

Defective Airbags

By: R. Ben Hogan, III

Not all airbags are created equal. Some are overpowered. Some are untethered. Some can seriously injure or kill seatbelted occupants. This article will outline the history of airbag safety standards, and give pointers for recognizing airbag defect issues.

History of Airbags

In 1966, Congress enacted the National Traffic and Motor Vehicle Safety Act and created the agency that eventually became the National Highway Traffic Safety Administration (NHTSA). The secretary of transportation was directed to formulate "federal motor vehicle safety standards."¹ A "federal motor vehicle safety standard" is defined as a "minimum standard for motor vehicle or motor vehicle performance."² The Act provides that "compliance with a motor vehicle safety standard prescribed under this chapter does not exempt a person from liability at common law."³

In the late 1960's, the federal government took an interest in the development of "passive restraints" which required no action on the part of the occupant. Various types of passive restraints were considered, including motorized seat belts, cushioned interiors and airbags. In 1969, Transportation Secretary John Volpe announced that the federal government was considering a motor vehicle safety standard to require passive restraints,

¹49 U.S.C. § 30111.

²49 U.S.C. § 30102(a)(9).

³49 U.S.C. § 30103(e). The House Report on the purpose of this provision states: "It is intended and this subsection specifically establishes, that compliance with safety standards is not to be a defense or otherwise affect the rights of parties under common law, particularly those related to warranty, contract and tort liability." H.R. Report #1776, 89th Congress, 2nd Session (1966).

and this was codified as Federal Motor Vehicle Safety Standard 208 (FMVSS208). From 1970 to 1984, the passive restraint standard was repeatedly issued, rescinded and postponed without ever going into effect. In July 1984, Transportation Secretary Elizabeth Dole reissued the passive restraint rule at 49 Federal Register 28962, and it required passive restraints be phased into passenger cars during the 1987-1990 model years. Under the 1984 Passive Restraint Rule, the passive restraint chosen by the manufacturer was required to meet specific injury criteria for the properly positioned average adult male [generally, the 50th percentile dummy] belted and unbelted, in a 30 m.p.h. crash into a fixed barrier. The first requirement is that the head of the dummy not sustain "head injury criteria" (HIC) measurements in excess of 1,000 units. There are also requirements for maximum chest forces and femur loads.

In order to encourage automobile manufacturers to use airbags, NHTSA issued a final rule known as the "one car credit" which allowed passenger cars manufactured between 1988-1994 to be deemed in compliance even if they had only a driver's side airbag. Under this rule, no passenger airbags were required through the 1994 model year, although many manufacturers started using passenger airbags prior to 1994.⁴ On March 26, 1991, NHTSA issued a final rule extending the passive restraint requirements of FMVSS208 to light trucks and mini vans.⁵ Again, in order to encourage use of airbags in light trucks, NHTSA issued a "one truck credit" rule which allowed trucks to be deemed in compliance

⁴49 C.F.R. § 571.208 at § 4.1.3.2.1; also see § 4.1.3.4 (a)(1); § 4.1.3.3.1; § 4.1.3.4(a)(1) and § 4.1.4.1.b.

⁵56 Federal Register 12472-12487 (March 26, 1991). FMVSS208 was phased in during the 1995-1998 model years for "trucks, multi-purpose passenger vehicles (such as passenger vans and 4-wheel drive utility vehicles)" which are collectively described as "light trucks."

even if they had only an airbag on the driver's side, and manual three point belt system on the passenger side, during these years.⁶ In March of 1997, NHTSA granted a petition of the American Automobile Manufacturers Association to allow "depowering" of airbags. The method was to permit a sled test to take the place of a barrier crash test. This option was granted and went into effect beginning with the 1998 model year.⁷

The Transition to Airbags From Motorized Belts

Apparently unhappy with the fact that NHTSA in 1984 had given the auto industry the option between airbags and passive seat belt technology, Congress in 1991 passed the Intermodal Surface Transportation and Efficiency Act which provided that airbags were the only means by which the automobile manufacturer could comply with FMVSS208. Under the Act, 95% of all cars and light trucks had to have airbags by the 1997 model year and 100% by the 1998 model year. No vehicle was required to be equipped with airbags prior to the 1997 model year. NHTSA issued a final rule September 2, 1993 requiring the phase in of airbags in passenger cars and light trucks during the 1998 and 1999 model years.⁸ Again, NHTSA allowed the "one car credit" and "one truck credit" for vehicles manufactured on or before August 31, 1998, permitting them to have only a driver airbag so long as there was a three point manual passenger restraint system.

In airbag litigation, manufacturers often say "the government made me do it." As can be seen from this history, that is not so. The government never told car companies

⁶49 C.F.R. § 571.208 at § 4.2.5.1.2; § 4.2.5.5 and § 4.2.5.4(c).

⁷62 Federal Register 12960-12975 (March 19, 1997).

⁸58 Federal Register 46551-46568 (September 2, 1993).

how powerful to make the inflators, where to put the sensors, how many to have, whether to tether the bags, where to locate vents or how they should deploy. In fact "one car" and "one truck" rules have meant that no passenger airbags have been required by the government on vehicles manufactured before September 1, 1998.

The Marketing of Airbags

After customer research by Chrysler showed that customers preferred airbags over motorized seat belts, Chrysler became the first domestic automobile manufacturer to introduce driver airbags as standard equipment in 1988. Chrysler began marketing passenger airbags in mini vans in 1994. Although it was legally possible for a company to comply with passive restraint system mandates through various seat belt systems prior to 1997, and is still possible to avoid passenger airbags under the "one truck rule" and "one car rule," virtually all manufacturers followed Chrysler's marketing lead. By the early 1990's, there were not only driver airbags but passenger airbags in most upscale automobiles and by the mid-1990's in most mini vans. In the early 1990's, Nissan advertised that its Altima could be compared to a Mercedes because it also afforded passenger airbag protection. Ford copied this advertising for its Taurus and Windstar. Advertising of passenger airbags typically showed slow motion billowing pillows gradually forming into soft round shapes. Such advertising was rewarded. Safety conscious customers deliberately purchased automobiles having airbags for the advertised additional safety. None of the advertising mentioned the potential hazards of airbags, or instructed passengers to keep their seats in the rear most position to avoid the sorts of impacts that manufacturers were seeing between airbags and crash dummies. The consumer

expectation promoted by manufacturer advertising of airbags was the image of the billowing pillow. Nowhere in the advertising were images of an explosion followed by a burst of material traveling toward the passengers face at up to 180 m.p.h.

The decision by Chrysler in the late 1980's to market airbags caught many manufacturers with their marketing pants down. In the subsequent rush to sell safety, after so many years of stalling airbag technology, some companies made marketing decisions before their airbags had been given proper due care testing.

Airbag Defects

There are safe airbags and there are unsafe airbags. Safe airbags are generally the result of design programs that have incorporated "due care" testing. European car companies and General Motors have been the leaders in performing "due care" testing, which assures that airbags placed in their automobiles not only meet FMVSS208 requirements, but also do not cause preventable injuries. "Due care" analysis and testing makes sure airbags will not hurt vehicle occupants that are either larger or smaller than the 50th percentile Hybrid III dummy, and will not deploy into seatbelted drivers or passengers, no matter where on the seat track their seat is located. A seatbelted occupant is exactly in the position he or she was placed by the manufacturer. No matter where his or her seat is on the seat track, that seat and seat track were put in the vehicle by the manufacturer. Small women (i.e., 5th percentile female), seated in forward positions on the seat track, are not "out of position." For a manufacturer to knowingly design an airbag that will slam into the face of seatbelted people is borderline criminal. While General Motors and most European manufacturers have been careful in their airbag designs, many others were in

such a rush to market that obvious hazards were overlooked or ignored.

Examples

The Ford Taurus, Ford Windstar, Nissan Altima and Toyota Corolla passenger airbags in the early '90's were not tethered. A tether is an internal strap that operates to limit the travel of the airbag. The safe airbag will fully deploy without striking the seatbelted passenger.

An airbag is not supposed to strike an occupant in the face while deploying. Some airbags, particularly early designs, had powerful inflators that propelled the bags at speeds up to 200 m.p.h. Recent, depowered bags have lowered those speeds considerably. While a lower powered inflator is a safety measure, it does not replace a tether.

Imagine what can happen to someone struck in the face by a deploying airbag at 200 m.p.h. Companies who furnished untethered airbags saved roughly \$3.00 for each tether. Yet NHTSA crash tests of cars with those bags showed dummies being struck in the face by untethered bags and injuries in later crashes were predictable.

Overpowered airbags can be a hazard. Among recent airbag verdicts is one in Tennessee where an airbag broke the neck of an elderly lady, who was seatbelted.

A tether is misdesigned if it permits the bag to strike the face of a seatbelted passenger, no matter where on the seat track the seat is located. Some manufacturers have not adequately tested the deployment of airbags where the seat is in the far forward position.

The number, design and location of sensors is important. A sensor costs about \$10.00. Automobiles must have sensors around the front crush zone, and typically also

have one in the occupant compartment. A sensor in the occupant compartment is less exposed to weather, but has a difficult "guessing game" as to both whether the collision is high enough force to justify deployment of the airbag and the timing of the deployment. Having fewer sensors may save money, but it risks the safety of vehicle occupants from unnecessary or late deployment of the airbag.

What Did They Know and When Did They Know It

On October 6, 1980, several staff members of the National Highway Traffic Safety Administration met with Ford Motor Company to discuss the airbag program. At that time, according to a Ford memorandum by W. J. Bohan, dated 11/7/80 found at Bates MT-0001, Ford told NHTSA that their testing program suggested there could be danger to children seated in the front seat from deployment of airbags. According to the memo, almost two decades ago, "NHTSA suggested that the warning label include a caution that children should be placed in the rear seats." Neither Ford nor other automobile companies adopted this suggestion until many years later, after several tragic deaths involving children and airbags.

On October 2nd and 3rd, 1991 another group of NHTSA engineers traveled to Detroit to meet jointly with General Motors, Ford and Chrysler. By that time NHTSA was aware of six cases where the airbag caused deaths of an occupant in low severity crashes. According to a NHTSA document dictated October 21, 1991, by John Jacobus, mechanical engineer with NHTSA, "GM indicated that, in their view, as long as the driver and passenger are belted, the bags should not cause injury, but that they were aware of inflator induced injuries as a possible injury scenario.... Based on the two unexpected airbag

[inflator induced injury] fatalities in the Geo Storm and the Firebird per million car years, GM projects 200 [inflator induced injury] fatalities for the entire industry per million car years."

General Motors engineer Taras Rudnitsky in 1991 was already designing tethered airbags for GM cars to prevent inflation-induced injuries. Much published literature documents the advantages of tethers. See for example, Sullivan and Cossar, *Airbag Deployment Characteristics, Final Report*, NHTSA, 1992; Reed, et al, *Investigation of Airbag Induced Skin Abrasions*, SAE Technical Paper 922510; Kress, et al, *A Discussion of the Airbag System and Review of Induced Injuries*, SAE Technical Paper 960658; Warner, et al, *Airbag Deployment Frequency and Injury Risks*, SAE Technical Paper 960664.

In addition, published literature recommends "due care" testing with dummies representing infants and adult occupants ranging from the 5th percentile female to the 95th percentile male. SAE Recommended Practice J-850, *Fixed Rigid Barrier Collision Tests*. The 5th percentile female sits about 10 inches from the airbag module. She has to sit there in order to reach the foot pedal controls. ⁹ As early as 1991, General Motors told NHTSA engineers that a 2-inch clearance between an occupant's chest and the airbag module is necessary to substantially reduce injuries from inflation. [John Jacobus memo of October 21, 1991, cited earlier]. It has been pointed out that even spacing of as little as ½ inch to 1 inch reduces inflation induced injuries. ¹⁰

⁹D. Leonardis, et al, *Survey of Driver Seating Positions in Relation to the Steering Wheel*, SAE Technical Paper 980642.

¹⁰Melvin, et al, *Assessment of Airbag Deployment Loads with the Small Female Hybrid III Dummy*, SAE Technical Paper 933119.

Legal Defenses

Several cases address the fact that claims of defective airbag designs are neither expressly nor impliedly preempted. Harris v. Ford Motor Company, 110 F.3d 1410, 1415 (9th Cir. 1997) "Other courts have rules that when manufacturers choose to install an airbag pursuant to Standard 208, they may be liable for defects connected with the particular design of an airbag as well as its manufacturer"; Perry v. Mercedes Benz of North America, Inc., 957 F.2d 1257, 1265-66 (5th Cir. 1992) "Once the manufacturer chooses an option that includes an airbag system, Standard 208 S5-S6 merely sets forth minimum performance requirements for that system. To allow tort liability for that system would not remove or require any particular choice, or otherwise frustrate 'flexibility' that the federal scheme provides Congress sought to meet its goal of minimizing the number of deaths and injuries caused by auto accidents by setting forth minimum standards and leaving common law liability in place"; Irving v. Mazda Motor Corporation, 136 F.3d 764 n4 (11th Cir. 1998) "If a claim was asserted that two-point systems (such as that installed on the Mazda MX-6) were not defective in general, but that the specific design selected by Mazda for its two-point system was unreasonably dangerous, preemption would be less clear." Courts have allowed claims to proceed on the theory that no airbag was furnished in an automobile in New York, Arizona, Indiana, New Hampshire and Ohio. On the other hand, courts have held such claims preempted in Mississippi, Pennsylvania and Idaho. In Alabama, there was no preemption ruling, but in Schwartz v. Volvo, the Alabama Supreme Court simply ruled that it would not permit such a claim to go forward for public policy