

Transmitted by the expert from
Australia

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Proposal for draft amendment to Regulation No. 94

(Protection of occupant in the event of a frontal collision)

Note: The text presented was transmitted by the expert from Australia in order to clarify head injury requirements in Regulation No. 94.

A. PROPOSAL

Annex 4: "DETERMINATION OF PERFORMANCE CRITERIA"

Paragraph 1., amend to read:

"1. HEAD INJURY CRITERIA"

Paragraph 1.2., amend to read:

"1.2. If there is contact between the head and any vehicle component, a calculation of the value of HPC is made,...."

Paragraph 1.1., to be deleted.

Paragraphs 1.2., 1.2.1., 1.2.2., 1.2.3., 1.2.4. and 1.3., to be renumbered as 1.1., 1.1.1., 1.1.2., 1.1.3., 1.1.4. and 1.2. respectively.

B. JUSTIFICATION

ECE Regulation No. 94, Paragraph 5.2.1.1. reads

5.2.1.1. The head performance criterion (HPC) shall not exceed 1000 and the resultant head acceleration shall not exceed 80 g for more than 3 ms. The latter shall be calculated cumulatively, excluding rebound movement of the head;

Annex 4 specifies the method for determining performance criteria:

DETERMINATION OF PERFORMANCE CRITERIA

1. HEAD PERFORMANCE CRITERION (HPC)
 - 1.1. This criterion is considered to be satisfied when, during the test, there is no contact between the head and any vehicle component.
 - 1.2. If that is not the case, a calculation of the value of HPC is made, on the basis of the acceleration (a), measured according to paragraph 5.2.1. of annex 3, by the following expression:

$$HPC = (t_2 - t_1) \left[\frac{1}{t_2 - t_1} \int_{t_1}^{t_2} a dt \right]^{2.5}$$

in which:

- 1.2.1. the term 'a' is the resultant acceleration measured according to paragraph 5.2.1. of annex 3 and is measured in units of gravity, g (1 g = 9,81 m/s²);
- 1.2.2. if the beginning of the head contact can be determined satisfactorily, t₁ and t₂ are the two time instants, expressed in seconds, defining an interval between the beginning of the head contact and the end of the recording for which the value of HPC is maximum;
- 1.2.3. if the beginning of the head contact cannot be determined, t₁ and t₂ are the two time instants, expressed in seconds, defining a time interval between the beginning and the end of the recording for which the value of HPC is maximum.
- 1.2.4. Values of HPC for which the time interval (t₁ - t₂) is greater than 36 ms are ignored for the purposes of calculating the maximum value.
- 1.3. The value of the resultant head acceleration during forward impact which is exceeded for 3 ms cumulatively is calculated from the resultant head acceleration measured according to paragraph 5.2.1. of annex 3.

Annex 4, paragraph 1 appears to be ambiguous.

The heading for this paragraph is Head Performance Criterion (HPC), however, subparagraph 1.3. concerns an additional requirement for 3ms resultant head acceleration, which is a different assessment value from HPC.

Subparagraph 1.1. states that "this criterion" is satisfied if there is no contact between the dummy head and any vehicle component.

Is this intended to mean that HPC is satisfied if there is no head contact, but that the 3ms resultant head acceleration must be assessed regardless of head contact?

If GRSP confirms that the intention is that 3ms head acceleration must be assessed regardless of head contact, Australia would propose the above mentioned amendments to the text of Regulation No. 94.

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