

The Inertial Effects of Booster Seats on Three-Year-Old ATD

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ABSTRACT

The Federal Motor Vehicle Safety Standard does not set a maximum weight for booster seats. And child seats, including combination seats, are being constructed with increased robustness, therefore increasing the mass. Increased booster seat mass would have increased loading on a child during a frontal impact since the booster seat configuration is not attached to the vehicle seat. Therefore, testing was conducted using the FMVSS213 crash pulse and four combinations of high weight boosters. The first two combinations provided a baseline of the child loading the belt system, while the booster was restrained to the vehicle seat and the second with a non-constrained booster loading the child into the seat belt system. The final two combinations verified that high weight booster seats add additional load to the child with and without the use of a tether. It was concluded that increased booster weight directly relates to an increased force applied to a child. Therefore, booster seats should have an upper weight limit to minimize the effect of inertial loading on children at the lower end of the use weight range.