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### Economic Commission for Europe

#### Inland Transport Committee

#### World Forum for Harmonization of Vehicle Regulations

#### Working Party on Passive Safety

#### Fifty-first session

Geneva, 21–25 May 2012

Item 4(b) of the provisional agenda

#### Global technical regulation No. 9 (Pedestrian safety) – Proposal for Amendment 2

### Final Progress Report

#### Submitted by the expert from the Netherlands\*

The final progress report reproduced below was prepared by the expert from the Netherlands to describe the process of developing of Amendment 2 to the text of the UN grt No. 9. It is based on a document without a symbol (GRSP-50-32) distributed during the fiftieth session of the Working Party on Passive Safety (GRSP).

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\* In accordance with the programme of work of the Inland Transport Committee for 2010–2014 (ECE/TRANS/208, para. 106 and ECE/TRANS/2010/8, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

## A. Introduction

1. The purpose of UN global technical regulation No. 9 is to improve the front structures of vehicles which have been identified as causing injury during a collision with a pedestrian or other vulnerable road user.
2. The objective of this proposal is to amend UN global technical regulation (GTR) No. 9 regarding pedestrian safety of motor vehicles to improve the safety for pedestrians and other vulnerable road users. It is intended to clarify the current text of UN GTR No. 9 on pedestrian safety to prevent misinterpretations and to introduce editorial corrections.

## B. Justification of the changes

3. Based on comments by the expert from OICA found in informal document GRSP-48-27, GRSP recognised that interpretation difficulties can arise with the current wording used in UN GTR No. 9, as well as the draft UN Regulation (1958 Agreement) on pedestrian safety concerning the use of the first contact point as the main reference point for the head form test procedure. Corrigendum No. 2 to UN GTR No. 9 made this even more obvious for the future application of GTR No. 9 by Contracting Parties to the 1998 Agreement as well as the UN Regulation to the Contracting Parties of 1958 Agreement.
4. Experience in Japan and Europe show that the first contact point may not be appropriate as the main reference point for testing. It is true that a first contact will always be achieved. However, there are points on the bonnet surface that may be identified as being of interest (due to underlying structures, hard points, etc.) but where a direct first contact is impossible due to the bonnet design. Assuming that the main impact energy is transferred in the centre-plane of the impactor that also contains the centre of gravity of the impactor, it would with the proposed changes, nevertheless, be possible to test such points, to achieve first contacts in the surrounding area and to allocate test results to such points. GRSP considers that this proposed procedure is clearer since it can be used for every point within the borderlines of the test area on the bonnet surface, independent of whether a point can be contacted by the headform during a test or not. Furthermore, the proposed procedure allows a well-defined positioning of the impactor while a first contact may be achieved with different points of the impactor's surface. Finally, the proposed procedure will guarantee that vehicles of the same width have an identical width of the test area.
5. This proposal contains the necessary changes to the texts of UN GTR No. 9 and to the draft UN Regulation (1958 Agreement) on the headform test as a three-dimensional system of a measuring point (also referred to as test point, being the point being closest to an underlying structure, to hard points, etc.), a target point (also referred to as the aiming point, being the point the propelling device targets to), and a first contact point (also referred to as impact point, being the point where the initial contact of the impactor with the bonnet surface occurs).
6. In this spatial geometry, the measuring point as well as the target point are always in the centre-plane of the impactor that is aligned to the vertical longitudinal plane of the vehicle. The test result achieved (i.e. a Head Injury Criterion (HIC) value) shall always be allocated to the measuring point, independent of where the first contact occurred.
7. In addition to the three-dimensional definition of the point to be tested, GRSP was also made aware of a discrepancy in the headform test area definition. According to the current test procedure described in GTR No 9 and in the draft Regulation, the impact can occur only within the child and/or adult headform test area excluding an offset of one-half the headform diameter. The calculation of the HIC 1000 or the HIC 1700 zones,

respectively, is nevertheless done for the whole area between the side reference lines. In practice, this could create a situation of possible misinterpretation when assigning the HIC zones to the bonnet surface since it may be possible to assign the less challenging criterion to areas that cannot be tested. The wording proposed with this document provides a clear procedure, i.e. the HIC value is to be calculated only for the area to be tested. Consequently, this leads to a smaller HIC 1700 area in total which will contribute to increased pedestrian safety.

8. This proposal also clarifies the same approach for the legform impactor test geometry of aligning the impactor's centre-plane with the measuring point as described above for the headform impactor.

9. Additional clarifications are proposed for the legform test procedures. In particular, it is suggested to clarify the definition of the bumper test area, based on the content of Commission Regulation (EC) No. 631/2009.

10. Also, the test conditions for the lower legform to bumper test area are clarified in the case of bumpers with varying heights.

11. Finally, some minor editorial corrections are proposed to clarify the certification of the impactors.

12. The changes to the procedures as described above are based on the experiences collected since UN GTR No. 9 was discussed during the meetings of the former Informal Group on Pedestrian Safety (INF GR PS). In the meantime, several experiences could be collected when testing vehicles to comply with legislation in Japan and Europe as well as with consumer requirements worldwide. The procedures represent common practice in regulatory use. The proposed changes will contribute to the clarity of future worldwide pedestrian protection regulations in order to minimize the room for interpretations when the GTR No. 9 or the draft UN regulation will enter into force in the national legislation of Contracting Parties.

### **C. History of the gtr**

13. The draft global technical regulation on pedestrian safety was established in the Global Registry on 12 November 2008 by consensus of the Contracting Parties and issued under the reference ECE/TRANS/180/Add.9.

14. The proposal to develop this amendment to UN GTR No. 9 was first submitted to the Executive Committee of the 1998 Agreement (AC.3) for due consideration during the 150th session of WP.29 (15 - 18 November 2011) as document ECE/TRANS/WP.29/2011/148, sponsored by the Netherlands.

15. During its fifty-first session on 21-25 May 2012, GRSP adopted the proposal.

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