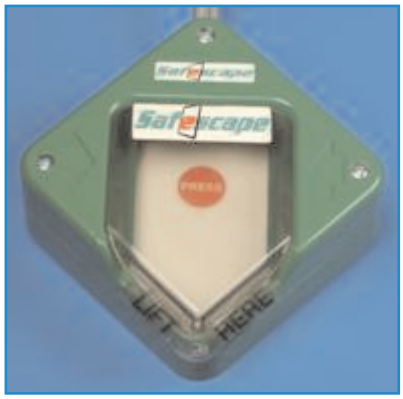
Safescape® Specification Model DGSRAB1
Standard Unit with Alarm and Braking System Link

1.0 Design



The Safescape® emergency egress device works in the following way:

The unit employs an 'actuator' which is a small pin and cylinder device. The 'actuator' produces a force which acts on the pin and pushes it through the glass window. By this action the window is broken into many small parts. The 'actuator' is electrically powered and the power is supplied by a long life battery. All components are housed within an aluminium enclosure.

1.1 Type of glass

Safescape® is designed to break standard transport double glazed, toughened glass windows to BS 857.

1.2 Easy to use

To make operation easy a simple push button is employed to initiate the window breaking. The option of a thin polyester film applied to the whole window is used to:

1) contain the small glass fragments produced.
2) to aid personnel in pushing the window out in one piece.
3) protect personnel from glass.

1.3 Signage

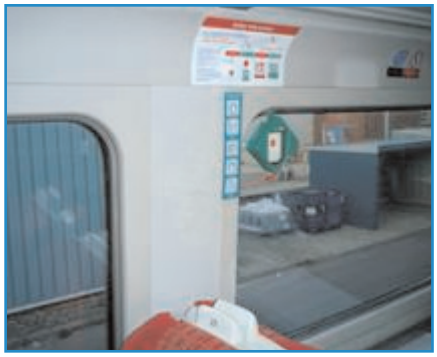
Signage will be provided which demonstrates the steps necessary to operate the system, both with graphics symbols and as text. The steps are:

1) Break the plastic tamper seal
2) Open the flip up cover
3) Break the break glass panel over the button
4) Press the firing button.
5) Push out the window

1.4 Illumination

The firing button is sign written with the word **<push>** printed in luminous ink, as is the area surrounding the button.

1.5 Positioning on the window



The unit can be positioned anywhere on the window, however access to the unit must be given due consideration. Positioning should be clear of curtains, seats and other obstructions. A position close to the window frame is recommended.

1.6 Tamper devices

Four types of tamper evident devices are fitted which are designed to reduce malicious operation:

1) Plastic break off sealing tag, similar to those found on fire extinguishers.
2) Lift up cover which is linked to an audible alarm.
3) Break glass cover over the firing button.
4) When the button is pressed emergency braking is initiated via the Passenger Communication System.

1.7 Battery life

Two batteries power the unit; one is dedicated to firing the actuator and the other powers the audible alarm. Both batteries will have a shelf life of 10 years.

2.0 Operation

The method of operation of the Safescape® unit is as follows:

1) Break the plastic tamper seal.
2) Open the flip up cover.
3) Break the break glass panel over the button.
4) Press the firing button. By pushing the button the actuator will fire instantaneously and break the window.
5) Push out the window, by doing this an emergency egress is created.

The matrix below shows the series of operations required.

	Alarm sounds	Brakes applied	Window broken
Seal broken	No	No	No
Cover lifted	Yes	No	No
Glass broken	Continues to sound	No	No
Button pushed	Continues to sound	Yes	Yes

2.1 Reset after emergency braking

After the Safescape® device is activated, emergency braking will take place. As with the Passenger Communication System pull down lever, it must be reset to disengage the braking system. This is reset in the Safescape® unit by a discreet switch mounted under the break glass.

3.0 Installation and Maintenance

The device is designed to be fitted quickly and with the minimum of tools, by a semi skilled technician. The unit will be bonded to the designated escape window using an acrylic double-sided tape. This requires that the window is cleaned using a preparatory glass cleaner. A wiring connection must be made with the Passenger Communication System. Depending on the type of vehicle the typical installation time is approximately 45 minutes.

3.1 Window film fitment

The window film is similar to products already used on the railways as sacrificial coatings and must be fitted by trained fitters. The area in which the Safescape® unit will be bonded must not be filmed.

3.2 Circuit/battery testing

Continuity of the firing circuit can be tested by removing the front cover. This is fixed down by security screws and requires special tools to remove it. By removing the front cover access is given to a test button. When depressed a LED will illuminate to indicate that the power is present and the continuity of the circuit is good.

To check the alarm battery it is necessary to remove the plastic seal and perform a test by lifting the flip up cover. An audible alarm should sound. A replacement plastic seal should be fitted.

The batteries require replacing every 10 years. The alarm battery can be replaced manually at the depot, and is situated in the front cover. The firing battery, which is inside the enclosure, requires that the chassis and battery are removed as one unit and replaced with a new unit.

3.3 Braking test

The Braking activation can be tested by removing the tamper-proof screws, removing the cover and then pressing the main firing button. This will prompt a braking activation but will not fire the actuator, as a de-activation switch breaks this circuit, the action of removing the cover operates this switch.

3.4 De-activation switch

A micro switch will isolate the firing button if the cover is removed from the device. This is designed to stop accidental firing when the cover is removed.

3.5 Maintenance after an audible alarm event

If the lift up cover has been operated and an audible alarm made, then the battery must be replaced. This will be evident if:

1) Personnel hear the alarm.
2) The plastic seal is broken.

3.6 Maintenance after the device has been fired

The entire unit must be replaced.

Technical Specification

Physical and Environmental

Size	120 x 120 x 47 mm (4.72 x 4.72 x 1.85 inches)
Weight	800 gms (28.21 ounces)
Enclosure	Cast aluminium
Finish	Powder coating complies to BS 476 pt 7 & BS 476 pt 7 Class 0 Rating
Paint finish colour	R6029 80% gloss (green)
Operating Temperature	-20oC to +85oC (-4oF to +185oF)
Weather Proofing	IP65

Functional

Actuator pin deployment time	5 ms
Actuator output force	2 KN
Break Panel	Safeglass ®
Power Supply	6 volts
Battery Life	10 years

Bonding Method

Acrylic Tape	3m 4941

Audible Alarm

Power	6 volts
Sound	95 DB
Duration	1 hour

Braking System

Braking maximum holding relay current	2amp