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BEFORE THE
SENATE COMMITTEE
ON
COMMERCE, SCIENCE, AND TRANSPORTATION
REGARDING THE EFFECTIVENESS OF AIR BAGS

January 9, 1997

Mr. Chairman and Members of the Committee:

Thank you for your invitation to appear before you today to testify on the effectiveness of air bags. With me today are Don Bischoff, our Executive Director, Bob Shelton, our Associate Administrator for Safety Performance Standards, and Jim Hedlund, our Associate Administrator for Traffic Safety Programs.

Mr. Chairman, we appreciate the opportunity that this hearing affords us to discuss the beneficial and adverse effects of air bags and to report on the agency's comprehensive program to address the concerns about air bags.

First, I want to give you a thumbnail description of the problem of motor vehicle crashes and the role that air bags play in reducing that problem. As I do so, I urge you to keep in mind that just as the issue of highway safety is complex, so is the issue of air bag safety. It does not lend itself to a single or simple solution. All of us who are concerned about highway safety have a role to play in resolving the issues of air bag safety.

Mr. Chairman, the problem of motor vehicle safety must be seen for what it is: a public health problem. As an emergency physician, I witnessed day after day the tragic effects of highway crashes as the victims were wheeled through the doors of our emergency room. As

helpful as we sometimes were in restoring crash victims to health, my overwhelming concern came to be how we could prevent those crashes and lessen the danger they present to people on the highway. The numbers are appalling: Motor vehicle crashes take the lives of thousands of Americans every year: 41,400 in 1995. That's 113 lives every day. We estimate that about the same number died in 1996. Crashes are the leading cause of all deaths under age 44 and for each age between 5 and 27. They are the leading cause of head injuries for all age groups. Head injuries, in turn, are the leading cause of fatalities in motor vehicle crashes. Nearly two-thirds of fatal and serious crash injuries occur in frontal crashes, the crashes where air bags provide optimal protection, particularly in combination with lap and shoulder belts.

These injuries occur as the result of the violent forces that occur in what has been called the "second collision." When a vehicle crashes, it stops suddenly. The occupants move at the original speed of the vehicle until they, too, contact something. If they hit the steering wheel or the windshield or the dashboard at high speed, the result can be serious or fatal injury. Alternatively, if they are restrained, the chance of such injury is significantly reduced. Safety belts help to prevent or reduce the effects of this second collision.

So does the air bag. The air bag is designed to inflate fully before an occupant first impacts it. As the occupant's body moves into it, the bag deflates, slowing the occupant gradually over a longer distance, while it distributes the crash forces uniformly over the occupant's body. The air bag provides supplemental protection to belt wearers in severe crashes and substantial protection to those who chose not to wear their safety belts.

To do its job of protecting occupants, the air bag has to move into place quickly -- faster than the blink of an eye. The typical air bag deploys in 25 thousandths of a second. Its speed is

the secret of its benefits, and also, as I will discuss in a moment, the source of its problems.

The air bag's safety potential has attracted the interest of the Congress, our agency, the motor vehicle manufacturers, and the general public for many years. The agency first explored the use of air bags in 1969, when it asked for public comments on their feasibility. In subsequently issuing a series of rules on occupant protection, beginning in 1970, NHTSA always had air bags in mind as the best means of providing automatic protection. I want to emphasize that we still believe that air bags are the current best means of providing automatic protection. Without automatic protection, the third of the driving population that does not wear safety belts will continue to be at unnecessarily great risk, and those who wear their belts will be less fully protected.

The agency's standard on occupant protection has always been framed in the broadest performance terms. The standard requires a vehicle to meet certain injury criteria when crashed into a fixed barrier at 30 miles per hour with crash dummies in the front positions. The criteria must be met with restrained as well as unrestrained dummies. This gives the manufacturers great freedom in designing their vehicles. As noted in 1984, when the standard was issued, this freedom allows the manufacturers to incorporate a number of features to reduce the potential risks associated with air bag deployments:

- a dual level inflation system whose operation is based on impact severity (a low level for lower impact speeds and a higher one for higher speeds or more severe crashes);
- a dual level inflation system whose operation is based on a switch in the vehicle seat or elsewhere that measures occupant size or weight and senses whether an

occupant is out of position (a low level for out-of-position occupants and a higher one for properly positioned occupants);

- a dual level inflation system whose operation is based on an electronic proximity detector in the dashboard (a low level if the occupant is near the dashboard and a higher one if the occupant is farther away); and
- other technological measures such as the bag's shape and size, instrument panel contour, aspiration, and inflation technique.

To these measures can be added such measures as using tethers and new folding patterns, changing the location of the air bag module, altering the direction of deployment, and increasing the deployment threshold. Each of these measures can be implemented without changing the criteria in the standard, and could have been adopted by the manufacturers at any time since 1984.

Changes to the criteria themselves, as I will discuss in a moment, require research to evaluate the effects of such changes on vehicle occupants. It is the critical need for complex and accurate research data that has necessitated our present regulatory approach to air bag safety. Quite simply, it takes time to fully evaluate whether any of these measures, which are currently permitted, are so effective that they should be required by regulation.

Under the Intermodal Surface Transportation Efficiency Act of 1991, 90 percent of passenger cars in the current model year (1997) must have air bags, and all passenger cars must have them by model year 1998. They begin to be required in light trucks and vans in model year 1998 and must be installed in all of these vehicles by model year 1999. The market is actually far ahead of this schedule.

The cumulative production of vehicles with air bags reached the 10 million mark for driver air bags during model year 1992 and for passenger air bags during model year 1995. Air bags are now standard equipment on most passenger vehicles. As of the end of model year 1996, approximately 56 million air bag vehicles have been produced for sale in the United States. About 27 million of these have passenger air bags. The numbers are increasing rapidly.

Now that so many air-bag-equipped vehicles have entered the fleet, we are beginning to get enough data to evaluate air bag effectiveness in the real world.

We can make the following statements with confidence:

Air bags are reducing fatalities. NHTSA estimates that air bags have deployed more than 800,000 times in crashes and have saved approximately 1,664 lives (1,500 drivers and 164 passengers) as of November 1996.

Air bags are reducing serious injuries to the head and chest. We have strong indications from our hospital studies and our data bases from actual crashes that air bags are effective in reducing the severity of these often-disabling injuries.

The number of lives saved and injuries prevented will increase dramatically as the number of air-bag-equipped vehicles in the fleet increases. We anticipate that air bags will save 3,000 lives annually when the fleet is fully equipped.

All of this is good news, but we have also seen that air bags can cause injury as they deploy:

There are a number of injuries to arms and hands. While not life threatening, these injuries can be serious.

There is a small but alarming number of fatal injuries, especially to small children.

At the time I last appeared before Congress, in March of this year, we had investigated 15 crashes in which a child had been fatally injured by a passenger-side air bag. We now know of 32 children who have been fatally injured in the last three years. Of these children, 9 were infants riding in rear-facing infant seats and 23 were children between the ages of 1 and 9. Of these 23 children, 19 were unrestrained, two were wearing the lap belt portion of their safety belts, and two were wearing lap and shoulder belts.

We have also investigated 19 fatalities involving driver-side air bags between September 1990 and March 1996. Of these, the majority of drivers were unrestrained. Fifteen of the 19 were women, 10 of whom were 5'2" or shorter. Most were over 60 years old. We have not verified any additional driver fatalities in the United States since March. I am submitting information for the record that summarizes the available data on air bag fatalities and injuries.

How does it happen that a life-saving device can itself cause death? Let me return to the point I began earlier. The answer lies in the speed with which an air bag must inflate if it is to move into place and protect occupants in the split-second interval before the second collision. If the air bag is fully or nearly fully inflated before an occupant encounters it, everything is fine. The occupant will be cushioned by the bag. This is true for occupants of all sizes. But if the occupant is too close to the air bag module when the air bag begins to inflate, the energy of the bag itself can cause injury. If the occupant is extremely close to the inflating air bag, even touching the air bag's cover, the force exerted by the air bag can be deadly. Children in rear-facing infant restraints start out up against or near the air bag module and are at great risk.

Unrestrained children are thrown forward by pre-impact braking and are often up against the dashboard when the bag deploys.

Nothing has a higher priority for us than the safety of children We must not sacrifice children in the name of safety.

So what are we doing to address this issue now, and in the future?

We are doing a lot and we are going to do more. We need to act quickly, but also take care to retain the benefits of the air bag. Our most urgent goal is to increase the use of safety belts and to ensure that children are restrained by devices appropriate to their age and size and ride in the back seat whenever possible. With a third of vehicle occupants still not wearing safety belts, the potential benefit from air bags is very high. We think there are measures that will enable us to keep those benefits while ensuring that air bags do not cause harm. Some of these measures are educational and some are technological. Others will require a regulatory solution.

In December 1991, NHTSA issued its first consumer advisory warning owners of rear-facing child restraints not to use such a restraint in the front seat of a vehicle with a passenger air bag. At that time, no casualties to infants had occurred. The agency has issued at least six additional public advisories on the subject.

We issued a new labeling requirement in 1993 to warn parents about the dangers of placing rear-facing infant seats in the front seat of vehicles with passenger air bags. In the summer of 1995, as passenger air bags were beginning to enter the fleet in large numbers, we formed a new task force within NHTSA to track the performance of air bags, with a special focus on their adverse effects. By October 1995 we had become sufficiently concerned about the

risks of air bags to children to issue an emphatic warning to all parents about the dangers of carrying children in the front seat. We are continuing to repeat this warning.

During the past year we have conducted an unprecedented public education campaign on these issues, both directly and in cooperation with many partners. A year ago we widely disseminated this information. We followed this up with articles and information in the media, in corporate and organization newsletters, in conferences, and in mail sent directly to all physicians and all elementary schools. The list of participating organizations and activities runs to ten pages. I will be pleased to provide it to the Subcommittee for the record.

In January the agency held a "Call to Action" conference with over 50 organizations to develop a three-part strategy of education, legislation, and enforcement. Following this, we were instrumental in forming the Air Bag Safety Campaign, a coalition of all automobile manufacturers, air bag suppliers, and many insurers. Campaign members embraced the three-part strategy and have contributed over $10 million to carry it out. You will learn more about their activities later in this hearing from Janet Dewey, the Campaign's Executive Director.

The agency's public outreach effort on air bags has been extended to all levels of the Department. On December 5, Secretary Peña requested that all the surface transportation agencies become involved in outreach. At the initiative of Federal Highway Administrator Rodney Slater, a conference call took place on December 13 between the regional offices of all the surface agencies, as well as the Federal Highway Administration's division offices -- 95 field offices in total. The Regional Intermodal Safety Task Forces will coordinate outreach activities at the state level.

As I mentioned at the beginning of my testimony, a special activity began as the result of

your comments in our appropriations hearings last spring. You suggested that a video on safe transportation practices for infants, to be shown in hospitals and pre-birth classes, would be very useful. Working with the National Transportation Safety Board, the Maternal and Child Health Bureau of the Department of Health and Human Services, the National Center for Child Abuse and Neglect, and the Consumer Product Safety Commission, we produced a 20-minute video entitled "Protecting Your Newborn" and an accompanying instructor's guide. General Motors and Ford contributed the majority of the funding. In October we tested the video in 6 hospitals across the country. It received positive reviews. Some parents who watched it said it was so valuable that they would go out and buy it. They also gave us many valuable suggestions for improving it. We will complete final editing next Monday and will have the video, in both English and Spanish, ready for distribution by January 1. It will be distributed through many outlets: hospitals, peri-natal instructors, community health groups, police, and others. The video discusses many aspects of child transportation, including child seats and air bags.

It is urgently necessary to increase the use of safety belts and child safety seats and to ensure that children ride in the back seat wherever possible. **Our data from non-air bag crashes show that 72 percent of 5 to 15-year-old children fatally injured in the front seat are unrestrained.** Since air bags present an added risk to small children who are unrestrained, we must do more to increase restraint use as air bag- equipped vehicles enter the fleet,

In our first regulatory step affecting air bag designs, taken in May 1995, we amended the occupant protection standard to permit a passenger-side cutoff switch for vehicles that do not have a rear seat or that do not have a rear seat large enough to accommodate a rear-facing infant restraint. These switches are now being installed in a number of vehicles.

On November 9, 1995, after our public advisory on the dangers of air bags to children, we issued a request for comments to obtain advice on possible amendments to our regulations to reduce the adverse effects of air bags. We sought comments to help us overcome a surprising lack of data in the public record about air bag performance characteristics. The comments were helpful, but we did not receive comprehensive data on air bag performance. We are continuing to encourage the motor vehicle manufacturers to provide whatever data they can.

On August 6, 1996, we issued a notice of proposed rulemaking to propose new, eye-catching warning labels, to permit cutoff switches to be installed in all vehicles, and to consider the prospects for "smart" air bags that would not present a risk to children or small women.

On November 22, we issued a final rule to require the new warning labels. The new labels reflect comments from the parents of children who have been killed by air bags. These parents have told us in the strongest terms that eye-catching labels with a strong message are necessary to alert other parents to the dangers of driving with children in the front seat of air-bag-equipped vehicles. We believe the new labels will help. The vehicle manufacturers are enclosing the new labels in letters they are sending to all owners of vehicles with passenger air bags. These letters will remind owners that the quickest way to prevent the deaths of children from air bags is also the easiest and cheapest: buckle them in the back seat.

On December 26, we issued three additional rulemaking actions, which were published on January 6:

* A final rule that permits cutoff switches to be installed until September 1, 2000, in vehicles that do not have a rear seat large enough to accommodate a rear-facing infant seat. This extends the permission for these vehicles for two more years.

* A notice of proposed rulemaking to permit motor vehicle dealers and repair businesses to deactivate one or both air bags in a vehicle, upon written authorization by the vehicle's owner. Comments are due by February 5.

* A notice of proposed rulemaking that would amend the performance requirements of the standard to permit the vehicle manufacturers to depower their air bags by approximately 20-35 percent. Comments are due by February 5.

The proposal to permit depowering reflects the results of research that the agency has been conducting since early 1996 to evaluate the effects of depowering air bags. We had sought information from the motor vehicle industry to assist us in this evaluation, but found that many of our questions could not be answered from the information provided. We therefore undertook our own testing on an emergency basis. This led us to a tentative conclusion that depowering could lessen the risks to children and other occupants who might be at risk if they are too close to a deploying air bag. Consistent with our findings, a petition submitted by the domestic motor vehicle manufacturers on August 23, 1996, as amended by a letter of November 13, urged us to permit depowering. This petition was the first time that the manufacturers had reached agreement on a course of action to mitigate the adverse effects of air bags. We are proposing two alternative approaches to permitting depowering, including the approach developed through our research as well as the approach requested by the manufacturers. We will solicit public comments and anticipate issuing a final rule early next year.

We believe this combination of actions offers the best way to remedy the safety problems of air bags in the short term. The two-year extension for cutoff switches will enable owners of pickup trucks and sports cars to carry infants with greater safety. If someone is anxious about

possible injury from an air bag, that person can ask a dealer to deactivate it, as is the practice in Europe. We believe that deactivation would seldom be advisable, since the benefits of air bags outweigh the risks in almost all cases, but there are individuals who may need deactivation and they should be able to have it done.

Depowering should sharply reduce the risk of air bags to children wearing safety belts and to children who are moderately out of position. It may benefit even those who are substantially out of position. And we anticipate that depowering the driver air bag will benefit small drivers, who may be unable to sit far enough from the air bag for safety.

At the same time, we are concerned about the trade-offs involved in proposing to depower air bags or to allow them to be deactivated. There is a possibility that an air bag that is depowered will not be able to protect occupants in the high-speed crashes for which the air bag has been designed. The risks would be greater for unbelted occupants, who are the persons that the air bag was originally intended to protect. Unfortunately, many Americans still ride without wearing their safety belts. We will be addressing this issue in our rulemaking actions.

All of these measures together provide an interim way to address the problem of air bag safety. The ultimate solution, we believe, is the smart air bag. Technology is rapidly evolving that will enable air bags to be tailored to provide appropriate levels of benefit to occupants of differing sizes and positions in crashes of varying severity. If the occupant is too small, or too close to the air bag, the air bag may be designed not to deploy or to deploy with lesser force.

Our final rulemaking action in this series will be a proposal in early 1997 to require smart air bags. We outlined the possible shape of such a requirement in our August 1996 notice. When smart bags are installed in new vehicles, most or all of the interim measures described

earlier will no longer be necessary. We will propose to mandate the phase-in of smart air bags starting with the 1999 model year. Once smart air bags become available, there will no longer be a need to deactivate or depower air bags.

While these regulatory actions will solve the problem for future vehicles, I must again stress the urgency of dealing with vehicles currently on the road. This requires education for everyone who rides in an air bag vehicle. Everyone must observe the precautions on the new labels -- that children should sit in the back, that all occupants should be properly buckled, that seats should be moved as far back as practical from the air bag, and that rear-facing child seats must never be placed in the right front seat of a vehicle with a passenger air bag. We are repeating this message aggressively through every medium available to us and urging our partners in the Air Bag Safety Campaign to do the same.

To further these goals, we held a round table discussion on Monday of this week with representatives from the industries and organizations that play key roles in the effort to improve air bag safety. Our focus was on public education and on the prospects for smart air bags.

Our next step will be to convene a public meeting on each of these topics, at which we hope to have the broadest possible representation from all interested persons. In January we will hold a meeting, in cooperation with the Air Bag Safety Campaign, to renew our air bag safety message efforts. We are inviting the National Safety Council and the National Transportation Safety Board to join us in hosting the meeting.

The second meeting will be held in early February to further define smart air bag technology. We are inviting representation from the National Aeronautics and Space Administration, the National Transportation Safety Board, and Transport Canada, as well as

many other safety groups. We intend to use this meeting to help us begin our rulemaking with as much information as can be found. Our proposal on smart bags will follow shortly after the February meeting.

I believe that the actions I have described present a comprehensive approach to eliminating the risks of air bags while preserving their benefits. I believe that our regulatory actions will be widely supported. It is in the public interest to keep air bags. It is even more in the public interest to improve air bags. That's what we are going to do.

Mr. Chairman, this concludes my testimony. I will be glad to answer your questions.