

Guidelines Part 16 - Division 2 - General Machine Requirements

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G16.24 Alternate means of escape - Purpose-built window breaking device (formerly G16.17) [Copy section link](#)

Issued August 18, 2014; Revised consequential to September 1, 2021 Regulatory Amendment

Regulatory excerpt

Section 16.24 of the *OHS Regulation* ("Regulation") states:

- (1) If mobile equipment manufactured after January 1, 2000 has a single cab entrance door, the mobile equipment must have an alternative means of escape that is clearly marked both inside and outside the cab and that
 - (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 mobile equipment is in use,
 - (e) requires a force of not more than 135 N (30.3 lbf) to open, and
 - (f) provides a clear opening, the minimum dimensions of which comply with *ISO Standard 2867-2011(R2016), Earth-moving machinery - Access systems*.
- (2) Mobile equipment manufactured before January 1, 2000 with a single cab entrance door must meet the requirements for an alternative means of escape required at the date of manufacture.

Purpose of guideline

This guideline describes when a purpose-built window breaking device may meet the requirements of section 16.24 of the *Regulation*.

Background

Section 16.24 of the *Regulation* requires an alternate means of escape for mobile equipment with a single cab entrance door. The intent of this requirement is to allow a secondary means of escape if the primary means is obstructed, e.g., due to fire, overturn, submersion, or other mishap.

In most circumstances an openable window can be built into a cab design, or a second door or hatch can be installed in the cab. This is what is anticipated by section 16.24(1) of the *Regulation*.

There may be circumstances where it is not practicable to install or retrofit the cab of mobile equipment with openable windows or to install a second door or hatch, such as the following:

- Cab structural strength would be significantly altered by installing an alternate means of escape
- A redesigned alternate means of escape would affect the machine capacity or range of motion

In these circumstances, it may be acceptable to install a purpose-built device to break a window in an emergency so that a person can escape from a cab. For example, this could be a commercially available device that permanently attaches directly to the window and can be used by the operator to break the glass by punching into the device. Although the device does not open the window directly, it does open an egress point by breaking the window.

Use of a tool

The *Regulation* states that the alternate means of escape must be openable without the use of a tool. Therefore, it is not acceptable to rely on a hammer or other loose commercial glass breaking devices in the cab for the purpose of breaking a window. Even if the device is tethered to the window, it is still not an acceptable means because there is a significant chance of the device being removed or otherwise being unavailable in an emergency.

However, if a device can be permanently installed on a window so that it cannot be removed in any normal way (i.e., becomes integral with the glass), and can be readily used to break the window, then it would not be considered a tool and could be acceptable under the *Regulation*.

Mobile equipment manufactured after January 1, 2000

For mobile equipment manufactured after January 1, 2000, all the requirements of section 16.24(1) of the *Regulation* apply.

As an alternate means of escape, an openable hatch or window has some important advantages in terms of reliability. For example, a hatch can be tested and drills can be run regularly to check that the operator can open it in an emergency situation, whereas the purpose-built device cannot readily be tested to ensure the operator can use it to break a window in an emergency. Factors that may affect the utility and reliability of the purpose-built device include the following:

- The device will only be effective with certain types of window glass, e.g., tempered glass versus non-tempered or laminated glass. Not all window glass is tempered glass, and even when it is, it is not always labelled as such. An employer may need to contact the mobile equipment, device, and/or glass supplier to determine whether the glass is of a type that will be broken by the device.
- The device will only be effective for certain thicknesses of glass. An employer will need assurance that the device will work when required in an emergency.
- Tempered glass breaks into fragments rather than sharp shards. While the fragments do not represent the same high hazard as sharp angular shards, there is still a danger of fragments lodging in the skin or eye, and workers need to be made aware to take precautions when breaking the glass.
- When a tempered glass window breaks, it may stay relatively in place in the frame and will then need to be pushed in order to remove it from the frame.

- All equipment operators must be trained in how to properly use the device in an emergency, and refresher training may be required periodically.
- The device needs to be part of a regular inspection regime to ensure it remains in place and undamaged. There is no practical way to test the functioning of the device on a periodic basis. The device may have an expiry date and this will need to be part of the inspection.
- A window film (e.g., advertising, anti-vandalism) or double glazing may affect performance of the device.

A purpose-built device is acceptable if the following considerations are met:

- The requirements of *Regulation* sections 16.24(1)(a)–(f) are met.
- Manufacturer's instructions are followed (both the mobile equipment and the device manufacturer).
- It is not practicable to install an openable escape hatch, door, or window as the alternate means of escape.
- The window is of a type and condition that will break as necessary by use of the device according to the manufacturer's instructions. The window material and the thickness are important in this consideration.
- The window can be safely broken from the inside (by the equipment operator) and the outside (by rescuers).
- The window and attached device do not create an additional hazard. Tempered glass will break into fragments. Workers need to be made aware that the fragments could become embedded in the eye or skin and precautions need to be taken. If the window is of a type that will break into sharp shards that are likely to cause injury to a worker, then this method would not be acceptable.
- The installed device does not obscure the operator's view or otherwise hinder equipment operation.
- The device is installed in a location on the window so that it is likely to be readily accessible when necessary in case of mishap.
- The device is part of the pre-use inspection of the mobile equipment. The presence and condition of the device must be verified.
- Instructions on how to use the device are clearly visible inside and outside the window.
- The device is permanently affixed at the window.
- A qualified person has inspected the installed device and provided written confirmation to the employer that the device is installed in accordance with the considerations listed here. This information is provided to the joint health and safety committee or worker representative, as applicable, and is made available to a WorkSafeBC prevention officer upon request.

Mobile equipment manufactured prior to January 1, 2000

As per section 16.24(2) of the *Regulation*, mobile equipment manufactured prior to January 1, 2000 and having a single cab entrance door must be equipped with an alternate means of escape should the primary means be blocked.

The prescriptive requirements of sections 16.24(1)(a)–(f) do not apply to this mobile equipment. Employers should provide openable hatches or windows as an alternate means of escape wherever practicable — however, a purpose-built device such as described in this guideline is also acceptable as an alternate means of providing escape, provided that the manufacturer's instructions are followed.