



PROPOSAL FOR NEW CRITERIA FOR HEADFORM IMPACTOR TO BONNET TESTS AND JUSTIFICATION

Proposal for new wording of the criteria (GR PS 143 Rev1):

4.3. Adult headform impact:

To verify the compliance with the performance requirements as specified in paragraphs 5.2.1. and 5.2.3., both ...

5.2.1 Headform to bonnet:

The HIC recorded shall not exceed 1000 over one half of the child headform test area and, in addition, shall not exceed 1000 over 2/3 of the combined child and adult test areas. The HIC for the remaining areas shall not exceed 1700. For impact points in the windscreen test area, the requirements of paragraph 5.2.3. shall apply.

5.2.2 To be deleted.

5.2.3 Headform to windscreen: (to be renumbered later)

Text as proposed by OICA

Justification:

Current situation:

Existing requirements and criteria of pedestrian protection regulations / directives contain relaxation zones providing for HIC values above 1000: HIC for 1/3 (33%) of the entire bonnet test area shall not exceed 2000; in the remaining part HIC shall be below 1000, independent of the headform impactor used. This is because it is not technically feasible to achieve HIC less than 1000 for the complete bonnet test area as confirmed by independent studies.

General ideas and first approach:

The headform test requirements for future regulations for pedestrian protection should be more demanding for vehicle fronts than existing requirements and thus more effective for pedestrians. However, the design solutions should remain technically feasible.

A first approach could be to apply the relaxation zone separately for the child and adult test areas, i.e. HIC below 1700 to a maximum of 1/3 of each test zone.

Conflicts and consequences for vehicle fronts:

Necessary under-bonnet components such as locks, suspension tower, etc. will not fundamentally change in their position. They need to be located in the child headform test area. This often results in more than 33% of relaxation zone for the child test area alone (Figures 1 and 2).

The combination of a significantly reduced maximum HIC value of 1700 and a relaxation zone maintained at 33% means that the above-mentioned first approach is technically unfeasible.

The very last consequence would be a withdrawal of some vehicle types from the market accompanied with huge social and economic problems.

Alternative approach:

An alternative approach could be as follows:

“The HIC recorded shall not exceed 1000 over one half of the child headform test area and, in addition, shall not exceed 1000 over 2/3 of the combined child and adult headform test areas. The HIC of the remaining areas shall not exceed 1700.”

Figure 3 compares the effectiveness (percentage of saved pedestrians) in the bonnet test area for existing regulations (HIC below 2000 in 33% of the entire test area) and for this alternative approach (HIC below 1700 in x% of the test area). The calculation method is the same as the one used by TRL in the study carried out for the European Commission.

The comparative effectiveness diagram shows that more pedestrians would be saved even if the relaxation zone of the bonnet test area is around 50%. This improvement is due to the significantly reduced HIC limit of 1700.

Conclusion:

The requirements of the alternative approach are in harmony with the general targets of future legislation, i.e. better pedestrian protection while maintaining technical feasibility of possible design solutions.

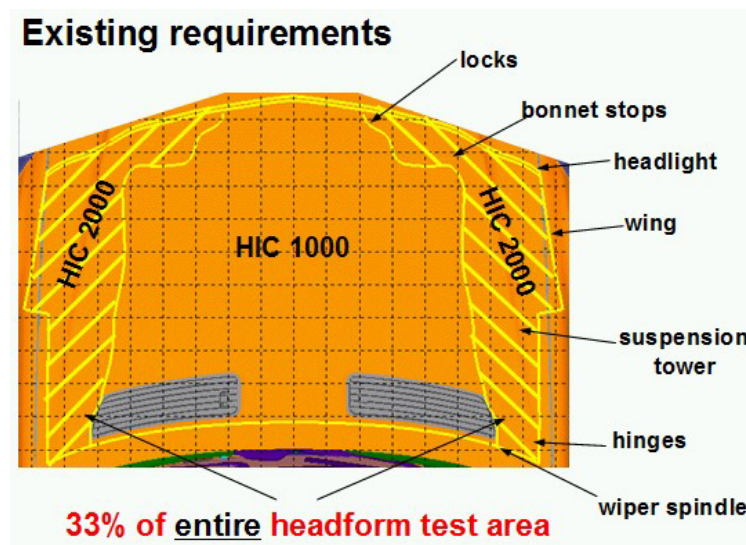


Figure 1

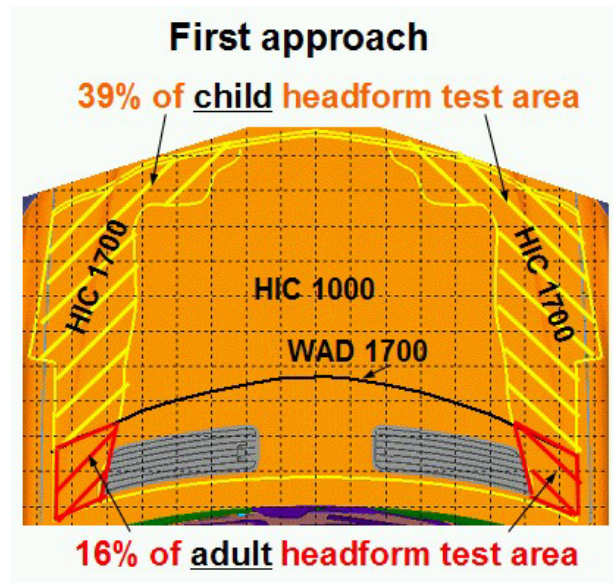


Figure 2

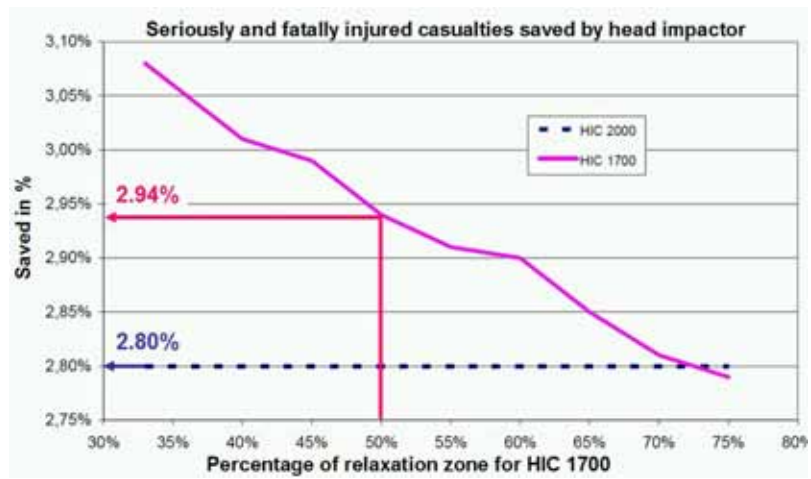


Figure 3