

Proposal for Supplement 1 to the 05 series of amendments to Regulation No. 48 (installation of lighting and light-signalling devices)

To simplify and clarify requirements for the headlamps initial aiming, aiming tolerances and making it independent from the light source used in the headlamp.

The text reproduced below was prepared by the expert from Poland to amend requirements in Regulation No. 48 to take into consideration real visibility distance and glaring according to headlamps Regulations.

The modifications to the current text of the Regulation are marked in bold or strikethrough characters.

A. 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 vertical part of cut-off with road surface shall remain between [50m] and [100m].

$h < 0.8$

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.~~

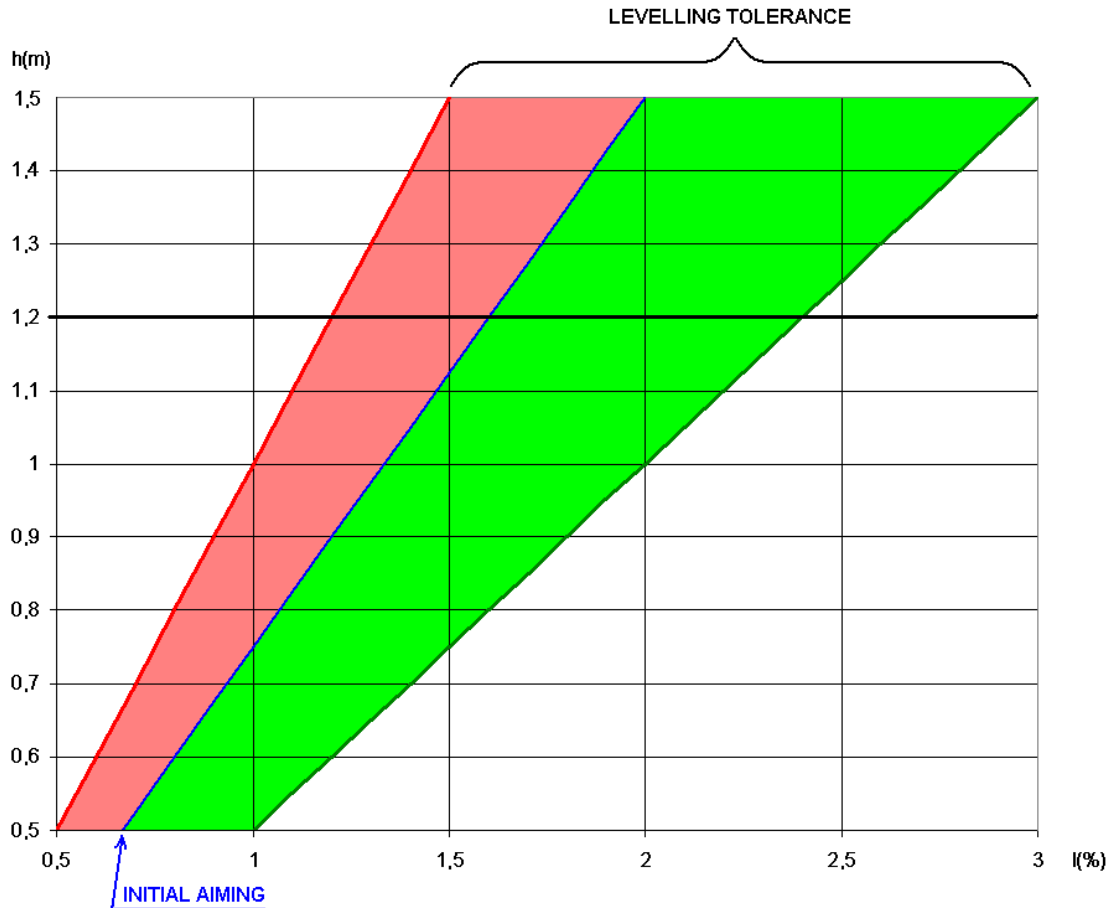
$h > 1.0$

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 [50 per cent] than required in the respective Regulations. The measuring conditions should be as described in relevant Regulation based at the measuring screen centre (H-V) located at height of headlamp reference axis and in vertical plane including headlamp reference axis."

Paragraph 6.2.6.2.1., correct 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."

Paragraph 6.2.6.2.2., shall be deleted

Paragraph 6.2.6.2.3.(former), renumber as paragraph 6.2.6.2.2. and correct to read:

"6.2.6.2.2. In the event of a failure of devices described in paragraphs 6.2.6.2.1. and ~~6.2.6.2.2.~~, the dipped-beam shall not assume a position in which the dip is less than it was at the time when the failure of the device occurred."

Annex 9

Paragraph 1.3.2., correct 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 par. 6.2.6.1.2. with additional tolerance [± 0.2] per cent, and all photometric requirements for glare zones should remain not more than prescribed in par. 6.2.6.1.2. with 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.~~

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

B. Justification

For many years in the Regulation No 48 there have been used fixed values of initial aiming of headlamps and their tolerances in specific ranges depending of 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 even 20m and 200m. These values do not take into account additional conformity of production tolerances. But the requirement of the automatic levelling has been made dependent on the luminous flux of the light source. This requirement has no connection with real headlamp performance regarding road illuminance 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 position 0.75 m and aimed 1% down. In practice the mounting height changes from 0.5 m up to 1.2 m (1.5 m) as it is allowed by Regulation 48. On the other hand there are many doubts regarding aiming and glare in real conditions which are being subjectively identified and linked with kind of light source used, which does not reflect the truth. It is also important headlamp design influence which cannot be defined. It was basically an attempt to solve this problem by introduction of an artificial 2000 lm luminous flux condition as a criterion for automatic levelling requirement. **But the real reason of problems is the aiming tolerance allowed by the Regulation No 48.**

The above mentioned proposal links **presently used requirements** of the headlamps Regulations with the influence **of the allowed mounting height**. This proposed performance based objective requirements should solve the problem of attempting to add Regulation descriptions which are artificial, arbitrary, and neither justified enough nor scientific-based. The example of that can be making automatic aiming dependent on light sources (25W HID, LED etc.) or old artificial 2000 lm condition. The above proposal replaces this situation by an introduction of clear visibility distance and glare criteria present in the requirements currently in force.
