

## GRE Task Force on Glare Prevention (TF GP)

### 2<sup>nd</sup> meeting (hybrid session)

**20 May 2025**  
**9:30 – 17:00 (CEST)**

BMDV (Federal Ministry for Digital and Transport) - Bonn (Germany)

### REPORT

		Documents
1.	<p><b>Welcome and opening remarks</b></p> <p>The Chairman welcomed the participants to the meeting and thanked Mr Krautscheid, as representative of the BMDV, for hosting this session.</p>	
2.	<p><b>Introduction of participants and organisations</b></p> <p>A list of all participants is available in Annex 1 to this Report.</p>	
3.	<p><b>Adoption of the agenda</b></p> <p>The agenda was adopted with a minor modification to the schedule of the meeting. A revised agenda, reflecting the agreed modifications, was circulated as document TFGP-02-01/Rev.1.</p>	TFGP-02-01
4.	<p><b>Approval of the report on the last meeting</b></p> <p>The report on the 1<sup>st</sup> meeting (8 Apr 2025) was approved without modifications.</p>	TFGP-01-05
5.	<p><b>Outcome of discussion from GRE-92</b></p> <p><u><i>Approved ToR of the Task Force on “Glare Prevention”</i></u></p> <p>The Chairman informed that the Terms of Reference of the Task Force were approved with some minor amendments under point III - Rules of Procedure, indents 1 to 3. The approved ToR can be found in document GRE-92-25/Rev.1</p> <p><u><i>Progress report to GRE-92</i></u></p> <p>Mr Puglisi briefly presented the status report at GRE-92 (see doc. GRE-92-26).</p>	GRE-92-25/Rev.1  GRE-92-26
6.	<p><b>Review of available literature</b></p> <p>Mr. Lamontain offered to share his thesis on “Requirements and evaluation methods for an adaptive glare-free low beam on reflective road surfaces” with the GRE-TF and to add it to the available literature on glare.</p> <p>Mr Puglisi explained that the first document in the literature (ref. TFGP-Ref.01) originates from a comprehensive study carried out by a dedicated GTB Task Force over ten years ago, submitted as an informal document to GRE-71. Over the past decade, vehicles technology and characteristics (such as weight, size, and headlamp design) have evolved considerably, though some core issues have remained consistent. This earlier document could serve as a solid foundation and help avoid unnecessary duplication of work.</p> <p>Mr Krautscheid raised concerns about the Klettwitz study, noting that not all conditions during testing were fully controlled, which limits the clarity of the findings. Mr Rovers added that although GRE had previously established an</p>	TFGP-Ref.01 to Ref.10

Informal Working Group on glare and levelling (IWG-VGL), the group did not reach a conclusive outcome. The issue was then passed to IWG-SLR, which successfully achieved to improve headlamp levelling and phased out manual systems from Regulation 48 Series 09. These developments suggest that while some follow-up occurred, gaps may remain, and if homework teams are created to focus on PTI-related issues, they should take a comprehensive look at all aspects of the vehicle. Where gaps exist, new studies should be initiated to ensure all relevant areas are addressed.

Regarding the collection of the ADAC presentations (doc. TFGP-Ref.07) Mr Bailey acknowledged that the file is quite extensive and asked how the group should proceed. In response, Mr Puglisi suggested dividing the material into several smaller presentations to make it more manageable. Mr Böttcher offered to do this for the next meeting, along with a summary of the ADAC symposium.

The Chairman noted that Day 1 of the ADAC symposium focused heavily on medical aspects, with relatively little technical content. Conversely, Day 2 featured more technically oriented presentations. The following points reflect the group's consideration on Day 2 contents:

- 12 Prof. Dr.-Ing. habil. S. Völker: Glare due to headlights – Jealousy of expensive cars or a real risk for traffic safety?
- 13 Dr.-Ing. Ernst-Olaf Rosenhahn: Nighttime Traffic Glare Analysis by Measurements and new Statistical Evaluations
- 14 Elisabeth Kemmler: Impacts of light source size and luminance on discomfort glare in mesopic vision
- 15 Anielia Johannsen: The impact of luminance in night-time encounter situations
- 16 Prof. Dr.-Ing. Benedikt Lamontain: Glare from Headlamps on Wet Roads and the Potential to Increase Road Safety
- 17 Prof. Dr.-Ing. habil. Tran Quoc Khanh: Soiling of the headlight cover as a cause of glare
- 18 Dr. Michael Hamm: Glare Contributors in Automotive World
- 19 Tomasz Targosinski: How glare is regulated, and should be regulated in UN ECE Regulations
- 20 Dr. Rainer Neumann: Automotive Road Illumination – Glare Control and Prevention
- 21 Markus Peier: Avoiding Glare at Night by Adaptively Controlling the Rear Lights (Summary)

#### Presentation 12:

Mr Manz commented that vehicles should use sensor technology to determine the optimal road illumination, rather than relying on driver judgment. Mr Rovers followed by noting that the human eye functions as an adaptive sensor and therefore cannot be used as a consistent reference point - what seems acceptable in one setting may become problematic at night under sudden luminance changes.

Mr Bailey observed that adaptive solutions may help, however, the group currently lacks sufficient data to draw firm conclusions.

#### Presentation 15:

Mr Puglisi reported that the GTB-funded study has shown that the size of headlamps has no impact on glare as long as the aiming is correct. Mr Neumann informed that the study presented at ADAC was the continuation of the initial GTB study and emphasised that correct aiming is key: if headlamps are properly aimed, their size has minimal impact on glare.

Mr Schröder cautioned that the study was conducted under static conditions, which may not reflect real-world driving scenarios where vehicles are in motion.

Mr Rovers highlighted the need to identify which parameters truly influence glare and which do not. Mr Schramm suggested that understanding the link between discomfort glare and road safety should be a focus of future work. Mr Schröder added that numerous studies point to misalignment as a major cause of discomfort glare, while no clear connection has been established between headlamp size and disability glare.

Mr Böttcher shared findings from a survey indicating that people often respond to discomfort glare by instinctively closing their eyes, which represents a safety risk. He also recommended to consider changes to the cut-off line, especially on the left side which has slightly increased.

Mr Manz raised a methodological concern: since participants in glare surveys often cannot pinpoint the exact source of the glare, how can we reduce the amount of light entering drivers' eyes without compromising visibility range? Illuminance at the driver's eye is the decisive factor for glare in road traffic at night.

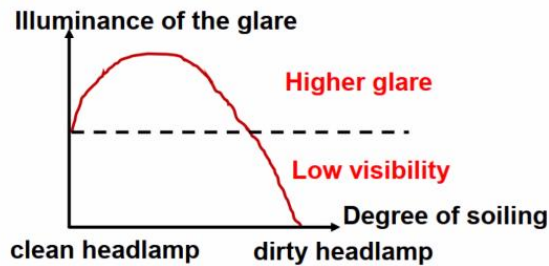
Presentation 17:

Mr Schröder highlighted the importance of the cleaning system, especially in case of glare-free dipped-beam headlamps where dirt generates much more glare than dirt on passing-beam headlamps. Mr Rovers emphasized the continued relevance of soiling and damage (especially in plastic headlamps) which were already identified as concerns in earlier studies. Mr Manz pointed out that cleaning improves the visibility of the driver but does not necessarily reduce the glare, unless it is designed to do so. To have real improvement, frequent cleanings are necessary, but this requires significant onboard water capacity.

Mr. Rover recalled that glare illuminance increases with increasing dirt on lens but then decreases again because dirt reduces both visibility and glare, as summarised in the diagram below:

▪ **Schmidt-Clausen, Germany 1978 & Van Laarhoven, Holland 1994**

- *Glare illuminance increases with increasing pollution and then decreases again*



Presentation 18:

Mr Schramm reported that no new information is available beyond what has already been published in the study by Michael Hamm. Mr Krautscheid noted that headlamp height has increased over time, which may influence glare dynamics and alignment.

On headlamp misalignment post-delivery, Mr. Hamm observed that both the front axle and headlamps undergo a settling period over the first 1,000+ kilometres, resulting in slight changes in the aiming. This behaviour is non-linear and varies between vehicles.

Mr Rovers commented that significant misalignment occurs in the early life of a vehicle. Regulatory frameworks currently allow a time gap between type approval and the first Periodic Technical Inspection (PTI), during which such misalignments often go unchecked. The Task Force should investigate this issue, as well as Conformity of Production (CoP).

Mr Puglisi observed that, as shown in this presentation, headlamps check during PTI are frequently carried out improperly or executed poorly.

The group identified three main steps in the initial aiming process:

- At the end of the production line;
- At the dealer;
- At the first PTI.

	<p>Nevertheless, it remains unclear what regulatory interventions could effectively resolve the inconsistencies observed in practice.</p> <p>Mr Choda observed that, as PTI is managed by the 1997 Agreement, he recommended to contact CITA to suggest improvements. He added that in Canada, federal jurisdiction ends after the first point of sale. In USA, different states have PTI-like requirements, but there is nothing at federal level.</p>	
<p>7.</p>	<p><b>Next steps</b></p> <p><u>Establishment of “Homework teams” (literature, PTI, initial aiming, Reg. 48, cut-off, ADB and AFS, etc.)</u></p> <p>The Chairman explained that, at this stage, priority should be given to establish HWTs working on literature review and Periodic Technical Inspection (PTI).</p> <p>Mr Matarazzo confirmed that GTB will provide the literature collected, as well as a summary of the part studied already by the GTB experts.</p> <p>Ms Davignon informed that Transport Canada commissioned a report which is currently in progress and, once published (tentatively July 2025), could be shared along with an executive summary. Mr. Choda recommended to have a global approach and not focussing only on the 1958 Agreement.</p> <p>Mr Manz wondered whether the German association on traffic accidents may have data regarding the role of glare in crashes, but Mr Lamontain commented that such data is difficult to obtain and not readily accessible.</p> <p>Mr Targosinski and Mr Böttcher proposed that the Homework Team (HWT) on cut-off should begin its work immediately, citing the large amount of input already available on the topic. Mr Rovers acknowledged the importance of the cut-off, not only its sharpness but also its position and geometry, however advised caution since a clear roadmap and a clear goal for the relevant homework team has not yet been defined. Therefore, launching the homework team at this stage would be premature.</p> <p>After the initial considerations, the following HWTs were formed:</p> <p><u>HWT Literature:</u></p> <ul style="list-style-type: none"> <li>○ Federico Matarazzo (GTB, Coordinator)</li> <li>○ Phil Bailey (UK)</li> <li>○ Magnus Nordeke (OICA)</li> <li>○ Burkhard Böttcher (FIA)</li> <li>○ Harm Zeven (FIA)</li> </ul> <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>- #1 Filter by <b>July 2025</b> the list of available studies to identify those most relevant to focus on.</li> <li>- #2 Examine the selected studies by <b>September 2025</b>.</li> </ul> <p><b>Expectation</b></p> <ul style="list-style-type: none"> <li>- By <b>September 2025</b>, produce a summary that identifies the key factors, both in terms of their frequency and their relevance.</li> </ul> <p><b>Target</b></p> <ul style="list-style-type: none"> <li>- Present an input to <b>GRE-93 in October 2025</b> and request additional guidance from GRE if needed.</li> </ul>	

	<p><u>HWT PTI:</u></p> <ul style="list-style-type: none"> <li>○ Ralph Schröder (DE, Coordinator)</li> <li>○ Peter Ondrejka (CITA, Co-Coordinator)</li> <li>○ Harm Zeven (FIA)</li> <li>○ Thomas Schramm (OICA)</li> <li>○ Rainer Krautscheid (DE)</li> <li>○ Tomasz Targosinski (PL)</li> </ul> <p><b>Approach</b></p> <p>Focus on three key stages of the initial vehicle life:</p> <ul style="list-style-type: none"> <li>- <b>End of the production line / Conformity of Production (CoP)</b> - the initial setup and alignment phase;</li> <li>- <b>At the dealer / point of delivery / first point of sale</b> - including any adjustments or checks made before the vehicle reaches the customer;</li> <li>- <b>First Periodic Technical Inspection (PTI)</b> - the first formal assessment since the vehicle is on the road.</li> </ul> <p>After having collected enough information of each stage, the HWT-PTI should be able to determine <b>what occurs between these three stages</b>.</p> <p><u>HWT on Reg. 48 (not active for the time being):</u></p> <ul style="list-style-type: none"> <li>○ Magnus Nordeke (OICA, Coordinator)</li> <li>○ Marc Fischer (DE)</li> <li>○ Derwin Rovers (NL)</li> <li>○ Davide Puglisi (GTB)</li> <li>○ Federico Matarazzo (GTB)</li> </ul> <p>Mr. Rovers recalled that HWTs shall not report directly to GRE but bring their feedback back to the GRE-TF.</p>	
8.	<p><b>Any Other Business</b></p> <p>No other business was discussed.</p>	
9.	<p><b>Next meetings</b></p> <p><u>3<sup>rd</sup> meeting in Brussels (BE) on Tuesday, 8 July 2025</u></p> <p>The next meeting of the TF-GP will be held in Brussels, the day before SLR-73. Inputs from the HWTs shall be provided to the TF Secretariat before the 1<sup>st</sup> July 2025 in order to be distributed one week prior to the meeting.</p> <p><u>4<sup>th</sup> meeting in Brussels (BE) on Tuesday, 9 September 2025</u></p> <p>The 4<sup>th</sup> meeting of the TF-GP will be held in Brussels, the day before SLR-74. Mr Bailey informed that UK is conducting a study on glare, and the results will be submitted to the TF Secretariat for examination during the September session.</p> <p>The participants agreed on following additional dates in 2025:</p> <ul style="list-style-type: none"> <li>- <u>5<sup>th</sup> session (editorial)</u>: 10 October (9:30 - 12:30 am CEST, via Webex only), to prepare the status report to GRE-93.</li> <li>- <u>6<sup>th</sup> session</u>: 9 December in Brussels, the day before SLR-75 (subject to confirmation from CLEPA).</li> </ul>	
10.	<p><b>Closure</b></p> <p>The Chairman thanked the participants for the fruitful contribution and closed the meeting.</p>	

**Participation at the 2<sup>nd</sup> TF-GP meeting**  
*Bonn (DE)/Hybrid, 20 May 2025*

Marc Fischer	DE / TF co-chair	In person
Derwin Rovers	NETHERLANDS / TF co-chair	In person
Davide Puglisi	GTB / TF co-secretary	WebEx
Federico Matarazzo	GTB / TF co-secretary	WebEx
Rav Choda	AAPC	WebEx
Daniel Kutschkin	AUSTRALIA	WebEx
Marie Williams-Davignon	CANADA	WebEx
Lai Lan	CHINA	WebEx
Li Jinjie	CHINA	WebEx
Peter Ondrejka	CITA	WebEx
Ana I. Munoz	CLEPA	WebEx
Frederic Hay	CLEPA	WebEx
Thomas Bauckhage	CLEPA	WebEx
Burkhard Böttcher	FIA	WebEx
Harm Zeven	FIA	WebEx
Karl Manz	GERMANY	In person
Rainer Krautscheid	GERMANY	In person
Ralph Schröder	GERMANY	In person
Rainer Neumann	GTB	WebEx
Benedikt Lamontain	Guest	WebEx
Walter Schlager	IEC	WebEx
Pere Hernandez	IMMA	WebEx
Takashi Su	IMMA	WebEx
Varun Sharma	IMMA	WebEx
Kotaro Hashimoto	JAPAN	WebEx
Yoko Kato	JAPAN	WebEx
Yasumasa Tominaga	JAPAN	WebEx
Fernando Roshan	NORWAY	WebEx
Ziya Metin Coskun	OICA	In person
Thomas Schramm	OICA	In person
Magnus Nordeke	OICA	WebEx
Tomasz Targosinski	POLAND	WebEx
Phil Bailey	UK	WebEx