

Status Report of Technical Working Subgroup on Amendment 3 to GTR9	
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<b>Next meeting</b>	Not planned

### Background

On 14 and 15 June 2021, the GRSP Task Force on Pedestrian Protection GTR9 Amendment 3, chaired by the United States of America and attended by Contracting Parties to the 58 and 98 agreement and Industry Representatives, held its first meeting. The Task Force discussed the Proposal for Amendment 3 to UN-GTR9 (ECE/TRANS/WP.29/2021/53) which deals with clarifications of the pedestrian headform test procedure to the bonnet top. The proposal was submitted by GRSP to WP.29 and AC.3 for consideration and vote at their March 2021 sessions; the vote was however deferred by AC.3 until its June 2021 session, pending further discussions at GRSP. Meanwhile, GRSP agreed at its May 2021 session to establish the Task Force, awaiting a revised proposal in December 2021.

During the Task Force meeting the different positions were exchanged. It was found that prior to taking any further decision on how to proceed with Draft Amendment 3, a common understanding of the goals was needed to be developed on a technical basis.

Upon this need, the Technical Working Subgroup (TWSG) on Amendment 3 was formed. The group has met three times with technical experts from several Contracting Parties and Industry representatives.

### Meetings and Results

**The first meeting of TWSG**, co-chaired by the United States of America and Germany and attended by Japan, the US, Germany and Industry Representatives, was held online on 28 September 2021.

The different interpretations of UN-GTR9 regarding the markup were compared and **it was found that the sequence of test area determination being a key point to clarify the situation.**

**It was also found that the US interpretation of the GTR9 markup is that HIC1,000 in the tested zone must at least lead to a HIC1,000 area expanding over 2/3 of the area of the complete bonnet top, and that this approach is different to the prescriptions in Draft Amendment 3 to UN-GTR9 and UN-R 127 where 2/3 of the impact area must meet HIC1,000.**

Furthermore, during the first meeting, the test point methods („2D“ measuring point, „3D“ point of first contact) and impactor alignments were examined and compared. The group was asked for opinions on main contributing factors to the HIC calculation and whether tests to the lateral „offset zones“ should be permitted or not; however further discussions were postponed to the next meeting.

Consensus was found within the group on the next steps which were to first create a common understanding on a technical basis regarding the markup sequence, main contributing factors to the actual headform acceleration (measuring point, target/aiming point, CoG, first contact point) and the permission of tests in the offset zone. Subsequently, the intention would be to implement a consensus with regards to markup and test area within Draft Amendment 3 to UN-GTR9, if and wherever possible.

**The second meeting of TWSG**, chaired by Germany and attended by Japan, the US, Germany and Industry Representatives, was also held online, on 02 November 2021.

Markup sequence and test point selection according to UN-GTR9 Draft Amendment 3 which is also reflecting the procedure according to UN-R127.01, were described. It was clarified that at least 2/3 of the impact area (excluding the „offset zones“) must meet HIC 1,000 during tests with the headform velocity vector aiming at points inside this impact area. **It was pointed out that, different to Draft Amendment 3, the US interpretation**

of UN-GTR9 would allow tests outside the reference lines, but in that case without a need to meet any performance targets ("no requirement zone").

A discussion of a comparison table of the different markup and test point methods revealed the need for additional provisions of GTR9 for reflecting the US interpretation, e.g. how a small surface leading to an impact area smaller than 2/3 of the total area would be dealt with. It was also clarified by the US that further contingencies would need to be addressed by changes to UN-GTR9.

The different aspects related to the markup and test point methods were further discussed and evaluated, using a model of a sports car for marking and headform alignment methods to different structures. Amongst other things, also a new idea of generating a new line in the lateral offset zone, working as a new lateral limitation for the test area, was brought forward by the US and discussed.

The US indicated agreement to the „2D“ test method in case of permitting tests with the headform center of gravity aiming at points located well within the lateral offset zones.

The group found that good progress was made in terms of creating a common understanding and a possible acceptance of the 2D method by the US, but linked to certain conditions, with however some still outstanding technical questions:

- What is the order during markup procedure? Which zones are baseline for positioning and testing and which zones indicate the performance?
- What is the clarity benefit and worst-case assessment within the NHTSA interpretation and the amendment?
- Are tests in the offset zones allowed in terms of performance assessment?

The questions listed above resulted in the following two action items to be dealt with at the final meeting:

- 1) Description of the markup sequence / procedure and zone assignment as interpreted by the US
- 2) Potential safety benefit, technical feasibility and possible side effects of testing in the offset zones (CoG aiming at points therein)

**The third and final meeting of TWSG** was chaired by Germany and attended by the European Commission, Japan, Korea, The Netherlands, the US, Germany and Industry members. It took place online on 03 December 2021.

The two remaining technical items were summarized by Germany and possible shortcomings from marking the HIC zones prior to the offset lines as well as aiming the headform center of gravity at lateral offset zones were demonstrated. It was concluded by the majority of group members that Draft Amendment 3 (ECE/TRANS/WP.29/2021/53) would resolve these shortcomings, providing more clarity to the headform procedure without changing any existing prescriptions or requirements. However, it also turned out that neither of the two depicted ways of interpretation of UN-GTR9 corresponded to the understanding of the US who read GTR9 in a way that at least two thirds of the bonnet top area must be located in the impact area and zones rather than impact points are to be assessed.

Further demonstrations took place, showing that the formerly agreed introduction of offsets for positioning the headform impactor would not impair the assessment of the complete bonnet top area, with deformed offset areas not being untested areas but rather contributing to the HIC calculation. At the same time, offsets would avoid glancing blows and assessing structures outside the reference lines. From these points it was concluded that Draft Amendment 3 would provide for these clarifications.

The remaining discussions pointed on the majority of the group members understood Draft Amendment 3 to UN-GTR9 being a clarification of the practice already in place in the European Union, Japan and Korea, while the US interpretation of transposing GTR9 to compliance testing still being under development with rulemaking not yet started. A written or visual description of the entire procedure was not provided by the US.

The meeting concluded with the finding that at this point in time, based on the only available fully elaborated procedure which is in place since many years already (UN-R 127.01), no common agreement could be achieved under the 1998 agreement. An adoption of Draft Amendment 3 to UN-GTR9 as laid down in document ECE/TRANS/WP.29/2021/53 thus remains unlikely.

#### Further Information

All meeting documents can be found under

<https://files.bast.de/index.php/s/pk4WdyfgyRk5A9H>

for further reference.