

Crashes Studied

Child Injury Conditions Analyzed

Children are least likely to be injured in crashes if they are restrained and in the back seat, and are most likely to be injured if unrestrained and in the front seat. These findings from an Insurance Institute for Highway Safety study are based on data involving 26,971 passengers less than 15 years of age in reported crashes in a two year period.

The study found that unrestrained children in the front right seat have the highest injury rate. Back seat location reduced the injury rate by 28 percent among unrestrained children and 18 percent for restrained children. Use of restraints, such as seat belts or child restraints, reduced the injury rate by 39 percent in the front seat and 31 percent in back.

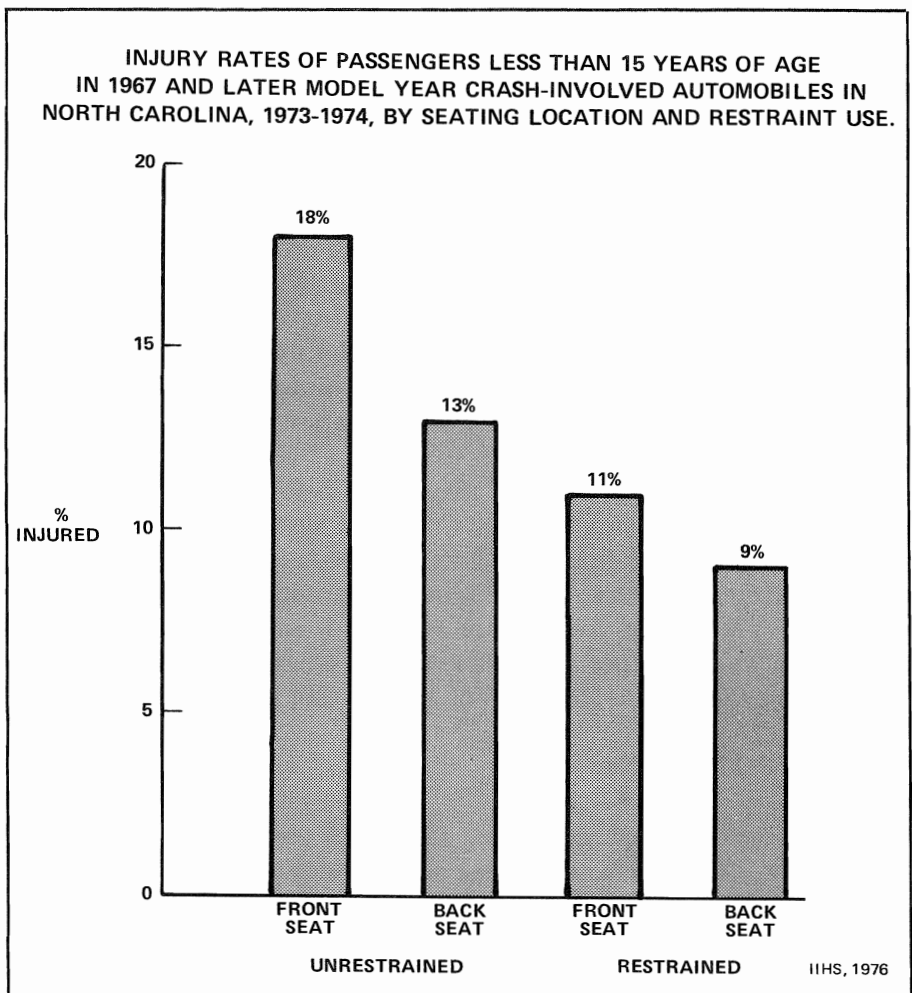
More than 90 percent of the children in the surveyed crashes were unrestrained. This finding paralleled those in earlier IIHS studies of restraint use for children in automobiles. (See *Status Report*, Vol. 10, No. 10, May 12, 1975.)

Based on the findings, the study made the following recommendations for "children's travel in automobiles presently on the road without automatic restraints such as air cushions:"

- Children should be restrained by a seat belt or a specially designed child restraint system and preferably should travel in the back seat.

- Children should not travel unrestrained, but if they do, as is unfortunately usually the case, they should be in the back seat.

(Cont'd on page 2)



- Children should never travel unrestrained in the front seat, particularly the front right seat.

Injury rates of children in the study are given in the figure on page one.

SURVEY FINDINGS

The results were based on data obtained for passengers less than 15 years of age traveling in 1967 and later model year automobiles (including station wagons) that were in reported crashes in North Carolina during 1973 and 1974.

The study concluded that “the only way in which a substantial increase can be made in the proportion of adequately protected children of all ages – presently less than 1 in 10 – is through providing them with ‘passive’ protection, such as air cushions.” Not only do air cushions work automatically but “developments in air cushion technology suggest that children – even those who are in unusual positions in the vehicle – can be protected by these devices.” (See *Status Report*, Vol. 10, No. 12, July 9, 1975.)

The authors, Allan Williams and Paul Zador, emphasized that “the importance of always traveling in a vehicle in such a way as to be restrained should a crash occur is confirmed by the finding that restrained child passengers were less likely to be injured than unrestrained child passengers, regardless of seating location. That is, there was an advantage to being restrained in the front seat compared with traveling unrestrained in back.”

EUROPEAN LAWS QUESTIONED

This finding, said the authors, brings into question laws in those European countries that prohibit children from sitting in the front seat, since automobiles in these countries are not required to be equipped with seat belts in the back. “Thus, the laws requiring children to travel in back in effect require that most children who have outgrown or do not have a specially designed child or infant restraint system be unrestrained. Adults in the front seat are required to be protected by available seat belts, but the laws in effect make it illegal for most children to be so protected,” according to the study.

The study also pointed out that “criteria issued by the National Highway Traffic Safety Administration to encourage states to pass mandatory seat belt laws are also not adequate.” The NHTSA criteria for such laws would apply only to motor vehicle occupants aged four or older and 40 pounds or more and no mention of preferred seating location is made.

The study concluded that mandatory belt use laws should not exclude children of any age from the requirement of using an appropriate restraint system. Victoria, Australia recently amended its mandatory belt use law to require that all children and infants in the front seat be restrained. “No other jurisdiction that has enacted a belt use law is known to have included this provision. However, in Ontario, Canada, only infants one year old or younger are exempted, and drivers are legally responsible for seeing that all other children up to age 16 use available seat belts unless they use a specially designed child restraint,” according to the study. (See *Status Report*, Vol. 10, No. 20, Dec. 10, 1975.)

BETTER PROTECTION

The study also emphasized that much greater crash protection could be provided in contemporary automobiles. “There have long been ways to design vehicles that better handle” both external and internal crash forces. “Unfortunately, vehicle manufacturers have not chosen to utilize these fully. For example, in crashes and in sudden braking situations, unrestrained infants riding on front seats commonly fly forward and hit the usually insufficiently padded lower areas of instrument panels.

“Not all interior structures routinely impacted by children in crashes are included in the relevant U.S. federal standard [FMVSS 201] currently in force providing for occupant protection in interior impact . . . ,” despite the agency’s intention, stated in 1967, to “proceed with the development of requirements to further reduce the impact hazard to the unrestrained child.”

Copies of the full report *Injuries to Children in Automobiles in Relation to Seating Location and Restraint Use* can be obtained by writing to “Injuries to Children in Automobiles,” Insurance Institute for Highway Safety, Watergate Six Hundred, Washington, D.C. 20037.

NHTSA: ‘Ford Control Arm Not Defective’

The National Highway Traffic Safety Administration has again maintained its position that the lower control arms used in the front suspensions of approximately 5.5 million 1965-1970 Ford Motor Co. cars are not defective. A lower control arm failure – more than 500 failures have been confirmed – can cause the front wheel to wrench out of place, forcing the driver to lose control.

In December 1973, the agency declared that the Ford lower control arms, which it had then been investigating for more than three years, were not defective. However, NHTSA decided to reopen its investigation after a March 1974 public meeting at which the Insurance Institute for Highway Safety, the Center for Auto Safety and an independent metallurgist, who had worked on a National Bureau of Standards study of the problem, submitted data and analyses questioning the agency’s declaration of “no defect.” (See *Status Report*, Vol. 9, No. 6, March 26, 1974.

Now, NHTSA Administrator James Gregory has stated that while “not all of the issues and information unanimously dictate a single conclusion” as to the Ford lower control arms, his review of “all the available information in this matter, both old and new,” yields “no basis for modifying my original decision” that no defect exists.

Addressing some of the points raised in 1974 by IIHS and others questioning the “no defect” finding, Gregory said that:

- The Ford lower control arm (LCA) failures do not constitute a “defect in performance” by definitions laid down by a federal court in another defect case. These definitions have no bearing because “LCA failure is associated with severe impact type driving events.” (See *Status Report*, Vol. 9, No. 13, July 8, 1974.)

The court had ruled in another case that a defect exists if a “significant number of failures” occur during normal use or result from “expected owner abuse.” IIHS presented evidence at the March 1974 public meeting showing even if the impact theory were valid, that such a theory does not dispel the fact that impact damage is a documented form of “expected owner abuse.” IIHS had cited as evidence a Ford report that showed the auto maker estimates that 55 percent of the cars it manufacturers are in damage-producing crashes each year. Another study, conducted by IIHS and State Farm, found evidence of impacts on more than 50 percent of all 1968 and 1969 cars.

- “Most failures examined by NHTSA and by Ford indicated evidence of significant impact damage. Further, a closer examination of the case file shows that each of the individual failures cited at the meeting as not having impact damage, had evidence of significant impacts,” Gregory said.

Both IIHS and the Center for Auto Safety had pointed out that during NHTSA’s investigation, in instances where agency investigators found failures without evidence of impact damage, NHTSA had deferred to Ford’s finding of impact damage on the same car.

Additionally, IIHS had pointed out that a series of high speed curb impact tests sponsored by NHTSA to substantiate its “severe impact” theory, did not produce any lower control arm failures.

- Comparisons of fatigue test data between standard lower control arms and reinforced components, used on police cars, “showed no significant differences,” according to Gregory.

In tests to determine fatigue thresholds of *standard* lower control arms, NHTSA contractors had used *reinforced* police car components. NHTSA claimed that those tests demonstrated the adequacy of the unreinforced standard arm as well. IIHS and others had said that NHTSA could not validly make such a claim.

- Lower control arms that had been dismantled and reassembled by Ford, and then used in NHTSA sponsored tests, “performed in a manner virtually identical to original assembly arms,” Gregory said.

IIHS and others had pointed out that results from tests using rebuilt components were invalid.

- Tests by Syracuse University and “a study of failure rate in highly corrosive areas discounted any significant contribution” of corrosion to the failure rate of Ford lower control arms, Gregory said.

IIHS and the Center for Auto Safety pointed out that NHTSA’s corrosion tests were performed on reinforced police arms and not the lower control arms used on civilian cars, which were supposed to be the subject of investigation. IIHS had also pointed out that the studies in corrosive areas were based on “failure report figures that both Ford and the Department of Transportation have indicated are grossly inadequate.”

NHTSA officials said that a detailed analysis of the defect case will be issued in the near future.

UPDATE . . .

CATALYTIC CONVERTER MEETING: The safety of catalytic converters will be examined at a National Highway Traffic Safety Administration public meeting scheduled for May 26, 1976. NHTSA previously opened a public docket to gather information on hazards posed by catalytic converters. In addition, NHTSA and the Environmental Protection Agency have considered, but never acted on, a proposal to require overheating warning lights for the devices. (See *Status Report*, Vol. 10, No. 19, Nov. 24, 1975.)

The purpose of the meeting is to gather “information and views on the susceptibility of catalytic converters to significant overheating and fires,” to be used in possible rulemaking, NHTSA said. Persons wishing to make presentations at the meeting should contact Robert Helmuth of NHTSA’s Office of Defect Investigations at (202) 462-2840. The meeting will be held in room 2230 of the Nassif Building, 400 Seventh St., S.W., Washington, D.C., from 9:30 a.m. to 5 p.m.

PRESIDENT SIGNS HIGHWAY BILL: President Ford has signed into law the Federal-aid Highway Act of 1975. The law prohibits the Department of Transportation from penalizing states that don’t have motorcycle helmet use laws. The full burden of enacting – or repealing – helmet laws now rests on the shoulders of state legislators.

Among other things, the law also calls on DOT to refrain from enforcing its other highway safety program standards for one year while the department studies the effect that the standards have had on highway losses. (See *Status Report*, Vol. 11, No. 6, April 12, 1976.)

Correction

The previous issue of *Status Report* (Vol. 11, No. 7) contained an article entitled, "How Air Bags and Seat Belts Complement Each Other." Table I of that article contained an arithmetic error in the number of injuries reported in front and front-angle crashes. The error changes the percentage given for the effectiveness of lap and shoulder belts. A corrected table is shown below.

TABLE 1
INJURIES (AIS \geq 2) BY TYPE OF CRASH AND BELT USE
TOWAWAY CRASHES OF 1973-75 MODEL CARS*

| | <u>FRONT AND FRONT-ANGLE CRASHES</u> | | | <u>SIDE, REAR AND ROLLOVER CRASHES</u> | | |
|--|--------------------------------------|-------------------|--|--|-------------------|--|
| | <u>Unbelted</u> | <u>Lap Belted</u> | <u>Lap and Shoulder Belted</u> | <u>Unbelted</u> | <u>Lap Belted</u> | <u>Lap and Shoulder Belted</u> |
| Percent Injured | 12 | 10 | 5 | 13 | 7 | 5 |
| Number of Occupants Involved | 3,514 | 964 | 1,456 | 2,544 | 851 | 1,429 |
| Percent Effectiveness of Lap Belt Only | = $\frac{12 - 10}{12} = 17\%$ | | | = $\frac{13 - 7}{13} = 46\%$ | | |
| Percent Effectiveness of Lap and Shoulder Belt | = $\frac{12 - 5}{12} = 58\%$ | | | = $\frac{13 - 5}{13} = 62\%$ | | |

IIHS, 1976

*Extracted from Table 3, p. 10 in Donald W. Reinfurt, Claudio Z. Silva, and Yosef Hochberg, "A Statistical Analysis of Seat Belt Effectiveness in 1973-75 Model Cars Involved in Towaway Crashes," University of North Carolina Highway Safety Research Center, October, 1975.

The error also changes the sentence in the article which reads, "Lap and shoulder belts in combination reduced severe injuries only *33 percent* in front and front-angle crashes compared to 62 percent in side, rear and rollover crashes." The corrected sentence should read, "Lap and shoulder belts in combination reduced severe injuries *58 percent* in front and front-angle crashes compared to 62 percent in side, rear and rollover crashes."

Leon Robertson, author of the study, said that the error does not change the conclusion that air bags and seat belts are complementary systems for occupant crash protection.

Court Critical Of 'Certification Acceptance' Plans

The Center for Auto Safety won an initial round in its court battle over "certification acceptance" – a Federal Highway Administration procedure by which state governments "certify" that their highway construction and hazard removal programs meet federal safety requirements. (See *Status Report*, Vol. 9, No. 22, Dec. 10, 1974.)

The U.S. District Court for the District of Columbia ruled that the regulations under which states can qualify for certification acceptance were improperly drawn up. Specifically, it found that the Federal Highway Administration repeatedly met with and sought the advice of representatives of the American Association of State Highway and Transportation Officials (AASHTO) in writing the regulations. The court ruled that AASHTO is an advisory committee as defined by the Federal Advisory Committee Act and that meetings between AASHTO and FHWA violated the "open meeting" provisions of that act in that they were not open to the public.

The court ordered that all future meetings between AASHTO and federal government agencies for the purposes of obtaining AASHTO's advice or recommendations comply with the provisions of the advisory committee act. The court did not – as CAS urged – overturn the certification acceptance regulations on the basis of these private meetings. The court noted that "the original regulations are no longer in effect and . . . the present regulations, while similar in a number of respects to the original version, are also envisioned as temporary . . ." by the agency.

An FHWA attorney told *Status Report* that the agency is considering an appeal of this decision.

CAS also asked that the court review FHWA's acceptance of Georgia's certification that its highway programs meet federal safety requirements. The center maintains that this was "a clear error of judgment" on FHWA's part. Georgia was the first state to make use of the certification acceptance plan.

The court agreed to review Georgia's certification acceptance and ordered both sides in the case to submit a timetable for submission of the agency record and for further arguments in regard to whether or not Georgia's plan meets federal requirements.

The case, *Center for Auto Safety v. Tiemann*, U.S. District Court for the District of Columbia (C.A. No. 74-1662), was decided April 28, 1976.

BMCS Asks Comments On 'Hours Of Service'

The Bureau of Motor Carrier Safety says it is thinking about changing "hours of service" rules for commercial truck and bus drivers. The bureau is also considering setting hours of service requirements for "mechanics, loaders and helpers employed by interstate motor carriers."

Current regulations, which apply only to truck and bus drivers in interstate commerce, specify that "a driver shall not drive for periods in excess of 10 hours following 8 consecutive hours off duty, or drive for any period after having been on duty 15 hours following 8 consecutive hours off duty. On duty time is limited to 60 hours in any 7 consecutive days, except that carriers operating every day of the week may permit drivers to remain on duty not more than 70 hours in any period of 8 consecutive days." These rules have not been substantially revised since they were established in 1962.

In recent years, the Bureau of Motor Carrier Safety has denied at least six petitions that sought to alter hours of service regulations. "Each petition was denied because of the absence of adequate data, facts and information upon which to justify the revisions sought," BMCS said.

Although "the problem of fatigue-related accidents has long been recognized, . . . little research has been attempted in the commercial vehicle field," BMCS said.

Before the end of this year the bureau plans to conclude a research program, started in 1971, dealing with "the relationship between fatigue, hours of service and commercial vehicle driver safety. The main objective is to identify the factors that cause driver fatigue and contribute to unsafe operations," it said.

To lay the groundwork for "major rulemaking" once the research is finished, the bureau has asked for public comment on current requirements and the desirability of changing them. The request for comments, along with an extensive list of questions that the bureau wants addressed, appeared in the *Federal Register*, Vol. 41, No. 30, Feb. 12, 1976. Comments are requested by July 30, 1976.

In This Issue

- | | |
|---|---|
| ● Child Injury Conditions Analyzed . . . Page 1 | ● Correction: Air Bags And Seat Belts . . . Page 5 |
| ● NHTSA: 'Ford Control Arm Not Defective' . . . Page 3 | ● Court Critical Of 'Certification Acceptance' Plans . . . Page 6 |
| ● Update: Catalytic Converters, Highway Bill . . . Page 4 | ● BMCS Asks Comments On 'Hours Of Service' . . . Page 6 |

(Contents may be republished, whole or in part, with attribution.)

the highway
loss reduction

STATUS REPORT

Editor: Tim Ayers

Writers: Ralph Hoar, Stephen Oesch, Christine Whittaker

Production: Diane Everitt, Hazel Zuchelli

INSURANCE INSTITUTE for HIGHWAY SAFETY

WATERGATE SIX HUNDRED • WASHINGTON, D.C. 20037

(AREA CODE 202-333-0770)

IIHS MASTER FILE COPY