



Engineering Sciences Section – 2008

C5 Comparison of Acceleration Data and Human Subject Kinematics in Bumper-to-Bumper vs. Bumper-to-Hitch Low-Speed Collisions

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After attending the presentation, participants will have a greater appreciation of the biomechanical implications in low speed bumper-to-bumper vs. bumper-to-hitch collisions. Participants will also understand that the crash pulse is significantly longer and the absorbed energy, vehicle and occupant accelerations may be significantly lower in bumper-to hitch collisions.

There is a popular notion that striking the hitch of a so-called, rigid bumper vehicle, may result in higher accelerations, shorter crash pulses, and more severe kinematic responses of occupants in rear collisions. This study impacts the forensic and scientific community by revealing crash test results that seem to indicate that bumper-to-hitch impacts are less severe than identical bumper-to-bumper collisions. Participants will learn that crash pulses are significantly longer and crash accelerations are significantly lower when the bumper of a bullet vehicle engages only the hitch of a target vehicle and bumper deformation occurs.

The author will present data from at least twelve crash tests in which half of the impacts were bumper-to-bumper and half were bumper-to-hitch impacts.

Biomechanics, Low-Speed, Crash