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MAJOR FLAW FOUND IN DEFENSE ENGINEERS' ANALYSES

Defense engineers commonly underestimate Delta V by erroneously comparing sample crash tests with the automobile accident that is the subject of the litigation. Delta V is often used by defense experts to determine the risk and severity of injury.

The defense engineer compares the amount of vehicle damage found with rigid barrier Insurance Institute for Highway Safety (IIHS) tests to the amount of damage caused by the car to car subject accident. IIHS tests are performed at 5 mph and this figure is then converted into Delta V. For example, if "e," the coefficient of restitution (bounciness) is 0.2, then a 5 mph barrier impact produces a Delta V of 6 mph. If the vehicle damage produced by the IIHS Delta V 6 mph impact is greater than that produced by the subject accident, the engineer concludes the Delta V of the subject accident was less than 6 mph.

Research proves that this is a flawed comparison. A prescribed level of Delta V will produce more vehicle damage in a rigid barrier test than in a car to car collision. Conversely, a prescribed level of Delta V will produce less vehicle damage in a car to car collision than in a rigid barrier test. An article from the Society of Automotive Engineers (SAE) noted:

"As seen in the car to car staged collision, the crush energy is shared mutually but not necessarily equally, between the two vehicles. This differs from a rigid barrier impact which directs all of the crush energy into the one test vehicle. The impulse or acceleration pulse in the two vehicle collision will have different characteristics than the rigid barrier test. The car to car impact will generally have a longer acceleration pulse duration when compared to a similar Delta V rigid barrier impact . . . If the accelerations are lower, crushing forces will be lower, resulting in lower overall vehicle crush." (Kerkhoff et al, 1993)

A 2001 SAE article concluded: "For a prescribed level of vehicular dynamic deformation, it is possible to have a 100% variation in the change in vehicle velocity, depending upon the structural dynamics of the testing involved . . . As has been shown, a wide variation in the change in vehicle velocity (Delta V) can be developed for a given level of dynamic deformation, depending upon the type of test utilized by a researcher." (Burkhard, 2001)

The Delta V required to cause a prescribed amount of damage to the subject vehicle as a result of a car to car collision is significantly greater than the Delta V required to produce the same amount of damage to an identical vehicle as a result of a rigid barrier test. It is possible to have a 100% variation. Considering this and using the example cited above, the Delta V for the subject car to car impact was less than 12 mph, not less than 6 mph.

Reliance on rigid barrier tests such as those performed by IIHS grossly underestimates

the Delta V of the subject vehicle, thereby leading to gross underestimations of injury likelihood and severity.

If you would like to discuss this or any other matter with Dr. Immerman, please call 602.368.9496. We offer free initial consultations.

Burkhard, PM: "Delta V, BEV and Coefficient of Restitution Relationships as Applied to the Interpretation of Vehicle Crash Test Data," SAE 2001-01-0499, 2001.

Kerkhoff JF, Husher SE, Varat MS, Busenga AM and Hamilton K: "An Investigation into Vehicle Frontal Impact Stiffness, BEV and Repeated Testing for Reconstruction," SAE 930899, 1993.

MUSCLE INJURIES HEAL WITH ABNORMAL SCAR TISSUE

A major study disproves the widely accepted belief that muscle strain injuries fully heal with normal tissue.

In the October 2001 issue of *Current Opinion in Orthopedics*, researchers from Children's Hospital of Pittsburgh and University of Pittsburgh reported:

Even though muscles retain their ability to regenerate after injury, the healing process is very slow and often leads to incomplete functional recovery. We, along with others, have observed that injured muscle promptly initiates the process of healing; however, it is often inefficient and hindered by fibrosis (ie, scar tissue formation). ("Muscle injury and repair," volume 12:409-415 Yong Li; James Cummins; Johnny Huard)

Defense medical and engineering experts consistently claim that traumatically induced muscle strain injuries fully heal with normal tissue. There is now conclusive scientific evidence that they are mistaken. Strain injuries oftentimes become chronic pain conditions with long term symptoms and need for medical care. Read the entire abstract at <http://www.co-orthopaedics.com>.

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