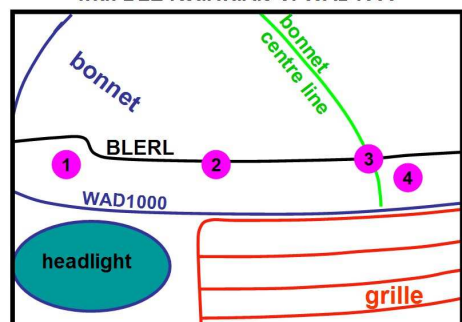


## OICA position on keeping the size of the exemption zone in the bonnet leading edge area

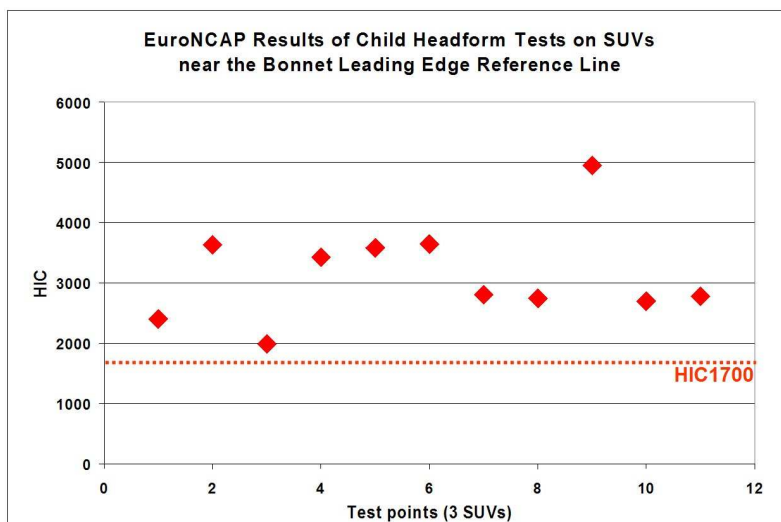
The child headform impact zone always starts at least one headform diameter rearward of the bonnet leading edge reference line. This exemption zone was considered by EEVC WG17 (chapter 7.4.1 of the WG17 1998 Report) and requested by industry to reduce the conflicts arising when designing for the upper legform impact and the child headform impact in the same area. In addition, there are feasibility problems linked to the unavoidable implementation of necessary functional devices (bonnet locks, headlamp mountings, bonnet stops, etc.) in this area even if an upper legform test is not required.

These problems are confirmed by several tests performed in this critical area close to the bonnet leading edge, e.g. EuroNCAP tests. Currently there are no design solutions available to solve these problems and there will not be any in the timeframe of the EU Regulation. An exemption zone of half a headform diameter is not sufficient to solve these problems.

EuroNCAP Child Head Results for SUV  
with BLE Rearwards of WAD1000



1	Bonnet leading edge (headlight)	HIC 2749
2	Bonnet leading edge (grille)	HIC 4949
3	Bonnet leading edge (grille)	HIC 2694
4	Bonnet leading edge (bonnet catch)	HIC 2778



Although these results were obtained with the 2.5 kg impactor at 40 km/h it is not expected that the HIC would be halved under draft GTR / draft EU Phase 2 / TRIAS 63 conditions. These results clearly demonstrate the feasibility problems that exist in this area. In addition, the exemption zone already exists in the European as well as in the Japanese legislation. For continuity in evaluation of the vehicles, the 165 mm should be maintained in the GTR.

Furthermore, given the time frame of the possible enforcement of the GTR and the EU Phase 2 and the above-mentioned feasibility problems it is impossible to change the definition of the child headform impact zone at such short notice. All-new vehicle models to be launched in 2010 already have a fixed and fully developed front architecture and package now based on the one diameter (165 mm) distance from the bonnet leading edge reference line.

In this case, once again, the recommendations of EEVC WG17 Report 1998 apply (chapter 8.2):

„The leadtimes of the Directive should be considered, taking into account that important vehicle changes could be necessary. Such changes generally necessitate that a

‘pedestrian friendly’ vehicle needs to be designed for the earliest concept stage and not by modification of an existing vehicle.“

Potential effectiveness of the new Commission requirement:

For vehicles with high bonnet leading edges the pedestrian (almost exclusively children) head impact speed to the bonnet leading edge area is significantly lower than the car to pedestrian collision speed. This is because the acceleration of the whole body occurs much earlier than in the case of adults. This leads to the low relative velocity between the bonnet and the head. Figure 1 shows the kinematics of a 6-year-old child and a typical SUV vehicle. The diagram on the right shows the relative head impact velocity compared to the car to pedestrian collision speed. The vehicle front has been modified in an attempt to meet the WG17 requirements (Matra/TNO feasibility study carried out for ACEA). It can be seen that at 40 km/h the relative head impact speed is approximately half the vehicle collision speed.

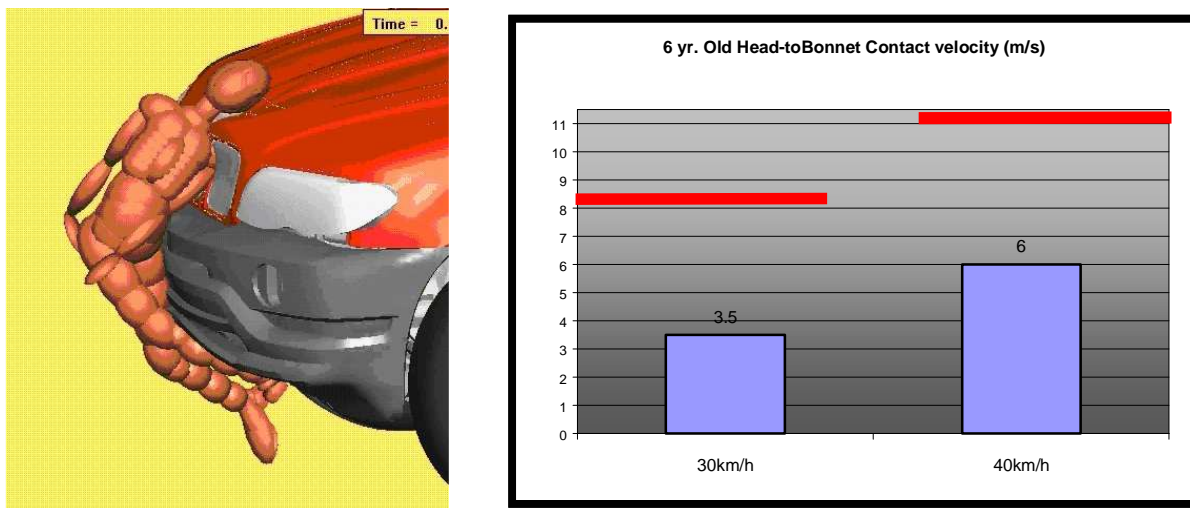


Figure 1. 6-Year old kinematics with SUV (Matra/TNO feasibility study)

Investigation of the results from JARI simulations in the framework of IHRA activities show that the relative child head impact speed for the bonnet area immediately rearward of the bonnet leading edge is around 27 km/h at a collision speed of 40 km/h. This confirms the above findings.

Mandatory testing at 35 km/h in the area immediately rearward of the bonnet leading edge will therefore not bring the anticipated effectiveness. Given the above-mentioned feasibility problems in this area, attention should be paid to the requirements and test conditions before taking any decision on the extension of the child headform test area.

OICA therefore urgently requests the retention of the current and worldwide harmonized value of 165 mm for the relevant vehicle shapes, which is absolutely needed for the development of feasible designs in the contemplated time frame.