



Unit	1084
Title	Describe Regulations and Standards Related to Heavy Equipment in Forestry
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BC Forest Safety

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Unit Introduction

What you will learn in this unit

By the end of this unit, you will be able to demonstrate knowledge of:

- Legislation
- Regulations
- Guidelines and documentation

Why it's important for you to learn this unit

As a forestry worker, due diligence requires you to understand regulations, who the regulatory bodies are, and the responsibilities, safety and reporting procedures that apply to you. It is important each worker knows how to access the information regarding regulations and standards as well as have the appropriate training.

Are you ready to take this unit?

It is recommended prior to starting this unit, that you have completed the following units:

- [1002 – Describe Forestry Industry](#)
- [1003 – Describe Safe Work Practices](#)
- [1036 – Describe Regulations and Legislation related to General Forestry](#)

Does this unit apply to you?

This unit applies to the following occupations:

- All Mechanized Harvesting Equipment Operators

Section 1084-1: Legislation

What you need to know about this section

By the end of this section, you will be able to demonstrate knowledge of the following key point:

1.1 Supplier's responsibilities related to Workers Compensation Act, Section 26, general duties of suppliers

Key Point 1.1: Supplier's Responsibilities Related to Workers Compensation Act, Section 26, General Duties of Suppliers

According to the Workers Compensation Act (WCA), Section 26 explains the general responsibilities of suppliers regarding:

- Tools
- Equipment
- Machines
- Devices
- Biological, chemical or physical agents

Supplier's Responsibilities

Every supplier must:

- ensure that any tool, equipment, machine or device, or any biological, chemical or physical agent, supplied by the supplier is safe when used in accordance with the directions provided by the supplier and complies with the OHS provisions and the regulations,
- provide directions respecting the safe use of any tool, equipment, machine or device, or any biological, chemical or physical agent, that is obtained from the supplier to be used at a workplace by workers,
- ensure that any biological, chemical or physical agent supplied by the supplier is labelled in accordance with the applicable federal and provincial enactments,
- if the supplier has responsibility under a leasing agreement to maintain any tool, equipment, machine, device or other thing, maintain it in safe condition and in compliance with the OHS provisions, the regulations and any applicable orders, and
- comply with the OHS provisions, the regulations and any applicable orders.

Supplier's Responsibilities Related to Workers Compensation Act, Section 26, General Duties of Suppliers

1. Every supplier must provide directions for the safe use of:
 - Tools and equipment
 - Biological, chemical or physical agents
 - Tools, equipment, machines, and biological, chemical or physical agents
 - Equipment only
 2. Every supplier must ensure that any biological, chemical or physical agent is:
 - Safely used, labelled, and supplied with safe directions
 - Safely used
 - Safely labelled
 - Supplied with safe directions
-



Now check your answers on the next page.

Suppliers Responsibilities Related to Workers Compensation Act, Section 26—Self-Quiz Answers

1. Every supplier must provide directions for the safe use of:

Answer: **Tools, equipment, machines, and biological, chemical or physical agents**

2. Every supplier must ensure that any biological, chemical or physical agent is:

Answer: **Safely used, labelled, and supplied with safe directions**

Section 1084-2: Regulations

What you need to know about this section

By the end of this section, you will be able to demonstrate knowledge of the following key points:

2.1 Regulations part 16 related to operating mobile equipment

2.2 Regulations part 16, 16.21 protective structures, 16.22 rollover protective structures, 16.17 escape from cab, and 16.34 competency of operators

2.3 Regulations related part 26 related to operating mobile equipment

Key Point 2.1: Regulations Part 16 Related to Operating Mobile Equipment

Source: <https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation/part-16-mobile-equipment#60B372A0A0394B5DA895488C8C60B945>

After reading this key point, you will be able to demonstrate knowledge of regulations related to operating mobile equipment.

General Requirements

The OHS Regulations Part 16, Sections 16.3 to 16.20 includes the general requirements for operating mobile equipment.

Note: At the time of publication (summer 2019) WorkSafeBC was in the process of updating the OHS Regulations Part 16. An updated copy of the new regulations is expected the summer of 2020.

Read each section thoroughly, as you are required and expected to know it. The sections relate to the following topics:

Regulation	Description
16.3 Operation & Maintenance	This section covers: <ul style="list-style-type: none">• Maintenance records for any service, repair or modification• Servicing, maintenance and repair of mobile equipment• Mobile equipment used off maintained roads• Variable reach rough terrain forklift truck• Record of inspections and maintenance
16.4 Competency of Operators	This section covers: <ul style="list-style-type: none">• When a person can operate mobile equipment• Trainees can operate equipment when under the supervision of a trained instructor
16.5 Operator's Responsibility	This section covers: <ul style="list-style-type: none">• Operators must operate the equipment safely• Maintain full control of the equipment• Comply with the laws governing the operation of the equipment
16.6	A supervisor must not knowingly operate or permit a worker to operate mobile equipment that could create

Regulation	Description
Supervisor's Responsibility	an undue hazard to the health or safety of any person.
16.7 Standards	This section covers: <ul style="list-style-type: none"> • The design, fabrication, use, inspection and maintenance of mobile equipment must meet the requirements of the applicable standards • Read all of the standards thoroughly
16.8 & 16.8.1 Warning Signal Device	Backup Alarm If an operator of mobile equipment cannot directly, or by a mirror, see behind the equipment, they must not use the equipment without an automatic audio warning device that warns others in the vicinity. Extended Component Visual and audio warning devices required when mobile equipment is used to collect, transport or compact waste material, recyclable material or both.
16.9 Lights	This section covers lights required: <ul style="list-style-type: none"> • When mobile equipment used during the period from a half hour after sunset to a half hour before sunrise • To illuminate direction of travel • The working area • The cab instruments • As headlights and backing lights
16.10 Rear View Mirrors	This section covers: <ul style="list-style-type: none"> • Mobile equipment must have a mirror providing an undistorted reflected view to the rear • Use of parabolic mirrors with flat mirrors to improve rear vision • A parabolic mirror, flat mirror or both may be used on a lift truck • A rear view mirror is not required if the conditions of use are impracticable
16.11 Window Standards	This section covers: <ul style="list-style-type: none"> • The standards of glazing required on mobile equipment
16.12 Maintenance	Windshields, side and rear windows, and rear-vision mirrors must be maintained to provide clear vision to the operator.
16.13 Braking	This section covers braking system standards, including:

Regulation	Description
Requirements	<ul style="list-style-type: none"> • All applicable standards • Equipment manufactured before the standards • Off-road transport vehicles on a slope greater than 20% • Parking systems • Supplementary means for controlled stop • WorkSafeBC exemptions
16.14 Supplementary Steering	This section covers: <ul style="list-style-type: none"> • Supplementary system to steer to a controlled stop during a power failure • Supplementary steering system requirements by Society of Automotive Engineers (SAE) • Supplementary steering system for a rubber tired skidder manufactured after January 1, 2000
16.15 Steering Wheel Knobs	This section covers: <ul style="list-style-type: none"> • A steering wheel knob is not permitted if road wheel reaction forces to the steering wheel are hazardous to the operator • A steering wheel knob must be a low profile or mushroom type, and lie completely within the periphery of the steering wheel
16.16 Safe Starting	Mobile equipment must be protected against engine starter engagement when the engine is coupled to the wheels or tracks.
16.18 Controls	This section covers operating controls that must: <ul style="list-style-type: none"> • Meet the requirements of a standard acceptable to WorkSafeBC for the type of equipment • Be identified to show the function they serve and be located and maintained to allow safe operation
16.19 Load Handling Attachments	This section covers: <ul style="list-style-type: none"> • Buckets, forks, booms, hoists and other load handling attachments must only be installed as specified by the equipment manufacturer or by a professional engineer • The installation specified must include instructions for safe use and evaluation of stability, including the effect of load swing
16.20 Load Ratings	This section covers load ratings that: <ul style="list-style-type: none"> • Must have a permanently affixed notation, legible to the operator, stating the rated load • Must be displayed in the cab if the rated load varies with the reach • If the equipment is modified, the employer must

Regulation	Description
	<p>ensure that the rated load and load chart reflect the new load ratings</p> <ul style="list-style-type: none"> Do not apply to mobile logging equipment, which is exempt from these requirements

Guards

The OHS Regulation Part 16, Sections 16.21 to 16.28 includes the guarding required for mobile equipment.



Learning Point

The term ROPS stands for Roll Over Protective Structure and FOPS stands for Falling Object Protective Structure. These are both standards that equipment cabs are designed to that protect the operator during roll over incidents or when struck by an object (log, rock, debris, etc.)

[Read each section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

Regulation	Description
<p>16.23 ROPS Standards</p>	<p>This section covers the applicable standards:</p> <ul style="list-style-type: none"> CSA Standard B352.0-95 CSA Standard B352.1-95 CSA Standard B352.2-95 Society of Automotive Engineers (SAE) Standard J1040 MAY94 ISO Standard 3471: 1994
<p>16.24 ROPS Certification</p>	<p>This section explains that:</p> <ul style="list-style-type: none"> A ROPS must be certified by the ROPS manufacturer or a professional engineer Any addition, modification, welding or cutting on an ROPS must be done by the instructions and be recertified by the ROPS manufacturer or a professional engineer
<p>16.25 ROPS Identification</p>	<p>Information must be permanently marked on an ROPS, such as the:</p> <ul style="list-style-type: none"> Name and address of the manufacturer or the professional engineer who certified the ROPS Model number or other means of identifying the machine for which the ROPS was designed Serial number or other means of identifying the ROPS Maximum weight of the machine for which the

Regulation	Description
	<p>ROPS was designed</p> <ul style="list-style-type: none"> Standard to which the ROPS conforms <p>Modified ROPS must be permanently marked with the:</p> <ul style="list-style-type: none"> Identification of the modifications Recertification date Re-certifying engineer's name and address
16.26 Effect of ROPS on Visibility	ROPS and other structures must be designed and installed to provide an adequate view for the operator to safely use the machine.
16.27 Shear Hazards	<p>Mobile equipment with moving parts close to the operator's compartment must be guarded so that:</p> <ul style="list-style-type: none"> The controls inside the compartment cannot be operated from outside the compartment, unless there is no hazard No part of any operator in the compartment can enter the hazard area created by the moving part
16.28 Guarding Moving Parts	<p>This section explains that:</p> <ul style="list-style-type: none"> Exposed moving parts that are a hazard to workers must be guarded according to a standard acceptable to WorkSafeBC If a part must be exposed for proper function, it must be guarded

Seat Requirements and Rider Restrictions

In the OHS Regulations Part 16, Sections 16.29 to 16.31 include the seat requirements and rider restrictions for operating mobile equipment.

[Read each section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics.

Regulation	Description
16.29 Operator's Seat	<p>This section explains that:</p> <ul style="list-style-type: none"> A safely located and securely mounted seat must be provided for the operator unless the equipment is designed to be controlled by an operator in the standing position The operator's seat must be designed to allow the operator to safely operate the equipment according to its intended use, control distance, and duration of use Seating for equipment operated on rough terrain

Regulation	Description
	must provide lateral restraint
16.30 Restricted Access	Only authorized persons may be on mobile equipment while the equipment is in motion.
16.31 Rider Restriction	<p>This section explains that:</p> <ul style="list-style-type: none"> • The operator of mobile equipment is the only worker permitted to ride the equipment unless the equipment is a worker transportation vehicle • A worker who must ride on mobile equipment to carry out a job task may ride non-ROPS equipped mobile equipment • Rear mounted footboards or platforms must not be occupied if the equipment is backing up • A worker on a rear mounted platform on non-ROPS equipped equipment as part of retrieving traffic cones from a roadway is not prohibited from occupying the platform when the equipment is backing up (under specific conditions) • A worker other than the operator may only ride on equipment with a ROPS for the purpose of training or maintenance, and only then if the equipment is operated in an area with no significant hazard of rollover

Seat Belts

In the OHS Regulations Part 16, Sections 16.32 to 16.33 include the seat requirements and rider restrictions for operating mobile equipment.

[Read each section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

Regulation	Description
16.32 Provision	<p>This section explains that:</p> <ul style="list-style-type: none"> • Mobile equipment with ROPS and side boom tractors must have seat belts which meet the requirements of Society of Automotive Engineers (SAE) Standard J386 JUN93 • Seat belts must be maintained in good condition
16.33 Use	<p>This section explains that:</p> <ul style="list-style-type: none"> • If mobile equipment has seat belts required by

Regulation	Description
	<p>law, the operator and passengers must use the belts whenever the equipment is in motion or an operation that could be unstable</p> <ul style="list-style-type: none"> The use of a seat belt is not required for a road grader operation that requires the operator to stand, a side boom tractor without a ROPS, or ROPS equipped mobile equipment if the mobile equipment operates in a specific location where there is no significant hazard of rollover

Operating Requirements

In the OHS Regulations Part 16, Sections 16.34 to 16.46 include the operating requirements for mobile equipment.

[Read each section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

Regulation	Description
<p>16.35 Securing Tools and Equipment</p>	<p>The operator must maintain the cab, floor and deck of mobile equipment free of material, tools or other objects that could:</p> <ul style="list-style-type: none"> Create a tripping hazard Interfere with the operation of controls Be a hazard to the operator or other occupants
<p>16.36 Unattended Equipment</p>	<p>This section explains that:</p> <ul style="list-style-type: none"> The operator must not leave the controls unattended unless the equipment has been secured against movement such as by setting the parking brake, placing the transmission in the manufacturer's specified park position, and by chocking wheels where necessary Any grapples or tongs on mobile equipment must be landed in a safe position before the equipment controls are left unattended
<p>16.37 Securing Elevated Loads</p>	<p>This section explains that:</p> <ul style="list-style-type: none"> An operator must not leave unattended any elevated load, part, extension or machine, unless it has been immobilized and secured against movement If a worker is required to work beneath an elevated part of mobile equipment, the elevated part must be securely blocked Hydraulic or pneumatic jacks must not be used for blocking unless fitted with devices to prevent their collapse in the event of loss of hydraulic or pneumatic pressure

Regulation	Description
	<ul style="list-style-type: none"> • A dump truck with a chassis manufactured after January 1, 1999 must have a permanently affixed mechanical device capable of supporting the empty dump box in the raised position
16.38 Assistance on Grades	<p>If the surface grade or condition may result in mobile equipment having insufficient braking capability to maintain control:</p> <ul style="list-style-type: none"> • The equipment must be snubbed by a cable or • A suitable vehicle must be used to ensure safety
16.39 Swinging Equipment	<p>If a hazard is created by the swinging movement of the load, cab, counterweight or any other part of the mobile equipment:</p> <ul style="list-style-type: none"> • A worker must not be within range of the swinging load or equipment, and • The operator must not move the equipment when any worker is exposed
16.40 Clearance	<p>Equipment must be positioned so that:</p> <ul style="list-style-type: none"> • No swinging portion of the equipment can come within 60 cm (2 ft) of any obstruction in any area accessible to workers, or • Entry to such areas must be prevented by barriers or other effective means
16.41 Boarding/ Leaving	<p>A person must not board or leave any mobile equipment while it is in motion, except in an emergency</p>
16.42 Obstructed View	<p>If the operator's view of the work area is obstructed, the operator must not move the equipment until precautions have been taken to protect any worker from injury, including:</p> <ul style="list-style-type: none"> • Inspection by the operator of the area where the equipment will be moved • Direction by a signaller in continuous view of the operator and having an unobstructed view of the area into which the equipment will move, or • Direction by a traffic control or warning system
16.43 Pedestrian and Equipment Traffic	<p>This section explains that:</p> <ul style="list-style-type: none"> • Designated walkways must be used to separate pedestrian traffic from areas of operation • If designated walkways are impracticable, use safe work procedures to minimize the possibility of collision in hazardous work areas • Where lift truck use is separated from pedestrian traffic, a lift truck may travel forward with an

Regulation	Description
	elevated load if it will improve the operator's view of the path of travel
16.44 Securing Loads	This section explains that: <ul style="list-style-type: none"> • When material or equipment is transported, it must be secured to prevent movement of the load which could create a hazard to workers • To protect the crew of a vehicle transporting a load that might shift, a means of load restraint must be provided
16.45 Restraint for Cylindrical Objects	This section explains that: <ul style="list-style-type: none"> • Cylindrical objects transported on their sides must be restrained against movement during loading and unloading • If perimeter pins are part of the restraint system, the pins must extend above the top of the uppermost lay adjacent to the pin by the diameter of the largest cylindrical object stacked above the uppermost lay adjacent to the pin, and have a minimum height of 46 cm (18 in) • If cylindrical objects are blocked or restrained by specialized dunnage, perimeter pins specified by subsection (above) are not required.
16.46 Lift Truck Loads	This section explains that: <ul style="list-style-type: none"> • A load transported on a lift truck must not project a distance greater than half its height above the fork carriage, back rest or back rest extension • No part of a load of objects may project above the fork carriage, back rest or back extension • A load that could shift must be restrained if the load or the truck becoming unstable • The above three conditions do not apply if the load is assembled and handled in such a way that no part of the load will fall off

All-Terrain Vehicles

In the OHS Regulations Part 16, Sections 16.49 to 16.55 include the requirements for all-terrain vehicles.

[Read each section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

Regulation	Description
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Regulation	Description
16.49 Prohibited Use	An all-terrain cycle must not be used in any occupational, industrial, or commercial workplace.
16.50 Modifications	A modification to an ATV which affects its structural integrity or stability must be certified by a professional engineer.
16.51 Operator's Manual	This section explains that: <ul style="list-style-type: none"> • The operator's manual for an ATV must be kept in a secure place with the vehicle or at a location readily available to the operator • The operator must use an ATV according to the instructions in the operator's manual
16.52 Use on Sloping Ground	If the manufacturer has not set limits for ATV operation on sloping ground, 5% is the maximum slope. Unless the employer has developed and implemented written safe work procedures for any steeper slope.
16.53 Operator Training	The employer must ensure that each ATV operator is properly trained in the safe operation of the vehicle. The training must cover: <ul style="list-style-type: none"> • The operator's pre-trip inspection • Use of personal protective apparel • Operating skills according to the ATV manufacturer's instructions • Basic mechanical requirements • Loading and unloading the vehicle
16.54 Personal Protective Equipment	An ATV operator and any passenger must wear: <ul style="list-style-type: none"> • Eye protection • Hearing protection • Clothing suitable for the environmental conditions • Gloves and clothing that cover the ankles, legs and arms when the hazards required them
16.55 Loading and Unloading	This section explains that: <ul style="list-style-type: none"> • Loading and unloading an ATV on/off a carrier vehicle must be done in a safe manner • Ramps used in loading or unloading must be placed at a suitable angle, be wide enough and a surface with adequate grip for the tires

Regulations Part 16 Related to Operating Mobile Equipment—Self-Quiz

1. Buckets, forks, booms, hoists and other load handling attachments must only be installed:
 - According to the instructions for safe use
 - As specified by the equipment manufacturer or by a professional engineer
 - As specified by the equipment manufacturer or by a professional engineer *and* include instructions for safe use

2. If an operator of mobile equipment cannot directly, or by a mirror, see behind the equipment, they must not use the equipment without:
 - A coworker to watch the road
 - An automatic audio warning device that warns others in the vicinity
 - An automatic audio warning device and a coworker to watch the road

3. Only authorized persons may be on mobile equipment:
 - When the equipment is parked
 - While the equipment is in motion
 - While the equipment is being worked on

4. A modification to an ATV which affects its structural integrity or stability must be:
 - Certified by a professional engineer
 - Reviewed by the operator
 - Certified by a professional engineer and reviewed by the operator



Now check your answers on the next page.

Regulations Part 16 Related to Operating Mobile Equipment—Self-Quiz Answers

1. Buckets, forks, booms, hoists and other load handling attachments must only be installed:

Answer: **As specified by the equipment manufacturer or by a professional engineer *and* include instructions for safe use**

2. If an operator of mobile equipment cannot directly, or by a mirror, see behind the equipment, they must not use the equipment without:

Answer: **An automatic audio warning device that warns others in the vicinity**

3. Only authorized persons may be on mobile equipment:

Answer: **While the equipment is in motion**

4. A modification to an ATV which affects its structural integrity or stability must be:

Answer: **Certified by a professional engineer**

Key Point 2.2: Regulations Part 16, 16.21 Protective Structures, 16.22 Rollover Protective Structures, 16.17 Escape from Cab, and 16.34 Competency of Operators

This key point describes the following regulations related to operating mobile equipment:

- 16.17, Escape from a Cab
- 16.21, Protective Structures
- 16.22, Rollover Protective Structures
- 16.34, Start of Shift Inspection

16.17 Escape from a Cab

This section relates to escaping from a cab:

- a) Mobile equipment with a single cab entrance door, manufactured after January 1, 2000, must have an alternate means of escape that is clearly marked both inside and outside the cab and that:
 - is not located on the same surface as the cab entrance door
 - is usable regardless of the position of movable components or accessories of the machine
 - does not pose additional hazards to the operator
 - can be opened from both the inside and outside without the use of tools when the equipment is in use
 - requires a force of not more than 135N (30lbs) to open
 - provides a clear opening of at least 65cm (26in) in diameter if circular, 60cm (24in) on each side if square, and 47cm by 65cm (19in by 26in) if rectangular, or the dimensions of which comply with ISO Standard 2867-1994, Earth-Moving Machinery - Access Systems
- b) Mobile equipment with a single cab entrance door, manufactured before January 1, 2000, must meet the requirements for an alternate means of escape required at the date of manufacture, unless otherwise directed by WorkSafeBC.

16.21 Protective Structures

This section relates to protective structures:

- a) Operators of mobile equipment must be protected against falling, flying or intruding objects or material by means of suitable cabs, screens, grills, shields, deflectors, guards or structures.
- b) The means of protection must meet the requirements of the following applicable standard:
 - WCB Standard — [G601, Standard for Log Loader and Log Yarder Backstops](#)
 - WCB Standard — [G602, Standard for Log Loader and Log Yarder Raised Cabs](#)
 - WCB Standard — [G603, Standard for Log Loader and Log Yarder Window Guards](#)
 - WCB Standard — [G604, Standard for Light-Duty Screen Guards for Off-Highway Equipment](#)
 - WCB Standard — [G605, Standard for Mobile Equipment Half-Doors](#)
 - WCB Standard — [G607, Standard for Medium Duty Screen Guards — Front End Log Loader](#)
 - WCB Standard — [G608, Standard for Mobile Equipment Roof Structures — Heavy Duty](#)
 - WCB Standard — [G609, Standard for Mobile Equipment Roof Structures — Light Duty](#)
 - Society of Automotive Engineers (SAE) Recommended Practice J231 JAN81, Minimum Performance Criteria for Falling Object Protective Structure (FOPS)
 - Society of Automotive Engineers (SAE) Standard J1043 SEP87, Performance Criteria for Falling Object Protective Structure (FOPS) for Industrial Machines
 - ISO Standard 3449:1992, Earth-Moving Machinery — Falling-Object Protective Structures — Laboratory Tests and Performance Requirements
 - Society of Automotive Engineers (SAE) Recommended Practice J1084 APR80, Operator Protective Structure Performance Criteria for Certain Forestry Equipment
 - Society of Automotive Engineers (SAE) Recommended Practice J1356 FEB88, Performance Criteria for Falling Object Guards for Excavators
- c) A worker must not remain in the cab of a vehicle while loads are elevated over the cab unless the cab is protected by an adequate overhead guard

Note: Information on the selection of guarding for mobile equipment used in various applications is provided in the WorkSafeBC publication [Standards for Operator Protective Structures \(OPS\)](#).

16.22 Rollover Protective Structures

This section relates to rollover protective structures (ROPS):

- a) The following types of mobile equipment, weighing 700 kg (1,500 lbs.) or more, must have ROPS:
 - crawler tractors, loaders and skidders
 - wheel tractors, dozers, loaders and skidders

- motor graders
 - self-propelled wheel scrapers
 - compactors/rollers
 - self-propelled rock drills moved by an on-board operator
 - wheeled trenchers manufactured after January 1, 1999
 - pipe layers or side boom tractors manufactured after January 1, 2000
- b) WorkSafeBC may require an ROPS on any mobile equipment if the equipment design or use indicates the need
- c) Mobile equipment listed may be used without an ROPS if:
- the equipment is used in a location where there is not a high chance of rollover, and
 - the ground is free of variation that might cause a rollover

Note: When conditions make following the regulations impractical, other proposals to give protection to workers may be submitted to WorkSafeBC.

16.34 Start of Shift Inspection

This section relates to start of shift inspection:

- a) The operator must inspect the equipment before the start of the shift and as required to ensure the safe operating condition
- b) The operator must report defects and conditions affecting the safe operation of the equipment to the supervisor or employer
- c) Any repair or adjustment necessary for the safe operation of the equipment must be made before the equipment is used

Regulations Part 16, 16.21 Protective Structures, 16.22 Rollover Protective Structures, 16.17 Escape from Cab, and 16.34 Competency of Operators—Self-Quiz

1. The weight of mobile equipment that must have an ROPS is:
 - 400 kg or more
 - 500 kg or more
 - 600 kg or more
 - 700 kg or more
2. Mobile equipment with a single cab entrance door must have an alternate means of escape that:
 - can be opened from the inside when the equipment is in use
 - can be opened from the outside when the equipment is in use
 - can be opened from both the inside and outside with the use of tools when the equipment is in use
 - can be opened from both the inside and outside without the use of tools when the equipment is in use



Now check your answers on the next page.

Regulations Part 16, 16.21 Protective Structures, 16.22 Rollover Protective Structures, 16.17 Escape from Cab, and 16.34 Competency of Operators—Self-Quiz Answers

1. The weight of mobile equipment that must have an ROPS is:

Answer: **700 kg or more**

2. Mobile equipment with a single cab entrance door must have an alternate means of escape that:

Answer: **can be opened from both the inside and outside without the use of tools when the equipment is in use**

Key Point 2.3: Regulations Part 26 Related to Operating Mobile Equipment

In the OHS Regulations Part 26, Sections 26.12.1 to 26.18 apply to equipment operation.

[Read each section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

Regulation	Description
26.12.1 Equipment Capabilities	Any equipment designed or adapted for a specific function in a forestry operation must be able to be used safely. These requirements are met if the equipment is used: <ul style="list-style-type: none"> • According to the manufacturer's instructions • As specified by a professional engineer • In a way that is acceptable to WorkSafeBC
26.12.2 Radio Controlled Equipment	In a forestry operation, any equipment that is controlled by remote control must be equipped with a failsafe or stop mechanism, in case the remote control fails.
26.13 Non-slip Floor and Controls	Foot controls, floors, steps and surfaces where workers walk or stand must be constructed of or covered with a non-slip material that works with the workers' footwear.
26.13.1 Equipment Operator Protections	This section explains that: <ul style="list-style-type: none"> • Protective guards must be used on a self-loading log transporter or similar equipment unless it is not practical, and the absence of guards does not pose a hazard to the operator • The heel bar on the operator's side of the loader boom of a self-loading log transporter must be equipped with a deflector shelf and must not be used for heeling logs • If pushing or pulling the boom too far on logging equipment could cause the backstop to crush the equipment operator's cab, boom stops must be installed on the equipment
26.13.2 Maintaining	Log-handling equipment must not move with a load lifted higher than required that then blocks the operator's vision.

Regulation	Description
Operator Vision	
<p>26.13.3</p> <p>Mobile Yarders</p>	<p>This section explains that:</p> <ul style="list-style-type: none"> • A mobile yarder must have a permanently attached, legible and visible sign provided by the equipment manufacturer or a professional engineer (see specifics in the regulations) • The sign is at the mobile yarder's location • A mobile yarder must be rigged and used according to the sign • A mobile yarder must not be moved with the spar or tower in the vertical operating position unless stability can be maintained • Multiple throttle controls on a mobile yarder must be arranged to avoid using two or more controls at one time • A mobile yarder and its equipment must be inspected frequently and at least as often as stated in the manufacturer's instructions. • Manufacturer's manuals must be kept where the yarder is located be on hand for any person maintaining the yarder
<p>26.13.4</p> <p>Saw Chain Shot</p>	<p>Saw chain shot means when one or more parts of a saw chain travels at high speed when the chain breaks. This applies to equipment that is:</p> <ul style="list-style-type: none"> • Used in mechanical falling activities or log processing • Equipped with a saw that cuts using a saw chain and • Manufactured on or after May 1, 2019 <p>Mobile equipment must meet one of these requirements:</p> <ul style="list-style-type: none"> • Have protective guards or other devices that prevent the mobile equipment's cab windows from being struck by saw chain shot • Each cab window that could be struck by saw chain shot must meet the requirements in the regulations (see the detailed specifics)
<p>26.14.1</p> <p>Hazard Area of Logging Equipment</p>	<p>This section explains that:</p> <ul style="list-style-type: none"> • A hazard area created by using logging equipment must be identified • Workers close to the logging equipment and hazard must be told about every identified hazard area • A worker must not enter a hazard area unless the equipment operator gives clear permission

Regulation	Description
<p>26.14.2 Designated Safe Work Area</p>	<p>This section explains that:</p> <ul style="list-style-type: none"> • A safe work area must be marked for workers (on foot) who are close to any operating logging equipment • The boundaries of a safe work area must be communicated to all workers who are close to the safe work area • No equipment may enter a safe work area unless the equipment operator first gets clear permission from all workers in the safe work area or from the supervisor and those workers take a safe position
<p>26.14.3 Traffic Control</p>	<p>If vehicles on a road in a forestry operation are required to drive through a hazard area or a safe work area, traffic control appropriate to the hazard must be used.</p>
<p>26.16 Slope Limitations</p>	<p>This sections explains that:</p> <ul style="list-style-type: none"> • If the manufacturer's maximum slope stability limit for logging equipment is known, the equipment must be operated inside that limit • If the manufacturer's maximum slope stability limit for logging equipment is not known, the equipment must be operated inside limits <ul style="list-style-type: none"> (a) a rubber tired skidder must not be operated on a slope which exceeds 35%; (b) a crawler tractor, feller buncher, excavator and other similar equipment must not be operated on a slope which exceeds 40%; (c) any other forestry equipment specifically designed for use on a steep slope must not be operated on a slope which exceeds 50%. • Logging equipment may be operated beyond the maximum slope limits if a qualified person does a risk assessment and develops written safe work practices acceptable to WorkSafeBC, and implements them to ensure the equipment's stability during operation • Logging equipment must not be operated in a location or in a way that its stability cannot be assured
<p>26.18 Landslides</p>	<p>In a forestry operation where there may be a risk of a landslide:</p> <ul style="list-style-type: none"> • The risk must be assessed with a standard acceptable to WorkSafeBC • If a risk is found, written safe work procedures

Regulation	Description
	must be developed that meet the standard <ul style="list-style-type: none"><li data-bbox="597 260 1208 323">• Workers must be educated in the safe work procedures

Regulations Part 26 Related to Operating Mobile Equipment—Self-Quiz

1. Workers must not enter a hazard area of a working machine until:

- A fellow worker gives clear permission
- The supervisor gives clear permission
- The equipment operator gives clear permission
- All of these answers

2. Saw chain shot means:

- When a saw chain breaks and makes a sound like a shot
- When a saw catches and the chain breaks
- When a saw chain breaks and one or more parts travels at high speed
- None of the above



Now check your answers on the next page.

Regulations Part 26 Related to Operating Mobile Equipment—Self-Quiz Answers

1. Workers must not enter a hazard area until:

Answer: **The equipment operator gives clear permission**

2. Saw chain shot means:

Answer: **When a saw chain breaks and one or more parts travels at high speed**

Section 1084-3: Guidelines and Documentation

What you need to know about this section

By the end of this section, you will be able to demonstrate knowledge of the following key points:

3.1 Guidelines related to using mobile equipment

Key Point 3.1: Guidelines Related to Using Mobile Equipment

After reading this key point, you will be able to demonstrate knowledge of the guidelines related to using mobile equipment.

Part 16 Guidelines – General Requirements

In the Occupational Health & Safety Regulation Guidelines Part 16, Sections 16.3 to 16.19 apply to general requirements for mobile equipment operation.

[Read each section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

Guidelines	Description
16.3 (& 4.3 (3)) Tag out procedure for identifying unsafe mobile equipment	Section 4.3(3) of the Regulation states that: A tool, machine or piece of equipment determined to be unsafe for use must be identified in a manner which will ensure it is not inadvertently returned to service until it is made safe for use. Read the guidelines for examples that satisfy the requirements of section 4.3(3).
16.3 (& 4.3(4)) Fuel tank filler and vent outlet locations	This guideline describes the requirements that apply to the modification of mobile equipment and considerations related to fuel tank filler and vent outlet locations. Read the guidelines for the procedures that satisfy the requirements of section 4.3(4).
16.4(1)(c) Operating equipment with air brakes	There are two types of vehicle air brake systems, which can be generally described as "air assisted" brake systems and "air actuated" brake systems. Read the guidelines for the procedures that satisfy the requirements of 16.4(1)(c).
16.7(j)-1 Lift truck operator training 16.7(j)-2 Lift truck operator training	Guideline 16.7(j)-1 specifies the training requirements for lift truck operators. Section 16.7(j) requires lift truck operators be trained in accordance with CSA Standard B335-94, Industrial Lift Truck Operator Training. Guideline 16.7(j)-2 specifies two alternatives to the Standard that are acceptable to WorkSafeBC, and to

Guidelines	Description
– alternative standards	summarize the applicable requirements of the alternative standards. Read the guidelines for the procedures that satisfy the requirements of 16.7(j)-1 and 16.7(j)-2.
16.13 Braking requirements – mobile equipment – alternate standard 16.13(3) Braking requirements – mobile equipment	This guideline explains the purpose of an: <ul style="list-style-type: none"> • Alternate standard for a braking system • Alternate standard for braking performance requirements • The performance requirements of the standard Read the guidelines for the procedures that satisfy the requirements of 16.13 and 16.13(3).
16.17 Alternate means of escape - Purpose-built window breaking device	This guideline describes when a window breaking device meets the regulation. Read the guidelines for the procedures that satisfy the requirements of 16.17.
16.18 Acceptable standards for operating controls	This guideline specifies an acceptable standard for mobile equipment operating controls. Read the guidelines for the procedures that satisfy the requirements of 16.18.
16.19 Load handling attachments - forklifts	This guideline gives information about installation, written instructions for safe use and stability, and rated capacity when a forklift (also known as a lift truck) is fitted with a load handling attachment. Read the guidelines for the procedures that satisfy the requirements of 16.19.

Part 16 Guidelines – Guards

In the Occupational Health and Safety Regulation Guidelines Part 16, Sections 16.21 to 16.28 apply to guards for mobile equipment operation.

[Read each section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

Guidelines	Description
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Guidelines	Description
<p>16.21 Protective structures for hydraulic excavators pioneering on steep side hills</p>	<p>These standards specify the minimum operator protection expected on a hydraulic excavator exposed to intruding or flying objects, such as loose debris, snags, tree trunks, or limbs, conditions encountered in pioneering steep side hill logging grades and right-of-way construction.</p> <p>Read the guidelines for the procedures that satisfy the requirements of 16.21.</p>
<p>16.21(2)-1 Operator protective structure standards for agricultural tractors</p>	<p>This guideline refers to:</p> <ul style="list-style-type: none"> • Standards for operator protective structures on mobile equipment • Alternative standards on mobile equipment • Standard for operator protective structures on agricultural tractors <p>Read the guidelines for the procedures that satisfy the requirements of 16.21(2)-1.</p>
<p>16.21(2)-2 Protective structures - acceptable alternate standards</p>	<p>This guideline refers to:</p> <ul style="list-style-type: none"> • Alternate standards to the standard series for protective structures on mobile equipment • Scopes of the ISO and SAE standards differ from the G600 standards <p>Read the guidelines for the procedures that satisfy the requirements of 16.21(2)-2.</p>
<p>16.22 Rollover Protective Structures (ROPS)</p>	<p>This guideline explains when ROPS are not required and the alternative to ROPS when the ROPS requirements are not practical.</p> <p>Read the guidelines for the procedures that satisfy the requirements of 16.22.</p>
<p>16.23 ROPS standards - acceptable alternate standards</p>	<p>This guideline refers to alternative standards acceptable to WorkSafeBC for agricultural, construction, earthmoving, forestry, industrial, and mining machines.</p> <p>Read the guidelines for the procedures that satisfy the requirements of 16.23.</p>
<p>16.24 ROPS certification - damaged sweep arms</p>	<p>This guideline refers to when sweep arms on skidders need to be replaced or recertified. Sweep arms can get damaged through contact with large trees or logs.</p> <p>Read the guidelines for the procedures that satisfy the requirements of 16.24.</p>
<p>16.28 Guarding Moving</p>	<p>This guideline refers to guarding moving parts of mobile equipment to prevent the operator</p>

Guidelines	Description
Parts	<p>contacting them while in the operator's position.</p> <p>This applies to moving parts such as:</p> <ul style="list-style-type: none"> • engine cooling fans • accessory drive belts • specialized equipment • drive shafts • tracks • sprockets • components beneath the vehicle <p>Read the guidelines for the procedures that satisfy the requirements of 16.28.</p>

Part 16 Guidelines – Seat Requirements and Rider Restrictions

In the Occupational Health and Safety Regulation Guidelines Part 16, Section 16.31 applies to rider restrictions for mobile equipment operation.

[Read this section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

- Requirements that if a worker must ride on non-ROPS equipped mobile equipment to carry out a job
- These or similar requirements should be met so that the rider can be transported safely

Part 16 Guidelines – Seat Belts

In the Occupational Health and Safety Regulation Guidelines Part 16, Section 16.33 applies to the use of seat belts on forklifts.

[Read this section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

- Using a seat belt while operating a forklift depends on the type of forklift and whether it has a Rollover Protective Structure (ROPS)
- the year the forklift was manufactured
- manufacturer's instructions

Part 16 Guidelines – Operating Requirements

In the Occupational Health and Safety Regulation Guidelines Part 16, Sections 16.43 and 16.44 apply to operating requirements for mobile equipment operation.

[Read this section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

Guidelines	Description
<p>16.43(3) Pedestrian and Equipment Traffic</p>	<p>This guideline refers to low lift and high lift truck stability. A lift truck works on the principle of the truck and its load balanced over a fulcrum, where the weight of the lift truck counterbalances the load on its forks.</p> <p>When a lift truck's load exceeds its capacity rating (weight and/or load centre), unstable conditions may cause the truck to tip over.</p> <p>Read the guidelines for the procedures that satisfy the requirements of 16.43(3).</p>
<p>16.44(2) Acceptable Standard for Load Restraint</p>	<p>This guideline refers to the load restraint used to protect the crew of a vehicle transporting a load that might shift on rapid deceleration and must meet a standard acceptable to WorkSafeBC.</p> <p>Read the guidelines for the procedures that satisfy the requirements of 16.44(2).</p>

Part 16 Guidelines – All Terrain Vehicles

In the Occupational Health and Safety Regulation Guidelines Part 16, Section 16.50 applies to all terrain vehicle operation.

[Read this section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

This guideline refers to modifications to all-terrain vehicles (ATVs) that require certification by a professional engineer.

Some modifications affecting structural integrity include:

- Modifications to the frame, suspension, or steering
- Critical components replaced with lower quality items
- Poor repair practices, for example, bad welding or welding non-weldable parts
- Increasing horsepower or torque

Some modifications affecting stability include:

- Changing the centre of gravity
- Changing the suspension
- Changing the load distribution and size
- Changing the wheelbase
- Changing the horsepower or gearing
- Installing tanks for carrying liquids without adequate internal baffles in the tanks

Part 26 Guidelines – Forestry Operations and Similar Activities

In the Occupational Health and Safety Regulation Guidelines Part 26, Section 16 and 18 that apply to mobile equipment operation in forestry operations.

[Read this section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics:

Guidelines	Description
26.16 Slope Limitations: Safe Work Procedures	This guideline refers to what employers need to do to develop safe work procedures for operating equipment beyond the limitations in section 26.16(3) and to ensure stability of logging equipment on steep slopes. Read the guidelines for the procedures that satisfy the requirements of 26.16.
26.18 Accessible Standards for Landslide Risk Assessments	This guideline refers to the standard for performing landslide risk assessments and developing written safe work procedures. This must be done by a registered professional with qualifications in landslide risk assessments. Read the guidelines for the procedures that satisfy the requirements of 26.18.

Guidelines and Documentation – Cab Guarding

In the Occupational Health and Safety Regulation Guidelines Part 26, Section 16 and 18 that apply to mobile equipment operation in forestry operations.

[Read this section thoroughly](#), as you are required and expected to know it. The sections relate to the following topics. However, not that at the time of publication, WorkSafe BC was in the process of updating Part 16 requirements for mobile equipment.

You will note references to Regulations, which are specified under legal statutes (Acts) and are “the law” in BC. Other references are made to “Standards” which may be referenced in regulations. A piece of equipment may be non-compliant with a standard but may not be “illegal” if proper justification for the non-compliance is provided. For example, a cab modification is not compliant to the equipment manufacturers standard, but the modification is signed off and approved by a Professional Engineer. “Guidelines” may be considered the next step away from a legal statute and are a recommended good practice, but non-compliance is not illegal.

Guidelines	Description
G602	Refers to the equipment manufacturing standards for cab construction on mobile equipment with

Guidelines	Description
	raised cabs.
G603	Refers to the equipment manufacturing standards for cab guarding for mobile equipment such as log loaders and log yarders at logging sites, log sorting, and log loading facilities.
G604	Refers to the equipment manufacturing standards for “light duty” cab guarding screens for mobile equipment where impact by log is not possible.
G608 / SAE231	Refers to the equipment manufacturing standards for equipment roof or top of cab construction on mobile equipment, for the purposes of protecting the operator from falling objects such as trees and large limbs.
SAE J1084	Refers to the equipment manufacturing standards for cab protection from the boom and associated attachments and loads where impact by log is not possible.
“Understanding the requirements of mobile logging”	https://www.worksafebc.com/en/resources/health-safety/information-sheets/requirements-for-mobile-logging-equipment-in-bc?lang=en

Guidelines Related to Using Mobile Equipment—Self-Quiz

1. What is the equipment manufacturing standard for cab guarding for mobile equipment such as log loaders and log yarders at logging sites?
 - G609
 - G603
 - CSA C22.2
 - ISO 9001
2. What are some modifications that affect the stability of All Terrain Vehicles (ATVs)?
 - Changing the centre of gravity
 - Changing the suspension and wheelbase
 - Changing the load distribution and size
 - All of these answers



Now check your answers on the next page.

Guidelines Related to Using Mobile Equipment—Self-Quiz Answers

1. What is the equipment manufacturing standard for cab guarding for mobile equipment such as log loaders and log yarders at logging sites?

Answer: **G603**

2. What are some modifications that affect the stability of All Terrain Vehicles (ATVs)?

Answer: **All of these answers**