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**Economic Commission for Europe****Inland Transport Committee****World Forum for Harmonization of Vehicle Regulations****Working Party on Lighting and Light-Signalling****Eighty-third session**

Geneva, 21–24 April 2020

Item 7 (c) of the provisional agenda

**Other UN Regulations:****UN Regulation No. 86 (Installation of lighting and light-signalling devices for agricultural vehicles)****Proposal for a draft amendment to UN Regulation No. 86****Submitted by the experts from the European Agricultural Machinery Association\***

The text reproduced below was prepared by the experts from the European Agricultural Machinery Association (CEMA) with the aim to improve lateral lighting on vehicles of more than 4,6 m and to take into account asymmetric vehicles designs. It intends also to provide some editorial corrections and to harmonize some requirements with UN Regulation No. 48. The modifications to the current 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 2020 as outlined in proposed programme budget for 2020 (A/74/6 (part V sect. 20) para 20.37), 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.



## I. Proposal

*Paragraph 5.1.1., amend to read:*

- "5.1.1. Vehicles shall be fitted with the permanently connected socket outlet specified in ISO standard 1724:2003 (Road vehicles - Connectors for the electrical connection of towing and towed vehicles - 7 pole connector type 12 N (normal) for vehicles with 12 V nominal supply voltage), or ISO 1185:2003 (Road vehicles - Connectors for the electrical connection of towing and towed vehicles - 7-pole connector type 24 N (normal) for vehicles with 24 V nominal supply voltage) or both when they have a connection for attaching trailed vehicles or mounted machines. **The 13-pole connector specified in ISO 11446-1:2012 (Road vehicles - Connectors for the electrical connection of towing and towed vehicles - Part 1: 13-pole connectors for vehicles with 12 V nominal supply voltage not intended to cross water fords) or ISO 11446-2:2012 (Road vehicles - Connectors for the electrical connection of towing and towed vehicles - Part 2: 13-pole connectors for vehicles with 12 V nominal supply voltage intended to cross water fords) may be used alternatively. In addition, a 7-pole connector specified in ISO 3732:2003 (Road vehicles - Connectors for the electrical connection of towing and towed vehicles - 7-pole connector type 12 S (supplementary) for vehicles with 12 V nominal supply voltage) may be installed.**"

*Paragraph 5.6., amend to read:*

- "5.6. On vehicles whose external shape is asymmetrical, the requirements of paragraphs 5.5.1. and 5.5.2. shall be satisfied as far as possible. ~~These requirements shall be regarded as having been met if the distance of the two lamps from the median longitudinal plane and from the bearing plane on the ground is the same.~~"

*Paragraph 5.11. and its subparagraphs, amend to read:*

- "5.11. The electrical connections shall be such that the front and rear position lamps, the end-outline marker lamps, if they exist, the side-marker lamps, if they exist, and the rear registration plate illuminating device can only be switched ON and OFF simultaneously.

This condition does not apply:

- 5.11.1. When front and rear position lamps are switched ON, as well as side-marker lamps when combined or reciprocally incorporated with said lamps, as parking lamps; **or;**
- 5.11.2. When side-marker lamps flash in conjunction with direction indicators.**
- 5.11.~~2~~**3.** To front position lamps when their function is substituted under the provisions of paragraph 5.12.1. below."

*Paragraph 6.2.4.2.1., amend to read:*

- "6.2.4.2.1. Minimum 500 mm; this value may be reduced to 350 mm for vehicles with a maximum **overall** width not exceeding 1,300 mm."

*Paragraph 6.2.4.2.4., amend to read:*

- "6.2.4.2.4. In the case of tractors equipped for the fitting of portable devices at the front, two dipped-beam headlamps in addition to the lamps mentioned in paragraph 6.2.2. shall be allowed at a height not exceeding ~~3,000~~ **4,000** mm if the electrical connections are such that two pairs of dipped-beam headlamps cannot be switched on at the same time."

*Paragraph 6.5.1., amend to read:*

- "6.5.1. Presence: Mandatory. Types of indicators fall into categories (1, 1a, 1b, 2a, 2b, 5 and 6) the

assembly of which on one tractor constitutes an arrangement (A to D).

Arrangement A ~~and D~~ shall be allowed only on vehicles of category T whose overall length does not exceed 4,600 mm and in the case of which the distance between the outer edges of the illuminating surfaces is not more than 1.60 m.

Arrangements B, C **and D** shall apply to all vehicles of category T.

For vehicles of categories R and S category 2a lamps shall be used.

Additional direction-indicator lamps optional."

*Paragraph 6.5.4.2., amend to read:*

"6.5.4.2. Height

Above the ground not less than 400 mm and not more than 2,500 mm and within a maximum height of 4,000 mm for optional direction-indicator lamps.

For vehicles with a maximum **overall** width not exceeding 1,300 mm not less than 350 mm above the ground."

*Paragraph 6.5.8., amend to read:*

"6.5.8. If it is optical, it shall be a green flashing light which, in the event of the malfunction of any of the direction-indicator lamps other than the repeating side direction-indicator lamps **or the side-marker lamps when flashing**, is either extinguished, or remains alight without flashing, or shows a marked change of frequency."

*Paragraph 6.7.4.2., amend to read:*

"6.7.4.2. Height

S1 or S2 categories:

Above the ground, not less than 400 mm and not more than 2,500 mm and within a maximum height of 4,000 mm for optional stop lamps.

S3 or S4 categories:

Above the mandatory stop lamps. ~~and in~~ **The** horizontal plane tangential to the lower edge of the apparent surface of a S3 or S4 category device shall be above the horizontal plane tangential to the upper edge of the apparent surface of S1 or S2 categories devices.

Two optional category S1 or S2 devices:

Above the ground, not less than 400 mm and within a maximum height of 4,000 mm."

*Paragraph 6.8.1., amend to read:*

"6.8.1. Presence:

Mandatory on all vehicles of category T.

Mandatory on all vehicles of categories R and S exceeding 1,600 mm in **overall** width.

Optional on other vehicles of categories R and S.

The front position lamps may be omitted if end-outline marker lamps are installed and meet all the installation requirements for front position lamps."

*Paragraph 6.8.7.*, amend to read:

"6.8.7. Electrical connections: No individual specifications (see paragraph 5.11.).

**However, if a front position lamp is reciprocally incorporated with a direction-indicator, the electrical connection of the front position lamp on the relevant side of the vehicle or the reciprocally incorporated part of it may be such that it is switched off during the entire period (both ON and OFF cycle) of activation of the direction-indicator lamp."**

*Paragraph 6.9.4.2.*, amend to read:

"6.9.4.2. Height Except as provided in paragraph 6.9.5.1. above the ground not less than 400 mm and not more than 2,500 mm.

For vehicles with a maximum **overall** width not exceeding 1,300 mm above the ground not less than 250 mm."

*Paragraph 6.11.4.2.*, amend to read:

"6.11.4.2. Height Above the ground, not less than 400 mm and not more than 2,500 **mm**."

*Paragraph 6.12.1.*, amend to read:

"6.12.1. Presence: ~~Mandatory on vehicles exceeding 2,550 mm in width.~~ Optional on vehicles between **exceeding 1,800 mm in overall width. Prohibited on all other vehicles.** ~~and 2,550 mm in width."~~

*Paragraph 6.14.1.*, amend to read:

"6.14.1. Presence: Mandatory on vehicles of category T. ~~Prohibited~~ **Optional** on vehicles of categories R and S **in addition to 6.25**. Prohibited on all other vehicles."

*Paragraph 6.14.4.2.*, amend to read:

"6.14.4.2. Height Except as provided in paragraph 6.14.5.1., not less than 400 mm and not more than 900 mm above the ground.

For vehicles with a maximum **overall** width not exceeding 1,300 mm above the ground not less than 250 mm.

However, the upper limit may be increased to not more than 1,200 mm if it is impossible to keep within the height of 900 mm without having to use fixing devices liable to be easily damaged or bent.

**When the reflectors are mounted in addition to 6.25., they shall keep within a**

**height between 400 mm and 4000 mm above the ground."**

*Paragraph 6.14.5.1.1., amend to read:*

"6.14.5.1.1.

Two retro-reflectors shall keep within the maximum height of 900 mm above the ground. However, this upper limit may be increased to not more than 1,500 mm where the shape, structure, design or operational conditions of the vehicle ~~compliance with 900 mm~~ **makes it impossible to comply with 900 mm limit**, without having to use fixing devices liable to be easily damaged or bent.

A distance of at least 300 mm between the interior edges of the rear retro-reflectors shall be observed, and they shall have a vertical angle of visibility above the horizontal of 15°."

*Paragraph 6.15.1., amend to read:*

"6.15.1. Presence:

Mandatory on **all** vehicles ~~of category T~~ the length of which exceeds ~~6~~ **4,6** m ~~and on all vehicles of categories R and S.~~ Optional on **all other vehicles** ~~tractors~~ the length of which does not exceed 6 m.

**Optional on all vehicles where conspicuity markings according to 6.21. are fitted."**

*Paragraph 6.15.4.2., amend to read:*

"6.15.4.2. Height

Not less than 400 mm and not more than 900 mm above the ground.

However, the upper limit may be increased to not more than ~~1,500~~ **2,500** mm if it is impossible to keep within the height of 900 mm without having to use fixing devices liable to be easily damaged or bent."

*Paragraph 6.15.5., amend to read:*

"6.15.5. Geometric visibility:

Horizontal angle: 20° forwards and rearwards.

Vertical angle: 10° above and below the horizontal. The vertical angle below the horizontal may be reduced to 5° if the ~~length~~ **height above the ground** of the reflector is less than 750 mm."

*Paragraph 6.15.6. amend to read:*

"6.15.6. Orientation:

Towards the side. **Where the orientation does not change, the reflector may rotate."**

*Paragraph 6.17.1., amend to read:*

"6.17.1. Presence:

Optional on vehicles of category T.

Mandatory on vehicles of categories R and S.

**Optional on vehicles where signalling panels or signalling foils according to 6.26. are installed."**

Paragraph 6.17.4.1., amend to read:

"6.17.4.1. Width:

That point on the illuminating surface which is farthest from the vehicle's median longitudinal plane shall not be more than 400 mm **from the extreme outer edge of the vehicle.** ~~and for~~ **For** vehicles of category R and S **this distance shall not be** more than 150 mm. ~~from the extreme outer edge of the vehicle.~~

The distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall be not less than 600 mm. This distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,300 mm."

Paragraph 6.17.4.2., amend to read:

"6.17.4.2. Height:

Above the ground, not less than 300 mm nor more than 1,500 mm. If this is not possible due to the design the front reflectors shall be **arranged** as low as possible."

Paragraph 6.18.1., amend to read:

"6.18.1. Presence:

Mandatory on all vehicles of categories T ~~and R~~ exceeding ~~4,6 m~~ in length. **Mandatory on all vehicles of categories R having a sum of the axle loads above 3,5 t and exceeding 4,6 m in length.** Optional on all other vehicles."

Paragraph 6.18.4.3., amend to read:

"6.18.4.3. Length:

At least one side-marker lamp shall be fitted to the middle third of the vehicle, the foremost side-marker lamp being not further than 3 m from the front. The distance between two adjacent side- marker lamps shall not exceed 3 m. If the structure, design or the operational use of the vehicle makes it impossible to comply with such a requirement, this distance may be increased to 4 m.

The distance between the rearmost side-marker lamp and the rear of the vehicle shall not exceed 1 m.

However, for vehicles the **overall** length of which does not exceed 6 m and for chassis-cabs, it is sufficient to have one side-marker lamp fitted within the first third ~~and/or~~ within the last third of the vehicle length. **For tractors, one side-marker lamp fitted within the middle third of the vehicle length is also sufficient.**

**The side marker lamp may be part of the light emitting surface in common with the side retro-reflector."**

Paragraph 6.18.7., amend to read:

"6.18.7. Electrical connections

~~No individual specifications (see paragraph 5.11):~~ **Except as provided in 5.11, on**

vehicles of category T where installation of side-marker lamps is mandatory, these shall be wired to flash, provided that this flashing is in phase and at the same frequency with the direction-indicator lamps at the same side of the vehicle."

Paragraph 6.25.4.2., amend to read:

"6.25.4.2. Height:

Except as provided in paragraph 6.25.5.1., not less than 400 mm and not more than 1,500 mm above the ground.

For vehicles with a maximum overall width not exceeding 1,300 mm above the ground not less than 250 mm above the ground."

Paragraph 6.26.1., amend to read:

"6.26.1. Presence:

~~Mandatory~~ **Marking with class 5 or class F mandatory** on vehicles exceeding 2,550 mm in overall width.

Optional on vehicles of ~~category S~~ not exceeding 2,550 mm in overall width."

Paragraph 6.26.3., amend to read:

"6.26.3. Arrangement

~~According~~ **Marking with class 5 or class F according** to the specifications of Annex 6."

Annex 6, Paragraph 1.1, amend to read:

"1.1. Signalling panels and signalling foils shall have the following dimensions:"

Figure 1

**Basic standard area**

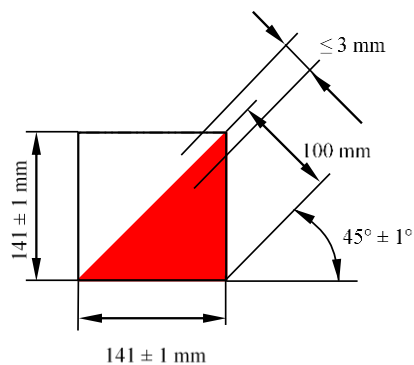
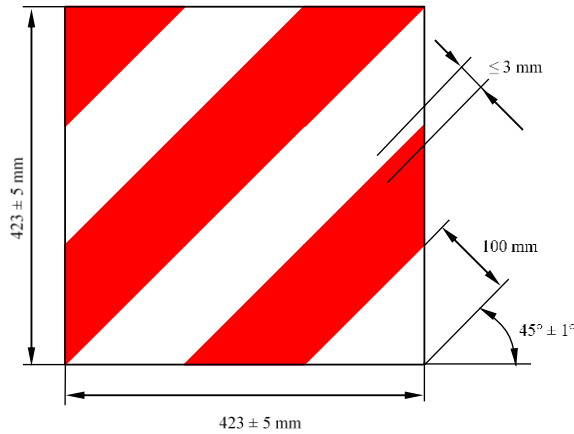


Figure 2

**Signalling panel or signalling foil (Form A is shown as an example)**



Annex 6, Paragraph 1.1, Table 1, amend to read:

"Table 1

**Dimensions [mm]**

Signalling panel or signalling foil	<i>a</i> [mm]	<i>b</i> [mm]	Surface [cm <sup>2</sup> ]
Form A	423 ± 5	423 ± 5	≥ 1,790
Form B	282 ± 5	282 ± 5	≥ 795
Form R1	282 ± 5	423 ± 5	≥ 1,193
Form R2	423 ± 5	282 ± 5	
Form L1	141 ± 5	846 ± 5	≥ 1,193
Form L2	846 ± 5	141 ± 5	
Form K1	141 ± 5	423 ± 5	≥ 596
Form K2	423 ± 5	141 ± 5	

Deviations from the specified formats are permitted, provided that:

- (a) The visible surface of each panel or foil shall be at least equal to 4 basic standard areas and
- (b) Each panel or foil shall comprise at least 3 entire basic standard areas.

If the structure, design or the operational use of the vehicle makes it impossible to comply with such a requirement, each panel or foil may be split into 2 parts as long as each part comprises at least 2 entire basic standard areas."

Annex 6,

Paragraph 1.2., Table 2, amend the title to read:

~~Number~~ **Minimum number** of panels or foils visible from the front and from the rear"

Insert a new paragraph 1.3., to read:

**"1.3. Signalling panels or foils of Form A may be combined with lamps, if the surface of the boards covered by the lamps does not exceed 150 cm<sup>2</sup>."**

## II. Justification

1. There are editorial errors which should be corrected. Also, some wording should be improved for better understanding. The use of the term "overall width" should be used in the document for clarification.

2. It is estimated that accidents may be considerably reduced by increasing the conspicuity of agricultural and forestry vehicles by adapting the requirements for appropriate enhanced lighting installations in UN Regulation No. 86

3. In the European Union, the identical requirements were introduced in June 2018 (EU Regulation 2018/829 amending EU Regulation 2015/208). EU aims at the adoption of UN



Regulation No. 86. This will be easier if both EU and UN legislative requirements are identical.

4. The 13-pole connector according to ISO 11446-1:2012 and ISO 11446-2:2012 should be alternatively permitted.
5. The supplementary 7-pole connector according to ISO 3732:2003 should also be permitted.
6. The requirements concerning the symmetry of the lighting installation should be adapted in order to consider also special vehicles with an asymmetric shape.
7. Additional dipped-beam headlamps should be allowed up to a height of 4,000 mm.
8. Adaptation of the side direction-indicators requirements for tractors above 4,6 m long.
9. Additional non-triangular rear reflectors should be permitted for vehicles of categories R and S. In some cases, additional reflectors are desirable with regard to a better visibility, however, often there is not enough space to install triangular reflectors (see figure 1 below).
10. The lowest position to install side reflectors is often above 1500 mm. Therefore, the height should be raised to 2500 mm max.
11. This amendment introduces the necessary changes into UN Regulation No. 86.



Figure 1  
Position of additional reflectors: the lowest position of side reflectors are often above 1500 mm.