- Work safely

Line (GAC): J Maintain Elevating Systems
Competency: J6 Maintain Car Enclosures

Learning objectives

- The learner will be able to describe the maintenance of car enclosures.
- The learner will be able to maintain car closures.

Learning Tasks		Content	
1	Describe the maintenance of car enclosures	<ul style="list-style-type: none"> • Personal safety • Public safety • Door operation <ul style="list-style-type: none"> - Safety devices • Retiring cams • Car door and gates • Car operating panel and fixtures • Car interior • Car top maintenance • Car top inspection station 	<ul style="list-style-type: none"> • Car guide maintenance • Mandatory maintenance tasks • Company specific maintenance tasks • Housekeeping • Levelling devices • Load weighing devices • Safeties • Traveling cable, compensating chain, and rope attachments
2	Maintain car enclosures	<ul style="list-style-type: none"> • Procedures • Safety 	<ul style="list-style-type: none"> • Code requirements

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Achievement Criteria:

Performance: The learner will carry out routine maintenance on a car enclosure.

Conditions: The learner will be given:

- An elevator car
- Materials
- Tools
- Documentation
- Maintenance procedures

Criteria: The learner will be assessed on their ability to:

- Maintain public safety.
- Follow maintenance procedures.
- Complete required documentation.
- Work safely and efficiently.

Line (GAC): J Maintain Elevating Systems
Competency: J9 Maintain Elevating Device Cabs, Carriages, and Platforms

Learning objectives:

- The learner will be able to describe mandatory maintenance requirements.

Learning Tasks		Content	
1	Describe mandatory maintenance requirements.	<ul style="list-style-type: none"> • Code requirements • Procedures • Testing 	<ul style="list-style-type: none"> • Maintain log book <ul style="list-style-type: none"> - Tests - Inspections - Maintenance - Records for previous five years

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Line (GAC): J Maintain Elevating Systems
Competency: J10 Apply Basic Hoistway Maintenance

Learning objectives:

- The learner will be able to describe maintenance of hoistways.
- The learner will be able to maintain hoistways

Learning Tasks		Content	
1	Describe maintenance of hoistways	<ul style="list-style-type: none"> • Visual inspection of wire rope • Suspension means maintenance • Hall door maintenance • Traveling cable maintenance • Sheave bearing maintenance • Visual inspection of counterweight • Pit equipment maintenance 	<ul style="list-style-type: none"> • Safety device maintenance <ul style="list-style-type: none"> - Hoistway devices - Door interlocks - Vision panels in doors - Straps on vertical doors - Slipper inserts and rollers - Door guide shoes - Housekeeping - Environmental concerns
2	Maintain hoistways	<ul style="list-style-type: none"> • Procedures • Safety 	<ul style="list-style-type: none"> • Car top access • Pit access

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.

Achievement Criteria:

Performance 1: The learner will perform car top procedures on a completed elevator.

Conditions 1: The learner will be given:

- Running elevator
- Car top procedures

Criteria 1: The learner will be assessed on their ability to:

- Use company procedures to gain access to the car top:
- With unlocking device
- Keyed access
- Use company procedures to control

Performance 2: The learner will perform pit procedures on a completed elevator.

Conditions 2: The learner will be given:

- Running elevator
- Pit procedures

Criteria 2: The learner will be assessed on their ability to:

- Use company procedures to gain access to the pit:
 - With unlocking device
 - Keyed access
 - Walk in pit
- Work safely and efficiently.

Line (GAC): J Maintain Elevating Systems
Competency: J11 Apply Basic Maintenance to Machine Rooms or Control Spaces

Learning objectives

- The learner will be able to describe the maintenance of machine rooms or control spaces.
- The learner will be able to maintain machine rooms or control spaces.

Learning Tasks		Content	
1	Describe the maintenance of machine rooms or control spaces	<ul style="list-style-type: none"> • Personal safety • Drive machine maintenance <ul style="list-style-type: none"> - Oil - Bearings • Lubricate bearings on drive sheaves • Safety device maintenance <ul style="list-style-type: none"> - Car push button - Relay (freestanding type) - Fuses - Overload elements - Contacts - Non-programmable modules - Door and gate rollers, chains, cables - Phase reversal relays 	<ul style="list-style-type: none"> • Visual inspection of control equipment • Housekeeping • Environmental concerns • Check hydraulic oil • Maintain and replace v-belts • Inspect couplings on hydraulic drives (observe and report)
2	Maintain machine rooms or control spaces	<ul style="list-style-type: none"> • Procedures • Safety 	<ul style="list-style-type: none"> • Code requirements

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.


Line (GAC): J Maintain Elevating Systems
Competency: J12 Apply the Requirements of Class M/MR Contractor's Directive

Learning objectives:

- The learner will be able to explain the requirements of the Class M/MR Directive.
- The learner will be able to describe the scope of work a Class M/MR Contractor can perform.
- The learner will be able to describe the scope of work performed by a Class A or RA Contractor.

Learning Tasks		Content	
1	Explain the requirements of the Class M/MR Directive	<ul style="list-style-type: none"> • Maintenance contracts with Class A or RA Contractor • Log book <ul style="list-style-type: none"> - Maintenance activities - Tests - Inspections - Five-year requirements 	<ul style="list-style-type: none"> • Communication protocols with Class MR and Class A Contractors <ul style="list-style-type: none"> - Equipment lockout - Jumper policy - Troubleshooting policy • Incident reporting
2	Describe the scope of work a Class M/MR Contractor can perform	<ul style="list-style-type: none"> • Inspections <ul style="list-style-type: none"> - Hoistways - Pit - Machine room • Emergency procedures <ul style="list-style-type: none"> - Entrapments - BCSA requirements 	<ul style="list-style-type: none"> • Replacement of identical or equivalent items • Logbook <ul style="list-style-type: none"> - Oil changers - Repairs - Maintenance
3	Describe the scope of work performed by a Class A or RA Contractor	<ul style="list-style-type: none"> • Motors • Relays (solid state) • Contactors 	<ul style="list-style-type: none"> • Retiring device • Adjustments relating to normal operations

Theory Assessment: The learner must achieve a minimum of 70 percent on a written examination.



Appendix A: References to Acts, Regulations, and Codes

CODES AND REGULATIONS

This section contains a summary of the important Codes, Regulations and Acts that apply to each competency in the Program Outline.

REFERENCES

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Elevator World Inc. (2010).

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Elevator World Inc.: Mobile, Alabama

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ABBREVIATIONS USED IN CITING REFERENCES

FE	Field Employee’s Handbook
OHS	Occupational Health and Safety
WCA	Workers Compensation Act
WSBC	WorkSafeBC

LINE A: USE SAFE WORK PRACTICES

A1: Control Workplace Hazards

- WCA Part 3, Division 3, Section 115 – 117
– General Duties of Employers, Workers and Others
- OHS Regulation Part 5, Section 5.2
– General Information Requirement
- OHS Regulation Part 6, Section 6.6
– Assessment and Classification
- OHS Regulation Part 6, Section 6.8
– Procedures
- FE Safety Handbook, Section 4.2 – 4.4
– Fall Arrest
- FE Safety Handbook, Section 7
– Lockout and Tagout

A2: Comply with the OHS Regulation and WorkSafeBC Standards

- WCA Part 3, Division 3, Section 115 – 117
– General Duties of Employers, Workers and Others
- WCA Part 1, Division 5, Section 53
– Worker Notification of Injury

A3: Use WHMIS

- Hazardous Products Act (Canada)
- WSBC Guideline G5.3-1
– WHMIS Application

A4: Use Personal Protective Equipment

- OHS Regulation Part 8
– Personal Protective Equipment and Clothing
- FE Safety Handbook, Section 3
– Personal Protective Equipment

A5: Apply Fire Prevention Practices

- OHS Regulation Part 4, Section 4.32
– Access to Work Area
- WSBC Guideline G5.97
– Emergency Plan
- WSBC Guideline G5.99
– Risk Assessment

LINE C: USE FUNDAMENTAL SKILLS

C8: Apply Troubleshooting Techniques

- None

LINE E: INSTALL TRACTION ELEVATORS

E5: Describe the Fundamentals of Traction Systems

- None

LINE F: INSTALL HYDRAULIC ELEVATORS

F5: Describe the Fundamentals of Hydraulic Systems

- None

LINE G: APPLY THE PRINCIPLES OF ELECTRICITY AND ELECTRONICS

G12: Describe the Basic Electrical and Electronic Systems

- None

LINE J: MAINTAIN ELEVATING SYSTEMS

J3: Evacuate Trapped Passengers

- None

J6: Maintain Cabs

- CEC Section 38
- B44.2

J9: Review Mandatory Maintenance

- B44.2

J10: Apply Basic Hoistway Maintenance

- B44.2

J11: Apply Basic Maintenance to Machine Room Components or Control Spaces

- B44.2

J12: Apply the Requirements of the Class M/MR Contractor's Directive

- BC Safety Authority Class M/MR Contractor's Directive



Do it right. Stay safe.



The BC Safety Authority is an independent, self-funded organization mandated to oversee the safe installation and operation of technical systems and equipment.

In addition to issuing permits, licences and certificates we work with industry to reduce safety risks through assessment, education and outreach, enforcement, and research.

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