

Spinal Kinematics in Adults Exposed to Low Speed Frontal Acceleration

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ABSTRACT

The development of effective motor vehicle safety systems requires a humanlike (biofidelic) anthropomorphic test device (ATD), or crash test dummy, to ensure safety systems mitigate injuries in human beings. A new, modular sled design called the low acceleration seating buck (LASB) has been developed to recreate the low-impact accelerations (no more than 5 G's) similar to that of an amusement park bumper car. The sled will be used to perform non-injurious biomechanical experiments on live volunteer adults to determine the differences in thoracic and cervical flexibility as compared to adult ATDs. Live volunteer adults will be fitted with electromyography sensors as well as reflective markers so that a 3D motion analysis system can track movement of the head, neck, and spine. Additional sensors will be placed throughout the sled and on the volunteer to extract acceleration data of the head for all three axes of rotation. The data will be used with the intention of either verifying current ATD design or aid in the development of future ATDs.