

## **Proposal for amendment to Regulation No. 46 (Devices for indirect vision)**

The modifications to the current text and (the adopted proposal ECE/TRANS/2016/9) of UN Regulation No. 46 are marked in bold for new characters and strikethrough for deleted characters.

### **I. Proposal**

*In Contents, title of Part I, Annexes 10 and 11, amend to read:*

" I. Devices for indirect vision (**including obstacle detection systems to support fields of vision**)

.....

10 Calculation of the detection distance for CMS of Classes V, VI and VIII

11 Determination of the displayed object size for CMS of Classes V, VI and VIII ..  
....."

*Paragraph 1.1., amend to read:*

"1.1. This Regulation applies:

- (a) To compulsory and optional devices for indirect vision (**including obstacle detection systems to support fields of vision**), set out in the table under paragraph 15.2.1.1.1. of this Regulation for vehicles of category M and N<sup>1</sup> and to compulsory and optional devices for indirect vision (**including obstacle detection systems to support fields of vision**) mentioned in paragraphs 15.2.1.1.3. and 15.2.1.1.4. of this Regulation for vehicles of category L<sup>1</sup> with bodywork at least partly enclosing the driver;
- (b) To the installation of devices for indirect visions (**including obstacle detection systems to support fields of vision**) on vehicles of categories M and N and on vehicles of category L<sup>1</sup> with bodywork at least partly enclosing the driver. "

*The title of Part I, amend to read:*

" I. Devices for indirect vision (**including obstacle detection systems to support fields of vision**)"

*Paragraph 2.1.4., amend to read:*

"2.1.4. "Vision support system" means a system to enable the driver to detect and/or see objects in the area adjacent to the vehicle (**excluding the system defined in paragraph 2.1.14. below**)."

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*Insert a new paragraph 2.1.14 , to read:*

**"2.1.14. "Obstacle detection system" means a system to enable the driver to detect objects in the area adjacent to the vehicle."**

*Insert a new paragraph 2.1.15 , to read:*

**"2.1.15. "Sonar system" means a system as defined in paragraph 2.1.14. above, which uses sound waves, etc. to enable the driver to detect objects in the area adjacent to the vehicle. This definition is based on the definition given in ISO 17386-2010."**

*Insert a new paragraph 2.4.7. , to read:*

**"2.4.7. Class VIII: "Close-proximity rear-view devices", giving the field of vision defined in paragraph 15.2.4.8."**

*Paragraph 5.4.3., amend to read:*

**"5.4.3. Additional symbol(s) I or II or/and III or/and IV or/and V or/and VI or/and VII or/and VIII, specifying the class to which the type of device for indirect vision belongs. The additional symbol shall be placed in any convenient position in the vicinity of the circle containing the letter "E"."**

*Paragraph 6.1.1.2., amend to read:*

- "6.1.1.2. (a) Rear-view mirrors (Classes II to ~~VH~~ VIII)**  
The edge of the reflecting surface ..... to the longitudinal median plane of the vehicle.
- (b) Rear-view mirrors (Class I and Class VIII)**  
In cases, ..... this requirement shall apply to the edge of the projecting part."

*Paragraph 6.1.1.3., amend to read:*

**"6.1.1.3. When the mirror is mounted on a plane surface, all parts, irrespective of the adjustment position of the device, including those parts remaining attached to the support after the test provided for in paragraph 6.3.2. below, which are in potential, static contact with a sphere either 165 mm in diameter in the case of a Class I mirror or 100 mm in diameter in the case of a Class II to ~~VH~~ VIII mirror, shall have a radius of curvature 'c' of not less than 2.5 mm."**

*Paragraph 6.1.1.7., amend to read:*

**"6.1.1.7. The parts of Classes II to ~~VH~~ VIII mirrors referred to in paragraphs 6.1.1.2. and 6.1.1.3. above which are made of a material with a Shore A hardness not exceeding 60 are exempt from the relevant provisions. "**

*Insert new paragraph 6.1.2.1.7., to read:*

**"6.1.2.1.7. " Close-proximity rear" view devices (Class VIII)**  
**The contours of the reflecting surface shall be of simple geometric form and its dimensions such that the mirror provides the field of vision specified in paragraph 15.2.4.8. of this Regulation."**

Paragraph 6.1.2.2.4.3., amend to read:

"6.1.2.2.4.3. 300 mm for "wide-angle" mirrors (Class IV) ~~and~~ , "close-proximity" mirrors (Class V) **and "close-proximity rear-view devices (Class VIII);"**

Paragraph 6.2.2.2., amend to read:

"6.2.2.2. Functional requirements for camera-monitor devices of Classes V ~~and~~ , VI **and VIII "**

Paragraph 6.3.2.2.7.2., amend to read:

"6.3.2.2.7.2. Class II to ~~VH~~ **VIII** mirrors

(a) .....

(b) .....

Where ..... from the ground. "

Paragraph 15.2.1.1.1., amend to read:

"15.2.1.1.1. The fields of vision prescribed in paragraph 15.2.4. below shall be obtained from the minimum number of mandatory mirrors or camera-monitor devices set out in the following table.

A minimum number of camera-monitor systems is undefined, but they shall provide the same field of vision as given in the table below and the provision on the minimum mounting height does not apply.

In the case of camera-monitor systems, the maximum number of monitors shall not exceed the corresponding number of mirrors.

**Regarding class VIII other devices can be accepted Camera monitor systems (or other devices)."**

Paragraph 15.2.1.1.2., amend to read:

"15.2.1.1.2. In the case a camera-monitor system is used for rendering (the) field(s) of vision, the relevant field(s) of vision shall be permanently visible to the driver when the ignition is on or the vehicle master control switch is activated (whichever is applicable). However, when the vehicle is moving forward at a speed above 10 km/h or backwards, the monitor or the part of the monitor intended for rendering the Class VI field of vision may be used for other information (**excluding Class VIII**). Multiple images may be used or displayed provided that the monitor has been approved in this mode.

**Furthermore, in the case of a camera-monitor system intended for rendering the Class VIII field of vision, it may be such that the relevant field of vision is permanently visible to the driver only when the vehicle is moving backwards."**

Add new columns to paragraph 15.2.1.1.3., to read:

"

<i>Vehicle category</i>	<b><i>Close-proximity rear-view Class VIII</i></b>
M <sub>1</sub>	<b>Compulsory</b> May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
M <sub>2</sub>	<b>Compulsory</b> May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
M <sub>3</sub>	<b>Compulsory</b> May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
N <sub>1</sub>	<b>Compulsory</b> May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
N <sub>2</sub>	<b>Compulsory</b>
≤ 7.5 t	May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
N <sub>2</sub>	<b>Compulsory</b>
> 7.5 t	May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
N <sub>3</sub>	<b>Compulsory</b> May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).

"

Paragraph 15.2.2.2., amend to read:

- "15.2.2.2. Class II to ~~VII~~ **VIII** mirrors shall be visible through the **side** windows or through the portion of the windscreen that is swept by the windscreen wiper. Nevertheless, for design reasons, this last provision (i.e. the provisions relating the cleaned part of the windscreen) shall not apply to:
- (a) Class II to VII mirrors on the passenger side and optional exterior mirrors on the driver side of vehicles of categories M<sub>2</sub> and M<sub>3</sub>;
  - (b) Class VI front-view mirrors;
  - (c) **Class VIII close-proximity rear-view mirrors.**"

Paragraphs 15.2.4.8., 15.2.4.9., 15.2.4.9.1., 15.2.4.9.2. and 15.2.4.10.(former), renumber as paragraphs 15.2.4.9., 15.2.4.10, 15.2.4.10.1, 15.2.4.10.2 and 15.2.4.11.

Insert new paragraphs 15.2.4.8. to 15.2.4.8.2., to read:

- "15.2.4.8. Class VIII close-proximity rear-view device**
- 15.2.4.8.1. The field of vision shall be bounded by the following planes and shall be such that the driver can see at least part of cylindrical objects with a height of 1,000 mm and a diameter of 300 mm whose centre is located within the boundaries of the field of vision:**

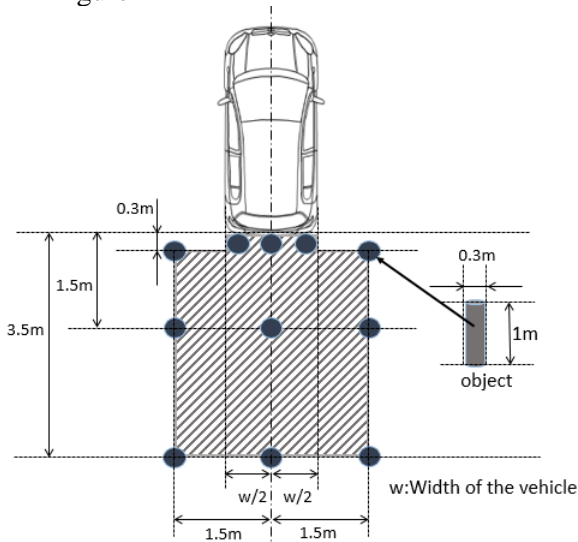
- (a) A transverse vertical plane through the outermost point of the rear of the vehicle;
- (b) A transverse vertical plane 3,500 mm behind the plane defined in (a);
- (c) Two longitudinal vertical planes parallel to the longitudinal vertical median plane of the vehicle, each of which is situated at a distance of 1,500 mm from that plane on either side, respectively; and
- (d) For the area between the two longitudinal vertical planes defined in (c) and within the width of the vehicle, a transverse vertical plane 300 mm behind the plane defined in (a).

**15.2.4.8.2.** If the field of vision defined in paragraph 15.2.4.8.1. can be perceived via a combination of devices for indirect vision of other Classes or directly, it is not mandatory to equip the vehicle with a Class VIII close-proximity rear-view device. In addition, the requirement may be met using a combination of mirrors of Class VIII and other Class(es) or using an obstacle detection system."

*Insert new Figure 11:*

**" Class VIII field of vision**

Figure 11



"

*Paragraph 15.2.4.10.2.(new), amend to read:*

"15.2.4.10.2. Classes II, III, IV, V, ~~and~~ VI **and VIII** devices for indirect vision and Class VII mirrors

In the fields of vision specified above, obstruction due to the bodywork and its components, such as other cab devices for indirect vision, door handles, ....."

Paragraph 16.2., amend to read:

"16.2. Classes V, ~~and VI and VIII~~ camera-monitor devices"

Annex 1, item 9.1.1., amend to read:

"9.1.1. In the case of camera-monitor systems of Classes V, ~~and VI and VIII~~, the class, the detection distance [mm], contrast, luminance range, glare correction, display performance (black and white/colour) image repetition frequency, luminance reach of the monitor:..... "

Annex 3, item 9., amend to read:

".....  
9. Brief description .....  
Identification of the device: mirror, camera/monitor, other device<sup>2</sup>  
Device for indirect vision of Classes I, II, III, IV, V, VI, **VIII**, S<sup>2</sup>  
..... "

Annex 4, Appendix, item 2., amend to read:

".....  
2. Class(es) of mirrors and devices for indirect vision (I, II, III, IV, V, VI, VII, **VIII**, S)<sup>2</sup>  
..... "

The title of Annex 10., amend to read:

"Calculation of the detection distance for CMS of Classes V, ~~and VI and VIII~~"

The title of Annex 11., amend to read:

"Determination of the displayed object size for CMS of Classes V, ~~and VI and VIII~~"

Annex 11, paragraph 1.4., amend to read:

"1.4. Data supplied by the instructions for use  
In the case of Classes V, ~~and VI and VIII~~ camera monitor devices the instructions for use shall include a table that shows the minimum and maximum mounting height of the camera above ground under consideration of different viewing distances. The camera shall be mounted within the applicable height range. The viewing distances shall be selected from the intended context of use. The following table shows an example. .... "

## **II. Justification**

In Japan, the number of casualties in backover accidents recorded over the past five years (2010–2014) is about 10,000 persons. Since it is obvious that these accidents were caused by the driver's failure to check behind the vehicle, it is necessary to enable the driver to notice any pedestrians behind the vehicle while backing up.

Furthermore, in the United States, NHTSA has announced their decision to make it mandatory that vehicles to be manufactured in or after 2018, including passenger cars and light-duty trucks, be equipped with a camera that expands the rear field of view to check behind the vehicle. This is intended to reduce backover accidents as there have been a large number of children killed by reversing vehicles.

If it is determined that the additional requirements proposed herein will be reflected in the Regulation as a new series of amendment, we will add other necessary requirements, such as those for paragraphs 4, 5, and 22, and Annex 5, in our next proposal.

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