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PROPOSAL FOR DRAFT 02 SERIES OF AMENDMENTS TO REGULATION No. 46
(Rear-view mirrors)

Transmitted by the expert from the Netherlands

Note: The text reproduced below was prepared by the expert from the Netherlands to update its proposal TRANS/WP.29/GRSG/2002/10 for the draft amendment of the Regulation in order to be in line with the text of EU Directive 2003/97/EC. The modifications to the original text are marked in **bold** characters.

Note: This document is distributed to the Experts on General Safety Provisions only.

A. PROPOSAL

Paragraph 2.1., amend to read:

"2.1. "Devices for indirect vision" means devices to observe the traffic area adjacent to the vehicle which cannot be observed by direct vision. **These** can be conventional mirrors, camera-monitors or other devices able to **present** information about the indirect field of vision to the driver."

Paragraph 2.1.1.9., heading and first formula, amend to read:

"2.1.1.9 "Aspherical mirror" means a mirror **composed** of a spherical and an aspherical part, in which the transition of the reflecting surface from the spherical to the aspherical part has to be marked. The curvature of the main axis of the mirror is defined in the x/y **coordinate** system defined by the radius of the spherical primary calotte with:

$$y = R - \sqrt{(R^2 - x^2)} + k(x - a)^3$$

R: nominal radius
....."

Paragraph 2.1.2.7., replace the figure "8 arc-minutes" by "eight arc-minutes".

Paragraph 2.1.2.12., correct the words "the perceptual limits by the range within the perceptual limits" to read "the perceptual limits by the range **of** the perceptual limits".

Paragraph 2.1.3., correct the words "Camera-monitor type" to read "**camera-monitor** type".

Paragraph 5.1., correct the word "paragraphs" to read "**paragraph**".

Subparagraph 6. (former)., correct the title "6. MIRRORS" to renumber as "6.1. MIRRORS".

Paragraph. 6.1.2.1.2.1., amend to read:

"6.1.2.1.2.1. The dimensions of the reflecting surface must be such that it is possible to inscribe therein:

- a rectangle 40 mm high the base length of which, measured in millimetres, has the value 'a';
- a segment which is parallel to the height of the rectangle and the length of which, expressed in millimetres, has the value 'b'."

Paragraph 6.1.2.1.2.2., in the table, first row, correct the figure "[mm]" to read "(mm)" (twice).

Paragraphs 6.1.2.2.4.1. and 6.1.2.2.4.2., correct the figures "1,200 mm" to read "**1 200 mm**"

Paragraph 6.1.3.2.1.2., amend to read:

"6.1.3.2.1.2. The centre of percussion of the pendulum coincides with the centre of the sphere, which forms the hammer. It is at a distance 'l' from the axis of oscillation in the release plane, which is equal to $1\text{ m} \pm 5\text{ mm}$. The reduced mass of the pendulum is $m_0 = 6.8 \pm 0.05$ kilograms. **The** relationship of 'm₀' to the total mass 'm' of the pendulum and to the distance 'd' between the"

Paragraph 6.1.3.2.2.1., amend to read:

"6.1.3.2.2.1. Mirrors shall be positioned on the pendulum impact rig **in such a way** that the axes which are horizontal and vertical when the mirror is installed on a vehicle in accordance with the applicant's mounting instructions are in a similar position."

Paragraph 6.1.3.2.2.4., amend to read:

".....

The displacement must be no greater than is strictly necessary for the execution of the test; it must be limited in such a way that:

- either the sphere delimiting the hammer remains at least tangential to the cylinder as defined in paragraph 6.1.1.5.;
- or the point of contact with the hammer is located at least 10 mm from the periphery of the reflecting surface."

Paragraphs 6.1.3.2.2.6.1. and 6.1.3.2.2.6.2., amend to read:

"6.1.3.2.2.6.1. Interior mirrors

- Test 1: The points of impact shall be as defined in paragraph 6.1.3.2.2.3. The impact must be such that the hammer strikes the mirror on the reflecting surface side.
- Test 2: Point of impact on the edge of the protective housing, such that the impact produced makes an angle of 45° with the plane of the reflecting surface and is situated in the horizontal plane passing through the centre of that surface. The impact must occur on the reflecting surface side.

6.1.3.2.2.6.2. Exterior mirrors

- Test 1: The point of impact shall be as defined in paragraph 6.1.3.2.2.3. or 6.1.3.2.2.4. The impact must be such that the hammer strikes the mirror on the reflecting surface side.
- Test 2: The point of impact shall be as defined in paragraph 6.1.3.2.2.3. or 6.1.3.2.2.4. The impact must be such that the hammer strikes the mirror on the side opposite to the reflecting surface.

Where Class II or III rear-view mirrors are fixed to the same mounting as Class IV rear-view mirrors, the **above-mentioned** tests shall be executed on the lower mirror. Nevertheless, the technical service responsible for testing may repeat one or both of these tests on the upper mirror if this is less than 2 m from the ground."

Paragraph 6.2.3.2., amend to read:

"6.2.3.2. The functionality shall be guaranteed under the circumstances of use in which the system shall be put into service. Depending on the technology used in obtaining images and presenting them paragraph 6.2.2.2. shall be entirely or partly **applicable**. In other cases this can be achieved by establishing and demonstrating by means of system sensitivity analogous to paragraph 6.2.2.2. that a function is ensured that is comparable to or better than what is required for and by demonstrating that a functionality is guaranteed that is equivalent or better than ~~the one~~ that **is** required for mirror- or camera-monitor type devices for indirect vision."

Paragraph 8.3., correct the word "procedureset" to read "**procedures set**".

Paragraph 9.2., correct the words "approval form" to read "**communication form**".

Paragraph 12.3.1., add a semicolon the end of the subparagraph.

Paragraph 12.3.3., correct the word "co-ordinates" to read "**coordinates**".

Paragraph 12.3.4., correct the words "type approval markings" to read "**type-approval markings**".

Paragraph 12.6., correct the words "Forward control" to read "**Forward control**" (underlined).

Paragraph 15.1.1., to amend to read:

"15.1.1. (reserved)."

Paragraph 15.1.4., amend to read:

"15.1.4. The fields of vision defined below shall be established using ambinocular vision, the eyes being at the 'driver's ocular points' as defined in paragraph 12.1. The fields of vision shall be determined when the vehicle is ~~in~~ unladen in the condition described in paragraph 12.5. They shall ~~[in case of mirrors]~~ be established through windows which have a total light transmission factor of at least 70 per cent measured normal to the surface."

Paragraph 15.2.1.1.1., amend to read:

"15.2.1.1.1. The fields of vision prescribed in paragraph 15.2.4. shall be obtained from the minimum number on mandatory mirrors set out in the following table. Where the presence of a mirror is not requested on a mandatory base, this means that no other system for indirect vision can be requested on a mandatory base."

Paragraph 15.2.1.1.2., correct the reference "paragraphs 15.2.4.5 and 15.2.4.6" to read "**paragraph 15.2.4.6**".

Paragraph 15.2.2.3., delete the word "tested".

Paragraph. 15.2.2.7., last sentence, amend to read:

"..... These mirrors shall not, however, be mounted on vehicles the cab height of which is such as to prevent compliance with this **requirement**. **In** this case **another** device for indirect vision is not requested."

Paragraph. 15.2.4.1., replace the words "20-m-wide" by "**20 m wide**"; in figure 3, amend the words "Drivers eye points" to read "**Driver's ocular** points" as well as the title of figure 3, correct to read "Field of **vision** of Class I mirror".

Paragraph 15.2.4.2.1., amend the words "5-m-wide" to read "**5 m wide**".

Paragraph 15.2.4.2.2., replace the words "5-m-wide" by "**5 m wide**"; in figure 4, amend the words "Drivers eye points" to read "**Driver's ocular** points" as well as the title of figure 4, correct to read "Field of **vision** of Class II mirrors".

Paragraph 15.2.4.3.2., replace the words "4-m-wide" by the words "**4 m wide**", correct the words "n addition" to read "**In** addition" and replace the words "a plane which is parallel" by "a plane parallel". In figure 5, amend the words "Drivers eye points" to read "**Driver's ocular** points", and the title of figure 5, correct to read "Field of **vision** of Class III mirrors".

Paragraph 15.2.4.4.1., replace the words "15-m-wide" by the words "**15 m wide**".

Paragraph 15.2.4.4.2., replace the words "15-m-wide" by the words "**15 m wide**"; in figure 6 amend the words "Drivers eye points" to read "**Driver's ocular points**".

Paragraph 15.2.4.5.5., amend the reference "Figure 7" to read "Figures **7a and 7b**"; correct the words "installation of a class V close" to read "installation of a **Class V** close". In figures 7a and 7b, amend the words "drivers' eye points" to read "**The driver's ocular points**", and in figure 7a, amend the word "Ground" to read "Ground **level**".

Paragraph 15.2.4.6.1., amend to read:

- "15.2.4.6.1. The field of vision must be such that the driver can see at least a flat horizontal portion of the road, which is bounded by:
- one traverse vertical plane through the outermost point of the front of the vehicle-cab,
 - one traverse vertical plane 2 000 mm in front of the vehicle,
 - one longitudinal vertical plane parallel to the longitudinal vertical median plane going though the outermost side of the vehicle at the driver's side **and**
 - one longitudinal vertical plane parallel to the longitudinal vertical median plane 2 000 mm outside the outermost side of the vehicle opposite to the driver's side.

The front of this field of

... characteristics regarding the **bodywork** cannot fulfil the requirements by ..."

Paragraph 15.2.4.6.1., in figure 8, amend the words "Drivers eye points" to read "**Driver's ocular points**".

Paragraph 15.2.4.6.2., amend "1.200 mm" to read "**1 200 mm**".

Paragraph 15.2.4.9., last sentence, correct the words "Other, equivalent, methods" to read "Other equivalent methods".

Paragraph 15.3.1., amend to read:

- "15.3.1. A device for indirect vision shall give such performances that **a** critical object can be observed within the described field of vision, **taking** into account the critical perception."

Paragraph 15.3.3., the words "and the verification of the functional requirements" should be deleted.

Paragraph 15.3.5., at the end of the paragraph, the colon should be replaced by a full stop.

Paragraph 15.3.5.1., amend to read:

- "15.3.5.1 The field of vision (figure 9) must be such that the driver can see at least a flat horizontal portion of the road, which is bounded by:

- a vertical plane aligned **on** the furthest rear point of the complete vehicle and perpendicular to the longitudinal vertical median plane of the vehicle;
- a vertical plane which is parallel to and positioned **2 000** mm to the rear of the previous plane (with respect to the rear of the vehicle);
- two longitudinal vertical planes defined at the outermost sides of the vehicle and which are parallel to the longitudinal vertical median plane of the vehicle."

Paragraph 15.3.5.2., in figure 9, the words "Ground level" and the related arrow should be deleted.

Paragraph 17.2., correct the word "manufacurered" to read "**manufactured**".

Paragraph 21.8., correct the reference "Regulation No. 10" to read "Regulation No. **46**".

Annex 1, heading, correct the words "A4 paper or in a folder" to read "A4 paper or **on** a folder".

Annex 1, item 9.2., correct the word "prescriptions" to read "**instructions**".

Annex 2, heading, correct the words "A4 paper or in a folder" to read "A4 paper or **on** a folder".

Annex 2, item 12.1.2.1., correct the word "prescriptions:." to read "**instructions:**".

Annex 4, appendix, item 4., correct the words "drivers' seating" to read "**driver's** seating".

Annex 6.

Paragraph 1.1.3., replace the reference to footnote 3/ by a reference to footnote 1/.

Paragraph 1.1.4., correct the word "equi-energy" to read "**equi energy**".

Paragraph 1.1.5., correct the words "of at least several candelas per square metre" to read "of at least several **cd/m²**".

Annex 7, heading, amend to read:

"PROCEDURE FOR DETERMINING THE RADIUS OF CURVATURE '**r**' OF THE
REFLECTING SURFACE OF A MIRROR"

Annex 10.

Heading and paragraph 1., amend to read:

"CALCULATION OF THE DETECTION DISTANCE

1. CAMERA MONITOR DEVICE FOR INDIRECT VISION"

Paragraph 1.2., amend the words "The manufacturer shall supply the values for H_m, N_m and D_m." to read "The manufacturer shall supply the values for H_m **and** N_m".

Paragraph 2., amend to read:

"2. SECONDARY FUNCTIONAL REQUIREMENTS

Based on the installation conditions, a determination shall be made to discover whether the entire device can still satisfy the functional requirements listed in paragraph 6.2.2. of this Regulation, especially the glare correction, the maximum and **the** minimum luminance of the monitor. It shall also be determined the degree to which the glare correction will be addressed and the angle at which sunlight can strike a monitor and **these shall be** compared to the corresponding measuring results from the system measurements. This can be based on **either** a CAD-generated model, a determination of the angles of light for the device when mounted on the relevant vehicle, or by carrying out relevant measurements on the relevant vehicle as described in paragraph 6.2.2.2. of this Regulation."

B. JUSTIFICATION

All amendments are corrections of typing errors or editorial or typographical corrections of the text in order to be in line with the final text of Directive 2003/97/EC. However the amendment of paragraph 15.1.1. is substantial.
