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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. 86 (Installation of Lighting and Light-Signalling Devices for Agricultural Vehicles)

Submitted by the Working Party on Lighting and Light-Signalling*

The text reproduced below was adopted by the Working Party on Lighting and Light-Signalling (GRE) at its ninetieth session (ECE/TRANS/WP.29/GRE/90, para. 21). It is based on ECE/TRANS/WP.29/GRE/2023/12/Rev.1 as amended by informal document GRE-90-32. 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 2024 sessions.

* In accordance with the programme of work of the Inland Transport Committee for 2024 as outlined in proposed programme budget for 2024 (A/78/6 (Sect. 20), table 20.5), 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.



Paragraph 2.4.1., second sentence, for “2.5.2.” read “2.4.2.”

Paragraph 3.2.5., for “2.10.” read “2.5”.

Paragraph 3.3., amend to read:

"3.3. An unladen vehicle fitted with a complete set of lighting and light-signalling equipment, as prescribed in paragraph 3.2.2. above, and representative of the vehicle type to be approved shall be submitted to the Technical Service conducting approval tests."

Add a new paragraph 5.22. to read:

"5.22. All lamps (devices) shall, where applicable, be type approved according to the corresponding device UN Regulations as specified in the relevant subparagraphs of paragraph 6. of this Regulation when installed on a vehicle."

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.
 Notwithstanding provisions of paragraph 5.17 and related subparagraphs, within this field, at least 90 % 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 6.4.4.2., third indent, for “an downwards inclination” read “a downwards inclination”.

Paragraph 6.8. and its subparagraphs, amend to read:

"6.8. Front position lamps (UN Regulations Nos. 7 or 148)

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.

6.8.2. Number: Two, four or six.

6.8.3. Arrangement: No individual specifications. If more than two front position lamps are fitted, at least one pair of front position lamps shall be fixed.

6.8.4. Position

6.8.4.1. Width: For at least one pair of front position lamps, that point on the illuminating surface which is farthest from the vehicle's median longitudinal plane shall be not more than 400 mm from the extreme outer edge of the vehicle.

- For at least one pair of front position lamps the distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall be not less than 500 mm. This distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,400 mm.
- For additional pairs of front position lamps, the distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall be not less than 100 mm.
- 6.8.4.2. Height: For at least one pair of front position lamps, not less than 400 mm and not more than 2,500 mm above the ground.
- For additional pairs of front position lamps, not more than 4,000 mm above the ground.
- 6.8.4.3. Length: No specifications provided that the lamps are aligned forwards and the angles of geometrical visibility specified in paragraph 6.8.5. are complied with.
- 6.8.5. Geometric visibility: The single pair or the combination of all pairs of front position lamps shall fulfil the following requirements:
- Horizontal angle: 10° inwards and 80° outwards. However, the angle of 10° inwards may be reduced to 5° if the shape of the bodywork makes it impossible to keep to 10°. For vehicles with any overall width not exceeding 1,400 mm this angle may be reduced to 3° if the shape of the bodywork makes it impossible to keep to 10°.
- Vertical angle: 15° above and below the horizontal. The vertical angle below the horizontal may be reduced to 10° if the height of the lamp above the ground is less than 1,900 mm, and to 5° if this height is less than 750 mm.
- 6.8.6. Orientation: Towards the front.
- 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 time (both ON and OFF cycle) of operation of the direction-indicator lamp.
- 6.8.8. Tell-tale: Mandatory. This tell-tale shall be non-flashing. It shall not be required if the instrument panel lighting can only be turned on simultaneously with the front position lamps."

Paragraph 6.9. and its subparagraphs, amend to read:

- "6.9. Rear position lamps (UN Regulations Nos. 7 or 148)
- 6.9.1. Presence: Mandatory.
- The rear position lamps may be omitted if end-outline marker lamps are installed and meet all the installation requirements for rear position lamps.
- 6.9.2. Number: Two, four or six.
- 6.9.3. Arrangement: No individual specifications. If more than two rear position lamps are fitted, at least one pair of rear position lamps shall be fixed.
- 6.9.4. Position
- 6.9.4.1. Width: For at least one pair of rear position lamps, that point on the illuminating surface which is farthest from the vehicle's median longitudinal plane shall be not more than 400 mm from the extreme outer edge of the vehicle.
- For at least one pair of rear position lamps, the distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall be not less than 500 mm. This distance may be reduced to 400 mm where the overall width of the vehicle is less than 1,400 mm.
- For additional pairs of rear position lamps, the distance between the inner edges of the two apparent surfaces in the direction of the reference axes shall be not less than 100 mm.
- 6.9.4.2. Height: For at least one pair of rear position lamps, not less than 400 mm and not more than 2,500 mm above the ground.
- For vehicles with a maximum overall width not exceeding 1,300 mm, not less than 250 mm above the ground.
- For additional pairs of rear position lamps, not more than 4,000 mm above the ground.
- 6.9.4.3. Length: At the rear of vehicle, at least one pair of rear position lamps shall not be more than 1,000 mm from the rearmost point of the vehicle.
- 6.9.5. Geometric visibility: The single pair or the combination of all pairs of rear position lamps shall fulfil the following requirements:
- Horizontal angle: either 45° inwards and 80° outwards, or 80° inwards and 45° outwards. The horizontal inward angle may be reduced to 30° if the shape of the bodywork makes it impossible to reach 45°.
- Vertical angle: 15° above and below the horizontal. The angle below the horizontal

- may be reduced to 10° if the height of the lamp above the ground is less than 1,900 mm, and to 5° if this height is less than 750 mm.
- 6.9.6. Orientation: Towards the rear.
- 6.9.7. Electrical connections: No individual specifications (see paragraph 5.11.).
- However, if a rear position lamp is reciprocally incorporated with a direction indicator, the electrical connection of the rear 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 time (both ON and OFF cycle) of operation of the direction-indicator lamp.
- 6.9.8. "Circuit closed" tell-tale: Mandatory. It shall be combined with that of the front position lamps."

Paragraph 6.12.2., amend to read:

- "6.12.2. Number: Two visible from the front and/or two visible from the rear.
- Optional: additional lamps may be fitted as follows:
- (a) Two visible from the front;
- (b) Two visible from the rear."

Paragraph 6.14. and its subparagraphs, amend to read:

- "6.14. Rear retro-reflectors, non-triangular (UN Regulations Nos. 3 or 150)
- 6.14.1. Presence: Mandatory on vehicles of category T. Optional on vehicles of categories R and S in addition to paragraph 6.25.
- 6.14.2. Number: Two, four or six.
- The performances of these devices shall conform to the requirements concerning Class IA or IB retro-reflectors in UN Regulations Nos. 3 or 150. 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.
- 6.14.3. Arrangement: No individual specifications.
- 6.14.4. Position
- 6.14.4.1. Width: For at least one pair of rear retro-reflectors, that point on the illuminating surface which is farthest from the vehicle's median longitudinal plane shall be not more than 400 mm from the extreme outer edge of the vehicle.
- In case one single pair of rear retro-reflectors is fitted, 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.

In case that more than one pair of rear retro-reflectors are fitted, for at least one pair a distance of at least 300 mm between the inner edges of the two apparent surfaces in the direction of the reference axes shall be observed, and they shall have a vertical angle of visibility above the horizontal of 15°.

If signalling panels or signalling foils are fitted, according to the requirements given in paragraph 6.26., the single pair or the combination of pairs of rear retro-reflectors do not need to comply with the location requirements set out in the first sub-paragraph.

6.14.4.2. Height:

For at least one pair of rear retro-reflectors 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 1,500 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.

For additional pairs of rear retro-reflectors, not more than 2,500 mm above the ground.

When the reflectors are mounted in addition to paragraph 6.25., they shall keep within a height between 400 mm and 4,000 mm above the ground.

6.14.4.3. Length:

No individual specifications.

6.14.5. Geometric visibility:

The single pair or the combination of all pairs of rear retro-reflectors lamps shall fulfil the following requirements:

Horizontal angle: 30° inwards and outwards.

Vertical angle: 15° above and below the horizontal. The vertical angle below the horizontal may be reduced to 5° if the height of the reflector is less than 750 mm.

6.14.6. Orientation:

Towards the rear.

6.14.7. Other requirements:

The illuminating surface of the retro-reflector may have parts in common with that of any other rear lamp."

Paragraph 6.15.1., amend to read:

"6.15.1. Presence:

Mandatory on all vehicles the length of which exceeds 4,6 m. Optional on all other vehicles.

Optional on all vehicles where conspicuity markings according to paragraph 6.21. are fitted.”

Paragraph 6.15.4.3., amend to read:

- “6.15.4.3. Length: One reflector shall be not more than 3 m from the foremost point of the vehicle, and either the same reflector or a second reflector shall be not more than 3 m from the rearmost point of the vehicle.
- The distance between two reflectors on the same side of the vehicle 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.”

Paragraph 6.17. and its sub-paragraphs, amend to read:

- “6.17. Front retro-reflectors, non-triangular (UN Regulations Nos. 3 or 150)
- 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 paragraph 6.26. are installed.
- 6.17.2. Number: Two, four or six.
- 6.17.3. Arrangement: No individual specifications.
- 6.17.4. Position
- 6.17.4.1. Width: For at least one pair of front retro-reflectors, 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. For vehicles of category R and S this distance shall not be more than 150 mm.
- In case one single pair of front retro-reflectors is fitted, 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.
- In case that more than one pair of front retro-reflectors are fitted, for at least one pair a distance of at least 300 mm between the inner edges of the two apparent surfaces in the direction of the reference axes shall be observed, and they shall have a vertical angle of visibility above the horizontal of 15°.
- If signalling panels or signalling foils are fitted, according to the requirements given in paragraph 6.26., the single pair or the combination of pairs of front retro-reflectors do not need to comply with the location requirements set out in the first subparagraph.

- 6.17.4.2. Height: In case one single pair of front retro-reflectors is fitted, not less than 300 mm nor more than 1,500 mm above the ground.
If this is not possible due to the design the front reflectors shall be arranged as low as possible.
In case that more than one pair of front retro-reflectors are installed, at least one pair shall be bound by the requirements set in the first sub-paragraph.
For additional pairs of front retro-reflectors, not more than 2,500 mm above the ground.
- 6.17.4.3. Length: At the front of the vehicle.
- 6.17.5. Geometric visibility: The single pair or the combination of all pairs of front retro-reflectors lamps shall fulfil the following requirements:
Horizontal angle: 30° inwards and outwards.
Vertical angle: 10° above and below the horizontal. The vertical angle below the horizontal may be reduced to 5° in the case of a retro-reflector less than 750 mm above the ground.
- 6.17.6. Orientation: Towards the front.
- 6.17.7. Other requirements: The illuminating surface of the retro-reflector may have parts in common with the apparent surface of any other lamp situated at the front."

Paragraph 6.21.4. and its subparagraphs, amend to read:

- "6.21.4. Position
- 6.21.4.1. Width:
- 6.21.4.1.1. The conspicuity marking shall be as close as practicable to the extreme outer edge of the vehicle.
- 6.21.4.1.2. The cumulative horizontal length of the conspicuity marking elements, as mounted on the vehicle, shall equate to at least 80 % of the overall width of the vehicle, excluding any horizontal overlap of individual elements.
- 6.21.4.1.3. However, if it is impossible to achieve the value referred to in paragraph 6.21.4.1.2, the cumulative length may be reduced to 60 %.
- 6.21.4.2. Height:
- 6.21.4.2.1. Line markings and contour markings lower element(s): as low as practicable compatible with the shape, structure, design and operational requirements of the vehicle.
- 6.21.4.2.2. Contour markings upper element(s): as high as practicable compatible with the shape, structure, design and operational requirements of the vehicle.
- 6.21.4.3. Length:

- 6.21.4.3.1. The conspicuity marking shall be as close as practicable to the ends of the vehicle and reach to within 1,000 mm of:
- 6.21.4.3.1.1. for tractors, each end of the vehicle;
- 6.21.4.3.1.2. for trailers, each end of the vehicle (excluding the drawbar).
- 6.21.4.3.2. The cumulative horizontal length of the conspicuity marking elements, as mounted on the vehicle, excluding any horizontal overlap of individual elements, shall equate to at least 80 % of:
- 6.21.4.3.2.1. for tractors, the length of the vehicle excluding the cab;
- 6.21.4.3.2.2. for trailers, the length of the vehicle (excluding the drawbar).
- 6.21.4.3.3. However, if it is impossible to achieve the value referred to in paragraph 6.21.4.3.2., the cumulative length may be reduced to 60 %.”

Paragraph 6.25. and its sub-paragraphs, amend to read:

- "6.25. Rear retro-reflectors, triangular (UN Regulations Nos. 3 or 150)
- 6.25.1. Presence: Mandatory on vehicles of categories R and S. Prohibited on vehicles of category T.
- 6.25.2. Number: Two, four or six.
- Six rear retro-reflectors may only be fitted when the overall width of the vehicle, including its tyres, exceeds 2,550 mm.
- Additional retro-reflecting devices and materials (including two retro-reflectors not complying with paragraph 6.25.4. below), are permitted provided they do not impair the effectiveness of the mandatory lighting and light-signalling devices.
- 6.25.3. Arrangement: The apex of the triangle shall be directed upwards.
- 6.25.4. Position
- 6.25.4.1. Width: For at least one pair of rear retro-reflectors, the point on the illuminating surface which is farthest from the vehicle's median longitudinal plane shall be not more than 400 mm from the extreme outer edge of the vehicle.
- In case one single pair of rear retro-reflectors is fitted, 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.
- In case that more than one pair of rear retro-reflectors are fitted, for at least one pair a distance of at least 300 mm between the inner edges of the two apparent surfaces in the

direction of the reference axes shall be observed, and they shall have a vertical angle of visibility above the horizontal of 15°.

If signalling panels or signalling foils are fitted, according to the requirements given in paragraph 6.26., the single pair or the combination of pairs of rear retro-reflectors do not need to comply with the location requirements set out in the first subparagraph.

6.25.4.2. Height:

For at least one pair of rear retro-reflectors, 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 not less than 250 mm above the ground.

However, the upper limit may be increased to not more than 1,250 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.

For additional pairs of rear retro-reflectors, not more than 2,500 mm above the ground.

6.25.4.3. Length:

No individual specifications.

6.25.5. Geometric visibility:

The single pair or the combination of all pairs of rear retro-reflectors lamps shall fulfil the following requirements:

Horizontal angle: 30° inwards and outwards.

Vertical angle: 15° above and below the horizontal. The vertical angle below the horizontal may be reduced to 5° if the height of the reflector is less than 750 mm.

6.25.6. Alignment:

Towards the rear.

6.25.7. Other requirements:

The illuminating surface of the retro-reflector may have parts in common with that of any other rear lamp."
