

## Option Offered To Rollover Requirement

The National Highway Traffic Safety Administration has decided to give auto makers at least until 1977 to comply with rollover protection requirements of its passive restraint standard (FMVSS 208).

It has done so by allowing them, as an alternative to the rollover requirements, an option of complying instead with a newly announced "roof crush resistance" standard (FMVSS 216).

Some safety administration officials believe that by being allowed to substitute the new standard for rollover provisions in the passive restraint standard auto makers will be more willing to install passive restraints before the mandatory 1976 model year deadline.

Manufacturers had long complained that rollover requirements of the passive restraint standard would be difficult to meet. The standard (208) specifies that a test developed by Mercedes-Benz be used to test performance of passive restraints in rollover crashes.

Auto makers argue that the rollover test does not give repeatable results.

However, according to safety administration officials, the biggest problem actually facing the manufacturers is to meet the rollover requirement that no portion of a test dummy leave the vehicle during the rollover test. This new option will give auto makers "more time to work up ways to keep people from going out the window," one safety administration official said.

The new roof standard requires that a rigid test block move not more than five inches when applied downward against certain segments of a car's roof. The test is a static test in which pressure is applied gradually until it reaches a force of 1.5 times the weight of the car or 5,000 pounds, whichever is less.

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Under DOT contract, Lockheed-Georgia Co. performed a series of tests on roof structures using 1970 model Ford sedans and hardtops. In its final report to the safety administration the company noted that:

- "The average front seat occupant of representative passenger cars being manufactured at the present time has only a very few inches of headroom clearance in his normal seating position . . . . Permanent deformation values of no more than approximately three inches intrusion into the passenger compartment should be permitted." (The new standard allows roof deformation of at least five inches.)
- A dynamic test in which a car is dropped on its roof is a "more realistic test method" to demonstrate compliance with a safety standard. (The standard employs a static test.)
- Car roof structures should be able to withstand a force twice the car's curb weight. (The standard requires test forces of only 1.5 times the vehicle weight or 5,000 pounds.)

When asked why the report's recommendations were not followed, a safety administration engineer responded, "They do the research and can recommend whatever they want, but we have to set standards that are reasonable and practicable."

The standard makes no mention of the amount of space that must exist between the roof and the top of an occupant's head, either prior to or following the test, nor does it require any impact-attenuating performance in the ceiling of the car to reduce head and brain damage in rollovers.

A safety administration engineer said the agency decided not to specify certain amounts of headroom because such requirements would "discriminate against smaller cars." (Three separate studies conducted by Cornell Aeronautical Laboratory indicate that rollover is more common among small cars than among large cars. One of the studies, presented at the Twelfth Stapp Crash Conference in 1968, concluded that in rural areas, "The frequency of principal rollover was much greater among small cars than among larger cars . . . .")

In issuing the standard the safety administration said, "The roof crush standard will provide protection in rollover accidents by improving the integrity of the door, side window and windshield areas." The standard requires that all windows be closed during testing. However, it contains no provision to lessen the chance in a real world crash that windows would break, increasing the possibility that car occupants may be ejected or showered with shattered glass during a rollover crash.

### *Holiday Schedule*

Because of the Christmas and New Year holidays, Status Report will not be published January 3. Publication will resume Jan. 17, 1972, with Vol. 7, No. 1.

## Value Of Two Safety Devices Reported

Researchers at the University of North Carolina have found that lap safety belts and energy absorbing steering columns have resulted in substantial reductions in the frequency of seriously injured drivers in crashes.

Donald N. Levine and his colleagues at the Highway Safety Research Center, Chapel Hill, N.C., found that energy absorbing steering columns and lap belts together can reduce the frequency of serious injury to drivers in crashes about 52 per cent. The researchers did not report on the effectiveness of shoulder harnesses.

They arrived at their conclusions by comparing North Carolina crash data during 1966 and 1968, as reported by police, by grouping the crashes into four mutually exclusive categories — (1) cars without energy absorbing steering columns in which drivers were not wearing lap belts; (2) cars without energy absorbing steering columns in which drivers were wearing lap belts; (3) cars with energy absorbing steering columns in which drivers were not wearing lap belts, and (4) cars with energy absorbing steering columns in which drivers were wearing lap belts. The researchers then compared driver injury experience between each group.

**STEERING COLUMNS:** Energy absorbing steering columns were found to be most effective "at medium speeds (30-49 miles per hour), to a much lesser degree at high speeds (50 miles per hour and above) and even less so at low speeds (29 miles per hour and below)," they reported.

Their report explained that, "In lower speed crashes the force levels may not be great enough for the energy absorbing systems to make much difference (in injuries); that is, the non-energy absorbing wheel may suffice in most instances when low speed crashes are considered. On the other hand, in higher speed crashes the forces may be so great that even presence of an energy absorbing system often cannot help materially."

(Energy absorbing steering columns are often erroneously called "collapsible." If the steering column actually "collapsed" in a crash it would lose its potential for absorbing energy. However, by yielding under crash forces in a controlled fashion, the energy absorbing device reduces those forces.

(To explain the lessened effectiveness at lower and higher speeds an analogy can be made between the energy absorbing steering column and a firenet. If a person jumps from a very low height into a firenet the net may make little difference, since little or no injury could be expected to result from a jump of such a short distance — even without a net. Should the jump occur from an extremely great height, the net may prove less than fully effective in reducing injury because it "bottoms out," allowing the person to impact the sidewalk before forces produced in the jump are completely absorbed by the net — a "bottoming out" effect that can occur when an energy absorbing steering column is impacted in a high speed crash. At intermediate heights, the net's effectiveness would be at a maximum.)

The researchers found that the energy absorbing system is most effective for medium speed frontal crashes and car-ran-off-the-road crashes. They estimated these reductions in frequency of serious and fatal driver injury:

- For All Types Of Crashes — An average reduction of 14 per cent at all speeds, and of 27 per cent at medium speeds.
- For Front-End Crashes — An average reduction of 14 per cent at all speeds, and of 30 per cent at medium speeds.
- For Ran-Of-The-Road Crashes — An average reduction of 14 per cent at all speeds, and of 35 per cent at medium speeds.

Energy absorbing steering systems were introduced in 1967 model passenger cars produced by American Motors, Chrysler and General Motors. Ford began making them available in 1968 model cars. It has been estimated that some 300,000 drivers died needlessly on spear-like steering columns before auto makers switched to the energy absorbing devices.

**LAP BELTS:** The researchers also reported finding, among drivers who were wearing safety lap belts, "a reduction of 30-40 per cent below the level (of injury) sustained by unbelted drivers" in frontal crashes at medium speeds.

The researchers concluded that lap belts are effective in reducing the frequency of serious and fatal injuries for all speeds and in particular at high speeds. They also concluded that the belts are effective in reducing serious and fatal injuries in front, rear, car-ran-off-the-road and other crashes.

Based on the North Carolina crash sample tabulations, the lap belts reduced serious and fatal injuries by 43 per cent in all crash modes at all speeds and, more importantly, by 49 per cent for all high speed crashes considered separately. The researchers also gave these examples of serious and fatal driver injury reductions:

- For Front-End Crashes — 32 per cent at all speeds, 40 per cent at high speeds;
- For Rear-End Crashes — 58 per cent at all speeds (high speed crash results for rear-end impacts were not tabulated separately);
- For Ran-Off-The-Road Crashes — 49 per cent at all speeds, 54 per cent for high speeds.

The study was partially financed by the North Carolina Governor's Highway Safety Program and by the Insurance Institute for Highway Safety. Inquiries as to availability of the report, entitled "Effectiveness of Lap Seat Belts and Energy Absorbing Steering Systems in the Reduction of Injuries," should be addressed to The University of North Carolina, Highway Safety Research Center, Chapel Hill, N.C. 27514.

## California Seeks Shield Against Preemption

California has asked the U. S. Congress to allow the state to keep its own bumper law even if the Congress passes legislation giving the Department of Transportation authority to promulgate property loss reduction standards on a national scale.

In a joint resolution of its legislature, the state petitioned the Congress to "recognize and give full faith and credit to the motor vehicle property damage standards provided by California law . . . ."

The California law requires that, beginning Sept. 1, 1973, all new passenger cars sold or registered in the state be equipped with bumper systems that protect them from "any property damage" in five mile per hour test crashes front and rear into a standard test barrier. (See Status Report, Vol. 6, No. 15, Aug. 16, 1971.)

Legislation that has passed the U. S. Senate (S. 976) and is currently under consideration in the House (H. R. 11627) would forbid any state from having a "property loss reduction standard which is not identical" to a federal standard, unless the Secretary of Transportation determined that a "more stringent" state standard should be allowed because of "conditions peculiar to that state."

According to a Senate Commerce Committee staff member, the legislation passed by the Senate "meets them (California) half way" by allowing a state to petition DOT for authority to issue its own more stringent standards. A staff member of the House Commerce Committee, which recently concluded hearings on the bill, said the California petition will "be given very serious consideration" when the committee begins its work on the final committee version of the bill. The House Committee, chaired by Rep. John E. Moss (D-Calif.), is "very concerned" about preempting the state role in loss reduction, the staff member said.

## **Fuel Spills In Crashes Studied**

Fuel tank leakage was found in 15 out of 200 injury-causing crashes by a Cornell Aeronautical Laboratory study — a seven per cent frequency rate which may be low, CAL conceded, but which causes major consequences when fires result.

The CAL study, sponsored by the National Highway Traffic Safety Administration, involved test crashes of 11 instrumented cars against barriers, plus analysis of damage to 1,438 vehicles involved in injury-producing highway crashes.

Reporting the work in its Research Trends, CAL said that the number of crashes studied so far is not sufficient to determine whether federal motor vehicle safety standards covering fuel system integrity are adequate. The report added, however, that "improvements can come about only through a consideration of the entire fuel system — fuel tank location, fuel line, electrical system and exhaust routing, and surrounding structure configuration . . . ."

The report said "one of the surprises" found was that, in the studied crashes, cars with mid-chassis tanks filled from the left developed leaks more often than did vehicles with rear tanks filled from the rear (10 per cent versus 7 per cent). The researchers found that fuel leakage was not always caused by fuel tank perforations. "In numerous accidents, the cap to the fuel filler-pipe flies off and the gasoline sloshes out, often a quart or more," they said.

The CAL report added that "the danger of a gas leak is greatest . . . when your car is struck in the area where the gas tank's filler-pipe is located. For example, if your tank is in the rear of your car, filled from the back, the chances you'll develop a fuel leak are 3 per cent if you're hit head-on hard enough to cause injury . . . and 26 per cent if you're hit with equal force from the rear."

## **NHTSA Seeks Ban Of Unsafe Tires**

The National Highway Traffic Safety Administration has proposed a ban on the sale of all substandard tires that are now being sold with designations as "unsafe for highway use." The action follows several attempts by the agency to halt illicit sales of such tires for highway use.

Since 1968 tire manufacturers have been allowed to mark substandard tires (tires which are not certified as complying with FMVSS 109) with "off-highway" or "farm use only" designations. Such tires were intended to be limited to use in off-the-road low speed operations. However, according to the safety administration, "Despite manufacturers' repeatedly stated intentions of restricting the sale of these tires to off-road vehicles, the tires have continued to be sold for use on public highways in many parts of the United States."

More than 80,000 such tires were distributed by tire manufacturers since Dec. 1, 1970, according to safety administration figures. That quantity is "a much higher number than was believed necessary to satisfy the off-road market. There is no effective method available to insure that these tires are not used on the nation's highways" short of banning their sale, the agency says.

The difficulty arises because "the tires in question appear to be the same as passenger car tires but are sold at a lower cost. For this reason they are easily sold for use on passenger cars to purchasers who either are unconcerned about the tires' safety, believe false claims that the warning labels are purely a formality and can be safely ignored, or are unaware of the potential danger because the warning labels have been removed," the agency said in proposing that the tires be banned from sale altogether.

The safety administration has settled out of court with two tire distributors for selling substandard tires. The agency is currently investigating several other tire distributors for illegal sale of the tires, according to a spokesman.

In letters sent earlier this year, safety administrator Douglas Toms appealed to the governor of each state to use "whatever administrative procedures" possible to prevent "unscrupulous distributors and dealers" from selling substandard tires.

Comments on the proposed ban should be sent to the Docket Section, National Highway Traffic Safety Administration, Room 5221, 400 Seventh Street, S.W., Washington, D.C. 20590, prior to Dec. 30, 1971.

## **Loss Reduction Film Available**

The Insurance Information Institute has produced a 13.5 minute color film urging that "life-saving technology" be taken "off the shelf" and put "where it belongs — into our cars and highways."

The film, entitled "Too High A Price," outlines "a multi-billion dollar problem and points to possible solutions" through improved automobile and highway design, according to III.

The film is available for loan at no charge from Associated Sterling Films, 866 Third Avenue, New York, N. Y. 10022. Purchase information on the film is available from III offices in most major cities.

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