

CRASHWORTHINESS LITIGATION

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Introduction

Crashworthiness embodies the concept that an automobile manufacturer must take into consideration the fact that its vehicle will foreseeably become involved in collisions, which presents a duty on the part of the manufacturer to minimize the injurious effects of foreseeable collisions. This is so despite the fact that the collision may have been caused by the plaintiff or a drunk driver or a myriad of reasons unrelated to a defect in the manufacture of the vehicle. The crashworthiness doctrine focuses on the concept of "enhanced injury" or "second-collision" injury, which follows the collision. A defect or combination of defects in the vehicle which increases the severity of the injury is at the heart of crashworthiness, second-collision, or enhanced-injury cases.

Cases that involve a defective design of the vehicle which contribute to the occurrence of the accident itself, such as a high center of gravity of a sport utility vehicle, are more in the order of a design defect case. Crashworthiness cases generally involve a second collision of the occupant with components of the interior, or structural components such as the roof. Seat and seatbelt failure and ejection cases involving doors, door latches and windows are also second-collision cases. While the cause of an automobile-related accident may involve negligence or momentary inattention, the cause of an enhanced injury related to the design of a vehicle occurs over a long period of time involving numerous engineers, engineering principles, research and testing. The injured occupant is powerless to prevent the enhanced injuries, while the automotive industry has a duty to do so.

Principles of Crashworthiness

The landmark case regarding crashworthiness is *Larsen v. General Motors Corp.*, 391 F.2d 495 (1968, CA 8 Minn). *Larsen* held that “while automobiles are not made for the purpose of colliding with each other, a frequent and inevitable contingency of normal automobile use will result in collision and injury-producing impacts.” *Larsen* involved head injuries from a severe rearward movement of a steering mechanism following an accident. Crashworthiness is based primarily upon the law of negligence and strict liability, as well as breach of warranty. The product liability standard in California was established in *Barker v. Lull Engineering Co.*, (1978) 20 Cal.3d 413, 133 Cal.Rptr. 225, which allows an injured occupant to recover if the defect in the vehicle fails to meet ordinary consumer expectations. Ordinarily an expert need not testify where the defect is obvious. *Campbell v. General Motors Corp.*, (1982) 32 Cal.3d 112, 184 Cal.Rptr. 891. However, an expert may not testify as to consumer expectations where the alleged defect is unusually complex and beyond the experience of the average consumer: *Soule v. General Motors Corp.* (1994) 8 Cal.4th 548, 34 Cal.Rptr.2d 607. Generally, an expert witness is permitted to testify as to consumer expectations in crashworthiness cases involving the inflation of an airbag following a rear-end collision. *Bresnahan v. Chrysler Corp.* (1995) 32 Cal.App.4th 1559, 38 Cal.Rptr.2d 446. While the consumer expectation test is applicable to crashworthiness cases, the defense will try to shift the test of design defect to the risk/benefit test, arguing that the benefits of the product as a whole outweigh the danger inherent in the design.

A defective design theory predicated upon negligence focuses on the manufacturers duty to minimize the risk of serious injury in a crash, no matter how the crash is caused. The defendant has a duty to take into account foreseeable misuse of the product. *Self v. General*

Motors Corp. (1974) 42 Cal.App.3d 1, 116 Cal.Rprt. 575. There may be more than one cause of the enhanced injury. Comparative negligence is a defense applicable to crashworthiness, product liability and negligence. *Daly v. General Motors Corp.* (1978) 20 Cal.3d 725, 144 Cal.Rptr. 380. Causation in a crashworthiness case is satisfied by proof that the manufacturer of the defective product is liable if the enhanced injuries are caused by a defect which is a legal cause, defined by *BAJI* 3.76 as a "substantial factor" in bringing about the damage. The doctrine of "concurrent causation," pursuant to *BAJI* 3.77 is applicable, which requires the jury to consider each wrong that was a necessary condition of causing injuries, and if it was "operative at the moment of the injury and acted with another cause," the defendant manufacturer is jointly liable. See, *Douppnik v. General Motors Corp.* (1990) 225 Cal.App.3d 849, 275 Cal.Rptr. 715.

As a practical matter, the plaintiff's attorney must explain the design defect to the jury before the facts of the accident, so that the accident can be placed in the context of the design defect. Emphasis needs to be placed on the manufacturer's duty to take collisions or accidents into consideration as reasonably foreseeable occurrences involving their product requiring recognition of the reality of every day use. *Cronin v. J.B.E. Olsen Corp.* (1972) 8 Cal.3d 121, 104 Cal.Rptr. 433. The jury must be informed that the manufacturer is required to evaluate the crashworthiness of its product and take steps as may be reasonable and practical to forestall particular crash injuries and mitigate the seriousness of others. *Self v. General Motors, supra.* An expert should generally explain the concept of duty, foreseeability and defect to the jury before the fact witnesses testify so that the jury will understand the design defect's role in causing the enhanced injury. The plaintiff is not required to suggest or prove an alternative design. *Bernal v. Richard Wolfe Medical Instruments Corp.* (1990) 221 Cal.App.3d 1326, 272 Cal.Rptr. 41. However, it is usual for the plaintiff to suggest an alternative design that was possible, cost effective and available, which would have mitigated against the enhanced injury.

The plaintiff has the burden of proving a causal connection between the defect and the plaintiff's enhanced injuries. If the injury is indivisible, the plaintiff is not required to show the specific injuries he would have received in the absence of an alleged defect or which injuries would have occurred had an alternative design been used. *American Law Product Liability* 3rd section 29.9. The burden is on the defendant to show apportionment of the damages, but if the damages cannot be apportioned or are indivisible, the defendant is jointly liable. *Douppnik v. General Motors, supra*. The plaintiff meets its burden of proving causation if the evidence shows that the product defect was a substantial factor in causing injuries in excess of those caused by the first collision. *American Law Product Liability 3d*, section 29.11. Proof of causation may be established by circumstantial evidence. *Diamond v. Catapillar Tractor Co.* (1976) 65 Cal.App.3d 173, 134 Cal.Rptr. 895.

A primary defense is that the accident was so severe that the injuries would have been caused in any event. Defendants are not required to manufacture an accident proof vehicle. *Henderson v. Harnischfeger Corp.* (1974) 12 Cal.3d 663, 117 Cal.Rptr. 1. The defendant will usually dispute the manner in which the accident occurred, posturing the case to convince a jury that the design defect was not the cause of the enhanced injuries or that the injuries were not related to any alleged design defect. The defendant may also claim that an alternate design would be impractical, expensive or of no consequence to the facts of the accident.

Crashworthy Design Considerations

Occupant packaging design principles were enunciated by Hugh DeHaven in 1952 in a technical article entitled *Accident Survival - Airplane and Passenger Car*. Occupant packaging principles were defined by DeHaven as "(1) contains and does not collapse upon the contents; (2) absorbs and distributes impact forces; (3) restrains the contents, preventing contact with the outer

packaging, thereby allowing the contents to take advantage of the energy absorbing characteristics of the package; and (4) transmits impact forces to the strongest parts of the contents.”

Crashworthy design principles require automobile manufacturers to have a safe vehicle design which prevents intrusion of another vehicle into the passenger compartment. This recognizes the importance of a survivable occupant space. The occupant should be safely restrained to prevent unnecessary movement within the vehicle. Occupants should be prevented from being ejected from the vehicle, which statistics have shown cause far more serious and fatal injuries. Occupants of vehicles should be provided with an interior that helps to absorb forces, such as smooth surfaces, padding and collapsible steering columns.

During a collision, the occupants inside a vehicle are subjected to rapid deceleration from frontal impacts and rapid acceleration from rear and side impacts. A crashworthy design minimizes the destructive effect of these forces by distributing them over as great a period of time as possible so as to ride down the energy and over as large a surface area as possible, so as to distribute the forces which would otherwise be imposed upon the body of the occupant.

Common Vehicle Defects

Seatbelt and Restraint Systems. Lap-only seatbelts allow the upper body to jackknife over the belt causing spinal injuries and severe abdominal injuries, as well as brain damage. Most vehicles in the United States did not contain shoulder harnesses in the rear seats until the late 1980s. Some vehicles have only shoulder belts which can lead to submarining under the belt, causing strangulation, quadriplegia and brain damage. See *Ketchum v. Hyundai* (1996) 49 Cal.App.4th 1672, 57 Cal.Rptr.2d 595. Some vehicles contain a separate shoulder belt and manual lap belt. Some occupants forget to buckle the lap belt or assume the shoulder restraint fully protects them.

Other vehicles contain seatbelts with a tension-relieving device, which introduces slack into the shoulder belt, which can result in unnecessary movement causing severe head injury. These so-called window-shade devices present unnecessary danger. Door-mounted automatic belts do not restrain occupants from being ejected if a door opens during a collision. The design also allows for excessive belt slack, permitting unnecessary occupant excursion. Some seatbelt-retractor designs allow excessive spool-out of the webbing before the belt locks up. Other retractor designs permit "skip-lock," which allows the belt to lock up late in the accident sequence, causing excessive belt slack.

Also of important is the manner in which the seatbelt mechanism is attached to the floor or the seat, as well as the angles of attachment. These factors can contribute to excessive excursion, permitting unnecessary contact by the occupants body with the interior of the vehicle. Some seatbelts have inappropriately located release mechanisms which are easily activated during a collision. Other defects in seatbelt mechanisms include premature release due to inertial unlatching. It has been proven that some seatbelts will release by merely slapping the side of the mechanism.

Seat-design Defects. In a frontal collision, seats can become dislodged from the seat rails, permitting occupants to contact the interior of the vehicle. Seat backs that collapse or break can cause an occupant to be thrown into the rear seat or can cause ejection. Seat failures can occur in low-speed accidents and also contribute to further loss of control by the driver.

Doors and Door Latches. If a door latch fails, it greatly increases the odds of ejection during a survivable collision.

Side-impact Defects. If the side structures are not stiff or rigid enough to withstand incoming forces, the occupants will be vulnerable to higher accident forces. Some vehicles have

nothing more than sheetmetal separating the occupant from a side impact, instead of rigid door beams and padding.

Inadequate Rollover Protection. Some vehicles have defective roofs without adequate reinforcement or defective A and B pillars which allow the roof to collapse and compromise the survivable occupant space, causing severe spinal injury or brain injury. See *Doupnik v. General Motors, supra*. Restraint systems that permit excessive occupant excursion toward the roof contribute to enhanced injuries. Many roof-crush cases occur as a result of a rollover defect, where the vehicle has an unacceptable static stability ratio (which is determined by dividing one-half of the vehicle track width by the height of the center of gravity). Certain sport utility vehicles are much more prone to rollover than passenger vehicles. In rollover accidents, there is a higher incidence of ejection and serious injury than in non-rollover accidents. Rollover accidents are foreseeable to auto manufacturers who have a duty to protect occupants in this type of foreseeable collision.

Window Defects. A front windshield is usually made of laminated glass which contains a glazing that holds the glass together. It helps to prevent ejection and serious injuries. Many vehicles have side windows and rear windows that are not laminated and fail to prevent occupant ejection or serious injuries. Some vehicles have inadequate windshield retention systems to prevent the windshield from popping out, permitting occupant ejection during a collision.

Interior Padding. Padding is necessary on the underside of the roof and other structures to prevent serious injury when contacted by an occupant. Padded surfaces absorb energy and minimize the injuries sustained.

Fuel System. In a survivable accident, the fuel tank or various components of the fuel system, may allow for excessive fuel leakage. The location and placement of the fuel tank may

cause it to break or puncture during a minor collision. Hoses and connections may loosen or break, permitting unnecessary gasoline leakage. Fuel pumps may fail to deactivate and continue to pump gasoline following a collision. The result of a fuel system defect is unwarranted, severe burn injuries and death.

The Initial Investigation is the Key

It is vital in a crashworthiness case to secure the accident vehicle. This is the key evidence. Your experts need to examine the vehicle and photograph it. If possible, store the vehicle in a secured facility to avoid any accusation of contamination of the evidence.

At an early stage, the vehicle must be inspected by an expert. Destructive testing should never occur without the defendants being present and the testing being videotaped to avoid any allegation of spoliation of evidence.

It is equally important to obtain a copy of the full medical and hospital records, including all films of diagnostic testing, the ambulance and paramedic report, the police report and photographs, statements of all witnesses, as well as policemen, firemen, paramedics, tow truck operators who moved the vehicle and anyone else who came upon the scene before the occupant was moved. You must photograph the scene of the accident immediately and document all tire marks, gouge marks, debris, etc., before it deteriorates.

If there is an issue as to the design of the roadway, have it looked at by an engineer who can analyze its vital statistics. An accident reconstructionist must be brought into the case early to analyze the configuration of the impact, the speeds of the vehicles at impact, the direction of the forces, the force levels upon the occupants, the movements of the occupants within the vehicle (occupant kinematics) and the occupants change in velocities (Delta V).

Once the subject vehicle is looked at by a design engineer and the accident is reconstructed by a competent accident reconstructionist, a decision needs to be made to engage a biomechanical expert to determine the actual mechanism of the injury and why it occurred.

The preliminary investigation will focus on the discovery of the involved design defect contributing to the enhanced injuries. It usually takes a seasoned expert to look at, analyze and decipher the various physical clues that follow a collision.

Conclusion

Because the prosecution of a crashworthiness case is expensive, time consuming and difficult, these cases must be selected carefully, screened, properly investigated and invested with a high degree of professional expertise. Trial lawyers are the only resort that seriously injured consumers have against the rich and powerful automotive industry in a crashworthiness case. As a result of the efforts of trial lawyers over the years, automotive safety has improved substantially, yet there remains a lot of good work to be done.