

Passive Restraints: The State Of Debate

For three years the federal government has been in a locked-horns struggle with the automobile industry over the single most controversial safety standard in automotive history—the standard that would put passive restraints, of which the best known are air bags, on 1976 model cars.

From the time the government issued its first passive restraint proposals in 1969, auto makers have pressed for substantive changes as well as for more time in which to meet the requirements of the rule (FMVSS 208). The government's first formal announcement, an Advance Notice of Proposed Rulemaking issued in July 1969, proposed that passive restraints be required in all seating positions by Jan. 1, 1972. By another proposal issued in May 1970, the safety administration changed that effective date to Jan. 1, 1973. In November 1970, when the agency issued its first passive restraint rule, the date was slipped by 18 more months to July 1, 1974. Another revision, in March 1971, put off the deadline for full passive protection in automobiles to Aug. 15, 1975.

In each case the changes were requested by auto makers. With each successive change, protective requirements were altered, each time resulting in a weakening of the rule. (See *Status Reports*, Vol. 5, No. 20, Nov. 17, 1970; Vol. 6, No. 6, March 29, 1971; and Vol. 6, No. 18, Oct. 4, 1971.)

As the rule now stands, passive restraints will be required for the first time on 1976 model cars. The devices must provide passive restraint protection at all seating positions in a 30 mile per hour head-on barrier crash. Protection will also be required in 30 mile per hour barrier test crashes at angles up to 30 degrees from head-on, in 20 mile per hour lateral test crashes and in rollover test crashes.

For 1974 and 1975 model cars, manufacturers may meet requirements for protection of front seat occupants in 30 mile per hour head-on barrier crashes with one of three options:

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Option One: Sole use of passive restraints;
Option Two: Passive restraints augmented by lap belts; *Option Three:* Belts with inertia reel retractors used in conjunction with ignition interlocks and a warning system that signals when seats are occupied and belts are not in use. (Current standards requiring lap belt protection for rear seat passengers remain in effect during that period.)

LITIGATION ISSUES

Still unhappy with the requirements, American Motors, Chrysler, Ford, Jeep Corp., Volkswagen, Audi and the Automobile

Importers of America are fighting the safety administration's rule in the U.S. Court of Appeals for the Sixth Circuit, in Cincinnati, Ohio.

Before the court can decide whether or not the passive restraint rule is lawful it must first determine the scope of its own authority over federal motor vehicle safety rulemaking. Auto makers argue that the role of the court is to review the massive record—compiled in six volumes weighing more than 25 pounds—on which NHTSA based its passive restraint rule and determine if the agency's rule is “supported by substantial evidence on the basis of the entire record.”

The government argues that the court does not have the authority “to review the merits of the various technological arguments” bearing on the rule. According to NHTSA, the role of the court is to determine only “whether the agency complied with applicable procedural requirements (such as providing notice and an opportunity to comment on any proposal) and whether the agency's ruling reflects a rational consideration of the relevant matters presented by interested parties.” NHTSA claims that it gave “full consideration to the points raised” in the record by auto makers and others and that “the evidence overwhelmingly supports” its rule.

Auto makers contend the record shows that the standard fails to “meet the need for motor vehicle safety,” be “practicable” and be stated in “objective terms,” as is required by the National Traffic and Motor Vehicle Safety Act of 1966. They charge that the rule is “arbitrary and capricious” and that NHTSA has, among other things, “withheld highly relevant information” that influenced its decisions and “has constantly shifted requirements” of the rule.

The manufacturers also claim that the “Congress clearly meant to require that safety standards be based on technology known as of the date of the issuance of the standard”—a situation that does not exist in the case of air bags, they claim. The Center for Auto Safety, in a brief filed with the court in support of the government, argues that the Congress intended that safety standards be used to prod the auto industry. The Center quotes the Senate Report that accompanied the 1966 safety act: “This legislation reflects the faith that the restrained and responsible exercise of Federal authority can channel the creative energies and vast technology of the automobile industry into a vigorous and competitive effort to improve the safety of vehicles”

(Ralph Nader earlier brought court action against the safety administration in the U.S. District Court for the District of Columbia. Soon after NHTSA issued its most recent postponement of passive protection requirements, Nader sought to have the postponement overturned because, he charged, confidential documents originating in the White House had played a part in NHTSA's decision to grant the delay. He asked that those documents be made public. However, after examination of the papers, the court denied Nader's request and described the papers as “working documents, reports and memoranda,” which the agency is not required to make public. Nader's appeal of the decision was also denied.)

In defending its passive restraint rule against the auto makers' court action, the safety administration has told the court that “when fully implemented” the standard will result in an “annual saving of about 9,000 lives and 700,000 disabling injuries” from automobile crashes. “Economic savings in terms of wage losses, medical expenses and insurance expenses occasioned by passive restraint systems would significantly outweigh the cost per unit,” NHTSA said in its brief.

PROBLEMS: PROS AND CONS

Although the rule does not specifically require air bags, and some researchers have submitted to NHTSA and auto makers a variety of alternatives to the air bag, auto makers and government officials seem to regard the inflatable restraints as the most promising device for meeting the standard's requirements. However, auto makers claim that unsolved problems still surround air bags. The problems, they say, involve noise that is generated when the protective devices deploy, occupants that are caught out of position when

the bags are activated, multiple collision effectiveness and reliability of the sensor devices to activate the bags in a crash. The safety administration claims that the problems have been solved.

Noise: According to the safety administration, "The major suppliers, who have gone to work on the sound problem, now report sound levels of from 145 to 160 decibels" when air bags deploy in tests. Sounds under 160 decibels are "roughly equivalent to the sound of a toy cap pistol," which is "an acceptable sound level," the agency says. Auto makers point to federal regulations in other areas that either prohibit or recommend against noise levels above 140 decibels.

The safety administration contends that car occupants involved in a crash would "surely" prefer "to suffer the possible hearing damage that might result from deployment of the air cushion . . . than to be killed by going through the windshield or colliding with the dashboard."

Out-Of-Position Occupants: In its brief to the court, Chrysler claims that occupants thrown out of position by panic braking preceding a crash, or not seated in "the recommended seating position," could be injured or killed by a deploying air bag.

(cont'd. on page 4)

Passive Restraint Requirements, Options

The chart below outlines current requirements and options of the National Highway Traffic Safety Administration's passive restraint rule (FMVSS 208).

REQUIREMENTS FOR PASSENGER CARS	MODEL YEAR				
	1972	1973	1974	1975	1976
Passive protection at all seating positions in head-on, angled, lateral and rollover crashes	Option 1	Option 1	Option 1	Option 1	Required
Passive protection for front seat occupants in head-on crashes with seat belts at all seating locations and a seat belt warning system			Option 2	Option 2	
Seat belts with ignition interlock and seat belts warning system. Shoulder belts, if provided, must be non-detachable from lap belts and have inertia reels			Option 3	Option 3	
Lap belts with warning system	Option 2	Option 2			
Lap and shoulder belts with warning system	Option 3	Option 3			

(cont'd. from page 3)

NHTSA argues that "modern inflatable restraint systems provide a great deal of protection to occupants who may be slouched in their seats, or otherwise out of position."

Multiple Impacts: American Motors cites in its brief a Dec. 16, 1971, report issued by the House Subcommittee on Government Activities that said the subcommittee was told by "DOT representatives" that the government "had conducted no tests or knew of no tests of air bag systems with either multiple or sustained inflation capabilities."

NHTSA says in its brief that systems "developed recently by General Motors and others" have "the capability of including a second generator that can reinflate the bag in the event of a multiple collision."

Sensor Reliability: Ford claims that "laboratory and other controlled testing" of air bags is "insufficient to permit a reasonable prediction as to the reliability of air bags under actual operating conditions." The auto maker said that in July 1971, it "presented (NHTSA) the latest results of its testing of sensor devices which disclosed a high rate of failure of such devices to perform adequately."

The safety administration says that "air bag sensors have undergone many millions of miles of road testing" without "a single bona fide instance of inadvertent deployment in a non-impact situation" and that there is "no substance to the notion that inflatable restraint systems are subject to any significant measure of unreliability."

FIELD TESTS

One major complaint voiced by both auto makers and loss reduction researchers is that air bags as yet have not been subjected to extensive real-world field tests. To date, neither the government nor private industry have conducted large scale fleet tests of the devices.

(In a story in the Sept. 6, 1971, issue of *The National Observer*, Dr. William Haddon, Jr., president of the Insurance Institute for Highway Safety, was quoted as saying, "We simply have not had experience in actual (air bag) use with people It's as if we had developed polio vaccine largely using animals and immediately said we should immunize people by the tens of thousands." This is not "prudent or professionally responsible," he said.)

In May 1970, the safety administration unveiled plans for a five year field test program that was to involve 12,500 vehicles. More than 1,000 air bag equipped vehicles were to be tested in 1971 alone. The project never got off the ground. According to Lynn L. Bradford, acting director of the safety administration's fleet testing program, NHTSA decided to wait until auto maker-installed systems became available before beginning its field test program. The agency is now negotiating with auto makers and is "pushing for April or May" delivery of air bag equipped Fords and an autumn delivery of air bag equipped GM cars, Bradford told *Status Report*. He said the agency's field test fleet will include only about 1,000 vehicles.

In June 1970, General Motors announced that it planned "to produce approximately 25,000 pilot (air bag) component units on production tools between January 15 and April 15, 1972. After extensive component testing, a number of these units will be installed in modified 1972 vehicles for road evaluation, potentially on the public highway." However, GM Board Chairman Richard C. Gerstenberg recently said that the company's first large scale fleet tests will consist of only 1,000 air bag equipped 1973 model year Chevrolets.

Ford is the only other auto maker to announce plans for air bag fleet testing. In 1970 it told the safety administration of plans to install "200 to 400 units for in-company experimentation" during the 1971 model year and 2,000 to 4,000 during the 1972 model year. In 1971 Ford says it equipped "some 90

company-operated Mercury sedans with air bag modules to evaluate the sensor and firing circuit." The inflation systems on the bags were never made operable, the company says.

A Ford spokesman told *Status Report* that the company plans to field test about 1,000 air bag equipped cars during 1972. As part of its field test program, Ford recently entered into an agreement with Allstate Insurance Companies to field test 200 air bag equipped Mercurys. According to Allstate Board Chairman Judson B. Branch, the company plans "to demonstrate that air bags as presently developed are reliable, safe and have an as yet unrealized people-saving potential."

Air Bags: 2 Decades Of Development And Debate

In 1952, the first of a series of patents was filed for automatically inflating air cushions to protect occupants of crashing vehicles. In 1968, prototype development became advanced enough to signal the start of active federal government interest. In that year, Eaton Yale and Towne, Inc., a major air bag developer, demonstrated it to the then National Highway Safety Bureau (NHSB) and said such a system "could be ready in three to four years." Following is a chronology of federal government passive restraint rulemaking procedures since that time. (For a similar chart chronicling air bag development's earlier history, see *Status Report*, Vol. 5, No. 14, Aug. 17, 1970.)

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|----------------|---|
| 1968, July | NHSB Director Dr. William Haddon, Jr., meets with auto manufacturers' representatives and Eaton Yale and Towne, Inc., representatives to establish a federal interest in accelerating air bag development and use. |
| 1969, April | NHSB Acting Director Dr. Robert Brenner supports air bag concept in Senate hearing. |
| 1969, June | NHSB issues Advance Notice of Proposed Rulemaking for "Inflatable Occupant Restraint System," proposed effective date Jan. 1, 1972. |
| 1969, August | NHSB holds public meeting on proposed rule; manufacturers ask for postponement of effective date. |
| 1970, May | NHSB proposed deadline deferred to Jan. 1, 1973. |
| 1970, May | NATO sponsored international conference in Milford, Mich., demonstrates air bag state-of-the-art; auto makers oppose Jan. 1, 1973, deadline. |
| 1970, June | NHSB holds second public meeting on passive restraints. |
| 1970, November | NHSB issues rule requiring front seat passive restraints effective July 1, 1973, for passenger cars, and passive restraints at all seating positions effective July 1, 1974, for passenger cars, multipurpose vehicles and trucks weighing less than 10,000 pounds. |
| 1971, March | In response to auto makers' petitions, NHTSA* revises requirements for passive protection in crashes and allows—for cars manufactured between Aug. 15, 1973, and Aug. 14, 1975—two options for |

compliance: full passive systems for all seating positions, or passive protection for front occupants and seat belts at each seating position and a warning system. Mandatory passive protection in angled, side and rollover crashes is postponed from July 1, 1974, to Aug. 15, 1975.

- 1971, April Chrysler, followed by other manufacturers, seeks court review of NHTSA's passive restraint rule.
- 1971, October NHTSA proposes third option for cars manufactured between Aug. 15, 1973, and Aug. 14, 1975, allowing installation of seat belts with ignition interlock systems.
- 1972, February NHTSA formally adds third option proposed in October 1971.

*Formerly National Highway Safety Bureau (NHSB), renamed National Highway Traffic Safety Administration by the Federal-Aid Highway Act of 1970.

Possible Chevrolet Steering Hazard Uncovered

Examination and testing of full-sized 1971 Chevrolet automobiles equipped with power steering have disclosed that "gravel can lodge in the gap between the steering coupling and frame and obstruct the steering to an extent which seriously impairs the driver's ability to control the vehicle, even with fully operable power steering."

The analysis, recently completed for the Insurance Institute for Highway Safety by Value Engineering Laboratory, a private organization, was prompted by reports from Jackson, Miss., that two leased 1971 Chevrolets had experienced jamming of their steering systems attributed to gravel and other debris thrown up into a pocket between a steering linkage component—the relay rod—and the front frame crossmember.

One of the two reported incidents resulted in a crash into a ditch. The driver of the leased car said he had "pulled as hard as I could, but the wheel would not turn . . ." The driver of the other car, reporting similar trouble, said that "by applying a great deal of strength" he was able to free the steering mechanism. He said that it had "locked" as he completed a right turn but that the incident ended without a crash.

After testing 1971 Chevrolets, Value Engineering said it had "confirmed that gravel and other debris could become lodged in this area (the relay-rod trouble spot cited in initial accounts of the suspected defect). However, it was determined that this could not lock the steering system" because the large mechanical advantage of power steering "would either crush the gravel or deflect the relay rod and allow it to pass over the largest piece of gravel which could be lodged."

When the engineering laboratory examined the power steering system further, it discovered that lodging of gravel was the "most probable cause" of the trouble, but at a different location—the flexible, rotating coupling positioned between the driver and the power-assist system at the base of the steering column. Gravel, rocks or other foreign objects lodged between the coupling and an adjacent frame section could duplicate the experiences of the two drivers, engineers found, since it could "prevent the driver from turning the steering wheel."

The Institute has provided the National Highway Traffic Safety Administration the analysis prepared by Value Engineering. Earlier it had provided the safety agency the reports of the two power steering failures.

House Panel Dents 'Bumper Bill'

Auto manufacturing interests have successfully persuaded a House subcommittee to vote against a legislative provision authorizing the Department of Transportation to set car damageability standards.

At the request of auto makers, the Commerce and Finance Subcommittee of the House Interstate and Foreign Commerce Committee has voted, 4-3, to scrap the standards-setting requirement and replace it with a "consumer information" provision.

The abandoned language of the House bill (H.R. 11627) was similar to wording in a Senate-passed measure (S. 976). It would have required DOT to issue car performance standards to minimize damage in low speed crashes. Dr. William Haddon, Jr., president of the Insurance Institute for Highway Safety, earlier testified before the House subcommittee that the Institute's series of low speed crash tests of new model cars had shown "the huge, wasteful problem . . . of the needless, designed-in susceptibility of modern automobiles to costly cosmetic damage even in very low speed 'fender benders.' "

Substitute provisions backed by auto interests and accepted by the House subcommittee would "provide for the publication of objective consumer information concerning the damage susceptibility of passenger cars." It would call for a program similar to the consumer information program mandated by the National Traffic and Motor Vehicle Safety Act of 1966 as a complement to motor vehicle safety standards.

The safety consumer information program is generally regarded as ineffective. The National Highway Traffic Safety Administration's deputy administrator, Charles Hartman, said in a letter last year to Ralph Nader, "The results of the (vehicle safety) consumer information regulations issued by us to date are of great concern to us. Probably very few prospective purchasers have used the information"

The subcommittee's action drew a rebuke from Nader. The manufacturer-backed consumer information substitute would require that DOT get its "consumer information" data on auto damageability from insurers; "noticeably absent is any authority to require manufacturers to supply technical and performance data under agency regulations as exists under present law for safety-related information," Nader noted in a letter to Committee Chairman Harley Staggers (D-W. Va.).

In light of DOT's "history of prior contempt for consumer information authority," Nader asked, "how can the committee consider additional consumer information authority a satisfactory substitute for minimum standards?"

Nader urged the full Interstate and Foreign Commerce Committee not only to restore the original standards-setting provision, but also to add a provision "requiring NHTSA by a specific date to issue standards to protect pedestrians from vehicle exteriors." The "tragic implications that hostile weapon-like front end designs hold for pedestrians, bicyclists and others impacted by these cars" were stressed in the Institute's earlier testimony during House and Senate hearings.

The full House committee is scheduled to consider H.R. 11627 on or about March 21.

Correction

Vincent L. Tofany, New York State's Commissioner of Motor Vehicles, has been named to the Department of Transportation's Motor Vehicle Safety Advisory Council. His name was inadvertently omitted from the list of new council members in *Status Report*, Vol. 7, No. 4, Feb. 28, 1972. The omission is regretted.

Miller Named Institute Vice President

A. Eugene Miller, a systems engineer formerly with the consulting firm, AUERBACH Associates, Inc., has joined the Insurance Institute for Highway Safety as vice president for operations. Miller served with the Philadelphia-based consulting firm for 14 years. As one of its earliest members he established its Washington office in 1962 and was a principal consultant and director of technical staff, communications systems and program development.

His consultant work included broad, diverse experience in design and implementation of large, complex systems, including direct management and technical involvement in the development of the Department of Defense's world-wide Automatic Digital Network (AUTODIN), a communications system that employs electronic computers for routing and relaying data. Earlier, Miller was a project development engineer for the Burroughs Corporation. He holds bachelor's and master's degrees from the University of Pennsylvania.

Daniel G. Lewis, who has been acting as Institute vice president for operations, now is serving as assistant vice president for program evaluation.

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