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Status Report

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Adams Given Passive Restraint Evidence

The docket on the federal occupant protection safety standard (FMVSS 208) closed on May 27. With this evidence in hand, Secretary of Transportation Brock Adams has stated he will make a decision by July 1 on whether or not he will mandate installation of passive restraints in new autos. (See *Status Report,* Vol. 12, No. 7, May 9, 1977.)

This issue of *Status Report* is devoted to selections from submissions to the docket made by the Insurance Institute for Highway Safety regarding questions raised at the Secretary's April 27 and 28 hearing on occupant protection and passive restraints. Unless noted, the material is directly quoted from the IIHS submissions. The boxed items deal with docket submissions by other organizations. (On page 2, a separate story deals with a meeting on the related topic of future safety standards for electric and hybrid vehicles.)

ISSUE: DOT's Past Failure To Promote Public Understanding Of Passive Restraints, Compared With Its $1,000,000 Promotion Of Belt Use

During the April 28 hearing, Secretary Adams, in a colloquy with Kathleen Sheeky, witness for the Consumer Federation of America, stated:

> One thing you mentioned which was you said there was a great deal of misunderstanding, that the consumers really didn't know about an item such as the air bag, and that any reaction really that occurs would occur afterwards. I am really concerned about this . . . I just mention that because I assume that in past, the government did what it was capable of in terms of what you describe as consumer education or consumer communication in support of the position that had been taken, but it didn't seem to make much of a dent at the time . . . .

The Secretary's assumption is incorrect. *The facts are as follows:*

1. The Department has not expended any of its budget whatsoever at any time to promote public understanding of passive restraints in general or air bags in particular. (Source: NHTSA Public Information Office.)

2. The Department has since 1970 expended at least $1 million to promote public understanding and use of safety belts. (Source: NHTSA Public Information Office.) . . .

ISSUE: Air Bag Reliability In High Mileage And Older Vehicles

At the April hearing, some witnesses expressed concern about the reliability of air bags as vehicles age . . . . *The facts are as follows:*

1. Of the 143 air bag deployment crashes, 19 were crashes of vehicles with over 40,000 miles at the time of the crash.

2. Eight of these 19 high mileage deployments occurred in vehicles with over 60,000 miles.

NHTSA Sets Electric Vehicle Safety Meeting

The safety of electric vehicles will be the subject of a National Highway Traffic Safety Administration public meeting scheduled for July 14.

The agency is seeking public discussion on what current and future federal safety standards are needed for electric vehicles and hybrid vehicles – vehicles propelled by a combination of electric and other power sources.

The meeting is part of NHTSA's effort to prepare a Congressionally mandated study of electric and hybrid vehicle safety. Congress directed, in the Electric and Hybrid Vehicle Research, Development and Demonstration Act of 1976, that the study be completed by Sept. 17, 1977.

NHTSA outlined a number of topics that the agency would like discussed at the July public meeting, including the "appropriateness" of existing federal standards for electric and hybrid vehicles and development of new standards "to address safety problems unique to electric and hybrid vehicles," such as:

- "Shock hazard from batteries, either in normal use or in a collision environment."
- "Spillage of electrolyte from batteries during a collision."
- "Potential for explosion of batteries."
- "Uncontrolled release of energy . . . from an energy storage device in a hybrid vehicle, such as a hydraulic system or a flywheel."

Persons wishing to make a presentation at the meeting should contact Sam Daniel of NHTSA's Office of Crashworthiness at 202/426-2264 before June 27, 1977.

As with the Department of Transportation's fuel economy and occupant crash protection public meetings, DOT funding is available for individuals and groups that lack sufficient financial resources to fully participate in the meeting. (See *Status Report,* Vol. 12, No. 3, Feb. 14, 1977.) Although the closing date for requesting financial assistance was June 6, NHTSA can still consider late applications. Requests should be submitted to: Administrator, NHTSA, 400 Seventh St., S.W., Washington, D.C. 20590.

The July 14 meeting, which begins at 9:30 a.m., will be held in room 2230 at 400 Seventh St., S.W., Washington, D.C. 20590.

3. The highest mileage vehicle involved in a deployment had travelled over 90,000 miles at the time of the crash.

4. There have been *no* cases identified where the air bags failed to deploy in crashes of vehicles with high mileage.

[Supporting material follows.]

AIR BAG EQUIPPED CRASH INVOLVED VEHICLES WITH MILEAGES GREATER THAN 40,000 AT THE TIME OF AIR BAG DEPLOYMENT

Make and Model	Location Of Crash	Date Of Crash	Mileage At Time Of Crash
1973 Chevrolet Impala	Highland, Michigan	2-15-74	54,999
1972 Mercury Monterey Custom	Valdosta, Georgia	8-22-74	63,084
1974 Oldsmobile 98 Regency	Mayhew, Mississippi	2-19-75	53,754
1973 Chevrolet Impala	Houston, Texas	3-15-75	63,695
1973 Chevrolet Impala	Somerville, Alabama	3-18-75	90,445
1973 Chevrolet Impala	San Antonio, Texas	5-08-75	61,030
1973 Chevrolet Impala	Dalton, Georgia	5-09-75	50,663
1973 Chevrolet Impala	Landover, Maryland	5-21-75	48,795
1973 Chevrolet Impala	Needles, California	6-07-75	67,333
1973 Chevrolet Impala	Milford, Michigan	7-09-75	49,320
1973 Chevrolet Impala	Seattle, Washington	1-01-76	57,165
1973 Chevrolet Impala	West Bloomfield, Michigan	4-11-76	69,255
1974 Oldsmobile Delta 88	Moorpark, California	4-21-76	48,975
1975 Oldsmobile Toronado	DuPage County, Illinois	6-03-76	55,846
1974 Oldsmobile 98 Regency	Amarillo, Texas	7-13-76	45,837
1973 Chevrolet Impala	Erie, Pennsylvania	9-14-76	66,031
1974 Buick Riviera	Atchison, Kansas	9-25-76	55,460
1974 Cadillac Eldorado	Mercer, Pennsylvania	10-23-76	43,193
1974 Oldsmobile 98 Regency	Red Oak, Iowa	10-25-76	75,020

Wage And Price Panel Supports Passives

The Presidential panel that monitors the inflationary impact of federal regulations has told the Department of Transportation that "the available economic analysis appears to support moving toward a passive performance standard" for automobiles.

Shifting from an earlier position that the government should sponsor a large scale fleet test before requiring passive restraints, the White House Council on Wage and Price Stability said in comments to the National Highway Traffic Safety Administration's occupant restraint docket that in the past it was not convinced that there was "sufficient evidence to warrant a final decision mandating passive restraint systems, especially in view of the uncertainty of air bag effectiveness in small cars.

"In the more than two years since the Council's initial involvement, however, additional testing has taken place and further studies have been completed on the effectiveness of air bags (the most commonly discussed passive system). We have been advised by experts at the National Highway Traffic Safety Administration that limited testing with small automobiles equipped with air bags indicates that these systems are technologically feasible in small cars."

Citing NHTSA figures, the Council noted that the low use rate of safety belts makes them "relatively cost ineffective" – about twice as expensive per life saved as passive restraints.

ISSUE: Air Bag Performance In A Range Of Weather Conditions

At the April hearing, Secretary Adams asked the Thiokol representative a question concerning the performance of air bag systems "in varying weather conditions such as the Alaskan conditions where it goes down to considerably below zero, or New Mexico where it goes considerably above 100 degrees . . . ." *The facts are as follows:*

1. There have been at least ten real world air bag deployment crashes at temperatures below 30° Fahrenheit.

2. There have been at least two air bag deployment crashes in which the temperature was at or above 90° Fahrenheit.

3. In Lombard, Illinois on Jan. 8, 1976, an air bag deployed appropriately in a crash where the temperature was below 0° Fahrenheit.

4. In Needles, California on June 7, 1975, an air bag deployed appropriately in a crash where the temperature was 94° Fahrenheit.

5. Among the bad weather air bag deployment crashes, one occurred in a heavy snow storm in Canada when the air bag equipped vehicle pulled out to overtake a slow moving snow plow and crashed head-on with a tractor trailer. The air bags deployed appropriately . . . .

6. In response to Secretary Adams's question, the Thiokol representative stated:

> . . . We as a matter of practice subject our units to environmental testing very similar to what is done with a rocket motor or a military item such that it is fired and evaluated at low temperatures, high temperatures under high humidity conditions, under vibration conditions, it's a very sensitive program which we subject our units to – we feel it applies to this product as well . . . .

[Supporting material follows.]

EXTREME TEMPERATURES AT TIME OF SELECTED AIR BAG DEPLOYMENT CRASHES

Make and Model	Location Of Crash	Date Of Crash	Temperature At Time Of Crash
1973 Chevrolet Impala	Highland, Michigan	2-15-74	19°
1974 Oldsmobile Delta 88 Royale	Schiller Park, Illinois	2-08-74	20-29°
1975 Oldsmobile Regency 98	Cabano, Quebec	11-21-74	20°
1974 Buick Electra Custom	Columbus, Ohio	2-06-75	20's
1974 Oldsmobile Toronado	Syracuse, New York	3-14-75	27°
1975 Buick Electra Limited	Ashland, New York	12-04-75	24°
1975 Oldsmobile Regency 98	Vaughan, Ontario	12-18-75	12°
1975 Oldsmobile Toronado	Lombard, Illinois	1-08-76	< 0°
1975 Cadillac DeVille	Bay City, Michigan	1-21-76	Lower 20's
1974 Oldsmobile Delta 88 Royale	Lake Villa, Illinois	3-11-76	20-29°
1974 Buick Riviera	Houston, Texas	8-21-74	90°
1973 Chevrolet Impala	Needles, California	6-07-75	94°

ISSUE: 'Inadvertent' (Non-Crash) Air Bag Deployments

At the April hearing, several witnesses claimed that large numbers of inadvertent air bag deployments could be expected if passive restraints were mandated. Their claims were in error, and were based primarily on air bag deployments that have occurred in *non*-crash situations . . . . *The facts are as follows:*

1. The adjective inadvertent is inappropriate for virtually all of the deployments that are generally considered in this category; they should be more appropriately characterized as non-crash deployments since in most cases the sensors correctly detected forces that in crash situations should have produced deployments.

2. In the more than three hundred million miles of use of air bag equipped cars on the roads of the United States, *only four* non-crash air bag deployments have occurred while the vehicles were being driven *on the highway,* and none of the drivers lost control of their vehicles.

   The first of these four . . . involved an early General Motors design and the deployment was believed caused by electromagnetic interference. As a result, design changes were incorporated into the 1974 and later air bag equipped cars to preclude such deployments. A second non-crash deployment . . . was caused by wear to the wiring connecting the bumper detector because the wire had been pulled out of position by a tow truck operator during prior servicing. As a result of this incident, General Motors recalled 1974 and 1975 Cadillac vehicles equipped with air bags in order to correct the vehicle design defect that permitted the problem to occur. Another non-crash deployment . . . occurred because the driver was carrying a leaking tank of highly explosive propane in the trunk of the car. The propane exploded. Accelerations resulting from the shock waves of the explosion were so violent that the sensor deployed the air bags. In the fourth case . . . the bumper sensor, which had not been securely bolted during prior servicing, fell off, was dragged along the road, sensed forces of sufficient magnitude, and triggered the deployment.

   Of the other eight non-crash deployments, six occurred in repair shops, another . . . resulted from a major fire in the engine compartment of the vehicle while parked, and the other . . . reportedly resulted from the deliberate intent of the son of the vehicle's owner to demonstrate that the car was equipped with air bags, by striking the bumper of the vehicle while it was parked with the ignition on.

3. As with any designs in the developmental stages, the experience gained as a result of these non-crash deployments has enabled manufacturers to incorporate appropriate design changes to reduce their occurrence even further. For example, two of the non-crash deployments resulted from bumper sensors being dragged underneath a moving vehicle. A relatively simple design could electrically deactivate sensors that are detached from their correct mounting position and thus prevent this type of non-crash deployment. Other designs being developed for future air bag equipped cars will preclude deployments of air bags of *non*-moving vehicles, even when their bumpers are subjected to crash-level forces. This will eliminate non-crash deployments of the striking-of-the-bumper-while-parked variety illustrated above.

[Detailed descriptions of the non-crash deployments can be obtained by writing for "Non-Crash Deployments," Insurance Institute for Highway Safety, Watergate Six Hundred, Washington, D.C. 20037.]

Quoted Without Comment

Unfortunately, we're probably going to see more serious injuries and deaths per accident in the years ahead and that, unfortunately again, is going to raise the cost of insurance for everybody.

On the personal injury side, it would be very helpful if Congress would mandate air bags. They would materially reduce fatalities and serious injuries. In the current climate, we think there is a good chance that air bags will be mandated and phased in on new cars in the future.

Excerpted from a *Chicago Sun-Times* interview with
James S. Kemper, Jr., chairman of the Kemper Corporation.

ISSUE: Tennessee Child Restraint Use Law

A witness at the April 27 public hearing on FMVSS 208 stated that a new state law in Tennessee "will require children under four years of age to wear federally approved child restraint systems (as specified in FMVSS 213) while riding in an automobile on Tennessee streets and highways" . . . . *The facts are as follows:*

1. The Tennessee law actually requires that a child need not be placed in a child restraint if "such child is held in the arms of an older person riding as a passenger in the motor vehicle." (Amendment to Tennessee Code Annotated, Section 59-930.)

2. In separate testimony at the April 27 hearing, a surgeon testified that "the restraining arms of a mother are completely inadequate in an accident situation. Five mothers admitted under my care have had their twelve month old baby killed on their laps . . . ."

3. If the Tennessee law increases the number of children traveling in the laps of other persons rather than in child restraints or seated alone unrestrained, the deaths of children could actually increase because the weight of the person in whose lap the child is sitting would increase the force with which the child strikes hostile interior structures in frontal crashes. Since the heads, necks and upper torsos of both lap- and lap-shoulder-belted adults in forward crashes commonly smash into vehicle structures ahead of them, such crushing of children in arms can occur whether or not the adults are belted. Moreover, it has long been known that the forward forces which the bodies of children and adults experience in crashes commonly greatly exceed the rearward forces that can be exerted by braced or encircling arms.

4. The Tennessee law exempts children in recreational trucks and vans and in trucks weighing one or more tons.

5. The Tennessee law is illustrative of the kinds of qualifications that can be expected in belt use and child restraint use laws that would lessen their effectiveness or perhaps even result in greater harm in the case of children held by older persons.

ISSUE: Unfounded GM Claim That Air Bags May Not Offer Additional Protection To The Unrestrained Driver

At the April 27 hearing, Dr. David Potter of the General Motors Corporation stated:

> I think, based on the limited data we have – and one must admit that 132 deployments is not large – that the spectacular benefit simply is not there. That is, at least in the area of fatalities and aggravated injuries there does not seem to be a very distinctive difference between the air bag deployed situation and the unrestrained drivers . . . .

This statement was based on a GM study in which injuries to front seat occupants in crash involved vehicles in which air bags deployed were compared to injuries sustained by unrestrained front seat occupants in similar crashes. *The facts are as follows:*

1. Even though air bags are specifically designed to provide protection in *frontal* crashes (the type in which a majority of occupant deaths occur), the GM comparisons include virtually all of the air bag deployment crashes regardless of the type of impact. Thus, vehicles that were struck in the side, undercarriage impacts and impacts with overhanging structures are included. The air bag is not designed to provide optimum protection in these crash modes. GM's inclusion of non-frontal crashes in its data produces a substantial underestimation of the effectiveness of air bags in frontal crashes –

crashes in which air bags are designed to protect. By analogy, GM's evaluation approach is as if the medical research to evaluate the very effective polio vaccine had counted (among those who had received the vaccine, and those who had not) illnesses due to all kinds of viruses, and not focused on those due to polio virus. The result would have been the wrong answer, just as GM's approach, for this reason alone, gives the wrong answer.

2. In addition, the GM comparisons ignore the performance of air bags in relation to the severity of the crash. In low severity crashes, which constitute the large majority of all those that occur, there is a low probability of the occupants sustaining any injuries, whether they are restrained or not, and that when injuries are sustained they will be minor. Consequently, the effectiveness of any restraint system will appear to be low if it is assessed in such low severity crashes.

In addition, in very severe crashes, and particularly when there is penetration of the occupant compartment of the vehicles, the effectiveness of *any* restraint system will be reduced. Consequently,

DOT Told Air Bags Decrease Liability Risk

Cars equipped with passive restraints "are likely to pose a less serious product liability hazard than cars lacking passive restraints," an insurance industry executive has told the Department of Transportation.

Adding to testimony he gave at DOT's two-day passive restraint hearing in April, where he spoke for companies that write more than 95 percent of the auto insurance in the U.S., Donald W. Segraves, vice president of the American Mutual Insurance Alliance, told Transportation Secretary Brock Adams in a submission to the occupant protection docket, that passive restraints "do not create any new product liability exposure; the exposure already exists because cars frequently crash and cause injury to their occupants."

During the April hearing, Adams asked several insurance industry witnesses whether auto makers would be able to obtain liability insurance against claims arising from any potential malfunction of an air bag.

In his recent docket submission, Segraves said that "at least one major casualty insurer offered to insure the air bag equipped cars that would have been produced under former Secretary of Transportation William Coleman's demonstration program, at the same price the manufacturers paid for their non-air bag equipped models."

Segraves explained that auto makers' "product liability claims today arise most frequently from the failure of some operating system on the vehicle that causes a crash or increases the severity of injury in a crash. Many of those claims would be eliminated if the occupants were saved from injury by a passive restraint system, even if a malfunction occurred in some other component and a severe crash resulted. An injury prevented is often a product liability claim prevented as well," he said.

Passive restraints "will help alleviate the product liability problem, in the same way that placing guards on a punch press helped alleviate the product liability risk of the punch press manufacturer," Segraves said.

restraint systems are intended to provide maximum effectiveness in crashes that are serious enough that unrestrained occupants have a high probability of being injured, but not so severe that the occupant compartment is seriously intruded.

For these several reasons, it is imperative, and a minimum requisite of competent, professional analysis, that in studies such as GM's, the effectiveness of any restraint system be considered in relation to the crash severities.

3. The GM method treats all injuries above a certain level the same and ignores the effect of multiple injuries. This results in a substantial underestimate of the effectiveness of the air bag restraint system, especially because it is a system that is very effective in reducing the frequency and severity of the more serious, life threatening and costly injuries.

4. When the data used by GM in its September submission to Secretary Coleman's docket are re-analyzed by crash direction and severity, greatly different conclusions emerge. For frontal crash involved vehicles with Vehicle Deformation Indices (VDIs) of 1 and 2 – relatively low severity crashes – only 15 percent of the air bag protected occupants and 13 percent of the unrestrained occupants received injuries of AIS 2 or greater, a difference of no statistical significance. ["AIS" refers to the Abbreviated Injury Scale, a system which provides criteria for identifying the severity of injuries. Injuries for which severity can be determined are rated on a scale of 1 through 6 with 1 being the least serious.] For the vehicles in the more severe crashes with VDIs 3 through 5, however, where the likelihood of injury, particularly serious and fatal injury, is high, 42 percent of the unrestrained occupants received injuries of AIS 2 or greater, whereas only 24 percent of the air bag protected occupants received such injuries.

5. In the frontal corner crash involved vehicles included in the GM study, none of the air bag restrained occupants received an overall AIS rating of greater than 1, except the occupant who was found dead after his car struck a pole in Memphis . . . . In that case it is still not known whether his death occurred before or during the crash. In the non-air bag frontal corner crash-involved comparison vehicles, however, 12 percent of the unrestrained occupants received AIS 2 injuries and 6 percent sustained AIS injuries of 3 or greater.

6. For all of the other vehicles included in the GM study that were not in either front or frontal corner crashes (these include vehicles with side impact damage, undercarriage impact damage, and damage from impacts with overhanging structures) the injury results for the air bag protected occupants and the unrestrained occupants are very comparable.

7. GM's greatly erroneous claim that there is no difference between the injuries to unrestrained occupants and air bag restrained occupants is based on GM's failure to provide the proper analyses of the data, and in particular its failure to separate the results for relatively homogeneous crash types and also to separate the results by crash severity.

ISSUE: Comparison Of Front Seat Occupant Injuries In Head-On Crashes Of Air Bag Equipped Vehicles With Other Vehicles

At the April hearing, a representative of the American Automobile Association (AAA) testified that in head-on or almost head-on collisions, the air bag-protected occupants did not receive any better protection than the unrestrained occupants of the other vehicles . . . . The AAA representative was in error. *The facts are as follows:*

1. The witness incorrectly implied that among the first 118 air bag deployment crashes reported to NHTSA, there were 36 head-on or almost head-on crashes with air bag deployments in which belts were not used by the occupants of either car. There have not been anywhere near as many as 36 head-on air bag deployment crashes. Therefore, most of the crashes referred to could not have been head-on. Consequently, the conclusions of the comparison are invalid.

2. Of the 148 air bag deployment crashes to date, only 13 were true head-on crashes. In only nine of these 13 head-on crashes can the occupant injuries be compared. (With respect to the other four, see section 4, below.) In the nine crashes, 12 of the 14 air bag-protected occupants received only minor injuries whereas only 5 of the 13 occupants of the other vehicles received only minor injuries (Attachment 1).

3. In seven of the nine crashes where the occupant injuries can be compared, the air bag-protected occupants received less severe injuries than the corresponding occupants of the vehicles that they crashed with. . . .

   In one of the remaining crashes . . . the occupants of both vehicles received only minor injuries. The other head-on crash that can be compared . . . was a very severe crash with major occupant compartment intrusion to both vehicles. The estimated closing speed of the two vehicles in this crash was 110 mph. The driver of the air bag equipped car and the two occupants of the other car were killed in this extremely severe crash, in which, according to DOT, "no restraint system would have been of any help."

4. The occupant injuries in the other four head-on crashes cannot be compared for a variety of reasons (Attachment 2). In two of the crashes, . . . the details of the injuries to the occupants of the non air bag-equipped cars are not known. In the other two crashes, one . . . was a head-on crash with a six-wheel van truck and the other . . . was a head-on crash with a tractor trailer.

[Supporting attachments can be obtained by writing for "Occupant Injuries Attachments," Insurance Institute for Highway Safety, Watergate Six Hundred, Washington, D.C. 20037.]

Maryland Commission Urges Passive Protection

The Maryland Transportation Commission has urged U.S. Transportation Secretary Brock Adams to require the installation of an "effective passive restraint system" in passenger cars before 1981. After holding a series of "information meetings," at which "arguments for and against passive restraint systems in passenger cars were presented by experts," the Commission concluded that "air bags will reduce severe injuries and fatalities to occupants in cars involved in frontal collisions." On that basis, the Commission voiced its support for "the immediate initiation of definite and positive steps by the automobile industry to develop" such passive restraints and their installation before 1981.

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