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Consideration and vote by AC.3 of draft global technical regulations and/or draft amendments to established global technical regulations

Proposal for Amendment 1 to global technical Regulation No. 1 (Door locks and door retention components)

Submitted by the representative of the United States of America*

The text reproduced below was adopted by the Working Party on Passive Safety (GRSP) at its fiftieth session. It is based on document ECE/TRANS/WP.29/GRSP/2011/4, not amended (ECE/TRANS/WP.29/GRSP/50, para. 4). It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Executive Committee (AC.3) for consideration.

* 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.

I. Introduction

1. The objective of Amendment 1 to global technical Regulation (UN GTR) No. 1 on door locks and door retention components intended to reduce door latch system failures is to incorporate changes that were developed during the rulemaking process of the United States of America (U.S.A) and UN Regulation No. 11, then further discussed by Working Party on Passive Safety (GRSP) delegates. This report describes the rationale used to justify the changes.

II. History

2. On 18 November, 2004, the Executive Committee of the 1998 Agreement (AC.3) established the UN Global Technical Regulation on Door Locks and Door Retention Components (UN GTR No. 1) of the 1998 Global Agreement, under the World Forum for Harmonization of Vehicle Regulations (WP.29). According to this Agreement, on 15 December, 2004, the U.S.A. issued a notice of proposed rulemaking (NPRM) closely based on gtr No. 1. Subsequently, the U.S.A. published two Final Rules on 6 February 2007 (72 FR 5385; Docket No. NHTSA-2006-23882) and February 19, 2010 (75 FR 7370; Docket No. NHTSA-2010-0015) incorporating the requirements of the gtr into their national regulations. Through this rulemaking process, minor changes were made clarifying the regulatory text. Furthermore, as the gtr was incorporated into ECE regulation 11 under the 1958 Agreement, additional clarifications were recommended.

3. In the U.S.A. rulemaking process, the Notice of Proposed Rulemaking is open to public comment; during this time, the U.S.A. received several comments from motor vehicle manufacturers, motor vehicle manufacturer trade associations, vehicle component manufacturers, an advocacy organization, and an individual citizen. Comments were submitted by Nissan North America (Nissan); Porsche Cars North America (Porsche); America Honda Motor Company Limited (Honda); Ford Motor Company (Ford); Thomas Built Buses Inc. (Thomas Built Buses); Blue Bird Body Company, a bus manufacturer (Blue Bird); Alliance of Automobile Manufacturers (Alliance); Association of International Automobile Manufacturers, Inc. (AIAM); Truck Manufacturers Association (TMA); TriMark Corporation, a door latch manufacturer (TriMark); Delphi, a vehicle component manufacturer; Advocates for Highway Safety, an advocacy organization (Advocates); and Barb Sachau, a private citizen.

4. Vehicle component manufacturers, motor vehicle manufacturers and their representative associations were generally supportive of the proposed rulemaking as well as the gtr process. These comments did raise issues regarding some of the proposed test requirements and test procedure specifications. Some of these comments also requested additional clarification of the proposed rule.

III. Justification of Changes

A. Part A, Technical Rational, Section IV

5. The gtr excluded some door types that are not commonly used and which would have required new requirements and test procedures. Subsequent to the adoption of the UN GTR, the issue of side doors that open vertically arose. Consideration was given to applying the requirements and test procedures for rear doors that open vertically, however data was not available to determine whether or not this would be appropriate. Therefore this proposal

amends Part A to clarify that the UN GTR was intended to address common door types and that Contracting Parties may address doors not regulated by the gtr at the national level.

B. Definitions, paragraph 3.1 and paragraph 3.18.

6. According to paragraph 2. of Informal document No. GRSP-36-5, the vehicle manufacturers are concerned that the definition of the "Auxiliary Door Latch", as stipulated in paragraph 3.1. of UN GTR No. 1, as well as the hinged door performance requirements, as specified in paragraph 5.1. of UN GTR No. 1, are not clear. As written, a manufacturer must have all auxiliary door latches meet the same requirements as primary door latches, because there is no way to determine which is primary and which is auxiliary if they all have a secondary latching system. This was not the intent of the global technical regulation. Therefore, paragraphs 3.1. and 3.18. were revised to clarify the definitions.

C. Hinge requirements for back doors, paragraph 5.1.5.1.(d)

7. According to the comments received on the NPRM for Federal Motor Vehicle Safety Standard (FMVSS) 206, Alliance and TMA requested clarification that the vertical load hinge in paragraph 5.1.5.1.(d) applies to back doors only. Upon analysis of this comment, it was found that the proposed revisions must be made in order to clarify the exact definition of vertical load hinge.

D. Door latch closure warning system, paragraphs 4.2.2. (b) and 5.1.5.4.(b)

8. It was recommended that text be added specifying that the visual warning must be visible by the driver of the vehicle. This text is consistent with the seat belt warning systems regulated in FMVSS 208.

E. Separation requirement for sliding door test, paragraph 5.2.4.2.1.

9. In paragraph 5.2.4.2.1., the UN GTR specified that a test failure can be indicated by a 100 mm separation of the interior of the door from the exterior of the vehicle's doorframe. At any point, there must not be more than 100 mm of separation, even if the latch holds, to protect against partial ejections. The 100 mm limit is based on a commonly used measurement for maximum allowable open space in the U.S.A. and Canada for school bus opening requirements.

10. Nissan requested clarification as to whether a non-compliance would occur when a gap separation occurred where the gap measured greater than 100 mm at the exterior opening, but less than 100 mm at the interior of the opening. The intent of the gtr was that, for failure of the requirement, the separation throughout the gap must exceed 100 mm. The example provided by Nissan would not be a failure. This is consistent with the intent to limit ejections through a separation.

11. It was recommended to amend the text in paragraph 5.2.4.2.1, to clarify that a spherical volume with a 100 mm diameter cannot pass through the opening. This change does not require a physical sphere be passed through the opening to validate the requirement. The words "interior" and "exterior" were switched from the original proposal to better describe the direction in which the sphere would be passed while taking the measurement, but this change does not alter the meaning of the sentence.

F. Clarifications of the text for paragraph 5.1.3., Annex 1, Annex 2 paragraph 2.3.3.5., Annex 2 paragraph 2.3.3.6., and Annex 3 paragraph 2.1.3.

12. In the NPRM and consistent with the UN GTR, the U.S.A. proposed regulatory text that removed any implication that the latch load is applied relative to the vehicle orientation. Alliance generally agreed with the proposed rule as applied to the hinged doors but requested additional clarification and corrections to the test procedure. The proposed clarifications to the regulatory text clarify the process of the testing procedure.

G. Clarifications of the text for Annex 2, paragraph 2.3.2.4.

13. This change clarifies the test set-up to allow for optional tethering of the door if there are concerns that during the test the door may damage the recording equipment.

H. Annex 4

1. Test Device and Set-Up

14. With regard to the force application device as specified in paragraph 3.3. of Annex 4, Nissan and Alliance favoured mounting the device external to the vehicle, instead of on the vehicle floor. Comments here expressed concern that mounting the force application device inside the vehicle could deform the vehicle floor and allow the device to move from its original position when applying a load. This, they stated, would introduce a significant amount of test variability.

15. The U.S.A. experienced similar concerns with the mounting of the test device, but resolved the issue through use of reinforced plates. The reinforcement plates provided a level surface for the support of the loading device. The plates also distribute loading on the floor of the test vehicle to reduce the movement of the device that could otherwise occur due to localized deformation at the attachment points.

16. During the 11 May 2005 meeting between the U.S.A., Alliance and the Ford Motor Company, an evaluation test presented results which demonstrated that use of the reinforcement plates on the vehicle floor avoids problematic displacement while under loading.

17. Both U.S.A. and other comments have demonstrated the ability to apply the requisite load to a vehicle door without causing displacement of the force application device. In order to minimize potential test variability, it is recommended that the UN GTR specify that a loading device is to be rigidly mounted when applying a load.

18. In paragraphs 3.6.1. and 3.7.1., the test procedure specifies that the force application plates are to maintain the displacement of the force application device in the transverse direction. This ensures that as force is applied, a door system continues to experience a transverse load. Although NHTSA did not experience penetration of door sheet metal from the loading plates, we recognized that without rounded edges on the plates, this might be a problem. Therefore, it is recommended that the loading plates have edges rounded to a radius of 6 mm \pm 1 mm.

19. The procedure specifies that the plates are permitted to rotate in the longitudinal direction relative to the loading ram. The loading plates are fixed perpendicularly to the hydraulic loading arms in a manner that does not allow for rotation in a transverse direction. Additionally, the loading plates are connected directly to the hydraulic ram shafts by a threaded stud attached to the back of the plate that allows for longitudinal rotation.

This longitudinal rotation allows for better adjustment of the plate to the contour of a vehicle door and provides acceptable results in testing performed by the U.S.A. Paragraphs 3.6.1.1. and 3.7.1.1. of Annex 4 clarify the rotation of the force application plate.

20. The test procedure specified that the loading plates be placed at the "door edge" as in paragraph 3.6.3. and paragraph 3.7.3. of Annex 4. The test procedure also specifies that all the door trim and decorative components are to be removed during test set-up as in paragraph 3.2. of Annex 4. Nissan's comments is stated that the term "door edge" could be prone to misinterpretation and asked that the term be further defined. Nissan also stated that trim components on a door pillar that overlap a sliding door could interfere with the test set-up. To address these concerns, it is recommended that the force application plates are placed within 12.5 mm from the interior edges of the sliding door as is noted in paragraphs 3.6.3 and 3.7.3 of Annex 4. This specification will ensure that force is applied directly to the portion of the door in which the latch mechanism is installed. Typically, a latch mechanism is within 12.5 mm of the interior edge of a vehicle door. Further, it is recommended that pillar trim and non-structural components that overlap a door be removed to permit proper placement of the loading plates as is reflected in the recommended changes to paragraph 3.2. of Annex 4.

2. Application of Force

21. Alliance raised several concerns with the specified procedure for operating the force application devices. First, Alliance requested that a 500 N preload be applied prior to determining the initial position of the ram arms for the purpose of measuring the transverse displacement of the ram arms. Alliance stated that a preload of 500 N would ensure that the loading plates are correctly positioned and would improve repeatability of the test by eliminating the effect of free play in the system. Specifying the pre-load is consistent with the force application test procedures specified in UN GTR No. 7 on Head Restraint Systems. Paragraph 3.12 of Annex 4 incorporates a pre-load requirement for the sliding door test procedure specifying that the test loading device achieve a pre-load of 500 N; once the pre-load is achieved the displacement measuring devices are then zeroed out.

22. Alliance recommended that the test procedure control the load force application rather than the displacement. As stated above, the UN GTR requires that the displacement is controlled (20–90 mm per minute) until a load of 9,000 N is reached, and then holding the resulting load for 10 seconds. Comments stated that controllers currently in use do not allow for simultaneous control of both displacement and load, and that the procedure as specified would raise practicability concerns.

23. In response to Alliance's concern, it is recommended that the procedure specify that 9,000 N force is achieved in not less than 90 seconds and not more than 120 seconds. The 90 – 120 second duration corresponds to loading rates of 4,500 N/min to 6,000 N/min, which according to data from tests conducted by the U.S.A. is comparable to the loading rates of 20 to 90 mm/min as specified originally.¹ Therefore it is recommended to amend paragraph 4.1. of the Annex address the concerns of the manufacturers.

3. Performance Requirement

24. In Annex 4 paragraph 4.3., both Nissan and Alliance expressed concern that the specified period of 10 seconds for maintaining the load was not adequate to permit measurement of separations between a vehicle body and the sliding door. Nissan stated that based on its experience it could take up to a minute to make the necessary measurements.

¹ Federal Register; Vol.75, No. 33; 19 February 2010, pgs. 7370-7383.

Alliance recommended a period of 30 seconds. Alliance stated that this would be adequate to limit deformation of the door sheet metal and still provide enough time for the necessary measurements. For paragraph 4.4. of Annex 4, it is recommended to specify that the load be maintained for 30 seconds. As suggested by Alliance, it is believed that it is practical to make the specified measurements in this time.
