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Item 4.6.28 of the provisional agenda

1958 Agreement:**Consideration of draft amendments to existing****UN Regulations submitted by GRE****Proposal for Supplement 1 to the 01 series of amendments to
UN Regulation No. 86 (Installation of lighting and light-
signalling devices for agricultural 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/2018/9, ECE/TRANS/WP.29/GRE/2018/12 and Annexes III and VII to the report. The text refers to the three new simplified UN Regulations on Light-Signalling Devices (LSD), Road Illumination Devices (RID) and Retro-Reflecting 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

Supplement 1 to the 01 series of amendments to UN Regulation No. 86 (Installation of lighting and light-signalling devices for agricultural vehicles)

Paragraph 2. and its subparagraphs, amend to read:

"2. Definitions

For the purposes 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 with regard to the installation of lighting and light-signalling devices*" means vehicles which do not differ in such essential respects as:
- 2.1.1. The dimensions and exterior shape of the vehicle;
- 2.1.2. The number and positioning of the devices.
- 2.1.3. The following are likewise considered not to be vehicles of a different type:
- 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 type, number, positioning and geometric visibility of the lamps prescribed for the vehicle type in question;
- Vehicles on which optional lamps are fitted or are absent;
- Vehicles which are fitted with lamps, the position of which varies according to the direction of traffic in the country of registration.
- 2.3. "*Lamp*" means a device designed to illuminate the road or to emit a light signal. Rear registration plate illuminating devices and retro-reflectors shall likewise be regarded as lamps.
- 2.3.1. "*Equivalent lamps*" means lamps having the same function and authorized 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 lamps*" means devices having separate apparent surfaces in the direction of the reference axis, separate light sources, and separate lamp bodies.
- 2.3.3. "*Grouped lamps*" means devices having separate lenses and separate light sources, but a common lamp body.
- 2.3.4. "*Combined lamps*" means devices having separate apparent surfaces in the direction of the reference axis, but a common light source and a common lamp body.
- 2.3.5. "*Reciprocally incorporated lamps*" 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 in the direction of the reference axis and a common lamp body.

- 2.3.6. "*Concealable illuminating lamp*" means a headlamp capable of being partly or completely hidden when not in use. This result may be achieved by means of a movable cover, by displacement of the headlamp or by any other suitable means. The term "retractable" is used more particularly to describe a concealable lamp the displacement of which enables it to be inserted within the bodywork.
- 2.3.7. "*Lamps of variable position*" means lamps installed on the vehicle which can move in relation to the vehicle, without being detached.
- 2.3.8. "*Front fog-lamp*" means the lamp used to improve the illumination of the road in case of fog, snowfall, rainstorms or dust clouds.
- 2.3.9. "*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.
- 2.3.10. "*End-outline marker lamp*" means the lamp fitted to the extreme outer edge as close as possible to the top of the vehicle and intended clearly to indicate the vehicle's overall width. This lamp is intended, for certain vehicles, to complement the vehicle's front and rear position lamps by drawing particular attention to its bulk.
- 2.3.11. "*Work lamp*" means a device for illuminating a working area or process.
- 2.3.12. "*Retro-reflector*" means a device used to indicate the presence of a vehicle by reflection of light emanating from a light source unconnected with the vehicle, the observer being situated near that source. For the purpose of this Regulation, the following are not considered as retro-reflectors:
- 2.3.12.1. Retro-reflecting number plates;
- 2.3.12.2. Other plates and retro-reflecting signals which shall be used to comply with a Contracting Party's specifications for use as regards certain categories of vehicles or certain methods of operation.
- 2.4. "*Light source*" means one or more elements for visible radiation, which may be assembled with one or more transparent envelopes and with a base for mechanical and electrical connection.
- A light source may also be constituted by the extreme outlet of a light-guide, as part of a distributed lighting or light-signalling system not having a built-in outer lens.
- 2.5. "*Illuminating surface*" (see Annex 3).
- 2.5.1. "*Illuminating surface of a lighting device*" (main-beam headlamp, dipped-beam headlamp, front fog lamp, reversing lamp and cornering 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. 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 dipped-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.
- 2.5.2. "*Illuminating surface of a light-signalling device other than a retro-reflector*" (direction indicator lamp, hazard-warning signal, stop lamp, rear-registration

plate illuminating device, front position lamp, rear position lamp, rear fog lamp, parking lamp, end-outline marker lamp, side-marker lamp and daytime running 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 to verify the distance to the extreme edges of the vehicle and the height above the ground.

For other applications of the illuminating surface, e.g. distance between two lamps or functions, the shape of the periphery of this illuminating surface shall be used. The screens shall remain parallel, but other orientations are allowed to be used.

In the case of a light-signalling device whose illuminating surface encloses either totally or partially the illuminating surface of another function or encloses a non-lighted surface, the illuminating surface may be considered to be the light-emitting surface itself (see e.g. Annex 3).

2.5.3. "*Illuminating surface of a retro-reflector*" (retro-reflector) means, as declared by the applicant during the component approval procedure for the retro-reflectors, the orthogonal projection of a retro-reflector in a plane perpendicular to its axis of reference and delimited by planes contiguous to the declared outermost parts of the retro-reflectors' 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 their duly accredited representative, the orthogonal projection of:

Either the boundary of the illuminating surface projected on the exterior surface of the lens;

Or the light-emitting surface;

In a plane perpendicular to the direction of observation and tangential to the most exterior point of the lens. Different examples of the application of apparent surface can be found in Annex 3 to this Regulation.

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

This shall be declared according to one of the following conditions:

- (a) In the case where the outer lens is textured, the declared light-emitting surface shall be all or part of the exterior surface of the outer lens;
- (b) In the case where the outer lens is non-textured the outer lens may be disregarded and the light-emitting surface shall be as declared on the drawing, see Annex 3.

2.7. "*Axis of reference*" (or "reference axis") means the characteristic axis of the lamp determined by the manufacturer of the lamp for use as the direction of

- reference ($H = 0^\circ$, $V = 0^\circ$) for photometric measurements and for installing the lamp on the vehicle.
- 2.8. "*Center of reference*" means the intersection of the axis of reference with the exterior light-emitting surface, specified by the manufacturer of the lamp.
- 2.9. "*Extreme outer edge*" on either side of the vehicle means the plane parallel to the median longitudinal plane of the vehicle and touching its lateral outer edge, disregarding the projection:
- 2.9.1. Of tyres near their point of contact with the ground and connections for tyre-pressure gauges and tyre inflating/deflating devices/ducts;
- 2.9.2. Of any anti-skid devices which may be mounted on the wheels;
- 2.9.3. Of devices for indirect vision;
- 2.9.4. Of side direction indicator lamps, end-outline marker lamps, front and rear position lamps, parking lamps and side retro-reflectors;
- 2.9.5. Of customs seals affixed to the vehicle and devices for securing and protecting such seals.
- 2.10. Overall dimensions:
- 2.10.1. "*Overall width*" means the distance between the two vertical planes defined in paragraph 2.9. above;
- 2.10.2. "*Overall length*" means the distance between the two vertical planes perpendicular to the median longitudinal plane of the vehicle and touching its front and rear outer edge, disregarding the projection:
- (a) Of devices for indirect vision;
- (b) Of end-outline marker lamps;
- (c) Of coupling devices, in the case of motor vehicles.
- 2.11. "*Single and multiple lamp*"
- 2.11.1. "*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:
- (i) 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; or
- (ii) The distance between two adjacent/tangential distinct parts does not exceed 15 mm when measured perpendicularly to the reference axis; or
- (c) Any assembly of two independent retro-reflectors, whether identical or not, that has been approved separately and is installed in such a way that:

- (i) The projection of their apparent surfaces in the direction of the reference axis occupies not less 60 per cent of the smallest quadrilateral circumscribing the projections of the said apparent surfaces in the direction of the reference axis; or
 - (ii) The distance between two adjacent/tangential distinct parts does not exceed 15 mm when measured perpendicularly to the reference axis.
- 2.11.2. "*Two lamps*" or "*an even number of lamps*" means a single light-emitting surface in the shape of a band or strip if such band or strip is placed symmetrically in relation to the median longitudinal plane of the vehicle, extends on both sides to within at least 0.4 m of the extreme outer edge of the vehicle, and is not less than 0.8 in length; the illumination of such surface shall be provided by not less than two light sources placed as close as possible to its ends; the light-emitting surface may be constituted by a number of juxtaposed elements on condition that the projections of the several individual light-emitting surfaces on a transverse plane occupy not less than 60 per cent of the area of the smallest rectangle circumscribing the projections of the said individual light-emitting surfaces.
- 2.12. "*Operating tell-tale*" means a visual or auditory signal (or any equivalent signal) indicating that a device has been switched on and is operating correctly or not.
- 2.13. "*Circuit-closed tell-tale*" means a tell-tale showing that a device has been switched on but not showing whether it is operating correctly or not.
- 2.14. "*Color of the light emitted from the device*" The definitions of the color 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.
- 2.15. "*Slow-Moving Vehicles (SMV) rear marking plate*", a triangular plate with truncated corners with a characteristic pattern faced with retro-reflective and fluorescent material or devices (class 1); or with retro-reflective materials or devices only (class 2) (see UN Regulation No. 69 or [RRD]);
- 2.16. "*Signalling panel or signalling foil*" means a device used to indicate to other road users the presence of a wide or long vehicle when viewed from the front, rear or side."

Paragraph 5.2., amend to read:

- "5.2. The illuminating lamps (main-beam headlamp, dipped-beam headlamp and front fog lamp) shall be so installed that correct adjustment of their orientation can easily be carried out."

Paragraph 5.10., amend to read:

- "5.10. No red light which could give rise to confusion shall be emitted from a lamp as defined in paragraph 2.3. in a forward direction and no white light which could give rise to confusion, shall be emitted from a lamp as defined in paragraph 2.3. in a rearward direction. No account shall be taken of lighting devices fitted for the interior lighting of the vehicle. In case of doubt, this requirement shall be verified as follows:

..."

Insert a new paragraph 5.20., to read:

"5.20. 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., amend to read:

"6.1. Main-beam headlamps (UN Regulations Nos. 98, 112 and 113 or [RID])"

Paragraph 6.2., amend to read:

"6.2. Dipped-beam headlamps (UN Regulations Nos. 98, 112 and 113 or [RID])"

Paragraph 6.2.5., amend to read:

"6.2.5. Geometric visibility: Defined by angles α and β

$\alpha = 15^\circ$ upwards and 10° downwards,

$\beta = 45^\circ$ outwards and 5° inwards.

Within this field, virtually the whole of the apparent surface of the lamp shall be visible.

The presence of partitions or other items of equipment near the headlamp shall not give rise to secondary effects causing discomfort to other road users."

Paragraph 6.3., amend to read:

"6.3. Front fog lamps (UN Regulation No. 19 or [RID])"

Paragraph 6.3.5., amend to read:

"6.3.5. Geometric visibility: Defined by angles α and β

$\alpha = 5^\circ$ upwards and downwards;

$\beta = 45^\circ$ outwards and 5° inwards."

Paragraph 6.4., amend to read:

"6.4. Reversing lamp(s) (UN Regulation No. 23 or [LSD])"

Paragraph 6.4.5., amend to read:

"6.4.5. Geometric visibility: Defined by angles α and β

$\alpha = 15^\circ$ upwards and 5° downwards;

$\beta = 45^\circ$ to right and to left if there is only one lamp;

$\beta = 45^\circ$ outwards and 30° inwards if there are two lamps."

Paragraph 6.5., amend to read:

"6.5. Direction-indicator lamps (UN Regulation No. 6 or [LSD])"

Paragraph 6.7. and 6.7.1., amend to read:

"6.7. Stop lamps (UN Regulation No. 7 or [LSD])"

- 6.7.1. Presence: S1 or S2 of devices as described in UN Regulation No. 7 or [LSD]:
Mandatory on all vehicles.
S3 or S4 of devices as described in UN Regulation No. 7 or [LSD]: Optional
on all vehicles."

Paragraph 6.8., amend to read:

- "6.8. Front position lamps (UN Regulation No. 7 or [LSD])"

Paragraph 6.9., amend to read:

- "6.9. Rear position lamps (UN Regulation No. 7 or [LSD])"

Paragraph 6.10., amend to read:

- "6.10. Rear fog-lamps (UN Regulation No. 38 or [LSD])"

Paragraph 6.11., amend to read:

- "6.11. Parking lamps (UN Regulation No. 77, 7 or [LSD])"

Paragraph 6.12., amend to read:

- "6.12. End-outline marker lamps (UN Regulation No. 7 or [LSD])"

Paragraph 6.14., amend to read:

- "6.14. Rear retro-reflectors, non-triangular (UN Regulation No. 3 or [RRD])"

Paragraph 6.14.2., amend to read:

- "6.14.2. Number: Two or four (see paragraph 6.14.5.1.).

The performances of these devices shall conform to the requirements concerning Class IA or IB retro-reflectors in UN Regulation No. 3 or [RRD]. Additional retro-reflecting devices and materials (including two retro-reflectors not complying with paragraph 6.14.4. below), are permitted provided they do not impair the effectiveness of the mandatory lighting and light-signalling devices."

Paragraph 6.15., amend to read:

- "6.15. Side retro-reflectors, non-triangular (UN Regulation No. 3 or [RRD])"

Paragraph 6.15.2., amend to read:

- "6.15.2. Number:

Such that the requirements for longitudinal positioning are complied with. The performances of these devices shall conform to the requirements concerning Class IA or IB retro-reflectors in UN Regulation No. 3 or [RRD].

Additional retro-reflecting devices and materials (including two retro-reflectors not complying with paragraph 6.15.4. below), are permitted provided they do not impair the effectiveness of the mandatory lighting and light-signalling devices."

Paragraph 6.16., amend to read:

- "6.16. Rear registration plate illuminating device (UN Regulation No. 4 or [LSD])"

Paragraph 6.17., amend to read:

- "6.17. Front retro-reflectors, non-triangular (UN Regulation No. 3 or [RRD])"

Paragraph 6.18., amend to read:

"6.18. Side-marker lamps (UN Regulation No. 91 or [LSD])"

Paragraph 6.19., amend to read:

"6.19. Daytime running lamp (UN Regulation No. 87 or [LSD])"

Paragraph 6.20., amend to read:

"6.20. Cornering lamp (UN Regulation No. 119 or [RID])"

Paragraph 6.21., amend to read:

"6.21. Conspicuity markings (UN Regulation No. 104 or [RRD])"

Paragraph 6.22., amend to read:

"6.22. SMV rear marking plate (UN Regulation No. 69 or [RRD])"

6.22.1. Presence: Optional on vehicles with a maximum design speed of not more than 40 km/h. Prohibited on all other vehicles.

6.22.2. Number: According to Annex 15 of UN Regulation No. 69 or Annex 25 of UN Regulation No. [RRD].

6.22.3. Arrangement: According to Annex 15 of UN Regulation No. 69 or Annex 25 of UN Regulation No. [RRD].

6.22.4. Position

Width: According to Annex 15 of UN Regulation No. 69 or Annex 25 of UN Regulation No. [RRD].

Height: No individual specifications.

Length: According to Annex 15 of UN Regulation No. 69 or Annex 25 of UN Regulation No. [RRD].

6.22.5. Geometric visibility: According to Annex 15 of UN Regulation No. 69 or Annex 25 of UN Regulation No. [RRD].

6.22.6. Orientation: According to Annex 15 of UN Regulation No. 69 or Annex 25 of UN Regulation No. [RRD]."

Paragraph 6.24., amend to read:

"6.24. Manoeuvring lamps (UN Regulation No. 23 or [LSD])"

Paragraph 6.24.9.2., amend to read:

"6.24.9.2. The requirement of 6.24.9.1. shall be verified by a drawing or simulation or deemed be satisfied if the installation conditions comply with paragraph 6.2.2. of UN Regulation No. 23 or paragraph 5.10.2. of UN Regulation No. [LSD], as noticed in the communication document in Annex 1, paragraph 9."

Paragraph 6.25., amend to read:

"6.25. Rear retro-reflectors, triangular (UN Regulation No. 3 or [RRD])"

Paragraph 6.26., amend to read:

"6.26. Signalling panel and signalling foil (UN Regulations Nos. 70 and 104 or [RRD])"

Annex 1

Item 6, amend to read:

"6. Equivalent lamps: yes/no² (see paragraph 2.3.1.)"

Annex 6

Paragraph 2., amend to read:

"2. Each panel or foil shall be according to the specifications of UN Regulation No. 70, class 5 or UN Regulation No. 104, class F or UN Regulation No. [RRD], class 5 or class F."
