

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

Note: The text reproduced below was prepared by the experts from Germany in order to permit the use of a camera monitor systems instead of all compulsory and optional mirrors, set out in the table under paragraph 15.2.1.1.1., intended to be installed on motor vehicles. New text is given in **bold**, while deleted text is ~~crossed out~~.

A. PROPOSAL

Amend paragraph 2.1.1.12. to read:

2.1.1.12 “Class of ~~mirror~~ **device for indirect vision**” means all devices having one or more common characteristics or functions. They are classified as follows:

Amend paragraph 2.1.4. to read:

2.1.4 “Type of device for indirect vision” means devices that do not differ on the following essential characteristics:

- design of the device inclusive, if pertinent, the attachment to the bodywork;
- in case of mirrors the class, the shape, the dimensions and radius of curvature of the mirror's reflecting surface;
- in case of camera-monitor devices **the class** ~~the detection distance~~ and the range of vision.

Amend paragraph 3.3.2. to read:

3.3.2. in case of ~~other~~ devices for indirect vision **other than mirrors**: one sample of all ~~the~~ **these** parts.

Amend paragraph 4.2. to read:

4.2. Every device **for indirect vision** shall possess ~~on its protective housing~~ a space large enough to accommodate the approval mark, which must be legible when the device has been mounted on the vehicle; this space shall be shown on the drawings referred to in Annex 1.

Amend paragraph 5.4.3. to read:

5.4.3. ~~An additional symbol I or II or III or IV or V or VI, specifying the class to which the type of mirror belongs or the symbol S in case of any device for indirect vision other than a mirror. The additional symbol shall be placed in any convenient position in the vicinity of the circle containing the letter “E”.~~

Additional symbol(s) I or/and II or/and III or/and IV or/and V or/and VI, specifying the class to which the type of for indirect vision belongs.

Amend paragraph 15.1.2.. to read:

- 15.1.2. ~~Mirrors and other~~ devices for indirect vision must be fitted in such a way that the mirror or other device does not move so as significantly to change the field of vision as measured or vibrate to an extent which would cause the driver to misinterpret the nature of the image perceived.

Amend paragraph 15.2. to read:

15.2. ~~MIRRORS~~ **DEVICES FOR INDIRECT VISION**

Amend paragraph 15.2.1.1.2. to read:

- 15.2.1.1.2. In case the described field of vision of a ~~front-mirror prescribed in paragraph 15.2.4.6. and/or a close proximity mirror described in paragraph 15.2.4.5~~ can be obtained by another device for indirect vision that is approved according to paragraph 6.2. and that is installed according to paragraph 15., this device can be used instead of the relevant mirror or mirrors.

In case a camera/monitor device is used **to replace mirrors prescribed in paragraph 15.2.4.5 and 15.2.4.6.**, the monitor must exclusively show:

- (a) the field of vision prescribed in paragraph 15.2.4.5. when the close proximity mirror has been substituted,
- (b) the field of vision prescribed in paragraph 15.2.4.6. when the front mirror has been substituted while the vehicle is moving forward with a speed up to 30 km/h, or
- (c) simultaneously the fields of vision prescribed in paragraphs 15.2.4.5. and 15.2.4.6. when the close proximity mirror and the front mirror have been substituted. In the case of the vehicle is moving forward at a higher speed

Amend paragraph 15.2.2.1. to read:

- 15.2.2.1. ~~Mirrors~~ **Devices for indirect vision** must be so placed that the driver, when sitting on the driving seat in a normal driving position, has a clear view of the road to the rear, side(s) or front of the vehicle.

Amend paragraph 15.2.2.3. to read:

- 15.2.2.3. In the case of any vehicle, which is in chassis/cab form when the field of vision is measured, the minimum and maximum body widths shall be stated by the manufacturer and, if necessary, simulated by dummy headboards. All vehicles and ~~mirror~~ **devices for indirect vision** configurations taken into consideration during

the tests shall be shown on the type-approval certificate for a vehicle with regard to the installation of **mirrors devices for indirect vision** (see Annex 4).

Amend paragraph 15.2.2.4. to read:

15.2.2.4. The prescribed exterior ~~mirror~~ **device for indirect vision** on the driver's side of the vehicle must be so located that an angle of not more than 55° is formed between the vertical longitudinal median plane of the vehicle and the vertical plane passing through the centre of the mirror/**image** and through the centre of the straight line 65 mm long which joins the driver's two ocular points

Amend paragraph 15.2.2.5. to read:

15.2.2.5. ~~Mirrors~~ **Devices for indirect vision** must not project beyond the external bodywork of the vehicle substantially more than is necessary to comply with the requirements concerning fields of vision laid down in paragraph 15.2.4.

Amend paragraph 15.2.4.1. to read:

15.2.4.1. ~~Interior rear view mirror~~ **device for indirect vision of Class I**

Amend paragraph 15.2.4.2. to read:

15.2.4.2. ~~Main exterior rear view mirrors~~ **devices for indirect vision of Class II**

Amend paragraph 15.2.4.2.1. to read:

15.2.4.2.1. ~~Exterior rear view mirror~~ **device for indirect vision** on the driver's side

Amend paragraph 15.2.4.2.2. to read:

15.2.4.2.2. ~~Exterior rear view mirror~~ **device for indirect vision** on the passenger's side

Amend paragraph 15.2.4.3.. to read:

15.2.4.3. ~~Main exterior rear view mirrors~~ **devices for indirect vision Class III**

Amend paragraph 15.2.4.3.1. to read:

15.2.4.3.1. ~~Exterior rear view mirror~~ **device for indirect vision** on the driver's side

Amend paragraph 15.2.4.3.2. to read:

15.2.4.3.2. ~~Exterior rear view mirror~~ **device for indirect vision** on the passenger's side

Amend paragraph 15.2.4.4. to read:

15.2.4.4. ~~“Wide-angle” exterior mirror~~ **device for indirect vision** (Class IV)

Amend paragraph 15.2.4.4.1. to read:

15.2.4.4.1. ~~“Wide-angle” exterior mirror~~ **device for indirect vision** on the driver’s side

Amend paragraph 15.2.4.4.2. to read:

15.2.4.4.2. ~~“Wide-angle” exterior mirror~~ **device for indirect vision** on the passenger’s side

Amend paragraph 15.2.4.5. to read:

15.2.4.5. ~~“Close proximity” exterior mirror~~ **device for indirect vision** (Class V)

Amend paragraph 15.2.4.5.5. to read:

15.2.4.5.5. In case the field of vision described in Figures 7a and 7b can be perceived through the combination of the field of vision from a Class IV ~~wide-angle mirror~~ **device for indirect vision** and that of a Class VI ~~front mirror~~ **device for indirect vision**, the installation of a Class V ~~close proximity mirror~~ **device for indirect vision** is not compulsory.

Amend paragraph 15.2.4.6. to read:

15.2.4.6. ~~“Front” mirror~~ **device for indirect vision** (Class VI)

Amend paragraph 15.2.4.6.1. 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:

- (a) one traverse vertical plane through the outermost point of the front of the vehicle,
- (b) one traverse vertical plane 2 000 mm in front of the plane defined in (a),
- (c) one 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) 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 vision opposite to the driver's side may be rounded off with a radius of 2 000 mm (see figure 8)".
For the defined field of vision, see also paragraph 15.2.4.8.2.

The provisions for **devices Class VI front mirrors** are compulsory for forward controlled (as defined in paragraph 12.5.) vehicles of categories N2 > 7.5 t and N3.

If vehicles of these categories cannot fulfil the requirements by using a front mirror or a ~~camera/monitor~~ device **for indirect vision**, a vision support system shall be used. In the case of a vision support system this device must be able to detect an object of 50 cm height and with a diameter of 30 cm within the field defined in figure 8.

Amend paragraph 15.2.4.6.2. 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 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, a ~~front mirror~~ **device for indirect vision** of Class VI is not mandatory.

Amend paragraph 15.2.4.8.1. to read:

- 15.2.4.8.1. ~~Interior rear view mirror~~ **device for indirect vision** (Class I)

Amend paragraph 15.2.4.8.2. to read:

- 15.2.4.8.2. Exterior ~~mirrors~~ **devices for indirect vision**(Classes II, III, IV, V and VI)
In the fields of vision specified above, obstruction due to the bodywork and its components, such as other cab mirrors, 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.

Amend paragraph 15.3.4. to read:

- 15.3.4. Installation requirements for the monitor
The viewing direction of the monitor shall roughly be the same direction as the one for the ~~main~~ adequate mirror.

Amend paragraph 15.3.5. to read:

- 15.3.5. Vehicles of category **M and N M2 and M3** and ~~complete or completed vehicles of categories N2 > 7.5 t and N3~~ having a special bodywork for refuse **collection** may

be equipped on the rear part of their bodywork with a device for indirect vision other than a mirror in order to ensure the following field of vision.

B. JUSTIFICATION

Germany would like to permit the use of a camera monitor systems instead of all compulsory and optional mirrors, set out in the table under paragraph 15.2.1.1.1., intended to be installed on motor vehicles to use the safety and environmental benefits of this technology as there are:

- no obstructions
- no adjustment
- reduced CO₂-emission
- wider field of view
- free of pollution
- night vision
- integrated advanced driver assistant systems (lane departure warning)

As it is mentioned in Informal Document GRSG-94-XX, Germany is of the opinion, that the current procedure and requirements for the assessment of camera-monitor devices belongs to the standardization processes on international level. Our proposal is to address this standardization items to the responsible standardization committees like ISO TC 22/SC 13/ WG8, that is also in charge for ISO 15008 and ISO TC159/SC4/WG2 (Human factors engineering-Visual display requirements). ISO 15008 is addressing the requirements for visual information presentation in vehicles. It should be extended to the requirements and measurement methods for camera-monitor devices and their applications. Future regulations for camera-monitor devices should refer to these standards as usually practiced.
