

MOTOR VEHICLE MANUFACTURERS ASSOCIATION  
of the United States, Inc.

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November 3, 1980

Dr. Robert L. Hess, Director  
Highway Safety Research Institute  
The University of Michigan  
2901 Baxter Road  
Ann Arbor, Michigan 48109

Dear Dr. Hess:

Subject: Critique of Utility Vehicle Research Report

An MVMA panel of safety, research and methodology experts, representing the major light truck and utility vehicle manufacturers, has prepared the enclosed critique of the UM/HSRI Report No. UM-HSRI-80-14, "On-Road Crash Experience of Utility Vehicles," published in April 1980.

The critique expresses the panel members' concern regarding the quality and the biases of the study. There is no intent to infer that utility vehicles do not have different stability characteristics than general use passenger vehicles.

I'm certain that HSRI wants to assure the highest quality in its research programs. Your review of the panel's concerns regarding this study would be appreciated.

Very truly yours,

  
Paul F. Allmendinger  
Vice President  
Technical Affairs Division

Encl.

# MVMA Light Truck Accident Panel

## Comments

### "On-Road Crash Experience of Utility Vehicles"

UM/HSRI

(UM-HSRI-80-14)

The MVMA Light Truck Accident Panel has reviewed the report "On-Road Crash Experience of Utility Vehicles" published by the University of Michigan Highway Safety Research Institute which was prepared for and sponsored by the Insurance Institute for Highway Safety. The Panel consists of resident safety, research and methodology specialists, representing major manufacturers from the light truck industry.

The Panel believes that direct comparison of utility vehicle crash experience with passenger car crash experience is inappropriate since such a comparison tends to obscure the necessary distinction between the design and use of a passenger car and the design and use of a utility vehicle.

Utility vehicles are distinctly different from passenger cars and therefore should be expected to behave differently than passenger cars, just as other classes of vehicles like heavy trucks or motorcycles behave differently than passenger cars.

Utility vehicles are a distinct class of vehicles designed for use both on rough terrain and on public highways (a fact acknowledged by the authors, P. 133). To achieve both uses, varying design requirements influence the characteristics of utility vehicles. The very features that provide the desired utility in off-road use--high ground clearance, short wheelbase, and narrow overall width--preclude the possibility of providing the same magnitude of handling and stability on the highway that is typical of a passenger car. This tradeoff is apparent in the appearance of utility vehicles.

To imply that utility vehicles are somehow deficient because they don't behave like passenger cars, as this report does, is to deny the very distinction that gives them utility.

In addition to the direct comparison between utility vehicles and passenger cars, the Panel expressed concerns about the selection of the data sources, the thoroughness of the analysis, the accuracy of the findings and conclusions, and the gratuitous opinions throughout the report. Careful analysis of the report leads to the conclusion that it lacks scientific exactitude and objectivity.

The Scope and Objective section of the report defines the intent of the study in terms that are unassailably scientific, objective, and for the most part appropriate. It further states that the study "has been limited to on-road collisions involving utility vehicles only." It is distressing therefore to find that the report contains off-road collision data and numerous unsupported opinions that reveal an apparent bias against utility vehicles. Typical of this bias is the opinion offered on the top of page 134, "It is misleading to depict utility vehicles as suitable for highway use unless they have the same handling and stability characteristics as other vehicles." Other vehicles suitable for highway use have a very wide range of stability characteristics ranging from sports cars to heavy duty trucks with high centers of gravity. It is safe to assume that utility vehicles have better "handling and stability characteristics" than loaded trucks but will never be able to approach the characteristics of sports cars. Therefore, the opinion quoted is meaningless, as well as gratuitous.

The MVMA is concerned that, once having decided to compare utility vehicles with passenger cars, the report did not present a completely fair comparison. Despite some subtle disclaimers, the report tends to generalize from analysis that is, in some cases, inappropriate or erroneous. MVMA is accustomed to seeing a higher degree of objectivity and technical rigor in work produced by the HSRI, and was therefore disappointed upon review of the subject report. The following are some specific examples selected to demonstrate why the MVMA is disappointed. In some cases the examples are not significant to the results of the report but are given in the hope that the reader will understand the reason for the MVMA's disappointment with the lack of technical rigor in the report.

#### Accident Data Sources

As will be explained in more detail below, several of the data sources cited and used in the analysis, such as the military accident data, product liability cases, and the police-reported data, are likely to contain biases that affect the analysis, lack rigorous scientific investigation, and/or are of questionable relevance to

the "on-road" crash experience of utility vehicles. It also appears that the report partially relies upon historical data which include off-road use, in spite of the statement that "the focus of this study has been limited to on-road collisions involving utility vehicles only." Our specific comments are as follows:

- o Military Accident Experience. It appears that the military data include off-road accidents dating back as far as 1944. These antiquated data are irrelevant to the on-road performance of today's utility vehicles.
- o Product Liability Review. These cases represent allegations made by advocates for interested parties and may not be objective, factual accident data. Some of the data presented are beyond the stated scope of the project, i.e., cases involving vehicles not in the study population, stated to be limited to on-road accidents. The report further offers the unsubstantiated opinion that the 111 cases (representing 3 years of case reports) "...undoubtedly considerably underrepresent the actual nationwide incidence of the lawsuits involving utility vehicles" (pp. 26-30).
- o Mass Accident Data. Police-reported state accident files are generally recognized by researchers to have limitations in their use which are not acknowledged nor identified in the report. Because utility vehicles are by nature more rugged and better suited to traverse rough terrain than are other vehicles, it is possible that utility vehicles are involved in many accidents of less severity that are not reported to the police. Passenger cars in similar accident situations would be more likely to be reported because of more severe damage and/or assistance required to extricate the vehicles. This difference would be especially prevalent in single-vehicle accidents. This possible under-reporting of total comparable accident circumstances might account for some of the apparent over-involvement of utility vehicles in more accidents of a severe nature compared to passenger cars. Also, using the police-reported KABCO scale to identify "serious (disabling) injury" has not proven to be a reliable method of accurately reporting the severity of injuries (p.55). Although the report uses this injury rating system in the analysis, it later acknowledges that "...all other data files (except CPIR) coded only overall injury--and often inaccurately" (p. 108).

## Data Analysis

Some of the analysis of the data was incomplete. In several cases the data appeared not to have been fully analyzed, or the analysis was not fully explained. Examples include the following:

- o Exposure to Risk. The report points out that the road and driver characteristics are markedly different for utility vehicle accidents vs. passenger car accidents. Utility vehicle accidents tend to occur in rural, snow and ice covered roadways and involve young male drivers. The report makes no effort to normalize the data to control for these characteristics even though some of them may have a significant influence on accident experience. Once differences in these characteristics (which have been shown in other studies to influence injury risk) have been identified, a thorough analysis should account for these characteristics to determine injury and fatality rates properly reflective of vehicle differences (pp. 58-71).
- o Rollover Rates. The report omitted analysis results which significantly lessen the rollover rate differences between passenger cars and utility vehicles. For example, on page 111 it presents 1977 Fatal Accident Reporting System (FARS) data indicating that 29% of the utility vehicle fatal crashes involve rollovers (as a first event) compared to 6% for passenger cars. There is a footnote indicating that the 1978 FARS data show a 45% rollover frequency attributable to coding rollovers which occur at any point in the accident sequence in the 1978 data. However, the report fails to point out that the corresponding passenger car percentage from the 1978 FARS data is 24%. Further analysis of the data also shows that for a certain category of passenger cars (1968 and later model year small cars) the rollover rates in fatal accidents approach and sometimes exceed the utility vehicle rollover rate (12% to 46%). Included in these rollover statistics are some sports cars with low centers of gravity (c.g.'s). This tends to indicate that rollover may not be solely attributable to a high c.g., as the report leads one to believe, but rather to other exposure-to-risk factors such as road conditions.
- o Utility Vehicle Fatality Frequencies. It appears that many of the fatality figures do not represent strictly the fatal injuries to occupants of the subject vehicles but rather involvement of the vehicle in a fatal accident. This results in including pedestrian accidents, bicycle accidents, and those accidents in which the fatality occurred in another vehicle. The result is a distorted fatality frequency and a distorted fatality rate for the utility vehicle (pp. 50-51).

o Data Inconsistent with Stated Study Population. Although the report carefully identifies the study population of vehicles at the outset, the listing (p. 19) is frequently ignored in the analysis by including those makes and models of utility vehicles stated to be specifically excluded. For example, on page 73, the report states that "Jeeps (sic) are shown to be involved in over one-half of the accidents." The accident data used to support this statement (Appendix G) include Willys vehicles, military units, Jeep Wagoneers and "station wagons" and Jeep postal service vehicles, all of which had been excluded from the study population. Over one-third of the vehicles in the case listing in Appendix G are these non-study vehicles.

o Off-Road vs. On-Road. The report states the project objective to be the study of the "on-road" crash experience of utility vehicles (pp. ii, iii, 2, 4); however, the definition of "road" has not been made clear, with the result that the data analyzed are not limited strictly to what might normally be called on-road accidents. In addition to the previously mentioned off-road experience of military vehicles and litigation cases cited in the report, it appears that several of the police-reported accident cases cited may also have occurred off-road, e.g., "accident occurred on mountain road" (page 76); "speeding down undeveloped road" (page H-4); and "collision with forklift" (page H-4). Since these appear to be off-road accidents that were included in the analysis, it is not clear how many other similar off-road cases are included in the state files and subsequently the report analysis. In addition, an entire section (5.8.3) is devoted to off-road use and injury experiences of utility vehicles. The accidents reported therein have little relevance to the stated purpose of the report.

### Statements, Findings, and Conclusions

Many of the findings and statements made in the report are misleading or speculative or, in some instances, erroneous. The following are cited as examples:

o Page 148, "...among those vehicles with a smaller stability envelope, the tire side forces may be sufficient to initiate the overturn..." --This statement is not supported by the data presented in this study.

Page 148, "rollover occurred in about 30% of U.S. fatal crashes involving utility vehicles...only 6 percent of all U.S. fatal passenger car crashes." --Corresponding 1978 FARS data show these figures to be 45% and 24% respectively. The primary reason for the discrepancy from 1977 to 1978 is the method used to code rollover data. In 1977, rollover was coded only if associated with the first harmful event. In 1978, rollover was coded regardless of when the rollover occurred during the accident sequence. In addition, the 1978 FARS data show that passenger car rollover rates vary, further reducing the difference between the utility vehicle rate and some passenger cars.

Page 149, "rollover protection...is inadequate as the rollbar frequently collapses..." --Statement is speculative and is not based on statistical analysis of the data but rather on what would appear to be an extremely low number of isolated cases. From the photographic analysis (pp. 81-99), in only one of the fifteen rollover cases was there any evidence of rollbar "collapse" -- following a 20 foot vertical drop (figure 4.4.2-4). Furthermore, collapse in itself does not reflect inadequate rollbar protection. Such collapse may assist in controlling or dissipating the forces of the crash.

Page 149, "the likelihood of (disabling) injury is about twice as great in utility vehicles as in passenger cars, for all occupants and for drivers, based on Michigan and Washington data." --Police-reported data are not reliable as a source for distinguishing serious/disabling injuries from other injuries, as the report itself acknowledges (see page 108).

Page 150, "of the 20 Federal Motor Vehicle Safety Standards (Numbers 201-219), only six apply to utility vehicles in their entirety." --This statement and one similar to it on page iv of the Executive Summary are inaccurate and misleading. In this sequence of safety standards there are only 18 standards (e.g. FMVSS 215 was replaced by FMR 581 effective 9/1/78) and three of these 18 standards do not pertain to the issue (e.g. FMVSS 213, Child Seating Systems, FMVSS 217 Bus Window Retention and Release and FMVSS 218 Motorcycle Helmets). There are actually 34 Federal Standards applicable to passenger cars, 26 to MPVs and 25 to trucks (utility vehicles can be classified as either MPVs or trucks).

- o Page 147, "utility vehicle drivers involved in crashes generally are younger and more often male than their counterparts in passenger cars." --These factors, although acknowledged, were not included in the statistical analyses, comparing utility vehicles with passenger cars. They should have been included to permit a valid conclusion about the relative accident performance of the vehicles in the study.
  
- o Page 80-89, Photographic Analysis--Many of the descriptive statements accompanying the accident photographs bear little relation to the accident under consideration. In other instances, significant items should have been noted but were not. For example, on page 81, first figure, the occupant was ejected through the door window with the roof structure holding up. That this ejection mode is not unique to utility vehicles but is often seen with unrestrained occupants of all vehicles is very important to placing this event in proper perspective. On page 89, it is not clear why it was significant that the subject Blazer had no rollbar. Further, the level of head injury sustained in the Blazer is not untypical of head injuries seen in similar passenger car accident situations. A similar comment is appropriate for the figure on page 90.

#### Brief Summary

The report's direct comparison of two distinctly different types of vehicles is inappropriately handled. In addition, there are concerns about the selection and treatment of the data sources, the thoroughness of the analysis, the accuracy of the findings and conclusions, and the gratuitous opinions throughout the report. Careful analysis of the report leads to the conclusion that it lacks scientific exactitude and objectivity.