

Transmitted by the representative of
the United States of America

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INLAND TRANSPORT COMMITTEE

World Forum for Harmonization of Vehicle Regulations

One-hundred-and-forty-fifth session
Geneva, 24-27 June 2008
Item 17.2 of the provisional agenda

**PROGRESS ON THE DEVELOPMENT OF NEW GLOBAL TECHNICAL REGULATIONS
AND ON THE AMENDMENTS OF GLOBAL TECHNICAL REGULATIONS**

Gtr No. 7 (Head restraints)

Proposal to develop Phase II of gtr No. 7 and to establish an informal group for its development

Submitted by the representative of Japan */

The text reproduced below has been submitted by Japan and contains a proposal to develop amendments to global technical regulation (gtr) No. 7. The proposal is submitted to the Executive Committee (AC.3) of the 1998 Agreement for its consideration (paragraph 6.4. of the Agreement). If AC.3 agrees on the need to amend gtr No. 7, the proposal should be referred to the appropriate Working Party (para. 6.3.3. of the Agreement). This proposal is based on informal document No. WP.29-144-23.

*/ In accordance with the programme of work of the Inland Transport Committee for 2006-2010 (ECE/TRANS/166/Add.1, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance performance of vehicles. The present document is submitted in conformity with that mandate.

I OBJECTIVE OF THE PROPOSAL

1. Japan proposes the development of Phase II of gtr No. 7 as an amendment to the gtr. Japan also proposes the establishment of an informal group for the development of this Phase. The informal group will discuss appropriate methods for testing and evaluating injuries due to rear impact crashes.

II BACKGROUND

2. At its 143rd session, in November 2007, the World Forum for Harmonization of Vehicle Regulations (WP.29) agreed to provide guidance to GRSP for the development of the draft gtr on head restraint (ECE/TRANS/WP.29/1064, para. 81) and that Phase II of the gtr should consider, as indicated in informal document No. WP.29-143-23-Rev.1, the following issues:

- (a) The head restraint height of 850 mm;
- (b) The appropriate dynamic test, including the test procedure, injury criteria and the associated corridors for the BioRID II dummy.

3. To address minor whiplash injuries (MAIS 1) that occur in low speed rear impact crashes ($\Delta V \leq 18$ km/h), insurance industry groups, such as the International Insurance Whiplash Prevention Group (IIWPG) (Insurance Institute for Highway Safety (IIHS) and Thatcham), have already started dynamic test evaluations of seats, EuroNCAP plans to introduce dynamic whiplash test rating in 2008, and JNCAP plans to introduce it in 2009. However, the testing and evaluation methods vary from one programme to another. Additionally, the European Enhanced Vehicle-safety Committee (EEVC) Working Group 12 has been investigating the appropriate dynamic test to address whiplash injuries in low speed crashes, including the test procedure, injury criteria and the associated corridors for the BioRID II dummy.

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4. At higher speed rear impact crashes ($\Delta V \geq 18$ km/h), there are as many minor whiplash injuries as recorded in the low speed crashes and there are a significant number of more severe whiplash injuries (MAIS 2 and MAIS 3) occurring.² The United States is currently evaluating several dummies and a dynamic test that could address these injuries.

III SUBJECTS FOR REVIEW AND TASKS TO BE UNDERTAKEN

5. With regard to head restraint height, the informal group should decide:

- (a) How to define the effective height;
- (b) The height requirements.

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6. With regard to the low and higher speed dynamic tests, the informal group should:

- (a) Define test conditions that reflect accidents in the real world, including the performance of seat backs and head restraints as a system;
 - (i) Tests conducted on the whole vehicles as available on the market, and/or on real seats conducted with sleds;
 - (ii) Number and conditions of sled pulses;

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² <http://www.sae.org/events/gim/presentations/2008moorhouse1.pdf>

- (b) Clarify the theories on the mechanism of whiplash injury in order to identify which of them better reflects reality;
 - (i) Analyzing accidents;
 - (ii) Performing volunteer tests and simulations with human body finite elements (FE) models;
- (c) Evaluate dummies that reflect the above mechanism with high fidelity to the human body and which demonstrates a high level of perfection as a measuring instrument;
 - (i) BioRID II is promising with its high fidelity to the human body, but still needs improving in testing methods, structure, etc. because it has a problem with reproducibility;
 - (ii) Improve the sitting method to reduce variation in results in the initial sitting position of the dummy;
- (d) Evaluate indicators of human body injury that reflect the whiplash mechanism;
- (e) Define reference values which should be based on the results of injury risk analysis and feasibility studies.

Comment [sm1]: To specific, several indicators need to be evaluated.

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7. With regard to evaluation, the informal group should evaluate the effects on reduction of injury and cost-effectiveness of the proposals.

IV WORK SCHEDULE

- 8. In the year 2008
 - (a) June – Submission of Japan's official proposal for the development of the Head Restraint gr Phase II at the WP.29 session
 - (b) November – Approval by WP.29/AC.3
 - (c) Date to be determined – 1st Informal group meeting
 - (d) December - 1st progress report submitted to GRSP
- 9. In the year 2009
 - (a) Date to be determined – 2nd Informal group meeting
 - (b) May - 2nd Progress report and Head restraint height requirement draft submitted to GRSP
 - (c) Date to be determined – 3rd Informal group meeting
 - (d) December - 3rd Progress report submitted to GRSP

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10. In the year 2010

- (a) Date to be determined – 4th Informal group meeting
- (b) May – 4th Progress report and Head restraint height requirement draft submitted to GRSP
- (d) December – 5th Progress report submitted to GRSP

11. After the year 2011

- (a) Date to be determined - Dynamic test requirement draft submitted to GRSP
- (b) Date to be determined - gr formal document submitted to GRSP
- (c) Date to be determined - gr will be presented for vote to the WP.29

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