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PROPOSAL TO AMEND THE GLOBAL TECHNICAL REGULATION
CONCERNING DOOR LOCKS AND DOOR RETENTION COMPONENTS

Technical Sponsor: United States of America

Note: The text reproduced below referring to Paragraph 3.1 and 3.18 was proposed as formal document TRANS/WP29/GRSP/2005/11e. It is based on document TRANS/WP.29/2003/49 that had been submitted by the United States of America, not amended (TRANS/WP.29/926, para. 132).

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A. Statement of Technical Rational and Justification

I. Introduction

The objective of this proposal is to amend the current global technical regulation (gtr) regarding door locks and door retention components intended to reduce door latch system failures. At the November 18, 2004 Session of the Executive Committee, the United States of America (U.S.), as a Contracting Party of the 1998 Global Agreement, under the World Forum for Harmonization of Vehicle Regulations (WP.29), voted in favour of establishing the first global technical regulation (gtr) on Door Locks and Door Retention Components (gtr 1). Per this Agreement, on December 15, 2004, the U.S. issued a notice of proposed rulemaking (NPRM) closely based on gtr 1. Subsequently, the U.S. published the Final Rule on February 06, 2007 (72 FR 5385; Docket No. NHTSA-2006-23882) incorporating the requirements of the gtr into our national regulations. Through this rulemaking process, minor changes were made to clarify the regulatory text. The purpose of this proposal is to incorporate these minor changes to clarify the requirements and test procedures of the gtr, and align it with the U.S. regulation.

In the United States rulemaking process, the Notice of Proposed Rulemaking is open to public comment; during this time, the U.S. 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); 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.

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

In light of the recent incorporation of the gtr into the U.S. regulation, we believe that this would be an excellent opportunity for the international community to amend the gtr concurrently with the U.S.. Everyone could benefit from the clarification of the testing procedures and the wording updates that were found during the drafting and comment period of the door locks and door retention components regulation.

II. Justification of Changes

Definitions, paragraph 3.1 and paragraph 3.18:

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 gtr No. 1, as well as the hinged door performance requirements, as specified in paragraph 5.1. of 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.

Hinge Requirements for Back Doors, paragraph 5.1.5.1.(d)

According to the comments received on the NPRM for FMVSS 206, the 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 below revisions must be made in order to clarify the exact definition of the vertical load hinge.

Door Latch Closure Warning System, paragraphs 4.2.2. b) and 5.1.5.4 (b)

U.S. recommends that language is added specifying that the visual warning must be able to be seen by the driver of the vehicle. This language is consistent with the seat belt warning systems regulated in FMVSS 208.

Separation Requirement for Sliding Door Test, paragraph 5.2.4.2.1.,

In paragraph 5.2.4.2.1, the 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. and Canada for school bus opening requirements.

Nissan requested clarification as to whether a noncompliance would occur in a case in which 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. The U.S. recommends amending 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.

Clarifications of the text for Annex 1:

In the NPRM and consistent with the GTR, the U.S. proposed regulatory text that removed any implication that the latch load is applied relative to the vehicle orientation. The 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.

Annex 4:

a. Test Device and Set-Up

With regard to the force application device as specified in paragraph 3.3. of annex 4, Nissan and the Alliance favoured mounting the device external to the vehicle, instead of on the vehicle floor. These commenters 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.

NHTSA experienced similar concerns with the mounting of the test device, but resolved the issue through use of reinforced plated. 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.

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

Both NHTSA and commenters 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, the U.S. recommends the gtr specify that a loading device is to be rigidly mounted when applying a load.

In paragraphs 3.6. and 3.7., 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 may be a problem. Therefore, we are recommending that the loading plates have edges rounded to a radius of $6 \text{ mm} \pm 1 \text{ mm}$.

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. In its comments Nissan 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, the U.S. recommends that the force application plates are placed within 12.5 mm from the interior edge of 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, we recommend 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.

b. Application of Force

The Alliance raised several concerns with the procedure for operating the force application devices. The Alliance recommended that the test procedure control the load force application rather than displacement. As stated above, the gtr requires that the displacement is controlled (20-90 mm per minute) until a load of 9000 N is reached, and then holding the resulting load for 10 seconds. The commenter 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.

In response to the Alliance’s concern, the U.S. recommends that the procedure specifies that the load be controlled at a rate not to exceed 2,000 N per minute, as reflected in the recommended changes to paragraph 4.1. in annex 4. In the vehicle testing conducted by the U.S., a load rate of 2,000 N per minute resulted in a displacement rate comparable to the proposed 20 – 90 mm displacement rate. However, we recognize that given the controllers currently in use, controlling for the load is a more practicable procedure.

Additionally, the U.S. would like to recommend revising paragraph 4.4. of annex 4 to specify holding the maximum load for 30 seconds. This duration was recommended by the Alliance and is sufficient time to measure any gap separations between the door and doorframe as specified by the procedure.

c. Performance Requirement

In annex 4 paragraph 4.3., both Nissan and the 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. The Alliance recommended a period of 30 seconds. The Alliance stated that this would be adequate to limit deformation of the door sheet metal and still provide enough time for the necessary measurements. The U.S. is proposing a revision to the test procedure to specify that the load be maintained for 30 seconds. As suggested by the Alliance, we believe that it is practical to make the specified measurements in this time.

III. Countries that have incorporated GTR 1 into their regulations

- Australia;
- Canada;
- Finland;
- France;
- Germany;
- Hungary;
- Italy;
- Japan;
- Netherlands;
- Russian Federation;
- Spain;
- Sweden;
- Switzerland;
- United Kingdom;
- United States of America

B. Proposed amendments

Paragraph 3.1., amend to read:

"3.1. "Auxiliary Door Latch" is a latch equipped with a fully latched position, **with or without a secondary latch position**, and fitted to a door or door system equipped with a primary door latch system."

Paragraph 3.18., amend to read:

"3.18. "Primary Door Latch" is a latch equipped with both a fully latched position and a secondary latched position **and is designated as a "primary door latch" by the manufacturer. The manufacturer may not thereafter change such designation.**

Each manufacturer shall, upon request, provide information regarding which latches are "primary door latches" for a particular vehicle or make/model."

Paragraph 4.2.2. b), amend to read:

"4.2.2. "b) a door latch system with a fully latch position and a door closure warning system. **The door latch closure warning system shall be located where it can be clearly seen by the driver.**

Paragraph 5.1.5.1. (d), amend to read:

"5.1.5.1. "Each door hinge system shall:

(d) On back doors only, not separate when a vertical load of 9,000 N is applied.

- (1) Not separate when a load of 11,000 N is applied perpendicular to the hinge face plate (longitudinal test) such that the hinge plates are not compressed against each other (Load Test One).**
- (2) Not separate when a load of 9,000 N is applied perpendicular to the axis of the hinge pin and parallel to the hinge face plate (transverse load test) such that the hinge plates are not compressed against each other (Load Test Two).**
- (3) Not separate when a load of 9,000 N is applied in the direction of the axis of the hinge pin (Load Test Three – only for back doors that open in a vertical direction)."**

Paragraph 5.1.5.4. (b), amend to read:

"5.1.5.4. "b) A door closure warning system shall be provided for those doors. **The door closure warning system shall be located where it can be clearly seen by the driver.**"

Paragraph 5.2.4.2.1., amend to read:

"5.2.4.2.1. "A separation ~~between the interior of the door and the exterior edge of the doorframe exceeds 100mm, which permits a sphere with a diameter of 100 mm to pass~~ **unobstructed between the exterior of the vehicle and the interior of the vehicle**, while the required force is maintained."

Annex 1

Paragraph 2.1.2.1.1., amend to read:

"2.1.2.1.1. ~~Adapt~~ **Attach** the test fixture to the mounting provisions of the latch and striker. Align in the direction of engagement parallel to the linkage of the fixture. Mount **the fixture with** the latch and striker in the fully latched position ~~to the test fixture~~ **in the test machine so as to apply a load perpendicular to the face of the latch.**"

Paragraph 2.1.2.2.1., amend to read:

"2.1.2.2.1. ~~Adapt~~ **Attach** the test fixture to the mounting provisions of the latch and striker. Align in the direction of engagement parallel to the linkage of the fixture. Mount **the fixture with** the latch and striker in the secondary latched position ~~to the test fixture~~ **in the test machine so as to apply a load perpendicular to the face of the latch.**"

Paragraph 2.2.2.1.1., amend to read:

"2.2.2.1.1. "Adapt the test fixture to the mounting provisions of the latch and striker. Mount the latch and striker in the fully latched position ~~to the test fixture~~ **in the test machine so as to apply a load in the direction of the latch opening.**"

Paragraph 2.2.2.2.1., amend to read:

"2.2.2.2.1. "Adapt ~~Attach~~ **Attach** the test fixture to the mounting provision of the latch and striker. **Align the direction of the engagement parallel to the linkage of the fixture.** Mount the **fixture with the** latch and striker in the secondary latched position ~~to the test fixture~~ **in the test machine so to apply a load perpendicular to the face of the latch.**"

Paragraph 2.3.2.1., amend to read:

"2.3.2.1. "Adapt the test fixture to the mounting provisions of the latch and striker. Mount the latch and striker in the fully latched position ~~to the test fixture~~ **in the test machine so as to apply a load in the direction of the latch opening.**"

Annex 4

Paragraph 3.2., amend to read:

"3.2. "Remove seats and any interior components that may interfere with the mounting and operation of the test equipment **and all pillar trim and any non-structural components that overlap the door and cause improper placement of the force application plates.**"

Paragraph 3.3., amend to read:

"3.3. "Mount the force application devices and associated support structure to the floor of the test vehicle. **Each force application device and associated support structure is rigidly fixed on a horizontal surface on the vehicle floor, while applying the loads.**"

Paragraph 3.6.1., amend to read:

"3.6.1. "The force application plate is 150 mm in length, and 50 mm in width, and at 15 mm in thickness. **The plate edges are rounded to a radius of 6 mm ± 1 mm.**"

Paragraph 3.6.3., amend to read:

"3.6.3. "The force application plate is positioned as close to the edge of the door as possible, ~~it is not necessary for the force application plate to be vertical.~~ **but not such that the forward edge of the plate is more than 12.5 mm from the interior edge...**"

Paragraph 3.7.1., amend to read:

"3.7.1. "The force application plate is 300 mm in length, and 50 mm in width, and at 15 mm in thickness. **The plate edges are rounded to a radius of 6 mm ± 1 mm.**"

Paragraph 3.7.3., amend to read:

"3.7.3. "The force application plate is positioned as close to the edge of the door as possible, ~~it is not necessary for the force application plate to be vertical.~~ **but not such that the forward edge of the plate is more than 12.5 mm from the interior edge...**"

Paragraph 4.1., amend to read:

"4.1. "Move each force application device at a rate of ~~20—90 mm per minute~~ **up to 2000 N per minute,...**"

Paragraph 4.4., amend to read:

"4.4. "Maintain the force application device position of paragraph 4.3., **and within 30 seconds**, ~~and~~ measure the separation between the exterior edge of the doorframe and the interior of the door along the perimeter of the door."
