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AMENDMENTS TO OTHER REGULATIONS UNDER THE 1958 AGREEMENT

Regulation No. 46 (Devices for indirect vision)

Proposal for draft amendments to Regulation No. 46

Submitted by the expert from the International Motorcycle Manufacturers Association

The text reproduced below was prepared by the expert from the International Motorcycle Manufacturers Association (IMMA) to be inserted into the Regulation requirements for Class VII mirrors, intended for L category vehicles, along with provisions for installation of rear-view mirrors on L category vehicles fitted with bodywork. The modifications to the current text of the Regulation are marked in **bold** characters.

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

A. PROPOSAL

Text of the Regulation,

Paragraph 1.1. and the corresponding footnote 1/, amend to read:

"1.1. to devices for indirect vision intended to be installed on motor vehicles of categories L, M and N 1/ and to all other motor vehicles having less than four wheels fitted with bodywork which partly or wholly encloses the driver and,

1/ As defined in Annex 7 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), (document TRANS/WP.29/78/Rev.1/Amend.2 as last amended by Amend.4)."

Paragraph 1.2.1., amend to read:

"1.2.1. motor vehicles of categories L, M and N;"

Paragraphs 2.1.1.1. and 2.1.1.2., amend to read:

"2.1.1.1. "Interior or inside mirror" means a device as defined in paragraph 2.1., which can be fitted in the passenger compartment of a vehicle.

2.1.1.2. "Exterior or outside mirror" means a device as defined in paragraph 2.1., which can be mounted on the external surface of a vehicle."

Paragraph 2.1.1.5., amend to read:

"2.1.1.5. "The principal (or main) radii of curvature at one point on the reflecting surface ( $r_j$ )" means the values obtained .... "

Paragraph 2.1.1.12., amend to read:

"2.1.1.12. "Class of mirror" means all devices having one or more common characteristics or functions. They are classified as follows:

(a) Class I: "Interior rear-view mirror", giving the field of vision defined in paragraph 15.2.4.1.

....

(e) Class VI: "Front mirror", giving the field of vision defined in paragraph 15.2.4.6.

(f) **Class VII: Mirrors intended for L category vehicles."**

Paragraph 5.4.1., footnote 3/, amend to read:

"3/ 1 for Germany, .... 10 for **Serbia**, .... , 47 for **Republic** of South Africa, .... , 50 for Malta, 51 for the Republic of Korea, **52 for Malaysia and 53 for Thailand.** Subsequent numbers shall be assigned .... "

Paragraph 5.4.3., amend to read:

"5.4.3. An additional symbol I or II or III or IV or V or VI or VII, specifying the class to which .... "

Insert new paragraphs 6.1.2.1.6. to 6.1.2.1.6.2., to read:

**"6.1.2.1.6. Mirrors for category L vehicles (Class VII)**

**6.1.2.1.6.1. Inside mirrors (Class I)**

**The mirror shall satisfy the requirements laid down in paragraph 6.1.2.1.1.**

**6.1.2.1.6.2. Main outside mirrors (Class VII)**

**The minimum dimensions of the reflecting surface shall be such that:**

- (a) its area shall not be less than 6,900 mm<sup>2</sup>;
- (b) the diameter of circular mirrors shall not be less than 94 mm;
- (c) where rear-view mirrors are not circular, their dimensions shall enable a 78 mm diameter circle to be prescribed on their reflecting surface.

**The maximum dimensions of the reflecting surface shall be such that:**

- (a) the diameter of any circular rear-view mirror shall not be greater than 150 mm;
- (b) the reflecting surface of any non-circular rear-view mirror shall lie within a rectangle measuring 120 mm x 200 mm."

Paragraph 6.1.2.2., amend to read:

"6.1.2.2. Reflecting surface and coefficients of reflection for mirrors of Classes I to VI"

Insert new paragraphs 6.1.2.3. to 6.1.2.3.5., to read:

**"6.1.2.3. Reflecting surface and coefficients of reflection for Class VII mirrors**

**6.1.2.3.1. The reflecting surface of a mirror shall be spherically convex.**

**6.1.2.3.2. The 'r' value shall not be less than 1,200 mm in the case of inside mirrors (Class I).**

**6.1.2.3.3. The average 'r' of the radius of curvature measured at the reflecting surface shall not be less than 1,000 mm or more than 1,500 mm in the case of Class VII mirrors.**

**6.1.2.3.4. The value of the coefficient of regular reflection determined in accordance with the method described in Annex 6 shall not be less than 40 per cent. If the reflecting surface is of the dipping type (with "day" and "night"**

positions) it must, in its "day" position, enable the colours of road traffic signs to be recognized. The value of the coefficient of regular reflection in the "night" position shall not be less than four per cent.

**6.1.2.3.5.** The reflecting surface shall retain the characteristics laid down in paragraph 6.1.2.2.5, even after prolonged exposure to bad weather under normal conditions of use."

Paragraph 6.1.3.1., amend to read:

"6.1.3.1. Mirrors **in Classes I to VI** shall be subjected to the tests described in paragraph 6.1.3.2. **and, in case of Class VII mirrors, to the tests described in paragraph 6.1.3.2.3.**"

Insert new paragraphs 6.1.3.3. to 6.1.3.3.2., to read (including the insertion of references to a new Figure 1a and a new Figure 1a):

**6.1.3.3. Bending test on the protective housing attached to the stem (Class VII)**

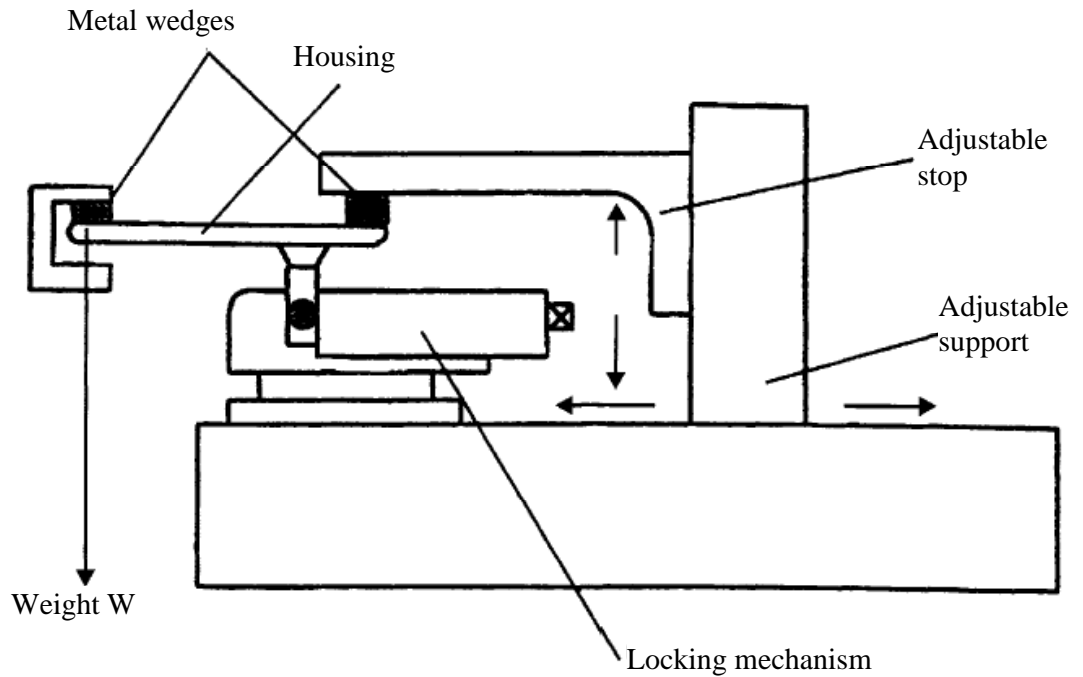
**6.1.3.3.1. Description of test**

The protective housing is placed horizontally in a device in such a way that it is possible to lock the attachment support adjusters firmly. In the direction of the largest dimension of the housing, the end closest to the point of attachment on the adjuster for the support shall be immobilized by a 15 mm-wide rigid stop covering the entire width of the housing.

At the other end, a stop identical to the one described above is placed on the housing so that the specified test load can be applied to it (Figure 1a).

The end of the housing opposite to that where the force is exerted may be locked rather than held in position as shown in Figure 1a.

**6.1.3.3.2.** The test loading shall be 25 kilograms and shall be maintained for one minute.



**Figure 1a: Example of rear-view mirror bending-test rig"**

Paragraphs 6.1.3.3. and 6.1.3.3.1. (former), renumber as paragraphs 6.1.3.4. and 6.1.3.4.1.

Paragraph 6.1.3.3.1.1. (former), renumber as paragraph 6.1.3.4.1.1. and amend to read:

"**6.1.3.4.1.1.** This requirement is not applicable to mirrors stuck to the windscreen, in respect of which the requirement stipulated in paragraph 6.1.3.4.2. shall apply after the test."

Paragraphs 6.1.3.3.1.2. to 6.1.3.3.3.2. (former), renumber as paragraphs 6.1.3.4.1.2. to 6.1.3.4.3.2.

Paragraph 12.3.3., amend to read:

"12.3.3. The coordinates of point R (**where applicable**);"

Paragraph 12.4., amend to read:

"12.4. "Vehicles of categories L, M<sub>1</sub>, M<sub>2</sub>, M<sub>3</sub>, N<sub>1</sub>, N<sub>2</sub> and N<sub>3</sub>" means those defined in **Annex 7 to the Consolidated Resolution on the Construction of Vehicles (R.E.3), (document TRANS/WP.29/78/Rev.1/Amend.2 as last amended by Amend.4).**"

Insert new paragraphs 15.1.5. to 15.1.5.7., to read:

**"15.1.5. Prescriptions applicable to Class VII rear-view mirrors**

**15.1.5.1. All mirrors shall be adjustable.**

**15.1.5.2. The outer edges of the reflecting surface shall be encased in a protective housing (cup, etc.) which, throughout its perimeter, shall at all points and in all directions have a 'c' value of not less than 2.5 millimetres. If the reflecting surface protrudes beyond the protective housing, the radius of curvature 'c' on the perimeter protruding beyond the protective casing shall be not less than 2.5 mm and the reflecting surface shall retract into the protective housing under a force of 50 N applied to the most protruding point in relation to the protective housing in a horizontal direction approximately parallel to the median longitudinal plane of the vehicle.**

**15.1.5.3. With the rear-view mirror mounted on a flat surface, all of its parts in all positions of adjustment of the device and all of the parts remaining attached to the supporting base after the test provided for in paragraph 6.1.3.2., which are likely to be struck, under static conditions, by a sphere which is either 165 mm in diameter in the case of inside rear-view mirrors or 100 mm in diameter in the case of outside rear-view mirrors, shall have a radius of curvature 'c' of at least 2.5 mm.**

**15.1.5.4. The edges of the attachment holes or clearances, the largest diagonal diameter of which is less than 12 mm, are not required to meet the radius criteria laid down in paragraph 15.1.5.3., provided that they have been rounded off.**

**15.1.5.5. The device used to attach a rear-view mirror to a vehicle shall be designed in such a way that a cylinder 50 mm in radius, the axis of which is one of the swivel or rotation axes enabling the rear-view mirrors as a whole to swing back in the direction under consideration in the event of impact, shall at least partly intersect the surface to which the device is attached.**

**15.1.5.6. The parts of the outside mirrors referred to in paragraphs 15.1.5.2. and 15.1.5.3. of which the Shore A-hardness does not exceed 60 shall be exempted from the corresponding requirements.**

**15.1.5.7. Parts of inside mirrors having a Shore A-hardness of less than 50 and which are attached to rigid supports shall not be subject to the provisions of paragraphs 15.1.5.2. and 15.1.5.3., save in respect of those supports."**

Paragraph 15.2., amend to read:

**"15.2. MIRRORS FOR CATEGORY M AND N VEHICLES"**

Insert new paragraphs 15.3. to 15.3.4.3.2., to read (including the insertion of references to new Figures 8a and 8b and new Figures 8a and 8b):

**"15.3. MIRRORS FOR CATEGORY L VEHICLES**

**15.3.1. Position**

**15.3.1.1. All rear-view mirrors shall be attached in such a way that they remain in a stable position under normal vehicle driving conditions.**

**15.3.1.2. Rear-view mirrors 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 and side(s) of the vehicle.**

**15.3.1.3. Exterior rear-view mirrors shall be visible through the side window or through the portion of the windscreen, which is swept by the windscreen wiper.**

**15.3.1.4. 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 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 (see Annex 4).**

**15.3.1.5. The prescribed exterior rear-view mirror 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 rear-view mirror and through the centre of the straight line 65 mm long which joins the driver's two ocular points.**

**15.3.1.6. Rear-view mirrors 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 15.3.4.**

**15.3.1.7. Where the lower edge of an exterior rear-view mirror is less than two meters above the ground when the vehicle is loaded to its maximum permissible all-up weight, this rear-view mirror must not project more than 0.20 m beyond the overall width of the vehicle measured without rear-view mirrors.**

**15.3.1.8. Subject to the requirements of paragraphs 15.3.1.6. and 15.3.1.7., rear-view mirrors may project beyond the permissible maximum widths of vehicles.**

**15.3.2. Number**

**15.3.2.1. Minimum number of rear-view mirrors required for bodied vehicles**

Category of vehicle	Inside mirror (Class I)	Main outside mirror(s) (Class VII)
Three-wheel mopeds (including light quadricycles) and tricycles	one <u>1/</u>	one, if there is an inside mirror; two, if there is not an inside mirror
<u>1/</u> No inside rear-view mirror is required if the visibility conditions referred to in paragraph 15.3.4.1. below cannot be met. In this case, two outside rear-view mirrors are required, one on the left and one on the right hand side of the vehicle.		

**15.3.2.2.** Where a single outside rear-view mirror is fitted, this shall be located on the left hand side of the vehicle in those countries where the traffic drives on the right and on the right hand side of the vehicle in those countries where the traffic drives on the left.

**15.3.2.3.** Class I and III rear-view mirrors are also acceptable for mopeds, motorcycles and tricycles.

**15.3.2.4.** Maximum number of optional rear-view mirrors

**15.3.2.4.1.** The fitting of an outside rear-view mirror on the side of bodied vehicles opposite to that of the mandatory rear-view mirror referred to in paragraph 15.3.2.1. is permissible. The rear-view mirror shall meet the requirements of this Regulation.

**15.3.3.** Adjustment

**15.3.3.1.** Drivers shall be able to adjust rear-view mirrors from their driving position. In the case of three-wheel vehicles having bodywork, the mirror may be adjusted with the door closed but the window may be open. However, the mirror may in any case be locked in position from the outside.

**15.3.3.2.** Rear-view mirrors, which can be restored to their original position without adjustment after being pushed backwards, are not subject to the requirements of paragraph 15.3.3.1.

**15.3.4.** Field of vision in the case of bodywork

**15.3.4.1.** Inside rear-view mirror

**Interior rear-view mirror (Class I)**

The field of vision must be such that the driver can see at least a 20 m wide, flat, horizontal portion of the road centred on the vertical longitudinal median plane of the vehicle and extending from 60 m behind the driver's ocular points (Figure 8a) to the horizon.



**15.3.4.2. Main exterior rear-view mirror (Classes III and VII)**

**15.3.4.2.1. Left-hand exterior rear-view mirror for vehicles driven on the right of the road and right-hand exterior rear-view mirror for vehicles driven on the left of the road.**

The field of vision must be such that the driver can see at least a 2.50 m wide, flat, horizontal portion of the road, which is bounded on the right (in the case of vehicles driven on the right), or on the left (in the case of vehicles driven on the left) by the plane which is parallel to the median longitudinal vertical plane passing through the outermost point of the vehicle on the left (in the case of vehicles driven on the right), or on the right (in the case of vehicles driven on the left) and extends from 10 m behind the driver's ocular points to the horizon (Figure 8b).

**15.3.4.2.2. Right-hand exterior rear-view mirror for vehicles driven on the right and left-hand exterior rear-view mirror for vehicles driven on the left.**

The field of vision must be such that the driver can see at least a 4 m wide, flat, horizontal portion of the road which is bounded on the left (in the case of vehicles driven on the right), or on the right (in the case of vehicles driven on the left) by a plane parallel to the median longitudinal vertical plane passing through the outermost point of the vehicle on the right (in the case of vehicles driven on the right) or on the left (in the case of vehicles driven on the left) and which extends from 20 m behind the driver's ocular points to the horizon (Figure 8b).

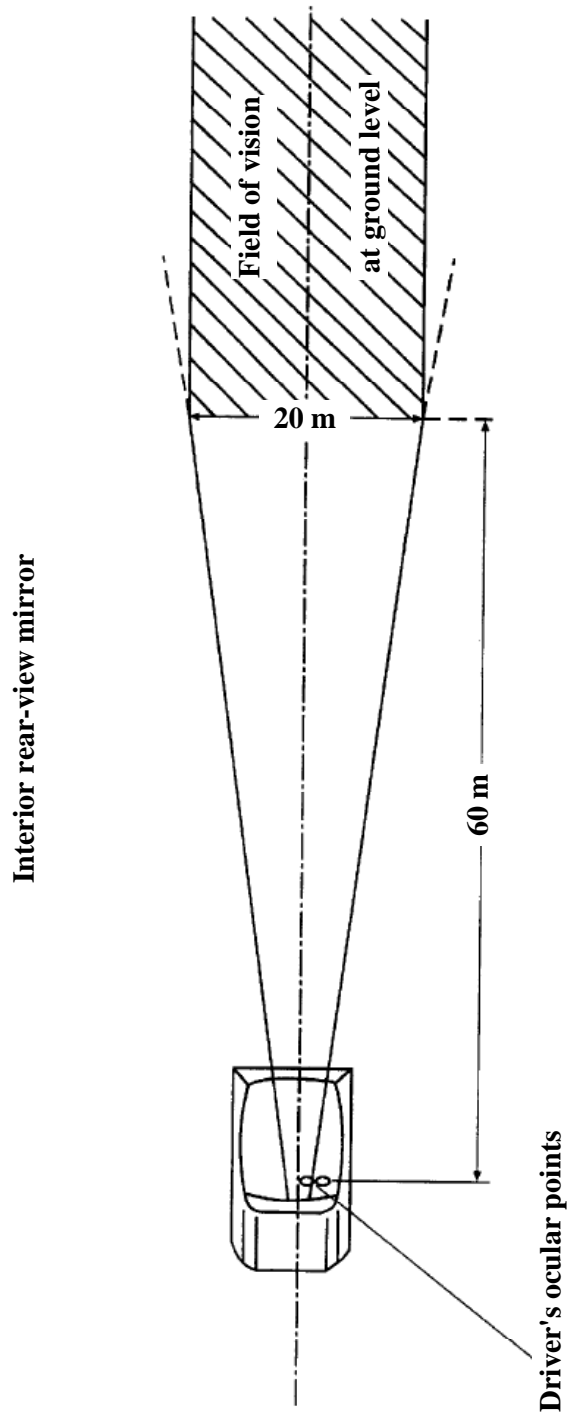
**15.3.4.3. Obstructions**

**15.3.4.3.1. Interior rear-view mirror (Class I)**

A reduction in the field of vision due to the presence of devices such as head-restraints, sun-visors, rear window wipers and heating elements is permissible, provided that all these devices together do not obscure more than 15 per cent of the field of vision. The degree of obstruction is measured with the headrests adjusted to their lowest possible position and with the sun-visors folded back.

**15.3.4.3.2. Exterior rear-view mirrors (Classes III and VII)**

In the fields of vision specified above, obstruction due to the bodywork and some of its components, such as door handles, outline marker lights, direction indicators and the extremities of 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.



**Figure 8a**

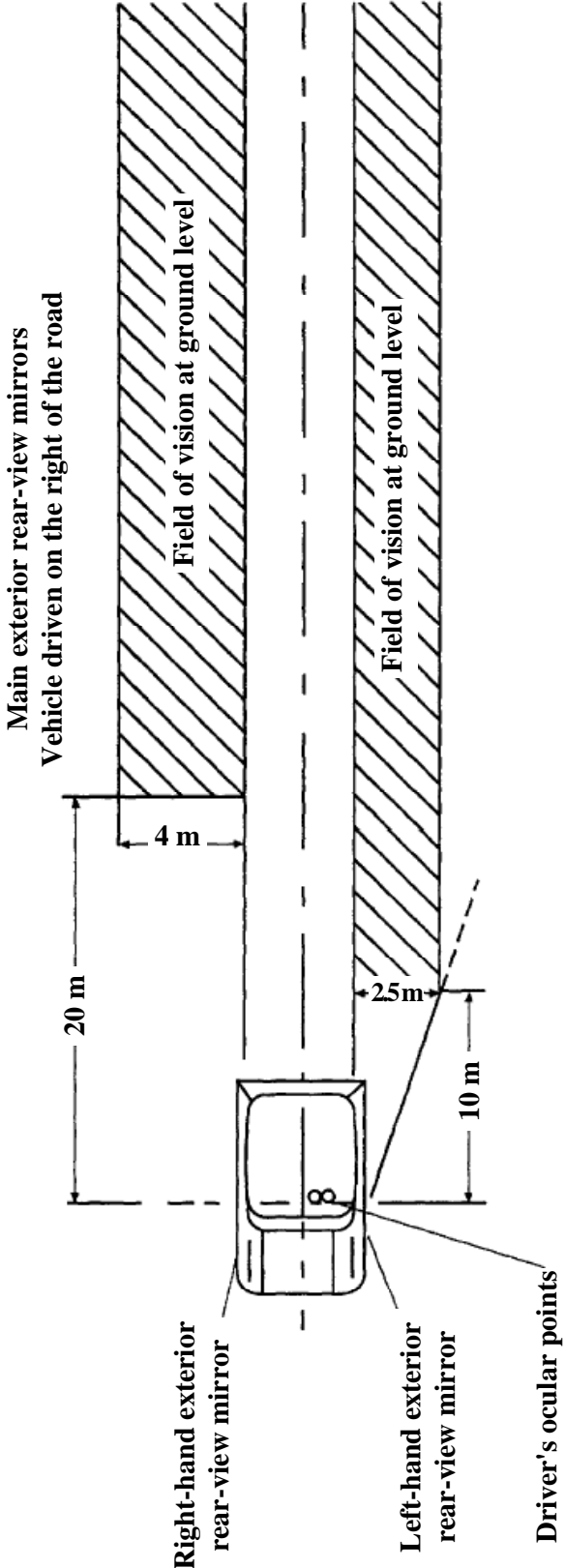


Figure 8b''

Paragraphs 15.3. to 15.3.5.1. (former), renumber as paragraphs 15.4. to 15.4.5.1.

Paragraph 15.3.5.2. (former), renumber as paragraph 15.4.5.2. and amend to read:

"**15.4.5.2.** If vehicles of these categories cannot fulfil the requirements of paragraph 15.4.5.1. by using a camera/monitor device, other devices for indirect vision can be used. In this case the device must be able to detect an object of 50 cm height and with a diameter of 30 cm within the field defined in paragraph 15.4.5.1."

Annex 3, item 9., amend to read:

"9. Brief description .....

Identification of the device: mirror, camera/monitor, other device 2/

Device for indirect vision of Class I, II, III, IV, V, VI, **VII**, S 2/

.... "

Annex 4.

Item 4., amend to read:

"4. Category of vehicle: (**L**, M<sub>1</sub>, M<sub>2</sub>, M<sub>3</sub>, N<sub>1</sub>, N<sub>2</sub> ≤ 7.5t, N<sub>2</sub> > 7.5t, N<sub>3</sub>) 2/"

Appendix to type-approval communication form, item 2., amend to read:

"2. Class(es) of mirrors and devices for indirect vision (I, II, III, IV, V, VI, **VII**, S) 2/"

## B. BACKGROUND

Currently there are no provisions for rear-view mirror installation on L-category vehicles with bodywork in the United Nations' Economic Commission for Europe (UNECE) Regulations. Nevertheless, common sense has apparently been used for years and type approvals have been granted. However, during the discussion on the scopes of the Regulations at the Working Party on General Safety Provisions (GRSG) in 2005, this gap was pointed out and IMMA was asked to find a solution.

The relevant Regulations are Nos. 46 (rear-view mirrors for vehicles of categories M, N and L, with bodywork partly or wholly enclosing the driver) and 81 (rear-view mirrors for mopeds/motorcycles). Both Regulations contain two parts: the approval of mirrors and the approval of their installation on vehicles. The problem is that Regulation No. 46 allows approving the rear-view mirrors for L-category vehicles with bodywork but do not allow installation of those mirrors on L-category vehicles. Regulation No. 81 only covers mirrors and their installation on L-category vehicles without bodywork.

C. JUSTIFICATION

IMMA's conclusion is that the simplest solution to the problem is to transpose both the specific requirements for L-category vehicle mirrors and the installation requirements from the European Union (EU) Directive 97/24/EC (Chapter 4) into Regulation No. 46.

This proposal clarifies which mirrors can be used (either the Regulation No. 46 or the special L-category vehicle mirrors) and, most importantly, it makes it officially possible to approve their installation on L-category vehicles with bodywork.

The requirements for L-category vehicles without bodywork remain unchanged.

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