Proposal for amendment of UN Regulation No. 107
(M2 and M3 vehicles)

BMFE Informal Working Group (IWG) is in charge to evaluate and develop the opportunity for regulatory amendment(s) aimed at increasing the safety of M2 and M3 vehicles in case of fire by improving their general construction with regard to evacuation time.

In this work and according to UN Regulation n°107, amendment to improve glass breaking devices efficiency has been studied.

The modifications to the current text of UN Regulation n°107 are marked in bold for new characters.

Glass breaking device efficiency

I Proposal

Annex 3, paragraph 7.6.8.2., amend to read :

7.6.8.2. Every emergency window shall either:

7.6.8.2.1. Be capable of being easily and instantaneously operated from inside and from outside the vehicle by means of a device recognised as satisfactory. This provision includes the possibility of using e.g. panes of laminated glass or plastic material, or

7.6.8.2.2. be made of ~~readily breakable safety~~ **[toughened]** glass pane(s). This latter provision precludes the possibility of using panes of laminated glass or of plastic material. **An easy-to-operate** device shall ensure that each window can be broken **and removed within [xx] sec by a single person from inside the passenger compartment. The technical service shall verify by testing the operation of the device~~.~~ and by measuring the timing between device is unlocked and the moment where enough debris have been removed to allow the single person to evacuate corresponding to the dimensions specified in paragraph 7.6.3.1.3. The device shall meet the following requirements.**

Annex 3, paragraph 7.6.8.2.2, insert new paragraphs 7.6.8.2.2.1 to 7.6.8.2.2.5 to read :

7.6.8.2.2.1 The device shall be fixed adjacent to or on the emergency window and positioned in the upper third of the height of the window surface.

In case the implementation of the device is not technically compatible with the positional requirements above, the device ~~can~~ shall be located adjacent to or affixed on each emergency window. However, ~~at the time of the Type Approval~~, the manufacturer shall demonstrate to the satisfaction of the Technical Service the following points :
- **Analysis conducted to determine the location of the device;**
- **Definition of the measures put in place to prevent unintended use.**

These evidences shall be verified by the Technical Service ~~during the approval process~~.

7.6.8.2.2.2 The device shall be clearly visible for any passenger in its direct vicinity. It shall be marked in red and supplemented by a safety sign. ~~[If the device can be obstructed (e.g. by a closed curtain), a supplementary safety sign that indicates the location of the nearest device shall be installed where it is visible to the intended passenger at all times.]~~

7.6.8.2.2.3 The device shall be readily available at all times and be operable in the event of a failure of the vehicle's power supply. The device shall be designed to prevent misuse. At least one of the following mitigating measures at the manufacturer's choice shall be available. The device shall

(a) be permanently fixed adjacent to or on each emergency window; or

(b) engage a warning signal being audible or visible at the driver's seating position, when the device is temporarily removed from its designated location.

7.6.8.2.2.4 The device shall be equipped with a protective cover or designed to prevent unintended operation and requiring ~~an~~ one additional action to unlock by any person operating the device. If a protective cover is used, the device shall remain visible by passengers.

7.6.8.2.2.5. The ~~inner~~ surfaces of each emergency window may be fitted with a plastic film to enable the person to remove the window pane or panes ~~with his hands~~. ~~[~~The plastic film shall be cut at the outer edge of the emergency window and following ~~the~~ a patterns ~~e.g.~~ shown in picture XX below~~]~~. In case of fitting a plastic film to the emergency exit, it shall be compatible with the device and shall not reduce its efficiency. In addition, the characteristics of the approved glazing shall remain unchanged. ~~The device for breaking the glass for the emergency windows at the rear of the vehicle shall be positioned either centrally above or below the emergency window or, alternatively, a device shall be positioned adjacent to each end of the window.~~

Annex 3, paragraph 7.6.9.5., amend to read :

7.6.9.5. Escape hatches shall be capable of being easily opened or removed from the inside and from the outside. However, this requirement shall not be construed as precluding the possibility of locking the escape hatch for the purpose of securing the vehicle when unattended, provided that the escape hatch can always be opened or removed from the inside by the use of the normal opening or removal mechanism. In the case of a ~~readily breakable~~ hatch **made of or with ~~[~~toughened~~]~~ glass pane(s)**, an **easy-to-operate** device shall **ensure that the glass pane(s) can be broken and removed within [xx] sec by a single person from inside the passenger compartment. The technical service shall verify by testing the operation of the device~~.~~ and by measuring the timing between the moment where the device is unlocked and the moment where enough debris have been removed to allow the single person to evacuate corresponding to the dimensions specified in paragraph 7.6.3.1.5. The device shall meet the following requirements.**

7.6.9.5.1 The device shall be clearly visible for any passenger in its direct vicinity. It shall be marked in red and supplemented by a safety sign. ~~[If the device can be obstructed (e.g. by a closed curtain), a supplementary safety sign that indicates the location of the nearest device shall be installed where it is visible to the intended passenger at all times.]~~

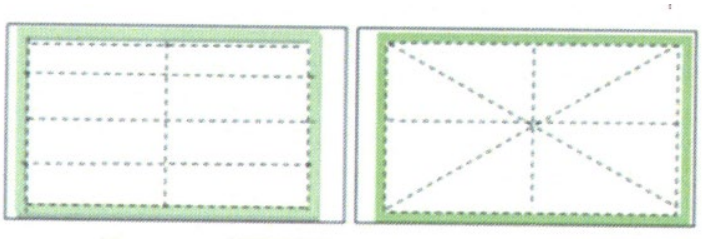
7.6.9.5.2 The device shall be readily available at all times and be operable in the event of a failure of the vehicle's power supply. The device shall be designed to prevent misuse. At least one of the following mitigating measures at the manufacturer's choice shall be available. The device shall

(a) be permanently fixed adjacent to or on each escape hatch; or

(b) engage a warning signal being audible or visible at the driver's seating position, when the device is temporarily removed from its designated location.

7.6.9.5.3 The device shall be equipped with a protective cover or designed to prevent unintended operation and requiring ~~an~~ one additional action to unlock by any person operating the device. If a protective cover is used, the device shall remain visible by passengers.

7.6.9.5.4. The ~~inner~~ surfaces of each escape hatch may be fitted with a plastic film to enable the person to remove the window pane or panes ~~with his hands~~. The plastic film shall be cut at the outer edge of the escape hatch and following ~~the~~ a patterns ~~e.g.~~ shown in picture XX below. In case of fitting a plastic film to the escape hatch, it shall be compatible with the device and shall not reduce its efficiency. In addition, the characteristics of the approved glazing shall remain unchanged.



Picture XX

II Justification

Experts agreed during GRSG 119th session to extend BMFE IWG activities to consider the specific purpose of the device for glass breaking efficiency.

After experts discussions, this efficiency could be improved based on 3 main principles :

- **Better location**
- **Better visbility**
- **Easier to use**

The considerations covering the 3 principles included in this proposal are the following ones :

§ 7.6.8.2.2. (emergency window) / § 7.6.9.5. (escape hatche) :

Non design restrictive with a simple action to break all layers, covering all main passenger profiles.

§ 7.6.8.2.2.1. (emergency window) :

Adapted location preserving easy access and contributing to avoid non intentional operation.

§ 7.6.8.2.2.2. (emergency window) / § 7.6.9.5.1. (escape hatche) :

Adapted level of visibility with understandable description on how to proceed.

§ 7.6.8.2.2.3. (emergency window) / § 7.6.9.5.2. (escape hatche) :

Device continuous available taking care of misuse prevention.

The target is to have a device permanently coupled to the vehicle even during device use or, alternatively, unambiguous alert given to the driver when this is no longer the case. A non-permanent attachment system (e.g. clamp, clip, etc.) cannot be considered as meeting the requirement of point (a).

§ 7.6.8.2.2.4. (emergency window) / § 7.6.9.5.3. (escape hatche) :

Reinforcement of unintended operation avoidance.

The target is to ensure the device can't be enabled accidentally by mainly non reversible system (e.g. sewing, plastic breakable cover, locking system, etc …). The means used to permanently couple the device to the vehicle and protect it against unintentional manipulation are separate processes.

§ 7.6.8.2.2.5. (emergency window) / § 7.6.9.5.4. (escape hatche) :

Glass ejection facilitation opportunity after breaking.