

Proposal for Supplement 2 to the 05 series of amendments to Regulation 48

Note: The text reproduced below was prepared by the expert from Poland. It supersedes ECE/TRANS/WP.29/GRE/2012/21 and was prepared in order to remove the present problem of the artificial 2,000 lm borderline and LED automatic levelling requirements. The modifications to the existing text of the Regulation are marked in bold for new or strikethrough for deleted characters, the modifications to ECE/TRANS/WP.29/GRE/2012/21 are marked in red.

I. Proposal

Paragraph 6.2.6.1.2., amend to read:

"6.2.6.1.2. Depending on the mounting height in metres (h) of the **dipped-beam headlamp reference axis, the vertical inclination of the cut-off of the dipped beam, (in the direction of the reference axis) measured on the unladen vehicles, taking in account 0.1 per cent accuracy, shall have the value of initial aiming for which the horizontal part of cut-off crosses the surface of flat horizontal road at the distance of 75 m from the headlamp.**

The aiming limits under all the static conditions of Annex 5 should be such that the distance of crossing of the vertical part of cut-off with road surface shall remain between [50 m] and [100 m] including aiming inaccuracy.

The crossing distance could be lower but not less than [25 m] under condition that there will be a note in the car, located in the place easily visible for the driver, expressing the shortest visibility distance e.g.: "SAFE USE OF PASSING BEAM HEADLAMPS DURING NIGHT TIME IN THIS VEHICLE ON A STRAIGHT ROAD UNDER HEADLAMP MAINTENANCE AS PRESCRIBED IN VEHICLE USER MANUAL IS RESTRICTED TO VISIBILITY DISTANCE.....m" [WHICH REFLECTS A MAXIMUM SPEED OF ... km/h]".

The same value of minimum visibility distance should be declared in paragraph 10.9. of the communication form (see Annex 1) and in vehicle user manual. It is also possible on the same way to declare longer than minimum required visibility distance according applicant knowledge."

$h < 0.8$

limits: ~~between 0.5 per cent and 2.5 per cent~~

initial aiming: ~~between 1.0 per cent and 1.5 per cent~~

$0.8 < h < 1.0$

limits: ~~between -0.5 per cent and -2.5 per cent~~
initial aiming: ~~between -1.0 per cent and -1.5 per cent~~

Or, at the discretion of the manufacturer,

limits: ~~between -1.0 per cent and -3.0 per cent~~
initial aiming: ~~between -1.5 per cent and -2.0 per cent~~

The application for the vehicle type approval shall, in this case, contain information as to which of the two alternatives is to be used.

$h > 1.0$

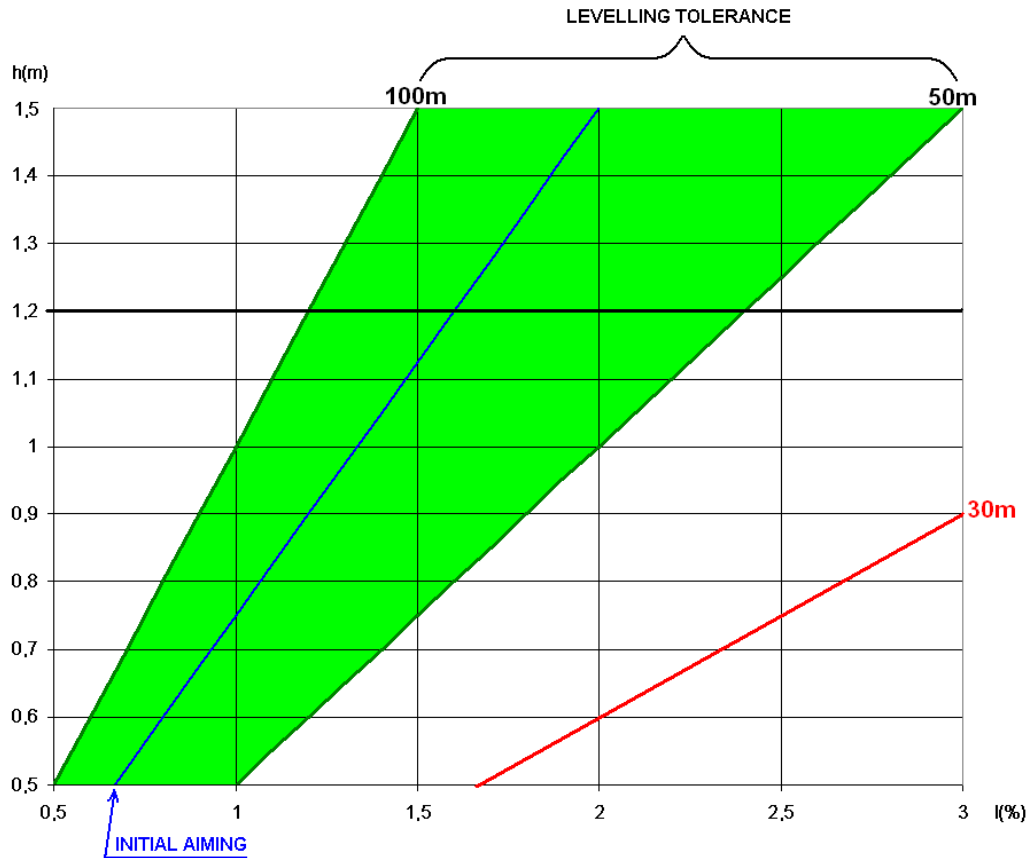
limits: ~~between -1.0 per cent and -3.0 per cent~~
initial aiming: ~~between -1.5 per cent and -2.0 per cent~~

The above limits and the initial aiming values are summarized in the diagram below.

For category N3G (off road) vehicles where the headlamps exceed a height of 1,200 mm, the limits for the vertical inclination of the cut off shall be between:

~~-1.5 per cent and -3.5 per cent.~~

The initial aim shall be set between: ~~2 per cent and -2.5 per cent.~~



Insert a new paragraph 6.2.6.1.3., to read:

"6.2.6.1.3. Under all static conditions of Annex 5, all photometric values for glare zones required by the respective Regulations (zone III for Regulations Nos. 112 and 123, on and above line H/H2, or on and above line H/H3/H4 for Regulation No. 98) shall be not more [100 per cent] than required in the respective Regulations. The **measuring** conditions should be as described in the relevant Regulation based at the measuring screen centre (H-V) located at the height of the headlamp reference axis and in a vertical plane including headlamp reference axis. **"This condition is understand to be met when aiming tolerance is not higher than prescribed. If of vehicle design reasons is not possible to maintain upper levelling in prescribed limit it is possible higher levelling tolerance but under glare conditions prescribed above and checked during headlamp type approval.**

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., 6.2.6.1.2. **and 6.2.6.1.3** the "device shall be automatic."

Insert a new paragraph 6.2.6.5., to read:

"6.2.6.5. ~~There should be a note in the car, located in the place easily visible for the driver, expressing the shortest visibility distance and the lowest speed corresponding to the worst condition of aiming and loading: e.g.: "SAFE USE OF PASSING BEAM HEADLAMPS DURING NIGHT TIME IN THIS VEHICLE ON A STRAIGHT ROAD IS RESTRICTED TO VISIBILITY DISTANCE ... m WHICH REFLECTS A MAXIMUM SPEED OF ... km/h". The same values of visibility distance and speed should be also declared by the manufacturer in paragraph 10.9. of the communication form (see Annex 1) and in vehicle user manual."~~

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.

Dipped-beam headlamps with a light source or LED module(s) producing the principal dipped beam and having a total objective luminous flux which exceeds 2,000 lumen shall only be installed in conjunction with the installation of headlamp cleaning device(s) according to Regulation No. 45.¹¹

~~With respect to vertical inclination 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 new paragraph 10.9., to read

"10.9. Comments regarding the headlamps visibility distance ~~and maximum speed.~~"

Annex 9, paragraph 1.3.2., amend to read:

"1.3.2. Variation of inclination with load

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 para. 6.2.6.1.2. with an additional tolerance of $[\pm 0.2]$ per cent, and all photometric requirements for glare zones should remain not more than prescribed in para. 6.2.6.1.3. with an additional tolerance of $[30]$ per cent.**

~~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.~~

In the case of a class "F3" front fog lamp with (a) light source(s) having a total objective luminous flux which exceeds 2,000 lumen, the variation of the downward inclination as a function of the loading conditions specified within this section shall remain within the range:

0.7 per cent to 3.3 per cent for front fog lamp mounting height $h \leq 0.8$;

1.2 per cent to 3.8 per cent for front fog lamp mounting height $h > 0.8$ m.

The states of loading to be used shall be as follows, as indicated in Annex 5 of this Regulation, for every system adjusted accordingly."

Paragraphs 5.29. and 5.29.1., amend to read:

~~"5.29. A light source module shall be:~~

~~(a) only removable from its device with the use of tools and~~

~~(b) so designed that regardless of the use of tool(s), it is not mechanically interchangeable with any replaceable approved light source.~~

~~5.29.1. A LED module does not need to be replaceable, if so stated in the communication sheet of the component type approval.~~

5.29. A LED module does not need to be replaceable, if so stated in the communication sheet of the component type approval."

II. Justification

1. For many years, Regulation No. 48 has used fixed values of initial aiming of headlamps and their tolerances in specific ranges depending on the mounting height. As a result, in the real road condition for the new type approved vehicles, it is possible to have an illuminated road section starting immediately in front of the vehicle and ending between 20m and 200m. These values do not take into account additional conformity of production tolerances. But the requirement of automatic levelling has been made dependent on the

luminous flux of the light source. This requirement has no clear connection with real headlamp performance regarding road illumination and glare. The requirements specified for glare zone in headlamps regulations have no practical translation to real road condition because requirements are defined for the fixed headlamp height 0.75 m and aimed 1 per cent down. In practice the mounting height changes from 0.5 m up to 1.2 m (1.5 m) as it is described in Regulation No. 48. On the other hand there are many doubts regarding aiming and glare in real conditions which are being subjectively identified and linked with the kind of light source used, which does not reflect the reality. It is also important as an influence to headlamp design which cannot be defined simply. It was basically an attempt to solve this problem by introducing an artificial 2000 lm luminous flux condition as a criterion for automatic levelling requirement. But the first and basic reason of visibility/glare problems is the aiming tolerance allowed by the present Regulation No. 48.

2. The above mentioned proposal links presently used requirements of the headlamps Regulations with the influence of the allowed mounting height and all loading conditions. It replaces the present situation by introducing performance based requirements: clearly defined visibility distance and glare criteria present in the Regulations currently in force.
