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Awareness of the proximity of Vulnerable Road Users

UN Regulation No. 46 (Devices for indirect vision)

Proposal for the 05 series of amendments of UN Regulation No. 46

**Submitted by the expert from Germany and by the expert from the
International Organization of Motor Vehicle Manufacturers ***

The text reproduced below was prepared by the expert from Germany and the expert from the International Organization of Motor Vehicle Manufacturers (OICA) to amend UN Regulation No. 46 to align radii requirements for Camer Monitor Systems (CMS) of UN Regulation No. 46 with the radii requirements of UN Regulation Nos. 26 and 61. It is based on informal document GRSG-121-18 and GRSG-121-19. The modifications to the current text of the UN Regulations are marked in in bold for new and strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2021 as outlined in proposed programme budget for 2021 (A/75/6 (Sect.20), para 20.51), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate



I. Proposal

Insert a new paragraph 6.1.1.9.:

"6.1.1.9. The requirements of paragraph 6.1.1.3. do not apply to mirrors, if their lower edge is mounted not less than 2 m above the ground when the vehicle is under a load corresponding to its maximum technical permissible mass."

Paragraph 6.2.1.3., amend to read:

"6.2.1.3. The effectiveness of the CMS of Classes I to ~~IV~~VI shall not be adversely affected by magnetic or electrical fields. This shall be demonstrated by compliance with the technical requirements and transitional provisions of Regulation No. 10, 04 series of amendments or any later series of amendments."

Paragraph 6.2.2.1.1., amend to read:

"6.2.2.1.1. When the devices of the camera-monitor system are mounted in the position recommended by the manufacturer for normal driving, 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 CMS or parts of CMS installed inside the vehicle or 100 mm in diameter in the case of a CMS or parts of CMS installed outside the vehicle, shall have a radius of curvature "c" of not less than 2.5 mm."

Paragraph 6.2.2.1.2., amend to read:

"6.2.2.1.2. ~~Edges of fixing holes or recesses of which the diameter or longest diagonal is less than 12 mm are exempt from the radius requirements of paragraph 6.2.2.1.1. above provided that they are blunted.~~
The requirements in paragraph 6.2.2.1.1. above shall not apply to parts of the external surface which protrude less than 5 mm, but the outward facing angles of such parts shall be blunted, and are considered save where such parts protrude less than 1.5 mm. For determining the dimension of the projection, the following method shall apply:"

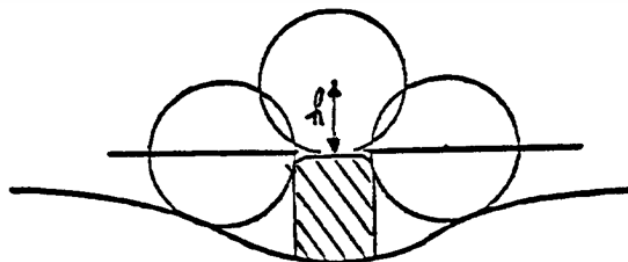
Insert a new paragraph 6.2.2.1.2.1., to read:

"6.2.2.1.2.1. The dimension of the projection of a component which is mounted on a convex surface may be determined either directly or by reference to a drawing of an appropriate section of this component in its installed condition."

Insert a new paragraph 6.2.2.1.2.2., to read:

"6.2.2.1.2.2. If the dimension of the projection of a component which is mounted on a surface other than convex cannot be determined by simple measurement, it shall be determined by the maximum variation of the distance of the centre of a 100 mm diameter sphere from the nominal line of the panel when the sphere is moved over and is in constant contact with that component. Figure 1 shows an example of the use of this procedure.

**Figure 1
 Example for the measurement by maximum variation**



Paragraph 6.2.2.1.3., amend to read:

"6.2.2.1.3. For parts of the camera and the monitor which are made of a material with a Shore A hardness of less than 60 and which are mounted on a rigid support, the requirements of paragraph 6.2.2.1.1. above shall only apply to the support. Edges of fixing holes or recesses of which the diameter or longest diagonal is less than 12 mm are exempt from the radius requirements of paragraph 6.2.2.1.1. above provided that they are blunted."

Insert a new paragraph 6.2.2.1.4., to read:

"6.2.2.1.4. For parts of the camera and the monitor which are made of a material with a Shore A hardness of less than 60 and which are mounted on a rigid support, the requirements of paragraph 6.2.2.1.1. above shall only apply to the support."

Insert a new paragraph 6.2.2.1.5., to read:

"6.2.2.1.5. The requirements of paragraph 6.2.2.1.1. do not apply to CMS if their lower edge is mounted not less than 2 m above the ground when the vehicle is under a load corresponding to its maximum technical permissible mass."

Paragraph 6.3.1.1., amend to read:

"6.3.1.1. The test provided for in paragraph 6.3.2. below shall not be required in the case of any Class II to ~~IV~~VI exterior device for indirect vision of which no part is less than 2 m from the ground, regardless of the adjustment position, when the vehicle is under a load corresponding to its maximum technically permissible mass.

This derogation also applies to the attachments of devices for indirect vision (attachment plates, arms, swivel joints, etc.) which are situated less than 2 m from the ground and which do not project beyond the overall width of the vehicle, measured in the transverse plane passing through the lowest mirror attachments or any other point forward of this plane if this configuration produces a greater overall width.

In such cases, a description specifying that the device for indirect vision shall be mounted so as to conform to the above-mentioned conditions for the positioning of its attachments on the vehicle shall be provided.

Where advantage is taken of this derogation, the arm shall be indelibly marked with the symbol

$$\frac{\Delta}{2m}$$

and the type approval certificate shall be endorsed to this effect."

Paragraph 16.1.1., amend to read:

"16.1.1. Intended use, activation and deactivation

The intended use shall be mentioned within the operator's manual. The procedure for activation and deactivation of the CMS of Classes II and III shall allow a safe use of the vehicle.

The CMS shall be activated when the vehicle is opened (e.g. unlocking of the doors, opening of a front door or any other means by the choice of the manufacturer).

In addition to the requirements mentioned in paragraph 15.2.1.1.2., after each engine switch-off the system shall remain operational for a period of at least $T_1 = 120$ s. After T_1 period and for a period of at least $T_2 = (420 - T_1)$ seconds the system shall be able to be reactivated such that the required field of vision is made available within 1 second by manoeuvring any front door opening automatically and, if available, manually by the driver. After T_2 period the

system shall be able to be reactivated within 7 seconds (e.g. by initiating any front door opening process).

Notwithstanding the provisions above, any other concept ~~to activate or deactivate the system~~ **providing at least the same level of safety** shall be demonstrated ~~to the satisfaction of the Technical Service~~ **and to the Approval Authority** within the safety concept that is provided according to the provisions in Annex 12, paragraph 2."

Insert new paragraphs 22.18. to 22.24., to read:

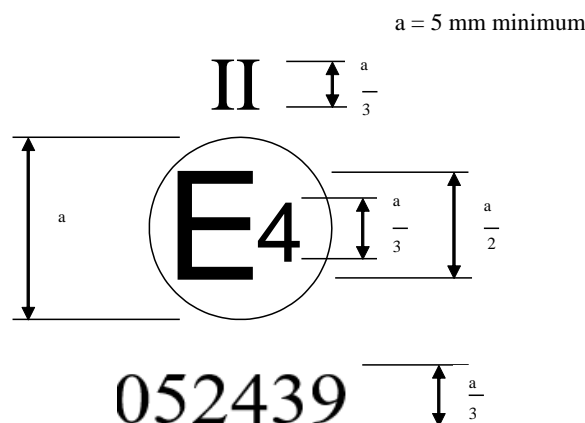
- "22.18. As from the official date of entry into force of the 05 series of amendments, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept type approvals under this Regulation as amended by the 05 series of amendments.**
- 22.19. As from 1 September 2024 Contracting Parties applying this Regulation shall not be obliged to accept type approvals to the preceding series of amendments, first issued after 1 September 2024.**
- 22.20. Until 1 September 2026, Contracting Parties applying this Regulation shall accept type approvals to the preceding series of amendments, first issued before 1 September 2024.**
- 22.21. As from 1 September 2026, Contracting Parties applying this Regulation shall not be obliged to accept type approvals issued to the preceding series of amendments to this Regulation.**
- 22.22. Notwithstanding paragraph 22.21., Contracting Parties applying this Regulation shall continue to accept type approvals of a type of vehicle or type of device for indirect vision issued according to the preceding series of amendments to this Regulation.**
- 22.23. Contracting Parties applying this Regulation may grant type approvals according to any preceding series of amendments to this Regulation.**
- 22.24. Contracting Parties applying this Regulation shall continue to grant extensions of existing approvals to any preceding series of amendments to this Regulation"**

Annex 5; amend to read:

"Annex 5

Arrangement of approval mark of a device for indirect vision

(See paragraph 5.4. of the Regulation)



The above approval mark affixed to a device for indirect vision indicates that the device is a main rear-view device, of Class II, which has been approved in the Netherlands (E 4) pursuant to Regulation No. 46 and under approval number 052439. The first two digits of the approval number indicate that Regulation No. 46 already included the 05 series of amendments when the approval was granted.

Note: The approval number and the additional symbol shall be placed close to the circle and either above or below the "E" or to the left or right of that letter. The digits of the approval number shall be on the same side of the "E" and point in the same direction. The additional symbol shall be directly opposite the approval number. The use of Roman numerals as approval numbers shall be avoided so as to prevent any confusion with other symbols."

II. Justification

Paragraphs 6.1.1.9. and 6.2.2.1.5.:

To bring the requirements for radii of external projections of mirrors and Camera Monitor Systems (CMS) in line with the requirements of the UN Regulations with regard to the external projections of passenger cars, UN Regulation No. 26, and commercial vehicles, UN Regulation No. 61, it is proposed to insert new paragraphs 6.1.1.9. and 6.2.2.1.4. to the existing text of the regulation, exempting mirrors and parts of CMS mounted not less than 2 m above the ground when the vehicle is under a load corresponding to its maximum technical permissible mass, from the radius requirements in paragraph 6.1.1.3. for mirrors and paragraph 6.2.2.1.1. for CMS.

Paragraph 6.2.1.3.:

Also with the amendments in Revision 6 of the UN Regulation No. 46 the error to use roman number "IV" instead of "VI" occurred.

Paragraph 6.2.2.1.1.:

Revision 6 of the UN Regulation No. 46 modified the structure of the regulation and formulated separately the requirements for mirrors and CMS in paragraph 6. As result of this, the requirements in paragraph 6.1.1.3. apply now only for mirrors and not for CMS. For CMS there is now only requirement after the impact test which is, that the lens should not be broken.

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 VII mirror, shall have a radius of curvature 'c' of not less than 2.5 mm.

Paragraph 6.2.2.1.2. to 6.2.2.1.4.:

In the UN Regulation No. 46 actually we have different requirements of the outer radius for a mirror system for indirect vision and a camera-monitor-device for indirect vision. For some safety functions (e.g. rain deflector, wind deflector) on the camera-monitor device, it would be useful to have the same requirements as a mirror system.

In the area of camera lenses special deflector geometry is necessary to improve the image quality captured by the camera. These deflectors are influencing or preventing air turbulences and through this are keeping rainwater and dirt particles away from the optical system.

Paragraph 6.3.1.1.:

Also with the amendments in Revision 6 of the UN Regulation No. 46 the error to use roman number "IV" instead of "VI" occurred.

Paragraph 16.1.1.:

For vehicles like buses, which have a good direct view through a door, there is probably no need for the activation and deactivation requirements defined in paragraph 16.1.1. To take into account the specificities of these vehicles there shall be other safety concepts also possible, if they can provide at least the same level of safety.
