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Seat Belt Forensics

Article originally published by: Professional Investigative Engineers, I-ENG-A® Member Firm, CO

The use of seat belts in passenger cars and trucks is more common and acceptable today than ever before. We are often reminded as we travel down a highway that we should "Buckle Up - It's The Law."

According to the National Highway Traffic Safety Administration (NHTSA), 48 states and the District of Columbia require the use of safety belts. All 50 states require that young children ride in car safety seats.

A national "Buckle-Up America" week is observed each May, and the media devotes regular coverage on the subject of seat belt use (and non-use). In fact, a recent article in a Michigan newspaper reported on a unique aspect of seat belt research conducted at Michigan State University. The researchers at Michigan State concluded that some Hollywood movies could be creating a public health risk by portraying few characters wearing seat belts. One has to ask just how long it will be before the movie industry is held liable when someone fails to wear a seat belt.

Seat Belt Use During Accidents

In spite of the laws and media attention regarding automobile safety belts, 33 percent of Americans still do not consistently wear belts while driving. It is therefore not uncommon for an attorney or insurance adjuster to request the services of a forensic engineer to determine the status of seat belt use associated with a traffic accident. Unfortunately, these automobile accidents often involve serious injuries or fatalities.

When the occupants of a vehicle are wearing seat belts during a significant traffic accident, evidence of such use can usually be found.

Evidence that a seat belt was loaded during a sudden impact includes stretched or worn belt straps, burnished areas on the belt, and distorted buckles. Determining the status of seat belt use becomes more complex due to the phenomenon of "inertial buckle release."

Seat Belt Failure

An I-ENG-A® accident reconstruction seminar demonstrated how easily one type of seat belt could fail when an inertial force was applied. In this demonstration, a minimal force was applied to the seat belt floor bracket, causing the buckle to easily "pop" open. It has been determined that this buckle release occurs when energy is applied to the back of the buckle by the forward movement of the occupant. This energy is then transferred to the buckle spring, which releases the tension on the latch plate, and subsequently allows the buckle to detach.

Even though laboratory results reveal that inertial forces can in fact cause a buckle to open, automobile manufacturers have argued these forces can not occur in actual accidents. In October 1999, however, General Motors lost a \$5 million verdict when attorneys were able to convince a jury that a seat belt buckle released due to inertial forces.

Items to Investigate

Accurately determining the status of seat belt use is important since case valuations and jury verdicts are affected by the amount of fault attributed to a plaintiff's failure to wear a seat belt. It is also easy and dangerous to assume that a seat belt admittedly not worn by a plaintiff was in good working condition.

Seat belts, like any automotive component, can fail due to misuse or poor care. Therefore, when the status of belt-use plays a key role in a case, the restraint system should be examined for all indicators including use, non-use and inoperative conditions.

Determining the consequences to an accident victim if he or she had been wearing a seat belt is another topic worthy of subsequent discussion.

RECENT

RECALLS/INVESTIGATIONS:

December 23, 2004 - GM issued minivan recall: General Motors Corp. has announced it is recalling 717,302 minivans because passengers could hurt their arms or wrists when opening a power sliding door, according to U.S. safety regulators

December 10, 2004 - Federal safety regulators asked DaimlerChrysler to recall 600,000 vehicles. Federal safety regulators have asked DaimlerChrysler AG to recall 600,000 Dodge Durango and Dakota trucks because their wheels could fall off. investigation includes vehicles from the 2000 to 2003 model years.

December 6, 2004 - Federal regulators investigate safety concerns for Hummer H2. After receiving three reports of wheels falling off the Hummer H2, federal regulators are now investigating the vehicles, according to NHTSA.

CURRENT EVENTS

NHTSA Looks at Ford Seat Belt Failures

October 28, 2004

U.S. safety reviews of front seat belt failures on Ford F-series pickups and other models that were part of a 2001 recall of 1.4 million vehicles may be underway. The National Highway Traffic Safety Administration said it asked Ford for more information after it received 20 complaints following the seat belt failure recall.

Two reports included crashes with injuries, and in 11 cases there was a seat belt failure. The seat belt failures occurred after Ford dealers followed recall procedures and found no defects. Nine complaints were received that did not indicate if recall steps were followed.

The seat belt failure models were made by the former TRW Inc. Reviews are being made to include the 2001 F series, as well as 2001 Ford Crown Victoria sedans, Ford Windstar minivans and Ford Expedition and Lincoln Navigator SUVs.

The NHTSA inquiry could lead to another seat belt failure recall.

Crashworthiness.com. 5.Jan.2005
<<http://www.crashworthiness.com/articles/seatbelt-failures.html>>

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