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Item 4.6.22 of the provisional agenda

1958 Agreement:**Consideration of draft amendments to existing****UN Regulations submitted by GRE****Proposal for Supplement 2 to the 02 series of amendments to
UN Regulation No. 53 (Installation of lighting and light-
signalling devices for L₃ vehicles)****Submitted by the Working Party on Lighting and Light-Signalling*****Revision 1**

The text reproduced below was adopted by the Working Party on Lighting and Light-Signalling (GRE) at its seventy-ninth session (ECE/TRANS/WP.29/GRE/79, para. 9). It is based on ECE/TRANS/WP.29/GRE/2018/15 and Annexes III, VI and VII to the report. The text refers to the two new simplified UN Regulations on Light-Signalling Devices (LSD), Road Illumination Devices (RID) and Retro-Reflective Devices (RRD) (ECE/TRANS/WP.29/2018/157, ECE/TRANS/WP.29/2018/158 and ECE/TRANS/WP.29/2018/159, respectively). It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee AC.1 for consideration at their November 2018 sessions.

* In accordance with the programme of work of the Inland Transport Committee for 2018–2019 (ECE/TRANS/274, para. 123 and ECE/TRANS/2018/21/Add.1, cluster 3.1), 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

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Supplement 2 to the 02 series of amendments to UN Regulation No. 53 (Installation of lighting and light-signalling devices for L₃ vehicles)

Paragraph 2. and its subparagraphs, amend to read:

"2. Definitions

For the purpose of this Regulation, the definitions given in the latest series of amendments to UN Regulation No. 48 in force at the time of application for type approval shall apply, unless otherwise specified in this Regulation.

- 2.1. "*Vehicle type*" means a category of vehicles which do not differ from each other in such essential respects as:
 - 2.1.1. The dimensions and external shape of the vehicle;
 - 2.1.2. The number and position of the devices;
 - 2.1.3. The following shall likewise not be deemed to be "vehicles of a different type":
 - 2.1.3.1. Vehicles which differ within the meaning of paragraphs 2.1.1. and 2.1.2. above but not in such a way as to entail a change in the kind, number, position and geometric visibility of the lamps prescribed for the vehicle type in question; and
 - 2.1.3.2. Vehicles on which lamps approved under one of the Regulations annexed to the 1958 Agreement, or lamps allowed in the country in which the vehicles are registered, are fitted, or are absent where their fitting is optional;
- 2.2. "*Unladen vehicle*" means a vehicle without a driver, or passenger, and unladen, but with its fuel tank full and its normal complement of tools;
- 2.3. "*Lamp*" means a device designed to illuminate the road or to emit a light signal to other road users. Rear registration plate lamp and retro-reflectors are likewise to be regarded as lamps;
 - 2.3.1. "*Equivalent lamps*" means lamps having the same function and authorised in the country in which the vehicle is registered; such lamps may have different characteristics from those of the lamps with which the vehicle is equipped at the time of approval, on condition that they satisfy the requirements of this Regulation;
 - 2.3.2. "*Independent lamp*" means devices having separate apparent surfaces, separate light sources and separate lamp bodies;
 - 2.3.3. "*Grouped lamps*" means devices having separate apparent surfaces and separate light sources, but a common lamp body;
 - 2.3.4. "*Combined*" means devices having separate apparent surfaces, but a common light source and a common lamp body;
 - 2.3.5. "*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 apparent surfaces and a common lamp body;
 - 2.3.6. "*Direction indicator lamp*" means the lamp used to indicate to other road-users that the driver intends to change direction to the right or to the left;

A direction indicator lamp or lamps may also be used according to provisions of UN Regulation No. 97.

- 2.3.7. "*Front position lamp*" means the lamp used to indicate the presence of the vehicle when viewed from the front;
- 2.3.8. "*Rear position lamp*" means the lamp used to indicate the presence of the vehicle when viewed from the rear;
- 2.3.9. "*Retro-reflector*" means a device used to indicate the presence of a vehicle by the reflection of light emanating from a light source not connected to the vehicle, the observer being situated near the source;

For the purpose of this Regulation, retro-reflecting number plates are not considered as retro-reflectors;

- 2.4. "*Light-emitting surface*" of a "lighting device", "light-signalling device" or a retro-reflector means all or part of the exterior surface of the transparent material as declared in the request for approval by the manufacturer of the device on the drawing, see Annex 3;

- 2.5. "*Illuminating surface*" (see Annex 3);

- 2.5.1. "*Illuminating surface of a lighting device*" (driving beam (main beam) headlamp, passing beam (dipped beam) headlamp, front fog lamp means the orthogonal projection of the full aperture of the reflector, or in the case of headlamps with an ellipsoidal reflector of the "projection lens", on a transverse plane. If the lighting device has no reflector, the definition of paragraph 2.5.2. below shall be applied. If the light emitting surface of the lamp extends over part only of the full aperture of the reflector, then the projection of that part only is taken into account.

In the case of a passing-beam headlamp, the illuminating surface is limited by the apparent trace of the cut-off on to the lens. If the reflector and lens are adjustable relative to one another, the mean adjustment should be used;

In the case where any combination of a headlamp producing the principal passing-beam and additional lighting units or light sources designed to produce bend lighting are operated together, the individual illuminating surfaces, taken together, constitute the illuminating surface.

- 2.5.2. "*Illuminating surface of a light-signalling device other than a retro-reflector*" (direction indicator lamp, stop lamp, front position lamp, rear position lamp, hazard warning signal, rear fog lamp means the orthogonal projection of the lamp in a plane perpendicular to its axis of reference and in contact with the exterior light-emitting surface of the lamp, this projection being bounded by the edges of screens situated in this plane, each allowing only 98 per cent of the total luminous intensity of the light to persist in the direction of the axis of reference. To determine the lower, upper and lateral limits of the illuminating surface, only screens with horizontal or vertical edges shall be used;

- 2.5.3. "*Illuminating surface of a retro-reflector*" (para. 2.3.9. above) means the orthogonal projection of a retro-reflector in a plane perpendicular to its axis of reference and delimited by planes continuous to the outermost parts of the retro-reflector's optical system and parallel to that axis. For the purposes of determining the lower, upper and lateral edges of the device, only horizontal and vertical planes shall be considered;

- 2.6. The "*apparent surface*" for a defined direction of observation means, at the request of the manufacturer or his duly accredited representative, the orthogonal projection of:
- Either the boundary of the illuminating surface projected on the exterior surface of the lens (a-b),
- Or the light-emitting surface (c-d),
- In a plane perpendicular to the direction of observation and tangential to the most exterior point of the lens (see Annex 3 to this Regulation);
- 2.7. "*Centre of reference*" means the intersection of the axis of reference with the exterior light-emitting surface; it is specified by the manufacturer of the lamp;
- 2.8. "*Extreme outer edge*", on either side of the vehicle means the plane parallel to the median longitudinal plane of the vehicle and touching the lateral extremity of the vehicle, disregarding the projection or projections:
- 2.8.1. Of rear-view mirrors,
- 2.8.2. Of direction indicator lamps,
- 2.8.3. Of front and rear position lamps and retro-reflectors;
- 2.9. "*Over-all width*" means the distance between the two vertical planes defined in paragraph 2.8. above;
- 2.10. "*Colour of the light emitted from the device*". The definitions of the colour of the light emitted given in UN Regulation No. 48 and its series of amendments in force at the time of application for type approval shall apply to this Regulation.
- 2.11. "*Gross vehicle mass*" or "maximum mass" means the technically permissible maximum laden mass as declared by the manufacturer.
- 2.12. "*Laden*" means so loaded as to attain the gross vehicle mass as defined in paragraph 2.11. above.
- 2.13. "*Horizontal inclination*" means the angle created between the beam pattern when the motorcycle is set as specified in paragraph 5.4. of this Regulation, and the beam pattern when the motorcycle is banked (see drawing in Annex 6);
- 2.14. "*Horizontal inclination adjustment system (HIAS)*" means a device that adjusts the horizontal inclination of the headlamp towards zero;
- 2.15. "*Bank angle*" means the angle made with the vertical by the vertical longitudinal median plane of the motorcycle, when the motorcycle is rotated about its longitudinal axis (see drawing in Annex 6);
- 2.16. "*HIAS signal*" means any control signal or, any additional control input to the system or, a control output from the system to the motorcycle;
- 2.17. "*HIAS signal generator*" means a device, reproducing one or more of the HIAS signals for system test;
- 2.18. "*HIAS test angle*" means the angle δ created by the headlamp cut-off line and HH line (in case of an asymmetrical beam headlamp, the horizontal part of the cut-off shall be used), (see drawing in Annex 6).
- 2.19. "*Bend lighting*" means a lighting function to provide enhanced illumination in bends.

- 2.20. "H plane" means the horizontal plane containing the centre of reference of the lamp.
- 2.21. "Sequential activation" means an electrical connection where the individual light sources of a lamp are wired such that they are activated in a predetermined sequence.
- 2.22. "Emergency stop signal" means a signal to indicate to other road users to the rear of the vehicle that a high retardation"

Paragraph 3.2.1., amend to read:

- "3.2.1. A description of the vehicle type with regard to the items mentioned in paragraphs 2.1.1. to 2.1.3. above; the vehicle type duly identified shall be specified;"

Paragraphs 3.2.4. and 3.2.5., amend to read:

- "3.2.4. If necessary, in order to verify the conformity to the prescriptions of the present regulation, a layout drawing or drawings of each lamp showing the illuminating surface, as defined in paragraph 2.7.1. above, the light-emitting surface as defined in paragraph 2.4. above, the axis of reference as defined in UN Regulation No. 48 and the centre of reference as defined in UN Regulation No. 48. This information is not necessary in the case of the rear registration plate lamp (as defined in UN Regulation No. 48).
- 3.2.5. The application shall include a statement of the method used for the definition of the apparent surface (paragraph 2.6. above)."

Paragraphs 5.6.2.1., 5.6.2.2. and 5.6.2.3., amend to read:

- "5.6.2.1. Single lamps as defined in paragraph 2.16.1. of UN Regulation No. 48, subparagraph (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 75 mm when measured perpendicularly to the reference axis.

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

- 5.6.2.2. Single lamps as defined in paragraph 2.16.1. of UN Regulation No. 48, subparagraph (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.

- 5.6.2.3. Single lamps as defined in paragraph 2.16.1. of UN Regulation No. 48, subparagraph (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 5.8.1., amend to read:

- "5.8.1. The photometric characteristics of a direction indicator lamp except for categories 5 and 6 specified in UN Regulation No. 6 or [LSD], and of a direction indicator lamp specified in UN Regulation No. 50 or [LSD] may be varied during a flash by sequential activation of light sources as specified in paragraph 5.6. of UN Regulation No. 6 or paragraph 5.6.11. of UN Regulation No. [LSD] or in paragraph 6.8. of UN Regulation No. 50.

This provision shall not apply when direction indicator lamps of categories 2a and 2b of UN Regulation No. 6 or [LSD] or category 12 of UN Regulation No. 50 or [LSD] are operated as emergency stop signal according to paragraph 6.14. of this Regulation."

Paragraph 5.14.4., amend to read:

- "5.14.4. Stop lamp, S1 category device specified in UN Regulation No. 7 or [LSD] or stop lamp specified in UN Regulation No. 50 (paragraph 6.4.) or stop lamp for category L vehicles in UN Regulation No [LSD];"

Paragraph 5.15.4., amend to read:

- "5.15.4. Stop lamp, S3 category device specified in UN Regulation No. 7 (paragraph 6.4.) or [LSD];"

Paragraph 5.19.2., amend to read:

- "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 2.16.1. of UN Regulation No. 48), 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."

Insert a new paragraph 5.21., to read:

- "5.21. A device type approved according to any preceding series of amendments to UN Regulations Nos. [LSD] and/or [RID] and/or [RRD] is deemed equivalent to one approved according to the latest series of amendments to the pertinent UN Regulations Nos. [LSD] and/or [RID] and/or [RRD], when the change indexes (defined in UN Regulation No. 48) related to each individual lamp (function) do not differ. In this case such a device may be fitted on the vehicle to be type approved without any update of the device type approval documents and device markings."

Paragraph 6.1.1.1., amend to read:

- "6.1.1.1. For motorcycles having a cylinder capacity $\leq 125 \text{ cm}^3$

...

- (i) Class A, B, D, CS, DS or ES of UN Regulation No. [RID]"

Paragraph 6.1.1.2., amend to read:

- "6.1.1.2. For motorcycles having a cylinder capacity > 125 cm³
 ...
 (h) Class A, B, D, DS or ES of UN Regulation No. [RID]
 ..."

Paragraph 6.2.1.1., amend to read:

- "6.2.1.1. For motorcycles having a cylinder capacity ≤ 125 cm³
 ...
 (i) Class A, B, D, CS, DS or ES of UN Regulation No. [RID]"

Paragraph 6.2.1.2., amend to read:

- "6.2.1.2. For motorcycles having a cylinder capacity > 125 cm³
 One or two of approved type according to:
 (a) Class D or E of UN Regulation No. 113;
 (b) UN Regulation No. 112;
 (c) UN Regulation No. 1;
 (d) UN Regulation No. 8;
 (e) UN Regulation No. 20;
 (f) UN Regulation No. 72;
 (g) UN Regulation No. 98;
 (h) Class A, B, D, DS or ES of UN Regulation No. [RID]
 Two of approved type according to:
 (i) Class C of UN Regulation No. 113;
 (j) Class CS of UN Regulation No. [RID]"

Paragraph 6.2.3.1.4., amend to read:

- "6.2.3.1.4. If installed, additional lighting unit(s) which provide bend lighting, type approved as part of the passing-beam according to UN Regulation No. 113 or [RID], shall be installed under the following conditions:

In the case of (a) pair(s) of additional lighting units, they shall be installed so that their reference centre(s) are symmetrical in relation to the median longitudinal plane of the vehicle.

In the case of a single additional lighting unit, its reference centre shall be coincident with the median longitudinal plane of the vehicle."

Paragraph 6.2.4., amend to read:

- "6.2.4. Geometric visibility
 Defined by angles α and β as specified in paragraph 2.13. of UN Regulation No. 48:
 ..."

Paragraph 6.2.5.7., amend to read:

"6.2.5.7. Additional light source(s) or additional lighting unit(s) may be activated only in conjunction with the principal passing-beam or the driving-beam to produce bend lighting. The illumination provided by the bend lighting shall not extend above the horizontal plane that is parallel with the ground and containing the reference axis of the headlamp producing the principal passing-beam for all bank angles as specified by the manufacturer during type approval of the device according to UN Regulation No. 113 or [RID]."

Paragraph 6.2.5.8., amend to read:

"6.2.5.8. The requirement in paragraph 6.2.5.7. above shall be tested as follows:

The test vehicle shall be set as specified in paragraph 5.4. of this Regulation. Measure the bank angles on both sides of the vehicle under every condition where the bend lighting is activated. The bank angles to measure are the bank angles specified by the manufacturer during type approval of the device according to UN Regulation No. 113 or [RID].

The handlebar may be fixed in the straight ahead position so as not to move during the vehicle inclination.

For the test, the bend lighting may be activated by means of a signal generator provided by the manufacturer.

The system is considered to satisfy the requirements of paragraph 6.2.5.7. above, if all measured bank angles on both sides of the vehicle are greater than or equal to the minimum bank angles given in the communication form for the type approval of the device according to UN Regulation No. 113 or [RID].

Conformity to paragraph 6.2.5.7. above may be demonstrated by the manufacturer using other means accepted by the Type Approval Authority responsible for type approval."

Paragraph 6.2.6., amend to read:

"6.2.6. Electrical connections

The control for changing over to the passing-beam(s) shall switch off the driving-beam(s) simultaneously. Passing-beam headlamps with a light source approved in accordance with UN Regulation No. 99 shall remain switched on when the driving-beam is illuminated.

6.2.6.1. The additional light source(s) or additional lighting unit(s) used to produce bend lighting shall be so connected that it (they) cannot be activated unless the headlamp(s) producing the principal passing-beam or the driving-beam is (are) also activated.

The additional light source(s) or additional lighting unit(s) used to produce bend lighting on each side of the vehicle may only be automatically activated when the bank angle(s) is(are) greater or equal to the minimum bank angle(s) given in the communication form for the type approval of the device according to UN Regulation No. 113 or [RID].

However, the additional light source(s) or additional lighting unit(s) shall not be activated when the bank angle is less than three degrees.

The additional light source(s) or additional lighting unit(s) shall be deactivated when the bank angle(s) is (are) less than the minimum bank angle(s) given in

the communication form for the type approval of the device according to UN Regulation No. 113 or [RID]."

Paragraph 6.3.2., amend to read:

"6.3.2. Arrangement

Two front indicators (category 1 as specified in UN Regulation No. 6 or [LSD] or category 11 specified in UN Regulation No. 50 or [LSD]).

Two rear indicators (category 2 as specified in UN Regulation No. 6 or [LSD] or category 12 specified in UN Regulation No. 50 or [LSD])."

Paragraph 6.3.3.1., amend to read:

"6.3.3.1. ...

For rear indicators, the clearance between the inner edges of the two illuminating surfaces shall be at least 180 mm on the condition that the prescriptions of paragraph 2.13. of UN Regulation No. 48 are applied even when the registration plate is mounted;"

Paragraph 6.4.1., amend to read:

"6.4.1. Number

One or two approved as a category S1 device according to UN Regulation No. 7 or [LSD] or stop lamp according to UN Regulation No. 50 or stop lamp for category L vehicles of UN Regulation No. [LSD].

Optional one approved as a category S3 device according to UN Regulation No. 7 or [LSD]."

Paragraph 6.4.3., amend to read:

"6.4.3. Position

6.4.3.1. For category S1 device specified in UN Regulation No. 7 or UN Regulation No. [LSD] or stop lamp specified in UN Regulation No. 50 or [LSD]

In height: not less than 250 mm nor more than 1,500 mm above the ground;

In length: at the rear of the vehicle.

6.4.3.2. For the category S3 device specified in UN Regulation No. 7 or [LSD]

In height: The horizontal plane tangential to the lower edge of the apparent surface shall not be less than 850 mm above the ground.

However, the horizontal plane tangential to the lower edge of the apparent surface shall be above the horizontal plane tangential to the upper edge of the apparent surface of the category S1 device specified in UN Regulation No. 7 or [LSD] or stop lamp specified in UN Regulation No. 50 or stop lamp for category L vehicles of UN Regulation No. [LSD].

In length: at the rear of the vehicle."

Paragraph 6.4.4., amend to read:

"6.4.4. Geometric visibility

For category S1 device specified in UN Regulation No. 7 or [LSD] or stop lamp specified in UN Regulation No. 50 or stop lamp for category L vehicles of UN Regulation No. [LSD]

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.

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°.

For category S3 device specified in UN Regulation No. 7 or [LSD]

Horizontal angle: 10° to the left and to the right of the longitudinal axis of the vehicle.

Vertical angle: 10° above and 5° below the horizontal."

Paragraph 6.5.1., amend to read:

"6.5.1. Number

One, approved as a category 2 device according to UN Regulation No. 50 or [LSD]. The device may consist of several optical components designed to illuminate the space reserved for the registration plate."

Paragraph 6.10.4., amend to read:

"6.10.4. Geometric visibility

Defined by angles α and β as specified in paragraph 2.13. of UN Regulation No. 48:

..."

Paragraph 6.11.4., amend to read:

"6.11.4. Geometric visibility

Defined by angles α and β as specified in paragraph 2.13. of UN Regulation No. 48:

..."

Paragraph 6.13.2., amend to read:

"6.13.2. Number

One or two of approved type according to UN Regulation No. 87 or [LSD]."

Annex 5

Paragraph 1.2.1., amend to read:

"1.2.1. The angles of geometric visibility shall be checked in accordance with paragraph 2.13. of UN Regulation No. 48. The values measured for the angles shall be such that the individual specifications applicable to each lamp are fulfilled except that the limits of the angles may have an allowance corresponding to the $\pm 3^\circ$ variation permitted in paragraph 5.3. of this Regulation for the mounting of the light-signalling devices."
