

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

The modifications to the current text of UN Regulation No. 46 are marked in bold for new characters and strikethrough for deleted characters.

I. Proposal

List of contents, Annexes amend to read:

“

12 Test methods and safety provisions for CMS of Classes I to IV

13 Test Methods and Safety Provisions for Sonar Systems “

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 N¹ 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 L¹ 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 L¹ 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**)."

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.

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 6.2.2.2., 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>	<i>Close-proximity rear-view Class VIII</i>
M ₁	Compulsory May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
M ₂	Compulsory May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
M ₃	Compulsory May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
N ₁	Compulsory May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
N ₂	Compulsory
≤ 7.5 t	May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
N ₂	Compulsory
> 7.5 t	May be viewed using a combination of direct view and indirect vision devices (of Classes I through VI).
N ₃	Compulsory 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 ~~VH~~ **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 M₂ and M₃;
- (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 each cylindrical objects with a height of 1,000 mm and a diameter of 300 mm which is located at 6 positions within the boundaries of the field of vision as defined in Figure.11:

(a) A transverse vertical plane of the outermost point of the rear of the vehicle;

(b) A transverse vertical plane 3,500 mm behind the outermost point of the rear of the vehicle;

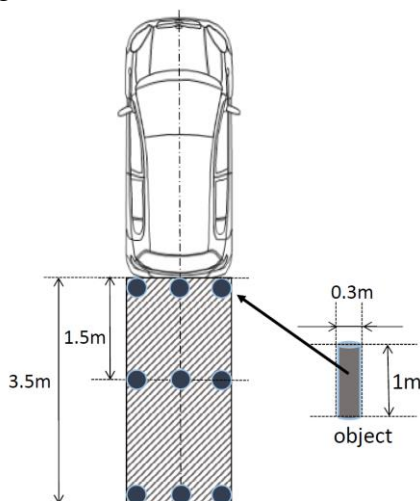
(c) Two longitudinal vertical planes parallel to the longitudinal vertical median plane of the outermost point of the side of the vehicle.

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 from the driver's looking back ocular points described in 15.2.4.8.3., 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



"

Insert new paragraphs 15.2.4.8.3., to read:

" **15.2.4.8.3.** **“The driver’s looking back ocular points” means two points located at 96mm longitudinally rearward, 158mm horizontally inside vehicle center and 6mm vertically above from “the driver’s ocular points” described in 12.1. "**

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 device²
1 Device for indirect vision of Classes I, II, III, IV, V, VI, VII, **VIII** ²
 "

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)²
 "

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. "

Insert a new Annex 13, to read:

“ Annex 13 Test Methods and Safety Provisions for Sonar Systems

1. System activation

The system shall be activated when the reverse gear is selected.

2. Driver interface and information presentation strategy

2.1. Audible information

When an object is detected in the rear horizontal area as described in paragraph 5.1. below, audible information in accordance with **ISO 15006** shall be given.

In presenting audible information, the distance may be identified at two or more levels. These zones may be indicated by changing the frequency of intermittent sound, and faster intermittent sound or continuous sound shall be used as the distance becomes closer.

2.2. Duration of signalling

Signalling for an object shall last as long as the object is detected and shall end when the object is no longer detected or when the system is deactivated.

To reduce the driver’s discomfort, the audible signal can be automatically suspended temporarily after a certain time set by the manufacturer has elapsed, provided that the system remains to be activated. If, while the audible signal is automatically suspended temporarily, the distance to the object becomes short, the audible signal shall be automatically resumed. If the distance to the object becomes long, the audible signal may remain suspended.

3. General test conditions

The test object shall be as per Clause 7.1 of ISO 17386 :2010. During testing, the wind speed must not exceed 1 m/s. The temperature shall be $20 \pm 5^{\circ}\text{C}$ and the humidity shall be $60 \pm 25\%$. There shall be no rain or snow. The test shall be performed on a flat, dry asphalt or concrete surface. The test must not be affected by the reflection of sound waves or electromagnetic waves from any walls, auxiliary testing equipment or any other objects in the environment.

4. Dynamic performance of object detection

4.1. Detection latency

The detection latency as measured according to paragraph 4.2. must not exceed 0.6 s.

4.2. Detection latency test method

4.2.1. Test conditions

The testing environment and test object shall be as per paragraph 3 of this Annex. The test object shall be located in the detectable grids within the rear horizontal area in paragraph 5 of this Annex. The test vehicle in the initial state shall be with the detection system being activated and shall be in a parking condition. Here, parking condition means the P (park) position being selected in the case of vehicles equipped with automatic transmissions, whereas it means the neutral gear being selected and the parking brake being engaged in the case of vehicles equipped with manual transmissions.

4.2.2. Test procedures

(1) With the vehicle being in the initial state, locate the test object behind the vehicle and select the reverse gear. In the case of vehicles equipped with manual transmissions, release the parking brake after selecting the reverse gear.

(2) Measure the elapsed time (detection latency) from the moment at which the reverse gear is selected to the moment at which the audible warning starts. In the case of vehicles equipped with manual transmissions, the detection latency shall be the elapsed time from the moment at which the parking brake is released to the moment at which the audible warning starts.

5. Rear horizontal area detection rate

5.1. Monitoring area

The maximum detection distance in Clauses 5.4.2 and 5.4.3 of ISO 17386 :2010 shall be [1.0] m (Class R2).

5.2. Minimum detection rate

The minimum detection rate required for the rear horizontal area shall be as follows:

- 90% for A1 as defined in Clause 5.4.3 of ISO 17386 :2010;
- 87% for the rear-2 range in A2 as defined in Clause 5.4.3 of ISO 17386 :2010.

There must be no undetected hole larger than a square consisting of two-by-two grids.

Here, the rear horizontal area test procedures shall be as per Clause 7.3 of ISO 17386 :2010.

6. Self-test capabilities and failure indication

As per Clause 5.5 of ISO 17386 :2010.

7. Operation with trailers

As per Clause 5.6 of ISO 17386 :2010. “

II. Justification

This proposal is updated proposal for VRU-Proxi-02-03 Class VIII field of Vision that mentioned as next action for Japan in 5th 5th VRU-Proxi-IWG.

This material were compiled by VRU-Proxi-02-03 material and VRU-Proxi-IWG-05-02 Sonar test method.
