

20-22 Nov. 2002
12th IHRA/PS N237
Adelaide, Australia

IHRA Computer Simulation Results

- After Discussion -

Current IHRA PS WG Position on Pedestrian Headform Component Testing

28 June 2002

The IHRA Pedestrian Safety Working Group has developed a preliminary head impact component test procedure for passenger cars. This preliminary test procedure is described in Appendices D and E of the 2001 interim report; however, the head-form impact speed and the impact angle with respect to the horizontal have not yet been finalized. In order to develop appropriate impact speeds and angles, an extensive modeling effort was undertaken by three of the member organizations: JARI, RARU, and NHTSA. This effort modeled adult and child pedestrian impacts at three vehicle impact speeds, two vehicle front-end stiffnesses, three vehicle front-end shapes, and three pedestrian walking positions. Results from the three models were compared and significant variations in kinematics were observed due to differences in the three human model structures. A single model, the JARI model, was selected as appearing to provide better results than the other two models. This model will be further developed in a collaborative effort by the three original modeling organizations plus TRL with the intent of providing more accurate pedestrian impact simulations that will aid in finalizing component test conditions.

At this time there is disagreement among members of the PSWG regarding the reliability of the pedestrian model results and the advisability of depending on these results for the determination of pedestrian head-form component test conditions. The group feels that the results of the modeling represent the best available information at the present time. Some members feel that the use of a value within the range defined by the average impact speed plus/minus one standard deviation is advisable for current usage. Other members feel that using a value equal to the average impact speed plus one standard deviation is advisable.

Users of these results should keep in mind the PSWG goal of reducing the numbers of pedestrian fatalities and serious injuries. The current results of the modeling effort are presented in the following charts along with the means and plus/minus one standard deviation for each test parameter at each vehicle speed. The user should apply these interim results recognizing that this research is continuing and that although modeling has limitations, it is the best available representation of the physical event at the present time.

Head Impact Speed Ratio

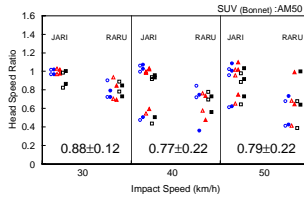
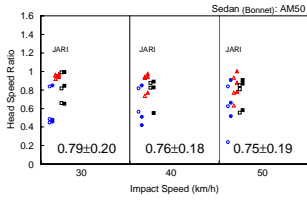
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SUV

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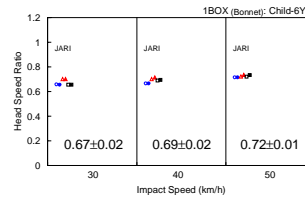
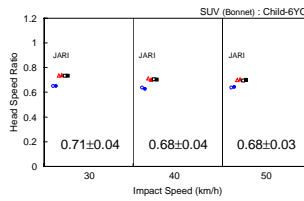
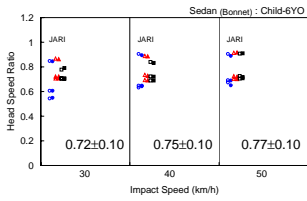
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Child-6YO

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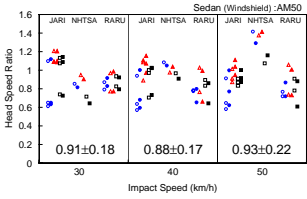
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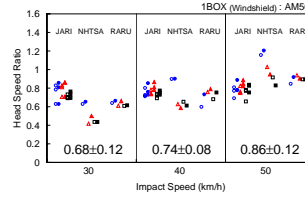
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No Windshield Contact



Child-6YO

Sedan

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- BLE/Grille Contact -

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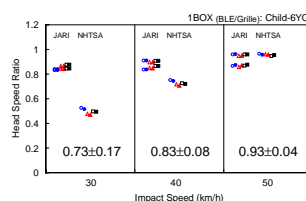
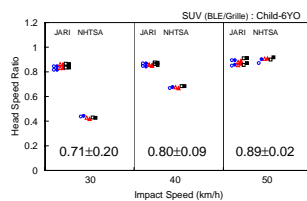
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No BLE/Grille Contact



Head Impact Angle

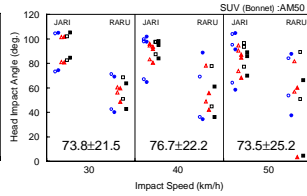
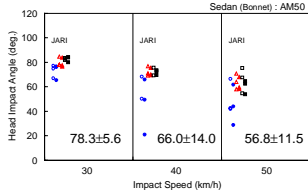
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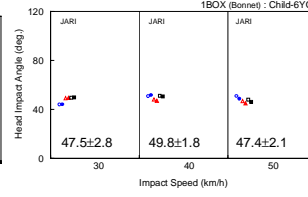
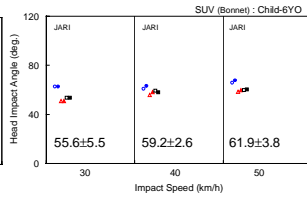
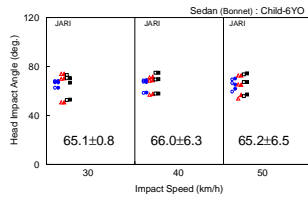
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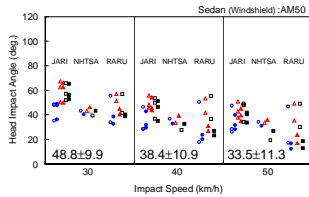
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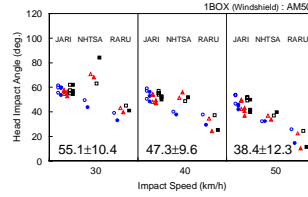
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No Windshield Contact



Child-6YO

Sedan

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No Windshield Contact

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- BLE/Grille Contact -

AM50

Sedan

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No BLE/Grille Contact

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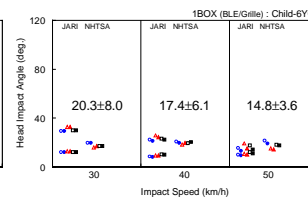
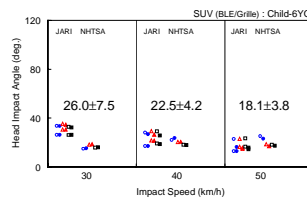
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No BLE/Grille Contact



WAD

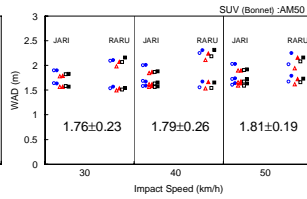
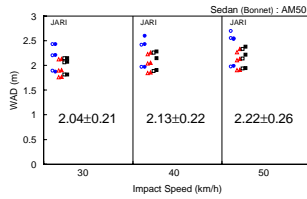
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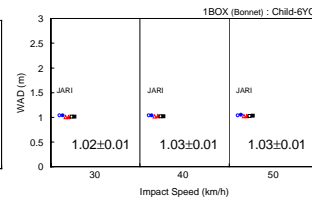
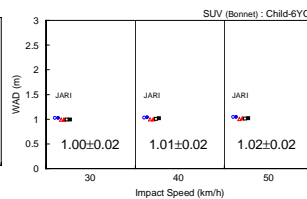
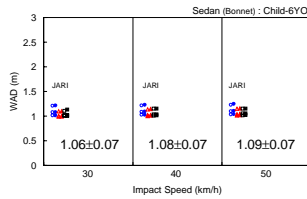
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Child-6YO

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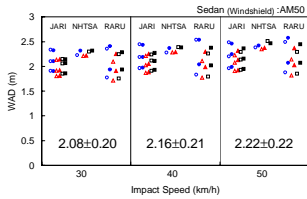
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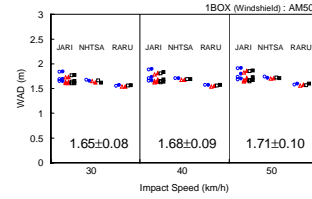
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No Windshield Contact



Child-6YO

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No BLE/Grille Contact

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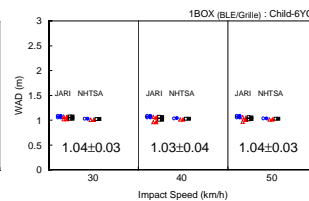
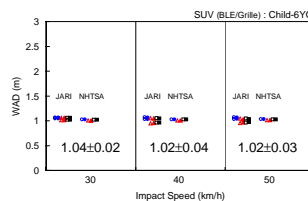
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No BLE/Grille Contact



WAD Ratio

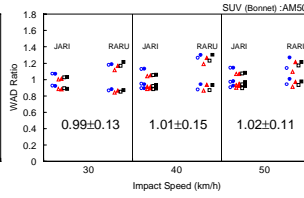
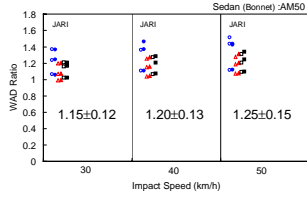
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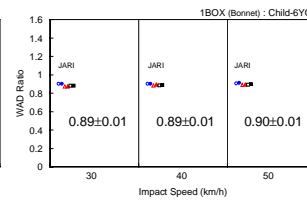
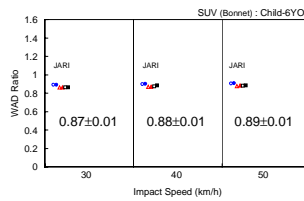
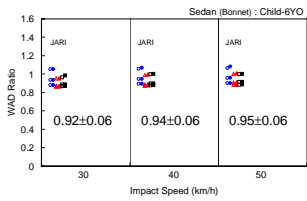
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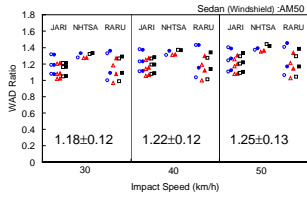
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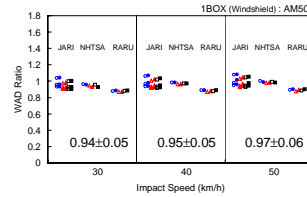
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No Windshield Contact



Child-6YO

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