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**World Forum for Harmonization of Vehicle Regulations****Working Party on Lighting and Light-Signalling****Seventy-second session**

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Item 4 (i) (iv) of the provisional agenda

**Other business – Any other business****Proposal for Supplement 15 to the 01 series of amendments  
to Regulation No. 53 (Lighting installation motorcycles)****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), introducing the possibility of installing interdependent lamps for L<sub>3</sub> category vehicles. It supersedes ECE/TRANS/WP.29/GRE/2014/8. Also, the amendment reflects the recent amendments to Regulation No. 48, Supplement 2 to its 06 series of amendments and further includes some editorial corrections to the current Regulation No. 53 text. The modifications to the existing text of the Regulation are marked in bold for new or strikethrough for deleted characters.

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\* In accordance with the programme of work of the Inland Transport Committee for 2012–2016 (ECE/TRANS/224, para. 94 and ECE/TRANS/2012/12, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## I. Proposal

Paragraphs 2.5.2. to 2.5.5., amend to read:

- 2.5.2. "Independent lamp" means devices having separate ~~illuminating~~ **apparent** surfaces, separate light sources and separate lamp bodies;
- 2.5.3. "Grouped lamps" means devices having separate ~~illuminating~~ **apparent** surfaces and separate light sources, but a common lamp body;
- 2.5.4. "Combined" means devices having separate ~~illuminating~~ **apparent** surfaces, but a common light source and a common lamp body;
- 2.5.5. "Reciprocally incorporated" means devices having separate light sources or a single light source operating under different conditions (for example, optical, mechanical, electrical differences), totally or partially common ~~illuminating~~ **apparent** surfaces and a common lamp body;"

Insert new paragraphs 2.5.18. to 2.5.19., to read:

- 2.5.18. "**Interdependent lamp system**" means an assembly of two or three interdependent lamps providing the same function.
- 2.5.18.1. "**Interdependent lamp marked "Y"**" means a device operating as part of an interdependent lamp system. Interdependent lamps operate together when activated, have separate apparent surfaces in the direction of the reference axis and separate lamp bodies, and may have separate light source(s).
- 2.5.19. "**Lamps marked "D"**" means independent lamps, approved as separate devices in such a way that they are allowed to be used either independently or in an assembly of two lamps to be considered as a "single lamp"."

Paragraph 2.11., amend to read:

- 2.11. "Angles of geometric visibility" means the angles which determine the field of the minimum solid angle in which the apparent surface of the lamp must be visible. That field of the solid angle is determined by the segments of the sphere of which the centre coincides with the centre of reference of the lamp and the equator is parallel with the ground. These segments are determined in relation to the axis of reference. The horizontal angles  $\beta$ , correspond to the longitude and the vertical angles  $\alpha$  to the latitude. ~~There must be no obstacle on the inside of the angles of geometric visibility to the propagation of light from any part of the apparent surface of the lamp observed from infinity. If measurements are taken closer to the lamp, the direction of observation must be shifted parallel to achieve the same accuracy.~~

~~On the inside of the angles of geometric visibility no account is taken of obstacles, if they were already presented when the lamp was type approved.~~

~~If, when the lamp is installed, any part of the apparent surface of the lamp is hidden by any further parts of the vehicle, proof shall be furnished that the part of the lamp not hidden by obstacles still conforms to the photometric values prescribed for the approval of the device as an optical unit (see Annex 3 of this Regulation). Nevertheless, when the vertical angle of geometric visibility below the horizontal may be reduced to 5° (lamp at less than 750~~

mm above the ground) the photometric field of measurements of the installed optical unit may be reduced to 5° below the horizontal;"

Paragraphs 2.14., amend to read:

- 2.14. "A single lamp" means:
- (a) A device or part of a device having one lighting or light-signalling function, one or more light source(s) and one apparent surface in the direction of the reference axis, which may be a continuous surface or composed of two or more distinct parts; or
  - (b) ~~Any assembly of two independent lamps, whether identical or not, having the same function, both approved as type "D" lamp and installed so that the projection of their apparent surfaces in the direction of the reference axis occupies not less than 60 per cent of the smallest quadrilateral circumscribing the projections of the said apparent surfaces in the direction of the reference axis.~~ **Any assembly of two lamps marked "D", whether identical or not, having the same function, or**
  - (c) **Any assembly of two independent retro-reflectors, whether identical or not, that have been approved separately; or**
  - (d) **Any interdependent lamp system composed of two or three interdependent lamps marked "Y" approved together and providing the same function.**

Insert a new paragraph 2.31., to read:

"2.31. "H plane" means the horizontal plane containing the centre of reference of the lamp."

Paragraph 5.6., amend to read:

"5.6. Grouped, combined or reciprocally incorporated **or single** lamps"

Paragraph 5.6.2., amend to read:

"5.6.2. ~~Where the apparent surface of a single lamp is composed of two or more distinct parts, it shall satisfy the following requirements:~~ **Single lamps"**

Paragraph 5.6.2.1., amend to read:

"5.6.2.1. ~~Either the total area of the projection of the distinct parts on a plane tangent to the exterior surface of the transparent material and perpendicular to the reference axis shall occupy not less than 60 per cent of the smallest quadrilateral circumscribing the said projection, or the distance between two adjacent/tangential distinct parts shall not exceed 15 mm when measured perpendicularly to the reference axis.~~

**Single lamps as defined in paragraph 2.14. (a), composed of two or more distinct parts, shall be installed in such a way that:**

- (a) **either the total area of the projection of the distinct parts on a plane tangent to the exterior surface of the outer lens and perpendicular to the reference axis shall occupy not less than 60 per cent of the smallest quadrilateral circumscribing the said projection; or**
- (b) **the minimum distance between the facing edges of two adjacent/tangential distinct parts shall not exceed 75mm when measured perpendicularly to the reference axis.**

**These requirements shall not apply to a single retro-reflector."**

*Insert new paragraph 5.6.2.2., to read:*

- "5.6.2.2. Single lamps as defined in paragraph 2.14. (b) or (c), composed of two lamps marked "D" or two independent retro reflectors, shall be installed in such a way that:**
- (a) either the projection of the apparent surfaces in the direction of the reference axis of the two lamps or retro reflectors occupies not less than 60 per cent of the smallest quadrilateral circumscribing the projections of the said apparent surfaces in the direction of the reference axis; or**
  - (b) the minimum distance between the facing edges of the apparent surfaces in the direction of the reference axis of two lamps or two independent retro reflectors does not exceed 75 mm when measured perpendicularly to the reference axis."**

*Insert new paragraph 5.6.2.3., to read:*

- "5.6.2.3. Single lamps as defined in paragraph 2.14. (d), shall fulfil the requirements of paragraph 5.6.2.1.**

**Where two or more lamps and/or two or more separate apparent surfaces are included into the same lamp body and/or have a common outer lens, these shall not be considered as an interdependent lamp system.**

**However, a lamp in the shape of a band or strip may be part of an interdependent lamp system. "**

*Paragraph 5.7., amend to read:*

- "5.7. The maximum height above ground shall be measured from the highest point and the minimum height from the lowest point of the apparent surface in the direction of the reference axis. For passing beam headlamps, the minimum height from the ground shall be measured from the lowest point of the effective outlet of the optical system (e.g. reflector, lens, projection lens) independent of its utilization.**

**Where the (maximum and minimum) height above the ground clearly meets the requirements of the Regulation, the exact edges of any surface need not be determined.**

**When referring to the distance between lamps, the position, as regards width, shall be determined from the inner edges of the apparent surface in the direction of the reference axis.**

**Where the position, as regards width, clearly meets the requirements of the Regulation, the exact edges of any surface need not be determined.**

**For the purposes of reducing the geometric visibility angles, the position of a lamp with regard to height above the ground, shall be measured from the H plane."**

*Insert new paragraph 5.10.1., to read:*

- "5.10.1. In the case of an interdependent lamp system, all light sources shall be switched on and off simultaneously."**

*Insert new paragraphs 5.19. to 5.20.5., to read:*

- "5.19. Rear position lamps, rear direction-indicators and rear retro-reflectors, may be installed on movable components only:**
- 5.19.1. If at all fixed positions of the movable components the lamps on the movable components meet all the position, geometric visibility, colorimetric and photometric requirements for those lamps.**
- 5.19.2. In the case where the functions referred to in paragraph 5.19. are obtained by an assembly of two lamps marked "D" (see paragraph 2.14.), only one of the lamps needs to meet the position, geometric visibility and photometric requirements for those lamps at all fixed positions of the movable components.**
- 5.19.3. Where additional lamps for the above functions are fitted and are activated, when the movable component is in any fixed open position, provided that these additional lamps satisfy all the position, geometric visibility and photometric requirements applicable to the lamps installed on the movable component.**
- 5.19.4. In the case where the functions referred to in paragraph 5.19. are obtained by an interdependent lamp system either of the following conditions shall apply:**
- (a) **Should the complete interdependent lamp system be mounted on the moving component(s), the requirements of paragraph 5.19.1. shall be satisfied. However, additional lamps for the above functions may be activated, when the movable component is in any fixed open position, provided that these additional lamps satisfy all the position, geometric visibility, colorimetric and photometric requirements applicable to the lamps installed on the movable component.**
- or**
- (b) **Should the interdependent lamp system be partly mounted on the fixed component and partly mounted on a movable component, the interdependent lamp(s) specified by the Applicant during the device approval procedure shall meet all the position, outwards geometric visibility, colorimetric and photometric requirements for those lamps, at all fixed positions of the movable component(s). The inwards geometric visibility requirement(s) is(are) deemed to be satisfied if this(these) interdependent lamp(s) still conform(s) to the photometric values prescribed in the field of light distribution for the approval of the device, at all fixed positions of the movable component(s).**
- 5.20. General provisions relating to geometric visibility**
- 5.20.1. There shall be no obstacle on the inside of the angles of geometric visibility to the propagation of light from any part of the apparent surface of the lamp observed from infinity. However, no account is taken of obstacles, if they were already presented when the lamp was type-approved.**
- 5.20.2. If measurements are taken closer to the lamp, the direction of observation shall be shifted parallel to achieve the same accuracy.**
- 5.20.3. If, when the lamp is installed, any part of the apparent surface of the lamp is hidden by any further parts of the vehicle, proof shall be**

furnished that the part of the lamp not hidden by obstacles still conforms to the photometric values prescribed for the approval of the device.

5.20.4. When the vertical angle of geometric visibility below the horizontal may be reduced to 5 degrees (lamp at less than 750 mm above the ground, measured according to the provisions of paragraph 5.7.) the photometric field of measurements of the installed optical unit may be reduced to 5 degrees below the horizontal.

5.20.5. In the case of an interdependent lamp system the geometric visibility requirements shall be fulfilled when all its interdependent lamps are operated together."

*Paragraph 6.3.4., amend to read:*

"6.3.4. Geometric visibility

Horizontal angles: 20° inwards, 80° outwards.

Vertical angles: 15° above and below the horizontal.

~~The vertical angle below the horizontal may be reduced to 5 degrees, however, if the height of the lamps is less than 750 mm. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.7.), the downward angle of 15° may be reduced to 5°.~~

*Paragraph 6.4.4., amend to read:*

"6.4.4. Geometric visibility

Horizontal angle: 45° to left and to right for a single lamp;

45° outwards and 10° inwards for each pair of lamps.

Vertical angle: 15° above and below the horizontal

~~The vertical angle below the horizontal may be reduced to 5 degrees, however, if the height of the lamp is less than 750 mm. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.7.), the downward angle of 15° may be reduced to 5°.~~

*Paragraph 6.6.4., amend to read:*

"6.6.4. Geometric visibility

Horizontal angle: 80° to the left and to the right for a single lamp:

the horizontal angle may be 80° outwards and 20° inwards for each pair of lamps.

Vertical angle: 15° above and below the horizontal.

~~The vertical angle below the horizontal may be reduced to 5 degrees, however, if the height of the lamp is less than 750 mm. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.7.), the downward angle of 15° may be reduced to 5°.~~

*Paragraph 6.7.4., amend to read:*

"6.7.4. Geometric visibility

Horizontal angle: 80° to left and to right for a single lamp:

the horizontal angle may be 80 degrees outwards and 45° inwards for each pair of lamps.

Vertical angle: 15° above and below the horizontal.

~~The vertical angle below the horizontal may be reduced to 5 degrees, however, if the height of the lamp is less than 750 mm. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.7.), the downward angle of 15° may be reduced to 5°.~~

*Paragraph 6.8.4., amend to read:*

"6.8.4. Geometric visibility

Horizontal angle: 30° to left and to right for a single reflector;

30° outwards and 10° inwards for each pair of reflectors;

Vertical angle: 15° above and below the horizontal.

~~The vertical angle below the horizontal may be reduced to 5 degrees, however, if the height of the lamp is less than 750 mm. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.7.), the downward angle of 15° may be reduced to 5°.~~

*Paragraph 6.9.3., amend to read:*

"6.9.3. "Circuit-closed" tell-tale

Mandatory. Flashing red signal lamp or, in the case of separate tell-tales, the simultaneous operation of the tell-tale prescribed in paragraph ~~6.3.10~~ 6.3.8."

*Paragraph 6.12.4., amend to read:*

"6.12.4. Geometric visibility

Horizontal angles  $\beta = 30^\circ$  to the front and to the rear.

Vertical angles  $\alpha = 15^\circ$  above and below the horizontal.

~~The vertical angle below the horizontal may be reduced to 5 degrees, however, if the height of the retro reflector is less than 750 mm. However, where a lamp is mounted below 750 mm (measured according to the provisions of paragraph 5.7.), the downward angle of 15° may be reduced to 5°.~~

## II. Justification

1. The rear trunk lid that is commonly used for four-wheeled vehicles may be adopted for future scooter type motorcycles to secure the storage space for helmet, etc. and improve the appearance and marketability. Without this amendment, the regulatory requirements for the lamp system may lead to motorcycle design constraints.

2. Currently the interdependent lamp system is approved under Regulations Nos.7 and 48 and is already available on the market. This provision provides increased design freedom and balances the modern appearance and functionality during loading /unloading from the storage space.

3. L category vehicles are included in the scope of the Regulation No.7, and as such the certified stop lamps, front position lamps, and rear position lamps can also be applied to motorcycles. With these previous examples, interdependent lamp systems should also be approved for use on L category vehicles.

4. This proposal not only increases the design freedom of motorcycle lamp systems and improves the vehicle functionality but it does it without jeopardizing the road safety.
  5. This amendment also reflects the recent amendments to Supplement 2 to the 06 series of amendments to Regulation No. 48, where measurement height taken at the H-plane is changed to 750 mm, with some editorial corrections to current text of Regulation No. 53.
  6. This proposal reflects the recent amendments to Regulation No. 48 (ECE/TRANS/WP.29/GRE/2014/6, agreed text at the seventy-first GRE session that clarified the definitions of “single lamps”, “lamps marked D” and “interdependent lamps”. This proposal also aligns the definition of the maximum 75 mm separation (formerly exclusive for single lamp definition of interdependent lamps) and consistently applies to “single lamps” of two or more distinct parts, to an assembly of two “lamps marked D” and to an assembly of two independent retro-reflectors.
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