

**Economic and Social Council**Distr.: General
29 November 2019

Original: English

Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations**Working Party on Automated/Autonomous and Connected Vehicles*****Fifth session**

Geneva, 10-14 February 2020

Item 7 of the provisional agenda

Advanced Emergency Braking Systems**Proposal for Supplements to the original text and the 01 series of amendments to UN Regulation No. [152] (Advanced Emergency Braking Systems for M₁ and N₁ vehicles)****Submitted by the experts from the Informal Working Group on Advanced Emergency Braking Systems for vehicles of Categories M₁ and N₁****

The text reproduced below was prepared by the experts from the Informal Working Group on Advanced Emergency Braking Systems (AEBS) for vehicles of Categories M₁ and N₁ in order to improve the text of the Regulation on the assessment of the AEBS robustness. The modifications to the existing text of the Regulation are marked in bold for new and strikethrough for deleted characters.

* Formerly: **Working Party on Brakes and Running Gear (GRRF)**.

** In accordance with the programme of work of the Inland Transport Committee for 2020 as outlined in proposed programme budget for 2020 (A/74/6 (part V sect. 20) para 20.37), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.



I. Proposal

Add a new paragraph 6.10., to read:

- “6.10. Robustness of the system**
- 6.10.1. Any of the above test scenarios, where a scenario describes one test setup at one subject vehicle speed at one load condition of one category (Car to Car, Car to Pedestrian), shall be performed two times. If one of the two test runs fails to meet the required performance, the test may be repeated once. A test scenario shall be accounted as passed if the required performance is met in two test runs. The number of failed tests runs within one category shall not exceed:**
- 10.0 per cent of the performed test runs for the Car to Car tests; and
 - 10.0 per cent of the performed test runs for the Car to Pedestrian tests.
- 6.10.2. The root cause of any failed test run shall be analyzed together with the Technical Service and annexed to the test report. If the root cause cannot be linked to a deviation in the test setup, the technical service may test any other speeds for subject vehicle and target vehicle within the speed range as defined in paragraphs 5.2.1.3., 5.2.2.3. or 5.2.2.4. as relevant.**
- 6.10.3. During the assessment as per Annex 3, the manufacturer shall demonstrate, via appropriate documentation, that the system is capable of reliably delivering the required performances.”**

II. Justification

1. This proposal is the follow-up of the general agreement reached at the fourth session of the Working Party on Automated/Autonomous and Connected Vehicles (GRVA), in September 2019, about the need to address the robustness of the system and potential uncertainties due to the test method.
 2. Due to influences that are external to the system, it is simply impossible to ensure that every test run is performed under the exact same conditions. This is why it cannot be concluded that AEBS cannot achieve the maximum performance with only one test run failure. At the same time it is necessary to check that any test failed is not linked to a systematic failure the AEBS.
 3. The present text is the outcome of the discussion of the AEBS informal working group at its tenth session and propose a balanced solution to the two issues at stake.
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