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Inland Transport Committee

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

Geneva, 31 March–03 April 2014

Item 4(b) of the provisional agenda

**Regulation No. 48 (Installation of lighting and light-signalling devices) –
Proposal for amendments to the 06 series of amendments****Proposal for Supplement 3 to the 06 series of amendments to
Regulation No. 48 (Installation of lighting and light-signalling
devices)****Submitted by the expert from Poland***

The text reproduced below was prepared by the expert from Poland, introducing an alternative set of performance-based requirements for the initial aiming of dipped-beam headlamps and allowing removing the artificial 2,000 lm borderline and Light Emitting Diode (LED) automatic levelling. It is a revision of ECE/TRANS/WP.29/GRE/2013/57, as discussed during the sixty-ninth session of the Working Party on Lighting and Light-Signalling (GRE). The modifications to the existing text of the UN Regulation are marked in bold for new or strikethrough for deleted characters.

* 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

Paragraph 6.2.6.1.1., amend to read:

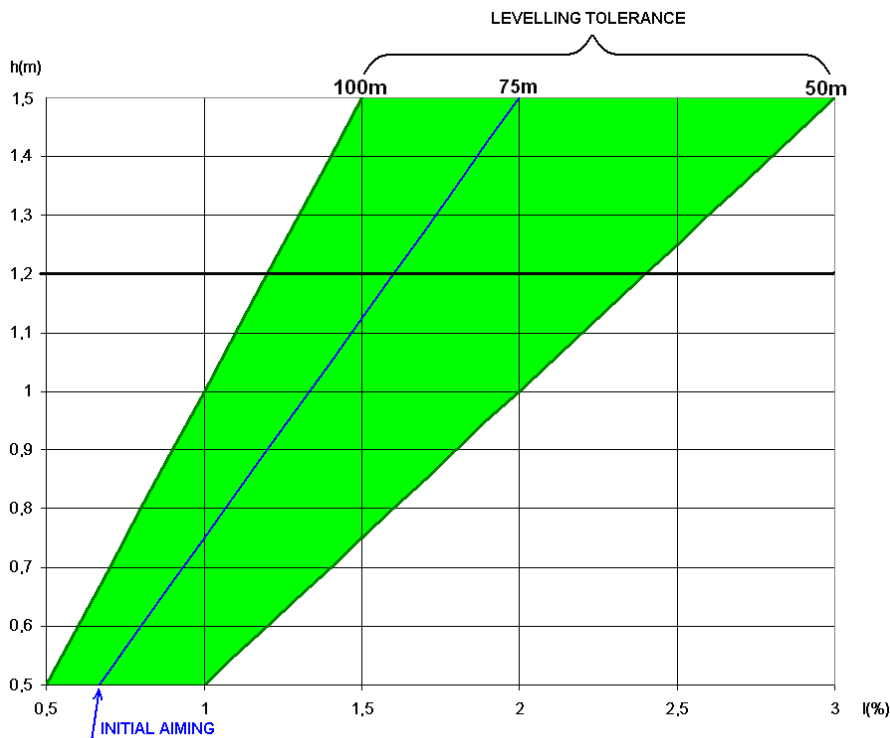
"6.2.6.1.1. The initial downward inclination of the cut-off of the dipped-beam to be set in the unladen vehicle state with one person in the driver's seat shall be specified within an accuracy of 0.1 per cent by the manufacturer and indicated in a clearly legible and indelible manner on each vehicle close to either headlamp or the manufacturer's plate by the symbol shown in Annex 7.

The value of this indicated downward inclination shall be defined **by the manufacturer** in accordance with **either** paragraph 6.2.6.1.2. **or paragraph 6.2.6.1.3.**"

Insert a new paragraph 6.2.6.1.3., to read:

"6.2.6.1.3. Depending on the mounting height in metres (h) of the dipped-beam headlamp reference axis, the initial downward inclination of the cut-off of the dipped-beam shall have the value (initial headlamp aim) for which the horizontal part of the cut-off intersects with the surface of a flat horizontal road at a distance 75 m from the headlamp (see diagram below).

The vertical inclination of the cut-off of the dipped beam headlamp under all the static conditions of Annex 5 shall be such that the distance of intersection of the horizontal part of the cut-off with the road surface shall remain between 50 m and 100 m, including aiming inaccuracy (see diagram below).



Paragraph 6.2.6.2.1., amend to read:

"6.2.6.2.1. In the case where a headlamp levelling device is necessary to satisfy the requirements of paragraphs 6.2.6.1.1. and **either** 6.2.6.1.2. **or** **6.2.6.1.3. (whichever applies)** the device shall be automatic."

Paragraph 6.2.6.2.2., amend to read:

"6.2.6.2.2. However, devices which are adjusted manually, either continuously or non-continuously, shall be permitted, provided they have a stop position at which the lamps can be returned to the initial inclination defined in paragraph 6.2.6.1.1. by means of the usual adjusting screws or similar means.

These manually adjustable devices shall be operable from the driver's seat.

Continually adjustable devices shall have reference marks indicating the loading conditions that require adjustment of the dipped-beam.

The number of positions on devices which are not continuously adjustable shall be such as to ensure compliance with the range of values prescribed in **paragraphs either** 6.2.6.1.2. **or** **6.2.6.1.3. (whichever applies)** in all the loading conditions defined in Annex 5.

For these devices also, the loading conditions of Annex 5 that require adjustment of the dipped-beam shall be clearly marked near the control of the device (Annex 8)."

Paragraph 6.2.9., amend to read:

"6.2.9. Other requirements

The requirements of paragraph 5.5.2. shall not apply to dipped-beam headlamps.

...

With respect to vertical inclination, **in the case the values used for the downward inclination of the cut-off of the dipped-beam that are in accordance with paragraph 6.2.6.1.2.,** the provisions of paragraph 6.2.6.2.2. above shall not be applied for dipped-beam headlamps:

- (a) With LED module(s) producing the principal dipped beam; or
- (b) With a light source producing the principal dipped beam and having an objective luminous flux which exceeds 2,000 lumen.

In the case of filament lamps ..."

Annex 1, insert a new item 10.9., to read:

"**10.9. Value used for the initial downward inclination of the cut-off of the dipped-beam (according to paragraph 6.2.6.1.1.) as defined:**

- (a) **In accordance with paragraph 6.2.6.1.2.² or**
- (b) **In accordance with paragraph 6.2.6.1.3.² "**

Annex 9, paragraph 1.3.2., amend to read:

"1.3.2. Variation of inclination with load

- (a) **In the case the values used for the downward inclination of the cut-off of the dipped-beam are in accordance with paragraph 6.2.6.1.2**

the variation of the dipped-beam downward inclination as a function of the loading conditions specified within this section shall remain within the range

0.2 per cent to 2.8 per cent for headlamp mounting height
 $h < 0.8$;

0.2 per cent to 2.8 per cent for headlamp mounting height
 $0.8 \leq h \leq 1.0$; or

0.7 per cent to 3.3 per cent (according to the aiming range chosen by the manufacturer at the approval);

0.7 per cent to 3.3 per cent for headlamp mounting height
 $1.0 < h \leq 1.2$ m;

1.2 per cent to 3.8 per cent for headlamp mounting height
 $h > 1.2$ m.

(b) In the case the values used for the downward inclination of the cut-off of the dipped-beam are in accordance with paragraph 6.2.6.1.3., the variation of the dipped-beam downward inclination as a function of the loading conditions specified within this section shall remain within the range prescribed in paragraph 6.2.6.1.3.

In the case of a class "F3" front fog lamp ..."

II. Justification

1. In UN Regulation No. 48, values were fixed for the initial aiming of dipped-beam headlamps (and their tolerances) in specific and rather large ranges depending on the mounting height. As a result, in real-world road conditions for new type-approved vehicles, it is possible to have an illuminated road section in relatively big range. Cut-off and 75R crossing distance with road surface can change from 20 m to 200 m without taking into account additional conformity of production tolerances, allowed by the current text of UN Regulation No. 48. This is far outside assumptions included in headlamps' (as components) requirements.

2. The main advantage of this proposed alternative is orientation to safety by maintaining good and predictable minimum road illumination distance, controlled glare and removed light source dependent automatic levelling requirement. It is strictly "performance based" because it guarantees the same road illumination at the distance of horizontal part of cut-off and for point 75R crossing with road surface (at 75 m) independently of the mounting height of the headlamp for each vehicle meeting this proposed alternative requirements. It is in line with headlamps' requirements (as components) under the road conditions without any additional checking or measurements.

3. This proposal does not describe any specification regarding design, giving freedom to the manufacturers because the choice of light source and method of levelling is left up to them to decide: halogen, gas-discharge, LED, automatic levelling, automatic suspension, multistep or smooth manual levelling especially for vehicles with harder suspension or higher headlamps mounting height and is not excluding any future innovations without a need of amendments. In this proposal there is no need for additional tolerance margin for manufacturing process. It is integrally included in the requirements because there is only one value for initial aim for given mounting height and a part or whole levelling tolerance can be used as a margin according to the production needs. Presently there are no requirements regarding accuracy and way of working automatic levelling allowing the road illumination to vary within a very big range (cut-off and 75R crossing distance with road surface from 20 m to 200 m) also for automatic levelling. Practical tests conducted at the Motor Transport Institute on many presently

manufactured vehicles have shown that proposed requirements are feasible and could be easily met by a meaningful percentage of presently manufactured cars.

4. Introducing this proposal, which is based on physical nature of illuminating, as a voluntary alternative to the present requirements will now allow it to be used in practice and increase road traffic safety.
