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BEFORE THE
TRANSPORTATION SUBCOMMITTEE
OF THE
HOUSE COMMITTEE ON APPROPRIATIONS
REGARDING THE EFFECTIVENESS OF AIR BAGS

December 19, 1996

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 Phil Recht, our Deputy Administrator, and Jim Hedlund, our Associate Administrator for Traffic Safety Programs.

Mr. Chairman, I want to express my appreciation for the leadership you have shown on the issue of air bag safety. I can report that final editing is being done as we speak on the air bag video that you suggested in our appropriations hearing last spring. We expect to have the video in full national distribution by early January. We further appreciate the opportunity that this hearing affords us to discuss the beneficial and adverse effects of air bags and to report on the aggressive, multi-faceted program that the agency has put together 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.

Motor vehicle crashes continue to take the lives of thousands of Americans every year: 41,400 in 1995. That's 113 lives every day. We project that about the same number will die 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.

Within the past month we have announced a final rule on this proposal and three additional steps:

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 November 22, we also announced that we would issue three more rulemaking actions:

- * 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.

* 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.

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.

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.

Before I conclude, Mr. Chairman, I want to thank you again for your efforts in focusing attention on air bag safety. Safety is the Department's top priority, and you have strongly supported our safety efforts. As you have recognized, you and your colleagues in Congress can play a constructive role in educating the public about air bags and in encouraging the public to use their safety belts. The combination of air bags and safety belts provides the best protection ever devised for motor vehicle occupants.

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

AIR BAG DATA:

FRONTAL IMPACTS, AIR BAG SAVES AND AIR BAG FATALITIES

FRONTAL IMPACTS. Frontal impacts are the number one fatality and injury causing mode of crash, resulting in 64 percent of all driver and right-front passenger fatalities and 65 percent of all driver and right-front passenger AIS 2-5 injuries. (AIS 2-5 stands for Abbreviated Injury Scale levels of moderate to critical injuries.) The estimated fatality and injury totals for 1994 are shown below. The injuries are those for National Accident Sampling System-Crashworthiness Data System (NASS-CDS) towaway accidents only.

1994 Fatalities and Moderate to Serious Injuries

in Frontal Impacts

(Passenger Cars and Light Trucks)

	Drivers	Right Front Passengers	Total
Fatalities	13,437	3,814	17,251
Injuries	124,484	30,299	154,783
Total	137,921	34,113	172,034

AIR BAG SAVES AND FATALITIES. As the agency has confronted the problem of low speed fatalities and injuries from air bags, it has faced a serious dilemma. On the one hand, air bags have proven to be highly effective in reducing fatalities, and are

resulting in substantial net benefits in terms of lives saved. The agency estimates that, to date, air bags have saved 1,664 driver and passenger lives (1,500 drivers and 164 passengers).¹

At the same time, air bags are actually causing fatalities in some situations, especially to children. As of December 1, 1996, NHTSA's Special Crash Investigation program had identified 32 crashes in which the deployment of the passenger-side air bag resulted in fatal injuries to a child. One adult passenger and 19 drivers have also been fatally injured.

Air Bag Saves and Fatalities

1986 - Present

(Passenger Cars and Light Trucks)

	Drivers	Right Front Passengers	Total
Air Bag Saves	1,500	164	1,664
Air Bag Fatalities	19	33	52

PASSENGER FATALITIES. The fatalities involving children have occurred in 1993 and later calendar years. Nine of the fatalities involved infants in rear-facing child seats. Of the other children, 19 were unrestrained, two more were wearing only

¹ This estimate of gross savings is cumulative, through November 1, 1996. The net savings would be 1,612.

the lap belt with the shoulder belt behind them, and two were wearing a lap and shoulder belt at the time of the crash. Most children were either infants or between the ages of 4-7. See the tables below.

Infant Passenger-side Air Bag Related Fatalities

(In Rear Facing Infant Seats)

(By MY of Vehicle and CY of Death)

	CY 89	CY 90	CY 91	CY 92	CY 93	CY 94	CY 95	CY 96	Total # of infant passenger- side air bag fatalities	# of vehicles w/ passenger- side air bags
MY89										78,000
MY90										149,000
MY91										44,000
MY92										421,000
MY93										1,352,000
MY94							1	1	2	5,547,000
MY95							2	4	6	8,936,000
MY96								1	1	10,750,000
TOTAL							3	6	9	27,277,000

Child (Non-infant) Passenger-side Air Bag Related Fatalities

(By MY of Vehicle and CY of Death)

	CY 89	CY 90	CY 91	CY 92	CY 93	CY 94	CY 95	CY 96	Total # of child (non- infant) passenger- side air bag fatalities	# of vehicles w/ passenger- side air bags
MY89										78,000
MY90										149,000
MY91										44,000
MY92										421,000
MY93					1	1	1		3	1,352,000
MY94						3	1	1	5	5,547,000
MY95						1	3	8	12	8,936,000
MY96								3	3	10,750,000
TOTAL					1	5	5	12	23	27,277,000

Age of Children Fatally Injured in Air Bag Deployments

<1	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
9	1		1	5	7	4	3		2					32

Type of Restraint

Used by Children Fatally Injured by Air Bags

Type of restraint used	# of children
None	19
Lap belt only	2
Lap and shoulder belt	2
Unknown	
Rear-facing infant restraint	9
Forward-facing child restraint	
Booster seat	
Total	32

These cases involved pre-impact braking, and were relatively low speed crashes. The nonuse or improper use of safety belts in conjunction with pre-impact braking resulted in the forward movement of the children such that they were close to the instrument panel and the air bag system at the time of the air bag deployment. Because of this proximity, the children appear to have sustained fatal head or neck injuries from the deploying passenger-side air bag. The agency has examined all air bag cases with child fatalities in its Fatal Accident Reporting System (FARS) and believes it has identified all cases involving fatalities.

In addition to the 32 children who have been fatally injured

during passenger-side air bag deployments, one adult, a woman in her 90's, sustained a fatal injury under similar air bag deployment circumstances.

DRIVER FATALITIES. As of November 15, 1996, NHTSA's Special Crash Investigation program had identified 19 minor to moderate severity crashes in which fatal injuries to the driver were associated with the deployment of the driver-side air bag. The data suggest that unrestrained small statured and/or older drivers are more at risk than other drivers from a driver air bag. (See tables below.) The agency notes that older drivers are more at risk than younger drivers under a wide range of crash circumstances, regardless of type of restraint used.

NHTSA notes that these driver fatalities are very rare in comparison to the number of vehicles equipped with driver air bags and to the number of drivers saved by air bags. Further, NHTSA notes that the last reported death of a female driver 5 feet 2 inches or less that was due to an air bag was in November 1995, more than a year ago. Proper belt use is important. Ten of the 19 drivers appear to have been unrestrained at the time of the crash. In addition, two appeared to be out-of-position (slumped over the wheel). (See tables below.)

Driver Air Bags: Fatalities and Lives Saved

(Fatalities Shown by MY of Vehicle and CY of Fatality)

	CY 89	CY 90	CY 91	CY 92	CY 93	CY 94	CY 95	CY 96	Driver air bag fatalities	Drivers saved by air bag	# of Vehicles produced w/ driver air bags
MY89							1		1		500,000
MY90		1	1		1	2	1		6		2,500,000
MY91			2	2	1		1		6		2,867,000
MY92					1	1			2		5,084,000
MY93											7,595,000
MY94						2	1		3		9,890,000
MY95								1	1		13,690,000
MY96									0		14,321,000
TOTAL	0	1	3	2	3	5	4	1	19	1,500	56,447,000

Driver Air Bag Fatalities--Women (5'2" or Less)

(By MY of Vehicle and CY of Fatality)

	CY 89	CY 90	CY 91	CY 92	CY 93	CY 94	CY 95	CY 96	Total # of driver air bag fatalities (women 5'2" or less)	# of vehicles produced w/ driver air bags
MY89							1		1	500,000
MY90		1			1		1		3	2,500,000
MY91			1	1			1		3	2,867,000
MY92					1	1			2	5,084,000
MY93										7,595,000
MY94							1		1	9,890,000
MY95										13,690,000
MY96										14,321,000
TOTAL		1	1	1	2	1	4		10	56,447,000

Driver Air Bag Fatalities--other Adults

(By MY of Vehicle and CY of Fatality)

	CY 89	CY 90	CY 91	CY 92	CY 93	CY 94	CY 95	CY 96	Total # of driver air bag fatalities (other adults)	# of vehicles produced w/ driver air bags
MY89										500,000
MY90			1			2			3	2,500,000
MY91			1	1	1				3	2,867,000
MY92										5,084,000
MY93										7,595,000
MY94						2			2	9,890,000
MY95								1	1	13,690,000
MY96										14,321,000
TOTAL			2	1	1	4		1	9	56,447,000

Age of Drivers Fatally Injured in Air Bag Deployments

<20	20-29	30-39	40-49	50-59	60-69	70-79	>80	Total
1	1	4	4	2	1	6		19

Type of Restraint

Used by Drivers Fatally Injured in Air Bag Deployments

Type of restraint used	# of drivers
None	10
Belts misused	1
Lap and shoulder belt (Driver blacked out and slumped forward at time of crash due to medical condition.)	2
Lap and shoulder belt	4
Unknown	2
Total	19

COMPARISON OF PASSENGER AND DRIVER AIR BAG FATALITIES.

Several comparisons between the data for child fatalities and driver fatalities need to be drawn. The annual number of child fatalities is very small, but growing steadily. The number of adult fatalities is not growing. Most child fatalities have occurred in very recent model year vehicles, model year 1994 and 1995 vehicles. In contrast, only one woman 5 feet 2 inches or less has died in a post model year 1992 vehicle. Most fatalities of those women occurred in model year 1990-1992 vehicles. (See tables below.)

Driver Air Bag Fatalities by Calendar Year of Death

	CY 89	CY 90	CY 91	CY 92	CY 93	CY 94	CY 95	CY 96	TOTAL
Women (5'2" or less)		1	1	1	2	1	4		10
Other adults			2	1	1	4		1	9
TOTAL		1	3	2	3	5	4	1	19

Child Air Bag Fatalities by Calendar Year of Death

	CY 90	CY 90	CY 91	CY 92	CY 93	CY 94	CY 95	CY 96	TOTAL
Children (non- infant)					1	5	5	11	22
Infants							3	6	9
TOTAL					1	5	8	17	31

Drivers Air Bag Fatalities by Model Year of Vehicle

	MY 89	MY 90	MY 91	MY 92	MY 93	MY 94	MY 95	MY 96	TOTAL
Women (5'2" or less)	1	3	3	2		1			10
Other adults		3	3			2	1		9
TOTAL	1	6	6	2		3	1		19

Children

Air Bag Fatalities by Model Year of Vehicle

	MY 89	MY 90	MY 91	MY 92	MY 93	MY 94	MY 95	MY 96	TOTAL
Children (non- infant)					3	5	11	3	22
Infants						2	6	1	9
TOTAL					3	7	17	4	31

POTENTIAL NUMBER OF PERSONS SAVED OR FATALLY INJURED BY CURRENT AIR BAGS. The dilemma faced by NHTSA, and ultimately the public, is how to address the problem of low speed fatalities from air bags while preserving their substantial life-saving benefits. Based on analyses of real world data, NHTSA estimates that if all passenger cars and light trucks on the road today had current air bags, there would be more than 3,000 lives saved each year, as compared to a no-air-bag fleet (assuming current belt

use rates). On the driver side, 616 belted drivers and 1,686 unbelted drivers would be saved, for a total of 2,302 lives saved. This is a net figure, i.e., it accounts for the possibility of some drivers being fatally injured by the air bag.

The potential number of lives saved by passenger-side air bags is much smaller than driver-side air bags primarily because the passenger seat is occupied much less frequently than the driver's seat. If all passenger cars and light trucks had current passenger-side air bags, the agency estimates that 223 belted and 491 unbelted passengers aged 13 and above would be saved annually, for a total of 714 lives saved.

However, this 714 figure would be partially offset by fatalities caused by the air bag to children 12 and under. If current rates of child fatalities were experienced in an all-air-bag fleet, 128 children would be fatally injured by air bags annually, again assuming no technological improvements, changes to air bags, or behavioral changes by vehicle operators (e.g., ensuring that any children placed in the front seat properly use occupant restraints or, preferably, placing children in the rear seat). The figure of 128 includes 90 forward-facing children, most of whom would be unbelted, and 38 infants in rear-facing child restraints.

NHTSA emphasizes that its rulemaking proceedings and related educational efforts are intended to ensure that risks of adverse effects of air bags are reduced so that the theoretically projected air bag fatalities never materialize, while the potential benefits of air bags are retained, to the maximum extent possible.