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Item 4(a) of the provisional agenda

**Awareness of the Proximity of Vulnerable Road Users:
UN Regulation No. 46 (Devices for indirect vision)****Proposal for the 06 of amendments to UN Regulation No. 46
(Devices for indirect vision)****Submitted by the expert from Germany on behalf of the Task Force on
UN Regulation No. 46 ***

The text reproduced below was prepared by the expert from Germany on behalf of the Task Force on UN Regulation No. 46 (TF UN-R 46). It based on GRSG.124-20-Rev.1, GRSG-125-24 and GRSG-125-30 distributed at the 124th and 125th sessions of the Working Party on General Safety Provisions (GRSG) and on the discussions, which took place during the meeting of the Task Force on UN-R 46 on May 4 and 5, 2023 held in-person and online in Cologne, Germany. Participants of the task force were experts from China, France, Germany, India, the Republic of Korea, The Netherlands, Sweden, European Association of Automotive Suppliers (CLEPA) and International Organization of Motor Vehicle Manufacturers (OICA). The modifications to the current text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

* In accordance with the programme of work of the Inland Transport Committee for 2023 as outlined in proposed programme budget for 2023 (A/77/6 (Sect. 20), table 20.6), 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

[Paragraph 2.1.1.3., amend to read:

"2.1.1.3. ~~"Surveillance mirror" means a mirror other than the ones defined in paragraph 2.1.1. above which can be fitted to the inside or outside of the vehicle in order to provide fields of vision other than those specified in paragraph 15.2.4. of this Regulation. deleted~~"]

Paragraph 2.2., amend to read:

"2.2. "Type of device for indirect vision" means devices that do not differ on the following essential characteristics:

- (a) Design of the device inclusive, ~~if pertinent,~~ the attachment to the bodywork **[in so far as it has an adverse effect on the performance of the device];**
- (b) In the case of mirrors, the class, the shape, the dimensions and radius of curvature of the mirror's reflecting surface;
- (c) In the case of camera-monitor systems, the class, the field of view, the magnification and resolution."

[Paragraph 2.3., amend to read:

"2.3. ~~"Surveillance camera monitor recording device" means a camera and either a monitor or recording equipment other than the camera monitor system defined in paragraph 2.1.2. above which can be fitted to the inside or outside of the vehicle in order to provide fields of vision other than those specified in paragraph 15.2.4. of this Regulation or to provide a security system within or around the vehicle. deleted~~"]

Paragraph 5.2., amend to read:

"5.2. An approval number shall be assigned to each **approved type in accordance with Schedule 4 of the Agreement (E/ECE/TRANS/505/Rev.3)**. ~~Its first two digits (at present 04) shall indicate the series of amendments incorporating the most recent major technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another type of device for indirect vision.~~

[Notwithstanding the provisions above a device for indirect vision capable of displaying more than one field of view shall be assigned by a single approval number.]"

Paragraph 6.1.1.2., amend to read:

"6.1.1.2. (a) Rear-view mirrors (Classes II to VII)

~~The edge of the reflecting surface shall be enclosed in a protective housing (holder, etc.) which, on its perimeter, shall have a value "c" greater than or equal to 2.5 mm at all points and in all directions.~~

When the edge of the reflecting surface is enclosed in a protective housing, the radius of curvature "c" on the housing's perimeter shall be not less than 2.5 mm at all points and in all directions, figure below (i).

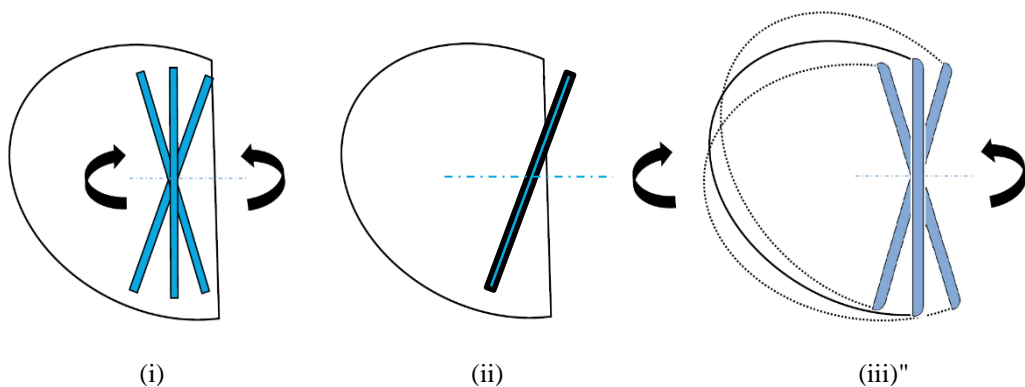
When ~~If~~ the reflecting surface projects beyond the protective housing **in any adjustment position (figure below (ii))**, the radius of curvature "c" on the edge of the projecting part shall be not less than 2.5 mm and the reflecting surface shall return into the protective housing under a force of 50 N applied to the point of greatest projection, relative to the protective housing, in a horizontal direction, approximately parallel to the longitudinal median plane of the vehicle.

When the edge of the reflecting surface is not enclosed by the protective housing independent from any adjustment position, the radius of curvature "c" on its perimeter shall be not less than 2.5 mm at all points and in all directions and shall apply to the edge of the projecting part, figure below (iii).

- (i) Edge of the reflecting surface enclosed in a protective housing
- (ii) Reflecting surface projects beyond the protective housing in a specific adjustment position
- (iii) Edge of the reflecting surface not enclosed by the protective housing

(b) Rear-view mirrors (Class I)

In cases where the edge of the reflecting surface is enclosed in a protective housing (holder, etc.), the radius of curvature "c" on its perimeter shall be not less than 2.5 mm at all points and in all directions. In cases, where the edge of the reflecting surface projects beyond the protective housing, this requirement shall apply to the edge of the projecting part.



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 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~~ **device for indirect vision** 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 6.3.2.,.., amend to read:

"6.3.2. Impact test

The test according to this paragraph is not to be carried out for devices integrated in the bodywork of the vehicle and providing a frontal deflecting area of an angle not more than 45° measured in relation to the longitudinal median plane of the vehicle, or devices not protruding more than 100 mm measured beyond the circumscribing bodywork of the vehicle according to Regulation No. 26.

The test is also not to be carried out in case of a camera of a Class I CMS, which is mounted on the roof of the vehicle.]"

[Paragraph 6.3.2.1.1., amend to read:

"6.3.2.1.1. The test rig consists of a pendulum capable of swinging about two horizontal axes at right angles to each other, one of which is perpendicular to the plane containing the "release" trajectory of the pendulum.

[The end of the pendulum comprises a hammer formed by a rigid sphere with a diameter of 165 ± 1 mm ~~having~~ **[including/excluding]** a 5 ± 1 mm thick rubber covering of Shore A hardness 50 **[to protect the rigid sphere [at the impact point]]**].

[The end of the pendulum comprises a hammer formed by a rigid sphere with a diameter of ~~165~~ **155** ± 1 mm **and** a 5 ± 1 mm thick rubber covering of Shore A hardness 50].

[The end of the pendulum comprises a hammer formed by a rigid sphere with a diameter of 165 ± 1 mm **and** a 5 ± 1 mm thick rubber covering of Shore A hardness 50.]

A device is provided which permits determination of the maximum angle assumed by the arm in the plane of release.

A support firmly fixed to the structure of the pendulum serves to hold the specimens in compliance with the impact requirements specified in paragraph ~~6.1.3.2.2.6.~~ **6.3.2.2.7.** below.

..."]

Paragraph 6.3.2.2.2.1., amend to read:

"6.3.2.2.2.1. Devices for indirect vision shall be positioned on the pendulum impact rig in such a way that the axes which are horizontal and vertical when the ~~mirror~~ **device for indirect vision** is installed on a vehicle in accordance with the applicant's mounting instructions are in a similar position;"

Paragraph 6.3.2.2.2., amend to read:

"6.3.2.2.2.2. When a device for indirect vision is adjustable with respect to the base, the test position shall be that in which any pivoting device is least likely to operate, within the limits of adjustment provided by the applicant. **[When the edge of the reflecting surface is not enclosed by the protective housing according to paragraph 6.1.1.2. (iii) the worst case test positions for both impact directions shall be identified by the Technical Service in consultation with the manufacturer];**"

Paragraph 6.3.2.2.5., amend to read:

"6.3.2.2.5. When, under the conditions governing adjustment laid down in paragraphs 6.3.2.2.1. and 6.3.2.2.2. above parts of the device for indirect vision limit the return of the hammer, the point of impact shall be displaced in a direction perpendicular to the axis of rotation or pivoting in question.

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

- (a) Either the sphere delimiting the hammer remains at least tangential to the cylinder as defined in paragraph 6.1.1.6.;
- (b) Or, in the case of mirrors, the point of contact with the hammer is located **on the reflecting surface** at least 10 mm from the periphery of the reflecting surface."

Paragraph 6.3.2.2.7.3., amend to read:

"6.3.2.2.7.3. Camera-Monitor Systems

- (a) Test 1: The point of impact shall be as defined in paragraphs 6.3.2.2.4. ~~or 6.3.2.2.5.~~ The impact shall be such that the hammer strikes the camera on the lens side.
- (b) Test 2: The point of impact shall be as defined in paragraphs 6.3.2.2.4. ~~or 6.3.2.2.5.~~ The impact shall be such that the hammer strikes the camera on the side opposite to the lens.

Where more than one camera is fixed to the same mounting, the above-mentioned tests shall be executed on the lower camera. Nevertheless, the Technical Service responsible for testing may repeat one or both of these tests on the upper camera if this is less than 2 m from the ground."

Insert new paragraphs 12.7. to 12.9., to read:

"12.7. "Centre-steered vehicle" means a vehicle that is steered from a central driving position."

12.8. "Central driving position" is defined when Y coordinate of the "R" point¹ is in Y₀ position within ±60 mm.

12.9. "Side-steered vehicle" means a vehicle which is not a centre-steered vehicle."

Paragraph 14.2., amend to read:

"14.2. An approval number shall be assigned to each **approved type in accordance with Schedule 4 of the Agreement (E/ECE/TRANS/505/Rev.3)**. ~~Its first two digits (at present 04) shall indicate the series of amendments incorporating the most recent or technical amendments made to the Regulation at the time of issue of the approval. The same Contracting Party shall not assign the same number to another vehicle type."~~

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

<i>Vehicle category</i>	<i>Rear-view Class I</i>	<i>Main rear-view Class II</i>	<i>Main rear-view Class III</i>	<i>Wide-angle view Class IV</i>	<i>Close-proximity view Class V</i>	<i>Front-view Class VI</i>
M ₁	Compulsory Unless the vehicle is fitted with anything other than safety glazing material in the field of vision prescribed in paragraph 15.2.4.1.	Optional	Compulsory 1 on the driver's side and 1 on the passenger's side Class II mirrors devices for indirect vision may be fitted as an alternative.	Optional 1 on the driver's side and/or 1 on the passenger's side	Optional 1 on the driver's side and 1 on the passenger's side (both shall be fitted at least 2 m above the ground)	Optional 1 device for indirect vision (a front mirror) shall be fitted at least 2 m above the ground)
M ₂	Optional (no requirements for the field of view)	Compulsory 1 on the driver's side and 1 on the passenger's side	Not permitted	Optional 1 on the driver's side and/or 1 on the passenger's side	Optional 1 on the driver's side and 1 on the passenger's side (both shall be fitted at least 2 m above the ground)	Optional 1 device for indirect vision (a front mirror) shall be fitted at least 2 m above the ground)
M ₃	Optional (no requirements for the field of view)	Compulsory 1 on the driver's side and 1 on the passenger's side	Not permitted	Optional 1 on the driver's side and/or 1 on the passenger's side	Optional 1 on the driver's side and 1 on the passenger's side (both shall be fitted at least 2 m above the ground)	Optional 1 device for indirect vision (a front mirror) shall be fitted at least 2 m above the ground)
N ₁	Compulsory Unless the vehicle is fitted with anything other than safety glazing material in the field of vision prescribed in paragraph 15.2.4.1.	Optional	Compulsory 1 on the driver's side and 1 on the passenger's side Class II mirrors devices for indirect vision may be fitted as an alternative.	Optional 1 on the driver's side and/or 1 on the passenger's side	Optional 1 on the driver's side and 1 on the passenger's side (both shall be fitted at least 2 m above the ground)	Optional 1 device for indirect vision (a front mirror) shall be fitted at least 2 m above the ground)

<i>Vehicle category</i>	<i>Rear-view Class I</i>	<i>Main rear-view Class II</i>	<i>Main rear-view Class III</i>	<i>Wide-angle view Class IV</i>	<i>Close-proximity view Class V</i>	<i>Front-view Class VI</i>
N ₂ ≤ 7.5 t	Optional (no requirements for the field of view)	Compulsory 1 on the driver's side and 1 on the passenger's side	Not permitted	Compulsory For both sides if a Class V mirror can be fitted Optional For both sides together if not In addition according to paragraphs 15.2.4.5.6. to 15.2.4.5.11. for vehicles with a mounting height of the Class V mirror of not less than 2.4 m (see paragraph 15.2.4.5.12.): the required field of vision (paragraphs 15.2.4.5.6. to 15.2.4.5.9.) may be viewed using a combination of direct view and indirect vision devices (of Classes IV, V, VI).	Compulsory (see paragraphs 15.2.2.7. and 15.2.4.5.5.) 1 on the passenger's side For centre-steered vehicles (see paragraphs 15.2.2.7. and 15.2.4.5.5.) on both sides Optional 1 on the driver's side (both shall be fitted at least 2 m above the ground). A tolerance of +10 cm may be applied In addition according to paragraphs 15.2.4.5.6. to 15.2.4.5.11. for vehicles with a mounting height of the Class V mirror of not less than 2.4 m (see paragraph 15.2.4.5.12.): the required field of vision (paragraphs 15.2.4.5.6. to 15.2.4.5.9.) may be viewed using a combination of direct view and indirect vision devices (of Classes IV, V, VI).	Optional 1 front mirror device for indirect vision (a front mirror shall be fitted at least 2 m above the ground) In addition according to paragraphs 15.2.4.5.6. to 15.2.4.5.11. for vehicles with a mounting height of the Class V mirror of not less than 2.4 m (see paragraph 15.2.4.5.12.): the required field of vision (paragraphs 15.2.4.5.6. to 15.2.4.5.9.) may be viewed using a combination of direct view and indirect vision devices (of Classes IV, V, VI).

<i>Vehicle category</i>	<i>Rear-view Class I</i>	<i>Main rear-view Class II</i>	<i>Main rear-view Class III</i>	<i>Wide-angle view Class IV</i>	<i>Close-proximity view Class V</i>	<i>Front-view Class VI</i>
N ₂ > 7.5 t	Optional (no requirements for the field of view)	Compulsory 1 on the driver's side and 1 on the passenger's side	Not permitted	Compulsory 1 on the driver's side and 1 on the passenger's side In addition according to paragraphs 15.2.4.5.6. to 15.2.4.5.11. for vehicles with a mounting height of the Class V mirror of not less than 2.4 m (see paragraph 15.2.4.5.12.): the required field of vision (paragraphs 15.2.4.5.6. to 15.2.4.5.9.) may be viewed using a combination of direct view and indirect vision devices (of Classes IV, V, VI).	Compulsory (see paragraph 15.2.2.7. and 15.2.4.5.5) 1 on the passenger's side For centre-steered vehicles (see paragraphs 15.2.2.7. and 15.2.4.5.5.) on both sides Optional 1 on Driver's side (both shall be fitted at least 2 m above the ground) In addition according to paragraphs 15.2.4.5.6. to 15.2.4.5.11. for vehicles with a mounting height of the Class V mirror of not less than 2.4 m (see paragraph 15.2.4.5.12.): the required field of vision (paragraphs 15.2.4.5.6. to 15.2.4.5.9.) may be viewed using a combination of direct view and indirect vision devices (of Classes IV, V, VI).	Compulsory (see paragraph 15.2.1.1.2 1 front mirror device for indirect vision (a front mirror shall be fitted at least 2 m above the ground) In addition according to paragraphs 15.2.4.5.6. to 15.2.4.5.11. for vehicles with a mounting height of the Class V mirror of not less than 2.4 m (see paragraph 15.2.4.5.12.): the required field of vision (paragraphs 15.2.4.5.6. to 15.2.4.5.9.) may be viewed using a combination of direct view and indirect vision devices (of Classes IV, V, VI).

<i>Vehicle category</i>	<i>Rear-view Class I</i>	<i>Main rear-view Class II</i>	<i>Main rear-view Class III</i>	<i>Wide-angle view Class IV</i>	<i>Close-proximity view Class V</i>	<i>Front-view Class VI</i>
N ₃	Optional (no requirements for the field of view)	Compulsory 1 on the driver's side and 1 on the passenger's side	Not permitted	Compulsory 1 on the driver's side and 1 on the passenger's side In addition according to paragraphs 15.2.4.5.6. to 15.2.4.5.11. for vehicles with a mounting height of the Class V mirror of not less than 2.4 m (see paragraph 15.2.4.5.12.): the required field of vision (paragraphs 15.2.4.5.6. to 15.2.4.5.9.) may be viewed using a combination of direct view and indirect vision devices (of Classes IV, V, VI).	Compulsory (see paragraph 15.2.2.7. and 15.2.4.5.5) 1 on the passenger's side For centre-steered vehicles (see paragraphs 15.2.2.7. and 15.2.4.5.5.) on both sides Optional 1 on driver's side (both shall be fitted at least 2 m above the ground) In addition according to paragraphs 15.2.4.5.6. to 15.2.4.5.11. for vehicles with a mounting height of the Class V mirror of not less than 2.4 m (see paragraph 15.2.4.5.12.): the required field of vision (paragraphs 15.2.4.5.6. to 15.2.4.5.9.) may be viewed using a combination of direct view and indirect vision devices (of Classes IV, V, VI).	Compulsory (see paragraph 15.2.1.1.2 1 front mirror device for indirect vision (a front mirror shall be fitted at least 2 m above the ground) In addition according to paragraphs 15.2.4.5.6. to 15.2.4.5.11. for vehicles with a mounting height of the Class V mirror of not less than 2.4 m (see paragraph 15.2.4.5.12.): the required field of vision (paragraphs 15.2.4.5.6. to 15.2.4.5.9.) may be viewed using a combination of direct view and indirect vision devices (of Classes IV, V, VI).

Paragraph 15.2.1.1.2., re-positioned after the tables and 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) **and if the camera-monitor system is [ready to operate (see paragraph 16.1.2.),]** and not used for other information. 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. Multiple images may be used or displayed provided that the monitor has been approved in this mode."

Paragraphs 15.2.1.1.3., remain unchanged and re-positioned after the tables

[*Paragraph 15.2.1.2.*, shall be deleted:

~~"15.2.1.2. The provisions of this Regulation do not apply to the surveillance mirrors defined in paragraph 2.1.1.3. Nevertheless, the exterior surveillance mirrors shall be mounted at least 2 m above the ground when the vehicle is under a load corresponding to its maximum technical permissible mass or shall be fully integrated in a housing including Class II or III mirror(s) which is (are) type approved to this Regulation."~~

Paragraph 15.2.2.6., amend to read:

"15.2.2.6. Where the lower edge of a Classes II to VII ~~mirror~~ **device for indirect vision** is less than 2 m above the ground when the vehicle is loaded to its technically permissible maximum laden mass, this ~~mirror~~ **device** shall not project more than 250 mm beyond the overall width of the vehicle measured without ~~mirrors~~ **these devices**."

[*Insert new paragraph 15.2.3.10.*, to read:

"**15.2.3.10. In case a pure camera-monitor system device (not a dual function CMS) is used as Class I for indirect vision, the monitor shall be located in a position close to the longitudinal centre plane of the vehicle and 30° [$\pm 5^\circ$] below the horizontal line going through the "driver's ocular points" as defined in paragraph 12.1.**"

Paragraph 15.2.3.2., amend to read:

"15.2.3.2. If a Class II, III, IV or VII mirror is fitted on the driver's side, it shall be capable of being adjusted from inside the vehicle while the door is closed, although the window may be open. The mirror may, however, be locked in position from the outside. **In case of a centre-steered vehicle this provision applies to mirrors on both sides.**"

Paragraph 15.2.4.5.12., amend to read:

"15.2.4.5.12. The field of vision prescribed in paragraphs 15.2.4.5.1. to 15.2.4.5.4. may be viewed using a combination of a close-proximity view device (Class V) and a wide-angle view device (Class IV).

In such cases the close-proximity view ~~mirror~~ **device for indirect vision** (Class V) shall provide at least 90 per cent of the field of vision prescribed in paragraphs 15.2.4.5.1 to 15.2.4.5.4. and the ~~Class IV mirror~~ **device for indirect vision (Class IV)** shall be adjusted in a way that it simultaneously provides the field of vision prescribed in paragraph 15.2.4.4.2."

Paragraph 15.2.4.6.1., amend to read:

"15.2.4.6.1. The field of vision shall be such that the driver can see at least a flat horizontal portion of the road, which is **for side-steered vehicles** bounded by:

- (a) A transverse vertical plane through the outermost point of the front of the vehicle;

- (b) a transverse vertical plane 2,000 mm in front of the plane defined in (a);
- (c) a longitudinal vertical plane parallel to the longitudinal vertical median plane going through the outermost side of the vehicle at the driver's side; ~~and~~
- (d) a 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; **and**
- (e) ~~The~~ **the** front of this field of vision opposite to the driver's side may be rounded off with a radius of 2,000 mm (see Figure ~~9~~ **9.1**).

The field of vision shall be such that the driver can see at least a flat horizontal portion of the road, which is for centre-steered vehicles bounded by:

- (f) **A transverse vertical plane through the outermost point of the front of the vehicle;**
- (g) **a transverse vertical plane 2,000 mm in front of the plane defined in (a);**
- (h) **a longitudinal vertical plane parallel to the longitudinal vertical median plane 2,000 mm outside the outermost side of both sides of the vehicle; and**
- (i) **the front of this field of vision on both sides may be rounded off with a radius of 2,000 mm (see Figure 9.2).**

For the defined field of vision, see also paragraph 15.2.4.9.2. below.

The provisions for Class VI front-view devices are compulsory for forward controlled (as defined in paragraph 12.5. of this Regulation) vehicles of categories $N_2 > 7.5$ t and N_3 .

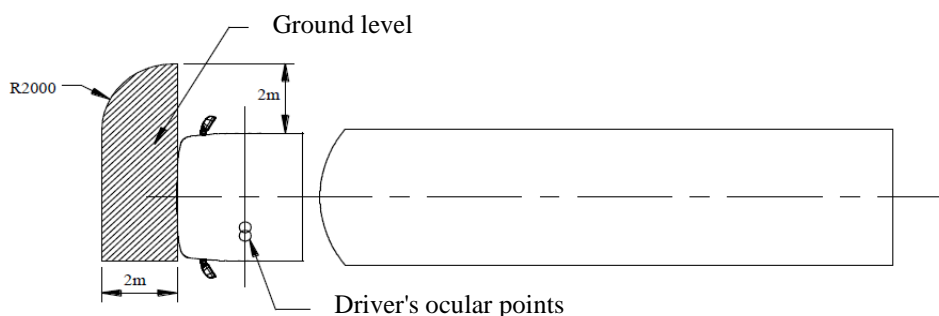
If vehicles of these categories cannot fulfil the requirements by using a front-view device, a vision support system shall be used. In the case of a vision support system this device shall be able to detect an object of 50 cm height and with a diameter of 30 cm within the field defined in Figure ~~9~~ **9.1 and Figure 9.2.**"

Figure 9, renumber as Figure 9.1. and amend to read:

"Figure 9

Figure 9.1

Class VI field of vision for side-steered vehicle"

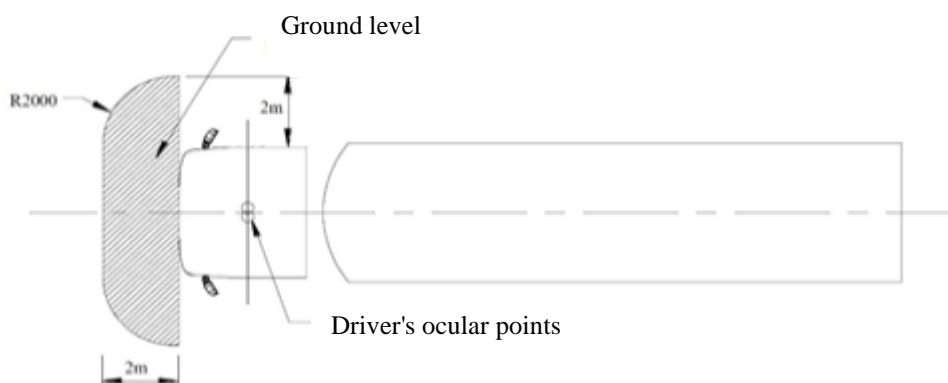


"

Insert a new figure 9.2., to read:

"Figure 9.2

Class VI field of vision for centre-steered vehicle"



"

Paragraph 15.2.4.6.2., amend to read:

"15.2.4.6.2. However, if the driver can see, taking into account the obstructions by the A-pillars, a straight line 300 mm in front of the vehicle at a height of 1,200 mm above the road surface and which is **in case of a side steered vehicle** situated between a longitudinal vertical plane parallel to the longitudinal vertical median plane going through the outermost side of the vehicle at the driver's side and a longitudinal vertical plane parallel to the longitudinal vertical median plane 900 mm outside the outermost side of the vehicle opposite to the driver's side **and for centre-steered vehicles a longitudinal vertical plane parallel to the longitudinal vertical median plane 900 mm outside the outermost side of the vehicle on both sides**, a Class VI device for indirect vision is not mandatory."

Paragraph 15.2.4.9.2., amend to read:

"15.2.4.9.2. Classes II, III, IV, V, and VI 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, outline marker lights, direction indicators and front and rear bumpers, as well as reflective-surface cleaning components, shall not be taken into account if they are responsible for a total obstruction of less than 10 per cent of the specified field of vision. In the case of a vehicle designed and constructed for special

purposes where, due to its special features, it is not possible to meet this requirement, the obstruction of the required field of vision of a Class VI ~~mirror~~ **device for indirect vision** caused by the special features may be more than 10 per cent but not more than necessary for its special function."

Paragraph 16.1.2., amend to read:

"16.1.2. Operating readiness (System availability)

Non-operation of the system (**e.g. CMS failure or CMS in a folded position on driver request**) shall be recognizable to the driver ~~and is (e.g. CMS failure indicated by, i.e. e.g.~~ warning indication, display information, absence of status indicator). The information for the driver shall be explained in the operator's manual."

Paragraph 16.1.3.1., amend to read:

"16.1.3.1. Magnification factor

The minimum and the average magnification factors of the CMS, in both horizontal and vertical directions shall not be lower than the magnification factors indicated below.

~~The minimum magnification factor shall not be less than:~~

- ~~(a) — for Class I: 0.31;~~
- ~~(b) — for Class II (driver's side): 0.26;~~
- ~~(c) — for Class III (driver's side): 0.29;~~
- ~~(d) — for Class IV (driver's side): 0.054;~~
- ~~(e) — for Class II (passenger's side): 0.13;~~
- ~~(f) — for Class III (passenger's side): 0.19;~~
- ~~(g) — for Class IV (passenger's side): 0.016.~~

~~The average magnification factor shall not be less than:~~

- ~~(h) — for Class I: 0.33;~~
- ~~(i) — for Class II (driver's side): 0.31;~~
- ~~(j) — for Class III (driver's side): 0.31;~~
- ~~(k) — for Class IV (driver's side): 0.091;~~
- ~~(l) — for Class II (passenger's side): 0.16;~~
- ~~(m) — for Class III (passenger's side): 0.20;~~
- ~~(n) — for Class IV (passenger's side): 0.046."~~

Insert new paragraphs 16.1.3.1.1. to 16.1.3.1.3., to read:

"16.1.3.1.1. The minimum magnification factor for side-steered vehicles of classes M and N shall not be less than:

- (a) For Class I: 0.31;**
- (b) For Class II (driver's side): 0.26;**
- (c) For Class III (driver's side): 0.29;**
- (d) For Class IV (driver's side): 0.054;**
- (e) For Class II (passenger's side): 0.13;**
- (f) For Class III (passenger's side): 0.19;**
- (g) For Class IV (passenger's side): 0.016.**

The average magnification factor for side-steered vehicles shall not be less than:

- (h) For Class I: 0.33;
- (i) For Class II (driver's side): 0.31;
- (j) For Class III (driver's side): 0.31;
- (k) For Class IV (driver's side): 0.091;
- (l) For Class II (passenger's side): 0.16;
- (m) For Class III (passenger's side): 0.20;
- (n) For Class IV (passenger's side): 0.046.

16.1.3.1.2. The minimum magnification factor for centre-steered vehicles of classes M₁ and N₁ shall not be less than:

- (a) For Class I: 0.31;
- (b) For Class II (driver centre): 0.26;
- (c) For Class III (driver centre): 0.29;
- (d) For Class IV (driver centre): 0.054.

The average magnification factor for centre-steered vehicles shall not be less than:

- (e) For Class I: 0.33;
- (f) For Class II (driver centre): 0.31;
- (g) For Class III (driver centre): 0.31;
- (h) For Class IV (driver centre): 0.046."

16.1.3.1.3. The minimum magnification factor for centre-steered vehicles of classes M₂, M₃, N₂ and N₃ shall not be less than:

- [(a) For Class I: 0.31;]
- (b) For Class II (driver centre): 0.22;
- (c) For Class IV (driver centre): 0.043.

The average magnification factor for centre-steered vehicles shall not be less than:

- [(d) For Class I: 0.33;]
- (e) For Class II (driver centre): 0.23;
- (f) For Class IV (driver centre): 0.068."

Paragraph 16.1.4., amend to read:

"16.1.4 Magnification aspect ratio

In the required field of view, the difference between the average magnification factor for horizontal and vertical direction of a CMS shall satisfy the following equations depending on the individual ~~mirror~~ classes.

..."

[Paragraph 16.2.5., shall be deleted:

~~"16.2.5. The provisions of this Regulation do not apply to the surveillance camera-monitor recording devices defined in paragraph 2.3. of this Regulation. Exterior surveillance cameras either shall be mounted at least 2 m above the ground when the vehicle is under a load corresponding to its maximum technical permissible mass, or, if their lower edge is less than 2 m from the ground, shall not project more than 50 mm beyond the overall width of the vehicle measured without this device and have a radii of curvature of not less than 2.5 mm."~~

Insert new paragraphs 22.26. to 22.33., to read:

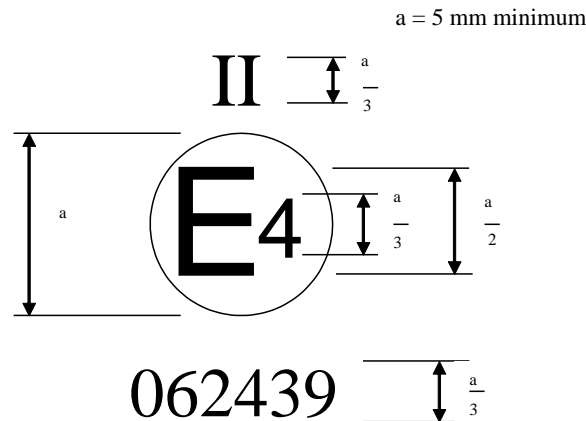
- "22.26. As from the official date of entry into force of the 06 series of amendments, no Contracting Party applying this Regulation shall refuse to grant or refuse to accept type approvals under this Regulation as amended by the 06 series of amendments.**
- 22.27. As from 1 September [202X], Contracting Parties applying this Regulation shall not be obliged to accept type approvals to the preceding series of amendments, first issued after 1 September [202X].**
- 22.28. Until 1 September [202Y], Contracting Parties applying this Regulation shall accept type approvals to the preceding series of amendments, first issued before 1 September [202X].**
- 22.29. As from 1 September [202Y], Contracting Parties applying this Regulation shall not be obliged to accept type approvals issued to the preceding series of amendments to this Regulation.**
- 22.30. Notwithstanding paragraph 22.29., Contracting Parties applying this Regulation shall continue to accept type approvals of devices for indirect vision other than CMS issued according to the preceding series of amendments to this Regulation.**
- 22.31. Notwithstanding paragraph 22.29., Contracting Parties applying this Regulation shall continue to accept type approvals issued according to the preceding series of amendments to this Regulation, for the vehicles and CMS which are not affected by the changes introduced by the 06 series of amendments.**
- 22.32. Contracting Parties applying this Regulation may grant type approvals according to any preceding series of amendments to this Regulation.**
- 22.33. 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 062439. The first two digits of the approval number indicate that Regulation No. 46 already included the 06 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

1. The Task Force considered several items regarding UN Regulation No. 46 based on already introduced documents:

- (a) Proposal by the Republic of Korea to clarify the diameter of the impact test rig, document GRSG-125-24. This issue is handled in paragraph 6.3.2.1.1.
- (b) Proposal by OICA to introduce centre-steered vehicles and corresponding magnification factors, document ECE/TRANS/WP.29/GRSG/2023/9. This proposal was amended by the Task Force to also cover M₁ and N₁ vehicle categories.
- (c) Proposal by OICA to introduce frameless outside mirrors, document ECE/TRANS/WP.29/GRSG/2023/16 as amended by GRSG-125-03-Rev.1. Additionally, the test procedure was clarified by amending paragraph 6.3.2.2.2.2. The Technical Service shall identify in consultation with the manufacturer the test positions for both directions.
- (d) Proposal by OICA to clarify the possibility of having foldable camera wings, document GRSG-125-30.

2. Furthermore, several other topics were brought to the attention of the experts and the proposal was amended accordingly:

- (a) Impact Test for Class I Camera Monitoring system (CMS) on the vehicle's roof. The test is seen as unnecessary because a contact is seen as very unlikely. Paragraph 6.3.2. was amended accordingly.
 - (b) Pendulum Test Position. The procedure to displace the impact location in case of mirrors was unclear as it was only stating to move the impact point at least 10 mm from the periphery of the reflecting surface. This could lead to impact positions on the housing. The experts agreed that this is not in line with the intention of the Regulation. Hence, paragraph 6.3.2.2.5. was amended in sake of further clarification.
 - (c) The provisions for surveillance cameras shall be deleted as it is already stated that UN Regulation No. 46 do not cover this kind of cameras. Nevertheless, requirements for the radius of curvature were also introduced by UN Regulation No. 46. The provisions will be moved to UN Regulation No. 25 (M1 vehicles) and No. 61 (N vehicles), which are dealing with external projections (except for devices for indirect vision approved to UN Regulation No. 46).
 - (d) On several occasions a reference to "mirror" was found. This shall be amended to refer to "device for indirect vision" to have the same provisions for camera monitor systems.
 - (e) It shall be sufficient to have only one approval number for devices for indirect vision, which are capable to display more than one field of vision. According to paragraph 5.4.3. it is already foreseen to have one device for multiple fields of views: 5.4.3.Additional symbol(s) I or II or/and III or/and IV or/and V or/and VI or/and VII, 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".
 - (f) The positioning of the monitor of a pure Class I CMS (not a dual function CMS) shall also consider people wearing bi-focal glasses. The area for near vision is usually at the bottom of the glasses. A monitor position similar to a Class I mirror would be inconvenient for these drivers and therefore probably in conflict with paragraphs 16.1.5. and 16.1.7. A new paragraph 15.2.3.10. is proposed to cope with this situation.
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