

Transmitted by the representatives of Japan and the  
United Kingdom

Informal document No. WP.29-152-13  
(152<sup>nd</sup> WP.29, 9-12 November 2010  
agenda item 17.2.)

**Amendments to the proposal to develop Phase II of gtr No. 7 (Head restraints)  
and to establish an informal group for its development**

The text reproduced below was submitted by the representative of Japan and the United Kingdom and proposes amendments to the proposal to develop amendments to global technical regulation (gtr) No. 7 (ECE/TRANS/WP.29/AC.3/25). The proposed amendments are marked in bold and in strikethrough characters.

## A. PROPOSAL

Insert a new paragraph 4., to read:

"4. At its June 2009 session, AC.3 gave its consent to establish the informal group, under the chairmanship of the United Kingdom and with the technical sponsorship by Japan, to evaluate whether the BioRID II dummy can be used to develop an amendment to gtr 7 to reduce low speed rear impact injuries.

**Note: If the injury criteria research does not produce the desired results, then the group will consider submitting dynamic test using BioRID II as an alternative to the Hybrid III test."**

Paragraph 9., amend to read:

"9. In a first step (under the chairmanship of the United Kingdom and with the technical sponsorship by Japan)

(b) In the year 2009

(i) June – Approval by WP29/AC.3

(ii) December – 1<sup>st</sup> informal group meeting

(c) In the year 2010

(i) February - 2<sup>nd</sup> informal group meeting,

(ii) ~~May - 1<sup>st</sup> progress report with new working schedule proposal~~

**May - 3<sup>rd</sup> informal group meeting, 1<sup>st</sup> progress report submitted to GRSP.**

(iii) ~~Date to be determined - 3<sup>rd</sup> informal group meeting~~

**September - 4<sup>th</sup> informal group meeting**

(iv) November – Report progress and resume consideration of the development of a high speed test at WP.29 AC.3

(d) In the year ~~2011~~ **2012**

(i) **December** –Low speed - gtr formal document submitted to GRSP

(ii) ~~Low speed - gtr will be presented for vote to the WP.29~~

**(e) In the year 2013**

**(i) June -Low speed requirements will be presented for vote to the WP.29**

## B. JUSTIFICATION

The United States is currently evaluating several dummies and a dynamic test that could address not only the higher speed accident but also the lower speed accident minor neck injuries. At the fourth informal group meeting (September 21-22, 2010), there was a discussion to begin collaborative efforts between the United States and Japan to compare cadaver testing and modelling to assess which injury criteria is the most appropriate for use to address minor neck injuries. This effort is expected to be completed by the end of 2011. Additionally, there are still concerns with repeatability and reproducibility of the dummy that need more time to resolve.

With the aim of harmonizing the rear impact dummy, it is recommended that the submission of low speed –gtr formal document to GRSP is postponed to December, 2012 from 2011. However, if the injury criteria research does not produce the desired results, then the group will consider submitting dynamic test using BioRID II as an alternative to the Hybrid III test by December, 2012 to avoid the further delay of submission.

## I. OBJECTIVE OF THE PROPOSAL

1. The representative of Japan proposes the development of Phase 2 of gtr No. 7 and has incorporated the amendments proposed by the United State of America. <sup>1/</sup> He 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 one-hundred-and-forty-third session, in November 2007, the World Forum for Harmonization of Vehicle Regulations (WP.29) agreed to provide guidance to the Working Party on Passive Safety (GRSP) for the development of the draft gtr on head restraints (ECE/TRANS/WP.29/1064, para. 81) and that Phase 2 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 biofidelic rear impact dummy II (BioRID II).

3. At its one-hundred-and-forty-eighth session, in June 2009, the Executive Committee of the 1998 Agreement (AC.3) agreed on the two-step approach suggested by the representatives of the United Kingdom and of the United States of America. This approach will consider whether BioRID II can more effectively address injuries occurring in low speed rear impact crashes and focus on reducing injuries in higher speed rear impact crashes as a second step.

4. To address minor neck injuries (maximum abbreviated injury scale 1 (MAIS)) that occur in low speed rear impact crashes, insurance industry groups, such as the International Insurance Whiplash Prevention Group (IIWPG) (Insurance Institute for Highway Safety (IIHS) and Thatcham), have been conducting dynamic evaluations of seats. The European new car assessment programme (EuroNCAP) introduced dynamic evaluations of seats in 2008, and the Japanese new car assessment programme (JNCAP) introduced dynamic evaluations of seats 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 minor injuries in low speed crashes, including the test procedure, injury criteria and the associated corridors for the BioRID II dummy. At its June 2009 session, AC.3 gave its consent to establish the informal group, under the chairmanship of the United Kingdom and with the technical sponsorship by Japan, to evaluate whether the BioRID II dummy can be used to develop an amendment to gtr 7 to reduce low speed rear impact injuries.

**Note: If the injury criteria research does not produce the desired results, then the group will consider submitting dynamic test using BioRID II as an alternative to the Hybrid III test.**

5. At higher speed rear impact crashes ( $\Delta V \geq 18$  km/h), there are as many minor injuries as recorded in the low speed crashes and there are a significant number of more severe injuries (MAIS 2 and MAIS 3) occurring in some countries. The United States of America is currently evaluating several dummies and a dynamic test that could address these injuries. As a second step, AC.3 will resume consideration of development of a high speed test at its November 2010 session.

## III. SUBJECTS FOR REVIEW AND TASKS TO BE UNDERTAKEN

6. 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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<sup>1/</sup> ECE/TRANS/WP.29/2008/115, ECE/TRANS/WP.29/2009/47 and ECE/TRANS/WP.29/2009/48

7. With regard to low speed dynamic test, 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 vehicle as available on the market, and/or on production seats mounted on sleds;
    - (ii) Number and conditions of sled pulses;
  - (b) Working within the accepted knowledge concerning the mechanism of minor neck injury and other rear impact injuries, identify parameters that may be used to advance developments in occupant protection through, for example;
    - (i) Analyzing accidents;
    - (ii) Performing volunteer tests (low speed only) 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 demonstrate an acceptable level of perfection as a measuring instrument;
    - (i) In particular, the dummy evaluations shall include an assessment of their biofidelity in the critical areas associated with the safety technology under review, their repeatability and their reproducibility;
    - (ii) Define the dummy sitting conditions to minimise variation in test results;
    - (iii) Harmonize the test dummy and calibration test;
  - (d) Evaluate indicators of human body injury that reflect the minor neck and other rear impact injury mechanisms;
    - (i) E.g. measure the relative movement between the upper and lower parts of the neck and the forces applied to each of these parts;
  - (e) Define reference values which should be based on the results of injury risk analysis and feasibility studies.
8. With regard to evaluation, the informal group should evaluate the effects on reduction of injury and cost-effectiveness of the proposals.

#### **IV. WORK SCHEDULE**

9. In a first step (under the chairmanship of the United Kingdom and with the technical sponsorship by Japan)
- (a) In the year 2008
    - (i) June – Submission of the official proposal from the representative of Japan for the development of the Head Restraint gr Phase 2 at the one-hundred-and-forty-fifth session of WP.29.
  - (b) In the year 2009
    - (i) June – Approval by WP29/AC.3

- (ii) December – 1<sup>st</sup> informal group meeting
  - (c) In the year 2010
    - (i) February - 2<sup>nd</sup> informal group meeting,
    - (ii) **May - 3<sup>rd</sup> informal group meeting, 1<sup>st</sup> progress report submitted to GRSP.**
    - (iii) **September - 4<sup>th</sup> informal group meeting**
    - (iv) November – Report progress and resume consideration of the development of a high speed test at WP.29 AC.3
  - (d) In the year **2012**
    - (i) **December** –Low speed - gtr formal document submitted to GRSP
  - (e) **In the year 2013**
    - (i) **June –Low speed requirements will be presented for vote to the WP.29**
10. In a further step (discuss on high speed under [to be determined].)
- (a) [To be determined]
    - (i) Higher speed – Dynamic test requirement draft submitted to GRSP
    - (ii) Higher speed - gtr formal document submitted to GRSP
    - (iii) Higher speed – gtr will be presented for vote to the WP.29
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