Transmitted by the expert from the International Automotive Lighting and Light Signalling Expert Group (GTB)

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GTB Study Visibility and Glare

(With reference to WP.29/2011/99 and Corr.1)

1. The GTB proposal for the introduction of new 25W gas discharge light sources with an objective luminous flux of 2000 lm in GRE64 (Oct 2010) generated concerns about the 2000 lm criterion as described in Regulation No. 48, paragraph 6.2.9. After consideration, GRE65 (March 2011) adopted this proposal (GRE/2011/03) for submission to WP.29 (WP.29/2011/101), including a proposal to require automatic levelling for all low beam headlamps independent from the light source technology and independent from the light source luminous flux (WP.29/2011/99 and Corr.1). A long transitional period was proposed. GRE indicated to be open for relaxation of this new requirement or for adopting alternatives during the beginning of this period if based upon proper arguments and study. The discussion on WP.29/2011/99 and Corr.1 was deferred for about 2 or 3 years.

2. GTB took up this challenge to study visibility and glare and concentrated on levelling in relation to load. A GTB Task Force Coordination of Automotive Visibility and Glare Studies (TF CAVGS) was installed to coordinate activities over the participating GTB working groups and invited one liaison-expert from each main stakeholder organisation (GRE, OICA, CLEPA, SAE and CIE). The TF CAVGS activities were open for participation by GRE experts and its home page was publically accessible (GRE-66-21 and GRE-67-39). Major objectives were:

(1) To improve the understanding of different factors that influence visibility and glare

(2) To identify results of the study that might reveal alternatives for automatic static levelling.

3. A literature review was started in GTB Working Group Safety and Visual Performance (WG SVP). GTB Working Group Front Lighting (WG FL) organised a night drive test on a DEKRA test track in Klettwitz and data were analysed by the Technical University Darmstadt (TUD). The first results have been presented in GRE68 (GRE-68-38, GRE-68-39 and GRE-68-40).

4. Discussion in GRE68 and internal discussion in GTB indicated that additional study was needed. TUD made additional analyses of the night drive test. In WG FL contributions were requested from vehicle manufacturers for feasibility of application of the outcome of the night drive test. Simulations were done to enrich the night drive glare data with visibility range data. Also the effect of 1% Down aim used for the Klettwitz tests was evaluated and the loading conditions deviating from current prescriptions in Regulation No. 48 were debated in depth. WG SVP investigated whether the outcome of the night drive test and the outcome of the simulations did fit in the overview of available literature.

5. In accordance with major objective #1 "to improve the understanding of different factors that influence visibility and glare and their respective weighted importance" as listed above, GTB is now ready to present a complete overview of the outcome of these studies, which, with the consent of GRE, is foreseen for the morning of 1st of April 2014.

6. Since the expert from Poland introduced a proposal (latest update GRE/2014/11) which overlaps with the scope of the GTB study, GTB and the expert from Poland agreed that the background of the calculations of the Polish proposal would also be presented as part of the session. The expert from OICA was invited to provide a presentation on loading definitions and achievable aiming tolerances (see also GRE-67-27 and GRE-68-20) to complete this morning session.

7. In line with major objective #2 "to identify results of the study that might reveal alternatives to the adopted mandatory requirements for automatic levelling and cleaning for the passing beam and front fog lamps" as listed above, GTB has identified a suggestion for an alternative for automatic static levelling for all low beam headlamps, and this suggestion will be presented following the overview of the outcome of the studies. GTB is in contact with the expert from Poland and with the expert from OICA to find a common conclusion.

8. Headlamp levelling is a challenging subject because glare complaints are inherent to visibility of the road ahead for the driver. Therefore guidance from GRE for further steps is awaited.