TFGP-01-04

GRE Task Force Glare Prevention

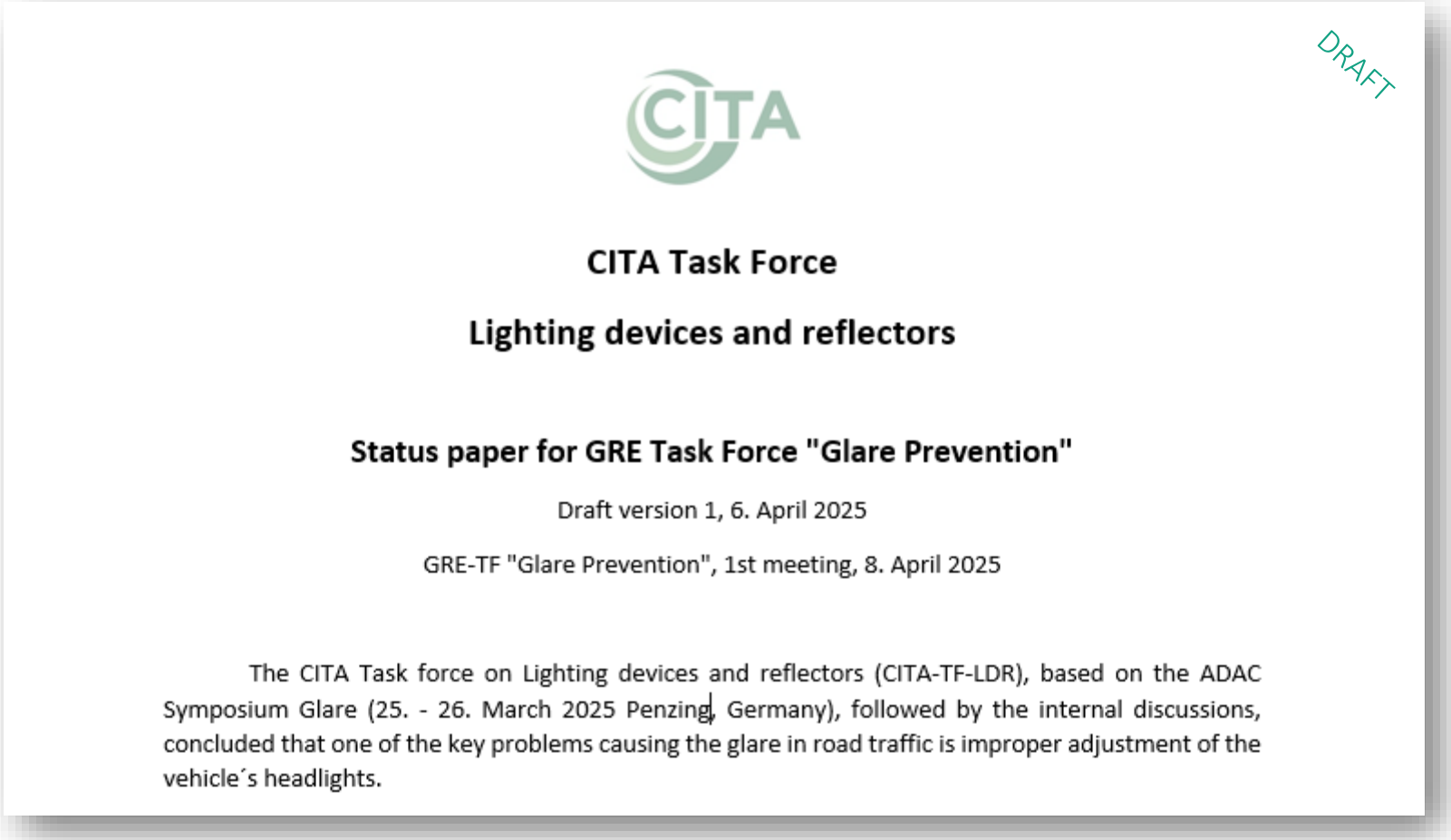
CITA
Task Force Lighting devices and reflectors (TF LDR) is working on the input for GRE (TF GP)

8. April 2025

by **Peter Ondrejka**

CITA TF LDR to GRE TF GP

- drafting the „Status paper for GRE TF Glare Prevention“



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CITA Task Force

Lighting devices and reflectors

Status paper for GRE Task Force "Glare Prevention"

Draft version 1, 6. April 2025

GRE-TF "Glare Prevention", 1st meeting, 8. April 2025

The CITA Task force on Lighting devices and reflectors (CITA-TF-LDR), based on the ADAC Symposium Glare (25. - 26. March 2025 Penzing, Germany), followed by the internal discussions, concluded that one of the key problems causing the glare in road traffic is improper adjustment of the vehicle´s headlights.

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CITA-TF-LDR is also facing difficulties during the process of updating CITA Recommendation no. 25 on Headlamp Alignment Testing in Vehicle Inspection (rel. February 2022), because on the one hand, there is a strong need for adaptation of the current inspection procedures used during periodic technical inspections (PTI) of the vehicles in use accordingly to the present headlight technology, followed by the improvement of the measurement precision, repeatability of the results and the use of camera based digital headlight testers instead of old optical devices where the evaluation of the headlight cut-off position is subjected to strong influence of human factor.

But on the other hand, any improvement of the situation related to the headlight adjustment in PTI environment is very complicated nearly impossible, if the fundamental requirements related to headlights and definitions laid down on the type approval level are weak, non-consistent and are missing an important criterion.

Thereof CITA-TF-LDR identified as a starting point at least following four problems to solve:

I.

The definition of the headlight cut-off in TA requirements has been changed and is specified in a very imprecise manner, however the general requirement in the present regulation gives the clear message as following:

I. Cut-off definition, elbow point (PTI useful)

II. Keeping headlights testable during PTI

III. Deleting ambiguous TA deffinitions (R149...)

IV. Auto leveling req. mounting height / initial aiming box

V. Soiling etc.

VI., VII...

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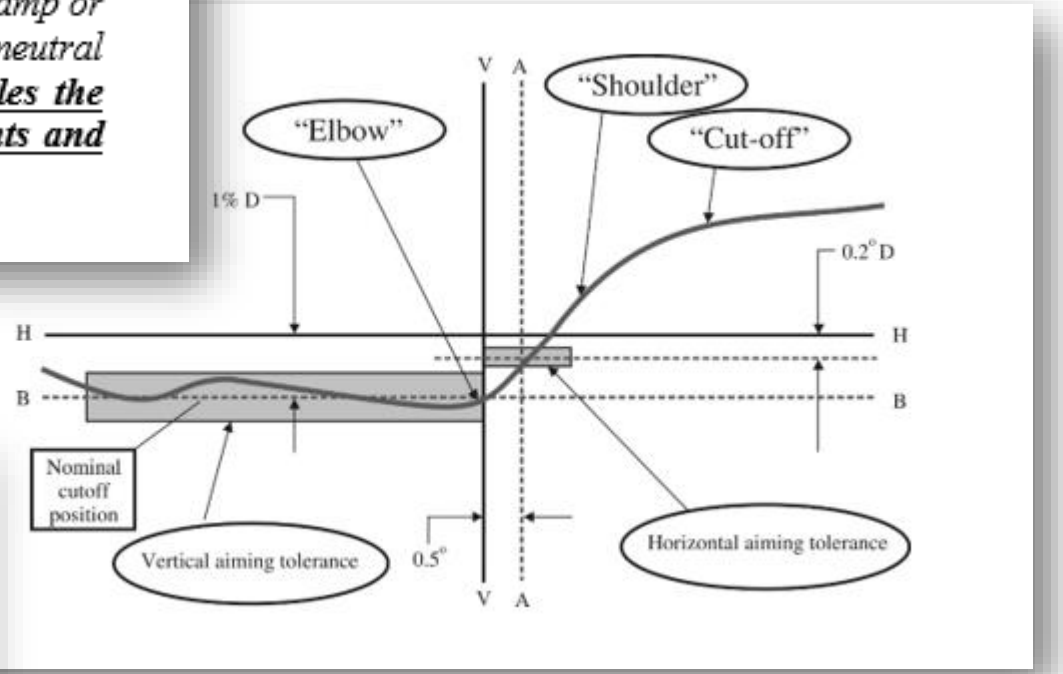
UNECE R149

Annex 5

1.1. *The luminous intensity distribution of a principal passing-beam headlamp or of at least one lighting unit for a class C passing beam of an AFS in its neutral state* ***shall incorporate a "cut-off" (see Figure A5-I), which enables the headlamp to be adjusted correctly for the photometric measurements and for the aiming on the vehicle.***



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Comments:

- It should be guaranteed, the particular precision of aiming in static conditions and the cut-off line shall meet this expectation in the annex 5 point 1.1. But "straight" part on the left is not straight on the picture, and an "Elbow" is not clear point which is possible to properly set. Definition should be clear and allowing to be practically verified by the measurement and/or translated to digital evaluation algorithm. There is no guarantee, that the current definition will lead to a clear and repeatable headlamp aiming.

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III.

Another mistake in the regulation is the possibility to change the aim during the type approval test. This means that the headlights cannot be aimed correctly in cases of in-use conditions (after TA), because aligning them according to cut-off line may then result in different road illumination and possible glare in traffic. The point 1.2.3 de facto excludes the possibility for correct headlight aim adjustment according to UENECE R149, Annex 5, point 1.1. see the intro.

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~~*1.2.3. Where a headlamp or AFS so aimed does not meet the requirements set out in paragraphs this Regulation 5.2. to 5.4. of this Regulation respectively, its alignment may be changed, provided that the axis of the beam is not displaced:*~~

~~*Horizontally from line A by more than:*~~

~~*(a) 0.5° to the left or 0.75° to the right, for right hand traffic; or*~~

~~*(b) 0.5° to the right or 0.75° to the left, for left hand traffic; and*~~

~~*Vertically not more than 0.25° up or down from line B.*~~

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IV.

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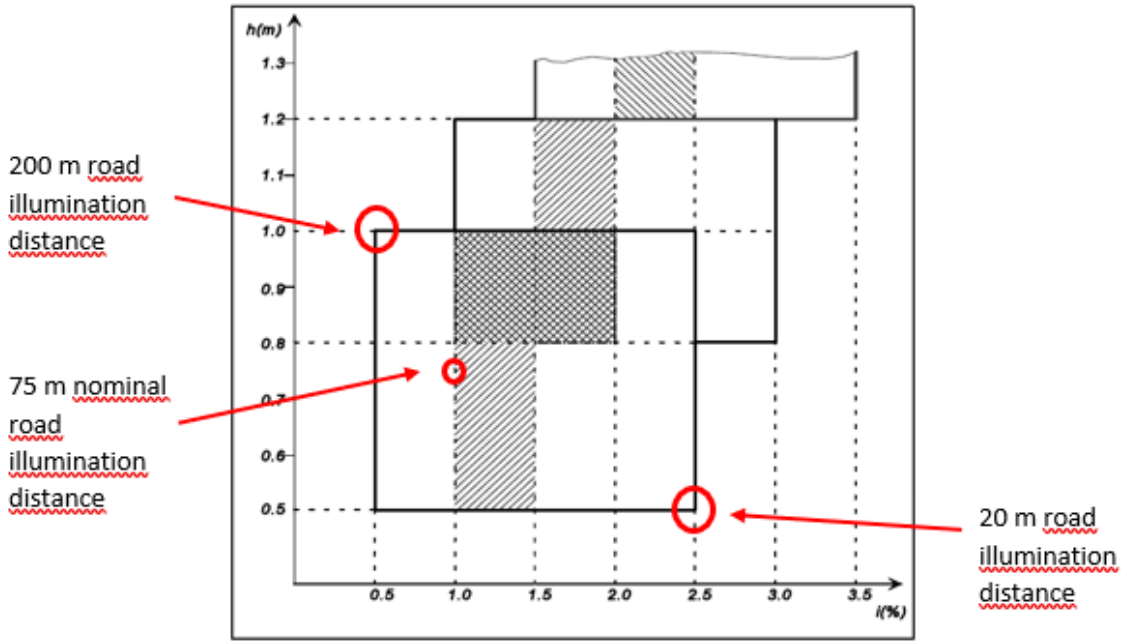
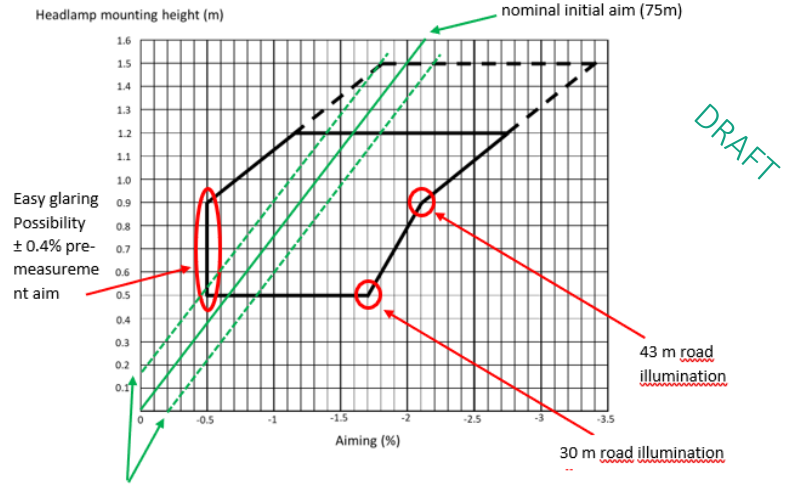
The next problem is the initial aiming/leveling tolerances. Both, the currently required range of leveling and the new conditions that require automatic leveling are unacceptable.

Present range of the road illumination allows to set it from 20m up to 200m, (nominal is 75m).



Initial aim can be anywhere in the "box". No requirements regarding precision of automatic leveling.



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Technically feasible automatic leveling tolerances ± 0.2% (based on real tests on M1 vehicles in Karlsruhe in 2022 during SLR group meeting).

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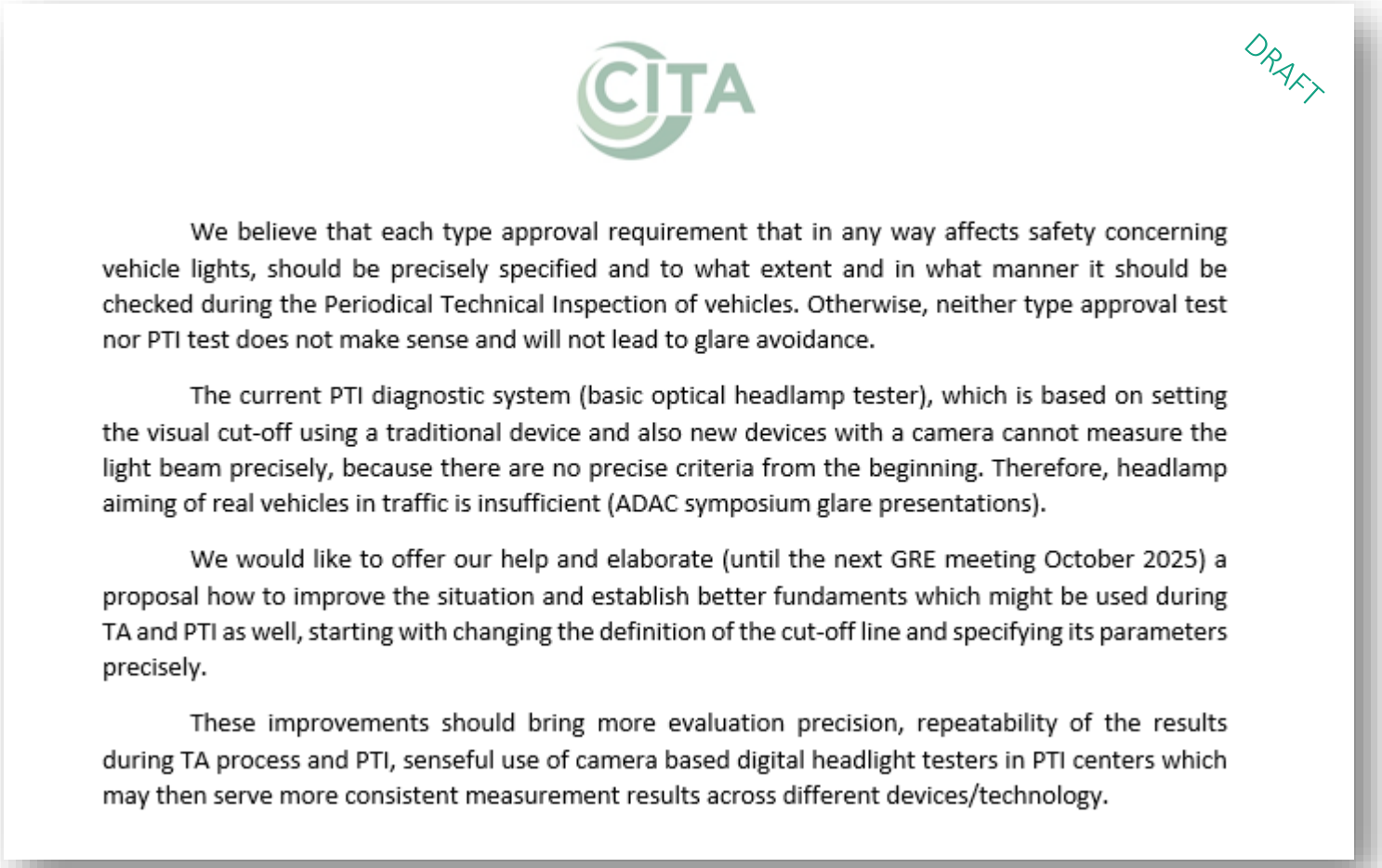

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We believe that each type approval requirement that in any way affects safety concerning vehicle lights, should be precisely specified and to what extent and in what manner it should be checked during the Periodical Technical Inspection of vehicles. Otherwise, neither type approval test nor PTI test does not make sense and will not lead to glare avoidance.

The current PTI diagnostic system (basic optical headlamp tester), which is based on setting the visual cut-off using a traditional device and also new devices with a camera cannot measure the light beam precisely, because there are no precise criteria from the beginning. Therefore, headlamp aiming of real vehicles in traffic is insufficient (ADAC symposium glare presentations).

We would like to offer our help and elaborate (until the next GRE meeting October 2025) a proposal how to improve the situation and establish better fundaments which might be used during TA and PTI as well, starting with changing the definition of the cut-off line and specifying its parameters precisely.

These improvements should bring more evaluation precision, repeatability of the results during TA process and PTI, senseful use of camera based digital headlight testers in PTI centers which may then serve more consistent measurement results across different devices/technology.

- CITA TF LDR will deliver the „Status paper for GRE TF Glare Prevention“

THANK YOU

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