

#### 16.47 Training

- (1) The employer must establish and implement safe work procedures for servicing mobile equipment tires, rims and wheels, including safe procedures for
  - (a) inspecting tire, rim and wheel components,
  - (b) mounting a tire to the rim and wheel, and inflating a tire,
  - (c) installing and removing tire assemblies from mobile equipment, and
  - (d) demounting tires from the rim and wheel assemblies.
- (2) Workers assigned to work on tires, rims and wheels must be trained in and follow the safe work procedures established under subsection (1).

#### 16.48 Equipment and procedures

- (1) A tire must be deflated before demounting, and deflation must be done in an area where ignition sources are controlled or removed.
- (2) Each tire, rim and wheel part must be cleaned and inspected for damage before mounting, and cracked, broken, bent or otherwise damaged parts replaced.
- (3) A tire must be inflated using a remote chuck with a sufficient length of hose and an inline, hand operated valve with a gauge so the worker is outside the likely trajectory should wheel components separate during inflation.
- (4) A tire mounted on a multipiece rim wheel must be placed in a cage or other restraining device when it is being inflated.
- (5) If a bead expander is used to seat the beads of a tire, it must be removed before the tire is inflated to more than 34.5 kPa (5 psi).
- (6) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]
- (7) Welding or heating on assembled rim or wheel parts is not permitted, except that limited heating to facilitate removal of a wheel from a hub is acceptable after the tire has been deflated by removing the valve core.
- (8) A tire on a multipiece rim wheel must be deflated to atmospheric pressure by removing the valve core or by other effective means before demounting, and in the case of a dual wheel arrangement, both tires must be deflated to atmospheric pressure before loosening any wheel nuts.
- (9) Multipiece rim and wheel components must not be interchanged except as permitted by rim/wheel charts from the appropriate rim/wheel manufacturer.
- (10) Multipiece rim wheels which have been used at less than 80% of the recommended inflation pressure for that application must be deflated, disassembled and inspected before reinflation.
- (11) Procedures other than those specified in subsections (1) to (10) that provide equivalent or better safety may be used if acceptable to the Board.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

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#### 16.32 Provision

- (1) 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, Operator Restraint System for Off-Road Work Machines*.
- (2) Seat belts must be maintained in good condition.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

#### 16.33 Use

- (1) If mobile equipment has seat belts required by any law in British Columbia, the operator and passengers must use the belts whenever the equipment is in motion, or engaged in an operation which could cause the equipment to become unstable.
- (2) The use of a seat belt is not required for
  - (a) a road grader operation that requires the operator to stand, in which case, an enclosed cab with closed cab doors or other effective restraining devices must be used,

(b) a side boom tractor without a ROPS, or

(c) ROPS equipped mobile equipment if the mobile equipment operates in a specific location where there is no significant hazard of rollover, and the surface in the area of operation is maintained free of ground irregularities which might cause a rollover.

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#### 16.34 Start of shift inspection

- (1) The operator must inspect the equipment before the start of operation on the shift and thereafter as required to ensure the safe operating condition of the equipment.
- (2) The operator must report defects and conditions affecting the safe operation of the equipment to the supervisor or employer.
- (3) Any repair or adjustment necessary for the safe operation of the equipment must be made before the equipment is used.

#### 16.35 Securing tools and equipment

The operator must maintain the cab, floor and deck of mobile equipment free of material, tools or other objects which could create a tripping hazard, interfere with the operation of controls, or be a hazard to the operator or other occupants in the event of an accident.

#### 16.36 Unattended equipment

- (1) The operator of mobile equipment must not leave the controls unattended unless the equipment has been secured against inadvertent movement such as by setting the parking brake, placing the transmission in the manufacturer's specified park position, and by chocking wheels where necessary.
- (2) Any grapples or tongs on mobile equipment must be landed in a safe position before the equipment controls are left unattended.

#### 16.37 Securing elevated loads

- (1) An operator must not leave unattended any elevated load, part, extension or machine, unless it has been immobilized and secured against inadvertent movement.
- (2) If a worker is required to work beneath an elevated part of mobile equipment, the elevated part must be securely blocked.
- (3) 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.
- (4) 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

- (1) If the grade or condition of the travel surface may result in a piece of mobile equipment having insufficient braking capability to maintain adequate control the equipment must be snubbed by a cable, or a suitable vehicle must be used to ensure safety when negotiating the grade.
- (2) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

#### 16.39 Swinging equipment

If a hazard is created by the swinging movement of the load, cab, counterweight or any other part of the mobile equipment 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 so exposed.

#### 16.40 Clearance

Equipment must be positioned so that 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

A person must not board or leave any mobile equipment while it is in motion, except in an emergency.

#### 16.42 Obstructed view

If a mobile equipment operator's view of the work area is obstructed the operator must not move the equipment until precautions have been taken to protect the operator and any other worker from injury, including

- (a) immediately before the movement, the inspection by the operator on foot of the area into which the equipment will be moved,
- (b) direction by a signaller stationed in a safe position in continuous view of the operator and having an unobstructed view of the area into which the equipment will move, or
- (c) direction by a traffic control or warning system.

#### 16.43 Pedestrian and equipment traffic

- (1) Where practicable, designated walkways must be used to separate pedestrian traffic from areas of operation of mobile equipment.
- (2) If it is impracticable to provide designated walkways, adequate safe work procedures to minimize the possibility of collision must be used in hazardous work areas, including
  - (a) the use of a traffic control system,
  - (b) enforcement of speed limits for mobile equipment,
  - (c) a requirement for the pedestrian and the mobile equipment operator to acknowledge each other's presence before the pedestrian proceeds through the hazardous area, or
  - (d) other effective means.
- (3) In areas where lift truck use is separated from pedestrian traffic, a lift truck may travel forward with an elevated load if such operation will improve the operator's view of the path of travel, provided that operating conditions are maintained to ensure vehicle stability and the specifications of the equipment manufacturer are not compromised.

#### 16.44 Securing loads

- (1) When material or equipment is being transported it must be loaded or secured to prevent movement of the load which could create a hazard to workers.
- (2) To protect the crew of a vehicle transporting a load which might shift on rapid deceleration of the vehicle, a means of load restraint must be provided which
  - (a) will prevent significant load shift relative to the carrier under emergency stopping conditions, and
  - (b) meets a standard acceptable to the Board.
- (3) Subsection (2) does not apply to logging trucks operating in compliance with the requirements of [Part 26 \(Forestry Operations and Similar Activities\)](#).

#### 16.45 Restraint for cylindrical objects

- (1) Cylindrical objects transported on their sides must be effectively restrained against inadvertent movement during loading and unloading.
- (2) If perimeter pins are used as part of the restraint system for cylindrical objects 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).
- (3) If cylindrical objects are individually blocked or otherwise effectively restrained by specialized dunnage, perimeter pins specified by subsection (2) are not required.

#### 16.46 Lift truck loads

- (1) A unitized load being 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 of the lift truck.
- (2) No part of a load comprised of loose objects may project above the fork carriage, back rest or back extension of a lift truck.
- (3) A load which could shift during transportation must be restrained if such shifting would result in the load or the lift truck becoming unstable.
- (4) Subsections (1) to (3) do not apply if the load is assembled and handled in such a way that there is no possibility of any part of the load falling off.

**Note:** The following requirements for all-terrain vehicles are in addition to the other requirements for mobile equipment in this Part which also apply to ATVs. Any vehicle used off maintained roads, including an ATV, is required by [section 16.3\(6\)](#) to be appropriate and safe for the intended use.

#### 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 may affect its structural integrity or stability must be certified by a professional engineer.

#### 16.51 Operator's manual

- (1) The operator's manual for an ATV must be kept in a secure place with the vehicle or at another location readily accessible to the operator.
- (2) The operator must use an ATV in accordance with the instructions in the operator's manual.

#### 16.52 Use on sloping ground

- (1) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]
- (2) If the manufacturer has not set limits for operation of the ATV on sloping ground, 5% is the maximum allowable slope unless the employer has developed and implemented written safe work procedures appropriate for any steeper slope on which the equipment is to be used.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

#### 16.53 Operator training

- (1) The employer must ensure that each ATV operator is properly trained in the safe operation of the vehicle.
- (2) The training program for an ATV operator must cover
  - (a) the operator's pretrip inspection,
  - (b) use of personal protective apparel,
  - (c) operating skills according to the ATV manufacturer's instructions,
  - (d) basic mechanical requirements, and
  - (e) loading and unloading the vehicle, if this is a job requirement.

#### 16.54 Personal protective equipment

- (1) An ATV operator and any passenger on an ATV must wear eye protection as required by [Part 8 \(Personal Protective Clothing and Equipment\)](#), and hearing protection meeting the requirements of [Part 7 \(Noise, Vibration, Radiation and Temperature\)](#).
- (2) An ATV operator and any passenger on an ATV must wear
  - (a) clothing suitable for the environmental conditions, and
  - (b) when necessary to protect against the hazards presented at the worksite, suitable gloves and clothing which covers the ankles and legs and the arms to the wrists.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

#### 16.55 Loading and unloading

- (1) Loading and unloading of an ATV onto or off a carrier vehicle must be done in a safe manner.
- (2) If ramps are used when loading or unloading an ATV, they must be placed at a suitable angle, be sufficiently wide and have a surface finish which provides an adequate grip for the ATV's tires.

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### 16.1 Definitions

In this Part

*"all-terrain cycle"* means a motorized off-highway vehicle designed to travel on 3 low pressure tires, with a seat designed to be straddled by the operator and handlebars for steering;

*"all-terrain vehicle" or "ATV"* means a motorized off-highway vehicle, designed to travel on 4 or more low pressure tires with or without tracks added, with a seat designed to be straddled by the operator and handlebars for steering;

*"mobile equipment"* means a wheeled or tracked vehicle which is engine or motor powered, together with attached or towed equipment, but not a vehicle operated on fixed rails or tracks;

*"no significant hazard of rollover"* means an area in which there are no grades exceeding 10%, no operating areas with open edges, no open ramps, loading docks, ditches or other similar hazards which might cause a rollover;

*"specific location"* means a yard, plant or other clearly defined and limited area in which mobile equipment is operated, but does not include an entire municipality, district, transient forestry operation or construction site.

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### 16.29 Operator's seat

(1) A safely located and securely mounted seat must be provided for the operator of mobile equipment unless the equipment is designed to be controlled by an operator in the standing position.

(2) The operator's seat must be of a design that allows the operator to safely operate the equipment with due regard for the type and intended use of the equipment, reach distances to controls and duration of use.

(3) Seating for equipment operated on rough terrain must provide adequate lateral restraint.

### 16.30 Restricted access

Only authorized persons may be on mobile equipment while the equipment is in motion.

### 16.31 Rider restriction

(0.1) In this section:

*"barricade"* means a barricade referred to as a class 1A, class 1, class 2 or class 3 barricade in chapter 2 of the traffic control manual;

*"buffer vehicle"* means a vehicle referred to as a buffer vehicle in the section entitled "Buffer Vehicles" in chapter 2 of the traffic control manual;

*"flashing arrow board"* means a traffic sign referred to as a flashing arrow board in the section entitled "Flashing Arrow Boards (FABs)" in chapter 2 of the traffic control manual;

*"flexible drum"* means a traffic control device referred to as a flexible drum in the section entitled "Flexible Drums" in chapter 2 of the traffic control manual;

*"multilane roadway"* means a roadway that has 2 or more lanes in which traffic flows in the same direction, including climbing and passing lanes, whether or not there are also lanes in which traffic flows in the opposite direction;

*"ROPS"* means a rollover protective structure that meets the requirements of sections 16.23, 16.24, 16.25 and 16.26;

*"traffic cone"* means a traffic cone or tubular marker referred to in the section entitled "Traffic Cones and Tubular Markers" in chapter 2 of the traffic control manual;

"traffic control manual" means the [Traffic Control Manual for Work on Roadways](#) (revised and consolidated, 1999), published by the government.

(1) The operator of mobile equipment is the only worker permitted to ride the equipment unless the equipment is a worker transportation vehicle meeting the requirements of [Part 17 \(Transportation of Workers\)](#), or as contemplated by subsection (2), subsections (3.1) and (3.2) or subsection (4).

(2) A worker who must ride on mobile equipment to carry out a job task may ride non-ROPS equipped mobile equipment on

(a) an appropriate seat, or

(b) other safe facilities provided by the equipment manufacturer or designed by a professional engineer, which include

(i) a footboard or platform upon which the worker stands or sits, located to protect the worker from contact with roadside objects or other vehicles,

(ii) hand-holds, and

(iii) a safety belt, harness, guardrail or other effective means of restraint, except where the worker is a swamper riding on the back of a garbage truck during short pickup runs at speeds of less than 20 km/h.

(3) Rear mounted footboards or platforms must not be occupied if the mobile equipment is backing up.

(3.1) A worker who is occupying a rear mounted platform on non-ROPS equipped mobile equipment as part of a method of retrieving traffic cones from a closed lane of a multilane roadway is not prohibited under subsection (3) of this section or under section 18.3 from occupying the platform when the mobile equipment is backing up if all of the following conditions are met:

(a) the mobile equipment is backing up in the closed lane;

(b) the employer has

(i) identified the hazards to the workers at the workplace, and

(ii) taken measures

(a) to eliminate the hazards, or

(b) if it is not practicable to eliminate an identified hazard, to minimize the risk to workers from the hazard to the lowest level practicable;

(c) a written safe work procedure that

(i) relates to that method of retrieving traffic cones, and

(ii) includes a description of the measures referred to in paragraph (b)

has been established by the employer and is being followed;

(d) the mobile equipment is not exceeding a speed of 15 km per hour;

(e) the mobile equipment has the following operating devices:

(i) two or more 360 degree flashing yellow lights;

(ii) a flashing arrow board pointing toward the open lane adjacent to the closed lane;

(f) the mobile equipment has an audio warning device that

(i) makes a distinct sound that is audible, above the ambient noise level in the workplace, to both the driver of the mobile equipment and the worker, and

(ii) operates automatically and at all times while the mobile equipment is backing up;

(g) there is an effective 2-way voice communication system between the driver of the mobile equipment and the worker while the worker is on the platform;

(h) one of the following requirements is met:

(i) behind the rear of the mobile equipment, barricades are placed across the closed lane or flexible drums are placed in the centre of the closed lane, in accordance with the following:

(A) the barricade or flexible drum closest to the mobile equipment is at all times located not more than 250 m from the rear of the mobile

equipment;

(B) the barricades or flexible drums are located along the length and to the end of the closed lane at intervals of not greater than 250 m;

(ii) directly behind and at a safe distance from the rear of the mobile equipment, in the closed lane, there is a buffer vehicle that meets the following requirements:

(A) the buffer vehicle is at all times located not more than 100 m from the rear of the mobile equipment;

(B) the buffer vehicle has two or more 360 degree flashing yellow lights and the lights are operating;

(C) the buffer vehicle has a flashing arrow board pointing toward the open lane adjacent to the closed lane and the flashing arrow board is operating;

(D) there is an effective 3-way voice communication system among the driver of the buffer vehicle, the driver of the mobile equipment and the worker while the worker is on the platform;

(i) the worker is riding on safe facilities that meet the requirements of subsection (2) (b);

(j) the maximum load capacity established for the platform by the manufacturer or by the professional engineer who designed the platform is clearly marked on the platform and is not being exceeded.

(3.2) Unless otherwise provided in subsection (3.1), the equipment, arrangements and procedures referred to in that subsection must meet all applicable requirements in respect of equipment, arrangements and procedures that are set out for traffic control under Part 18.

(4) A worker other than the operator may only ride on mobile 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.

[Amended by B.C. Reg. 253/2001, effective January 28, 2002.]

[Amended by B.C. Reg. 188/2011, effective February 1, 2012.]

#### 16.2 Application

This Part applies to mobile equipment used by or around workers.

**Note:** Mobile equipment required to meet the requirements of the *Motor Vehicle Act* or the *Industrial Transportation Act* is subject to this Regulation for matters not specifically governed by those Acts and the regulations made under them.

#### 16.3 Operation and maintenance

(1) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

(2) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

(3) Maintenance records for any service, repair or modification which affects the safe performance of the equipment must be maintained and be reasonably available to the operator and maintenance personnel during work hours.

(4) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

(5) Servicing, maintenance and repair of mobile equipment must not be done when the equipment is operating, unless continued operation is essential to the process and a safe means is provided.

(6) Mobile equipment used off maintained roads must be appropriate and safe for the intended use considering factors such as the nature of the travel surface, the slope of the travel surface, and the activities to be undertaken.

(7) In addition to complying with the applicable requirements in this Part, a variable reach rough terrain forklift truck, as defined in section 2 of the standard adopted by reference under section 16.7 (e), must meet and be used in accordance with the requirements of sections 14.5, 14.7, 14.8, 14.12, 14.13, 14.15, 14.39, 14.43 and 14.69.

(8) A record of inspections and maintenance meeting the requirements of section 4.9 must be kept by the operator of a variable reach rough terrain forklift truck, as defined in section 2 of the standard adopted by reference under section 16.7 (e), and any other persons inspecting and maintaining that truck.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

[Amended by B.C. Reg. 312/2012, effective February 1, 2013.]



#### 16.4 Competency of operators

(1) A person must not operate mobile equipment unless the person

(a) has received adequate instruction in the safe use of the equipment,

(b) has demonstrated to a qualified supervisor or instructor competency in operating the equipment,

(c) if operating equipment with air brakes, has a valid air brake certificate or a driver's license with an air brake endorsement, or evidence of successful completion of a course of instruction on air brake systems by an organization acceptable to the Board, and

(d) is familiar with the operating instructions for the equipment.

(e) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

\* See section [4.10](#) of the OHS Regulation.

(2) Subsection (1)(a) and (c) does not apply if a trainee operates the equipment under the supervision of a qualified instructor, or a supervisor.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

#### 16.5 Operator's responsibility

The operator of mobile equipment must operate the equipment safely, maintain full control of the equipment, and comply with the laws governing the operation of the equipment.

#### 16.6 Supervisor's responsibility

A supervisor must not knowingly operate or permit a worker to operate mobile equipment which is, or could create, an undue hazard to the health or safety of any person, or is in violation of this Regulation.

#### 16.7 Standards

The design, fabrication, use, inspection and maintenance of mobile equipment must meet the requirements of the following applicable standard:

(a) Articulating Boom Cranes: *ANSI Standard ASME B30.22-2005, American National Standard for Articulating Boom Cranes*;

(b) Four Wheel All-Terrain Vehicles: *ANSI Standard SVLA-1-1990, American National Standard for Four Wheel All-Terrain Vehicles - Equipment, Configuration, and Performance Requirements*;

(c) Mobile and Locomotive Cranes: [CSA Standard Z150-1998, Safety Code for Mobile Cranes](#), or *ANSI Standard ASME B30.5-2004, Mobile and Locomotive Cranes*;

(d) Powered Industrial Trucks (low lift and high lift): *ANSI Standard ANSI/ITSDF B56.1-2009, Safety Standard for Low Lift and High Lift Trucks*;

(e) Rough Terrain Forklifts: *ANSI Standard ANSI/ITSDF B56.6-2011, Safety Standard for Rough Terrain Forklift Trucks*;

(f) Side Boom Tractors: *ANSI Standard ASME B30.14-2004, Side Boom Tractors*;

(g) Vehicles with Mounted Aerial Devices (except fire-fighting equipment): [CSA Standard CAN/CSA-C225-10 Vehicle-mounted aerial devices](#) or *ANSI/SIA A92.2-2009 Vehicle-mounted elevating and rotating aerial devices*;

(h) Vehicles with Mounted Aerial Devices (fire fighting equipment): *NFPA 1904, Aerial Ladder and Elevating Platform Fire Apparatus, 1991 Edition*;

(i) Safety and hazard warnings: *ISO Standard 9244:1995 Earth-moving machinery - safety signs and hazard pictorials - General principles*;

(j) Lift Truck Operator training: [CSA Standard B335-94, Industrial Lift Truck Operator Training](#).

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 312/2012, effective February 1, 2013.]

#### 16.8 Warning signal device - backup alarm

If an operator of mobile equipment cannot directly or by a mirror or other effective device see immediately behind the mobile equipment, the mobile equipment must not be used unless the mobile equipment has an audio warning device that

(a) provides a signal to people in the vicinity that, if practicable, is audible above the ambient noise level in the workplace where the equipment is being used, and

(b) is activated automatically when the equipment controls are positioned to move the equipment in reverse.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

#### 16.8.1 Warning signal device - extended component

(1) If mobile equipment is used to collect, transport or compact waste material, recyclable material or both, the mobile equipment must have a visual or audio warning device that

(a) provides a signal to the operator of the mobile equipment when a lifting mechanism, top door cover, body, tilt frame or tailgate component of the mobile equipment is extended in a manner that

(i) is likely to contact an overhead obstruction when the mobile equipment is in use, or

(ii) creates a hazardous condition, and

(b) meets the requirements of subsection (2) or (3), whichever is applicable.

(2) If a visual warning device is provided under subsection (1), the visual warning signal from the device must display within the operator's field of vision when the operator is using the mobile equipment.

(3) If an audio warning device is provided under subsection (1), the audio warning signal from the device must make a distinct sound that is audible to the operator above the ambient noise level when the operator is using the mobile equipment.

[Enacted by B.C. Reg. 312/2010, effective February 1, 2011.]

#### 16.9 Lights

(1) Mobile equipment used during the period from 1/2 hour after sunset to 1/2 hour before sunrise, or when persons or vehicles are not clearly discernible at a distance of 150 m (500 ft), must have and use lights to adequately illuminate

(a) the direction of travel,

(b) the working area about the mobile equipment, and

(c) the cab instruments.

(2) A headlight and backing light required by subsection (1)(a) must meet the requirements of *Society of Automotive Engineers (SAE) J1029 MAR86, Lighting and Marking of Construction and Industrial Machinery*.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

#### 16.10 Rear view mirrors

(1) Mobile equipment must have a mirror or mirrors providing the operator with an undistorted reflected view to the rear of the mobile equipment or combination of mobile equipment, except as provided in subsections (1.1), (1.2) and (2).

(1.1) If necessary to improve rear vision, parabolic mirrors in combination with flat mirrors may be used.

(1.2) A parabolic mirror, flat mirror or both may be used on a lift truck.

(2) A rear view mirror is not required on mobile equipment if the conditions of use or equipment structure makes the use of mirrors impracticable.

[Enacted by B.C. Reg. 253/2001, effective January 28, 2002.]

#### 16.11 Window standards

(1) Windows on mobile equipment must be made of safety glazing meeting the requirements of *ANSI Standard Z26.1-1990, American National Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways - Safety Code*.

(2) If the maximum travel speed of a machine is 40 km/h (25 mph) or less, tempered windscreen glazing meeting the requirements of *ANSI/SAE Z26.1-1990, American National Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways - Safety Code*, section 4, item 2 is permitted for use as the windshield on the front of the machine.

(3) If wipers are used on plastic glazing, the glazing surface must be hard coated.

(4) Each window on mobile equipment manufactured after February 1, 2002 or otherwise installed on mobile equipment after that date must be marked to identify the manufacturer, the standard to which the window conforms, and in the case of polycarbonate windows, the thickness and grade of material.

[Enacted by B.C. Reg. 253/2001, effective January 28, 2002.]

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

#### 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 requirements

(1) Mobile equipment must have braking systems meeting the requirements of the following applicable standard:

- (a) *Society of Automotive Engineers (SAE) Standard J1473 OCT90, Brake Performance - Rubber-Tired Earthmoving Machines;*
- (b) *Society of Automotive Engineers (SAE) Standard J1026 APR90, Braking Performance - Crawler Tractors and Crawler Loaders;*
- (c) *Society of Automotive Engineers (SAE) Standard J1178 ISO11169 DEC94, Machinery for Forestry - Wheeled Special Machines - Vocabulary, Performance Test Methods, and Criteria for Brake Systems;*
- (d) *Society of Automotive Engineers (SAE) Standard J1472 JUN87, Braking Performance - Roller Compactors;*
- (e) *ANSI Standard ASME B56.1-1993, Safety Standard for Low Lift and High Lift Trucks;*
- (f) *ANSI Standard ANSI/ASME B56.6-1992, Safety Standard for Rough Terrain Forklift Trucks;*
- (g) *SAE J/ISO 11512 MAR96, Machinery for Forestry - Tracked Special Machines - Performance Criteria for Brake Systems.*

(2) Mobile equipment manufactured before the publication of the standards listed in subsection (1) may remain in service using the brake system originally specified by the manufacturer unless, in the opinion of the Board, modification is necessary to ensure that the braking system is adequate.

(3) Mobile equipment used as an off-road transport vehicle on a slope greater than 20% must have a braking system meeting the performance requirements of *Society of Automotive Engineers (SAE) Standard J1178 ISO11169 DEC94, Machinery for Forestry - Wheeled Special Machines - Vocabulary, Performance Test Methods, and Criteria for Brake Systems.*

(4) Mobile equipment must have a parking system that does not use gas or fluid pressure to maintain its application and the parking system control must be located so that the operator, in the operator's seat, can activate it.

(5) If mobile equipment depends on engine power for stopping and power failure will result in loss of adequate capability to stop, supplementary means must be provided to enable the operator to bring the equipment to a controlled stop.

(6) If the Board is satisfied that it is not practicable to comply with subsections (1) to (5), the Board may exempt the mobile equipment from their application subject to conditions the Board specifies.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

\* See also section 4.4 of the OHS Regulation.

**Note:** Under subsection (5) the automatic and gradual application of spring brakes is an acceptable supplementary means if warning devices are installed to warn of low air pressure and allow the operator to bring the vehicle to a controlled stop.

#### 16.14 Supplementary steering

(1) If wheeled mobile equipment depends on engine power for steering and power failure will result in loss of adequate directional control, a supplementary system must be provided to enable the operator to steer to a controlled stop.

(2) The supplementary steering system required by subsection (1) for equipment capable of a travel speed greater than 20 km/h (13 mph) must meet the requirements of *Society of Automotive Engineers (SAE) Standard J1511 ISO5010 FEB94, Steering For Off-Road, Rubber-Tired Machines.*

(3) A rubber tired skidder manufactured after January 1, 2000 must have a supplementary steering system meeting the requirements of subsection (2).

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

#### 16.15 Steering wheel knobs

- (1) A steering wheel knob is not permitted on mobile equipment if road wheel reaction forces to the steering wheel are hazardous to the operator.
- (2) 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.

#### 16.17 Escape from a cab

(1) 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 which

- (a) is not located on the same surface as the cab entrance door,
  - (b) is usable regardless of the position of movable components or accessories of the machine,
  - (c) does not pose additional hazards to the operator,
  - (d) can be opened from both the inside and outside without the use of tools when the equipment is in use,
  - (e) requires a force of not more than 135 N (30 lbs) to open, and
  - (f) provides a clear opening of at least 65 cm (26 in) in diameter if circular, 60 cm (24 in) on each side if square, and 47 cm by 65 cm (19 in by 26 in) if rectangular, or the dimensions of which comply with *ISO Standard 2867-1994, Earth-Moving Machinery - Access Systems*.
- (2) 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 the Board.

[Amended by B.C. Reg. 381/2004, effective January 1, 2005.]

#### 16.18 Controls

- (1) Operating controls for mobile equipment must meet the requirements of a standard acceptable to the Board for the type of equipment.
- (2) Operating controls must be identified to show the function they serve and be located and maintained to allow safe operation of the equipment.
- (3) Repealed. [B.C. Reg. 381/2004, effective January 1, 2005.]

#### 16.19 Load handling attachments

- (1) Buckets, forks, booms, hoists and other load handling attachments must only be installed on mobile equipment as specified by the equipment manufacturer or when certified by a professional engineer for use on the equipment.
- (2) The installation specified by the equipment manufacturer or certified by the professional engineer under subsection (1) for hoists or load handling attachments must
  - (a) include instructions for safe use of the equipment with the load handling attachment, and
  - (b) provide for the evaluation of the stability of the equipment, including the effect of load swing.

[Amended by B.C. Reg. 320/2007, effective February 1, 2008.]

#### 16.20 Load ratings

- (1) Mobile equipment designed and used for lifting, hoisting or similar operations must have a permanently affixed notation, legible and visible to the operator, stating the rated load of the equipment.
- (2) A load chart must be displayed in the operator's cab if the rated load varies with the reach of the equipment.
- (3) If the equipment is modified the employer must ensure that the rated load and load chart are changed as necessary to reflect the new load ratings.
- (4) Mobile logging equipment is exempt from the requirements in subsections (1) to (3).

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#### 16.21 Protective structures

- (1) 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.
- (2) The means of protection must meet the requirements of the following applicable standard:
  - (a) [\*WCB Standard — G601, Standard for Log Loader and Log Yarder Backstops;\*](#)
  - (b) [\*WCB Standard — G602, Standard for Log Loader and Log Yarder Raised Cabs;\*](#)
  - (c) [\*WCB Standard — G603, Standard for Log Loader and Log Yarder Window Guards;\*](#)
  - (d) [\*WCB Standard — G604, Standard for Light-Duty Screen Guards for Off-Highway Equipment;\*](#)
  - (e) [\*WCB Standard — G605, Standard for Mobile Equipment Half-Doors;\*](#)
  - (f) [\*WCB Standard — G607, Standard for Medium Duty Screen Guards — Front End Log Loader;\*](#)
  - (g) [\*WCB Standard — G608, Standard for Mobile Equipment Roof Structures — Heavy Duty;\*](#)
  - (h) [\*WCB Standard — G609, Standard for Mobile Equipment Roof Structures — Light Duty;\*](#)
  - (i) *Society of Automotive Engineers (SAE) Recommended Practice J231 JAN81, Minimum Performance Criteria for Falling Object Protective Structure (FOPS);*
  - (j) *Society of Automotive Engineers (SAE) Standard J1043 SEP87, Performance Criteria for Falling Object Protective Structure (FOPS) for Industrial Machines;*
  - (k) *ISO Standard 3449:1992, Earth-Moving Machinery — Falling-Object Protective Structures — Laboratory Tests and Performance Requirements;*
  - (l) *Society of Automotive Engineers (SAE) Recommended Practice J1084 APR80, Operator Protective Structure Performance Criteria for Certain Forestry Equipment;*
  - (m) *Society of Automotive Engineers (SAE) Recommended Practice J1356 FEB88, Performance Criteria for Falling Object Guards for Excavators.*
- (3) 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.

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

\* See also section [4.4](#) of the OHS Regulation.

**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

- (1) The following types of mobile equipment, weighing 700 kg (1 500 lbs) or more, must have rollover protective structures (ROPS):
  - (a) crawler tractors, loaders and skidders;
  - (b) wheel tractors, dozers, loaders and skidders;
  - (c) motor graders;
  - (d) self-propelled wheel scrapers;
  - (e) compactors/rollers;
  - (f) self-propelled rock drills moved by an on-board operator;
  - (g) wheeled trenchers manufactured after January 1, 1999;
  - (h) pipe layers or side boom tractors manufactured after January 1, 2000.
- (2) The Board may require a ROPS to be installed on any mobile equipment if the design of the equipment or circumstances of use indicate the need.
- (3) Mobile equipment listed in subsection (1) may be used without a ROPS if

- (a) the equipment operates in a specific location where there is no significant hazard of rollover, and
- (b) the surface in the area of operation is maintained free of ground irregularities which might cause a rollover.

**Note:** Where circumstances render compliance with the requirement for ROPS impracticable, alternative proposals designed to provide equivalent protection to workers may be submitted to the Board for consideration.

#### 16.23 ROPS standards

A ROPS must meet the requirements of one of the following applicable standards:

(a) [CSA Standard B352.0-95, Rollover Protective Structures \(ROPS\) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines — Part 1: General Requirements](#), and

(i) [CSA Standard B352.1-95, Rollover Protective Structures \(ROPS\) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines — Part 2: Testing Requirements for ROPS on Agricultural Tractors](#), or

(ii) [CSA Standard B352.2-95, Rollover Protective Structures \(ROPS\) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines — Part 3: Testing Requirements for ROPS on Construction, Earthmoving, Forestry, Industrial, and Mining Machines](#);

(b) *Society of Automotive Engineers (SAE) Standard J1040 MAY94, Performance Criteria for Rollover Protective Structures (ROPS) for Construction, Earthmoving, Forestry, and Mining Machines*;

(c) *ISO Standard 3471: 1994, Earth-moving Machinery — Rollover Protective Structures — Laboratory Tests and Performance Requirements*.

(d) Repealed. [B.C. Reg. 312/2003, effective October 29, 2003.]

[Amended by B.C. Reg. 312/2003, effective October 29, 2003.]

\* See section [4.4](#) of the OHS Regulation.

**Note:** Clause 6 of [CSA Standard B352-M80, Rollover Protective Structures \(ROPS\) for Agricultural, Construction, Earthmoving, Forestry, Industrial and Mining Machines](#) is a standard acceptable to the Board under section 4.4(2) for the design of a ROPS for a one-of-a-kind machine.

#### 16.24 ROPS certification

(1) A ROPS must be certified by the ROPS manufacturer or a professional engineer as meeting a standard specified in section 16.23.

(2) Any addition, modification, welding or cutting on a ROPS must be done in accordance with the instructions of and be recertified by the ROPS manufacturer or a professional engineer.

#### 16.25 ROPS identification

(1) The following information must be permanently marked upon a ROPS:

- (a) the name and address of the manufacturer or the professional engineer who certified the ROPS;
- (b) the model number or other effective means of identifying the machine for which the ROPS was designed;
- (c) the serial number or other unique means of identifying the ROPS;
- (d) the maximum weight of the machine for which the ROPS was designed;
- (e) the standard to which the ROPS conforms.

(2) Modified ROPS must be permanently marked with the following information:

- (a) an identification of the modifications effected;
- (b) the date of recertification;
- (c) the name and address of the recertifying engineer.

#### 16.26 Effect of ROPS on visibility

ROPS and other structures required by this Part for the protection of the operator must be designed and installed to provide an adequate view for the operator to safely use the machine.

#### **16.27 Shear hazards**

Mobile equipment with moving parts close to the operator's compartment must be effectively guarded so that

- (a) the controls inside the compartment cannot be operated from outside the compartment, unless there is no hazard, and
- (b) no part of any person in the operating position inside the compartment can project into the hazard area created by the moving part.

#### **16.28 Guarding moving parts**

Exposed moving parts on mobile equipment which are a hazard to the operator or to other workers must be guarded according to a standard acceptable to the Board, and if a part must be exposed for proper function it must be guarded as much as is practicable consistent with the intended function of the component.

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