



*Brian O'Neill: Joined Institute in 1969.*

## Brian O'Neill Is Named President of IIHS and HLDI

The boards of directors of the Insurance Institute for Highway Safety (IIHS) and the Highway Loss Data Institute (HLDI) have appointed Brian O'Neill to head both organizations.

O'Neill, executive vice president of IIHS and senior vice president of HLDI, follows William Haddon, Jr., M.D., who had served as president of the Institute since 1969. Dr. Haddon died on March 4, 1985.

The coauthor of *The Injury Fact Book* and the author of numerous scientific papers, O'Neill is vice chairman of the National Safety Council's Committee on Alcohol and Other Drugs. He has served on the Advisory Committee for the Department of Transportation's National Accident Sampling System and the National Academy of Sciences' Committees on Trauma Research and Geometric Design Standards for Highway Improvements.

O'Neill joined the Institute staff in 1969. He received his B.Sc. in mathematics and statistics from the Bath University of Technology in England in 1965.

## Tempo Air Bag Saves Driver From Serious Injury in Collision

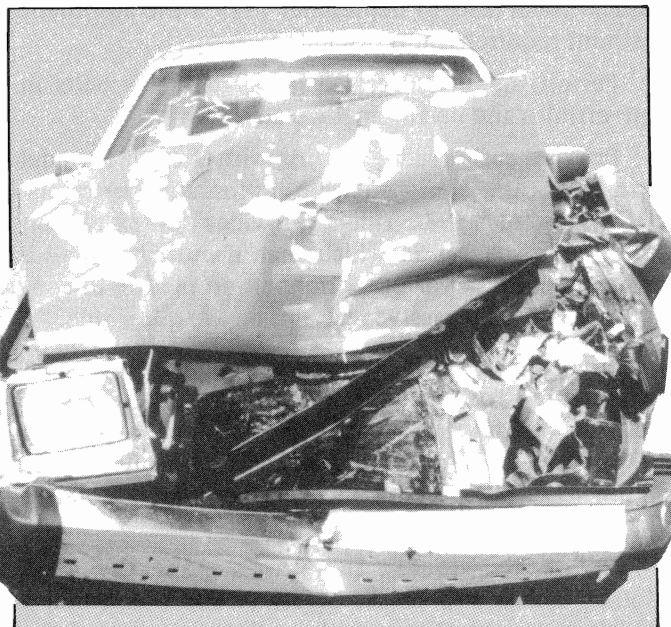
A Travelers Insurance employee escaped serious injury when the air bag equipped Ford Tempo she was driving skidded into an oncoming propane gas tanker.

Melanie Stephenson reports she was driving on a narrow, winding, hilly road at about 10:30 a.m. on June 18, 1985. The road was wet from rain.

As she rounded a downhill blind curve to the right, she said she was surprised by a tanker truck approaching from the opposite direction and braked sharply. The Tempo she was driving skidded to the left, into the 28,000 pound truck's path and the left front of the car hit the truck.

Stephenson was wearing her lap/shoulder belt when the crash occurred and reports that she was not aware

*(Cont'd on Page 7)*



*Air bag: A good fellow traveler.*

## NHTSA Announces Proposed Rule Changes On Auto Safety Standard

Recently, the National Highway Traffic Safety Administration (NHTSA) made a number of proposals that would affect the occupant protection safety standard for cars.

The proposed rule changes in the Federal Motor Vehicle Safety Standard (FMVSS) 208 are:

### Improved Seat Belt Assemblies:

- NHTSA proposes delaying the date for comfort and convenience requirements until September 1986, the date manufacturers must also begin phasing in automatic restraints.
- Except for the driver position, lap and shoulder belts in the front seat that are equipped with emergency locking retractors would have to be equipped with separate locking devices in order to secure child restraints. The proposed rule would also permit a number of other seat belt modifications.

The requirement for locking child seats in place would not apply to cars equipped with automatic seat belts that have only upper torso restraints, such as the VW Golf and Toyota Cressida.

### Belt and Automatic Restraint Requirements:

- Require dynamic testing of manual seat belts in vehicle crash tests by September 1989 if the automatic restraint requirement is rescinded.
- Permit manufacturers to install only lap belts in convertibles and no automatic restraints.
- Provide early credit, starting with the 1986 model year, for cars equipped with automatic restraints. NHTSA's July 1984 ruling provides an extra half credit for each car in which manufacturers install a driver side air bag or other nonbelt protection in conjunction with any passive restraint on the other side.

Under the July rule, 10 percent of all new cars must be equipped with automatic protection starting with the 1987 model year, followed by 25 percent in the 1988 model year, 40 percent in 1989, and 100 percent in the 1990 model year. (See *Status Report*, Vol. 19, No. 13, July 28, 1984.)

- Define the "due care" provision of the 1966 Motor Vehicle and Traffic Safety Act to mean that a vehicle is in compliance with a safety standard if the manufacturer establishes that care was exercised to meet safety requirements.

- Eliminate the current oblique barrier test impact requirement for compliance.

### Anthropomorphic Crash Test Dummies:

- Allow the use of General Motors' Hybrid III test dummy for FMVSS 208 compliance testing or the currently used Hybrid II until September 1991. After that, only the Hybrid III could be used if this proposal is adopted.
- Establish new head injury criterion (HIC) calculation methods. Two alternative methods for HIC calculation are being contemplated. One would calculate a HIC value for head contacts only. In the absence of head contact, a new injury measure would be set for the neck. The second method would calculate the HIC in both contact and noncontact situations and limit the time duration of the measured acceleration to 36 milliseconds. The HIC is currently calculated in contact and noncontact situations without any limit on time duration.
- Establish new criteria for neck, chest, facial, and knee and tibia injuries.

## Institute Urges NHTSA To Grant Ford Request On Restraint Rule

A Ford request that cars equipped with air bags only on the driver side be included in manufacturers' quotas under the federal government's automatic restraint rule should be granted quickly, the Insurance Institute for Highway Safety says.

In a letter to Diane Steed, the head of the National Highway Traffic Safety Administration (NHTSA), Brian O'Neill, Institute president, noted that the agency has not yet addressed the Ford Motor Company's August 1984 petition. Ford had asked NHTSA to count its cars equipped with driver side air bags and manual belts for front seat passengers toward the percentage of cars that must be equipped with automatic seat belts or air bags during the 1987-1989 model year phase-in period for automatic restraints. Ford is now producing for fleet purchasers Tempos with driver side air bags and passenger side manual belts. (See "Tempo Air Bag Saves," Page One.) It is the only manufacturer besides Mercedes-Benz presently offering air bags.

NHTSA currently provides “credit” equivalent to one and a half vehicles for each car equipped with a “nonbelt” automatic restraint such as an air bag on the driver side, so long as the passenger side is equipped with an automatic restraint. Ford requested that a non-belt driver system without a passive passenger system be counted as one vehicle. Currently, a vehicle so equipped does not qualify for any credit.

“The Ford position is reasonable and logical,” the Institute said, “...granting a credit of 1.0 for driver-side air bag systems without a passive passenger restraint would be consistent with NHTSA’s goal of encouraging alternatives to automatic belts.”

The Institute also asked the agency to provide a two-vehicle credit for each car equipped with full front seat air bags during the automatic restraint phase-in period. The extra credit is needed, the Institute noted, “because at present, there is no incentive to develop air bag systems for front seat passengers.”

General Motors, in a separate submission, also asked that cars equipped with driver side air bags or other nonbelt automatic protection systems and manual lap/shoulder belts in both the driver and right front passenger positions be counted toward meeting the rule. GM supports a single unit credit for the production of each such car during the automatic restraint phase-in period. GM also asked NHTSA to consider allowing the arrangement to continue beyond Sept. 1, 1989, when all cars are required to have full front seat automatic restraints, unless enough states enact seat belt use laws. This would enable automakers to go forward with air bag development knowing that if the rule is rescinded, they need not have undergone the development costs for a passenger side system.

Because the purpose of the credit requested by Ford and GM would be primarily to encourage the rapid marketing of cars equipped with air bags before the 1990 model year deadline requiring all cars to be equipped with either automatic seat belts or air bags (or some other passive restraint technology), the Institute said that NHTSA should act quickly.

Mercedes-Benz is the only manufacturer to provide consumers an \$880 Supplemental Restraint System, which includes a driver-side air bag. In comments to the docket, the automaker said it has detected no decrease in sales attributable to air bags. The company stated that it intends to continue providing air bags even if NHTSA’s automatic restraint requirement is rescinded.

## Institute: Air Bags Can Be Easily Fitted Into Convertible Design

Convertibles should not be exempt from the automatic restraint requirements that become effective in September of 1989, the Insurance Institute for Highway Safety has advised the U.S. Department of Transportation.

In comments submitted in response to a proposed rule that would eliminate any requirement for automatic protection for front seat occupants of convertibles (see “NHTSA Announces,” Page 2), the Institute said: “Air bags similar to, if not identical with, those designed for sedans can be readily incorporated into the design of convertibles, as NHTSA (National Highway Traffic Safety Administration) has pointed out.”

“Even if the manufacturers choose to equip only their convertibles with air bags,” the Institute said, “the resulting higher costs of the air bags due to limited production should not significantly affect convertible sales, because most of these vehicles are currently sold as luxury or semiluxury cars, with much higher prices than corresponding sedan models.”

Automatic seat belts can also be installed in convertibles if appropriate modifications are made, the Institute noted. And, in fact, car makers already provide three-point manual lap and shoulder belts for front seat occupants and have told NHTSA they intend to retain them.

In other remarks concerning proposed changes to Federal Motor Vehicle Safety Standard (FMVSS) 208, Occupant Protection, the Institute said:

- HIC Calculation: Two alternative proposals for Head Injury Criterion (HIC) calculation replace the present methodology with methods by which higher head injury levels would be permitted. “The Institute believes that neither of the alternatives being considered should be adopted and that the current method of HIC calculation is preferable to either of the proposed changes,” the letter said.

The present HIC level of 1,000 approximates the forces that can produce a moderate head injury and there is “mounting evidence that even mild brain injury can produce long-term disability,” the Institute letter said. In addition, research has shown that brain injuries occur when HIC levels are considerably lower than the currently calculated 1,000 that is set as the

*(Cont’d on Page 4)*

## FMVSS 208

(Cont'd From Page 3)

maximum allowable level under FMVSS 208's automatic restraint requirements.

Comments submitted by various manufacturers supported even less stringent HIC calculation methods than at least one of the two NHTSA proposals.

- **Due care:** The Institute agreed that a proposed amendment *specifically* applying the "due care" provision of the 1966 Act to standard 208 was "reasonable." Under this provision a vehicle would be in compliance with the standard if the manufacturer "had no reason to know" that a vehicle did not meet the standard and it had exercised due care in complying with the standard. However, the Institute told NHTSA that "due care" should be defined "to require that recognized statistical procedures are employed by the manufacturers. This means that the manufacturers must determine the mean and standard deviation of each test measurement for each car line, and target their designs so that the bulk of vehicles manufactured would produce test results below the maximums specified...."

- **Oblique crash tests:** IIHS reiterated its June 12, 1984, statement that it would concur with the proposed elimination of the current 30-degree oblique test requirement "but only if its elimination will accelerate the use of air bag systems." The Institute noted that in most oblique tests, dummy responses indicate the crashes are less severe, regardless of whether the vehicle is equipped with manual belts, air bags, or automatic belts.

Most manufacturers supported NHTSA's proposed dropping of the oblique test requirement, although GM stated it would continue such tests even if they were not required.

- **Crash tests for manual belts:** The Institute said it supports dynamic testing of manual belts in vehicle crash tests immediately, rather than waiting until Sept. 1, 1989, as NHTSA proposes. Such testing "need not be tied to the rescission of the automatic restraint requirements," the Institute said, noting that the agency itself had already concluded that most cars should be able to meet the requirement. "Requiring the dynamic testing of manual belts would result in the upgrading of the crash performance of many vehicles, including light trucks, vans, and utility vehicles, for which automatic restraint requirements have not yet been proposed," the Institute said.

Ford and AMC opposed and GM asked to defer any crash test requirement for manual belts "until the 208 issue is resolved." And a number of manufacturers expressed concern that their light trucks and vans equipped with manual belts could not meet a crash test requirement.

- **Early credit for cars equipped with automatic restraints:** The Institute supported NHTSA's proposed "credit" for cars equipped with air bags or automatic seat belts prior to the 1987 model year. "These early credits should encourage manufacturers to either initiate or increase the installation of automatic systems before they are required," said the Institute. The letter also urged NHTSA to provide credit for cars equipped with driver side air bags and manual lap and shoulder belts for front seat passengers. (See "Institute Urges," Page 2.)

The Institute noted that none of the proposed amendments to the standard should cause manufacturers to request a delay of the 208 leadtime schedule. "There can be no justification for any postponements of the present schedule," since NHTSA is already providing generous leadtime under the current schedule, the letter said.

## Institute Supports Hybrid III With Added Injury Criteria

The Insurance Institute for Highway Safety supports a proposal by NHTSA to use a new dummy for compliance testing, but only if additional injury criteria are adopted as well.

In comments submitted to the docket on Federal Motor Vehicle Safety Standard (FMVSS) 208, the Institute called the Hybrid III dummy an improvement over the Hybrid II, which is currently required in compliance testing.

The National Highway Traffic Safety Administration (NHTSA) has proposed that automakers be allowed to use either dummy until 1989, when the Hybrid III would become the sole test dummy. NHTSA has also proposed adopting new standards for facial, neck, thoracic, and knee and tibia injuries because of the dummy's enhanced biomechanical fidelity.

"IIHS agrees that [the Hybrid III] represents a significant advancement in anthropomorphic test devices," the Institute said. It also "supports the adoption of the Hybrid III dummy for FMVSS 208 compliance testing, but only if the proposed facial injury criteria are adopted simultaneously and if other proposed injury criteria for the neck, thorax, and legs are adopted effective with the exclusive use of the Hybrid III."

Not to do so, the Institute said, "would simply add

to the complexity and expense of compliance testing without any public benefit.”

Automakers commenting on the proposal said that introduction of the Hybrid III would at best be premature because the dummy is not widely available and there are questions about the dummy’s durability and variability of neck structures. Even GM, the automaker that developed the dummy, appeared to hedge in comments to the docket, saying that NHTSA should “provide time in the regulatory process...prior to requiring its exclusive use or regulating its full range of measurement capability.”

**Facial laceration** — New facial injury criteria proposed by NHTSA as part of its latest rulemaking package should be adopted as soon as the Hybrid III is permitted to be used as a test device under FMVSS 208. NHTSA said it would delay the criteria until automakers could install antilacerative windshields.

“However,” said the Institute, “the major sources of facial injury to belted occupants are from the steering assembly and instrument panel rather than the windshield. Implementing a facial injury standard would help reduce these injuries by forcing improvement to current belt systems.”

“In addition,” the Institute noted, “some manufacturers may choose to meet the automatic restraint requirements with so-called ‘friendly interiors’ in which occupants’ faces can be expected to impact windshields and other interior components. Allowing the protection offered to faces and heads by such systems to be evaluated on the basis of the HIC [Head Injury Criterion] alone could lead to designs that would produce acceptable HIC scores but unacceptable facial injuries.”

**Neck injury criteria** — The Institute agreed that neck injury criteria should be set but reported that in tests using criteria proposed by NHTSA, the Institute found that in some impacts neck loads can be acceptable while HIC scores are not, using current HIC calculation methods. That finding underscores the need to keep current methods for calculating HICs, the Institute said, rather than adopting one of NHTSA’s proposals to introduce new calculation methods that would, in effect, lower HIC scores. (See “Institute: Air Bags,” Page 3.)

**Thorax deflection criteria** — Adding such criteria to FMVSS 208 will help evaluate the injury potential of occupants striking steering assemblies or other interior components, the Institute said. A study comparing the dummy with human volunteers indicates that care should be taken, however, to assure that there are im-

provements in the dummy’s lower thorax to provide more realistic responses.

**Knee and tibia criteria** — IIHS endorsed NHTSA’s proposed addition of knee shear and tibia bending and compression fracture criteria once the Hybrid III becomes the only test dummy used for compliance purposes.

**Head injury criterion** — The Institute reinforced its opposition to new methodology for calculating HIC scores because both of the alternatives offered by NHTSA would lower the scores measured by the dummies, thus, in effect, raising the permitted forces.

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## Survey Identifies Head Injury Patients

A study of Rhode Island residents with head injuries in nursing homes shows that 10 out of 19 of those patients had suffered the injuries in car crashes.

The survey of 93 nursing homes in and near Rhode Island in May of 1982 identified 19 head-injured patients who had been sent to nursing homes directly from acute care hospitals. Ten of the 19 suffered their head injuries as a result of car crashes, three in assaults, three in falls, one in a suicide attempt, one from a gunshot wound, and one from an unknown cause. The report appears in the May-June issue of *Public Health Reports*, and was written by Daniel Fife, M.D., of the Institute, together with William Hollinshead, M.D., director of Family and Child Health of the Rhode Island Department of Health, and Gerald Faich, M.D., associate director of the National Center for Drugs and Biologics of the Public Health Service.

The study, the authors report, provides a very conservative population-based estimate of head-injured patients in long-term care facilities.

In Rhode Island, the average cost paid by Blue Cross for a nursing home bed exclusive of medications, medical services, special nursing, and rehabilitative care, was \$50 per day in 1981, the researchers reported. “Thus, based on 1981 charges, the annual price of the beds occupied by the 19 Rhode Island residents confined to nursing homes because of head injuries was \$347,000, exclusive of medications and professional services.”

For copies of the study, “Nursing Home Residency After Head Injury,” by Daniel Fife, William Hollinshead, and Gerald Faich, write Publications, Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.



## Alaska Reports 20 Deaths And 583 Injuries In 3-Wheel Vehicle Crashes

Alaska reports at least 20 deaths and 538 injuries during 1983 and 1984 — including six people permanently disabled by head or spinal cord injuries — resulting from operation of three-wheel, all-terrain vehicles.

Those killed ranged in age from 12 to 53 years. The preliminary report is part of a statewide study conducted by epidemiologists from the Alaska health department.

Ten of the deaths resulted from head injuries. Eight of those individuals were not wearing helmets. Nineteen of the 20 who were killed were operating the “three-wheelers” and one passenger died. Although the vehicles are designed for only one rider, 29 percent of all the impacts reported by the police involved more than one rider, the report said.

The six patients with severe head and spinal cord injuries are “now permanently disabled and will re-

quire long-term skilled care,” at an estimated lifetime cost of \$11.5 million, the researchers said.

Only 9 percent of the riders in the 234 incidents reported by police were wearing helmets at the time of the impact. Police also found that while three-wheel vehicles are designed for off road use, 63 percent of the crashes occurred on roads, and the vehicles most often were traveling straight ahead when the incidents occurred.

The study, “Injuries Associated With Three-Wheel All-Terrain Vehicles — Alaska,” by S. Jenkerson and J. Middaugh, M.D., appeared in the April 19, 1985 edition of the *Morbidity and Mortality Weekly Report* published by the Centers for Disease Control.

## Daytime Headlights Improve the Odds For Motorcyclists



In the 14 states where motorcyclists are required to keep their headlights on in the daytime, the risk of being involved in a fatal crash during those hours has been lowered by 13 percent, the Insurance Institute for Highway Safety reports.

The study, conducted by Paul L. Zador, examines the effects of the laws that were adopted between 1975 and 1983 in comparison with 30 states without such laws.

“In the 14 states that had motorcycle headlight use laws during the study period, about 600 daytime crashes of the type included in the study were prevented by these laws,” the author said in an article in the May issue of the *American Journal of Public Health*. Of the 30 states without such laws, about 140 fatal motorcycle crashes could have been averted by their adoption, Zador said.

The Zador study adds to the mounting evidence that daytime lights do help. Zador noted that in recent years, most new motorcycles have been sold with lights that are wired to the ignition. Thus, “the effects attributable to laws requiring daytime headlight use will diminish in the future as the number of older motorcycles without this feature is reduced.”

For copies of the report, “Motorcycle Headlight-Use Laws and Fatal Motorcycle Crashes in the U.S., 1975-83,” by Paul L. Zador, write Publications, Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.

### **Status Report Index**

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## **Study of Seating Patterns May Help Bus Designers**

A new study examining seating preferences on the Washington, D.C., metrorail system indicates children may be much more willing than adults to sit facing rearward.

If that is so, the researchers report in the June issue of the *American Journal of Public Health*, then designers should think about building school buses so that the seats face toward the rear. Scientists have long known that rearward seating offers increased protection for passengers because in most impacts, the seat back will support the spinal column better and help spread the crash load.

Alison M. Trinkoff, with the Johns Hopkins School of Hygiene and Public Health, studied the passenger seating patterns and found that while only 25 percent of 154 adults she observed chose rear facing seating (at times when they could make either choice) 66 percent of the 21 children seen chose rearward facing seats.

The research was conducted with the support of the Insurance Institute for Highway Safety.

For copies write for "Seating Patterns on the Washington, D.C. Metro Rail System," by Alison M. Trinkoff, Publications, Insurance Institute for Highway Safety, Watergate 600, Washington, D.C. 20037.

## **NHTSA May Modify Truck Air Brake Rule**

The National Highway Traffic Safety Administration (NHTSA) has issued a notice of proposed rulemaking that would modify its truck air brake standard that applies to straight trucks, buses, and tractor trailers. When a truck or bus driver applies his brakes, there is a perceptible lag before the air brakes actually engage. Currently, NHTSA requires that manufacturers test the time lag on their trailer brakes while they are still on the assembly line, using a test rig. NHTSA is proposing to increase the allowable time lapse in this simulated test.

NHTSA proposed the change because manufacturers have been using larger diameter tubing than may be desirable. For although this tubing produces good assembly line test results, research shows that in real-world braking situations, the larger tubing actually slows down brake activation time. By changing the test requirements, NHTSA hopes to encourage manu-

facturers to use smaller diameter tubing that will speed up the brake activation time in the real world and thus improve the performance of the trailer brakes.

The agency also said the proposals would provide a better balanced braking capacity for most tractor trailers. Comments on the proposed change to Federal Motor Vehicle Safety Standard 212, Air Brake Systems, must be submitted by Dec. 30, 1985. If the rule is adopted, NHTSA says the changes would become effective in one year.

## **Tempo Air Bag Saves Driver From Serious Injury In Collision With Truck**

*(Cont'd From Page 1)*

that the air bag had deployed until after the crash was over. Her knees struck the dashboard and there was evidence of moderate loading of the seat belt, Institute engineers who investigated the crash reported. The crash was equivalent to hitting a solid barrier at 23 mph, the Institute analysis concluded.

The crash caused both doors to jam on the left side of the car. The investigators concluded that the impact "was sufficiently severe that without the seat belt and air bag, the driver would have experienced significant injuries to the head, chest, and knees."

Other Ford Tempos equipped with driver air bags deployed in less severe crashes. So far, the General Services Administration (GSA) has reported five crashes of Tempos in its fleet.



*Ford Tempo struck propane gas tanker.*

## On The Inside

- **THE BOARDS OF DIRECTORS** of IIHS and HLDI appoint Brian O'Neill to head both organizations. ...Page 1
- **AIR BAG:** Driver in air bag equipped car escapes serious injury in collision with truck. ...Page 1
- **FMVSS 208:** NHTSA makes a number of proposals that would affect the occupant protection safety standard for cars. ...Page 2
- **INSTITUTE SAYS** Ford's request that cars equipped with air bags only on the driver side be included in quotas should be granted quickly. ...Page 2
- **CONVERTIBLES SHOULD NOT** be exempt from the automatic restraint requirements, the Institute advises DOT. ...Page 3
- **HYBRID III:** Institute supports a proposal to use the new dummy for compliance testing, but only if additional injury criteria are also adopted as well. ...Page 4
- **NURSING HOME STUDY:** A study of Rhode

Island residents with head injuries in nursing homes shows that 10 out of 19 of those patients had suffered the injuries in car crashes. ...Page 5

- **ALASKA REPORTS** at least 20 deaths and 583 injuries during 1983 and 1984 resulting from operation of three-wheel, all-terrain vehicles. ...Page 6

- **MOTORCYCLE HEADLIGHTS:** In the 14 states where motorcyclists are required to keep their headlights on in the daytime, the risk of being involved in a fatal crash has been lowered by 13 percent, the Institute reports. ...Page 6

- **STATUS REPORT** Index is available free. ...Page 6

- **NEW STUDY EXAMINING** seating preferences on the Washington, D.C., metrorail system indicates children may be much more willing than adults to sit facing rearward. ...Page 7

- **NHTSA ISSUES** a proposal that would modify its truck air brake standard. ...Page 7

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# Status Report

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Editor: James H. Mooney

Associate Editor: Rea Tyler

Production: Nina Minschwaner, Diahann Hill